

THREE-PHASE TRANSFORMERLESS BATTERY INVERTER

Battery inverter up to 1165 kVA with 1000 V technology

The INGECON® SUN STORAGE Power is a three-phase bidirectional battery inverter that can be used in grid-connected and stand-alone systems. This inverter offers a high-power density in a single power block, providing different configurable operating modes. Besides, it features the same technology as Ingeteam's PV inverters, facilitating the supply of spare parts.

Easy maintenance

String inverter philosophy has been applied in the design of this central inverter, facilitating the inverter usage. Moreover, the input and output lines are integrated into the same cabinet, in order to make maintenance work easier.

Battery management

The INGECON® SUN STORAGE Power features a highly advanced battery control technology, ensuring the maximum life of the storage system. The battery temperature could be controlled at all times ensuring an enhanced lifespan of the accumulator. This inverter is 100% compatible with Ingeteam's PV inverters.

Software included

Included at no extra cost the software INGECON® SUN Manager for monitoring and recording the inverter data over the Internet. Ethernet communications are supplied as standard.

The INGECON® SUN STORAGE Power three-phase inverter complies with the most demanding international standards.

Standard 5 year warranty, extendable for up to 25 years

PROTECTIONS

- Output short-circuits and overloads.
- Insulation failures.
- Motorized DC load break disconnect.
- DC and AC surge arresters, type 2.
- Motorized AC circuit breaker.
- Additional protection for the power stack, as it is air cooled by a closed loop.

INTEGRATED ACCESSORIES

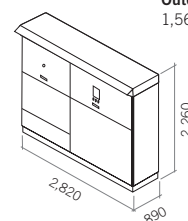
- Ethernet communication.
- DC pre-charge system.
- AC pre-charge system.

OPTIONAL ACCESSORIES

- DC fuses.
- DC surge arresters, type 1.
- Heating kit, for operating at an ambient temperature of -30 °C (-22 °F).
- Sand trap kit.

Size (mm)

Outdoor
1,560 kg.



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Stand-alone operating mode:

The INGECON SUN® STORAGE Power, together with Ingeteam's Plant Controller, generates the stand-alone AC grid (to which the PV inverters -both string and central models- and the loads are connected). The ISS Power is able to control the energy flows between this

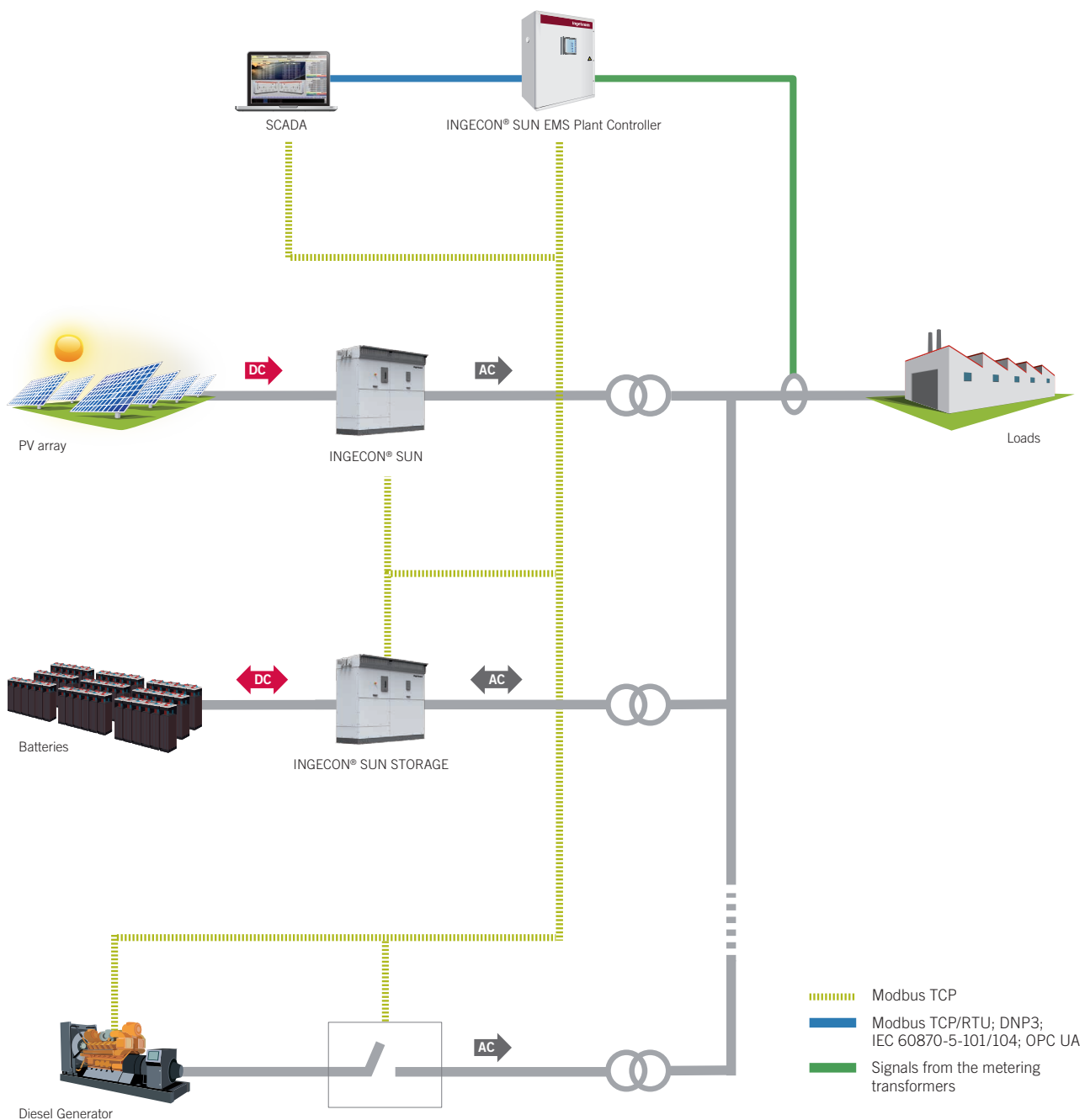
grid and the batteries, based on their status at any given time.

An advanced control system, based on a frequency droop and requiring no communications, manages the power generated by the INGECON SUN® PV inverters

based on the consumption data and the battery state of charge.

The back-up power source (a diesel generator) will only start when the battery state of charge is below a certain programmable threshold.

Schema for stand-alone mode



Grid-connected operating modes:
- Self-consumption

This operating mode is conceived for grid-connected systems with renewable energy sources, in order to minimise grid consumption. If the loads demand more energy than the one produced by the renewable sources then the batteries would cover this demand, increasing the self-consumption ratio.

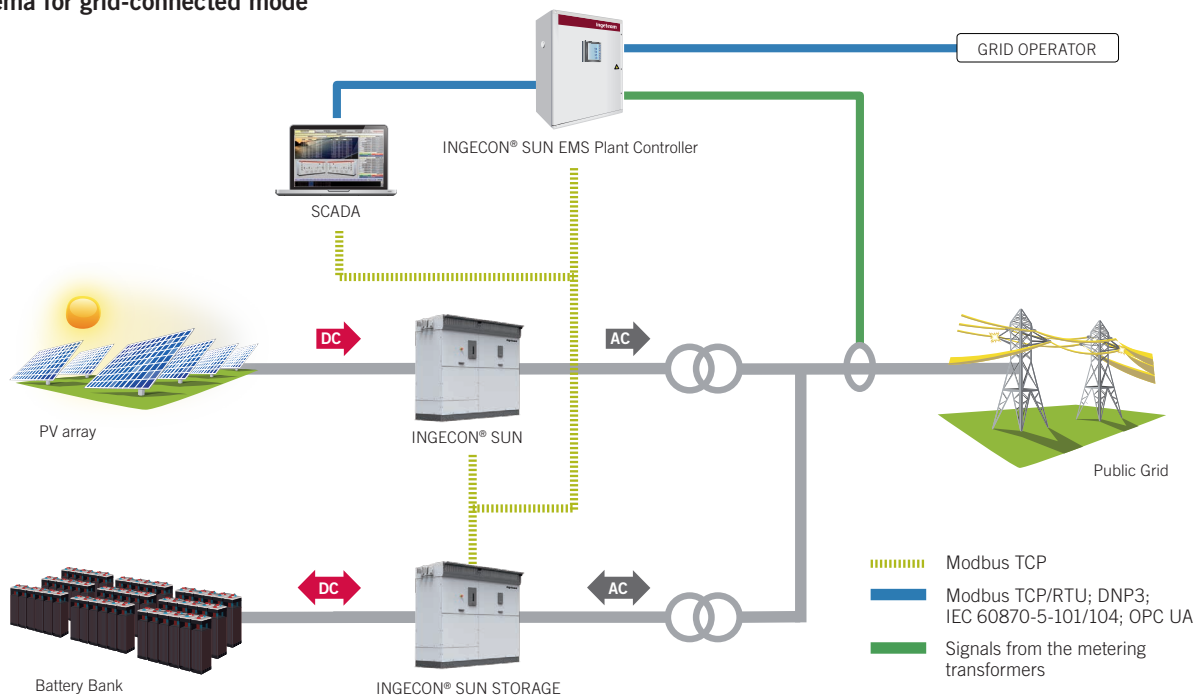
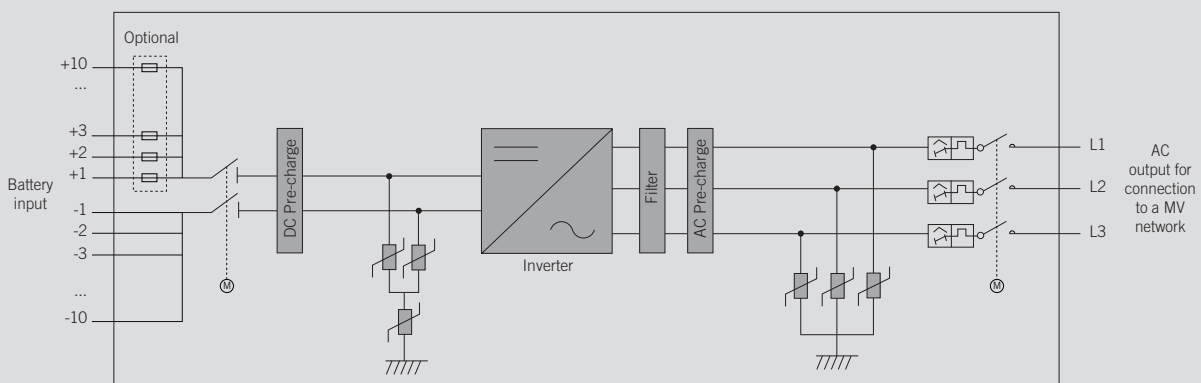
Back-up functionality is also available. If a grid outage occurs, the battery inverter generates the AC network and the energy stored in the batteries is used to power the loads.

- Grid Support

This operating mode is mainly based on active and reactive power control functions that can be implemented thanks to Ingeteam's power plant controller:

- Active Power Curtailment.
- Ramp Rate Control.
- Fast Frequency Regulation.
- Solar Power Reserve.
- Energy Time Shifting.
- P Open Loop.
- Hybrid Self-Consumption.

- Uninterrupted Power Supply.
- Stand-Alone Generation.
- Q Open Loop.
- Dynamic Reactive Compensation.
- Peak-Shaving.
- On Demand Q.
- Power Factor Control.
- Automatic Voltage Regulation.
- Voltage Droop Control.
- Power Oscillations Damping.
- Black Start capability.

Schema for grid-connected mode

SUN STORAGE Power


	750TL B270	830TL B300	1000TL B360	1070TL B385	1110TL B400	1165TL B420
Input (DC)						
Battery voltage range for stand-alone mode	397 - 820 V	440 - 820 V	524 - 820 V	560 - 820 V	580 - 820 V	609 - 820 V
Battery voltage range for grid-connected modes ⁽¹⁾	435 - 820 V	482 - 820 V	575 - 820 V	614 - 820 V	638 - 820 V	669 - 820 V
Maximum voltage ⁽²⁾	1,050 V					
Maximum current	2,000 A					
Type of battery ⁽³⁾	Li-ion, lead, Ni-Cd and flow batteries					
Nº inputs with fuse holders	5 up to 10					
Fuse dimensions	630 A / 1,500 V / aR / 100 kA (L/R 5mS) (optional)					
Type of connection	Single copper bar (up to 30 cables) or multiple copper bars with fuse holders					
Input protections						
Overvoltage protections	Type 2 surge arresters (type 1 optional)					
DC switch	Motorized DC load break disconnect					
Other protections	Up to 10 pairs of DC fuses (optional) / Insulation failure monitoring / Anti-islanding protection / Emergency pushbutton					
Output (AC)						
Power @35 °C / @50 °C	748.3 kVA / 688.4 kVA	831.4 kVA / 765 kVA	1,000 kVA / 918 kVA	1,066.9 kVA / 981.8 kVA	1,108.5 kVA / 1,020 kVA	1,164 kVA / 1,070.8 kVA
Current @35 °C / @50 °C	1,600 A / 1,472 A					
Rated voltage	270 V IT System	300 V IT System	360 V IT System	385 V IT System	400 V IT System	420 V IT System
Frequency	50 / 60 Hz					
Power Factor adjustable	Yes, 0-1 (leading / lagging)					
THD (Total Harmonic Distortion) ⁽⁴⁾	<3%					
Type of connection	Connection to cables or copper bars					
Output protections						
Overvoltage protections	Type 2 surge arresters					
AC breaker	Motorized AC circuit breaker					
Anti-islanding protection	Yes, with automatic disconnection					
Other protections	AC short circuits and overloads					
Features						
Maximum efficiency	98.7%	98.7%	98.9%	98.9%	98.9%	98.9%
CEC efficiency	98.3%	98.3%	98.5%	98.5%	98.6%	98.5%
Max. consumption aux. services	4,700 W (25 A)					
Average power consumption per day	2,000 W					
Stand-by or night consumption ⁽⁵⁾	60 W					
General Information						
Ambient temperature	-20 °C to +65 °C					
Relative humidity (non-condensing)	0 - 100%					
Protection class	IP54 (IP56 with the sand trap kit)					
Corrosion protection	C5H					
Maximum altitude	4,500 m (for installations beyond 1,000 m, please contact Ingeteam's solar sales department)					
Cooling system	Forced air with temperature control (230 V phase + neutral power supply)					
Air flow range	0 - 7,800 m³/h					
Average air flow	4,200 m³/h					
Acoustic emission (100% / 50% load)	<66 dB(A) at 10m / <54.5 dB(A) at 10m					
Marking	CE, ETL					
EMC & Security standards	EN 61000-6-1, EN 61000-6-2, EN 61000-6-4, EN 61000-3-11, EN 61000-3-12, EN 62109-1, EN 62109-2, IEC62103, EN 50178, FCC Part 15, AS3100					
Grid connection standards	IEC 62116, Arrêté 23-04-2008, CEI 0-16 Ed. III, Terna A68, G59/2, BDEW-Mittelspannungsrichtlinie:2011, P.O.12.3, South African Grid code (ver 2.6), 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, GGC&CGC China, DEWA (Dubai) Grid code, Jordan Grid Code, RETIE Colombia					

Notes: ⁽¹⁾ Minimum voltage DC (V_{DC, min}) for V_{grid,max} = 1.1 p.u. and Power Factor=1. If V_{grid,max} is higher than this value, the minimum voltage should be corrected as V_{DC, min} * V_{grid,max} / 1.1. For other DC voltage ranges, please contact Ingeteam's solar sales department ⁽²⁾ Beyond 820 V, the maximum current decreases gradually ⁽³⁾ Please contact Ingeteam's solar sales department to access the full list of compatible batteries and BMS ⁽⁴⁾ For P out >25% of the rated power and voltage in accordance with IEC 61000-3-4 ⁽⁵⁾ Consumption from battery.