



# Info on **waterloop**<sup>®</sup> 100% biological waste water (black and grey waters) purification technology



**KLIMAHOUSE**  
trend 2011





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**What does it mean “100% biological waste water purification technology”?**

This means waters are purified exclusively via the growth of a bacteria flora inside the waterloop® filters: therefore, the oxidation of sewage is done exclusively via an organic-controlled-no chemical process, no chemical additives.

<b>The three steps of the organic purification</b>	<b>Consequence</b>	<b>Output waters' norms respect</b>
1. continuous filtering of black and grey waters through filters	▶ The growth of bacteria-flora and the organic oxidation process. The bacteria flora absorbs any smell	
2. sedimentation and separation of clean waters from the organic mud	▶ The emerging water is more and more clear. A system of flaps stabilizes the liquid inside the tank	<b>TAB 3 91/271 CE</b> “discharge on waters”
3. final nano-filtration and de-bacteria process	▶ The clear water goes through a nano-filtration process, to avoid any suspended solids and bacteria. The pump dedicated to this process discharges clean waters from the depurator, pulls the water through the filters and pressurizes the water inside the final holding tank, for discharge or re-use	<b>MEPC 159/55</b> “green star” <b>TAB 4 91/271 CE</b> “discharge on ground”

Note:

The Tab 4, 91/271 CE is the most severe norm on the quality of the output waters. It allows for a complete discharge on ground, but the “underground waters” should be at a minimum deep of 1 meter from the ground.

**WATERLOOP PURIFICATORS**

**CODE M/R1**

They suit the Tab 4, 91/271 CE and the MEPC 159/55 IMO-Marpol. According to these, the output water is fully recyclable except for alimentary ones. Consequently, this product suits well for housings, camping's, holiday villages, hotels (where water could be re-used for irrigation, washing cars, re-fill WC'flushing tanks, Yachts and Ships)

**CODE T**

They suit the Tab. 3, 91/271 CE “discharge on waters”. This means not recyclable water. Consequently, this product suits well for housings close to a river or for work-boats like tugs, working inside ports or for small ferries in internal lakes/ lagoons (i.e. Venice)



**The black and grey waters purification system is the “heart” of a larger plant design, called “complete sanitation system”. It is explained below:**

**(A): choice of depuration system (if code T or M)**

- For ground operation, the choice is for the possibility to re-use the output water, for irrigations, gardening, washing cars and re-fill the WC' flushing tanks. In this case the choice is for code M. If there is no need to re-use water and the house/hotels are close to a river, Code T is OK.
- For marine applications, our suggestion is for code M. This allows for the full respect of the MEPC (Marine Environment Protection Committee), IMO-Marpol norms and “green star” application. Only for work-boats like tugs or ferries, operating in “inland waters” like ports or lagoons, code T fits well.

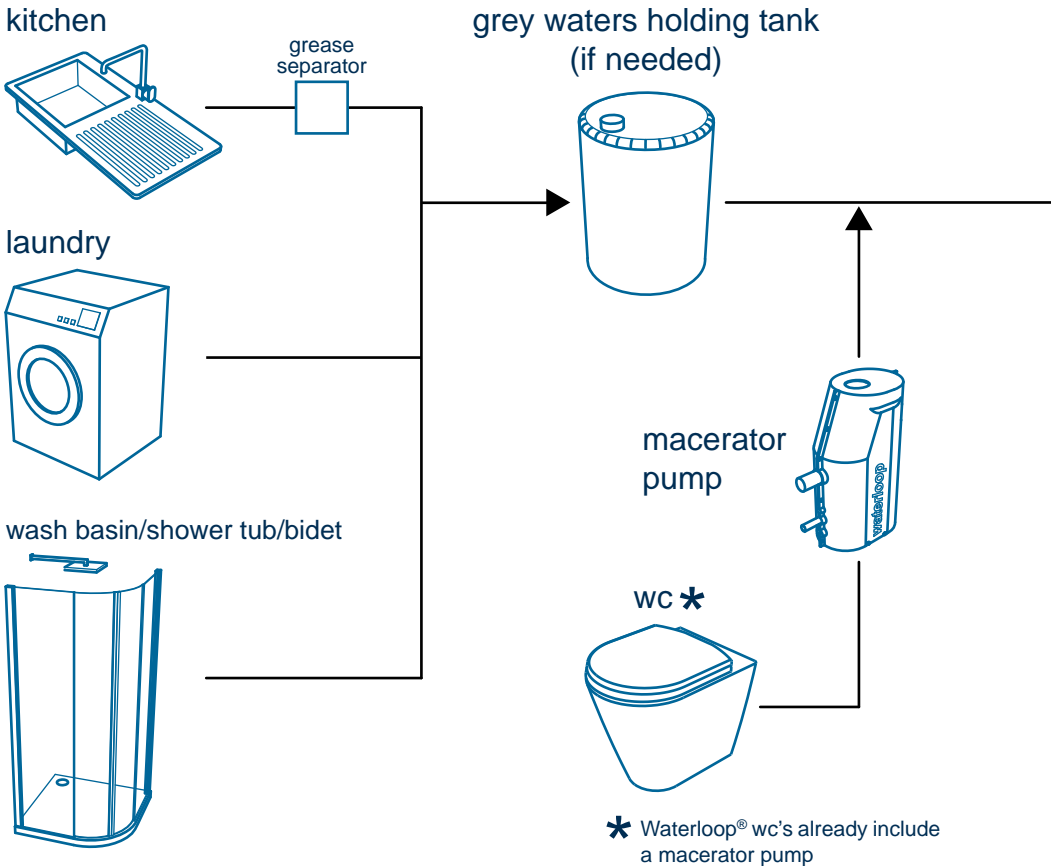
**(B): black and grey waters inlet**

- Black waters (coming from WC'), should go directly to waterloop® purification system. If they are stocked, the risk is for a more difficult purification. A macerator pump is needed to grind toilet paper. For this reason:
- In case of use of waterloop® WC or other competitor products which already include a macerator pump, black water should go directly to the depurator. In case of traditional-gravity WC', a macerator pump is needed.
- Grey waters, from wash basins, bidets, showers, tubs, laundry, kitchen, should need a holding tank before go to the depurator. The need of the holding tank is for a smooth, continuous charge of depurator, avoiding for overcharge in case of many bathrooms contemporary use. As an example, if 3 bathrooms with showers, a 150 litres tank is largely enough, if 3 bathrooms with showers and 1 bathroom with a tub, a 300 litres tank is enough.
- Grey water coming out from Kitchen, should go through a “grease separator”.

**(C): discharge of clear-clean waters coming out from the process**

- In case of code T, a pump is needed to push water to the river (for ground operations) or outside the boat (for marine applications i.e. Tug boats).
- In case of code M, the filtering kit includes a powerful pump. This allows for different options, like push the water to a holding tank in case the need/the willing to re-use water, or simply to push water on ground or outside the boat.

THE WATERLOOP FLOW  
(waters inlet)

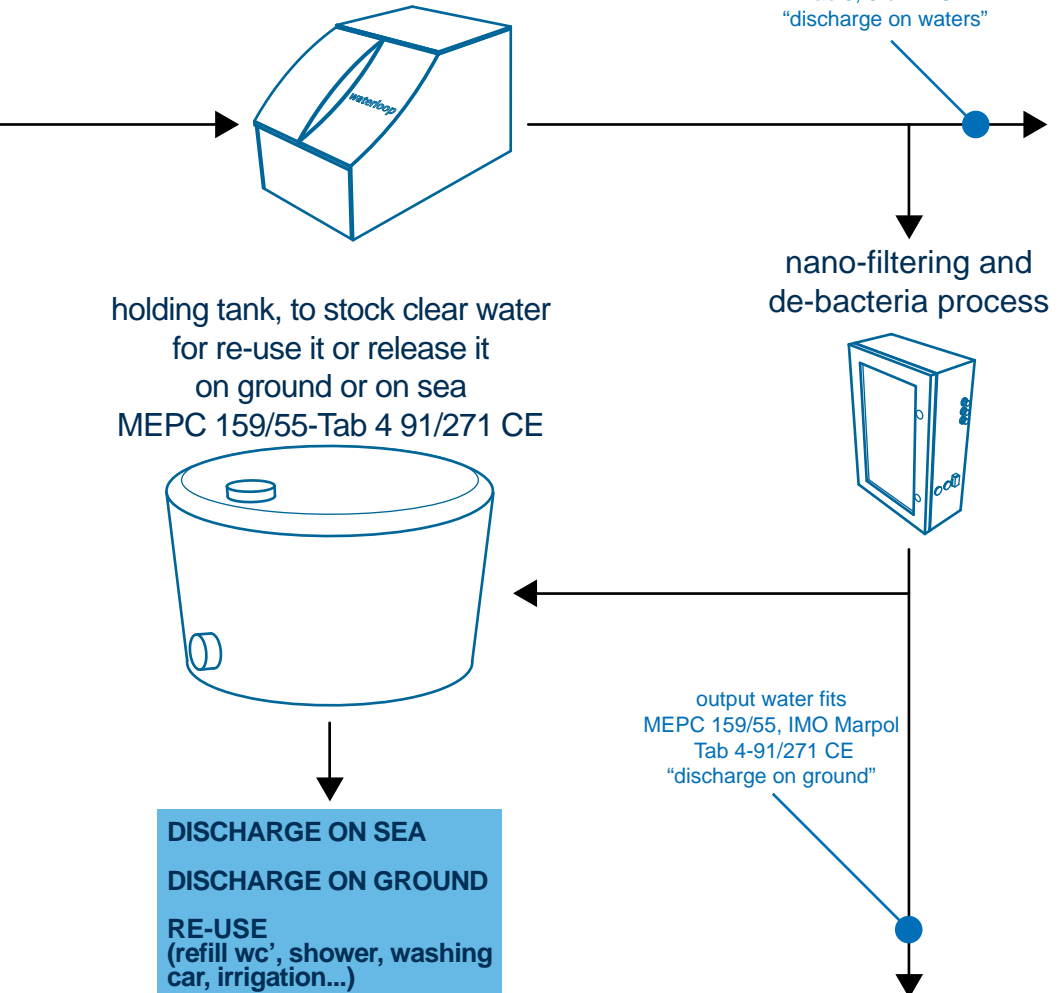


In case of an already available imhoff tank/biological tank, a submerged pump can push waste waters to the **waterloop**® purificator system

# THE WATERLOOP FLOW (purification + clean waters discharge)



## WASTE WATERS 100% BIOLOGICAL PURIFICATION SYSTEM





## QUESTIONS AND ANSWERS ABOUT WATERLOOP® PURIFICATION

### **Q: Why biological purification?**

A: Because it is much more green and simpler than the other technologies marketed today. Our technology doesn't require chlorine or corrosives, doesn't need to capture water from outside, to be then mixed with output water, in a way to lower the respect of the norms. For these reasons, waterloop® technology is less "consumption oriented" and doesn't require many pumps, valves etc. Less working parts means a more reliable system.

### **Q: Why waterloop is the first to jump into compacted-size biological sewage purification?**

A: because biological purification requires a bigger volume than chemical or mixed chemical-biological. Space is fundamental on yachts, less in housing. But we believe it is important to start, then thanks to new technologies and electronics, we think it will be possible to further compact our products. Biological purification as above said has plenty of advantages, including the fact that, in an unwanted event, the risk is to stock organic waste, not chemical or corrosives.

*More: we can also design products on demand, from 4 up to 5,000 inhabitants-passengers and cooperate with our customer's technical department to find design solutions to fit them in narrow space also.*

### **Q: How to start the operations?**

A: fill with clean water 50% of the depurator tank, then put a small bag of lyophilized bacteria flora inside a WC and activate the flush. In three days the bacteria flora will run at 100% efficiency. The size of the tank inside the depurator guarantees for a three-day capacity, while bacteria flora is growing (50% efficiency at first day).

### **Q: At the end of the season, may I turn off the depurator?**

A: Yes. First thing to do is to collect the sediment mud at the bottom of the tank: a horizontal valve allows for this operation. Mud inside the depurator is max. 30 litres-no smells. Collect it in a tank and send it to the public sewage treatment. Then, open the top cover and wash the internal part with a hydro-cleaner. A valve fitted at the bottom of the depurator allows for complete empty.





**Q: How much is the working life of the filters?**

A: 6 years, then they should be replaced.

**Q.: What to do if the yacht/ the house is not utilized continuously?**

A: the depurator is designed to suit for an intermittent use also. A week time without work is OK. For a longer period, it is necessary to maintain it at work, supplying electricity. It can also work with a compact photovoltaic system.

**Q: For the first start-up operations, can waterloop® supply technical assistance?**

A: Yes. For specially designed depurators (like for big yachts-ships and housings), it is already included in the guarantee, as well training personnel.

For small – standard applications, we could do it. Just ask for.

**Q: Which are the risk for an un will event?**

A: Risks are two:

(1) If the bacteria flora doesn't activate.

This risk is practically close to a zero event. Anyway, an advanced electronic check-box system, with remote control is under way. It will be ready October 2010 and it will control the growth of the bio-flora.

(2) A bad management from the crew (in case of ships): if they send fuel to the depurator.

As already said, training is foreseen during the first start-up of the plant. In housing, this risk doesn't exist: soaps and detergents are more and more biological.

**Remind that in case of a bad management of biological depurator, the maximum risk is to stock organic waste, easy to handle. While in case of a chemical depurator breakdown, the risk is to lose chemicals/corrosives on waters/on ground.**

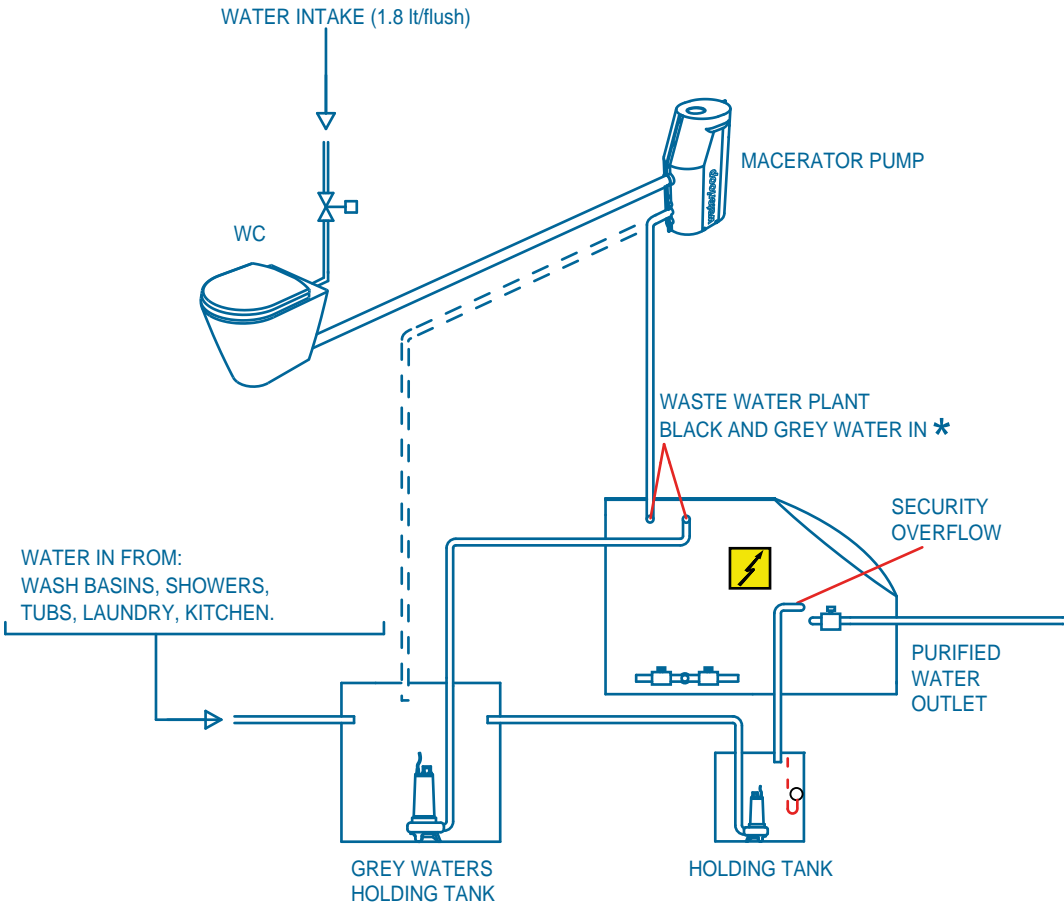


- ▶ **Quality of the output waters - norms**  
TAB 3 - TAB 4 - MEPC
  
- ▶ **Marine system flow**  
installation guidelines
  
- ▶ **Edil system flow**  
installation guidelines

PARAMETER	unit of measur.	TAB 3 91/271 CE	TAB 4 91/271 CE	MEPC 159(55)	WATERLOOP
pH		5,9 - 9,5	6,0 - 8,0	6,0 - 8,5	<b>6,0 - 8,0</b>
Biochemical oxygen demand BOD(5)	mg/l	≤ 40	≤ 20	≤ 25	<b>10</b>
Chemical oxygen demand COD	mg/l	≤ 160	≤ 100	≤ 125	<b>80</b>
Total suspended solids TSS	mg/l	≤ 80	≤ 25	≤ 35	<b>25</b>
Total Coliforms TC	UFC/100 mL	-	≤ 100	≤ 100	<b>0</b>
Fecal Coliforms FC	UFC/100 mL	-	-	≤ 1	<b>0</b>

# MARINE SYSTEM FLOW

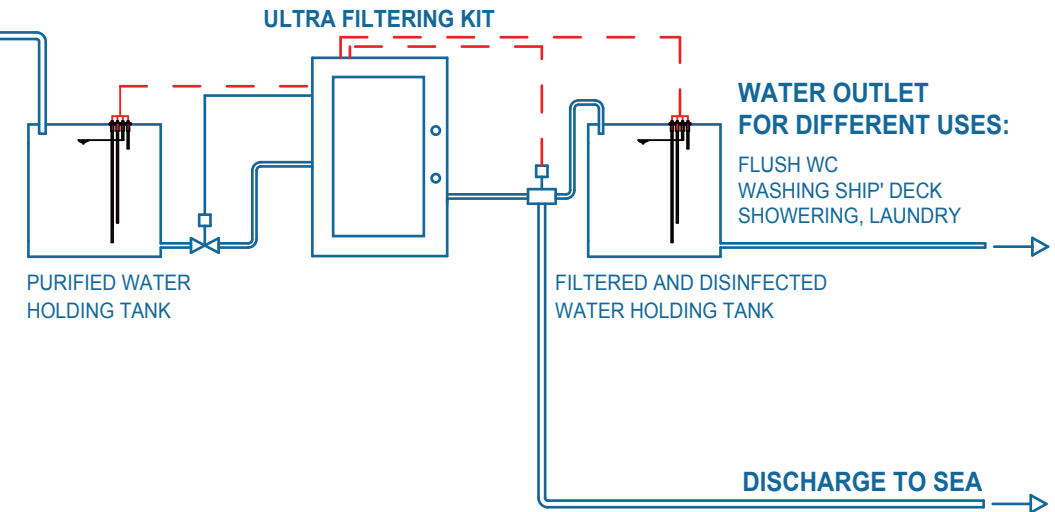
(installation guidelines)



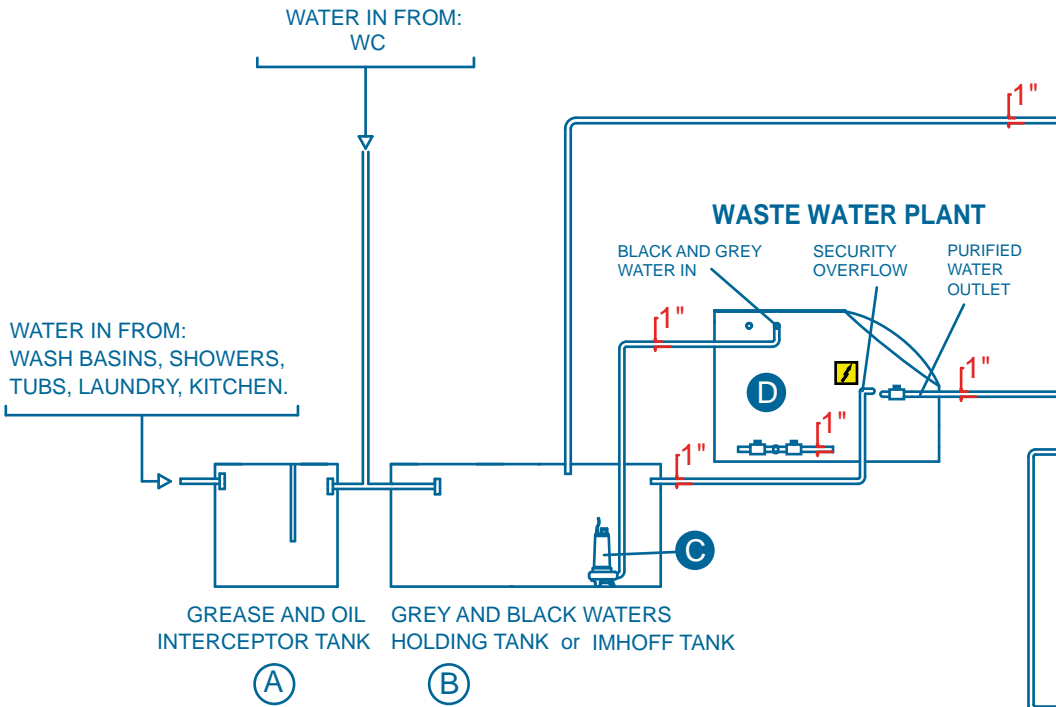
NOTE:

- - - optional link
- \* Waterloop purificator can work with any type of toilet on the condition that the incoming water is pre-macerated

# MARINE SYSTEM FLOW (installation guidelines)



# BUILDING SYSTEM FLOW (installation guidelines)

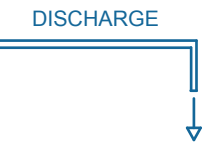
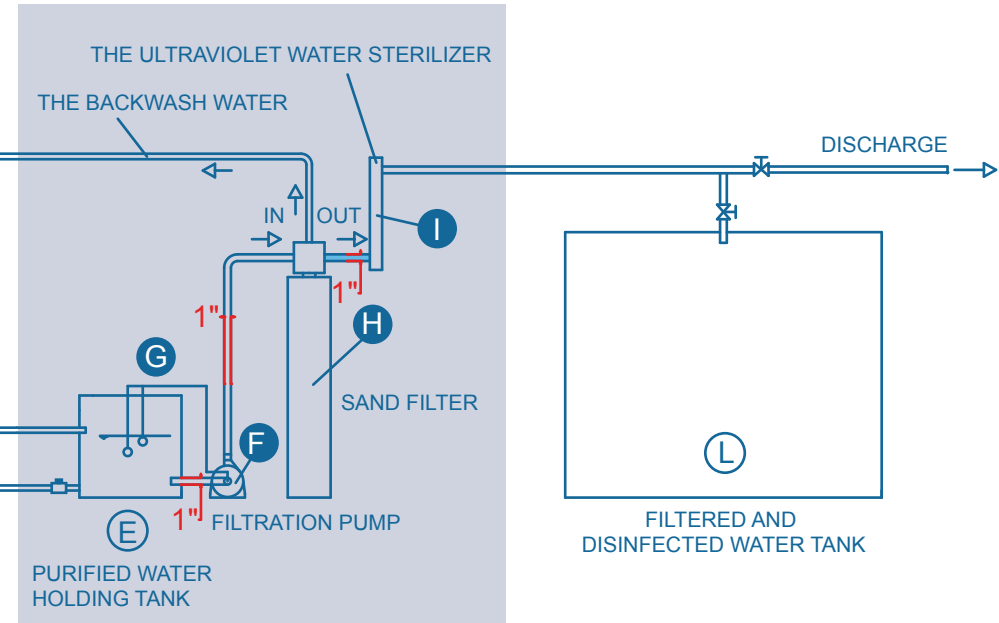


 = products supplied by WATERLOOP including electrical connections

# BUILDING SYSTEM FLOW (installation guidelines)



## ULTRA-FILTRATION KIT



## SUGGESTED VOLUMES OF THE TANKS (liters)

	# of Equivalent Inhabitants		
	3	6	10/12
(A)	190	270	400
(B)	700	900	1.500
(E)	200	300	400



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