EVAC OPTIMA 5 WALL TOILET

TECHNICAL INFORMATION
TECHNICAL DATA

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

* Prestige seat and cover fulfill ANSI Z124.5 - 1997 [Plastic Toilet (Water closet) Seats] requirements.
VACUUM TOILET
6560393   OPTIMA PUSH BUTTON

Materials
- Cover: ABS, RAL 9016
- Button: ABS, RAL 9016
- Push button arms: POM, natural white
- Push button base: POM, natural white
- Buckling cone: TPV, white

Connections
- Hose nipple Ø4

Shipping data
- Net weight: 0.13 kg
VACUUM TOILET
6559513  EVAC OPTIMA 5, WALL MODEL, PRESTIGE
6559517  EVAC OPTIMA 5, WALL MODEL, PRESTIGE SOFT CLOSE

NOTE: Recommended place for the button. If placement is changed, consult EVAC.

Shut-off valve 1/2” MPT
Vacuum breaker
Flexible water hose
Discharge pipe alignment tolerance to be ±3.0 mm
P/N 6544769 Rubber elbow 90°, optional connection
P/N 5433572 Straight connection hose
Vacuum breaker
Pneumatic push button
Seat and cover: Prestige or Prestige Soft Close
U-beam (Not Evac supplied) Fasten the beam to a solid structure.

Overflow point

NOTE: Overflow point is inside the toilet bowl

* The vacuum breaker air inlet must be located at a minimum of 150 mm (6") above the overflow point of the toilet.
VACUUM TOILET

6559513  EVAC OPTIMA 5, WALL MODEL, PRESTIGE
6559517  EVAC OPTIMA 5, WALL MODEL, PRESTIGE SOFT CLOSE

Dimensions of toilet service opening through the wall

Toilet supporting beams for wall models

Cross section A - A

Installation kit P/N 6560986 consists of:
- Plastic nut M12  2 pcs
- Guiding nut    2 pcs
- Edge strip     1 pc
- Connection sleeve 1 pc
- Hose clamp    2 pcs

NOTE: Thread on the bolt must be full length.
**VACUUM TOILET**

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

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

• Connect the water connection hose (A) to the water valve (B).

• Install the back plate assembly to the wall using the bowl fastening bolts (C) (M12, not included) and the guiding nuts (D) (M12). The guiding nuts are necessary.

• Connect the hose (E) from the flushing ring to the water valve (B). **Do not use any kind of grease during installation!** Secure with the hose clamps. Tighten the hose clamps with pliers.

! **NOTE:** Install the hose (E) from the flushing ring in the toilet bowl to the right side of the discharge valve.

• Lift bowl onto the fastening bolts (C) and tighten the securing nuts (F). Tightening torque is 15-20 Nm.

! **NOTE:** Check through the toilet service opening in the wall that the hoses run smoothly. The hoses shall not have any kinks.

• Fit the edge strip as shown in figure 1. Place the joint of the strip to the bottom side of the bowl.

• Install the seat and the cover. See the installation of the seat and cover Prestige Soft Close (doc. 002503-3).

• Connect the discharge connection pipe. Secure with the hose clamps.

• Connect the shut-off valve/vacuum breaker assembly to the water supply. The shut-off valve must be installed to the water supply piping’s side to ensure the correct flow direction in the vacuum breaker. Note the vacuum breaker must be installed vertically as shown.

• Connect the water connection hose (A) to the shut-off valve/vacuum breaker assembly.

• Install the pneumatic push button (doc. 003802-1).
Installation

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

! NOTE: Do not open the seat (with the hinges inserted) hinges before assembly. The opening angle must not exceed 110°.
VACUUM TOILET
6546819  PRESTIGE SOFT CLOSING, SEAT AND COVER

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.
1. Drill Ø6 hole for the hose (B).
2. Loosen the cover (A) from the base.
3. Connect the plastic hose (B) from the control mechanism to the nipple of the base. Warm the end of the hose if needed to help installation.
4. Install the push button base using screws (C) (not included) on to the wall.
5. Place the push button mechanism (D). Note “O”-marks.
6. Snap the cover (A) its place.

**NOTES:**

- Note that the hose (B) is not flattened during installation. The air impulse must always flow free.
- Make sure that the plastic hose is not detached from the control mechanism.
**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.
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
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</th>
<th>Discharge Period</th>
<th>Color</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Short</td>
<td>Red</td>
<td>1.5 sec</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>Blue</td>
<td>2.0 sec</td>
</tr>
<tr>
<td></td>
<td>Longer</td>
<td>White</td>
<td>2.5 sec</td>
</tr>
</tbody>
</table>

Less restriction shortens the time

Water valve opening time

<table>
<thead>
<tr>
<th>Jet</th>
<th>Bowl Water Level</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Normal</td>
<td>White</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Blue</td>
</tr>
</tbody>
</table>

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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:**

- **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**
- **Control mechanism**
- **Vacuum hose**
- **Relief valve**
- **Flush ring**

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**Notes:**

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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).
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**.

Dismantling of the discharge valve

Fig. 3

- Rubber sleeve
- Cover
- Spring
- Rubber sleeve
- Cover

Fig. 4

- Press
- Discharge valve body
- Closing mechanism
- Rubber sleeve and brace

1. Remove the rubber sleeves, the covers and the springs (see fig.3).
2. Press lightly the closing mechanisms and remove the rubber sleeve with the brace (see fig.4).
VACUUM TOILET

6559513  EVAC OPTIMA 5, WALL MODEL, PRESTIGE
6559517  EVAC OPTIMA 5, WALL MODEL, PRESTIGE SOFT CLOSE

SPARE PARTS

Date: 07 Mar 2016  Doc. 004039-1

5980801 WATER SUPPLY KIT
5431884 Shut-off valve
5432728 Seal
6543414 Filter
5432548 Vacuum breaker
5433215 Water connection hose with two seals

6540936 Edge strip
5990759 Nut (x2)
5779098 Guiding nut (x2)
5433594 Hose clamp (x2)
5433572 Connection sleeve

6560986 INSTALLATION KIT
5779098 Guiding nut (x2)
6540936 Edge strip
5990759 Nut (x2)

6560393 Optima push button
6546818 Prestige, seat and cover
or
6546819 Prestige Soft Close, seat and cover

6562977 Back plate (doc. 004054-1)

5805900 Hose to push button

6543414 Filter
5432548 Vacuum breaker
5433215 Water connection hose with two seals

5432728 Seal
6543414 Filter
5432548 Vacuum breaker
5433215 Water connection hose with two seals

6542402 Hose clamp

6560986 INSTALLATION KIT
5779098 Guiding nut (x2)
6540936 Edge strip
5990759 Nut (x2)

6540968 Flushing ring

6540968 Flushing ring

6542318 Spring
5431884 Shut-off valve
5432728 Seal
6543414 Filter
5432548 Vacuum breaker
5433215 Water connection hose with two seals

5432728 Seal
6543414 Filter
5432548 Vacuum breaker
5433215 Water connection hose with two seals

5432728 Seal
6543414 Filter
5432548 Vacuum breaker
5433215 Water connection hose with two seals

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6543414 Filter
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6543414 Filter
5432548 Vacuum breaker
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5432728 Seal
6543414 Filter
5432548 Vacuum breaker
5433215 Water connection hose with two seals

5432728 Seal
6543414 Filter
5432548 Vacuum breaker
5433215 Water connection hose with two seals

5432728 Seal
6543414 Filter
5432548 Vacuum breaker
5433215 Water connection hose with two seals

5432728 Seal
6543414 Filter
5432548 Vacuum breaker
5433215 Water connection hose with two seals

6559988 Toilet bowl, includes flushing ring, spring and hose clamp

6560393 Optima push button
6546818 Prestige, seat and cover
or
6546819 Prestige Soft Close, seat and cover

6562977 Back plate (doc. 004054-1)

5805900 Hose to push button
VACUUM TOILET
6562977 BACK PLATE ASSEMBLY
6562978 BACK PLATE ASSEMBLY

6560674 Control mechanism

Valve seat
O-ring
Valve flap

6545052 MINI-CHECK VALVE KIT

6560680 Water valve

6542995 Wall support, left and right
Nut and hose nipple (only in part 6562978)

6562976 Discharge valve

5481004 Hose, L=360 (only in part 6562978)
6542402 Hose clamp (only in part 6562978)

5736326 Hose, L=270
5507000 Elbow

6543072 Component plate

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VACUUM TOILET
6562976  DISCHARGE VALVE

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

6562653 Rubber diaphragm

6534134 Membrane

6542985 Housing

6547089 Closing mechanism (sold only as a kit)

6562975 Rubber sleeve
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
**VACUUM TOILET**  
6560674  CONTROL MECHANISM FOR OPTIMA TOILETS

*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
VACUUM TOILET
6546818  PRESTIGE, SEAT AND COVER

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
VACUUM TOILET
6560393 OPTIMA PUSH BUTTON

6560705 Buckling cone
**VACUUM TOILET**

6559514 EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE  
6559518 EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE SOFT CLOSE  
6559524 EVAC OPTIMA 5, WALL MODEL USPH, OPEN FRONT

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**Materials**  
Bowl: White vitreous china  
Seat and cover; *Prestige, Prestige Soft Close and Open Front: 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 with USPH: 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 6559514, wall model USPH, Prestige,  
P/N 6559518, wall model USPH, Prestige Soft Close  
Net weight: 21.1 ±0.5 kg  
Shipping weight: 24.6 ±0.5 kg  
Shipping volume: 0.168 m³

P/N 6559524, wall model USPH, Open Front  
Net weight: 19.9 ±0.5 kg  
Shipping weight: 22.4 ±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.
Materials
- Cover: ABS, RAL 9016
- Button: ABS, RAL 9016
- Push button arms: POM, natural white
- Push button base: POM, natural white
- Buckling cone: TPV, white

Connections
- Hose nipple Ø4

Shipping data
- Net weight: 0.13 kg
**VACUUM TOILET**

6559514  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE
6559518  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE SOFT CLOSE
6559524  EVAC OPTIMA 5, WALL MODEL USPH, OPEN FRONT

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I NOTE: Recommended place for the button. If placement is changed, consult EVAC.

USPH Vacuum breaker
Shut-off valve 1/2" MPT
Flexible water hose
Discharge pipe alignment tolerance to be ±3.0 mm

P/N 5433572  Straight connection hose
P/N 6544769  Rubber elbow 90°, optional connection

Overflow point
Vacuum breaker

!* The vacuum breaker air inlet must be located at a minimum of 150 mm (6") above the overflow point of the toilet.*
VACUUM TOILET

6559514  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE
6559518  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE SOFT CLOSE
6559524  EVAC OPTIMA 5, WALL MODEL USPH, OPEN FRONT

Dimensions of toilet service opening through the wall

Toilet supporting beams for wall models

Cross section A - A

Installation kit P/N 6560986 consists of:
- Plastic nut M12: 2 pcs
- Guiding nut: 2 pcs
- Edge strip: 1 pc
- Connection sleeve: 1 pc
- Hose clamp: 2 pcs

Bolt M12 (not Evac supplied) to be welded.

! NOTE: Thread on the bolt must be full length.
VACUUM TOILET

6559514  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE
6559518  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE SOFT CLOSE
6559524  EVAC OPTIMA 5, WALL MODEL USPH, OPEN FRONT

- Connect the water connection hose (A) to the water valve (B).
- Install the back plate assembly on the wall using the bowl fastening bolts (C) (M12, not included) and the guiding nuts (D) (M12). The guiding nuts are necessary.
- Connect the hose (E) from the flushing ring to the connecting nipple on the back plate (see drawing: Water supply). **Do not use any kind of grease during installation!** Secure with hose clamps. Tighten the hose clamps with pliers.

**! NOTE:** Install the hose (E) to the right side of the discharge valve and below the hose (F).

- Lift the bowl onto the fastening bolts and tighten the securing nuts (G). Tightening torque is 15-20 Nm.

**! NOTE:** Check through the toilet service opening in the wall that the hoses run smoothly. The hoses shall not have any kinks.
VACUUM TOILET
6559514  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE
6559518  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE SOFT CLOSE
6559524  EVAC OPTIMA 5, WALL MODEL USPH, OPEN FRONT

- Fit the edge strip as shown in the figure 1. Place the joint of the strip to the bottom side of the bowl.
- Install the seat and the cover. See the installation of the seat and cover Prestige Soft Close (doc. 002503-3).
- Connect the USPH vacuum breaker to the connecting nipples of the back plate (see drawing: Water supply).
- Fix the USPH vacuum breaker to the wall.
- Connect the discharge connection pipe. Secure with the hose clamps.
- Connect the shut-off valve to the water supply. The shut-off valve must be installed to the water supply piping’s side to ensure the correct flow direction in the vacuum breaker. Note the vacuum breaker must be installed vertically as shown.
- Connect the water connection hose (A) to the shut-off valve.
- Install the pneumatic push button (see doc. 003802-1).

Water supply

![Diagram of water supply with labels:
- Technical water connection
- Pipe Ø12
- Shut-off valve, 1/2” MPT BSP
- Hose A, (EPDM) L=400
- Braid of stainless steel wire
- Vacuum breaker
- Hose (EPDM), L=500
- Hose (EPDM), L=810
- Water valve
- Hose to the flushing ring in the toilet bowl
- Hose clamps
- Back plate assembly
- Connecting nipples
- Discharge connection pipe]

! NOTE: For non-U.S. flag vessels
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°.
VACUUM TOILET
6546819 PRESTIGE SOFT CLOSING, SEAT AND COVER

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
6560393  OPTIMA PUSH BUTTON

1. Drill Ø6 hole for the hose (B).
2. Loose the cover A from the base.
3. Connect the plastic hose (B) from the control mechanism to the nipple of the base. Warm the end of the hose if needed to help installation.
4. Install the push button base using screws (C) (not included) on to the wall.
5. Place the push button mechanism (D). Note “O”-marks.
6. Snap the cover (A) its place.

Control mechanism

Plastic hose (B) to the push button.

! NOTES:

Note that the hose (B) is not flattened during installation. The air impulse must always flow free.

Make sure that the plastic hose is not detached from the control mechanism.
**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.

Discharge valve
Relief valve
6562975 Rubber sleeve
6562653 Rubber diaphragm

Water supply
Filter

Minimum valve

Water valve
6560678 Diaphragm
5774150 Filter

Control mechanism
5778600 Air filter

Flushing ring
Pneumatic push buttons
6560393 Push button
6560000 Push button

! 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
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</th>
<th>Discharge Period</th>
<th>Jet Color</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Short</td>
<td>Red</td>
<td>1.5 sec.</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>Blue</td>
<td>2.0 sec.</td>
</tr>
<tr>
<td></td>
<td>Longer</td>
<td>White</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</th>
<th>Water Level</th>
<th>Jet Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Normal bowl water</td>
<td>White</td>
</tr>
<tr>
<td></td>
<td>Low bowl water</td>
<td>Blue</td>
</tr>
</tbody>
</table>
VACUUM TOILET
6562976 DISCHARGE VALVE FOR EVAC OPTIMA 5 TOILETS AND OPTIMA URINALS

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 witch 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 |

---

**Diagram:**
- **Vacuum hose**
- **Control mechanism**
- **Flush ring**
- **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**.

1. Remove the rubber sleeves, the covers and the springs (see fig.3).
2. Press lightly the closing mechanisms and remove the rubber sleeve with the brace (see fig.4).
VACUUM TOILET

6559514 EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE
6559518 EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE SOFT CLOSE
6559524 EVAC OPTIMA 5, WALL MODEL USPH, OPEN FRONT

SPARE PARTS

Date: 08 Mar 2016  Doc. 004038-1

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VACUUM TOILET

6562977  BACK PLATE ASSEMBLY
6562978  BACK PLATE ASSEMBLY

Date: 29 Apr 2016  Doc. 004054-2

SPARE PARTS

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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 )

5778001 Jet carrier complete
( not alternative Jets )

5778002 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.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>654843</td>
<td>Buffers (2 + 4) for seat and cover</td>
</tr>
<tr>
<td>6547809</td>
<td>HINGE KIT</td>
</tr>
</tbody>
</table>

**Diagram:**
- **Cover**
- **Seat**
- **Hinge Kit**
- **Buffers (2 + 4)** for seat and cover

---

**SPARE PARTS**

**Date:** 16 Oct 2014  
**Doc.:** 002510-5

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VACUUM TOILET
6546819  PRESTIGE SOFT CLOSE, SEAT AND COVER

6549843
Buffer (2 + 4) for seat and cover

Cover

Seat

6547813
Hinge, right

6547812
Hinge, left

6547811
HINGE KIT
VACUUM TOILET
6560393 OPTIMA PUSH BUTTON

6560705 Buckling cone
**VACUUM TOILET**

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

**P/N 6541772 Water supply kit, USPH**

6541409 VACUUM BREAKER COMPLETE, USPH, WALL MODEL

5432548 Vacuum breaker

5432728 Seal

5431884 Shut-off valve

5433215 Water connection hose (includes: 2 x seal)

**P/N 5980802 Water supply kit, USPH**

5435336 VACUUM BREAKER ASSEMBLY, USPH

5957210 Elbow wall fast flange

5432548 Vacuum breaker

5430164 Elbow

5432728 Gasket

5430166 Coupling

5433215 Water connection hose (includes: 2 x seal)

5430166 Coupling G1/2

5910601 (x2) Cu pipe Ø12x1

**SPARE PARTS**
**VACUUM TOILET**

**6559527  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE WITH AUTOFLUSH UNIT**

**6559528  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE SOFT CLOSE WITH AUTOFLUSH UNIT**

---

**Max. 395**

**Max. 550**

**Max. 450**

---

**Materials**

- Bowl: White vitreous china
- Seat and cover; *Prestige and Prestige Soft Close: UF-S
- Box of control unit: ABS
- Cover of sensor: ABS
- Box of power supply: plastic

**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)
- Sensor distance: 600 mm (set); 100...700 mm (adjustable)

**Electrical data**

- Power supply: 100...240 V ~ 1.5-0.7 A, 50/60 Hz 1-phase

**Connections**

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

**Shipping data**

- Net weight: 21.4 ±0.5 kg
- Shipping weight: 23.7 ±0.5 kg
- Shipping volume: 0.168 m³

---

* Prestige seat and cover fulfill ANSI 2124.5 - 1997 [ Plastic Toilet ( Water closet ) Seats ] requirements.
VACUUM TOILET
6560803  OPTIMA AUTOFLUSH UNIT

Materials
Control unit; bellows: rubber, cover and bottom of control box: ABS
Sensor: cover: ABS white, bottom plate: POM
Box of power supply: plastic

Operating data
Sensor type: Infra red
Sensor distance: 600 mm (set); 100 ... 700 (adjustable)
Sensor activation: delay 5 sec. (set); 0 ... 10 sec. (adjustable)
Flushing timing: 2.5 sec. (set); 0 ... 10 sec. (adjustable)
Flushing activation delay: < 2 sec.
Power consumption: Stand-by 0.7 W, operating 45 W
Operating temperature: 0 ... +60°C
Operating voltage: 24V DC 30 mA
Protection class; Control unit: IP44, Power supply: IP64

Connections:
Power supply: 100-240 V ~ 1.5-0.7 A, 50/60 Hz

Shipping data:
Net weight: 0.83 kg

Other
Installation screws are not included in delivery

Optima AF push button
Cable to power supply (lenght 300 mm)

Power supply
Cable to sensor unit (lenght 500 mm)

Control unit
Cable (lenght 260 mm)

Depth 35 mm
Depth 40 mm
Depth 30 mm
Ø4.5

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VACUUM TOILET

6559527  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE WITH AUTOFLUSH UNIT
6559528  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE SOFT CLOSE WITH AUTOFLUSH UNIT

**Notes:**
- Bolt M12 (not Evac supplied) to be welded.
- Thread on the bolt must be full length.
- Total length of bolt = T + 73±2

**Cross section A - A**

- Beam
- Toilet bowl
- Edge strip
- Sensor unit
- Water supply
- Shut-off valve 1/2" MPT
- Flexible water hose
- Discharge pipe alignment tolerance to be ±3.0 mm

**Overflow point**

- Vacuum breaker
- The overflow point is inside the toilet bowl

**Installation Diagrams:**

- Control unit
- USPH vacuum breaker
- Power supply (optional place)
- Control mechanism
- Water supply (optional place)
- Water supply hose
- Rubber elbow 90°, optional connection
- Shut-off valve 1/2" MPT
- Flexible water hose

**Installation Details:**

- **Shut-off valve 1/2" MPT**
- **Flexible water hose**
- **Discharge pipe alignment tolerance**
- **Bolt M12** (not Evac supplied)
- **Thread on the bolt**
- **Total length of bolt**
- **Sensor unit**
- **Water supply**
- **Shut-off valve 1/2" MPT**
- **Flexible water hose**
- **Discharge pipe**
- **P/N 6544769**
- **Rubber elbow 90°, optional connection**
- **P/N 5433572**
- **Straight connection hose**
- **Control unit** (optional place)
- **USPH vacuum breaker**
- **Power supply** (optional place)
- **Control mechanism**
- **Water supply** (optional place)
- **Water supply hose**
- **Rubber elbow 90°, optional connection** *(USPH wall bracket)*
- **Min. 280**
- **Hose from control mechanism**
- **Hose from control mechanism**
- **Sensor unit**
- **P/N 5433572**
- **Straight connection hose**
- **U-beam** (Not Evac supplied)
- **Fasten the beam on solid structure.**
VACUUM TOILET

6559527   EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE WITH AUTOFLUSH UNIT
6559528   EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE SOFT CLOSE WITH AUTOFLUSH UNIT

Dimensions for the toilet service opening and the hole for the autoflush unit

Toilet supporting beams for wall models

Instalation kit P/N 6560986 consists of:

- Plastic nut, M12: 2 pcs
- Guiding nut: 2 pcs
- Edge strip: 1 pc
- Straight connection hose: 1 pc
- Hose clamp: 2 pcs
VACUUM TOILET

6559527  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE WITH AUTOFLUSH UNIT
6559528  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE SOFT CLOSE WITH AUTOFLUSH UNIT

! NOTE: Do not use any kind of grease during installation.

! NOTE: Install the hose (E) to the right side of the discharge valve and below the hose (F).

- Connect the water connection hose (A) to the water valve (B).
- Install the backplate assembly on the wall using the bowl fastening bolts (C) (M12, not included) and the guiding nuts (D) (M12). The guiding nuts are necessary.
- Connect the hose (E) from the flushing ring to the connecting nipple on the backplate.

- Secure with the hose clamp. Tighten the hose clamp with the pliers.
- Lift the bowl onto the fastening bolts (C) and tighten the securing nuts (D). Tightening torque is 15-20 Nm.

  ! NOTE: Check through the toilet service opening in the wall that the hoses run smoothly. The hoses shall not have any kinks.

- Fit the edge strip as shown in the figure 1. Put the joint of the edge strip to the bottom side of the bowl.
- Install seat and cover.
VACUUM TOILET

6559527  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE WITH AUTOFLUSH UNIT
6559528  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE SOFT CLOSE WITH AUTOFLUSH UNIT

- Connect the USPH vacuum breaker to the connecting nipples of the back plate.
- Install the USPH vacuum breaker to the wall.
- Connect the discharge connection. Secure with the hose clamps.
- Connect the shut-off valve to the water supply. Note that the USPH vacuum breaker must be installed vertically as shown.
- Connect the water connection hose (A) to the shut-off valve.
- Install the push button to the wall. (See document no. 003607-1)
- Connect the power supply (220 - 240 V AC 50 Hz).
• Drill the holes (Ø9) for the sensor cable (A) and the hose (B).
• Loose the cover (C).
• Loose the sensor (D) and the strain relief.
• Thread the sensor cable and hose (B) through the wall.
• Connect the hose (B) to the nipple of the push button base. Warm the end of the hose if needed to help installation.

**NOTE:** Secure the hose (B) is not flattened during installation. The air impulse must be always flow free.
• Put the sensor cable through the strain relief.
• Note place of the the strain relief. Install the push button base with the strain relief using the screws (E) to the wall.
• Place the push button mechanism. Note "O"-marks.
• Place the sensor (D) with the screws (X).
• Connect the cable (A) to the sensor (D).
• Snap on the cover (C).
• Install the control unit and the power supply (optional places, note the length (1m) of the hose (B) and the cable (A)) with the screws (not included) on the wall.
• Connect the cable (G) to the power supply.

**NOTE:** Installation screws are not included in delivery.
Operation (autoflush)

The user is detected by the infra-red photoelectric sensor, which automatically activates the toilet flush after the user leaves the detection region.

After the user is sensed for at least five seconds and then leaves the detection region, the control unit will activate the control mechanism.

The sensor and the control unit start 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 the discharge valve housing and forces to open the rubber diaphragm in the discharge valve. The 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. Atmospheric air pulse enters the discharge valve, which closes. After a short delay, atmospheric air pulse reaches the water valve, which closes and lets a certain level of water at the bottom in the bowl. When the flushing cycle has stopped the system is ready for the next flushing.

! NOTE: No flush will occur if:
• The sensing period is less than five seconds.

After the flush starts, further flush activation signals are disabled to prevent double flushing for a present (10 seconds) period of time. If the sensor detection lasts for five or more seconds and ends after the signal disable period, the toilet will flush.
VACUUM TOILET
6559527  EVAC OPIMA 5, WALL MODEL USPH, PRESTIGE WITH AUTOFLUSH UNIT
6559528  EVAC OPIMA 5, WALL MODEL USPH, PRESTIGE SOFT CLOSE WITH AUTOFLUSH UNIT

Operation (manual)

The toilet bowl 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.
• 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.
• Keep your hand five seconds in front of the sensor eye. It start 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.
• Press the 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 sensor has been activated or the push button has been 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 or activating the sensor.
• Close the seat cover of the toilet.
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 or clean the flap of the mini-check valve in every toilet.
- Check operation, the Optima AF push button, the seat and cover, rinse pattern, discharge pattern.
- Check possible water and vacuum leakage.

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.

<table>
<thead>
<tr>
<th>Discharge valve</th>
<th>Water valve</th>
<th>Control mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relief valve</td>
<td>5560678 Diaphragm</td>
<td>5778600 Air filter</td>
</tr>
<tr>
<td>6562975 Rubber sleeve</td>
<td>5774150 Filter</td>
<td></td>
</tr>
<tr>
<td>6562653 Rubber diaphragm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mini-check valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flushing ring</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
VACUUM TOILET
6560803 OPTIMA AUTOFLUSH UNIT

Operation

The control unit activates the control mechanism. Vacuum moves from the hose 1 to the hose 2. The water valve and the discharge valve opens.

After the preset time the control mechanism starts closing cycle of the water valve and the discharge valve.

The sensor detects user from front of the toilet/urinal. When user goes away from the toilet/urinal it flushes automatically after a short delay. When a flushing cycle is done the toilet is ready for the next flushing.

The sensor is located on the sensor plate which is normally placed on the wall. When user is detected, the sensor gives an electrical signal to the control box, which is normally placed in the toilets service space. The control box converts this electrical signal to the pneumatic signal, which goes to the toilets/urinal control mechanism. The control mechanism is same reliable mechanism, which is successfully used on Evac Optima 5 toilets. When the pneumatic signal is detected by the mechanism, it starts the traditional flushing cycle of the vacuum toilet/urinal.

The control box is connected to 100 - 240 V 50/60 Hz power supply. Unit is equipped with transformer which converts operation voltage to 24 V, this ensures safe operation of control unit.

Adjusting of the flushing time

The functioning of the vacuum toilet is controlled by the autoflush unit. You can adjust detection distance by turning the adjustable screw.

- flushing cycle time, from 1.5 sec up to 2.5 sec (control mechanism)
- flushing water amount, normal – low (control mechanism)
- detection distance, from 10 cm to 70 cm (control unit)

0 = test
1 = 10 cm
2 = 20 cm
3 = 30 cm
4 = 40 cm
5 = 50 cm
6 = 60 cm
7 - 9 = 70 cm

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**VACUUM TOILET**

6560674  CONTROL MECHANISM FOR EVAC OPTIMA TOILETS AND URINALS

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**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
**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**

Jet 1
- Short discharge period: Red jet, 1.5 sec.
- Normal discharge period: Blue jet, 2.0 sec.
- Longer discharge period: White jet, 2.5 sec.

Less restriction shortens the time

**Water valve opening time**

Jet 6
- Normal bowl water level: White jet
- Low bowl water level: Blue jet
**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 witch 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

**6559527** EVAC OPIMA 5, WALL MODEL USPH, PRESTIGE WITH AUTOFLUSH UNIT  
**6559528** EVAC OPIMA 5, WALL MODEL USPH, PRESTIGE SOFT CLOSE WITH AUTOFLUSH UNIT

## TROUBLE SHOOTING

<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 autoflush unit or control mechanism  
• Check relief valve operation  
• Check and clean hoses |
| Bowl does not become empty when flushed | • Blocked bowl  
• Discharge valve blocked, sharp tools may damage rubbers  
• Rubber sleeves leaking  
• Leak in discharge valve housing  
• Loose / clogged hoses | • Clean bowl  
• Clean discharge valve  
• Clean vacuum hoses  
• Check that rubber sleeves are undamaged  
• Check relief valve operation  
• Check and clean hoses |
| No water, but otherwise rinsing water | • Water shut-off valve closed  
• No water pressure  
• Filter full or dirt in water valve  
• Flushing ring loose  
• Flushing ring clogged | • Open valve  
• Provide water pressure  
• Clean filter  
• Connect flushing ring  
• Clean flushing ring |
| 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 autoflush unit or push button  
• Sensor is broken  
• Jammed control mechanism  
• Jammed quick relief valve | • Check vacuum level, remove blockage in piping  
• Clean / change flap of mini-check valve  
• Check hoses and operation of autoflush unit or buckling cone in push button  
• Change sensor  
• Change control mechanism  
• Check air filter condition. It should be place.  
• Check relief valve operation |

---

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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**.

Fig. 1

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).

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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**.

1. Remove the rubber sleeves, the covers and the springs (see fig.3).
2. Press lightly the closing mechanisms and remove the rubber sleeve with the brace (see fig.4).
VACUUM TOILET
6559527  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE WITH AUTOFLUSH UNIT
6559528  EVAC OPTIMA 5, WALL MODEL USPH, PRESTIGE SOFT CLOSE WITH AUTOFLUSH UNIT

6560803  OPTIMA AUTOFLUSH UNIT
(document 003614-1)

Optima AF push button

Power supply

Optimale AF push button

Control unit

6546819  Prestige Soft Close, seat and cover

6546818  Prestige, seat and cover

6540968  Flushing ring

6559988  Toilet bowl, includes flushing ring, spring and hose clamp

6542318  Hose clamp

6542402  Hose clamp

6542977  Back plate (doc. 004054-1)

6560986  INSTALLATION KIT

5779098  Guiding nut (x2)

5909759  Nut (x2)

6540936  Edge strip

5433594  Hose clamp (x2)

5433572  Connection sleeve

6560986  INSTALLATION KIT

5779098  Guiding nut (x2)

5909759  Nut (x2)

6540936  Edge strip

5433594  Hose clamp (x2)

5433572  Connection sleeve

6541772  WATER SUPPLY KIT
(document 6:01024J)

Shut-off valve

Connection hose with seals

Vacuum breaker USPH

6KXWR postpones

Power supply

Vacuum breaker USPH

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VACUUM TOILET
6560803  OPTIMA AUTOFLUSH UNIT

6560724 OPTIMA AF PUSH BUTTON
6560705 Buckling cone
6545541 Sensor

6546109 Power supply

3510100 Bellows complete
6545539 CONTROL UNIT
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

---

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

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**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

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Datetime *19 Oct 2016*
Prestige seat and cover fulfills ANSI Z124.5 - 1997 (Plastic Toilet Seats (Water closet)) requirements.

6549843
Buffers (2 + 4) for seat and cover

Cover
Seat

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

6549843 Buffer (2 + 4) for seat and cover

Cover

Seat

6547813 Hinge, right

6547812 Hinge, left

6547811 HINGE KIT
VACUUM TOILET
6541772 WATER SUPPLY KIT
5980802 WATER SUPPLY KIT

P/N 6541772 Water supply kit, USPH

P/N 5980802 Water supply kit, USPH
**VACUUM TOILET**

6559507  EVAC OPTIMA 3, FLOOR MODEL, MOSAIK

---

### Materials
- Bowl: White vitreous china
- Seat and cover, Mosaik: PP
- Pneumatic push button: Grey 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
- Net weight: 20 ±0.5 kg
- Shipping weight: 22 ±0.5 kg
- Shipping volume: 0.168 m³
VACUUM TOILET
6559507  EVAC OPTIMA 3, FLOOR MODEL, MOSAIK

*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.

P/N 5433572
Straight connection
Mounting screws on the floor

Installation kit P/N 6560988 consists of:
- Rubber elbow 1 pc
- Hose clamp 2 pcs
• 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 pipe with the hose clamps.
• Connect the shut-off valve (H) / vacuum breaker assembly (G) to the water supply. The shut-off valve must be installed to the water supply piping’s side to ensure the correct flow direction to the vacuum breaker (G). Note that the vacuum breaker must be installed vertically as shown.
• Connect the water connection hose (A) to the shut-off valve (H) / vacuum breaker (G).
• Install the seat and the cover.
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. Atmospheric air enters to the discharge valve witch closes. After a short delay the atmospheric air pulse reaches to the water 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 sufficient vacuum (-0.3 bar) is available.
• Open the water supply valve in the water supply piping.
• Press the vacuum 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 3, 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.
• The 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 the 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 (5747500) 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 (6540968) and the flushing operation.

Every 10 years; yearly and 5 years maintenance plus:
• Change the rubbers parts: rubber sleeve (6562975, 2 pcs), rubber diaphragm (6562653).
• 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
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

Jet 1  
Short discharge period  Red jet  1.5 sec.
Normal discharge period  Blue jet  2.0 sec.
Longer discharge period  White jet  2.5 sec.
Less restriction shortens the time

Water valve opening time

Jet 6  
Normal bowl water level  White jet
Low bowl water level  Blue jet

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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 valve 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:
Atmospheric air enters to the discharge valve which closes.

Maintenance

See document 003924-1 for scheduled maintenance.
VACUUM TOILET
EVAC OPTIMA 3, 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 | • Shut off the problematic branch line valve  
• Remove foreign object  
• Change discharge valve  
• Check and if necessary change control mechanism |
| 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         | • Water shut-off valve closed              | • Open valve  
• No water pressure  
• Filter full or dirt in water valve  
• Flush ring loose  
• Flush ring clogged  
• Filter blocked up in water supply |
| Toilet is overflowing                        | • Water valve jammed in open position      | • Close water shut-off valve  
• Bowl clogged or discharge valve not operating  
• Misuse (buckets of water thrown in the bowl)  
• Too low vacuum (less than 30 kPa) to flush |
| 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 | • 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. |

![Diagram of toilet parts](image)

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VACUUM TOILET
6559984  DISCHARGE VALVE FOR EVAC OPTIMA 3 TOILETS

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet does not become empty when flushing</td>
<td>• Foreign object in bowl or in discharge valve</td>
<td>• Shut off the problematic branch line valve</td>
</tr>
<tr>
<td></td>
<td>• Water shut-off valve closed</td>
<td>• Remove foreign object</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Change discharge valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Check and if necessary change control mechanism</td>
</tr>
</tbody>
</table>

Removal of the discharge valve (wall models)

From the cabin side:

1. Close the shut-off valve.
2. Remove the bowl.
3. Disconnect the rubber hose (A) from the water valve or from the connecting nipple (only in USPH model).
4. Loose (only in USPH model) the water valve from the component plate.
5. Unscrew two screws*.

From the service space side:

1. Close the shut-off 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. Disconnect the rubber hose (A) from the water valve or from the hose nipple (only in USPH model).
5. Loose (only in USPH model) the water valve from the component plate.
6. Unscrew two screws* (See fig.1).

Removal of the discharge valve (floor models)

1. Close the shut-off 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. (See installation document 003611-2 or 003613-2 (USPH model))
6. Remove the screws**. (See fig. 2)
7. Disconnect the rubber hose (A) from the water valve or the connecting nipple (only in the USPH models).
8. Remove the back plate.

---

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9. Loose (only in the USPH model) the water valve from the component plate.
10. Unscrew two screws*.

Dismantling of the discharge valve

Fig. 3

Rubber sleeve
Cover
Spring

Fig. 4

Press
Discharge valve body
Closing mechanism
Rubber sleeve and brace

1. Remove the rubber sleeves, the covers and the springs. (See fig.3)
2. Press lightly the closing mechanisms and remove the rubber sleeve with the brace (See fig.4).
VACUUM TOILET
6559507  EVAC OPTIMA 3, FLOOR MODEL, MOSAIK

6540973  Seat and cover, Mosaik
6540968  Flushing ring
6559986  Back plate (document 004036-1)
6559989  Toilet bowl, includes flushing ring, spring and hose clamp

5980801  WATER SUPPLY KIT
  5431884  Shut-off valve
  5432728  Seal
  6543414  Filter
  5432548  Vacuum breaker
  5433215  Water connection hose with two seals

6544996  Pneumatic push button and
6542450  Gasket
6542318  Spring
6542402  Hose clamp
6560988  INSTALLATION KIT
  5433594  Hose clamp (x2)
  6544769  Rubber bend

5433414  Filter

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VACUUM TOILET

6559986    BACK PLATE, EVAC OPTIMA 3, FLOOR MODEL
6559987    BACK PLATE, EVAC OPTIMA 3, FLOOR MODEL USPH

6560674  Control mechanism

6545052  MINI-CHECK VALVE KIT

6543072  Component plate (not includes support plate)

6545157  Hose, L=390 (only in part 6559987)

6559984  Discharge valve (doc. 003933-1)

6542402  Hose clamps (only in part 6559987)

6560680  Water valve

Nuts and hose nipples (only in part 6559987)
6545041 RECOMMENDED SPARE PART KIT:
1 x 6562653 Rubber diaphragm
2 x 6562975 Rubber sleeve

6562653 Rubber diaphragm
6542985 Housing
6562975 Rubber sleeve
6547089 Closing mechanism (sold only as a kit)
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
6560680  WATER VALVE
**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

---

**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
VACUUM TOILET
6540973  SEAT AND COVER, MOSAIK

2 x Hinge body

6542726 Hinge kit

2 x Nut

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VACUUM TOILET
6544996  PNEUMATIC PUSH BUTTON

6542449  Locking ring
6544997  Connection flange
3510100  Bellows complete
6542438  Button

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VACUUM TOILET
6559508  EVAC OPTIMA 3, FLOOR MODEL USPH, MOSAIK

Date: 08 Jan 2015  Doc.: 003600-2

TECHNICAL DATA

Materials
- Bowl: White vitreous china
- Seat and cover, Mosaik: PP
- Pneumatic push button: Grey 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
- Net weight: 21.1 ±0.5 kg
- Shipping weight: 23.1 ±0.5 kg
- Shipping volume: 0.168 m³
The vacuum breaker air inlet must be installed min.150 mm (6") above the overflow point of the toilet.

Optional discharge connection
Mounting screws on the floor

Installation kit P/N 6560988 consists of:
- Rubber elbow 1 pc
- Hose clamp 2 pcs
• Connect the water connection hose (A) to the water valve (B).
• Connect the pipes from the USPH vacuum breaker (G) to the connecting nipples of the backplate. Note the correct flow direction (see water supply in the USPH models 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 pipe with the hose clamps.
• Fix the USPH vacuum breaker on the wall.
• Connect the shut-off valve (H) to the water supply.
• Connect the water connection hose (A) to the shut-off valve (H) / vacuum breaker (G).
• Install the seat and the cover.
Water supply

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

6559505  EVAC OPTIMA 3, WALL MODEL, MOSAIK
6559506  EVAC OPTIMA 3, WALL MODEL USPH, MOSAIK
6559507  EVAC OPTIMA 3, FLOOR MODEL, MOSAIK
6559508  EVAC OPTIMA 3, FLOOR MODEL USPH, MOSAIK

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. Atmospheric air enters to the discharge valve with its closing. After a short delay the atmospheric air pulse reaches to the water 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 is ready for the next flush.

Start-up
• Clean the bottom of the toilet bowl.
• Check sufficient vacuum (-0.3 bar) is available.
• Open the water supply valve in the water supply piping.
• Press the vacuum push button. Presing 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 3, 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.
• The 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 the 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 (5747500) 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 (6540968) and the flushing operation.

Every 10 years; yearly and 5 years maintenance plus:
• Change the rubbers parts: rubber sleeve (6562975, 2 pcs), rubber diaphragm (6562653).
• Change the diaphragm (6560678) of the water valve.

Discharge valve
Water supply
Water valve
Control mechanism
Push buttons

! NOTE: Use only genuine Evac spare parts.
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</th>
<th>Short discharge period</th>
<th>Normal discharge period</th>
<th>Longer discharge period</th>
<th>Less restriction shortens the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Red jet 1.5 sec.</td>
<td>Blue jet 2.0 sec.</td>
<td>White jet 2.5 sec.</td>
<td></td>
</tr>
</tbody>
</table>

Water valve opening time

<table>
<thead>
<tr>
<th>Jet</th>
<th>Normal bowl water level</th>
<th>Low bowl water level</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>White jet</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 valve 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:
Atmospheric air enters to the discharge valve witch closes.

Maintenance

See document 003924-1 for scheduled maintenance.
**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
# VACUUM TOILET
## EVAC OPTIMA 3, 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 | • Shut off the problematic branch line valve  
• Remove foreign object  
• Change discharge valve  
• Check and if necessary change control mechanism |
| Bowl does not become empty when flushed | • Discharge valve blocked  
• Leak in discharge valve housing  
• Discharge pipe blocked  
• Rubber sleeves leaking | • Clear stoppage, if any, in discharge valve  
• Sharp tools may damage rubber  
• Check that rubber sleeves are undamaged and correctly fitted |
| 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, rubber  
• 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 | • 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. |

---

Diagram of the control mechanism:

- 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

---

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### VACUUM TOILET
**6559984  DISCHARGE VALVE FOR EVAC OPTIMA 3 TOILETS**

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| Toilet does not become empty when flushing | • Foreign object in bowl or in discharge valve  
• Water shut-off valve closed | • Shut off the problematic branch line valve  
• Remove foreign object  
• Change discharge valve  
• Check and if necessary change control mechanism |

**Removal of the discharge valve (wall models)**

**From the cabin side:**

1. Close the shut-off valve.
2. Remove the bowl.
3. Disconnect the rubber hose (A) from the water valve or from the connecting nipple (only in USPH model).
4. Loose (only in USPH model) the water valve from the component plate.
5. Unscrew two screws*.

**From the service space side:**

1. Close the shut-off 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. Disconnect the rubber hose (A) from the water valve or from the hose nipple (only in USPH model).
5. Loose (only in USPH model) the water valve from the component plate.
6. Unscrew two screws* (See fig.1).

**Removal of the discharge valve (floor models)**

1. Close the shut-off 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. (See installation document 003611-2 or 003613-2 (USPH model))
6. Remove the screws**. (See fig.2)
7. Disconnect the rubber hose (A) from the water valve or the connecting nipple (only in the USPH models).
8. Remove the back plate.
9. Loose (only in the USPH model) the water valve from the component plate.
10. Unscrew two screws*.

Dismantling of the discharge valve

Fig. 3

Rubber sleeve
Cover
Spring

Fig. 4

Discharge valve body
Closing mechanism
Press
Rubber sleeve and brace
Press

1. Remove the rubber sleeves, the covers and the springs. (See fig.3)
2. Press lightly the closing mechanisms and remove the rubber sleeve with the brace (See fig.4).
VACUUM TOILET
6559508  EVAC OPTIMA 3, FLOOR MODEL USPH, MOSAIK

5980802 WATER SUPPLYKIT
(doc. 6:01024J)

5640973 Seat and cover, Mosaik

6559987 Back plate (document 004036-1)

6542318 Spring

6544996 Pneumatic push button and 6542450 Gasket

6542402 Hose clamp

6560988 INSTALLATION KIT

5433594 Hose clamp (x2)

6544769 Rubber bend

6560347 Plastic spacer

6544898 Buffex

6544898 Washers

6544898 Screw

Back plate

Lock nut

Fixing plate

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VACUUM TOILET

6559986  BACK PLATE, EVAC OPTIMA 3, FLOOR MODEL
6559987  BACK PLATE, EVAC OPTIMA 3, FLOOR MODEL USPH

- 6560674 Control mechanism
- 6543072 Component plate (not includes support plate)
- 6545052 MINI-CHECK VALVE KIT
- 6545157 Hose, L=390 (only in part 6559987)
- 6559984 Discharge valve (doc. 003933-1)
- 6542402 Hose clamps (only in part 6559987)
- 6560680 Water valve
- Nuts and hose nipples (only in part 6559987)

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VACUUM TOILET
6559984  DISCHARGE VALVE

6545041 RECOMMENDED SPARE PART KIT:
1 x 6562653  Rubber diaphragm
2 x 6562975  Rubber sleeve

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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

---

**Diagram:**

- 6560678 Diaphragm
- 5774500 Slider
- 5774800 Permanent magnet
- 5522700 Conical spring
- 5774300 Housing
- 3752211 O-ring
- 3790009 V-ring
- 5774000 Cover
- 2610104 Screw
- 6542826 Membrane
- 5774150 Filter
- 6560677 Solenoid valve

---

**Note:**

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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

5778001
Jet carrier complete
(not alternative Jets)

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
VACUUM TOILET
6540973  SEAT AND COVER, MOSAIK

2 x Hinge body
2 x Nut
6542726 Hinge kit
VACUUM TOILET
6544996  PNEUMATIC PUSH BUTTON

6542449 Locking ring
6544997 Connection flange
3510100 Bellows complete
6542438 Button

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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

SPARE PARTS

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VACUUM TOILET
6559505  EVAC OPTIMA 3, WALL MODEL, MOSAIK

Materials
- Bowl: White vitreous china
- Seat and cover, Mosaik: PP
- Pneumatic push button: Grey 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: $1.2 \pm 0.15$ litres/flush (water pressure: 4 bar, vacuum: -0.4 bar)
- Air consumption: $\sim 60 \pm 10$ 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
- Net weight: 17.2 ±0.5 kg
- Shipping weight: 19.2 ±0.5 kg
- Shipping volume: 0.168 m³
**VACUUM TOILET**

6559505   EVAC OPTIMA 3, WALL MODEL, MOSAIK

---

**NOTE:** Recommended place for the push button. If placement is changed, consult EVAC.

Shut-off valve 1/2" MPT

Vacuum breaker

Flexible water hose

Discharge pipe alignment tolerance to be ±3.0 mm

P/N 6544769 Rubber elbow 90°, (optional connection)

P/N 5433572 Connection sleeve

---

* The vacuum breaker air inlet must be located at a minimum of 150 mm (6") above the overflow point of the toilet.

---

*NOTE:* Overflow point is inside the toilet bowl
Dimensions of toilet service opening through the wall

Toilet supporting beams for wall models

Cross section A - A

Installation kit P/N 6560986 consists of:
- Plastic nut M12: 2 pcs
- Guiding nut: 2 pcs
- Edge strip: 1 pc
- Connection sleeve: 1 pc
- Hose clamp: 2 pcs
VACUUM TOILET
6559505  EVAC OPTIMA 3, WALL MODEL, MOSAIK

- Connect the water connection hose (A) to the water valve.
- Install the back plate assembly to the wall using the bowl fastening bolts (B) (M12, not included) and the guiding nuts (C) (M12). The guiding nuts are necessary.
- Connect the hose (D) from the flushing ring to the water valve. Do not use any kind of grease during installation! Secure with the hose clamps. Tighten the hose clamps with pliers.

- Lift the bowl onto the fastening bolts (B) and tighten the securing nuts (E). Tightening torque is 15-20 Nm.

! NOTE: Check through the toilet service opening in the wall that the hoses run smoothly. The hoses shall not have any kinks.

- Fit the edge strip as shown in figure 1. Place the joint of the strip to the bottom side of the bowl.
- Install the seat and the cover.
- Connect the discharge connection. Secure with the hose clamps.
- Connect the shut-off valve/vacuum breaker assembly to the water supply. The shut-off valve must be installed to the water supply piping's side to ensure the correct flow direction in the vacuum breaker. Note the vacuum breaker must be installed vertically as shown.
- Connect the water connection hose (A) to the shut-off valve/vacuum breaker assembly.
• Do the hole Ø100 to the insulation (insulated sheet metal wall). Drill the hole Ø48 to the wall. Install the push button. Connect the plastic hose (F) on to the nipple of push button. Warm the end of the hose if needed for installation.

! NOTE: The hose (F) can not be flatten after installation. Air impulse must always flow free.

! NOTE: Make sure the plastic hose (F) does not detach from the control mechanism.

! NOTE: Make sure the toilet cover does not interfere with the push button when opened.
**VACUUM TOILET**

6559505  EVAC OPTIMA 3, WALL MODEL, MOSAIK  
6559506  EVAC OPTIMA 3, WALL MODEL USPH, MOSAIK  
6559507  EVAC OPTIMA 3, FLOOR MODEL, MOSAIK  
6559508  EVAC OPTIMA 3, FLOOR MODEL USPH, MOSAIK

---

**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 are 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. Atmospheric air enters to the discharge valve witch closes. After a short delay the atmospheric air pulse reaches to the water 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 sufficient vacuum (-0.3 bar) is available.
- Open the water supply valve in the water supply piping.
- Press the vacuum push button. Presing 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 3, 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.
• The 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 the 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 (5747500) 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 (6540968) and the flushing operation.

Every 10 years; yearly and 5 years maintenance plus:
• Change the rubbers parts: rubber sleeve (6562975, 2 pcs), rubber diaphragm (6562653).
• Change the diaphragm (6560678) of the water valve.

Discharge valve

Water supply

Water valve

6562975 Rubber sleeve
6562653 Rubber diaphragm

Filter

6560678 Diaphragm

Mini-check valve

Filter

5774150 Filter

6540968 Flushing ring

Flushing ring

Control mechanism

5778600 Air filter

Push buttons
6544996 Push button (wall models)
Push button (floor models)

! 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</th>
<th>Short discharge period</th>
<th>Normal discharge period</th>
<th>Longer discharge period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Red jet 1.5 sec.</td>
<td>Blue jet 2.0 sec.</td>
<td>White jet 2.5 sec.</td>
</tr>
</tbody>
</table>

Less restriction shortens the time

Water valve opening time

<table>
<thead>
<tr>
<th>Jet</th>
<th>Normal bowl water level</th>
<th>Low bowl water level</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>White jet</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 valve 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:
Atmospheric air enters to the discharge valve and the control mechanism closes.

**Maintenance**

See document 003924-1 for scheduled maintenance.
## VACUUM TOILET
### EVAC OPTIMA 3, WALL MODELS

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

![Diagram of vacuum toilet components](image_url)

---

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# VACUUM TOILET

## 6559984  DISCHARGE VALVE FOR EVAC OPTIMA 3 TOILETS

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet does not become empty when flushing</td>
<td>• Foreign object in bowl or in discharge valve&lt;br&gt;• Water shut-off valve closed</td>
<td>• Shut off the problematic branch line valve&lt;br&gt;• Remove foreign object&lt;br&gt;• Change discharge valve&lt;br&gt;• Check and if necessary change control mechanism</td>
</tr>
</tbody>
</table>

## Removal of the discharge valve (wall models)

### From the cabin side:

1. Close the shut-off valve.
2. Remove the bowl.
3. Disconnect the rubber hose (A) from the water valve or from the connecting nipple (only in USPH model).
4. Loosen (only in USPH model) the water valve from the component plate.
5. Unscrew two screws*.

### From the service space side:

1. Close the shut-off 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. Disconnect the rubber hose (A) from the water valve or from the hose nipple (only in USPH model).
5. Loosen (only in USPH model) the water valve from the component plate.
6. Unscrew two screws* (See fig.1).

## Removal of the discharge valve (floor models)

1. Close the shut-off 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. (See installation document 003611-2 or 003613-2 (USPH model))
6. Remove the screws**. (See fig. 2)
7. Disconnect the rubber hose (A) from the water valve or the connecting nipple (only in the USPH models).
8. Remove the back plate.
9. Loose (only in the USPH model) the water valve from the component plate.

10. Unscrew two screws*.

Dismantling of the discharge valve

Fig. 3

Fig. 4

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

2. Press lightly the closing mechanisms and remove the rubber sleeve with the brace (See fig.4).
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VACUUM TOILET

6559983  BACK PLATE ASSEMBLY, EVAC OPTIMA 3, WALL MODEL
6559985  BACK PLATE ASSEMBLY, EVAC OPTIMA 3, WALL MODEL USPH

6560674  Control mechanism

6560680  Water valve

6542402  Hose clamp (only in part 6559985)

6542995  Wall support, left and right

6543072  Component plate

6545157  Hose, L=390 (only in part 6559985)

6559984  Discharge valve (doc. 003933-1)

6545052  MINI-CHECK VALVE KIT

Hose

Valve seat

O-ring

Valve flap

Nut and hose nipple (only in part 6559985)

Hose
6545041 RECOMMENDED SPARE PART KIT:
1 x 6562653  Rubber diaphragm
2 x 6562975  Rubber sleeve

VACUUM TOILET
6559984  DISCHARGE VALVE

6562975  Rubber sleeve

6542985  Housing

6562653  Rubber diaphragm

6547089  Closing mechanism (sold only as a kit)

6562975  Rubber sleeve
**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

---

**5778600 Air filter**

---

**5778001 Jet carrier complete (not alternative Jets)**

---

**5778000 Jet carrier complete (not alternative Jets)**

---

### Jet carrier identification:

<table>
<thead>
<tr>
<th>P/N</th>
<th>Colour</th>
<th>Size</th>
<th>Effect</th>
</tr>
</thead>
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<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
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VACUUM TOILET
6559506  EVAC OPTIMA 3, WALL MODEL USPH, MOSAIK

TECHNICAL DATA

Date: 14 Jan 2015  Doc. 003598-3

Materials
- Bowl: White vitreous china
- Seat and cover, Mosaik: PP
- Pneumatic push button: Grey 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 with USPH: 1/2” MPT, flexible hose
- Discharge: Discharge connection Ø50, connection sleeve includes two hose clamps to O.D. 48 - 52 mm pipes

Shipping data
- Net weight: 18.1 ±0.5 kg
- Shipping weight: 20.1 ±0.5 kg
- Shipping volume: 0.168 m³
**NOTE:** Recommended place for the button.
If placement is changed, consult Evac.

- **USPH Vacuum breaker**
- **Shut-off valve 1/2” MPT**
- **Flexible water hose**
- **Discharge pipe alignment tolerance to be ±3.0 mm**

![Diagram](image)

**Overflow point**

* The vacuum breaker air inlet must be located at a minimum of 150 mm (6") above the overflow point of the toilet.
Dimensions of toilet service opening through the wall

Toilet supporting beams for wall models

Cross section A - A

Installation kit P/N 6560986 consists of:
- Plastic nut: 2 pcs
- Guiding nut: 2 pcs
- Edge strip: 1 pc
- Connection hose: 1 pc
- Hose clamp: 2 pcs

Bolt M12 (not Evac supplied) to be welded.

**NOTE:** Thread on the bolt must be full length.
VACUUM TOILET
6559506  EVAC OPTIMA 3, WALL MODEL USPH, MOSAIK

- Connect the water connection hose (A) to the water valve.
- Install the backplate assembly on the wall using the bowl fastening bolts (B) (M12, not included) and the guiding nuts (C) (M12). The guiding nuts are necessary.
- Connect the hose (D) from the flushing ring to the connecting nipple on the backplate (see drawing: Water supply). Do not use any kind of grease during installation! Secure with the hose clamps. Tighten the hose clamps with pliers.

I NOTE: Install the hose (D) to the right side of the discharge valve and below the hose (F).

- Lift the bowl onto the fastening bolts (B) and tighten the securing nuts (E). Tightening torque is 15-20 Nm.

I NOTE: Check through the toilet service opening in the wall that the hoses run smoothly. The hoses shall not have any kinks.
VACUUM TOILET
6559506  EVAC OPTIMA 3, WALL MODEL USPH, MOSAIK

- Fit the edge strip as shown in the figure 1. Place the joint of the strip to the bottom side of the bowl.
- Install the seat and the cover.
- Connect the USPH vacuum breaker to the back plate’s connecting nipples (see drawing: Water supply).
- Fix the USPH vacuum breaker to the wall.
- Connect the discharge connection. Secure with the hose clamps.
- Connect the shut-off valve to the water supply. The shut-off valve must be installed to the water supply piping’s side to ensure the correct flow direction in the vacuum breaker. Note the vacuum breaker must be installed vertically as shown.
- Connect the water connection hose (A) to the shut-off valve.

Water supply

! NOTE: For non-U.S. flag vessels
Installation of push button

• Do the hole Ø100 to the insulation (insulated sheet metal wall). Drill the hole Ø48 to the wall. Install the push button. Connect the plastic hose (F) on to the nipple of push button. Warm the end of the hose if needed for installation.

! NOTE: The hose (F) cannot be flattened after installation. Air impulse must always flow free.

! NOTE: Make sure the plastic hose (F) does not detach from the control mechanism.

! NOTE: Make sure the toilet cover does not interfere with the push button when opened.
VACUUM TOILET

6559505  EVAC OPTIMA 3, WALL MODEL, MOSAIK
6559506  EVAC OPTIMA 3, WALL MODEL USPH, MOSAIK
6559507  EVAC OPTIMA 3, FLOOR MODEL, MOSAIK
6559508  EVAC OPTIMA 3, FLOOR MODEL USPH, MOSAIK

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. Atmospheric air enters to the discharge valve when closing. After a short delay the atmospheric air pulse reaches to the water 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 sufficient vacuum (-0.3 bar) is available.
- Open the water supply valve in the water supply piping.
- Press the vacuum 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.
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.
- The 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 the 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 (5747500) 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 (6540968) and the flushing operation.

**Every 10 years; yearly and 5 years maintenance plus:**
- Change the rubbers parts: rubber sleeve (6562975, 2 pcs), rubber diaphragm (6562653).
- Change the diaphragm (6560678) of the water valve.

**Discharge valve**
- 6562975 Rubber sleeve
- 6562653 Rubber diaphragm
- Mini-check valve

**Water supply**
- Filter

**Water valve**
- 6560678 Diaphragm
- 5774150 Filter
- Flushing ring (6540968)

**Control mechanism**
- 5778600 Air filter

**Push buttons**
- 6544996 Push button (wall models)
- Push button (floor models)

**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

Jet 1  
- Short discharge period: Red jet, 1.5 sec.
- Normal discharge period: Blue jet, 2.0 sec.
- Longer discharge period: White jet, 2.5 sec.

Water valve opening time

Jet 6  
- Normal bowl water level: White jet
- Low bowl water level: Blue jet
VACUUM TOILET
6559984  DISCHARGE VALVE FOR OPTIMA 3 TOILETS

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 valve 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:
Atmospheric air enters to the discharge valve which closes.

Maintenance
See document 003924-1 for scheduled maintenance.
# VACUUM TOILET

## EVAC OPTIMA 3, WALL MODELS

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

![Diagram of the vacuum toilet components](image)

---

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VACUUM TOILET
6559984  DISCHARGE VALVE FOR EVAC OPTIMA 3 TOILETS

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| Toilet does not become empty when flushing | • Foreign object in bowl or in discharge valve  
• Water shut-off valve closed | • Shut off the problematic branch line valve  
• Remove foreign object  
• Change discharge valve  
• Check and if necessary change control mechanism |

Removal of the discharge valve (wall models)

From the cabin side:

1. Close the shut-off valve.
2. Remove the bowl.
3. Disconnect the rubber hose (A) from the water valve or from the connecting nipple (only in USPH model).
4. Loose (only in USPH model) the water valve from the component plate.
5. Unscrew two screws*.

From the service space side:

1. Close the shut-off 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. Disconnect the rubber hose (A) from the water valve or from the hose nipple (only in USPH model).
5. Loose (only in USPH model) the water valve from the component plate.
6. Unscrew two screws* (See fig.1).

Removal of the discharge valve (floor models)

1. Close the shut-off 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. (See installation document 003611-2 or 003613-2 (USPH model))
6. Remove the screws**. (See fig. 2)
7. Disconnect the rubber hose (A) from the water valve or the connecting nipple (only in the USPH models).
8. Remove the back plate.
9. Loose (only in the USPH model) the water valve from the component plate.
10. Unscrew two screws*.

Dismantling of the discharge valve

Fig. 3

1. Remove the rubber sleeves, the covers and the springs. (See fig.3)
2. Press lightly the closing mechanisms and remove the rubber sleeve with the brace (See fig.4).

Fig. 4
VACUUM TOILET
6559506  EVAC OPTIMA 3, WALL MODEL USPH, MOSAIK

6559988 Toilet bowl, includes flushing ring, spring and hose clamp
6540973 Seat and cover, Mosaik
6540968 Flushing ring
6544996 Pneumatic push button
6542450 O-ring
6559985 Back plate (doc. 003973-1)
6542402 Hose clamp
6542318 Spring

6560986 INSTALLATION KIT
5779098 Guiding nut (x2)
6540936 Edge strip
5990759 Nut (x2)
5433594 Hose clamp (x2)
5433572 Connection sleeve

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VACUUM TOILET

6559983  BACK PLATE ASSEMBLY, EVAC OPTIMA 3, WALL MODEL
6559985  BACK PLATE ASSEMBLY, EVAC OPTIMA 3, WALL MODEL USPH

6560674   Control mechanism

6559984   Discharge valve (doc. 003933-1)

6543072   Component plate

6545157   Hose, L=390 (only in part 6559985)

6560680   Water valve

6542995   Wall support, left and right

6545052   MINI-CHECK VALVE KIT

6542402   Hose clamp (only in part 6559985)
6545041 RECOMMENDED SPARE PART KIT:
1 x 6562653  Rubber diaphragm
2 x 6562975  Rubber sleeve

---

6562653  Rubber diaphragm
6562975  Rubber sleeve
6542985  Housing
6547089  Closing mechanism (sold only as a kit)
**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

---

*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>

---

NOTICE: 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
VACUUM TOILET
6540973  SEAT AND COVER, MOSAIK

2 x Hinge body

6542726
Hinge kit

2 x Nut
VACUUM TOILET
6544996  PNEUMATIC PUSH BUTTON

6542449 Locking ring
6544997 Connection flange
3510100 Bellows complete
6542438 Button
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
VACUUM TOILET
6559992 EVAC OPTIMA URINAL

Date: 22 Feb 2016 Doc: 003820-3

TECHNICAL DATA

Materials
- Bowl: White vitreous china
- Flushing nozzle: POM, black
- Pneumatic 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: ~0.6 ±0.1 litre/flush (water pressure: 4 bar, vacuum: -0.4 bar)
- Air consumption: ~ 60 ±10 litre/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
- Net weight: 14.2 ±0.5 kg
- Shipping weight: 17.5 ±0.5 kg
- Shipping volume: 0.13 m³

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**TECHNICAL DATA**

**Date:** 14 Jan 2016

---

**VACUUM TOILET**

6560393   OPTIMA PUSH BUTTON

---

**Materials**

- Cover: ABS, RAL 9016
- Button: ABS, RAL 9016
- Push button arms: POM, natural white
- Push button base: POM, natural white
- Buckling cone: TPV, white

**Connections**

- Hose nipple Ø4

**Shipping data**

- Net weight: 0.13 kg
**VACUUM TOILET**

**6559992  EVAC OPTIMA URINAL**

- **Flexible water supply hose**
- **Discharge pipe alignment tolerance to be ±3.0 mm**
- **P/N 5433572** Straight connection hose
- **P/N 6544769** Rubber elbow 90°, optional connection
- **U-beam** (Not Evac supplied) Fasten the beam to a solid structure.

**VACUUM TOILET INSTALLATION**

Date: 22 Feb 2016  Doc. 004130-1

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Dimensions of toilet service opening through the wall

![Diagram showing dimensions of the toilet service opening through the wall.](image)

Toilet supporting beams for wall models

![Diagram showing toilet supporting beams.](image)

Cross section A - A

Bolt M12 (not Evac supplied) to be welded.

**NOTE:** Thread on the bolt must be full length.

**Installation kit P/N 6560986 consists of:**

- Plastic nut M12: 2 pcs
- Guiding nut: 2 pcs
- Edge strip: 1 pc
- Connection sleeve: 1 pc
- Hose clamp: 2 pcs

**Total length of bolt = T + 50±2**
**VACUUM TOILET**

6559992  EVAC OPTIMA URINAL

- Connect the water connection hose (A) to the water valve (B).
- Install the back plate assembly on the wall using the bowl fastening bolts (C) (M12, not included) and the guiding nuts (D) (M12). The guiding nuts are necessary.
- Connect the hose (E) from the flushing nozzle to the connecting nipple on the back plate. **Do not use any kind of grease during installation!** Secure with the hose clamp. Tighten the hose clamp with pliers.

**NOTE:** Install the hose (E) to the right side of the discharge.

- Lift the bowl onto the fastening bolts and tighten the securing nuts (G). Tightening torque is 15-20 Nm.

**NOTE:** Check through the urinal service opening in the wall that the hoses run smoothly. The hoses shall not have any kinks.
VACUUM TOILET
6559992  EVAC OPTIMA URINAL

• Fit the edge strip around the bowl as shown in the figure 1. Place the joint of the strip to the bottom side of the bowl.
• Connect the discharge connection hose. Secure with the hose clamps.
• Connect the shut-off valve to the water supply. The shut-off valve must be installed to the water supply piping's side to ensure the correct flow direction in the vacuum breaker. Note the vacuum breaker must be installed vertically as shown.
• Connect the water connection hose (A) to the shut-off valve.
• Install the pneumatic push button (see the document 003802-1).
1. Drill Ø6 hole for the hose (B).
2. Loose the cover A from the base.
3. Connect the plastic hose (B) from the control mechanism to the nipple of the base. Warm the end of the hose if needed to help installation.
4. Install the push button base using screws (C) (not included) on to the wall.
5. Place the push button mechanism (D). Note "O"-marks.
6. Snap the cover (A) in its place.

**NOTES:**

Note that the hose (B) is not flattened during installation. The air impulse must always flow free.

Make sure that the plastic hose is not detached from the control mechanism.
Operation
The urinal bowl 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 nozzle. 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 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 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 urinal 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 urinal not to be used for a long period
- Close the water supply valve.
- Run a flush cycle by pressing the push button.
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
**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 witch 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).
Scheduled maintenance program

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

Every year:

- Change the flap of the mini-check valve in every urinal.
- Check operation, the push button, 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 nozzle 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.
## VACUUM TOILET

6559992  EVAC OPTIMA URINAL
6562775  EVAC OPTIMA URINAL USPH

### TROUBLE SHOOTING

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| Urinal 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          | • Sharp tools may damage rubber                |
|                                                  | • Discharge pipe blocked                   | • Check that rubber sleeves are undamaged and correctly fitted |
|                                                  | • Rubber sleeves leaking                   | • Check relief valve operation                 |
| No water or too little rinsing water              | • Water shut-off valve closed              | • Open valve                                  |
|                                                  | • No water pressure                        | • Provide water pressure                       |
|                                                  | • Filter full or dirt in water valve       | • Clean filter                                 |
|                                                  | • Flushing nozzle loose                    | • Connect flushing nozzle                      |
|                                                  | • Flushing nozzle clogged                  | • Clean flushing nozzle                        |
|                                                  | • Filter blocked up in water supply        | • Clean filter                                 |
| Urinal is overflowing                             | • Water valve jammed in open position      | • Close water shut-off valve                   |
|                                                  | • Bowl clogged or discharge valve not operating | • Clean / change water valve nozzles, springs, rubbers |
|                                                  | • Misuse (buckets of water thrown in the bowl) | • Discharge bowl, valve and piping with normally flushing |
| Urinal does not flush                             | • No vacuum or low vacuum (less than 30 kPa) | • Check vacuum level, remove blockage in piping |
|                                                  | • Clogged mini-check valve                 | • Clean / change mini-check valve              |
|                                                  | • No impulse from push button              | • Check hoses and membrane of push button      |
|                                                  | • Jammed control mechanism                 | • Change control mechanism                     |
|                                                  | • Jammed quick relief valve                | • Check air filter condition. It should be place. |
|                                                  |                                          | • Check relief valve operation                 |

![Diagram of Urinal](image)

**Diagram:**
- Push button
- Control mechanism
- Vacuum hose
- Relief valve
- Flushing nozzle
- 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

---

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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. Lose (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. Lose (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).
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**.

Dismantling of the discharge valve

1. Remove the rubber sleeves, the covers and the springs (see fig.3).
2. Press lightly the closing mechanisms and remove the rubber sleeve with the brace (see fig.4).
URINALS
6559992 EVAC OPTIMA URINAL

6560393 Optima push button
5805900 Hose to push button
5820900 Elbow
658644 Flushing nozzle
6559993 Urinal bowl with flushing nozzle

5980801 WATER SUPPLY KIT
5431884 Shut-off valve
5432728 Seal
6543414 Filter
5432548 Vacuum breaker
5433215 Water connection hose with two seals

6559991 Back plate (doc. 004096-1)
6542402 Hose clamp
6574684 Hose
6543594 Hose clamp (x2)
5433572 Connection sleeve
6569738 Guiding nut (x2)
5990759 Nut (x2)
6542503 Edge strip
6569739 INSTALLATION KIT
VACUUM TOILET

6559991  BACK PLATE
6562981  BACK PLATE

SPARE PARTS

Date: 29 Apr 2016  Doc. 004096-2

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6574179 RECOMMENDED SPARE PART KIT:
1 x 6562653 Rubber diaphragm
2 x 6562975 Rubber sleeve
1 x 6543134 Membrane
VACUUM TOILET
6559990  WATER VALVE

6560678  Diaphragm
5774500  Slider
5774800  Permanent magnet
5522700  Conical spring
5774300  Housing
5774700  Valve washer
5722609  Jet
3752211  O-ring
5774600  Cover
2610104  Screw
3790009  V-ring
5774150  Filter
6542826  Membrane
6560677  Solenoid valve

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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

5778001
Jet carrier complete
  (not alternative Jets)

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
VACUUM TOILET
6560393  OPTIMA PUSH BUTTON

Date: 11 Jan 2016  Doc. 004057-1

SPARE PARTS

6560705
Buckling cone
**VACUUM TOILET**

**6562775  EVAC OPTIMA URINAL USPH**

### Materials
- Bowl: White vitreous china
- Flushing nozzle: POM, black
- Pneumatic 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: \(-0.6 \pm 0.1\) litre/flush (water pressure: 4 bar, vacuum: -0.4 bar)
- Air consumption: \(-60 \pm 10\) litre/flush (normal atmospheric air)

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

### Shipping data
- Net weight: 14.8 ±0.5 kg
- Shipping weight: 18.2 ±0.5 kg
- Shipping volume: 0.13 m³
Materials
Cover: ABS, RAL 9016
Button: ABS, RAL 9016
Push button arms: POM, natural white
Push button base: POM, natural white
Buckling cone: TPV, white

Connections
Hose nipple Ø4

Shipping data
Net weight: 0.13 kg
VACUUM TOILET
6562775 EVAC OPTIMA URINAL USPH

Flexible water supply hose

Discharge pipe alignment tolerance to be ±3.0 mm

P/N 5433572 Straight connection hose

P/N 6544769 Rubber elbow 90°, optional connection

Pneumatic push button

USPH vacuum breaker

Wall bracket

Min. 415 (Wall bracket)

U-beam
(Not Evac supplied)
Fasten the beam to a solid structure.

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Dimensions of toilet service opening through the wall

Toilet supporting beams for wall models

Cross section A - A

Installation kit P/N 6560986 consists of:
- Plastic nut M12 2 pcs
- Guiding nut 2 pcs
- Edge strip 1 pc
- Connection sleeve 1 pc
- Hose clamp 2 pcs

Bolt M12 (not Evac supplied) to be welded.

\[ \text{Thread on the bolt must be full length.} \]

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• Connect the water connection hose (A) to the water valve (B).
• Install the back plate assembly on the wall using the bowl fastening bolts (C) (M12, not included) and the guiding nuts (D) (M12). The guiding nuts are necessary.
• Connect the hose (E) from the flushing nozzle to the connecting nipple on the back plate. (See drawing: Water supply). **Do not use any kind of grease during installation!** Secure with the hose clamp. Tighten the hose clamp with pliers.

**NOTE:** Install the hose (E) to the right side of the discharge valve and below the hose (F).

• Lift the bowl onto the fastening bolts and tighten the securing nuts (G). Tightening torque is 15-20 Nm.

**NOTE:** Check through the urinal service opening in the wall that the hoses run smoothly. The hoses shall not have any kinks.
VACUUM TOILET
6562775  EVAC OPTIMA URINAL USPH

- Fit the edge strip around the bowl as shown in the figure. Place the joint of the strip to the bottom side of the bowl.
- Connect the USPH vacuum breaker to the connecting nipples of the back plate (see drawing: Water supply).
- Fix the USPH vacuum breaker to the wall.
- Connect the discharge connection hose. Secure with the hose clamps.
- Connect the shut-off valve to the water supply. The shut-off valve must be installed to the water supply piping’s side to ensure the correct flow direction in the vacuum breaker. Note the vacuum breaker must be installed vertically as shown.
- Connect the water connection hose (A) to the shut-off valve.
- Install the pneumatic push button (see the document 003802-1).

Water supply

![Diagram of water supply system]

---

**Water supply**

- **Vacuum breaker**
- **Technical water connection**
- **Pipe Ø12**
- **Shut-off valve, 1/2" MPT BSP**
- **Hose A, (EPDM, L=400)**
- **Braid of stainless steel wire**
- **Hose (EPDM), L=500**
- **Hose (EPDM), L=810**
- **Water valve**
- **Hose to the flushing ring in the urinal bowl**
- **Back plate assembly**
- **Discharge connection pipe**
- **Connecting nipples**
- **Hose clamps**

**NOTE:** For non-U.S. flag vessels
1. Drill Ø6 hole for the hose (B).
2. Loose the cover A from the base.
3. Connect the plastic hose (B) from the control mechanism to the nipple of the base. Warm the end of the hose if needed to help installation.
4. Install the push button base using screws (C) (not included) on to the wall.
5. Place the push button mechanism (D). Note "O"-marks.
6. Snap the cover (A) its place.

**NOTES:**

Note that the hose (B) is not flattened during installation. The air impulse must always flow free.

Make sure that the plastic hose is not detached from the control mechanism.
**Operation**
The urinal bowl 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 nozzle. 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 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 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 urinal 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 urinal not to be used for a long period**
- Close the water supply valve.
- Run a flush cycle by pressing the push button.
**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 occured:

- 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
**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>
</tbody>
</table>
| Less restriction shortens the time

**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**

---

**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 with 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).
Scheduled maintenance program

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

Every year:

• Change the flap of the mini-check valve in every urinal.
• Check operation, the push button, 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 nozzle 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.
## VACUUM TOILET

**6559992**  **EVAC OPTIMA URINAL**  
**6562775**  **EVAC OPTIMA URINAL USPH**

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Cause</th>
<th>Remedy</th>
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</table>
| Urinal 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  
• Flushing nozzle loose  
• Flushing nozzle clogged  
• Filter blocked up in water supply | • Open valve  
• Provide water pressure  
• Clean filter  
• Connect flushing nozzle  
• Clean flushing nozzle  
• Clean filter |
| Urinal 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 |
| Urinal 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:**

- Push button
- Control mechanism
- Vacuum hose
- Relief valve
- Flushing nozzle
- 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
VACUUM TOILET
6562976  DISCHARGE VALVE (OPTIMA 5 TOILETS, OPTIMA URINALS)

Removal of the discharge valve (wall models, urinals)

From the cabin side:

Fig. 1

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**.

Removal of the discharge valve (floor models)

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).
VACUUM TOILET
6562976  DISCHARGE VALVE (OPTIMA 5 TOILETS, OPTIMA URINALS)

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**.

1. Remove the rubber sleeves, the covers and the springs (see fig.3).
2. Press lightly the closing mechanisms and remove the rubber sleeve with the brace (see fig.4).
URINALS
6562775  EVAC OPTIMA URINAL USPH

6560393 Optima push button
5805900 Hose to push button
5820900 Elbow
6558644 Flushing nozzle
6559993 Urinal bowl with flushing nozzle
6574684 Hose
6562981 Back plate (doc. 004096-1)
6562503 Edge strip
6569738 Guiding nut (x2)
5990759 Nut (x2)
6542502 Hose clamp
6569739 INSTALLATION KIT

6541772 WATER SUPPLY KIT (document 6:01024J)
Vacuum breaker
USPH
Shut-off valve
Connection hose with seals

6541772 WATER SUPPLY KIT (document 6:01024J)

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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
6559990  WATER VALVE

23 Feb 2016 004153-1

6560678 Diaphragm
5774500 Slider
5774800 Permanent magnet
5522700 Conical spring
5774700 Valve washer
5722609 Jet
3752211 O-ring
5774600 Cover
3790009 V-ring
6542826 Membrane
2610104 Screw

5774150 Filter
6560677 Solenoid valve

V-RING

SPARE PARTS

Date: 23 Feb 2016  Doc. 004153-1

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**VACUUM TOILET**

**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

### *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
6560705 Buckling cone
VACUUM TOILET
6541772 WATER SUPPLY KIT, USPH,
5980802 WATER SUPPLY KIT, USPH,

P/N 6541772 Water supply kit, USPH

6541409 VACUUM BREAKER COMPLETE, USPH, WALL MODEL

5432548 Vacuum breaker

5432728 Seal

5433215 Water connection hose (includes: 2 x seal)

P/N 5980802 Water supply kit, USPH

5435336 VACUUM BREAKER ASSEMBLY, USPH

5957210 Elbow wall fast flange

5430164 Elbow

5430166 Coupling

5432548 Vacuum breaker

5432728 Seal

5433215 Water connection hose (includes: 2 x seal)

5910601 (x2) Cu pipe Ø12x1

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**VACUUM TOILET**

6559521  EVAC OPTIMA 5, B15, WALL MODEL USPH, PRESTIGE

---

**Materials**
- Bowl: White vitreous china
- Seat and cover, *Prestige*: UF-S
- Pneumatic push button: White plastic, ABS

**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 with USPH: 1/2" MPT, flexible hose
- Discharge: Discharge connection Ø50

**Shipping data**
- Net weight: 22.7 ±0.5 kg
- Shipping weight: 26.2 ±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.

Back plate P/N 6559504 has been certified as a Pipe Penetration for B-15 Bulkheads in conformity with:
- EC TYPE EXAMINATION CERTIFICATE No. MED 1350064/M1
- USCG APPROVAL No. 164.138/EC0038/MED 1350064/M1
- CERTIFICATE OF TYPE APPROVAL No. SAS F130091/M1
VACUUM TOILET  
6560393  OPTIMA PUSH BUTTON

Materials
- Cover: ABS, RAL 9016
- Button: ABS, RAL 9016
- Push button arms: POM, natural white
- Push button base: POM, natural white
- Buckling cone: TPV, white

Connections
- Hose nipple Ø4

Shipping data
- Net weight: 0.13 kg
VACUUM TOILET
6559521  EVAC OPTIMA 5, B15, WALL MODEL USPH, PRESTIGE

**Installation**

Date: 30 Nov 2015
Doc. 003576-2

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**Overflow point**

- **Vacuum breaker**

  - **NOTE:** Overflow point is inside the toilet bowl

  - *The vacuum breaker air inlet must be located at a minimum of 150 mm (6") above the overflow point of the toilet.*

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**NOTE:** Recommended place for the button.
If placement is changed, consult Evac.

**Connection hose (not Evac supplied):**
e.g. with heat resistant exhaust or chemical hose suitable for vacuum, hose material e.g. EPDM or EPM

**Recommended place for the button.**
If placement is changed, consult Evac.

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**Wall bracket**

- **USPH Vacuum breaker**

  - **Shut-off valve**
    - 1/2” BSP-M

**Water supply hose**

- **U-beam**
  (not Evac supplied)

  - Fasten the beam to solid structure.
VACUUM TOILET
6559521  EVAC OPTIMA 5, B15, WALL MODEL USPH, PRESTIGE

Dimensions of toilet service opening through the wall

Toilet supporting beams

Cross section A - A

Installation kit P/N 6560989 consists of:
- Plastic nut M12 2 pcs
- Guiding nut 2 pcs
- Edge strip 1 pc
- Screw 6 pcs

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• Lift the toilet bowl onto the fastening bolts (A) on the wall using the guiding nuts (B). The guiding nuts are necessary. Tighten the securing nuts (C). The tightening torque is 15-20 Nm.
• Fit the edge strip as shown in figure 1. Place the joint of the strip onto the bottom side of the bowl.
• Install the seat and cover.
• Connect the hose (D) from the flushing ring to the connecting nipple on the backplate. **Do not use any kind of grease during installation!** Secure with the hose clamp. Tighten the hose clamp with pliers.

**! NOTE:** Check through the toilet service opening in the wall that the hoses run smoothly. The hoses shall not have any kinks.

• Install the back plate assembly onto the beam using the self tapping screws.
• Connect the water connection hose (E) to the water valve.
• Connect the USPH vacuum breaker to the back plate’s connecting nipples. Secure with the hose clamps.
• Fix the USPH vacuum bracket horizontally on the wall. Note the vacuum breaker must be installed vertically as shown.
• Connect the discharge connection. Secure with the hose clamp.
• Connect the shut-off valve to water supply. The shut-off valve must be installed to the water supply piping’s side to ensure the correct flow direction in the vacuum breaker. Note the vacuum breaker must be installed vertically as shown.
• Connect the water connection hose (E) to the shut-off valve.
• Install the pneumatic push button.
1. Drill Ø6 hole for the hose (B).
2. Loose the cover A from the base.
3. Connect the plastic hose (B) from the control mechanism to the nipple of the base. Warm the end of the hose if needed to help installation.
4. Install the push button base using screws (C) (not included) on to the wall.
5. Place the push button mechanism (D). Note "O"-marks.
6. Snap the cover (A) its place.

**Control mechanism**

Plastic hose (B) to the push button.

**! NOTES:**

Note that the hose (B) is not flattened during installation. The air impulse must always flow free.

Make sure that the plastic hose is not detached from the control mechanism.
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.
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 or clean 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.

Discharge valve

| Relief valve | Water supply
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6562975 Rubber sleeve</td>
<td>Filter</td>
</tr>
<tr>
<td>6562653 Rubber diaphragm</td>
<td>Mini-check valve</td>
</tr>
</tbody>
</table>

Water valve

<table>
<thead>
<tr>
<th>5560678</th>
<th>Diaphragm</th>
</tr>
</thead>
<tbody>
<tr>
<td>5774150</td>
<td>Filter</td>
</tr>
</tbody>
</table>

Control mechanism

<table>
<thead>
<tr>
<th>5778600</th>
<th>Air filter</th>
</tr>
</thead>
</table>

Pneumatic push buttons

| 6560393 | Push button |

! NOTE: Use only genuine Evac spare parts.
VACUUM TOILET
6559504 DISCHARGE VALVE FOR EVAC OPTIMA 5, B15 TOILET USPH

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 witch closes immediatelly. After a short delay the atmospheric air pulse reaches the relief valve.

Maintenance

See document 004085-1 for scheduled maintenance.
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
Operation

The functioning of the vacuum toilet 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>Description</th>
<th>Jet 6</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short discharge period</td>
<td>Red jet</td>
<td>1.5 sec.</td>
<td>Normal bowl water level</td>
</tr>
<tr>
<td>Normal discharge period</td>
<td>Blue jet</td>
<td>2.0 sec.</td>
<td>Low bowl water level</td>
</tr>
<tr>
<td>Longer discharge period</td>
<td>White jet</td>
<td>2.5 sec.</td>
<td></td>
</tr>
<tr>
<td>Less restriction shortens the time</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Water valve opening time

<table>
<thead>
<tr>
<th>Jet 6</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal bowl water level</td>
<td>White jet</td>
</tr>
<tr>
<td>Low bowl water level</td>
<td>Blue jet</td>
</tr>
</tbody>
</table>
## TROUBLE SHOOTING

### VACUUM TOILET

#### 6559521  EVAC OPTIMA 5, B15, WALL MODEL, PRESTIGE

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

---

**Diagram:**

- **Vacuum breaker USPH**
- **Shut-off valve**
- **Water supply hose**
- **Push button**
- **Mini-check valve**
- **Control mechanism**
- **Water valve**
- **Vacuum hose**
- **Back plate**
- **Discharge valve**
- **Relief valve**
- **Flushing ring**
# VACUUM TOILET

## DISCHARGE VALVE, EVAC OPTIMA 5, B15, WALL MODEL

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| Bowl does not become empty when flushed | • Discharge valve blocked  
• Leak in discharge valve housing  
• Discharge pipe clogged  
• Rubber sleeves leaking | • Clear stoppage, if any, in discharge valve  
• Sharp tools may damage rubber  
• Check that rubber sleeves are undamaged and correctly fitted |

## Trouble Shooting

### Removal of the discharge valve

#### From the cabin side:

1. Close the water supply.
2. Detach the bowl.
3. Disconnect the hose (A), (B) and (C) from the discharge valve and the hose (D) from the back plate.
4. Unscrew two screws (K) and remove the discharge valve.

#### From the service space side:

1. Close the water supply valve.
2. Disconnect the water supply hose (E) from the water valve and the discharge piping from the back plate.
3. Disconnect the hose (F) from the push button.
4. Disconnect the hoses (G) and (H) from the pipes of the back plate.
5. Unscrew six screws (J) and loose the back plate from wall.
6. Disconnect the hose (D) from the back plate.
7. Disconnect the hoses (A, B, C) from the discharge valve.
8. Unscrew two screws (K) and remove the discharge valve.

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Dismantling of the discharge valve

1. Remove the rubber sleeves, the covers and the springs (see fig.1).
2. Press lightly the closing mechanisms and remove the rubber sleeve with the brace (see fig.2).
VACUUM TOILET
6559504  BACK PLATE

SPARE PARTS

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5736318</td>
<td>Hose, L=270</td>
</tr>
<tr>
<td>5736309</td>
<td>Hose, L=150</td>
</tr>
<tr>
<td>6559996</td>
<td>Discharge valve</td>
</tr>
<tr>
<td>5450694</td>
<td>Lock nut</td>
</tr>
<tr>
<td>5736309</td>
<td>Hose, L=150</td>
</tr>
<tr>
<td>5736322</td>
<td>Hose, L=50</td>
</tr>
<tr>
<td>5959902</td>
<td>Mini-check valve</td>
</tr>
<tr>
<td>5450694</td>
<td>Locking pin</td>
</tr>
<tr>
<td>6560680</td>
<td>Water valve</td>
</tr>
<tr>
<td>6560674</td>
<td>Control mechanism</td>
</tr>
<tr>
<td>5481107</td>
<td>Hose, L=230</td>
</tr>
<tr>
<td>5736309</td>
<td>Hose, L=150</td>
</tr>
</tbody>
</table>

Direction A

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VACUUM TOILET

6559996  DISCHARGE VALVE WITH BRACKET

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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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*5778001 Jet carrier complete (controls flushing period)

Alternatives for this Jet:
*5778000 Jet carrier complete
*5778002 Jet carrier complete
*5778004 Jet carrier complete

5778001 Jet carrier complete (not alternative Jets)

5778600 Air filter

5778000 Jet carrier complete (not alternative Jets)

**Jet carrier identification:**

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**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
**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

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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
6560393   OPTIMA PUSH BUTTON

6560705
Buckling cone