

Continuum **Rain Power** water generation system

The generation of pure drinking water from air achieved through mimicking the natural process of rain making!

The provision of clean drinking water in remote areas remains a major challenge. It is a key part of Continuum's environmental services strategy to be able to provide clean drinking water to even the most remote parts of the globe and for it to be easily established, readily available and provided at an affordable cost. The Rain Power remote water generation system is a proven solution to the problem of water availability in locations where water is not freely available, polluted or otherwise and there may be limited power available.

The Rain Power water generation system is designed to offer a highly efficient solution for delivering water for drinking and other purposes into areas that have limited access to clean water. The original vision for the product was to provide remote farms in water stressed areas with a high volume water generator for irrigation purposes, hence the large output volume in the original design.

Pure drinking water can be generated at the same volume by adding a simple filtration process. The technology was developed over a decade ago and through subsequent development and refinement it has achieved world-beating efficiency combined with very low running costs and exceptional reliability.

How our Rain Power system works

The basic design is scalable and comprises of three key components:

- A Tower Unit, 3.65 metres tall and 90 centimetres in diameter
- A Chiller Unit
- A Solar Energy Collector - a parabolic dish, 2.8 metres in diameter

The Solar Energy Collector, which comprises three hundred polished stainless steel mirror tiles in a parabolic array, focuses the heat from the sun to produce a

superheated refrigerant which is circulated within a closed-loop system. The superheated refrigerant passes through the Chiller Unit which super-cools the condenser mechanism in the Tower Unit, causing condensate to form into rain drops which fall to the base of the Tower Unit where the water is collected.

The Solar Energy Collector is the most efficient power source for the unit. It is fully automated and its position adjusted at frequent intervals so that it tracks the sun even in overcast conditions. The pumps that circulate the refrigerant require no power as they are thermodynamically driven by pressure and temperature differentials.

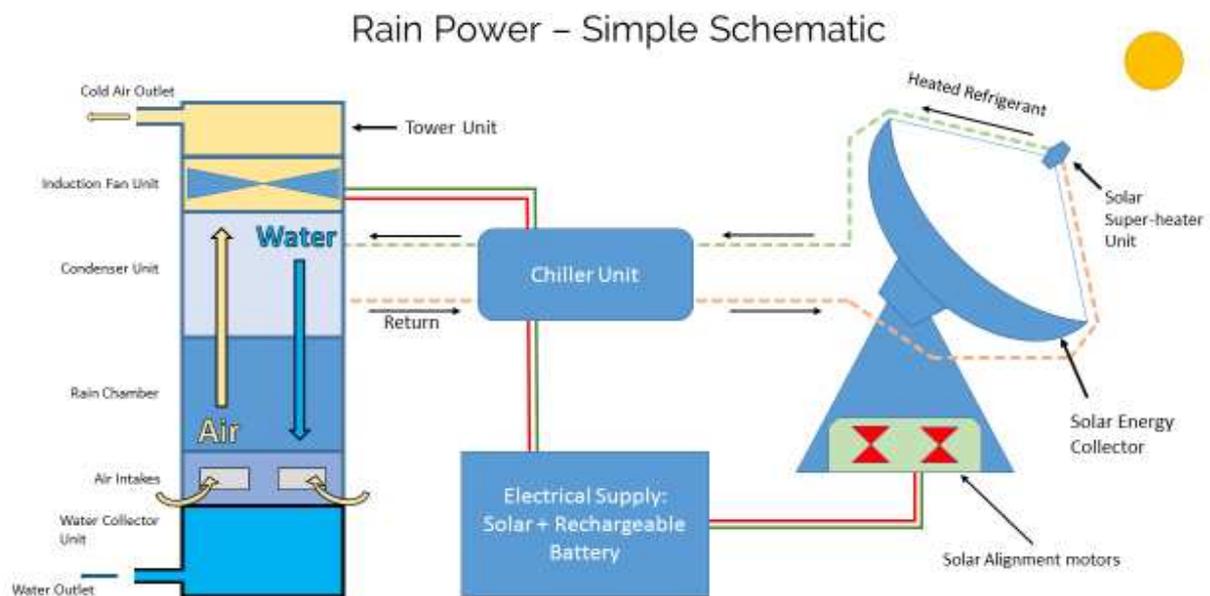
Air flow through the Tower Unit is maintained by a low speed induction fan which uses a small amount of electricity to provide impulse power. During daylight hours the electrical power consumption of the entire system can easily be satisfied by a single 10W photovoltaic solar panel combined with a rechargeable 12v battery. The Solar Energy Collector is capable of providing sufficient energy in overcast conditions.

At night, or when the solar energy collector cannot provide sufficient power for the closed-loop refrigerant circuit, the unit can be run from a normal electrical power supply. The maximum power consumption, which occurs when the solar energy collector produces no heat, is 5 kW per hour. If however there is no need to for 24 hour operation of the unit (s) then of course the system may be switched off during hours of darkness.

Production capacity of the unit is dependent on the humidity of the air. Using a combination of solar power and overnight electricity, at 96% humidity the water output over a 24 hour period is around 37,000 litres and in desert conditions of 20% humidity the output is 18,500 litres. Without the Solar Energy Collector, using a 5 kW per hour electricity supply will produce the same output. It is recommended that the Solar Energy Collector is utilised in an ideal installation as it makes the system independent of the need for electric power to be available.

The system is designed to produce clean drinking water – but to ensure that is clean enough for human consumption the water would need to be passed through a final and widely available micro-filtration system to remove any fine particulates.

The output water is produced at approximately 10°C below ambient air temperature while the output air from the exhaust at the top of the Tower Unit is at a nominal temperature of 5-7°C and with suitable ducting could be used to provide air conditioning in the vicinity of the unit.



Ongoing care and maintenance

The system requires minimal maintenance:

- The chiller unit will require the replacement of a single component once every two years.
- Once a week the unit will require a routine check – the frequency depends on the amount of airborne dust in the air that enters the unit.
- The main components are constructed using 316L stainless steel to give a nominal life of 25 years.
- The solar energy collector may need cleaning at regular intervals of about once per week to ensure optimum efficiency.

Modular and Scalable

The system is scalable in its application according to the requirement of the installation as it is modular in design. Smaller units may be formed in clusters according to the water output needs providing increased system resilience and reducing any redundancy of capacity with only a marginal reduction in energy efficiency.

In the case of large scale water needs larger systems can be installed to accommodate continual high demand and requirements.

The benefits of the Continuum Rain Power system

The Continuum Rain Power system provides an easy to implement and effective system for the provision of clean drinking water. The system offers the following key benefits:-

- Can be utilised on location where there may not be regular power supply.
- Uses a revolutionary condensing process providing water from the air, so the lack of actual water in the vicinity is not a problem for the system being able to provide clean drinking water.
- Totally scalable due to its modular design and format
- Mobile. Can be shipped in normal shipping containers
- Easy to set up and install
- Very low or no energy consumption (usage of the Solar Energy Collector is recommended)
- Reasonable cost of ownership and operation through an operating lease

More information

The Continuum Rain Power system is an innovative and very cost effective way to provide safe, clean drinking water to remote locations which may have little or no access to electric power or alternative sources of water.

Unlike the Continuum WTS system which cleans water that was previously contaminated making it potable, the Rain Power system is the solution for creating drinking water from nothing more than the air.

Using solar power technology to drive the unit it is completely stand alone when needed although mains power may also be used to power the unit during hours of darkness.

For more information as to how the Rain Power system can work for you please contact Continuum at info@continuum.li