

ELECTROLYZER CONVERTER BASED ON IGBT TECHNOLOGY

The maximum DC current density

The INGECON® H2 E-lyzer converters feature the largest DC current density on the market, with up to 12,000 A/dc of rated current. Thus, it is the best solution to feed the electrolyzers with DC power from renewable energy generation plants.

Latest generation electronics

The INGECON® H2 E-lyzer converters are based on Ingeteam's latest-generation IGBT technology, that enables AC-to-DC power conversion with no need of any additional harmonic filters nor STATCOM units, thanks to Ingeteam's THD (total harmonic distortion) lower than 3%.

These converters feature a very low power consumption thanks to an efficient power supply electronic board.

Furthermore, the hardware of the control unit allows accurate measurements and very reliable protections.

Improved medium voltage integration

These converters have been designed in order to facilitate a direct close-coupled connection with the MV/LV transformer. Thus, Ingeteam offers an all-in-one power station that is capable to perform MV to LV conversion while also converting from AC to DC.

Liquid Cooling System (LCS)

The LCS is a closed circuit supplied totally filled and purged, equipped with fast connectors with an anti-dripping system, so it offers zero risk of particle entrance. It has been designed to avoid siphons in order to easily purge it if necessary. The coolant used is a biodegradable glycol water mixture. There is no need of emptying the LCS in order to replace the phases, nor the sensors.



Long-lasting design

The converters have been designed to guarantee a long life expectancy, as demonstrated by the stress tests they are subjected to. Standard 2-year warranty, extendable for up to 25 years.

Ease of maintenance

All the elements can be removed or replaced directly from the converter's front and back sides, thanks to its new design.

Easy to operate

The INGECON® H2 E-lyzer converters feature a number of LEDs to show the converter operating status with warning lights to indicate any incidents. All this helps to simplify and facilitate maintenance tasks.

Monitoring and communication

Wi-Fi and dual Ethernet communications supplied as standard. Also included at no extra cost the monitoring applications to record and monitor the converter's internal operating variables through the Internet (alarms, real time production, etc.). Two Ethernet communication ports available (one for monitoring and one for plant controlling), allowing fast and simultaneous plant control.

PROTECTIONS

- DC Reverse polarity.
- Short-circuits and overloads at the output.
- Insulation failure DC.
- Lightning induced DC and AC surge arresters, type II.
- Motorized DC switch.
- Motorized AC circuit breaker.
- Hardware protection via firmware.
- Additional protection for the power stack, liquid cooled, IP65 rated and air cooled by a closed loop.
- Integrated stack discharge system.

OPTIONAL ACCESSORIES

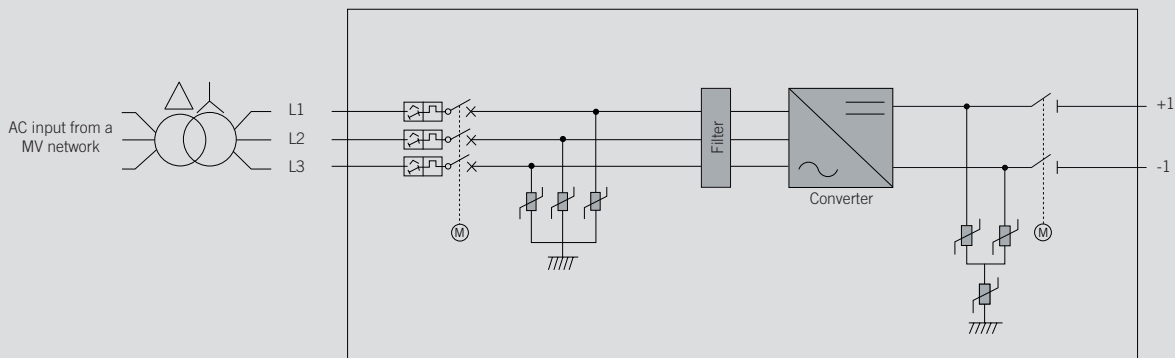
- Lightning induced DC and AC surge arresters, type I+II.
- Wattmeter on the AC side.

LIQUID COOLING SYSTEM

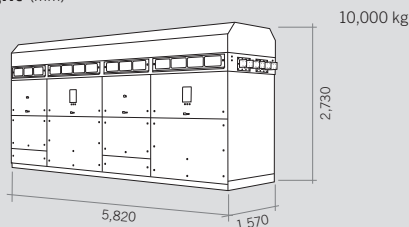
- LCS to refrigerate the IGBTs.
- More optimized component usage: greater thermal stability.
- Less moving components: lower power consumption and less maintenance works.
- No risk of particle entrance.
- C5H anti-corrosive rating with stainless steel components.
- LCS is used in many industries. Thus, it is very reliable, as its components are subject to many validation tests.
- Fast connectors with anti-dripping system Biodegradable glycol water mixture.
- No need of emptying the LCS in order to replace the phases, nor the sensors.

ADVANTAGES

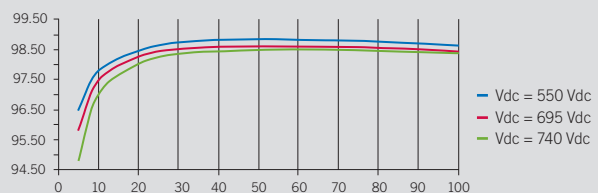
- Higher current density.
- Latest generation electronics.
- More efficient electronic protection.
- Enhanced performance.
- Easier maintenance thanks to its new design and enclosure.
- Lightweight spares.
- Components easily replaceable.



Size and weight (mm)



Efficiency INGECON® H2 E-lyzer



INGECON® H2 E12000

Output (DC)	
Voltage Range ⁽¹⁾	500 - 1,300 V
Maximum voltage	1,300 V
Rated current ⁽²⁾	12,000 A
Maximum current	15,860 A
Type of connection	Connection to copper bars
Number of power stacks	4
Output protection	
Overvoltage protections	Type II surge arresters (type I+II optional)
DC switch	Motorized DC load break disconnect
Other protections	Insulation failure monitoring / Electrolyser stack discharge system
Input (AC)	
Power @35 °C / @50 °C ⁽³⁾	15,296 kVA / 13,148 kVA
Current @35 °C / @50 °C ⁽³⁾	12,800 A / 11,000 A
Rated voltage	350 - 690 V IT System
Frequency	50 / 60 Hz
Power Factor adjustable	Yes, 0-1 (leading / lagging)
THD (Total Harmonic Distortion) ⁽⁴⁾	<3%
Input protections	
Overvoltage protections	Type II surge arresters (type I+II optional)
AC breaker	Motorized AC circuit breaker
Other protections	AC short circuits and overloads
Features	
Maximum efficiency	98.9%
Euroefficiency	98.5%
Max. consumption aux. services	9,000 W
Stand-by consumption	< 180 W
General Information	
Operating temperature	-20 °C to +60 °C
Relative humidity (non-condensing)	0 - 100%
Protection class	IP65 ⁽⁵⁾
Corrosion protection	External corrosion protection
Maximum altitude	4,500 m (for installations beyond 1,000 m, please contact Ingeteam's hydrogen sales department)
Cooling system	Liquid cooling system and forced air cooling system with temperature control (400V 3 phase + neutral power supply, 50/60 Hz)
Air flow range	0 - 18,000 m³/h
Average air flow	12,000 m³/h
Acoustic emission (100% / 50% load)	57 dB(A) at 10m / 49.7 dB(A) at 10m
Marking	CE
EMC and security standards	IEC 62920, IEC 61000-6-1, IEC 61000-6-2, IEC 61000-6-4, IEC 61000-3-11, IEC 61000-3-12, EN 50178, FCC Part 15, AS3100
Grid connection standards	IEC 62116, EN 50530, IEC 61683, EU 631/2016 (EN 50549-2, P.O.12.2, CEI 0-16, VDE AR N 4120 ...), G99, South African Grid code, Mexican Grid Code, Chilean Grid Code, Ecuadorian Grid Code, Peruvian Grid code, Thailand PEA requirements, IEC61727, UNE 206007-1, ABNT NBR 16149, ABNT NBR 16150, IEEE 1547, IEEE1547.1, DEWA (Dubai) Grid code, Abu Dhabi Grid Code, Jordan Grid Code, Egyptian Grid Code, Saudi Arabia Grid Code, RETIE Colombia, Australian Grid Code

Notes: ⁽¹⁾ For power voltage values, please contact Ingeteam. ⁽²⁾ Esta corriente nominal ha sido calculada para Vdc min=720 V y Vdc max=900 V; temperatura ambiente=35 °C. ⁽³⁾ Estos valores han sido calculados para G99, Vcos=25% of the rated power and voltage in standard ambient temperature (30 °C), except for the DC filter and the in-water heat exchanger, that are not calor aire-agua, que son IP54.



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