PRODUCT INFORMATION SHEET
Hydrogen Range Extender

REXH$_2$

From 60 to 600 kW

THE ON-BOARD HYDROGEN FUEL CELL POWER GENERATOR FOR ZERO-EMISSION NAVIGATION

With the REXH$_2$ and its record energy density, enjoy tomorrow's technology now.

EODev

Ecological and Designed for the Planet

The solution providing you with emission-free onboard energy, both at sea and at anchor.

Optimized for your Energy Needs

- Proven technology
- « Plug & Play » solution
- Compact design and light weight
- Complete modularity
- Zero emissions
- Quick refueling
- No noise pollution
- No minimum power required
- Data monitoring
- Instant start
- Predictive and simplified maintenance
- Optimized consumption and efficiency

$REXH_2$ Specifications

Performances

Power	From 60 to 600 kW
Life span	13 000 hours
Output voltage	± 600 V DC
Full power can be maintained over several hours	

Special Features

- No clogging
- No moving parts
- Possibility to stack up to 10 units
- Integrated H_2 safety management
- Compact

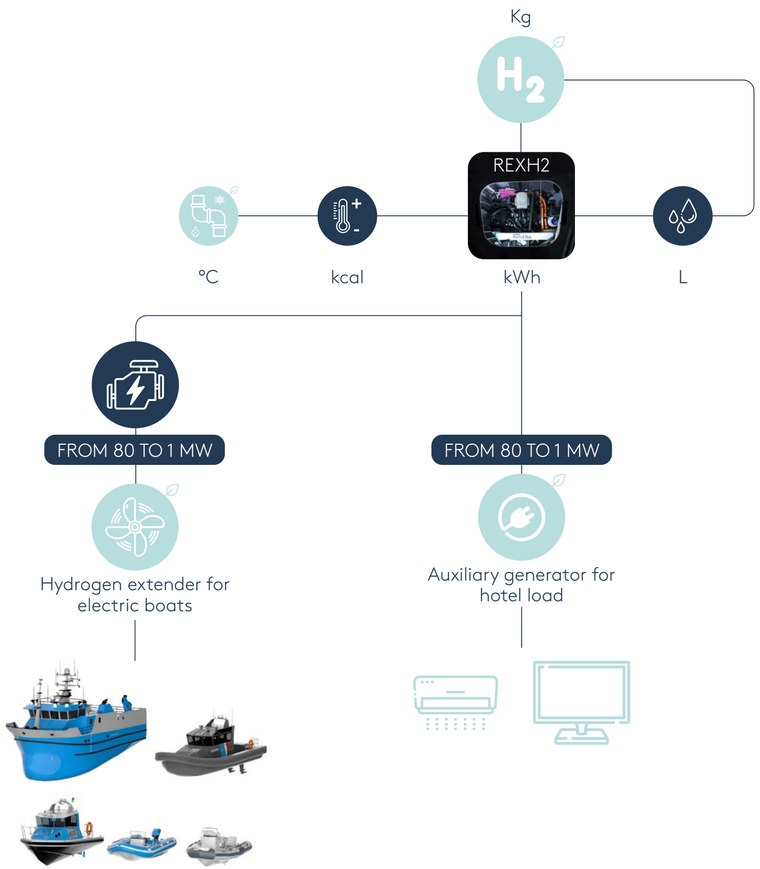
Integration

Complete ready-to-use system	
Size	100 cm x 100 cm x 100 cm
Weight	400 Kg (incl. Frame)
Power Management System included	

Custom-Made Solutions

1

Hybridization H_2 - Electrical



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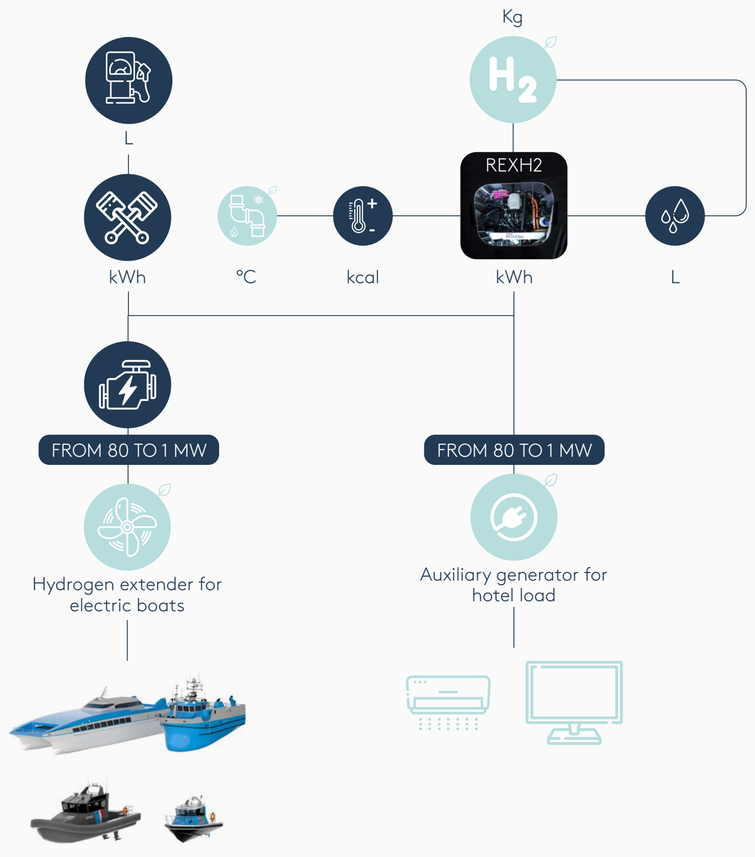
Hybridization H_2 Diesel-Electrical



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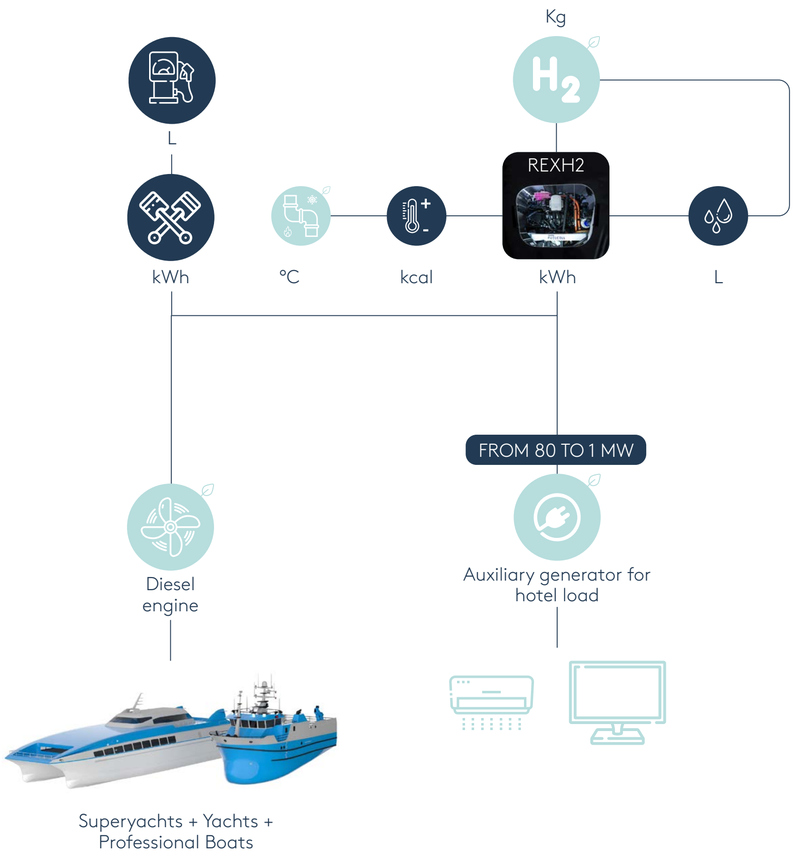
Hotel Load



Applications of the $REXH_2$

Yachting

USER PROFILE	CONFIGURATION
Medium to fast speeds	H_2 alone or coupled with photovoltaic panels
Short distances	
Profile : Tenders, Day-Boats	

Propulsion et Systems

Hotel load

All navigation zones

Pleasure Boating

USER PROFILE	CONFIGURATION
Slow to medium speed	Customized configuration
Medium range	
Yachts, Superyachts...	

Systems and hotel load

Port manoeuvres

Propulsion in protected areas

Professionals

USER PROFILE	CONFIGURATION
Slow speed	H_2 alone or coupled with solar panels/wind
Regular/recurrent routes	
Shuttles, Barge, Pilot boats...	

Propulsion et Systems

Hotel load

All navigation zones

Key Performance Indicators (KPIs)

100 kW 6 hours of navigation	Diesel	Electrical	Hydrogen
Environmental efficiency			
Emissions	CO_2 NO_X		H_2O
Access to protected zones	No	Yes	Yes
Noise			
Recharging / Refueling time	10 min	15h (Fast recharging)	10 min
Consumption	200 L diesel	700 kWh electricity	40 kg hydrogen
Weight (engine + fuel / energy source)			
Total volume			
Implementation cost	$	$ $ $	$ $
Energy cost	$	$ $	$ $ $
Energy cost evolution			
Energy density	++	+	+++

H_2 + Battery vs. Battery Alone

Twice as much energy storage capacity for the same volume

Potential of 10,000 cycles compared to 3,000 for a Li-ion battery

Hydrogen refueling time as fast as filling up a tank with traditional fuel

Mass : 7 times lighter

Price : 3 times less expensive

Price per kWh roughly equal to diesel price

$REXH_2$ V2
The Next Generation

Technology

Brand Fuel Cell	Toyota
Type of Fuel Cell	PEM
Hydrogen pressure at the $REXH_2$ inlet	11-15 bars
Required hydrogen quality	ISO14687 Grade D

Dimensions

Length	1600 mm
Width	1000 mm
Height	1000 mm
Weight	630 kg

Operating conditions

Ambient air temperature	-15°C to 40°C
Water temperature in exhaust (maximum)	65°C
Integrated cooling system (coolant/water)	Yes - 2'' 1x IN/1x OUT
External cooling system (water/sea water)	Upon request
Max sea water temperature and flow requirement	32°C @ 200LPM
Required inlet air & ventilation flow	8000 nL/min

Coming Spring 2022

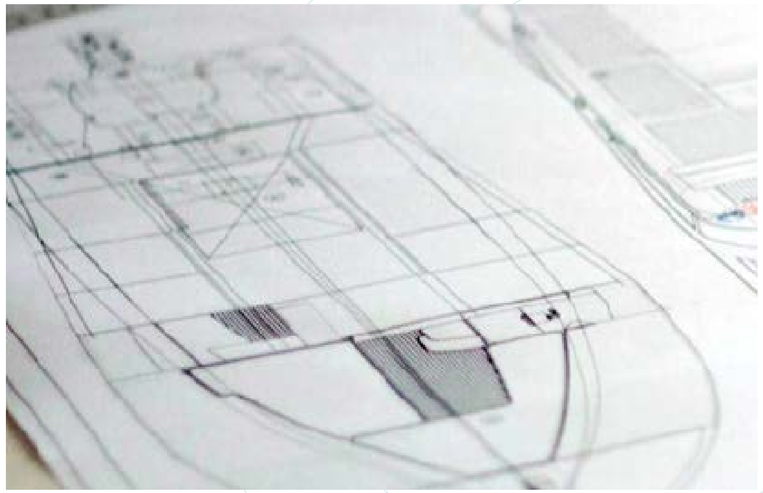
Miscellaneous

Integrated hydrogen safety ECU	Yes
Security sensors Number depends on architecture	H2 sensors, smoke sensor, accelerometer, ventilation sensor
Ex-proof extraction fan	Yes
Integrated air cleaner with exchangeable filter	Yes
Display and control buttons	Yes
Remote display communication/onboard HMI interface	CAN (NMEA interface upon request)
Remote monitoring	Wifi IP - 4G/5G/satellite (option)

Performances

Customer Bus Voltage (Range and Current type) **	600-725 VDC (70 kW)
** : REXH2 do not regulate the voltage	400 VDC (51 kW)
Total nominal net output power (EoL)	70 kW
Acoustic pressure level at 1m 50Hz	Ongoing tests
Acoustic pressure level at 7m 50 Hz	Ongoing tests
Estimated EoL (on a nominal duty cycle)	13.000 hours
Consumption at nominal power - BoL - EoL	4.6 - 5.4 H2 kg/h
Pure water production (vapour or liquid) - EoL	<50L/h
Protection index of REXH2	IP52 (standard), IP56 (option)

Q & A



1 *By using it on a yacht, customers have the possibility to reach and stay in a zero-emission zone, without noise, without emissions, while enjoying the normal comfort of the boat in total respect for the environment.* ››

TRUE

If you convert diesel engines to electric ones on large boats, they can be propelled by the use of solar panels, $REXH_2$(s), and batteries. As a result, there will be no noise, no emissions, and total environmental respect.

2 *A hydrogen boat can function without hydrogen where it is needed.* ››

TRUE

In the absence of hydrogen, the boat can indeed only run on batteries, both for propulsion and for hotel load. However, its autonomy will be limited depending on the possibilities of refueling hydrogen and/or recharging its batteries.

3 *We offer a yacht capable of living emission-free when not in use: when only the crew is on board, in a port, thanks to the use of solar panels. No unnecessary pollution.* ››

UNTRUE

If you install solar panels on the entire boat, their daily production will, on average, only cover about 20% of the crew's needs.

4 *Diesel-electric propulsions allow a fuel consumption saving of roughly 30%.* ››

UNTRUE

For equivalent performance, the gain in diesel fuel consumption in a diesel-electric system is actually quite limited - unless you optimize the use of an electric system by combining it with an H2 system in order to drastically reduce its diesel fuel consumption.

5 *A boat equipped with a H2 system does not generate its own hydrogen.* ››

UNTRUE

By taking an electrolyser on board and with an access to a source of electricity, for instance via a plug in a port, a boat can produce its own hydrogen. But it can also have its hydrogen delivered. H2 stations are currently being deployed in several ports.

EODev

Energy Designer

The energy mix optimization experts

$STSH_2$

The hydrogen refueling mobile station

GEH_2

The zero-emission hydrogen power generator

$REXH_2$

The on-board solution for zero-emission navigation

FOR MORE INFORMATION

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