



Operating- and Maintenance Manual



**Roediger® Vacuum toilet cpl.
Type Laufen ship standard
Article no.: 410001762**

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1. Notes on the Installation, Operation and Maintenance Manual

1.1 Manufacturer

Manufacturer: **Aqseptence Group GmbH**
Vacuum Technology Systems

Betriebsstätte Tostedt
Auf der Timmhorst 2
21255 Tostedt, Germany

1.2 Target group

The installation, operation and maintenance manual ("MANUAL") is intended for the operating personnel and service staff entrusted with maintenance and service work.

1.3 General

This installation, operation and maintenance manual contains all information required for:

- transporting
- installing
- commissioning
- removing faults
- maintaining
- shutting down
- Dismantling and disposing of the various main structural elements.

This MANUAL forms part of the technical documentation.

1.4 Signal words

The following signal words used in this installation, operation and maintenance manual are intended to draw your attention to certain facts and different hazard levels.

DANGER

This symbol marks a possible high-risk hazard which may result in death or serious body injury if the safety precautions specified are not taken.

WARNING

This symbol marks a possible medium-risk hazard which, if not avoided, may result in death or (serious) bodily injury.

ATTENTION

This symbol marks a possible low-risk hazard which, if not avoided, may result in light or medium bodily injury or material damage.

NOTE

This symbol marks important information about the individual subassemblies, handling of the individual subassemblies, or the respective part in the MANUAL to which your special attention should be drawn.

1.5 Copyright and rights of use

Aqseptence Group GmbH shall have the right to be referred to as the originator on its products, on all items reproduced and in publications concerning the product. Any violation of this right shall entitle Aqseptence Group GmbH to claim indemnification. Without proof Aqseptence Group GmbH may claim 100% of the customary remuneration as indemnification. Any proposals and instructions by the customer or the customer's employees and agents shall not influence the amount of the remuneration. Nor shall they result in a shared copyright.

Aqseptence Group GmbH is not obliged to submit any files or layouts (so called raw files) created by computer to the customer. If the customer requires submission of such computer data this shall be subject to a separate agreement and payment. If Aqseptence Group GmbH has provided any computer files to the customer, such files may only be changed with the prior consent of Aqseptence Group GmbH.

2. Safety

2.1 Transport

The vacuum toilet is delivered in a packaging (carton) on a pallet.
The packaging contains information on the positioning.
The transport may only be carried out with suitable means of transport.

VORSICHT

Risk of injury due to use of means of transport.

When using means of transport, incorrect applications may cause serious injury and material damage.

NOTE

Transportation, installation and first commissioning (also after relocation of any subassembly or of the plant) may only be carried out by staff of the manufacturer or persons authorised by the manufacturer.

Otherwise all liability and warranty claims shall be void.

DANGER



Danger due to suspended loads.

There is danger to life when suspended loads drop down. Serious injuries may be caused by loads swinging out.



- Stand clear of suspended loads.
- Do not stand between load and wall.
- Wear personal protective equipment (protective shoes, hard hat).
- Use only suitable and technically perfect lifting gear and means of transport for transporting, lifting and moving loads.
- Use only suitable and technically perfect lifting tackle.
- Lifting gear and means of transport may only be operated by authorised persons.
- Use only the specified fastening points.

Observe the accident prevention regulations of the trade associations and any supplementary regulations.

2.2 Intended use

The vacuum toilet is designed exclusively for:

- For the disposal of excrements and excretions from the human body.
- These are removed by pressing the flushing button via a connected vacuum system.
- Use for another purpose is not allowed.

Intended use includes observing:

- all instructions in this MANUAL
- the generally recognized rules of technology
- all relevant laws, standards and regulations

2.3 Foreseeable misuse

Any use for purposes other than those mentioned above is considered contrary to the intended use. The manufacturer cannot be held liable for any damage to persons or material damage resulting from such unintended use. The risk of such misuse lies entirely with the user.

ATTENTION

Danger of injury due to the use of third party components.

Malfunctions may occur if third party components are used. These may result in serious injury or considerable material damage.

Use exclusively original spare parts for maintenance and service work.

2.4 General safety instructions

The vacuum system has been built in accordance with all binding legal regulations and safety rules. It complies with state-of-the-art standards and the requirements of EC conformity.

Nevertheless the vacuum system may constitute a risk to persons and material property, when used incorrectly or contrary to its intended use. The user must therefore ensure that every person working on or with the vacuum system has read and understood the MANUAL and in particular chapter 2 "Safety" of this MANUAL.

WARNING

Danger of injury during fault removal and maintenance.

Fault removal and maintenance of the plant may only be carried out by qualified, commissioned and instructed service staff.

ATTENTION

Danger of injury due to the use of third party components.

Malfunctions may occur if third party components are used. These may result in serious injury or considerable material damage.

Use exclusively original spare parts for maintenance and service work.

2.5 Mechanical hazards

DANGER



Danger of injury by slipping.

Slipping and falling onto the ground or hard or pointed objects poses a serious injury hazard.

Remove any leaking wastewater. Close wet areas during and after cleaning.
Wear protective shoes.

WARNING



Danger of injury due to vacuum and rotating parts.

There is danger of crushing when body parts (hands) and protective clothing (textiles) are drawn in by the vacuum and rotating parts.



Before any maintenance work is carried out on vacuum pipes, suction pipes and pumps the plant must be shut down and secured against accidental restarting.

ATTENTION

Health hazard caused by leaking.

The waste water is transported through the evacuation valve into the connected vacuum system. Do not open any components of the waste disposal unit without convincing yourself that they are unpressurized and that no wastewater can leak out.

Eliminate leaked sewage. Block wet surfaces during and after cleaning.

Wear protective shoes.

Authorized maintenance personnel can shut off parts of the system by closing the appropriate valves.

The personnel must practice the closing of plant parts in operation and get to know the dangers arising.

2.6 Hygienic measures

The vacuum toilet is intended exclusively for the absorption of excrement and excretions from the human body and subsequent release of the wastewater via the vacuum system into the sewage system.

The vacuum toilet, the evacuation valve and the additional vacuum line are contaminated by sewage. The wastewater can be contaminated with pathogens that can affect health.

ATTENTION



Danger of infection by skin contact/inhalation of pathogens from wastewater.



- Grazes, cuts or other wounds should receive immediate medical attention.
- Wash your hands, forearms and face thoroughly with a disinfectant-soap solution before eating, smoking and before going to the toilet.



- Wear a mask when installing or removing discharge pumps or opening the tank.



- Wear personal protective equipment.

2.7 Protective clothing

In the case of work on components of the vacuum toilet, the personnel must carry the appropriate personal protective equipment.

Use required personal protective equipment:



- Protective suit



- Protective gloves



- Protective goggles



- Safety shoes



- Protective face mask

NOTE

Change protective clothing daily.

Keep contaminated clothing in separate containers intended for this purpose.

Wash contaminated clothing before next use.

NOTE

Clean and subsequently disinfect.

The working area should be kept clean, tidy, sanitary and dry.

3. Application / Function

3.1 Application

The vacuum toilet is used in the field of sewer and sanitary engineering in buildings as well as in shipbuilding (e.g. marine, maritime, yachts).

3.2 Purpose

The vacuum toilet is used to dispose of excrements and excretions from the human body. These are removed by pressing the flushing button via a connected vacuum system. Use for any other purpose is not allowed.

3.3 Components

Vacuum toilet wall-mounted Laufen ship standard article no.: 410001762

Consists of:

- Toilet bowl wall-m. toilet Model Laufen article no.: 318020000
- Equipment set f. Laufen wall WC ship article no.: 410001759
- WC seat Universal White for Laufen a VA article no.: 400008720

4.1 Structure and Description of function

The vacuum toilet contains three functional elements:

- a) The suction valve (1) separates the under atmospheric pressure toilet bowl from the vacuum tube system.
- b) The water valve (7) separates the fresh water line from the rinse nozzles in the toilet bowl
- c) The button control (3) controls all functions of the vacuum toilet

4.1.1 Structure

The button control is located above the toilet. Optionally, it can also be fastened in a flush-mounted box. (See 6.3.1 Special accessories) The button control is connected to the suction valve and the water valve via three control lines (11/12/13):

- a) Button control connection "u" - control line 11 - vacuum buffer – non return valve – vacuum suction valve - function: decrease of the control vacuum
- b) Button control connection "AV" - Control line 12 - Suction valve - Function: Opening of the suction valve
- c) Button control connection "WV" - Control line 13 - Water valve - Function: Opening of the water valve. Optionally, a USPH connection set can be inserted between the fresh water connection and the water valve. (See 6.3.1.

4.1.2 Description of function

By pressing the button control (3), the flushing process is initiated and the vacuum is transmitted via the control line (12 green) to the suction valve (1) and via the control line (13 purple) to the water valve (7). After the flushing time set in the knob control (3) has elapsed, the suction valve (1) closes the water valve after a delay time set by the adjusting screw (6) in the knob control. The rinsing process is completed and the toilet bowl is again provided with a water mask. If the vacuum in the vacuum system has dropped below a value of -0.35 bar, the flushing process will not be triggered when the button control is actuated. The rinsing process is stored and automatically triggered after the negative pressure has increased to - 0.38 bar.

The flushing time of the vacuum toilet can be varied by turning the adjustment screw (10) at the rear side of the push button (3), see figure 1.

The after running time of the water valve (7) can also be varied by turning the adjustment screw (6) of the push button (3), see figure 2.

4.2 Technical data

Working vacuum range:	-0.35 bar to -0.6 bar
Water consumption:	0.7 l - 1.2 l
Water pressure:	min. 1 bar, max. 5 bar
Air volume:	ca. 60 l per flushing
Flow rate V:	0.07 l/s
Weight:	26.6 kg
Material toilet:	ceramic
Maximum torque fastening:	5 Nm 0,5 Kg

5. **EC Declaration of Conformity**



Declaration of conformity

In accordance with EC directives

We hereby declare that the Valve described below, in its design and construction as well as in the version which we have placed on the market, complies with health and safety requirements of the EG Directive 2006/42/EG. In the event of a change of the machine not agreed with us, this declaration will lose its validity.

Article Description: Vacuum Toilet Ship
Series I: Roediger; Laufen

System: *Roediger®*
Material-No.: 410001732 / 410001762

Manufacturer: *Aqseptence Group GmbH*
Vacuum Technology Systems
Kinzigheimer Weg 104
D-63450 Hanau

The following national standards, guidelines and specifications were applied:

- EU- Directive 2006/42/ EG

The Roediger® operating instructions for the Vacuum Toilet are available.

- ⊗ In the original version
- ⊗ in the language EN

Hanau, 19.02.2018


ppa. Volker Zang
Global Product Director


i.A. Roger Kießling
Product Manager

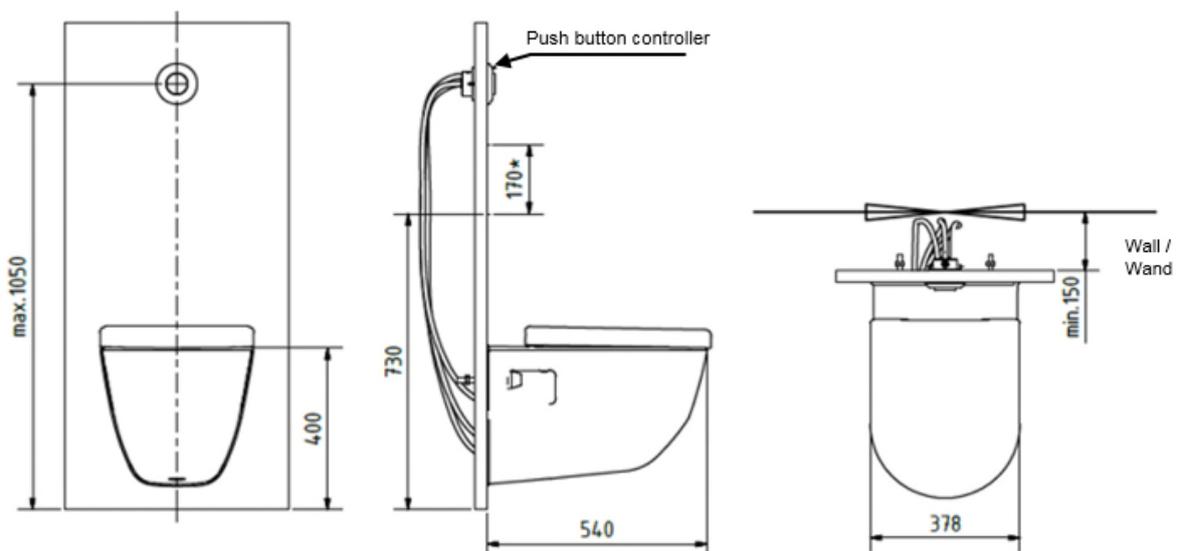
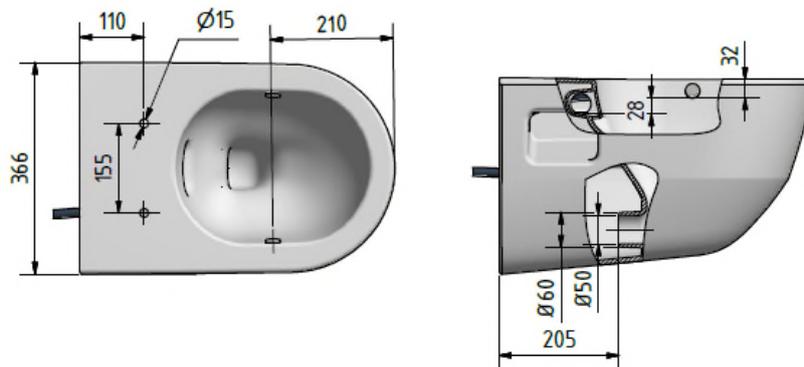
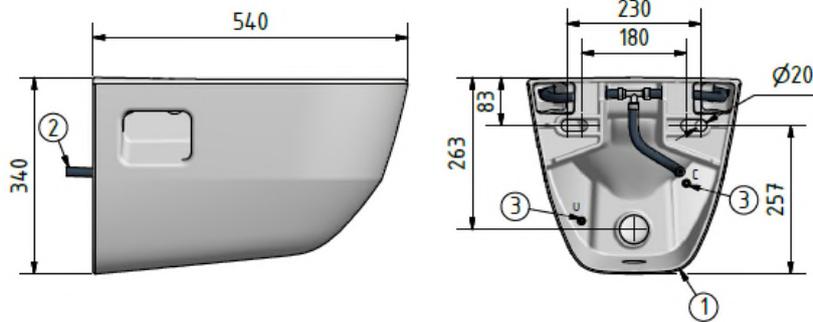
**A brand of
Aqseptence Group**

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6. Description of product

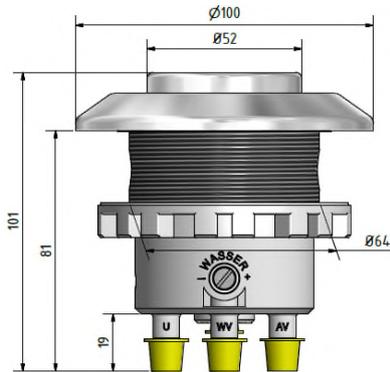
6.1 Pictures / Drawings

Toilet type Laufen article number: 318020000



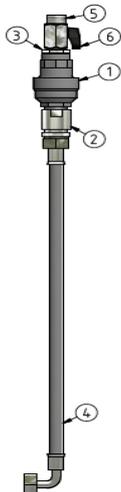
6.2 Operating element

Push button controller article no: 330031000



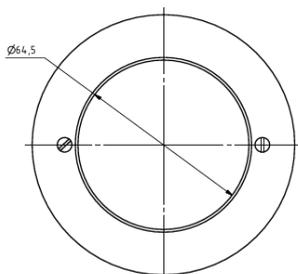
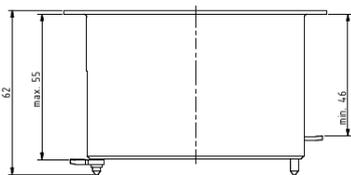
6.3 Special accessories

6.3.1 USPH Set: Article-no: 410007410

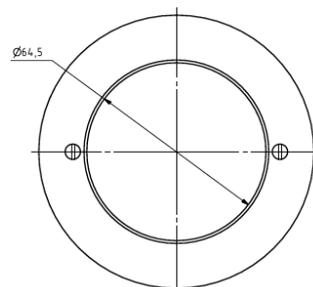
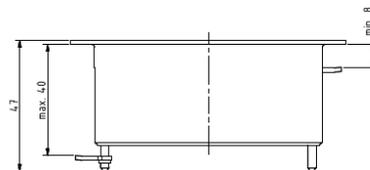


- 1 Water block 3/4"
- 2 Tube diffusers
- 3 Double tip
- 4 Armored hose
- 5 Ball valve
- 6 Handle ball valve

6.3.2 Button housing long version Article-no.: 311234002



Button housing short version Article-no.: 311234001



6.4 Assembly

Standard tool can be used for mounting.

 **NOTE**

The assembly and the first commissioning (even after conversion of the module or system) may only be carried out by the manufacturer's employees or by persons authorized by the manufacturer.

Otherwise the liability and any warranty claim will be void.

6.5 Commissioning

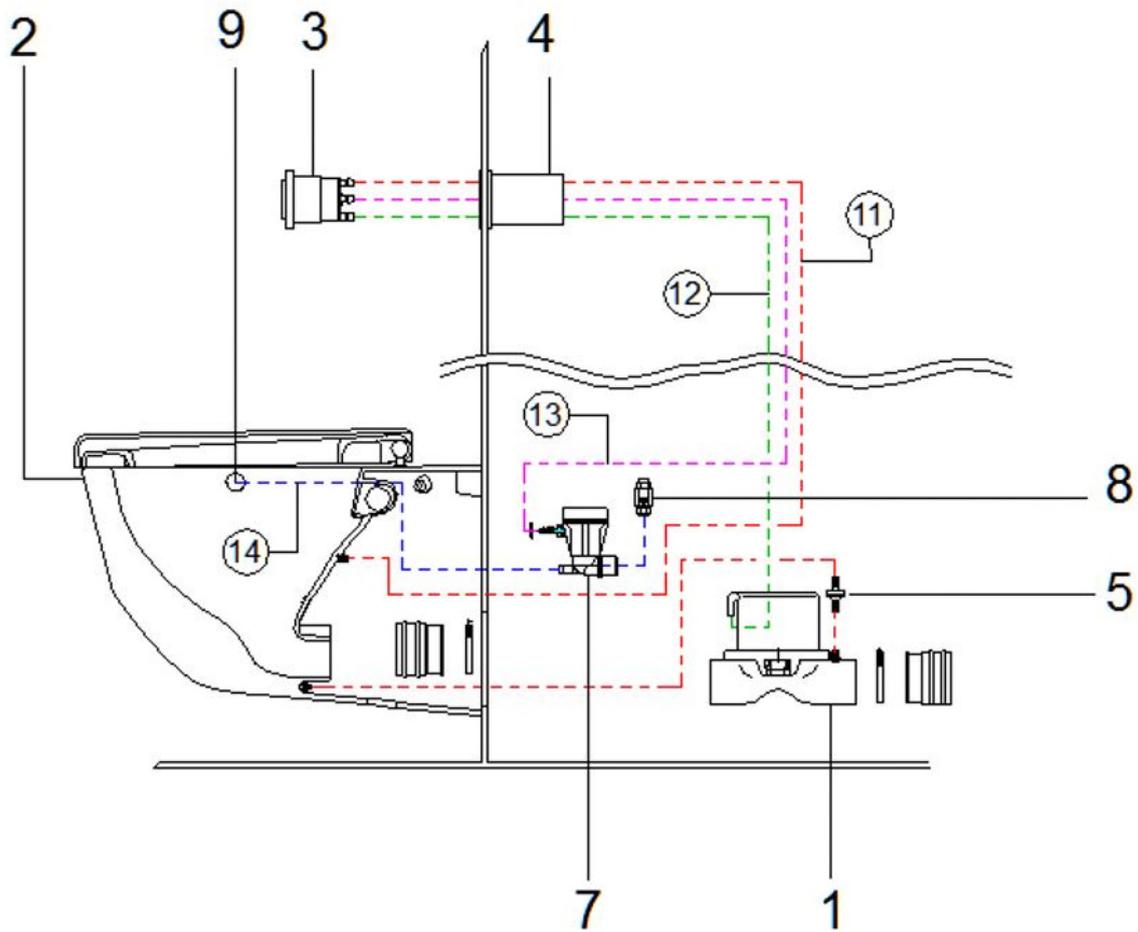


Figure 1

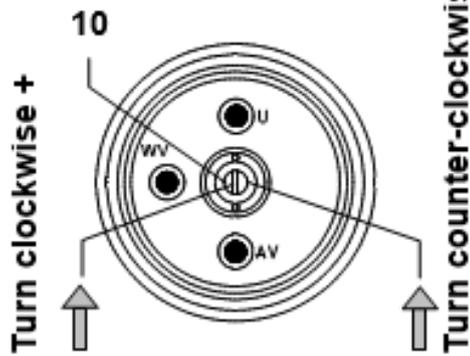
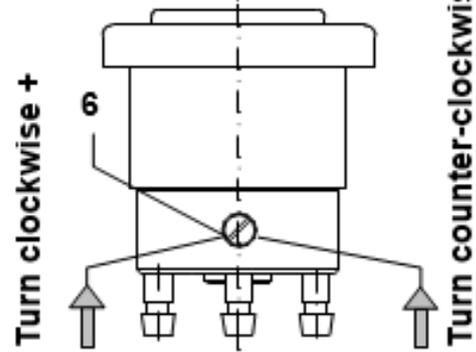


Figure 2



Before the toilet is installed and before the vacuum toilet is started-up please check the following items:

- The controller hoses are properly installed. They must all be pulled until the end onto the connection nozzles avoiding however that they snap off!
- The non-return valve (5) shall be installed correctly. The black side show to the vacuum valve. If required correct the installation of the non-return valve.
- Check if the controller hoses (11/12/13/14) and the interface valve (1) are filled with suctioned liquid. If so, remove liquid or dirt out of the controller hose or of the interface valve. Before removing the vacuum valve (1) for test purpose please close the vacuum connection. Then dismantle the vacuum valve (1) and remove the liquid from the valve. Reinstall the valve in reverse order after the control.
- Open the ball valve (8) for the flushing water process.
- Install the toilet body (2) and test the operation of the vacuum toilet operation by pressing the push button control (3). The whole flushing process of the vacuum toilet shall take approx. 5 seconds. If the opening time of the water valve (7) and of the interface valve (1) are not adjusted correctly, these times can be changed at the push button control (3). In order to realize this change the push button control (3) depending on the installation variant, can be set from the back of the cabin wall or pulled out of the optional flush-mounted box (4) (special accessories).
- Afterwards, the opening time of the vacuum valve (1) can be changed via the adjustment screw (10) and the opening time of the water valve (7) by turning the adjustment screw (6) Figure 2. Then push the button control (3) back into the flush-mounted box (4) (optional accessory).

If the opening time is adjusted correctly and the proper function of the vacuum toilet is proved the vacuum toilet can be commissioned.

Attention!

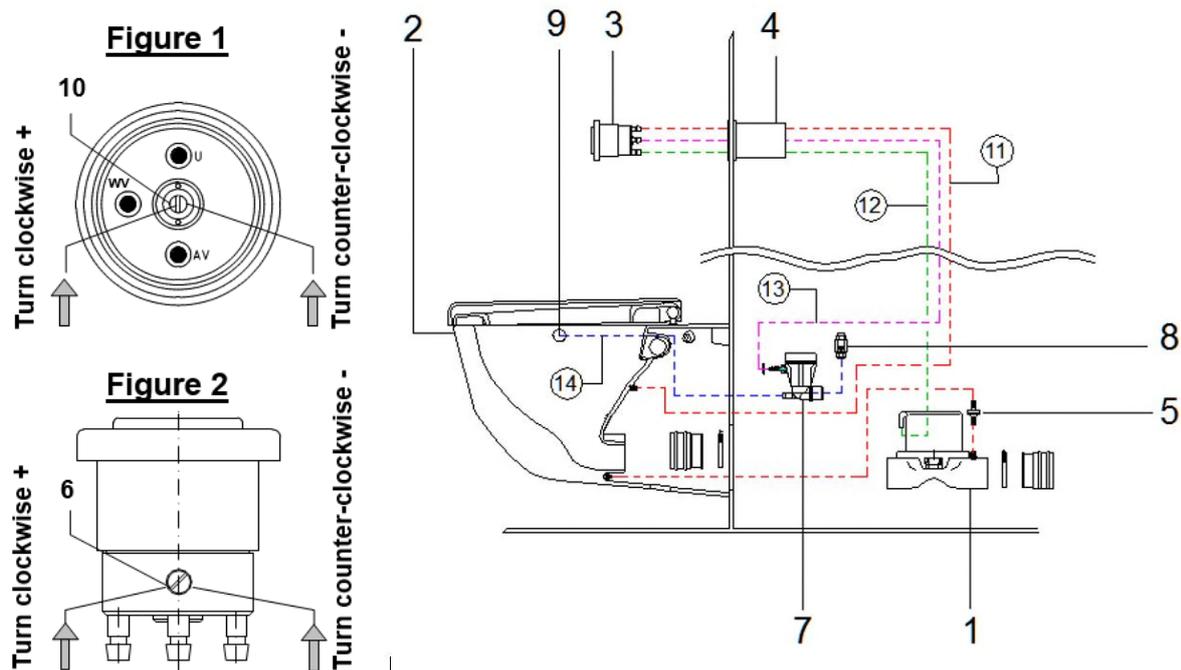
In case the remaining water quantity in the toilet bowl is too low because the pressure in the fresh water system is rather low it can be adapted to the fresh water pressure by turning the adjustment screw (6). If the connected vacuum line is a lifting line and the distance from the connection to the vacuum station is quite large, the opening time of the interface valve (1) should be adapted to the requirements. This means the opening time of the interface valve (1) shall be enlarged via the adjustment screw (10).

NOTE

The assembly and the first commissioning (even after conversion of the module or system) may only be carried out by the manufacturer's employees or by persons authorized by the manufacturer.

Otherwise the liability and any warranty claim will be void.

7. Troubleshooting



7.1 The vacuum toilet does not exhaust.

Possible cause

1. The pneumatic push button (3) does not activate cause of an insufficient vacuum pressure
2. The interface valve (1) is blocked.
3. The interface valve (1) is defect and does not open.
4. The control lines (11/12) are blocked or buckled.
5. The back flow valve (5) is not installed in the right way or is blocked.

Remedy

1. Check the vacuum station and the pipeline system. The pneumatic push button just actuates at a vacuum pressure at -0.34 bar. If there is existing a sufficient vacuum pressure, at the push button control (3) on the back of the cabin wall pull or put out of the on-wall box (4) (optional accessory), pull the control line (11) off the hose nozzle and check if there is vacuum at the control line. If there is existing no vacuum, there is a blockage in the mains. Locate the blockage and remove it. Then reconnect the push button with the control hose and secure it in the wall.
2. Close the vacuum line. Remove the vacuum toilet off the wall, remove the vacuum valve (1). Before removing the vacuum valve and close the vacuum line. Remove the blockage at the vacuum valve (1) and reinstall the vacuum toilet again (in reverse order). Open the vacuum line.
3. Close the vacuum line. Remove the vacuum toilet off the wall, exchange the vacuum valve (1) (see also note next page) and reinstall the vacuum toilet in reverse order. Open the vacuum line.
4. Close the vacuum line. Remove the vacuum toilet off the wall, pull the control lines (11/12/13) off the hose nozzle and remove the blockage in the control lines (11/12). Reinstall the vacuum toilet in reverse order. Open the vacuum line.
5. Close the vacuum line. Correct the installation of the non-return valve (5) or exchange the non-return valve. Open the vacuum line.

7.2 There is not enough dishwasher available.

Possible cause

1. The flow pressure of the supply of the fresh water is insufficient.
2. The ball valve (8) is not open or not totally open.
3. The available water will be exhausted without activating the pneumatic push button (3).

Remedy

1. Depending on the installation variant, can be set from the back of the cabin wall or pulled out of the optional flush-mounted box (4) (special accessories).
Change the amount of the dishwasher by using the adjusting screw (6) of the pneumatic push button (3). Then reconnect the push, if there is a wall box, button secure it in the wall box (4) (special accessories).
6. Close the vacuum line. Remove the vacuum toilet off the wall, open the ball valve (8) totally and reinstall the vacuum toilet again (in reverse order). Open the vacuum line.
2. Close the vacuum line. Remove the vacuum toilet off the wall, clean or exchange the vacuum valve (1) (see also note at this page) and reinstall the vacuum toilet in reverse order. Open the vacuum line.



NOTE

We recommend that, if the existing vacuum valve is not a type AV KM50, to exchange into the current version. The serial number of AV 50KM starts with 230.....
Current AV 50KM article number 410001565.

7.3 The water valve does not close after the actuation.

Possibly cause

1. The actual pressure in the pneumatic push button (3) is not sufficient to close the pneumatic push button.
2. The push button (3) inside is dirty.

Remedy

1. Depending on the installation variant, can be checked from the back of the cabin wall or pulled out of the optional flush-mounted box (4) (special accessories) pull the control line (11) off the hose nozzle (U) and check if there is sufficient vacuum pressure in the control line. Then connect the control line (11) again with the hose nozzle (U) reinstall the pneumatic push button, if there is a wall box. If there is existing no or less vacuum, there is a blockage in the mains. Locate the blockage and remove it. Then reconnect the push button with the control hose and secure it in the wall.
2. Exchange the pneumatic push button (3) to a new one. If there is no new pneumatic push button (3) available, put the vacuum toilet out of action by pulling out the control lines (11 and 13) and closing the controller hose (11) with a plug or an insulating tape.



NOTE

If errors cannot be rectified by the service technician, the manufacturer must be notified.

8. Maintenance

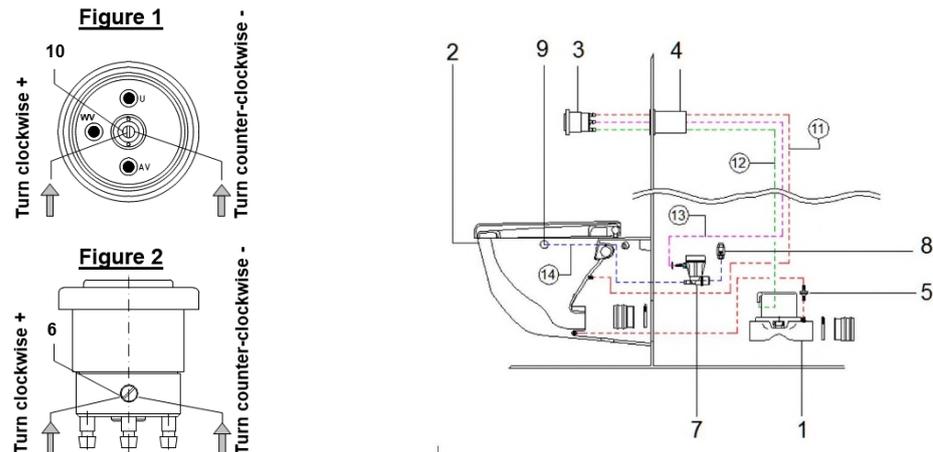
The functional checkup of the vacuum toilet for the operator is carried out by the daily use.

The support of the vacuum toilet body and the toilet seat can be done with standard cleanser.

8.1 Maintenance interval

Maintenance-free! Maintenance only in the event of a fault by trained specialist personnel.

8.2 Maintenance work



The following operations must be accomplished once a year.

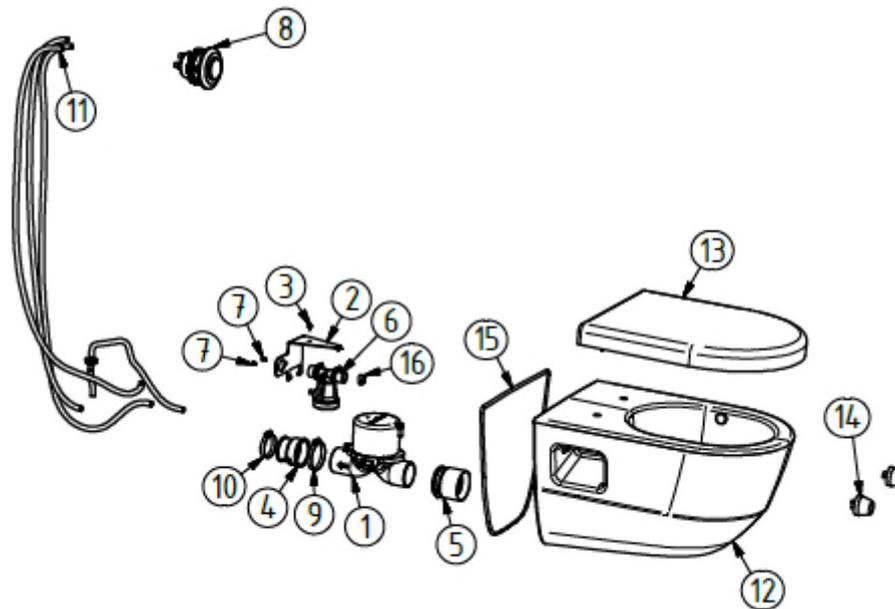
- Checkup of the external condition of the vacuum toilet.
- Checkup of the drain connection for leaks.
- Checkup of the control lines (11/12/13/14) for leaks.
- Checkup of all the control tubes concerning absorbed liquids or dirt. If necessary, remove the liquid and the dirt of the control lines or change the tubes.
- Checkup of the back-flow valve (5) for leaks and function. If fouling exists, exchange the back-flow valve (5).
- Functional checkup of the vacuum toilet by pressing the pneumatic push button (3). The entire flush event should take about 5 sec. If the opening time of the water valve (7) and of the interface valve (1) is not right, these times have to be adjusted at the pneumatic push button (3) again. (For adjustment see point 6.5).
- If there is more than one vacuum toilet connected in this ship project, random tests should be done at the vacuum toilets.

NOTE

If errors cannot be rectified by the service technician, the manufacturer must be notified.

9. Scope of delivery / spare parts

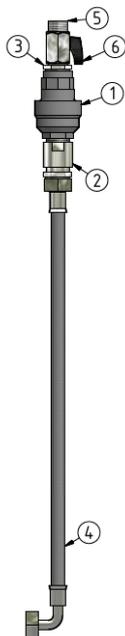
9.1 Scope of delivery spare parts



Description		Article-no.:	
	Vacuum toilet wall-mounted complete ship standard.		410001762
Pos.	Content	Piece	
1	Vac. valve Roe. 50/KM	1	410001565
2	Vacuum toilet / mounting panel	1	400006923
3	Tapping screw raised head A2 7981 4,8x9,	1	381111500
4	Vacuum valve 50 / rubber coupling 63/50	1	318053000
5	Konfix fitting DN50 with clamp 50-70W2	1	318012500
6	Water valve	1	330021500
7	Screw raised head DIN7985 A2 M4x8	2	400002304
8	Toilet push button control wall-m. chro.	1	330031000
9	Zebra hose clamps B 9 mm (50-70)	1	330505000
10	Zebra hose clamp B 9mm black7 40-60	1	364001000
11	Hose kit for wall-mounted toilet	1	318017520
12	Toilet bowl wall-m.toilet Model Laufen	1	318020000
13	WC seat Universal White for Laufen a VA	1	400008720
14	Cap set for vacuum toilet	1	318015000
15	Vacuum toilet / connection profile 5	1	318016500
16	Zebra hose clamp B 9mm black7 8-16	1	364002800

9.2 Scope of delivers spare parts accessories

9.2.1 USPH Set



POS	Article	Art. no.:	
	ZUB Toli ROE USPH Water connection ship	1	410007410
		Set	
	Content	NO.	
1	Water Block 3/4"	1	400004224
2	Pipe aerator DN20x20' chromed	1	400009034
3	MS double nipple red. 3/4" x 1/2"AG	1	400009030
4	Flex.hose VA DN8 3/4"ÜMx3/4"ÜM 90'	1	400009036
5	Ballofix ball valve DN15R ½" I/A	1	400009032
6	Ballofix handle mini-ball valve. DN6-15	1	400009033

9.2.2 Button housing

Short version
 Long version

Article no.: 311234001
 Article no.: 311234002

10. *Disassembly and disposal*

10.1 Disassembly

After the end of use of the Roediger®- vacuum toilet disassembly (demolition or scrapping) is carried out.

WARNING

Danger of injury.

The disassembly of the Roediger®- vacuum toilet may only be carried out by qualified, commissioned and instructed personnel.

10.2 Disposal of the plant

When any subassemblies or the vacuum toilet have been put out of service, they must be disposed of correctly sorted.

Separate iron, non-ferrous metals, plastic materials, electronic scrap etc.

Ask the local authorities for information about all applicable disposal regulations. Provide for environmentally friendly recycling of the respective materials.

10.3 Disposal of auxiliary materials



The Roediger®- vacuum toilet contains materials/consumables which must be treated and/or disposed of in compliance with the legal regulations for the protection of the environment and the user.



Cleaning agents, oils and greases are harmful to health and the environment and must not get into the ground or the public sewerage system.

11. Notes

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