E-Hy | HYDRO H2 BOILER | SUSTAINABLE HYDROGEN SYSTEM

BOILER - COGENERATOR

HYDROGEN-FUELED

100% ECO-SUSTAINABLE

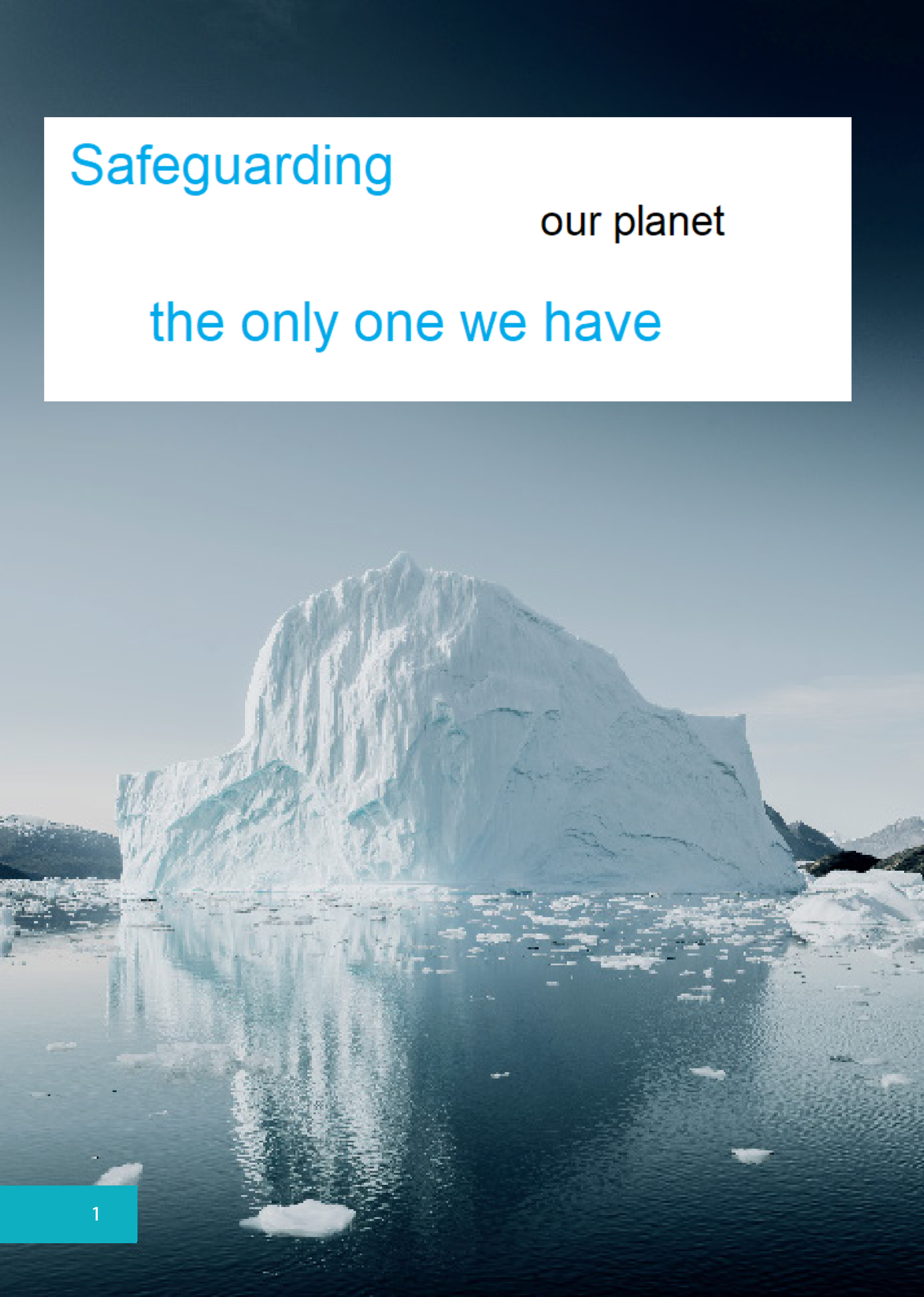
HYDRO H2 BOILER

REV 2021 - 01

Safeguarding

our planet

the only one we have



WHO WE ARE

E.HY. ENERGY HYDROGEN was born in 2014 as a response to the problem of atmospheric pollution produced by CO_2.

The company officially entered the market in January 2018, by presenting a range of hydrogen cogenerators for the production of electricity, domestic hot water and heating with an excellent price / performance ratio, around € 0.04 / kWh.

The company's main product is **HYDRO**, the first hydrogen boiler / cogenerator in the world. HYDRO is not only characterized by the use of hydrogen as a "fuel", but also by the fact that it is totally eco-sustainable, that is, it does not release fumes or waste into the air.

ETHICAL PROJECT

The World Health Organization has released a new report on environmental pollution, revealing that today 9 out of 10 people breathe highly polluted air and that every year 7 million people die worldwide from environmental pollution, both external and domestic. Thinking that the problem does not concern us, or that it involves only countries very far from us, such as China (1.8 million deaths a year - ANSA data), is a mistake that should not be underestimated: in fact, Italy is wins the black jersey in Europe (with 90 thousand deaths a year from fine dust - data from ANSA) surpassing even Germany and France.

Faced with this problem, the company has decided to devise an alternative solution to the energy market, which is considered the major cause of pollution. The solution allows not only not to impact the environment in any way, but also to economically save the end user. **An actua economic and social saving.**

PRODUCTS

The products created by Energy Hydrogen can fully replace the energy supply offered by the main suppliers on the market.

We think of an off-grid system, where the user does not depend on any energy supply, since those who use this system can stop depending on external electricity and gas supplies. **This means being completely independent and forgetting to receive bills.**

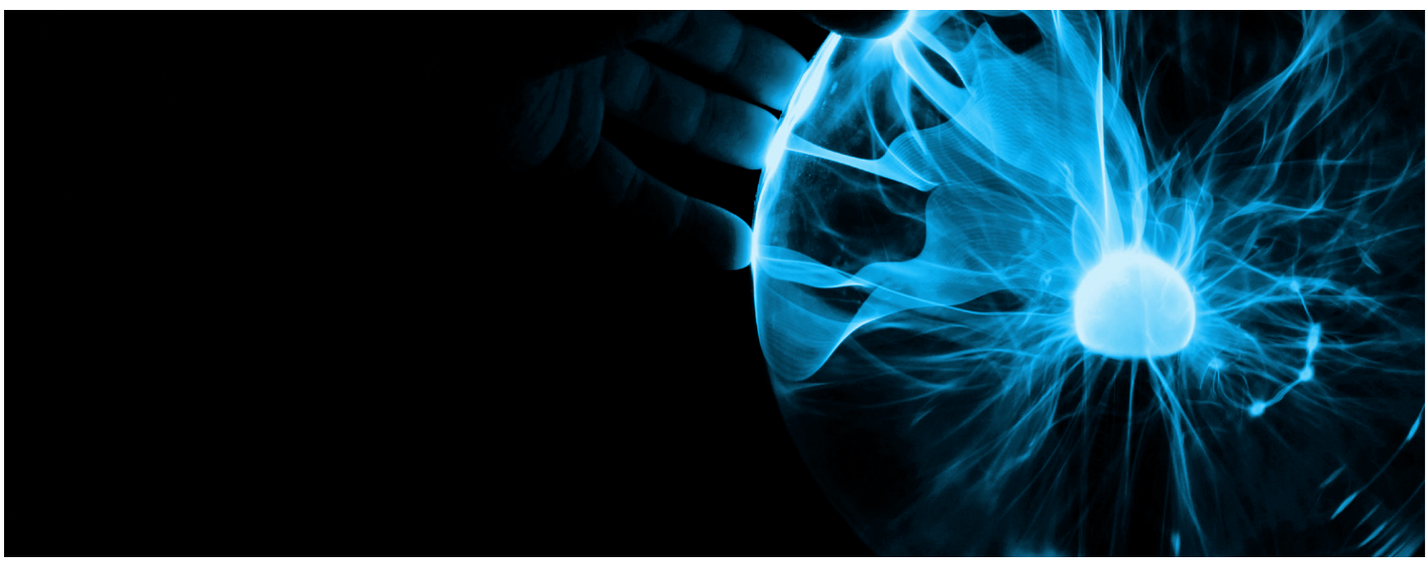
WHY USE HYDROGEN?

Hydrogen is the most promising energy source in recent years. Furthermore, the availability of this component is of magnificent importance. Hydrogen is everywhere, and we get it from simple H_2O. Furthermore, hydrogen opens up new perspectives not only in the employment field, but also in reference to the development of new technologies, based on the design principles of the fusion cell, present within HYDRO.

TECHNOLOGY

The novelty is not the use of hydrogen, but the technology used within the products, such as the fusion cell, patented by Eng. Marco Bertelli (Director of E. HY. Energy Hydrogen). The technology exploits a chemical-physical principle which, through a titanium catalyst, allows energy to be obtained with very few grams of hydrogen, water and oxygen.

Hydro is the first hydrogen boiler in the world, able to independently generate electricity and domestic hot water and heating. All this automatically and completely in isolation, without connections from external energy sources. Furthermore, the operating principle of HYDRO allows it not to release fumes or waste into the environment: The result is **0% CO_2 emissions**, and the energy that is generated inside is not dispersed, but reused.



A INSTALLATION

The basal installation with wall fixing is carried out by our authorized and certified technicians, present throughout the country, who guarantee dedicated and continuous technical assistance.

HYDRO is certified for indoor and outdoor installations. No particular predisposition to the existing system is required.

B CONTINUOUS COMMUNICATION

Hydro is equipped with a dual circuit board that intervenes to repair any errors.

In the event that it is not possible to eliminate the anomaly or failure, the machine will notify the user of the error and send a request for assistance to the parent company. The area contact person will intervene as soon as possible.

C H_2 - HYDROGEN

A special internal device allows you to generate hydrogen, store it inside the boiler and isolate it in total safety. By doing so, the total energy autonomy of the housing structure is allowed.

D DISPLAY AND CONNECTIVITY

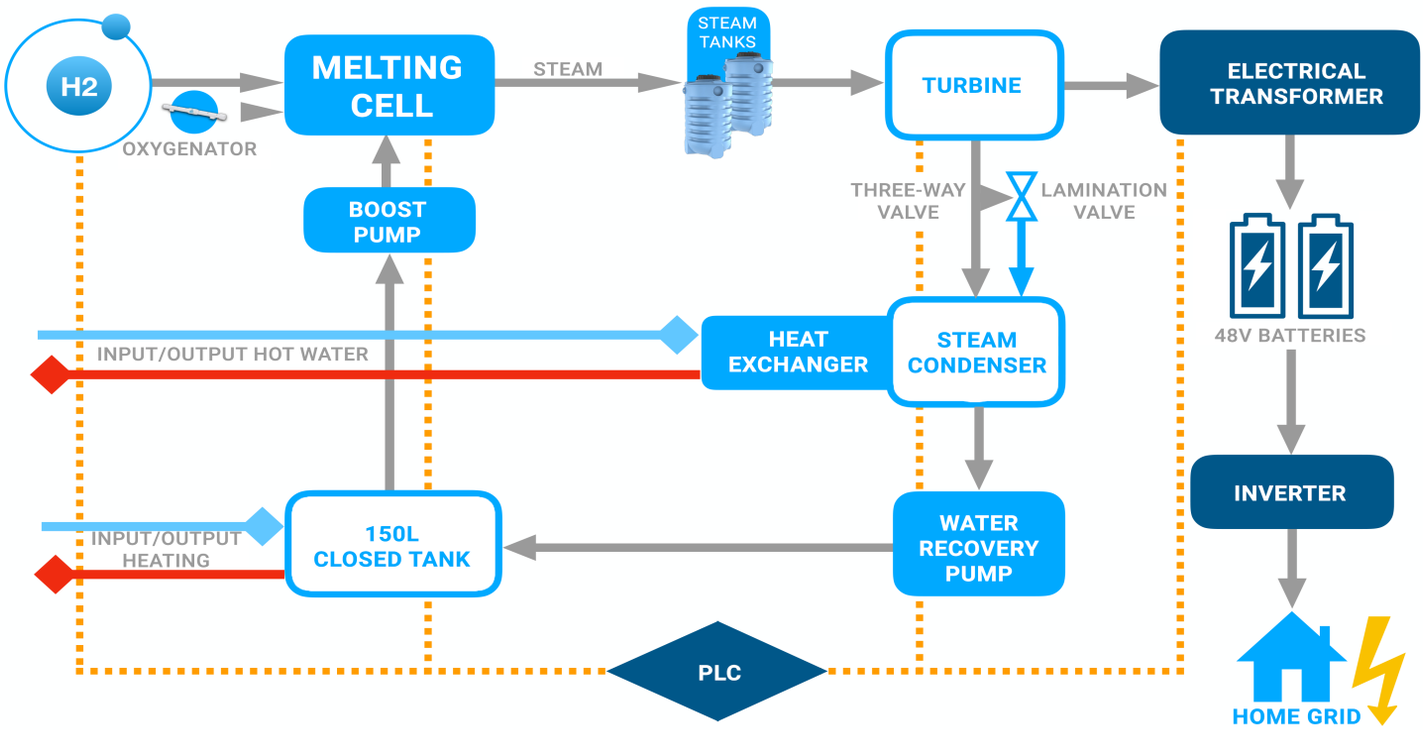
The front touchscreen display allows the user to view all the warnings relating to boiler operation. The programmable external thermostat, on the other hand, manages the thermal part of the structure, allowing it to be adjusted according to your needs.

HYDRO

Revolution starts here

What are you waiting for...join us!

OPERATING SCHEME HYDRO



ELECTRIC COGENERATOR

Through the generation of steam at high pressure, through a chemical-physical process with H_2 and H_2O on titanium plates, the steam generated is introduced into a turbine, specially patented by the company. This process results in a strong energy charge in the electrical transformer.

The energy generated by the transformer is stored in the batteries (two lithium batteries). The internal inverter distributes energy to the grid, up to a maximum of 6.2 kWh, according to the needs of the housing structure, without limits and independently. The recharging cycle will be repeated every time the battery autonomy is no longer sufficient to power the home.

BOILER

The thermal part uses the waste of the steam coming out of the turbine, providing useful energy to the home up to a maximum nominal of 31 kW.
The internal storage tank of 150 liters allows the water to be kept at a useful operating temperature for several hours (tank thermal transfer approximately 5 ° / h).

The temperatures of the domestic hot water and heating can be set from the front display of HYDRO and from the programmable thermostat.

Advantages

social value

ECONOMIC ADVANTAGES

The use of HYDRO allows you to 100% eliminate electricity and gas bills, as the boiler will independently provide the energy needed for the home, all without external connections. Its only component necessary for food is water. Considering that in the future the costs of energy supplies are destined to rise, the end user can amortize the expense of HYDRO within 3 years.

With HYDRO, the cost of the energy supply (electricity and heating) will be around € 0.01 per kWh.

SOCIAL VALUE

HYDRO differs from other boilers and other devices on the market thanks to its melting cell, which unlike a combustion cell does not release CO_2. Energy Hydrogen strongly believes that the most important advantage of HYDRO is the social aspect, which translates into eco-sustainability.

If an Energy Hydrogen device were used in every home instead of traditional boilers, tons of CO_2 in the atmosphere would be eliminated.

Une solution,

two different models

The G Series of the HYDRO range of boilers offers complete economic advantages on the supply of electricity, domestic hot water and heating, all in the utmost simplicity and in a single system. The unique innovative technology in the world allows you to completely eliminate the costs of energy supplies in homes, companies and offices.

G SERIES	BOILER	ELECTRIC COGENERATOR
MODEL	MAXIMUM THERMAL POWER	MAXIMUM ELECTRICAL POWER
HG 1	23 kW (19.000 kcal/h)	3,3 kWp
HG 2	27 kW (24.000 kcal/h)	4,5 kWp
HG 3	31 kW (27.000 kcal/h)	6,2 kWp
HYDROGEN CONSUMPTION		
1.80 g / h with a variation of +/- 10% depending on the model		

Unlike the G Series, the W Series only produces domestic hot water and heating like a normal boiler, but using hydrogen as an energy source. The W series also includes three different models each with different characteristics.

W SERIES	BOILER
MODEL	POTENZA TERMICA EROGABILE MASSIMA
HW 1	23 kW (19.000 kcal/h)
HW 2	27 kW (24.000 kcal/h)
HW 3	31 kW (27.000 kcal/h)
HYDROGEN CONSUMPTION	
1.80 g / h with a variation of +/- 10% depending on the model	

Both HG and HW Series include the internal hydrogen generator.

The hydrogen producer of E.HY. Energy Hydrogen allows you to keep HYDRO always active, without worrying about autonomy and consumption.

Energy autonomy

Savings and safety...

Stored inside HYDRO, the device consists of a peristaltic pump that draws distilled water and bioethanol from internal tanks in different percentages. The inside of the device consists of a tank, in which an electric arc is formed by means of a positive and a negative pole. The catalyst allows the formation of biogas (Syngas), with a high percentage of dirty hydrogen (H2 and O).

The hydrogen produced is stored inside a small container of 40 g, which allows the component to pass directly to HYDRO.

The company found that to produce 1 kg of hydrogen, very few electrical kWh are needed on average. The electrical absorption of the device takes place directly from the batteries inside the HYDRO (charged at the time of installation).

HYDROGEN CONSUMPTION

Unlike the cylinders previously installed on board, the hydrogen producer releases a quantity of dirty component, as it contains oxygen. The average consumption of hydrogen through the producer implies a slight increase in consumption by HYDRO.

Maintenance and installation on PAGE 10

GSM

The GSM module is equipped with a SIM card (provided by the user) which exchanges operating data with the Service Center, ready to intervene in the event of breakdowns.

SENSORS

The internal components of HYDRO, including the device for the production of H_2, are equipped with analog and digital sensors that constantly monitor its operation. Any anomaly is detected by the internal PLC.

PLC

The dual circuit control board represents the most important safety present in HYDRO. The PLC is similar to a PC, and constantly controls the operation of the boiler.

AS ENEA SAYS...

"Beyond the subjective perception of risk, a careful analysis resizes the concept of the dangerousness of hydrogen. [...] To identify potentially dangerous concentrations, sensors are used that can easily command adequate safety systems. "

SAFETY FIRST

HYDRO is managed by a double circuit electronic board (called PLC) which monitors each sensor inside. Any anomaly, mechanical or electrical, is reported via GSM to the Service Center and through the front interface (display) to the user.

The PLC can also intervene automatically if it can repair the anomaly by deactivating and reactivating other components.

The remote control allows the Service Center to repair system errors and anomalies on which the PLC is unable to intervene

The identification smart card prevents access to the configuration panel by strangers and possible criminals.

The systems mentioned above fully represent the safety present in HYDRO.

Installation in 4 steps

- Connection to the existing thermal and electrical system;
- Supply of distilled water and bioethanol for the hydrogen producer;
- Wall anchoring;
- Check configuration and start.

Guaranteed professionalism

The installation is guaranteed and certified by our installers, present throughout the country, who will provide technical and specific assistance for the entire period of use of HYDRO.

INTERNAL or EXTERNAL installation

HYDRO is approved and certified for outdoor installations, such as under a balcony, as long as it is partially protected from atmospheric agents (rain and snow).

Integration with photovoltaic system

If there is a PV system, it is possible to combine it with HYDRO. This configuration allows you to accumulate electricity in the internal battery pack, but above all to reduce the excess thermal energy produced by the boiler itself in the summer.

MAINTENANCE

HYDRO, unlike a traditional boiler, requires mandatory maintenance every six months by authorized technicians present all over the world.
This last operation is necessary in order to verify the correct functioning and energy supply of the same. On this occasion the hydrogen producer is overhauled, supplied with the main components with distilled water and bioethanol and restarted after refueling.

CERTIFICATIONS AND APPROVALS

The range of HYDRO boilers is CE approved and certified.
No additional certifications or extraordinary permits are required.

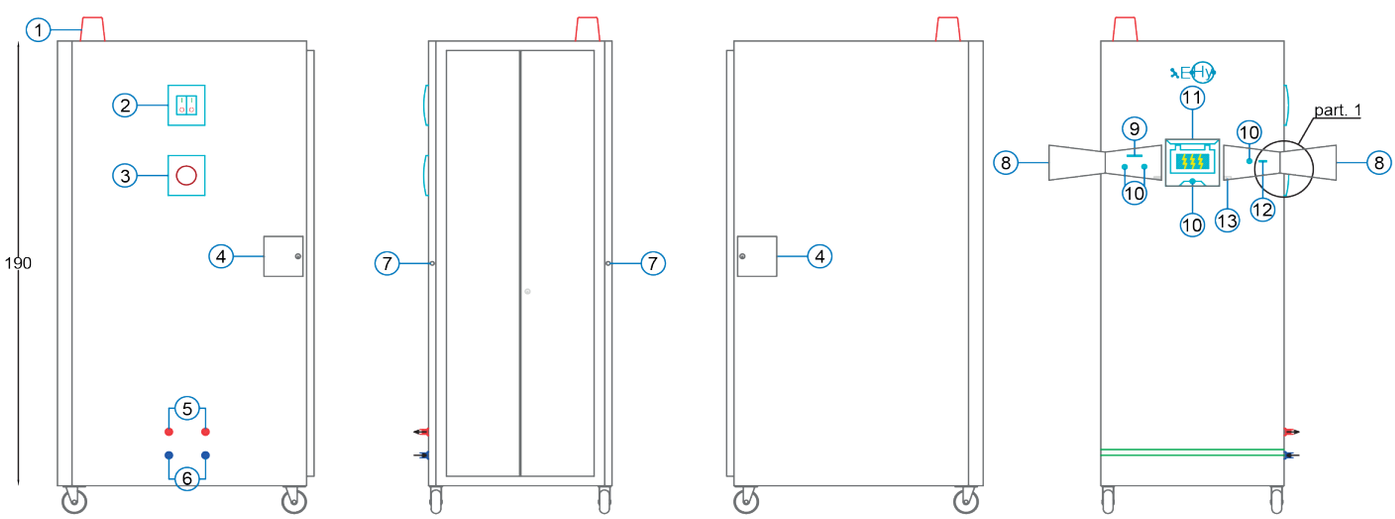
COGENERATOR TECHNICAL CHARACTERISTICS	UNIT OF MEASURE	HYDRO HG 1	HYDRO HG 2	HYDRO HG 3
Maximum deliverable power	kWp	3,3	4,5	6,2
INPUT				
Maximum DC input voltage	Volt		600	
Input DC activation voltage	Volt		200 (adj. 120..350)	
Operating range of DC input voltage	Volt		0.7 x V..580	
Rated DC input power	Watt	3800	4800	6200
INPUT PROTECTION				
Reverse polarity protection			Yes, from limited current source	
Insulation check			In accordance with local legislation	
OUTPUT				
Type of AC connection to the grid (phase)		Single	Single	Single / Triple
Rated AC output power	Watt	3600	4600	6000
Maximum AC output power	Watt	3600	5000	6000
Rated AC output voltage	Volt	220	220	220/400
Rated output frequency	Hertz		50	
ENVIRONMENTAL FEATURES				
Room temperature	°C	-20.. +55	-25.. +55	-25.. +55
Humidity	%	0..95	0..100 with condensation	
Acoustic emission			< 25 db(A) @ 5 m	
Environmental protection degree			IP65	
SAFETY				
EMC and safety standards		EN50178 EN61000-3-2 EN61000-6-1 EN61000-6-3 AS/NZS3100	EN50178 EN61000-3-11 EN61000-3-12 EN61000-6-1 EN61000-6-3 AS/NZS3100 AS/NZS60950	EN61000-3-11 EN61000-3-12 EN61000-6-1 EN61000-6-3 EN62109-1 EN62109-2 AS/NZS3100 AS/NZS60950
Certifications			CE	

ELECTRICAL POWER COMPONENTS TECHNICAL CHARACTERISTICS	UNIT OF MEASURE	HYDRO HG 1	HYDRO HG 2	HYDRO HG 3
TURBINE				
DC output	Volt		48 V with maximum range +/- 10% regulation	
Operating pressure	bar		2 / 3	
Action stages			3	
Reaction stages			3	
Environmental emissions			< 20 db(A) @ 1 m	
ALTERNATOR				
Energy production	Volt		48 V with maximum range +/- 10% regulation	
BATTERIES				
Lithium batteries	n.		2	
Storage power for each battery			Up to 100 Ah with 48 V intervention threshold	
Input / output voltage	Volt		48	
Storage energy for each battery	Ampère	50	60	100

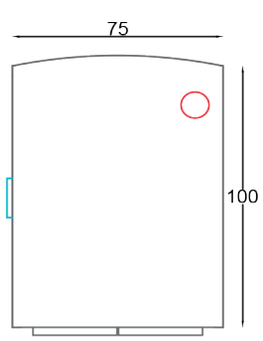
BOILER TECHNICAL CHARACTERISTICS	UNIT OF MEASURE	HYDRO HG / HW 1	HYDRO HG / HW 2	HYDRO HG / HW 3
Boiler code		1001 / 2001	1002 / 2002	1003 / 2003
Template code		4631 / 4629	4725 / 4723	4824 / 4822
Pallets for boiler	n.		3	
Maximum nominal domestic heat flow	kW (kcal/h)	21,7 (18.700)	27,4 (23.600)	30,9 (26.500)
Maximum nominal heating capacity	kW (kcal/h)	22,1 (19.000)	27,9 (24.000)	31,4 (27.000)
Minimum nominal heat input	kW (kcal/h)	4,7 (4.041)	5,1 (4.385)	6,8 (5.846)
Maximum useful sanitary heat output	kW (kcal/h)	19,9 (17.110)	26,8 (23.043)	30,1 (25.881)
Maximum useful heat output for heating	kW (kcal/h)	21,6 (18.572)	27,5 (23.645)	31,1 (26.741)
Minimum useful heat output	kW (kcal/h)	4,4 (3.783)	4,9 (4.213)	6,3 (5.417)
100% useful thermal efficiency (Pn 80/60 °C)	%	98,1	98,7	98,9
30% useful thermal efficiency (Pn 80/60 °C)	%	100,1	101	101,3
100% useful thermal efficiency (Pn 40/30 °C)	%	101,5	106,1	108,3
30% useful thermal efficiency (Pn 40/30 °C)	%	105,5	106,2	107,9
DHW continuous service flow rate (55 - 30 ° C)	liters/min	da 12 a 14	da 14 a 16	da 16 a 18
Minimum domestic circuit pressure	bar		from 1 to 1,5	
Heating expansion vessel capacity	liters		6	
Heating collection vessel capacity	liters		150	
Electric protection			IP65	
OUTPUT TEMPERTURES				
Maximum sanitary outlet temperature	°C		55	
Minimum sanitary outlet temperature	°C		8	
Maximum heating outlet temperature	°C		80	
Minimum heating outlet temperature	°C		8	

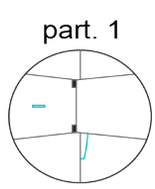
HYDRO GENERIC FEATURES	UNIT OF MEASURE	HYDRO HG / HW 1	HYDRO HG / HW 2	HYDRO HG / HW 3
WEIGHT				
Full load boiler weight	kg		from 280 to 420	
Empty boiler weight	kg		from 130 to 270	
DIMENSIONS				
Width	cm		75	
Height	cm		195	
Depth	cm		100	
EXTERNAL LINKS				
Domestic water (DHW) IN / OUT	n.		2	
Domestic water connection size	inches		3/4	
IN / OUT heating water	n.		2	
Heating connections size	inches		3/4	
Electrical wires	n.		from 3 to 5	
Electrical connections dimensions	mm		6	

External components



LEGEND	
1	Emergency flashing light
2	Main switch (safety cutout)
3	Stop button
4	Wall anchoring compartments
5	HOT output - DHW and heating
6	COLD entry - DHW and heating
7	Wall anchoring holes
8	Doors for opening - closing
9	SMART Card slot (for installers)
10	Control buttons (for installers)
11	Display
12	SIM Card slot
13	Left door opening hook





What you need to combine with HYDRO

Required accessories

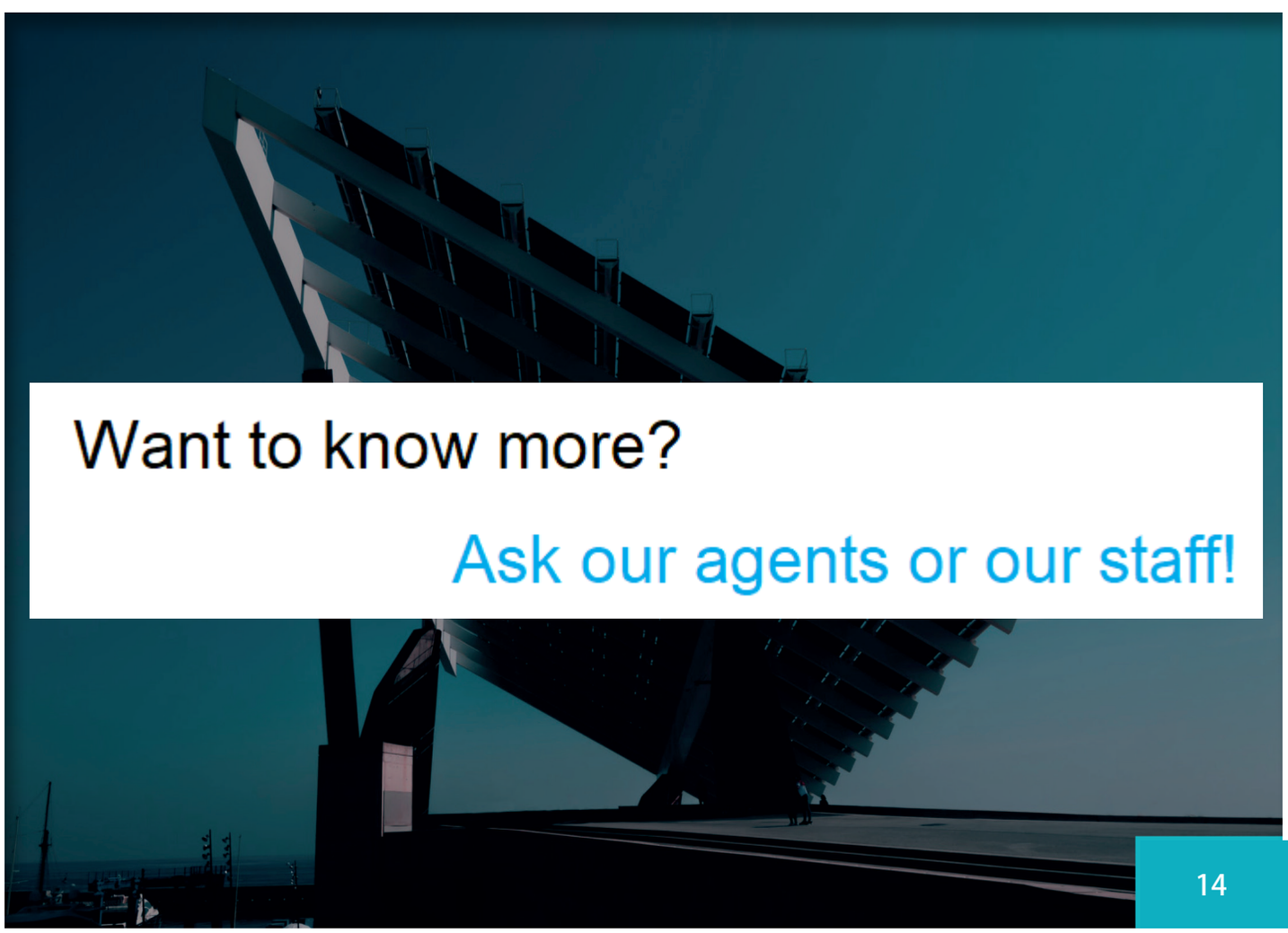
Heat exchanger	It carries out the exchange of thermal energy between different temperatures.	= 30 kW

OTHERWISE

External storage tank	It stores the excess hot water produced by HYDRO and releases it when needed.	> / = 200

Additional accessories

Photovoltaic system	The photovoltaic system contributes to a lower discharge of thermal energy, produced by the surplus of electrical use. It will also allow the accumulation of electricity inside the batteries.	< / = 3 kW



Agent

www.idrogenoverde.it

E.HY. Energy Hydrogen Solution S.p.A.
VAT 02349790507
Tel. 050 89 09 49
Email. info@idrogenoverde.it