Installation instruction for Graf EPro wastewater treatment system

EPro15 Domestic

EPro18 Commercial

Home Sewage Systems

The points described in these instructions must be observed under all circumstances. All warranty rights are invalid in the event of non-observance. Separate installation instructions and manuals are enclosed in the control cabinet.

Missing instructions must be requested from us immediately.
The tank must be checked for any damage prior to installation under all circumstances.

Missing instructions can be downloaded on www.graf.info or can be requested from GRAF AU.

Separate instructions for start-up, operation and maintenance of the system supplied in control cabinet.

Contents

1. General

- The installation of the tank must follow the directions in the enclosed installation instructions. These instructions also contain further information on the installation conditions for the tanks and how to connect up the inlet and outlet lines.

- During the operation of a wastewater treatment system some odour can arise. The location of the wastewater treatment system should be situated away from living areas (patio, windows on buildings, etc.).

- The treatment system needs ventilation so that air blown into the tank by the compressor, can escape together with gases without causing any problems. The ventilation lines must be arranged such as to allow natural ventilation (flue effect). The vent outlet height should be as high as possible (more than 3 m recommended). Additional ventilation lines or ventilation openings must be fitted if necessary.
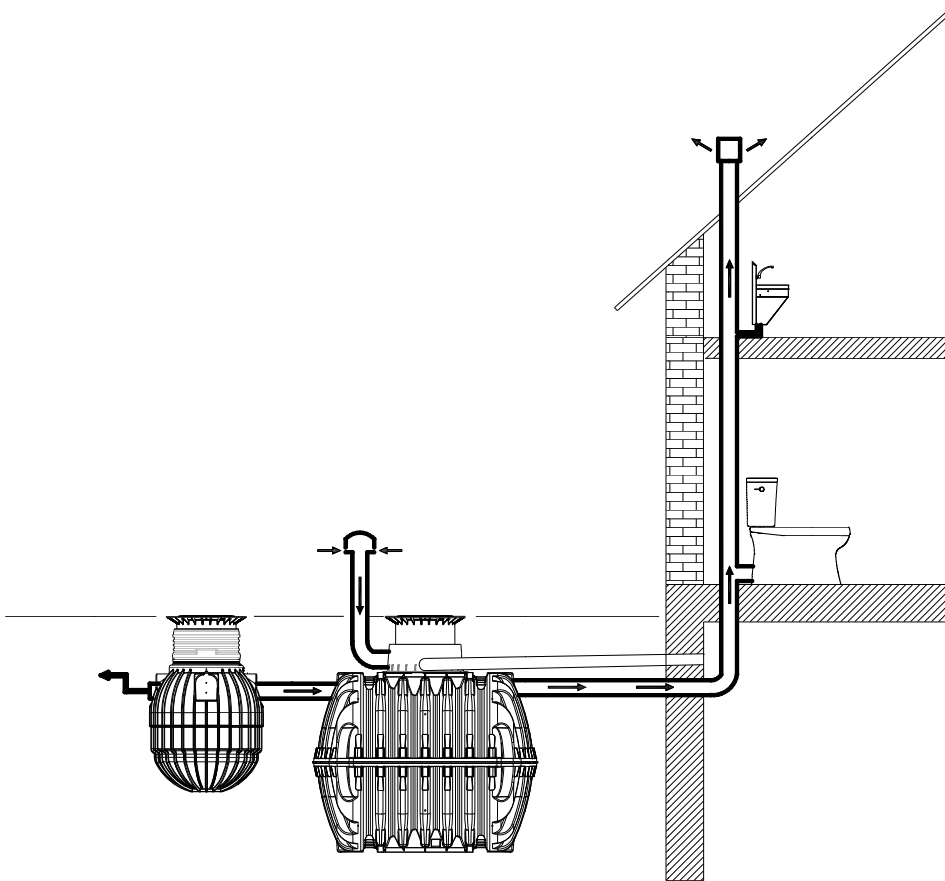
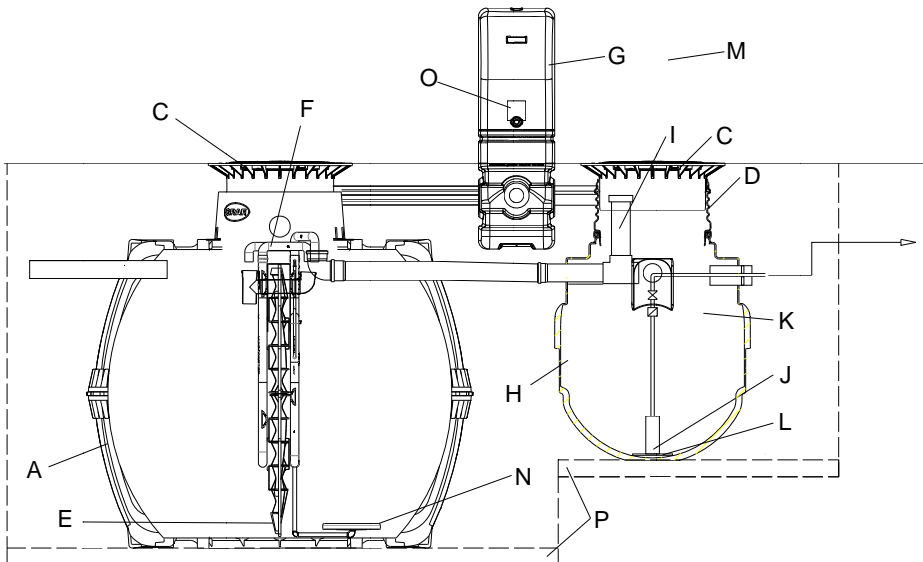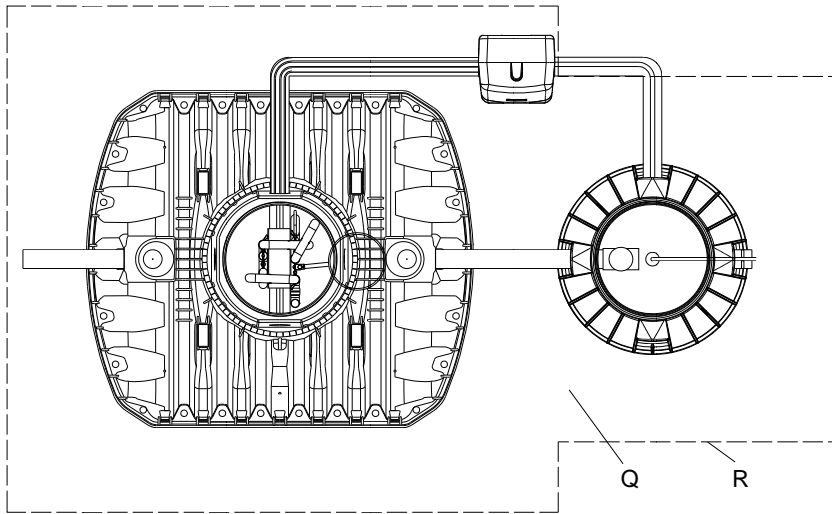Ventilation with seepage or an obstructed drain

2. Dimensions
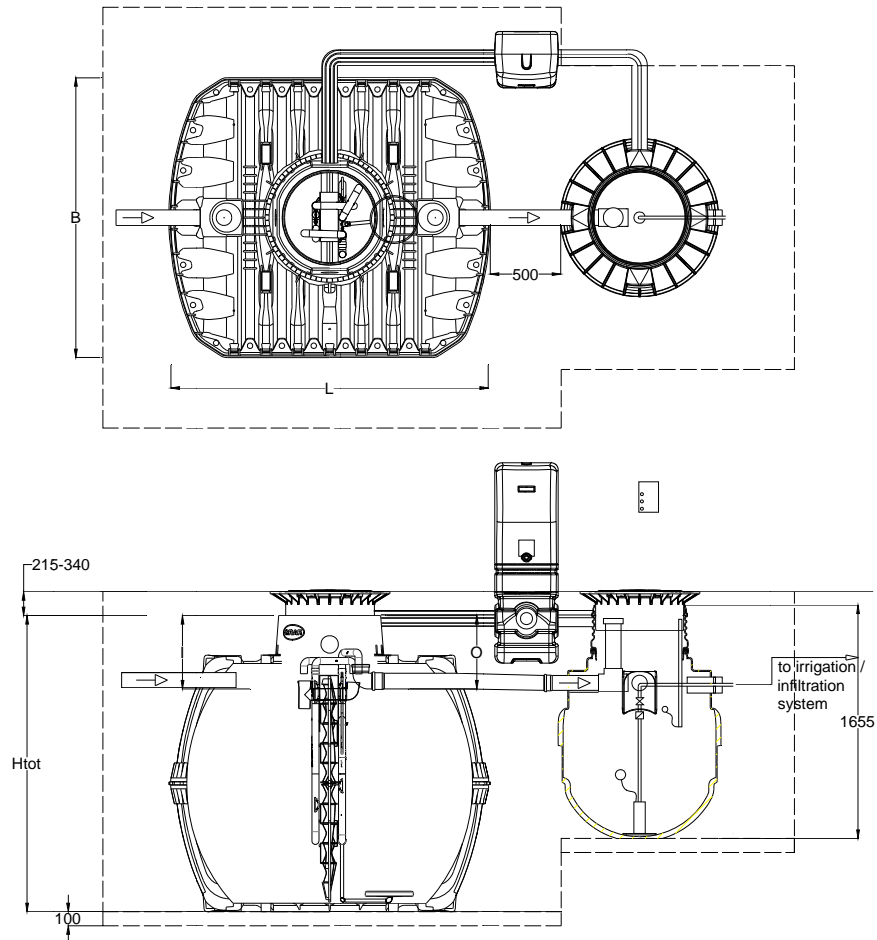
		Epro15 Domestic	Epro18 Commercial
Tank		4800 L	6500 L
PE		**10**	**10**
Max. hydraulic load		**1500 L/d**	**1800 L/d**
Length	L	2280 mm	2390 mm
Width	B	1985 mm	2190 mm
Height	H_{tot}		
Inlet	I		
Outlet	A		595 mm

3. System design

A	Carat Tank	J	Irrigation Pump
B	Tank Dome Mini	K	Highlevel Alarm Float
C	Tele Lid Mini	L	Pump Platform
D	Riser Extension	M	Internal Alarm Plate
E	Baffle	N	Air Diffusor
F	Air Lift / Aeration	O	Cabinet Ventilation Fan
G	Outdoor Cabinet Poly	P	100 mm Compacted Base Material
H	Pump Well 900 l	Q	Approved Backfill
I	Chlorine Tablet Feeder	R	Excavation

3. System design

EPro15 systems are available in 4 different versions:

<u>EPro15 One</u>

with chlorination and effluent pump in additional Sapphire 900 L tank

<u>EPro15 Two</u>

with effluent pump in additional Sapphire 900 L tank

<u>EPro15 Three</u>

w/o additional tank. Outflow free slope.

<u>EPro15 Three +O</u>

according to EPro15 Three, but with additional effluent pump inside the treatment plant
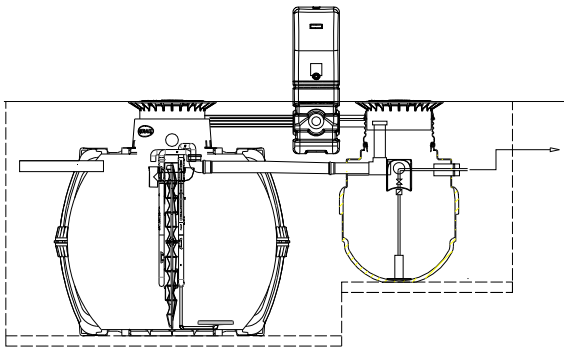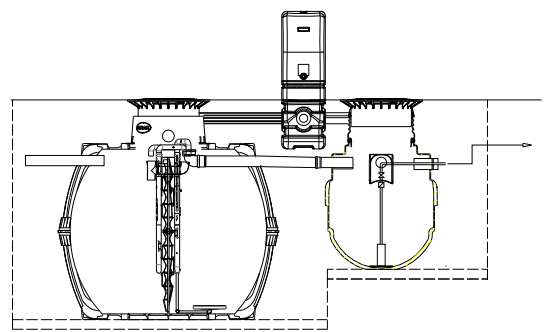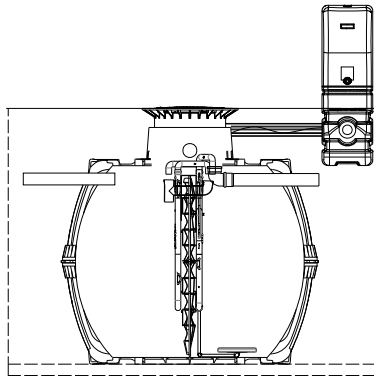
Figure 1: Epro15 One

Figure 2: Epro15 Two

Figure 1: Epro15 Three

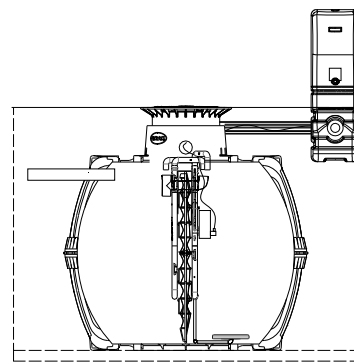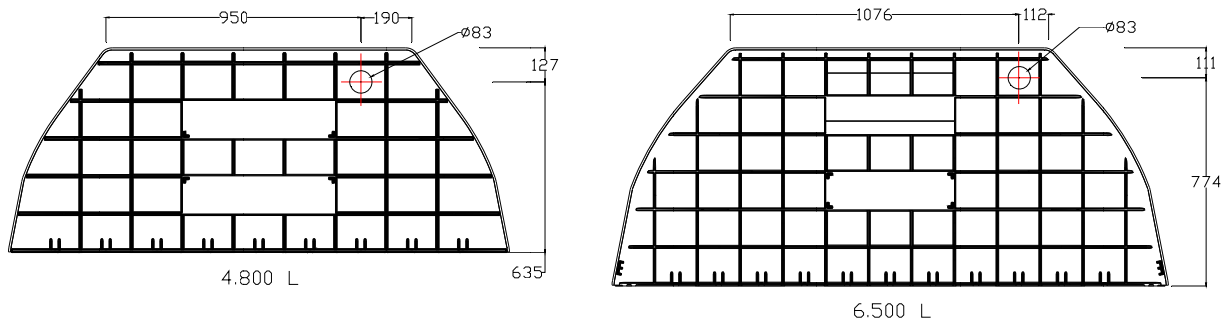Figure 2: Epro15 Three +O
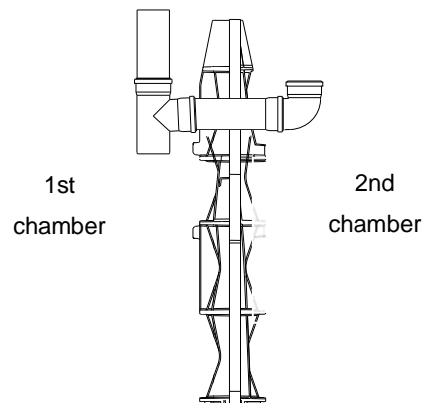
4. Assembly of tank components

Carat S tank has to be installed according to instruction manual. Before installing the baffle drill a hole in the top part of the baffle for emergency overflow.

4.1 Emergency overflow

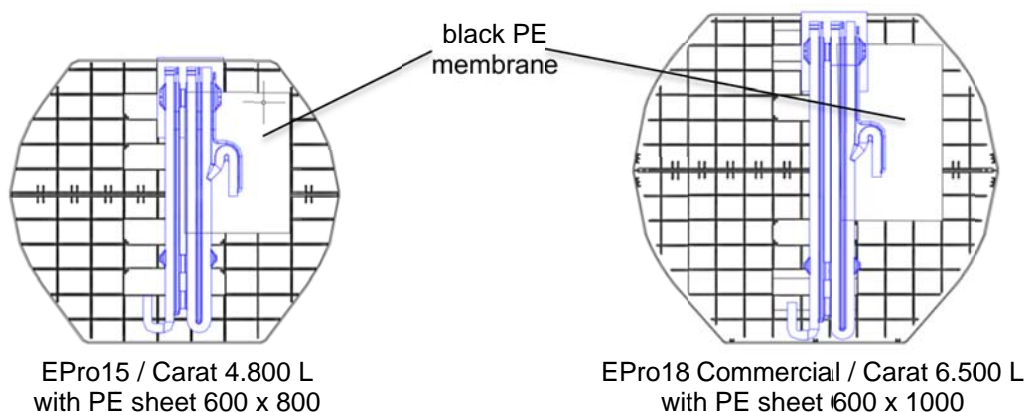- Drill hole with diameter 83 mm in the top part of baffle as shown in drawing:

- Put in DN70 seal and PVC-fittings as shown in drawing:
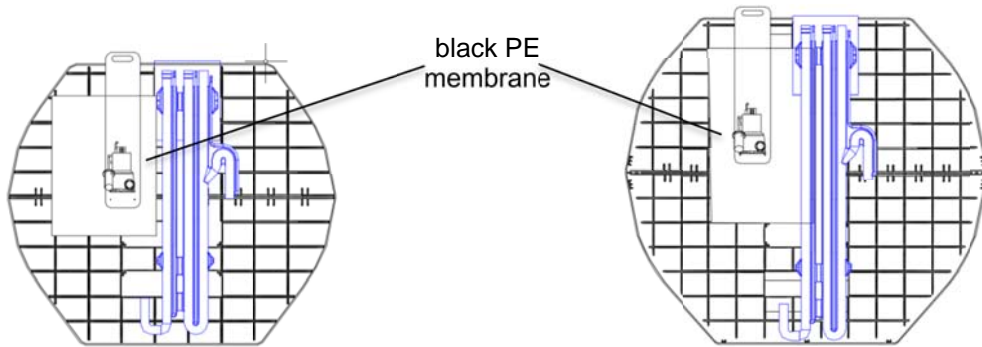

1st chamber   2nd chamber

4.2 Assembling PE-membrane

The black PE membrane supplied is screwed on to the baffle (2nd chamber side) with 6 self-drilling screws (3.5x13 mm). The corresponding washers should be used. The membrane prevents sludge which settles on the baffle from being drawn in by the clear water lifter. During the subsequent mounting of the installation kit, ensure that the outlet side is on the side where the PE membrane is fitted.
The exact position of the membrane is shown in the drawing.

black PE membrane

EPro15 / Carat 4.800 L
with PE sheet 600 x 800

EPro18 Commercial / Carat 6.500 L
with PE sheet 600 x 1000

4. Assembly of tank components


black PE membrane

EPro15 Three +O / Carat 4.800 L
with PE sheet 600 x 800

EPro18 Commercial +O / Carat 6.500 L
with PE sheet 600 x 1000

4.3 Holes for In- / Outflow

Holes for DN 100 inlet and drain pipes are to be drilled in all tanks and fitted with GRAF DN 100 edge seals. A core drill (Ø 124 mm) is required for drilling.

The height of the hole on the end faces of the tank can be found in the table below.
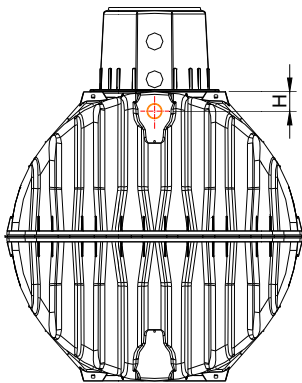
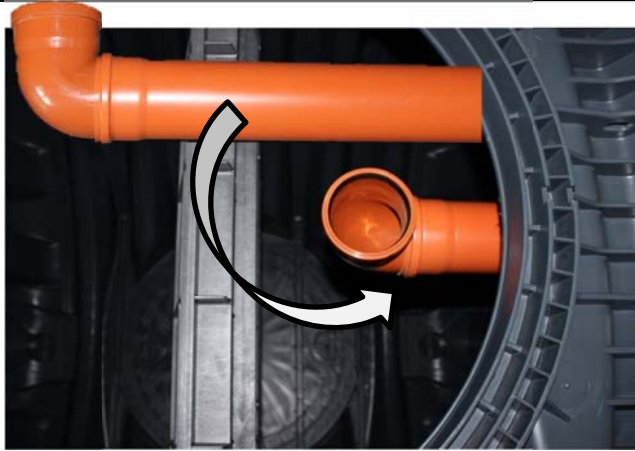| Tank	2700 L	3750 L	4800 L	6500 L
Height	140 mm	150 mm	230 mm	250 mm

5. Installation set-up kit

5.1 Installation of the outflow pipe

Drain pipe (pipe DN 110 (pipe and bow can be grey instead orange)) is installed from the inside to the outside.	For fixing drain pipe, DN 100 pipe clamp, threaded stud and two nuts are required.
For fastening the threaded rod, drill with a 9 mm drill through the tank.	The pipe is fixed by threaded bolt and pipe clamp.

5.2 Installation aeration unit

Screw together stainless steel pipes. All connections are to be sealed using Teflon tape. Tighten the plastic diffuser hand-tight	Do not allow water to enter the ventilation system!

By Epro18 Commercial, the two disc aerators are connected to the downpipe with a Y-piece.	

5.3   Installation of the aeration unit to the set-up kit

The stainless steel downpipe is inserted into the clamps provided between the excess sludge lifter and the clear water lifter.

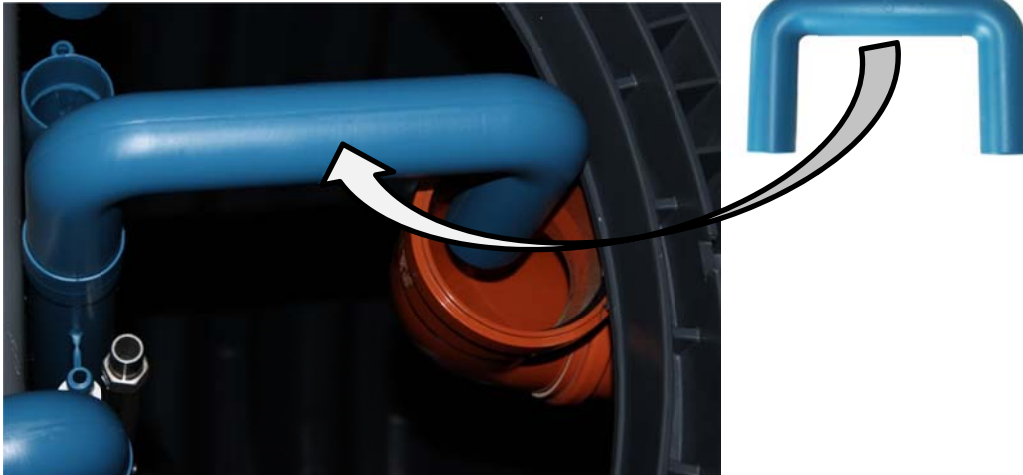By snapping - a clearly audible click sounds.

5.4 Inserting/Installation set-up kit

Set-up kit has to be set on the middle of the baffle. Disc aerator must be installed on side of outflow.

5.5 Installation of drain (U Bend)

The U-bend is placed on the clear water lifter. The outflow of the U-bend must lead into the drain pipe.
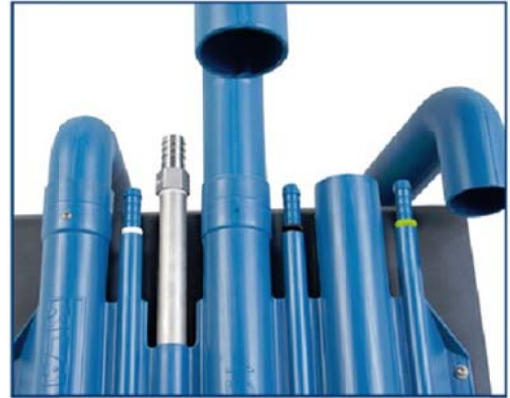
5.6 Fixing set-up kit and sleeve connections
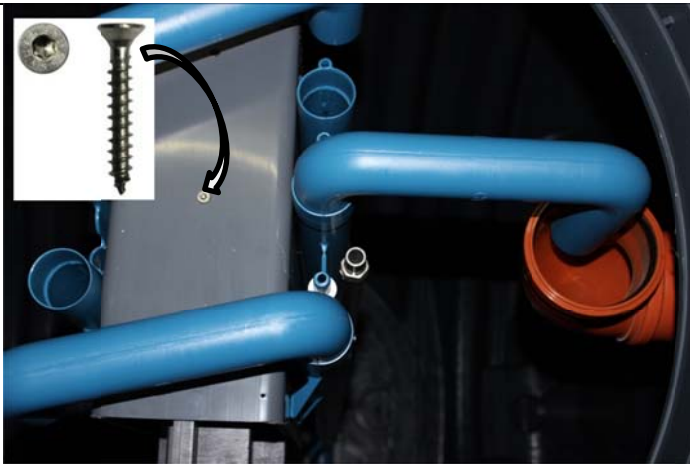
Set-up kit is fixed with a screw on the baffle.	All loose pipe connections must be fixed with drilling screws.

5.7 Air hose connection
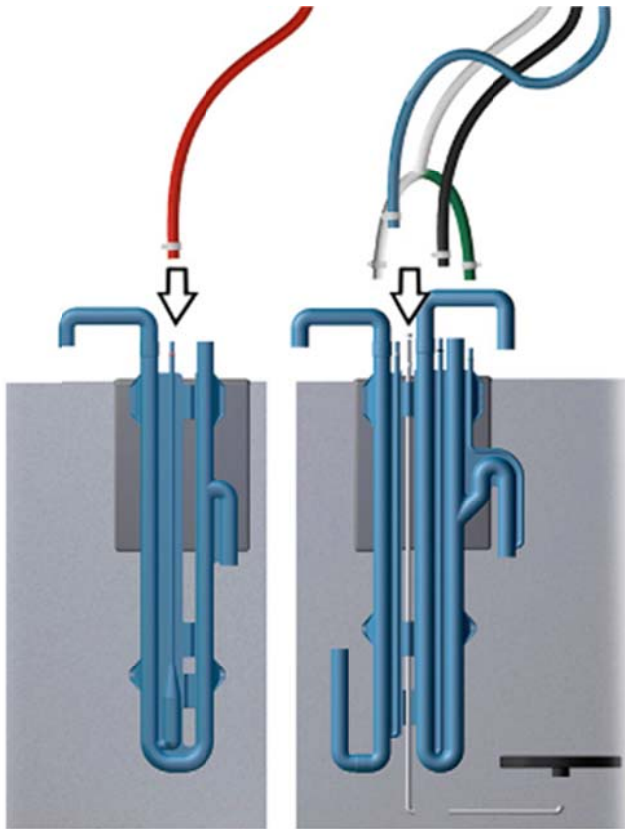
Colored marking at the EPro set-up-kit

Air hoses have to be drawn through the empty pipe. Colored hoses have to be connected and fixed with hose clamps according to color-coded grommets on the set-up kit.

The blue hose Ø19 mm must be connected to the stainless steel downpipe. There is no color marking.

	The green air hose is used for the patented air barrier. The discharge of suspended solids is enormous reduced for the first critical flushing surge.	

5.8   Components of Sapphire disinfection (as option) and pump-out tank

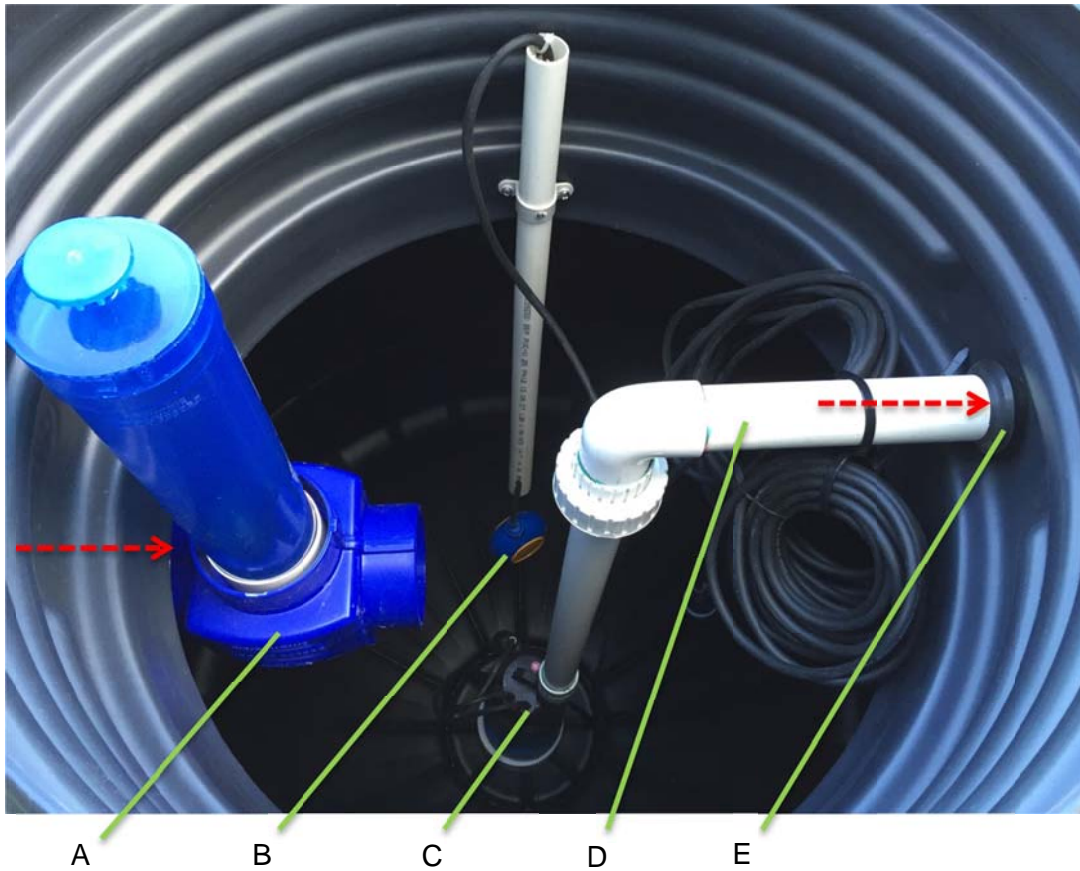| A	Chlorine Tablet Feeder	D	Pressure Pipe 40 mm
B	High Water Level Alarm Float	E	Lip Seal DN50
C	Irrigation Pump		

6. Assembly of switch cabinet

6.1 Components
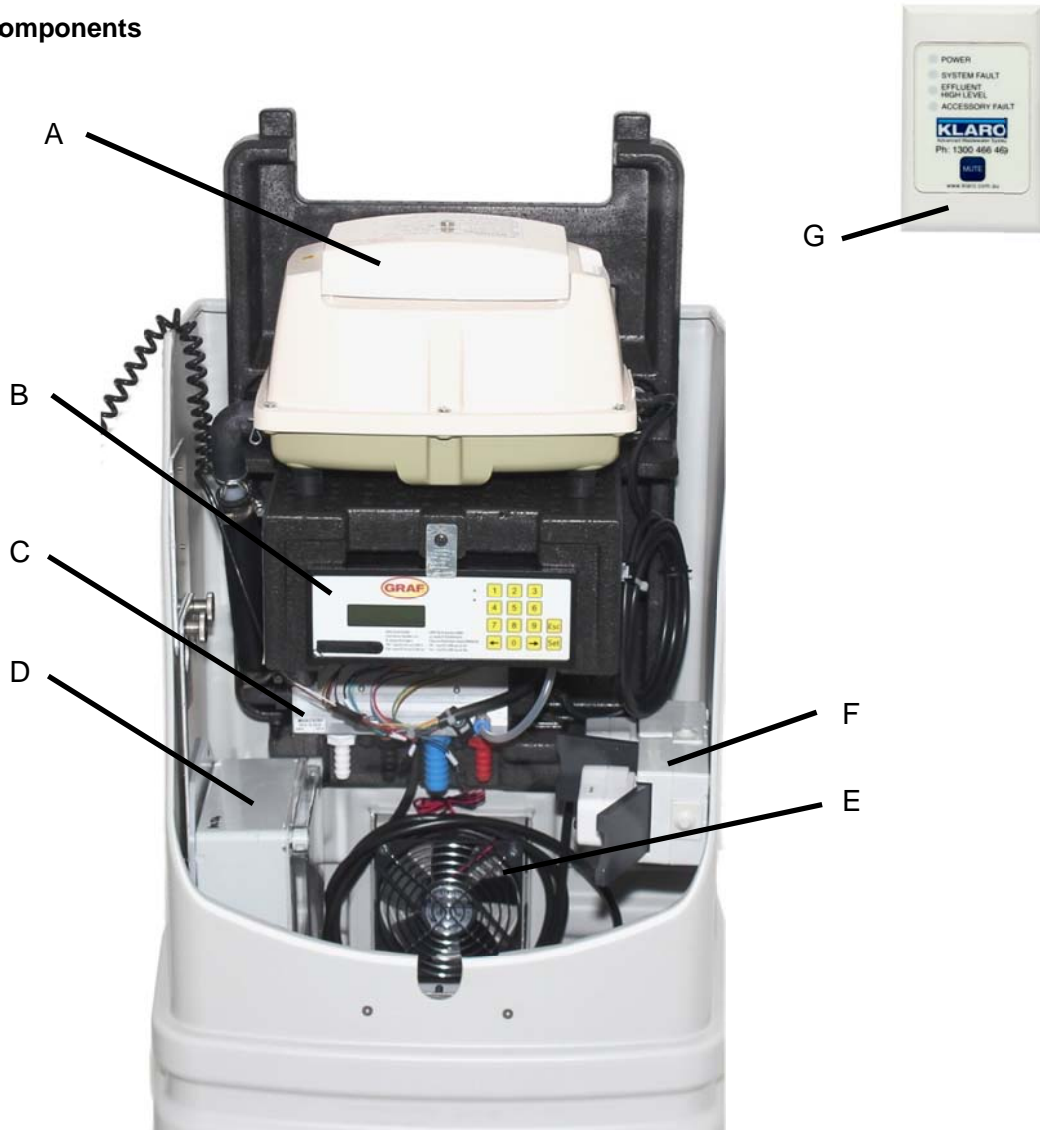
A	Piston Air Compressor	E	Cooling Fan
B	Control Unit KL24plus	F	Power Supply
C	Manifold with Step Motor Valves	G	Remote Alarm Plate
D	Auxiliar Alarm Unit		Alarm LED (not figured)

6.2 Assembly and installation

- Find proper location for the cabinet:

    o Close to the treatment tanks. Mind given length of air hoses (5 meter) and cables

    o Shady as possible

6. Assembly of switch cabinet

Graf plastic exterior cabinet for EPro15
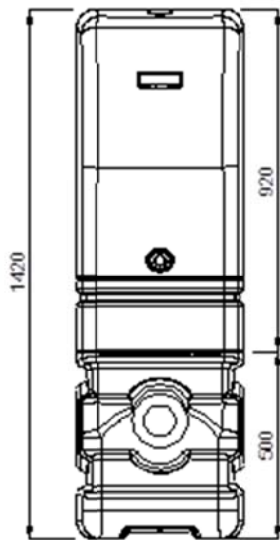
Excavations:

Length approx. 400 mm

Width approx. 450 mm

Depth approx. 500 mm

Conduit pipe:

Plastic cabinet for EPro18 Commercial

- Assemble bottom part and fix to top part according to instructions included

Excavatiions:

Length approx 585 mm

Width approx 315 mm

Depth approx 600–640 mm

Conduit pipe:

6. Assembly of switch cabinet

Graf plastic exterior cabinet for EPro15

Electric cable:
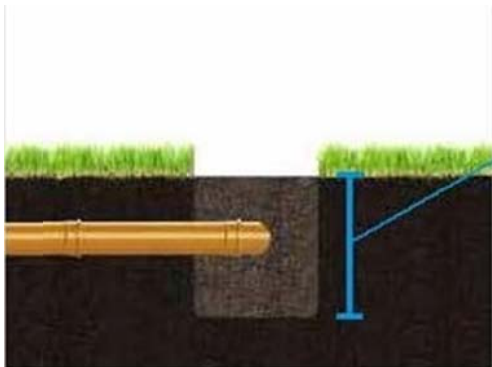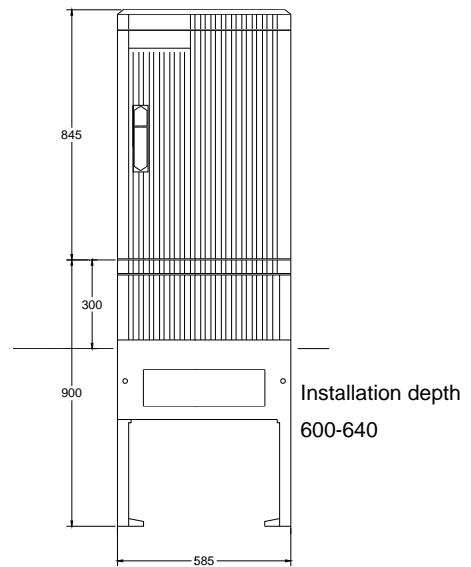

Illustration only: Must comply with all Australian Electrical standards

Filling up:

- Make sure cabinet stands levelled and upright before filling up the pit

- Use only material that is free from rock to prevent the cabinet from damage

Plastic cabinet for EPro18 Commercial

Electric cable:

Can go directly into the cabinet
through open bottom

Filling up:

- Make sure cabinet stands levelled and upright before filling up the pit

- Filling up the inside of bottom part with filling granulate (GRAF 107607). The granulate reduces humidity coming from soil which can lead to corriosion damage in long run. The granulate does not need to be replaced.

6.3 Air hose connection

- Pull the air hoses through the conduit pipe (100mm DWV PVC). Make sure hoses are not kinked.

- Seal the conduit pipe to prevent any gases from transfering from treatment tank into the cabinet and causing corrosion. Use one GRAF sealing cap at the cabinet side ant the second one to seal also the other end (tank side) of conduit pipe.

Insert the hoses from the thin side of the sealing cap

Push the hoses through the thin top layer. A plug of material remains stuck in the end of the hose.

Cut off the end of the hose to remove this plug.

Push the sealing cap into the conduit pipe to seal it tightly.

- Connect the hoses at both ends according their colour code:

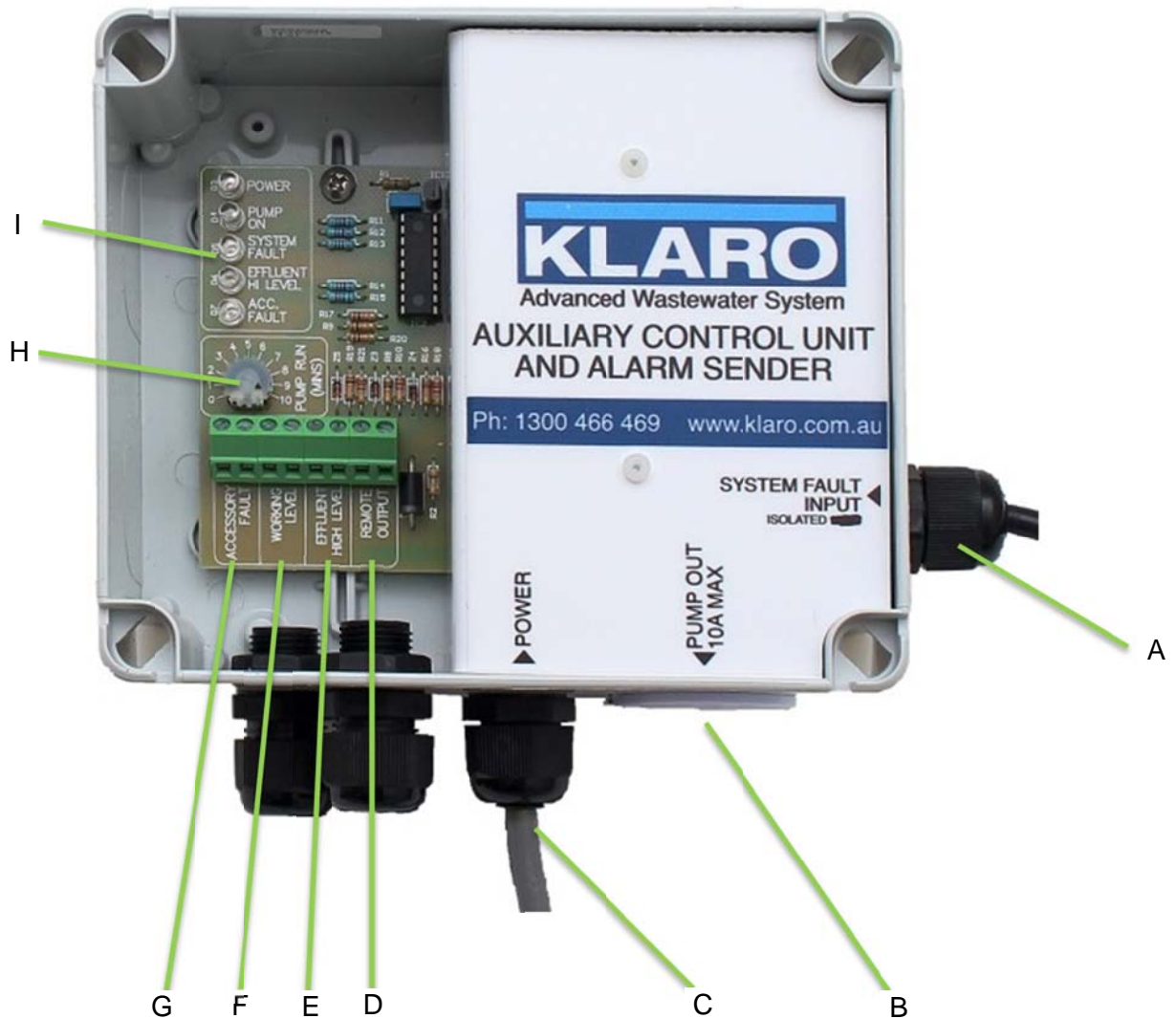|		
Charging air lifter (red)	→	**red hose**, 13mm
Aeration (stainless steel)	→	**blue hose**, 19mm
Discharging air lifter (black)	→	**black hose**, 13mm
Sludge return air lifter (white)	→	**white hose**, 13mm

6.4   Auxiliary controller

A	System Fault Input from KL24plus	F	Workload (option for additional float)
B	Power output for irrigation pump	G	Accessory Fault (option for additional alarm input)
C	Power Input	H	Pump Run, set to 10 min
D	Remote Output for Alarm Plate	I	Status LEDs
E	Effluent High Level / working for float switch		

- Auxiliary Alarm Unit must be installed inside the EPro Control Cabinet
- Connect "System Fault Input" (A) with alarm output plug "X1.5" of KL24plus control unit
- Connect irrigation pump to "Power Output" (B)
- Connect high-water-level / pump working level float (E))
- "Pump Run" (H) shall be set on maximum (10 min)
- Connect External Alarm Plate to "Remote Output" (D)
- Put the Power Plug (C) into the cabinets' power supply
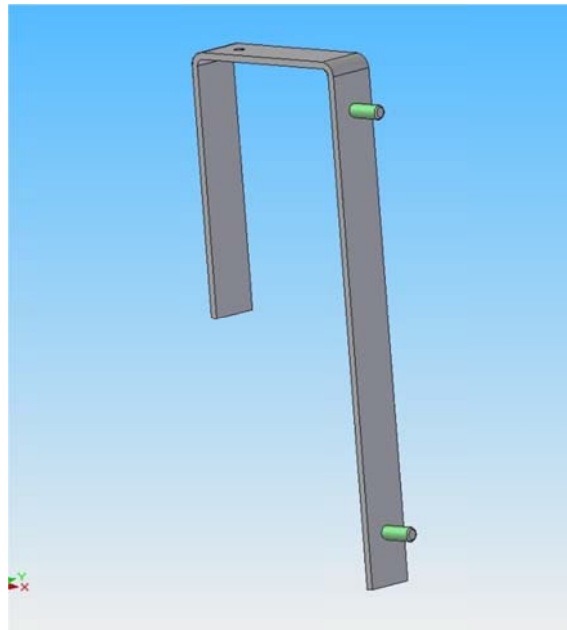
front   back
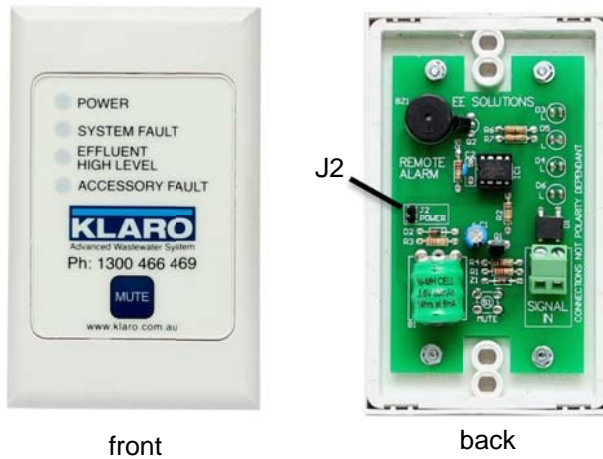
Remote alarm plate

- The 2 core connecting cable should be run in a separate conduit to the system power supply to avoid possible interference
- Install Remote Alarm Plate at a place where operator can easily hear and see it
- To activate the alarm, move the Power Bridge "J2" on the back from one pin to bridge two pins, before mounting alarm plate to the wall

7. Clear Water Pump Module (as option)

baffle height

+ XXX mm
min. level when
float switch off

560 mm
480 mm

Concrete, 10 EP

Carat 4800, 10 EP
Carat 6500, 10 EP
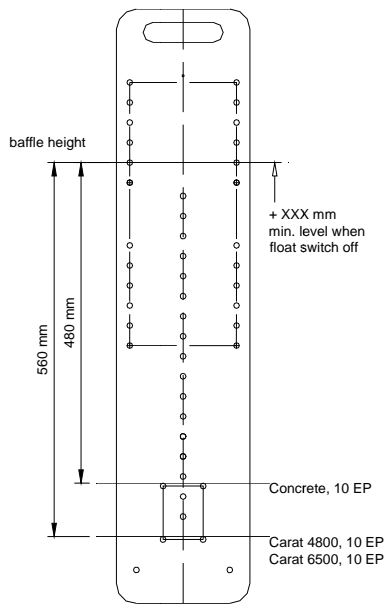
The brackets should be set with due consideration of the switch-off point of the pump used.

7.1 Select the right clip for the pump

4 pipe clips: 100-106 mm • 108-116 mm • 124-132 mm • 157-162 mm

7.2 Mounting the brackets

7.3 Strain relief

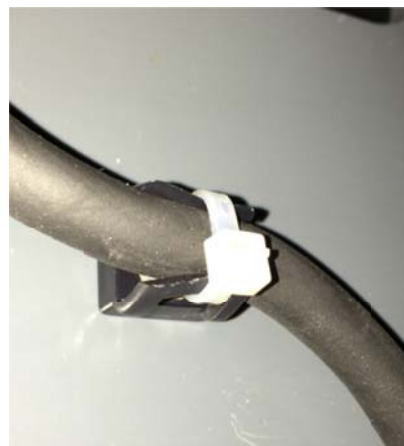## 7.4   Lower pump socket and clip mounting
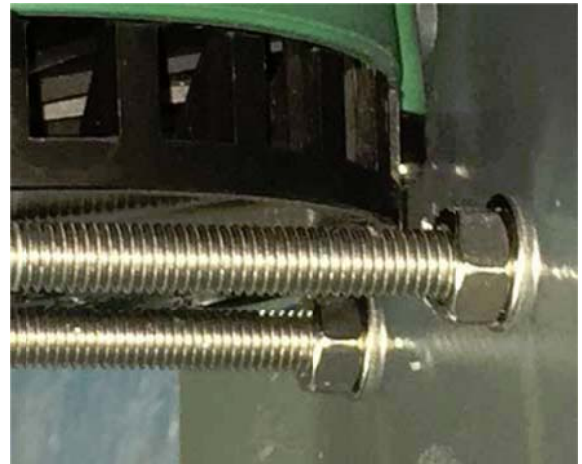
7.5   Installation in the tank

The clear water module is hung up on the partition baffle.

7.6 Electrical connection for clear water pump up to 2A

Pumps that takes maximum 2 Ampere can connected directly to the control system using a 3-pin plug connector and screwed on with both screws on the left and on the right.

7.7 Electrical connection for clear water pump more than 2A (maximum 6A)
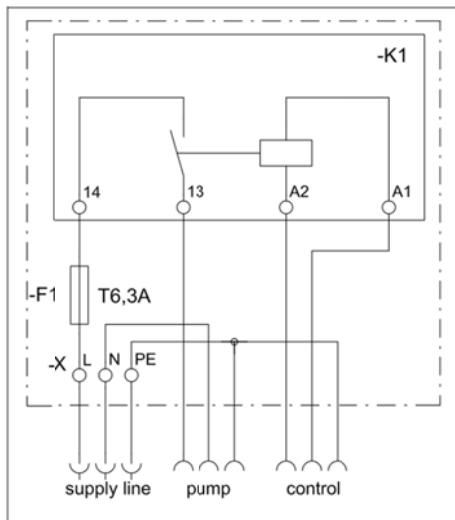
Pump is connected to the plug-in coupling using an EU-AU adaptor. The cable which is pulled out with the green 3-pin plug connector is plugged directly into the control system (X3) and screwed on with both screws on the left and on the right. The black EU power plug needs to plugged into the free socket of the cabinet.

7. Clear Water Pump Module (as option)

7.8   Programming the control unit

For running a submersible clear water pump, we are using the control unit's UV power outlet and UV setting.

Program settings in the Service Menu need to be changed for T09, T10, T11 and UV:

Time		Explanation	Valve	EPro15	EPro18 Com.
T 1	[min]	charging	1		
T 2	[min]	*Deniphase*			
T 3	[min]	*off*	2		
T 4	[sek]	*on*			
T 5	[min]	Aeration			
T 6	[min]	on	2		
T 7	[min]	off			
T 8	[min]	Sedimentation			
T 9	[min]	Discharging		12	12
T 10	[min]	on	3	0	0
T 11	[min]	off		1	1
T 12	[sec]	Sludge return	4		
T 13	[min]	break of cycle - off			
T 14	[min]	break of cycle- on	2		
T 15	[min]	Holiday - on			
T 16	[min]	Holiday - off			
T 17	[min]	total cycle time		shall be less than 360!	
T 18	[min]	total aeration time			
T 19	[min]	Total running time			
Duty cycle UV module				**12**	**12**

T-settings can be found in menu "duration period setup" and UV-settings in "UV-light unit setup".

For extending the standard pump time, enlarge T 09 and UV-time. Caution: Check T 17. Total cycle time must be less than 360 minutes!

Software Jumper

Set Software-Jumper 8 = 0.

The clear water pump can be operated in manual mode, see menu - UV module.

8.   Commissioning

- Finish all installation work described in this installation instruction
- Fill up the treatment tank with fresh water; otherwise no test run and system check are possible. You can stop filling up when water level is approx. 20 cm below bottom of outlet pipe
- Connect electric cable to Power Supply – double socket (licensed electrican only!)
- Plug in the power plug of the Auxiliary Alarm Controller into the GPO.
- Plug in power plug comming from control unit into Power supply. The control unit of an Epro15 will then start automatically. At Epro18 Commercial, you have to turn main switch to position "I". If the system goes on alarm and shows "Set Date and Time", you can quit the alarm by pressing ESC two times. Then you should enter the correct date and time in the control units' Operation Area.
- Go to "manual operation" in Operation Area and test all valves and the cooling fan. Turn them on by pressing "1" button and off by "0" button. You should always turn the previous off before jumping to the next. See if all air lifts are working and aeration on valve 2 shows fine bubbles. Finally leave "manual operation" with ESC.
- The cabinet is then ready to operate and will count down in "cyclepause" until the start of its first treatment cycle
- Find more information in "Start-up, operation and maintenance manual" inside the cabinet. Especially read the dos and don'ts.

9. Notes

www.graf.info

GRAF