INGECON SUN STORAGE

PowerMax U B Series
1,000 Vdc

THREE-PHASE TRANSFORMERLESS BATTERY INVERTER

Battery inverter up to 1165 kVA

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

Standard 5 year warranty, extendable for up to 25 years

PROTECTIONS

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

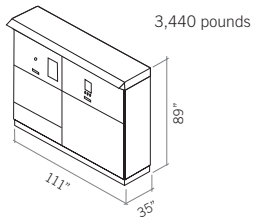
INTEGRATED ACCESSORIES

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

OPTIONAL ACCESSORIES

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

Size and weight (inches and lbs)



UL 9540 & UL 1741 COMPLIANT

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Ingeteam

Battery inverter up to 1165 kVA

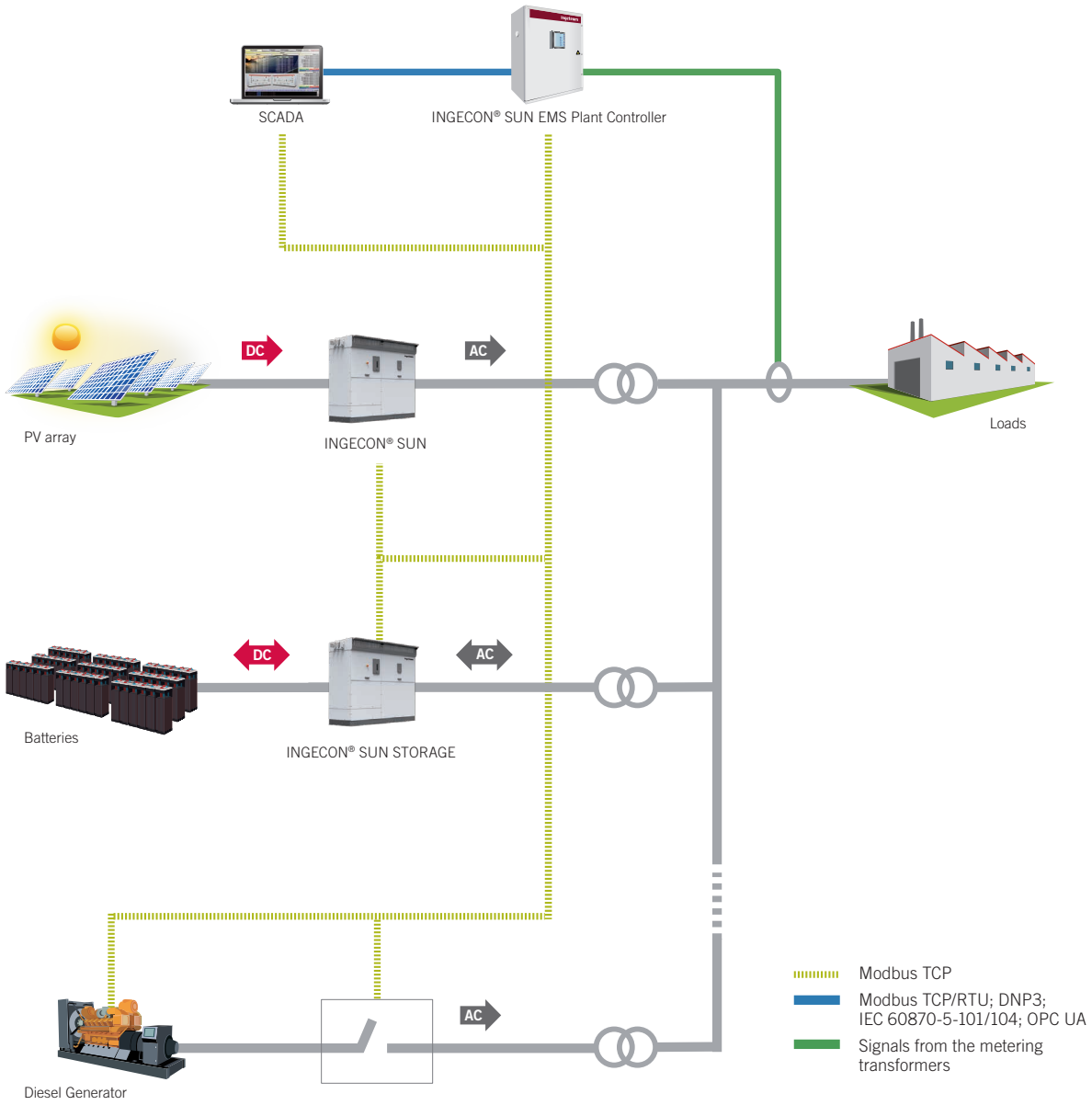
Stand-alone operating mode:

The INGECON SUN® STORAGE PowerMax, 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 PowerMax 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.

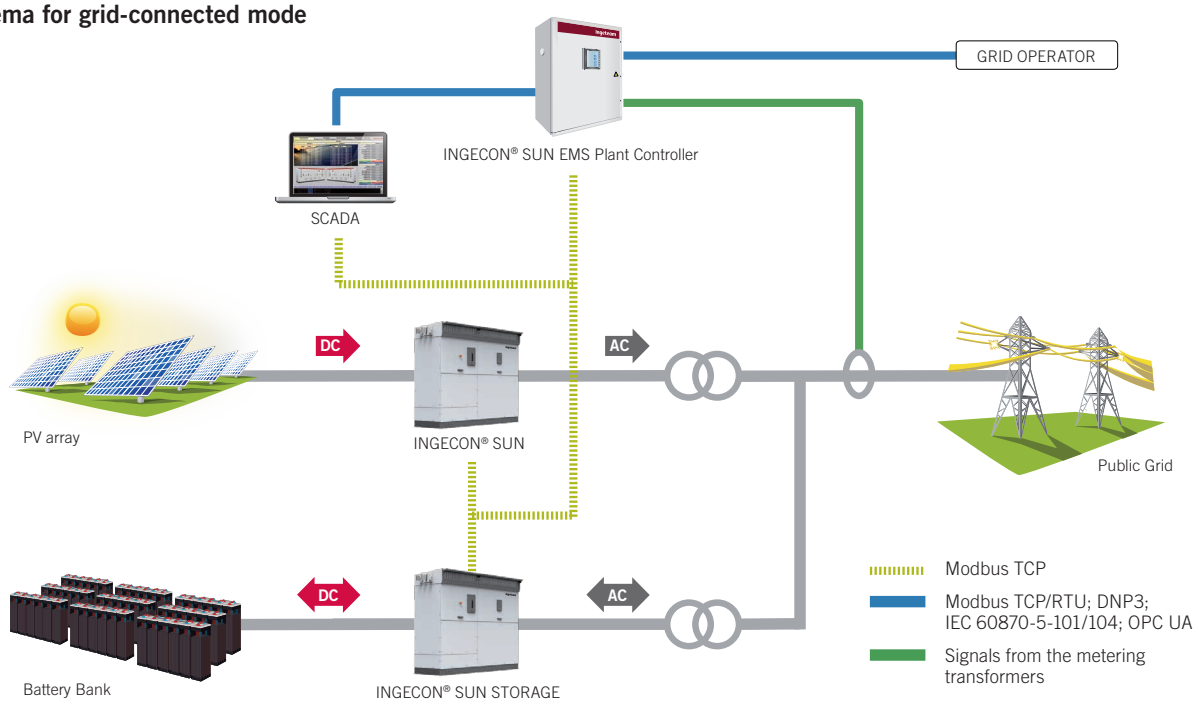
Back-up functionality is also available. If a grid outage occurs, the battery inverter generates the AC network and the energy stored in the batteries is used to power the loads.

– Grid Support

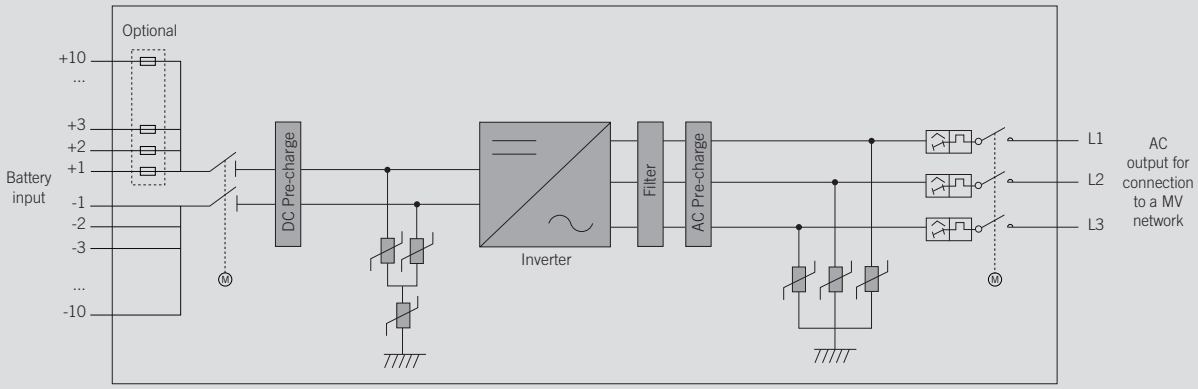
This operating mode is mainly based on active and reactive power control functions that can be implemented thanks to Ingeteam's power plant controller:

- 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 PowerMax U B Series



	750TL U B270	830TL U B300	1000TL U B360	1070TL U B385	1110TL U B400	1165TL U 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	480 - 820 V	574 - 820 V	614 - 820 V	637 - 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					
N° 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 mulitple copper bars with fuse holders					
Input protections						
Overvoltage protections	Type II surge arresters (type I+II 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 @95 °F / @122 °F	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 @95 °F / @122 °F	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[4]	1					
Power Factor adjustable	Yes, 0-1 (leading / lagging)					
THD (Total Harmonic Distortion)[5]	<3%					
Type of connection	Connection to cables or copper bars					
Output protections						
Overvoltage protections	Type II 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	4,250 W					
Average power consumption per day	2,000 W					
Stand-by or night consumption[6]	60 W					
General Information						
Ambient temperature	-4 °F to +140 °F (-20 °C to +60 °C)					
Relative humidity (non-condensing)	0 - 100%					
Protection class	NEMA 3R (NEMA 4 with the sand trap kit)					
Maximum altitude	14,770 ft (for installations beyond 3,300 ft, please contact Ingeteam's solar sales department)					
Cooling system	Forced air with temperature control (230 V phase + neutral power supply)					
Air flow range	0 - 78 ft³/s (0 - 7,800 m³/h)					
Average air flow	42 ft³/s (4,200 m³/h)					
Acoustic emission (100% / 50% load)	<66 dB(A) at 33 ft / <54.5 dB(A) at 33 ft					
Marking	CE, ETL					
EMC & Security standards	UL9540, UL1741, FCC Part 15, IEEE C37.90.1, IEEE C37.90.2, CSA22.2 No107					
Grid connection standards	IEC 62116, UL1741SA, IEEE 1547, IEEE 1547.1, NEC CODE, Rule 21, Rule 14H, CSA22.2 No107					

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 [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_{AC}>25% of the rated power [5] For P_{AC}>25% of the rated power and voltage in accordance with IEC 61000-3-4 [6] Consumption from battery.