3-SOL-X

Electricity, water, and green hydrogen from solar energy

ENERGY IN OUR HANDS

The 3-SOL-X solution, designed by Ambar S.A., is aimed at harnessing solar energy to produce electricity, hydrogen, and water at a low cost. Our solution enables the production of electricity in areas with extremely dry weather conditions and in remote locations.

The Stirling-based solar concentrator (CES-Stirling) collects solar energy through a circular paraboloid that directs the sunlight into a thermal chamber, providing heat to the Stirling engine. This engine powers an alternator for electrical energy generation at 110—220 VAC.

This electricity is used in our system to obtain water from an Atmospheric Water Generator (AWG) and to produce high-purity green hydrogen through an AEM electrolyzer. These components are integrated to create a circular economy, producing potable water and low-cost hydrogen that can be directly utilized by communities for personal consumption.

The 3-SOL-X solution is a renewable energy system that has no adverse environmental impact, is easily disposed of at the end of its lifespan, possesses a low carbon footprint, and incurs minimal costs, all thanks to the utilization of solar heat.

SYSTEM FEATURES

- Operates directly with solar heat.
- Stirling engine operating temperature: 400—550 [°C]
- Solar Concentrator Diameter: 3—10 [m]
- Electrical Voltage: 110—220 [VAC]
- Operating Frequency: 50—60 [Hz]
- Electrical Power: 1-10 [kWe]
- Total Weight: Approx. 550 [kg]
- Installation: On concrete casting.
- Production of potable water and green hydrogen.

APPLICATIONS

- Electricity, water, and hydrogen for household consumption.
- Water for the hotel industry, industries, livestock, and irrigation.
- Hydrogen as fuel for industries, steel mills, mining, and household consumption.

MARKET

- Household and hotel industry consumption.
- Small, medium, and large industries.
- Rural areas with high solar availability.

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TECHNICAL SPECIFICATIONS

Atmospheric Water Generator (AWG)			
Model No.	LT-AWG250E	LT-AWG500E	LT-AWG1000E
Production Capacity(L/Day)	250	500	1000
@30°C, 80%RH			
Power supply	AC220-240V, 50Hz	AC220-240V, 50Hz	AC380V, 50Hz
Input power(KW)	2.45	4.3	8.7
Working Temp	15ºC ~35ºC	15ºC ~35ºC	15ºC ~35ºC
Working Humidity(RH)	30%~100%	30%~100%	30%~100%
Refrigerant	R410A	R410A	R410A
Compressor quantities	1	2	2
Control system	PLC	PLC	PLC
Dimension D*W*H(mm)	850*1582*1113	1000*1582*1113	1579*1582*2027
Net weight(kg)	550	810	1070

AEM Electrolyser EL 4.0	
Type	AEM
Production rate	Up to 500 NL/h, up to 1.0785 kg/24 h
Hydrogen output purity	35 barg: 99.9% (< 1,000 ppm H_2O and < 5 ppm O_2) at 25 °C
	8 barg: 98,8% (< 12,000 ppm H_2O and < 5 ppm O_2) at 25 °C
Output pressure	Up to 35 barg
Nominal power consumption per Nm^3 of H_2 produced	4.8 kWh/Nm^3, beginning of life
Operative power consumption	2.4 kW, beginning of life
Peak power consumption	3 kW
Heat dissipation	0.6 kW, beginning of life
Max heat dissipation	0.9 kW, end of life
Standby power consumption	1 0.3 kW
Power supply	220 – 240 V (AC), 50/60 Hz
Maximum water input conductivity	20 µS/cm at 25 °C
Water consumption	~ 420 mL/h at 25 °C
Water input pressure range	1 – 4 barg
Ambient operative temperature range	5 °C – 45 °C
Ambient operative humidity range	Up to 90% humidity, non-condensing
IP rating	IP 20
Dimensions	W: 482 mm × D: 635 mm × H: 266 mm
Weight	42 kg
Space inside cabinet	6 U
Control and monitoring	Fully automatic with Enapter's EMS via 2.4 GHz Wi-Fi
	and Bluetooth, Modbus TCP over Ethernet
Conformity	CE mark according to the machine directive 2006/42/CE
	UKCA mark according to Supply Machinery (Safety) Regulations 2008

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