

## TRANSFORMERLESS PV INVERTER WITH AN EXTRA THERMAL STABILITY AND A GREATER POWER DENSITY

## Solar PV Central Inverter up to 5.4 MVA

### Greater power density

This solar PV inverter achieves a market-leading power density as it provides up to 5,378 kVA in just one power stack.

### Latest generation electronics

The INGECON® SUN 3Power U C Series Plus PV inverter features an innovative control unit that performs a more efficient and sophisticated inverter control, as it uses a last-generation digital signal processor.

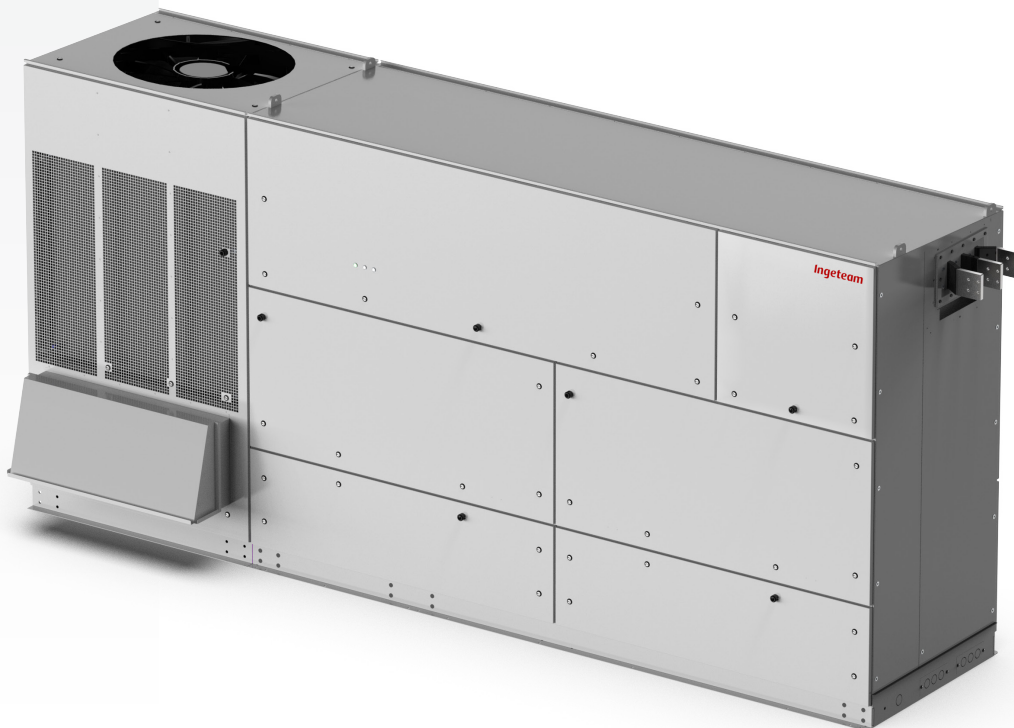
### Liquid Cooling System (LCS)

Ingeteam has already supplied +52 GW of liquid-cooled wind power converters worldwide. It offers a greater thermal stability and a more optimized component usage. The LCS has been designed to refrigerate the IGBTs, the power phases and the IP65 / NEMA 4 compartment. It features less moving components, so it consumes a lower amount of power and it requires less maintenance works.

The LCS is a closed circuit supplied totally filled and purged, equipped with fast connectors with an anti-dripping system, so it offers zero risk of particle entrance. It has been designed to avoid siphons in order to easily purge it if necessary. The coolant used is a biodegradable glycol water mixture. There is no need of emptying the LCS in order to replace the phases, nor the sensors.

### IP65 / NEMA 4 protection

A secondary liquid cooling system is used to refrigerate the air inside the NEMA 4-protected compartment. A water-air heat exchanger is used for that. This compartment contains the power and control electronics, the DC fuses, the DC and AC protections, the busbars and the power phases.



### Monitoring and communication

Dual Ethernet to communicate with the SCADA and the PPC (power plant controller). Moreover, it features Wi-Fi communication as access point to connect with the inverter during commissioning and O&M works. Ingeteam's advanced PV plant monitoring system INGECON® SUN Monitor is also available at no extra cost. The Smartphone application of the INGECON® SUN Monitor -available on the App Store and on the Play Store- makes it easier and more comfortable to monitor the PV plant.

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

#### PROTECTIONS

- DC Reverse polarity.
- Short-circuits and overloads at the output.
- Anti-islanding with automatic disconnection.
- Insulation failure DC.
- Up to 32 pairs of fuse-holders.
- Lightning induced DC and AC surge arresters, type II.
- Motorized DC switch to automatically disconnect the inverter from the PV array.
- Motorized AC circuit breaker.
- Hardware protection via firmware.
- Additional protection for the power stack, liquid cooled, IP65 rated and air cooled by a closed loop.

### Advanced grid support



Low Voltage Ride Through



Fast Frequency Regulation



Reactive Power at Night



Voltage Droop Control



Active Power Reserve Without Batteries



Grid Following & Grid Forming



Black Start Capability



Automatic Voltage Regulation

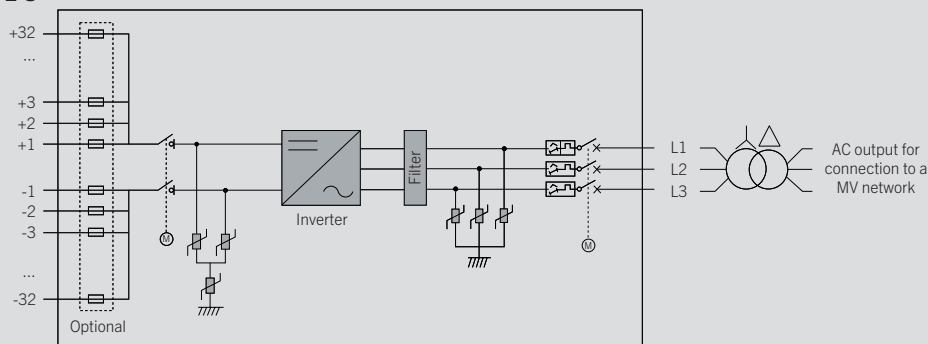
#### OPTIONAL ACCESSORIES

- Auxiliary services feeder.
- Grounding kit.
- Heating kit, for operating at an ambient temperature of down to -30 °C.
- DC surge arresters type I+II.
- AC surge arresters type I+II.
- DC fuses.
- Monitoring of the currents at the DC input.
- PID prevention kit (PID: Potential Induced Degradation).
- Integrated DC combiner box.

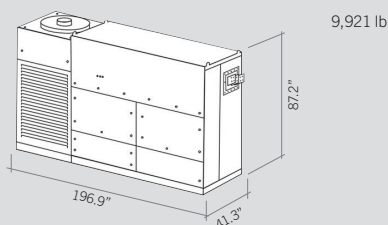
#### LIQUID COOLING SYSTEM

- LCS to refrigerate the IGBTs.
- More optimized component usage: greater thermal stability.
- Less moving components: lower power consumption and less maintenance works.
- No risk of particle entrance.
- Anti-corrosion protection with stainless steel components.
- LCS is used in many industries. Thus, it is very reliable, as its components are subject to many validation tests.
- Fast connectors with anti-dripping system
- Biodegradable glycol water mixture.
- No need of emptying the LCS in order to replace the phases, nor the sensors.

### INGECON® SUN 5380TL U



### Size and weight



	INGECON® SUN 5380TL U						
	C600	C615	C630	C645	C660	C675	C690
Input (DC)							
Recommended PV array power range <sup>(1)</sup>	4,715 - 6,080 kWp	4,832 - 6,231 kWp	4,950 - 6,383 kWp	5,068 - 6,535 kWp	5,186 - 6,687 kWp	5,304 - 6,839 kWp	5,422 - 6,991 kWp
Voltage Range MPP <sup>(2)</sup>	869 - 1,300 V	889 - 1,300 V	910 - 1,300 V	930 - 1,300 V	951 - 1,300 V	972 - 1,300 V	992 - 1,300 V
Maximum voltage <sup>(3)</sup>	1,500 V						
Maximum current	5,625 A						
Nº PV inputs	Up to 32						
Fuse dimensions	Up to 630 A / 1,500 V / UL PV / 100 kA (L/R 5mS) (optional)						
Type of connection	Connection to copper bars						
Power blocks	1						
MPPT	1						
Input protections							
Overvoltage protections	Type II surge arresters (type I+II optional)						
DC switch	Motorized DC load break disconnect						
Other protections	Up to 32 pairs of DC fuses (optional) / Reverse polarity / Insulation failure monitoring / Anti-islanding protection						
Output (AC)							
Power @98.6 ºF	4,677 kVA	4,793 kVA	4,910 kVA	5,027 kVA	5,144 kVA	5,261 kVA	5,378 kVA
Power @104 ºF	4,572 kVA	4,686 kVA	4,801 kVA	4,915 kVA	5,029 kVA	5,144 kVA	5,258 kVA
Power @122 ºF	4,032 kVA	4,133 kVA	4,234 kVA	4,335 kVA	4,435 kVA	4,536 kVA	4,637 kVA
Current @98.6 ºF	4,500 A						
Current @104 ºF	4,400 A						
Current @122 ºF	3,880 A						
Rated voltage <sup>(4)</sup>	600 V IT System	615 V IT System	630 V IT System	645 V IT System	660 V IT System	675 V IT System	690 V IT System
Frequency	60 Hz						
Power Factor <sup>(5)</sup>	1						
Power Factor adjustable	Yes, 0 - 1 (leading / lagging)						
THD (Total Harmonic Distortion) <sup>(6)</sup>	<3%						
Output protections							
Overvoltage protections	Type II surge arresters (type I+II optional)						
AC breaker	Motorized AC circuit breaker						
Anti-islanding protection	Yes, with automatic disconnection						
Other protections	AC short-circuits and overloads						
Features							
Operating efficiency	98.9%						
CEC	98.5%						
Max. consumption aux. services	12,800 W						
Stand-by or night consumption <sup>(7)</sup>	250 W						
Average power consumption per day	4,200 W						
General Information							
Ambient temperature	From -22 ºF to +140 ºF						
Relative humidity (non-condensing)	0-100% (Outdoor)						
Protection class	NEMA 4 <sup>(8)</sup>						
Corrosion protection	External corrosion protection						
Maximum altitude	14,770 ft (for installations beyond 3,300 ft, please contact Ingeteam's solar sales department)						
Cooling system	Liquid cooling system and forced air cooling system with temperature control (400V 3 phase + neutral power supply, 60 Hz)						
Air flow range	0 - 78 ft³/s (0 - 7,800 m³/h)						
Average air flow	42 ft³/s (4,200 m³/h per power block)						
Acoustic emission (100% / 50% load)	57 dB(A) at 33 ft / 49.7 dB(A) at 33 ft						
Marking	CE, SGS						
EMC and security standards	UL1741-SB, FCC Part 15, IEEE C37.90.1, IEEE C37.90.2, CSA22.2 No107						
Grid connection standards	IEC 62116, UL1741-SB, IEEE2800, IEEE1547, IEEE1547.1, NEC CODE, Electric Rule 21: 2015, CSA22.2 No107						

**Notes:**<sup>(1)</sup> Depending on the type of installation and geographical location. Data for STC conditions <sup>(2)</sup> Vmpp.min is for rated conditions (Vac=1 p.u. and Power Factor=1) and floating systems <sup>(3)</sup> Consider the voltage increase of the 'Voc' at low temperatures <sup>(4)</sup> Other AC voltages and powers available upon request <sup>(5)</sup> For P<sub>out</sub>>25% of the rated power <sup>(6)</sup> For P<sub>out</sub>>25% of the rated power and voltage in accordance with IEC 61000-3-4 <sup>(7)</sup> Consumption from PV field when there is PV power available <sup>(8)</sup> Except for the LC filter and the air-water heat exchanger, that are NEMA 3R.

## EUROPE

**Ingeteam Power Technology, S.A.**  
Avda. Ciudad de la Innovación, 13  
31621 Sarriena (Navarra) - Spain  
Tel.: +34 948 288 000  
Fax: +34 948 288 001  
e-mail: [evc.energy@ingetteam.com](mailto:evc.energy@ingetteam.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: [emobility.italia@ingetteam.com](mailto:emobility.italia@ingetteam.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@ingetteam.com](mailto:france@ingetteam.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@ingetteam.com](mailto:czech@ingetteam.com)

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

**Ingeteam Poland Spzoo**  
Ul. Koszykowa 60/62 m 39  
00-673, Warsaw, Poland  
Tel.: (+48) 22 821 99 30  
e-mail: [polska@ingetteam.com](mailto:polska@ingetteam.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@ingetteam.com](mailto:usa@ingetteam.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.ipm@ingetteam.com](mailto:proveedores.ipm@ingetteam.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@ingetteam.com](mailto:brazil@ingetteam.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@ingetteam.com](mailto:chile@ingetteam.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@ingetteam.com](mailto:liu.yimin@ingetteam.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@ingetteam.com](mailto:Thailand.pga@ingetteam.com)

## AUSTRALIA

**Ingeteam Australia Pty Ltd.**  
Iaccellerate Centre, Building 239  
Innovation Campus, Squires Way  
North Wollongong, NSW 2500 - Australia  
Tel.: +61 429 111 190  
e-mail: [australia@ingetteam.com](mailto:australia@ingetteam.com)

# Ingeteam

[www.ingetteam.com](http://www.ingetteam.com)