



Potable Water Supply Systems for Rural Areas



e.pure

e.pure.....Why?



e.pure is a portable water treatment plant, capable of treating water supplies from virtually any surface water source and converting it to the highest quality product water for drinking and general use purposes.

The **e.pure** plants are designed to provide the most suffering rural areas with healthy supply of drinking & home use water at low price and high quality.

e.pure plants can be built in most underdeveloped countries, with a variety of water treatment options to solve rural and arid areas drinking and home use water supply problems and associated health and environmental impacts.



Raw Water Sources

- rivers
- water canals
- lagoons
- agricultural drain canals
- reject & reuse water ponds
- shallow water wells
- springs

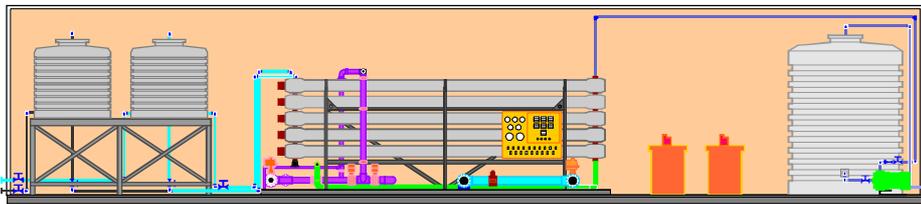


e.pure.....the Systems

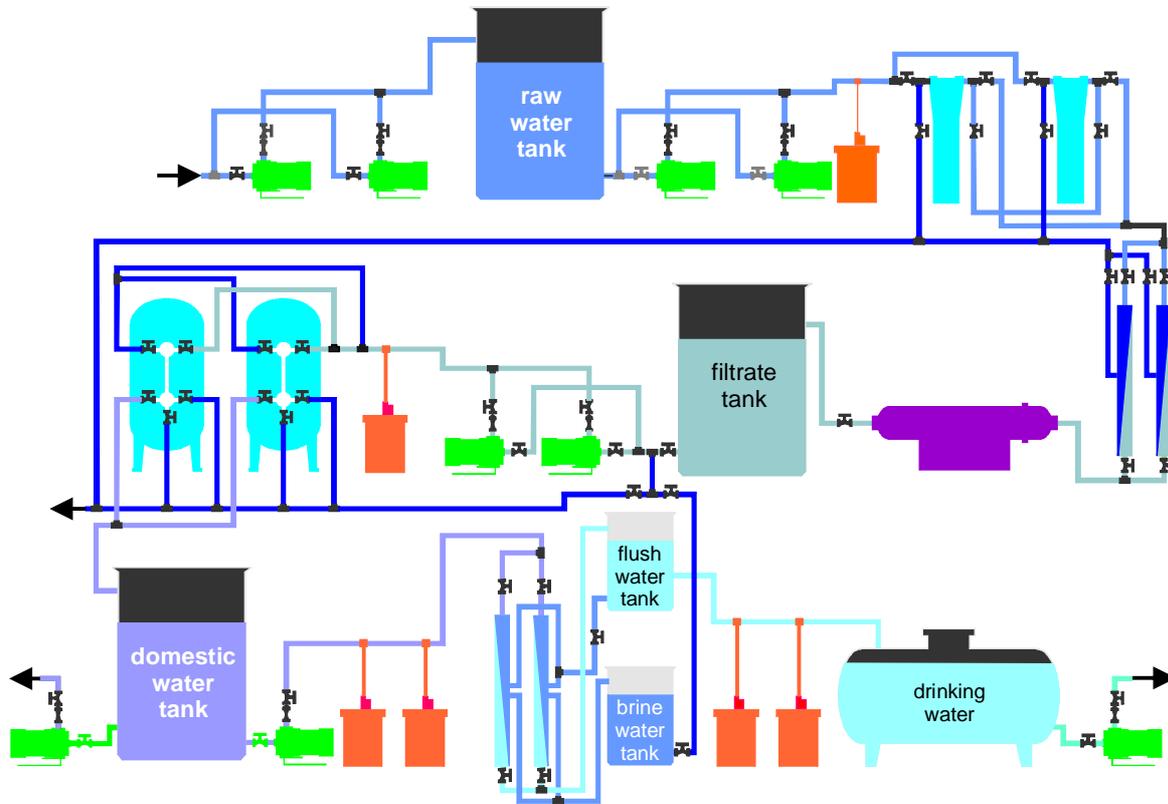
e.pure is factory built, tested and delivered to site, ready, for commissioning and start-up test.



All **e.pure** plants are built in standard ISO 20 or 40 Ft marine containers.



e.pure.....the Treatment Process



Raw water is received in an on-board raw water tank then pumped to Fine Screens **FS**, where sediments up to 100 micron are separated. Under a pre-set program, the **FS** are backwashed and rinsed to keep the filtration rate to the design value. The **FS** is arranged to allow for one backwashing the other.

Filtrate water is mixed with polymer to assist in coagulating fine sediments to allow for maximum separation across the next Ultrafiltration **UF** membranes. In the **UF** membranes, clean water is allowed to pass to pass across the membranes, while the sediments will be rejected in reject stream and returned to raw water tank. **UF** membranes will be frequently backwashed to remove the sediment blocking.

Treatment, cont'd

The UF filtrate is disinfected by an Ultraviolet UV sterilizer where at least 30'000 micro-watt second/cm² radiation intensity is exerted which is capable of killing virtually all (99.99 %) bacteria and viruses.

Disinfected water is stored in filtrate water tank before pumping to the next Media Filters **MF**. In the **MF**, water is pumped through Granular Activated Carbon **GAC** Filter to remove any taste, odor or smell. Most hydrocarbon and biological contaminants will be adsorbed in the **MF**, which will be backwashed from time to time to remove trapped sediments.

The filtered & sterilized water are stored in General Use Water **GUW** Tank. Part of the **GUW** is acidified, and mineral solubility is boosted then pumped through Reverse Osmosis **RO** membranes, where pure water is allowed to pass across the membranes as permeate while the minerals are accumulating the other side as brine. The permeate is stored in an overhead tank prior to discharge to the Drinking Water **DW** tank through chlorination and pH control treatment. Brine is stored in brine tank ready for **MF** backwashing or drain.

e.pure.....the Background



EPECO is manufacturing ROWPU's, the Reverse Osmosis Water Purification Units, for battle field operations.

In 1990 ROWPUs were built by EPECO.USA and were widely deployed in desert storm operations (August 2, 1990-Feb 23, 1991).

ROWPU's Gulf War II units were built on a light weight Aluminum-Titanium alloy frame with heavy duty rough terrain trailers.

Each Gulf War II ROWPU unit was capable of producing up to 500 cubic meters per day from seawater sources. All ROWPU units were fit with NBC (Nuclear, Biological and Chemical) decontaminators which secured the production of pure water under the most difficult military operations conditions.

e.purethe Capacity Range

e.pure is available in (6) models, EP 1k, EP 2k, EP 5k, 10k, 15k & 20k capable of supplying treated water to 1000, 2000, 5000, 10000, 15000 or 20000 persons with their daily needs of both drinking and general use waters. **e.pure** plant has (2) outlets.....First, ultra pure drinking water,.....Second, filtered and disinfected general use water. **e.pure** plant incorporates the most advanced, efficient and reliable technologies for treatment. Implementing physical membrane technologies allows for efficient, reliable and eco-friendly operation.

model	population service equiv. capita	low salt drinking water capacity m ³ /day	general use water capacity m ³ /day
e.pure EP 1 k	1000	8	80
e.pure EP 2 k	2000	16	160
e.pure EP 3 k	3000	24	240
e.pure EP 5 k	5000	40	400
e.pure EP 10 k	10000	80	800
e.pure EP 15 k	15000	120	1200
e.pure EP 20 k	20000	160	1600

e.purethe Options



e.pure plants are delivered with no auxiliary electric power supply package, however the plant can be equipped with diesel, petrol or gas driven electric generating set .

Photovoltaic **PV** electric power supply system including, **PV** cells, batteries, converters and controls can be also supplied as main or part loading power package



e.purethe Benefits

Drinking water purified by **e.pure** can be sold in Egypt (as an example) for 25 EGP/m³. The buyers may order 20 liters jenkins of high purity water for less than ½ EGP. This price is far below the bottled water retail price (15 liters bottles for 20 pounds each-2021). Saving may be 95% or more.....

Home use water purified by **e.pure** can be sold in Egypt for 15 EGP/m³. The buyers will order 20 liters jenkins for less than 1/3 EGP.

Proper operation of **e.pure** plant may allow for annual 10-12% net profits (after tax) within first 5 years. In the same period, gross profits will allow for repay of the capital loans and financial charges. In the next 5 years plan, net profits are expected to reach 15-17% per year with savings for full plant refurbishment within the full term.

Supplying the rural areas in poor countries, with healthy drinking and home use , will have strong positive impact on the public health. It's apparent that most epidemic diseases in rural areas now, are result from sub-standard water supplies.

e.pure is an eco-friendly project. **e.pure** plant uses minimum processing chemicals (more equal to or less than hygienic chemicals volume used by 2 housholds. No used chemicals are allowed to release directly or indirectly to the environment.

Due to the highly efficient physical process implemented in the **e.pure** plant operation, minimum electric power consumption per unit product is achieved. This is a major energy saving criteria.

e.pure plants are qualified to fit with photovoltaic PV electric power supply system, which supports the **e.pure** systems green energy intentions.



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