

SUN2000-50KTL-M3 Smart PV Controller



Higher Yields

Up to 30% More Energy
with Optimizer



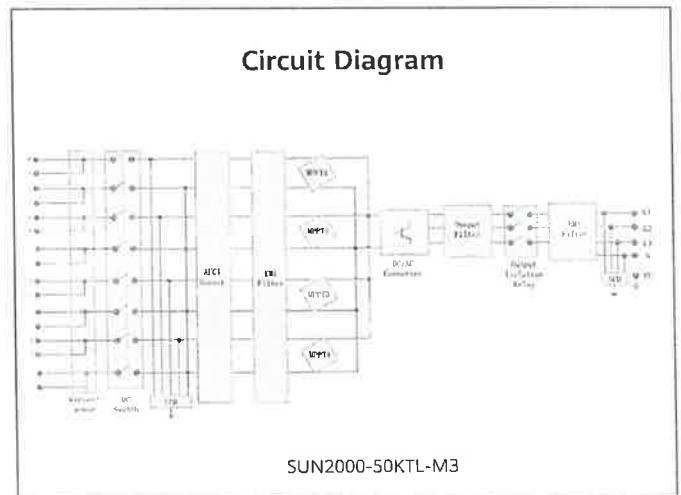
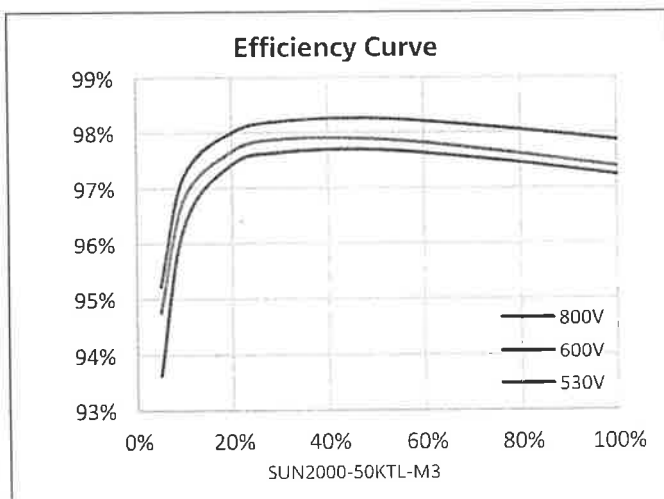
Active Safety

AI Powered
Active Arcing Protection



Flexible Communication

WLAN, Fast Ethernet, 4G
Communication Supported



Technical Specification

SUN2000-50KTL-M3

Efficiency

Max. Efficiency	98.5%
European Efficiency	98.0%

Input

Max. Input Voltage ¹	1,100 V
Max. Current per MPPT	30 A
Max. Current per Input	20 A
Max. Short Circuit Current per MPPT	40 A
Start Voltage	200 V
MPPT Operating Voltage Range ²	200 V ~ 1,000 V
Rated Input Voltage	600 V
Number of Inputs	8
Number of MPP Trackers	4

Output

Rated AC Active Power	50,000 W
Max. AC Apparent Power	55,000 VA
Max. AC Active Power (cosφ=1)	55,000 W
Rated Output Voltage	400 Vac / 480 Vac, 3W+(N) + PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Rated Output Current	72.2 A @ 400Vac, 60.1 A @ 480Vac
Max. Output Current	79.8 A @ 400Vac, 66.5 A @ 480Vac
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
Arc Fault Protection	Yes
Ripple Receiver Control	Yes
Integrated PID Recovery ³	Yes

Communication

Display	LED Indicators, Bluetooth + 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)

Optimizer Compatibility

DC MBUS Compatible Optimizer	MERC-1100/1300W-P
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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)	49 kg (108.1 lb)
Operating Temperature Range	-25°C ~ 60°C (-13°F ~ 140°F)
Cooling Method	Smart Air Cooling
Max. Operating Altitude	4,000 m (13,123 ft.)
Relative Humidity	0% RH ~ 100% RH
DC Connector	Amphenol HH4
AC Connector	Waterproof Connector + OT/DT Terminal
Protection Degree	IP 66
Topology	Transformerless
Nighttime Power Consumption	≤ 5.5W

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, 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. SUN2000-30-50KTL-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)
4. 50KTL Platform only supports C&I Optimizer (MERC-1100/1300W-P). The current version does not support this function and it can be upgraded to optimizer version via new inverter software version (Dec 30th, 2022).
Refer to [HTTP://solar.huawei.com/](http://solar.huawei.com/)

Vertex S+

DUAL GLASS N type i-TOPCOn MODULE

PRODUCT: TSM-NEG9R.28

POWER RANGE: 430-460 W

460 W

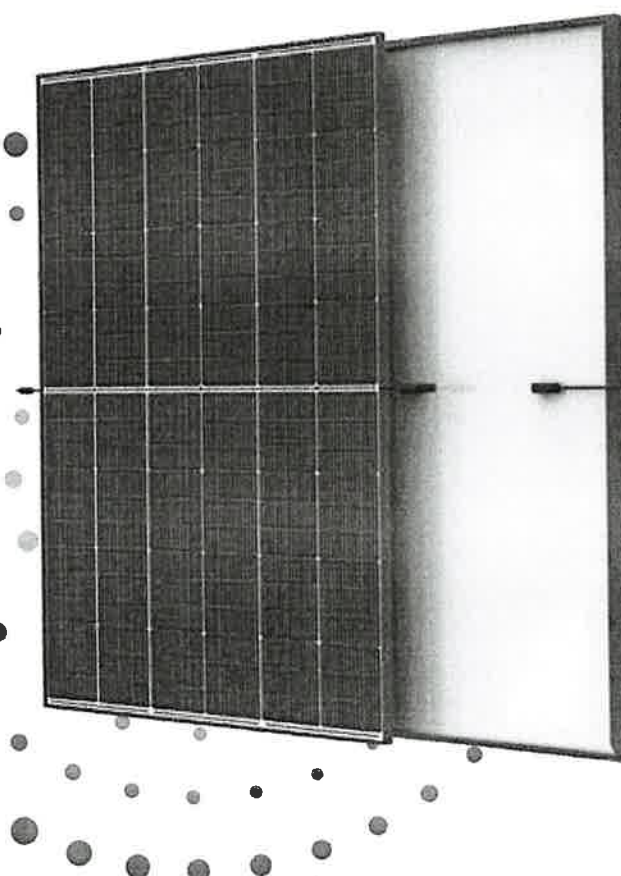
MAXIMUM POWER OUTPUT

0/+5 W

POSITIVE POWER TOLERANCE

23.0 %

MAXIMUM EFFICIENCY



Small in size, bigger on power

- Generates up to 460 W, 23.0 % module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping, lower series resistance, improved current collection and enhanced reliability
- Reduces installation cost with higher power bin and efficiency



Dual-glass Design, High Reliability

- Excellent fire rating and resistance to harsh environmental conditions
- 5,400 Pa snow load and 4,000 Pa wind load (test loads)



Maximize Energy Harvest

- Up to 25 years product warranty and 30 years power warranty
- 1 % first-year degradation and 0.4 % annual degradation enabled by N-type technology



Universal solution for residential and C&I rooftops

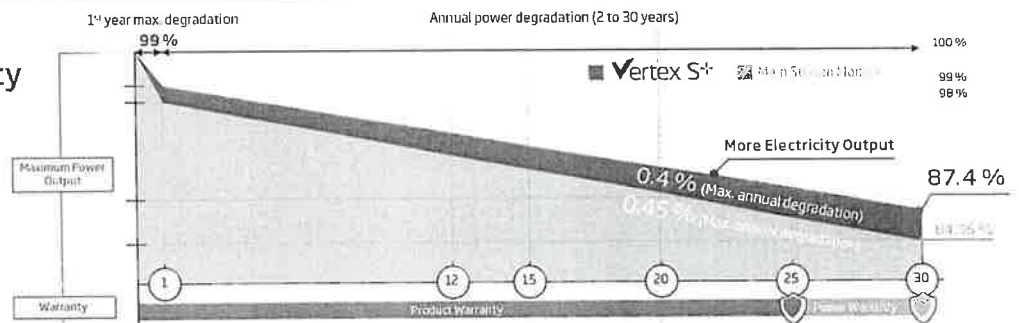
- Designed for compatibility with existing mainstream inverters, optimizers and mounting systems
- Perfect size and low weight for easy handling. Optimized transportation cost
- Flexible installation solutions for system deployment

Extended Vertex S+ Warranty

1 %
1st year max. degradation

0.4 %
Max. annual degradation from year 2 to 30

25 Years
Product Workmanship Warranty

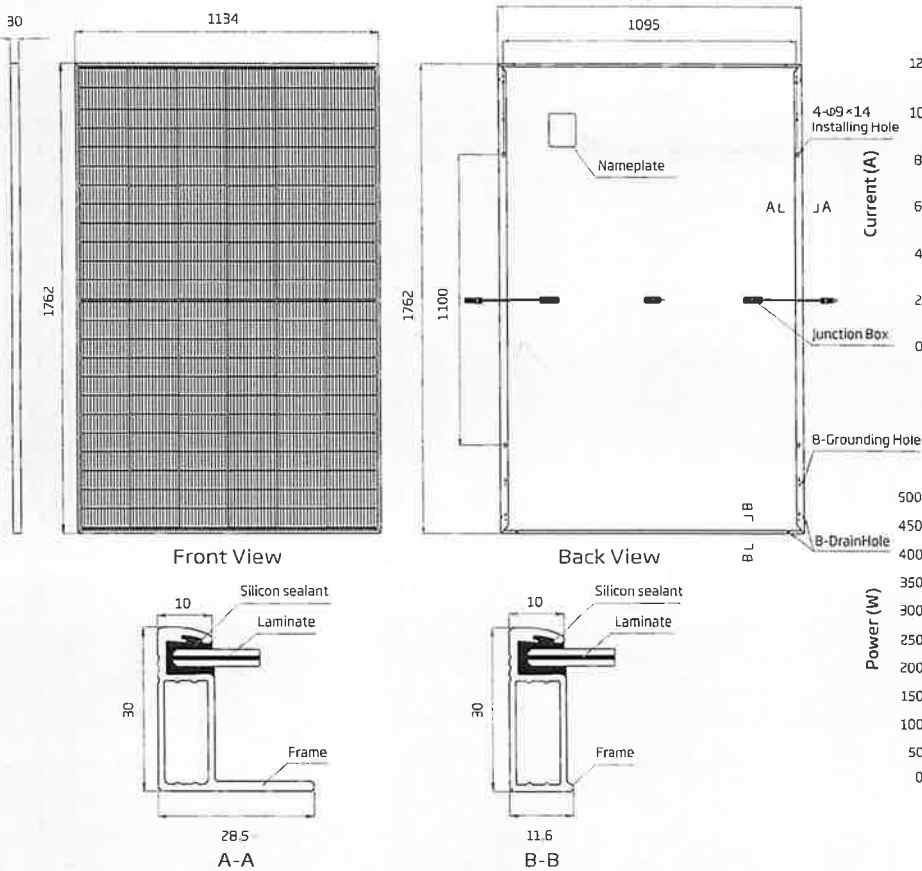


Comprehensive Products and System Certificates

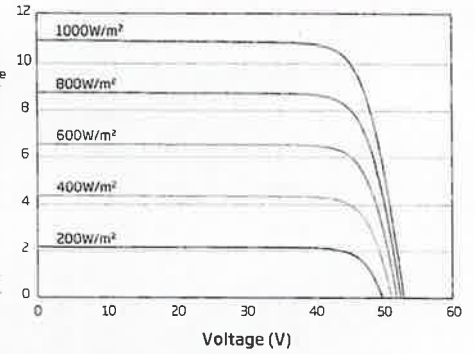


- IEC61215/IEC61730/IEC61701/IEC62716
- ISO 9001: Quality Management System
- ISO 14001: Environmental Management System
- ISO14064: Greenhouse Gases Emissions Verification
- ISO45001: Occupational Health and Safety Management System
- ISO14067: Product Carbon Footprint Limited Assurance
- ISO14025: Environmental Product Declaration

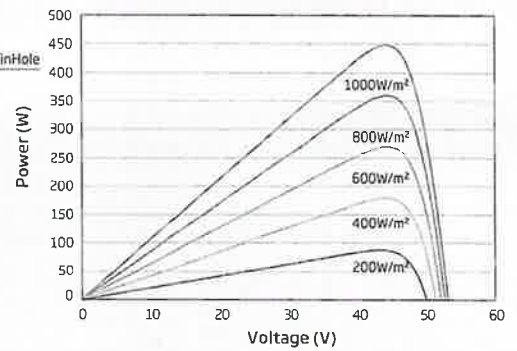
DIMENSIONS OF PV MODULE (mm)



I-V CURVES OF PV MODULE (450 W)



P-V CURVES OF PV MODULE (450 W)



ELECTRICAL DATA (STC)	TSM-430 NEG9R 2B	TSM-435 NEG9R 2B	TSM-440 NEG9R 2B	TSM-445 NEG9R 2B	TSM-450 NEG9R 2B	TSM-455 NEG9R 2B	TSM-460 NEG9R 2B
Peak Power Watts- P_{MAX} (Wp)*	430	435	440	445	450	455	460
Power Tolerance- P_{MAX} (W)							0/+5
Maximum Power Voltage- V_{MPP} (V)	43.2	43.6	44.0	44.3	44.6	45.0	45.4
Maximum Power Current- I_{MPP} (A)	9.96	9.99	10.01	10.05	10.09	10.11	10.14
Open Circuit Voltage- V_{oc} (V)	51.4	51.8	52.2	52.6	52.9	53.4	53.8
Short Circuit Current- I_{sc} (A)	10.59	10.64	10.67	10.71	10.74	10.77	10.81
Module Efficiency η_m (%)	21.5	21.8	22.0	22.3	22.5	22.8	23.0

STC: Irradiance 1000 W/m², Cell Temperature 25 °C, Air Mass AM 1.5. *Measuring tolerance: ±3 %.

ELECTRICAL DATA (NOCT)	TSM-430 NEG9R 2B	TSM-435 NEG9R 2B	TSM-440 NEG9R 2B	TSM-445 NEG9R 2B	TSM-450 NEG9R 2B	TSM-455 NEG9R 2B	TSM-460 NEG9R 2B
Maximum Power- P_{MAX} (Wp)	329	333	337	341	344	348	352
Maximum Power Voltage- V_{MPP} (V)	40.7	41.0	41.4	41.7	42.0	42.3	42.7
Maximum Power Current- I_{MPP} (A)	8.08	8.12	8.14	8.17	8.19	8.22	8.25
Open Circuit Voltage- V_{oc} (V)	48.7	49.1	49.5	49.9	50.2	50.6	51.0
Short Circuit Current- I_{sc} (A)	8.54	8.58	8.60	8.63	8.66	8.68	8.71

NOCT: Irradiance at 800 W/m², Ambient Temperature 20 °C, Wind Speed 1 m/s.

MECHANICAL DATA

Solar Cells	N-type i-TOPCON Monocrystalline
No. of cells	144 cells
Module Dimensions	1762 × 1134 × 30 mm
Weight	21.0 kg
Front Glass	1.6 mm, AR Coated Heat Strengthened Glass
Back Glass	1.6 mm, Heat Strengthened Glass
Frame	30 mm Anodized Aluminium Alloy, Black
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0 mm ² Landscape: 1100/1100 mm Portrait: 280/350 mm*
Connector	TS4 Plus / TS4 / MC4 EVO2*

*Special order only

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	43 °C (±2 °C)
Temperature Coefficient of P_{MAX}	-0.29 %/°C
Temperature Coefficient of V_{oc}	-0.24 %/°C
Temperature Coefficient of I_{sc}	0.04 %/°C

MAXIMUM RATINGS

Operational Temperature	-40 to +85 °C
Maximum System Voltage	1500 V DC (IEC)
Max Series Fuse Rating	25 A

WARRANTY

25 year Product Workmanship Warranty
30 year Power Warranty
1% first year degradation
0.4 % Annual Power Attenuation

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

Modules per box:	36 pieces
Modules per 40' container:	936 pieces