



HI-M^o ILO

535-550W

High Efficiency Half-Cell Mono PERC Module



Half-cut cell technology
New circuit design,
lower internal current,
lower Rs loss



Special circuit design
with much lower hot spot
temperature



Fire safety
(Class C, certified to
TÜV Rheinland and test
standards)



Resistance to power
attenuation passed TÜV
system voltage endurance
test

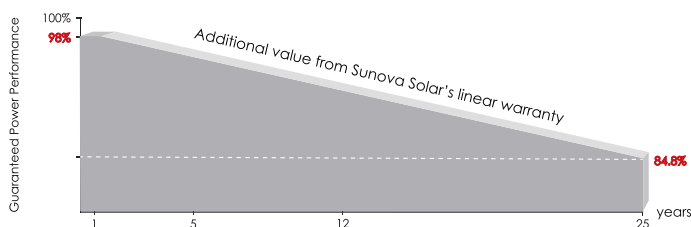


Resistance to salt-spray
corrosion
(IEC61701, certified to
TÜV test standard)



100% triple EL test
enabling remarkable
reduction of hidden crack
rate of modules

LINEAR PERFORMANCE WARRANTY



15 YEARS Product quality & process guarantee

25 YEARS Linear power guarantee

0.55% Annual Degradation Over 25 years

COMPREHENSIVE CERTIFICATES



ISO 9001: Quality Management System

ISO 14001: Environmental Management System Standard

OHSAS 18001: International Occupational Health and
Safety Assessment System Standard

PERFORMANCE INSURANCE



SS-550-72MDH 144 cells

ELECTRIC CHARACTERISTICS

Model of modules	SS-535-72MDH		SS-540-72MDH		SS-545-72MDH		SS-550-72MDH	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum power — P _{mp} (W)	535	398	540	402	545	406	550	410
Open-circuit voltage — V _{oc} (V)	49.34	46.57	49.42	46.65	49.51	46.74	49.60	46.82
Short-circuit current — I _{sc} (A)	13.79	11.14	13.85	11.19	13.94	11.27	14.04	11.35
Maximum power voltage — V _{mp} (V)	40.66	37.92	40.71	38.11	40.76	38.19	40.83	38.25
Maximum power current — I _{mp} (A)	13.16	10.51	13.27	10.56	13.38	10.64	13.48	10.73
Module efficiency — η _m (%)	20.7%		20.9%		21.1%		21.3%	
Power tolerance (W)	(0,+5)							
Maximum system voltage (V)	1500							
Maximum rated fuse current (A)	25							
Current operating temperature (°C)	-40~+85 °C							

STC (Standard Testing Conditions): Irradiance 1000W/m², Cell Temperature 25 °C, Spectra at AM1.5

NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m², Ambient Temperature 20°C, Spectra at AM1.5, Wind at 1m/s

STRUCTURAL CHARACTERISTICS

Module dimensions (L*W*H)	2279 x 1134 x 35 mm
Weight	27.6 kg
Number of cells	144 cells
Cell	PERC Monocrystalline 182x91 mm
Glass	Tempered, 3.2 mm AR, High transmittance, Low iron
Frame	Anodized aluminum alloy
Junction box	IP68
Output wire	4.0 mm ² , wire length: 300mm
Connector	MC4 Compatible
Mechanical load	5400 Pa

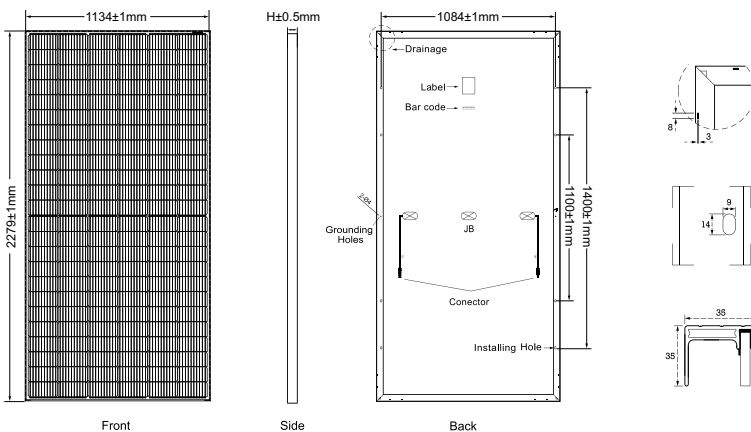
TEMPERFORMANCE RATINGS

Temperature coefficient (P_{max})	-0.35 %/°C
Temperature coefficient (V_{oc})	-0.27 %/°C
Temperature coefficient (I_{sc})	+0.048 %/°C
Nomial operating cell temperature	45±2 °C

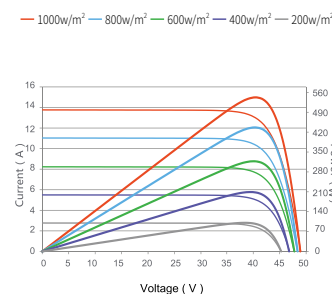
PACKAGING CONFIGURATION

Container	40HQ
Quantity/pallet	31
Pallets/container	20
Quantity/container	620

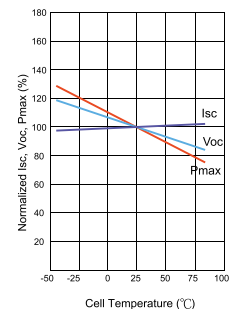
MODULE DIMENSIONS (mm)



Current-Voltage & Power-Voltage Curves (540W)



Temperature Dependence of I_{sc} , V_{oc} , P_{max}



Web: www.sunova-solar.com

E-mail: info@sunova-solar.com

* Sunova Solar Technology Co., Ltd reserves the right to make any adjustment to the information described herein without further notice. Please contact our company to use the latest version for contract.

SUN2000-50KTL-M0

Smart String Inverter



Smart

Smart I-V Curve Diagnosis supported



Efficient

Max. efficiency 98.7%



Safe

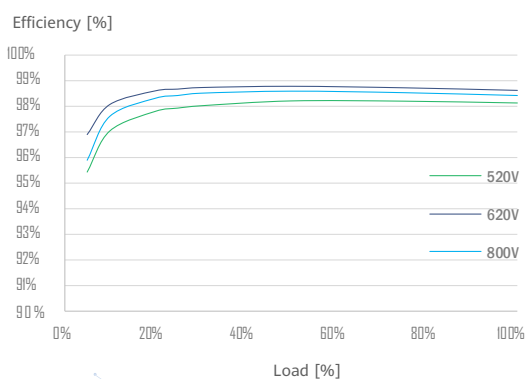
Fuse free design



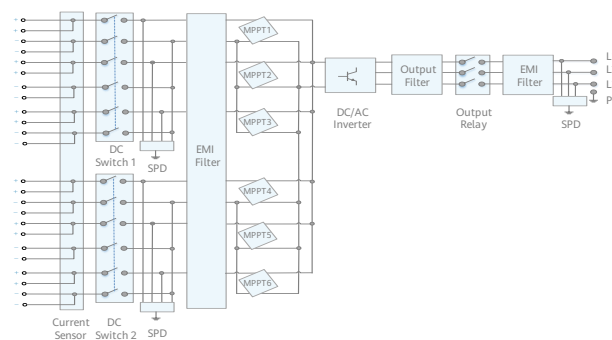
Reliable

Type II surge arresters for DC & AC

Efficiency Curve



Circuit Diagram



SUN2000-50KTL-M0

SUN2000-50KTL-M0

Technical Specification

Technical Specification	SUN2000-50KTL-M0
-------------------------	------------------

Efficiency	
Max. Efficiency	98.7%
European Efficiency	98.5%

Input	
Max. Input Voltage	1,100 V
Max. Current per MPPT	22 A
Max. Short Circuit Current per MPPT	30 A
Start Voltage	200 V
MPPT Operating Voltage Range	200 V ~ 1,000 V
Rated Input Voltage	600 V
Number of Inputs	12
Number of MPP Trackers	6

Output	
Rated AC Active Power	50,000 W
Max. AC Apparent Power	55,000 VA
Max. AC Active Power ($\cos\phi=1$)	55,000 W
Rated Output Voltage	220 V / 380 V, 230 V / 400 V, default 3W + N + PE; 3W + PE optional in settings
Rated AC Grid Frequency	50 Hz / 60 Hz
Rated Output Current	76 A @380 V / 72.2 A @400 V
Max. Output Current	83.6 A @380 V / 79.4 A @400 V
Adjustable Power Factor Range	0.8 LG ... 0.8 LD
Max. Total Harmonic Distortion	<3%

Protection	
Input-side Disconnection Device	Yes
Anti-islanding Protection	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Monitoring	Yes
DC Surge Arrester	Type II
AC Surge Arrester	Type II
DC Insulation Resistance Detection	Yes
Residual Current Monitoring Unit	Yes

Communication	
Display	LED Indicators, Bluetooth + APP
RS485	Yes
USB	Yes
Monitoring BUS (MBUS)	Yes

General Data	
Dimensions (W x H x D)	1,075 x 555 x 300 mm (42.3 x 21.9 x 11.8 inch)
Weight (with mounting plate)	74 kg (163.1 lb.)
Operating Temperature Range	-25°C ~ 60°C (-13°F ~ 140°F)
Cooling Method	Natural Convection
Max. Operating Altitude	4,000 m (13,123 ft.)
Relative Humidity	0 ~ 100%
DC Connector	Amphenol Helios H4
AC Connector	Waterproof PG Terminal + OT Connector
Protection Degree	IP65
Topology	Transformerless

Standard Compliance (more available upon request)	
Certificate	EN 62109-1/-2, IEC 62109-1/-2, EN 50530, IEC 62116, IEC 62910, IEC 60068, IEC 61683, IRR-DCC-MV, G99
Grid Code	IEC 61727, G59/3, DEWA, NRS 097-2-1, IEEE 1547, SASO, DEWA



Smart

Smart zero export control design



Simple

Easy to install on site



Reliable

Safety by lightning protection module

Technical Specification	SmartLogger3000A03EU	SmartLogger3000A01EU
Device Management		
Max. Number of Connected Devices	80	
Communication Interface		
WAN	WAN x 1, 10 / 100 / 1000 Mbps	
LAN	LAN x 1, 10 / 100 / 1000 Mbps	
RS485	COM x 3, 1200 / 2400 / 4800 / 9600 / 19200 / 115200 bps, 1000 m	
MBUS	MBUS x 1, 115.2 kbps, Compatible with PLC	No MBUS Communication Interface
2G / 3G / 4G ¹	LTE(FDD) : B1,B2,B3,B4,B5,B7,B8,B20 DC-HSPA+/HSPA+/HSPA/UMTS : 850/900/1900/2100 MHz GSM/GPRS/EDGE: 850/900/1800/1900 MHz ²	
Digital / Analog Input / Output	DI x 4, DO x 2, AI x 4	
Active DO	12V, 100mA (connection with relay, sensor)	
Communication Protocol		
Ethernet	Modbus-TCP, IEC 60870-5-104	
RS485	Modbus-RTU, IEC 60870-5-103 (standard), DL / T645	
Interaction		
LED	LED Indicator x 3 – RUN, ALM, 4G	
WEB	Embedded Web	
USB	USB 2.0 x 1	
APP	Communication by WLAN for Commissioning	
Environment		
Operating Temperature Range	-40°C ~ 60°C (-40°F ~ 140°F)	
Storage Temperature	-40°C ~ 70°C (-40°F ~ 158°F)	
Relative Humidity (Non-condensing)	5% ~ 95%	
Max. Operating Altitude	4,000 m (13,123 ft.)	
Electrical		
AC Power Supply	100 V ~ 240 V, 50 Hz / 60 Hz	
DC Power Supply	12 V / 24 V	
Power Consumption	Typical 8 W, Max. 15 W	
Mechanical		
Dimensions (W x H x D)	225 x 160 x 44 mm (8.9 x 6.3 x 1.7 inch, without mounting ears and antenna)	
Weight	2 kg (4.4 lb.)	
Protection Degree	IP20	
Installation Options	Wall Mounting, DIN Rail Mounting, Tabletop Mounting	

^{*1}: When putting inside metal box, extended antenna will be needed.

^{*2}: For recommended carriers list and details on supported frequencies, please contact local distributors.



Power Quality Analyser

UMG 103-CBM

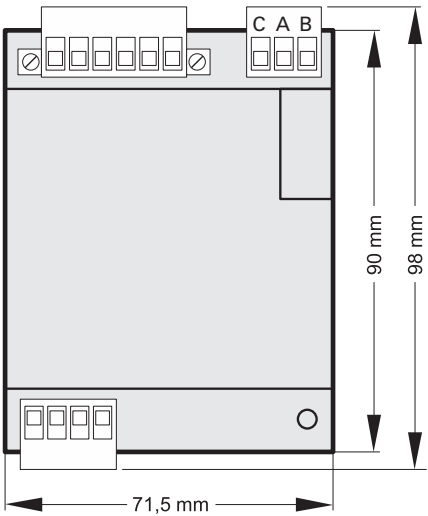
(Firmware 2.0)

Data sheet

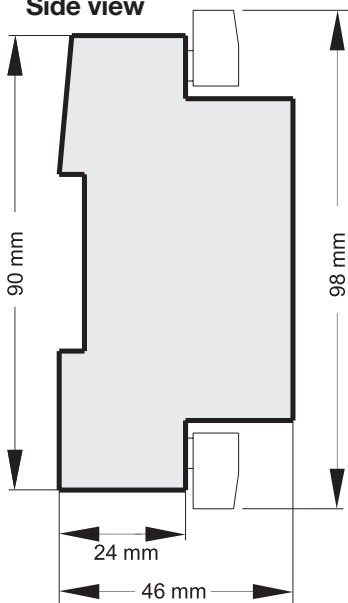
DEVICE VIEWS

UMG 103-CBM

Front view



Side view



TECHNICAL DATA

General	
Net weight (with attached connectors)	approx. 200 g (0.44 lb)
Device dimensions	h = 98 mm, w = 71.5 mm d= 46 mm, (h = 3.86 in, w = 2.82 in, d = 1.18 in)

Transport and storage	
The following information applies for devices that are transported or stored in their original packaging.	
Free fall	1 m (39.37 in)
Temperature	-20 °C to +70 °C (-4 °F to 158 °F)

Ambient conditions during operation	
The device • weatherproof and use stationary! • fulfills the conditions in accordance with DIN IEC 60721-3-3 • has protection class II according to IEC 60536 (VDE 0106, part 1) and does not require a protective earth connection.	
Working temperature range	-25 °C .. +60 °C (-13° F.to 140° F)
Relative humidity	5 to 95 % (at 25 °C/77 °F) without condensation
Operational altitude	0 .. 2000 m (1,24 mi) above sea level
Degree of pollution	2
Housing flammability class	UL94V-0
Installation position	any
Fixing/mounting	35 mm top hat rail (according to IEC/EN 60999-1, DIN EN 50022)
Stress by impact	2 joules, IK07 according to IEC / EN61010-1: 2010
Ventilation	Forced ventilation is not required.
Protection against ingress of solid foreign bodies and water	IP20 according to EN60529 September 2000, IEC60529:1989

Measurement data recording	
Memory (Flash)	4 MB
Battery (soldered)	BR 1632, 3 V
Typical life expectancy	8 - 10 years

Supply voltage	
The device gets the supply voltage from the measuring voltage!	
Supply from single phase	115 - 277 V (+-10%), 50/60 Hz
Supply from three phases	80 - 277 V (+-10%), 50/60 Hz
Power consumption	max. 1.5 VA

Voltage measurement	
3-phase, 4-conductor systems with rated voltages (L-N/L-L)	max. 277 V/480 V
Networks	Measurement in TT and TN networks
Rated surge voltage	4 kV
Protection of voltage measurement	1 - 10 A Trip characteristic B, (With IEC / UL approval)
Overvoltage category	300 V CAT III
Resolution	0.01 V
Crest factor	2 (related to 240 Vrms)
Sampling rate	5.4 kHz
Frequency range of the fundamental oscillation - resolution	45 Hz .. 65 Hz 0.01 Hz
Fourier analysis	1.-40. Harmonic

Current measurement	
Nominal current	5 A
Rated current	6 A
Crest factor	2 (related to 6 Arms)
Resolution	0.1 mA
Measuring range	0.005 .. 6 Arms
Overvoltage category	300 V CAT II
Rated surge voltage	2 kV
Power consumption	approx. 0.2 VA (Ri=5 mOhm)
Overload for 1 sec.	60 A (sinusoidal)
Sampling rate	5.4 kHz

Terminal connection capacity	
Conductors to be connected. Only one conductor can be connected per terminal!	
Single core, multi-core, fine-stranded	0.08 - 2.5 mm ² , AWG 28-12
Tightening torque	max. 0.5 Nm (0.74 ft lb)
Stripping length	min. 8 mm (0.32 in)

RS485 interface	
Protocol, modbus RTU	Modbus RTU/Slave
Transfer rate	9.6 kbps, 19.2 kbps, 38.4 kbps, 57.6 kbps, 15.2 kbps

Subject to technical changes.

The content of our documentation has been compiled with the utmost care and is based on the latest information available to us. Nevertheless, we would like to point out that the updating of this document cannot always be performed simultaneously with the further technical development of our products. Information and specifications can be changed at any time.

Please consult www.janitza.com for information on the current version.

Janitza electronics GmbH
Vor dem Polstück 6
35633 Lahnau, Germany
Support Tel. +49 6441 9642-22
Fax +49 6441 9642-30
e-mail: info@janitza.com
www.janitza.com

Janitza®

SUN2000-60KTL-M0 Smart PV Controller



Smart

12 strings intelligent monitoring



Efficient

Max. efficiency 98.7%



Safe

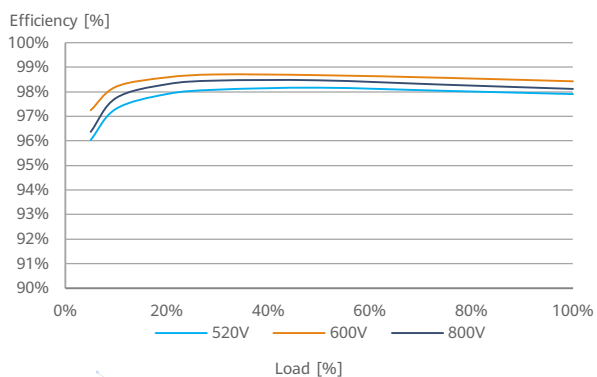
Fuse free design



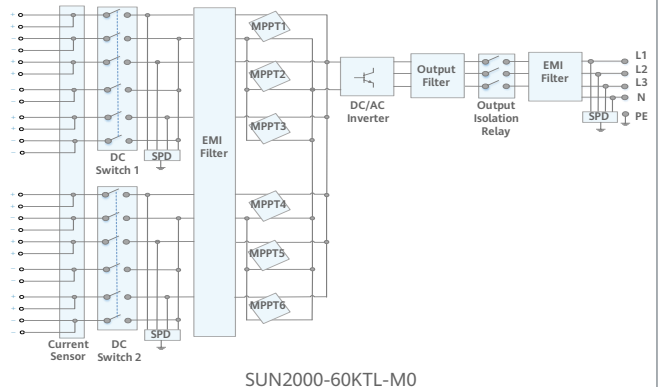
Reliable

Type II surge arresters for DC & AC

Efficiency Curve



Circuit Diagram



SUN2000-60KTL-M0

Technical Specification

Technical Specification	SUN2000-60KTL-M0
-------------------------	------------------

Efficiency	
Max. efficiency	98.9% @480 V; 98.7% @380 V / 400 V
European efficiency	98.7% @480 V; 98.5% @380 V / 400 V

Input	
Max. Input Voltage ¹	1,100 V
Max. Current per MPPT	22 A
Max. Short Circuit Current per MPPT	30 A
Start Voltage	200 V
MPPT Operating Voltage Range ²	200 V ~ 1,000 V
Rated Input Voltage	600 V @380 Vac / 400 Vac; 720 V @480 Vac
Number of MPP trackers	6
Max. input number per MPP tracker	2

Output	
Rated AC Active Power	60,000 W
Max. AC Apparent Power	66,000 VA
Max. AC Active Power (cosφ=1)	66,000 W
Rated Output Voltage	220 V / 380 V, 230 V / 400 V, default 3W + N + PE; 3W + PE optional in settings; 277 V / 480 V, 3W + PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Rated Output Current	91.2 A @380 V, 86.7 A @400 V, 72.2 A @480 V
Max. Output Current	100 A @380 V, 95.3 A @400 V, 79.4 A @480 V
Adjustable Power Factor Range	0.8 leading... 0.8 lagging
Max. Total Harmonic Distortion	< 3%

Protection	
Input-side Disconnection Device	Yes
Anti-islanding Protection	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Monitoring	Yes
DC Surge Arrester	Type II
AC Surge Arrester	Type II
DC Insulation Resistance Detection	Yes
Residual Current Monitoring Unit	Yes

Communication	
Display	LED indicators; WLAN adaptor + FusionSolar APP
RS485	Yes
USB	Yes
Monitoring BUS (MBUS)	Yes (isolation transformer required)
Smart Dongle-4G	4G / 3G / 2G via Smart Dongle – 4G (Optional)

General Data	
Dimensions (W x H x D)	1,075 x 555 x 300 mm (42.3 x 21.9 x 11.8 inch)
Weight (with mounting plate)	74 kg (163.1 lb.)
Operating Temperature Range	-25°C ~ 60°C (-13°F ~ 140°F)
Cooling Method	Natural Convection
Max. Operating Altitude	4,000 m (13,123 ft.)
Relative Humidity	0 ~ 100%
DC Connector	Amphenol Helios H4
AC Connector	Waterproof PG Terminal + Terminal Clamp
Protection Degree	IP65
Topology	Transformerless
Nighttime Power Consumption	< 2 W

Standard Compliance (more available upon request)	
Certificate	EN 62109-1/-2, IEC 62109-1/-2, EN 50530, IEC 62116, IEC 60068, IEC 61683
Grid Connection Standards	IEC 61727, VDE-AR-N4105, VDE 0126-1-1, BDEW, VDE 4120, UTE C 15-712-1, CEI 0-16, CEI 0-21, RD 661, RD 1699, P.O. 12.3, RD 413, EN-50438-Turkey, EN-50438-Ireland, C10/11

^{*1} The maximum input voltage is the upper limit of the DC voltage. Any higher input DC voltage would probably damage inverter.
^{*2} Any DC input voltage beyond the operating voltage range may result in inverter improper operating.

SUN2000-30/36/40KTL-M3 Smart PV Controller



Smart

8 strings intelligent monitoring



Efficient

Max. efficiency 98.7%



Safe

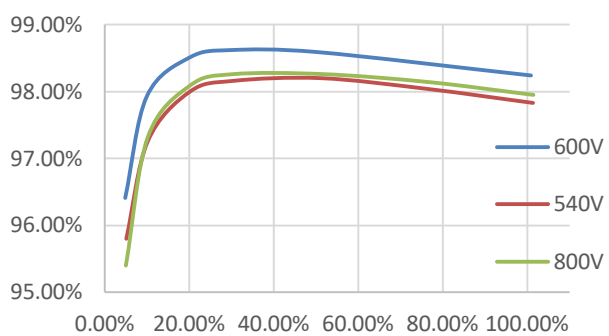
Fuse free design



Reliable

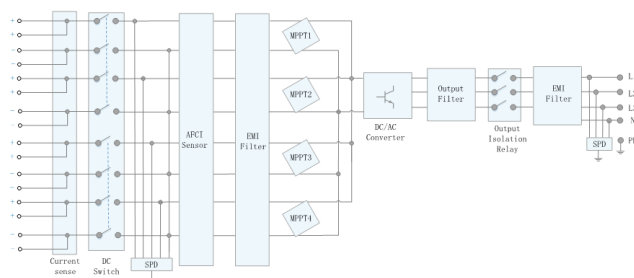
Type II surge arresters for DC & AC

Efficiency Curve



SUN2000-30/36/40KTL-M3

Circuit Diagram



SUN2000-30/36/40KTL-M3

Technical Specification

Technical Specification		SUN2000-30KTL-M3	SUN2000-36KTL-M3	SUN2000-40KTL-M3
Efficiency				
Max. Efficiency	98.7%			
European Efficiency	98.4%			
Input				
Max. Input Voltage ¹	1,100 V			
Max. Current per MPPT	26 A			
Max. Short Circuit Current per MPPT	40 A			
Start Voltage	200 V			
MPPT Operating Voltage Range ²	200 V ~ 1000 V			
Rated Input Voltage	600 V			
Number of Inputs	8			
Number of MPP Trackers	4			
Output				
Rated AC Active Power	30,000 W	36,000 W	40,000 W	
Max. AC Apparent Power	33,000 VA ³	40,000 VA	44,000 VA	
Rated Output Voltage	230 Vac / 400 Vac / 480 Vac, 3W/N+PE			
Rated AC Grid Frequency	50 Hz / 60 Hz			
Rated Output Current	43.3 A	52.0 A	57.8 A	
Max. Output Current	47.9 A	58.0 A	63.8 A	
Adjustable Power Factor Range	0.8 LG ... 0.8 LD			
Max. Total Harmonic Distortion	< 3%			
Protection				
Input-side Disconnection Device	Yes			
Anti-islanding Protection	Yes			
AC Overcurrent Protection	Yes			
DC Reverse-polarity Protection	Yes			
PV-array String Fault Monitoring	Yes			
DC Surge Arrester	Yes			
AC Surge Arrester	Yes			
DC Insulation Resistance Detection	Yes			
Residual Current Monitoring Unit	Yes			
Arc Fault Protection	Yes			
Ripple Receiver Control	Yes			
Integrated PID Recovery ⁴	Yes			
Communication				
Display	LED Indicators, Integrated WLAN + FusionSolar APP			
RS485	Yes			
Smart Dongle	WLAN/Ethernet via Smart Dongle-WLAN-FE (Optional) 4G / 3G / 2G via Smart Dongle-4G (Optional)			
Monitoring BUS (MBUS)	Yes (Isolation Transformer required)			
General Data				
Dimensions (W x H x D)	640 x 530 x 270 mm (25.2 x 20.9 x 10.6 inch)			
Weight (with mounting plate)	43 kg (94.8 lb)			
Operating Temperature Range	-25 ~ + 60 °C (-13 °F ~ 140 °F)			
Cooling Method	Natural Convection			
Max. Operating Altitude	4,000 m (13,123 ft.) (Derating above 2000 m)			
Relative Humidity	0% RH ~ 100% RH			
DC Connector	Staubli MC4			
AC Connector	Waterproof Connector + OT/DT Terminal			
Protection Degree	IP 66			
Topology	Transformerless			
Nighttime Power Consumption	≤ 5.5W			
Optimizer Compatibility				
DC MBUS Compatible Optimizer	SUN2000-450W-P			
Standard Compliance (more available upon request)				
Safety	EN 62109-1/-2, IEC 62109-1/-2, EN 50530, IEC 62116, IEC 60068, IEC 61683			
Grid Connection Standards	IEC 61727, VDE-AR-N4105, VDE 0126-1-1, BDEW, G59/3, UTE C 15-712-1, CEI 0-16, CEI 0-21, RD 661, RD 1699, P.O. 12.3,RD 413, EN-50438-Turkey, EN-50438-Ireland, C10/11, MEA, Resolution No.7, NRS 097-2-1, AS/NZS 4777.2, DEWA			

1. The maximum input voltage is the upper limit of the DC voltage. Any higher input DC voltage would probably damage inverter.

2. Any DC input voltage beyond the operating voltage range may result in inverter improper operating.

3. For Austria, German, Belgium & Ukraine the Max. AC Apparent Power will not exceed 30,000 VA (with regard to grid code: VDE-AR-N-4105, C10/11 & Austria)

4. SUN2000-30~40KTL-M3 raises potential between PV- and ground to above zero through integrated PID recovery function to recover module degradation from PID. Supported module types include: P-type (mono, poly), N-type (nPERT, HIT)