

## SINGLE-PHASE TL INVERTER WITH A DOUBLE MPPT SYSTEM

### 2.5TL M / 3TL M / 3.3TL M / 3.68TL M / 4.6TL M / 5TL M / 6TL M

The INGECON®SUN 1Play TL M inverters have been designed to maximize the power generation and also to facilitate user access to the PV plant. This solar inverter family is valid for low kilowatt residential applications, and also for decentralized commercial and industrial systems rated up to several hundred kilowatts.

In domestic installations, these inverters present the great advantage of being compatible with 30 mA RCDs, the most commonly used to protect the people against electric discharges.

#### High efficiency system

Ingeteam has developed its own technology to maximize the efficiency rates of the INGECON®SUN 1Play TL M inverter family.

Thanks to this *High efficiency system* and to the use of innovative electronic conversion topologies, values of up to 98% can be achieved. Furthermore, an advanced double-MPPT algorithm makes it possible to harness the maximum energy from the PV array at all times, even in difficult situations, such as scattered clouds and partial shadings.

#### Easy to install

The INGECON®SUN 1Play TL M inverters feature fast-on connectors on the DC side (type 4) and the AC side for a fast and easy connection to the system. Every country-specific configuration and language can be easily selected from the inverter screen. Moreover, the INGECON®SUN 1Play TL M inverters are compatible with all the PV module technologies on the market.

#### Simple operation and maintenance

Ingeteam is at the forefront of innovative firm-ware. As a result, the INGECON®SUN 1Play TL M inverters are extremely easy to operate. The menu displayed on the LCD screen has been designed so that it is simple and easy to use. These inverters feature an internal datalogger for several months data storage, accessible from a PC.

Every inverter can be accessed from either a remote PC or onsite from the inverter front touch key-pad through its LCD screen. The display also features a number of LEDs to indicate the inverter operating status.

These LED indicators light up whenever any incident is detected, thereby simplifying and facilitating equipment maintenance tasks.



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**Firmware updating**

The INGECON® SUN 1Play TL M inverters allow the user to perform the firmware (FW) updating himself. It is as easy as to download the latest version of the firmware from the Ingeteam website: **www.ingeteam.com**, and update it using a simple SD memory card.

**Monitoring and communication**

The internal operating variables and the internal datalogger can be monitored through a number of media such as USB communications, supplied as standard. Also, RS-485, Ethernet, Wi-Fi, and 3G communications are available upon demand.

Included at no extra cost are the INGECON® SUN Manager, INGECON® SUN Monitor and its Smartphone version iSun Monitor -available on the App Store- for monitoring and recording the inverter data over the Internet.

**Able to withstand extreme conditions**

The INGECON® SUN 1Play TL M inverter housing is suitable for outdoor use (IP65 protection rating). Likewise, it can be used under extreme atmospheric conditions with temperature ranges from -25 °C to +65 °C, although its main cooling system is air convection.

**SiC technology**

This solar inverter presents silicon carbide (SiC) components. SiC technology allows higher efficiency levels and also a more reliable, light and compact equipment.

**Long life expectancy**

Ingeteam takes every care in the selection and sizing of the electronic components used for its inverters. The 1Play inverters have been designed to guarantee a long life expectancy, as demonstrated as demonstrated by the stress tests they are subjected to.

**Standard 5 year warranty, extendable for up to 25 years**

OPTIONAL ACCESSORIES

- Inverter communication via RS-485, Ethernet, Wi-Fi or 3G.
- DC switch.
- INGECON® SUN WeatherBox for meteorological values measurement and registration.
- Four additional digital inputs.
- Self-consumption kit.

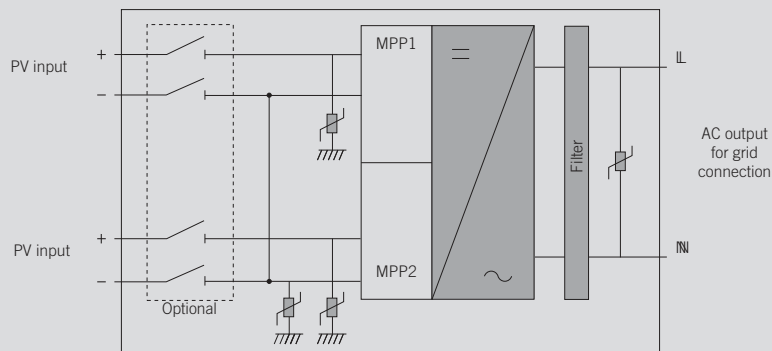
PROTECTIONS

- Reverse polarity.
- Input and output overvoltages with type 3 surge arresters.
- Output shortcircuits and overloads.
- Anti-islanding with automatic disconnection.
- Insulation failures.

MAIN FEATURES

- Compatible with 30 mA RCDs.
- Double-MPPT system.
- Available from 2.5 up to 6 kW.
- 98% maximum efficiency.
- SiC Technology inside.
- Inverter updating by the user through a SD memory card.
- USB communications supplied as standard.
- Two digital inputs as standard.
- Software INGECON® SUN Manager for PV plant access and data registration.
- Software INGECON® SUN Monitor for PV plant monitoring.
- LCD Display.
- Easy maintenance.
- Suitable for indoor and outdoor installations (IP65).
- Display-configurable potential free contact, to indicate insulation fault or grid connection.
- Compact design.
- Language and Country Code, rated voltage configurable by display.

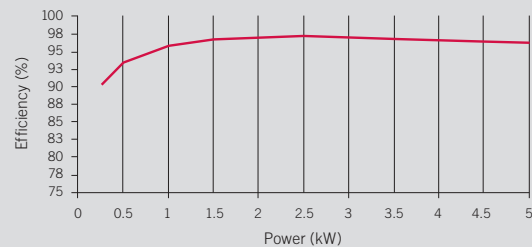
**1Play TL M**



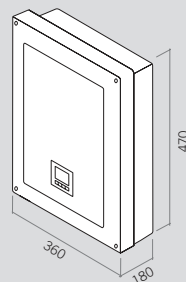
	2.5TL M	3TL M	3.3TL M	3.68TL M	4.6TL M	5TL M	6TL M
<b>Input (DC)</b>							
Recommended PV array power range <sup>(1)</sup>	2.8 - 3.3 kWp	3.2 - 4 kWp	3.8 - 4.4 kWp	3.9 - 4.8 kWp	5.2 - 6 kWp	5.7 - 6.5 kWp	6.3 - 7 kWp
Voltage range MPP1 <sup>(2)</sup>	125 - 750 V						
Voltage range MPP2 <sup>(2)(3)</sup>	90 - 750 V						
Maximum voltage <sup>(4)</sup>	850 V						
Maximum current (Input 1 / Input 2)	11 / 11 A						
Inputs (Input 1 / Input 2) <sup>(5)</sup>	1 / 1						
MPPT	2						
<b>Output (AC)</b>							
Rated power	2.5 kW	3 kW	3.3 kW	3.68 kW	4.6 kW	5 kW	6 kW
Max. temperature at rated power <sup>(6)</sup>	60 °C	55 °C	52 °C	50 °C	58 °C	55 °C	45 °C
Maximum current	16 A	16 A	16 A	16 A	26.2 A	26.2 A	26.2 A
Rated voltage	230 V						
Voltage range	122 - 265 V						
Frequency	50 / 60 Hz						
Power Factor	1						
Power Factor adjustable	Yes. Smax=2.5 kVA	Yes. Smax=3 kVA	Yes. Smax=3.3 kVA	Yes. Smax=3.68 kVA	Yes. Smax=4.6 kVA	Yes. Smax=5 kVA	Yes. Smax=6 kVA
THD	<3%						
<b>Efficiency</b>							
Maximum efficiency	97.6%	97.7%	97.7%	97.8%	97.9%	98%	98%
Euroefficiency	97.3%	97.4%	97.4%	97.5%	97.5%	97.6%	97.6%
<b>General Information</b>							
Refrigeration system	Air convection						
Stand-by consumption <sup>(7)</sup>	<10 W						
Consumption at night	0 W						
Ambient temperature	-25 °C to +65 °C						
Relative humidity (non-condensing)	0 - 100%						
Protection class	IP65						
Marking	CE						
EMC & Security standards	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, EN 62109-2, IEC62103, EN 50178, FCC Part 15, AS3100						
Grid connection standards	RD1699/2011, DIN V VDE V 0126-1-1, EN 50438, CEI 0-21, VDE-AR-N 4105:2011-08, G59/2, G83/2 <sup>(8)</sup> , P.O.12.3, AS4777.2, AS4777.3, IEC 62116, IEC 61727, UNE 206007-1, ABNT NBR 16149, ABNT NBR 16150, South African Grid code, Chilean Grid Code, Romanian Grid Code, Ecuadorian Grid Code, Peruvian Grid code, IEEE 929, Thailand MEA & PEA requirements, DEWA (Dubai) Grid Code, Jordan Grid Code						

**Notes:** <sup>(1)</sup> Depending on the type of installation and geographical location <sup>(2)</sup> The output power will be conditioned by the voltage and current configuration selected at each input <sup>(3)</sup> To drop to 90 V, the other input must be at least at 125 V <sup>(4)</sup> Must not be exceeded under any circumstances. Consider the voltage increase of the 'Voc' at low temperatures <sup>(5)</sup> Optionally, the DC inputs could be duplicated <sup>(6)</sup> For each °C of increase, the output power will be reduced at the rate of 1.8% <sup>(7)</sup> Consumption from PV field <sup>(8)</sup> Related only inverters up to 16 A.

**Efficiency INGECON® SUN 5TL M** V<sub>dc</sub> = 680 V



**Size and weight (mm)**



**2.5TL M / 3TL M / 3.3TL M / 3.68TL M**  
20 kg.

**4.6TL M / 5TL M / 5.5TL M / 6TL M**  
21 kg.



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