Technical Documentation
(Instruction Manual and Operations Logbook)
Fully Biological SBR Wastewater Treatment System SOLIDO®
for Small Wastewater Treatment Plants

DOKK5105E 251016 TD SOLIDO 2016

in PE container MONOLITH: SOLIDO 4-120 PT

Qualified advice by telephone: +49 (0)30 44013830 (9:00 to 16:00, CET)
www.premiertechaqua.de berlin@rewatec.de

PREMIER TECH AQUA

Rewatec®

Summary of Important Information

We are pleased that you have chosen a REWATEC small wastewater treatment plant. To ensure a long, reliable service life, it is important that you read and observe the information in this instruction manual.

The following warning and information symbols are used in this manual and are attached to the mains supply line:

Caution: Danger for persons and objects: electrical equipment installed, observe safety instructions

Caution/Note: Read technical documentation

Caution: Disconnect from the mains before carrying out repair work

Important safety instructions

- Connecting, start-up and opening electrical components should only be carried out by authorised personnel. The power cord must be protected with a 30 mA residual-current circuit breaker.
- The Solido technology capsule should **ONLY** be opened by a specialist company, and **ONLY** when the **power is switched off**.
- The small wastewater treatment plant should be installed by qualified personnel only. Make sure that the technical components can be accessed without any danger. Any deviations from the installation instructions provided are the responsibility of the specialist company and must be agreed upon with the manufacturer.
  Never enter the system unless the power has been switched off and the applicable accident prevention regulations are being observed (oxygen deficiency).
  Observe the safety instructions in the relevant chapters.

Important information for container installation

- **Pay attention to the on-site conditions**: The subsurface must be sufficiently stable and water permeable. In addition to observing the accident prevention regulations, make sure to consider: ground water, installation depth (recommendation: max. 1.2 m below ground), distances to buildings/ property boundaries, as well as traffic loads.
- **Use suitable backfill material**: The backfill material around the PE container must be able to be tightly compacted and must be permeable to water; it must create a solid packing and may not damage the surface of the tank. We recommend: round gravel, max. grain size of 8/16 mm – please check information sheet DORW0100 on our site.

Observe the following procedure:

1. Build a stable, level foundation (20 cm) from filling material.
2. Verify the integrity of the containers and their components and carefully place them into the pit without damaging them.

3. Fill in water into the lifters (because of bouyancy force) and afterwards half-fill the containers with water to stabilise them.
4. Add the filling material and compress in layers using a hand tamper.
5. Connect the inflow, outflow and connection pipe. For maintenance and leakage tests we recommend to extend the inlet pipe to the center of the first chamber.
6. Position shaft elements. When doing so, install the shaft assembly set (for MONOLITH II) if needed and adjust the height of the shafts as necessary (can be moved by max. 14 resp. 4 cm!).
7. Pass the cable conduit (DN50/DN100) and the air intake hose through the shaft and place the air inlet supports in a suitable position with a steady intake of the cleanest possible air. If necessary, extend the hose (up to max. 10 m).
8. Fill the rest of the excavated pit with filling material.
9. Check that the supply pipe and the roof deaeration provide sufficient aeration and deaeration for the containers (install a separate aeration pipe if necessary).

Important information for the installation of SOLIDO® wastewater treatment technology

Please observe the following safety instructions and installation steps:

1. **Choose the location of the control unit:** It should not be positioned in direct rain or sun, and it should be located between 10 m and max. 25 m from the treatment tank (standard cable length: 15 m; on-site up to max. 30 m permitted).
2. **Lay the cable:** Pull the control cable through the cable conduit (DN 50/DN100), ensuring that the plug is protected from moisture while doing so (never remove). Install the sealing to the building in such a way that it is possible to change the cable at a later point.
3. **Connect the pre-installed hoses** and/or supply air hose to the connections on the SOLIDO capsule according to the colours.
4. **Fix the overfill sensor (SWS)** to pre-installed clip at the sample container.
5. Place the **SOLIDO capsule** onto the air lifter in the SBR chamber which is provided for this purpose**.**
6. **Fix the cable in place:** Place the main grey cable into the holder of the cable bundle.
7. **Check the complete installation** (pipeline gradient, aeration and deaeration, accessibility)
8. **Start up the system** (including system setting and test operation) and brief the operator (prepare protocol).

Important information for reliable operation

The purification efficiency of a small wastewater treatment plant is a living system that is based on microorganism activity. Therefore, observe the following:

- Do not feed in any **harmful or damaging substances** (sanitary products, chemical or oily wipes, food leftovers, chemical cleaner, hair).
- Ensure that your **water consumption is min. 80 l/PT per day**; lower quantities may reduce the quality of the outflow values.
- Arrange a **maintenance contract** with a six-month maintenance interval (or as specified in your legal water permit).
- Familiarise yourself with the **functional principle**.

Troubleshooting

If the control unit beeps and the **red LED** warning light flashes, write down the error text displayed and switch off the warning tone. Call your maintenance service contact immediately.

Important legal notice

You require a **water usage permit issued by the appropriate authority.**
The **acceptance/start-up** of a small wastewater treatment plant may only be carried out by a **certified company** and must be documented in a **start-up protocol**. Otherwise the manufacturer warranty period is reduced to the statutory time.

Important warranty notice

MONOLITH containers are subject to a warranty period of 25 years. The SOLIDO wastewater treatment system has a 3-year warranty. The warranty assurance is dependent on the proper handling and correct operation of the system (e.g. maintenance contract with an authorised company).

The 3-year warranty for the SOLIDO wastewater treatment system covers the durability of all electrical and mechanical components. Any unauthorised alterations to the small wastewater treatment plant (e.g. changing the air lifters, opening the junction box/connection plug, manipulation of the control unit by non-qualified personnel) and/or the improper use of the plant and/or deviations from the configuration specified by PREMIER TECH AQUA (see the relevant section in the “Installation Instructions” chapter) are not permitted and void any warranty claims.

Please use the “Master Data Sheet” at the end of this document and retain all important documents if you wish to submit a warranty claim.

Table of Contents

1 Introduction

1.1 Scope

This “Technical Documentation for the SBR Wastewater Treatment System SOLIDO” refers primarily to the representation of SOLIDO as a technical configuration of REWATEC small wastewater treatment plants (2-36 PT). For more information, see:

- Technical documentation for the MONOLITH I and/or MONOLITH II underground containers (= treatment tanks)
- Short description of the SOLIDO PE complete plant (DOKK5201)
- Installation instructions for kiosk (DOKK7301 operation console)

1.2 Intended use

The SBR wastewater treatment system SOLIDO is used for the cleaning and purification of wastewater in domestic areas. This wastewater treatment system is not intended for any other use. Any other, improper use may cause damage and unexpected hazards. The manufacturer is not liable for any damages if this is the case. Observe the instructions for operating the plant (see chapter 3). When the system is to be taken out of use, it must be decommissioned properly (safe disconnection from the mains, ensure that the container has structural integrity, and if necessary, disconnect the inlets and outlets).

2 Description of the SOLIDO SBR Wastewater Treatment System

General

The small wastewater treatment system SOLIDO works as a sequencing batch reactor and has two treatment stages: the primary treatment and the SBR phase ("sequencing batch reactor"). During primary treatment, floating inorganic pollutants and pollutants that sediment are separated and held back from entering the wastewater stream. Only dissolved or floating pollutants reach the SBR. The biological treatment of one cycle in the SBR lasts 6 hours. It is made up of 4.5 to 5 hours of aeration and 1 to 1.5 hours of sedimentation. The excess sludge that is left over from the biological treatment is pumped into the primary treatment and accumulated there.

The treatment cycle is controlled by a control unit. This means that you can adapt the system to the local conditions as well as optimising the operating values.

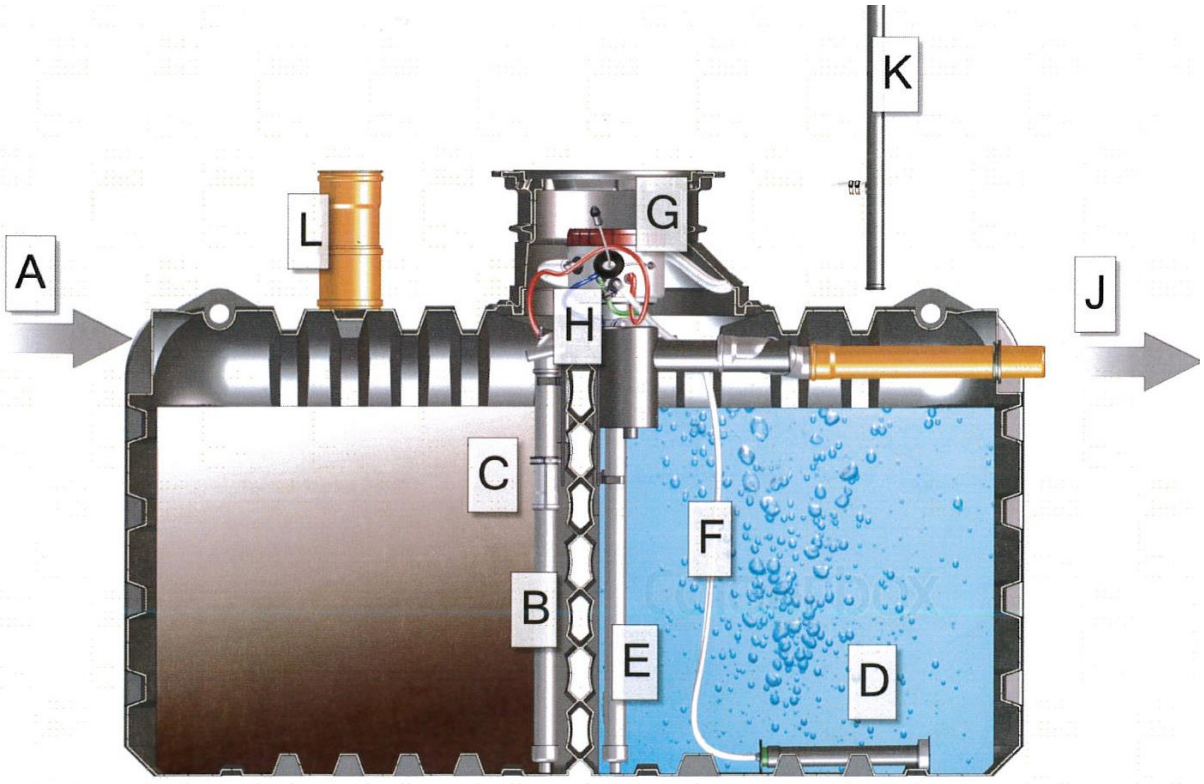
Sludge reservoir/buffer (primary treatment)

The domestic wastewater flows directly into this unit. It has three functions:

- Temporary storage of wastewater and provision of a buffer volume
- Mechanical pre-treatment of the wastewater through sedimentation processes and flotation (formation of “primary sludge”)
- Storage of the sludge that has been generated during the biological treatment (“secondary sludge”)

Sequencing batch reactor (SBR)

This is where the biological treatment of the wastewater takes place. The SOLIDO SBR wastewater treatment system comprises a technology capsule (G) a feed lifter (B), clearwater lifter (F) and excess sludge lifter (E). At the start of the treatment cycle, and after approx. 1.5 and 2.5 hours, the SBR section is fed wastewater from the buffer: the feed lifter (B) pumps wastewater out of the primary treatment and into the SBR reactor.



A	Inlet DN 100
B	Feed lifter (BSH)
C	Primary treatment
D	Tube diffuser (BEL)
E	Clearwater lifter (KWH) / Excess sludge lifter (ÜSH)
F	Air hose
G	Technology capsule with compressor and solenoid valves
H	Outflow immersion pipe with an integrated sampling container
J	Outlet
K	Supply air hose and supports
L	Shaft for clarifier sludge disposal
	Overfill sensor (SWS) – no figure

In the biological treatment that follows, the characteristic ingredients of wastewater are decomposed into biomass by floating microorganisms (activated sludge). The mixing and oxygen air supply needed for this is provided by the tube diffuser (D). The aeration is activated intermittently; this means that the diffuser operates between two breaks. A specific aeration time is stored, which is determined by the number of inhabitants, compressor type and filtration level. An interval, comprising the aeration time and break time, is always 20 minutes, so that the breaks last for different amounts of time (e.g.: 5 min aeration, 15 min break or 12 min aeration, 8 min break). After this aeration phase, which lasts around 5 hours, a 1 hour sedimentation phase begins. At the end, the clearwater lifter (F) pumps treated water into the immersion pipe (J) until the lowest intake point on the clearwater lifter has been reached.

Automatic Backflush

Due to our patent-registered lifter it is possible to backflush the lifters automatically everytime before they are started. The loss of activated sludge in the SBR-reactor is reduced siginficantly and the life time of the following soakaway is increased. Also possible congestions of the feeding lifter are avoided by the backflush automatic.

Excess sludge removal

Every time clearwater is drained at the end of a cycle, the excess sludge lifter is operated simultaneously. It feeds a mixture of activated sludge and water back into the primary treatment until the activated sludge level has reached the level of the intake opening on the air lifter.

This maintains a constant activated sludge volume and ensures that excess sludge is removed.

Normal mode / economy mode / holiday mode

The two operational states, normal mode and economy mode, run according to the following preset, fixed time patterns:

	Mo	Tu	We	Th	Fr	Sa	Su
08:00	Normal	Normal	Normal	Normal	Normal	Normal	Normal
14:00	Economy	Economy	Economy	Economy	Economy	Normal	Normal
20:00	Normal	Normal	Normal	Normal	Normal	Normal	Normal
02:00	Economy	Economy	Economy	Economy	Economy	Economy	Economy

With the option to reduce running times for the aeration and air lifters during "Economy" times, the daily fluctuation of wastewater generation in private households can be depicted. If operating conditions are not compatible with the preset running times, the individual running time blocks can be set to normal or economy mode. For longer periods where no wastewater is generated, e.g. holidays, you can select an economy mode for max. 30 days (holiday economy mode). After this period, the control unit automatically reverts back to the preset normal/economy mode time pattern (see chapter 5.2).

Sampling

In order to ensure that a representative sample is available at any time, a sampling container is integrated into the immersion pipe for the discharge, from which you can take a sample of the most recent clearwater that is being drained. We recommend that you use a slim sample taker.

Plant control unit

The SOLIDO system is equipped with a electronic controller of type S30. The sequence program is designed in a way that guarantees that the required outflow values are maintained through the proper adjustment of parameters.
When you enter the number of inhabitants into the plant, the preset control parameters are automatically loaded.

If it appears that the plant is underloaded or overloaded, these parameters must be adjusted according to the actual conditions by a specialist company (upon consultation with the PREMIER TECH AQUA specialist service if required). Refer to chapter 5.1 for a detailed description of the manner in which the control units operates.

Overfill Sensor (SWS)

Every SOLIDO capsule is equipped with an electrical overfill sensor (SWS), which immediately indicates high water levels in the tank (alarm on control unit).

Additional options by the use of control unit S 30 full version

The following additional components can optionally be connected to the controller

Option	Characteristics	Add. components
Sludge-Composting-System SKS	- no sludge removal - but composting	- sludge pump FEP - float switch SWS (level control separator)
Aktive feeding pump ABP (instead of lifter BSH)	- increasing buffer volume	- Aktive feeding pump ABP - float switch SWS (level control SBR)
Clearwater pump KWP (instead of lifter KWH)	- when lifting above inlet level is necessary on outlet	- Clear water pump with protection against dry running - suggestion: use overflow alarm

3 Operation and Maintenance Information

3.1 Inspection and maintenance requirements

Safety instructions for inspecting the system yourself, repair work and maintenance:

There may be a lack of oxygen in wastewater treatment plants.

Exercise extreme caution if you must enter the small wastewater treatment plant to carry out repairs or maintenance. Observe the applicable accident prevention regulations.

All electrical plant components must be switched off before entering a wastewater treatment plant (disconnect the plug).

There should always be two people present when a wastewater treatment plant is entered. Never enter behind a person who has fallen unconscious; call for help immediately.

Protect open containers from falling in.

Please pay attention to the fact that following any work done at the sewage container the child security of the TopCover has to be closed again!

The operator must check that the wastewater treatment plant is running fault-free **every day**. In case of a failure (e.g. error message issued by the control unit), inform the maintenance service immediately.

3.2 Inspection by the operator (according to German law)

1. The operator must have the inspection and maintenance work performed by a qualified expert[1] if he does not have the necessary expertise himself. In Germany, a certificate of qualification is offered by DWA, the German association for water, wastewater and waste (phone: +49(0)2242 872222, www.dwa.de).
2. The following should be carried out by the operator or by a contracted company:
   - ➔ Visual inspection of the outflow (also in the inspection chamber if necessary) to check for sludge output; sludge output may impair the operability of a downstream seepage system.
   - ➔ Inspection of the inflow and discharge for blockages (visual inspection)
   - ➔ Checking whether there is any floating sludge in the SBR and removing it (into the sludge reservoir)
   - ➔ Recording the operating times of the aggregates in the operations logbook
3. An operations logbook should be kept for every small wastewater treatment plant.
4. A template for an operations logbook can be found on the last page of this document. Failures, maintenance work, sludge removal, maintenance reports and other incidents should be recorded in the operations logbook. The operations logbook is to be handed over to the responsible authorities upon request.

3.3 Maintenance (according to German law)

In accordance with the legal water usage permit, the plant operator must take out a maintenance contract with a specialist company (qualified expert) that covers a fixed scope of work. Maintenance is usually performed twice a year (at an interval of six months) and includes the following activities for the wastewater treatment plant component:

- Inspection of the operations logbook and determination of regular operation (target/actual comparison).
- Function check of the important plant components (mechanical, electrical-technical, other), checking in particular for the formation of bubbles and the pumping function of the air lifters
- Function check of the control unit and the alarm function
- Maintenance of the compressor

  (see attached document “Operating Manual for MEDO LA Air Blower”)
- Optimisation of the operation parameters on the basis of inspection results from the SBR and outflow, upon consultation with the PREMIER TECH AQUA specialist service at +49 (0)30 44013830.
- Checking of the sludge height in the sludge reservoir and the removal of the sludge by the operator. Sludge should be removed as necessary in order to ensure the proper operation of the small wastewater treatment plant. The sludge should be removed when the sludge in the sludge reservoir reaches the following level: plants with sludge reservoir (250 l/PT): 70% full
- General cleaning maintenance, e.g. removal of sediment deposits
- Inspection of the structural condition of the plant

1 “Qualified experts” are those persons engaged by the operator or contracted third parties who are considered to have the training, knowledge and practical experience qualifying them to carry out the inspection of small wastewater treatment plants.

- Checking that aeration and deaeration is sufficient
- Checking the concentration of oxygen and sludge volume in the SBR basin
- Any maintenance carried out is to be recorded in the operations logbook

Sampling

A sample of the outflow is to be taken during maintenance. The following values should be checked (the water usage permit is to be used as a guideline):

- Temperature
- pH value
- Solids that sediment
- Transparency
- Chemical oxygen demand (COD)
- NH_4-N (if required)
- N_{inorg} (if required)
- BOD5 (if required)

Caution:
In SBR plants, outflow samples can be taken at any time from the sampling container, which is installed in the discharge of the SBR chamber. Samples can otherwise only be taken when the clearwater is being drained, unless a separate sampling shaft is installed.

The abovementioned maintenance activities and inspection results are recorded in a maintenance report which is then given to the operator. The operator must append the maintenance report to the operations logbook and submit it to the responsible water authorities upon request.

3.4 Additional information

The following recommendations and information should be considered as supplementary to the maintenance stipulations given in the DIBt approval:

1. **Checking for the formation of bubbles and checking the pumping function of the air lifters** are important measures which should also be performed during the operator's own plant inspections. If a reduction in performance occurs due to reduced compressed air performance, contact your maintenance service. (Measuring of back pressure of diffuser, contact PREMIER TECH AQUA)
2. The **compressor filter** must be inspected regularly during the maintenance, and promptly replaced if necessary. After the technology capsule has been opened **(by a specialist company only)**, ensure that the cover is properly shut again (recommended: torque 40 Nm). We recommend to lubricate the sealing from time to time with vaseline and to reseal the cover again. (Use "capsule key" to open technology capsule, see 4.11)
3. **The full biological purification efficiency (= COD decomposition > 85%) takes several months to develop and is only achieved if:**
   - **there are no structural defects** (e.g. heavy underloading or overloading, extraneous water inflow, faulty aeration and deaeration, installation faults)
   - it is certain that the domestic wastewater contains **no forbidden substances** (poisonous or damaging substances: see the next page) and that it is characteristic domestic wastewater (COD < 1000 mg/l; pH value = approx. 6.5 – 8.0)
   - the **proper function of the aggregates** is assured through regular maintenance.
4. **Washing and cleaning solutions should be added sparingly**

   An increasing number of "strong cleaning agents" are available on the market, which contain substances that feed on the oxygen necessary for the decomposition process and compromise the decomposing bacteria. The use of washing and cleaning solutions

should be kept to a basic minimum in order to achieve optimal decomposition (hint: reduce the amount of solution until you are no longer completely happy with the cleaning result, then gradually increase the amount you use).
This is specially important in households that use drinking water sparingly and heavily reduce their water consumption (to below 80 l/PT) The inflowing wastewater may enter the plant twice as concentrated as normal domestic wastewater. This poses the risk that, even if the plant is in perfect technical and biological working order, the outflow concentration is higher than the limit values stipulated by the water authorities (e.g. COD > 150 mg/l).

5. Supervision of the running-in phase by qualified personnel is advisable.

In the running-in phase, SBR plants should be supervised and, where possible, configured by a specialist company. Building a stable biological function is a prerequisite for ensuring fault-free plant functionality.

6. Help to avoid failures.

If you observe the operational guidelines listed here, you will save unnecessary costs while protecting the environment:

- ensure safe wastewater purification by not exceeding the limit values
- lower your costs (consumption quantities and energy consumption of the wastewater treatment plant) by avoiding unnecessary amounts of washing and cleaning agents
- prevent unnecessary repair expenses by avoiding damaging substances
- make sure the system settings are optimal (= less energy consumption) and ensure a long service life through professional maintenance
- longer permeability means a longer service life for the downstream seepage system

3.5 Items that do NOT belong in small wastewater treatment plants:

Common solids and liquids that do NOT belong in the toilet or drain (!!=but unfortunately are commonly found there):	**Effect:**	**Proper disposal**
Adhesive plasters	Block the pipes	Dustbin
Ash	Does not decompose	Dustbin
Bird sand	Blocks the plant	Dustbin
Backflush from water softener	Contaminate wastewater	Collecting point
Cat litter	Blocks the pipes	Dustbin
Chemicals	Contaminate wastewater	Collecting point
Cigarettes	Block the plant	Dustbin
Cleaning agent	Contaminate wastewater	Collecting point
Condoms !!	Block the plant	Dustbin
Cooking oil	Overloads the plant	Dustbin
Corks	Block the plant	Dustbin or collection point
Cotton swabs	Block the plant	Dustbin
Disinfectants	Kill bacteria	Do not use
Engine oil	Contaminates wastewater	Collection point or petrol station
Food leftovers (solid and liquid, e.g. out-of-date milk) !!	Overload the plant	Dustbin
Frying oil/grease/fats	Block the plant	Dustbin
Hair (insofar as can be avoided) !!	Block the plant	Dustbin
Insecticide	Contaminate wastewater	Collecting point
Medications	Contaminate wastewater	Collection point or pharmacy
Nappy wipes, oily cloths !!	Block the air lifters	Dustbin
Oily waste	Contaminate wastewater	Collecting point
Paint	Contaminate wastewater	Collecting point
Paint thinner	Contaminates wastewater	Collecting point
Paintbrush cleaner	Contaminate wastewater	Collecting point
Pantyliners, tampons !!	Block the plant	Dustbin
Pesticide	Contaminate wastewater	Collecting point
Pipe cleaner	Contaminates wastewater	Do not use
Razor blades	Block the plant	Dustbin
Sanitary towels !!	Block the plant	Dustbin
Textiles (cleaning cloths etc.)	Block the plant	Dustbin
Varnish	Contaminate wastewater	Collecting point
Wallpaper adhesive	Blocks the plant	Collecting point
WC rim blocks	Contaminate wastewater	Do not use
Wet wipes !!	Block the plant	Dustbin

3.6 How to identify operational failures and their causes

In addition to the monitoring function by the control unit (see section 5.8 Alarm messages), the basic plant functions must be checked with visual inspections. It is important to be able to recognise unusual water levels:

Plant fault	Probable cause	Repair
The plant is full everywhere; the water level in the primary treatment and SBR is so high that the wastewater is flowing out of the emergency overflow.	The clearwater cannot be transported out of the plant because the receiving water or seepage system will not absorb it.	⇒ Switch on the clearwater lifter and observe whether the wastewater is carried away or whether it flows back into the plant
	The plant is hydraulically overloaded.	⇒ Ask the operator if an unusual amount of wastewater or percolating water has entered the plant
	The clearwater drainage is not functioning, because	The function of the clearwater lifter can be checked by switching it on in manual mode
	a) the hose is connected incorrectly	⇒ Check that the blue hose is connected correctly. If necessary, bend the green hose to ensure that the clearwater lifter (KWH) is functioning properly ⇒ check throttle ÜSH
	b) the air lifter is not receiving enough compressed air or any air at all	Check that ⇒ the compressor is working with optimal performance during other functions, e.g. aeration (check the filter, if necessary) ⇒ the blue hose is not damaged or bent ⇒ hose connectors/nozzles, also inside capsule, are ok. ⇒ the lifter is not congested ⇒ Valve 1 is faulty or not switched correctly by the controller. Test ventil 1 with SOLIDO 2012 tester.

Plant fault	Probable causes	Repair
The primary treatment is permanently full; the water level is so high that the wastewater is flowing over the emergency overflow and into the SBR reactor. The water in the SBR reactor is at a normal, low level.	The feeding function is not working, because the air lifter is not receiving enough compressed air	The function of feed lifter can be checked by switching it on in manual mode. Check that ⇒ the compressor is working with optimal performance during other functions, e.g. aeration (check the filter if necessary) ⇒ that the red hose is not damaged or bent ⇒ hose connectors/nozzles, also inside capsule, are ok. ⇒ the lifter is not congested ⇒ Valve 2 is faulty or not switched correctly by the controller. Test valve 1 with SOLIDO 2012 tester.
The excess sludge lifter (ÜSH) is not working.	The excess sludge lifter (ÜSH) function is not working, because a) the hose is connected incorrectly b) the air lifter is not receiving enough compressed air	By switching on the clearwater lifter in manual mode the function of excess sludge lifter can be checked. Advice: The flow rate is depending of the actual water level. ⇒ Check that the green hose is connected correctly, bend the blue hose to test. Check that ⇒ the stop cock at green hose is completely open ⇒ the compressor is working with optimal performance during other functions, e.g. aeration (check the filter if necessary) ⇒ the green hose is not damaged or bent ⇒ hose connectors/nozzles, also inside capsule, are ok. ⇒ the lifter is not congested ⇒ Check ÜSH throttle valve

Plant fault	Probable causes	Repair
The excess sludge discharge is not enough.	At low water levels in the treatment plant (e.g. because of low hydraulic loading) the pump capacity of the excess sludge lifter is very low (e.g. water level 1 m -> pump capacity 0,5 l/min), and therefore it can be dificult to control or detect it.	⇒ Check that the stop cock at green hose is completely open ⇒ To increase the excess sludge discharge please contact PREMIER TECH AQUA.
Insufficient oxygen (O_2) in the SBR-tank, therefore maybe odor nuisance or bad efficiency	The aeration is not or not sufficiently working, because	The function of the aerator can be checked by switching it on in manual mode
	a)the diffuser is installed incorrectly	⇒ Check the position of the diffuser (i.e. is it positioned horizontally, central on the floor of the container?).
	b) the diffuser is not receiving enough compressed air	Check that ⇒ the compressor is working with optimal performance during other functions e.g. feeding (check the filter if necessary), ⇒ Check that the white hose is not damaged or bent ⇒ hose connectors/nozzle, also inside capsule, are ok. ⇒ Valve 3 is faulty or not switched correctly by the controller. Test valve 3 with SOLIDO 2012 tester. ⇒ Increase aeration time at controller
	c) head loss of diffuser is too high (e.g. congested or calcified)	⇒ Measure back pressure of diffuser with manometer and water level, maybe change diffuser, contact PREMIER TECH AQUA
	d) ventilation of entire treatment plant is not sufficient	⇒ Provide sufficient aeration and deaeration (unobstructed circulation)

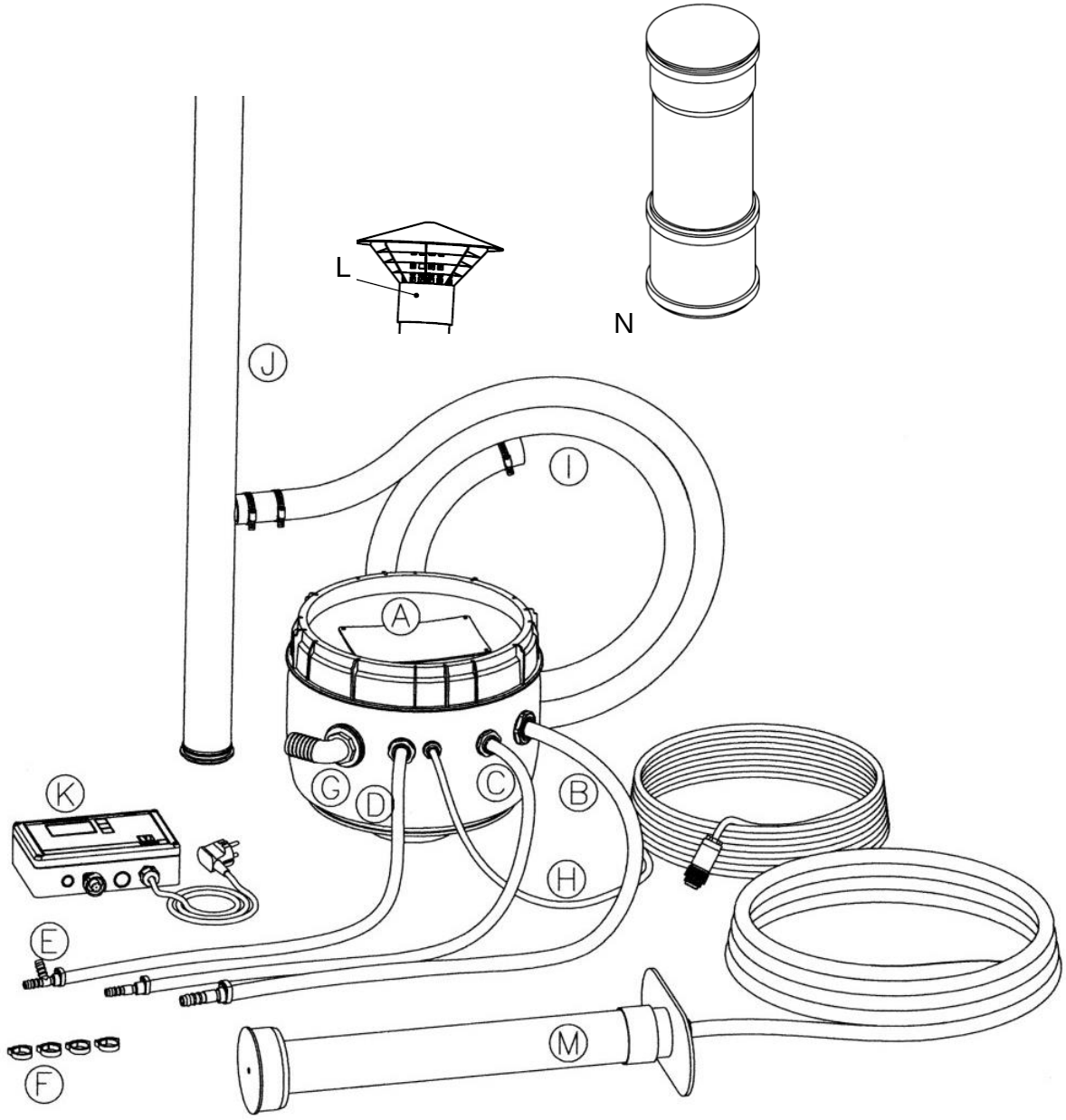
Plant fault	Probable causes	Repair
The efficiency of the plant is not satisfying **ADVICE:** **The plant reaches its full purification efficiency after approx 4 weeks, however this can take longer if there is a capacity underload or temperatures <12°.** **For a reduction of the start time, the SBR plants, will need activated sludge from another fully biological wastewater plant.**	Most of the failures mentioned above cause a decrease of the efficiency The following reasons can cause insufficient discharge values as well: - introduction of cleaning agent or disinfectants or other forbidden substances - insufficient air supply and aeration of the filtering tank - misarranged attachment of the FLUIDO - leakages of the container - percolating water/rain water - poor sludge disposal - wrong setting of the total number of inhabitants - Plant is disconnected from the mains for a long time	On behalf of the environment you should immediately inform your service, to assure a proper operation of the plant

Please check also Alarm messages

4 Installation Instructions

4.1 Checking the system components

Check that you have all system components and that they are in a flawless condition before beginning installation:



Item	Quantity	Description
A	1 pc	Technology capsule
B	1 pc	Compressed air outlet for tube diffuser (BEL), white
C	1 pc	Compressed air outlet for feed lifter (BSH), red
D	1 pc	Compressed air outlet for clearwater lifter (KWH), blue
E	1 pc	Compressed air outlet for excess sludge lifter (ÜSH), green with integrated throttle valve
F	4 pc	Hose clamp for B-E
G	1 pc	Hose nozzle for supply air hose
H	1 pc	Control cable, grey, with connection plug (15 m or 30 m)
I	1 pc	Supply air hose that can be laid in the ground, 3 m (pre-installed onto J)
J	1 pc	Air inlet support, PE (black)
K	1 pc	Control unit
L	1 pc	air vent (PP, grey)
M	1(-2) pc	Tube diffuser with 3,5 m hose
N	1 pc	Shaft for sludge disposal (KG DN200)
	1 pc	Overfill sensor, fixed to capsule (no figure)

IMPORTANT NOTES:

The diagram showing the scope of delivery and the following installation steps apply to the standard version single-container plant.

Items I, J and M are delivered hanging inside the container, please take out **before** installation.

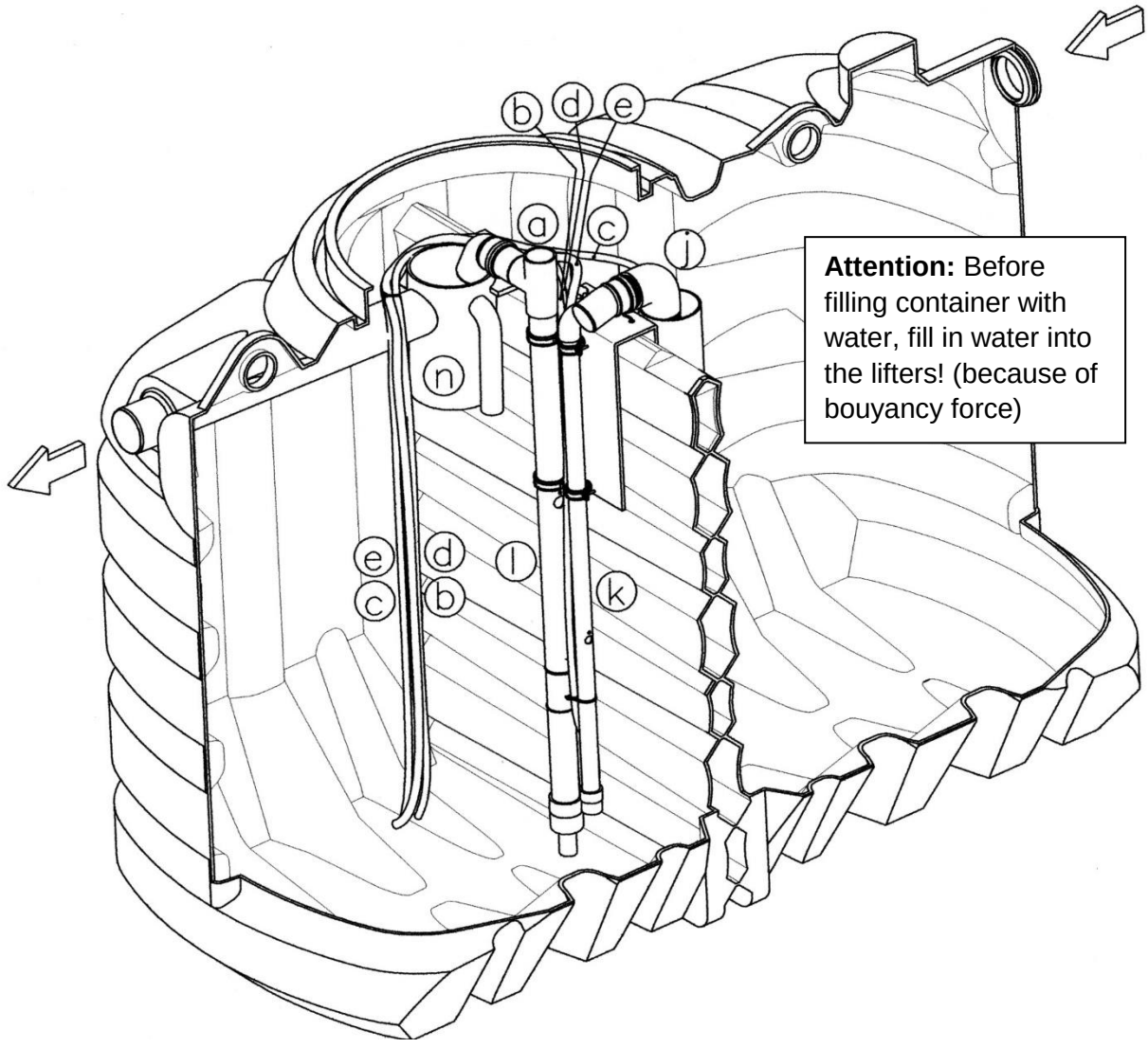
For ***two-container plants***, please also refer to ***section 4.7***.

For plants SOLIDO In-House (with case for valves) or kiosk please check the specific installation manuals.

4.2 Pre-installed components in the treatment tank MONOLITH II

With the REWATEC MONOLITH II treatment tank, the basic components of the SOLIDO SBR wastewater treatment system are already pre-installed (see figures):

Item	Quantity	Description
a	1 pc	Technology capsule holder
c	1 pc	Compressed air hose for feed lifter (BSH), red
d	1 pc	Compressed air hose for clearwater lifter (KWH), blue
e	1 pc	Compressed air hose for excess sludge lifter (ÜSH), green
j	1 pc	Feed lifter (BSH)
k	1 pc	Excess sludge lifter (ÜSH)
l	1 pc	Clearwater lifter (KWH)
n	1 pc	Outflow immersion pipe with sampling container and clip for overfill sensor



Note: The "Installation Instructions for MONOLITH II" (attached to the tank separately) is to be observed when installing the treatment tanks.

Cone (MONOLITH II)

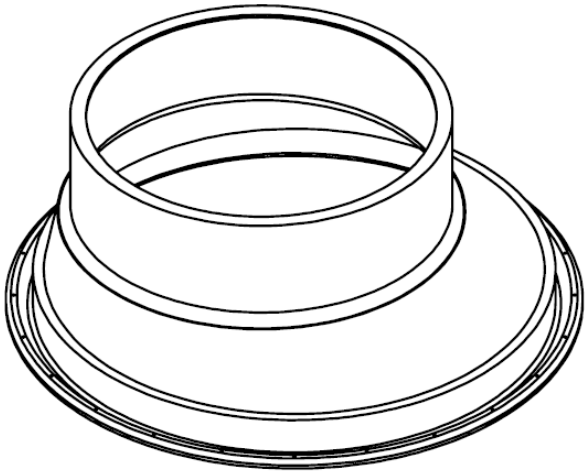
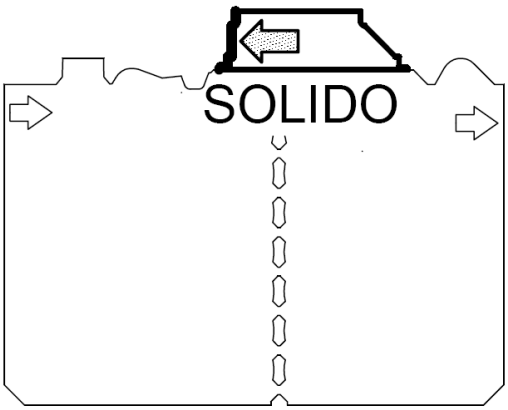


Fig.: Cone



The cone must be positioned with the flat side facing the inflow of the MONOLITH II treatment tank.

Due to transport conditions the cone could be fixed already to the container by screws.

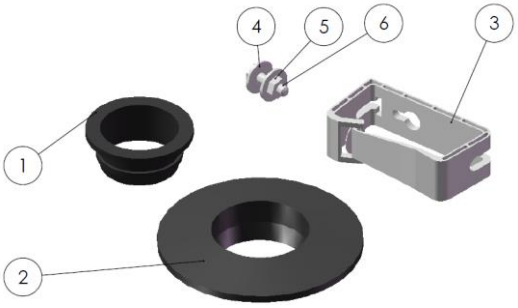


Fig.: Shaft assembly set

The shaft assembly set can be used on-site as needed. Two hole saws (D = 51 mm and D = 57 mm) are required for mounting the seals.

1 Seal for supply air hose

2 Seal for cable ductwork

3-6 Cable holder with screw

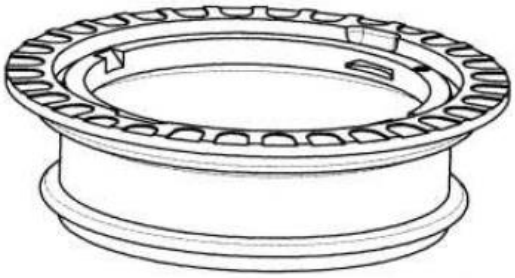


Fig.: VS 20 shaft

TIPS:

- Mount seals in the lower conical area to make sure that range of motion of the VS 20 is not limited in any way
- After positioning the VS 20, install the cable holder on top and through both components

IMPORTANT NOTE:

The VS 20 shaft can be moved on the cone by max. 14 cm**,** as it needs to be high enough to hold the technology capsule.

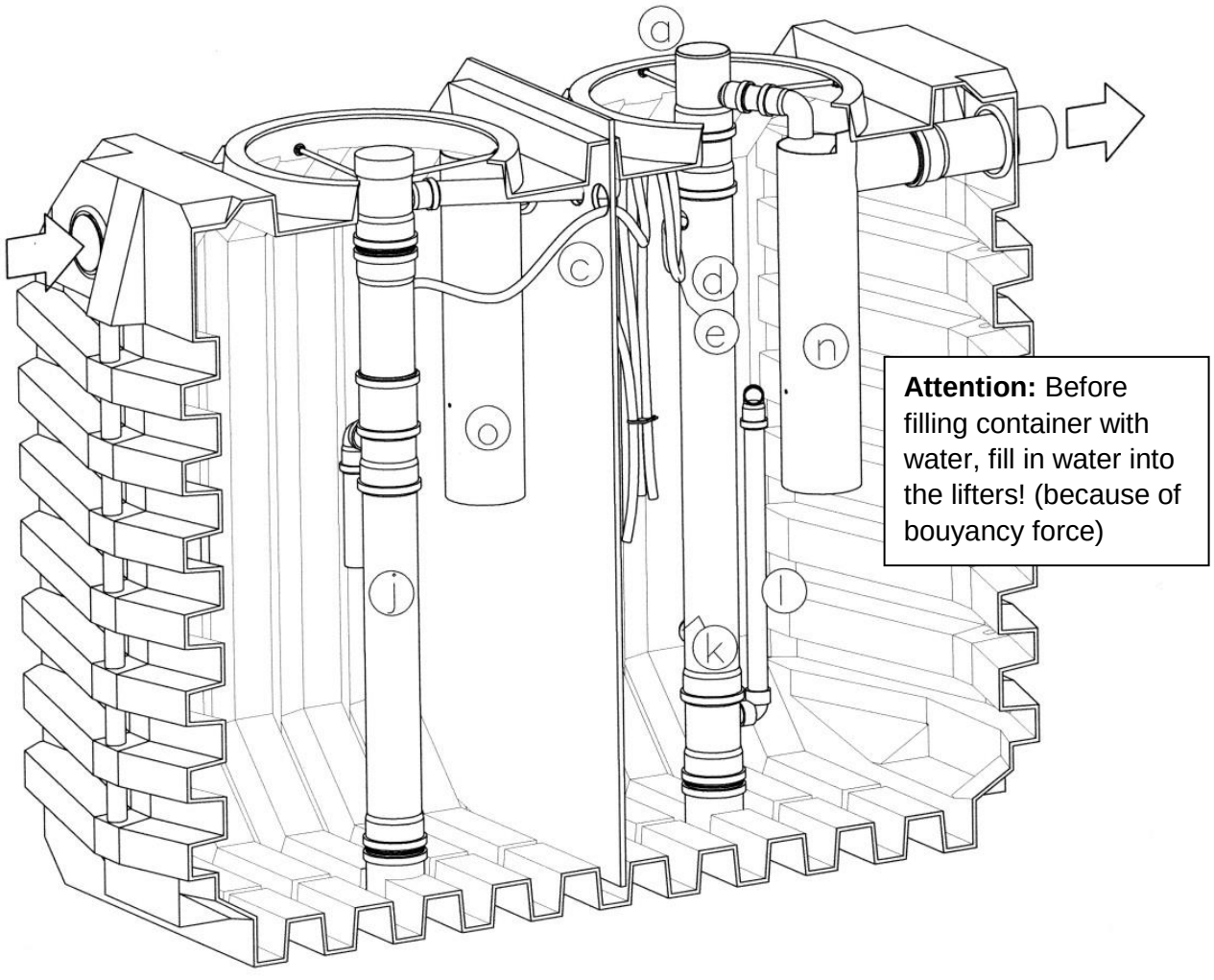
When using larger compressors (as from HP-120 or more), the capsule is 10 cm higher, and the shaft can be moved only 4 cm max.

If a shorter installation is absolutely necessary, you will have to select a different version with a capsule shaft or an kiosk instead of the technology capsule.

4.3 Pre-installed components in the treatment tank MONOLITH I

With the REWATEC MONOLITH I treatment tank, the basic components of the SOLIDO SBR wastewater treatment system are already pre-installed (see figures):

Item	Quantity	Description
a	1 pc	Technology capsule holder
c	1 pc	Compressed air hose for feed lifter (BSH), red
d	1 pc	Compressed air hose for clearwater lifter (KWH), blue
e	1 pc	Compressed air hose for excess sludge lifter (ÜSH), green
j	1 pc	Feed lifter (BSH)
k	1 pc	Excess sludge lifter (ÜSH)
l	1 pc	Clearwater lifter (KWH)
n	1 pc	Outflow immersion pipe with sampling container and clip for overfill sensor
o	1 pc	Primary treatment immersion pipe



Note: The "Installation Instructions for MONOLITH" (attached to the tank separately) is to be observed when installing the treatment tanks.

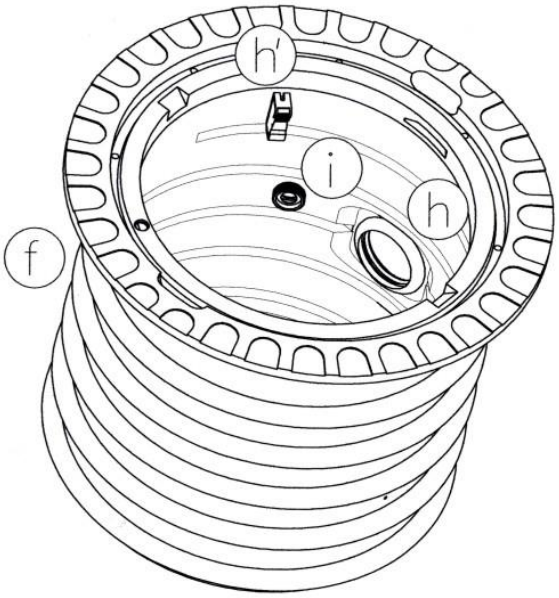
VS 60 shaft (MONOLITH I)

Because the VS 60 shaft can be placed in any position on the treatment container, the seals and the cable holder are pre-installed at the factory.

IMPORTANT NOTE:

The VS 60 shaft on the SBR chamber can be shortened by max. 14 cm**,** as it needs to be high enough to hold the technology capsule.

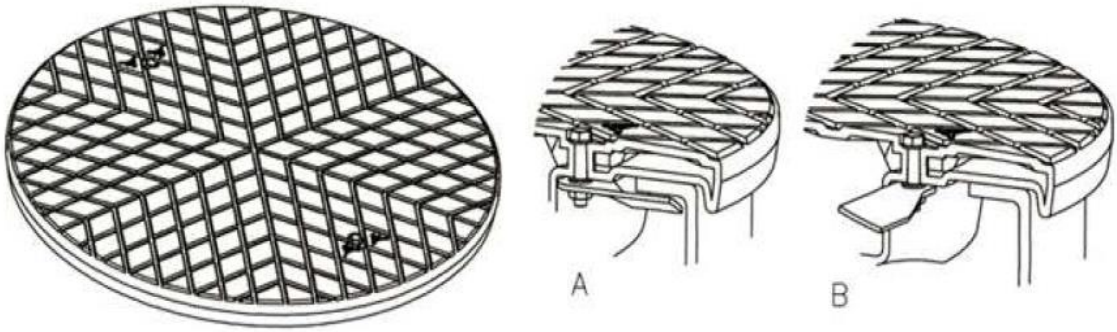
If a shorter installation is absolutely necessary, you will have to select a different version with a capsule shaft or an kiosk instead of the technology capsule.



f	1 pc	VS 60 shaft with pre-assembly
h	1 pc	Connection sealing for cable conduit DN 100
h'	1 pc	Cable holder for control cable
i	1 pc	Connection seal for supply air hose DN40

4.4 TopCover

The TopCover is classed with a capacity of up to 150 kg. The cover is equipped with two bars which serve as a child safety feature.



with child safety feature: A closed B open

IMPORTANT NOTE:

To prevent accidents, make sure that both child safety bars remain locked (13 mm socket wrench needed)!

4.5 Checklist BEFORE installing SOLIDO system

		OK?
1.	Is the control unit located between 10 m and 25 m away from the treatment plant? Is the control unit protected from rain and sun? Is the SOLIDO cable long enough? (optional: kiosk for control unit next to treatment plant)	☐
2.	Is a 230 V power supply plug with a 30 mA residual-current circuit breaker available? And protective earth conductor PE intact?	☐
3.	Is the treatment tank installed according to the installation instructions (inflow depth max. 120 cm below ground surface, the inflow and outflow correctly positioned)?	☐
4.	Is the shaft for sludge disposal (DN200) installed according to installation manual?	☐
5.	Are the seals of shaft assembly set (see 4.2) for supply air hose and cable ductwork installed? And the cable holder?	☐
6.	Is the air inlet support installed? And the air hose pulled into the shaft until the red mark? (length of hose 3 m, extension up to 10 m possible, max. 30 cm into ground)	☐
7.	Have the tube diffuser(s) been installed centered and horizontally on the tank bottom?	☐
8.	Were the lifters filled in with water to avoid buoyance force?	☐
9.	Is there enough height inside the shaft to put in the technology capsule?	☐
10.	Is the outlet pipe from the building connected to the inflow on the plant, and is the outflow of the wastewater treatment system connected to the receiving water or seepage system?	☐
11.	Is there sufficient aeration and deaeration in the container/s? (Roof deaeration or separate aeration and deaeration)	☐
12.	Is a cable conduit (DN 50 with taut wire, on-site) installed for the SOLIDO cable between the treatment plant and the control unit location?	☐
13.	Are all chambers about half filled with water?	☐

4.6 Installation steps for SOLIDO system

4.6.1 Fill in lifters with water

Before filling the container with water, the lifters have to be filled in with water to avoid buoyancy force on empty lifters!

4.6.2 Installation tube diffuser

Take the diffuser (M) at the white hose and put it centered and horizontally on the tank bottom of the second chamber.
Depending on size and number of containers, two diffusers are delivered.

On Capsules with compressor HP-120 or bigger the white air hose is in DN16. Please change the provided nozzle at the diffuser.

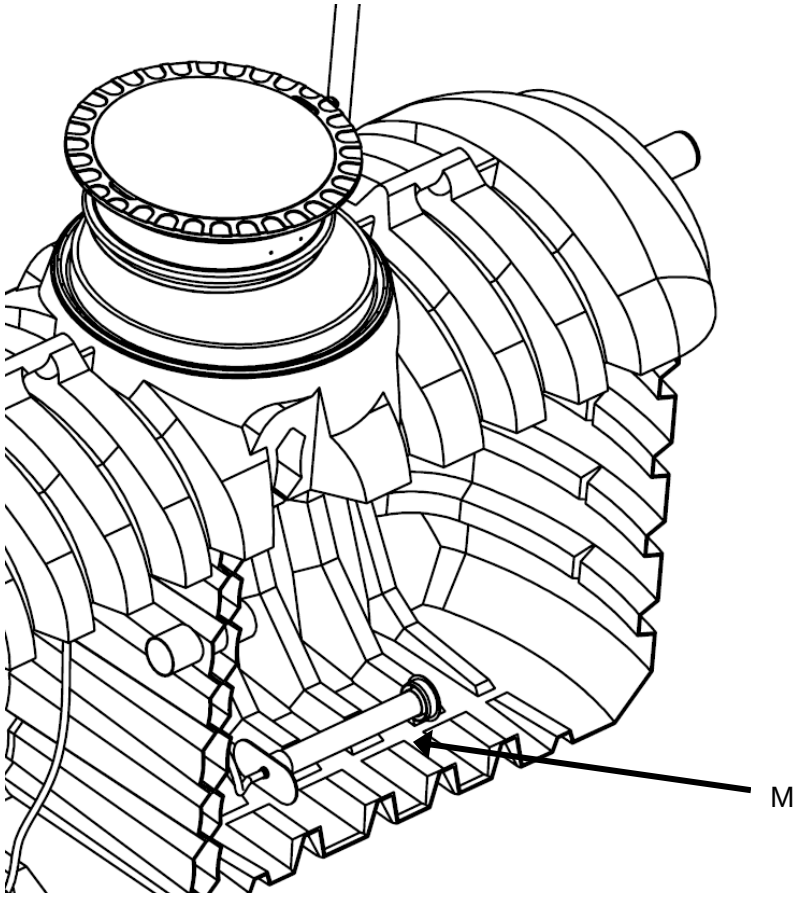
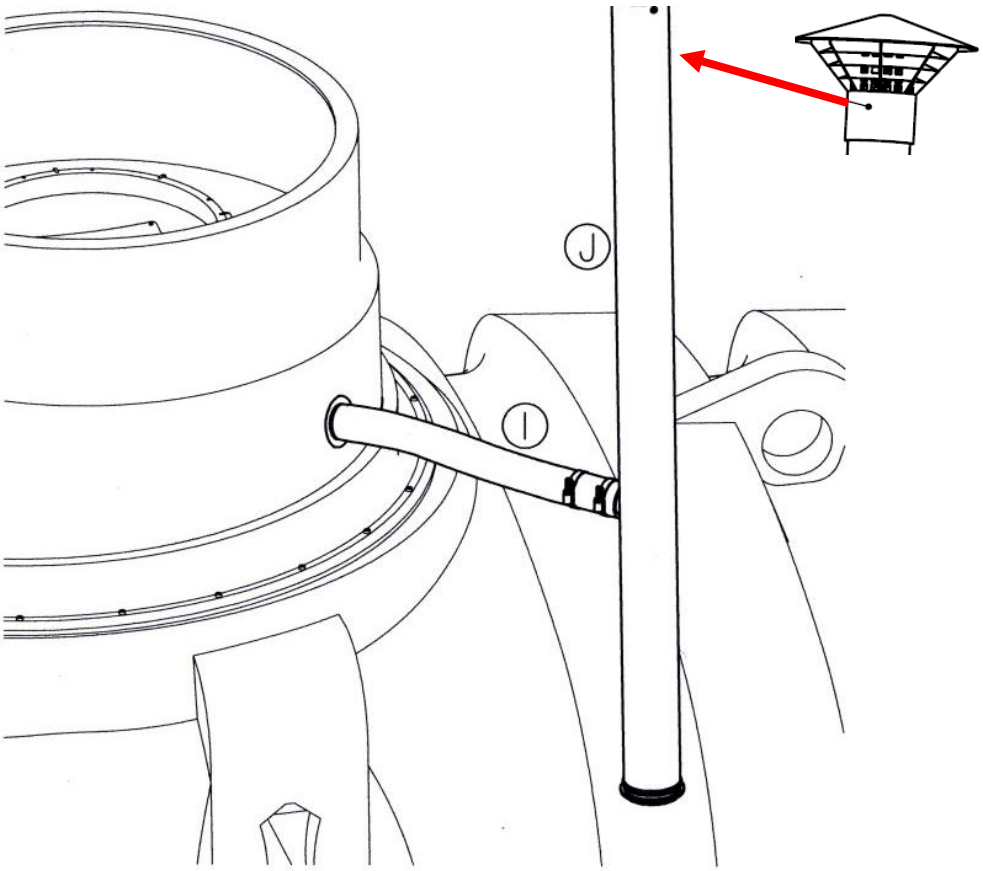


Fig.: Correct installation of tube diffuser in MONOLITH II

4.6.3 Connecting the air inlet support

Push the air supply hose (I) through the seal on the shaft and place the air inlet support (J) into position next to the treatment tank, about half of the height below ground, **at least 20 cm** above. The hose can be extended to a total length of 10 m if required.

Installing the hose, make sure that there is a slope in direction to the support pipe (the lower part of the pipe = condensate trap). Make also sure that the hose is pulled into the shaft until the **red mark**, so that enough hose is left in the shaft to reach comfortably the ground surface with the capsule. Install the provided plastic cap (air vent) on the top of the pipe.



4.6.4 Laying the control cable

1. Place the technology capsule **next to** the ready and installed treatment tank with shaft, at the same level.

2. Pull the control cable (H) through the cable conduit that is connected to the seal (h) on-site, through to the installation location of the control unit. Whilst doing so, protect the plug from moist or dirt.

3. Hang any excess cable either next to the control unit or in the cable holder in the shaft (removing the plug or shortening the cable voids your warranty claim).

4. Seal the conduit so that no unpleasant smells can escape. Do not wall it in, etc., because the control cable may need to be pulled out in the case of damage.

4.6.5 Connecting the technology capsule

1. Remove the supply air hose (I) and the compressed air hoses that are pre-installed in the tank (c, d, e) as well as the white hose of the tube diffuser (M).

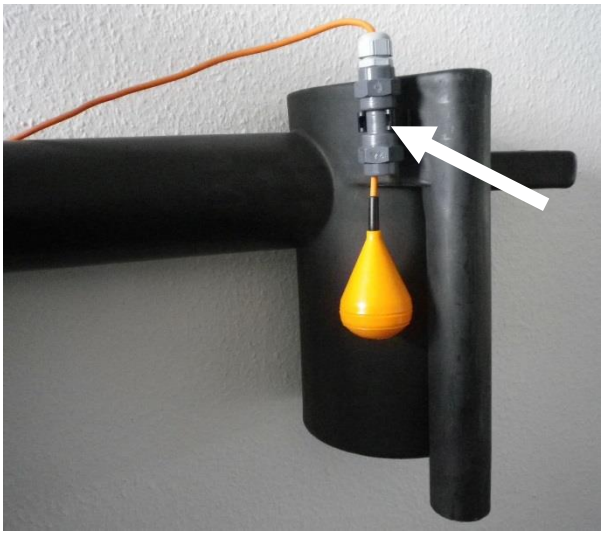
2. If necessary, shorten the compressed air hoses to the required lengths.
(NOTE: The length of the hoses is sufficient for installation with a total shaft length of 1,20 m; with the standard version, shortening the hoses by up to 60 cm is advisable).

3. Attach the hoses to the capsule by matching the colours (white, red, blue, green) (M→B; c→C, d→D, e→E) and then attach the supply air hose (I→G) outside of the shaft. On the compressed air outlet ÜSH, there is a stop cock mounted. It is open at delivery and can be closed until reaching enough active sludge volume in the SBR tank.

NOTE: The outlet for the ÜSH is an important original component with an integrated throttle valve for air distribution. Do not remove this component.

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

5. Fix overfill sensor (SWS) to preinstalled clip at sample chamber in the tank. Please check that the clip clicks between the two hexagon sleeves (see white flash in figure).

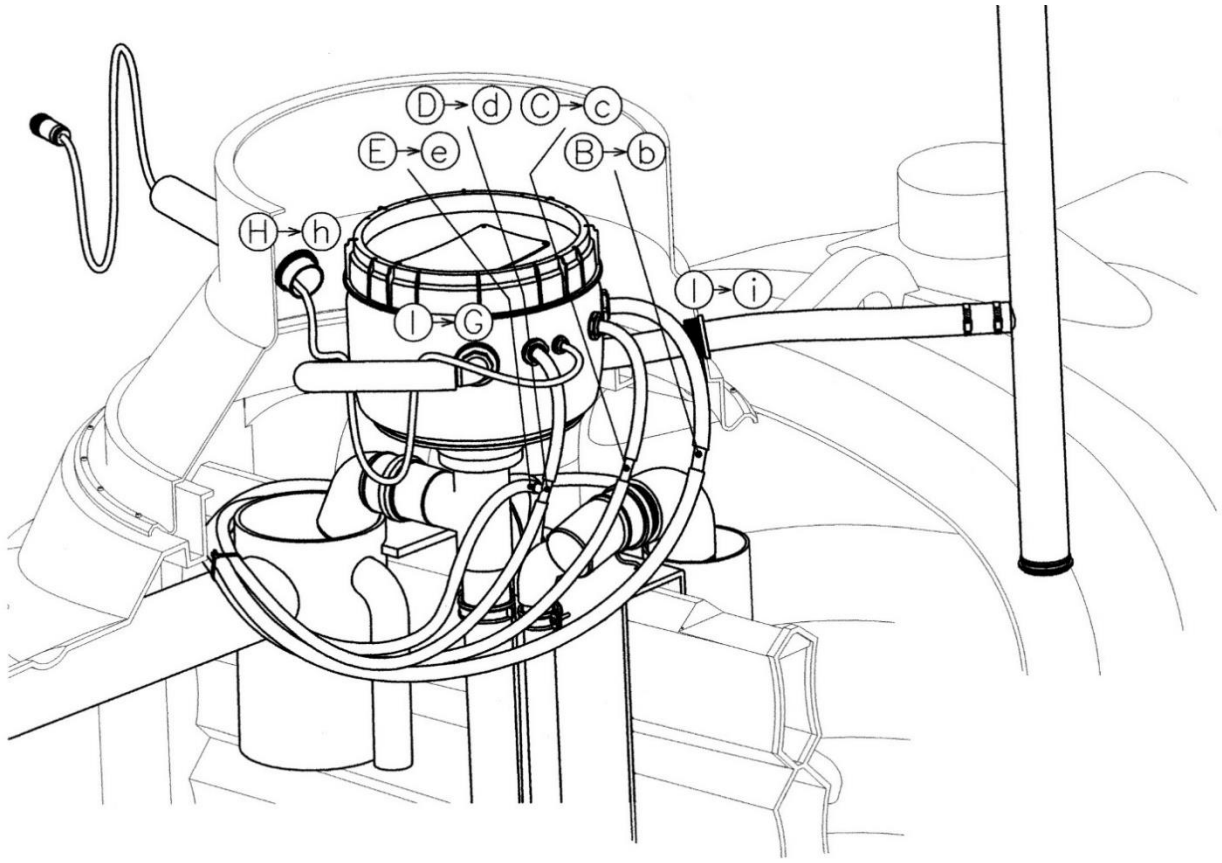


4.6.6 Inserting the capsule

1. Slightly turn the capsule when lowering it onto the shaft, so that the hoses are placed around the capsule.

2. Carefully place the technology capsule onto the holder on the top end of the clearwater lifter so that the capsule is positioned securely. For larger installation depths, the capsule can be positioned on a extension pipe (HT DN70, length 1 m, order no. KKZT0033) to improve accessibility.

3. Make sure that all hoses are connected properly so that they lie next to the capsule in the shaft and ensure that it is possible to remove the capsule for maintenance purposes.



4.7 Additional installation steps for multiple container plants

4.7.1 Arrangement of containers

When installing multiple containers plants, it must be ensured that the containers are positioned at the same height.

The two container plants are designed for serial installation. Pipes in DN75 resp. DN40 for feed lifters (BSH) and excess sludge lifters (ÜSH) are included in delivery.

If parallel installation is required, these pipes must be extended **on-site** so that they can be laid in the right direction with a downward gradient (hose can also be used to extend the lifter pipes into the connection pipes).

Three container plants: the primary treatment containers are installed parallel und the SBR-container after the second primary treatment container.

Four container plants: Install two primary treatment containers parallel and behind SBR-containers parallel. Primary treatment containers are connected at half of their height.

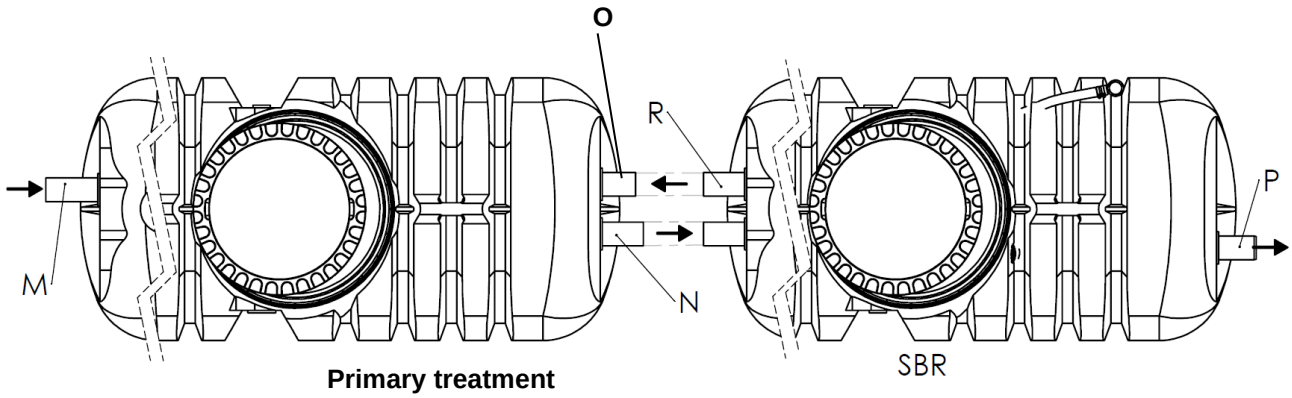
4.7.2 Installation

For multiple container plants, the following steps must be taken in addition to those already listed above:

1. The primary treatment and SBR treatment tanks must be connected using two horizontal underground DN 100 drainage pipes (to be provided on-site).
2. The two air lifter outflow pipes DN75 resp. DN40 should be removed; these are attached to each of the air lifters in the tanks.
3. The two air lifter outflow pipes should be pushed through the connection pipes and onto the flange of the respective air lifter.
4. The clear water lifter (KWH) and excess sludge lifter (ÜSH) are installed in the last chamber of SBR-container. The outflow pipe of excess sludge lifter ÜSH has to be extended to the last chamber of primary treatment and should end in the T-piece of the outflow of primary treatment.
5. The height specifications on-site are such that the air lifter outflow pipe of the feed lifter should have a downward gradient to the SBR reactor, and the excess sludge lifter should have a downward gradient to the primary treatment tank.
6. The feed lifter is installed in the last chamber of primary treatment. Pull the red airhose through the connecting pipework to SBR-container and connect it to technology capsule

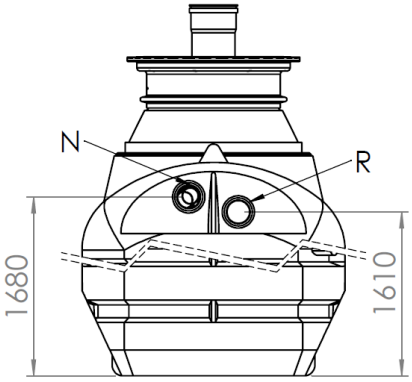
Always ensure that the containers are installed as planned and make sure that both containers are positioned at the same height!

Installing treatment plants with more than two containers, please pay attention to the specific drawings for each type of plant and/or contact PREMIER TECH AQUA +49-(0)30-44 01 38 30 (9:00 to 16:00 CET) or berlin@rewatec.de

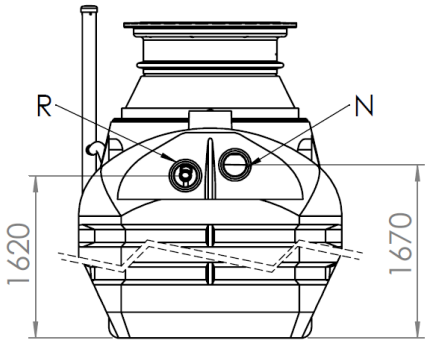


Primary treatment

M = inflow
N = overflow feed lifter BSH
R = overflow sludge lifter ÜSH
P = outflow
O = T-piece prim.treatment

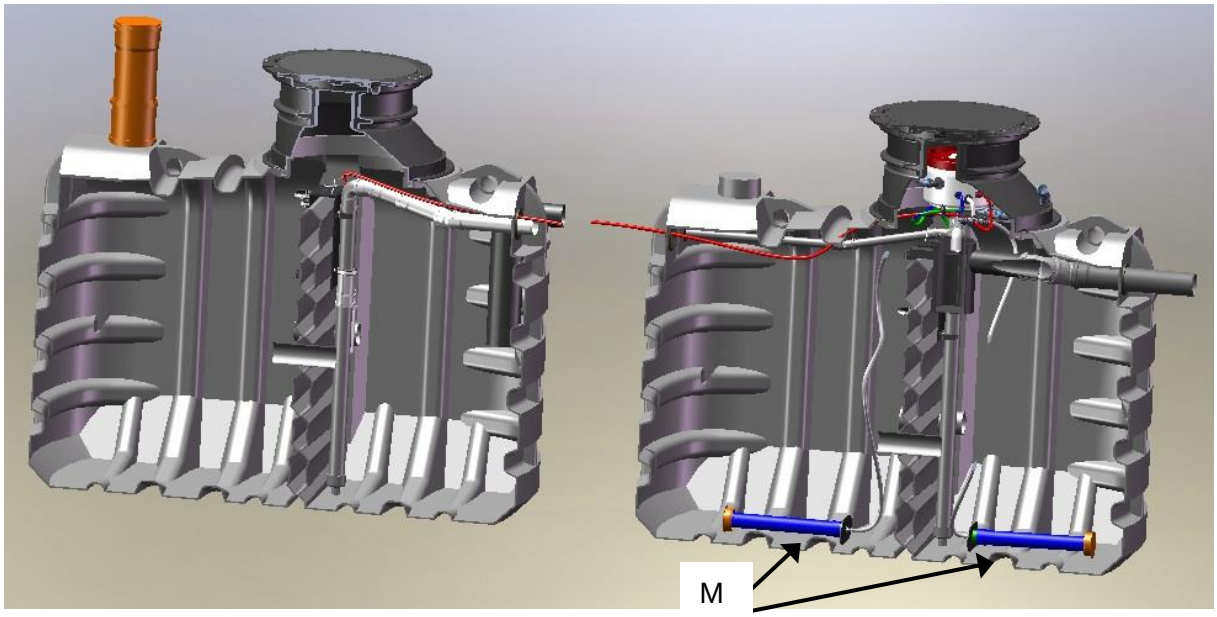


Primary treatment tank with outflow pipe from the feed lifter (BSH)



SBR tank with outflow pipe from the excess sludge lifter (ÜSH)

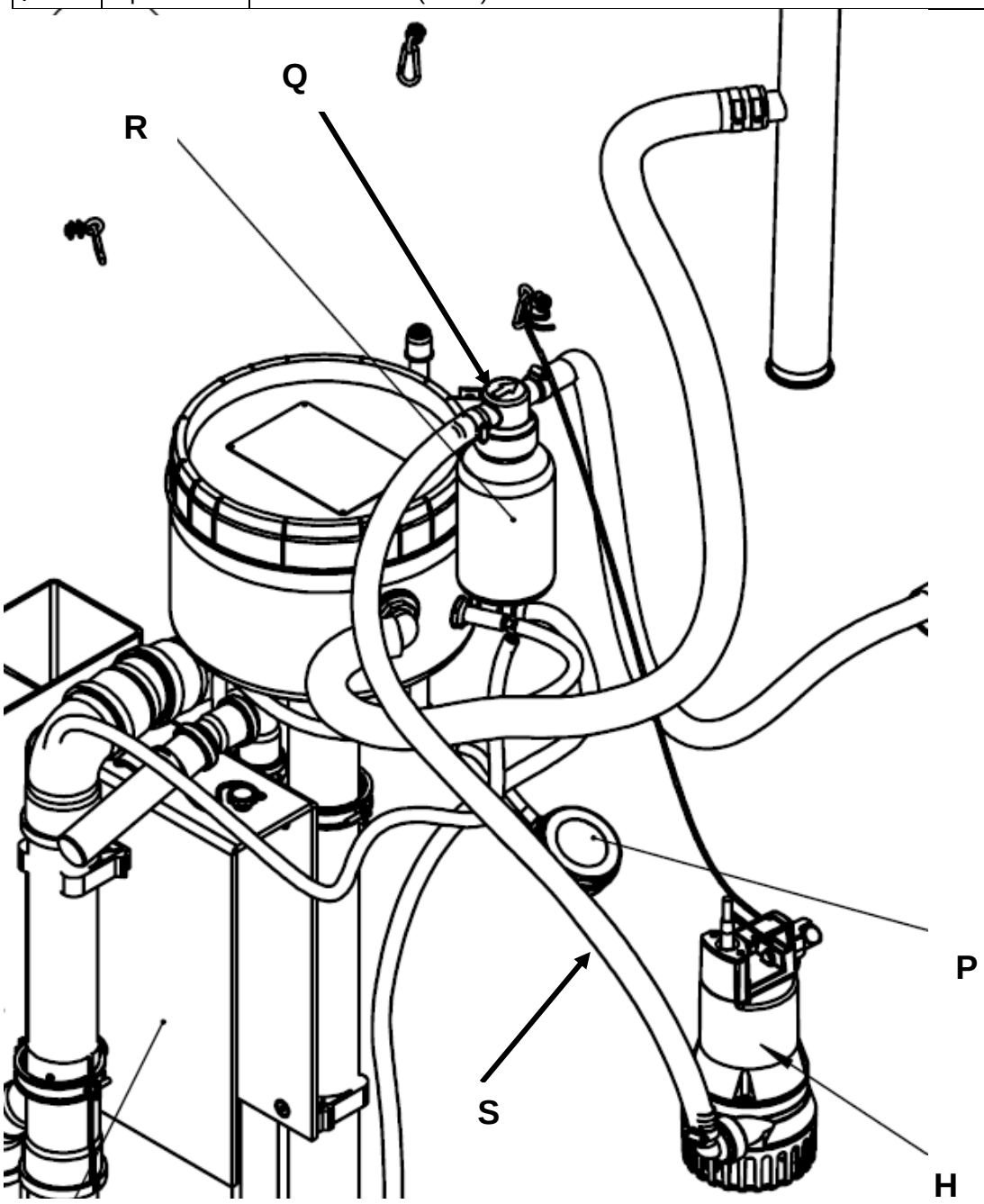
Multiple container plants are delivered with one tube diffuser per SBR-chamber:
Care for an even arrangement of the diffusers (M) in the container. The pressure hose from the compressor is connected to the T-piece. The hose between T-piece and diffuser should have the same length to distribute the air evenly. To improve an equal distribution on the two diffusers use the two provided stop cocks.



4.8 Option: Clearwater Pump instead Clearwater Lifter (KWP instead KWH)

The following parts are additionally included to delivery scope:

Item	Quantity	Description
H	1 pc.	Clearwaterpump KWP with float switch (instead KWH)
Q	1 pc.	Clearwater hose with cover for sample bottle (pre-installed in container)
R	1 pc.	Sample bottle with fixing material (belt strap, carabiner)
S	1 pc.	Hose, 1,20 m
	1 pc.	Controller S30 Full version (instead basis version), see chapter 5
	1 pc.	Hose connector, straight, DN10 for excess sludge lifter (not shown)
P	1 pc.	Overfill sensor (SWS)



Installation:

1. Pre-installed in the container you will find: clearwater hose (Q) with blue cover for sample bottle (similar to FLUIDO) and connector, a piece of hose (1,20 m) with clamp which has to be fixed to the clearwater pump. The other end of the hose has to be connected to the clearwater hose. The sample bottle (R) is delivered seperately.
2. Pull the cable of the KWP (20 m) together with cable of the SOLIDO capsule through the cable conduit to the controller and connect it to the right socket. Not used sockets have to be protected by special caps.
3. The KWP has to be positioned in that way that its integrated float switch will turn it off at a water level of **1,00 to 1,05 m** above the ground of the tank (in ML60: 1,20-1,25 m). Please confirm that the arm of the float switch can move up and down properly. The rope is fixed in the shaft by a carabiner and eyelet.
4. The sample bottle (R) is fixed with belt strap and carabiner to an eyelet in the shaft, near cover.
5. Disconnect an remove completely the blue T-piece and stop cock on the blue hose right at the capsule (it is not necessary for this installation).
6. Instead of the T-piece you have to use the simple connector (DN10, blue) to connect the blue hose at the capsule directly to the green hose from excess sludge lifter ÜSH.
7. When starting the control unit S30 full version, select the option "KWP instead of KWH" in the menu "select type of plant". The excess sludge takeout now is an extra cycle (taking 1-2 minutes) at the end of sedimentation right before clearwater takeout starts.
8. The KWP now automatically has a default maximum runtime, similar to FLUIDO. Normally the KWP is stopped by its float switch (protection against dry running).

4.9 Information on the type plate

The type plate with the year of manufacture is located on the cover of the SOLIDO capsule; the serial number is engraved on the bottom of the capsule and on the accompanying sticker. The following values are to be added by the installation company. Refer to the corresponding DIBt approval for the plant (included with every plant) for the values of the different volumes. Add the following information:

- Mark your plant type
  (information can be found in the delivery documentation)
- VS: volume of the sludge reservoir
- VP: volume of the buffer
- VR(SBR): volume of the SBR reactor

4.10 Start-up protocol

The operator must be informed of the operator's duties after start-up, and be made familiar with the operating guidelines in accordance with chapter 3. The operator should be given this instruction manual. The operator's signature is required as confirmation of receipt of this manual and the commissioning certificate. We recommend using the reverse side of the "Master data sheet" to write down any important information (serial number, delivery note number) for later use in warranty claims, for example. Here, it is helpful to place the sticker with the serial number in the area provided for this purpose.

4.11 REWATEC plant configuration and important original spare parts

The SOLIDO small wastewater treatment plant is delivered by PREMIER TECH AQUA with the system components described above. The use and installation of the delivered system components are part of the plant configuration specified by PREMIER TECH AQUA. Versions that deviate from this are not permitted (or without gaining authorisation from the PREMIER TECH AQUA specialist service at +49 (0)30 44013830) and effectively void any warranty claims. To retain the right to claim warranty, only the following original spare parts may be used for repair work:

Item no.	**Description**
SK14060 / SK14061	2014 SOLIDO technology capsule XP-60 with 15/30 m cable
SK14080 / SK14081	2014 SOLIDO technology capsule XP-80 with 15/30 m cable
ROKO0521	opening key for technology capsule
ROFE0872	SOLIDO air inlet support
ROEL0481 / ROEL0482	Compressor HIBLOW XP-60 / XP-80
ROKO0204	filter element for XP-60 / XP-80 B
ROEL0726	air distributor block triple 2012 with solenoid valves
ROSO2030	S 30 control unit
BEL5013 / BEL7513	Tube diffuser with hose 50cm / 75 cm

NOTES:

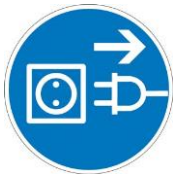
5 Operating Instructions for the S30 Control Unit

Symbols on the control unit:

Note: Electrical units are installed, follow safety instructions

Note: Read technical documentation

Note: Do not dispose of used devices with the household waste; return them to special collection points or send the components to PREMIER TECH AQUA post-paid.



Note: Disconnect from the mains before carrying out repair work

5.1 Important safety instructions

- **Never disconnect from the mains during normal operation.** The bacteria in the small wastewater treatment plant must have a regular supply of oxygen. For this reason, the power supply to the treatment plant should not be interrupted, even during longer periods of absence.
- **Before opening the control unit or carrying out repair work on the plant, it must be disconnected from the mains.**
- Connection of the small wastewater treatment plant to the mains should be carried out by a specialist electrical company only.
  --> Provide a 30 mA residual-current circuit breaker
  --> Check the correct operation of the mains connection **(protective earth conductor intact?)**
- **Installation and maintenance work should be carried out by a recognised specialist company only.** The proper operation of the small wastewater treatment plant must be checked regularly
  (twice a year, ideally) as part of a maintenance contract.
- A small wastewater treatment plant is a stationary electrical system. Like all electrical systems of this type, its safety should be tested every second year by an electrical technician according to VDE 0701-0702. Recommended checks are: the measurement of the insulating resistance, protective earth conductor resistance and the replacement leakage current.

5.2 General description

The controller S30 was developed for implementation with small wastewater treatment plants type SOLIDO (with technology capsule specification 2012) by PREMIER TECH AQUA. It has a graphical display and three operating buttons

It is available in two versions:

- Basic version (with one 7-pole socket) for SOLIDO
  (starting with Hardware 1.01 and Software V3.07 optional connecting of float switch to technology capsule possible)
- Full version (with three 7-pole sockets) for: plants with Sludge-Composting-System SOLIDO SKS, plants with Active Feeding Pump ABP (instead of lifter BSH), plants with clearwater pump (instead of lifter KWH) *(starting with Hardware 1.30 and Software V4.03 optional connecting of float switch to technology capsule possible)*

SOLIDO plants with the S30 have constant 4 cycles per day with the exact starting points 02:00, 08:00, 14:00 and 20:00.

The following terms and abbreviations are used:

Feeding:	Divided into 1st feeding, 2nd feeding, 3rd feeding
Pause:	Break between the intermittent aeration intervals
Aeration:	The aeration process that occurs during the cycle
Sedimentation phase:	Min. 60-minute sedimentation phase at the end of a cycle
Clearwater drainage:	Clearwater is drained
Compressor:	The compressor in the capsule as an aggregate
BEL:	Tube diffuser
BSH:	Feed lifter
KWH:	Clearwater lifter (the excess sludge lifter ÜSH runs parallel)
winter-eco:	optional setting, from November to the end of February the aeration time is automatically reduced to 85%, energy saving option, adjustable in menu “Service/select type of plant”
Start125%:	optional setting, start-up phase, during comissioning it will be automatically activated, then during 240 days the aeration time is increased to 125% of setted value, the duration is adjustable
SWS:	Overfill sensor
Overfill-Alarm:	alarm messsage on control unit
SKS*:	Sludge-Composting-System
FEP*:	Sludge pump(with SKS)
KWP*:	Clearwater pump (optional instead of lifter KWH)
ÜSH*:	Excess sludge lifter
ABP*:	Aktive feeding pump (optional instead of lifter BSH)

**only full version*

Further options with S 30 full version

Option / Socket	left	center	right
Sludge-Composting-System SKS	SOLIDO-capsule	float switch SWS (Separator)	FEP
Aktive feedeing pump ABP (instead BSH)	SOLIDO-capsule	-	ABP
Clearwater pump KWP (instead KWH)	SOLIDO-capsule	-	KWP

Sockets which are not in use, have to be protected by original protection caps.

5.3 Installation

The housing is mounted to the wall using two screws and the two fastening brackets included in the scope of delivery. The corresponding spacers can be glued to the rear side of the housing in the lower section.

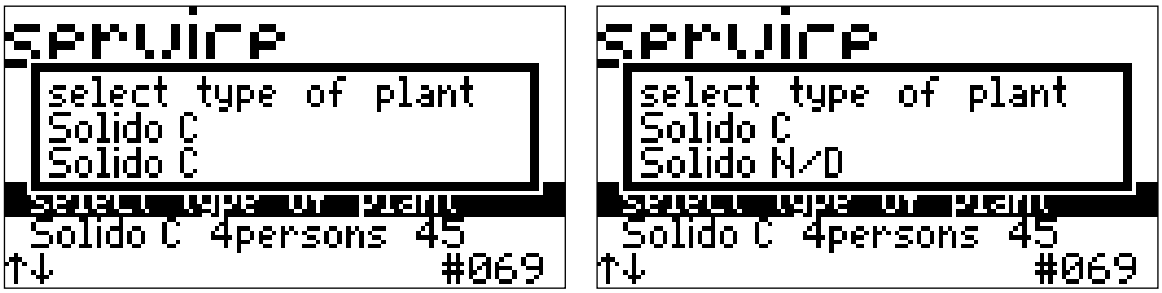
- When installed outdoors, the unit should not be positioned in direct sunlight or where it will receive direct rainfall. However, installation in a covered outdoor area (e.g. under a carport) is permitted.

5.4 Start-up

Important plant parameters are set during start-up. All of the three-line pop-up menus have the same structure:

First line: Title (which parameter is being set?)
Second line: Current setting
Third line: New setting if required (select using arrow buttons)

Example:



The following parameters are requested in the following order, using the same logic:

- **Language**
- **Set time**
- **Password**: 7682 fix (valid for start-up only)
  Alternative: REWATEC service password according to the "standard" formula
- **Type of plant (filtration level)**:
  SOLIDO C vs. SOLIDO N/D
- **Number of persons**: select a number between 2 and 28 PT (8 PT and above only in increments of 2)
- **Compressor**: 45-60, 80, 120, 150 or 200 l/min
- **winter-eco:** Yes/No

- **additional functions*:** SKS (Kompost) / ABP instead of BSH / KWP instead of KWH
- **SWS:** Yes
- **SWS-function:** Overfill-Alarm
- **Test mode**: The control unit switches on each of the appliances in turn; press a button to end the test run
- **Entries ok**: Yes/No?

**only full version*

The basic screen then appears and the control unit starts the first cycle:

Green LED, top:	indicates operational readiness (connected to the mains)
Red LED, bottom:	flashes to indicate an alarm message

Advice: Treatment plants operated at full capacity with a daily water amount over 100 L p.p. the value of KWHeco should be increased to the value of KHWnorm.

After commisioning start-up phase “start125%” will be automatically activated, then during 120 days the aeration time is increased to 125% of setted value, the duration is adjustable, see 5.6.4

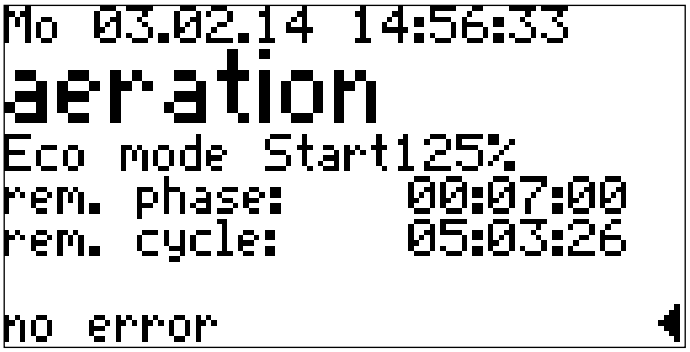
5.5 Power failure recognition

The control unit has a power failure recognition function. If the power supply in the incoming power connection is interrupted, the red LED flashes and an audible alarm sounds intermittently. Switch off the alarm and the LED completely by pressing and holding the middle button for longer than six seconds.

5.6 Operation/menu structure

5.6.1 Basic screen display:

Basic screen display: date, current cycle activity, cycle type, remaining time, errors



optional:

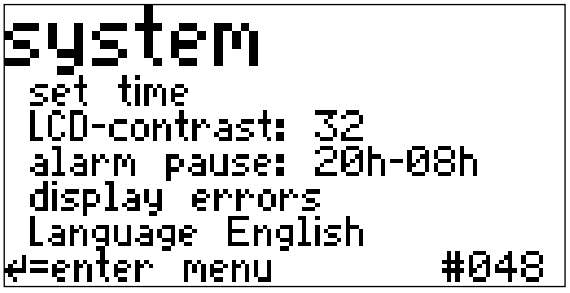
Start125%: plant is in start-up phase, aeration time 25% above setted value, max. 18 min

WS-: winter-eco is setted, but currently not active (-)

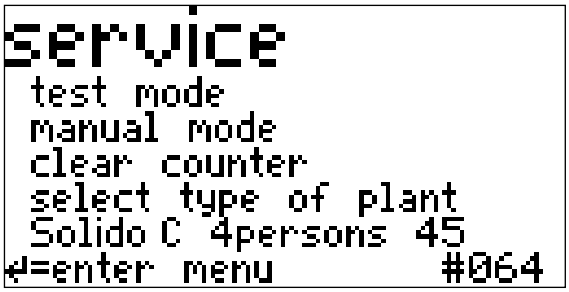
WS+: winter-eco active

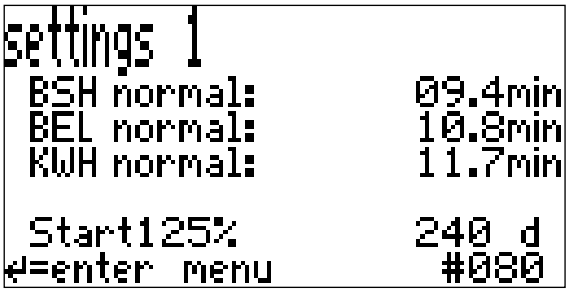
5.6.2 Additional levels for SOLIDO

The basic screen is one of a number of layers of the same level which form the menu; you can navigate between the layers using the arrow buttons.

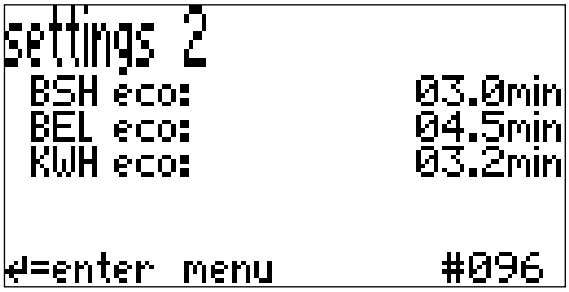


Alarm pause: Night's rest of the acoustical alarm, changeable

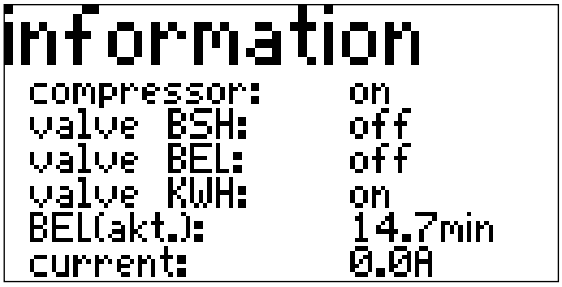




Start125%: start-up phase, aeration time at 125% of setted value, duration adjustable, max. 18 min.



Holiday: Max. 30 days can be set, plant then **only** runs in economic mode



BEL(akt.): actually, activated aeration time (resp. start-up phase and winter-eco)

Press the middle button to move down a level to the subitems in a menu. You can read the status on the subitems which are highlighted in black. The arrow buttons now allow you to select the subitems of a menu. If none of the subitems are highlighted in black, you have returned to the level above; here, the arrow buttons allow you to navigate between the main menu items. The numbers at the bottom right (# 144) indicate the menu field (for internal use).

Only S 30 full version:

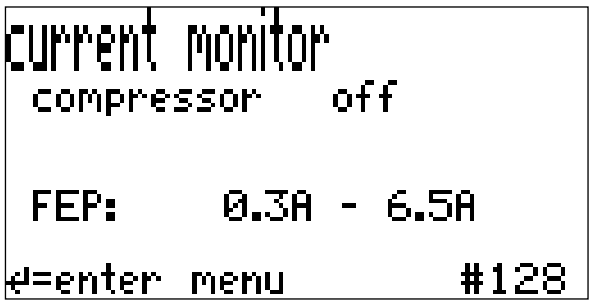
(still in german!)

additional screen: SKS (Kompost)

Option to deactivate FEP, recommended before sludge removal from separator

Setting FEP (standard): once a day, 4 a.m., 9 sec.

Status FEP and float switch SWS (separator)



current monitor compressor is activated/desactivated (on/off)

for FEP, setting of limit values (optional: ABP or KWP)*

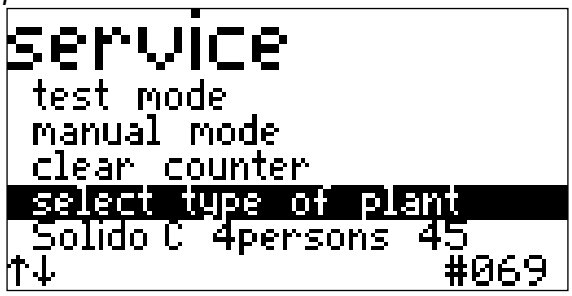
5.6.3 Application example in the password-protected area

To change the plant type:

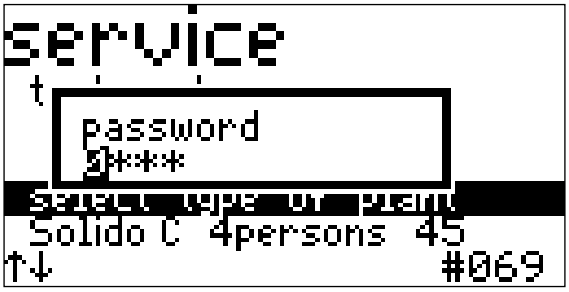
A SOLIDO plant of filtration level C with 4 PT and a 45/60 l/min compressor is to be changed to filtration level N/D with 7 PT, an 80 l/min:

- Select *Service* in the main menu

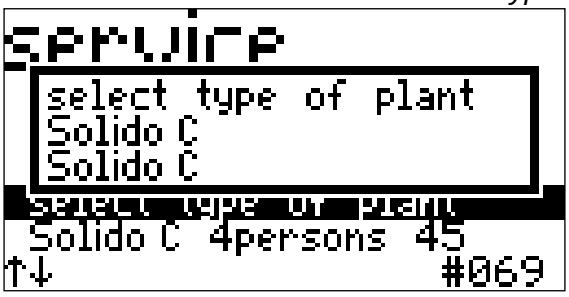
- Press the middle button and then use the arrow buttons to navigate to *Select type of plant*



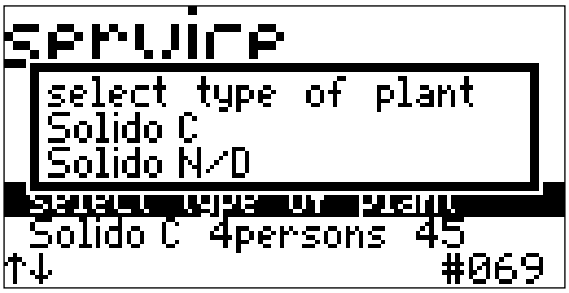
- Press the middle button, then enter *Service password*



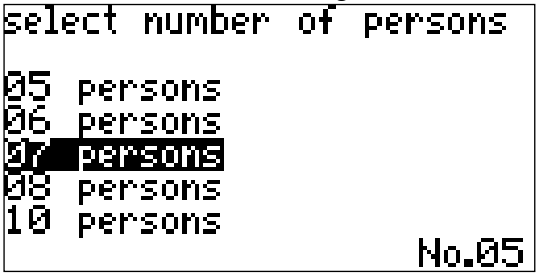
- Use the middle button to select *Select type of plant* again



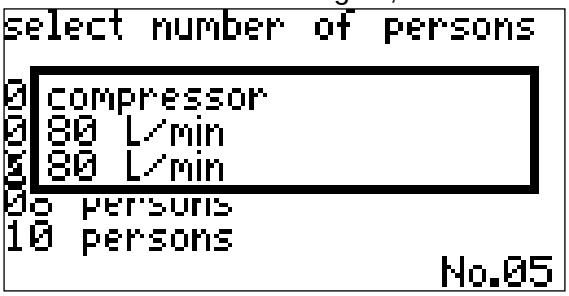
- Use the arrow button to switch from Solido C to Solido N/D



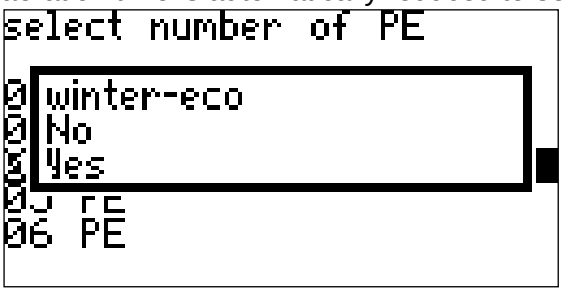
- Press the middle button again, then select the PT number.



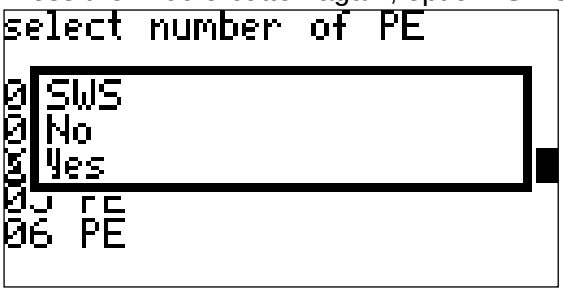
- Press the middle button again, then select the compressor



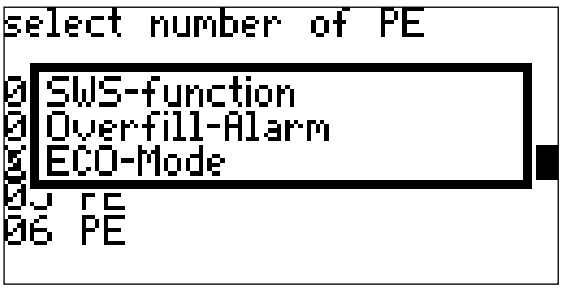
- Press the middle button again, option winter-eco (from november to end of february the aeration time is automatically reduced to 85%, energy saving option)



- Press the middle button again, option "SWS Yes/No" (default: No). Select: Yes

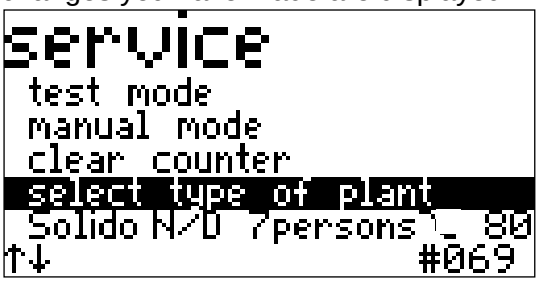


- Select: Overfill-Alarm



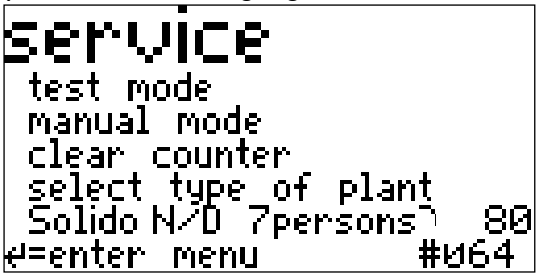
NOTE: If you choose the option "Overfill-Alarm", the float switch symbol is NOT shown on the display! If the float switch is switched to the upper position, the alarm appears immediately.

- Press the middle button again to select the final menu item, “Select plant type”. The changes you have made are displayed in the last line.



The plant type that is now selected is a Solido N/D 7 PT and an 80 l/min compressor.

- Press the downward arrow button twice to return to the top menu level (move the black highlighted bar down until it is no longer visible).

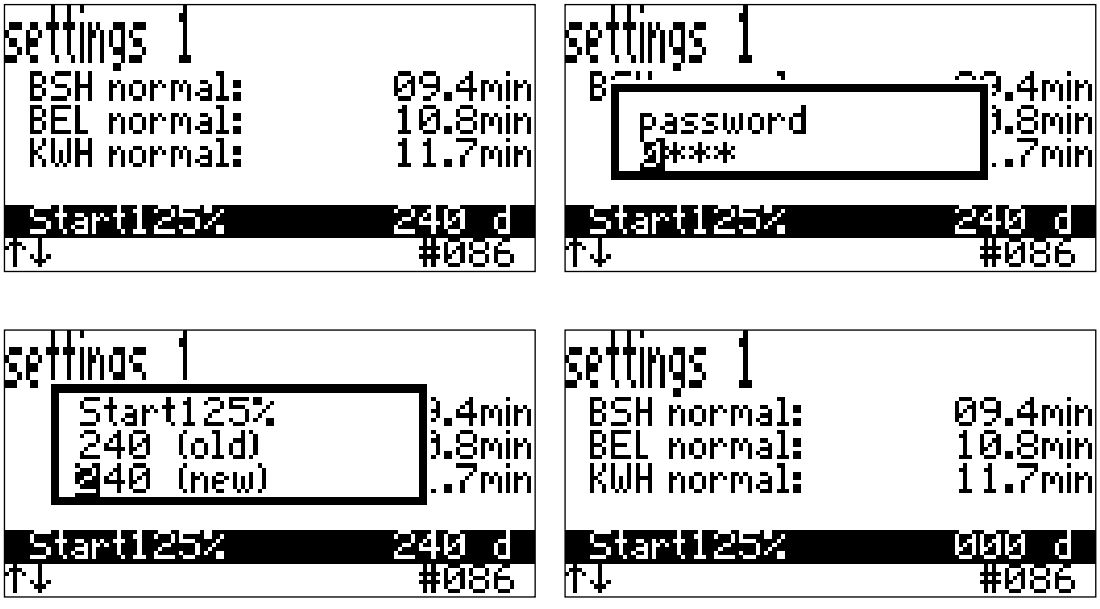


Advice: after changing the type of plant the start-up phase “Start125%” will **always be automatically activated**, for deactivating see 5.6.4

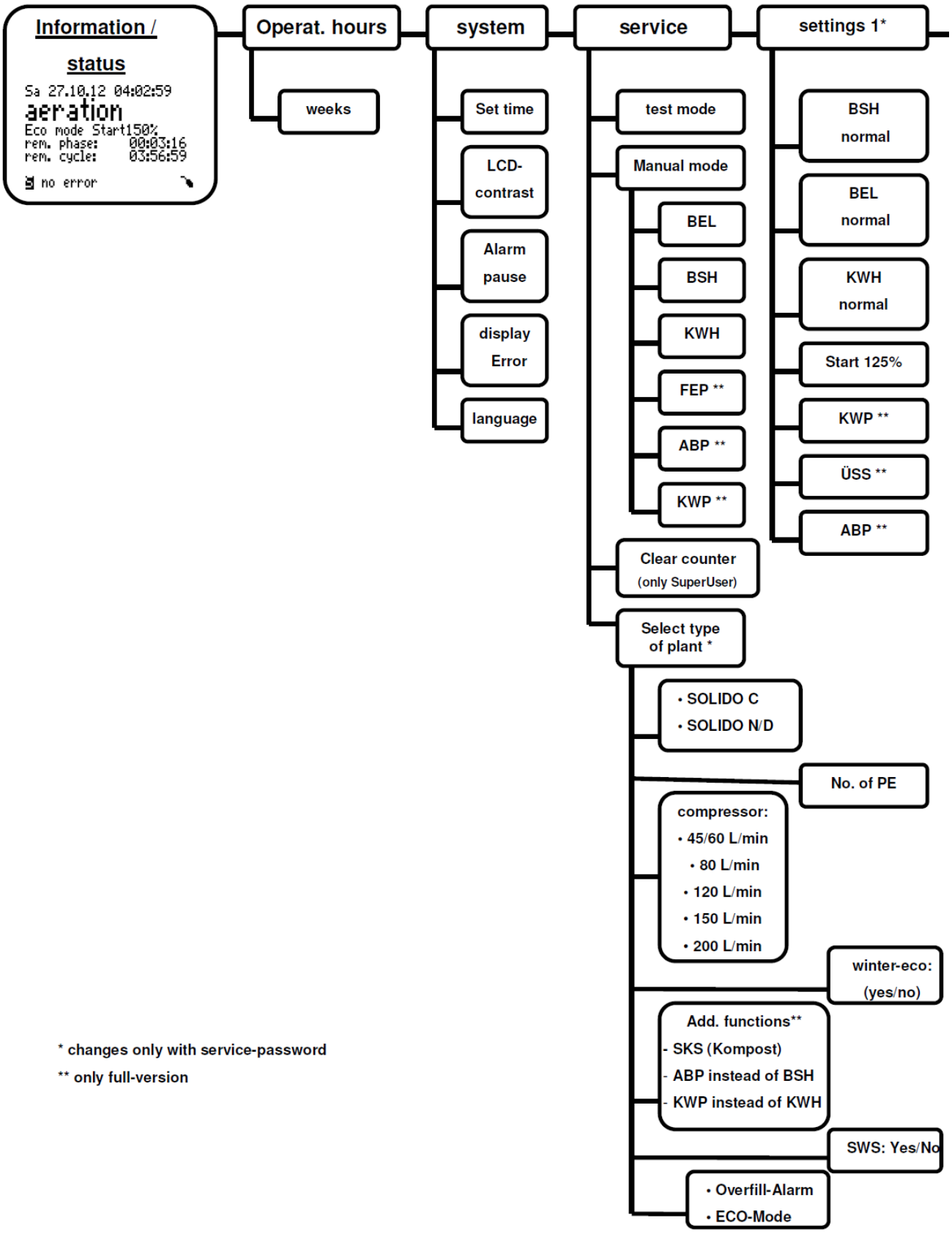
5.6.4 Start-up phase “Start125%”

After commisioning the controller or changing the plant type the start-up phase “Start125%” will always be automatically activated. During the next 120 days the aeration time is increased to 125% of setted value, maximum 18 min. The duration is adjustable.

To deactivate the start-up phase just set 0 days, as follows:

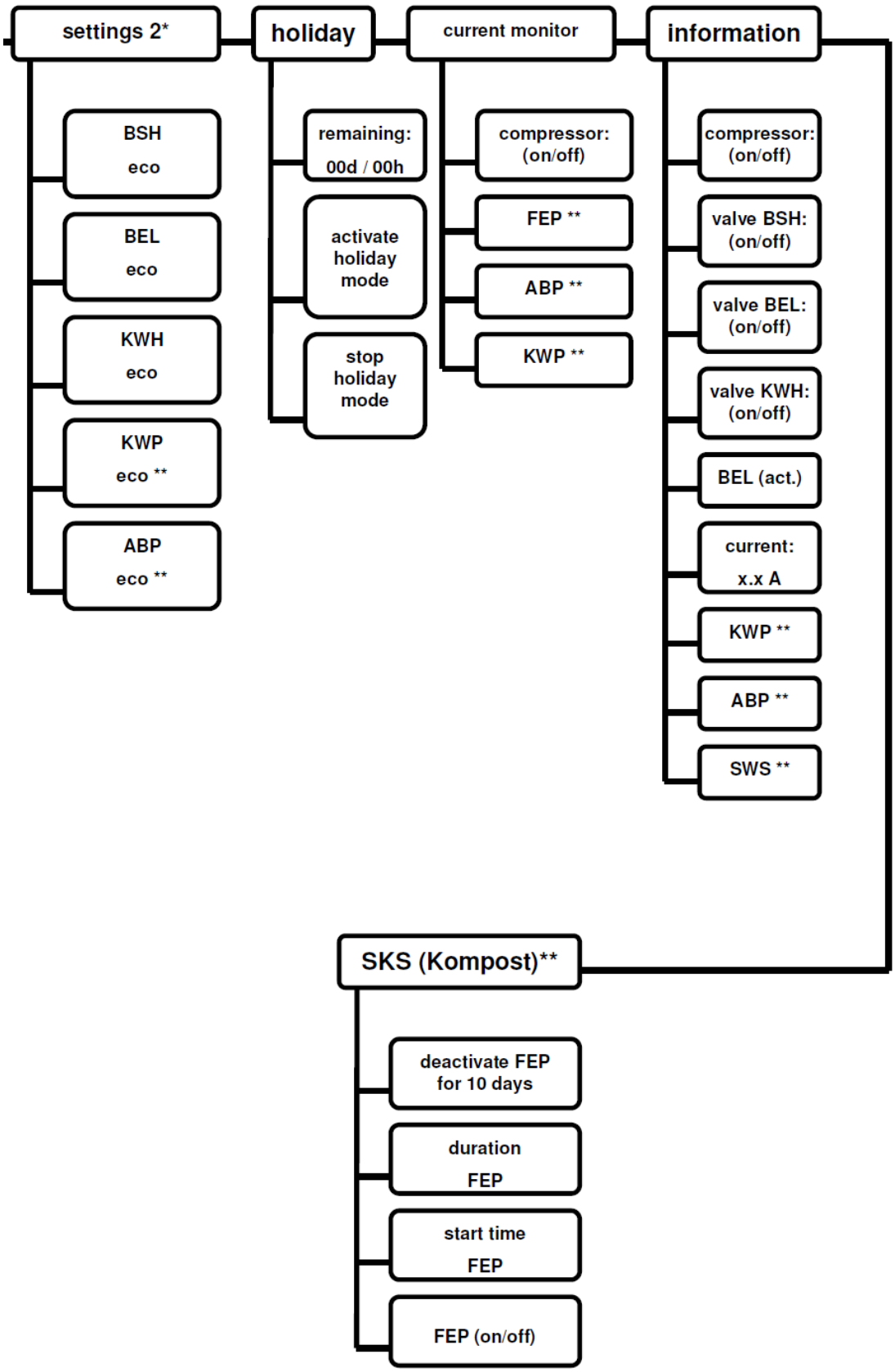


5.7 Menu overview of SOLIDO



* changes only with service-password

** only full-version


settings 2*
holiday
current monitor
information
BSH
eco
BEL
eco
KWH
eco
KWP
eco **
ABP
eco **
remaining:
00d / 00h
activate
holiday
mode
stop
holiday
mode
compressor:
(on/off)
FEP **
ABP **
KWP **
compressor:
(on/off)
valve BSH:
(on/off)
valve BEL:
(on/off)
valve KWH:
(on/off)
BEL (act.)
current:
x.x A
KWP **
ABP **
SWS **
SKS (Kompost)**
deactivate FEP
for 10 days
duration
FEP
start time
FEP
FEP (on/off)

5.8 Alarm messages

In the event of an alarm, **an acoustic signal sounds and the red LED** starts to flash. SOLIDO plants, standard version (controller basic version), have **one possible alarm message**, which is shown in the bottom line of the basic screen:

- **Compressor failure:** the minimum power requirement for the compressor has not been met:

Power consumption target values:	XP-60	0,3 A		
	XP-80	0,4 A	HP-150	0,9 A
	HP-120	0,8 A	HP-200	1,3 A

- **Overfill-Alarm:** the overfill sensor has switched to the upper position
  -> check water level in tanks

5.9 Measures to be taken when an alarm occurs:

- Middle button is pressed once (recommended for operators)
  → Warning signal is stopped permanently
  → Red LED continues to flash
  → Error message remains in the bottom line of the basic screen
  → Alarm is not issued again
  Middle button is pressed again (to be performed by a specialist company only)
  → Alarm is deactivated (until it is entered in the fault memory)
  → Red LED stops flashing
  → Error message at the bottom of the basic screen disappears
  → The plant is now "re-armed". An alarm is issued again at the next available opportunity if the cause of the error has not been eliminated

An interruption in the power supply will also deactivate the alarm. The S30 control unit has a ring memory for 40 error and event messages (e.g. also NETWORK ON/OFF).

Exeption: **Overfill-Alarm** is not erasable. The alarm disappears as soon as the float switch goes back to lower position.

5.10 Alarm messages S 30 full version:

Depending on the used option the following messages are shown:

- **Breakdown FEP** (the minimum power requirement for the pump has not been met check fuses)
- **Blockage FEP/ABP/KWP** (current consumption of the respective pump is too high → check the pump for plugging)
- **Separator full** (the float switch in the separator has switched to high, the FEP pump will not be started any more, emptying separator after about 10 days recommended)

5.11 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.

5.12 Service and 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.

Attention: **S30 full version**: T 5,0 A, 250V, H

Changing the battery:

No maintenance of the batteries is required; however, if the alarm duration begins to decrease, we recommend replacing the accumulators with new ones (Ni-MH size AA, capacity 1800mAh) **Only rechargeable accumulators are permitted; no normal batteries should be used.**

NOTES:

6 Appendix

6.1 Technical data for control unit

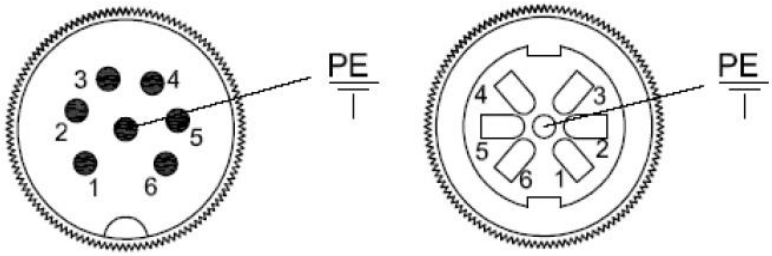
Housing material:	Polycarbonate for wall mounting
Dimensions:	200 x 120 x 60 mm (full version : 200 x 120 x 80 mm
Type of protection:	IP54
Supply voltage:	230 V AC, 50 Hz
Control:	Time-controlled with real time clock
Inputs:	1 float switch input (only full version)
Outputs:	4 relay outputs (full version: 5)
Alarm output:	1 alarm relay (pre-stamped in housing)
Interface:	Internal RS232 interface
Current measurement:	Provided
Power failure monitoring:	Provided
Connection technology:	1 x 7-pin flange socket (binder) (full version 3x)
Mains voltage via shock-proof plug:	3 x 1.0 mm², 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 fuse for all outputs (L/N)) **Full version**: 2x T 5,0 A, 250V, H
Sound level:	Max. 57 dB(A) when the acoustic alarm is sounding at a distance of 1 m

6.2 Environmental conditions for control unit

Permitted ambient temperatures:

Operating temperature:	Unit function: − 20°C to +55℃
Storage temperature:	− 25°C...+ 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

6.3 Wire configuration/terminal scheme for SOLIDO with S 30



Plug pins Screw connection on plug

S 30 basic version

Aggregate	Function	Plug pin no.
all	PE	PE
all	N	1
Compressor	L	2
Valve BSH	L	3
Valve KWH	L	4
Valve BEL	L	5
SWS (float switch, optional)	SWS on	6

S 30 full version

socket 1 (left)	socket 2 (center)	socket 3 (right)	Plug pin no.
PE	PE	PE	PE
N		N	1
L (Compressor)			2
L (Valve BSH)		L (FEP/ABP/KWP)	3
L (Valve KWH)			4
L (Valve BEL)	SWS ON		5
free	N (SWS)		6

6.4 Technical data and structure of the SOLIDO capsule

External dimensions of technology capsule: D = 340 mm, H = 252 mm
(higher capsule: H = 352 mm)

Material: HDPE

Approval: UN / 1H2 / X 38 / S

Protection class: IP55

Relative humidity: max. 95% rH (condensing) permitted

Sound level: Max. 36 dB(A) (with XP-60) at a height of 1.50 m directly above the cover of a small wastewater treatment plant installed in the ground

Solenoid valves: 3x 2/2-way solenoid valves,
DN 13, 1/2“ female thread, IP65

Installed compressors:

Model HIBLOW diaphragm compressor	**XP-60**	**XP-80**
Operating pressure	147 mbar	147 mbar
Applicable pressure range	130-180 mbar	130-180 mbar
Air feed rate at operating pressure	60 l/min.	80 l/min.
Apparent output of technology capsule (S)	120 VA	205 VA
Weight	4.3 kg	4.3 kg
Dimensions	208x132x186 mm	208x132x186 mm
Protection class	IP45	IP45

In the higher capsule:

Model HIBLOW diaphragm compressor	**HP-120**	**HP-150**	**HP-200**
Operating pressure	177 mbar	200 mbar	200 mbar
Applicable pressure range	50-300 mbar	50-300 mbar	50-300 mbar
Air feed rate at operating pressure	120 L/min.	150 L/min.	200 L/min.
Apparent output of technology capsule (S)	285 VA	330 VA	510 VA
Weight	8,5 kg	9 kg	9 kg
Dimensions	256x200x222mm	256x200x222mm	256x200x222mm
Protection class	IP44	IP44	IP44

For additional information, refer to the attached documents from the producers of the compressors.

6.5 EC declaration of conformity

EC declaration of conformity

PREMIER TECH AQUA GmbH (authorised distributor)
Bei der neuen Münze 11
22145 Hamburg

confirm hereby that the packaged domestic wastewater treatment plants for up to 50 PT in plastic container

Typ SOLIDO / MONOsolido comply with these EC-directives:

2006/42/EG	**Machinery Directive***
2004/108/EG	**Electromagnetic compatability**
2006/95/EG	**Low voltage equipment**
305/2011/EU	**Construction products**

*In the context of an evaluation process it was proved, that all relevant aspects regarding safety and health of Appendix I, Machinery Directive are met.

It was proved, that the following harmonised European standards are met:

EN ISO 12100-1/-2:2003/A1:2009	**Safety of machinery: Basic concepts, technical priniples**
EN ISO 13849-1-2:2008-09	**Safety of machinery: Safety-related parts of control systems**
EN ISO 14121-1:2007	**Safety of machinery: Principles for risk assessment**
EN 61010-1:2002-08	**Safety requirements for electrical equipment for control systems**
EN 61000-3-2:2006+A1:2009+A2:2009	**Electromagnetic compatibility: Limits for harmonic currents**
EN 61000-3-3:2008	**Electromagnetic compatibility: Limits for voltage variation**
EN 61000-6-1:2007	**Electromagnetic compatibility: Interference immunity**
EN 61000-6-3:2007	**Electromagnetic compatibility: Emitted interference**
EN 61326-1:2006-10	**Electromagnetic compatibility requirements**
EN 12566-3:2005+A1:2009+A2:2013	**Small wastewater treatment plants for up to 50 PT**

This declaration confirms compliance with the named directives and standards.
It does not guarantee for any properties of the product. All provided safety advices, technical documentation and guides for mounting, installation, commissioning, operation and maintenance must be regarded.

Hamburg, March 5, 2015 **Date of first marking: June 30, 2010**

Marco Rumberg, CEO PREMIER TECH AQUA GmbH and Documentation Agent

Document: DOKK5450E

6.6 EC declaration of performance

CE

PREMIER TECH AQUA Rewatec

Declaration of Performance (CPR No. 305/2011)

Nr. DOKK5451E

1	Code	**KBMSxxxx für SOLIDO - Domestic watewater treatment plants in plastic container**
2	Article number	**KBMS 3011, ~3015, ~3512, ~3520, ~3535, ~4445, ~4512, ~4545, ~5030, ~5X6, ~6012, ~6060, ~6660, ~6666**
3	Type of use	**Packaged domestic wastewater treatment plants**
4	Manufacturer	**PREMIER TECH AQUA GmbH, Bei der neuen Münze 11, D-22145 Hamburg**
5	Authorized person	**Marco Rumberg, marco.rumberg@rewatec.de**
6	System of assessment	**3**
7	Harmonized technical specification	**EN 12566-3:2005+A1:2009**
8	Notified body	**PIA GmbH (NB 1739) performed the initial inspection in the system of assessment 3 and created test reports.**

9 Essential characteristic

Essential characteristic	Performance			Harmonized technical specification
Efficieny of treatment				EN 12566-3:2005 +A1:2009 +A2:2013
Efficiency of degradation (for a tested daily organic load of BOD_5 = 0,25 kg/d)	COD = 94,3 % BOD_5 = 98,1% SS = 94,2% NH_4-N = 96,2 % Ntot = 73,1 % P = NPD			
SOLIDO Modell	- nominal organic daily load (BOD5):	- nominal hydraulic dailyflow (QN)	power consumption h [kWh/d]	
4 E-30	0,24	0,60	0,56	
5 E-35	0,30	0,75	0,65	
6 E-45	0,36	0,90	0,77	
8 E-60	0,48	1,20	0,98	
10 E-35/35	0,60	1,50	1,17	
12 E-45/45	0,72	1,80	1,63	
16 E-60/60	0,96	2,40	2,03	
18 E 45+45/45	1,08	2,70	2,21	
24 E 60+60/60	1,44	3,60	3,31	
32 E 60+60/60+60	1,92	4,80	4,34	
Water tightness (test with water)	pass			
Structural behaviour (pit-test)	earth covering: 1,0 m WET = 1,93 m			
Durability	pass			
Fire behaviour	E			
Release of hazardous materials	NPD			

The manufacturer according to nr. 4 is solely responsible for this declaration.

This declaration confirms compliance for with the named regulations, directives and standards. It does not guarantee for any properties of the product. All provided safety advices, technical documentation and guides for mounting, installation, commissioning, operation and maintenance must be regarded.

Signed for and on behalf of the manufacturer by:

Hamburg, March 5, 2015

7. Operations Logbook for SOLIDO®

	Operating hours (monthly check)				Comments/ specific incidents
Date	**Total running time compressor [h:min]**	**Aeration BEL [h:min]**	**Feed lifter BSH [h:min]**	**Clearwater lifter KWH [h:min]**	**In/outlets ok? Sludge removal? Maintenance, power failure, errors, sludge removal etc.**

	Operating hours (monthly check)				Comments/ specific incidents
Date	**Total running time compressor [h:min]**	**Aeration BEL [h:min]**	**Feed lifter BSH [h:min]**	**Clearwater lifter KWH [h:min]**	**In/outlets ok? Sludge removal? Maintenance, power failure, errors, sludge removal etc.**

	Operating hours (monthly check)				Comments/ specific incidents
Date	**Total running time compressor [h:min]**	**Aeration BEL [h:min]**	**Feed lifter BSH [h:min]**	**Clearwater lifter KWH [h:min]**	**In/outlets ok? Sludge removal? Maintenance, power failure, errors, sludge removal etc.**

	Operating hours (monthly check)				Comments/ specific incidents
Date	**Total running time compressor [h:min]**	**Aeration BEL [h:min]**	**Feed lifter BSH [h:min]**	**Clearwater lifter KWH [h:min]**	**In/outlets ok? Sludge removal? Maintenance, power failure, errors, sludge removal etc.**

Master Data Sheet for your REWATEC Small WWTP

You can use this sheet to keep a record of important technical details about your small wastewater treatment plant. With these details, your maintenance service company or PREMIER TECH AQUA service can provide quick assistance at any time. Please note that these details are required if you wish to make a warranty claim.

Plant type: _____

PREMIER TECH AQUA order or delivery note number:	_____	Date of start-up	_____
Or: Delivery date + dealer:	_____	Maintenance carried out by:	_____
SOLIDO serial no. (see bottom of technology capsule):	_____	Maintenance frequency:	_____
Control unit series no.:	_____	Software version of control unit:	_____

Tip: Attached included label here. (sample label)

Included, you will find a label sticker listing the important information regarding the SOLIDO technology capsule (item and serial number). Store this label in a safe place or place it here. Thank you!