

UP TO 3.93 MVA AT 1,500 V

THREE-PHASE TRANSFORMERLESS BATTERY INVERTER WITH AN EXTRA THERMAL STABILITY AND A GREATER POWER DENSITY

The INGECON® SUN STORAGE 3Power HV C Series is a three-phase bidirectional battery inverter that can be used in grid-connected and stand-alone systems. This one-of-a-kind battery inverter achieves a market-leading power density of 499 kW/m³, as it provides up to 3,928 kVA in just one power stack.

Latest generation electronics

The INGECON® SUN STORAGE 3Power HV C Series battery inverter features an innovative control unit that performs a more efficient and sophisticated inverter control, as it uses a last-generation digital signal processor.

Liquid Cooling System (LCS)

Ingeteam has already supplied +54 GW of liquid -cooled wind power converters worldwide. It offers a greater thermal stability and a more optimized component usage. The LCS has been designed to refrigerate the IGBTs, the power phases and the IP65 compartment. It features less moving components, so it consumes a lower amount of power and it requires less maintenance works.

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.

IP65 protection

A secondary liquid cooling system is used to refrigerate the air inside the IP65-protected compartment. A water-air heat exchanger is used for that. This compartment contains the power and control electronics, the DC fuses, the DC and AC protections, the busbars and the power phases.

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Three-phase transformerless battery inverter with an extra thermal stability and a greater power density

Power converter stands both, grid-following and grid forming operating modes:

Real power related functionalities

Renewable resources integration:

- Ramp limits.
- Power smoothing / firming / curtailment.
- Time shifting.
- Micro grids.

Grid support / Ancillary services:

- Frequency regulation.
- Synthetic inertia.
- Black start.
- Frequency control / protection.
- Virtual "Synchronous Machine".

Investment deferral:

- Peak shaving.
- Load shifting / Load following.
- Real power response improvement of conventional power plants.

Power efficiency:

- Time shifting.
- Price arbitrage.
- Real power response improvement of conventional power plants.
- Peak shaving.

Safety and quality:

- "Un-interruptible" Power.
- Grid code compliance.
- Transmission congestion relief / Power quality-reliability.

Reactive power related functionalities

- Voltage control (Q/V).
- Voltage control / protection.
- Fixed power factor (QPF).
- Fixed reactive power output (Qref).
- Limitation of response of Reactive Power.

Standard 5 year warranty, extendable upon request.

Protections

- Short-circuits and overloads at the output.
- Anti-islanding with automatic disconnection.
- Insulation failure DC.
- Up to 24 pairs of fuse-holders.
- 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.

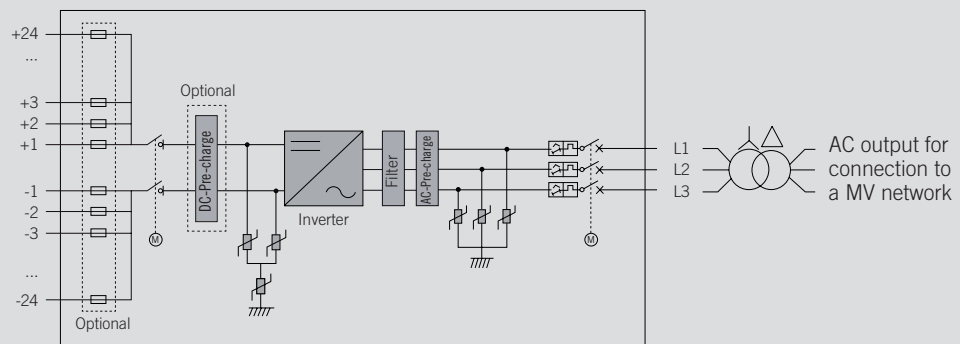
Optional Accessories

- Heating kit, for operating at an ambient temperature of down to -30 °C.
- DC surge arresters type I+II.
- AC surge arresters type I+II.
- DC fuses.
- Monitoring of the DC currents.
- Grounding kit.

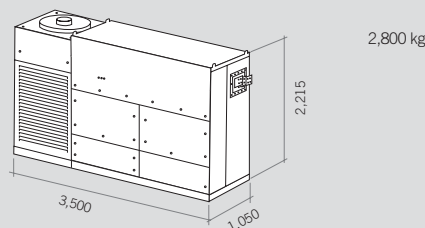
Liquid cooling system

- 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.
- Anti-corrosion protection 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.

INGECON® SUN STORAGE 3930TL



Size and weight (mm and kg)



INGECON® SUN STORAGE 3930TL HV

	C600	C615	C630	C645	C660	C675
INPUT (DC)						
Battery voltage range for off-grid mode	854 - 1,500 V	873 - 1,500 V	895 - 1,500 V	917 - 1,500 V	938 - 1,500 V	958 - 1,500 V
Battery voltage for grid-tied mode ⁽¹⁾	938 - 1,500 V	960 - 1,500 V	985 - 1,500 V	1,006 - 1,500 V	1,029 - 1,500 V	1,052 - 1,500 V
Maximum voltage	1,500 V					
Maximum current	3,357 A					
N° inputs with fuse-holders	Up to 24					
Fuse dimensions	Up to 630 A / 1,500 V / aR (optional)					
DC short circuit withstand capacity per DC input	250 kA, ≤5 ms / 825 MA²s					
Type of connection	Connection to copper bars					
Power blocks	1					

INPUT PROTECTIONS

Overvoltage protections	Type II surge arresters (type I+II optional)
DC switch	Motorized DC load break disconnect
Other protections	Up to 24 pairs of DC fuses (optional) / Reverse polarity / Insulation failure monitoring / Anti-islanding protection

OUTPUT (AC)

Discharge power @1,500 Vdc (30 °C / 50 °C)	2,806 kVA / 2,265 kVA	2,876 kVA / 2,322 kVA	2,946 kVA / 2,379 kVA	3,016 kVA / 2,435 kVA	3,087 kVA / 2,492 kVA	3,157 kVA / 2,549 kVA
Discharge current @1,500 Vdc (30 °C / 50 °C)	2,700 A / 2,180 A					
Charge power @1,500 Vdc (30 °C / 50 °C)	2,666 kVA / 2,152 kVA	2,732 kVA / 2,206 kVA	2,799 kVA / 2,260 kVA	2,866 kVA / 2,314 kVA	2,932 kVA / 2,368 kVA	2,999 kVA / 2,421 kVA
Charge current @1,500 Vdc (30 °C / 50 °C)	2,565 A / 2,071 A					
Rated voltage ⁽²⁾	600 V IT System	615 V IT System	630 V IT System	645 V IT System	660 V IT System	675 V IT System
Frequency	50 / 60 Hz					
Power Factor ⁽³⁾	1					
Power Factor adjustable	Yes, 0 - 1 (leading / lagging)					
THD (Total Harmonic Distortion) ⁽⁴⁾	<3%					

OUTPUT PROTECTIONS

Overvoltage protections	Type II surge arresters (type I+II optional)
AC breaker	Motorized AC circuit breaker
Anti-islanding protection	Yes, with automatic disconnection
Other protections	AC short-circuits and overloads

FEATURES

Operating efficiency	98.9%
CEC	98.5%
Max. consumption aux. services	7,600 W
Stand-by or night consumption ⁽⁵⁾	185 W
Average power consumption per day	2,500 W

GENERAL INFORMATION

Ambient temperature	-20 °C to +60 °C
Relative humidity (non-condensing)	0-100% (Outdoor)
Protection class	IP65 ⁽⁶⁾
Corrosion protection	External corrosion protection
Maximum altitude	4,500 m (for installations beyond 1,000 m, please contact Ingeteam's BESS 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, IEC 62109-1, IEC 62109-2, EN 50178, FCC Part 15, AS3100
Grid connection standards	IEC 62116, EN 50530, IEC 61683, EU 631/2016 (EN 50549-2, CEI 0-16, NTS Spain, VDE-AR-N 4120, VDE-AR-N 4110, Arrêté du 9 juin 2020, Terna A68), G99, South African Grid Code, Mexican Grid code, Chilean Grid Code, Ecuadorian Grid Code, Peruvian Grid Code, IEC61727, ABNT NBR 16149, ABNT NBR 16150, IEEE 1547, IEEE1547.1, DEWA (Dubai), Abu Dhabi Grid Code, Jordan Grid Code, Egyptian Grid Code, Saudi Arabia Grid Code, RETIE Colombia, Australian Grid Code

Notes

- (1) Minimum voltage DC (VDC, min) for $V_{grid,max} = 1.1 \text{ p.u.}$ and Power Factor=1. If $V_{grid,max}$ is higher than this value, the minimum voltage should be corrected as $VDC, \text{min} * V_{grid,max} / 1.1$. For other DC voltage ranges, please contact Ingeteam's BESS sales department
- (2) Other AC voltages and powers available upon request
- (3) For $P_{out} > 25\%$ of the rated power
- (4) For $P_{out} > 25\%$ of the rated power and voltage in accordance with IEC 61000-3-4
- (5) Consumption from Battery
- (6) Except for the LC filter and the air-water heat exchanger, that are IP54.

INGECON® SUN STORAGE 3930TL HV

C690

C715

C730

C745

C800

C840

INPUT (DC)

Battery voltage range for off-grid mode	979 - 1,500 V	1,014 - 1,500 V	1,035 - 1,500 V	1,056 - 1,500 V	1,132 - 1,500 V	1,188 - 1,500 V
Battery voltage for grid-tied model ⁽¹⁾	1,075 - 1,500 V	1,113 - 1,500 V	1,136 - 1,500 V	1,159 - 1,500 V	1,244 - 1,500 V	1,305 - 1,500 V
Maximum voltage	1,500 V					
Maximum current	3,357 A					
N° inputs with fuse-holders	Up to 24					
Fuse dimensions	Up to 630 A / 1,500 V / aR / 100 kA (L/R=5mS) (optional)					
Type of connection	Connection to copper bars					
Power blocks	1					

INPUT PROTECTIONS

Overvoltage protections	Type II surge arresters (type I+II optional)
DC switch	Motorized DC load break disconnect
Other protections	Up to 24 pairs of DC fuses (optional) / Reverse polarity / Insulation failure monitoring / Anti-islanding protection

OUTPUT (AC)

Discharge power @1,500 Vdc (30 °C / 50 °C)	3,227 kVA / 2,605 kVA	3,344 kVA / 2,700 kVA	3,414 kVA / 2,756 kVA	3,484 kVA / 2,813 kVA	3,741 kVA / 3,021 kVA	3,928 kVA / 3,172 kVA
Discharge current @1,500 Vdc (30 °C / 50 °C)	2,700 A / 2,180 A					
Charge power @1,500 Vdc (30 °C / 50 °C)	3,066 kVA / 2,475 kVA	3,177 kVA / 2,565 kVA	3,243 kVA / 2,618 kVA	3,310 kVA / 2,672 kVA	3,554 kVA / 2,870 kVA	3,732 kVA / 3,013 kVA
Charge current @1,500 Vdc (30 °C / 50 °C)	2,565 A / 2,071 A					
Rated voltage ⁽²⁾	690 V IT System	715 V IT System	730 V IT System	745 V IT System	800 V IT System	840 V IT System
Frequency	50 / 60 Hz					
Power Factor ⁽³⁾	1					
Power Factor adjustable	Yes, 0 - 1 (leading / lagging)					
THD (Total Harmonic Distortion) ⁽⁴⁾	<3%					

OUTPUT PROTECTIONS

Overvoltage protections	Type II surge arresters (type I+II optional)
AC breaker	Motorized AC circuit breaker
Anti-islanding protection	Yes, with automatic disconnection
Other protections	AC short-circuits and overloads

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(2) Other AC voltages and powers available upon request
(3) For P_{out} > 25% of the rated power
(4) For P_{out} > 25% of the rated power and voltage in accordance with IEC 61000-3-4
(5) Consumption from Battery
(6) Except for the LC filter and the air-water heat exchanger, that are IP54.

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