INGECON **SUN STORAGE** 1Play *TL M Series*



3TL M / 4.5TL M / 6TL M

SINGLE-PHASE HYBRID INVERTER WITH TWO SOLAR MPPTs

PV+BATTERY HYBRID SYSTEMS, STAND-ALONE AND GRID CONNECTED

The INGECON® SUN STORAGE 1Play TL M hybrid inverter makes it possible to combine photovoltaic generation and energy storage with no need for any additional PV inverters.

Dual MPPT system

This inverter features a dual maximum power point tracking (MPPT) system, that allows it to draw the maximum power from the PV array, including roof-mounted installations with different orientations or with partial shading.

EMS Inside

The inverter is equipped as standard with an energy management system (EMS). The EMS permits more advanced functionalities, such as self-consumption. Thanks to the built-in EMS, the installation can be monitored at all times via a PC or mobile phone with the free INGECON® SUN Monitor application, available at Play Store and App Store.

Start-up and monitoring

Fast and easy start-up and display of data and graphics through the integrated user interface. Furthermore, users can easily upgrade the inverter firmware from the application, through a PC, tablet or mobile.

5 year warranty, extendible up to 10 years

Ingeteam

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PV+battery hybrid systems, stand-alone and grid connected

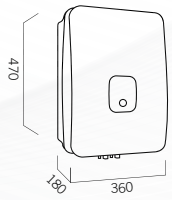
Protections

– AC overvoltages.
– Insulation faults.
– Short-circuits and overloads at the output.
– DC breaker for the PV array.
– Anti-islanding with automatic disconnection.

Features

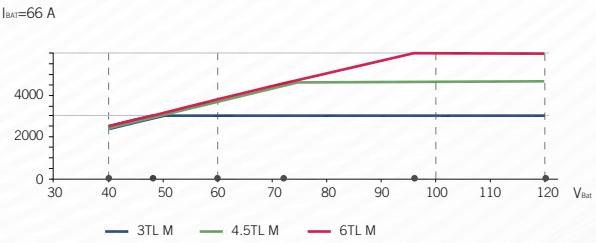
– Dual MPPT system.
– RS-485 communication for the wattmeter.
– Wi-Fi and Ethernet communication.
– CAN Bus 2.0 communicationfor the BMS (Battery Management System).
– 2 configurable digital inputs.
– 2 configurable potential free outputs.
– Pre-charging system at the battery input.
– Relay for the neutral to earth connection for critical loads in type TT installations.
– Rapid start-up and view of the installation thanks to the INGECON® SUN Monitor user interface.
– Possibility of operating just from the PV array and of adding the storage system at a later date.
– Suitable for indoor and outdoor installations (IP65).
– Back-up functionality available for self-consumption installations.
– Peak shaving functionality.
– Configuration of the battery charge / discharge times.
– Modbus TCP / Wi-Fi communication with EV chargers.
– DRM0 included (for the Australian market).

Weight and dimensions (mm)



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26 kg.

AC power in relation to battery voltage (with no PV power)

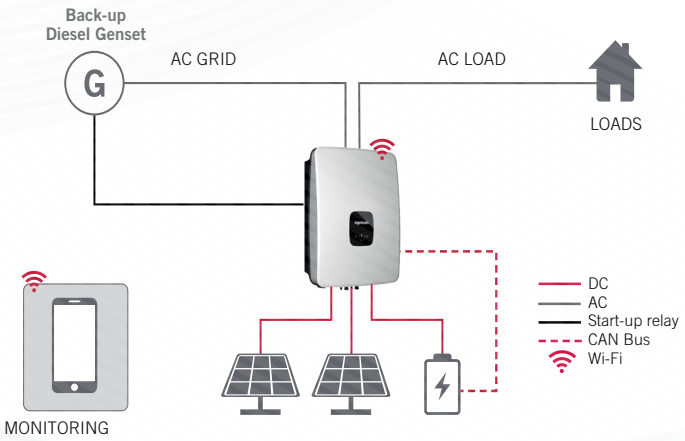


OPERATING MODES:

Stand-alone mode

The INGECON® SUN STORAGE 1Play TL M inverter generates a stand-alone AC grid and acts as a grid manager, guaranteeing the correct balance between PV generation, consumption and the storage system. It is equipped with a relay for the neutral-to-earth connection of the system loads in order to create a TT stand-alone network. Moreover, the inverter permits the connection of an auxiliary generator, which can be started-up through a potential-free output for charging the batteries.

Stand-alone diagram



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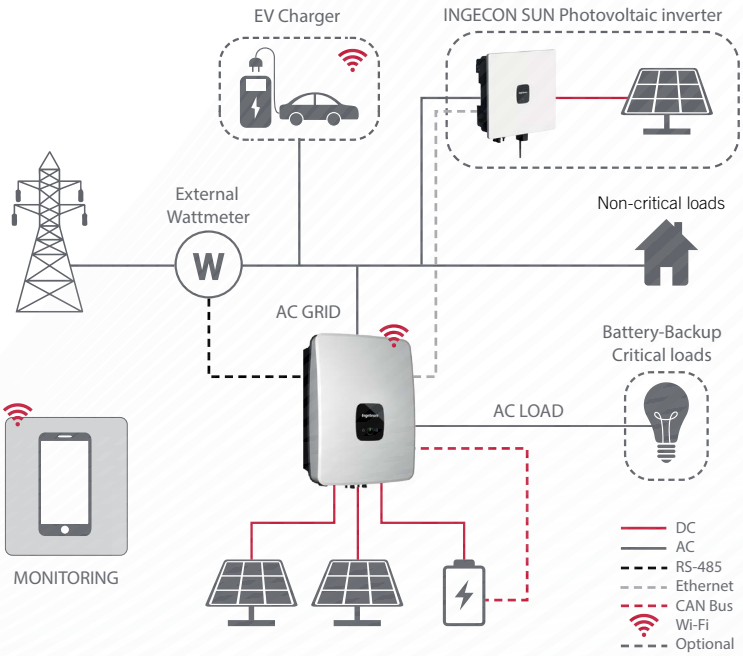
PV+battery hybrid systems, stand-alone and grid connected

GRID CONNECTED MODES

Self-consumption mode

This operating mode is directed at grid connection systems with renewable energy sources, in order to minimise grid consumption. If the energy generated is greater than demand, then any surplus energy could either be used to charge the batteries or to be injected into the grid. In addition, it features a back-up and a peak shaving functionality. Also, the user can programme the charge / discharge times of the batteries.

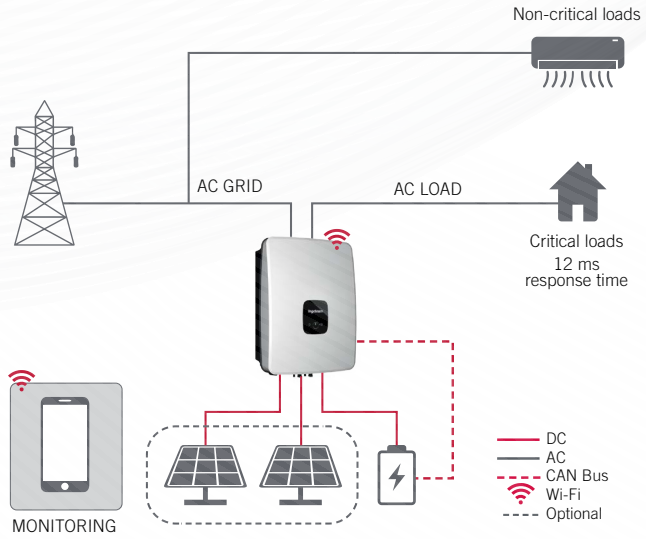
Self-consumption diagram



UPS mode

This operating mode has been designed for systems where grid outages are long and frequent, meaning that a back-up power source is required. In order to guarantee a power source, the inverter maintains the batteries charged. During a grid outage, the inverter generates an AC network and the energy stored in the batteries is used to power the critical loads. Its rapid response time means that the grid outage is insignificant for most loads.

UPS diagram



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	3TL M	4.5TL M	6TL M
BATTERY INPUT (DC)			
Voltage range[1]		40 ~ 460 V	
Maximum charge / discharge current		66 A	
Type of batery		Lead-acid, ion-lithium (LG, BYD, Pylontech...)[2]	
Comunication with ion-lithium battery		CAN BUS 2.0	
PV INPUT (DC)			
PV array maximum power		11.5 kWp	
MPP voltage range		80 ~ 480 V	
Operation voltage range		80 ~ 480 V	
Maximum input voltage[3]		550 V	
Maximum input current (input 1 / input 2)[4]		15 A / 15 A	
Shortcircuit current (input 1 / input 2)		20 A / 20 A	
Number of MPPTs		2	
Number of inputs (input 1 / input 2)		1 / 1	
GRID INPUT (AC)			
Rated voltage		230 V	
Voltage range		172 ~ 264 V	
Nominal Frequency		50 / 60 Hz	
Frequency range		40 ~ 70 Hz	
Network type		TT / TN	
Rated power	3 kW	4.5 kW	6 kW
Max. temperature for rated power		40 ºC	
Rated current	13 Arms	20 Arms	26 Arms
Power factor		0 ~ 1	
CRITICAL LOAD OUTPUT (AC)			
Max. power (25 ºC) 30 min, 2 min,3 s[5]		6,400 / 6,900 / 7,900 W	
Rated current	13 Arms	20 Arms	26 Arms
Rated voltage[6]		220 ~ 240 V	
Rated frequency[6]		50 / 60 Hz	
Power factor		- 0.8 ~ 1 ~ 0.8	
Back-up function response time		12 ms	
CRITICAL LOAD OUTPUT (AC)			
Maximum efficiency	95.5%	96%	96%
Euroefficiency	95.1%	95.2%	95.2%
COOLING SYSTEM			
Cooling system		Forced ventilation	
Air flow		45 m^3/h	
Consumption in stand-by mode		< 10 W	
Operating temperature		–20 ~ +65 ºC	
Relative humidity (non-condensing)		4 ~ 100 %	
Protection class		IP65	
Maximum altitude		2,000 m	
Marking		CE	
EMC and safety regulations	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61000-3-11, EN 61000-3-12, EN 62109-1, EN62109-2, AS62040.1, FCC Part 15		
Grid connection standards	DIN V VDE V 0126-1-1, EN 50438, CEI 0-21, VDE-AR-N4105:2011-08, G59/3, G83/2, AS4777.2:2015, IEC 62116,UNE 206007-1:2013, UNE 206006:2011, UNE 217001 IN:2015,NRS097-2-1, ABNT NBR 16149, ABNT NBR 16150, South African Grid code, P.O.12.2, G99, EN 50549-1		

Notes

(1) The maximum power supplied by the battery shall be the battery voltage multiplied by the maximum discharge current.
(2) Consult the Ingeteam website for a list of compatible batteries.
(3) Never exceed. Consider the voltage increase of the panels 'Voc' at low temperatures.
(4) For parallel connected PV inputs, the total maximum current would be 30 A.
(5) In stand-alone mode, these powers are only available if the power of the batteries added to the PV power reaches these values.
(6) Configurable voltage and frequency.

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