

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

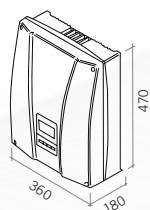
- AC overvoltages.
- Insulation faults.
- Short-circuits and overloads at the output.
- DC breaker for the PV array.
- Anti-islanding with automatic disconnection.

Features

- Dual MPPT system.
- RS-485 communication for the wattmeter.
- Wi-Fi and Ethernet communication.
- CAN Bus 2.0 communication for the BMS (Battery Management System).
- 2 configurable digital inputs.

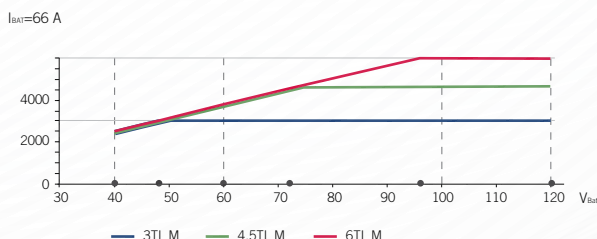
- 2 configurable potential free outputs.
- Pre-charging system at the battery input.
- Relay for the neutral to earth connection for critical loads in type TT installations.
- Rapid start-up and view of the installation thanks to the INGECON® SUN Monitor user interface.
- Possibility of operating just 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.
- DRMO included (for the Australian market).

Weight and dimensions (mm)



3TL M / 4.5TL M / 6TL M
26 kg.

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

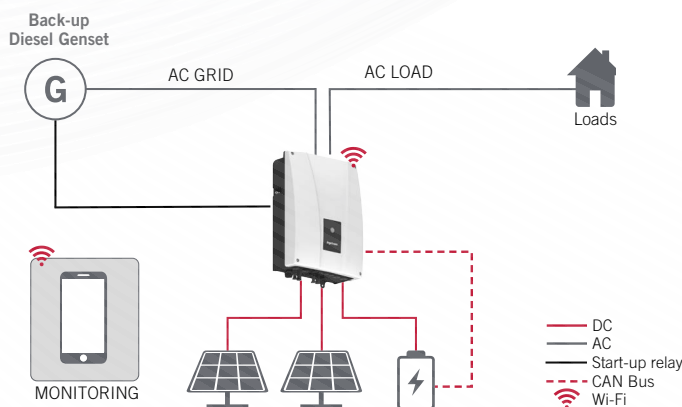


OPERATING MODES:

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



3TL M / 4.5TL M / 6TL M

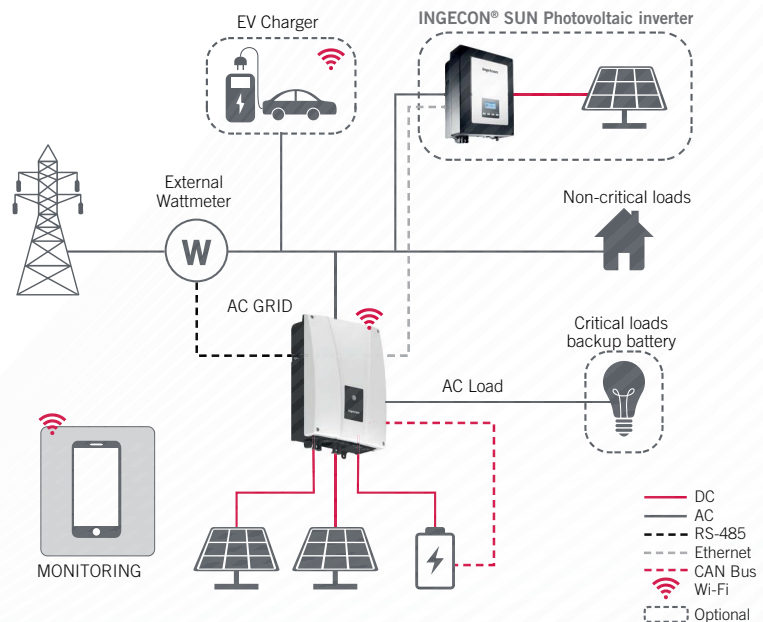
PV+battery hybrid systems, stand-alone and grid connected

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.

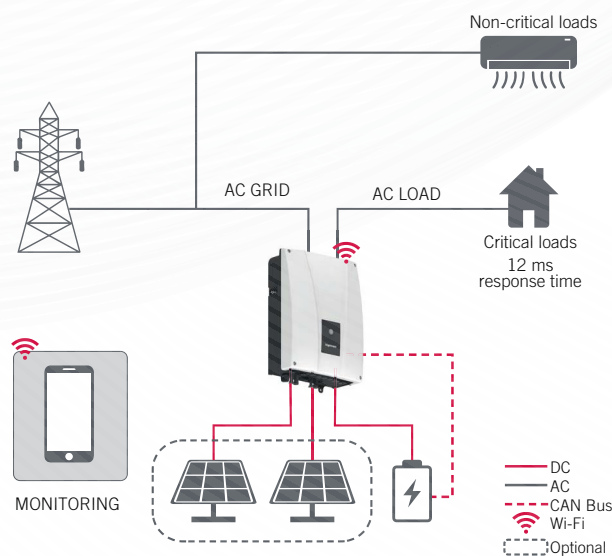
Self-consumption diagram



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



3TL M

4.5TL M

6TL M

BATTERY INPUT (DC)

Voltage range ⁽¹⁾	40 ~ 460 V
Maximum charge / discharge current	66 A
Type of battery	Lead-acid, ion-lithium (LG, BYD, Pylontech...) ⁽²⁾
Communication 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⁾	13.5 A / 13.5 A
Shortcircuit current (input 1 / input 2)	18 A / 18 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 °C	
Rated current	13 Arms	20 Arms	26 Arms
Power factor		0 ~ 1	

CRITICAL LOAD OUTPUT (AC)

Max. power (25 °C) 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 m³/h
Consumption in stand-by mode	< 10 W
Operating temperature	-20 ~ +65 °C
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 27 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.

EUROPE

Ingeteam Power Technology, S.A.
Avda. Ciudad de la Innovación, 13
31621 Sarriñena (Navarra) - Spain
Tel.: +34 948 288 000
Fax: +34 948 288 001
e-mail: evc.energy@ingeteam.com

Ingeteam S.A.
Parque Tecnológico de Bizkaia
Edificio 106
48170, Zamudio (Bizkaia) – Spain

Ingeteam S.r.l.
Via Emilia Ponente, 232
48014 Castel Bolognese (RA) - Italy
Tel.: +39 0546 651 490
Fax: +39 054 665 5391
e-mail: italia.energy@ingeteam.com

Ingeteam SAS
140 Rue Carmin - Le Naurouze B
31670 Labège - France
Tel.: +33 (0)5 61 25 00 00
Fax: +33 (0)5 61 25 00 11
e-mail: france@ingeteam.com

Ingeteam, a.s.
Technologická 371/1
70800 Ostrava - Pustkovec
Czech Republic
Tel.: +420 59 747 6800
Fax: +420 59 732 6899
e-mail: czech@ingeteam.com

Ingeteam GmbH
Grand Bateau – Zollhof 6
D-40221 – Düsseldorf, Germany
Tel.: +49 (0) 211 78177950
e-mail: deutschland@ingeteam.com

Ingeteam Poland Spzoo
Ul. Koszykowa 60/62 m.39
00-673, Warsaw, Poland
Tel.: (+48) 22 821 99 30
e-mail: polka@ingeteam.com

Ingeteam LTD.
Unit 10 Gordano 19, Garonor Way, Portbury
Bristol, BS20 TXE - United Kingdom
Tel.: +44 (0) 331 630 0305

NORTH AMERICA

Ingeteam Inc.
3550 W. Canal St.
Milwaukee, WI 53208 - USA
Tel.: +1 (414) 934 4100 / +1 (855) 821 7190
Fax: +1 (414) 342 0736
e-mail: usa@ingeteam.com

Ingeteam Power Technology México S de RL de CV
Av. Ejército Nacional Mexicano 351,
Chapultepec Morales, Granada,
Miguel Hidalgo,
CP: 11520
Ciudad de México, CDMX
Tel.: (+52) 55 6586 9930
e-mail: proveedores.iptm@ingeteam.com

SOUTH AMERICA

Ingeteam Ltda.
Rua Estácio de Sá, 560
Santa Genebra
Campinas - SP
CEP: 13080-010; São Paulo - Brazil
Tel.: (+55) 19 30 37 37 73
e-mail: brazil@ingeteam.com

Ingeteam Chile SpA
Balmoral n.º 309, Piso 10º, Oficina 1008,
7561282 Las Condes
Santiago, Chile
Tel.: (+56) 229 253 825
e-mail: chile@ingeteam.com

ASIA

Ingeteam Power Technology Shanghai, Co. Ltd.
Room 2606-F, No.360 South Pudong Road
China (Shanghai) pilot free trade zone
C.P 200120
Tel.: +86 139 1622 4886
e-mail: liu.yimin@ingeteam.com

Ingeteam India Pvt. Ltd.
Survey No. 111/1-111/3 & 111/5-111/7,
Village No.155, Mambakkam Village,
Chennai - Bangalore Main Road,
Sriperumbudur Taluk,
Kancheepuram District - 602106,
Tamilnadu, India

Ingeteam Power Technology S.A. UAE Branch
Al Bateen tower c6 Bainunah 1st floor
Street 34
Abu Dhabi - UAE
Tel.: +971 2 207 6666

Ingeteam Power Technology S.A.
Thailand representative office
100/67 Vongvanij B Building, 22nd floor,
Rama IX Road., HuayKwang,
10320 Bangkok
Te.: +66 22461798
e-mail: Thailand.pga@ingeteam.com

AUSTRALIA

Ingeteam Australia Pty Ltd.
Iacelerate Centre, Building 239
Innovation Campus, Squires Way
North Wollongong, NSW 2500 - Australia
Tel.: +61 429 111 190
e-mail: australia@ingeteam.com

Ingeteam

www.ingeteam.com