DEHOUST

ENERGIE. WÄRME. WASSER.

Installation, Operation and Inspection Manual

DEHOUST GWtec® 140, 240, 340, 440, 640

Greywater treatment plants for greywater reuse

Version 1.0 (September 2024)

US Version

www.dehoust.com

Manufacturer:

DEHOUST GMBH
Gutenbergstr. 5 -7
69181 Leimen
Germany

Contact:
Phone: +49 (0) 6224 9702-0
Fax: + 49 (0) 6224 9702-70
E-mail: info@dehoust.de

Website:
www.dehoust.com

Contents

1. Safety instructions

1.1. General safety instructions

This manual provides basic guidance for transport, handling, installation, commissioning, operation, maintenance, storage and final disposal. When using *GWtec®* greywater treatment plants, observe the relevant data, limits and operating conditions specified in this manual and in the Technical Data Sheet as revised from time to time.

Also, this manual is valid only in connection with the operation manual as delivered with the equipment or as applicable on the date of a software update. The latest operation manual for your current software version will be given to you each time the controller software runs an update with changed menu navigation.

Important:

- Never exceed the authorized operational thresholds for pressure, temperature, etc. specified in this documentation.
- Observe all safety and work instructions given in this manual.
- Respect all instruction labels or notices placed on the equipment and keep them in a perfectly readable condition. This is especially true for:
  - safety instructions
  - identifiers of ports and connections
  - type label
- Read the manual before installing and commissioning the *GWtec®* system and keep the manual within reach at the place of use. This applies to the operative(s), technician(s), or operators.
- Perform all installation and maintenance work always by duly authorized specialist personnel using appropriate tools.
- Have the operator check the technical condition of the *GWtec®* system at regular intervals.
- Observe the local safety and accident prevention regulations for the operation of the *GWtec®* system.
- Make sure the plant is installed and operated in accordance with the generally accepted rules of engineering.
- Do not make any modifications to the *GWtec®* plant, because you would lose all rights under the warranty.
- After a power outage or greywater supply interruption, ensure the process is restarted in a controlled and defined manner.
- The operator is responsible for meeting any additional applicable local regulations not mentioned in the manual.

1.2. Cross-reference to other instructions

For safe and smooth operation of the system, observe the additional instructions and manuals mentioned below, which are part of the delivery. These are:

- Compressor Operation Manual
- Wiring Diagram DEHOUST *GWtec®*
- P&I Flow Chart DEHOUST *GWtec®*

1.3. Symbols used in this manual

	Passages marked with this symbol indicate that failure to respect the relevant precautions may cause slight personal injury or minor material damage.
	Passages marked with this symbol indicate that failure to respect the relevant precautions may cause death, severe personal injury or substantial material damage.
	Passages marked with this symbol indicate the need to wear personal protective equipment – in this case: safety gloves.
	Passages marked with this symbol indicate the need to wear personal protective equipment – in this case: a dust mask.
	Passages marked with this symbol indicate the need to wear personal protective equipment – in this case: safety goggles.
	Passages marked with this symbol indicate the need to wash your hands to protect yourself from potential contamination.
	Passages marked with this symbol provide technical information and practical tips for avoiding damage to the plant. This symbol is not a safety instruction.
	Passages marked with this symbol indicate servicing intervals that need to be observed. In this case: every three months
	Passages marked with this symbol indicate maintenance intervals that need to be observed. In this case: every 2 years
	Passages marked with this symbol indicate that service or maintenance work shall be performed as required or in the event of wear.

1.4. Safety regulations

The following safety regulations apply in addition to the safety instructions and intended use given in this manual:

- Accident prevention, safety and operating regulations
- Safety regulations for handling hazardous substances
- Applicable standards and laws including but not limited to the following technical standards:
  DIN EN 16941-2, DIN EN12056, DIN 1988, DIN 1986, DIN EN 1717, DIN EN 806.

1.5. Risks and hazards from non-compliance with the manual

Failure to observe the instructions given in this manual will void any warranty and damage claims.
Non-compliance with the manual may, for example, result in the following hazards:

- danger to persons due to electrical, thermal, mechanical and chemical effects
- loss of key functions of the product
- failure of prescribed servicing and maintenance methods
- environmental hazards due to leaking hazardous substances

1.6. Operator's duty of care

The *GWtec®* greywater treatment plant for greywater reuse was designed and built after appropriate risk assessment and careful selection of applicable harmonized standards and other technical specifications. The product complies with the state of the art and guarantees maximum safety. In practical operation, this level of safety can only be achieved if all necessary measures are taken.

It is the operator's duty of care to plan these measures and supervise their implementation. In particular, the operator must ensure that

- the *GWtec®* greywater treatment plant for greywater reuse is used for the intended purpose only
- the *GWtec®* greywater treatment plant for greywater reuse is operated in a perfect functional condition only
- a full version of the manual in a readable condition is constantly kept within reach at the place of use of the *GWtec®* system
- only sufficiently qualified and authorized personnel install, commission, maintain and service the GWtec® system
- such personnel are instructed at regular intervals in all relevant aspects of safety at work and environmental protection and have read and understood the manual and, more specifically, the safety instructions contained therein
- none of the safety and warning labels on the *GWtec®* greywater treatment plant for greywater reuse are removed and that they remain readable;
- a risk assessment (in the spirit of Section §5 of the Safety at Work Act) is made to determine the additional risks and exposures resulting from the specific local working conditions at the place of use of the *GWtec®* system
- all additional safety and other instructions arising from the risk assessment are grouped together in an operating procedure (in the spirit of Section §6 of the Work Equipment Usage Ordinance)
- sewer discharge is sufficiently dimensioned

1.7. Safety instructions for maintenance, inspection and installation work

- You are not allowed to change or modify the system, unless with the prior consent of the manufacturer.
- Never use any parts other than original parts or spare parts authorized by the manufacturer.
  The use of non-compliant parts can void liability claims for defects arising therefrom.
- Switch off the system during all work on the equipment.
- Plant units (filter and pump) must have cooled down to ambient temperature.
- Always observe the inspection/maintenance procedure described in the manual.
- Reinstall or reactivate all safety guards and protective devices immediately after the work is done. Before restarting operation, follow the steps mentioned in the Commissioning section of the manual.
- Keep unauthorized persons (e.g. children) away from the system.

1.8. Duties of the operatives

The *GWtec®* greywater treatment plant for greywater reuse shall be installed, commissioned, repaired, maintained and decommissioned only by persons specifically trained, briefed and authorized for this purpose. The operator can request training sessions from the manufacturer/supplier as needed. Training sessions for the system must always be supervised by specialist personnel. The operator shall maintain an operating procedure containing clear assignment of authorities for every member. Moreover, particular qualifications are required for the following activities:

- work on electrical equipment:
  they shall be carried out by qualified electricians only
- installation, commissioning, servicing, maintenance and repair work:
  they shall be carried out by qualified specialist personnel only.

The fundamental regulations on safety at work, occupational health and accident prevention must be observed.

2. General information

The manual is part of the mentioned series and models. The manual describes their correct and safe use in all operational phases. The type-label indicates the series and size, key operating data and serial number.

To maintain warranty claims in the event of damage, report damages immediately to the authorized dealer by indicating the installation site and the series number of the equipment.

2.1. Warranty and liability

The *Standard Terms and Conditions of Sale and Delivery* of DEHOUST GmbH apply. No warranty and liability claims can be accepted in case of personal injury or material damage attributable to any of the following causes:

- improper use of *GWtec®*
- improper installation, commissioning, operation and maintenance of *GWtec®*
- failure to follow the instructions in the manual in terms of transport, handling, storage, installation, commissioning, operation, servicing and maintenance of *GWtec®*
- arbitrary structural modifications to *GWtec®*
- improper repairs
- disaster events by impact of foreign bodies and force majeure

2.2. Statutory warranty obligation (extract)

The statutory warranty obligation according to Section § 437 of the German Civil Code (BGB) applies.

Within the statutory warranty period, DEHOUST will at no charge remedy functional defects arising from manufacturing or material defects.

This applies to any defects or malfunctions occurring despite correct installation, proper operation and full compliance with the operating and installation instructions.

3. General description

GWtec® greywater treatment plants for greywater reuse treat slightly contaminated domestic sewage from household sources such as bathtubs, showers and sinks to produce high-quality water for non-potable uses. The so-called greywater undergoes mechanical and biological treatment using sophisticated filter technologies (hollow fiber membrane filters). The treated greywater such obtained meets the hygienic/microbiological quality requirements of the European Standard EN 16941-2 (Systems for the use of treated greywater) and can be reused for non-potable applications in a manner that makes sense both ecologically and economically.

3.1. Functional description

In a first step, the inflowing raw greywater undergoes mechanical filtration in the coarse filter where all non-dissolved water contaminants like textile fluffing or hair are removed. An automatic backwash unit cleans the filter plate in regular intervals to achieve high water yield.

In the next step, all organic, degradable water contaminants such as shower gel, shampoo, soap, etc. are decomposed with the assistance of specific microorganisms in the aerobic biological cleaning stage.

This is followed by a brief sedimentation phase, after which the core piece of the *GWtec®* greywater treatment plant, i.e. the hollow fiber membrane filter with a PESM membrane surface, begins to filtrate the pre-treated greywater. With a physical pore size of just 20 nm (2,500 times finer than a human hair), the filter safely retains any time all solid particles, germs and absorbed viruses within the system.

The filtration process is controlled by means of a specifically developed program (SmartFiltrationControl) for greywater filtration to achieve optimal filtration performance with maximum filter lifetime. After the filtration process, a defined amount of filtrated greywater is used for backwashing the hollow fiber membrane filter. Should the filtration pressure become excessively high, the filter will be given an additional backwash.

Thanks to the very high outflow quality – absolutely clear, odor-free and germ-free – the treated greywater (also known as service water) is suitable for hygienically safe long storage and a broad range of potential non-potable reuse applications.

Should no treated greywater be available, the system will automatically change over to mains water to continue supplying water to all connected reuse points.

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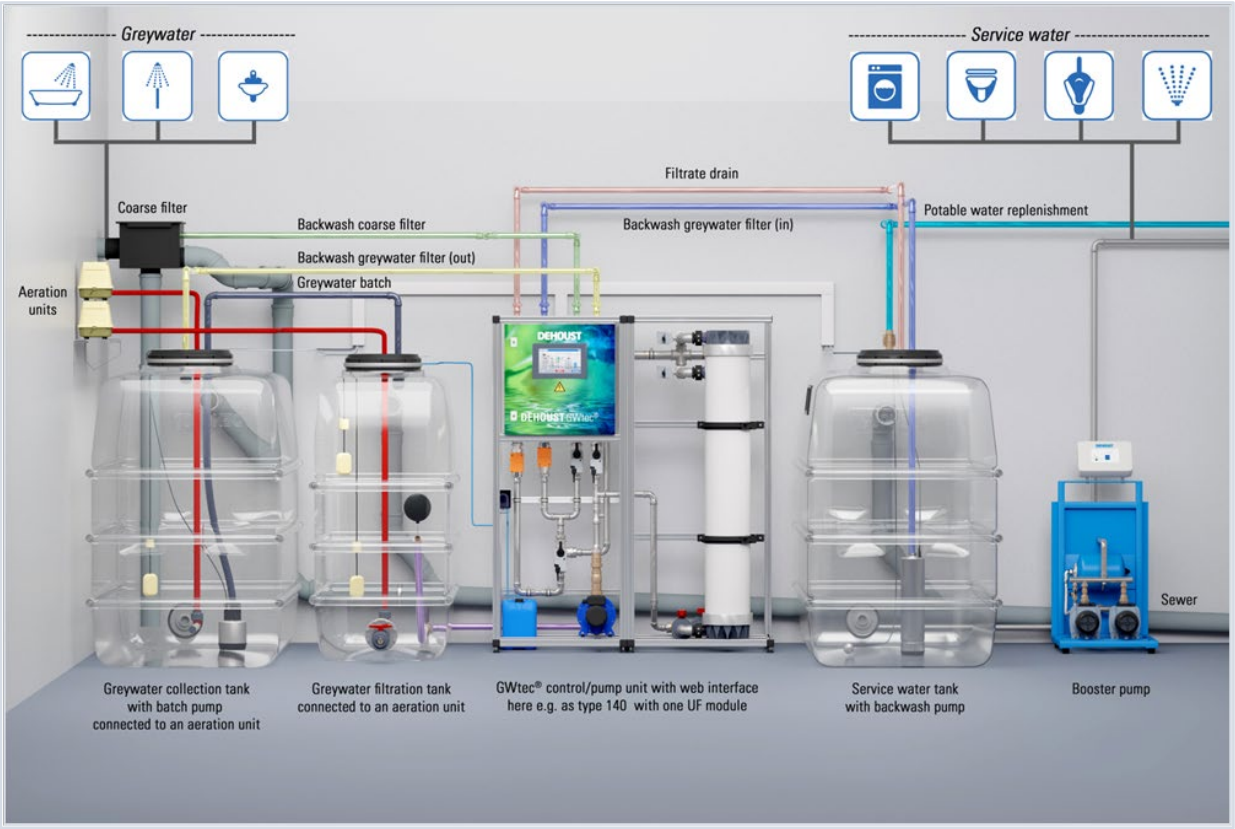
The centralized controller provides microelectronic monitoring and fully automatic control of all plant processes. Malfunctions are indicated through visual and sound alarms. It is possible to connect a potential-free alarm contact to a standard port.

3.2. Configuration



3.3. Scope of delivery

Various storage tanks are used, depending on the model type. Please refer to the packing list of the *GWtec®* greywater treatment plant and to the overall installation drawing which is included in the delivery.

Pre-assembled *GWtec®* greywater treatment plant composed of:

- coarse filter DEHOUST MAX I/MAX II
- greywater collection tank(s)
- greywater batch pump DOC 3/7
- aeration unit and aeration unit extension(s)
- greywater filtration tank
- *GWtec®* control/pump unit with web interface
- Smartfloc dosing station with 7.92-gallon (30 L) canister
- one or more UF modules
  (ultrafiltration module comprises the hollow fiber membrane filter with a PESM membrane surface)
- Service water storage tank with integrated mains water make-up of type AB (EN 1717)
- dry bacteria for building up the biological cleaning cultures
- installation accessories for above components
- instructions
  - installation, operation, inspection manual
  - compressor operation manual
  - P&I flowchart
  - wiring diagram of *GWtec®* greywater treatment plant

3.4. Intended use

The *GWtec®* greywater treatment plant shall be operated only in applications described in this manual. Any use of the *GWtec®* greywater treatment plant for purposes other than the intended use can cause harm to persons, neighboring plants and the environment.

Important:

- Operate the *GWtec®* greywater treatment plant in a perfect technical condition only!
- Do not operate the *GWtec®* greywater treatment plant when assembled in part only!
- Only operate the *GWtec®* greywater treatment plant for the treatment of slightly contaminated domestic sewage from showers, bathtubs and sinks only.
- Operate the *GWtec®* greywater treatment plant at water temperatures up to a maximum of 104° F only.
- Always take care to avoid any overheating, mechanical seal damage, cavitation damage[1], bearing damage, etc. Observe the specified maximum flows and pressures (Chapter 4).
- Do not restrict the upstream mains water make-up flow to the *GWtec®* greywater treatment plant (avoidance of cavitation damage, dry run of pressure booster system).
- Contact the manufacture for any operating modes other than those mentioned in the documentation.

[1] Cavitation is the spontaneous formation of voids in hydraulic fluids. Such voids occur in the form of bubbles. Since these bubbles have a vacuum inside, they collapse immediately. This might cause damage to the pump.

3.5. Improper use

The *GWtec®* greywater treatment plant is not designed for outdoor use. The effects of temperature, light and humidity can cause malfunctions and damage to the equipment.

- Do not use the *GWtec®* greywater treatment plant outdoors.
- Only use the *GWtec®* greywater treatment plant as intended.
- Do not (!) use the *GWtec®* greywater treatment plant to treat
  - industrial wastewater
  - highly contaminated sewage from kitchens
  - sewage containing feces
  - sewage from dish washers
  - sewage containing paints, dyes or colorants (e.g. residual paint, textile and hair dyes)
  - contaminated wastewater (e.g. concentrated lye and acids, medical mud baths, drugs/medications, highly foaming water additives, silicones, resins, solvents, colorants, flocculants)
- Do not fill any inflammable fluids into the fluid ports of the system
- Do not subject housings and tanks to mechanical loads (e.g. by placing objects on them or using them as a step)
- Do not make external modifications to the housings and tanks. Never paint or varnish housing parts and screws or bolts!
- Do not disassemble the *GWtec®* greywater treatment plant to a higher extent than what is needed for installation or servicing work

Space for personal notes:

4. GWtec® Technical Data

4.1. Dimensions & weights

	Greywater Connect Type	DEHOUST GWtec®140	DEHOUST GWtec®240	DEHOUST GWtec®340	DEHOUST GWtec®440	DEHOUST GWtec®640
Dimensions / weights / volumes	**Article No.**	**813371**	**813372**	**813373**	**813374**	**813393**
	Treatment capacity (GPD)	792 – 1,321	2,642	3,962	5,283	7,925 – 9,246
	Number of persons	100	200	300	400	600
	Effective volume of service water tank (gal)	792	1,057	2 x 1,057	3 x 1,057	7 x 1,057
	Effective volume of greywater tank (gal)	792	1,057	2 x 1,057	3 x 1,057	8 x 1,057
	Dimensions (WHD) (ft.)	15 x 8.9 x 6.3	Variant A: 18.8 x 9.5 x 7.38 Variant B: 16.6 x 9.5 x 7.38	Variant A: 29.5 x 9.6 x 7.38 Variant B: 26.9 x 9.6 x 7.38	Variant A: 39.4 x 9.6 x 7.38 Variant B: 34.4 x 9.6 x 7.38	Variant A: N/A Variant B: 74.1 x 9.6 x 7.38
	Hyperlink to plant configurations:		A B	A B	A B	B
	Required clearance above tank (in.)	at least 28"				
	Noise level (dB)	max. 48 dB(A)				
	Total weight (lb)	2,085	2,837	4,533	6,440	13,792
	Total weight when filled (lb)	18,620	24,883	45,318	68,171	163,706

4.2. Technology

	Greywater Connect Type	DEHOUST GWtec®140	DEHOUST GWtec®240	DEHOUST GWtec®340	DEHOUST GWtec®440	DEHOUST GWtec®640
Technologies	Greywater tank prefilter (in)	MAX coarse filter 0.02				
	Filter material	Hollow fiber membrane filter PESM membrane surface				
	Membrane filter pore size (nm)	20				
	Filtration stage	Ultrafiltration				
	Free outlet	Type AB				
	Mains water make-up	acc. to DIN EN 1717				
	Mains water make-up category	5				
	Rainwater make-up	optional				
	Plant controller	Fully automatic with real-time access				

4.3. Electrical data

	Greywater Connect Type	DEHOUST GWtec®140	DEHOUST GWtec®240	DEHOUST GWtec®340	DEHOUST GWtec®440	DEHOUST GWtec®640
Electrical data	Network connection	yes				
	Condition for network connection	Stable connection without firewall				
	Voltage supply (fusing)	400 V / 50 Hz / 16 A				
	Power input (W)	2310			2440	
	Current input (A)	5.9			6.2	
	Energy use/consumption (kWh/m³)	0.5 (0.019 kWh/gal // 0.014 kWh/cu.ft.)				
	Floating output	yes				
	Pressure booster	optional (DPA 14-40 Connect)				
	Pressure booster power input (W)	2960				
	Pressure booster voltage supply (fusing)	230 V / 50 Hz / 16 A				
	Class of protection:	IP 54				
	Insulation class	F				

4.4. Connections

	Greywater Connect Type	DEHOUST GWtec®140	DEHOUST GWtec®240	DEHOUST GWtec®340	DEHOUST GWtec®440	DEHOUST GWtec®640
Connections	Connection cable (m)	Fixed connection				
	Rainwater make-up connection	1 ¼“				
	Mains water make-up connection	1“ IT				
	Inlet/overflow connections	DN 100 (4”)				
	Tank drain connection	1 ½“ IT				
	Coarse filter backwash connection	1“ OT				
	Backwash IN	1 ¼“ IT				
	Backwash OUT	1 ¼“ IT				

4.5. Service water quality for GWtec® model series

Examples of guideline values for bacteriological monitoring acc. to EN 16941-2

Parameters CFU/100 ml	Application by spraying	Application w/o spraying			Test method		System type
	Jetting, garden sprinkler, car wash	Toilet flush	Garden irrigation	Cleaning, i.e. washing machine	Application by spraying	Application w/o spraying	
Escherichia coli	Not detectable	250	250	Not detectable	EN ISO 9308-1	EN ISO 9308-3	Individual sites and residential communities
Intestinal enterococci	Not detectable	100	100	Not detectable	EN ISO 7899-2, or EN ISO 7899-1	EN ISO 7899-1	Individual sites and residential communities
Legionella pneumophila	10	N/A [2]	N/A	N/A	EN ISO 11731	N/A	If analysis required for risk assessment
Total coliforms[3]	10	1000	1000	10	EN ISO 9308-1	EN ISO 9308-3	Individual sites and residential communities

Example values for general system check under EN 16941-2

Parameters [4]	Application by spraying	Application w/o spraying			Test method	System type
	Jetting, garden sprinkler, car wash	Toilet flush	Garden irrigation	Cleaning, i.e. washing machine		
Turbidity (NTU)	< 10.0	< 10.0	N/A	< 10	EN ISO 7027-1	all systems
pH	5 to 9.5	5 to 9.5	5 to 9.5	5 to 9.5	EN ISO 10523	all systems
Residual chlorine (mg/L)	< 2.0	< 2.0	< 5.0	< 2.0	EN ISO 7393-2	all systems if used
Residual bromine (mg/L)	0.0	< 5.0	0.0	< 5.0	EN ISO 10304-1	all systems if used

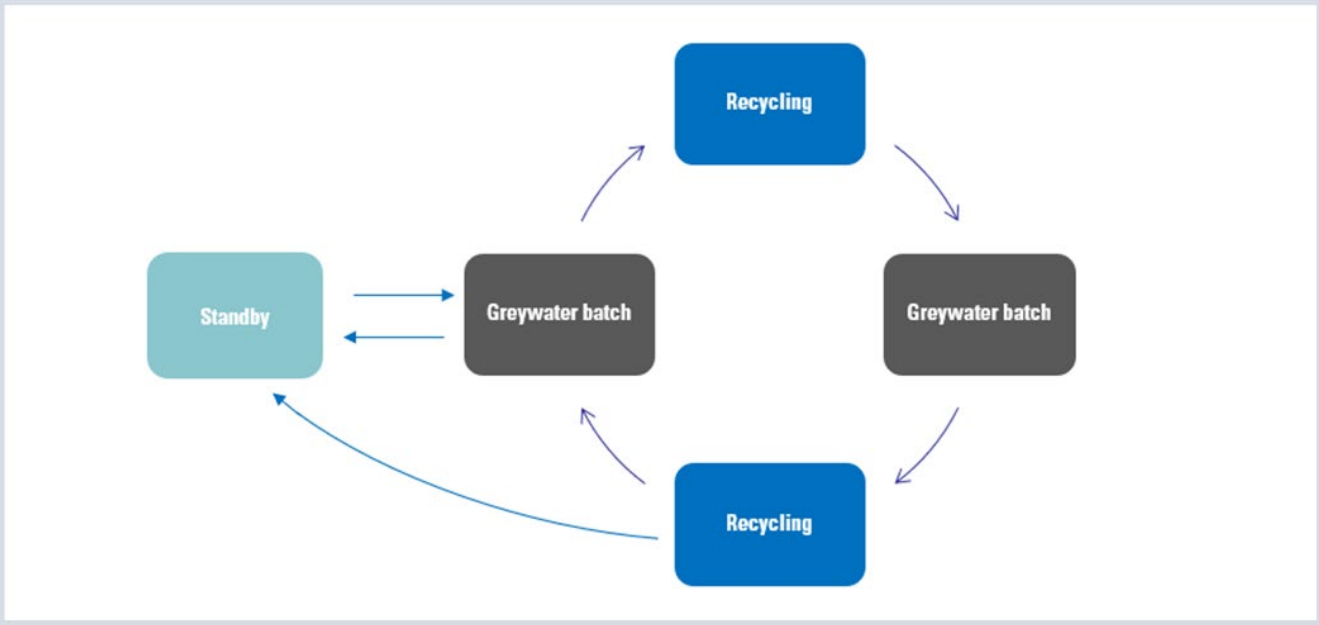
[2] N/A = not applicable

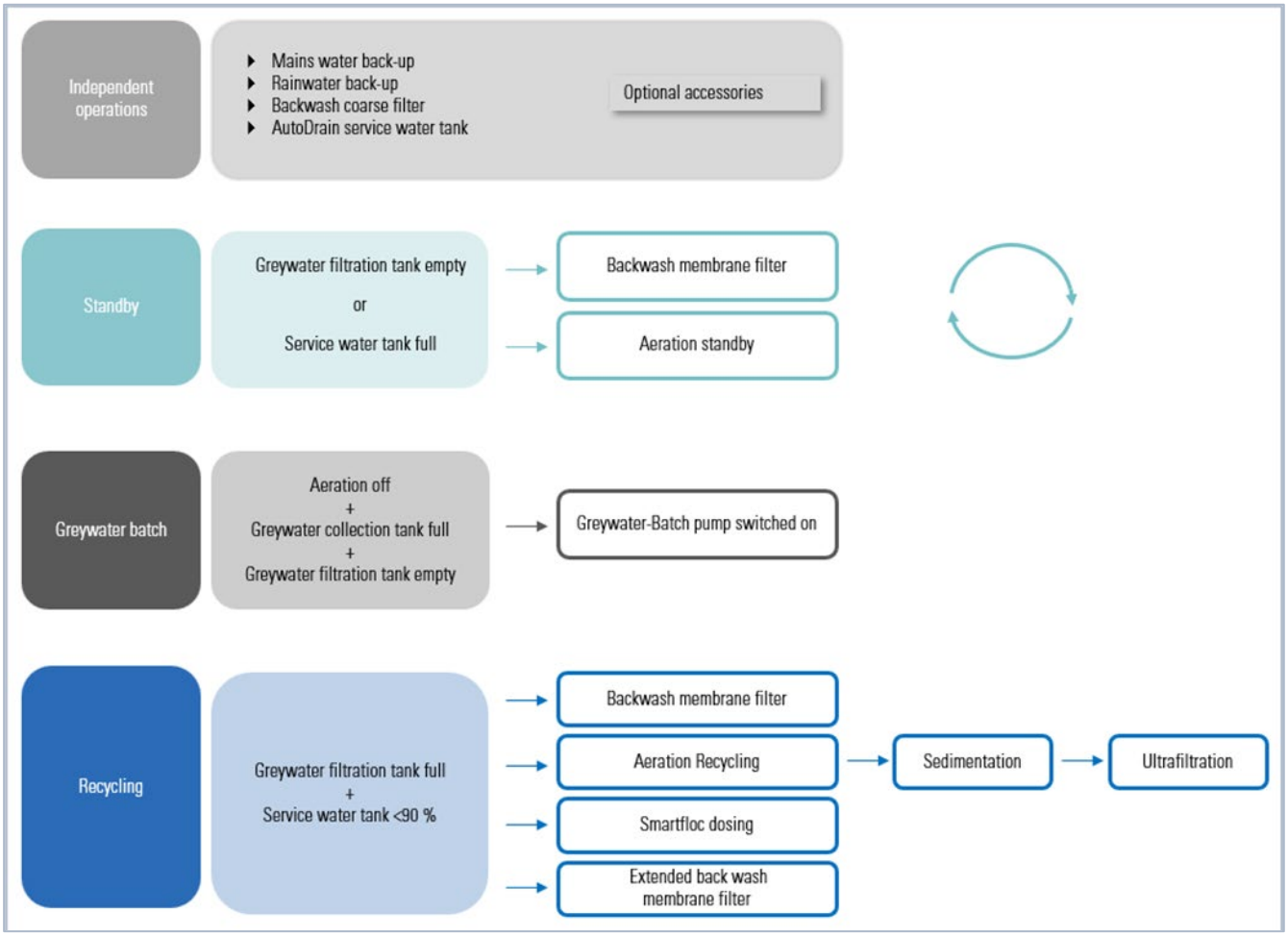
[3] „Total coliforms" is an indicative parameter showing that the plant is ready for operation. The above bacteriological guideline values for the treated greywater indicate the need to test the treated water quality for supply and use.

[4] In addition to the above parameters, all systems should be checked for suspended solids and color. The treated greywater should be visually clear, free of floating residues and basically uncolored for all applications. Color is particularly relevant for reuse in washing machines.

4.6. Operations

The controller of the DEHOUST *GWtec®* greywater treatment plant controls and monitors all processes and operations in a fully automatic manner. The key processes are now explained for better understanding.





4.6.1. Explanation of the different processes:

Mains water make-up	Automatic supply of make-up mains water within the defined liquid level limits of the service water tank (refer to Chapter 9.1.1).
Rainwater make-up	Automatic supply of make-up rainwater within the defined liquid level limits of the service water tank (refer to Chapter 9.1.1).
Backwash coarse filter	Automatic backwash of the screen in the coarse filter according to settings (refer to Chapter 9.1.2)
AutoDrain service water tank	Automatic drainage of the service water tank after longer rest periods according to settings (refer to Chapter 9.1.1).
Backwash filter	Backwash of the membrane filter comprised of backwash (filtrate side to greywater side) and forward flush (greywater side top to bottom). The timing and quantity settings for the backwash are explained in Chapter 9.1.2.
Extended backwash	Extended backwash of the membrane filter comprised of extended backwash (filtrate side to greywater side) and extended forward flush (greywater side top to bottom). The time and quantity settings for the extended backwash are explained in Chapter 9.1.2.
Aeration standby	Aeration during standby of the greywater in the greywater collection tank and greywater filtration tank by means of the aeration unit according to time settings (refer to Chapter 9.1.2).
Greywater batch pump	Recirculation of the greywater from the greywater collection tank into the greywater filtration tank using the greywater batch pump
Aeration during recycling	Aeration during recycling of greywater in the greywater collection tank and greywater filtration tank using the aeration unit according to time settings (refer to Chapter 9.1.2).).
Smartfloc dosing	A defined amount of Smartfloc flocculant is metered into the greywater filtration tank using the dosing pump in order to improve sedimentation. During recycling aeration, the flocculant is strongly mixed with the greywater to ensure a quicker reaction. The values are fixed values in the control program and cannot be changed.
Sedimentation	Rest phase in the greywater collection tank and greywater filtration tank to allow for settling of the suspended solids and particles before filtration. The related time settings are explained in Chapter 9.1.2.
Ultrafiltration	During filtration, the flow rate at S4.3 and the pressure at S4.1 are continuously monitored. These values in combination provide information about the condition of the filter and the quality of the greywater. If the filtration pressure is too high, filter backwash will be adjusted accordingly. If the flow rate is too low, the coarse filter backwash and greywater retention time (including pre-treatment, sedimentation time etc.) will be adjusted accordingly. This filtration control was developed under the name of SmartFiltrationControl (SFC) exclusively for the filtration of slightly contaminated greywater. The filtration settings are explained in Chapter 9.1.2

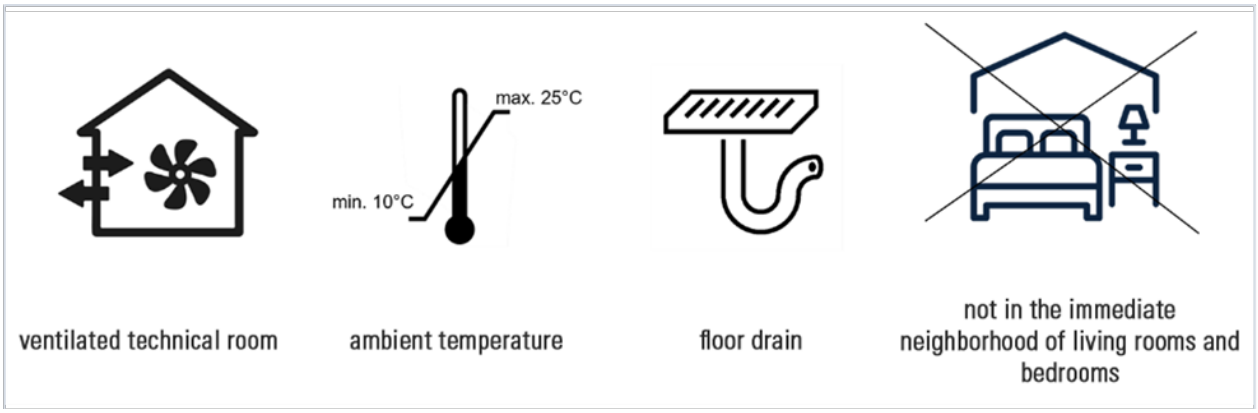
5. Handling and storage / installation

The product is delivered on several pallets. Please take care during handling to ensure the components are not bumped or knocked over. Keep all pallets or components in a dry and cool place that is protected from sun and frost.

Inspect every pack for damage upon delivery! Identify, record and report immediately any transport damage in detail in writing to the contract dealer or DEHOUST.

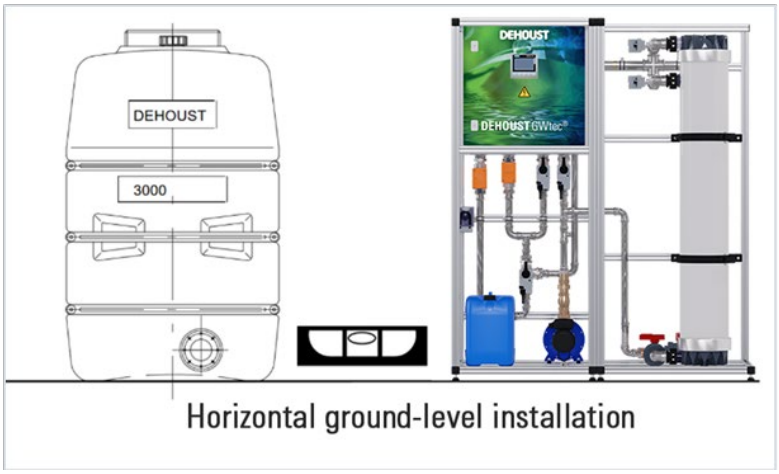
5.1. Requirements for the place of installation

- Install the *GWtec®* greywater treatment plant on a level horizontal floor in a frost-free, dry and properly ventilated place.
- The load-carrying capacity of the floor must match the total weight of the *GWtec®* system in a filled operational condition (cf. Chapter 4).
- Provide sufficient doorway clearance.
- Take into account tank widths:
  Tanks up to 528 gallons have a width of 2.36 ft.
  Tanks with 660 gallons or more have a width of 3.26 ft.
- Make sure the room temperature will not exceed the maximum admissible temperature (cf. Chapter 4) to minimize hygienic risks in the service water tanks.
- Make sure there is sufficient space of at least one meter in front of all components (coarse filter, storage tanks, *GWtec®* greywater treatment plant, membrane filter) to allow for servicing and repair.
- It is absolutely necessary for the place of installation to have a suitable floor drain or pump sump to be able to safely discharge overflowing water amounts in case of water backflow.

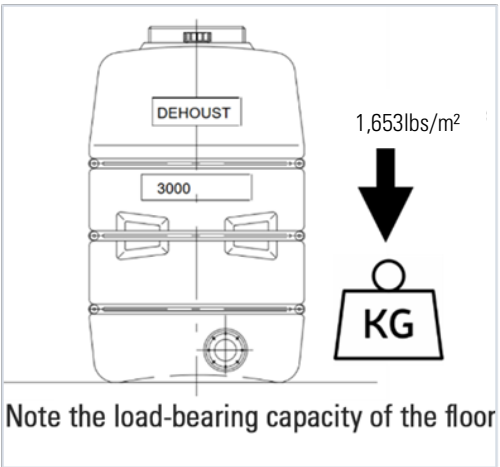


5.2. Installation of the tanks

The installation of the tanks shall be in accordance with the separate installation drawing. Each individual tank is appropriately labelled and marked.



Horizontal ground-level installation

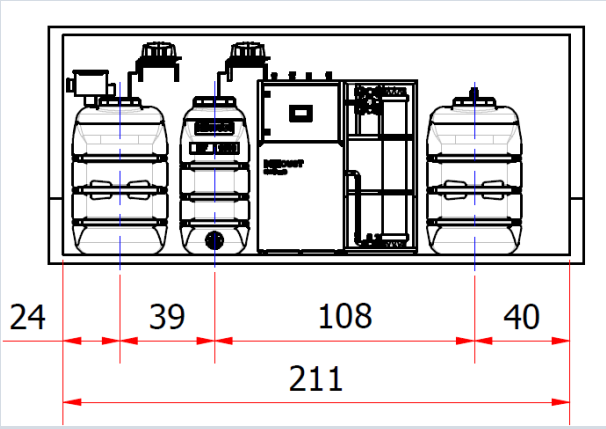
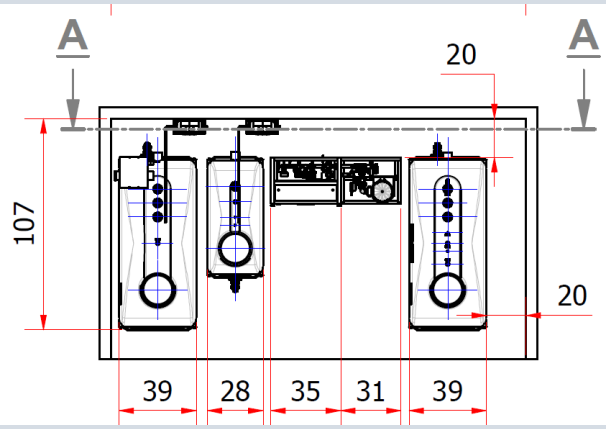


Note the load-bearing capacity of the floor

After installation in the predefined place, the system must be connected to the power grid for an initial period of no less than 72 hours before the commissioning work can begin.

It is absolutely necessary to install all tanks on the same level to avoid malfunctions in normal operation.

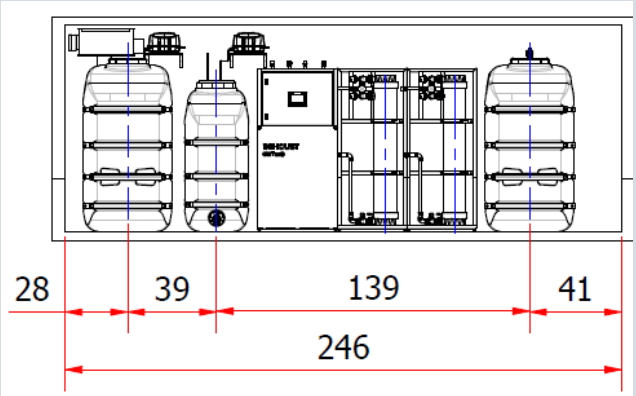
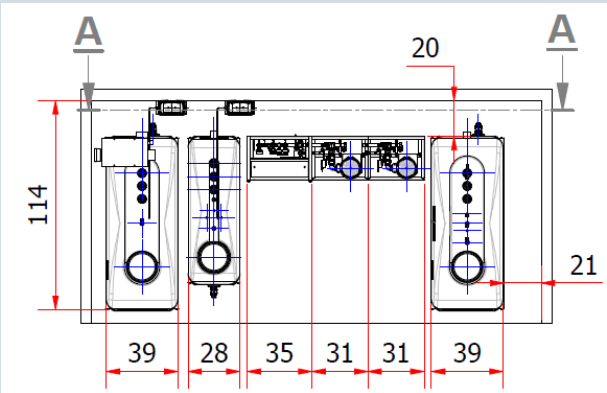
5.2.1. Installation of *GWtec®* 140

A filter element / front view	Installation top view
	

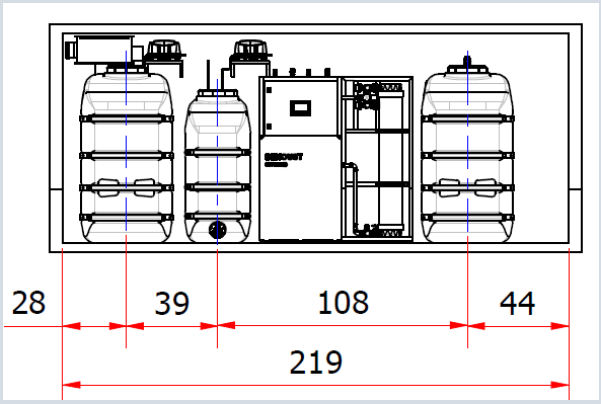
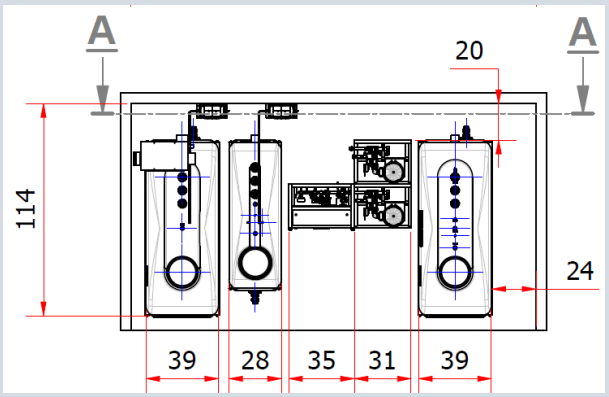
You will find detailed drawings and installation drawings at
https://www.dehoust.com/ProductFiles/Files/CAD/dh2d_813371_GWtec140.pdf

Space for personal notes:

5.2.2. Installation variants for *GWtec®* 240

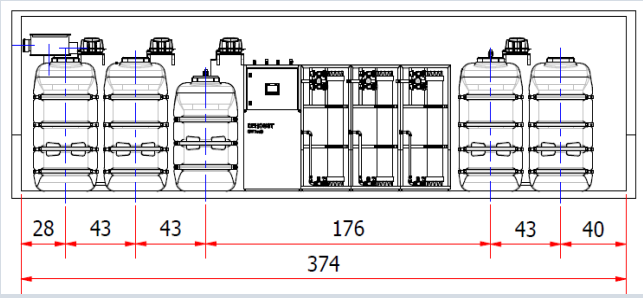
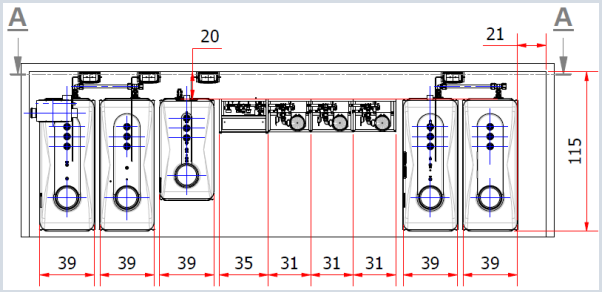
Variant A Two filter elements side by side	Installation top view
	

You will find detailed drawings and installation drawings at
https://www.dehoust.com/ProductFiles/Files/CAD/dh2d_813372_GWtec240A.pdf

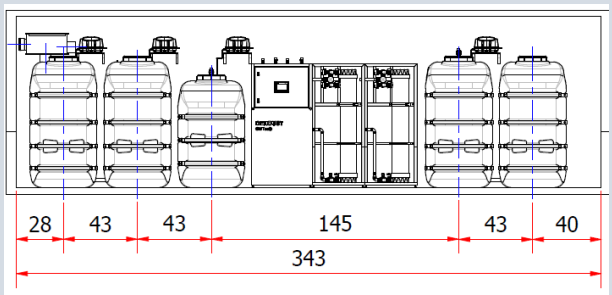
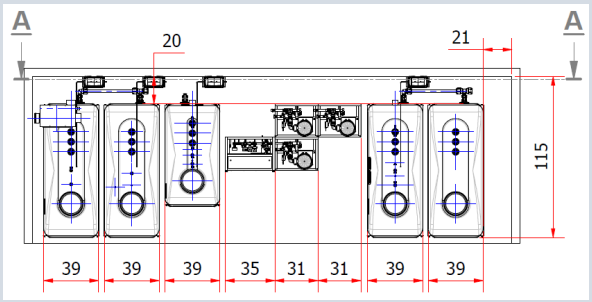
Variant B Two filter elements in series, 31.5" less space (width)	Installation top view
	

You will find detailed drawings and installation drawings at
https://www.dehoust.com/ProductFiles/Files/CAD/dh2d_813372B_GWtec240B.pdf

5.2.3. Installation variants for *GWtec®* 340

Variant A Three filter elements side by side	Installation top view
	

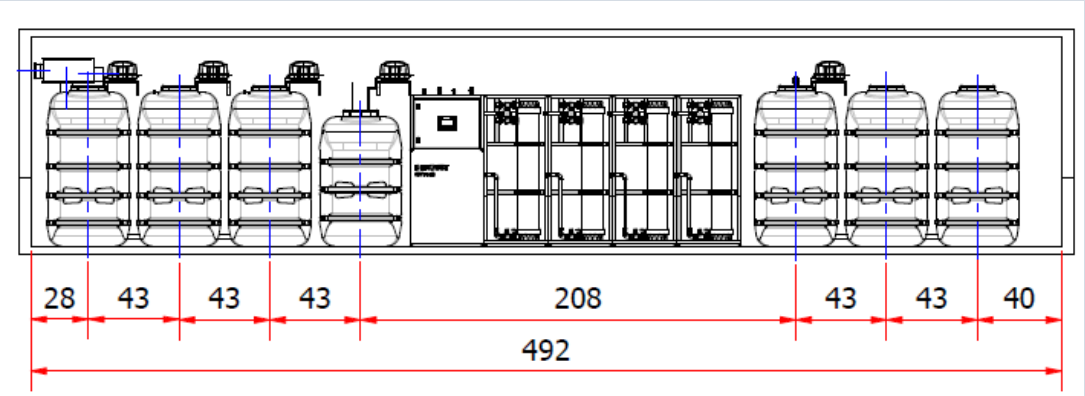
You will find detailed drawings and installation drawings at
https://www.dehoust.com/ProductFiles/Files/CAD/dh2d_813373_GWtec340A.pdf

Variant B Three filter elements 31.5" less space (width)	Installation top view
	

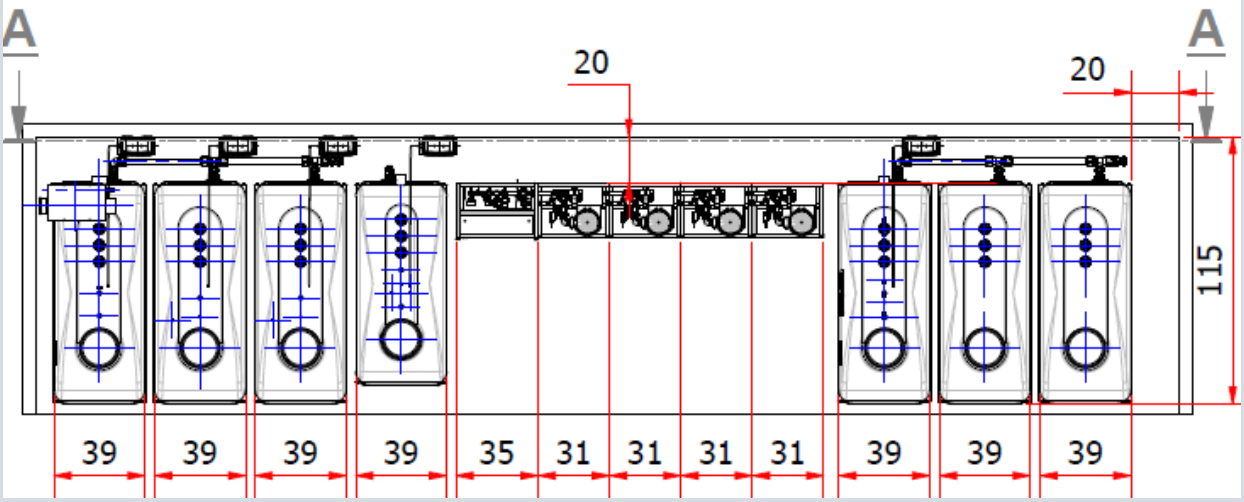
You will find detailed drawings and installation drawings at
https://www.dehoust.com/ProductFiles/Files/CAD/dh2d_813373B_GWtec340B.pdf

5.2.4. Installation variants for *GWtec®* 440

Variant A
Three filter elements side by side



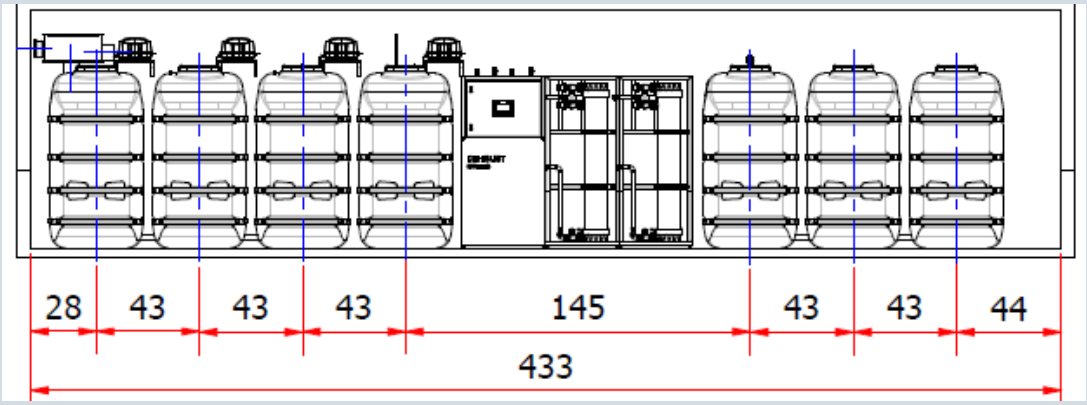
Installation top view



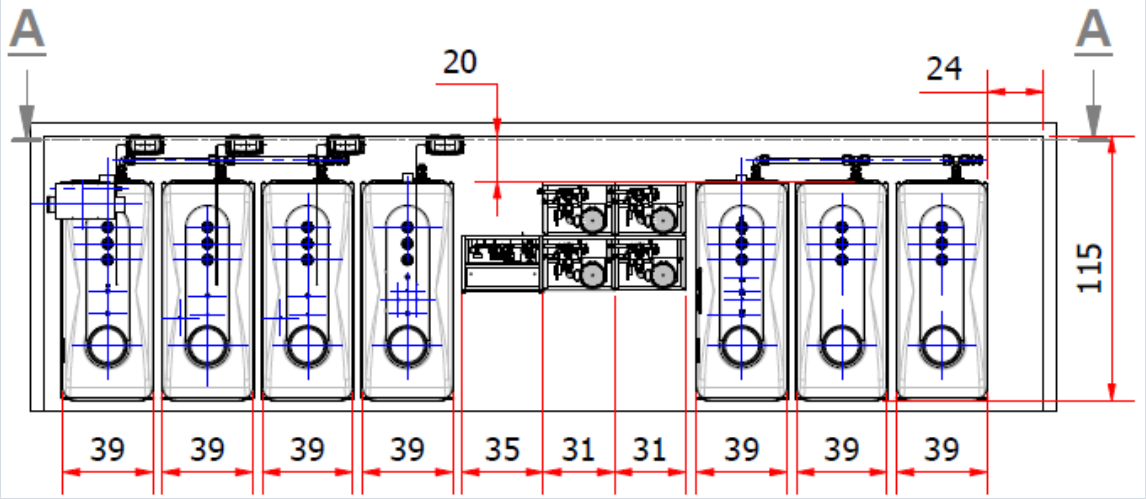
You will find detailed drawings and installation drawings at
https://www.dehoust.com/ProductFiles/Files/CAD/dh2d_813374_GWtec440A.pdf

Variant B

Four filter elements in a group,
63″ less space (width)



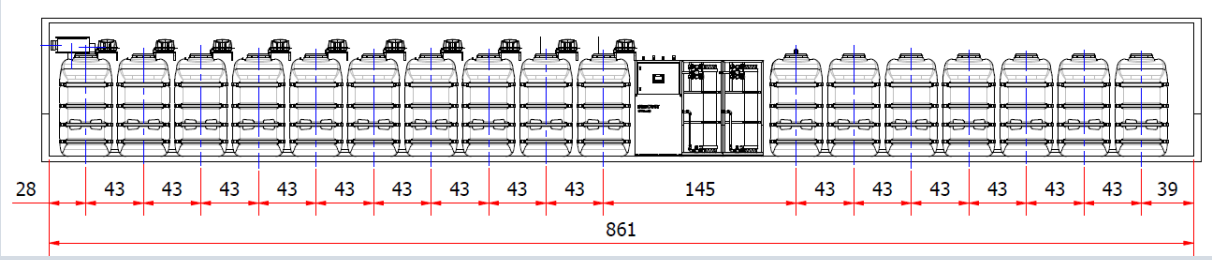
Installation top view



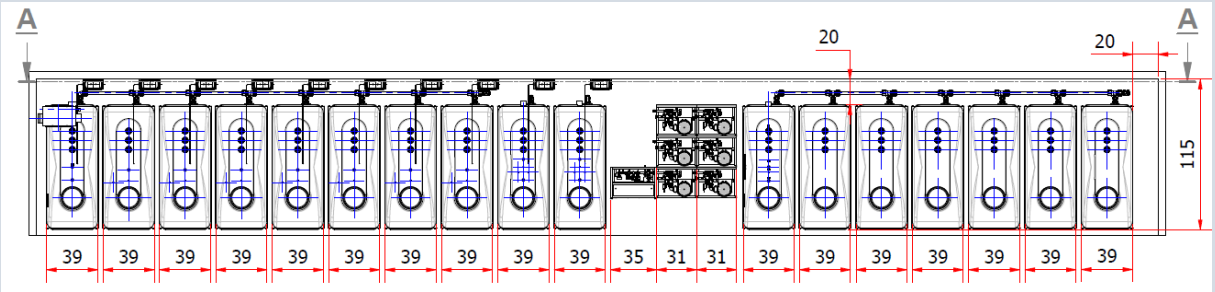
You will find detailed drawings and installation drawings at
https://www.dehoust.com/ProductFiles/Files/CAD/dh2d_813374B_GWtec440B.pdf

5.2.5. Installation of *GWtec®* 640

Variant B
Six filter elements in a group



Installation top view



You will find detailed drawings and installation drawings at
www.dehoust.com/ProductFiles/Files/CAD/dh2d_813393_GWtec640B_2024-08-12.pdf

6. Assembly

6.1. *GWtec®* Greywater Treatment Plant

6.1.1. Installation of the *GWtec®* system, the membrane filter and the greywater filtration tank

For ensuring safe operation, it is important to place the greywater filtration tank directly next to the greywater treatment plant and the membrane filter on the same level.

6.1.2. Piping between plant components

For the interconnection of plant components, we recommend the use of pipes from Viega corporation:

- Type Viega pipe Sanpress 2205, 35 x 1.5 mm, grade 1.4571,

or equivalent.

6.1.3. Installation on filter rack

Figure 1: Connecting plate

The *GWtec®* controller unit and the filter rack are rigidly fixed together using the connecting plate.

Place the two racks (*GWtec®* controller unit + filter rack) directly next to each other and secure them with the connecting plate.

Connect the lower and upper filtration pipes with the pipe unions to form secure, tight and stress-free threaded connections.

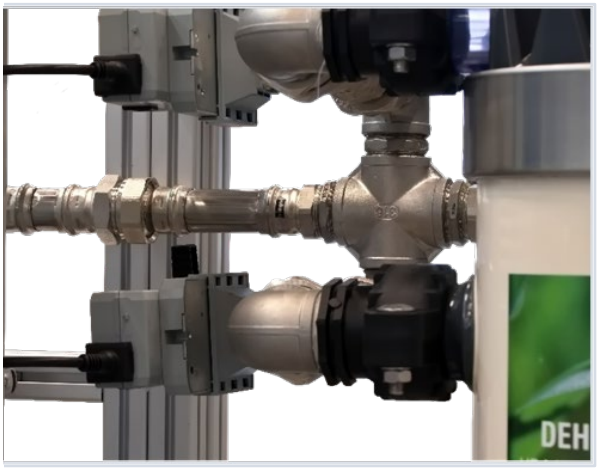


Figure 2: Connect the upper pipe union

Figure 3: Top filter connections

Figure 4: Connect the lower pipe union

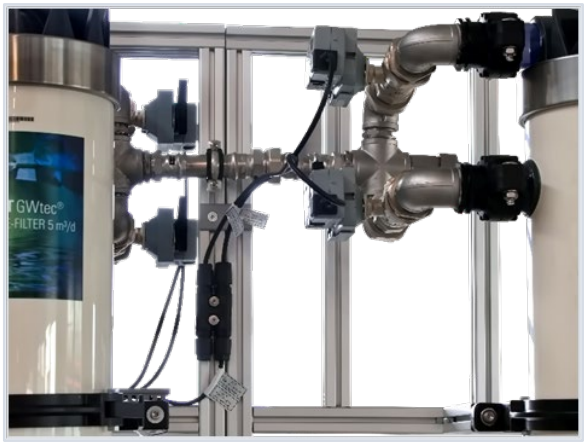


Figure 5: Top front connections

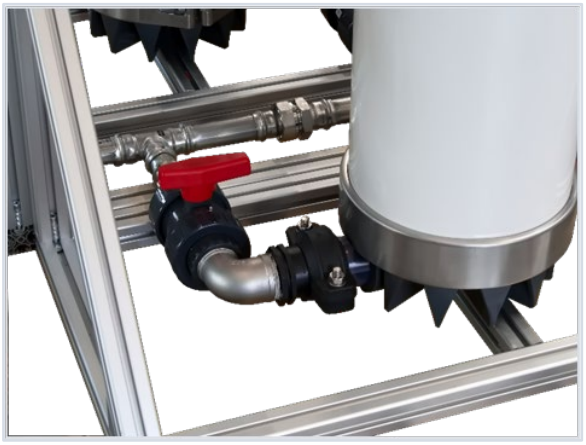


Figure 6: Bottom connections shut-off 2

Figure 7: Bottom connections

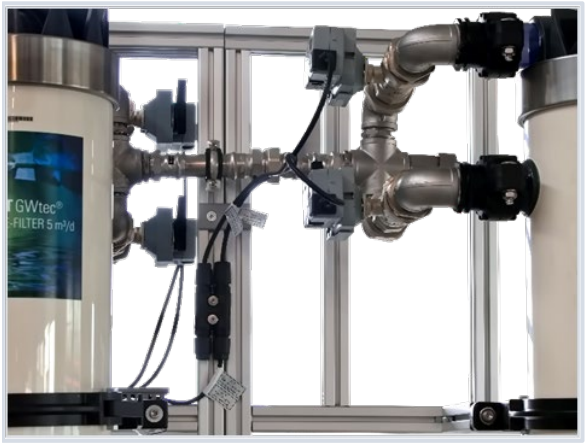
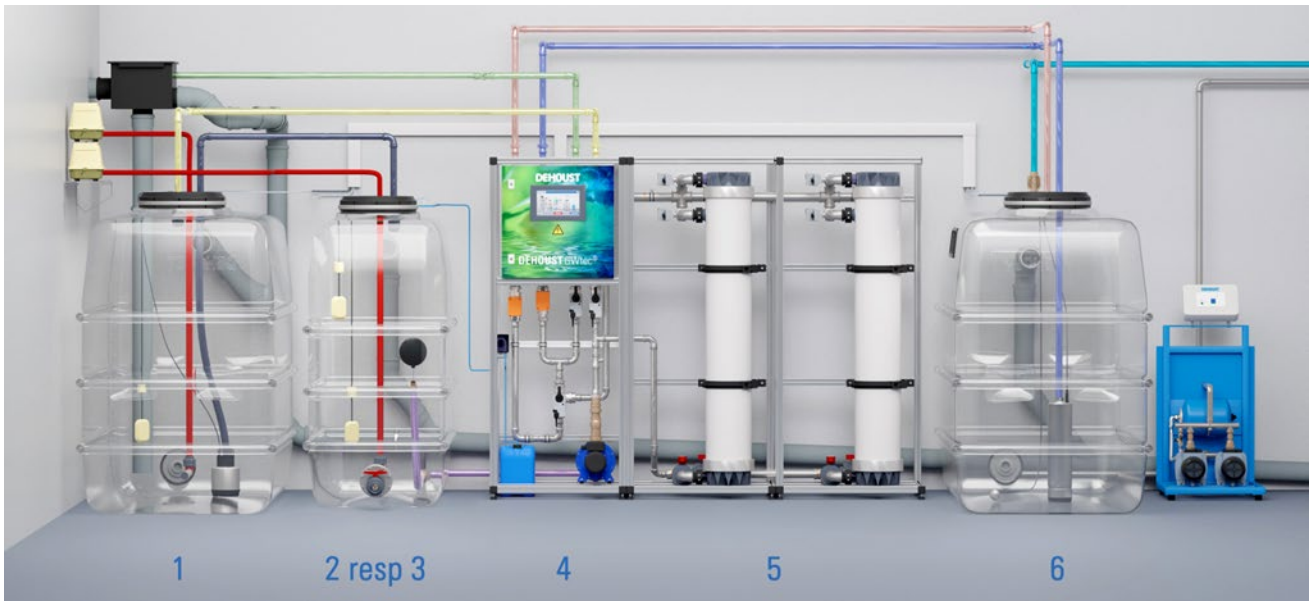


Figure 8: Top front connections

6.1.4. Cabling of modules



Module	Plant component
1	Greywater collection tank(s)
2	Greywater filtration tank
3	Rainwater filtration tank
4	*GWtec®* controller
5	Filter (depending on variants 1 to 6)
6	Service water storage tank

The modules are equipped with junction boxes to be connected with each other and with the *GWtec®* controller.

Labels at boxes and plugs

Labels at the *GWtec®* controller

6.1.5. Installation of the suction line to the filtration pump

Connect the appropriately labelled tank fitting (filtrate pump) of the greywater filtration tank with the suction inlet of the filtrate pump using the transparent PVC hose included in the delivery, the pre-mounted brass pipe union and the hose clamps.

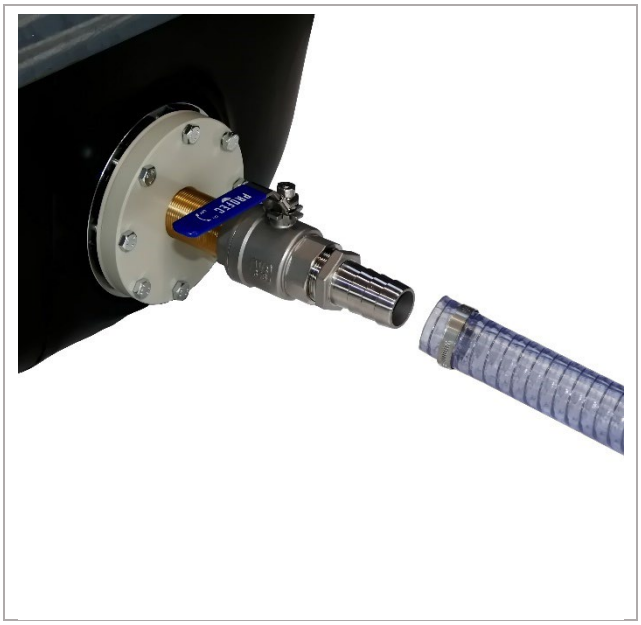


Figure 9: Attach the 1 ¼ inch (GWtec® 140/240) and 1 ½ inch (GWtec® 340/440/640) PVC hose to the greywater filtration tank using a stainless-steel hose clamp.

Figure 10: Attach the 1 ¼ inch (GWtec® 140/240) and 1 ½ inch (GWtec® 340/440/640) PVC hose to the filtrate pump using the (three-part) brass pipe union.

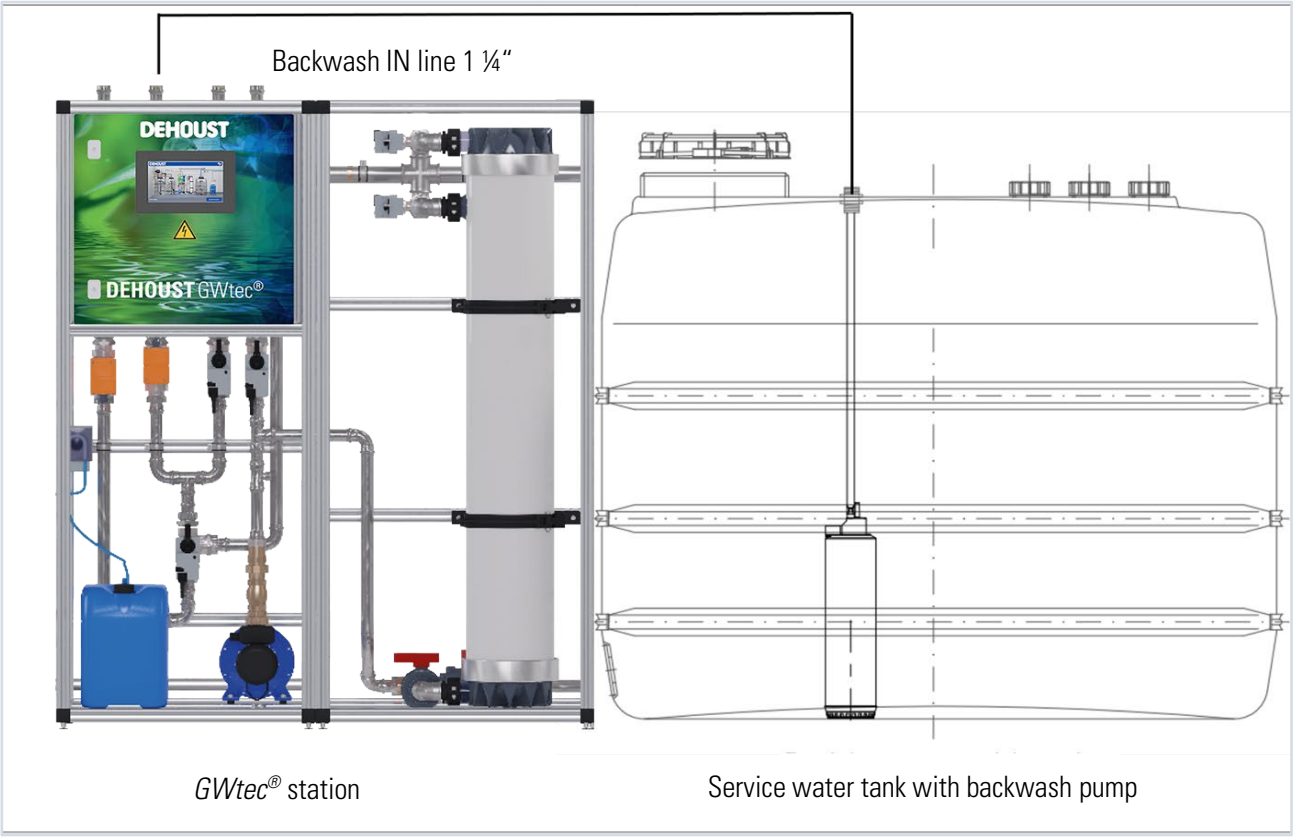
Please note the following to avoid malfunctions during operation:

- Maximum suction length: 3 meters
- Make sure the routing of the PVC hose to the filtrate pump is horizontal (no upward/downward slope)
- The PVC hose shall have no constrictions/kinks.
- Before start-up, open the shut-off valve at the greywater filtration tank
- Vent the pump (refer to Chapter 10).

.

6.1.6. Backwash "IN" connection

Install the DN 32 (1 ¼") backwash piping from the backwash pump at the service water tank (no drinking mains water) to the respective backwash inlet of the *GWtec®* station to form a secure, tight and stress-free connection. Use Viega pipe Sanpress 2205, 35x1.5 mm, grade 1.4571, or equivalent, for the backwash piping.



GWtec® station — Service water tank with backwash pump

Prevent any corrosion/erosion products that may form in the pipelines or service water tank from entering the membrane filter. We recommend the installation of a mains water filter with a mesh size of 125 micrometers to avoid the presence of abrasive or filter-blocking particles in the backwash water.

The backwash water must be free of abrasive or membrane-blocking particles and have at least the ultrafiltration water quality produced by the membrane filter
(refer to Chapter 4.5)

We recommend installing a shut-off valve and a releasable connection in the backwash line.

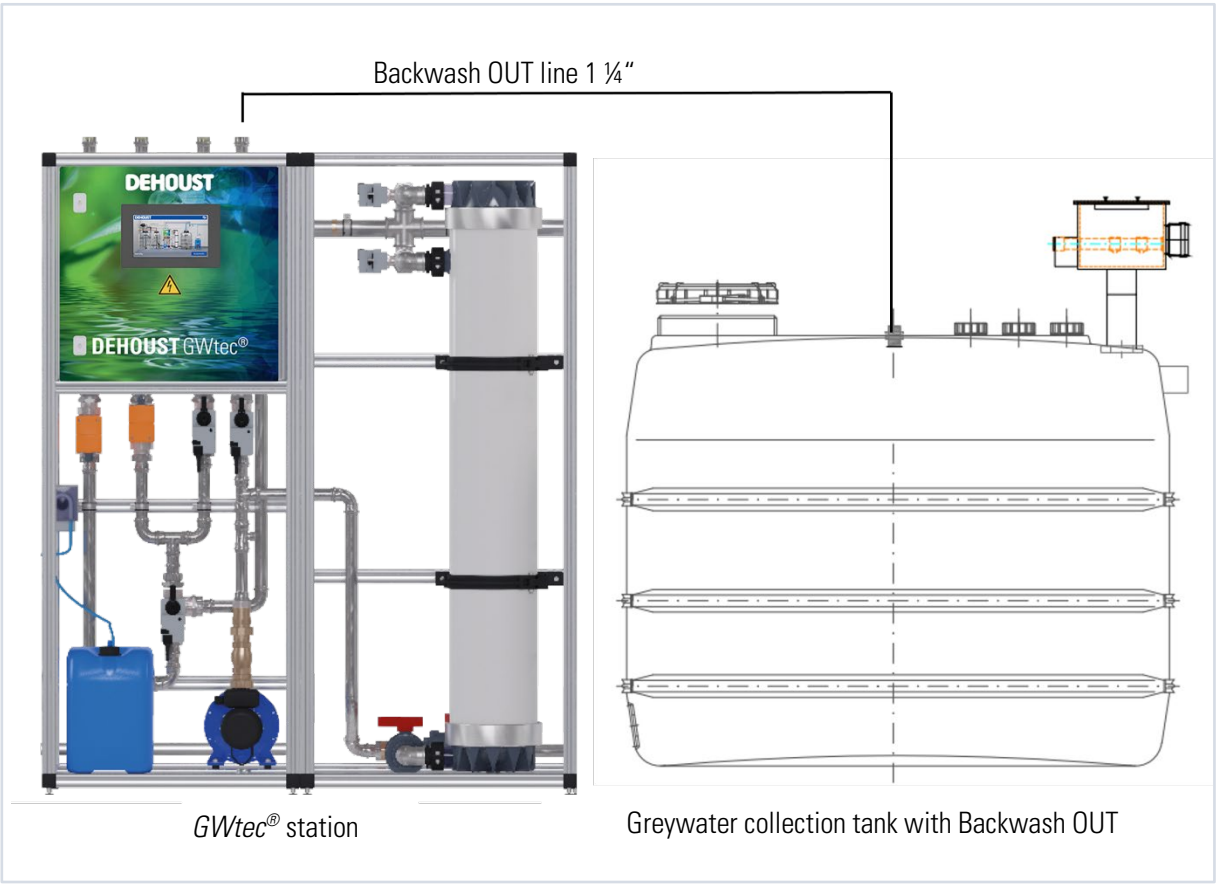
Do not connect it to the mains water line.

6.1.7. Backwash "OUT" connection

Connect the appropriately labelled fitting at the *GWtec®* station (Backwash OUT) with the tank fitting at the greywater collection tank (Backwash OUT) using a DN 32 (1 ¼") backwash line.

Alternatively, you can use the accordingly labelled fitting at the *GWtec® station* (Backwash OUT) to make the connection with the sewer to discharge the backwash flow to the sewage system.

Use Viega pipe Sanpress 2205, 35x1.5 mm, grade 1.4571, or equivalent, for the backwash piping.



GWtec® station

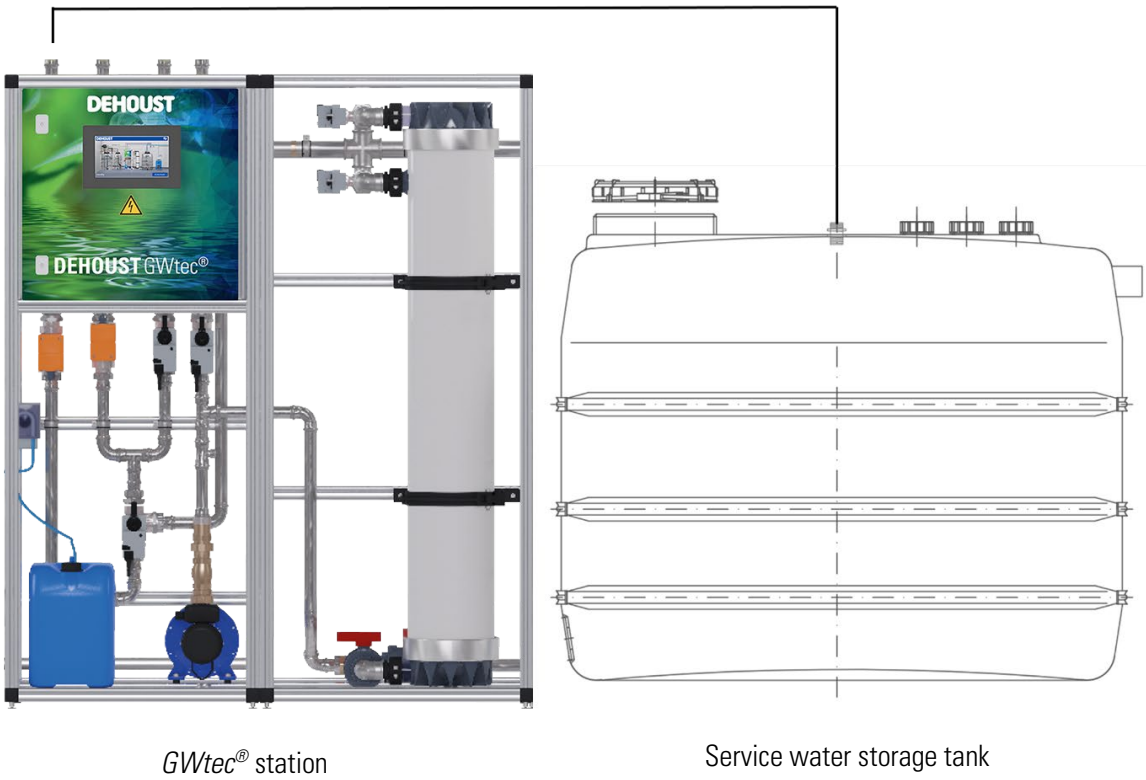
Greywater collection tank with Backwash OUT

	We recommend installing a shut-off valve and a releasable connection in the backwash line.
	Do not connect it to the mains water line.

6.1.8. Filtrate line connection

Connect the appropriately labelled fitting at the *GWtec®* station (filtrate outlet) with the tank fitting (filtrate outlet) at the service water tank.

To do so, use the black PVC hose included in the delivery and the pre-mounted PP hose nozzles inclusive of flat gaskets.



When laying the PVC hose, take care to avoid constrictions/kinks that might restrict the free flow of the outgoing filtrate.

6.2. Smartfloc dosing station

Connect the soft, transparent PVC hose to the suction lance. Do not insert the full length of the suction lance into the Smartfloc canister to have some spare length.

Figure 11: Smartfloc canister with suction lance

Place the Smartfloc canister into the *GWtec®* station and connect the soft, transparent PVC hose to the inlet (left side) of the dosing pump.

Connect the white PVC hose to the outlet (right side) of the dosing pump and to the "dosing pump" fitting on the greywater filtration tank. Push it through the fitting on the tank top and place the end of the PVC hose at a depth of at least 20-30 inches in the greywater filtration tank to allow for optimal mixing of the flocculant.

Figure 12: Placement of Smartfloc canister in the GWtec® station

Figure 13: Dosing pump

6.3. Coarse filter connection

6.3.1. Connection to water pipes

The connection of the greywater downpipe to the coarse filter should be made only after the completion of all construction work inside the building.

Connect the overflow of the coarse filter with sufficient slope to the drain/sewer.

Connect the filtrated greywater outlet with the inlet of the greywater collection tank in a secure, tight and stress-free manner.

Figure 14: Coarse filter

Figure 15: Internal view of coarse filter

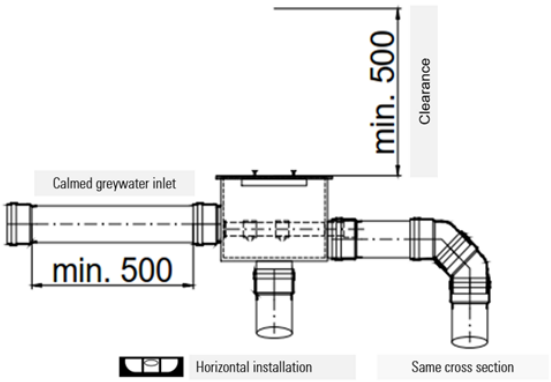


Figure 16: Coarse filter dimensions

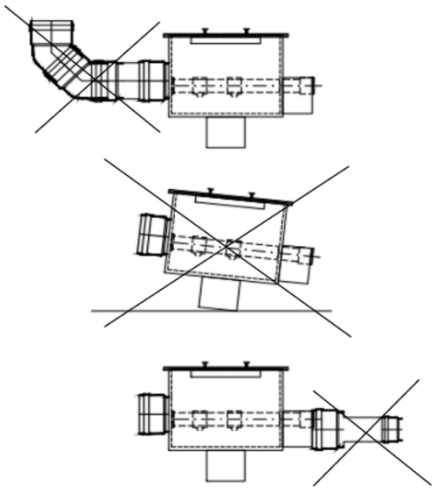


Figure 17: Mounting indications

Do not connect it to the mains water line.

6.3.2. Connection to the backwash line

Connect the backwash fitting of the DEHOUST MAX coarse filter with the service water piping from the *GWtec®* station (coarse filter backwash) in a secure, tight and stress-free manner.

Use Viega pipe Sanpress 2205, 35x1.5 mm, grade 1.4571, or equivalent, for the backwash piping.

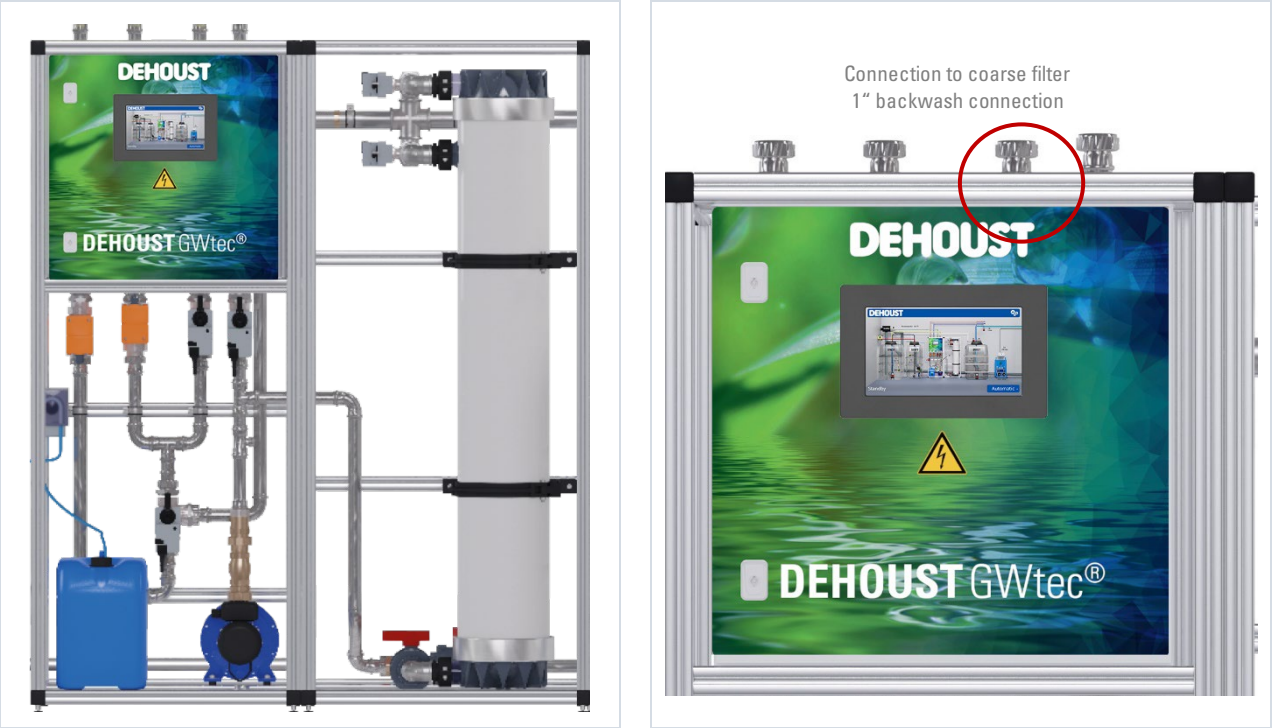
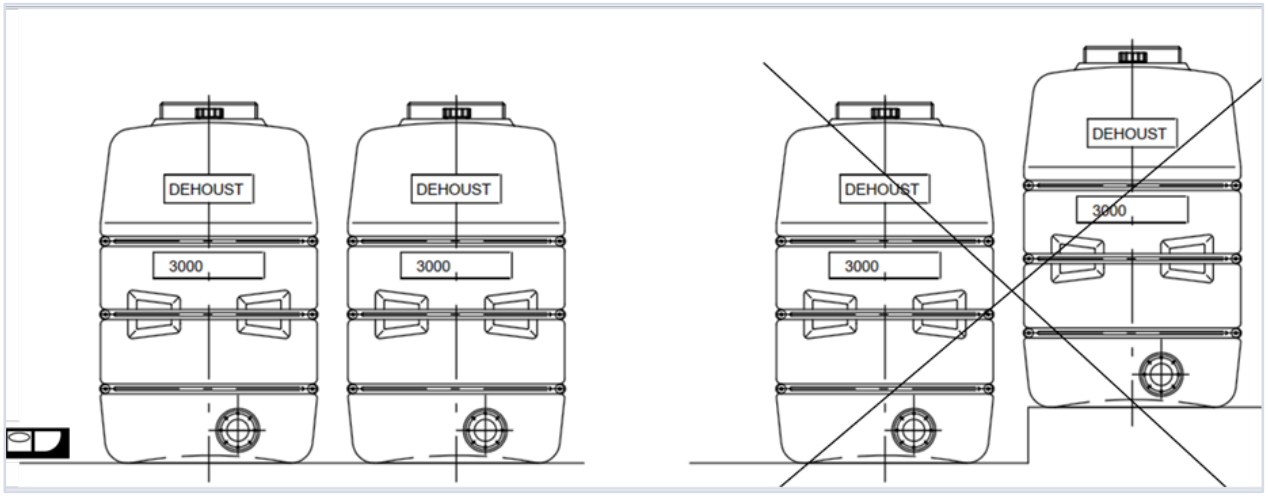


Figure 18: Connection to backwash line

Space for personal notes:

6.4. The storage tanks

6.4.1. Installation



Make sure the tanks are all installed horizontally on the same level to avoid malfunctions during operation.

6.4.2. Coarse filter connection

Connect the greywater from the coarse filter to the accordingly marked lip seal at the greywater collection tank (greywater inlet) in a secure, tight and stress-free manner.

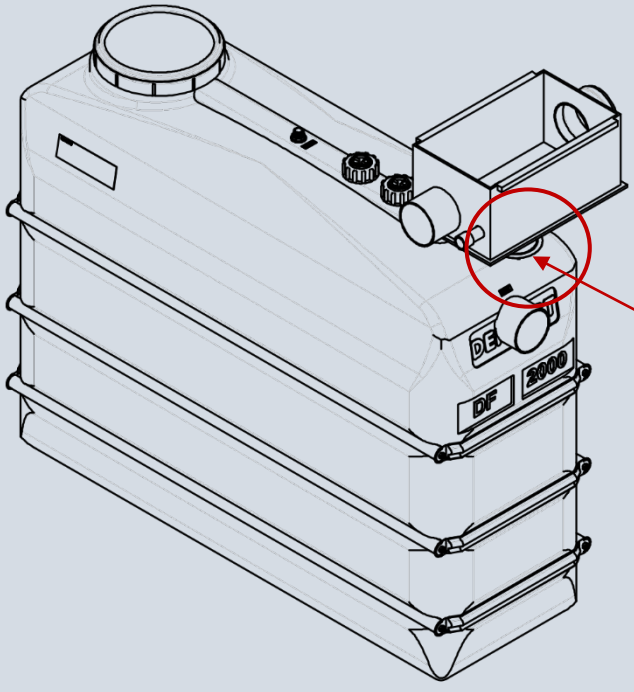


Figure 19: Tank/coarse filter connection

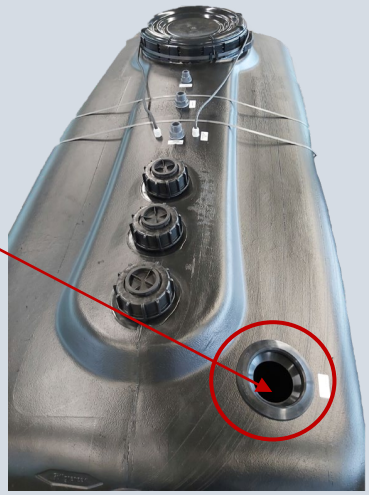
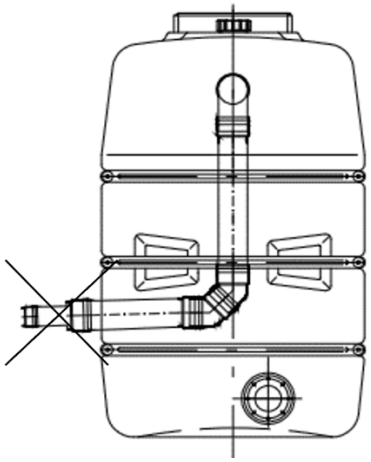


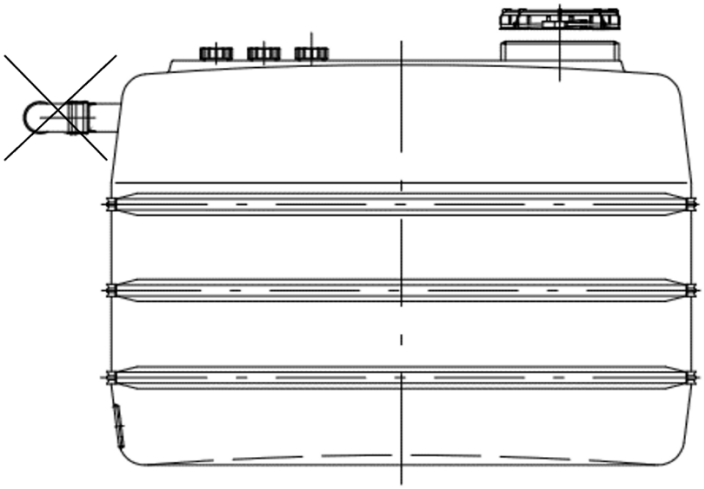
Figure 20: Tank with greywater inlet

6.4.3. Connection to sewer

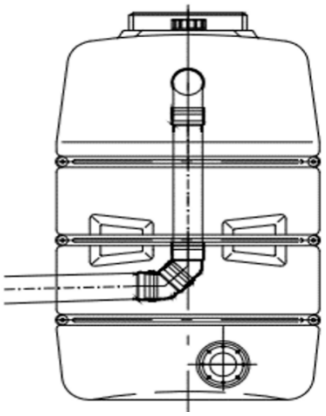
The overflow connector of the storage tank is a smooth pipe socket. Connect it with the sewer/drain.



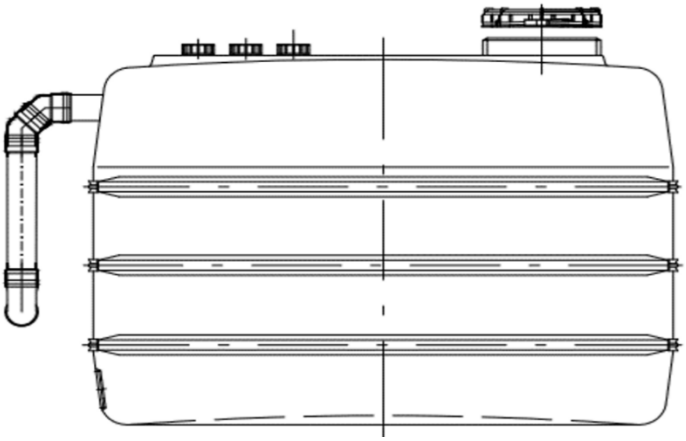
No cross-section reduction



Prevent backflow in storage tank



Lay overflow pipe with gradient



Install overflow pipe downwards

The installation room is exposed to a risk of flooding if the overflow fitting is not connected with the sewage system.

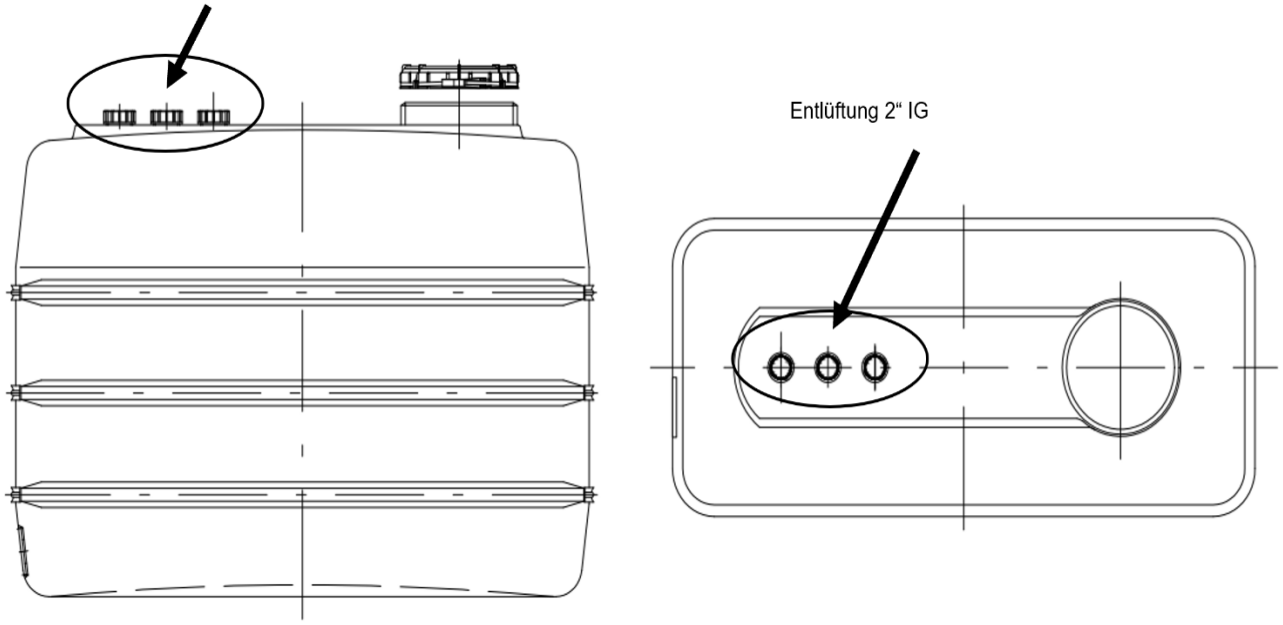
Since the storage tank undergoes lifting and settling movements, the connection must be flexible (for example, do not insert the pipe joint until stop into the tank fitting – leave a gap of about 0.4 inches).

You are recommended to install a siphon in the overflow line to avoid unpleasant odors.

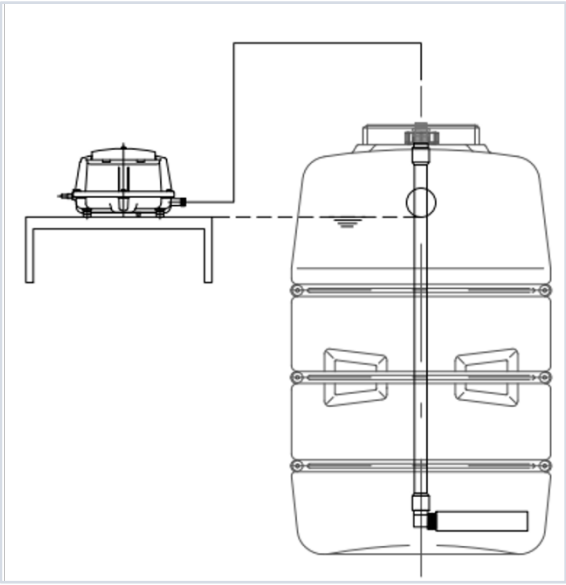
6.4.4. Vent connection (optional)

We recommend the installation of a separate vent line (not included in the delivery) for the greywater collection tank and the greywater filtration tank. Either tank features a 2" tank connector with internal thread for this purpose.

Vent line connection 2" female threads on the storage tank



6.5. The aeration unit



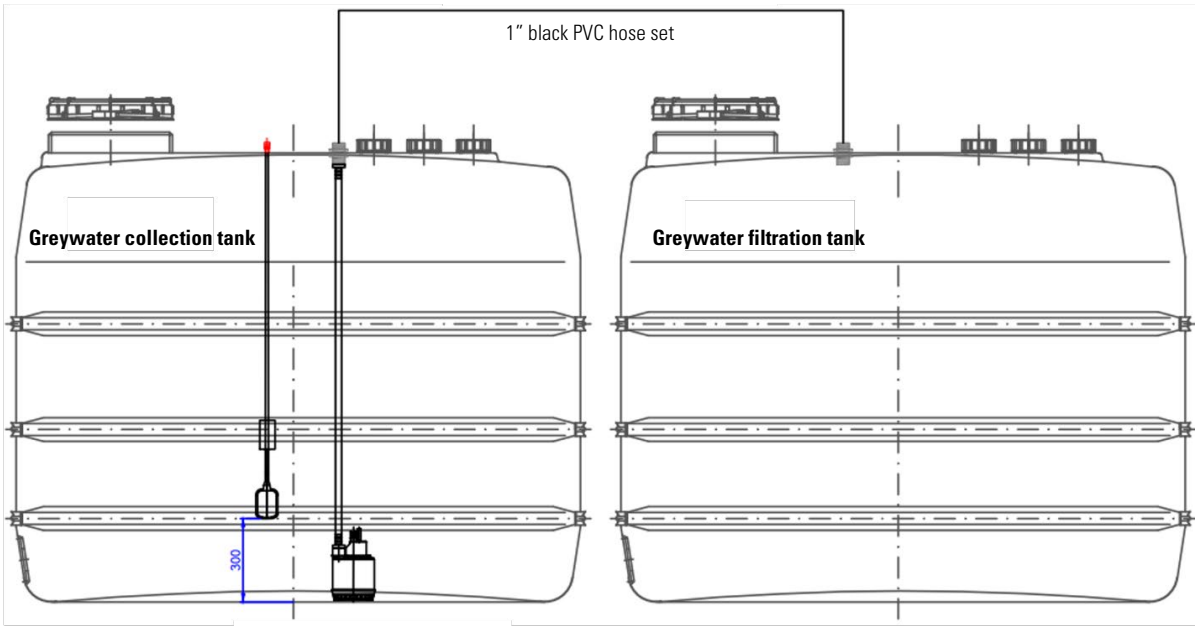
- *Install the compressor in the immediate vicinity of the greywater collection tank / greywater filtration tank.*
- *Place the compressor above the water level.*
- *Mount the pump console to a load-bearing wall using the mounting accessories included in the delivery.*
- *Ensure that all four feet of the compressor are firmly supported on the pump console.*
- *Connect it to the accordingly labelled tank fittings (aeration unit) using the red PVC hose included in the delivery and the pre-mounted PP hose nozzles inclusive of the white flat gaskets to form a secure, tight and stress-free connection.*

Figure 21: Aeration unit for greywater collection tank

When laying the PVC hose, take care to avoid constrictions/kinks that might restrict the free flow of air.

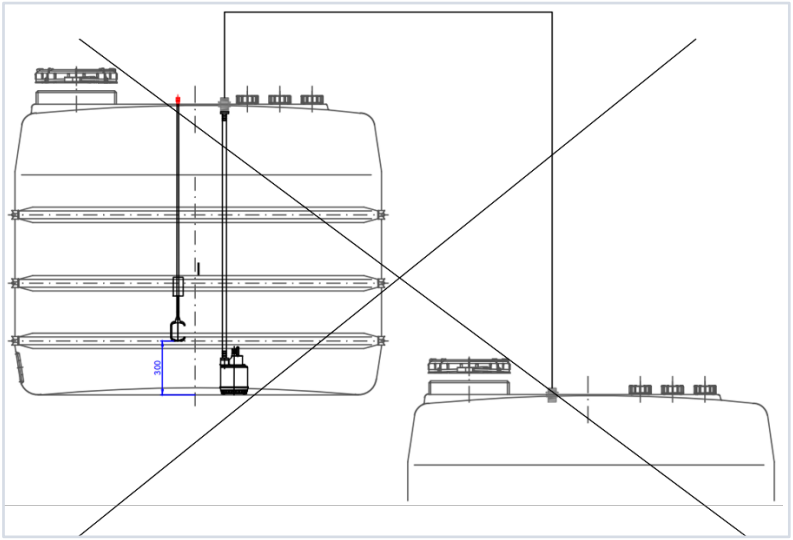
6.6. Greywater batch pump

Connect the accordingly labelled tank fittings (greywater batch pump) using the black PVC hose included in the delivery and the pre-mounted PP hose nozzles inclusive of the white flat gaskets to form a secure, tight and stress-free connection.



Greywater batch pump

Avoid siphon effect / self-draining



When laying the PVC hose, take care to avoid constrictions/kinks that might restrict the free flow of the greywater.

6.7. Backwash pump

Connect the backwash pump in the service water tank using the PVC plug-in connector and the black HDPE pipe to form a secure, tight and stress-free connection.

Pass the cable of the backwash pump from the inside through the screwed cable gland at the top of the tank (shown in red in the drawing) and tighten the cable gland to fix the cable.

Install the plug connector of the pump in accordance with the connecting diagram and connect it to the controller.

For service and maintenance reasons, the pump cable should be slack in the tank.

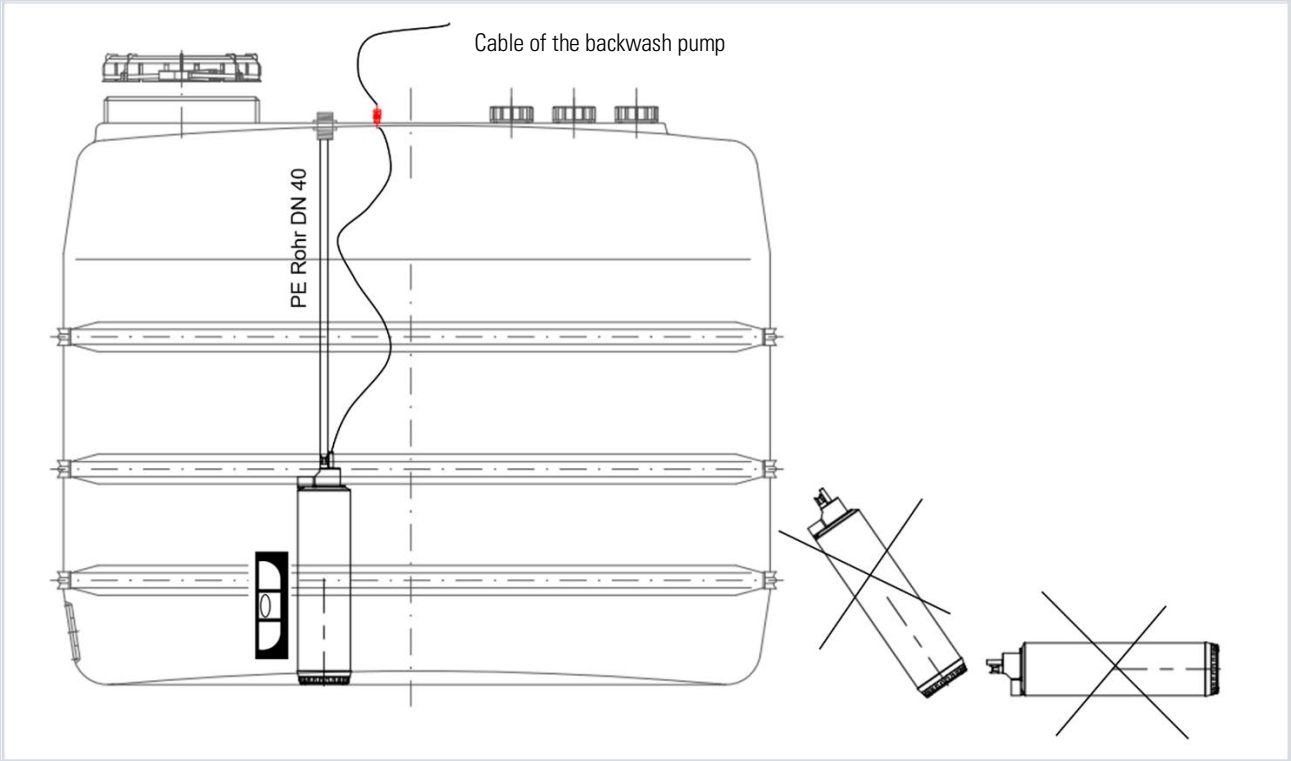


Figure 22: An upright position of the backwash pump within the tank is important

Never pull the pump cable.

6.8. Mains water make-up connection

Connect the appropriately labelled fitting at the service water tank (mains water make-up) in a secure, tight and stress-free manner to the mains water system. For this purpose, do not use any materials other than those certified for drinking water installations. (Cf. Chapter 14.2 "Installation of mains water flow sensor (Article 815070)").

- The building owner is recommended to install a shut-off valve, a releasable threaded connection and an external water fine filter (125 micrometers).
- We recommend the installation of a cold-water meter.

Since the service storage tank undergoes lifting and settling movements, the connection must be flexible.

The mains water make-up amount must correspond to the maximum volumetric flow of the connected pressure booster system to guarantee for a permanent water supply to the pressure booster system.

6.9. Emergency overflow of service water tank

In case of backflow into the service water tank, e.g. from clogged sewers, malfunction of a sewage lifting station, or the like,

the backflow water will be discharged into the installation room through the lateral emergency overflow slots in the tank. In Europe, this unrestricted overflow under the EN 1717 standard is mandatory for the protection of the mains water line.

Service water tank

The installation room must be equipped with an appropriate floor drain / pump sump for the safe discharge of backflows through the emergency overflow slot of the service water tank in a backflow situation.

6.10. Connection to the service water system

Connect the appropriately identified suction line fitting on the service water tank (see picture below) with the building's pressure booster system in a secure, tight and stress-free manner.

- The building owner is recommended to install a shut-off valve and a releasable threaded connection.
- We recommend the installation of a cold-water meter.

Service water storage tank

PVC shut-off valve for suction line towards the pressure booster system

Since the service storage tank undergoes lifting and settling movements, the connection must be flexible.

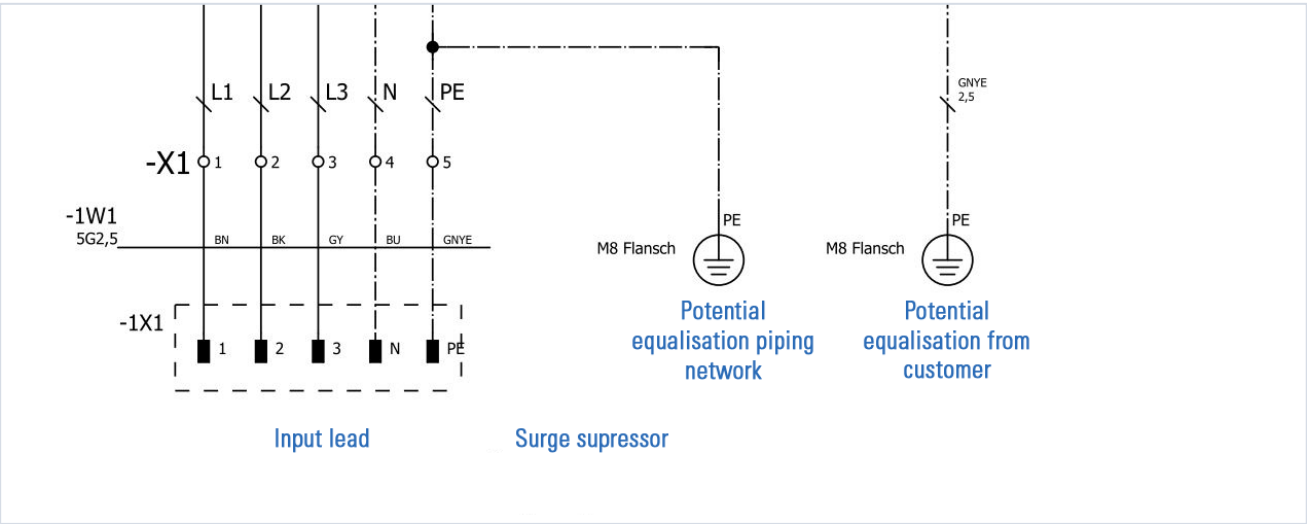
7. Electrical connection

The master switch is located on the right-hand side of the control cabinet of the *GWtec®* station.

Please observe the wiring diagram of the *GWtec®* greywater treatment plant.

Check the voltage information given on the type-label meets the actual local supply voltage.

Then connect the main power cable to the controller as shown on the type-label. So, the plant is securely connected with the electrical mains.



Provide fuse protection as indicated on the type-label.

Check the phase sequence of the mains power for clockwise rotation.

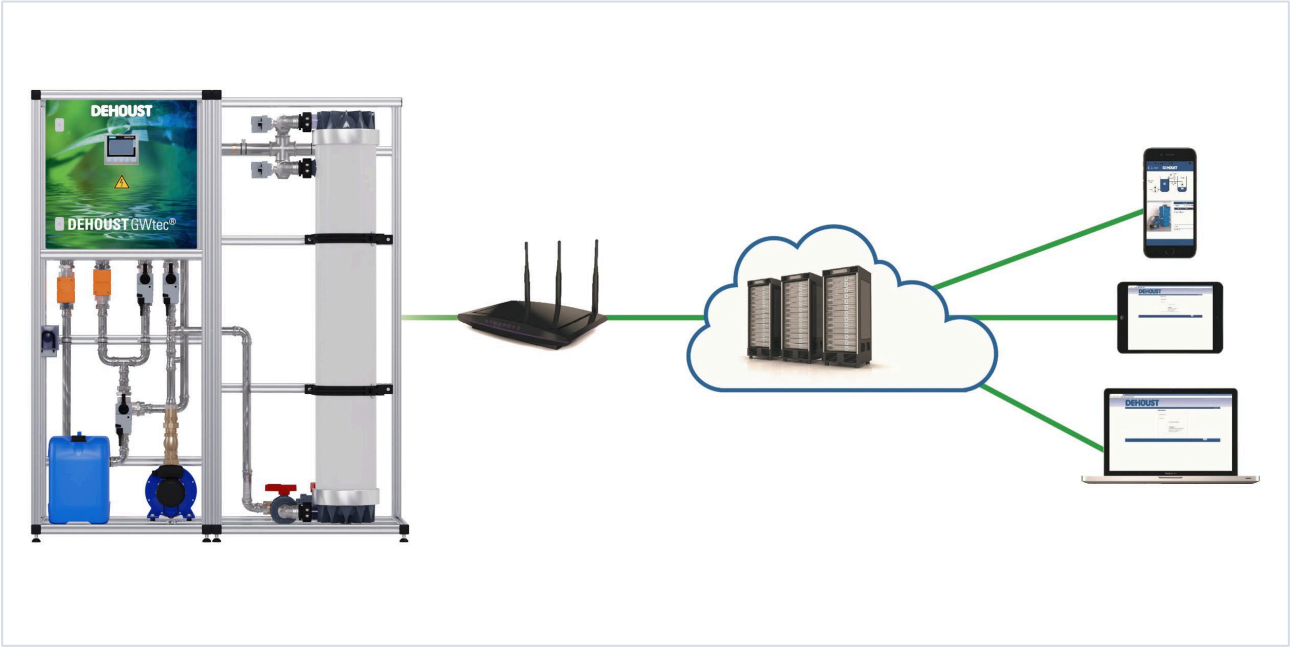
Always connect external electrical loads (for example, a pressure booster system) to a separate power source.

Electrical work shall be performed by qualified electricians only.

Specific national standards and laws have priority.

Space for personal notes:

8. DEHOUST Connect web interface

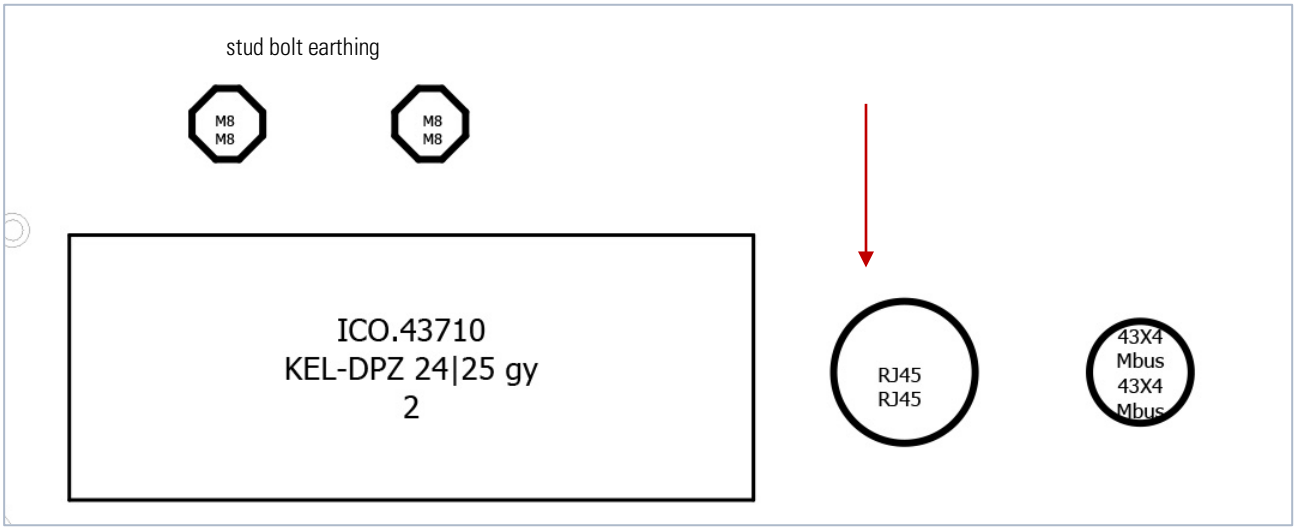


Connect the integrated web interface (RJ45 port at the bottom of the *GWtec®* controller – refer to the picture below) via a standard LAN cable to the operator's network/router.

The web interface establishes an outbound VPN connection to the *DEHOUST Connect* portal through one of the three TCP ports (80, 443, or 1194).

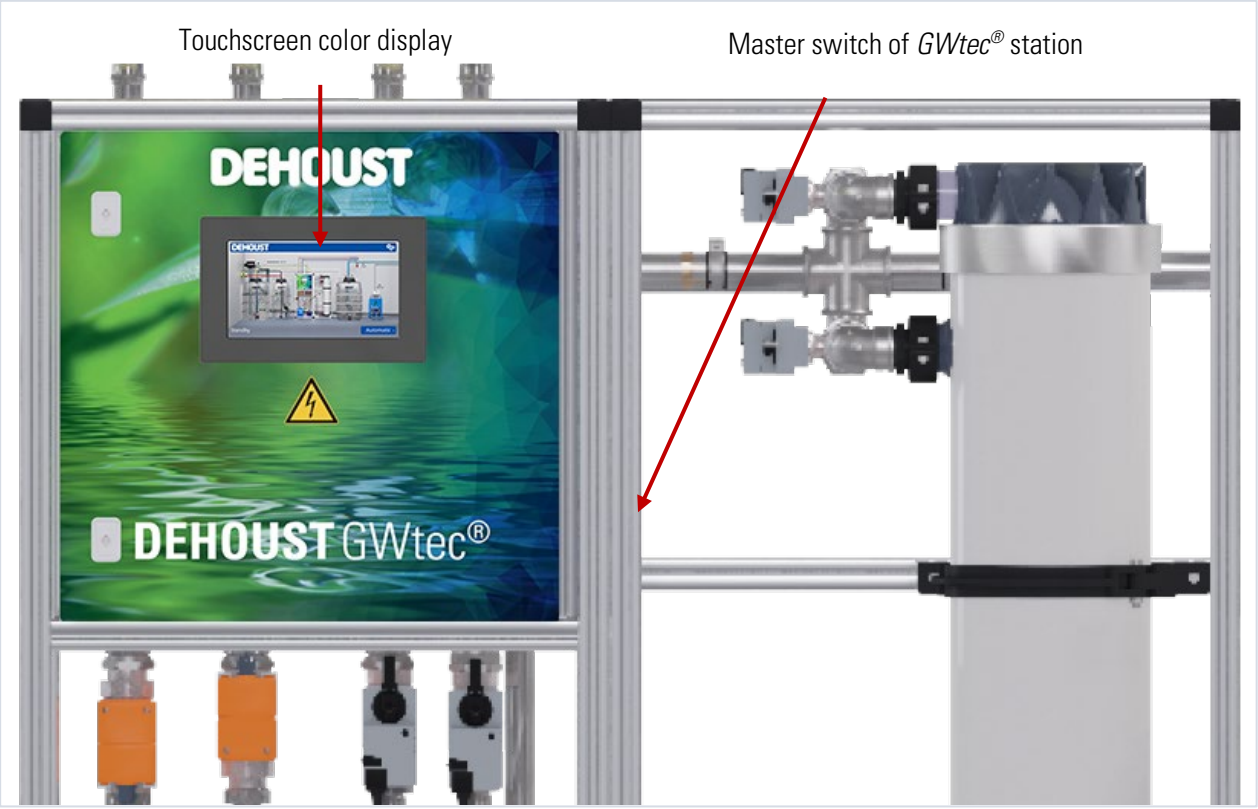
By default, the VPN connection is made through TCP port 1194. This port must be enabled for an outbound TCP connection in the operator's firewall.

The default port 587 must be enabled in the firewall to be able to send messages / alarms via e-mail.



9. Control via touchscreen color display

A TFT touchscreen color display is provided to allow control of the *GWtec® greywater treatment plant*. The main switch of the controller is located on the side of the control cabinet.



Inputs, changes and button operations are activated and performed by direct touch on the associated graphic symbols.

The top right segment of the touchscreen contains the Settings menu with messages and alarms, the middle segment indicates the current system status, and the bottom segment shows the current process (left), the main modes (right) and the EMERGENCY STOP button (central). The current process, in this case: "Standby", means that the system is waiting for the next step.

--- Messages and alarms --------
----- Settings ----------

Graphic representation of the *GWtec®* system flow charts inclusive of system parameters*

Components shown in red ▸ currently inactive / empty.

Components shown in green ▸ currently active / filled.

Status display – Emergency Stop – Main mode

* The flow charts include optional accessories.

Different variants of the above components can be used according to the configuration of your specific DEHOUST *GWtec®* system.

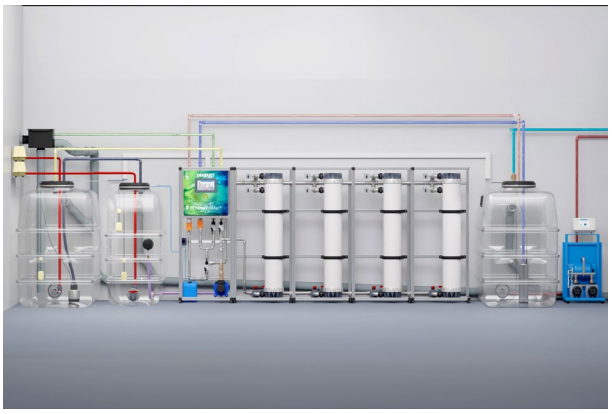
Please check the packing slip of the DEHOUST *GWtec®* system and the project drawing of the total system.

Plant variants (The system drawing can vary by the number of filters).

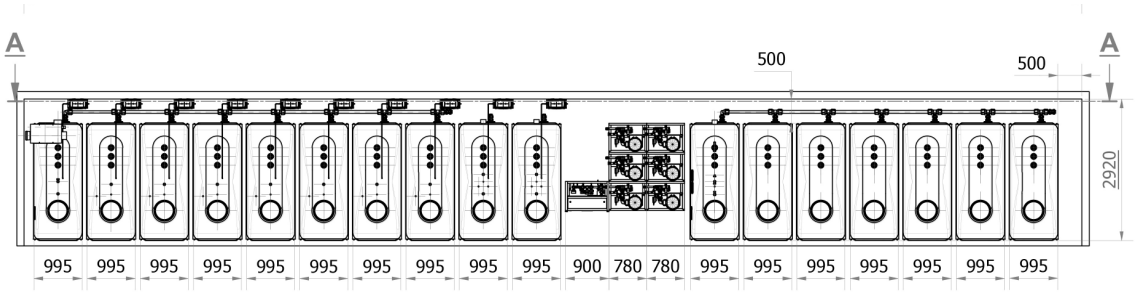
GWtec® 140

GWtec® 240

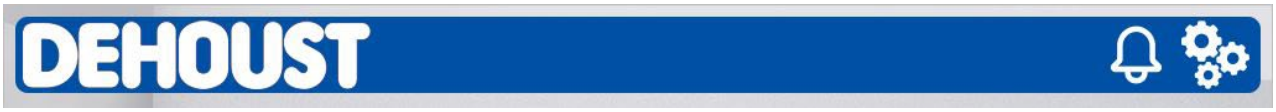
GWtec® 340



GWtec® 440



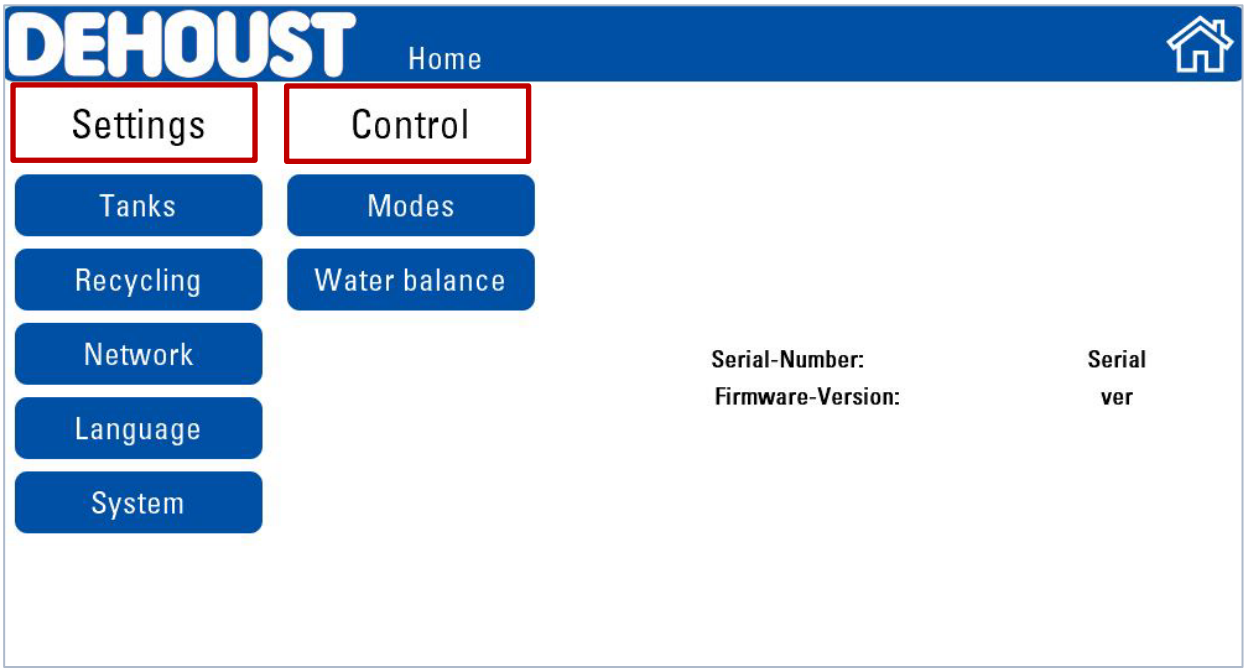
GWtec® 640



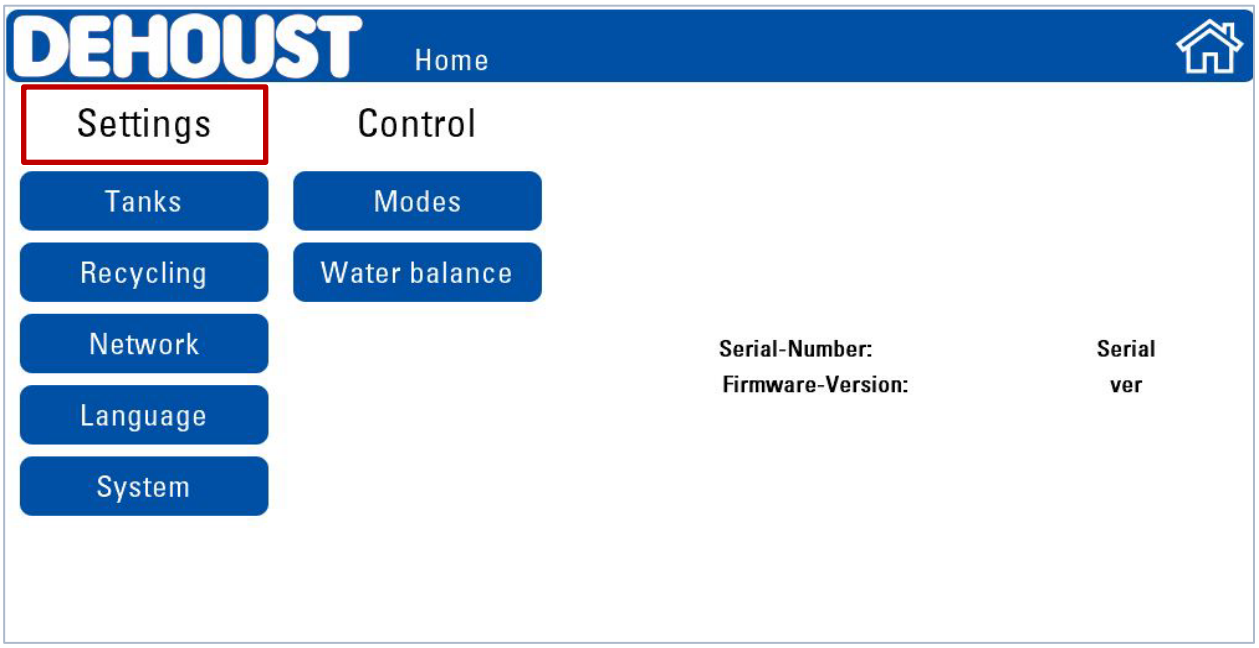
Touch the “Settings” gear icon to access the controller layout
(refer to Chapter 9.1 SETTINGS and 9.2 CONTROLLER)

Touch the “Messages and alarms” bell icon to access the overview of system messages
(refer to Chapter 9.3 MESSAGES).

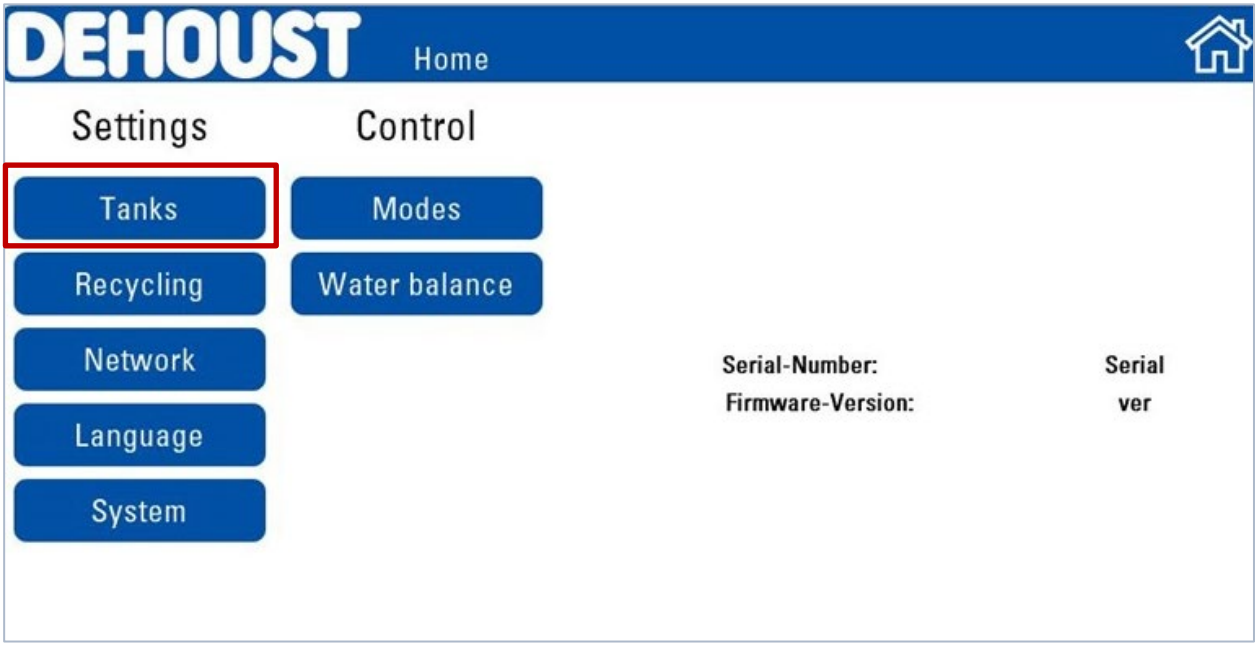
Touch the home (house) icon to return to the initial touchscreen menu
(refer to page 50).



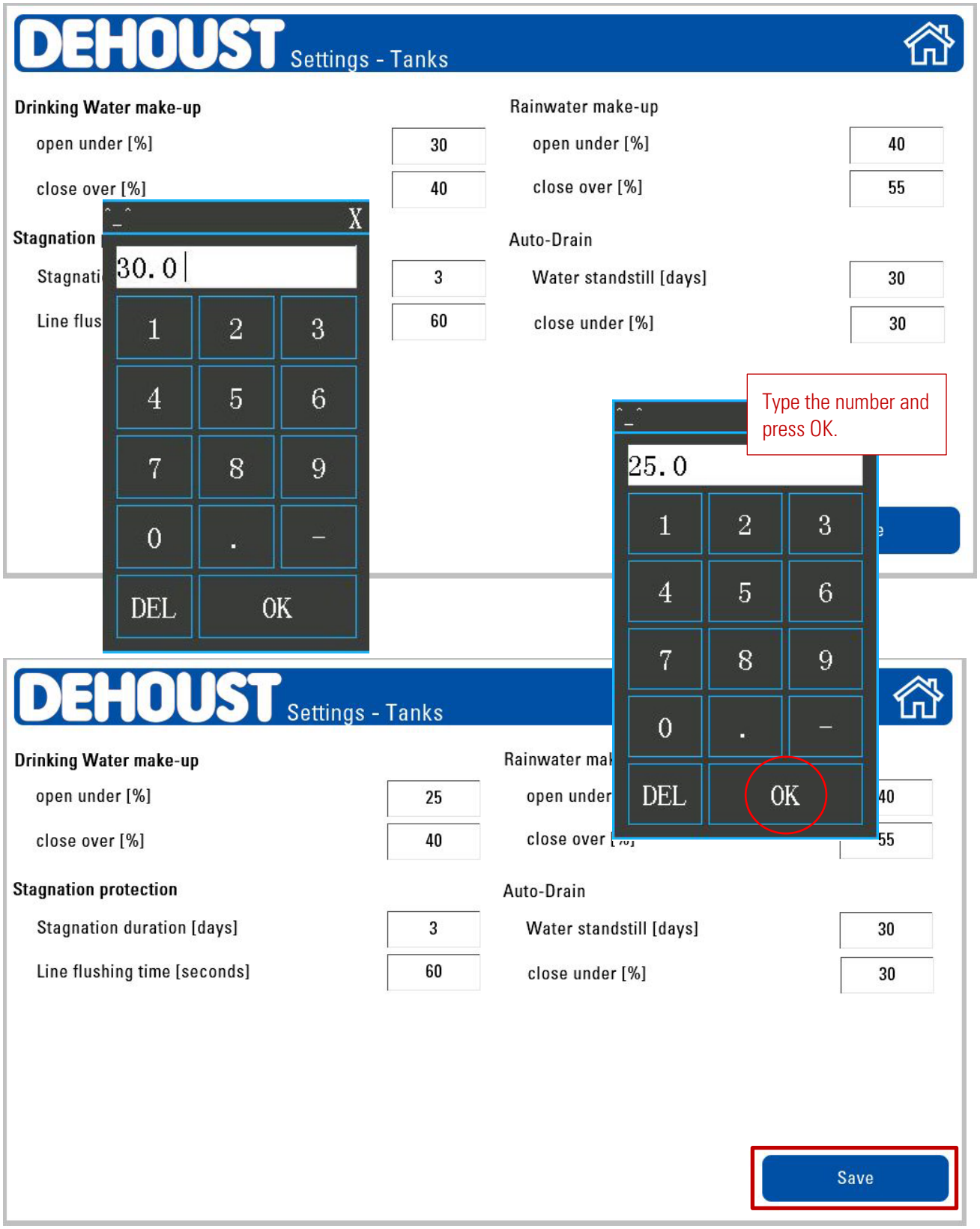
9.1. SETTINGS



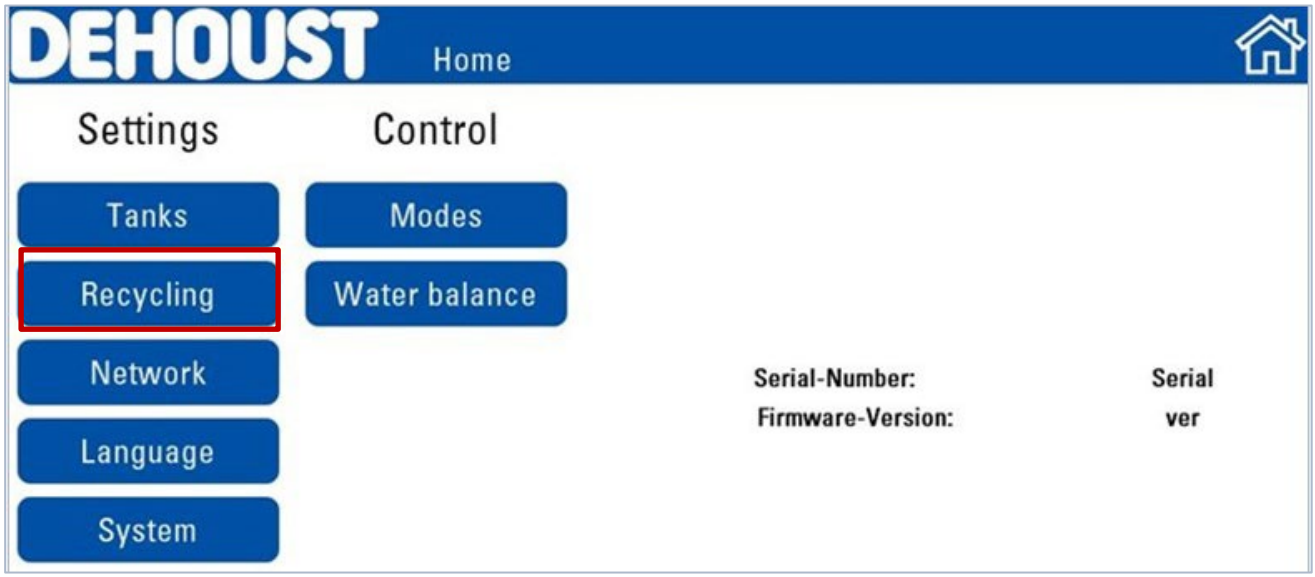
9.1.1. Tanks



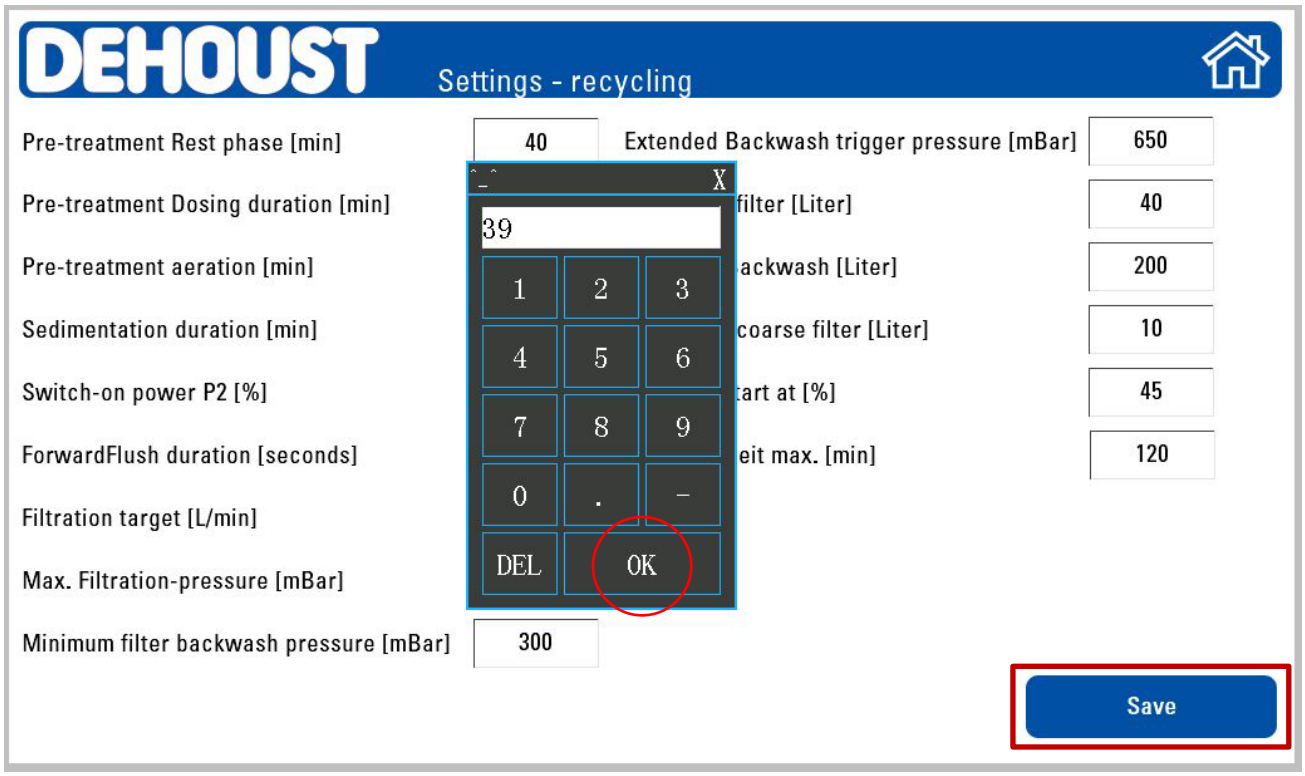
To change the parameters, for example, to reduce mains water make-up from a value below 30% to a value below 25%, touch the number pad on the display. An input field opens in the form of a number pad where you can change the value by "typing". The new value is immediately accepted in the tank settings. Do not forget to [Save] to maintain the values.



9.1.2. Recycling

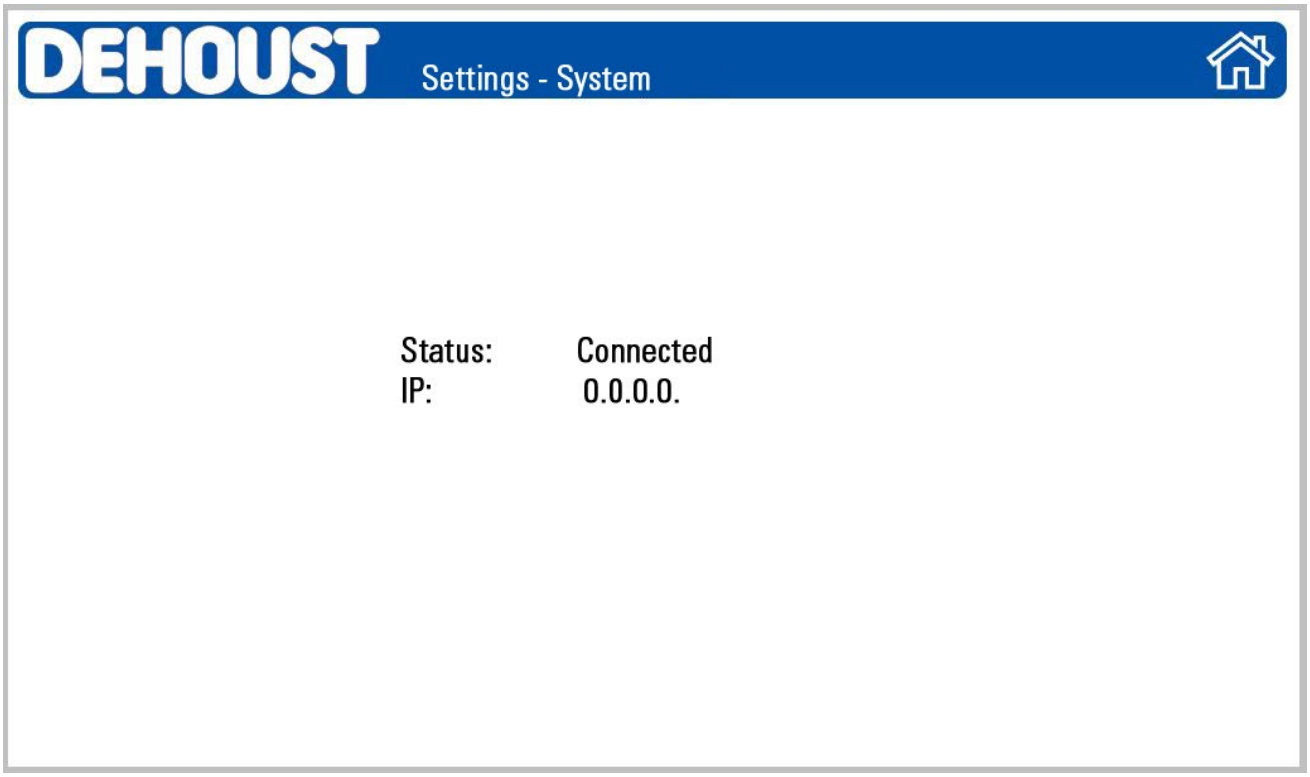


To change the parameters, touch the number pad on the display. An input field opens in the form of a number block where you can change the value by "typing". The new value is immediately accepted in the recycling settings. Do not forget to [Save] to maintain the values.

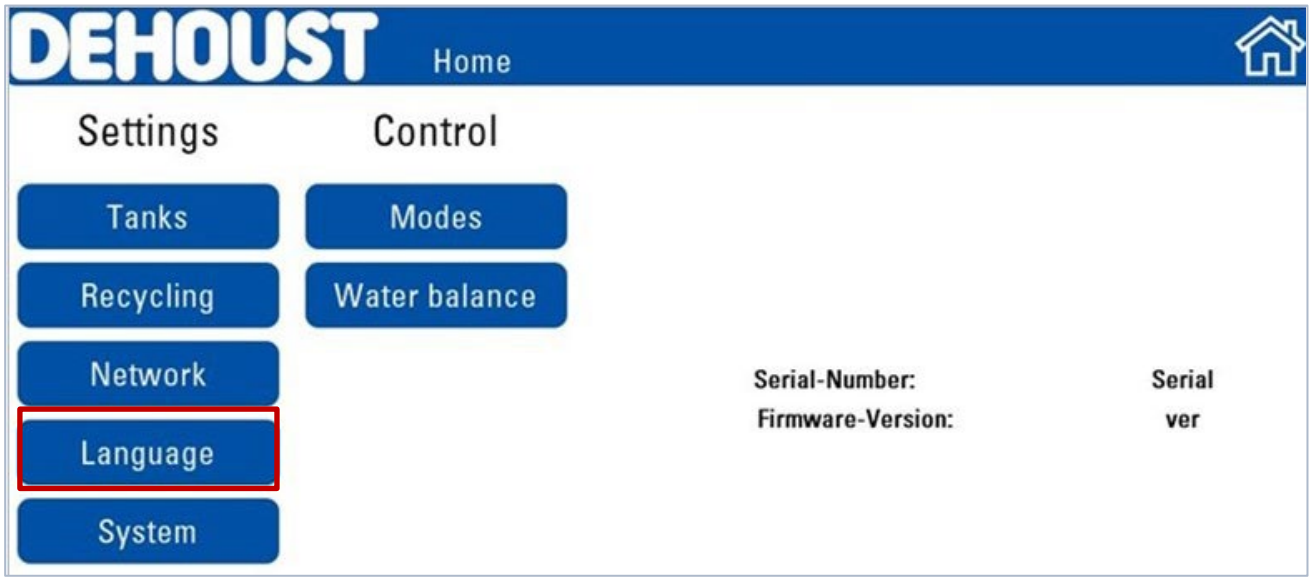


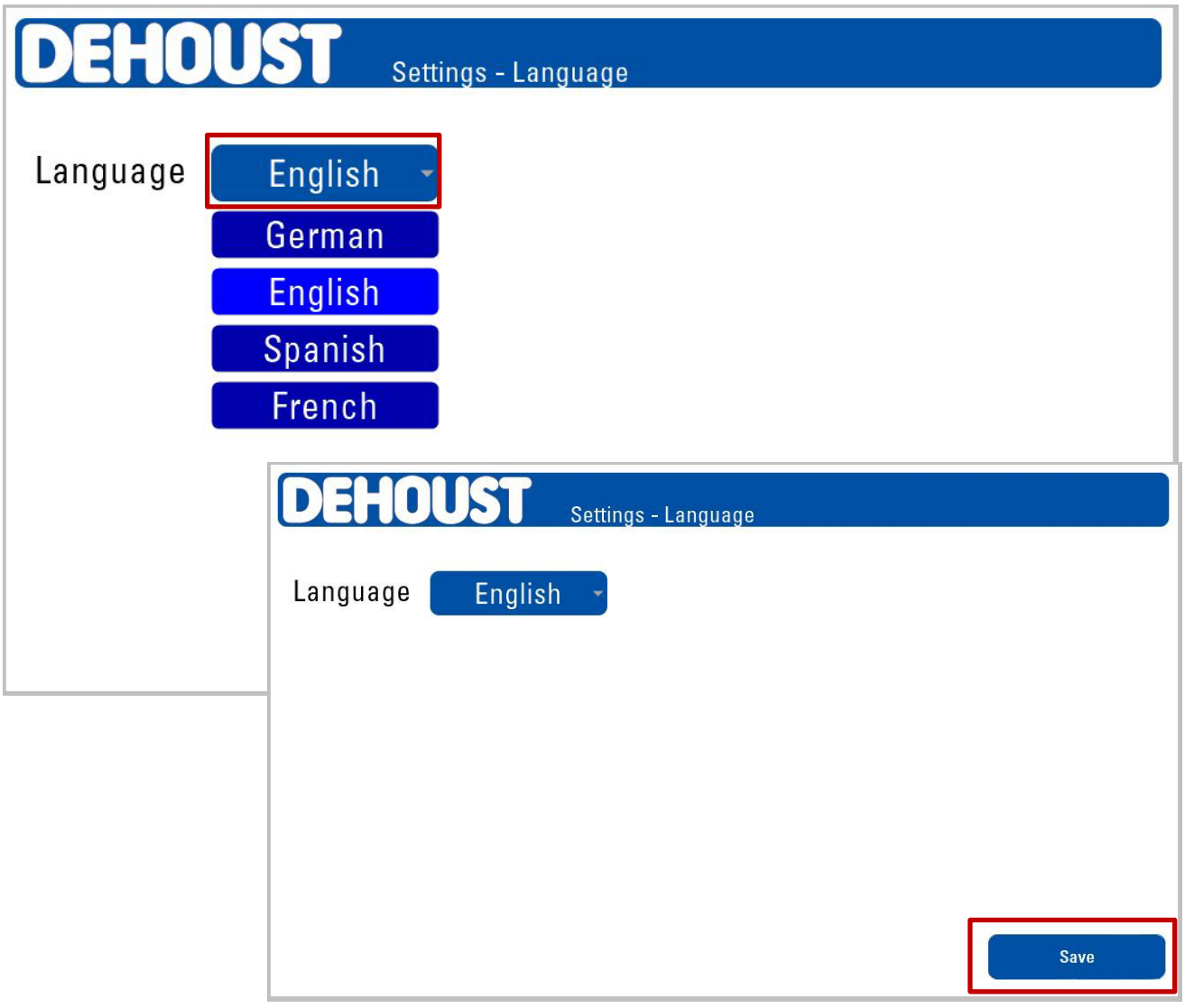
9.1.3. Network


DEHOUST
Home
Settings
Control
Tanks
Modes
Recycling
Water balance
Network
Language
System
Serial-Number:
Serial
Firmware-Version:
ver

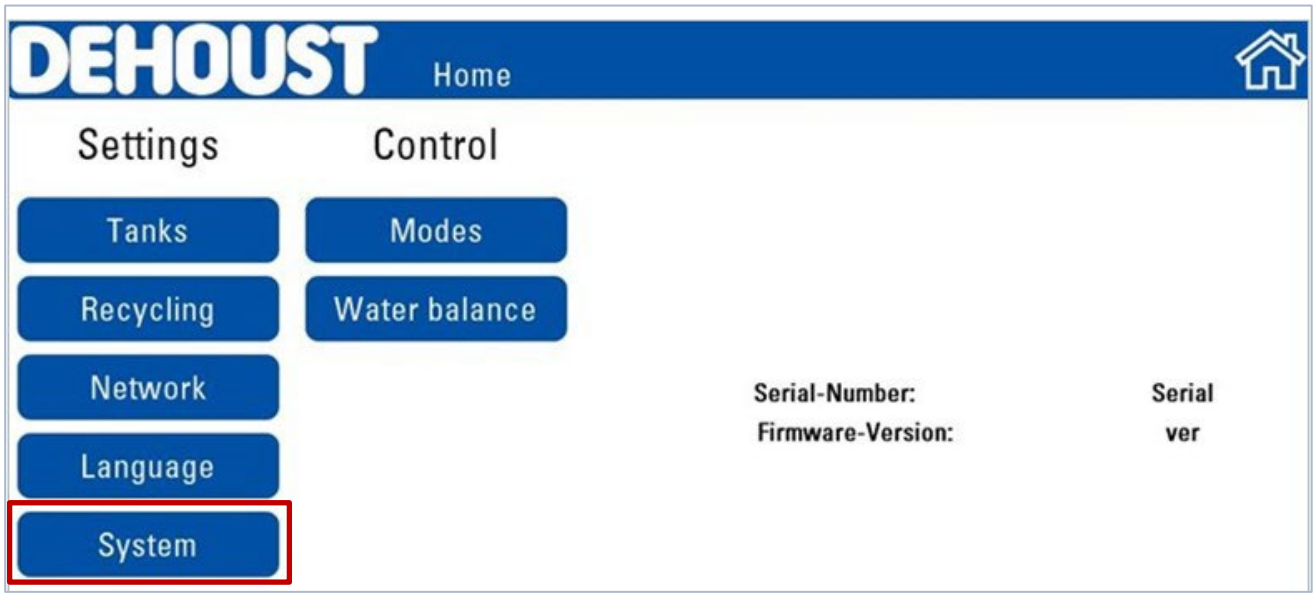

DEHOUST
Settings - System
Status:
Connected
IP:
0.0.0.0.

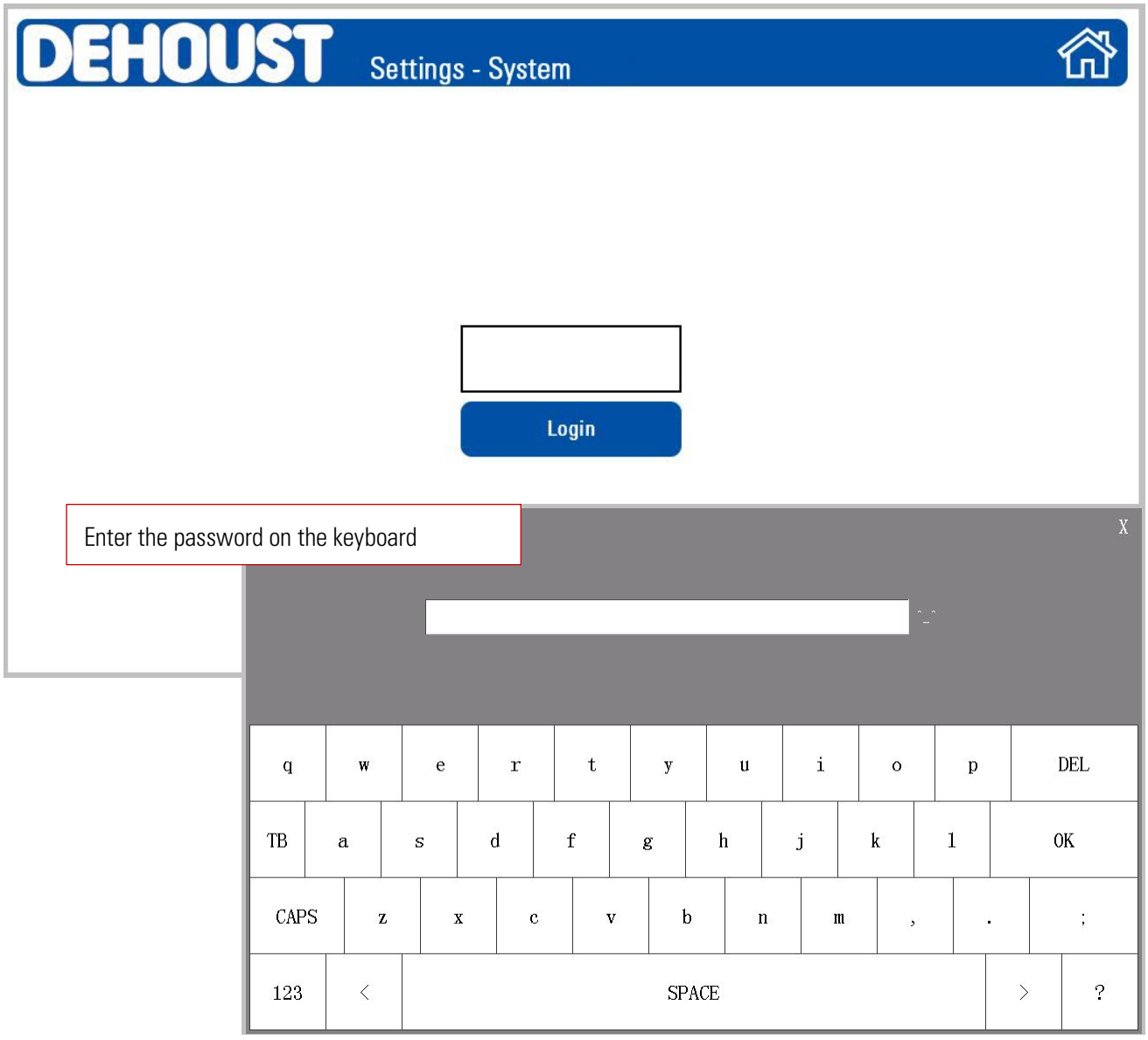
9.1.4. Language settings



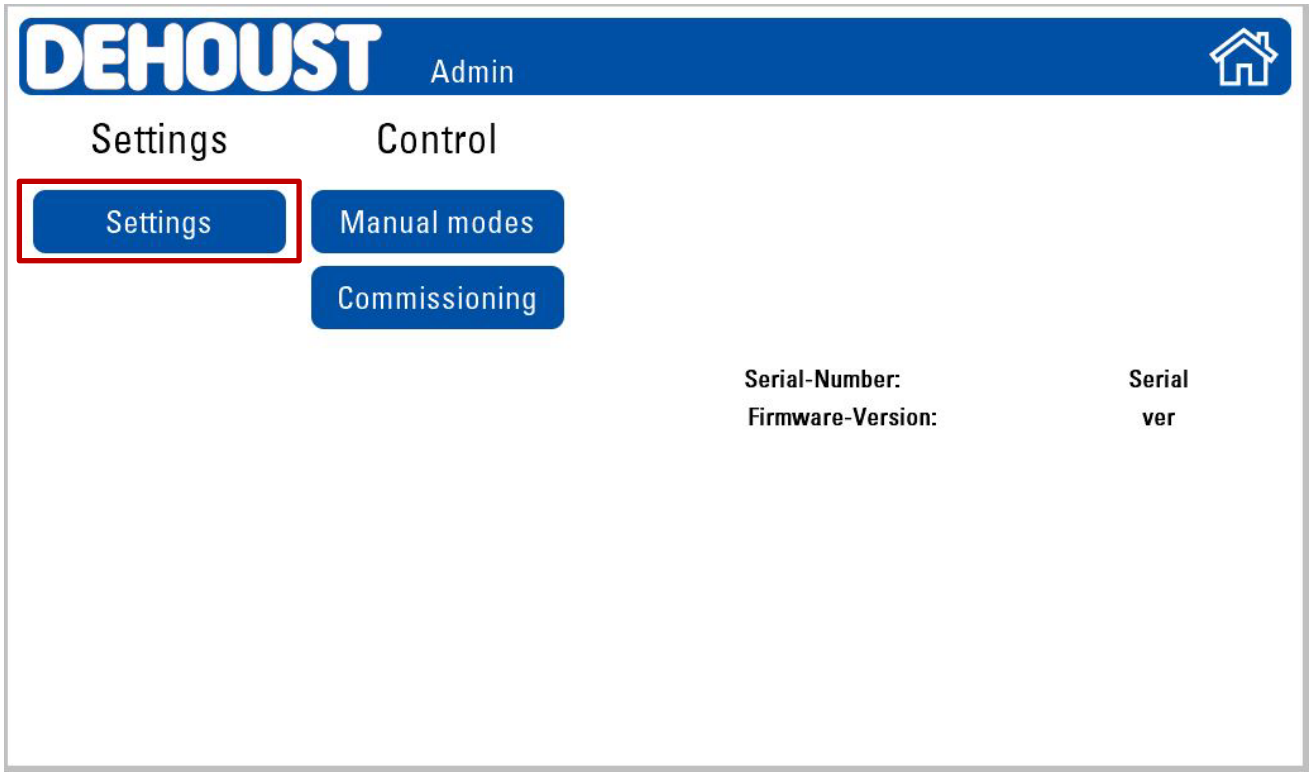


9.1.5. System

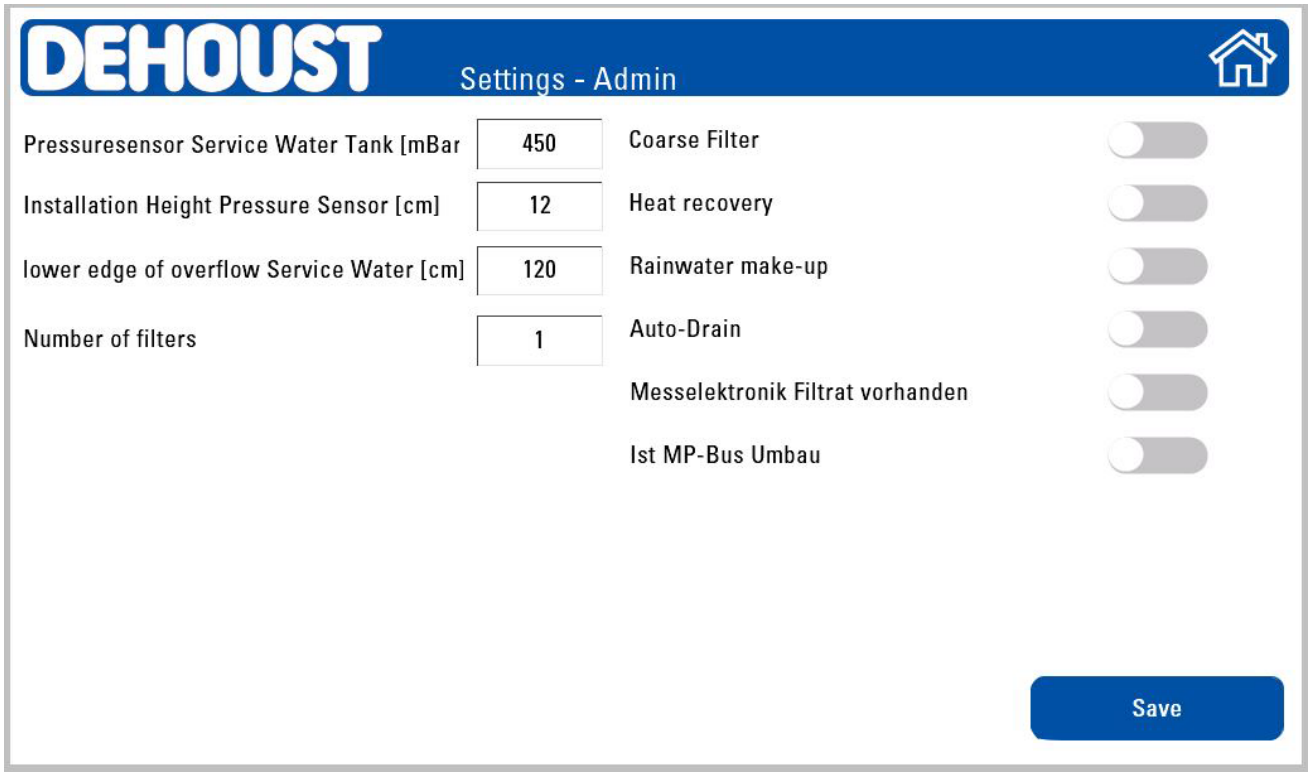

DEHOUST
Home
Settings
Control
Tanks
Modes
Recycling
Water balance
Network
Language
System
Serial-Number:
Serial
Firmware-Version:
ver


DEHOUST
Settings - System
Login
Enter the password on the keyboard
X
q w e r t y u i o p DEL
TB a s d f g h j k l OK
CAPS z x c v b n m , . ;
123 < SPACE > ?

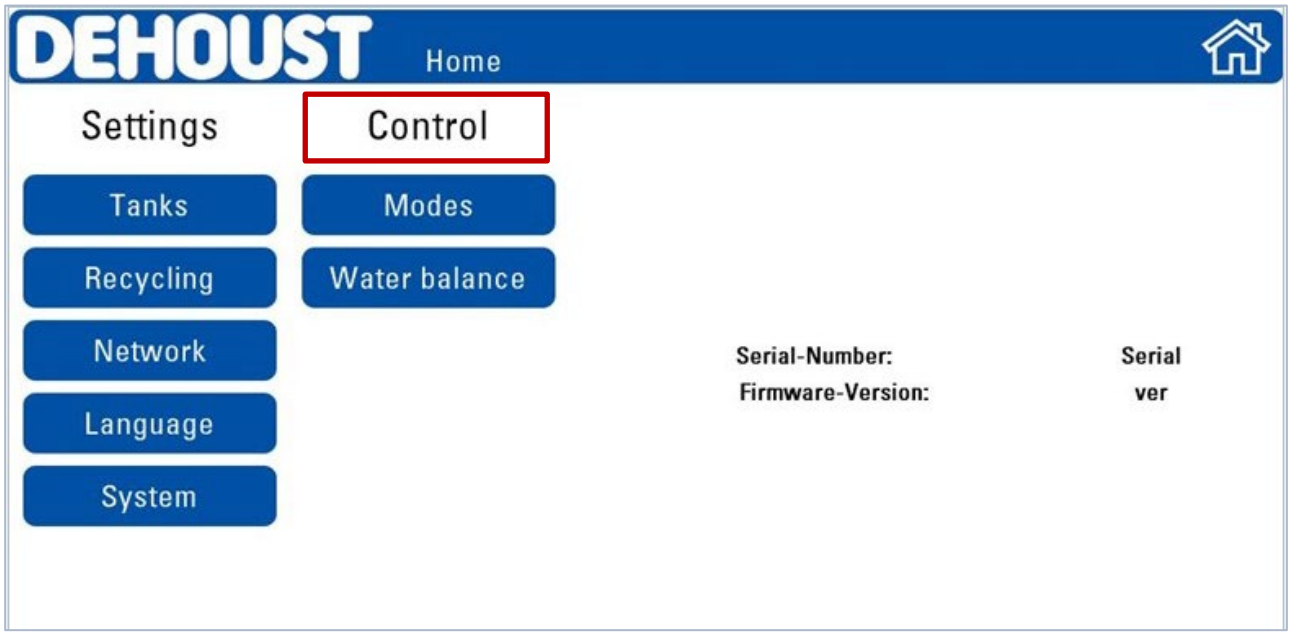
9.1.5.1. Settings (system)



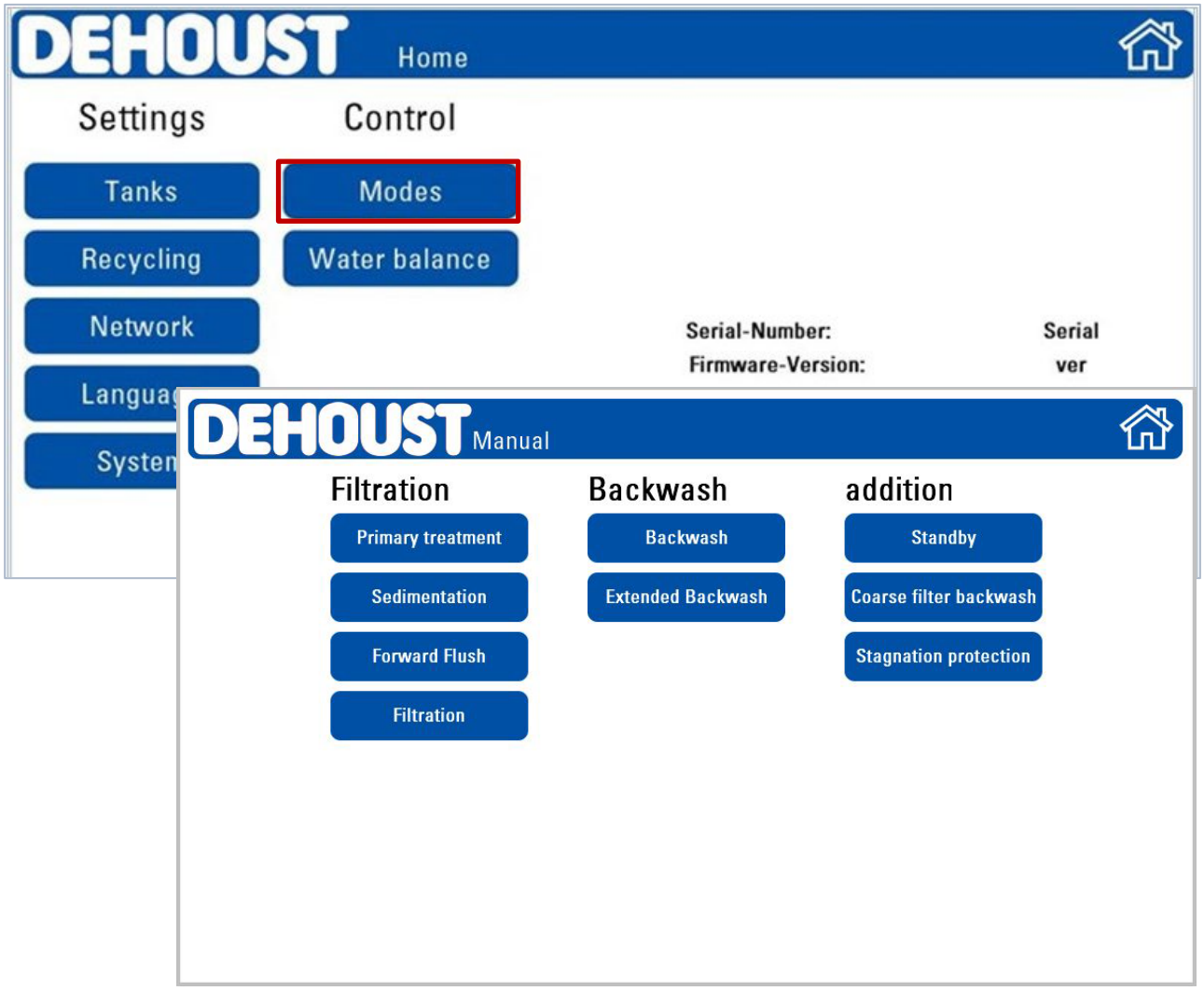
Click on [Settings] to open the following display:



9.2. CONTROLLER



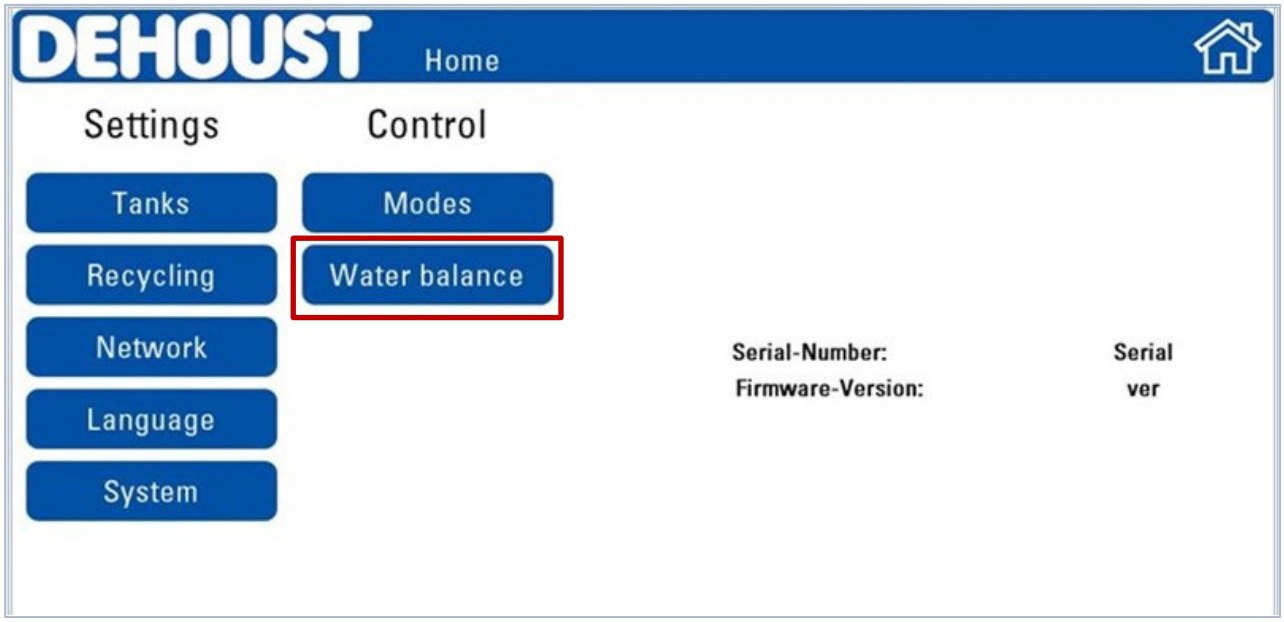
9.2.1. Modes



Modes	Function
Primary treatment	A defined amount of Smartfloc flocculant is metered into the greywater filtration tank using the dosing pump in order to improve sedimentation. During aeration in recycling, the flocculant is thoroughly mixed with the greywater to ensure a quicker reaction. The dosing pump is controlled to feed Smartfloc. The aeration is activated to run for a set duration.
Sedimentation	Rest phase in the greywater collection tank and greywater filtration tank to allow for settling of the suspended solids and particles before filtration. The dosing pump and aeration are switched off for a set duration.
Forward flush	The valve is opened, and the filtrate pump is started to evacuate any dirt or debris entrapped in the suction line between the filtration tank and the filtrate pump.
Filtration	Filtration is started according to settings.
Backwash	Backwash of the membrane filter according to settings.
Extended backwash	Extended backwash of the membrane filter according to settings.
Standby	Stop all current actions and put the system into standby.
Coarse filter backwash	Automatic backwash of the screen in the coarse filter according to settings.
Stagnation protection	Stagnation flushing of the mains water line according to settings.

- The system returns to standby at the end of every mode.
- If no further mode is activated within 10 minutes, the system returns automatically to the last operating condition used (Automatic/*Drinking Water mode* etc.).

9.2.2. Water balance



9.3. MESSAGES

Touch the “Messages and alarms” bell icon to open the overview display. Older messages are shown slightly greyed out. Click on [confirm] to acknowledge the alarm, and the system will attempt to continue operation in the previous mode.

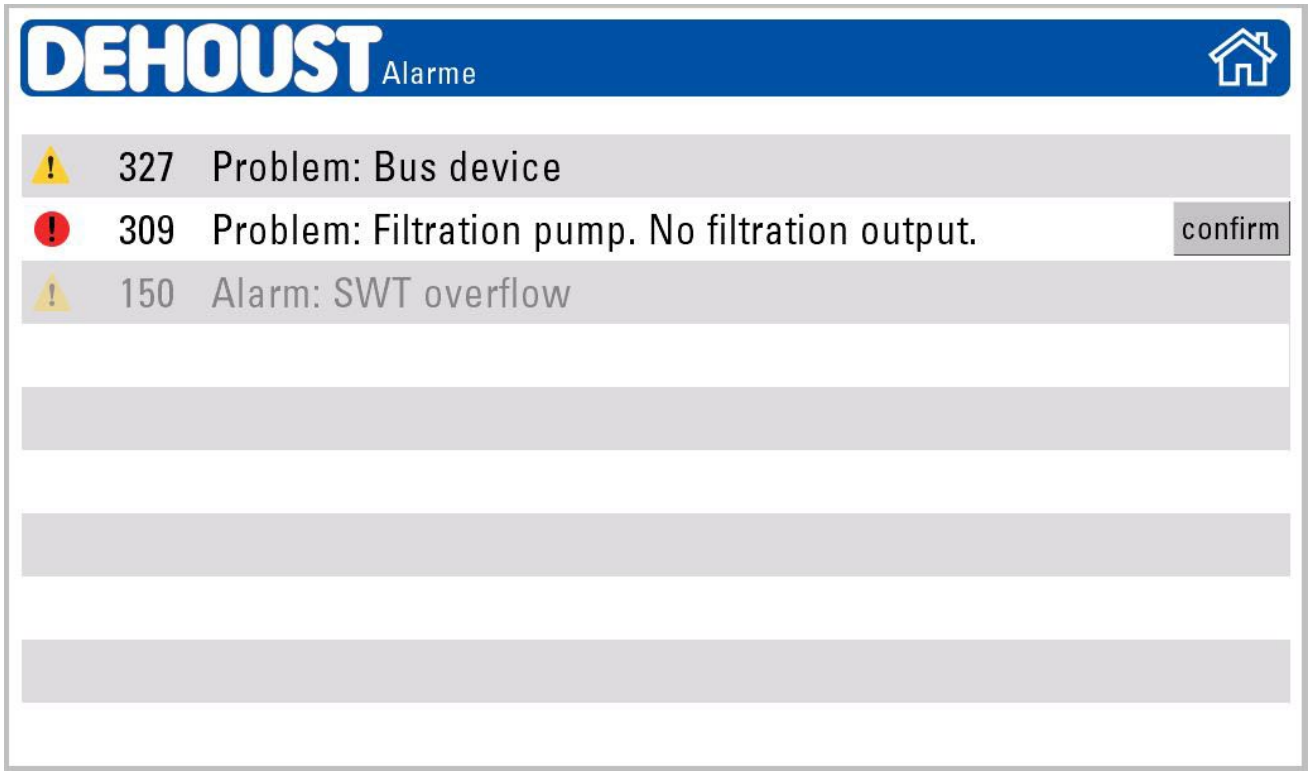


Figure 23: One example with two active alarms and a historic malfunction

10. Important tests prior to commissioning

Before starting the pressure and leakage testing and commissioning, the following work on the *GWtec®* greywater treatment plant must have been completed:

- The *GWtec®* greywater treatment plant is hydraulically connected in compliance with the national rules and regulations.
- The *GWtec®* greywater treatment plant is electrically connected to all safety devices in compliance with the national rules and regulations.
- The relevant country-specific regulations were observed and fulfilled.
- Electrical components are connected to the controller of the *GWtec®* greywater treatment plant according to the electrical circuit diagram.
- The coarse filter and all tank overflows are connected to the sewer.
- The *GWtec®* station is connected to the membrane filter, the coarse filter backwash and the service water system.
- The coarse filter backwash fitting is connected to the *GWtec®* station.
- The mains water make-up is connected to the mains water supply system.
- The PVC hoses for the greywater batch pump, aeration unit, filtrate outlet and backwash are properly connected.
- All relevant shut-off valves are open.

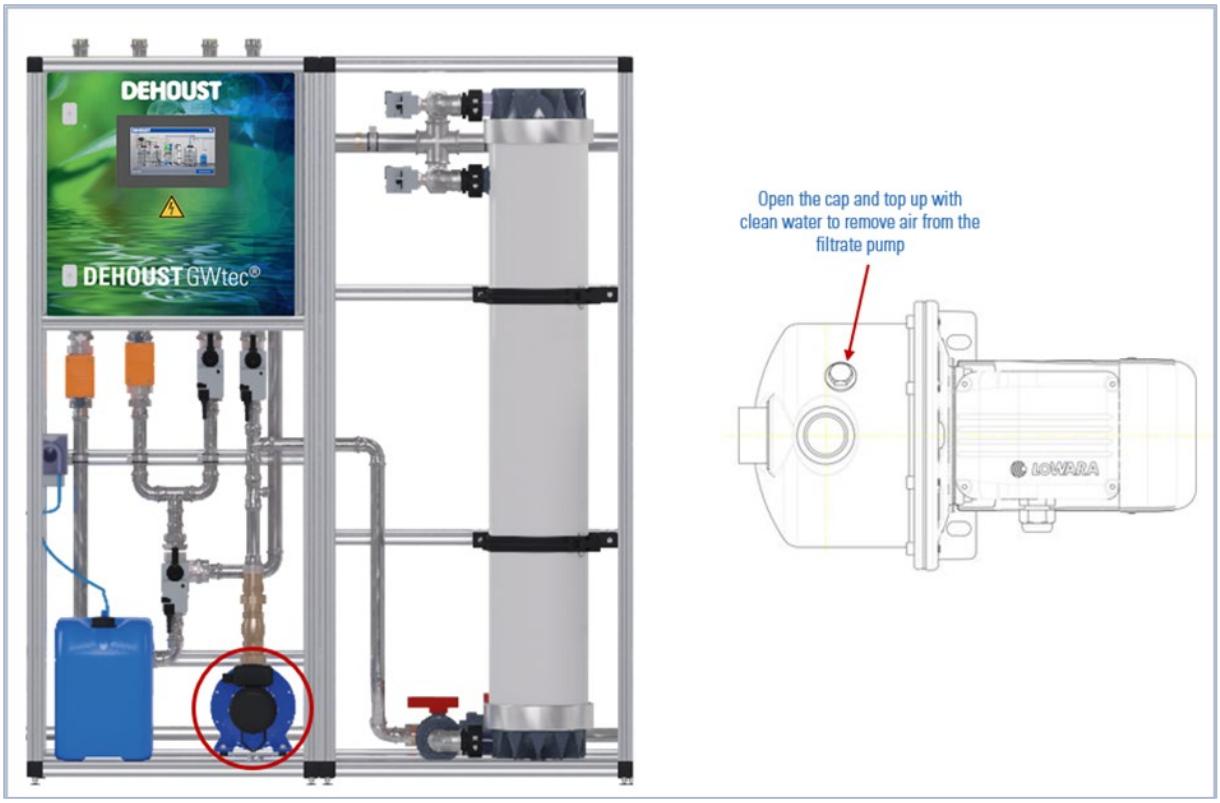


Figure 24: Venting the filtrate pump

10.1. Testing of single components

For testing individual components of the system, select the MODES function in the control settings.

The MODES function is used to run pressure and leakage tests on all individual sections of the *GWtec®* station and displace air with water.

The mains water make-up for the service water tank must have been connected, and the service water tank must have a liquid level of > 20% to allow for the activation of the backwash pump.

11. Commissioning

Take care to remove the three sealing caps of every membrane filter shortly before commissioning. The caps prevent drying out of the membrane filter and avoid irreversible damage.

Figure 25: Sealing caps

Tighten clamps with a torque of 40 Nm – risk of breaking!

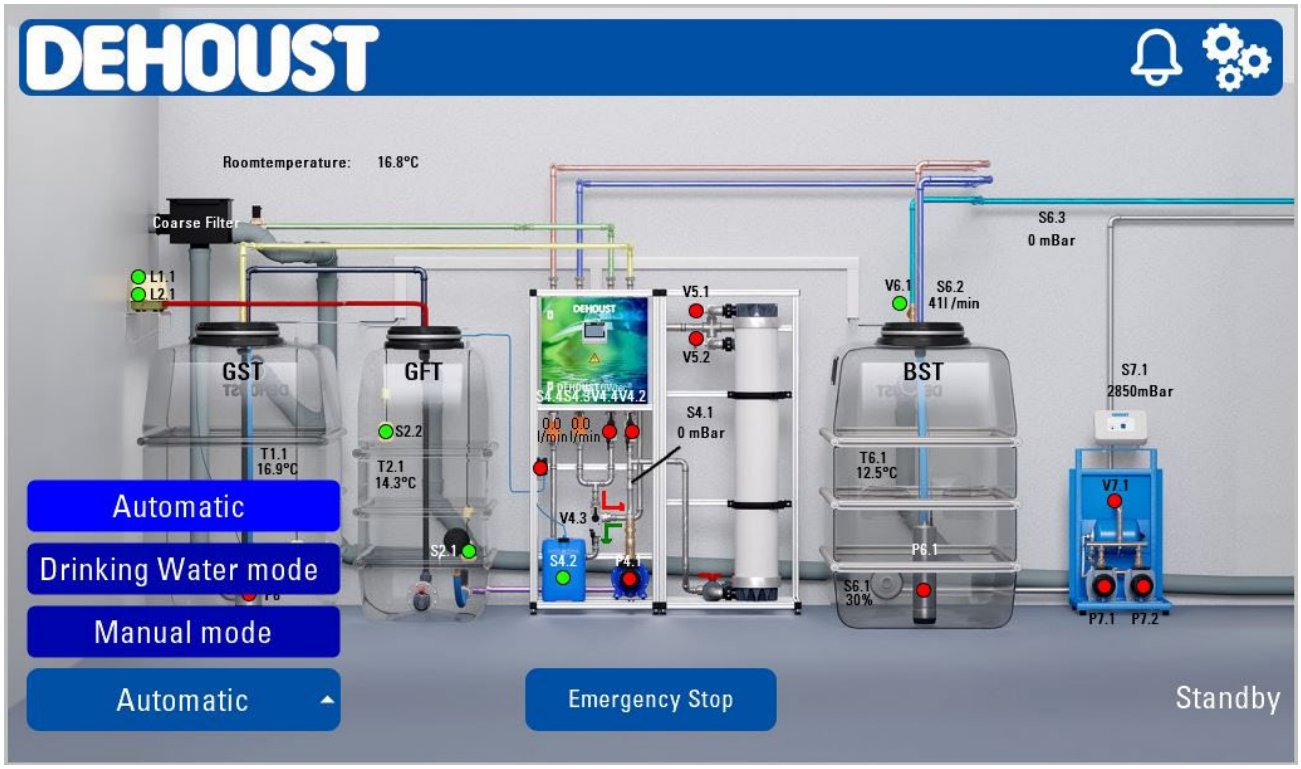
Commissioning the *GWtec®* greywater treatment plant **in three steps:**

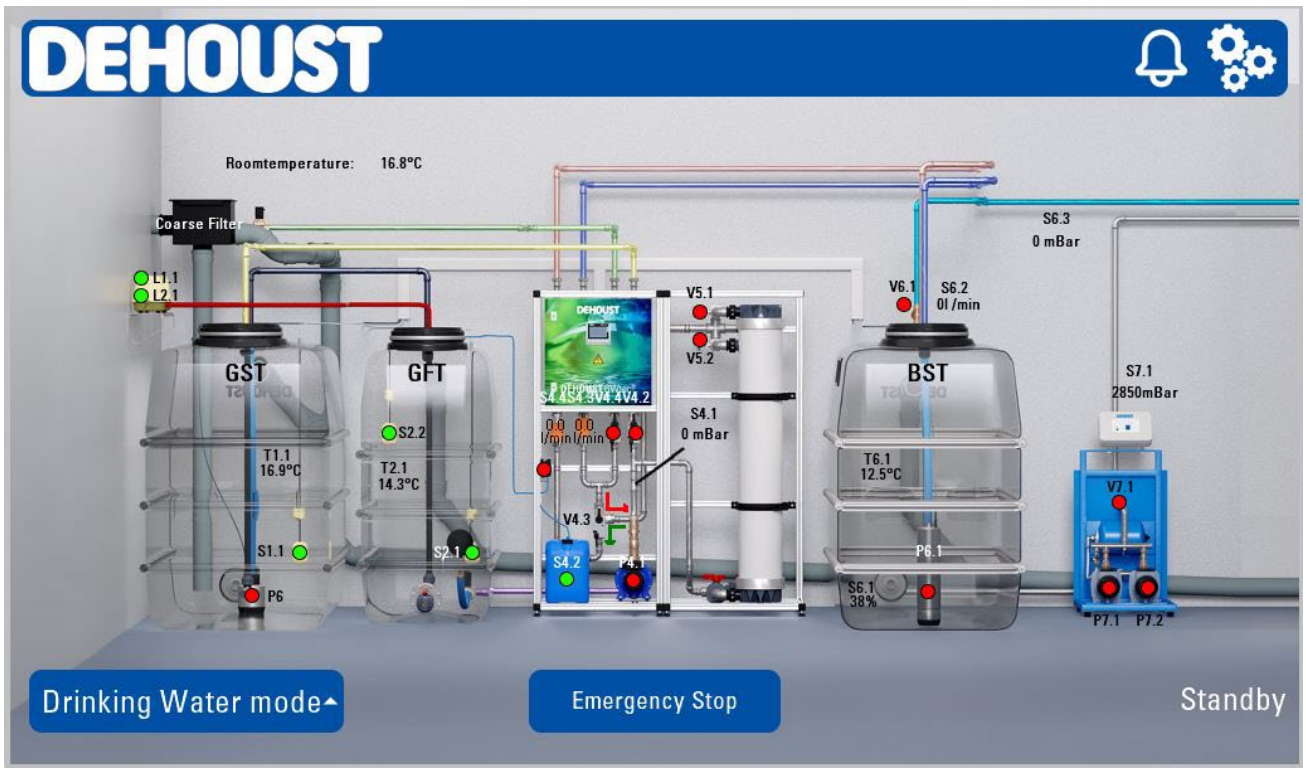
Step 1 **See Chapter 11.1 for details**	**Step 2** **See Chapter 11.2 for details**	**Step 3** **See Chapter 11.3 for details**
Commissioning in Drinking Water mode (controller screen) – without connection of the system to the greywater downpipe (bypass)	Changeover to Auto/Standby (control to *Auto/Standby*).	Do not activate the *Automatic* mode until the number of persons in the building exceeds 25% of the building's capacity.
Avoid any release of problematic substances into the greywater collection tank.	After completion of all construction work inside the building, connect the greywater downpipe to the greywater system.	
Always keep the greywater collection tank(s) and greywater filtration clean.	Activate the microbiological system of the greywater collection tank using the dry bacteria included in the delivery.	
The automatic drinking water make-up on the service water tank and the pressure booster system ensure the supply of drinking water.	Wait 1-2 weeks until the sewage bacteria culture is strong enough for successful biological cleaning of the greywater.	
Where possible, maintain this operating condition until the completion of all construction work inside the building.	The *GWtec®* station runs regular backwashes to keep the membrane filter moist and clean (at intervals of 12/24/72 hours, depending on the settings). The greywater plant aerates the greywater.	

11.1. Drinking Water mode – without greywater inflow

Maintain the *GWtec*® greywater treatment plant in this operating condition until completion of all construction works.

Do not connect the greywater inlet of the treatment system as long as construction is still in progress in the building. Instead, lay a greywater bypass directly to the sewer during this period.





Please perform the following steps:

- Disconnect the greywater line from the DEHOUST MAX coarse filter to ensure no greywater can enter the greywater tank.
- Drain and clean the greywater collection tank(s) and greywater filtration tank completely. Pump out standing water, if any, from the greywater collection tank(s) to the sewer.
- Switch on the controller via the master switch.
- After booting, switch the controller to [Drinking Water mode].
- Check for correct settings of the SWT immersion pressure sensor and mains water make-up, as described below.
- After the mains water make-up unit has automatically opened the solenoid valve and filled the service water tank up to the defined liquid level, open a domestic reuse point (for example, toilet flushing, water tap). Wait until water emerges with no entrapped air, then close the use point.

The aeration unit is now active and will aerate the grey water tanks intermittently. As long as there is no greywater in the storage tanks, the aeration pumps in the control cabinet can be left electrically disconnected for the moment.

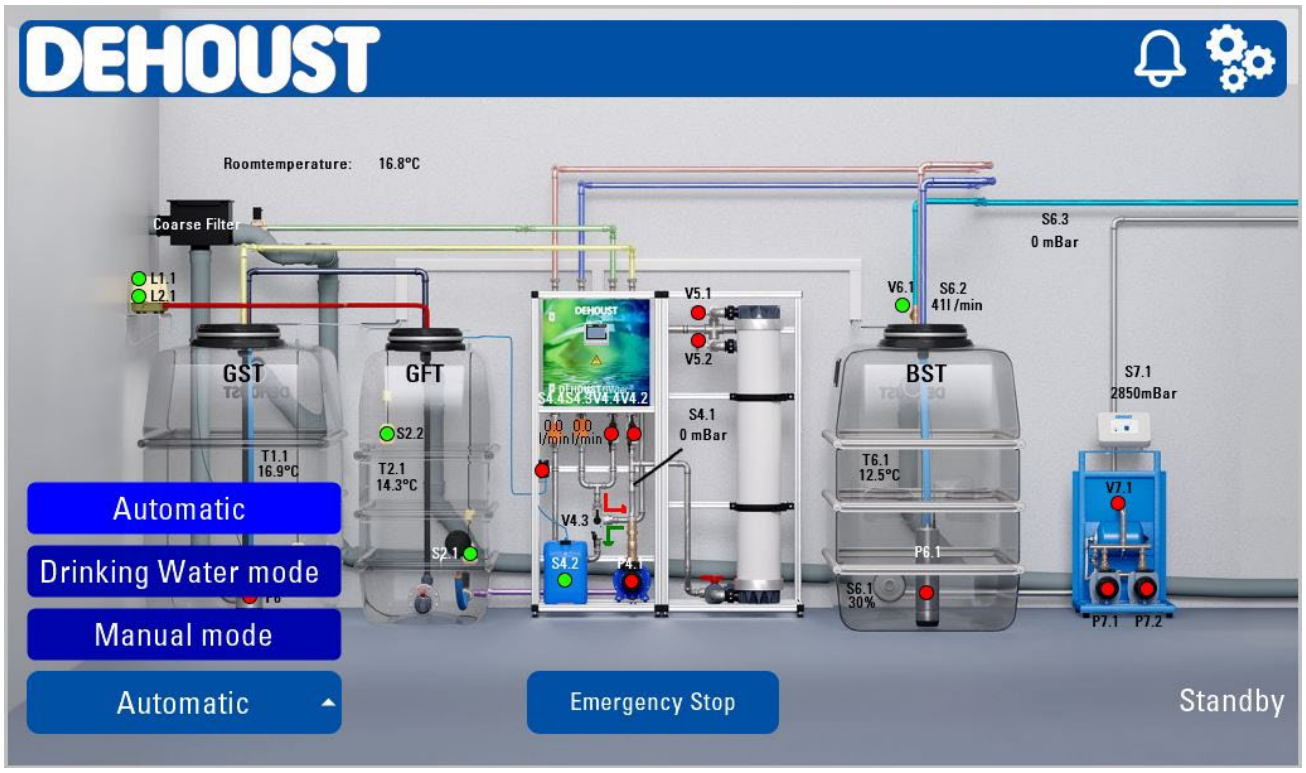
The system is now operative in *Drinking Water mode*.

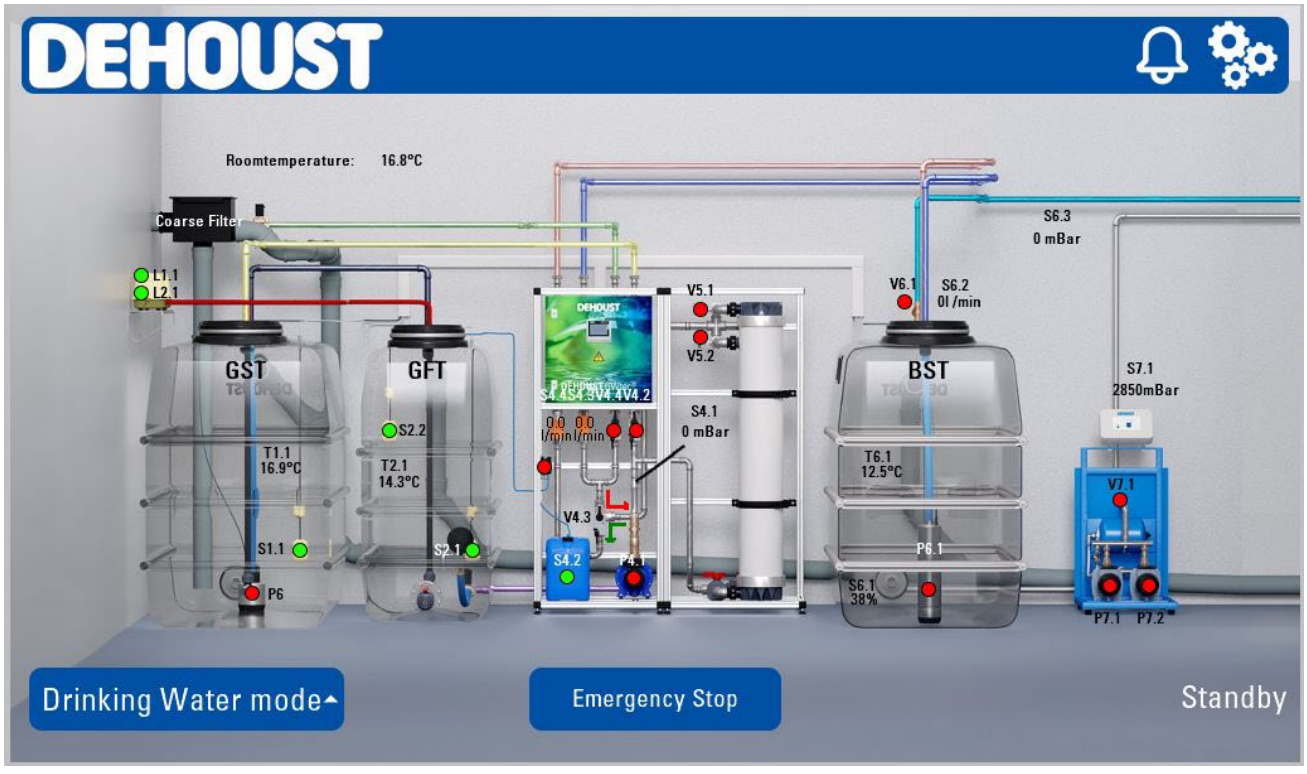
Take care to ensure that no greywater enters the coarse filter and the greywater collection tank in Step 1. This prevents detrimental substances from entering the greywater system during ongoing construction work.

- In this step, the reuse points are supplied with mains water only and not with treated greywater.
- Please refer to the manual of the pressure booster system.

11.2. Drinking Water mode – with greywater inflow

After completion of all construction work, the *GWtec®* greywater treatment plant should be operated in the *Drinking Water* mode until the number of persons in the building reaches at least 25% of the building's capacity. An efficient greywater bacteria culture in the *GWtec®* greywater treatment plant will develop only if a sufficient amount of new greywater enters the greywater storage tanks every day.





The operations mentioned in Step 1 must have been performed before. Then:

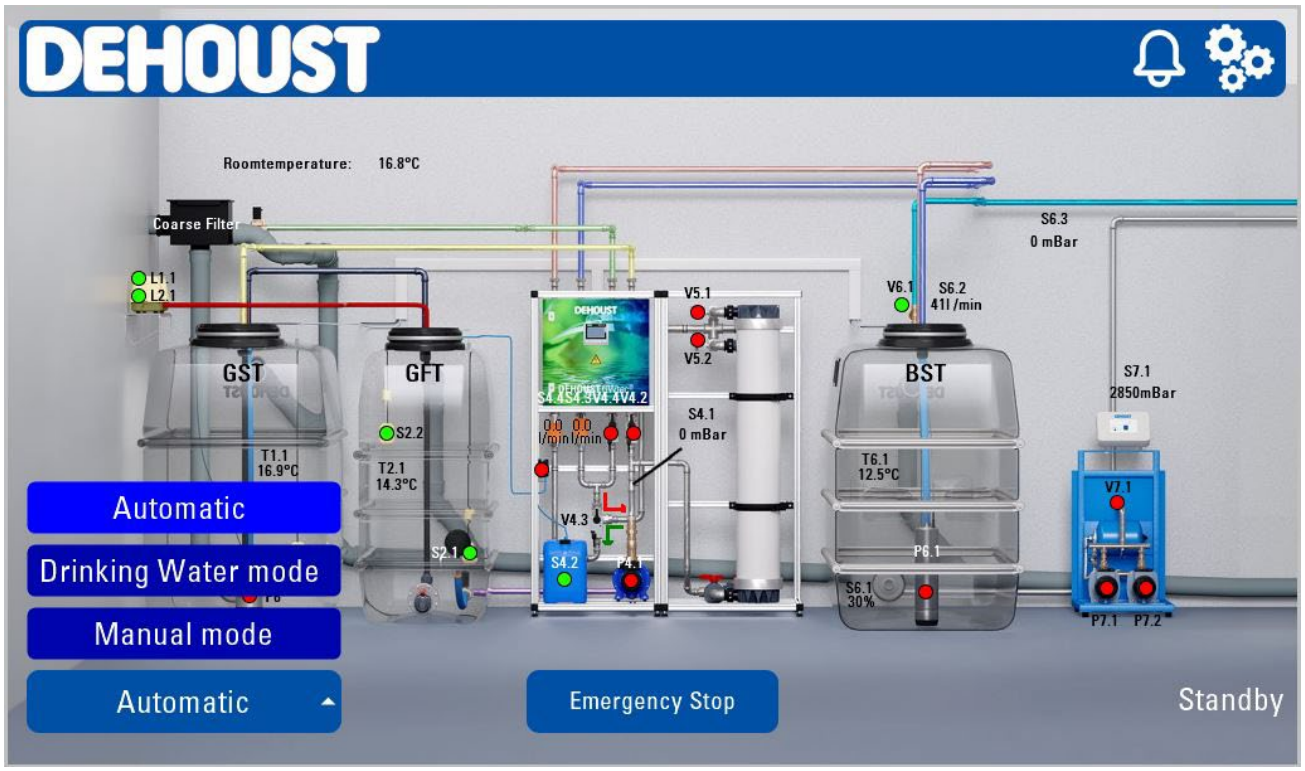
- Check the screen of the coarse filter and remove all waste and residue.
- Make sure that the greywater collection tank and the greywater filtration tank are clean and empty.
- Then connect the greywater inlet with the coarse filter.
- Add the dry wastewater bacteria, which are included in the delivery, to the greywater collection and filtration tanks (cf. Chapter 11.5.2).
- Set the controller to [Drinking Water mode] on the display of the plant.
- The greywater treatment plant performs a backwash of the membrane filter in defined cycles – set up the correct backwash volume of the backwash pump (refer to Chapter 9.1.2)
- Connect the aeration pump electrically in the control cabinet. Aeration and regular inflow of fresh greywater will build up a powerful biology within shortest time.
- Allow the system to run in the *Drinking Water mode* for the next 24 to 48 hours to build up a powerful bacteria culture.

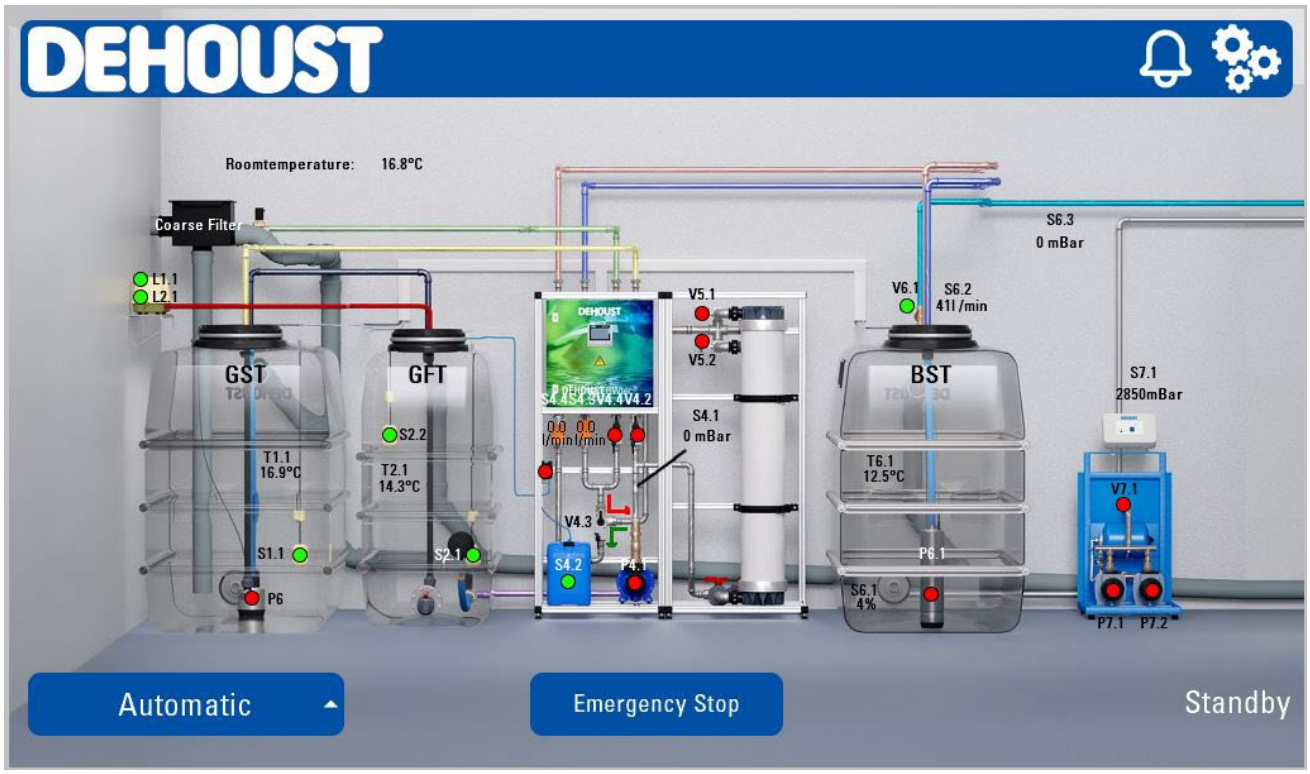
Modifications in the firmware can result in considerable changes in plant processes. Therefore, do not make any changes unless in close coordination with your contract dealer or DEHOUST.

- A slight smell of greywater cannot always be fully avoided in the installation room or in the treated water. This is not considered an odor nuisance of the product.
- You are recommended to install a separate (rooftop) vent line for the greywater collection tank and the greywater filtration tank.

11.3. Step 3: Automatic with greywater treatment

Once the typical powerful greywater microbiology is established, the control can be switched over to [Automatic].





The operations explained in Steps 1 and 2 must have been performed before.
Then:

- Check all relevant settings for *Automatic* and adjust them to your particular situation or needs.
- Switch the controller to [Automatic].
  Should the plant be on-line, this can be done by remote access.

Then the system is ready for greywater treatment with reuse.

Please bear in mind: the higher the setting for the filtration capacity, the higher the treatment capacity of the overall system, and the shorter the service time of the membrane filter.

11.4. Extended rest periods

A regular inflow of fresh greywater keeps up the continuous biological greywater treatment by microorganisms that are typical for wastewater. Longer rest periods with no greywater input (such as vacation, seasonal operation) will cause a reduction in the number of microorganisms. After a new inflow of fresh greywater, the microorganisms will need some time to achieve again maximum biological performance. During this period, the biological cleaning effectiveness of the treatment process may be reduced. Slight residual smells of shampoo, soap, etc. may be subjectively noted in the treated greywater.

If the rest period of the plant exceeds 4 weeks, repeat step 2 (Chapter 11.2).

Do not switch off the controller during a rest period in order to maintain the aeration function and regular backwashing of the membrane filter.

11.5. Building up biological cleaning

The required biological cleaning for greywater treatment is done by microorganisms designed to break down contaminants. The necessary individual components for the various tank sizes as well as a dosing schedule for your plant will be obtained from DEHOUST. It is important to observe the correct dosage, mixture and temperature and to give the microorganisms enough time for development. At the same time, special care is required when handling living organisms.

The following passages provide you with guidance on how to properly handle these microorganisms, which are delivered in the form of dry bacteria, considering all relevant occupational health and safety precautions, and how to prepare them for subsequent filling in the greywater collection and filtration tanks.

11.5.1. Personal protective measures

Handling contaminant-adapted microorganisms requires personal protective equipment and afterwards appropriate disinfection with a commercially available skin-friendly disinfectant.

Take care to always wear a dust mask (P1), a pair of safety goggles, and disposable gloves when filling in the microorganism preparations (in their dry form, e.g. when mixing them into the buffer solution). These precautions serve to prevent the intake of bacterial dusts or microorganism aerosols in the upper airways, avoid skin contact and prevent the spreading of germs.

11.5.2. Preparing the bacteria culture

To activate the contaminant-adapted microorganisms, proceed as follows:

- Observe the dosing schedule closely.
- Place ready the required amount of microorganisms / the mixing ratio with water is 1 : 10.
- Fill ten times more hand-warm water (max. 86°F) in a container of suitable size,
  e.g. 30 L (8.7 gals) of water for 3 Kg (6.6 lbs.) of microorganisms
- Per Liter (0.26 gal) of water, add to the container and dissolve 2.8 g (0,099 oz) of the buffer salt included in the package,
  e.g. 30 L (8.7 gals) of water x 2.8 g (0.099 oz) of buffer salt = 84 g (2.96 oz) of buffer salt
- Stir in the appropriate calculated and prepared amount of microorganisms.
- Allow the mixture to rest for about one hour up to a maximum of two hours while stirring occasionally.
- After said rest period, fill the then activated (rehydrated) microorganisms directly into the greywater tank and filtration tank according to the instructions.

Wear a P1 dust mask to prevent the intake of bacterial dust or microorganism aerosols in the upper airways during mixing.

Wear safety goggles when filling in the dry material and also when removing the bacteria suspension.

Wear disposable gloves to prevent spreading germs.

After handling of the microorganism, wash and disinfect your hands, e.g. with a commercially available skin-friendly disinfectant.

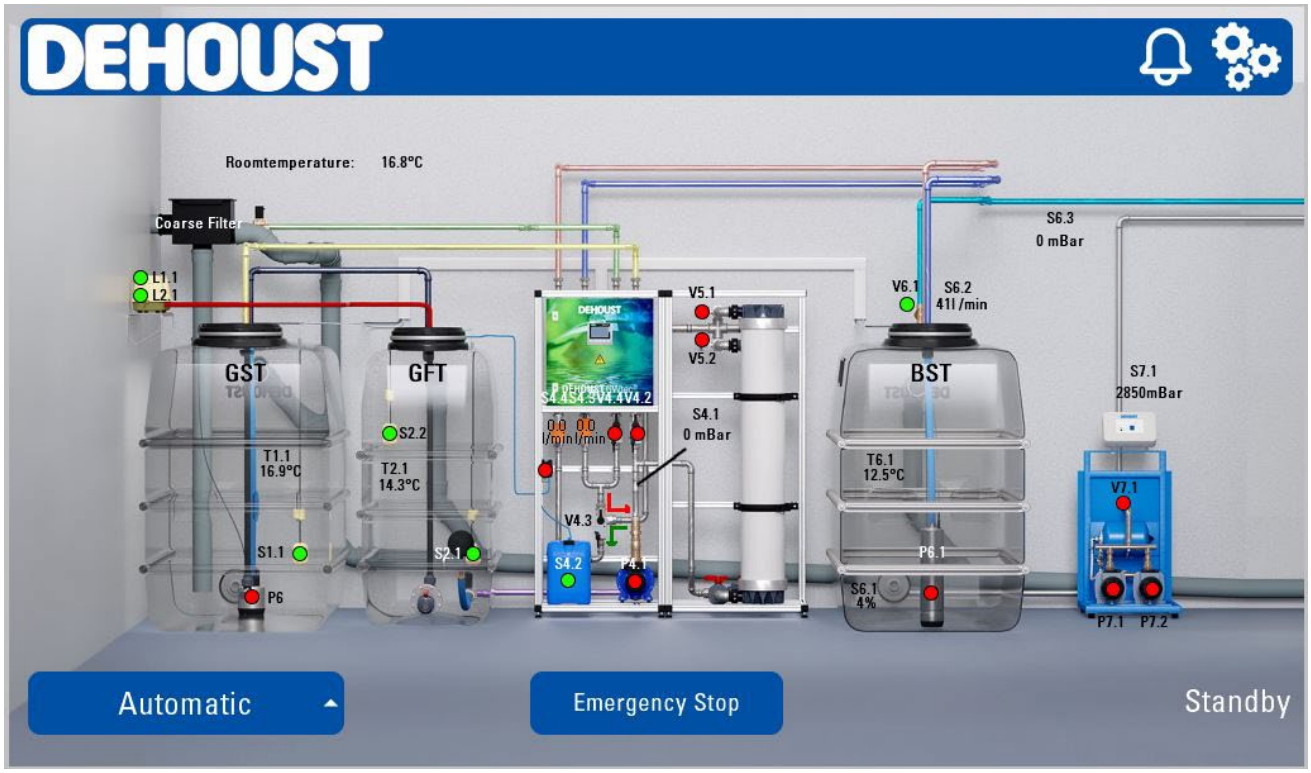
Space for personal notes:

12. Troubleshooting / alarms

12.1. Controller alarms

All fault/alarm messages are visually shown on the touchscreen display of the DEHOUST *GWtec®* station.

Touch the "Messages and alarms" bell icon to open the overview display. Older messages are shown slightly greyed out. Click on [confirm] to acknowledge the alarm, and the system will attempt to continue operation in the previous mode (refer to Chapter 9.1.3).



If the underlying fault has not been eliminated, the fault message either cannot be reset or appears soon again on the touchscreen display.

Error code	Error message	Possible causes	Remedy
2	**Problem:** **Backwash pump.** **Check.**	Alarm triggered by the motor circuit-breaker of backwash pump **P6.1.** → The floating alarm contact opens the output.	Check the backwash pump **P6.1**.
		The alarm will be reset automatically after elimination of the problem. For this, the motor circuit-breaker must be reset by hand.	
3	**Problem:** **Logic error in tank status**	**S2.2** is indicating water - **S2.1** is not. → The floating alarm contact opens the output. Batch, GFT aeration and filtration are disabled.	Check GFT float switch
		Alarm must be reset by hand.	
100	**Problem:** **SWT liquid level sensor error at S6.1**	Sensor **S6.1** gives no signal. → The floating alarm contact opens the output. The system automatically changes over to *Drinking Water mode* and disables the valve **V6.1.**	Check sensor S6.1.
		The alarm will be reset automatically as soon as the problem is eliminated or sensor S6.1 provides a signal again	
101	**Problem:** **Tank drain.** **Check V7.1.**	AutoDrain fails to signal a changed valve position within the check time. → The floating alarm contact opens the output. Valve V7.1 is closed, Recycling and V6.1 are re-enabled.	Check V7.1.
		Alarm must be reset by hand.	
150	**Alarm:** **SWT overflow**	Liquid level measured at S6.1 is > 120%. → The floating alarm contact opens the output.	Check liquid level in the service water tank and V7.1, S61.
		The alarm will be reset automatically as soon as the problem is eliminated or the liquid level at S6.1 is ≤ 100% again.	

Error code	Error message	Possible causes	Remedy
151	**Alarm: SWT empty. Dry-run protection activated**	The liquid level measured at **S6.1** in the service water tank is < 5% for more than 5 seconds. → The floating alarm contact opens the output. The system automatically changes over to *Drinking Water mode* and disables **V7.1** and **P6.1**.	Check service water tank and piping for leakage. And V7.1
	ⓘ	Alarm must be reset by hand.	
152	**Alarm: Mains water make-up**	If the make-up supply is active, the flow rate is below the lower limit (1.3 g.p.m), or if the make-up supply is inactive, the flow rate exceeds the lower limit. → The floating alarm contact opens the output.	Check the make-up flow.
	ⓘ	Alarm must be reset by hand.	
300	**Perform inspection soon!**	A number of minus 3,000 hrs has been reached for "Inspection after operating hours **P4.1**". → The floating alarm contact opens the output.	Carry out an inspection as soon as possible.
	ⓘ	Alarm must be reset by hand. Reset the P4.1 operating hours to be able to reset the alarm.	
301	**Inspection required!**	The alarm occurs when the number of **P4.1** operating hours > "Inspection after operating hours P4.1". → The floating alarm contact opens the output. The system automatically changes over to *Auto/Standby*.	Carry out an inspection.
	ⓘ	Alarm must be reset by hand. Reset the P4.1 operating hours to be able to reset the alarm.	
302	**Problem: Backwash**	During backwash, the flow rate at the sensor **S4.4** is < 1.3 g.p.m. → The floating alarm contact opens the output. The system automatically changes over to *Mains/Water*.	Check backwash.

Error code	Error message	Possible causes	Remedy
		Alarm must be reset by hand.	
309	**Problem: Filtration pump. No filtration output.**	During filtration, the filtration pressure measured at **S4.1** is < 0,725 psi for more than 60 seconds. Change over to Auto/Standby. → The floating alarm contact opens the output. The system automatically changes over to *Mains/Water*.	Check P4.1 and S4.1.
		Alarm must be reset by hand.	
327	**Problem: Bus device (*)**	One or more bus devices give no signal.	Check bus devices (valves/flow sensors).
		The alarm will be reset automatically as soon as the problem is eliminated, or all Modbus devices give signals.	
330	**Problem: Insufficient filtration**	The flow rate during filtration dropped or fell below the filtration flow setting (Ltr/min) (refer to Chapter 9.3.3). → The floating alarm contact opens the output.	Check the operating mode. Check the membrane filter for clogging. If necessary, contact DEHOUST or the contract dealer for inspection.
		The alarm will be reset automatically as soon as the problem is eliminated, or the actual flow rate exceeds the minimum target flow rate.	
331	**Alarm: Dosing canister empty**	The float switch **S4.2** of the dosing canister signals empty status. → The floating alarm contact opens the output. The dosing pump **P4.2** is disabled.	Check the liquid level of the Smartfloc canister.
		The alarm will be reset automatically as soon as the problem is eliminated or the float switch S4.2 signals full status.	
340	**Alarm: Filtration output**	Alarm when the filtration flow falls below 0.5 g.p.m.at 100% filtration pump capacity. → The floating alarm contact opens the output.	The capacity of the membrane filter is exhausted. The filter must be flushed or replaced.
		Alarm must be reset by hand.	

12.2. Pressure surges in mains water line

The solenoid valve of the mains water make-up opens gently through a servo-controlled membrane, which normally prevents pressure surges in the mains water line. Pressure surges (water hammer) occur when the difference between resting pressure and flow pressure is higher than 2 bar.

If the building owner installs a shut-off valve in the mains water line upstream of the mains water make-up connection, the flow can be restricted so far as to ensure that there is no pressure surge when the solenoid valve opens. The disadvantage of this method is a reduced make-up flow.

Check whether the flow rate of the pressure booster system is sufficient for normal service water consumption. The liquid level in the service water storage tank should not be allowed to fall below a level triggering the dry-run protection mode of the pressure booster system. If the pressure booster system changes over to the dry-run protection mode, it is necessary to restrict the flow rate also at the discharge end.

12.3. Presence of odors in the installation room

The regular oxygen inflow from the aeration unit for the biological cleaning stage is too low or might even be interrupted. Please check hose connections and operating parameters of the aeration unit and adjust/increase the flow rate where necessary.

- A slight smell of greywater cannot always be fully avoided in the installation room or in the treated water. This is not considered an odor nuisance of the product.
- You are recommended to provide a separate (rooftop) vent line for the greywater collection tank and the greywater filtration tank.

13. Inspection

The DEHOUST *GWtec®* system includes components that require inspection and servicing.

- Inspections should be carried out by the operator of the plant.
- Servicing and repairs shall be performed by qualified personnel only.

If faults/defects are found during an inspection of the DEHOUST *GWtec®* plant, please contact your contract dealer or DEHOUST.

Always avoid direct skin and eye contact with greywater and residues (wear rubber gloves) during work.

13.1. Coarse filter DEHOUST MAX

Open the lid of the housing (secured by hooks) of the coarse filter to inspect the screen. In case of persistent and coarse debris that could not be removed with nozzle water, clean the screen with a scrubbing brush. Discard the filter residues as residual waste.

13.2. Mains water make-up valve

Check the DW make-up solenoid valve for leakage and functionality. To do so, open/close the solenoid valve manually via the [Hand Mode] of the controller.

13.3. Hose and water connections

Check all hose connections (greywater batch pump, aeration unit, filtrate outlet, backwash line), mains water and service water connections to make sure there are no damages, leaks or porous or worn sections. Replace hoses/pipes as required and seal the connections.

For the sake of the operator, observe the specified inspection and servicing intervals and the described working steps.

13.4. Aeration unit

Interval: every 2nd year or after 20,000 operating hours

Follow the operation manual of the compressor with its detailed inspection recommendations.

13.5. Pressure booster system

Follow the detailed inspection recommendations in the operation manual of the pressure booster system.

13.6. *GWtec®* station

The inspection interval of the *GWtec®* station is governed by the number of operating hours of the filtrate pump. After a running time of 12,000 operating hours (approx. 20 months of operation) the controller display will show an *Inspection* message. Please contact a contract dealer or DEHOUST for the inspection.

The filtration output of the membrane filter depends on the composition of the greywater, the timing settings for aeration, sedimentation and filtration, the daily amount of greywater, and the consumption of service water. For said reasons, it may occasionally be necessary to replace the membrane filter before the end of the regular interval.

The inspection of the *GWtec®* station and the replacement of the membrane filter must be carried out by a contract dealer or by DEHOUST.

14. Optional accessories

14.1. AutoDrain for service water tank (Article 813456)

The AutoDrain function ensures constant water exchange in the service water tank to minimize stagnation and contamination risks in the system even for extended rest periods. The AutoDrain function is operated at stored settings (refer to Chapter 9.1.1) and must have been activated in the controller (refer to Chapter 9.1.5.1).

The ball valve is opened automatically for discharge to the sewer until a defined liquid level is reached in the tank. Then the ball valve is closed, and the service water tank refilled with make-up mains water up to a defined level.

When directly ordered with the plant, the AutoDrain ball valve is delivered pre-mounted to the service water tank.

14.1.1. Installation

Connect the AutoDrain ball valve to the corresponding drain cock / pipe coupling of the service water tank using the supplied pipe unions and brass double nipples and seal the connections.

Connect the AutoDrain line to the sewer drain or a suitable sewage lifting station.
Alternatively, install the AutoDrain ball valve into the service water main pipe.

Use the terminal box to extend to 10 meters the standard power supply cable of the AutoDrain ball valve (1.5 meter long) via the supplied data cable type Y (ST) Y 2 x 2 x 0.6 and connect it to the controller of the *GWtec®* station.

The electrical connection shall be in accordance with the circuit diagram DEHOUST *GWtec®* ▶ ***AutoDrain***

Failure to connect the AutoDrain to the sewer results in a risk of flooding for the installation room.

The sewer drain or sewage lifting station must be capable of discharging the maximum amount of service water from the pressure booster system.

14.1.2. Technical data

- Open-close motorized ball valve – Inlet: 1" OT
- Open-close motorized ball valve – Outlet: 1" IT
- Control: ModBus
- Motor torque: 5 Nm
- Motor runtime: 90 sec
- Electrical connection: 24 V / 50 Hz
- Wattage: 2.5 W
- Weight: 3.02 lbs
- Grey terminal box, LWH: 3.7 x 3.7 x 2.2 in
- Data cable Y(ST)Y 2 x 2 x 0,6; 32.8 ft

- Connect the drain line. Make sure it is free of stress. No forces shall be applied to the drain cock / pipe coupling of the service water tank.
- The building owner is recommended to install a shut-off valve and a releasable threaded connection.
- For the activation and setting of parameters of the AutoDrain function, please refer to the Chapter 9.1.1 for tank settings and to the Chapter 9.1.5.1 System settings.

Space for personal notes:

14.2. Mains water flow sensor (Article 815070)

Additional flow sensor (uncalibrated) for measuring the mains water flow rate.
Sensor with a flow rate of up to 52,83 g.p.m.

14.2.1. Installation

Make sure the flow sensor is installed and sealed in between the mains water make-up valve at the tank and the water mains entry point of the building.

The electrical connection shall be in accordance with the circuit diagram
DEHOUST *GWtec®* ▸ ***Mains water flow sensor***

14.2.2. Technical data

- Inlet: 1 1/2" IT
- Outlet: 1 1/2" IT
- Control: ModBus
- Electrical connection: 24 V / 50 Hz
- Wattage: 2.5 W

14.3. Service water flow sensor (Article 815075)

Additional flow sensor (uncalibrated) for measuring the service water flow rate.
Sensor with a flow rate of up to 52,83 g.p.m.

14.3.1. Installation

Connect and seal the flow sensor in the service water line.

The electrical connection shall be in accordance with the circuit diagram
DEHOUST *GWtec®* ▸ ***Service water flow sensor***

14.3.2. Technical data

- Inlet: 1 1/2" IT
- Outlet: 1 1/2" IT
- Control: ModBus
- Electrical connection: 24 V / 50 Hz
- Wattage: 2.5 W

For activating the service water flow sensor, please refer to the Chapter 9.1.1 und 9.1.5.1

14.4. GWtec® rainwater feeder package (Article 813457) with RFT rainwater filtration tank (Article 962046)

GWtec® rainwater feeder package for automatic rainwater make-up through the RFT rainwater filtration tank in a Dehoust *GWtec®*-type greywater treatment and reuse system.

The rainwater feeder pump and tank level monitoring are controlled via the *GWtec®* greywater treatment station.

14.4.1. Installation

14.4.1.1. Hydraulic connection

Install the RFT rainwater tank in parallel to the greywater filtration tank and connect it with the *GWtec®* station.

Screw the 1 ¼"external thread of the supplied floating intake line into the suction inlet of the feeder pump.

Place the feeder pump in a stable position onto the bottom of the external rainwater cistern.

Connect the discharge outlet of the feeder pump in a tight, fixed and stress-free manner to the building's feeder piping, which is installed on the *GWtec®*.

Connect the building's booster piping in a tight, fixed and stress-free manner to the appropriately labelled fitting on the service water storage tank of the *GWtec®*.

- To ensure fault-free operation of the GWtec® system, you should only use the original service water feeder pump included in the delivery.
- Never allow the feeder pump to hang from the feeder pipe by its dead weight.
- The float switch of the feeder pump must be freely movable.

- The floating intake line must be freely movable in the external rainwater cistern without hitting any obstacles.
- When dimensioning the feeder piping, select a cross-section size meeting the technical specifications.
- Dirt can get into the feeder piping during laying of the pipe.
  Therefore, you are recommended to flush the booster delivery line before connecting it to the service water storage tank.

14.4.1.2. Electrical connection

Lay the power supply cable of the rainwater feeder pump up to the *GWtec®*, extend the cable, if necessary.

Connect it to the *GWtec®* (refer to Chapter 6.1.4 "Cabling of modules").

Never allow the feeder pump to hang from the feeder cable by its dead weight.

For activating the rainwater make-up function, refer to the Chapters 9.1.1 and 9.1.5.1.

14.4.1.3. Tank level monitoring

An immersion pressure sensor is installed to monitor and visualize an external rainwater cistern. The immersion pressure sensor is suitable for water depths from 1 to 6 meters and has a more than 25-metre-long connecting cable.

The connecting cable must not be buried in the ground without protection. For buried installation, it is advisable to use a suitable DN 100 (4") underground pipe and lay the connecting cable inside the pipe between the external rainwater cistern and the *GWtec®*.

Never allow any water to penetrate into the protective tubing of the connecting cable. This may cause irreparable damage to the stainless-steel sensor. For protection during installation, it is advisable to seal the open end of the connecting cable with an adhesive tape.

Place the stainless-steel sensor head in a horizontal position on the bottom of the external rainwater cistern. Pull the entire connecting cable with protective tubing through the conduit up to the GWtec® Station in a way to ensure that the taut connecting cable with protective tubing can reach down to the bottom of the external rainwater cistern.

Connect it to the *GWtec®* (refer to Chapter 6.1.4 "Cabling of modules").

The sensor is delivered with detailed instructions.

14.4.2. Technical data

- Delivery rate, Qmax: 72,65 g.p.m.
- Delivery head: max. 44.3 ft
- Immersion depth: max. 32.8 ft
- Supply voltage: 230 V / 50 Hz
- Nominal power: 1,100 W
- Class of protection: IP 68
- Connection at discharge side: 1 ¼" IT
- Connection at suction side: 1 ¼" IT
- Stainless steel baseplate: 6.3 in
- Weight: 24.25 lbs.

14.4.3. General Information

The rainwater feeder pump has approval for operation

- for pumping service water (rainwater, well water)
- for installation in an existing rainwater storage space (e.g. cistern, buried tank)
- up to a maximum immersion depth of 33 ft (10 meters)
- in the environment of residential, office and commercial areas and small businesses

15. Customer services

15.1. Digital access to technical documentations

You will find a QR code on the inner surface of the door of the *GWtec®* controller. Please scan this code. You will then have direct access to our DEHOUST Cloud, and all our technical documents stored there for your specific equipment.

15.2. Notice for the residents of a building with a greywater reuse system (fill-in form)

DEHOUST

TO THE RESIDENTS - IMPORTANT INFORMATION
NEW TECHNOLOGY TO SAVE DRINKING WATER

Ladies and Gentlemen,

In your residential building, the waste water from the shower, bath, sink and washing machine is recycled using a modern in-house waste water treatment plant of the DEHOUST GWtec® 44 - system type, so that it can be reused as so-called *process water*. Implementation took place on .

This process water is not food-safe, but is of high quality, so that it is absolutely harmless from a health point of view and is ideal for flushing toilets, filling washing machines, cleaning floors or watering gardens, for example.

As a resident of this house, you now have a decisive advantage:
You make a very significant contribution to protecting our environment. You save valuable drinking water and protect your wallet at the same time.

We ask for your help to ensure that the biological-mechanical recycling process works and that we can guarantee the full operational reliability of the grey water system at all times:

- Please use a suitable **hair strainer** in the drain of your shower.
- Only use **biodegradable** body care products for showering, bathing and hand washing.
- Please **do not pour any paint residues, textile/hair dyes, varnishes or other discolouring additives** down the drain of the shower/bathtub/sink.
- **Chemicals** (e.g. bleach such as chlorine or hydrogen peroxide as well as medication and building materials (paint, plaster, etc.) must always be disposed of properly and in an environmentally friendly manner - **never in the sewage system**!
- Please **only use biodegradable** powders or liquid detergents (also such as in pods / caps, discs, etc.) that **do not contain bleach for laundry**.

Thank you very much!

*) The process water treated in this way far exceeds the hygienic-microbiological requirements according to DIN EN16941-2 and DWA data sheet M277.

www.dehoust.com
info@dehoust.de

DEHOUST

How does grey water treatment work?
For all those who want to know more.

Our DEHOUST grey water treatment system for the utilisation of process water treats slightly contaminated waste water (the technical term is "grey water") from baths, showers, sinks and, where applicable, washing machines to produce high-quality process water.

Wikipedia:
Process water (often also referred to as **service water**) is water that is used for a specific technical, commercial, agricultural or domestic application. Unlike drinking water, process water is not intended for human consumption, but should meet a certain minimum hygiene standard.

To obtain process water, grey water is treated mechanically and biologically using high-quality filter technologies. Afterwards, the process water obtained in this way meets the hygienic/micro-biological quality requirements of the European standard EN 16941-2 (systems for the use of treated grey water) and can thus be reused; an ecologically and economically sensible measure.

First, the incoming raw grey water is mechanically filtered through a coarse filter to remove all undissolved water constituents such as lint or hair. An automatic back-flushing unit cleans the filter at regular intervals.

In the next step, the recycling system ensures that all organic, degradable water constituents such as shower gel, shampoo, soap, etc. are broken down with the help of special micro-organisms.

After a subsequent short resting phase, the pre-treated grey water is passed through a microfine filter. Its mesh threads are 2,500 times finer than a human hair and safely retain all solid particles, germs and viruses in the system.

The filtration process is controlled by a specially developed software programme to ensure optimum filtration performance and a long service life.

Thanks to the very high quality of the process water obtained from this filtration – it is absolutely clear, odourless and germ-free – it is hygienic and health wise unobjectionable. It can be stored for a long time and is ideally suited for a variety of other recycling applications.

ANYONE WHO OPTS FOR GREY WATER TREATMENT IS LOOKING OUT FOR FUTURE GENERATIONS AND ACTS IN A FORWARD-THINKING AND ENVIRONMENTALLY CONSCIOUS MANNER.

www.dehoust.com
info@dehoust.de

16. Declaration of Conformity

EU – Konformitätserklärung Nr.2024-01
EU declaration of conformity No. 2024-01

DEHOUST

Wir bestätigen die Übereinstimmung mit den grundlegenden Anforderungen der europäischen Richtlinie(n) /
We confirm the conformity to the essential requirements of the European directive(s)

- MRL 2006 / 42 / EG 2014/30/EU
- DIN EN 1717

Die EU-Konformitätserklärung gilt für folgende Geräte und Produktbezeichnung /
The EU declaration of conformity applies to the following units and Product Designation

Produktbezeichnung / *Product Description / Appellation*:
Grauwasseranlage

Typ / *Type:*
DEHOUST GWtec® 140 - DEHOUST GWtec® 440

Artikelnummer / *item*:
813371 - 813374

Hersteller / *Manufacturer*:
Dehoust GmbH, Gutenbergstr 5-7, D - 69181 Leimen

Als Norm(en) wurde(n) hauptsächlich angewandt /
The following standard(s) was (were) manly applied:

- EN ISO 12100,
- EN 60204-1:2018, ISO *IEC 60204-1*:2016

Leimen, 11. 01.2024
Place and date of issue

ppa. Mike Weber

Dehoust GmbH
69181 Leimen
Gutenbergstraße 5-7
Tel. +49 (0) 6224/9702-0
www.dehoust.de

Niederlassungen:
31582 Nienburg
Forstweg 12
Tel. +49 (0) 5021/9703-0

01809 Heidenau
Dürerstraße 1
Tel. +49 (0) 3529/5658-0

53783 Eitorf
Wecostraße 7–11
Tel. +49 (0) 2243/9206-0

Geschäftsführung:
Wolfgang Dehoust,
Andreas Bichler
Amtsgericht Mannheim
HRB 709874,
UST-IdNr. DE 182634396

17. Disposal considerations

The operator of the system must recycle the packaging material in accordance with the local waste management regulations. At the end-of-life cycle, the equipment shall be shipped, free of freight charge for the manufacturer, to DEHOUST GmbH for disposal. All further dismantling/recycling action will be taken by the manufacturer.

DEHOUST

ENERGY. HEAT. WATER.

DEHOUST GmbH

69181 Leimen
Gutenbergstrasse 5-7
Phone +49 62 24 / 97 02-0
Fax +49 62 24 / 97 02-70
info@dehoust.de

31582 Nienburg
Forstweg 12
Phone +49 50 21 / 97 03-0
Fax +49 50 21 / 97 03-70

01809 Heidenau
Dürerstrasse 1
Phone +49 35 29 / 56 58-0
Fax +49 35 29 / 56 58-70

53783 Eitorf
Wecostrasse 7–11
Phone +49 22 43 / 92 06-0
Fax +49 22 43 / 92 06-66

www.dehoust.com