

## TRANSFORMERLESS CENTRAL INVERTERS WITH A MASTER-SLAVE CONFIGURATION

### 500TL X400 DCAC Indoor / 755TL X400 DCAC Indoor / 1000TL X400 DCAC Indoor

The central inverter with a Master-Slave configuration, in any of its configurations, is equipped with two to four power blocks connected in parallel to the same PV generator and to the same medium voltage transformer.

#### DC and AC supplies in the same cabinet

The input and output lines are integrated into the same cabinet, facilitating maintenance and repair work.

#### Maximum protection

These three phase inverters are equipped with a motorized DC load break switch to decouple the PV generator from the inverter. Optionally, the inverters can be supplied with an AC thermal magnetic breaker with door control, in addition to fuses, grounding kit and input current monitoring.

#### Maximum efficiency values

Through the use of innovative electronic conversion topologies, efficiency values of up to 98.8% can be achieved. Thanks to a sophisticated control algorithm, this equipment can

guarantee maximum efficiency through the selective operation of its power blocks, based on the PV power available. This maximizes the efficiency and service life of the equipment. In this way, in periods of low irradiance, it is able to increase performance by up to 1.8 points.

#### A complete range of equipment for all types of projects

Versions available:

- Indoor inverters with integrated DCAC cabinet.
- Indoor inverters with DC cabinet.
- Outdoor inverters with integrated DCAC cabinet.
- Symmetrical indoor inverters, with the connection cabinet on the opposite side, to make it possible to install two inverters facing each other, with a common power supply point.

#### Enhanced functionality

This new INGECON® SUN PowerMax range features a revamped, improved enclosure which, together with its innovative air cooling system, makes it possible to increase the ambient operating temperature to deliver its rated power up to 45 °C.



500TL X400 DCAC Indoor / 750TL X400 DCAC Indoor / 1000TL X400 DCAC Indoor

**Long-lasting design**

The inverters have been designed to guarantee a service life of more than 20 years, as demonstrated by the stress tests they are subjected to.

**Grid support**

The INGECON® SUN PowerMax family has been designed to comply with the grid connection requirements in different countries, contributing to the quality and stability of the electric system. These inverters therefore feature a low voltage ride-through capability, and can deliver reactive power and control the active power delivered to the grid.

**Ease of maintenance**

Easily replaceable modular power blocks for shorter maintenance times.

**Easy to operate**

The INGECON® SUN PowerMax inverters feature an LCD screen for the simple and convenient monitoring of the inverter status and a range of internal variables. The display also includes a number of LEDs to show the inverter operating status with warning lights to indicate any incidents. All this helps to simplify and facilitate maintenance tasks.

**Monitoring and communication**

RS-485 communications supplied as standard. Ethernet, Bluetooth and GSM / GPRS are also available. The following applications are included at no extra cost: INGECON® SUN Manager, INGECON® SUN Monitor and its Smartphone version iSun Monitor, available on the App Store. These applications are used for monitoring and recording the inverter's internal operating variables through the Internet (alarms, real time production, etc.), in addition to the historical production data.

PROTECTIONS

- DC Reverse polarity.
- Short-circuits and overloads at the output.
- Anti-islanding with automatic disconnection.
- Insulation failure DC.
- DC load breaker.
- 12 pairs of fuse-holders for inverters with 3 and 4 power blocks, and 8 pairs of fuse-holders for inverters with 2 power blocks.
- Lightning induced class 2 DC and AC surge arrestors.
- DC contactor to automatically disconnect the inverter from the PV array.

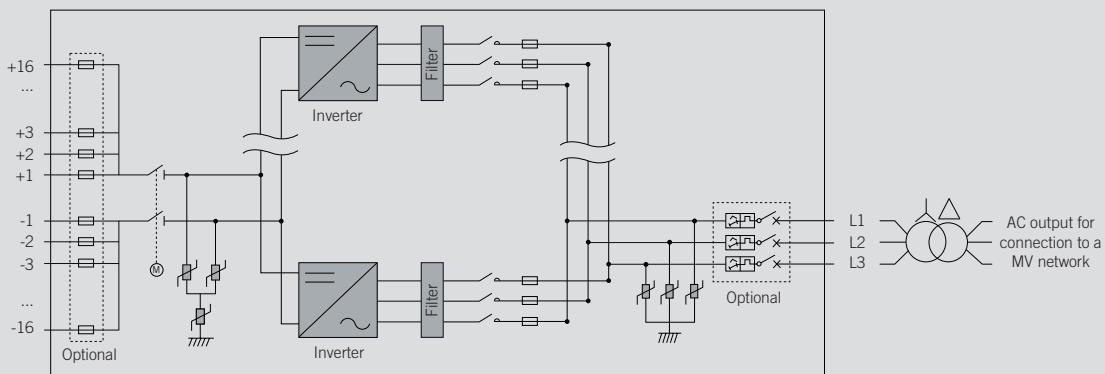
OPTIONAL ACCESSORIES

- AC circuit breaker.
- Motorization kit for the AC circuit breaker.
- Inter-inverter communication via Ethernet, Bluetooth or GSM / GPRS.
- Insulation failure AC.
- Grounding kit.
- Kit for operating at an ambient temperature of -30 °C.
- DC fuses.
- Blown fuse sensor at the DC input.
- Monitoring of the group currents at the DC input.
- Remote tripping of the AC protection.
- Wattmeter on the AC side.
- Low voltage ride-through kit.
- Extendable up to 16 fuse holders per inverter.

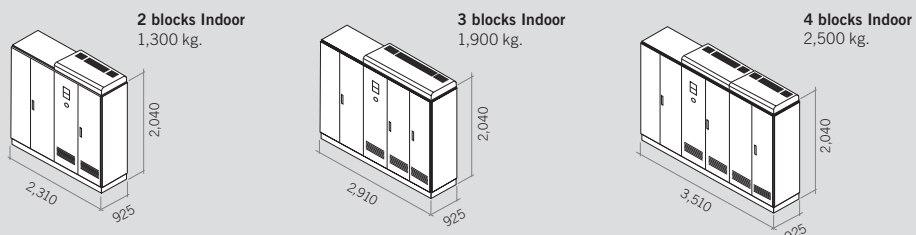
ADVANTAGES OF THE MASTER-SLAVE VERSION

- Enhanced performance.
- In the event of the failure of one of the blocks, the power is then distributed amongst the remaining blocks.
- Lightweight spares, for shorter delivery times.
- It allows to ground the PV array.

PowerMax X DCAC



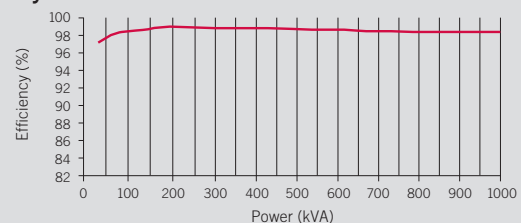
Size and weight (mm)



	500TL X400 DCAC Indoor	750TL X400 DCAC Indoor	1000TL X400 DCAC Indoor
<b>Input (DC)</b>			
Recommended PV array power range <sup>(1)</sup>	515.8 - 662.9 kWp	773.7 - 994.4 kWp	1,031.6 - 1,325.7 kWp
Voltage Range MPP	581 - 820 V	581 - 820 V	581 - 820 V
Maximum voltage <sup>(2)</sup>	1,050 V	1,050 V	1,050 V
Maximum current	900 A	1,350 A	1,800 A
N° inputs with fuse holders	8	12 (extendable up to 16)	12 (extendable up to 16)
Fuse dimensions	63 A / 1,000 V to 630 A / 1,000 V		
Type of connection	Connection to copper bars		
Power blocks	2	3	4
MPPT	1	1	1
Max. current at each input	From 40 A to 410 A for positive and negative poles		
<b>Input protections</b>			
Overvoltage protections	Type 2 surge arresters		
DC switch	Yes, motorized DC switch		
Other protections	Reverse polarity / Insulation failure monitoring / Anti-islanding protection		
<b>Output (AC)</b>			
Power @30 °C / @45 °C <sup>(3)</sup>	554.3 kVA / 509.9 kVA	831.4 kVA / 764.9 kVA	1,108.5 kVA / 1,019.8 kVA
Current @30 °C / @45 °C	800 A / 736 A	1,200 A / 1,104 A	1,600 A / 1,472 A
Rated voltage	400 V IT System	400 V IT System	400 V IT System
Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Phi Cosine <sup>(4)</sup>	1	1	1
Phi Cosine adjustable	Yes. Smax=554.3 kVA	Yes. Smax=831.4 kVA	Yes. Smax=1,108.5 kVA
THD (Total Harmonic Distortion) <sup>(5)</sup>	<3%	<3%	<3%
<b>Output protections</b>			
Overvoltage protections	Type 2 surge arresters		
AC breaker	Optional AC circuit breaker with door control, remote trip or motorized		
Anti-islanding protection	Yes, with automatic disconnection		
Other protections	AC short circuits and overloads		
<b>Features</b>			
Maximum efficiency	99.1%	99.1%	99.1%
Euroefficiency	98.8%	98.9%	99%
Stand-by consumption <sup>(6)</sup>	60 W	90 W	120 W
Consumption at night	60 W	90 W	120 W
<b>General Information</b>			
Ambient temperature	-20 °C to +55 °C	-20 °C to +55 °C	-20 °C to +55 °C
Relative humidity (non-condensing)	0 - 95%	0 - 95%	0 - 95%
Protection class	IP20	IP20	IP20
Maximum altitude <sup>(7)</sup>	3,000 m	3,000 m	3,000 m
Cooling system	Air forced with temperature control (230 V phase + neutral power supply)		
Air flow	2,670 m³/h (fans: 1,000 VA)	4,640 m³/h (fans: 1,300 VA)	5,340 m³/h (fans: 1,500 VA)
Acoustic emission	< 67 dB (A) at 1 m with fans working at maximum power		
Marking	CE		
EMC and 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.0.12.3, South African Grid code (ver 2.6), Chilean Grid Code, Romanian Grid Code, Ecuadorian Grid Code, Peruvian Grid code, IEEE 929, Thailand MEA & 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		

**Notes:** <sup>(1)</sup> Depending on the type of installation and geographical location. Data for STC conditions <sup>(2)</sup> Consider the voltage increase of the 'Voc' at low temperatures <sup>(3)</sup> For each °C of increase between 30 °C and 45 °C, the output power will be reduced at the rate of 0.57% / °C. Over 45 °C, the output power will be reduced at the rate of 1.8% / °C <sup>(4)</sup> For P<sub>out</sub>>25% of the rated power <sup>(5)</sup> For P<sub>out</sub>>25% of the rated power and voltage in accordance with IEC 61000-3-4 <sup>(6)</sup> Consumption from PV field <sup>(7)</sup> Over 1,000 m temperature for rated power is reduced at the rate of 4.5 °C for each 1,000 m.

**Efficiency INGECON® SUN 1000TL X400** V<sub>dc</sub> = 650 V





# Ingeteam

## **Ingeteam Power Technology, S.A.**

Avda. Ciudad de la Innovación, 13  
31621 SARRIGUREN (Navarra) - Spain  
Tel.: +34 948 288 000 / Fax: +34 948 288 001  
e-mail: solar.energy@ingeteam.com

## **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 GmbH**

Herzog-Heinrich-Str. 10  
80336 MUNICH - Germany  
Tel.: +49 89 99 65 38 0 / Fax: +49 89 99 65 38 99  
e-mail: solar.de@ingeteam.com

## **Ingeteam SAS**

La Naurouze B - 140 rue Carmin  
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 INC.**

5201 Great American Parkway, Suite 320  
SANTA CLARA, CA 95054 - USA  
Tel.: +1 (415) 450 1869 / +1 (408) 524 2929 / Fax: +1 (408) 824 1327  
e-mail: solar.us@ingeteam.com

## **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: solar.us@ingeteam.com

## **Ingeteam, a.s.**

Technologická 371/1  
70800 OSTRAVA - PUSTKOVEC  
Czech Republic  
Tel.: +420 59 732 6800 / Fax: +420 59 732 6899  
e-mail: czech@ingeteam.com

## **Ingeteam Shanghai, Co. Ltd.**

Shanghai Trade Square, 1105  
188 Si Ping Road  
200086 SHANGHAI - P.R. China  
Tel.: +86 21 65 07 76 36 / Fax: +86 21 65 07 76 38  
e-mail: shanghai@ingeteam.com

## **Ingeteam, S.A. de C.V.**

Ave. Revolución, n° 643, Local 9  
Colonia Jardín Español - MONTERREY  
64820 - NUEVO LEÓN - México  
Tel.: +52 81 8311 4858 / Fax: +52 81 8311 4859  
e-mail: northamerica@ingeteam.com

## **Ingeteam Ltda.**

Estrada Duílio Beltrami, 6975  
Chácara Sao Bento  
13278-078 VALINHOS SP - Brazil  
Tel.: +55 19 3037 3773 / Fax: +55 19 3037 3774  
e-mail: brazil@ingeteam.com

## **Ingeteam Pty Ltd.**

Unit 2 Alphen Square South  
16th Road, Randjiespark, Midrand 1682 - South Africa  
Tel.: +2711 314 3190 / Fax: +2711 314 2420  
e-mail: southafrica@ingeteam.com

## **Ingeteam SpA**

Cerro El Plomo 5630, Piso 9, Oficina 901  
7560742 Las Condes - Santiago de Chile - Chile  
Tel.: +56 2 26664370  
e-mail: chile@ingeteam.com

## **Ingeteam Power Technology India Pvt. Ltd.**

2nd Floor, 431  
Udyog Vihar, Phase III  
122016 Gurgaon (Haryana) - India  
Tel.: +91 124 420 6491-5 / Fax: +91 124 420 6493  
e-mail: india@ingeteam.com

## **Ingeteam Sp. z o.o.**

Ul. Koszykowa 60/62 m 39  
00-673 Warszawa - Poland  
Tel.: +48 22 821 9930 / Fax: +48 22 821 9931  
e-mail: polska@ingeteam.com

## **Ingeteam Australia Pty Ltd.**

Suite 112, Level 1, Mike Codd Building 232  
Innovation Campus, Squires Way  
North Wollongong, NSW 2500 - Australia  
Tel.: +61 499 988 022  
e-mail: australia@ingeteam.com