

PEM Electrolyser

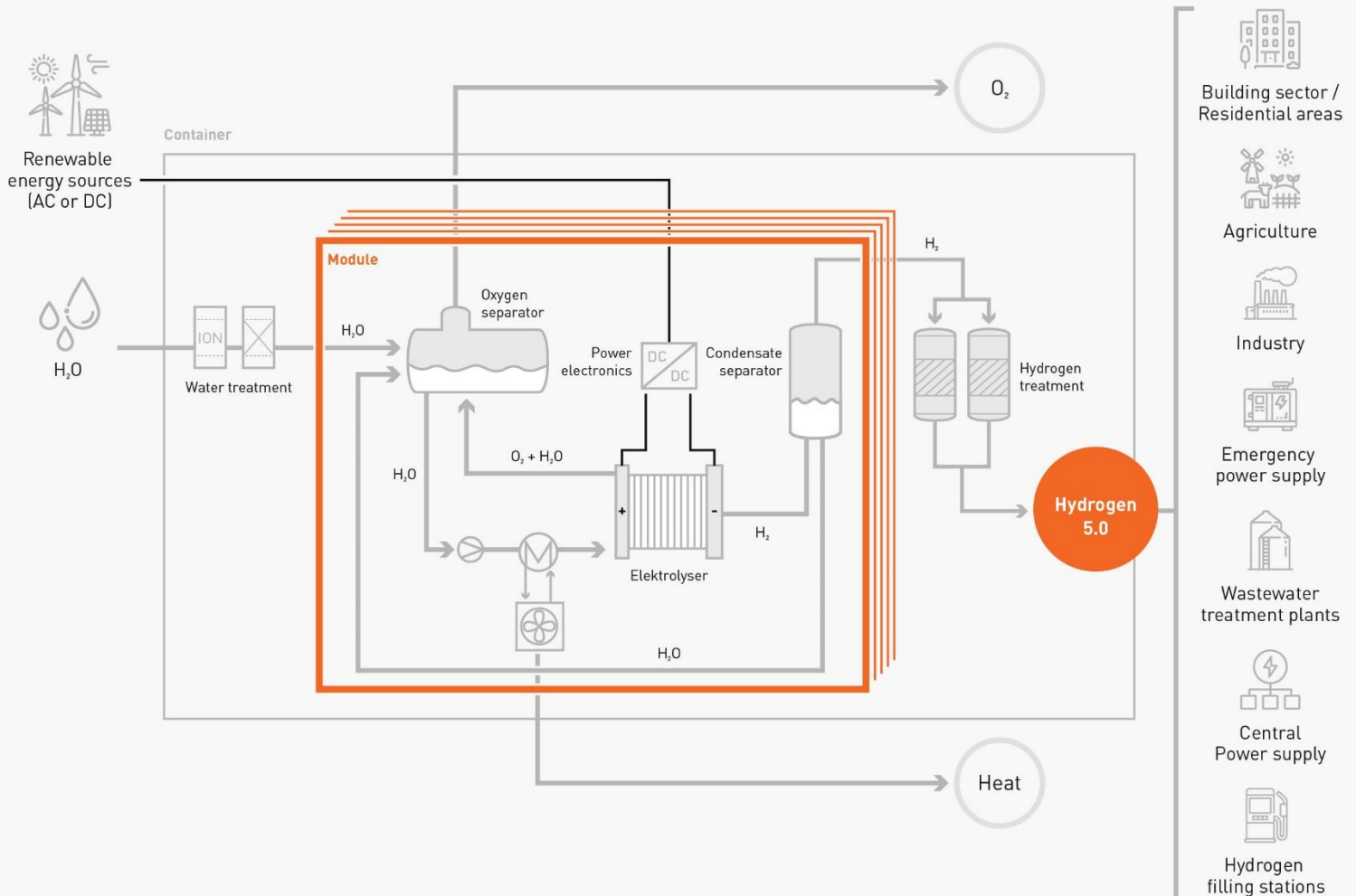


KEY ASPECTS

- Complete Plug'n'Produce system in a 20ft or 40ft container
- Scalable from 100KW to 1MW
- Production of hydrogen, oxygen and process heat
- Remote operation, monitoring and maintenance

BENEFITS

- Modular design for demand- and investment-optimized configuration
- Optimized for fluctuating renewable energy
- High efficiency at any load
- Easy maintenance
- Risk of production losses minimized
- Enables easy upgrades of production capacity
- Long service life

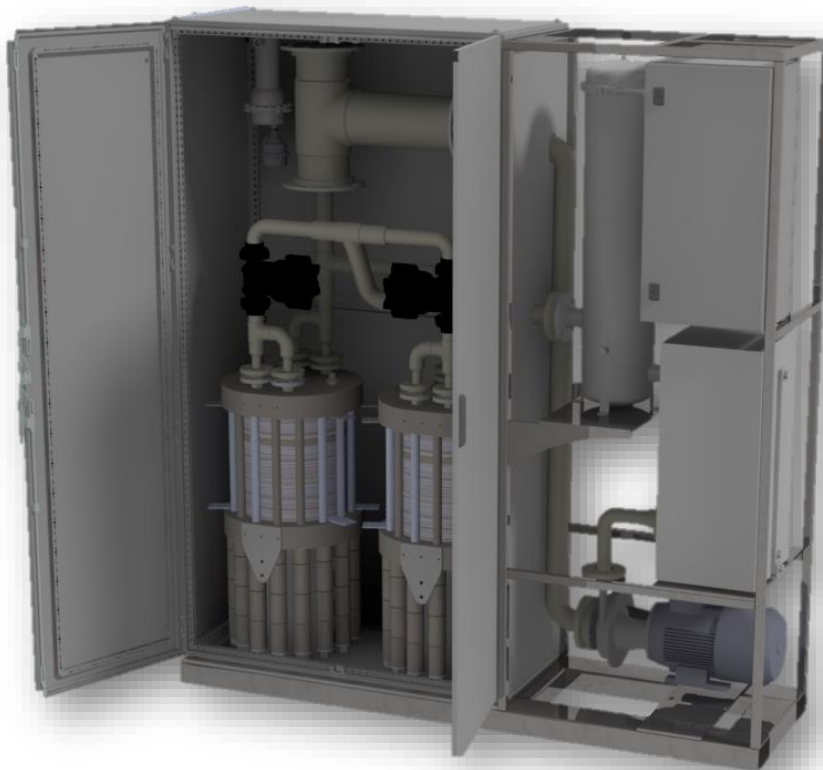


The „Green“ Hydrogen Production

Hydrogen is one of the key building blocks for a successful energy transition and is considered a link between energy generation and energy consumption due to its ability to store and transport energy. Hydrogen will also be indispensable in the context of sector coupling. In the production of green hydrogen by electrolysis, a very well tuned system of electrolysis stack and power electronics is an essential factor for high efficiency and longevity of the system.

We offer a complete solution that ensures the economical and ecological use of renewable energy. The system can be perfectly scaled to your needs and also be easily linked to a battery, hydrogen storage unit, fuel cell or your electrical consumers. This guarantees you maximum yield.

PEM electrolysis module



BENEFITS

- Flexible installation (container/ building)
- Simply upgradeable
- 100KW or 200KW power
- High operating reliability
- Efficient partial load operation
- Redundancy

Power class electrolyser		100 kW	200 kW	300 kW	400 kW	500 kW	1000 kW
Number of electrolysis modules (stacks)		1(1)	1(2)	2(3)	2(4)	3(5)	5(10)
Water treatment (reverse osmosis and ion exchanger)		✓	✓	✓	✓	✓	✓
Feed water and cooling circuit		✓	✓	✓	✓	✓	✓
Heat extraction via external cooler		✓	✓	✓	✓	✓	✓
Heat extraction to customer water circuit		Option	Option	Option	Option	Option	Option
H ₂ quality 3.0		✓	✓	✓	✓	✓	✓
H ₂ quality 5.0		Option	Option	Option	Option	Option	Option
Encapsulated hydrogen production in switch cabinet with all relevant monitoring functions		✓	✓	✓	✓	✓	✓
Power distribution		✓	✓	✓	✓	✓	✓
Control technology incl. sensors, safety control and display		✓	✓	✓	✓	✓	✓
Control parameters: Electrical power, hydrogen production quantity		✓	✓	✓	✓	✓	✓
Remote maintenance and remote control		✓	✓	✓	✓	✓	✓
Integration into a higher-level control system		✓	✓	✓	✓	✓	✓
Energy management (optimization of operational management of storage, consumers, generators)		✓	✓	✓	✓	✓	✓
Grid operator interface (direct sale/purchase, grid stabilization)		Option	Option	Option	Option	Option	Option
O ₂ production per day (24 h)	kg/d	415.2	830.4	1,246	1,661	2,076	4,152
O ₂ production per hour	kg/h	17.3	34.6	51.9	69.2	86.5	173
H ₂ production per day (24 h)	kg/d	52.8	105.6	158.4	211.2	264	528
H ₂ production per hour	kg/h	2.2	4.4	6.6	8.8	11	22
H ₂ production nominal per day (24 h)	Nm ³ /d	576	1,152	1,728	2,304	2,880	5,760
H ₂ production nominal per hour	Nm ³ /h	24	48	72	96	120	240
Maximum electrical power electrolyser stacks @BOL	kW	100	200	300	400	500	1000
Efficiency power supply	%	> 95	> 95	> 95	> 95	> 95	> 95
Electric power consumption nominal (from grid)	kWh/Nm ³	4.375	4.375	4.375	4.375	4.375	4.375
Device performance related to full load	%	40-100	20-100	14-100	10-100	8-100	4-100
Hydrogen output pressure at the electrolyser	bar	20-35	20-35	20-35	20-35	20-35	20-35
O ₂ Operating pressure 0.4 bar	bar	0.4	0.4	0.4	0.4	0.4	0.4
O ₂ Operating pressure option 2.0 bar		Option	Option	Option	Option	Option	Option
Warm start-up time maximum	s	30	30	30	30	30	30
Start-up time cold start maximum (from standby)	min	10	10	10	10	10	10
Water consumption drinking water min.	l/h	36	72	110	146	180	360
Water quality: drinking water		✓	✓	✓	✓	✓	✓
Power supply electrolyser max. (3x400 V / 50–60 Hz)	kW	125	250	375	500	625	1,250
Power supply option 3 x 800 V / 50 - 60 Hz		Option	Option	Option	Option	Option	Option
Power supply auxiliary units max. (3 x 400 V / 50 – 60 Hz)	kW	19	19	33	33	47	75
Sea container 20ft L x W x H (6.1 x 2.44 x 4.5)		✓	✓	✓	✓	-	-
Sea container 20ft transport L x W x H (6.1 x 2.44 x 2.9)		✓	✓	✓	✓	-	-
Sea container 40ft L x W x H (12 x 2.4 x 4.5)		-	-	-	-	✓	✓
Sea container 40ft transport L x W x H (12 x 2.4 x 2.9)		-	-	-	-	✓	✓
Weight approx.	t	8	9	11	12	18	32
Ambient temperature	°C	-20 - +40	-20 - +40	-20 - +40	-20 - +40	-20 - +40	-20 - +40