Alternative Water

Atmospheric Water Generators

AID8000™

AID8000™ GP

AID8000™ Advantages

Water is supplied from an alternative source, which is the atmosphere, allowing to set the ground with atmospheric water generation equipment in any area. The following advantages demonstrate the economic attractiveness of the project.

- The Greatest Water Output Up to 2,000 Gallons (8000 L) /Day
- Modular: 10’ → 20’ → 40’ ISO Container Size
- Super Heavy Duty, Structural Steel Case in ISO frame
- The Highest Efficiency & Better Performance on the Power Consumption per Gallon

- The lowest Energy cost: up to 0.16 kWh/liters

- The water produced by generating equipment directly flows cold and pure, being more suitable for consumption.

- Ideal energy-harvesting technology used in water generating equipment allows the option to obtain a competitive water price, not possible with other devices available on the market.

- All electric and electronic components are vented and pre-cooled to avoid over-heating and malfunctioning under extreme high temperature conditions.

- Wide operation field for extreme conditions:
    - Temperature limits (5°C - 55°C) 41°F-131°F.
    - Relative humidity limits 20%-99%.

- Quick and easiest installation start up and maintenance.
- Powered by any types of energy, including renewable.
- Standard spares
- Environmentally friendly

The most advanced technology developed by **ALTERNATIVE WATER** is based on the principle of dehumidifying the humid air to produce high quality and low mineralization water which has been certified by the USA authorities, having passed the relevant health checks and received, therefore, the mandatory National Register of Health, ensuring hygienic conditions and quality of the product.

AID8000 equipment is ecological that contributes to regeneration of the natural water cycle, to restore the humidity in the atmosphere that would otherwise remain accumulated in the upper layers of the same as a result of the greenhouse effect.

AID8000 equipment uses components completely free of CFC and is designed to be powered by electrical energy that can be obtained from the distribution network or alternatively wind turbines and photovoltaic sensors with automatic solar tracking.

AID8000 equipment is manufactured according to USA and CE quality standards, with components "Made in USA & Europe, UL & CE" for easy replacement, if necessary, to be available in the general market for industrial components.

1. Technical characteristics of the AID8000 module

AVERAGE WATER PRODUCTION AND ENERGY CONSUMPTION PER

Environmental conditions	50°F -90%HR	86°F -85%HR	104°C -90%HR
Water production	23.5 gal/h	64.6 gal/h	82.7 gal/h
Absorbed power	23 kWh	36 kWh	55 kWh
Power per liter	0.99 kWh/gal	0.54 kWh/gal	0.46 kWh/gal

OPERATING CHARACTERISTICS Temperature and relative humidity, max and minimum

Temperature	41°F-131°F
Relative humidity	20%-99%

CHARACTERISTICS TECHNICAL

Water Production	Nominal	64.6 gal/h (86°F -80%HR)
	Nominal absorbed power	36 kW
Compressor	Type	Hermetic Alternative
	Brand	ZBD-45 KCE-TF5
	Displacement (l/s)	65 A
	Nominal power CV	77CV
Fan	Nominal flow	40.000 m3/h
	Type	Radial variable speeds
	Available static pressure	14 mm. c.a.
	Power	4 kW-895 rpm
Cooling circuit	Gas	134A
	Gas Load	76 Kg
	Expansion	Thermostatic valve
Electric Characteristics	Voltage	400/460 V-III-50/60 Hz
	Max operating current	120 A
Sound level	Sonic pressure	70 dB (A)
Dimensions	High	87.8 inches
	Wide	86.6 inches
	Deep	1122 inches
	Weight	5842 pounds

2. Main Components of the AID8000 module as per NSF61 Standards

- The unit case is made of galvanized sheet iron profiles covered by synthetic painting coats;
- Cooling compressor ZBD-45 KCE-TF5 energy efficient refrigeration through capacity modulation;
- Cooling circuit made of cuprous pipes filled with ecological refrigerant R134A, environment friendly, free of CFCs;
- Cooling coils made of aluminum covered by polyurethane coats as per NSF61 standards;
- Energy recuperation system made of aluminum covered by polyurethane coats as per NSF61 standards;
- Electronic fan EC with low energy consumption rate;
- Water circuit made of stainless-steel pipes as per NSF61 standards;
- 50l internal condensing tray made of high-density stainless steel as per NSF61 standards
- Automatic water dispenser;
- Electronic programming control

2.1. WTS (Water Treatment System)

The WTS module is fully equipped to guarantee the Highest Quality of Water as per the WHO (World Health Organization) requirements. These water purification treatments are individually tailored regarding guidance for each geographical location.

- Solar heating protection for the Water Storage Tank
- Smart Treatment Devices
- Self-Cleaning Filtration Devices
- 1,000 Gallons (3,800L), rectangle, low profile, FDA-Approved, Food-Grade, BRA-Free, High-Density Polyethylene (HDPE)-NSF-61 Water Storage Tank
- 2 Heavy Duty Water Pumps
- Digital Water Quality Control

2.2. Measurement and Regulator Devices

pH & Chlorine Regulation System

Panel to measure and regulate the pH and chlorine concentration. It includes:

- Amperometry galvanic (copper-gold) cell
- Inductive sensor
- Flow meter
- Low pressure pH electrode (max 3 kg/cm^2)
- By-pass electrode socket
- 10” cartridge container with 5-micron wounded filter
- Polypropylene board with polycarbonate protection
- Sample collection
- Hydraulic and electric connections
- Dimensions: 500 x 600 x 10 mm
- Chlorine measure range: 0-3 ppm
- pH measure range: 0-14

Chlorine Dosing pumps

Dosing pumps with manual adjustable Flow rate by known on the front of the pump by changing the number of strokes per minute from 0 to 400.

- Back pressure: 8 bar
- Flow rate: 6 l/h
- Connections in/out: 4/6

- Stroke/minute: 400
- Weight: 1,7 kg
- Power Supply: 230 VAC / 50-60 Hz
- Protection degree: IP65
- Working Temperature: -10...40 oC
- PVDF Pump head and connectors.
- Level probe included.

Chlorine Tanks

Black or translucent polyethylene cylindrical tank with threaded closure.

- Outer graduated scale
- Capacity: 20 gallons
- Dimensions: Diameter: Height: 510mm 713 mm 170 mm

Recirculation Pump and Electric Panel
Water tank needs recirculation pump to carry sample water to measure panel and to achieve a water agitation.
Also, treated storage-water needs a pump with pressure control to pump it to the point of use.

Sediment filters

CINTROPUR filter made of first quality synthetic materials, suitable for drinking water. The centrifugal propeller transforms the water flow into a centrifugal movement that precipitates the heavy particles to the bottom of the vessel, while the filter mesh ensures the final filtration according to the chosen micron. It has a quick and easy lower drain valve. These filters provide high flow with low head loss.

- Nominal flow (25 µm mesh): 6,5m3/h
- Connection: 1 ¼'
- Filtration area: 840cm3
- Service pressure: 10 bars

- Maximum work pressure: 16 bars
- Maximum work temperature: 50C
- Weight: 1,7 Kg
- Includes 25 µm mesh, opening wrench and wall fixing bracket.

Dichlorination filters

System composed by a Greentank GRP vessel with top and bottom distributors WS655F valve. Made of heavy-duty Nonyl and controlled by a horizontal piston. 1 1⁄2" threaded male connection. Intuitive and user-friendly programming. Systems are supplied completely pre-programmed from factory, but it allows modifying all the internal parameters. Multiple regenerations configurations are available.

Multilingual display: English, French, Spanish and German.
Filtering load, composed by granulated active carbon impregnated with silver.

Characteristics

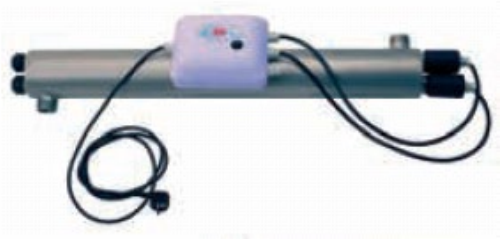
- Easy maintenance.
- Intuitive and user-friendly programming
- Advanced functions such as; Automatic calculation of treatment volumes, configurable reserve, programmer reset.
- Allows chronometric regeneration.
- Fully configurable regeneration cycles.
- Fast, reliable and fast locking connection.
- Advanced multilingual electronic programmer that allows to control all the operating parameters, including the duration of the distinct stages.

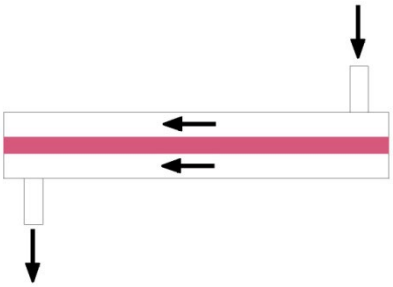
Technical specifications
Connection: 1 1⁄2”
Minimum pressure: 2 kg/cm^2
Maximum pressure: 6 kg/cm^2
Minimum temperature: 4C
Maximum temperature: 35C Powersupply:220V-12V (transformer included) other voltages available under request.

Load: 175 Kg of granulated active carbon impregnated with silver. Filtration area: 0’32 m2
Flow at 10 m/h: 3,2 m3
Flow at 15 m/h: 5,0 m3
Flow at 20 m/h: 6,8 m3
Backwash flow: 4,8 m3/h
Dimensions: A: 1911 mm; B:491mm; C:1705mm; D: 206 mm

UV light

The maximum flow rate that can pass through the ultraviolet light is 2.5 m3/h.





Inlet cut-off solenoid valve during regeneration/wash. Connection diameter 1 1⁄2”
• Two ways normally open • Material: brass
• Working voltage: 220 Vac. • Control kit electro valve

To prevent the leakage of certain pollutants and particles that appear in unknown environments, we have designed a treatment system that guarantees the water quality produced by our equipment, complies with the WHO (World Health Organization) and therefore is suitable for human consumption.
This process of water treatment ensures that the water produced is safe and suitable for consumption.

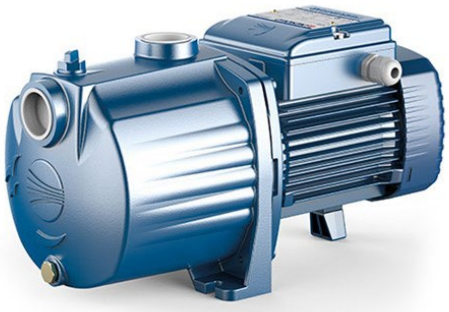
Water Storage Tank

1,000-gallons, rectangle, low profile, FDA-Approved, Food-Grade, BPA-Free High-Density Polyethylene (HDPE)-NSF-61 Approved Resin, Long-Term UV Rating to avoid color fading and breakdown.

Water pump

Pedrollo 2-4CP multi-stage centrifugal pumps

Suitable for use with clean water and liquids that are not chemically aggressive towards the materials from which the pump is made.
As a result of their quietness, these pumps are widely used in domestic applications such as the distribution of water in combination with small and medium sized pressure sets, and for the irrigation of gardens and allotments, etc.




DNV·GL

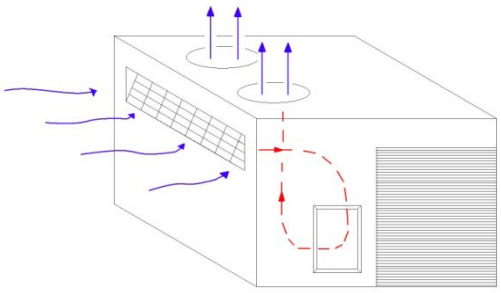
MANAGEMENT SYSTEM CERTIFICATE

PEDROLLO S.p.A. - Sede Legale e Operativa

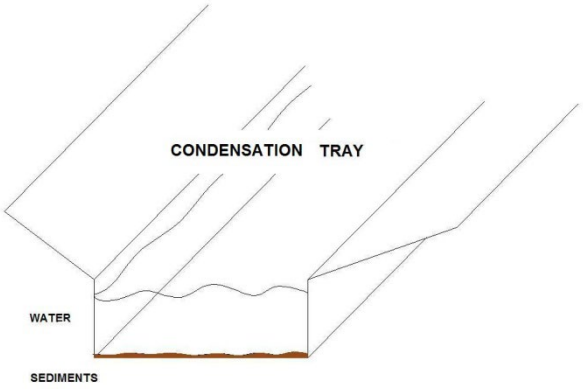
ISO 9001:2015

Filtration Stages:

1. As shown in the diagram below, the airflow passes through air filter category G3 composed by polypropylene fiber with gravimetrical capacity of 82%. This filter is reusable. Once a week should be removed and washed.

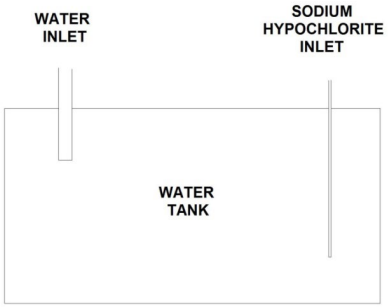


2. The next step of treatment is a natural settling of sediment that may have passed through the air filter. This settling occurs at the condensation tray. Once a week periodic cleaning should be done.

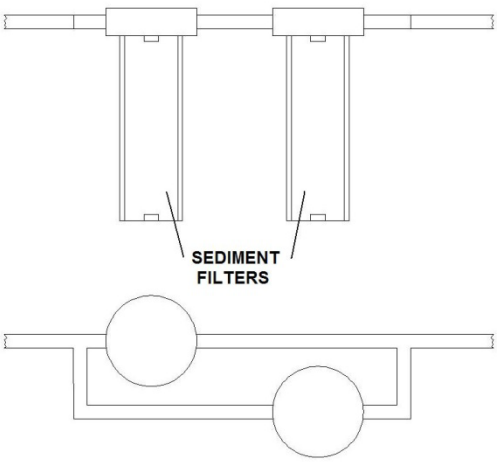


3. Then the filtered water passes to the storage tank when is treated by sodium hypochlorite injected by metering pump (brand TEKNA EVO, TPG model 603). This metering pump works in conjunction with a pulse counter (ZENNER brand, model ETK-IN, nominal flow rate of 1.5 m3 / h), the dosing quantity is 0.5 ml each 15 liters.

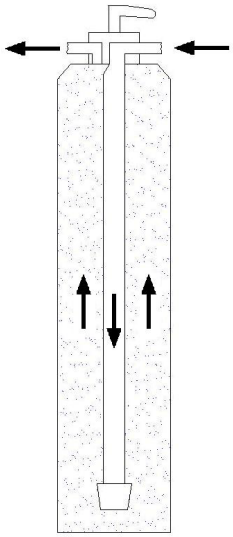
This data is always calculated under the rules of the World Health Organization assuming concentration of sodium hypochlorite near 1 ppm (1 part per million).



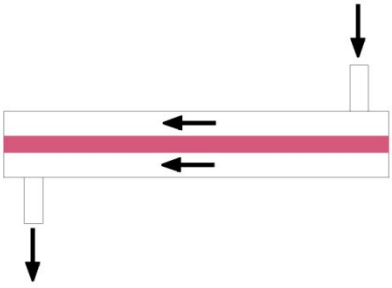
4. Next two sediment filters placed in parallel, achieve a flow rate of 1.6 m3/h; each has a maximum flow of 0.8 m3/h. The cartridge holder (transparent 3PL model) has connections of 1" and its flow rate ranges from 1.4 m3/h to 2.7 m3/h. These are standard components. It is recommended to replace every 3 or 6 months, depending on the environment they are located in.



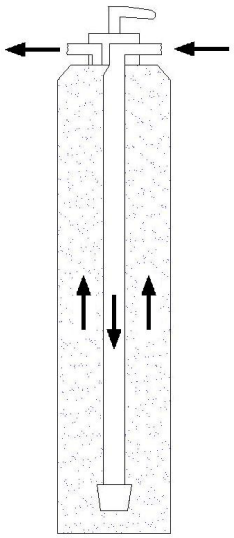
5. Now filtered water in stage 4, we do go through an active carbon filter, which kills 99.9% of bacteria and eliminates existing residual chlorine content in the water. The maximum flow through this filter is 4.5 m3/h. It is recommended to replace every 3 to 6 months.



6. This stage consists in the passage of water through an ultraviolet light to eliminate any bacteria that was not removed in the previous steps.
The maximum flow rate that can pass through the ultraviolet light is 2.5 m3/h.



7. Finally, the water passes through a re-mineralizing filter. There is a re-mineralizing compound inside (Kalaphos PH +) adding water minerals such as calcium and magnesium, and to regulate the PH of the water.
The maximum flow through this filter is 4.5 m3/h. It is recommended to replace this filter every 3 to 6 months.
The consumer can choose what minerals to be added to the water, to suit the custom re-mineralization.



2.3. APU Alternative Power Unit (OPTIONAL)

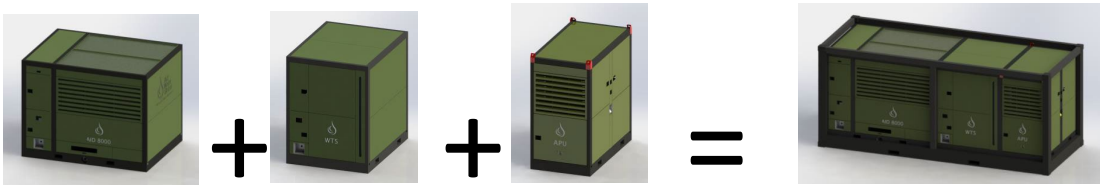
- High-Performance Energy Diesel Generator
- Engine Manufacturer - Deutz AG
- Alternator Manufacturer - Mecc Alte
- 120 Kva, 480v - 3ph - 60Hz
- 240 Gallon Diesel Tank
- 4 Days of Autonomy Run

Factors that bring value to this product are possibilities of power-supply shortages in some areas, high temperatures, temporary or emergency health care and welfare locations.

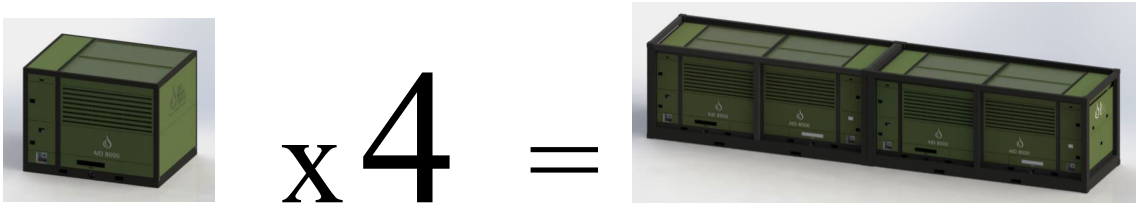
3. Modularity

Here is a brief, graphic explanation of the possible ISO Container compositions using the combination of ONE to THREE basic elements; the **AID8000™** water generating unit, the **WTS** water treatment system, and the **APU** auxiliary power unit, which becomes part of the self-powered, fully equipped **AID8000™ GP** unit.

AID8000 10’ ISO + AID8000 10’ ISO = **AID16000 20’ ISO**



AID8000 10’ ISO + WTS + APU = **AID8000 GP 20’ ISO**



AID8000 10’ ISO x4 = **AID32000 40’ ISO**

3.1. How to understand our technology

The water vapor condensation present in the atmosphere is the natural phenomenon responsible for the formation of clouds in the troposphere which develops into rain or into the formation of dew or frost, due to the changes and differences in temperature between the air masses and the earth's surface. The artificial reproduction of this natural phenomenon constitutes a radical innovation satisfying a human basic necessity that, in combination with renewable energy sources, it allows preservation of the planet's natural resources in a sustainable way.

As an actual fact, this phenomenon is artificially reproducible by means of a mechanical refrigeration cycle to produce drinking water of the same quality as rain. The refrigeration cycle energetic efficiency, whether activated by electrical energy or any other energy source, is the key for this technology's economical feasibility. Incorporating heat recuperation systems to a mechanically refrigerated circuit, activated by electric energy, has today given production energetic costs.

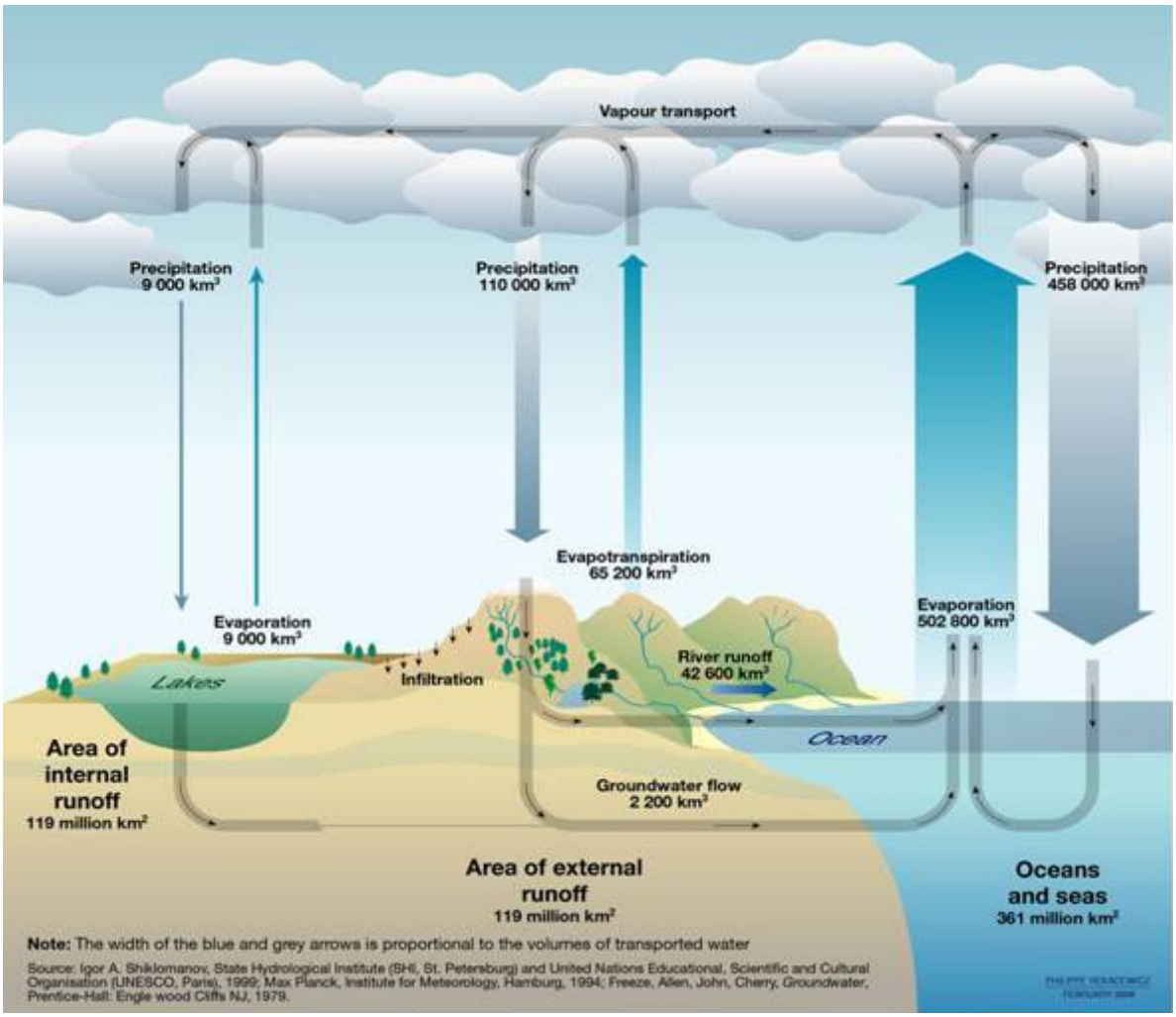
We are describing the technology used in the construction of the first potable water-producing commercial model, AID770, and 800 litres (200 gals) a day nominal production capacity, which is making its way to the commercial market for water supply in isolated areas, military camps and oil rigs.

3.2. A new drinking water renewable source

The water renewable sources are waters that are completely renewed within a one-year period. These are mainly waters from the rivers and the natural water contribution in the underground aquifers.

Just as the surface waters, the water present in the atmosphere is a renewable, natural resource; one percent (1%) of it is present in the atmosphere as water vapour and also as water drops and ice crystals in suspension inside the clouds.

The water in the atmosphere is in a permanent dynamic balance with the water in the oceans, and the surface and earth humidity. This is known as the HYDROLOGIC WATER CYCLE. The renewable period of the water present in the atmosphere is only 8 days, half of the 16-day renewable period that the river water takes and much less than the over 1000-year-renewable period that the underground and ocean waters take (Shiklomanov, 1999).



In the water cycle, the sun evaporates the ocean's water. The hot humid air rises in the troposphere expanding and cooling as the pressure lowers. The pressure and temperature reduction cause the water vapour in the air to saturate and condensate to form drops or ice crystals. The water vapour condensation is, therefore, the natural phenomenon responsible for the formation of clouds in the troposphere that provokes the rain or the formation of dew or frost on the earth's surface.

The artificial reproduction of this natural phenomenon would become a radical innovation to obtain a drinking water source and fulfil a human necessity.
It is possible to reproduce this phenomenon artificially by means of a mechanical refrigeration cycle to produce drinking water of the same quality as the rain. The main challenge is being able to extract this atmosphere humidity even when the environmental conditions are not favorable.

After seventeen years of extensive research, in order to develop an atmospheric water generator specially designed and optimized for this purpose, NEW models have been realized.

The photograph corresponds to the beginning of an 8,400 liter-per-day (2,000 gals), water-producing generator activated by a diesel power generator with field tests and demonstration trials carried out in Spain.

A window was made in the first prototype to visualize the water condensation in the cooling battery. It, literally, “rains inside the machine.” The water produced is collected on a tray and pumped into a tank where it is stored. Immediately afterwards, it is possible to incorporate a filtering phase with either activated or mineral coal.

This is a view into the window of the AID8000™, where reproduction of artificial rain 8,400 liters/day (2,000 gals). Pictures taken are during the first prototype tests and trials.

The water is obtained at about 8º C. It is of great purity and very low mineralization. The water obtained is registered in the USA Health Registry.

AID8000 equipment meets the most advanced performances in energy efficiency versus the amount of water generated; and all health standards in order to produce the low mineralized pure drinking water. It is proven and certified that the water supply can be carried out because there has been a previous analysis of the properties of water, as well as the production capacity of the equipment, so that it is technically feasible to install this equipment.

Economic viability: Taking into consideration the lowest power consumption rate, the greatest water output and versatility of easy-fit standard electrical/plumbing connections, its water quality/amount, computer monitoring and its easy maintenance, the AID8000 would be the most economically feasible equipment.

4. Back and side view of the 20’ AID8000™ GP self-containerized, self-powered unit, with WTS (water treatment system).

Left-side view of the AID8000™ GP, self-containerized, self-powered

Right-side view of the AID8000™ GP, self-containerized, self-powered

Front view of the AID8000 GP, self-containerized, self-powered

Left side view of the AID8000 GP, self-containerized, self-powered