

# REWATEC™

Solido Smart +P



## Installation & Servicing Guide

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### **Rewatec™ Solido SMART +P, 3000L to 9900L**

Phosphorus Removal Wastewater Treatment Plant

BS EN 12566-3.


### **Manual Version OM0033 Rev 3**

(DOKK5110F)

Created On: 21 Sept 2022



**Installers: To Safeguard Warranty Please  
Ensure You Are Using The Latest  
Installation Manual**

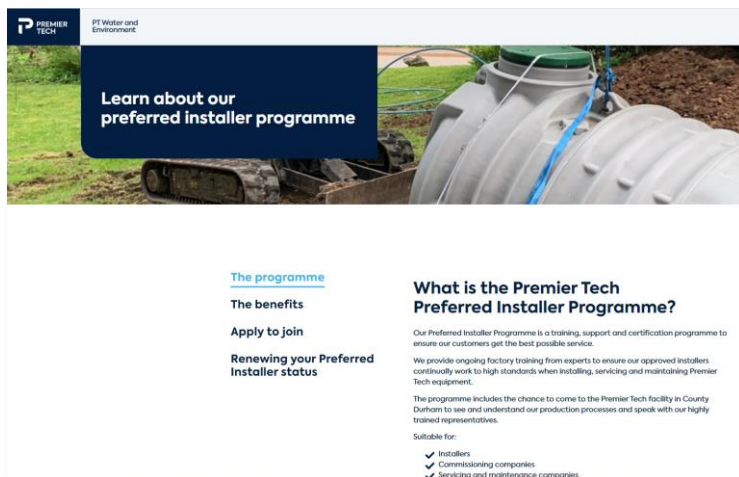
 This manual is designed for use by experienced sewage treatment tank installers & service providers. If you are not a professional installer you can obtain training from Premier Tech. (see below)

- Premier Tech are proud to warrant the workmanship and components of the tank for the time period shown in this manual.
- Installers, commissioning agents and service providers must ensure they adhere to the installation guidelines and allow for site specific environmental conditions.

Premier Tech Water & Environment provide full training for installers and servicing agents.

**For more information see:**

<https://www.premiertechaqua.com/en-gb/preferred-installer-programme>



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Property Owners Name:

Property Address:

City:

County:

Postcode:

Tel:

Installation Agents Name:

Installation Agents Address:

City:

County:

Postcode:

Tel:

Date Installation Carried Out:

TANK MODEL:

TANK SERIAL NUMBER:

This document constitutes guidance only – it is the responsibility of the installing agent to ensure the wastewater treatment plant is installed correctly, fully functional & operating as intended. For assistance please contact Premier Tech Water & Environment 0191 587 8650 / sales.ptwe.uk@premiertech.com

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# Health & Safety

The Solido SMART +P should be installed by qualified personnel only.

You must read these warnings carefully before installing or using the equipment. Should the equipment be transferred to a new owner, always ensure that all relevant documents are supplied.

Observe all hazard labels and take appropriate action to avoid exposure to the risks indicated.

Take care to maintain correct posture, particularly when lifting. Use appropriate lifting equipment when necessary.



- Only experienced contractors should carry out installation, following the guidelines.
- The unit should have a Pre-Service Agreement Inspection by a competent engineer.
- A qualified electrician should carry out electrical work.
- Covers must be kept locked.
- Observe all hazard labels and take appropriate action to avoid exposure to the risks indicated.

## Clothing

- We recommend the use of a dust mask and gloves when cutting components.
- Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves.

## Working Area

- Ensure that the working area is adequately lit.
- Ensure that you are familiar with safe working areas and accesses.
- Use only the designated access walkways. Do not walk on the cover or deep well safety mesh(es).
- Ensure proper footing and balance at all times.
- Avoid any sharp edges.

## Desludging

- Desludging should be carried out by a licensed waste disposal contractor holding the relevant permits to transport and dispose of sewage sludge.
- The contractor must refer to the desludge instructions in the Operating Handbook, a copy of the instructions is fastened under the covers.

## Maintenance and Inspection Procedures

- Should you wish to inspect the operation of the equipment, please observe all necessary precautions, including those listed below, which apply to maintenance procedures.
- The power supply to the equipment must be isolated at the control panel(s) before lifting the covers.
- If the equipment has to run with the covers off, all care must be taken to avoid contact with moving parts and electrical components or conductors.
- Drive guards must be replaced and secured if removed during maintenance.
- Once power has been isolated, the control panel must be kept locked shut to avoid accidental re-connection whilst work or inspection is being carried out.

## Electrical Components

- The electrical components must be connected, started up, and opened only by qualified authorised personnel. The power cord must be protected with a 30 mA residual-current circuit breaker.
- The technology capsule must be opened **ONLY** by a specialist company and **ONLY** when the power is switched off.

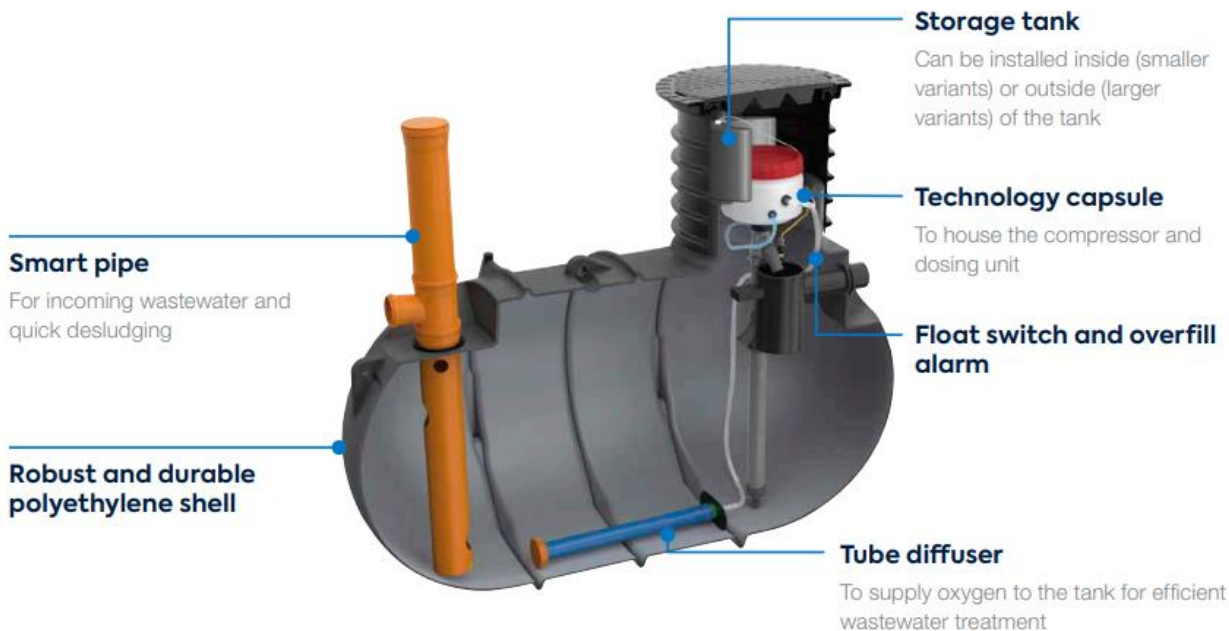


## Warning: irritating / corrosive Irritating to eyes and skin.

- The plant contains chemical agents, please avoid contact and wear suitable protective equipment.
- When handling, use only containers and fittings made of inert plastic.
- Disturbances in the treatment capacity of the plant is not expected when the chemical is in contact with the plant's mixed liquor.

Disclaimer: This document constitutes installation and inspection guidance only – it is the responsibility of the installation company to ensure the wastewater treatment plant is fully functional & operating as intended.

# Rewatec Solido SMART +P Overview



## TECHNICAL SPECIFICATIONS (REWATEC SOLIDO SMART +P)

PE	Chamber	Outlet	Length (mm)	Width (mm)	Height min-max (mm)
6	Single	Gravity/pump	2,420	1,420	2,470-2,570*
9	Single	Gravity/pump	2,420	1,700	2,750-2,850*
12	Single	Gravity/pump	2,400	2,010	2,625-3,035*
15	Single	Gravity/pump	2,765	2,310	2,915-3,350*
25	Single	Gravity/pump	3,400	2,310	2,915-3,350*

An external polyethylene pump station is required for the pump outlet.

\*Minimum height is as standard, maximum height corresponds to the maximum manway extension

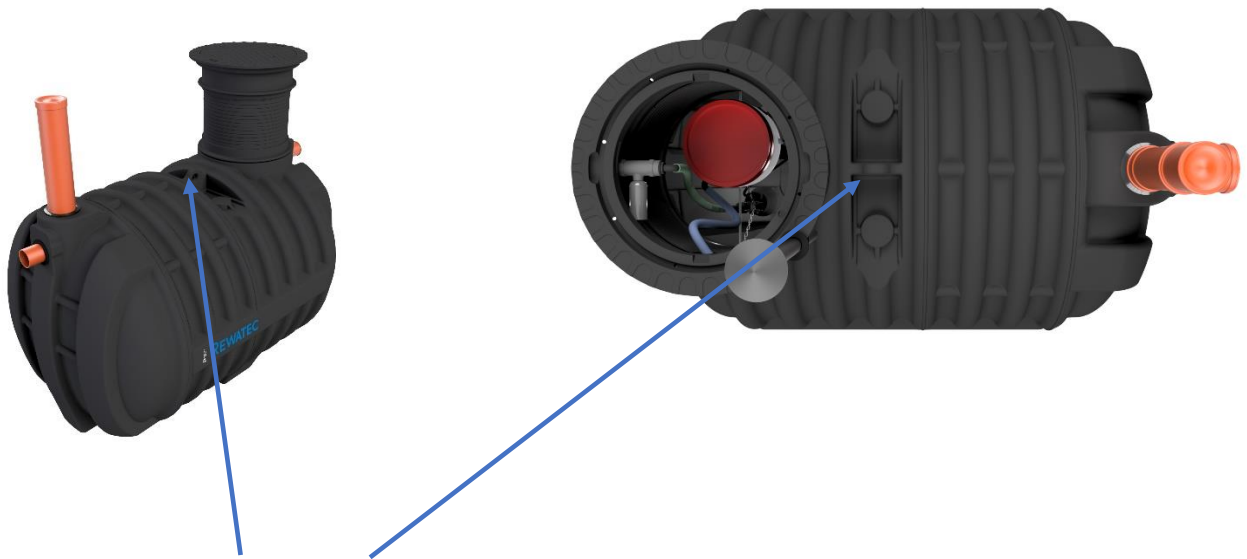


Shell Warranty – 25 Years\*  
 Technology & Pump Warranty – 3 Years\*  
 Design Life – 50 Years\*

\*Only when regular servicing schedule adhered to.

## Tank Handling

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- ☐ Use lifting point only.
- ☐ Connect a webbed sling to the lifting point. (Do NOT use any other item such as rope or chain)
- ☐ Lift using a suitable mechanical device such as a crane or digger.
- ☐ Take care not to damage the tank




Images for representation only




# Offloading Inspection

- ☐ Check tank for signs of transit damage.
- ☐ Ensure below items are present


## Solido +P Components




Components Box




Riser & Capsule



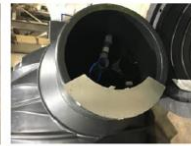
Large Dosing Tank Above 5200L




Small Dosing Tank Below 5200L




Dosing Chamber Plinth




Dosing Tank Plinth Fitted to Tank Neck




Dosing Chamber Fitted




Plinth & Capsule Fitted




Capsule Kit



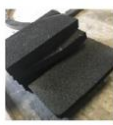
Adapter




Diffuser Kit




De-Sludge Pipe




Capsule Foam




+P Manuals




Sealing Ring




Pump Switch/Dosing Outlet & Holding Bracket




Connection from Dosing Chamber




Riser & Cover




Control Panel




Vent Pipe Kit



Diffuser



Airlift



Pump Station (Optional)

## Inside Capsule

Dosing Pump



Blower



Dosing Hose

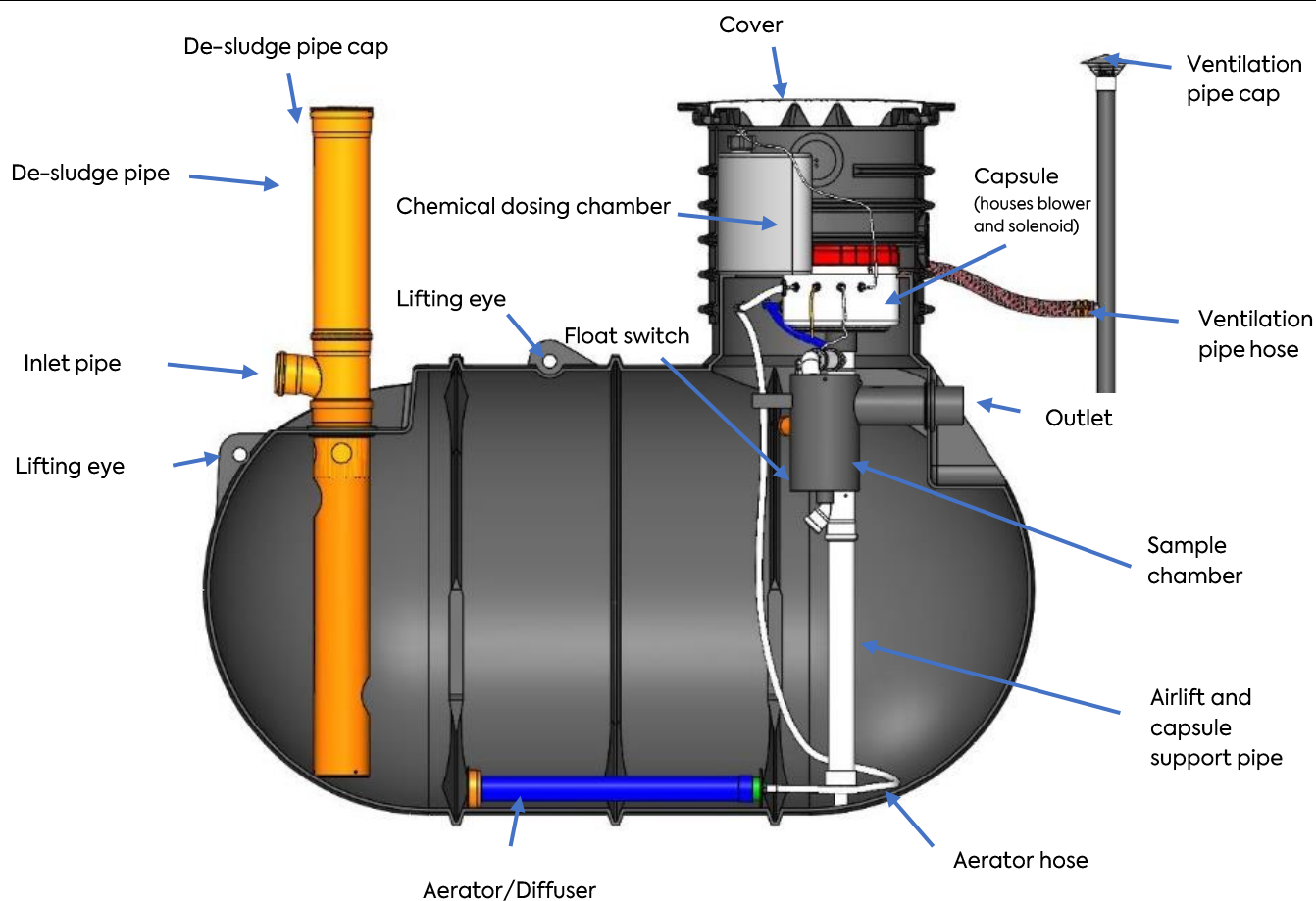


## Optional externally located pump station

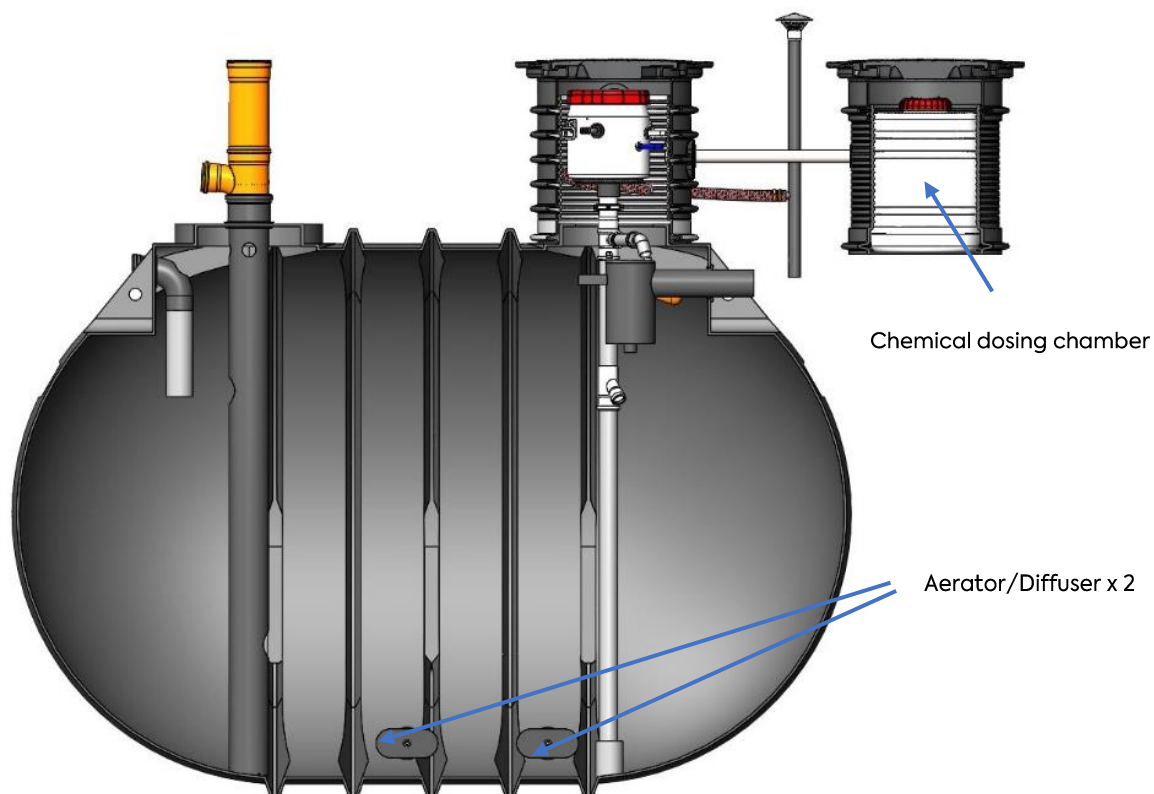




## 4500 and 5200L Tanks come with Internal Dosing Chamber



## 7600 and 9900L Tanks come with External Dosing Chamber



## How It Works

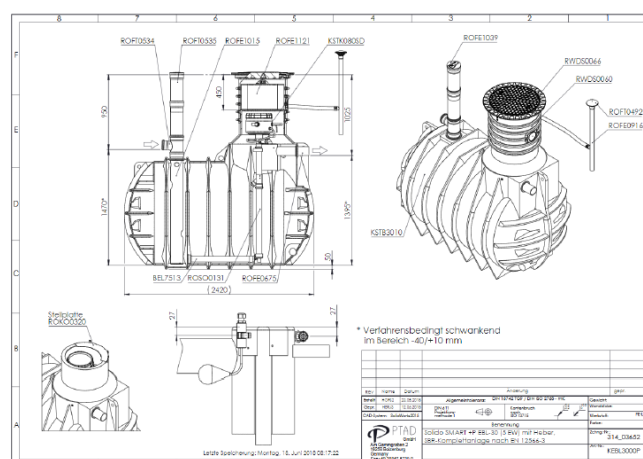
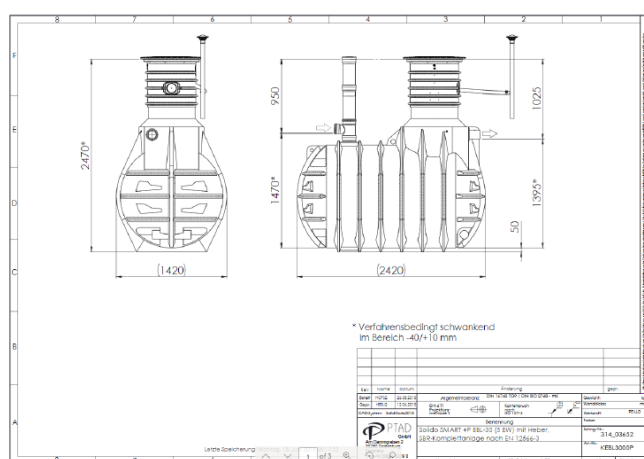
A chemical precipitant is dosed directly to the mixed liquor to reduce the phosphate concentration that accumulated in the incoming wastewater. Dosing is time-controlled using a timer and a peristaltic pump> the dose takes place at the end of the aeration cycle for optimal results.

The overall annual recommended dosage (pre-set) is approx. 5 litres per the nominally connected resident (PE).

## Dimension Drawings

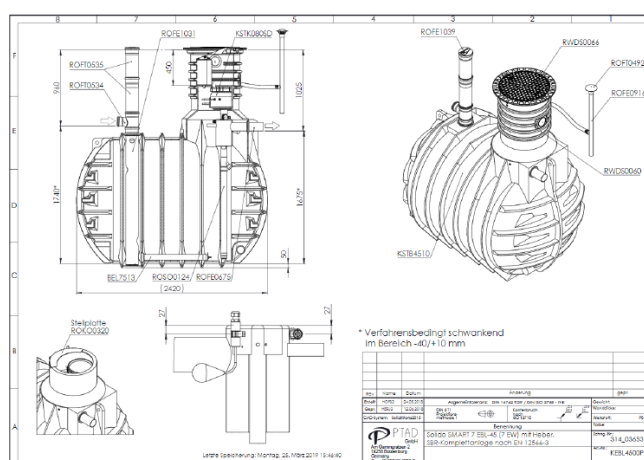
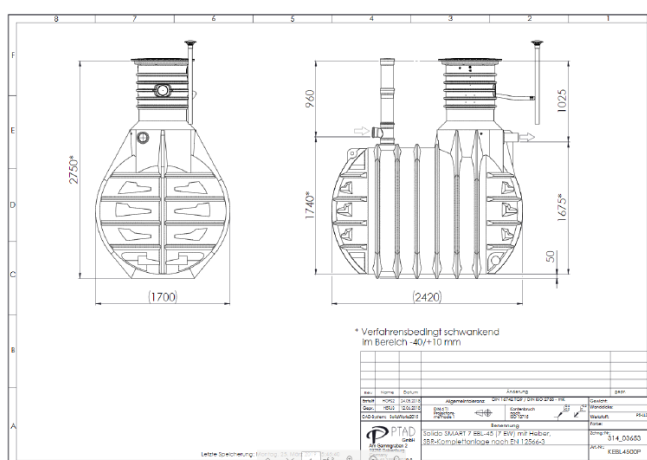
### Solido Smart +P Gravity 3000L (KEBL3000P / 394275)

**+P**

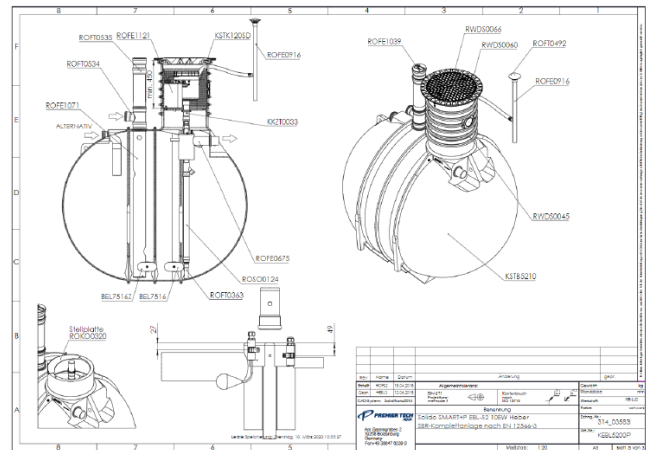


### Solido Smart +P Gravity 4500L (KEBL4500P / 394276)

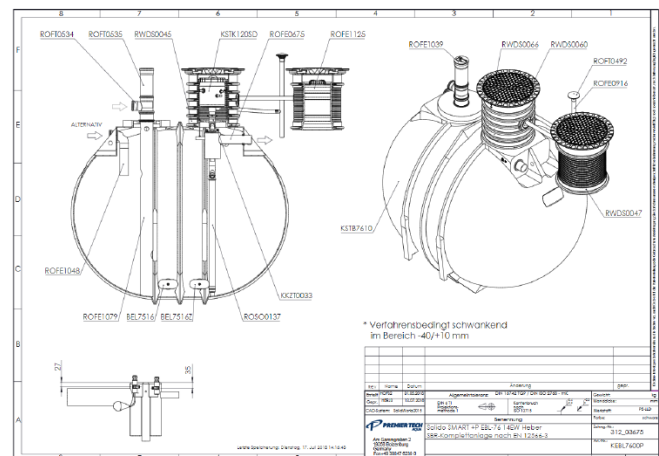
**+P**



**+P**



**+P**



# Assessing Ground Conditions

Ground conditions dictate whether the tank should be installed in pea gravel or concrete. A high-water table requires concrete installation, a low water table requires pea gravel installation.

Incorrect assessment of ground conditions can negatively impact the installation. Please ensure you read the below information.

Changing weather patterns in the UK mean that regions or areas that may have been relatively dry, may now be subjected to heavy and sporadic rainfall events.

## Signs of a High-Water Table

- ☐ Low permeability in soil (i.e., high clay content)
- ☐ Visible water table during excavation of the hole
- ☐ Naturally wet area
- ☐ Low lying or flat land
- ☐ Installation in a natural depression of the land
- ☐ Areas of low drainage or standing water
- ☐ Areas where water could congregate even if the land is currently dry

## Signs of a Low-Water Table

- ☐ Absence of water during excavation
- ☐ When installing on a hilltop or hillside location
- ☐ Dry excavation even during wet weather
- ☐ High permeability soil

## Installation in Periodic High-Water Table Conditions

If the ground water table could be above the turret (shoulder of the tank) height of the tank for a short period of time (defined as hours rather than days) a watertight connection between the tank and shaft system should be installed using a factory-provided welded joint (if considered necessary).

In such conditions, installation in concrete is recommended.

## Installation in High-Water Table Conditions

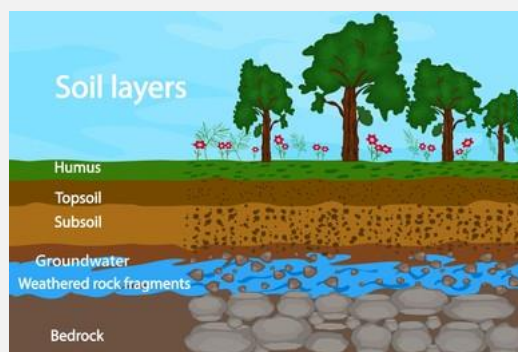
If the water table is at risk of being higher than the turret (shoulder) of the tank for a prolonged period (defined as days rather than hours) installation in concrete is recommended.

## Hillside Situations

If the soil of the area is subjected to movement the tank will be need to be secured with a supporting structure (e.g., a wall).

## Installation in Permanently Low-Water Table Conditions

The water table below the turret (shoulder of the tank). Where the water table is below the turret of the tank, installation in pea gravel is recommended.



## Backfilling

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After ensuring the tank is correctly positioned and perfectly flat in a bed of gravel.

- Fill the tank with water up to approximately 300mm then backfill to the same height with pea gravel or concrete depending upon your ground water conditions. (SEE BELOW FOR DETAILS ON WHEN TO USE PEA GRAVEL OR CONCRETE)
- Add 300mm more water then backfill again to approximately the same level as the water.
- Repeat this process until tank is completely backfilled with water up to the level of the pump and pea gravel until the body of the tank is completely covered.
- Above this level, top-soil or excavated material can be used.

*Failure to do this creates uneven interior/exterior loads and could damage the tank shell.*

### Low Water Table – Pea Gravel



Use pea gravel when installing in low water-table conditions.

The filling material around the tank must be compactable, permeable, and free of sharp objects. Round Gravel – Grain size between 5–16 mm. (alternatively 12–16 mm or 8–12 mm).

Soil, clay or “filler sand” **do not** meet these criteria.

The backfill material should reach at least of 250mm between the tank and the edge of the excavated hole.



## High Water Table – Concrete



Use concrete when installing in high water-table conditions.

Ensure the tank is correctly positioned and perfectly flat in a bed of concrete. Use a spirit level to achieve this.

The thickness of the concrete should be at least 250mm between the tank and the excavated hole.

Fill the tank with 300mm of water, then backfill to the same height with concrete and repeat until the body of the tank is completely covered.

*Failure to do this creates uneven interior/exterior loads and could damage the tank shell.*

# Locating the Tank & Hole Excavation

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If you are in any doubt about any aspect of the installation, please contact Premier Tech.

## Tank Positioning Next to Buildings

The excavation hole must be located a suitable distance away from buildings (Please check Building Regulations Part H).

For tanks that are required to be located on driveways or where traffic is expected to pass a steel cover and a strengthened manway is required. Available from Premier Tech as an option.



- Ensure there are no sub-surface obstacles such as pipes, cables or tree roots.
- Ensure depth is sufficient for the tank to be located plus there is sufficient space for surface top-soil.
- Ensure the space between the tank and the edges of the excavated hole are at least 250mm.
- Ensure the tank height and positioning is such that the influent pipe runs downwards towards the tank from the property and the effluent discharge pipe runs in the desired direction towards the discharge point.
- Place a layer of gravel on the base of the excavated hole.
- Ensure the tank is perfectly flat in the ground using a spirit level.



- The soil coverage required above the tank (standard max. 1,50 meter, depend also on the traffic loads). The soil coverage should not be more than 1.2m from the top of the tank (1.5 from the IL), otherwise maintenance of the sewage treatment systems cannot be carried out.

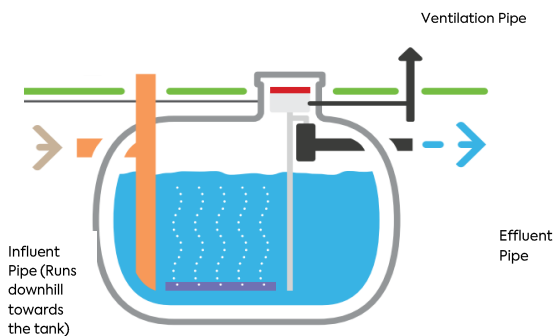


# Installation, Connections & Assembly

## 1. Positioning the Tank.

Ensure the tank height and positioning is such that the influent pipe runs downwards towards the tank from the property and the effluent discharge pipe runs in the desired direction towards the discharge point.

Ensure the discharge point will not be liable to flooding.



Cut down riser and de-sludge pipe to suit site requirements



## 2. The Tank Turret

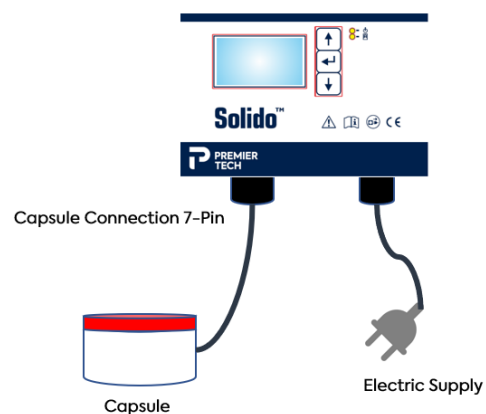
Can be cut down on-site if necessary to achieve the appropriate tank depth for the install. Use the horizontal mould lines to assist with this.



Tool Required: Angle grinder/circular saw or similar.

## 3. Locate the Control Unit

The control unit should be located up to a maximum of 30m from the tank. Either indoors or inside an optional control panel kiosk. The control panel should not be positioned in direct sunlight or where weather can reach it. Ensure the electricity supply is reliable. If it is not, use a UPS generator or similar.



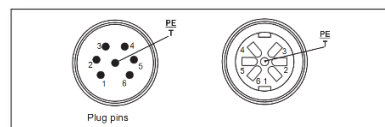
#### 4. Lay the Control Panel Cable

Pull the control cable of the capsule through a duct and route it to the chosen location of the control panel.

- Attach a wire to the end of the cable so that the cable can be pulled out of the conduit.
- Ensure the cable duct is positioned in a suitable location (ie Away from standing water, grass cutting equipment, traffic etc)
- Never disassemble the cable plug.
- Protect the plug from moisture.



Control Panel Cable



View of 7-Pin Socket  
For Tank Connection



Ensure a suitable cable duct is used.

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#### 5. Installing The Capsule & Components

Connect the pre-fitted hose on the grey lifter pipe located inside the tank (narrow blue hose) to the narrow blue hose coming out of the capsule.



Connect the clear braided hose attached to the diffuser's hose to the clear braided hose coming out of the capsule.



Place diffuser on the tank floor (centralised)



Connect the ventilation hose (connected to the ventilation pipe) to the black elbow joint attached to the side of the capsule.



Carefully place the technology capsule onto the top of the grey pipe (airlift) inside the tank so that the capsule is positioned securely.



Loosely bundle the hoses using a cable tie and place them around the capsule.

Lock the orange float switch in place on the pre-assembled retaining clip for the sampling pot in the tank.



Ensure hose pipe is clipped into manway using clip provided. This provides support for the hose. Use bolts and washers to achieve this.

Fit the capsule cable into the control panel.

If an extended electrical cable is required, ensure the connection is covered with heat shrink.



Image for Demonstration Purposes Only – Connect Hoses In-Situ

Fit the dosing hose to the pump inside the capsule

Dosing hose, PE, 4x6mm, transparent for precipitants with

Dosing element (pressure side, pre-assembled on the technology capsule)



Suction side    Pressure side

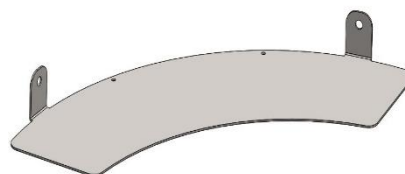
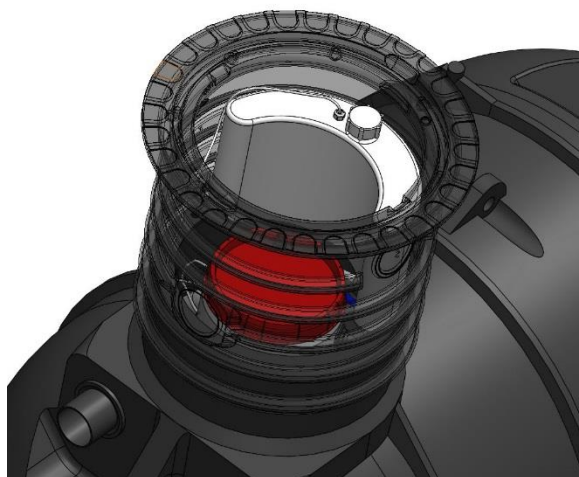
## 6. Positioning Chemical Dosing Tank 4500L and 5200L Only

Tank for precipitant, approx. 21 liters, with a pre-assembled dosing hose, suction filter with weight (suction side)

Storage tank positioning plate (base), screws, nuts and washers included

For systems with a VS60 shaft, insert the mounting plate with the tabs facing down between the edge of the container and the shaft.

Fix with screws if necessary.

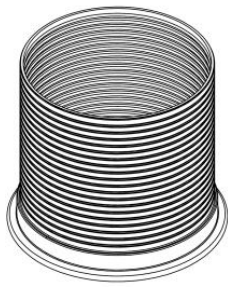


Affix plate to manway



For systems with an intermediate ring, fix the setting plate to the intermediate ring with the screws (tabs pointing upwards).

If necessary, fix it to the container with screws.

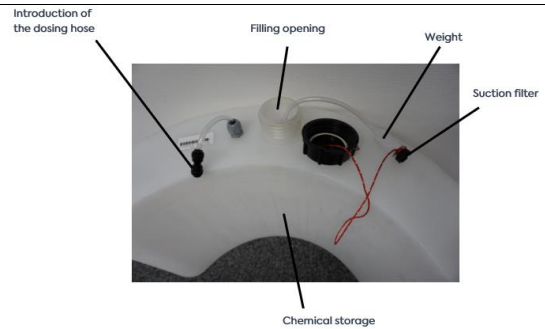


Only by specialist company:  
Fill the precipitant tank.



Observe hazard warnings

Place the precipitant tank on the setting plate and secure it with the belt loops and the carabiner to the eye bolt in the shaft.

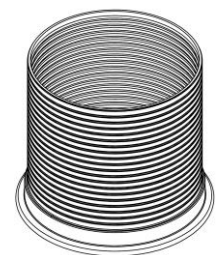
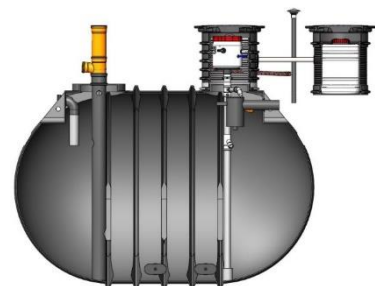


## 7. Positioning Chemical Dosing Tank 7600L and 9900L Only

Precipitant tank, approx. 66 litres, with pre-assembled dosing hose, suction filter with weight (suction side)

Level in the precipitant tank:  
10cm corresponds to approx. 13-14L

The tank is to be positioned in a covered encasement next to the main-tank (encasement provided)



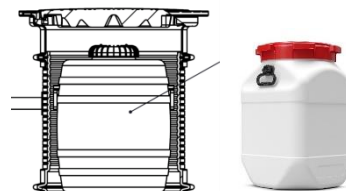
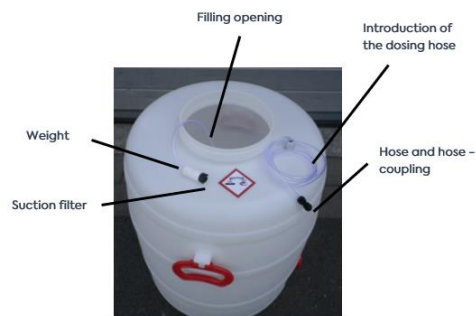
Only by specialist company:



Fill the precipitant tank.



Observe hazard warnings



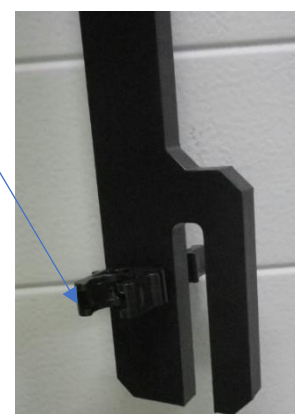
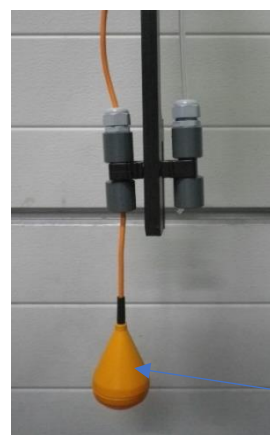
#### 8. Removable holder for overflow alarm SWS and dosing element Length 97 cm

Click the dosing element and the overflow detector into the retaining clips on the removable receptacle.

Use the left side for the float switch (high level alarm)

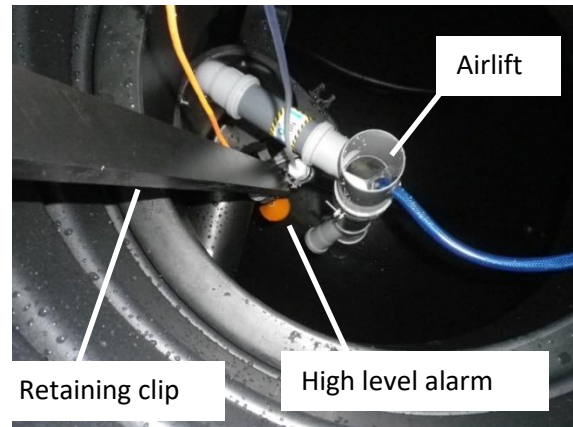


Dosing element on this side



Float switch on the other side

Place the removable receptacle with the dosing element and overfill indicator on the edge of the sampling pot.



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## 9. Positioning Manway onto Turret

Position rubber seal onto turret - make sure the rubber ring is well-positioned in the groove of the manway. No major force is required if the rubber seal is positioned correctly into the groove



Position manway onto turret and press down until seal is created and manway is level





## 10. Drilling Manway Holes & Fitting Pipes/Cables

Tool Required: Circular cutter drill bits



Ventilation pipe hose



Electrical cable from  
capsule

Ensure there is a water-tight  
seal between the ventilation  
hose and the manway.

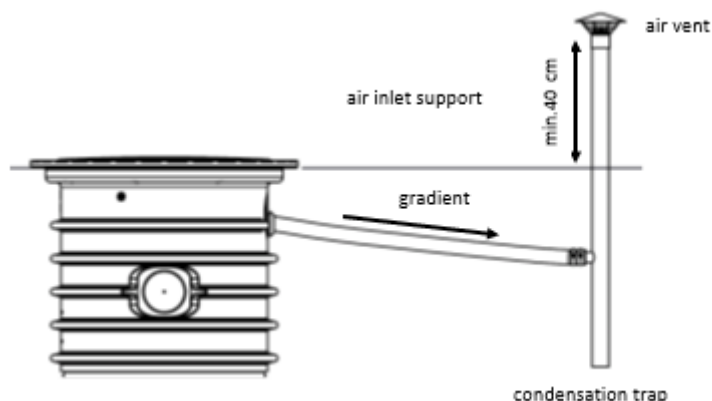


NOTE – Ensure holes drilled into the turret for pipes and cabling are completely water- tight. If you have any questions regarding how to do this please contact premier tech.

NOTE – To ensure air hose pipes do not kink, cut down hose lengths where required. For example, if you have excess pipe from the pump to the pump hose outlet, cut the hose down in size to prevent kinking.



## 11. Ventilation Pipe Installation



## 12. Optional Pumped Version (externally located)

Suspend the pump onto the threaded metal rods using the hooks located on the chain.

Attach the chain hooks into the turret as below. Position the hooks so they are easily accessible as high up in the turret as the chain length allows.

In the case that the effluent has to reach to a static head that the airlift cannot support, the product would have to be supported by our small-footprint pump station.

The pump station is made of polyethylene and is of a 500mm diameter. The pump (Top2 Vortex) is able to deliver the effluent volume and is enabled by an integrated float switch. The pipework is made of PVC and is of 1 " cable gland outlet (threaded, DN25) and a 32mm of pump connection inlet.

The function of the pump is only regulated by the float and no timers is included.

See pictures below with the corresponding legends.



From left to right: Overall view of the pump station; top lid of the pump station with the corresponding extension(s); view of the TOP Vortex pump with the integrated float switch



From left to right: Detail of the float switch; pipework connection (outlet); generic plan view showing the position of the pump; top of the pump station showing the outlet pipe outside the vessel

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### 13. Check the Complete Installation

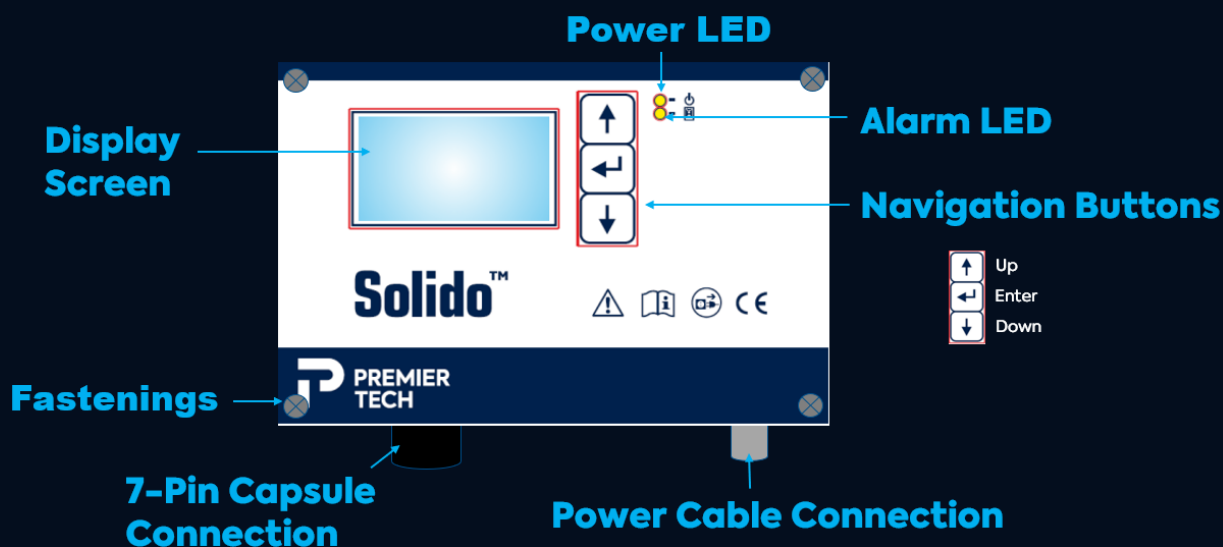
Check the full installation:

- Tank location
- Ground conditions including inlet/outlet pipes
- Backfill is stable
- Control panel location is accessible
- Connections all completed
- Electric supply is reliable

## 14. Perform Start-Up

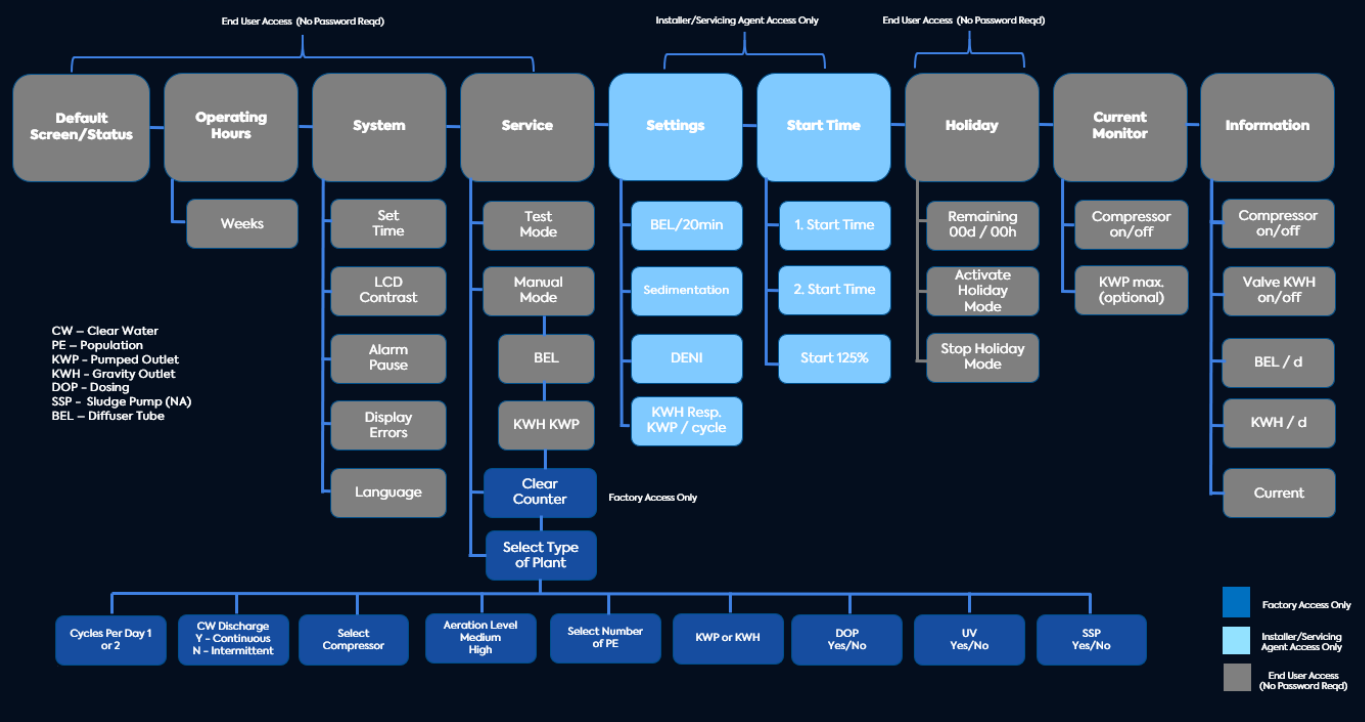
Once everything is connected, switch on the panel and configure the plant. Perform a test run to assess the electro-mechanical components.

### S40 Control Panel Overview



**P** The control panel switches on automatically as soon as it is connected to the power.

### Full Menu Structure



## Control Panel Password

The control panel requires a code to access the system. This is a safety feature to discourage access by end users. Contact Premier Tech for the password.



**The initial setup code is 7682 (First-time use only)**



+44 (0) 191 587 8650

[sales.ptwe.uk@premiertech.com](mailto:sales.ptwe.uk@premiertech.com)



[PT-WaterEnvironment.co.uk](http://PT-WaterEnvironment.co.uk)

## First Start Up (1/3)



- On first start up panel shows 'Sprache Deutsch'
- Press down to English – Press Enter.
- Set date and time using up down and enter.
- Enter Password 7682 using down and enter.
- Screen shows Solido Smart Yes press enter.
- Screen shows Cycles Per Day 2 press enter.

### Full Menu Structure

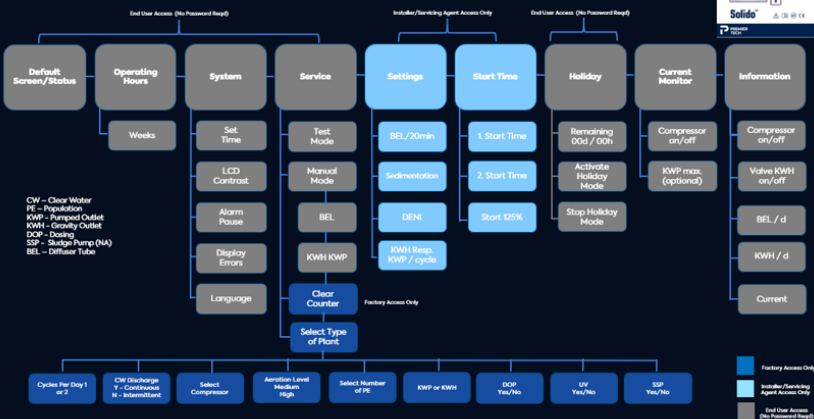


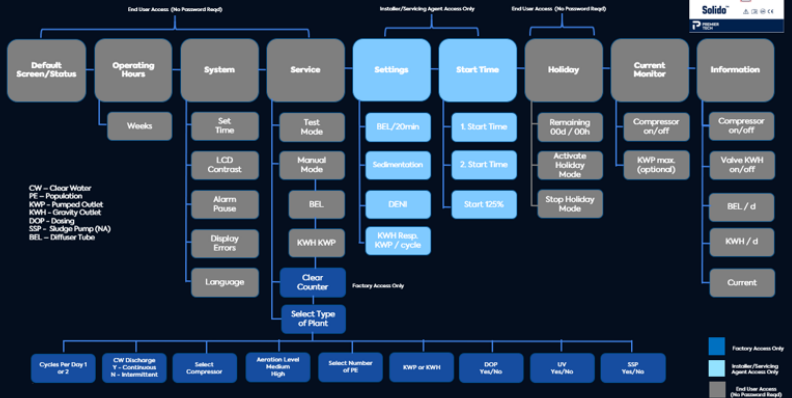
Abb.	Meaning
KKK	Wastewater treatment plant
SBR	Sequencing batch reactor
BEL	Tube diffuser
KWH	Clearwater lifter
SWS	Float switch
DOP	Dosing for Phosphorus Removal

## First Start Up (2/3)



- Screen shows Continuous CW Discharge Yes press enter (press NO only if you have a downstream process, i.e. slow infiltration bed, Ecoflo, reed bed or similar)
- Screen shows Select Compressor select correct option for your compressor type press enter.
- Screen shows Solido Smart C press enter.
- Screen shows Number of PE – using up and down select the number of persons in the property. Press enter.
- Screen shows KWP – Press enter for pumped outlet tanks. For gravity outlet tanks, press down it will show 'No', press enter.
- Where a pumped outlet tank is being installed – determine the distance from the tank to the effluent discharge. If the install requires pumped outlet more than 25m then access KWP and increase pumping time to 20 minutes.

### Full Menu Structure

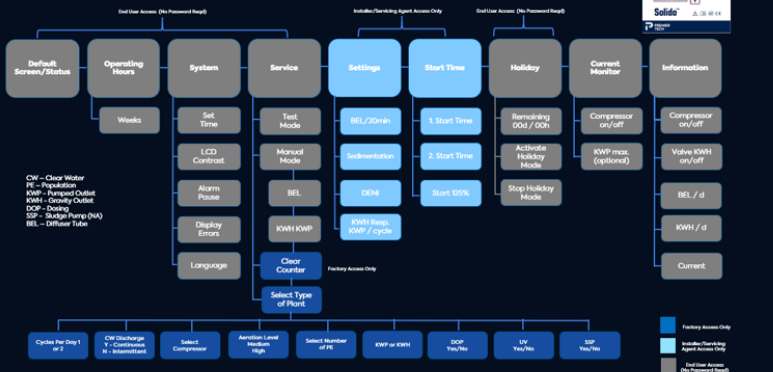


## First Start Up (3/3)



- Test mode will begin Do Not press any key if you want to run in test mode.
- It takes a few minutes to run the test mode depending upon the specification of tank.
- If the system runs without showing errors and does not alarm, then press the Enter Button.
- Screen shows 'Were inputs OK' press down till Yes then press Enter. The system will start. (If No is entered the system will reboot to initial settings then reconfigure from the start).
- If you want to temporarily silence the alarm press the Enter once. If you press the Enter again the alarm will reset but will continue until fault is rectified.

### Full Menu Structure



In some models, during setup, extra options may appear (depending on manufacturing date)

Aeration: Medium / High (press high)

DOP: Yes / No (Only press yes if installing a +P Phosphorus removal tank)

UV: Yes / No (press No)

SSP: Yes / No (press No)

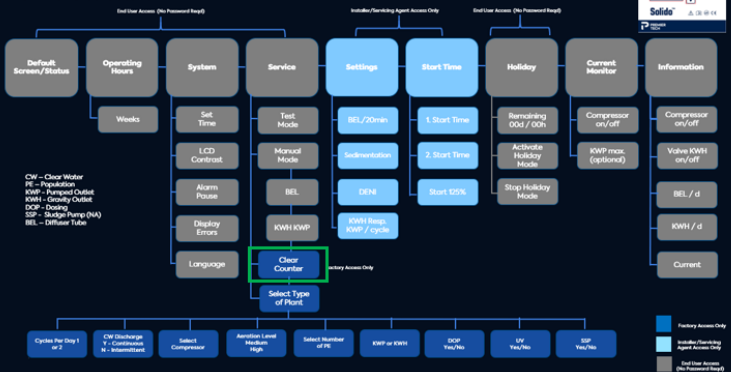
# Rebooting to Factory Settings



- Navigate to 'Clear Counter'
- Press Enter
- Contact Premier Tech for password and Enter
- Press Down until on the Start Time screen.
- Press Enter
- On Start Time screen press Down until on Reset - press Enter
- It will show Are You Sure press Down till shows Yes - press Enter
- System will reboot to factory settings.



## Full Menu Structure





## Changing The Set Volume Flow Of The Dosing Pump

### Note:

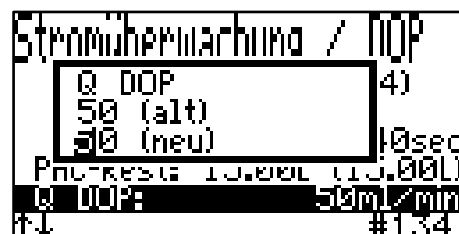
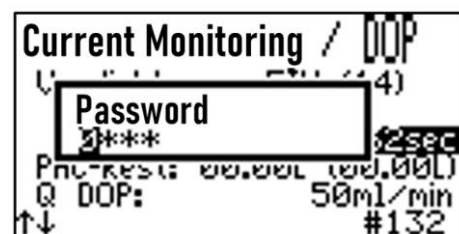
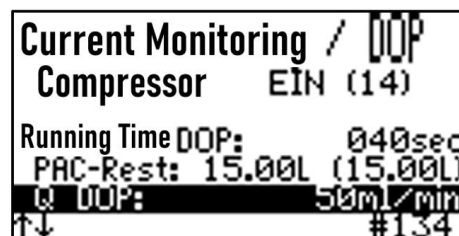
- Standard setting 42 ml / min (default during dosing)
- If a deviating value is determined during maintenance, *please enter this in the control.*

Volume flow of the pump

Standard value (pre-assigned) for SEKO PE-3:  
42 ml / min

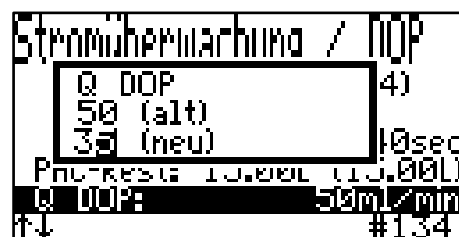
Note: if the distance between the precipitant tank and the pump is greater, an % increase in liters is necessary to compensate for the losses.

Press the middle button again and then enter the service password.

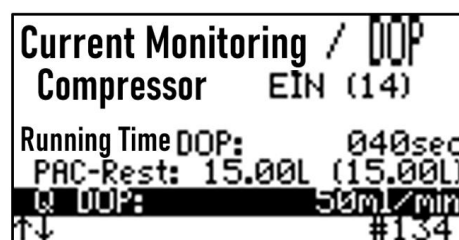


Enter the desired value,  
confirm with the middle button.

Adjustable max. 80ml / min



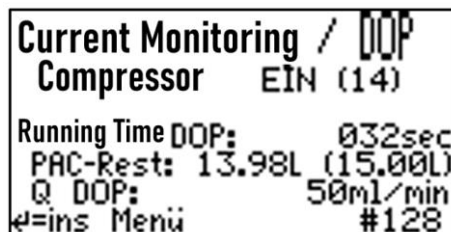
The new value is saved.



## Changing The Running Time Of The Dosing Pump

To optimize the cleaning performance of the system, it may be necessary to adjust the running time of the dosing pump (as part of maintenance).

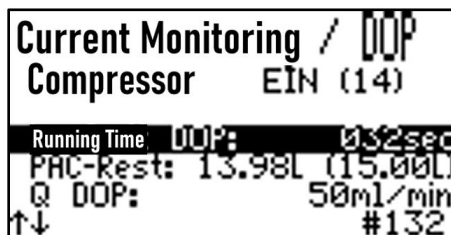
Go to the menu item  
Current monitoring / DOP



Current Monitoring / DOP  
Compressor EIN (14)  
Running Time DOP: 032sec  
PAC-Rest: 13.98L (15.00L)  
Q DOP: 50ml/min  
←ins Menü #128

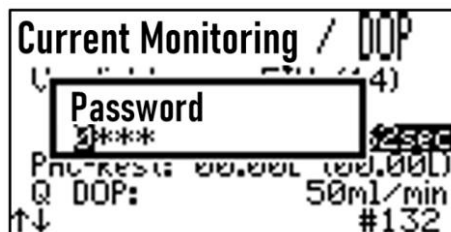
And scroll to the line, Term DOP

This is the running time of the dosing pump  
in sec per cycle



Current Monitoring / DOP  
Compressor EIN (14)  
Running Time DOP: 032sec  
PAC-Rest: 13.98L (15.00L)  
Q DOP: 50ml/min  
↑↓ #132

Press the middle button again and then enter  
the service password.



Current Monitoring / DOP  
Compressor EIN (14)  
Password  
3\*\*\* 12sec  
PAC-Rest: 00.00L (00.00L)  
Q DOP: 50ml/min  
↑↓ #132

Enter the desired value,  
confirm with the middle button.

Adjustable: 0-240s



Current Monitoring / DOP  
Compressor EIN (14)  
Running Time DOP  
032 (alt) 12sec  
040 (neu)  
PAC-Rest: 00.00L (00.00L)  
Q DOP: 50ml/min  
↑↓ #132

# 1. Start-Up & Commissioning Procedure

---

1. Is the control unit located no more than 30 m from the treatment plant and protected from rain and sun? ☐
2. Is a 230 V power supply plug with a 30 mA residual-current circuit breaker available? Is the protective earth conductor functioning? ☐
3. Is the treatment tank installed according to the installation manual? ☐
4. Is the sludge removal pipe installed in accordance with the installation instructions including extension and cap? ☐
5. Are the seals from the shaft assembly set for the air supply hose and cable conduit set in place? Is the cable holder installed? For pumped version, is the outlet installed? ☐
6. Is the hose pulled into the shaft up to the red marking? (Standard hose length 3m, extension up to 10m possible, max. 300mm deep into the ground) ☐
7. Is the diffuser pipe installed in the centre of and horizontally on the tank floor? ☐
8. Are the lifters filled with water to prevent them from being lifted? (Not applicable to pumped version) ☐
9. Check the inlet pipe from the house is connected and the outlet pipe is connected to the downstream pipework. ☐
10. Make sure ventilation is sufficient as described in this manual ☐
11. A wire is attached to the end of the cable so that the cable can be pulled out of the conduit in future if required. ☐
12. Fill the tank with clean water up to the level of the pump. ☐
13. Ensure the pump is hanging both on the threaded stainless-steel rods as well as on the chain hooks positioned in the turret. ☐

# Servicing Guide for Professionals



## Servicing & Maintenance

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Ensuring the sewage treatment plant is regularly maintained is necessary to ensure the operational efficiency of the tank and to limit the possibility of any faults occurring.

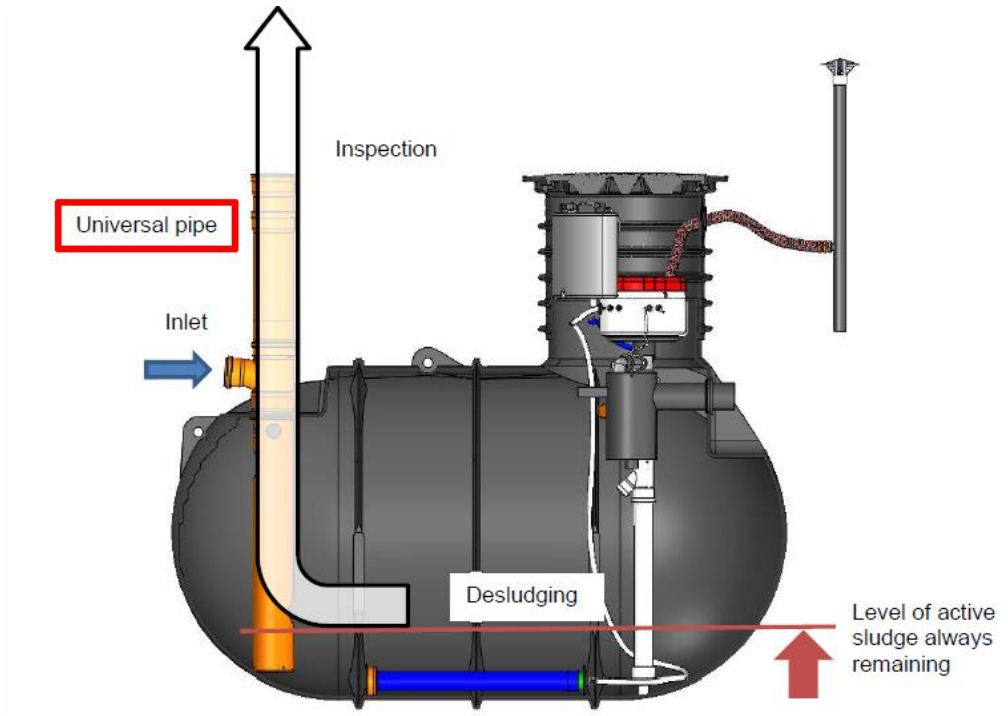
### ■ Servicing

This should be conducted by a professional wastewater treatment servicing agent as a matter of course at least once a year. Failure to do this could impact the performance of the wastewater treatment plant and void the warranty.

## De-Sludging

The design of the de-sludge pipe ensures that at 10% of the volume of contents will stay inside the tank. This is required to ensure ongoing biological operation.

De-Sludge using the de-sludge pipe only



- Desludging is required if the sludge level reaches 70% of the max. permitted.
- If the sludge volume fraction is lower than that, then an annual desludging is the maximum acceptable period for solids' accumulation.
- Your service provider should carry out this test by using two volumetric cylinders, one empty and one half full of water.
- You must check whether the functions of the calmed inlet, aeration devices, and clearwater lifter are impacted by damaging substances (i.e fats, rugs, inert solids). Substances that are damaging to functions should be removed each time that maintenance is performed.
- During desludging, you must ensure that airlift and aeration devices are not damaged, the plant is not in the middle of the sedimentation phase whenever possible, and that at least 10% of the sludge quantity remains in the container (inlet pipe has a corresponding opening to allow for the specific volume).

## Assessing Activated Sludge Volume In The Reactor (SSV30)

- measure water level in the reactor (after aeration, ideally around 11.30 am)
- aerate reactor per manual mode for 2min when tank is full, evaluate mixing
- take 250 ml sample of mixed activated sludge and fill into 1000 ml cylinder
- fill up with 750 ml of clearwater from sample pot to reach “1+3 dilution”
- allow settlement for 30min
- multiply resulting sludge level by factor 4 to get SSV30 in ml/l
- take picture and save it as part of maintenance report

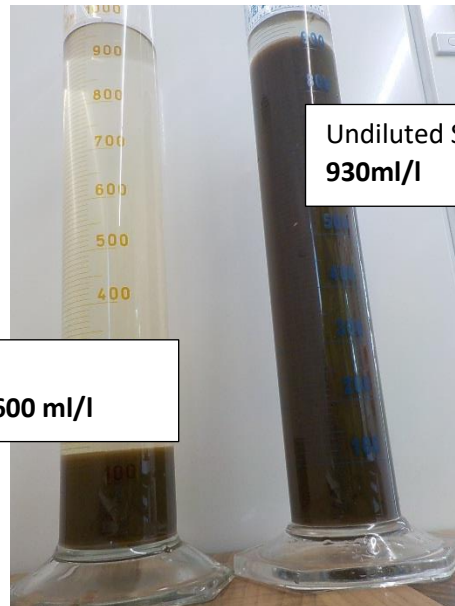


### Why dilute 1+3?

Example after 30min sedimentation:

Dilution „1+3“:  
 $SSV30 = 150 \text{ ml/l} \times 4 = 600 \text{ ml/l}$

The result of **600ml/l** is much closer to the real conditions in the tank.



Undiluted SSV30=  
**930ml/l**

### 9.3.Evaluation of Sludge Level SSV90norm and Desludging

For proper evaluation of  $SSV90_{\text{norm}}$  sludge level calculate according to this formula:

$$SSV90_{\text{norm}} = 0,95 \times SSV30 \times HR / HR_{\text{max}}$$

<b>SSV90<sub>norm</sub></b>	true sludge level in reactor after 90min of sedimentation normalized / standardized to HR <sub>max</sub>
<b>0,95</b>	factor for conversion of SSV30 to SSV90 (30 resp.90 min sedimentation)
<b>SSV30:</b>	measurement of sludge level in reactor in 1+3 dilution after 30min sedimentation at current water level HR during service
<b>HR:</b>	current water level at service
<b>HR<sub>max</sub>:</b>	max. reg. water level at full hydraulic load (see table below)





Desludging is required when  $SSV90_{norm} = 700 \text{ ml/l}$

#### EXAMPLE

- Type: EM2-35 (tank type)
- HR at service: 1,16 m
- HRmax according to table: 1,28 m
- level in cylinder (30min): 130 ml (1+3)  
(250ml sample+750ml clearwater)
- $SSV30 = 520 \text{ ml/l}$  (4x130)
- $SSV90_{norm}$   
=  $0,95 \times 520 \times (1,16 / 1,28) \text{ ml/l}$   
= 448 ml/l

→  $SSV90_{norm} = 448 \text{ ml/l}$

→ around 2/3 of total sludge storage volume capacity is currently filled

Table of max.regular water level at full hydraulic load HRmax:

Plant type	PE	HRmax	Height tank bottom to edge of manhole as reference for on- site measurement
EBL-26	5 PE	0,92 m	1,57 m
EBL-30	5 PE	1,12 m	1,96 m
EBL-45	8 PE	1,35 m	2,24 m
EBL-52	10 PE	1,54 m	2,21 m
EBL-76	15 PE	1,68 m	2,28 m
EBL-99	20 PE	1,81 m	2,28 m
EBL-76X2	30 PE	1,71 m	2,28 m
EBL-99X2	40 PE	1,81 m	2,28 m
EBL-99X3	50 PE	1,85 m	2,28 m

## Special Notes On Maintenance Of The Dosing Mechanism

This paragraph highlights the maintenance needs for the dosing equipment. This work is to be carried out by an experience service company only that knows the hazards from handling corrosive chemicals.

### Precipitants



**Warning: irritating / corrosive, Irritating to eyes and skin.**

**Avoid contact and wear suitable protective equipment.**

**Use only containers and fittings made of plastic.**

There is no expected hazard when the chemical agent is dispensed into the mixed liquor.

### Tools Required (Only By Professional Service Company)

- A dipstick made of plastic to be used for the measurement of the level in the precipitant tank
- Funnel and hose to be used for the refill of the precipitant tank

### Suction Filter In The Precipitant Tank (only by professional service company)

Check the suction filter in the precipitant tank for deposits or blockages. Clean if necessary.

### Level of Precipitant (only by professional service company)

As part of maintenance, the actual fill level in the precipitant tank must be compared with the “theoretical” fill level displayed on the control (PAC rest).

Fill level (large canister): 10cm corresponds to approx. 13-14L

In the event of significant deviations, the cause must be clarified (see likely scenarios below)

Possible causes:	Inspect:
The flow rate of the pump is not set correctly.	Measure the volume flow of the pump and adjust the settings on the control if necessary
Blockage at the dosing hose or dosing pump	Check the pump, hose and suction filter and clean if necessary.
Malfunction of the dosing pump	Check the pump.

### Filling The Precipitant Tank



**Danger:**

Observe the safety instructions for handling the precipitant, see Appendix

Polyaluminium hydroxide chloride PAC is used as a precipitant.

Container: canister 60L

See data sheets in the appendix

Annual consumption for an average single-family house: approx. 15 liters

After the precipitant tank has been filled, the new filling volume must be entered on the control.

## Dosing Pump

The pump hose inside the housing must be replaced once a year as part of the maintenance.

- Replacement hose: Persitalik hose, material: Santoprene



Please make sure that the plastic cover clicks back into place correctly!

## Notes For Plants With Pumped Outlet (option)

- The pump is positioned on the bottom of the tank; make sure that the integrated float moves freely and the length is short so it can easily reach to a vertical position.
- Consider 1 " cable gland outlet (threaded, DN25) and a 32mm of pump connection inlet

## Important Information on Control With DOP

- The metering pump is not monitored for current (no alarm if the pump fails)
- When vacation mode is activated, the dosing pump is inactive

## Alarm Relay (for an external signaller)

The control unit has an alarm relay, whereby contacts 11 and 12 of the relay can be connected to an external signalling device (e.g. warning light). Ensure that the external device has a separate power supply so that a power failure in the control unit can also be signalled. When an alarm sounds or there is a power failure, contacts 11 and 12 are connected to one another. Finally (to be performed by a qualified electrician only), the pre-punched opening on the housing is opened and the cable is expertly led through with a PG gland.

## Service & Maintenance (specialist companies only)

### Replacing the fuse:

If the control fuse is released, it should only be replaced by a microfuse of the following type: **T 4.0 A, 250 V, H** (time-delay glass tube microfuse 4.0 A; 5 x 20 mm with a high breaking capacity (opaque) according to EN 60127-2/III).

**Changing the battery:** Battery maintenance is not required; however, if the alarm duration begins to decrease or the alarm **Accu**, we recommend replacing the accumulators with new ones (type NiMH AA, capacity 1800 to 2100 mAh).

**Only rechargeable accumulators (batteries) are permitted; never use normal batteries.**

## Technical Data And Environmental Conditions For The Control Unit

### Technical Data

Housing material:	Polycarbonate for wall mounting
Dimensions:	200 x 120 x 60 mm
Type of protection:	IP54
Supply voltage:	230 V AC, 50 Hz
Control:	Time-controlled using real time clock
Inputs:	1 float switch input
Outputs:	4 relay outputs
Alarm output:	1 alarm relay
Interface:	Internal RS232 interface
Current measurement:	Available Power failure monitoring
Connection technology:	1 x 7-pin flange socket (binder)
Mains voltage via shock-proof plug:	3 x 1.0 mm <sup>2</sup> , 1.5 m long
Microfuses:	2x T 4.0 A, 250 V, H (time-delay glass tube microfuse) 4.0 A; 5 x 20 mm with a high breaking capacity, opaque, as a joint fuse for all outputs (L/N)
Sound level:	Max. 57 dB(A) when the acoustic alarm is sounding at a distance of 1 m

### Environmental conditions for control unit

#### Permitted ambient temperatures:

Operating temperature:	Unit function: -20°C to +55°C
Storage temperature:	-25°C to +60°C
Air pressure:	During operation and during storage, 80 kPa to 106 kPa
Relative humidity:	max. 95% rH (condensing) permitted
Ice formation:	Not permitted

### Type Plate Control Unit



## Technical Data For Solido SMART Technology Capsule

Outer dimensions of technology capsule:	D = 340 mm, H = 252 mm (High capsule: H = 352 mm)
Material:	HD-PE
Approval:	UN / 1H2 / X 38 / S
Protection class:	IPX6
Relative humidity:	max. 95% rH (condensing) permitted
Sound level:	max. 36 dB(A) at a height of 1.50 m directly above the cover of the Solido SMART +P (with XP-60)
Solenoid valves:	1 x 3/2-way solenoid valves, DN 13, 1/2" female thread, IP65

### Installed compressor:

<b>HIBLOW membrane compressor models</b>	<b>XP-80</b>
Operating pressure (mbar)	147
Applicable pressure range (mbar)	60-270
Air feed rate at operating pressure (l/min)	80
Max. apparent output of technology capsule (S) (VA)	205
Weight (kg)	4.3
Dimensions (mm x mm x mm)	208 x 132 x 186
Protection class	IP45

### In the higher capsule:

<b>HIBLOW membrane compressor models</b>	<b>HP-120</b>	<b>HP-200</b>
Operating pressure (mbar)	177	200
Applicable pressure range (mbar)	30 to 300	30 to 300
Air feed rate at operating pressure (l/min)	120	200
Max. apparent output of technology capsule (S) (VA)	285	510
Weight (kg)	8.5	9.0
Dimensions (mm x mm x mm)	256 x 200 x 222	256 x 200 x 222
Protection class	IP45	IP45



## Dosing Pump Information



### Dosing pump PE – 3

Catalogue number: PP0003A1000\_A

### Technical specifications

Housing protection of the pump	IP 65
Flow max (l/hr)	3.0
Pressure (bar)	0.1
Suction distance (m)	1.5
Hose connection	Nut 4x6mm
Power supply	230 VAC
Power requirement (W)	3.5
Electrical supply (mA)	100
Scope of delivery	Includes standard assembly kit
Dimensions (mm)	103 x 82 x 92 (H x W x D)
Standards	72/23EEC (19/02/1973) 89/336EEC (from 03/05/1989) EN60336-1

Final effluent pump (optional)

The pump used is TOP vortex (model. 2)



See details for model 2

MODEL	POWER (P <sub>2</sub> )		Q	0	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8
	kW	HP		0	20	40	60	80	100	120	140	160	180
Single-phase													
TOP 2 - VORTEX	0.37	0.50	H metres	7	6.5	6	5.4	4.8	4.2	3.5	2.9	2.2	1.5
TOP 3 - VORTEX	0.55	0.75		8.5	8	7.4	6.8	6.1	5.5	4.7	4	3.2	2.5

Q = Flow rate H = Total manometric head

Tolerance of characteristic curves in compliance with EN ISO 9906 Grade 3B.

## Technical specifications

Feature	Details
Pump body	Technopolymer
Suction filter	
Suction plate	
Diffuser	
impeller	Technopolymer Vortex type
Motorcasing	Stainless steel AISI 304
Motorcasing plate	Stainless steel AISI 431
Motor shaft	
Electrical motor	Single phase
Capacitor	10uF – 450VL (220V) 16uF – 250 VL (110-127 V)
Electrical motor	220V 60Hz
insulation	Class F
Protection	IP X8
Cable	5.0m H07 RNF power cable with Schuko plug
Hose connection	32 mm (with ring nut)

## Generic MSDS for PAC

### Chemical agent – properties

Agent name: Polyaluminium Chloride (PAC) solution

- Al<sub>3</sub><sup>+</sup>: 9.2 ±0.4 % (3.4 ±0.15 mol/kg)
- Al<sub>2</sub>O<sub>3</sub>: 17.4 ±0.6%
- pH (at 20°C): <2.0
- colour: Yellow (-ish)

Component	CAS-No	Weight (%)
PAC	1327-41-9	25-35%
Water	7732-18-5	65-75%

### Hazard Identification

#### Classification – OSHA regulatory status

This chemical is considered hazardous by the 2012 OSHA hazard Communication Standard (29 CFR 1910.1200)

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2
Corrosive to metals	Category 1

## PERFORMANCE RESULTS

**Premier Tech Aqua GmbH**

Am Gammgraben 2, 19258 Boizenburg, Germany

**EN 12566-3, Annex B**

Small wastewater treatment systems for up to 50 PT

**Small wastewater treatment system SMART + P Millenium 4m³**

One chamber SBR system with phosphorus precipitation

Test report PIA2017-300B22

Nominal organic daily load	0.20 kg BOD <sub>5</sub> /d												
Nominal hydraulic daily load	0.6 m³/d												
Material	Polyethylene												
Treatment efficiency (nominal sequences)	<table> <tr> <td>COD</td><td>95.5 %</td></tr> <tr> <td>BOD<sub>5</sub></td><td>98.7 %</td></tr> <tr> <td>N<sub>tot</sub></td><td>74.6 %</td></tr> <tr> <td>NH<sub>4</sub>-N*</td><td>99.1 %</td></tr> <tr> <td>P<sub>tot</sub></td><td>90.0 %</td></tr> <tr> <td>SS</td><td>95.5 %</td></tr> </table>	COD	95.5 %	BOD <sub>5</sub>	98.7 %	N <sub>tot</sub>	74.6 %	NH <sub>4</sub> -N*	99.1 %	P <sub>tot</sub>	90.0 %	SS	95.5 %
COD	95.5 %												
BOD <sub>5</sub>	98.7 %												
N <sub>tot</sub>	74.6 %												
NH <sub>4</sub> -N*	99.1 %												
P <sub>tot</sub>	90.0 %												
SS	95.5 %												
Electrical consumption	0.56 kWh/d												

\*determined for temperatures  $\geq 12^{\circ}\text{C}$  in the bioreactor

Performance tested by:

**PIA – Prüfinstitut für Abwassertechnik GmbH**

(PIA GmbH)

Hergenrather Weg 30

52074 Aachen, Germany

This document replaces neither the declaration  
of performance nor the CE marking



Notified Body  
No. 1739



Certified according to  
ISO 9001:2008



Elmar Lancé

February 2018



## INSTALLATION & SERVICING GUIDE

# REWATEC™

Solido Smart +P

