

## **ANEXO TÉCNICO 1-RESOLUCIÓN SEC MÓDULOS FOTOVOLTAICOS**

DIVISIÓN DE INGENIERÍA DE ELECTRICIDAD  
ACC 1769725/DOC 1581539/

AUTORIZA LOS PRODUCTOS QUE INDICA  
PARA EL USO EN INSTALACIONES DE  
GENERACIÓN ELÉCTRICA RESIDENCIAL.

RESOLUCIÓN EXENTA N° 21058

SANTIAGO,

06 NOV 2017

VISTOS

Lo dispuesto en el DFL N°4/20.018, de 2006 del Ministerio de Economía, Fomento y Reconstrucción, Ley General de Servicios Eléctricos; en la Ley N° 18.410 de 1985, Orgánica de la Superintendencia de Electricidad y Combustibles; en el Decreto Supremo N° 71 de 2014, modificado mediante el Decreto Supremo N° 103 de 2016, ambos del Ministerio de Energía, Reglamento de la Ley N° 20.571, que regula el pago de las tarifas eléctricas de las generadoras residenciales; en la Resolución Exenta N° 12.438 de 2016, de la Superintendencia de Electricidad y Combustibles que establece medida transitoria de seguridad como requisito previo para la conexión de unidades de generación residencial a las redes de distribución eléctrica; en la Resolución Exenta N° 1.600 de 2008, de la Contraloría General de la República, sobre exención del trámite de toma de razón; y

### CONSIDERANDO

Que mediante carta ingreso OP N° 25459 de fecha 30 de octubre de 2017, la empresa Ecoambiente Ingeniería Ambiental y Construcción Limitada, Rut: 76.517.866-5, con domicilio en avenida Príncipe de Gales N°5921, oficina 1504, comuna de La Reina, viene a solicitar la autorización de los productos para el uso en instalaciones de generación eléctrica residencial, que se indica en la Tabla I:

TABLA I

Item	Producto	Marca	Modelo	Potencia Máx. (W)	Rendimiento (%)	Voltaje en el punto máximo de potencia (Vmp) (V)	Corriente de corto circuito (Isc) (A)	Número de células	Peso (kg)	Dimensiones (mm)
1	Módulo Fotovoltaico	Shenzhen Suoyang New Energy	SY-320 WP	320	16,5	37,7	8,49	72	21	1956/992/35

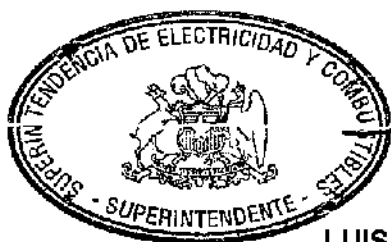
2° Que el solicitante ha presentado el certificado emitido por el organismo de certificación extranjero TÜV Nord, acreditado por DAKKS, miembro signatario IAF (International Accreditation Forum), N° 44780 16406749-138, que acredita que el producto contenido en la Tabla I precedente, cumple con todos los ensayos y procedimientos establecidos en las Normas IEC 61215 e IEC 61730.

3° Que, analizados los antecedentes presentados por el solicitante, se concluye que el producto contenido en la Tabla I, cumple con los requisitos establecidos en la Resolución Exenta N° 12.438 de 2016, de la Superintendencia de Electricidad y Combustibles.

### RESUELVO

1° Autorízase el uso del producto contenido en la Tabla I precedente, para ser empleado en las instalaciones eléctricas de generación residencial, conforme a la Ley N° 20.571.

**ANÓTESE, NOTIFIQUESE Y ARCHÍVESE**



**LUIS ÁVILA BRAVO**

Superintendente de Electricidad y Combustibles



#### Distribución.








- Ecoambiente Ltda.
- Of. Partes.
- Archivo.
- Transparencia Activa.
- DTIE.

**Caso N° 847695/**

## **ANEXO TÉCNICO 2-FICHA TÉCNICA FABRICANTE DE MODULOS FOTOVOLTAICOS**



## POLY SOLAR MODULE 156\*156 320WATT

-  Plus power tolerance (0-3%) to ensure the high reliability of power output
-  Modules certified by TÜV to withstand high level of wind loads (2400 Pa) and snow loads (5400 Pa)\*
-  Anti-reflective, hydrophobic layer of module surface (proprietary 800° C online coating technology) improves light absorption and reduces surface dust
-  Easy installation and minimal maintenance with compatibility to industry standard inverters and mounting systems
-  Special PV Module Insurances by world leading insurance company guarantees the benefit of PV investors and PV module users
-  Junction box and bypass diodes guarantee the modules free of overheating and "hot spot effect"
-  Modules' excellent performance under low light environments (mornings, evenings, and cloudy days) create better kWh/kW ratio and produce average 2-3% more electricity in the field

### PRODUCT FEATURE

- Bypass diode minimizes the power drop by shade.
- White tempered glass ,EVA resin,weather proof film and anodized aluminum frame to provide efficient protection from the severest environmental conditions.
- Waterproof.Perfect for grid applications.
- Product guarantee 10 years.

### Quality Assurance

- |                              |                                     |
|------------------------------|-------------------------------------|
| ● Electrical Insulation test | ● Damp heat Test                    |
| ● Outdoor exposure test      | ● Robustness after termination test |
| ● Hot-spot endurance test    | ● Wet leakage current test          |
| ● UV-exposure                | ● Mechanical load test              |
| ● Thermal cycling test       | ● Hail impact test                  |
| ● Humidity freeze test       | ● Bypass diode thermal test         |

## Physical Specifications

Dimension: 1956\*992\*35MM

Weight: 21.00KG/PCS

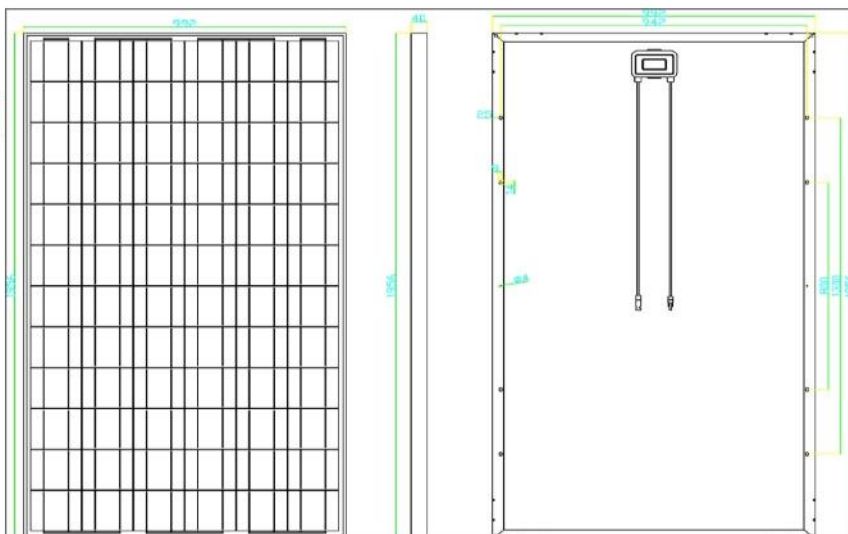
Packing : 2pcs in one carton

### Loading Capacity:

336pcs/ 20' Container

690pcs/ 40' Container

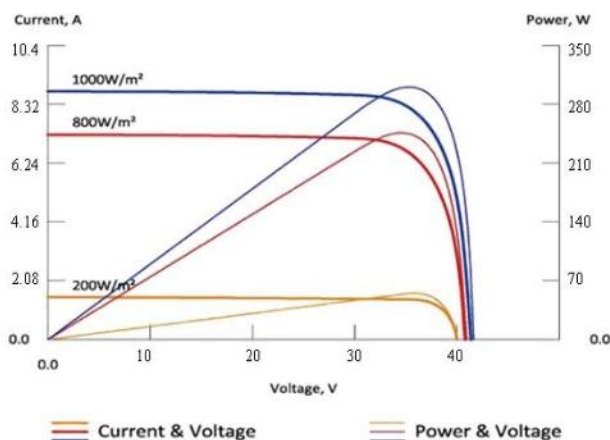
794pcs/ 40' HQ



PRODUCT SPECIFICATION	SY-320WP
Maximum Power (W)	320
Tolerance (%)	0/+3%
Open Circuit Voltage (V)	45.70
Short Circuit Current (A)	8.94
Maximum Power Voltage (V)	37.7
Maximum Power Current (A)	8.49
Module Efficiency (%)	16.5
Solar Cell Efficiency (%)	18.5
Series Fuse Rating (A)	15
Terminal Box	IP65
Maximum system voltage (V)	DC1000
Operating Temperature(°C)	-40°C---85°C

## Electrical Characteristics

Current-Voltage & Power-Voltage characteristics various irradiance levels



### Electric Performance Typical Performance Characteristics

Current Temperature Coefficient %/°C	+0.06
Voltage Temperature Coefficient %/°C	-0.34
Power Temperature Coefficient %/°C	-0.47
Performance Warranty:	90%output , 12 years 80%output , 25 years
Manufacture Warranty :	10years

## **ANEXO TÉCNICO 4-RESOLUCIÓN SEC DE INVERSORES**

DEPARTAMENTO DE NORMAS Y ESTUDIOS

ACC- 1174592 / DOC- 966283

**AUTORIZA LOS PRODUCTOS QUE INDICA  
PARA EL USO EN INSTALACIONES DE  
GENERACIÓN ELÉCTRICA RESIDENCIAL.**

**RESOLUCIÓN EXENTA Nº 9334**

**SANTIAGO, 17 JUL 2015**

**VISTO**

Lo dispuesto en la ley 18.410, orgánica de esta Superintendencia; la Ley núm. 20.571 que regula el pago de las tarifas eléctricas de las generadoras residenciales, y su reglamento aprobado mediante decreto N°71 de 2014, del Ministerio de Energía, la resolución N° 5308 de 2014, de esta Superintendencia que establece medida transitoria de seguridad como requisito previo para la conexión de unidades de generación residencial a las redes de distribución eléctrica, la resolución N° 1600 de 2008, de la Contraloría General de la República, sobre exención del trámite de toma de razón.

**CONSIDERANDO**

1° Que mediante carta ingreso OP N° 11675, de fecha 24 de junio de 2015, la empresa Fuenzalida y Santis Ltda., Rut: 76.076.858-8, con domicilio en Passy N° 59, oficina 2A, comuna de Providencia, viene a solicitar la autorización de los productos, para el uso en instalaciones de generación eléctrica residencial, que se indican en la Tabla I:

**TABLA I**

Ítem	Producto	Marca	Modelo	Rango voltaje DC de entrada (volt)	Potencia máxima de salida AC (watt)	Rendimiento máximo en (%)	Peso (Kg)	Dimensiones (mm)
1	Inversor	Ingeteam	Ingecon Sun 2.5 TL M	125-850	2500	98.4	20	470/360/180
2	Inversor	Ingeteam	Ingecon Sun 2.7 TL M	125-850	2700	98.4	20	470/360/180
3	Inversor	Ingeteam	Ingecon Sun 3 TL M	125-850	3000	98.4	20	470/360/180
4	Inversor	Ingeteam	Ingecon Sun 3.3 TL M	125-850	3300	98.4	20	470/360/180
5	Inversor	Ingeteam	Ingecon Sun 3.68 TL M	125-850	3680	98.4	20	470/360/180

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6	Inversor	Ingeteam	Ingecon Sun 4.6 TL M	125-850	4600	98.4	21	470/360/180
7	Inversor	Ingeteam	Ingecon Sun 5 TL M	125-850	5000	98.4	21	470/360/180
8	Inversor	Ingeteam	Ingecon Sun 5.5 TL M	125-850	5500	98.4	21	470/360/180
9	Inversor	Ingeteam	Ingecon Sun 6 TL M	125-850	6000	98.4	21	470/360/180
10	Inversor	Ingeteam	Ingecon Sun 10 TL	560-1000	10000	98.5	46.8	735/706/268
11	Inversor	Ingeteam	Ingecon Sun 12.5 TL	560-1000	12500	98.5	46.8	735/706/268
12	Inversor	Ingeteam	Ingecon Sun 15 TL	560-1000	15000	98.5	51.5	735/706/268
13	Inversor	Ingeteam	Ingecon Sun 20 TL	560-1000	20000	98.5	51.5	735/706/268
14	Inversor	Ingeteam	Ingecon Sun 10 TL M	200-1000	10000	98.5	56.2	735/706/268
15	Inversor	Ingeteam	Ingecon Sun 12.5 TL M	200-1000	12500	98.5	56.2	735/706/268
16	Inversor	Ingeteam	Ingecon Sun 15 TL M	200-1000	15000	98.5	57.8	735/706/268
17	Inversor	Ingeteam	Ingecon Sun 20 TL M	200-1000	20000	98.5	57.8	735/706/268

2° Que el solicitante ha presentado los certificados que se indican en la tabla II:

**TABLA II**

Ítem	Marca	Modelo	N° Certificado	Emitido por	Acreditado por	Bajo Normas
1	Ingeteam	Ingecon Sun 2.5 TL M	2614/0325/G1-CER 2614/0325/B1/E2-CER	SGS Tecnos	ENAC	IEC 62109 IEC 62116
2	Ingeteam	Ingecon Sun 2.7 TL M				
3	Ingeteam	Ingecon Sun 3 TL M				
4	Ingeteam	Ingecon Sun 3.3 TL M				
5	Ingeteam	Ingecon Sun 3.68 TL M				
6	Ingeteam	Ingecon Sun 4.6 TL M				
7	Ingeteam	Ingecon Sun 5 TL M				
8	Ingeteam	Ingecon Sun 5.5 TL M				
9	Ingeteam	Ingecon Sun 6 TL M				
10	Ingeteam	Ingecon Sun 10 TL	2614/0325/G3-CER 2614/0325/B3/E2-CER/E1	SGS Tecnos	ENAC	
11	Ingeteam	Ingecon Sun 12.5 TL				
12	Ingeteam	Ingecon Sun 15 TL				
13	Ingeteam	Ingecon Sun 20 TL				
14	Ingeteam	Ingecon Sun 10 TL M				
15	Ingeteam	Ingecon Sun 12.5 TL M				
16	Ingeteam	Ingecon Sun 15 TL M				
17	Ingeteam	Ingecon Sun 20 TL M				

3° Que analizados los antecedentes presentados por el solicitante, se concluye que los productos contenidos en la Tabla I, cumplen con los requisitos establecidos en la Resolución Exenta N° 5308 de 2014, de la Superintendencia de Electricidad y Combustibles.

### RESUELVO

1° Autorízase el uso de los productos contenidos en la Tabla I precedente, para ser empleados en las instalaciones eléctricas de generación residencial, conforme a la Ley 20.571.

### ANÓTESE, NOTIFÍQUESE Y ARCHÍVESE



  
**LUIS ÁVILA BRAVO**

Superintendente de Electricidad y Combustibles



  
**Distribución.**

- Of. Partes.
- Archivo.
- Transparencia Activa.
- DTIE.
- Fuenzalida y Santis Ltda.
- Caso N° 392751 /

## **ANEXO TÉCNICO 5-FICHA TÉCNICA FABRICANTE DE INVERSORES**

**LA MÁXIMA  
EFICIENCIA CON  
TECNOLOGÍA  
TRIFÁSICA  
MULTI-MPPT**

**10TL M / 15TL M / 20TL M / 28TL M / 33TL M /  
24TL M480 / 40TL M480**

Familia de inversores trifásicos multi-string para uso doméstico, industrial y en instalaciones fotovoltaicas de campo.

**Máxima eficiencia con dos entradas  
MPPT independientes**

Única etapa de potencia con un avanzado sistema de seguimiento del punto de potencia máxima (MPPT), que permite extraer la máxima energía del campo FV incluso en situaciones difíciles como las de nubosidad variable y sombreados parciales. Gran flexibilidad para configurar el campo fotovoltaico gracias al amplio rango de tensión de entrada de su doble sistema de seguimiento MPPT. Posibilita configuraciones asimétricas.

**Tecnología Plug & Play**

Muy fáciles de instalar. La conexión del inversor a la instalación se realiza de manera rápida y sencilla. Permite adecuar fácilmente la configuración e idioma del inversor a cada país desde la pantalla del propio inversor.

**Diseño robusto**

Envoltorio de acero especialmente diseñada para su instalación en interior y exterior (IP65). Soporta temperaturas extremas. Su diseño, junto con las pruebas de estrés a las que son sometidos, les permite alcanzar una vida útil de más de 20 años.

**Fácil mantenimiento**

Datalogger interno para almacenamiento de datos hasta 3 meses. Control desde un PC remoto o *in situ* desde el teclado del frontal del inversor a través de la pantalla LCD. LEDs indicadores de estado y alarmas.

**Fácil de manejar**

Los inversores INGECON® SUN 3Play TL M presentan una pantalla LCD para monitorizar el estado del inversor y sus variables internas de manera sencilla. El display también dispone de tres LEDs para indicar el estado de operación del inversor. Todo ello facilita las tareas de mantenimiento.

**Software incluido**

Incluyen sin coste las aplicaciones INGECON® SUN Manager, INGECON® SUN Monitor y su versión para smartphone iSun Monitor para la monitorización y registro de datos del inversor a través de internet. Comunicaciones RS-485 incluidas de serie. Además, el usuario puede descargar desde la web [www.ingeteam.com](http://www.ingeteam.com) la última versión del firmware del inversor, y actualizarlo utilizando una simple tarjeta de memoria SD.

**Garantía estándar de 5 años, ampliable hasta 25 años**



## 10TL M / 15TL M / 20TL M / 28TL M / 33TL M / 24TL M480 / 40TL M480

**Diferentes versiones para elegir**

En su intento de satisfacer las necesidades de sus clientes, Ingeteam ha creado cuatro versiones diferentes para la familia INGECON® SUN 3Play TL:

- “S”: Versión Estándar
- “S+”: Versión Estándar avanzada
- “P”: Versión Premium
- “P+”: Versión Premium avanzada

Todas las versiones vienen equipadas con varistores DC y AC tipo 3. La versión Estándar “S” representa el equipo más básico de todos. Presenta una doble entrada MPPT mediante bornas. La versión Estándar avanzada integra además un seccionador DC.

On the other hand, the Premium version includes two options for DC connection: conventional terminal blocks or fused and monitored PV connectors.

Moreover, it also features DC fuses, the input current measuring kit and a DC switch. The Advanced Premium version “P+” is supplied with DC surge arresters, type 2.

**PRINCIPALES CARACTERÍSTICAS**

- Sistema MPPT.
- Eficiencia máxima 98,5%.
- Entradas digitales.
- Comunicaciones RS-485 de serie.
- Actualización de firmware a través de una tarjeta de memoria SD.
- Software INGECON® SUN Manager para la visualización de parámetros y el registro de datos de la planta.
- Visualización de datos de la planta mediante el software INGECON® SUN Monitor.
- Pantalla LCD.
- Fácil mantenimiento.
- Contacto libre de potencial configurable desde el display para indicar fallo de aislamiento o conexión a red.
- Solución Plug & Play.
- Apto para instalaciones interiores y exteriores (IP65).
- Óptimas prestaciones a altas temperaturas.
- Diferentes versiones para todo tipo de proyectos.
- Diseño compacto.
- Idioma, Código de país y tensión nominal configurables por display.

**PROTECCIONES**

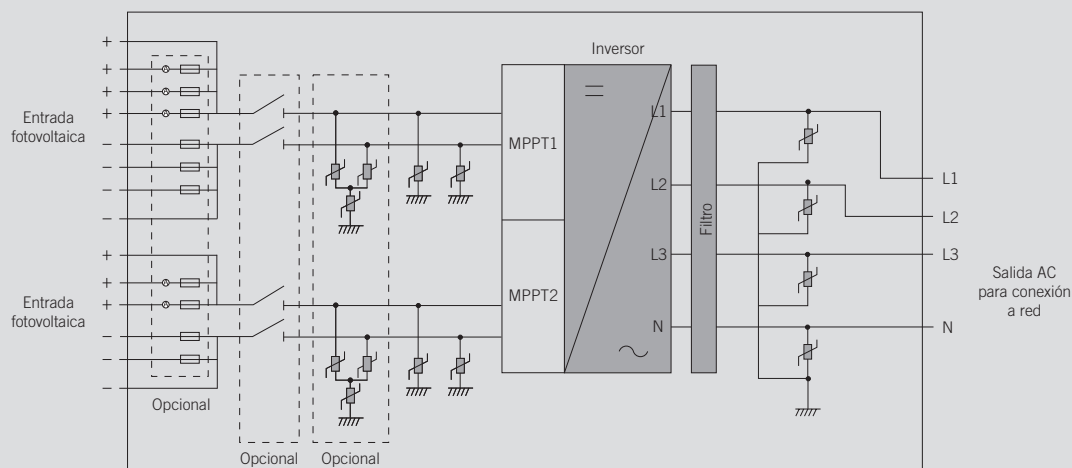
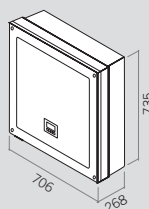
- Polarización inversa.
- Cortocircuitos y sobrecargas en la salida.
- Anti-isla con desconexión automática.
- Fallo de aislamiento.
- Sobretensiones DC y AC con descargadores tipo 3.

**ACCESORIOS OPCIONALES**

- Comunicación entre inversores mediante Ethernet, GSM / GPRS o Wi-Fi. Disponible también una segunda tarjeta de comunicación RS-485.
- Kit de autoconsumo.

**VENTAJAS**

- El mejor precio posible.
- Mantenimiento sencillo.
- Larga vida útil del inversor.

**3Play TL M Versión P+ (20 kW)****Dimensiones y peso (mm)**

**10TL M / 15TL M / 20TL M / 24TL M480**  
57,8 kg.

**28TL M / 33TL M / 40TL M480**  
62,5 kg.

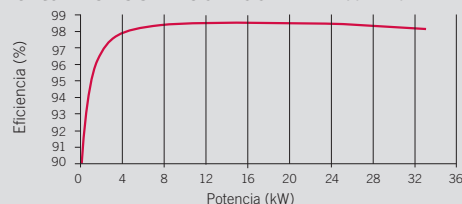
	10TL M	15TL M	20TL M	28TL M	33TL M
Valores de Entrada (DC)					
Rango pot. campo FV recomendado <sup>(1)</sup>	10,3 - 13,4 kW	15,5 - 20,1 kW	20,6 - 26,8 kW	28,9 - 37,5 kW	34 - 45 kW
Rango de tensión MPP1 <sup>(2)</sup>	200 - 820 V				
Rango de tensión MPP2 <sup>(2)</sup>	200 - 820 V				
Tensión máxima <sup>(3)</sup>	1.000 V				
Corriente máxima (Input 1 / Input 2) <sup>(4)</sup>	30 / 20 A	30 / 20 A	30 / 20 A	40 / 40 A	40 / 40 A
Entradas con bornas (Entrada 1 / Entrada 2)	1 / 1				
Entradas con conectores FV (Entrada 1 / Entrada 2) <sup>(5)</sup>	3 / 2	3 / 2	3 / 2	5 / 5	5 / 5
MPPT	2				
Valores de Salida (AC)					
Potencia nominal	10 kW	15 kW	20 kW	28 kW	33 kW
Máxima temperatura a potencia nominal <sup>(6)</sup>	55 °C	55 °C	55 °C	51 °C	51 °C
Corriente máxima	15 A	22 A	29 A	41 A	48 A
Tensión nominal	400 V				
Rango de tensión	187 - 528 V	187 - 528 V	187 - 528 V	304 - 528 V	304 - 528 V
Frecuencia nominal	50 / 60 Hz				
Power Factor	1				
Power Factor adjustable	Sí. Smáx=10 kVA; Qmax=10 kVAR	Sí. Smáx=15 kVA; Qmax=15 kVAR	Sí. Smáx=20 kVA; Qmax=20 kVAR	Sí. Smáx=28 kVA; Qmax=20 kVAR	Sí. Smáx=33 kVA; Qmax=20 kVAR
THD	<3%				
Rendimiento					
Eficiencia máxima	98,5%				
Euroeficiencia	98,3%				
Datos Generales					
Sistema de refrigeración	Ventilación forzada				
Caudal de aire	200 m³/h	200 m³/h	200 m³/h	400 m³/h	400 m³/h
Consumo en stand-by <sup>(7)</sup>	10 W				
Consumo nocturno	1 W				
Temperatura de funcionamiento	-25 °C a 65 °C				
Humedad relativa (sin condensación)	0 - 100%				
Grado de protección	IP65				
Marcado	CE				
Normativa EMC y de seguridad	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 61000-3-11, EN 61000-3-12, EN 62109-1, EN 62109-2, IEC62103, EN 50178, FCC Part 15, AS3100				
Normativa de conexión a red	RD1699/2011, DIN V VDE V 0126-1-1, EN 50438, CEI 0-16 Ed. III, 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				
Versiones disponibles					
Versión Standard	S		✓	✓	✓
	S+		✓	✓	✓
Versión Premium	P	✓	✓	✓	✓
	P+		✓	✓	✓

	Versión Standard		Versión Premium	
	S	S+	P	P+
Bornas	✓	✓	✓ <sup>(*)</sup>	✓ <sup>(*)</sup>
Conectores fotovoltaicos			✓	✓
DC Seccionador DC		✓	✓	✓
Descargadores DC, tipo 2				✓
Descargadores DC y AC, tipo 3	✓	✓	✓	✓
Fusibles DC			✓	✓
Kit de medida de corrientes			✓	✓

<sup>(\*)</sup> Bornas no disponibles para las versiones Premium de los inversores INGECON® SUN 28TL, 33TL y 40TL M480.

**Notas:** <sup>(1)</sup> Dependiendo del tipo de instalación y de la ubicación geográfica <sup>(2)</sup> La potencia de salida quedará condicionada por la configuración de tensión y corriente elegida en cada entrada <sup>(3)</sup> No superar en ningún caso. Considerar el aumento de tensión de los paneles 'Voc' a bajas temperaturas <sup>(4)</sup> La corriente máxima por conector FV es 11 A para las versiones Premium <sup>(5)</sup> Disponibles conectores dobles para conectar dos cables por cada entrada <sup>(6)</sup> Por cada °C de incremento, la potencia de salida se reducirá un 1,8% <sup>(7)</sup> Consumo desde el campo fotovoltaico <sup>(8)</sup> Sólo para inversores hasta 16 A de salida.

#### Rendimiento INGECON® SUN 33TL M V<sub>dc</sub> = 720 V



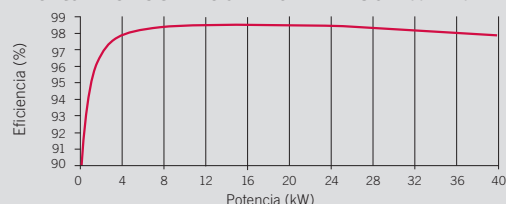
		24TL M480	40TL M480
Valores de Entrada (DC)			
Rango pot. campo FV recomendado <sup>(1)</sup>		24,7 - 32,2 kW	41,2 - 53,6 kW
Rango de tensión MPP1 <sup>(2)</sup>		200 - 820 V	
Rango de tensión MPP2 <sup>(2)</sup>		200 - 820 V	
Tensión máxima <sup>(3)</sup>		1.000 V	
Corriente máxima (Input 1 / Input 2) <sup>(4)</sup>		30 / 20 A	40 / 40 A
Entradas con bornas (Entrada 1 / Entrada 2)		1 / 1	
Entradas con conectores FV (Entrada 1 / Entrada 2) <sup>(5)</sup>		3 / 2	5 / 5
MPPT		2	
Valores de Salida (AC)			
Potencia nominal		24 kW	40 kW
Máxima temperatura a potencia nominal <sup>(6)</sup>		55 °C	51 °C
Corriente máxima		29 A	48 A
Tensión nominal		480 V	
Rango de tensión		187 - 528 V	304 - 528 V
Frecuencia nominal		50 / 60 Hz	
Power Factor		1	
Power Factor adjustable		Sí. Smáx=24 kVA; Qmax=24 kVAR	Sí. Smáx=40 kVA; Qmax=24 kVAR
THD		<3%	
Rendimiento			
Eficiencia máxima		98.5%	
Euroeficiencia		98.3%	
Datos Generales			
Sistema de refrigeración		Ventilación forzada	
Caudal de aire		200 m³/h	400 m³/h
Consumo en stand-by <sup>(7)</sup>		10 W	
Consumo nocturno		1 W	
Temperatura de funcionamiento		-25 °C a 65 °C	
Humedad relativa (sin condensación)		0 - 100%	
Grado de protección		IP65	
Marcado		CE	
Normativa EMC y de seguridad		EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 61000-3-11, EN 61000-3-12, EN 62109-1, EN 62109-2, IEC62103, EN 50178, FCC Part 15, AS3100	
Normativa de conexión a red		RD1699/2011, DIN V VDE V 0126-1-1, EN 50438, CEI 0-16 Ed. III, 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	
Versiones disponibles			
Versión Standard	S	✓	✓
	S+	✓	✓
Versión Premium	P	✓	✓
	P+	✓	✓

	Versión Standard		Versión Premium	
	S	S+	P	P+
Bornas	✓	✓	✓ <sup>(*)</sup>	✓ <sup>(*)</sup>
Conectores fotovoltaicos			✓	✓
DC Seccionador DC		✓	✓	✓
Descargadores DC, tipo 2				✓
Descargadores DC y AC, tipo 3	✓	✓	✓	✓
Fusibles DC			✓	✓
Kit de medida de corrientes			✓	✓

(\*) Bornas no disponibles para las versiones Premium de los inversores INGECON® SUN 28TL, 33TL y 40TL M480.

**Notas:** <sup>(1)</sup> Dependiendo del tipo de instalación y de la ubicación geográfica <sup>(2)</sup> La potencia de salida quedará condicionada por la configuración de tensión y corriente elegida en cada entrada <sup>(3)</sup> No superar en ningún caso. Considerar el aumento de tensión de los paneles "Voc" a bajas temperaturas <sup>(4)</sup> La corriente máxima por conector FV es 11 A para las versiones Premium <sup>(5)</sup> Disponibles conectores dobles para conectar dos cables por cada entrada <sup>(6)</sup> Por cada °C de incremento, la potencia de salida se reducirá un 1,8% <sup>(7)</sup> Consumo desde el campo fotovoltaico <sup>(8)</sup> Sólo para inversores hasta 16 A de salida.

#### Rendimiento INGECON® SUN 40TL M480 Vdc = 720 V



## **ANEXO TÉCNICO 6-GARANTÍA DEL FABRICANTE DE INVERSORES**



## ANNEX “A+B” - MANUFACTURER’S WARRANTY - INGECON® SERIES PRODUCTS & THIRD-PARTY PRODUCTS STANDARD WARRANTY

Ingeteam Power Technology S.A. and its subsidiaries (from now on, 'INGETEAM'), guarantee that their products are new products and comply with both technical specifications and applicable quality standards. INGETEAM guarantees the quality and performance of its products under the following terms and conditions. These Warranty conditions prevail over those indicated in chapter 10 of the INGETEAM General Sales Conditions.

### WARRANTY AGAINST DEFECTS IN COMPONENTS OR WORKMANSHIP

INGETEAM guarantees ex works that the products are free from any defects related to the components or the manufacturing process, which may prevent the normal operation under proper conditions of use, installation and maintenance.

Warranty periods:

PRODUCT	STANDARD WARRANTY PERIOD [No. of years]
INGECON SUN 1Play	5
INGECON SUN Lite	5
INGECON SUN 3Play	5
INGECON SUN Power	5
INGECON SUN PowerMax M/X/B	5
INGECON SUN StringControl	5
INGECON SUN StringBox	2
INGECON SUN STORAGE 1Play	3
INGECON SUN STORAGE Power	3
INGECON SUN STORAGE PowerMax X	3
INGECON SUN STORAGE PowerMax B	3
INGECON $\mu$ Wind	5
INGECON $\mu$ Wind Interface	5
INGECON EMS Manager	3
INGECON EMS Plant Controller	3
INGECON SUN ComBox	5
INGECON SUN WeatherBox	5
INGECON SUN PowerStation (Enclosure)	5
MV Transformer	2
MV Switchgear	2
LV Transformer	2
LV Auxiliary Panel	2
Air Conditioning Unit	2
UPS	2
INGEREV	2
Other accessories (communication cards, monitoring software and monitoring tools, etc.)	1
Spare Parts	1
The service activities that do not require any material	0.5

Table 1

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However, the effective warranty periods agreed with the Customer is stated in the Order Confirmation. If not otherwise stated in the Order Confirmation, the warranty period is 1 year.

The warranty is valid for the years written in Table 1 (or in the Order Confirmation, if different), starting from the date of commissioning of the product, with a maximum coverage period equal to the number of years written in Table 1 (or in the Order Confirmation) plus 3 months from the date of shipping of the product by INGETEAM. The shipping date is stated in the transport document accompanying the product, along with the serial number that identifies that specific product.

INGETEAM offers this warranty for all the products regardless of their geographic installation. INGETEAM reserves the right to offer extended warranties, adjusting to the characteristics of the different markets or countries where the equipment is installed. In these cases, such extended warranties shall be stipulated separately.

## WARRANTY TERMS AND CONDITIONS

### 1) WARRANTY CONDITIONS

- a) If, at any time during the validity period of this warranty, the purchased product should not operate correctly due to component or manufacturing defects, INGETEAM undertakes to repair the product or component at the manufacturer's premises. The Manufacturer shall carry out the repair of the defective product and/or component according to the modalities described in chapter No. 3.
- b) If, at any time during the validity period of this warranty, the purchased product should not operate correctly due to component or manufacturing defects, on customer request and at the conditions described in chapters No. 3 and 5, the Manufacturer shall provide on-site technical assistance to carry out the repair of the defective product and/or component.

The decision to carry out on-site assistance in countries deemed to be at risk shall be made exclusively by INGETEAM.

### 2) WARRANTY EXCLUSIONS

- a) The warranty rights established herein shall exclude any damage and malfunction or failure of the products and/or components due to the following circumstances:
  - Accidental damages.
  - Improper use or misuse of the device.
  - Failure to comply with the installation, operating, and maintenance instructions, as described in the Installation and User and Maintenance Manuals.
  - Modifications, changes or attempted repairs not authorized by INGETEAM after-sales department.
  - Damages due to erroneous operations during the removing/installation of a part/component if not carried out by INGETEAM's personnel.
  - Faults caused by lightning, flood, fire, earthquake, war, acts of terrorism or other force majeure causes, third-party actions or any other faults differing from the standard operating conditions of the device and out of INGETEAM's control.
  - Faults caused by surges arising from the DC side of the solar generator or from the AC side of the grid.
  - Consumables or materials subject to wear and tear such as fuses, over-voltage surge arrestors, batteries, relays, micro contactors, micro switches, handles, buttons and pilot lights, or any other insignificant value components.
  - Insufficient ventilation of the devices.
  - Damage due to marine corrosion or from salty air within the environment.
  - Damage during the transportation of the device if not carried out under INGETEAM's responsibility.

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- Any shipping damages attributable to improper packaging made by the Customer shall not be covered by the warranty.
- Failure to comply with the applicable regulations.
- b) The warranty shall not cover any products whose serial number has been altered or is not clearly identifiable.
- c) Any issues relating to the aesthetic aspects of the product, unless they negatively affect its performance, as specified in the technical or commercial documentation issued by INGETEAM.
- d) The warranty shall not cover minor defects that do not affect the energy production process.
- e) Costs not included in the Warranty:
  - The transfer costs of the technical staff of INGETEAM (such as living expenses, hours/days of travel, mileage cost, hours of idle waiting and related further additional expenses, overnight stay, airfares/other fares, car hire and related further additional expenses, customs fees, taxes, etc.) shall be charged to the Customer, based on the technical assistance rates in force at the time of the request. The labor costs (at Manufacturer's premises or at the PV plant) required for repairing the equipment faults covered by the warranty shall be borne by INGETEAM.
  - The shipping costs to return the product and/or component to the Manufacturer's premises and the shipping costs from the manufacturer's premises to the delivery address of the Customer shall be borne entirely by the Customer.
  - The costs for uninstalling, handling and reinstalling the repaired or replaced product, including the disassembly or access to the same once installed, shall be borne by the Customer.
  - The costs for handling the product, necessary to perform the repair activities, e.g. in order to make accessible the rear side of the inverter, shall be borne by the Customer.
- f) Warranty rights shall be suspended and may not be claimed in any way if the Customer fails to pay all or part of the product and/or component for which a warranty service has been requested.
- g) Any other rights not explicitly described herein are excluded from the warranty.

In case of products and/or components installed inside the European Union (EU) territory, the Directive 1999/44/CE of the European Parliament will be applied according to the respective applicable transposition.

### 3) WARRANTY TERMS AND CLAIM PROCEDURE

The warranty rights can be exercised during the warranty period (according to Table 1 and/or Order Confirmation) and immediately upon detecting any anomalies, except in case of visible defects, in which case the claim shall be submitted within a maximum of 7 days from the date of receipt of the products and/or components and always prior to their installation.

Any Customers or users of products that have purchased directly by INGETEAM who decide to exercise their warranty rights as stated in this document and within the above-mentioned validity periods should proceed as follows:

- a) Immediately notify in writing the After-Sales Dept. of INGETEAM Photovoltaic Division by the 'Repair Request Form' (Annex 'E'), duly filled in and signed. Such documentation shall be sent to the e-mail address of the Technical Assistance Dept. of the country of reference.

Upon receiving the claim, INGETEAM After-Sales Dept. shall analyze it and verify whether the request is covered by the warranty terms described herein, and shall inform the Customer of the procedures to follow.

If the claim is covered by the warranty terms, INGETEAM shall authorize the customer to return the product and/or component to be repaired at the manufacturer's premises. INGETEAM shall repair the product and/or component within a maximum period, whenever reasonably possible, of 5 working days from the date of receipt of the goods. INGETEAM shall use all the means deemed necessary to reduce the maximum response time.

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If on arrival at the factory the product and/or component returned for repair is deemed to be in perfect operating conditions, INGETEAM shall communicate to the customer any costs arising from the analysis and testing procedures.

In case the defect of the product and/or component returned for repair is deemed not to be covered by the warranty, INGETEAM will carry out the needed repairs, only after having informed the Customer by sending a quotation for the repair costs and having received the Customer's formal acceptance of such quotation.

Any repair and/or replacement of a product and/or component does not extend the warranty period. Anyway the minimum warranty period of the repaired or replaced part shall be 1-year.

- b) Immediately notify in writing the After-Sales Dept. of INGETEAM Photovoltaic Division by the 'On-Site Technical Assistance Request Form' (Annex 'L'), duly filled in and signed. Such documentation shall be sent to the e-mail address of the Technical Assistance Dept. of the country of reference.

Upon receiving the claim, INGETEAM After-Sales Dept. shall analyze it and verify whether the request is covered by the warranty terms described herein, and shall inform the Customer of the procedures to follow.

If the claim is covered by the warranty terms, INGETEAM shall provide on-site assistance in order to repair or replace the faulty product and/or component. INGETEAM shall provide on-site technical assistance within a maximum period, whenever reasonably possible, of 10 working days (excluding travel days) starting from the date of receipt of the 'Technical Assistance Request Form' (Annex 'L'), duly filled in and signed by the Customer. INGETEAM shall use all the means deemed necessary to reduce the maximum response time. INGETEAM shall provide the spare parts from its own stock after that the Customer has signed the 'Replacement Request Form' (Annex 'P'). In this case the Customer shall return the replaced part to INGETEAM; failure to return the replaced product and/or component within 10 (ten) calendar days will authorize INGETEAM to invoice the product and/or component supplied as replacement.

In order to receive on-site service within 2 working days, whenever reasonably possible, the customer must have previously purchased the spare parts recommended by INGETEAM and shall make them available at the site where the product and/or component that has given rise to the claim is installed. INGETEAM will use the spare parts previously purchased by the Customer and already stored at the Customer site to repair or replace the faulty product and/or component. If the spare parts are not available because are not included among those recommended by INGETEAM and previously purchased by the Customer, INGETEAM shall provide the spare parts from its own stock after that the Customer has signed the 'Replacement Request Form' (Annex 'P'). In this case the Customer shall return the replaced part to INGETEAM; failure to return the replaced product and/or component within 10 (ten) calendar days will authorize INGETEAM to invoice the product and/or component supplied as replacement.

The Customer will return his own product and/or component replaced at the manufacturer's premises. INGETEAM shall replace or repair the returned product and/or component. In case the defect of the product and/or component returned for repair is deemed not to be covered by the warranty, INGETEAM will carry out the needed repairs, only after having informed the Customer by sending a quotation for the repair costs and having received the Customer's formal acceptance of such quotation.

The on-site assistance shall be carried out by qualified and authorized personnel only. In case of on-site intervention by INGETEAM's qualified personnel, the Customer shall appoint a person in charge of facilitating the safe access of INGETEAM's technicians without delay to the site of installation of the products. The presence of the designated person appointed by the Customer shall be a prerequisite for the provision of the service, since the resolution of the problems may require taking actions on other parts of the installation. The designated person shall also be responsible for monitoring the operations and the amount of working time employed by INGETEAM's personnel.

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Any repair and/or replacement of a product and/or component during the on-site assistance does not extend the original warranty period. Anyway the minimum warranty period of the repaired or replaced part shall be 1-year.

- c) In case the defect of the product and/or component is deemed not to be covered by the warranty all the costs for these activities shall be borne by the Customer.
- d) INGETEAM reserves the right to provide a different model of product and/or component to process the claims covered by the warranty terms, in case the original model and/or component is out of production. All the replaced products and/or components shall be the property of INGETEAM.
- e) If the faulty component/product is replaced with another one, Customer shall notify it to any relevant authority and carry out any procedure related to the replacing of components in the PV installation, if necessary.

No claims will be accepted without the appropriate request form duly filled in (Annex E, L, P) and signed by the Customer.

#### 4) LIMITATIONS OF THE MANUFACTURER'S LIABILITY

- a) INGETEAM shall not be liable to the Customer, whether directly or indirectly, in the event of failure to or delay in complying with the warranty obligations due to causes of force majeure or any other unforeseen event and beyond the control of INGETEAM. The responsibility of INGETEAM arising under these warranty terms shall be limited to the obligations stated above.
- b) INGETEAM shall be liable for any direct damages and losses suffered by the Customer or by any third parties due to a serious breach by INGETEAM of its contractual obligations, or due to product defects or actions and omissions by INGETEAM's employees or subcontractors and other people towards whom INGETEAM bears legal responsibility, up to a maximum total claimed amount, of any type, including penalties and interventions involving warranty repairs or replacements under the warranty terms offered to the Customer, equal to fifty per cent (50%) of the total price of the goods or service that originated the claim.
- c) INGETEAM shall not be liable for any indirect damages or defects, incidental or consequential, that may be suffered by the Customer or by third parties, such as loss of production, income or benefits (lucrum cessans), loss of performance or availability, replacement costs, downtime costs, labor costs, investment costs or costs of a financial type, third party claims etc.
- d) INGETEAM must be notified of any damages immediately upon their detection.
- e) INGETEAM shall not be liable for any loss of income or benefits due to Customer's failure to comply with any applicable regulations regarding replacing of components.
- f) The above limitations shall apply provided that they do not contravene the legal provisions applicable in each country with respect to product liabilities. If this occurs only for some of the clauses, the invalidity shall affect only the clauses concerned, while all other provisions remain valid. Specifically, any clause included in this warranty contravening the 1999/44/CE Directive of the European Parliament or not according to what stated in the respective applicable transposition concerning products and/or components purchased to be used inside the European Union (EU) territory will be excluded.

#### 5) TECHNICAL ASSISTANCE RATES

All the costs for the on-site activities related to the repair of faults not covered by the warranty shall be borne by the Customer and charged according to INGETEAM's technical assistance rates in force at the moment of the request.

All the costs related only to the on-site working hours required to repair the faults covered by the warranty conditions shall not be charged to the Customer, while the transfer costs of INGETEAM's technical staff (such

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as living expenses, hours/days of travel, mileage cost, hours of idle waiting and related further additional expenses, overnight stay, airfares/other fares, car hire and related further additional expenses, customs fees, taxes, etc.) shall be borne by the Customer and charged according to INGETEAM's technical assistance rates in force at the moment of the request.

The transfer costs will be referred to the nearest INGETEAM Service Centre with respect to the installation site, unless there is a need to intervene with staff from INGETEAM Italy main office and/or original manufacturer's qualified personnel for reasons of technical expertise or/and with staff from another INGETEAM Service Centre because the nearest Service Centre to the installation site is not available.

## **6) ENTRY INTO FORCE, APPLICATION AND VALIDITY OF THE WARRANTY**

This Warranty Certificate is valid starting from its issuing that will be done together with the sending of the Order Confirmation and/or Purchasing Contract signed by both parties, and shall apply to all the products sold by INGETEAM and manufactured since the issue date, and shall maintain its validity even in the event of subsequent changes and modifications.

## **7) INDUSTRIAL AND INTELLECTUAL PROPERTY**

All the technology, planning, invention, work, design, process, know-how, software, calculation, as well as the manual, method, solution, idea, improvement, modification, contribution and in general, all information or associated documentation developed or supplied by INGETEAM related to the offer, execution of the contract or incorporated in the design or functioning of the supply that implies industrial or intellectual property will always be the exclusive property of INGETEAM, since the Customer cannot avail himself of the same in his own favor or in that of third parties without the prior written consent of INGETEAM for aims other than the fulfilment of the contract, as with the functioning and maintenance of the supply.

## **8) APPLICABLE LEGAL JURISDICTION AND RESOLUTION OF DISPUTES**

The contract and its execution shall be regulated by the Italian law. The Vienna Convention of 1980 on the International Sale of Goods shall not apply. To resolve any disputes concerning the interpretation and execution of the contract that cannot be resolved in an amicable manner between the parties will be the task of the Courts of Ravenna, with express renunciation by the parties of their right to submit any case to the Courts in their own jurisdiction, though INGETEAM reserves the right to initiate any legal action against the Customer in the location where the same has jurisdiction.

Technical Assistance Centre (T.A.C.): Via Emilia Ponente, 232 - 48014 Castel Bolognese (RA), Italy - Tel.: +39 0546 651490.

The forms Annex E and L, the mail address to send them, are available for downloading at [www.ingeteam.it](http://www.ingeteam.it)