IDROPAN-DELL'ORTO

DEPURATORI S.R.L.

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PLIMMER TEST UNIT

The Plimmer is an innovative system used to desalinate water without using resin or membrane filters.

It does not require chemical products to operate it.
Uses only a direct current at low voltages (1.5V) to create the separation electric field.

The Plimmer technology requires the lowest power consumption at equal quantities of separated salts.

Does not require the pretreatment of water – only a reusable/washable pre-filter for larger than 25 micron particles.

Does not use electrolysis as the main working principle – electrolysis requires higher voltages.

The most important ions that Plimmer is able to remove are :

Temporary Hardness $Ca(HCO_3)_2$ $Mg(HCO_3)_2$
Total Hardness $CaCl_2$ $MgCl_2$ $CaSo_4$ $MgSO_4$
Sodium chloride NaCl
Sodium sulphate Na_2SO_4
Nitrate Anion NO3
Nitrite Anion NO_2
Ammonia NH_4+
Iron (Fe) (when present in ionic form)
Magnesium (Mm) (when present in ionic form)
High level of oxidizers (when connected with humic acid)
Organic Micro pollutant (when present in dissociated form)
Hexavalent chrome
Arsenic
Heavy Metals

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HOW DOES IT WORKS

Plimmer uses different coupled electrodes contained in a pressurizable container, supplied with direct current at a potential difference of 1.6 Volt.
The electrodes are placed at a distance at an order of magnitude of 0.1mm.

Powering the electrodes, an electrostatic field is created. The salts contained in the water, that posses an electric charge, will be attracted by the electrode with opposite charge and blocked its surface by the electric field.

Operating as low voltages, electrolysis and gas production will not occur.
The result is the partial or total demineralization of the water.

The electrodes of the Plimmer will behave like those of a normal condenser. At a certain point, the ions will cover the whole surface of the electrodes, meaning that extra ions will not be captured.

In these conditions, the Plimmer is at full capacity. Blocking the water flux and removing the power supply it is possible to measure on the electrodes a potential difference equal to the blocked ions on the surface. This energy will be dissipated by short circuiting the electrodes. A maximum current is therefore obtained that will be used up in a short period of time. The blocked ions are now in their original form and are contained in the small volume of the cell. A short rinse will turn them in concentrated form for waste or recycle.

After the short circuiting, the poles of the power supply are inverted for a short period of time in order to make the ion releasing and recombination process quicker. Plimmer works according the condenser principle, holding back the ions on the electrode due to the potential difference applied on them. The p.d is in fact very low (approximately 1.5V) meaning that the system is intrinsically safe.

We are therefore talking about an electronic device that does not use chemical products in order to function, implying its eco-compatibility towards the principles of sustainable environment.

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One big advantage that Plimmer has is the fact that the percentage of demineralization can be varied according to the customers needs.

This can be done by varying the potential difference across the electrodes from 1 to 1.6V. This characteristic, unique in respect to all machinery on the market, gives the chance to alter the water's taste, adapting is for virtually infinite uses.

Plimmer does not need costly pre treatments. The low applied potential difference, helped by the short distance between the electrodes, will be able to destroy the cell membrane of any microorganism present in the water.

Plimmer reduces the bacteria charge by a factor of 90%

Plimmer acts on arsenic, holding back 100% of it.

For all these reasons, Plimmer is the technology that must be chosen for any type of water treatment.

TECHNICAL DATA

Maximum dissalated water quantity a 25°C 6000-70 00 liter per day
Maximum flow at 25°C 180-300 liters per hour dep ending from income conductivity and rejection request
Salt rejection 65-90 depending from income conductivity and flow
Installed power 0,3 Kw.
Dimensions mm. 600 x mm. 480 x mm. 320 H.

Plimmer Test can treat water with a conductivity input up to 2000 µS

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TEST UNIT WORKING PRINCIPLE

According to the customers preference, it is necessary to adjust values in order to change the

- Working flow
- Waste water volume during regeneration

The water flow influences greatly the output water quality.
Plimmer is a “linear” machine.

This means there is a linear relationship between the main operating values of working result and:

- Input salinity (TDS and conductivity)
- Flow
- Output salinity (therefore input-output salinity ratio)

As the input salinity grows, the output salinity grows.

As the flow grows, the output salinity increases.
And viceversa;

As input salinity decreases, output salinity decreases.

This means that as the flow decreases, the output quality increases.

As the flow decreases, the output salinity decreases.

This is true for the voltage to cells. An increase in voltage increases the output water quality.

An accurate adjustment is therefore necessary to satisfy the customer’s needs.