Sunmodule® Plus
SW 290 / 300 MONO

SOLARWORLD
REAL VALUE

Data sheet

HIGH QUALITY ENGINEERING BY SOLARWORLD

More than 40 years of technology expertise, ongoing innovation and continuous optimization create the foundation for the performance of Solarworld's high-quality modules. All production steps, from silicon to module, are established at our production sites, ensuring the highest quality for our customers every step of the way. Our modules are extremely flexible when it comes to their application and provide optimal solutions for installation and non-stop performance – worldwide.

- Especially stable, despite its low weight mechanical resilience of up to 8.5 kN/m²
- Tested in extreme weather conditions – resistance to salt spray, frost and hail-proof, resistance to ammonia, dust and sand
- PID-resistant and proven hotspot guarantee
- Highly-efficient cells (mono PERC) for the highest possible yields
- Harmonized components such as mounting systems, connector cables, inverters and energy storage systems can be delivered as complete system
- Patented drainage corners for optimized self-cleaning
- Front glass with an anti-reflective coating
- Long-term safety and guaranteed top performance – At least 97% of nominal power in the first year – 25-year linear performance warranty 20-year product warranty

High Quality Engineering by SolarWorld

VDE
Quality Tested
ID. 40045046

Sunmodule® Plus
SW 290 / 300 MONO

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PERFORMANCE UNDER STANDARD TEST CONDITIONS (STC)*

		SW 290	SW 300
Maximum power	P_{max}	290 Wp	300 Wp
Open circuit voltage	U_{oc}	39.6 V	40.0 V
Maximum power point voltage	U_{mpp}	31.9 V	32.6 V
Short circuit current	I_{sc}	9.75 A	9.83 A
Maximum power point current	I_{mpp}	9.20 A	9.31 A
Module efficiency	η_m	17.30 %	17.89 %

Measuring tolerance (P_{max}) traceable to TUV Rheinland: +/- 2% (TUV Power controlled, ID 0000039351)

*STC: 1000W/m², 25°C, AM 1.5

PERFORMANCE AT 800 W/m², NOCT, AM 1.5

		SW 290	SW 300
Maximum power	P_{max}	219.6 Wp	226.7 Wp
Open circuit voltage	U_{oc}	36.7 V	37.0 V
Maximum power point voltage	U_{mpp}	29.5 V	30.2 V
Short circuit current	I_{sc}	7.99 A	8.06 A
Maximum power point current	I_{mpp}	7.43 A	7.52 A

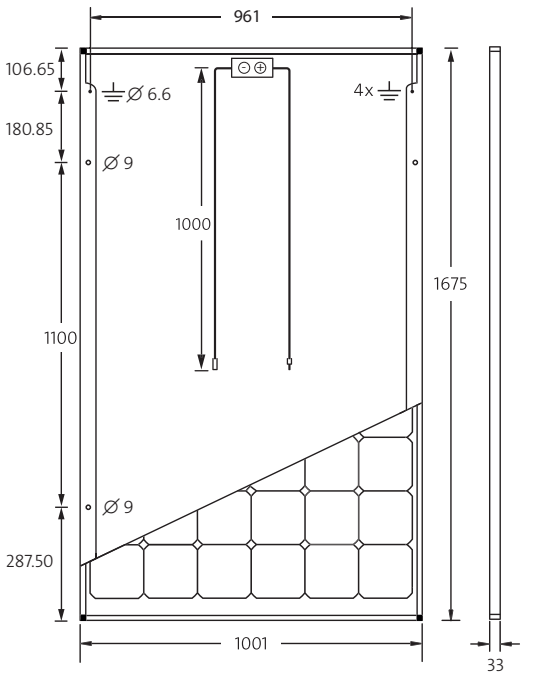
Minor reduction in efficiency under partial load conditions at 25°C: at 200 W/m², 97% (+/-3%) of the STC efficiency (1000 W/m²) is achieved.

PARAMETERS FOR OPTIMAL SYSTEM INTEGRATION

Power sorting	-0 Wp / +10 Wp
Maximum system voltage IEC	1000 V
Maximum reverse current	25 A
Number of bypass diodes	3
Operating range	-40°C - +85°C
*Maximum Design Loads (Two rail system)**	+5.4 kN/m² / -3.1 kN/m²
*Maximum Design Loads (Three rail system)**	+8.5 kN/m² / -3.1 kN/m²

*Please refer to the Sunmodule Installation instructions for the details associated with these load cases.

ISO 9001
ISO 14001
Certified



COMPONENT MATERIALS

Cells per module	60
Cell type	Mono crystalline PERC
Cell dimensions	156 mm x 156 mm
Front	Tempered safety glass (EN 12150)
Back	Film, white
Frame	Black anodized aluminum
J-Box	IP65
Connector	Amphenol H4 UTX

DIMENSIONS / WEIGHT

Length	1675 mm
Width	1001 mm
Height	33 mm
Weight	18.0 kg

THERMAL CHARACTERISTICS

NOCT	46 °C
TK I_{sc}	0.070 %/K
TK U_{oc}	-0.29 %/K
TK P_{mpp}	-0.39 %/K

ORDERING INFORMATION

Order number	*Description*
82000482	Sunmodule Plus SW 290 mono
82000432	Sunmodule Plus SW 300 mono

CERTIFICATES AND WARRANTIES

Certificates	IEC 61730	IEC 61215	UL 1703
	IEC 62716	IEC 60068-2-68	IEC 61701
Warranties	Product Warranty		20 years
	Linear Performance Guarantee		25 years

OFFICIAL DISTRIBUTOR

SunFields Europe | info@sfe-solar.com | www.sfe-solar.com

90002573 | V1 2017-01-01 EN

INGECON SUN

Power
Con transformador

50 / 60 / 70 / 80 / 90 / 100

ÓPTIMAS PRESTACIONES EN GRANDES INSTALACIONES MULTI-MEGAVATIO

Inversor trifásico para instalaciones en cubierta de medianas y grandes potencias, y para instalaciones multi-megavatio en suelo.

Máxima eficiencia a temperaturas elevadas
Avanzado sistema de seguimiento del punto de potencia máxima (MPPT). Es capaz de soportar huecos de tensión y dispone de un control de potencia activa y reactiva. Apto para instalaciones de media tensión.

Fácil instalación
No necesita elementos adicionales. Se puede desconectar manualmente de la red. Completo equipamiento de protecciones eléctricas incluido de serie.

Fácil mantenimiento
Datalogger interno para almacenamiento de datos de hasta 3 meses. Se puede controlar desde un PC remoto o *in situ* desde el teclado frontal del inversor. LEDs indicadores de estado y alarmas. Pantalla LCD. Vida útil de más de 20 años.

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.

Garantía estándar de 5 años, ampliable hasta 25 años

PROTECCIONES

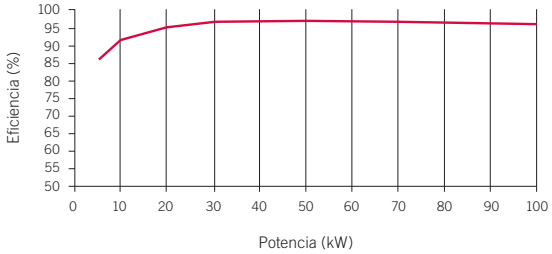
- Aislamiento galvánico entre la parte DC y AC.
- Polarizaciones inversas.
- Cortocircuitos y sobrecargas en la salida.
- Fallos de aislamiento.
- Anti-isla con desconexión automática.
- Seccionador DC.
- Fusibles DC.
- Seccionador magneto-térmico AC.
- Descargadores de sobretensiones DC y AC, tipo 2.

ACCESORIOS OPCIONALES

- Comunicación entre inversores mediante Ethernet, Bluetooth o RS-485.
- Comunicación remota GSM / GPRS.
- Monitorización de las corrientes de string del campo FV: INGECON® SUN String Control.
- Kit de puesta a tierra para los módulos FV que lo requieran.

RENDIMIENTO

INGECON® SUN 100
Vdc = 450 V



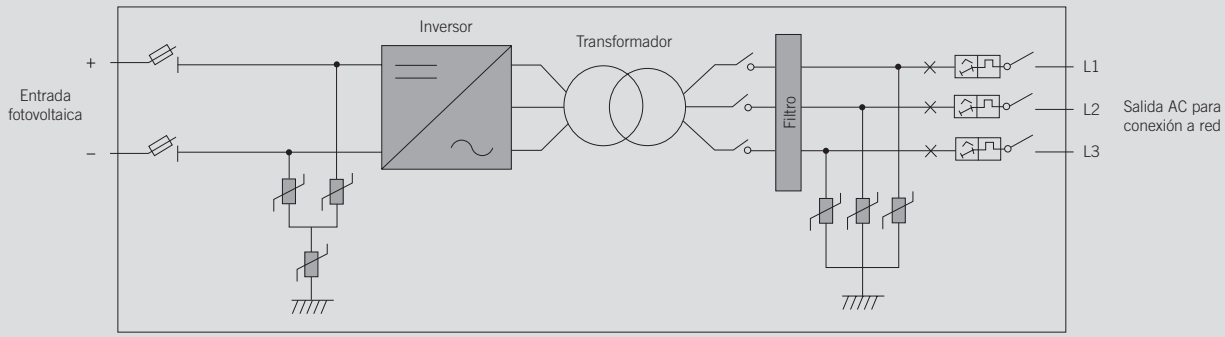
www.ingeteam.com
solar.energy@ingeteam.com

Ingeteam

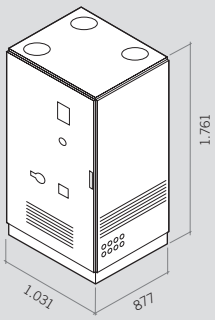
	50	60	70	80	90	100
Valores de Entrada (DC)						
Rango pot. campo FV recomendado[1]	52 - 65 kWp	63 - 78 kWp	73 - 91 kWp	83 - 104 kWp	93 - 117 kWp	104 - 130 kWp
Rango de tensión MPP	405 - 750 V	405 - 750 V	405 - 750 V	405 - 750 V	405 - 750 V	405 - 750 V
Tensión máxima[2]	900 V	900 V	900 V	900 V	900 V	900 V
Corriente máxima	130 A	156 A	182 A	208 A	234 A	260 A
Nº entradas	4	4	4	4	4	4
MPPT	1	1	1	1	1	1
Valores de Salida (AC)						
Potencia nominal[3]	55 kW	66 kW	77 kW	88 kW	99 kW	110 kW
Corriente máxima	93 A	118 A	131 A	156 A	161 A	161 A
Tensión nominal	400 V	400 V	400 V	400 V	400 V	400 V
Frecuencia nominal	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Coseno Phi[4]	1	1	1	1	1	1
Coseno Phi ajustable	Sí. Smáx=55 kVA	Sí. Smáx=66 kVA	Sí. Smáx=77 kVA	Sí. Smáx=88 kVA	Sí. Smáx=99 kVA	Sí. Smáx=110 kVA
THD[5]	<3%	<3%	<3%	<3%	<3%	<3%
Rendimiento						
Eficiencia máxima	96,3%	96,4%	97,2%	97,5%	96,9%	96,8%
Euroeficiencia	94,3%	94,7%	96,1%	96,2%	95,8%	95,7%
Datos Generales						
Refrigeración por aire	2.600 m³/h	2.600 m³/h	2.600 m³/h	2.600 m³/h	2.600 m³/h	2.600 m³/h
Consumo en stand-by[6]	30 W	30 W	30 W	30 W	30 W	30 W
Consumo nocturno	1 W	1 W	1 W	1 W	1 W	1 W
Temperatura de funcionamiento	-20ºC a +65ºC	-20ºC a +65ºC	-20ºC a +65ºC	-20ºC a +65ºC	-20ºC a +65ºC	-20ºC a +65ºC
Humedad relativa (sin condensación)	0 - 95%	0 - 95%	0 - 95%	0 - 95%	0 - 95%	0 - 95%
Grado de protección	IP20	IP20	IP20	IP20	IP20	IP20

Notas: [1] Dependiendo del tipo de instalación y de la ubicación geográfica [2] No superar en ningún caso. Considerar el aumento de tensión de los paneles 'Voc' a bajas temperaturas [3] Potencia AC hasta 40ºC de temperatura ambiente. Por cada ºC de incremento, la potencia de salida se reducirá un 1,8% [4] Para P_{AC}>25% de la potencia nominal [5] Para P_{AC}>25% de la potencia nominal y tensión según IEC 61000-3-4 [6] Consumo desde el campo fotovoltaico.
Referencias normativas: CE, EN 61000-6-2, EN 61000-6-4, EN 61000-3-11, EN 61000-3-12, EN 50178, EN 62109-1, EN 62109-2, FCC Part 15, IEC 62116, RD1699/2011, DIN V VDE V 0126-1-1, CEI 0-16, CEI 0-21, DE-AR-N 4105:2011-08, BDEW-Mittelspannungsrichtlinie:2011, A70 Terna, P.O.12.3, South Africa Grid code, IEEE929, IEC61727.

Power



Dimensiones y peso (mm)



50 / 60
900 kg.

70 / 80
1.026 kg.

90 / 100
1.162 kg.

Electronic single phase meter AS220

Electronic single phase meter for Smart Metering Applications

New requirements dependant from legislation and EU energy saving directives are dominating the European meter market. Smart Metering stands not only for the reading of electricity meters. With this approach the frequently reading of gas and water meters is included.
With the remote metering the standardization process becomes more and more important. With the adaptation of the well proven AS220 meter to the specific Smart Metering requirements, like modular communication, remote connection/disconnection, etc. the new AS220 meter match these new requirements respectively.

The meter is in accordance with the relevant DIN / IEC and MID standards.

Features

- High accuracy and stability
- DIN or BS version available
- 4-Quadrant measurement
- 4 energy and 4 demand tariffs, independently controllable
- Measurement of active, reactive and apparent demand
- Integrated tariff clock
- Time back-up with internal battery, exchangeable battery optional
- Readout of meter data according to VDEW specification by use of the EN 62056-21
- Readout of meter data without main power
- Integrated connect / disconnect relay up to 100A
- Anti-Tampering features, like
  - main and terminal cover removal detection
  - magnetic field detection
  - reverse run detection
  - always run positive measurement
- Communication module
  - WAN communication using GSM/GPRS
  - HAN communication for gas & water meter reading using wireless M-Bus, 868MHz
- Installation support features
- Optical interface acc. EN62056-21
- Use of OBIS identifier system (EN62056-61)
- Log file for registration of all events with time and date stamps
- Load profile for billing data
- Measuring of instantaneous values
- Power quality measurement
- Installation support features
- 1 electronic S0 output (optional)
- User friendly reading, setting and programming tool *alphaSET*

elster

Technical Data

Modifications or deviations are reserved R 1.3

Nominal voltage	2-wire, 1 system	220 .. 240V (-20% .. 15%)
Nominal frequency		50 / 60Hz, +/-5%
Nominal / maximum current	Continuous current Short duration	DC: 5(60)A, 5(80)A, 5(100)A DC: 7000A for 2 cycles
Starting current		DC: < 16mA
Accuracy	EN 62053-21 EN 50470-1 and 3	Class 2 or 1 Class A or B acc. MID
Power supply	Nominal voltage	220 … 240V (-20%..+15%)
1 electronic output	S0 standard	Acc. EN 62053-21
Interfaces	Optical interface	max 9600 Baud, EN62056-21 max. 9600 Baud, EN62056-21
Comms module	Electrical interface to E-meter WAN communication LAN communication	EN 62056-21 protocol, 9600 Baud AM100 - GSM/GPRS Transparent mode, EN62056-21 DLMS/COSEM protocol Wireless M-Bus or wired M-Bus acc. EN 13757-4
Internal tariff source	4 tariffs 4 seasons weekday dependent tariff scheme	Acc. EN 62054-21
Integrated connect/disconnect relay		Up to 100A Up to 10.000 switching cycles
Time backup for RTC	Battery Accuracy	> 10 years continuous operation at 25°C shelf life of 5 years < 5ppm
Time backup for readout without main power	Supercap Internal battery Additional exchangeable battery	0,5 days 5 years, depending on number of readouts 10 years, depending on number of readouts
Temperature condition	Operating temperature Storage temperature Humidity Temperature coefficient	-40°C…+70°C -40°C...+80°C 0 to 100% rel. humidity, non-condensing 0,01% per °C (PF=1 and PF=0,5)
EMC compatibility	Surge withstand (1,2/50µs) Dielectric test	6kV, R_{source} = 2Ohm 12kV, R_{source} = 40Ohm *) 4kV, 1min, 50Hz, MID E2
Power consumption	Without module Including module	< 0,7W, < 8VA
Connections	Direct connected meter Auxiliary connections	Terminals: Ø=9,0mm Terminals: Ø=4,0mm
Housing	Dimensions Protection class Material	DIN 43857 part 1, BS 7856 Housing: IP54, terminal block: IP31 Polycarbonate, non-inflammable, self-extinguishing synthetic material, recyclable, MID M1
Weight		<0,6 kg

*) only between main terminals

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A4: Especificaciones del cable conductor [33]

BAJA TENSIÓN
CA: 0,6/1kVCC:1,8 k

Norma de referencia EA 0038 / UTE C32-502 / TÜV 2Pfg 1169 / 08.2007

TÜVRheinland®

TOPSOLAR **PV ZZ-F (AS)**

Cables para instalaciones solares fotovoltaicas

Conductor: Cobre electrolítico estañado, clase 5 (flexible) según EN 60228

Aislamiento: Goma libre de halógenos tipo EI6

Cubierta: Goma ignifugada tipo EM8, libre de halógenos y con baja emisión de humos y gases corrosivos en caso de incendio.

Aplicaciones: Cables flexibles aptos para servicios móviles y para instalación fija. Adecuados para la conexión entre paneles fotovoltaicos y desde los paneles al inversor de corriente contínua a alterna. Cables de alta seguridad (AS): no propagadores del incendio, con baja emisión de humos y libres de halógenos. Aptos para instalaciones interiores y exteriores.

Norma Nacional/ Europea: UNE-EN 60332-1 / UNE-EN 50266 / UNE-EN 50267-1 / UNE-EN 50267-2 / UNE-EN 61034

Norma Internacional: IEC 60332-1 / IEC 60332-3 / IEC 60754-1 / IEC 60754-2 / IEC 61034