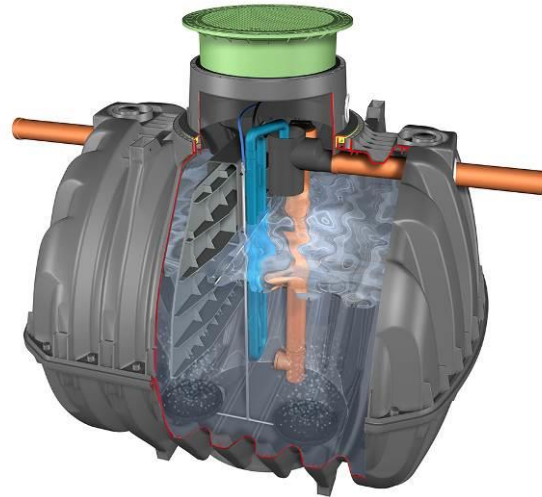


Installation instruction for GRAF Eclean One wastewater treatment system

EClean One

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.

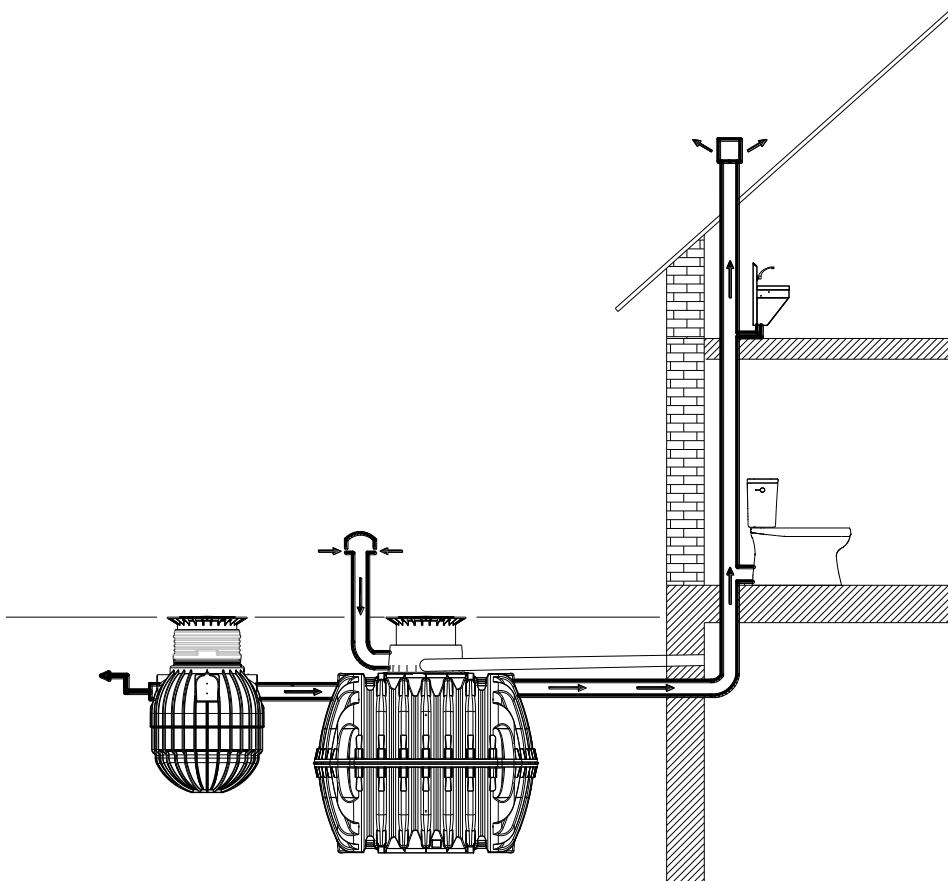
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1. General

1. General

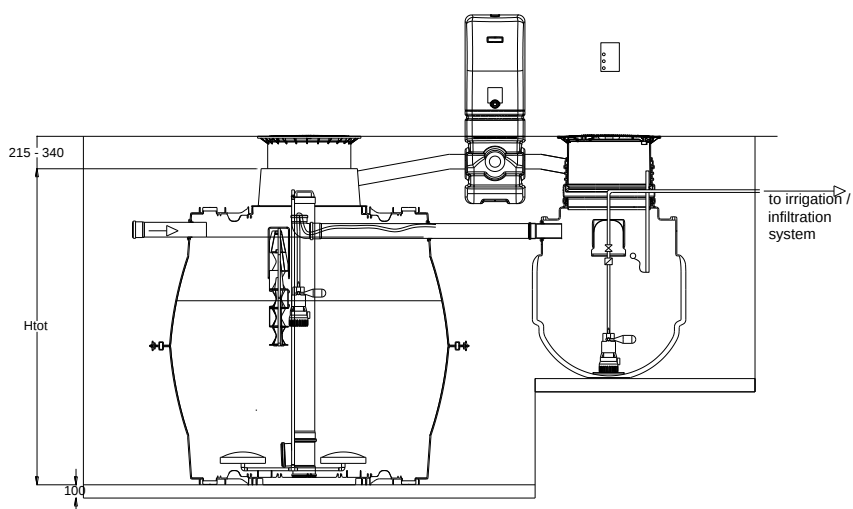
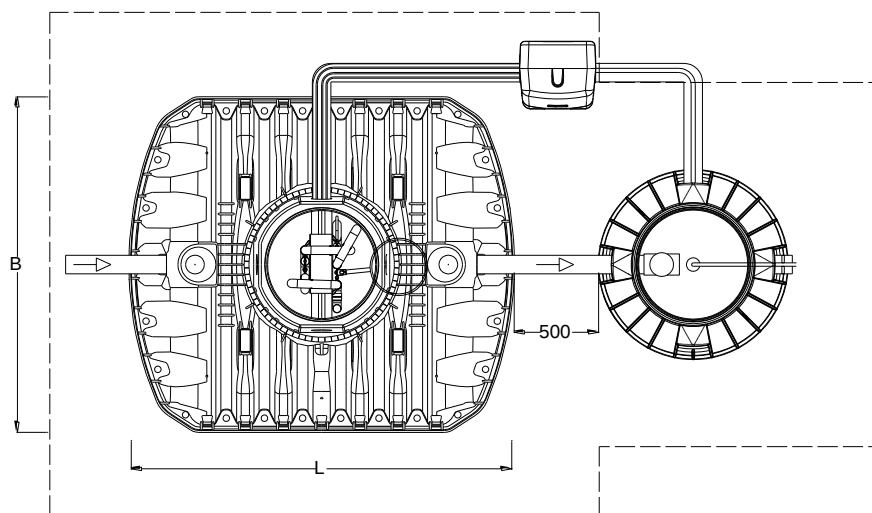
- The installation of the tank must follow the directions in the enclosed installation instructions. These instructions also contain further information on the installation conditions for the tanks and how to connect up the inlet and outlet lines.
- During the operation of a wastewater treatment system some odor 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

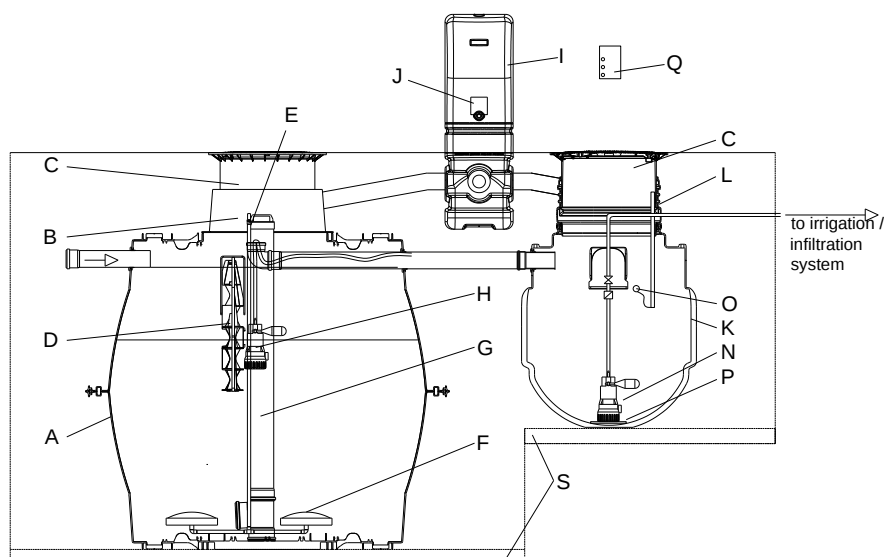
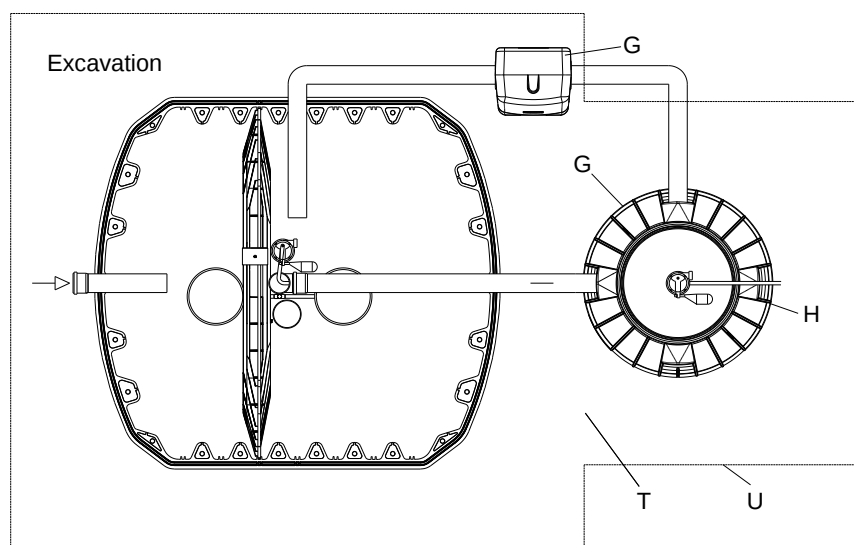
2. Dimensions



		Eclean20 ONE
Tank		6500 L
PE		10
Max. hydraulic load		1500 L/d
Length	L	2390 mm
Width	B	2190 mm
Height	H _{tot}	
Inlet	I	
Outlet	A	595 mm

3. System design

3. System design



A	Carat Tank 6500l	K	Pump Well 900l
B	Tank dome mini	L	Riser Extension
C	Tele lid mini	N	Irrigation Pump
D	Half-Baffle	O	Highlevel Alarm Float
E	Aeration	P	Pump Platform
F	Air Diffusor	Q	Internal Alarm Plate (optional)
G	De-sludging Pipe	S	100 mm Compacted Base Material
H	Discharging Pump	T	Approved Backfill
I	Outdoor Cabinet Poly	U	Excavation
J	Cabinet Ventilation Fan		

4. Assembly of tank components

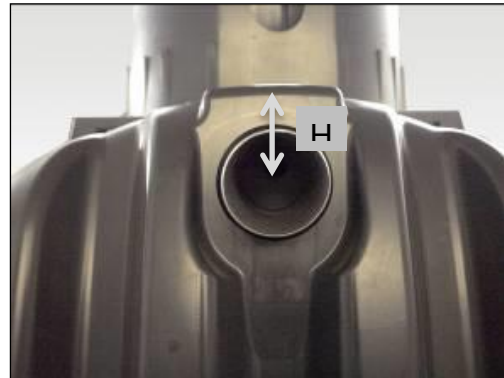
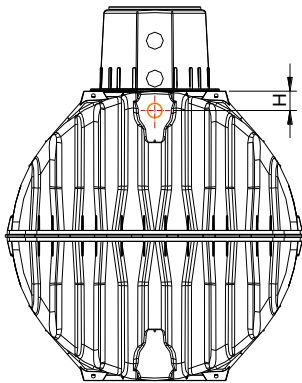
4. Assembly of tank components

Carat S tank has to be installed according to instruction manual.

4.1 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 ($\varnothing$ 124 mm) is required for drilling.

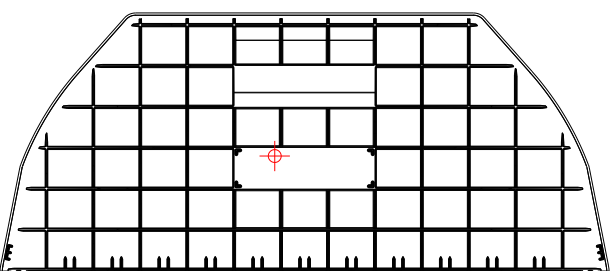
The height of the hole on the end faces of the tank can be found in the table below.



Tank	6500 L
Height	250 mm

5. Installation set-up kit

5. Installation set-up kit

1.	 Drill a hole using a 10 mm drill inside the baffle	2.	 The cross marks the point where the hole has to be drilled.
3.	 Fix the screw for the pipe clamp on the baffle.	4.	 Fix the pipe clamp at the baffle
5.	 Insert dividing wall in upper shell, one groove off from the center.	6.	 Once the baffle has been positioned, drill the inner rib directly above the wall using an 8 mm. drill.

5. Installation set-up kit

7.



Mount the fixing plate with the 1st screw. Drill a hole through the baffle by using the hole from the fixing plate as a drilling template. Use the same 8 mm drill.

8.



Mount the fixing plate with the 2nd screw.

Repeat this procedure on the opposite side

9.



Continue assembling the Carat RS tank as described in the installation instructions (seal, centring pins, lubricant)

10.



Place lower shell on upper shell with dividing wall.

11.



Fit clips to connect upper and lower shells.

12.



Turn tank with fitted dividing wall.

5. Installation set-up kit

13.



Drill inlet and outlet with DN 100 core drill (diameter 124 mm).

14.



Deburr hole. Insert DN 100 edge seal. The pipe must run from the inside out.
Affix "Outlet" sticker.

15.



Slide drain pipe through outlet hole from inside.

16.



For fixing drain pipe, DN 100 pipe clamp, threaded stud and two nuts are required.

17.



For fastening the threaded rod, drill with a 9 mm drill through the tank.

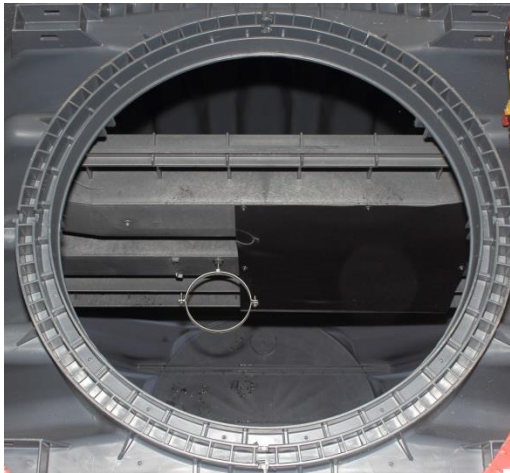
18.



The pipe is fixed by threaded bolt and pipe clamp.

5. Installation set-up kit

19.



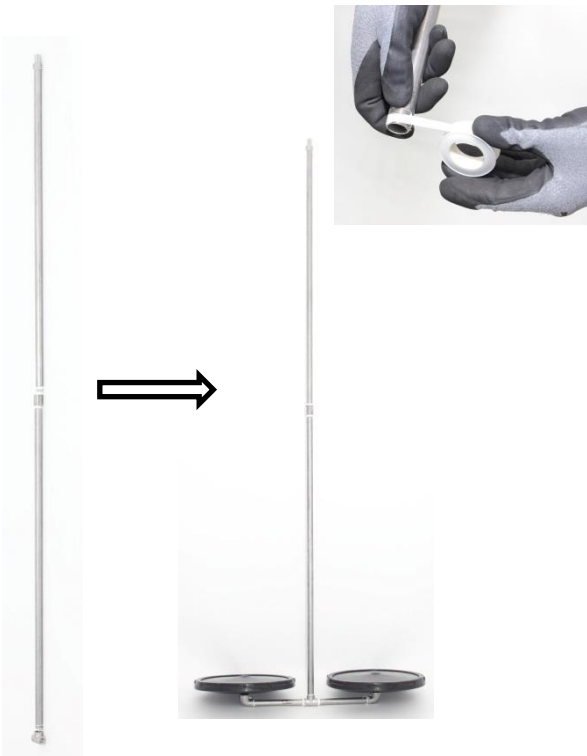
The black PE membrane supplied is screwed on to the baffle with self-drilling screws.

20.



Put the pipes together for the sludge extraction. Fix them with screws.

21.



Wrap the thread with PTFE tape and screw piping together as shown. Screw aerator plates together on piping as shown.

22.



Fix the tube for the sludge extraction at the pipe clamp.

5. Installation set-up kit

23.



The aeration unit has to be clicked on the mount.

24.



The aeration unit has to be set on the baffle and fixed with a screw.

25.



The hose has to be assembled to the pump and fixed with the clamp.

26.



The pump unit has to be set on the baffle next to the aeration unit.

27.

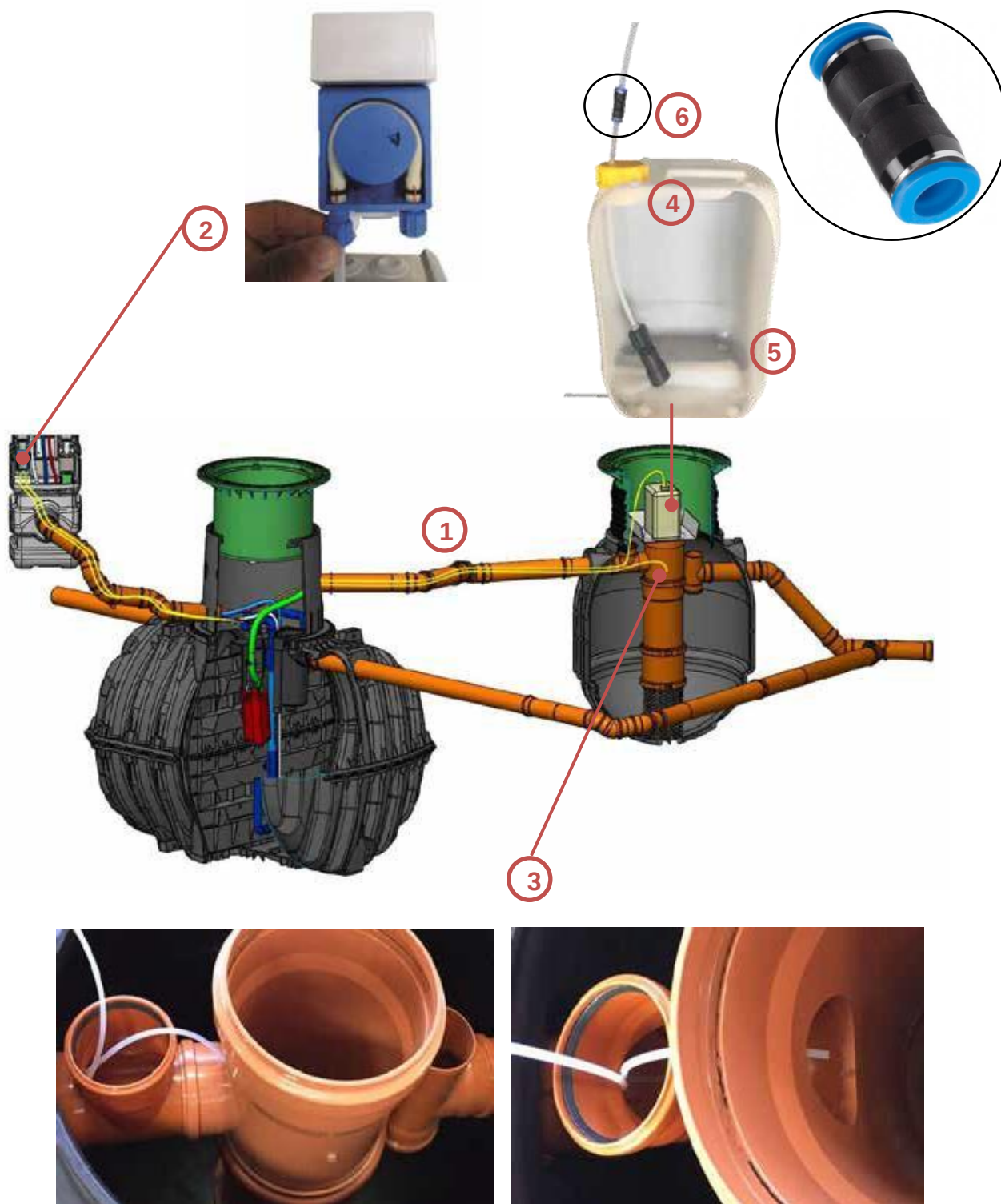


The outflow hose has to lead in the drain pipe.

6. Installation of the disinfection modul

6. Installation of the disinfection modul

6.1 General set-up



The canister containing chlorine (5) should be kept in the shaft above the tank. So the canister can be replaced with ease, the hose should be disconnected near the canister and reconnected with a coupling (6). The metering hose lies in the pipes running to the wastewater treatment system (1) and runs through this system to the control unit, where the hose is connected to the metering pump (2). From the metering pump output, the hose then runs back to the chlorine contact tank via the same route and there it is inserted into the inflow baffle (3).

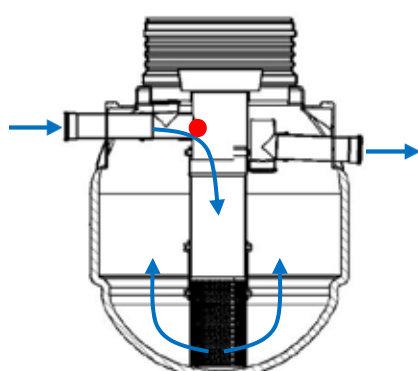
6. Installation of the disinfection modul

6.2 Positioning and piping

The chlorine contact tank should be installed such that from the end of the pump hose the clear water can pass the tank freely to its ultimate discharge point. To ensure this, the pipes must have a sufficient gradient running towards the chlorine contact tank. The wastewater treatment system's emergency overflow should pass via a bypass on the chlorine contact tank in order to avoid uncontrolled contamination in the event of malfunctions or long power cuts.

Using the tank with a shaft is a good idea as it provides enough room to store the chlorine canister.

6.3 Inflow baffle and attachment accessories



- Site of chlorine metering;
- Direction of flow;



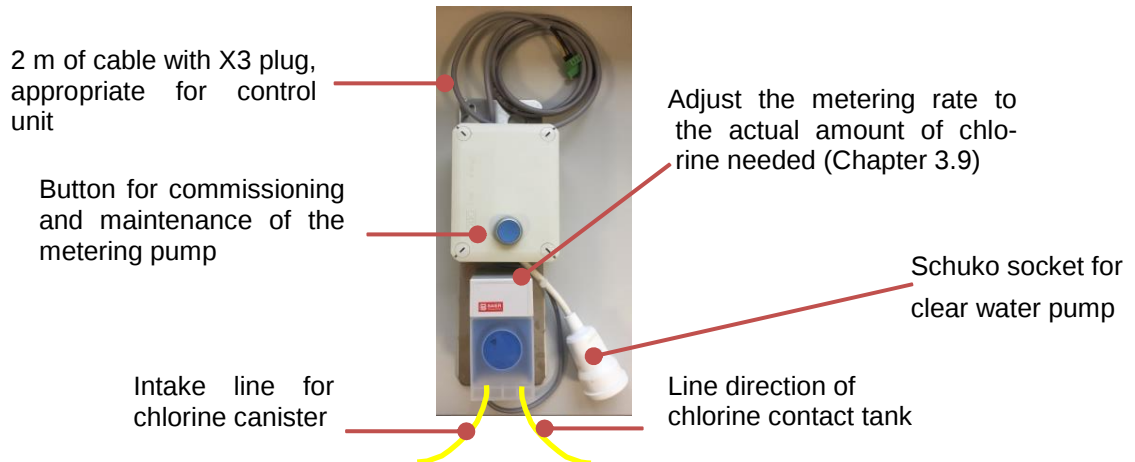
The chlorine canister should be accommodated in the shaft above the chlorine contact tank.

6.4 Metering pump

The metering pump can be fitted in the switch cabinet (or near the control unit, if attached in the building). The metering pump is fitted with 2 m of cable, which can be plugged into the X3 socket on the control unit. The metering pump also has a button for running the pump separately from the clear water pump. This is important when commissioning in order to fill the metering pump's hose with the chlorine solution. The following steps must be taken during starting up / maintenance in order to do this:

6. Installation of the disinfection modul

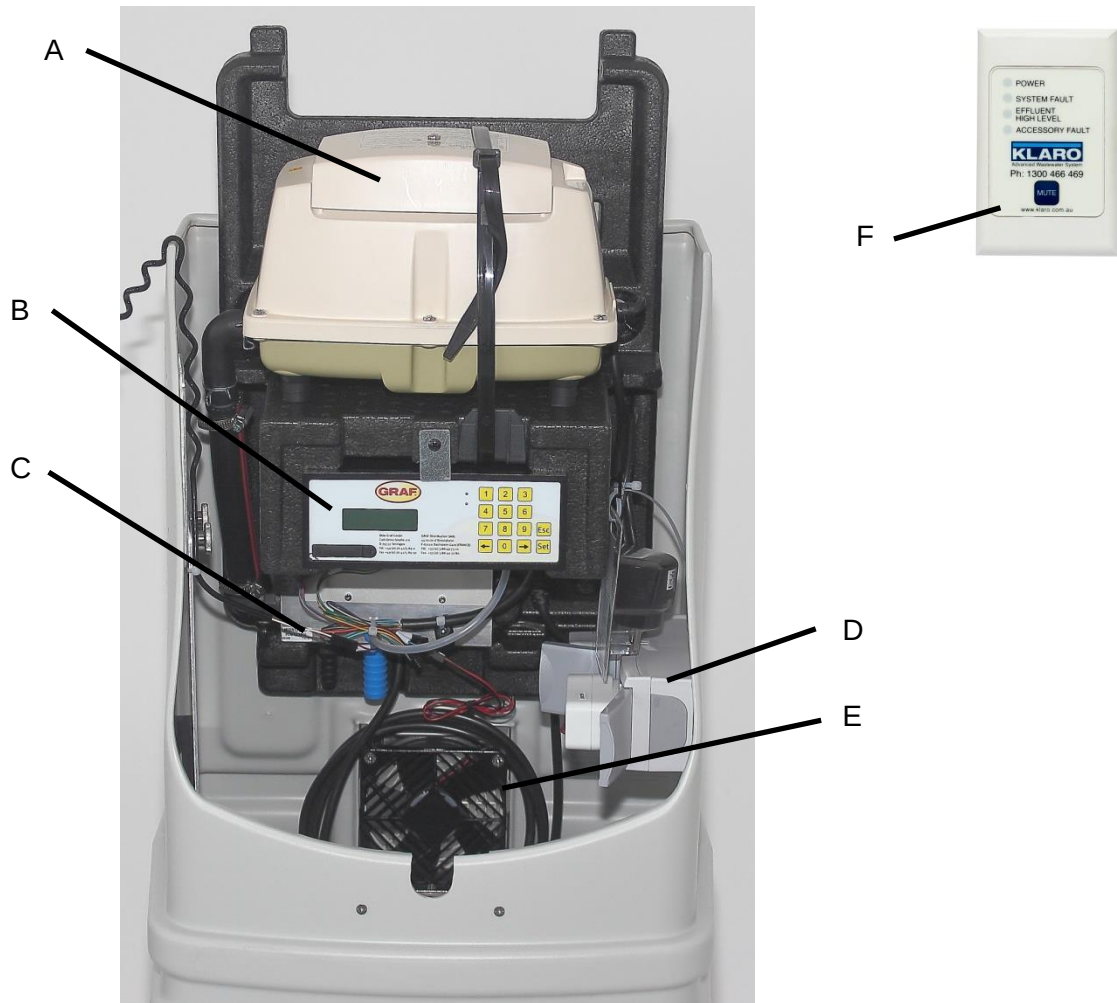
- Pull clear water pump's plug out of auxiliary control unit.
- Activate UV output in control unit in Manual mode menu item.
- Press button. The chlorine metering pump runs when the UV output is activated and the button is pressed. As soon as the button is released, the metering pump stops.
 - After maintenance of the chlorination system, the clear water pump's plug must be plugged back in.



7. Assembly of switch cabinet

7. Assembly of switch cabinet

7.1 Components



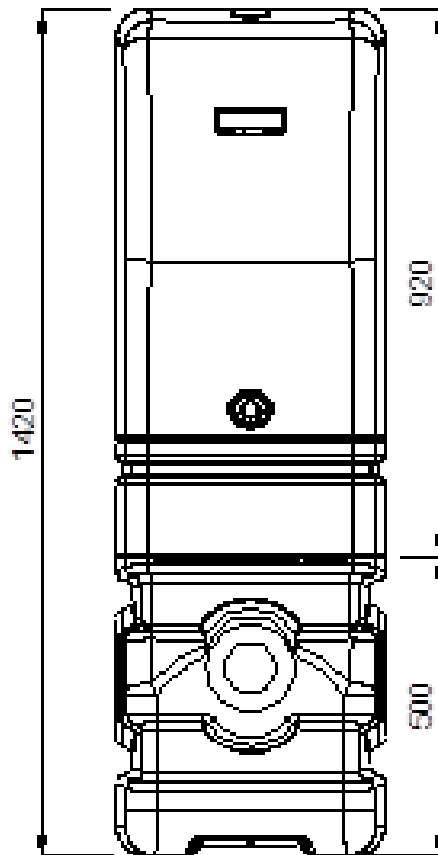
A	Piston air compressor	D	Power supply
B	Control Unit KL24plus	E	Cooling fan
C	Manifold with step motor valves	F	Remote alarm plate
	(not figured)		Alarm LED (not figured)

7.2 Assembly and installation

- Find proper location for the cabinet:
 - Close to the treatment tanks. Mind given length of air hoses (5 meter) and cables
 - Shady as possible

7. Assembly of switch cabinet

Graf plastic exterior cabinet for Eclean15



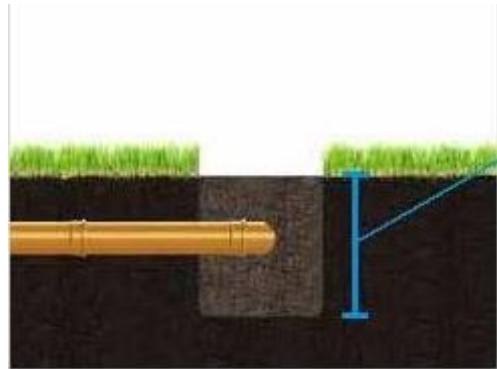
Excavations:

Length approx. 400 mm

Width approx. 450 mm

Depth approx. 500 mm

Conduit pipe:



Electric cable:



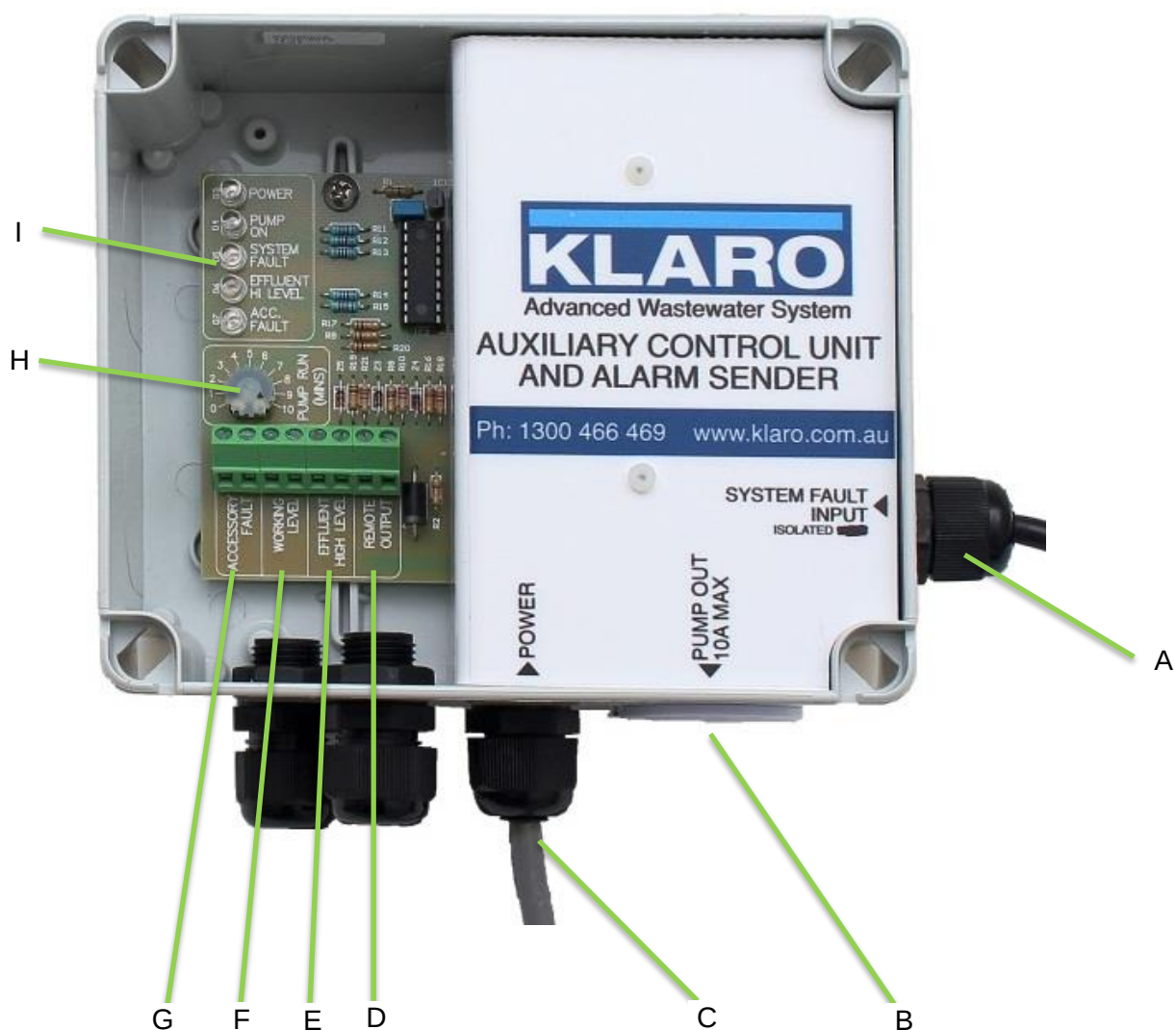
Filling up:

- Make sure cabinet stands leveled and up-right before filling up the pit
- Use only material that is free from rock prevent the cabinet from damage

Illustration only: Must comply with all Australian electrical standards

7. Assembly of switch cabinet

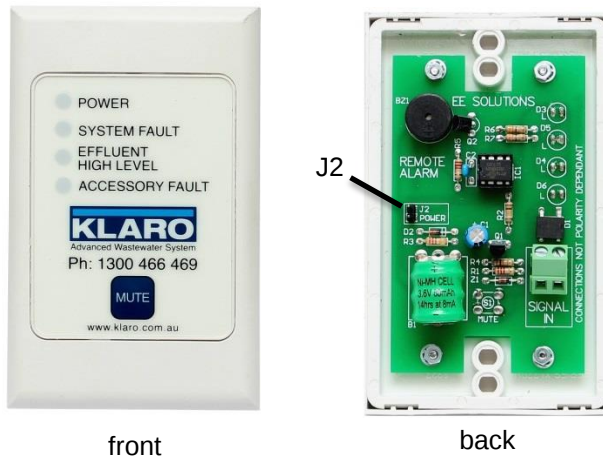
7.3 Auxiliary controller



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

7. Assembly of switch cabinet



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 the 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

8. Commissioning

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 electrician only!)
- Plug in the power plug of the auxiliary alarm controller into the GPO.
- Plug in power plug coming from control unit into Power supply. The control unit of an Eclean20 will then start automatically. 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 “cycle pause” 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.

8.1 Chlorine disinfectant

The chlorination system is designed for the addition of liquid sodium hypochlorite (also chlorine bleach, Na(OCl), with a concentration of 12.5% available chlorine. Lower concentrations are also possible (e.g. 6%).

The chemicals do not form part of the delivery. They are normally available from businesses selling pool accessories.

Safety notices:



- Sodium hypochlorite is a highly corrosive chemical! It may cause serious injury if it comes into contact with the skin or eyes!
- Gloves and goggles should always be worn when using chlorine solutions!
- The chlorine solution should be stored in a cool, dry and dark place to which unauthorised persons and children do not have access.
- Carefully read the safety data sheet for the product purchased!
- Contact with other chemicals, such as chlorine tablets and acids, should be avoided – risk of toxic gases and fire
- Under no circumstances should sodium hypochlorite be added to water disinfected with chlorine too soon. Fully empty the tank before changing disinfectant!

8. Commissioning

Chlorine requirement:

- The amount of chlorine required depends on many different parameters, such as contamination, ammonia nitrogen, pH and temperature and cannot be predicted with accuracy.
- Disinfection of nitrified water from the wastewater treatment system's outlet usually requires between 5-10 g of available chlorine per m³.
For example: 5 litres of bleach with 12.5 % available chlorine is sufficient for over 3 months in a 5-inhabitant system. A 6 % chlorine concentration doubles the amount of bleach needed.
- The pump's preset volumetric flow is around 5.5 ml / min. System-specific adaptations should be undertaken during initial maintenance (see Chapter 3.8).

Comments relating to the purchase and storage of the chlorine solution

- The chlorine concentration of the solutions decreases over time. Chlorine solutions should therefore always be bought fresh and additional chlorine canisters should not be stored for long periods. If they are stored, always place in a dark, cool environment. Note that corrosive gas may escape, even from sealed canisters.
- Bought-in chlorine solutions should always be used within 3 – 4 months of purchase.
- If temperatures in excess of 20°C are regularly anticipated at the storage site, it is well worth using chlorine solutions of lower concentrations. Chlorine solutions of lower concentrations (e.g. 6%) break down much slower than those of higher concentrations. However more storage space is then needed or the canisters have to be changed more frequently.
- If the canister cannot be stored in the shaft above the chlorine contact tank, it should be kept in a dark and cool place to which unauthorised persons and children do not have access. The canister must be positioned below the level of the hose pump. The collection tray should also be positioned under the canister in order to catch any split chlorine solution.

8.2 Adjusting chlorine metering rate

The pump is preset so that approx. 40 ml of chlorine solution is metered per m³ of water from the wastewater treatment system (see table on the following page, the value is underlined). Depending on the discharge quality of the wastewater treatment system, this then produces a residual chlorine value of 0.5 – 2.0 mg/l at the chlorine contact tank's outlet. This concentration is sufficient for good disinfection.

The metering rate may have to be adapted depending on regional requirements and varying outlet parameters such as pH, temperature or ammonia nitrogen. This can be done at the hose pump using the adjustment screw.



Adapting the chlorine metering rate at the adjustment screw using a screwdriver

8. Commissioning

The standard pump hose is suitable for flow rates of between 0.3 and 8.3 ml/min. Each step increases the flow rate by approx. 0.9 ml/min. There is an extra pump hose for higher flow rates (see table below).

Pump hose Outer hose diameter	Standard hose 4.8 mm	Optional hose 6.4 mm
Step	Flow rate in ml/min	
1	0.3	1.1
2	1.2	4.7
3	2.1	8.3
<u>4</u>	<u>3.0</u>	<u>11.8</u>
5	3.9	15.4
6	4.7	19.0
7	5.6	22.6
8	6.5	26.1
9	7.4	29.7
10	8.3	33.3

If there are no regional requirements, we would recommend setting the pump to the following chlorine concentrations in the outlet of the chlorine contact tank:

Chlorine in mg/l	Measure
< 0.5	Increase flow rate OK
0.5 - 2.5	Decrease flow rate

During normal maintenance work, the chlorine content in the discharge is checked using chlorine test strips for free and bonded chlorine or other suitable methods. The sum of these two parameters is known as the total chlorine and for safe disinfection should exceed a concentration of 0.5 mg/l.



Practical ways of determining the residual concentration of chlorine in the outlet Test strips (left) or DPD test method (right).

The measurements must be taken on site and not in a lab.

9. Notes

9. Notes

[illegible]