EVAC OPTIMA 5 FLOOR TOILET

TECHNICAL INFORMATION
VACUUM TOILET
6559515  EVAC OPTIMA 5, FLOOR MODEL, PRESTIGE
6559519  EVAC OPTIMA 5, FLOOR MODEL, PRESTIGE SOFT CLOSE

Materials
- Bowl: White vitreous china
- Seat and cover; *Prestige and Prestige Soft Close: UF-S
- Pneumatic push button: Chrome plated plastic
- Discharge valve: Plastic parts: PP, rubber parts: NR

Operating data
- Water pressure: 3...10 bar
- Operating vacuum: -0.3...-0.6 bar
- Water consumption: 1.2 ±0.15 litres/flush (water pressure: 4 bar, vacuum: -0.4 bar)
- Air consumption: 60 ±10 litres/flush (normal atmospheric air)

Connections
- Water supply: 1/2” MPT, flexible hose
- Discharge: Rubber elbow 90°, two hose clamps are included in the rubber elbow 90° to O.D. 48-52 mm pipe.

Shipping data
- P/N 6559515 Optima 5, floor model, Prestige
  - Net weight: 20.1 ±0.5 kg
  - Shipping weight: 22.1 ±0.5 kg
  - Shipping volume: 0.168 m³
- P/N 6559519 Optima 5, floor model, Prestige Soft Close
  - Net weight: 20.1 ±0.5 kg
  - Shipping weight: 22.1 ±0.5 kg
  - Shipping volume: 0.168 m³

* Prestige seat and cover fulfill ANSI Z124.5 - 1997 [Plastic Toilet (Water closet) Seats] requirements.
VACUUM TOILET
6559515  EVAC OPTIMA 5, FLOOR MODEL, PRESTIGE
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* The vacuum breaker air inlet must be installed min. 150 mm (6") above the overflow point of the toilet.

Optional discharge connection

Discharge pipe alignment tolerance to be ± 3.0 mm.
Mounting screws on the floor

Installation kit P/N 6560988 consists of:
- Rubber elbow 1 pc
- Hose clamp 2 pcs
VACUUM TOILET
6559515  EVAC OPTIMA 5, FLOOR MODEL, PRESTIGE
6559519  EVAC OPTIMA 5, FLOOR MODEL, PRESTIGE SOFT CLOSE

- Connect the water connection hose (A) to the water valve (B).
- Connect the discharge connection pipe to the floor/wall pipe.
- Put the toilet bowl to the floor on the mounting screws (C). Push the toilet 20 mm to the arrow (D) direction. Lock the toilet by tightening the nuts (E) onto the place. !NOTE: Do not turn the screws (F). Secure the discharge connection with the hose clamps.
- Connect the shut-off valve (H) to the water supply.
- Connect the water connection hose (A) to the vacuum breaker (G).
- Install the seat and the cover.
Installation

1. Install the parts of the installation kit. Note installation order.

2. Push the hinges into the hole of the seat and the cover.

! NOTE: Do not open the seat (with the hinges inserted) hinges before assembly. The opening angle must not exceed 110°.
3. Install the seat and the cover with the hinges on the installation screws on the bowl.

4. Tighten the retaining screws with a hex wrench. (The installation kit includes two hex wrenches.)

![NOTE: Do not use excessive force.]

Do not use excessive force when closing, this may cause irreparable damage to the device.

Maintenance

The seat is easy to clean, with just a few simple directions for you to observe.
- Use mild soap solution or biological cleaners.
- Rinse the seat and cover and the hinges with water and dry with a soft cloth.
- Do not use abrasive scouring powders for the seat, cover and hinges.
- Be careful with chemicals and cosmetics. Some of them may damage the seat.
- When you use abrasive, corrosive or chlorine based cleaners for the bowl, avoid contact with the seat, cover and hinges. Therefore, when you clean the bowl and flush cleaner away, make sure that the seat and the cover are in an upright position.
VACUUM TOILET
EVAC OPTIMA 5, WALL AND FLOOR MODELS

Operation
The toilet is flushed by pressing the push button. The pneumatic push button is connected to the control mechanism with a control hose, which transports the air pulse from the push button to the control mechanism. The air pulse starts the flushing sequence and the control mechanism connects vacuum to the control connections of the water valve and the discharge valve. The water valve opens and lets rinsing water flow into the bowl through the flushing ring. After a short delay vacuum acts in discharge valve housing and forces the rubber diaphragm in discharge valve to open. Contents of the bowl is drained to the vacuum sewer by a pressure difference between the bowl and vacuum sewer. The flushing cycle in the control mechanism starts the closing cycle. Vacuum enters to the relief valve. The relief valve opens the port between atmospheric air and the discharge valve. Atmospheric air enters to the discharge valve witch closes immediately. After a short delay the atmospheric air pulse reaches to the water valve and the relief valve. The water valve closes and lets a certain level of water at the bottom in the bowl. After the flushing cycle has stopped the push button and the system will be ready for the next flush.

Start-up
• Clean the bottom of the toilet bowl.
• Check the mini-check valve and the discharge valve are clean and working correctly.
• Check the water supply hose and the filter of the water valve are not blocked up.
• Check sufficient vacuum (-0.3 bar) is available.
• Open the water supply valve in the water supply piping.
• Press the toilet push button. Pressing the button starts the flushing sequence. The discharge valve opens and the contents of the bowl are extracted by vacuum. At the same time the bowl is rinsed by water.
• When the discharge valve has been closed water level is restored in the bowl by the closing time delay of the water valve.

Monitoring the vacuum toilet in the normal operation
• Check the water valve provides the rinse water to the bowl at the same time as the discharge valve extracts the bowl contents when the push button is pressed.
• Check the push button returns to its non-activated state.
• Check after the discharge valve closes, the water valve continues to provide water to the bowl. If the water valve time delay is correctly adjusted, there should be a pool of water at the bottom of the bowl.
• Check there are no water or air leaks.

! NOTE: Water consumption is dependent on the water supply pressure and the vacuum level.

Preparation for a toilet not to be used for a long period
• Close the water supply valve.
• Run a flush cycle by pressing the push button.
• Close the toilet seat cover.
VACUUM TOILET
EVAC OPTIMA 5, WALL AND FLOOR MODELS

Cleaning instruction for the seat and cover

- The seat is easy to clean, with just a few simple directions for you to observe.
- Use a mild soap solution or biological cleaners.
- Seat and hinges should not be left damp, but be dried with a soft cloth.
- When using abrasive, corrosive or chlorine based cleaners for the bowl, avoid contact with the seat and hinges. Therefore, when cleaning the bowl, make sure that seat and cover are in an upright position until all the cleaner has been flushed away.

Scheduled maintenance program

Maintenance program is based on 20 toilet flushes per day and 20 years operation.

Every year:

- Change the flap of the mini-check valve in every toilet.
- Check operation, the push button, the seat and cover, rinse pattern, discharge pattern.
- Check possible water and vacuum leakage.
- Clean the filter (not in USPH models) in the water supply.

Every 5 years; yearly maintenance plus:

- Open and clean the filter (5774150) of the water valve.
- Clean the air filter (5778600) of the control mechanism.
- Check the flushing ring and flushing operation.

Every 10 years; yearly and 5 years maintenance plus:

- Change the rubber sleeve (6562975, 2 pcs) and the rubber diaphragm (6562653) of the discharge valve and the diaphragm (6543134) of the relief valve.
- Change the diaphragm (6560678) of the water valve.

NOTE: Use only genuine Evac spare parts.
**Description of the flushing sequence**

**In the standby position FIG.1**

The control valve (1) is closed. Vacuum in the chambers (2) and (3) is equalized by the jets (4) and (5). Force of the spring (6) holds the mechanism in the non-activated position.

**In the position immediately after the push button has been pressed FIG.2**

Air pressure applied from the flush button to the chamber (7) has lifted the lever (8) and opened the control valve (1). Atmospheric air has entered the chamber (3) through the filter (9) and the valve (1). The force from the pressure difference between (2) and (3) has moved the shaft (10) to the left and the following sequence of events has occurred:

The inlet valve (11) has closed. The vacuum valve (12) has opened. Vacuum is distributed via the check valve (13) to both open. The chamber (14) is also subjected to vacuum through the check valve (21).

This vacuum will pull the lever (8) and close the valve (1) and the timer function will start. The chamber (3) will be evacuated through the jet (5) and the pressure difference (2-3) equalizes. At the certain level, the counterforce from the spring (6) will outweigh and the cycle will go in the opposite direction:

The vacuum valve (12) will close. The air inlet valve (11) will open and vacuum will enter the relief valve (22*), the atmospheric air enters the water valve, the discharge valve and the chamber (14). The discharge valve (18) will close and somewhat later (because of the jet (17)), the water valve (19) closes when a suitable water level has been reached at the bottom of the bowl. The relief valve* closes.

**Returning to the standby position FIG.3**

The whole system goes to the standby position ready for another flush.

**NOTE:** The diaphragm (16) has the same effective area as the air inlet valve (11) to balance the vacuum forces. FIG.3

**NOTE:** Check the valve (13) ensures that connected the valves in the activated position are unaffected by changes in the vacuum supply level.

**NOTE:** If vacuum is too low or absent the function is delayed. The control valve (1) stays open until the chamber (14) is subject to vacuum.

* Only in Optima 5, Optima 5A toilets and Optima urinals
**Operation**

The functioning of the vacuum toilet/urinal is entirely controlled by the control mechanism. The operation of the control mechanism is based on vacuum in the sewage piping system. Description of flushing sequence see document 003930-3.

Jet 1 (document 003930-3, pos.5) controls the discharge valve opening time.
Jet 2 (document 003930-3, pos.4) counters the effect of quick changes in the vacuum supply.
Jet 3 (document 003930-3, pos.15) delays the vacuum changes in the chamber (14) (see document 003930-3). This prevents a new flushing procedure to start before the previous procedure has stopped.

**Maintenance**

Check that the air filters (4) and (5) are not blocked.
Check hoses and pipe connections for leaks.

**Toilet discharge time**

<table>
<thead>
<tr>
<th>Jet 1</th>
<th>Short discharge period</th>
<th>Red jet</th>
<th>1.5 sec.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal discharge period</td>
<td>Blue jet</td>
<td>2.0 sec.</td>
</tr>
<tr>
<td></td>
<td>Longer discharge period</td>
<td>White jet</td>
<td>2.5 sec.</td>
</tr>
<tr>
<td></td>
<td>Less restriction shortens the time</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Water valve opening time**

<table>
<thead>
<tr>
<th>Jet 6</th>
<th>Normal bowl water level</th>
<th>White jet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low bowl water level</td>
<td>Blue jet</td>
</tr>
</tbody>
</table>
**VACUUM TOILET**

6562976  DISCHARGE VALVE FOR EVAC OPTIMA 5 TOILETS AND OPTIMA URINALS

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**Operation**

Closed condition:
The control mechanism shuts off connection between the vacuum piping and the discharge valve housing. As the valve housing is under atmospheric pressure the spring-loaded closing mechanism closes the rubber diaphragm and isolates the bowl from the vacuum piping.

Open condition:
As the control mechanism opens the discharge valve, the housing is subjected to vacuum, thus forcing the closing mechanism to open. This in turn allows the rubber diaphragm to open, and connects the bowl to the vacuum pipe line.

Closing sequence:
The vacuum pulse enters to the relief valve. The relief valve opens the port between atmospheric air and the discharge valve. Atmospheric air enters to the discharge valve which closes immediately. After a short delay the atmospheric air pulse reaches to the water valve and the relief valve.

**Maintenance**

The scheduled maintenance for Optima 5 toilets (see doc. 004058-1).
The scheduled maintenance for Optima Urinals (see doc. 004113-2).
# VACUUM TOILET

**EVAC OPTIMA 5, WALL AND FLOOR MODELS**

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| Toilet is discharging continuously (discharge valve open) | • Foreign object in bowl or in discharge valve  
• Blocked air relief tubing  
• Quick relief valve malfunction | • Shut off the problematic branch line valve  
• Remove foreign object  
• Change discharge valve  
• Check and if necessary change control mechanism  
• Check relief valve operation |
| Bowl does not become empty when flushed | • Discharge valve blocked | • Clear stoppage, if any, in discharge valve  
• Leak in discharge valve housing  
• Discharge pipe blocked  
• Rubber sleeves leaking | • Sharp tools may damage rubber  
• Check that rubber sleeves are undamaged and correctly fitted  
• Check relief valve operation |
| No water or too little rinsing water | • Water shut-off valve closed  
• No water pressure  
• Filter full or dirt in water valve  
• Flush ring loose  
• Flush ring clogged  
• Filter blocked up in water supply | • Open valve  
• Provide water pressure  
• Clean filter  
• Connect flushing ring  
• Clean flushing ring  
• Clean filter |
| Toilet is overflowing | • Water valve jammed in open position  
• Bowl clogged or discharge valve not operating  
• Misuse (buckets of water thrown in the bowl)  
• Too low vacuum (less than 30 kPa) to flush | • Close water shut-off valve  
• Clean / change water valve nozzles, springs, rubbers.  
• Discharge bowl, valve and piping with normally flushing |
| Toilet does not flush | • No vacuum or low vacuum (less than 30 kPa)  
• Clogged mini-check valve  
• No impulse from push button  
• Jammed control mechanism  
• Jammed quick relief valve | • Check vacuum level, remove blockage in piping  
• Clean / change mini-check valve  
• Check hoses and membrane of push button  
• Change control mechanism  
• Check air filter condition. It should be place.  
• Check relief valve operation |

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### Diagram

- **Control mechanism**
- **Flushing ring**
- **Vacuum hose**
- **Relief valve**
- **Shut-off valve**
- **Filter (not in USPH models)**
- **Seal (not in USPH models)**
- **Vacuum breaker**
- **Water supply hose**
- **Water valve**
- **Mini-check valve**
- **Discharge valve**
- **Push button**
VACUUM TOILET
6562976  DISCHARGE VALVE (OPTIMA 5 TOILETS, OPTIMA URINALS)

Removal of the discharge valve (wall models, urinals)

From the cabin side:

1. Close the water supply valve.
2. Remove the bowl.
3. Disconnect the rubber hose A from the water valve or from the connecting nipple (only in USPH models).
4. Loose (only in USPH models) water valve from the component plate.
5. Disconnect the hose C with the elbow from the relief valve.
6. Unscrew two screws**.

From the service space side:

1. Close the water supply valve.
2. Disconnect the water supply hose from the water valve and the discharge pipe from the backplate.
3. Unscrew two screws* (see fig.2).
4. Remove the back plate.
5. Disconnect the rubber hose A from the water valve or from the hose nipple (only in USPH models).
6. Loose (only in USPH models) water valve from the component plate.
7. Disconnect the hose from the relief valve.
8. Unscrew two screws** (see fig.1).

Removal of the discharge valve (floor models)

1. Close the water supply valve.
2. Disconnect the water hose from the water valve.
3. Disconnect the pipes of the vacuum breaker from the connection nipples.
4. Disconnect the toilet from the rubber bend.
5. Remove the toilet if needed.
6. Remove the screws* (See fig. 2).
7. Remove the back plate.
8. Disconnect the rubber hose A from the water valve or the connecting nipple (only in the USPH models).
Dismantling of the discharge valve

9. Loose (only in the USPH models) water valve from the component plate.
10. Disconnect the hose from the relief valve.
11. Unscrew two screws**.

First, remove the rubber sleeves, the covers and the springs (see fig. 3). Then, press lightly the closing mechanisms and remove the rubber sleeve with the brace (see fig. 4).
VACUUM TOILET

6559515  EVAC OPTIMA 5, FLOOR MODEL, PRESTIGE
6559519  EVAC OPTIMA 5, FLOOR MODEL, PRESTIGE SOFT CLOSE

6540968  Flushing ring
6546818  Seat and cover, Prestige or
6546819  Seat and cover, Prestige Soft Close
6562979  Back plate (doc. 004067-1)
6560000  Pneumatic push button and
6542450  Gasket
6546818  Water connection hose with two seals
5980801  WATER SUPPLY KIT
5432728  Seal
5431884  Shut-off valve
6543414  Filter
5432548  Vacuum breaker
5433215  Water connection hose with two seals

5432728  Seal
5431884  Shut-off valve
6543414  Filter
5432548  Vacuum breaker
5433215  Water connection hose with two seals

6542318  Spring
6542402  Hose clamp
6560000  Pneumatic push button and
6542450  Gasket
6542318  Spring
6542402  Hose clamp

6560000  Pneumatic push button and
6542450  Gasket

6559989  Toilet bowl, includes flushing ring, spring and hose clamp
6544898  Buffex
6560347  Plastic spacer
6544769  Rubber bend
6544898  Buffex
6560347  Plastic spacer

Lock nut
Fixing plate
Back plate
Bowl
Washer

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VACUUM TOILET

6562979 BACK PLATE, EVAC OPTIMA 5, FLOOR MODELS
6562980 BACK PLATE, EVAC OPTIMA 5, FLOOR MODELS USPH

6562976 Discharge valve
6545052 MINI-CHECK VALVE KIT
6545051 VALVE STEM KIT
5736326 Hose, L=270
5507000 Elbow
5481004 Hose, L=360 (only in part 6562980)
6542402 Hose clamp (only in part 6562980)
6560674 Control mechanism
6560674 Valve seat
O-ring
Valve flap
6560680 Water valve
6543072 Component plate (not included support plate)
Support plate
Nut and hose nipple (only in part 6562980)
VACUUM TOILET
6562976  DISCHARGE VALVE

6574179 RECOMMENDED SPARE PART KIT:
1 x 6562653  Rubber diaphragm
2 x 6562975  Rubber sleeve
1 x 6543134  Membrane
6543030 RECOMMENDED SPARE PART KIT:
1 x 3790009 V-ring
1 x 5774150 Filter
1 x 6560678 Diaphragm
1 x 5774701 Valve washer + Jet
VACUUM TOILET
6560674  CONTROL MECHANISM FOR OPTIMA TOILETS

*5778001 Jet carrier complete (controls flushing period)
Alternatives for this Jet:
*5778000 Jet carrier complete
*5778002 Jet carrier complete
*5778004 Jet carrier complete

5778000 Jet carrier complete (not alternative Jets)
5778600 Air filter

*Jet carrier identification:

<table>
<thead>
<tr>
<th>P/N</th>
<th>Colour</th>
<th>Size</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>5778004</td>
<td>Yellow</td>
<td>0.20</td>
<td>Extra long flushing period</td>
</tr>
<tr>
<td>5778000</td>
<td>White</td>
<td>0.30</td>
<td>Long flushing period</td>
</tr>
<tr>
<td>5778001</td>
<td>Blue</td>
<td>0.40</td>
<td>Normal flushing period</td>
</tr>
<tr>
<td>5778002</td>
<td>Red</td>
<td>0.50</td>
<td>Short flushing period</td>
</tr>
</tbody>
</table>

! NOTE: See also the operation and maintenance document:
Doc. 003936-1, Control mechanism

6546688 SPARE PART KIT
1 x 5778600 Air filter
2 x 5778001 Jet carrier complete
1 x 5778000 Jet carrier complete
1 x 5778700 Filter
1 x 6545052 Mini-check valve kit
Prestige seat and cover fulfills ANSI Z124.5 - 1997 (Plastic Toilet Seats (Water closet)) requirements.
VACUUM TOILET
6546819  PRESTIGE SOFT CLOSE, SEAT AND COVER

6549843  Buffer (2 + 4) for seat and cover
6547813  Hinge, right
6547812  Hinge, left
6547811  HINGE KIT
VACUUM TOILET
6560000  PNEUMATIC PUSH BUTTON

6542449  Locking ring
6544997  Connection flange
3510100  Bellows complete
6542438  Button

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VACUUM TOILET

6559516 EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE
6559520 EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE SOFT CLOSE
6559526 EVAC OPTIMA 5, FLOOR MODEL USPH, OPEN FRONT

Materials
- Bowl: White vitreous china
- Seat and cover: *Prestige, Prestige Soft Close and Open Front: UF-S
- Pneumatic push button: Chrome plated plastic
- Discharge valve: Plastic parts: PP, rubber parts: NR

Operating data
- Water pressure: 3...10 bar
- Operating vacuum: -0.3...-0.6 bar
- Water consumption: 1.2 ±0.15 litres/flush (water pressure: 4 bar, vacuum: -0.4 bar)
- Air consumption: 60 ±10 litres/flush (normal atmospheric air)

Connections
- Water supply: 1/2" MPT, flexible hose
- Discharge: Rubber elbow 90°, two hose clamps are included in the rubber elbow 90° to O.D. 48-52 mm pipe.

Shipping data
- P/N 6559516 Optima 5, floor model USPH, Prestige
  - Net weight: 21.1 ±0.5 kg
  - Shipping weight: 23.1 ±0.5 kg
  - Shipping volume: 0.168 m³

- P/N 6559520 Optima 5, floor model USPH, Prestige Soft Close
  - Net weight: 21.1 ±0.5 kg
  - Shipping weight: 23.1 ±0.5 kg
  - Shipping volume: 0.168 m³

- P/N 6559526 Optima 5, floor model USPH, Open Front
  - Net weight: 21.1 ±0.5 kg
  - Shipping weight: 23.1 ±0.5 kg
  - Shipping volume: 0.168 m³

* Prestige seat and cover fulfill ANSI Z124.5 - 1997 [Plastic Toilet (Water closet) Seats] requirements.
VACUUM TOILET

6559516  EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE
6559520  EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE SOFT CLOSE
6559526  EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE OPEN FRONT

P/N 5610010
Cover support
(Not Evac supplied)

Vacuum breaker
USPH

Flexible water connection hose

Pneumatic push button

Water supply 1/2” MPT

Shut-off valve

Discharge pipe alignment tolerance to be ±3.0 mm

Overflow point

510 ±10

380

160

114

90

550

Min. 150°

Max. 20

Min. 140

90

415

350

375

550

Min. 150°

186

480

415

350

375

Ø 48-52

245

25

20

160

Min. 140

*The vacuum breaker air inlet must be installed min.150 mm (6”) above the overflow point of the toilet.

Optional discharge connection
**VACUUM TOILET**

6559516  EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE
6559520  EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE SOFT CLOSE
6559526  EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE OPEN FRONT

Mounting screws on the floor

**Installation kit P/N 6560988 consists of:**
- Rubber elbow  1 pc
- Hose clamp  2 pcs
Installation

Date: 25 Feb 2015

VACUUM TOILET

6559516 EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE
6559520 EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE SOFT CLOSE
6559526 EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE OPEN FRONT

- Connect the water connection hose (A) to the water valve (B).
- Connect the pipes from the USPH vacuum breaker to the connecting nipples of the backplate. Note the correct flow direction (see water supply in the next page).
- Connect the discharge connection pipe to the floor/wall pipe.
- Put the toilet bowl to the floor on the mounting screws (C). Push the toilet 20 mm to the arrow (D) direction. Lock the toilet by tightening the nuts (E) onto the place. ! NOTE: Do not turn the screws (F). Secure the discharge connection with the hose clamps.
- Fix the USPH vacuum breaker on the wall.
- Connect the shut-off valve (H) to the water supply. Note that the vacuum breaker must be installed vertically as shown.
- Connect the water connection hose (A) to the shut-off valve (H).
- Install the seat and the cover.
VACUUM TOILET

6559516  EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE
6559520  EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE SOFT CLOSE
6559526  EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE OPEN FRONT

Water supply in the USPH models

Technical water connection pipe, Ø12
Shut-off valve 1/2” MPT BSP
Hose (EPDM), L=400, braid of stainless steel wire
Pipe Ø12 Cu (chromium plated)
Connection nipples (to the USPH vacuum breaker)
Water valve
Hose to flushing ring in bowl
Connection nipple (from the USPH vacuum breaker)

USPH vacuum breaker
VACUUM TOILET
6546819 PRESTIGE SOFT CLOSING, SEAT AND COVER

Installation

1. Install the parts of the installation kit. Note installation order.

2. Push the hinges into the hole of the seat and the cover.

! NOTE: Do not open the seat (with the hinges inserted) hinges before assembly. The opening angle must not exceed 110°.
3. Install the seat and the cover with the hinges on the installation screws on the bowl.

4. Tighten the retaining screws with a hex wrench.
   (The installation kit includes two hex wrenches.)

   ! NOTE: Do not use excessive force.

   Do not use excessive force when closing, this may cause irreparable damage to the device.

Maintenance

The seat is easy to clean, with just a few simple directions for you to observe.
• Use mild soap solution or biological cleaners.
• Rinse the seat and cover and the hinges with water and dry with a soft cloth.
• Do not use abrasive scouring powders for the seat, cover and hinges.
• Be careful with chemicals and cosmetics. Some of them may damage the seat.
• When you use abrasive, corrosive or chlorine based cleaners for the bowl, avoid contact with the seat, cover and hinges. Therefore, when you clean the bowl and flush cleaner away, make sure that the seat and the cover are in an upright position.
**VACUUM TOILET**
**EVAC OPTIMA 5, WALL AND FLOOR MODELS**

**Operation**
The toilet is flushed by pressing the push button. The pneumatic push button is connected to the control mechanism with a control hose, which transports the air pulse from the push button to the control mechanism. The air pulse starts the flushing sequence and the control mechanism connects vacuum to the control connections of the water valve and the discharge valve. The water valve opens and lets rinsing water flow into the bowl through the flushing ring. After a short delay vacuum acts in discharge valve housing and forces the rubber diaphragm in discharge valve to open. Contents of the bowl is drained to the vacuum sewer by a pressure difference between the bowl and vacuum sewer. The flushing cycle in the control mechanism starts the closing cycle. Vacuum enters to the relief valve. The relief valve opens the port between atmospheric air and the discharge valve. Atmospheric air enters to the discharge valve which closes immediately. After a short delay the atmospheric air pulse reaches to the water valve and the relief valve. The water valve closes and lets a certain level of water at the bottom in the bowl. After the flushing cycle has stopped the push button and the system will be ready for the next flush.

**Start-up**
- Clean the bottom of the toilet bowl.
- Check the mini-check valve and the discharge valve are clean and working correctly.
- Check the water supply hose and the filter of the water valve are not blocked up.
- Check sufficient vacuum (-0.3 bar) is available.
- Open the water supply valve in the water supply piping.
- Press the toilet push button. Pressing the button starts the flushing sequence. The discharge valve opens and the contents of the bowl are extracted by vacuum. At the same time the bowl is rinsed by water.
- When the discharge valve has been closed water level is restored in the bowl by the closing time delay of the water valve.

**Monitoring the vacuum toilet in the normal operation**
- Check the water valve provides the rinse water to the bowl at the same time as the discharge valve extracts the bowl contents when the push button is pressed.
- Check the push button returns to it’s non-activated state.
- Check after the discharge valve closes, the water valve continues to provide water to the bowl. If the water valve time delay is correctly adjusted, there should be a pool of water at the bottom of the bowl.
- Check there are no water or air leaks.

**NOTE:** Water consumption is dependent on the water supply pressure and the vacuum level.

**Preparation for a toilet not to be used for a long period**
- Close the water supply valve.
- Run a flush cycle by pressing the push button.
- Close the toilet seat cover.
VACUUM TOILET
EVAC OPTIMA 5, WALL AND FLOOR MODELS

Cleaning instruction for the seat and cover

• The seat is easy to clean, with just a few simple directions for you to observe.
• Use a mild soap solution or biological cleaners.
• Seat and hinges should not be left damp, but be dried with a soft cloth.
• When using abrasive, corrosive or chlorine based cleaners for the bowl, avoid contact with the seat and hinges. Therefore, when cleaning the bowl, make sure that seat and cover are in an upright position until all the cleaner has been flushed away.

Scheduled maintenance program

Maintenance program is based on 20 toilet flushes per day and 20 years operation.

Every year:

• Change the flap of the mini-check valve in every toilet.
• Check operation, the push button, the seat and cover, rinse pattern, discharge pattern.
• Check possible water and vacuum leakage.
• Clean the filter (not in USPH models) in the water supply.

Every 5 years; yearly maintenance plus:

• Open and clean the filter (5774150) of the water valve.
• Clean the air filter (5778600) of the control mechanism.
• Check the flushing ring and flushing operation.

Every 10 years; yearly and 5 years maintenance plus:

• Change the rubber sleeve (6562975, 2 pcs) and the rubber diaphragm (6562653) of the discharge valve and the diaphragm (6543134) of the relief valve.
• Change the diaphragm (6560678) of the water valve.

! NOTE: Use only genuine Evac spare parts.
**Description of the flushing sequence**

**In the standby position FIG.1**

The control valve (1) is closed. Vacuum in the chambers (2) and (3) is equalized by the jets (4) and (5). Force of the spring (6) holds the mechanism in the non-activated position.

**In the position immediately after the push button has been pressed FIG.2**

Air pressure applied from the flush button to the chamber (7) has lifted the lever (8) and opened the control valve (1). Atmospheric air has entered the chamber (3) through the filter (9) and the valve (1). The force from the pressure difference between (2) and (3) has moved the shaft (10) to the left and the following sequence of events has occurred:

The inlet valve (11) has closed. The vacuum valve (12) has opened. Vacuum is distributed via the check valve (13) to the discharge valve (18) and the water valve (19) which will both open. The chamber (14) is also subjected to vacuum through the check valve (21).

This vacuum will pull the lever (8) and close the valve (1) and the timer function will start. The chamber (3) will be evacuated through the jet (5) and the pressure difference (2-3) equalizes. At the certain level, the counterforce from the spring (6) will outweigh and the cycle will go in the opposite direction:

The vacuum valve (12) will close. The air inlet valve (11) will open and vacuum will enter the relief valve (22*), the atmospheric air enters the water valve, the discharge valve and the chamber (14). The discharge valve (18) will close and somewhat later (because of the jet (17)), the water valve (19) closes when a suitable water level has been reached at the bottom of the bowl. The relief valve* closes.

**Returning to the standby position FIG.3**

The whole system goes to the standby position ready for another flush.

**NOTE:** The diaphragm (16) has the same effective area as the air inlet valve (11) to balance the vacuum forces. FIG.3

**NOTE:** Check the valve (13) ensures that connected the valves in the activated position are unaffected by changes in the vacuum supply level.

**NOTE:** If vacuum is too low or absent the function is delayed. The control valve (1) stays open until the chamber (14) is subject to vacuum.

* Only in Optima 5, Optima 5A toilets and Optima urinals
VACUUM TOILET
6560674  CONTROL MECHANISM

Operation

The functioning of the vacuum toilet/urinal is entirely controlled by the control mechanism. The operation of the control mechanism is based on vacuum in the sewage piping system. Description of flushing sequence see document 003930-3.
Jet 1 (document 003930-3, pos.5) controls the discharge valve opening time. Jet 2 (document 003930-3, pos.4) counters the effect of quick changes in the vacuum supply. Jet 3 (document 003930-3, pos.15) delays the vacuum changes in the chamber (14) (see document 003930-3). This prevents a new flushing procedure to start before the previous procedure has stopped.

Maintenance

Check that the air filters (4) and (5) are not blocked.
Check hoses and pipe connections for leaks.

Toilet discharge time

<table>
<thead>
<tr>
<th>Jet 1</th>
<th>Short discharge period</th>
<th>Red jet</th>
<th>1.5 sec.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal discharge period</td>
<td>Blue jet</td>
<td>2.0 sec.</td>
</tr>
<tr>
<td></td>
<td>Longer discharge period</td>
<td>White jet</td>
<td>2.5 sec.</td>
</tr>
<tr>
<td></td>
<td>Less restriction shortens the time</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Water valve opening time

<table>
<thead>
<tr>
<th>Jet 6</th>
<th>Normal bowl water level</th>
<th>White jet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low bowl water level</td>
<td>Blue jet</td>
</tr>
</tbody>
</table>
**Operation**

**Closed condition:**
The control mechanism shuts off connection between the vacuum piping and the discharge valve housing. As the valve housing is under atmospheric pressure the spring-loaded closing mechanism closes the rubber diaphragm and isolates the bowl from the vacuum piping.

**Open condition:**
As the control mechanism opens the discharge valve, the housing is subjected to vacuum, thus forcing the closing mechanism to open. This in turn allows the rubber diaphragm to open, and connects the bowl to the vacuum pipe line.

**Closing sequence:**
The vacuum pulse enters to the relief valve. The relief valve opens the port between atmospheric air and the discharge valve. Atmospheric air enters to the discharge valve which closes immediately. After a short delay the atmospheric air pulse reaches to the water valve and the relief valve.

**Maintenance**

The scheduled maintenance for Optima 5 toilets (see doc. 004058-1).
The scheduled maintenance for Optima Urinals (see doc. 004113-2).
## VACUUM TOILET

**EVAC OPTIMA 5, WALL AND FLOOR MODELS**

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| Toilet is discharging continuously (discharge valve open) | • Foreign object in bowl or in discharge valve  
• Blocked air relief tubing  
• Quick relief valve malfunction | • Shut off the problematic branch line valve  
• Remove foreign object  
• Change discharge valve  
• Check and if necessary change control mechanism  
• Check relief valve operation |
| Bowl does not become empty when flushed | • Discharge valve blocked | • Clear stoppage, if any, in discharge valve  
• Leak in discharge valve housing  
• Discharge pipe blocked  
• Rubber sleeves leaking | | 
| No water or too little rinsing water | | • Open valve  
• Provide water pressure  
• Clean filter  
• Connect flushing ring  
• Clean flushing ring  
• Clean filter |
| Toilet is overflowing | • Water valve jammed in open position  
• Bowl clogged or discharge valve not operating  
• Misuse (buckets of water thrown in the bowl)  
• Too low vacuum (less than 30 kPa) to flush | • Close water shut-off valve  
• Clean / change water valve nozzles, springs, rubbers.  
• Discharge bowl, valve and piping with normally flushing |
| Toilet does not flush | • No vacuum or low vacuum (less than 30 kPa)  
• Clogged mini-check valve  
• No impulse from push button  
• Jammed control mechanism  
• Jammed quick relief valve | • Check vacuum level, remove blockage in piping  
• Clean / change mini-check valve  
• Check hoses and membrane of push button  
• Change control mechanism  
• Check air filter condition. It should be place.  
• Check relief valve operation |

---

**Diagram**

- Shut-off valve  
- Filter (not in USPH models)  
- Seal (not in USPH models)  
- Vacuum breaker  
- Water supply hose  
- Water valve  
- Mini-check valve  
- Discharge valve  
- Push button  
- Relief valve  
- Flushing ring  
- Control mechanism  
- Vacuum hose
**VACUUM TOILET**

6562976  DISCHARGE VALVE (OPTIMA 5 TOILETS, OPTIMA URINALS)

Removal of the discharge valve (wall models, urinals)

**From the cabin side:**

1. Close the water supply valve.
2. Remove the bowl.
3. Disconnect the rubber hose A from the water valve or from the connecting nipple (only in USPH models).
4. Loose (only in USPH models) water valve from the component plate.
5. Disconnect the hose C with the elbow from the relief valve.
6. Unscrew two screws**.

**From the service space side:**

1. Close the water supply valve.
2. Disconnect the water supply hose from the water valve and the discharge pipe from the backplate.
3. Unscrew two screws* (see fig.2).
4. Remove the back plate.
5. Disconnect the rubber hose A from the water valve or from the hose nipple (only in USPH models).
6. Loose (only in USPH models) water valve from the component plate.
7. Disconnect the hose from the relief valve.
8. Unscrew two screws** (see fig.1).

Removal of the discharge valve (floor models)

1. Close the water supply valve.
2. Disconnect the water hose from the water valve.
3. Disconnect the pipes of the vacuum breaker from the connection nipples.
4. Disconnect the toilet from the rubber bend.
5. Remove the toilet if needed.
6. Remove the screws* (See fig. 2).
7. Remove the back plate.
8. Disconnect the rubber hose A from the water valve or the connecting nipple (only in the USPH models).
Dismantling of the discharge valve

Fig. 3
1. Remove the rubber sleeves, the covers and the springs (see fig.3).

Fig. 4
1. Press lightly the closing mechanisms and remove the rubber sleeve with the brace (see fig.4).

9. Loose (only in the USPH models) water valve from the component plate.
10. Disconnect the hose from the relief valve.
11. Unscrew two screws**.
VACUUM TOILET

6559516  EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE
6559520  EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE SOFT CLOSE
6559526  EVAC OPTIMA 5, FLOOR MODEL USPH, OPEN FRONT

6540968  Flushing ring

6559989  Toilet bowl, includes flushing ring, spring and hose clamp

6546818  Seat and cover, Prestige
6546819  Seat and cover, Prestige Soft Close
6559548  Seat and cover, Open front

5980802  WATER SUPPLY KIT

5431884  Shut-off valve
5432548  Vacuum breaker
5433215  Water connection hose with two seals
5433594  Hose clamp (x2)
6544769  Rubber bend

65402318  Spring
6542402  Hose clamp
6560000  Pneumatic push button and Gasket

5433594  Hose clamp (x2)
6544769  Rubber bend
6559516  EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE
6559520  EVAC OPTIMA 5, FLOOR MODEL USPH, PRESTIGE SOFT CLOSE
6559526  EVAC OPTIMA 5, FLOOR MODEL USPH, OPEN FRONT

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VACUUM TOILET
6562979   BACK PLATE, EVAC OPTIMA 5, FLOOR MODELS
6562980   BACK PLATE, EVAC OPTIMA 5, FLOOR MODELS USPH
VACUUM TOILET
6562976 DISCHARGE VALVE

6574179 RECOMMENDED SPARE PART KIT:
1 x 6562653 Rubber diaphragm
2 x 6562975 Rubber sleeve
1 x 6543134 Membrane

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VACUUM TOILET
6560680 WATER VALVE

6543030 RECOMMENDED SPARE PART KIT:
1 x 3790009 V-ring
1 x 5774150 Filter
1 x 6560678 Diaphragm
1 x 5774701 Valve washer + Jet

6560678 Diaphragm
5774500 Slider
5774800 Permanent magnet
5522700 Conical spring
5774300 Housing
5774701 Valve washer + Jet
3752211 O-ring
5774600 Cover
2610104 Screw
3790009 V-ring
6542826 Membrane
5774150 Filter
6560677 Solenoid valve
**VACUUM TOILET**

6560674  CONTROL MECHANISM FOR OPTIMA TOILETS

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*Jet carrier identification:*

<table>
<thead>
<tr>
<th>P/N</th>
<th>Colour</th>
<th>Size</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>5778004</td>
<td>Yellow</td>
<td>0.20</td>
<td>Extra long flushing period</td>
</tr>
<tr>
<td>5778000</td>
<td>White</td>
<td>0.30</td>
<td>Long flushing period</td>
</tr>
<tr>
<td>5778001</td>
<td>Blue</td>
<td>0.40</td>
<td>Normal flushing period</td>
</tr>
<tr>
<td>5778002</td>
<td>Red</td>
<td>0.50</td>
<td>Short flushing period</td>
</tr>
</tbody>
</table>

**NOTE:** See also the operation and maintenance document: Doc. 003936-1, Control mechanism

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**6546688 SPARE PART KIT**

1 x 5778600  Air filter
2 x 5778001  Jet carrier complete
1 x 5778000  Jet carrier complete
1 x 5778700  Filter
1 x 6545052  Mini-check valve kit
Prestige seat and cover fulfills ANSI Z124.5 - 1997 (Plastic Toilet Seats (Water closet)) requirements.

6549843
Buffers (2 + 4) for seat and cover

6547809
HINGE KIT
VACUUM TOILET
6546819  PRESTIGE SOFT CLOSE, SEAT AND COVER

6549843
Buffer (2 + 4) for seat and cover

6547813
Hinge, right

6547812
Hinge, left

6547811
HINGE KIT

Cover

Seat
VACUUM TOILET
6560000  PNEUMATIC PUSH BUTTON

6542449  Locking ring
6544997  Connection flange
3510100  Bellows complete
6542438  Button

SPARE PARTS
Date: 13 Nov 2015  Doc. 004069-1
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VACUUM TOILET

6541772 WATER SUPPLY KIT, USPH,
5980802 WATER SUPPLY KIT, USPH,

P/N 6541772 Water supply kit, USPH

P/N 5980802 Water supply kit, USPH

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**VACUUM TOILET**

**6559513** EVAC OPTIMA 5, WALL MODEL, PRESTIGE

**6559517** EVAC OPTIMA 5, WALL MODEL, PRESTIGE SOFT CLOSE

---

**Materials**

- Bowl: White vitreous china
- Seat and cover: *Prestige and Prestige Soft Close: UF-S
- Optima push button: White plastic, ABS
- Discharge valve: plastic parts: PP, rubber parts: NR

**Operating data**

- Water pressure: 3...10 bar
- Operating vacuum: -0.3...- 0.6 bar
- Water consumption: ~1.2 ±0.15 litres/flush (water pressure: 4 bar, vacuum: -0.4 bar)
- Air consumption: ~ 60 ±10 litres/flush (normal atmospheric air)

**Connections**

- Water supply: 1/2” MPT, flexible hose
- Discharge: Discharge connection Ø50, connection sleeve includes two hose clamps to O.D. 48 - 52 mm pipes

**Shipping data**

- P/N 6559513 Optima 5, wall model, Prestige
- P/N 6559517 Optima 5, wall model, Prestige Soft Close
- Net weight: 21.1 ±0.5 kg
- Shipping weight: 24.6 ±0.5 kg
- Shipping volume: 0.168 m³

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* Prestige seat and cover fulfill ANSI Z124.5 - 1997 [Plastic Toilet (Water closet) Seats] requirements.