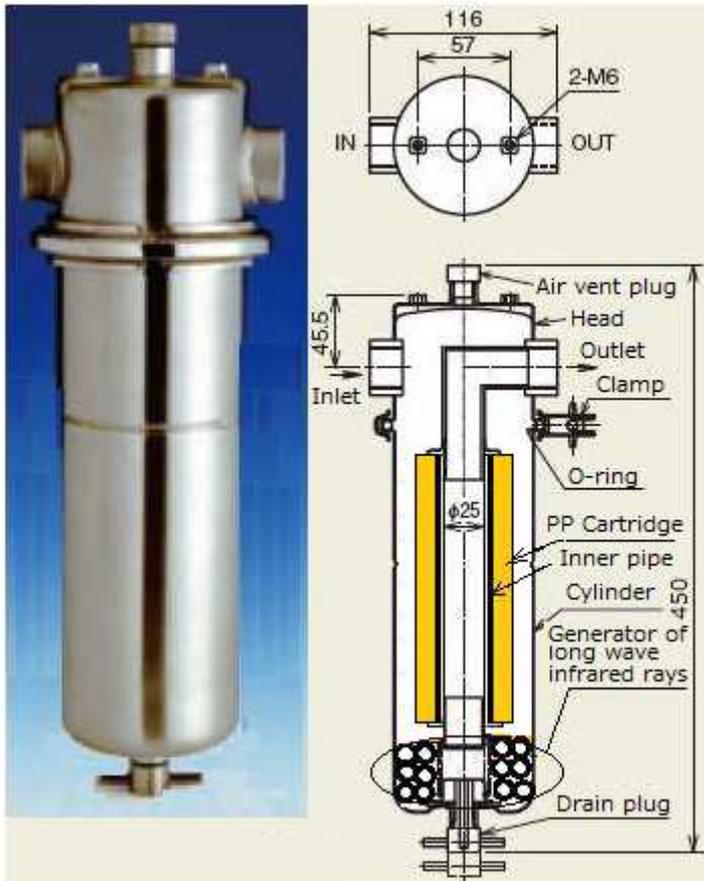


## Device of Activated Water

MassTech Equipment of Activated Water is the combination of One Pass Filter made by MassTech as the below drawings and the purifier made by AuthenTEC.



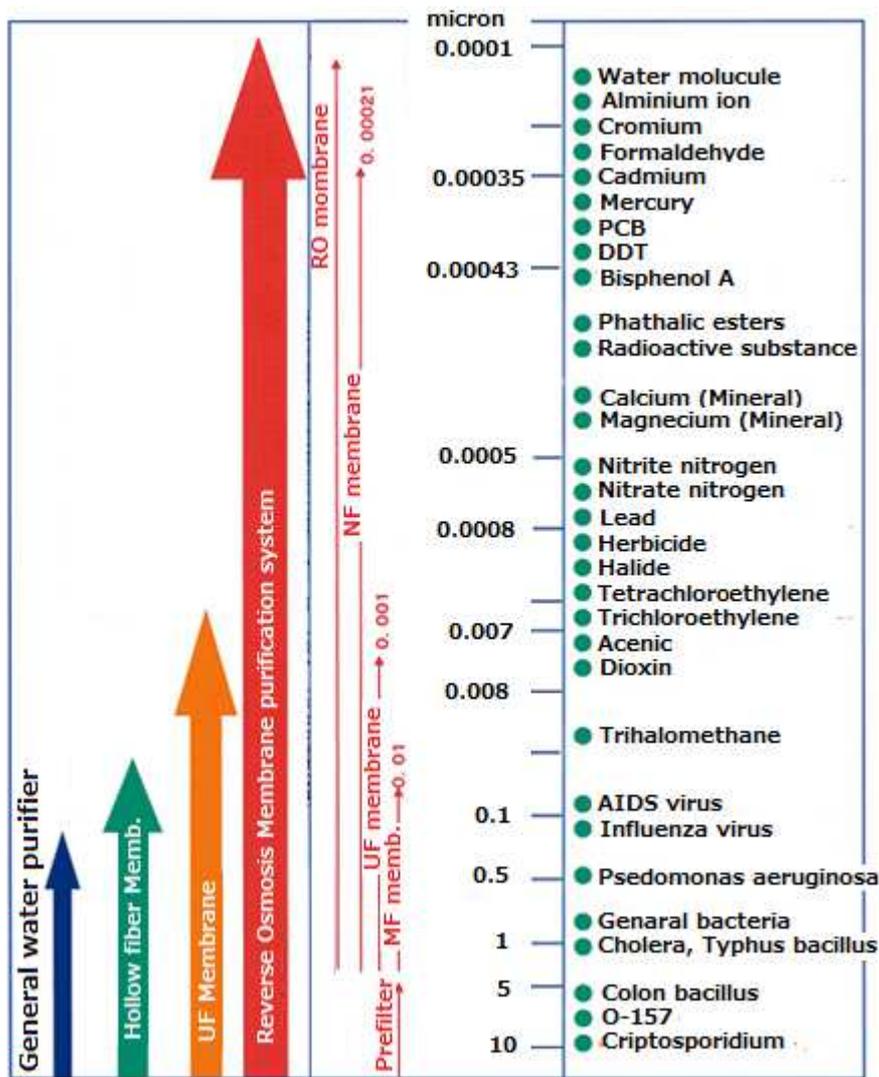
**One Pass Filter (MA-OPF03)**

## Product specification

Model designation	MA-OPF03
Head	SUS316
Cylinder	
O-ring STD.	FKM
Max. working temp.	95°C
Max. working Pressure	0.7MPa
Outlet diameter	G (PF) 3/4"
Drain plug	G (PF) 1/4"
Air vent plug	G (PF) 1/4"
Hight (H)	700mm
Width (W)	116mm
Product weight	1.8kg
Generator of LWIR	700g
Production amount	900L/hr
Mounting bracket (opt.)	<input type="checkbox"/>

## The method how to select the purifier

For water purifiers, it is important to grasp the water quality first. It is necessary to select a water purification method according to substance purifier. It is important to know what kind of problems are in your own water at the first. Of course, we can sometimes know the situation of the water by color, smell, etc., but we need to know the more details of the water. The following table shows the standard of selection for water purification method, please refer to it.



## Representative purifiers

Although there are some purification methods even for a water purifier, here are the five representative methods, activated carbon, hollow fiber membrane, ceramic, reverse osmosis membrane, MF/UF membrane. However, it is difficult to remove all harmful substances with only one type of method, so in general, most products combine multiple methods.

## Activated carbon

Activated carbon can remove chlorine, trihalomethane, etc. but can't remove heavy metals and nitrate nitrogen (carcinogen). In addition, the harmful substance adsorbed on activated carbon will remain as it is, the more it will be used, the lower the adsorption capacity will be, and if you continue to use it, you may release adsorbed substance so compare cartridge replacement cycles it becomes shorter and sharp, and attention is necessary.

### **Hollow fiber membrane**

Hollow fiber membranes are filtration membranes with countless of about 0.1 microns, which remove harmful substances and bacteria over this pore, but heavy metals and nitrate nitrogen (carcinogen), which are substances smaller than this pore, Virus etc. can't be removed.

Hollow fiber membranes are relatively inexpensive, so it is common to use them together with other types of activated carbon etc.

In addition, we can maintain taste because there is no need to remove minerals which are ingredients of water taste.

### **Ceramic**

Since the removal ability of ceramic is almost equal to hollow fiber membrane, this is also commonly used with activated carbon.

It has the feature that recycling by washing is possible as the characteristic of material.

### **Reverse osmosis membrane/NF membrane**

Reverse osmosis membranes can remove heavy metals, nitrate nitrogen (carcinogenic substances), viruses, etc. that can't be removed by other methods, but since the filter holes are too small, it is necessary and requires drainage.

Also, because mineral as a component of the taste of water is also removed, it becomes pure water, so if you add minerals at later stage and also you use it together with the device of the activated water, you can get the delicious water transcending natural water.

With respect to radioactive substances, it is said that it is theoretically

possible to remove substances that emit gamma rays such as iodine and cesium.



### Reverse osmosis membrane for the Seawater desalination plant

Among the reverse osmosis membranes, those whose pore sizes are approximately 1 to 2 nanometers and rejection rates of ions, salts are as low as approximately 70% or less are called Nano-filtration Membrane in English, and Nano-filters, or sometimes called NF membrane to distinguish it. But its form, principle, and usage are the same as reverse osmosis membrane.

### MF membrane and UF membrane

The pore size of the MF membrane is about 0.01 microns to 10 microns. Therefore, substances larger than this pore size are captured and "solid-liquid separation" is performed. UF membranes are "molecular sieves" that block molecular weight and molecular weight of thousands to hundreds of thousands in molecular weight and colloidal substances, and transmit low molecular weight substances and ions below it. Although a part of the fraction range of both membranes overlap, generally speaking, the MF membrane is coarse and the UF membrane can be said to be finer.

<p>UF membrane (10,000times)</p>	<p>MF membrane (10,000times)</p>

Materials blocked by MF membranes are shaped particles or microbial cells. As these particles and substances smaller than the bacteria permeate, concentration polarization phenomenon does not occur. The UF membrane is separated by a dense layer on the surface (also called a skin layer). It is thought that pores are present in the dense layer, and molecules and particles larger than the pore size are separated. Therefore, concentration polarization phenomena may be observed near the membrane surface. The MF membrane is normally operated at 200 k-Pa or less from the reduced pressure state. The UF membrane is normally operated at reduced pressure to 300 k-Pa or less.