

ABOUT PHONO SOLAR

Phono Solar Technology Co., Ltd. is one of the world's leading renewable energy product manufacturers and a well-trusted provider. The Phono Solar brand has become synonymous with high performing, top quality photovoltaic panels that are ideal for use in large scale power plants, commercial and residential installations.

The Enphase Microinverter is a compact unit that connects directly to Phono Solar PV modules, converting DC to AC power at source. The microinverter also sends vital health and performance information to the Enphase Envoy communications gateway.



Diamond Series

Onyx Series

HIGH PERFORMANCE AC SOLAR MODULE

250W-270W

PRODUCTIVE

- High efficiency solar module integrated with an Enphase microinverter, the world's most efficient microinverter
- High output due to excellent performance in weak-light conditions
- Each module is individually optimized
- Eliminates module mismatch loss
- Shading affects only the shaded panel, not the entire system
- M215: Peak efficiency 96.3%, CEC efficiency 96%, Euro efficiency 95.4%
- M250: Peak efficiency 96.3%, CEC efficiency 96%, Euro efficiency 96.5%

INTELLIGENT

- Performance monitoring on every module
- Issues with the array are automatically identified, diagnosed and resolved by remote trouble shooting
- Quick and simple design, installation and management
- Provides solar system performance information, analytics and automated alerts

SAFE

- No high voltage DC wiring
- Fire Prevention – no risk of DC arc faults



PV MODULE COMPLIANCE
MICRO INVERTER COMPLIANCE
VDE-0126-1-1, DK5940, C10/11, EN62109-2, G83/1-1, UL1741



MECHANICAL CHARACTERISTICS

Solar Cells	Monocrystalline 156mm x 156mm square, 6 × 10 pieces in series
Dimension	Length: 1640mm (64.6 inch)
	Width: 992mm (39.1 inch)
	Height: 40mm (1.6 inch) / 75mm (2.95inch)
Weight	21.6kg(47.6lbs)
Front Glass	3.2mm toughened glass
Frame	Anodized aluminium alloy
Cable	4mm ² (IEC) / 12AWG(UL), 900mm
Junction Box	IP 67 rated

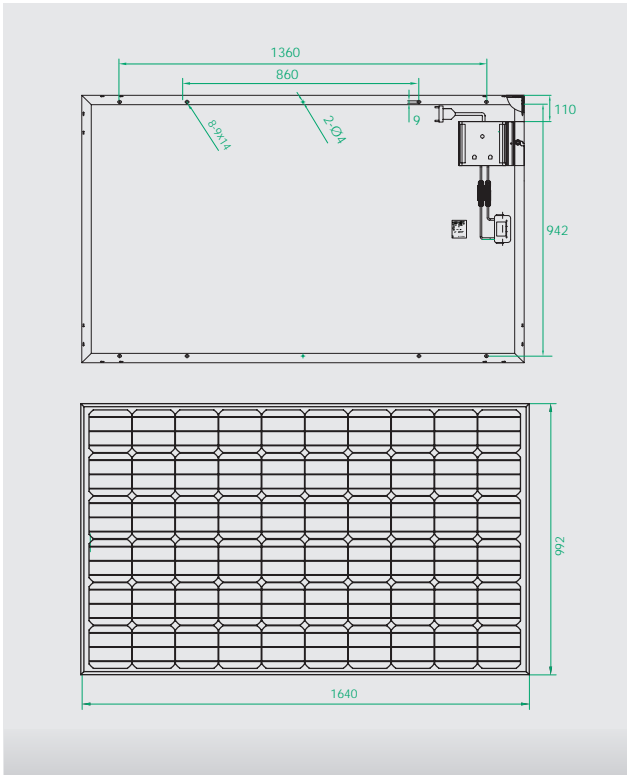
ABSOLUTE MAXIMUM RATING

Parameter	Values
Operating Temperature	From -40 to +85°C
Hail Diameter @ 80km/h	Up to 25mm
Surface Maximum Load Capacity	Up to 5400Pa
Maximum Series Fuse Rating	15A
IEC Application Class (IEC61730)	A
Fire Rating (UL 1703)	C
Maximum System Voltage	DC 1000V(IEC)
	DC 600V(UL)/1000V(ETL)

ELECTRICAL TYPICAL VALUES^{1,2}

Model	Rated Power (P _{mpp})	Rated Current (I _{mpp})	Rated Voltage (V _{mpp})	Short Circuit Current (I _{sc})	Open Circuit Voltage (V _{oc})	Module Efficiency (%)
PS250M-20/U	250W	8.24A	30.4V	8.65A	37.9V	15.37
PS255M-20/U	255W	8.35A	30.6V	8.75A	38.0V	15.67
PS260M-20/U	260W	8.46A	30.8V	8.85A	38.1V	15.98
PS265M-20/U	265W	8.55A	31.0V	8.95A	38.2V	16.29
PS270M-20/U	270W	8.65A	31.2V	9.05A	38.3V	16.60

DIMENSIONS



AC Electrical Specification

Maximum AC output power (-40 to 65°C)	215W	250W
Nominal output current	0.93A	1A
Nominal voltage	230V	240V
Nominal frequency	50.0Hz	60.0Hz
Power Factor	>0.95	>0.95
Maximum units per 20A branch circuit	17 (Ph + N); 27 (3Ph + N)	16 (Ph + N); 24 (3Ph + N)
Maximum output fault current	1.05 Arms, over 3 cycles; 25.2 Apeak, 1.74ms duration	850 mArms for 6 cycles
EN 50530 (EU) efficiency	95.40%	96.50%
Static MPPT efficiency (weighted, reference EN50530)	99.60%	99.40%
Communication	Power line	Power line
Night time power consumption	50mW	65 mW max
Operating temperature range (internal)	-40°C to + 85°C	-40°C to + 85°C
Cooling	Natural convection - No fans	Natural convection - No fans
Enclosure environmental rating	Outdoor – IP67	Outdoor – NEMA 6

WEAK LIGHT PERFORMANCE

Intensity [W/m ²]	I _{mpp}	V _{mpp}
1000	1	1
800	0.8	0.996
600	0.6	0.99
400	0.4	0.983
200	0.2	0.952
100	0.1	0.921

WARRANTY

MODULE-25 YEARS

INVERTER-25 YEARS (UK 20 YEARS)

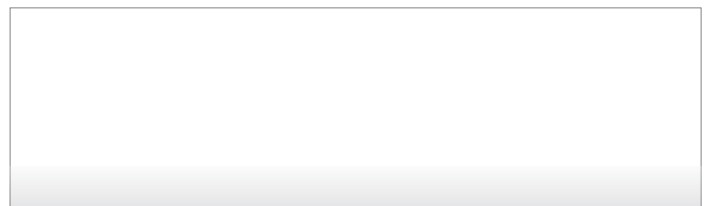
Note: This publication summarizes product warranty and specifications, which are subjected to change without notice. Additional information can be found on website: www.phonosolar.com

1. Defined as standard deviation of thousands measurements. Absolute power values depend on the measuring system. They can differ by +/-5% from one measuring system to another.

2. Measurement conditions under irradiance level of Standard Test Conditions(STC): 1000W/m², Air mass 1.5 Spectrum, cell temperature of 25°C.

www.phonosolar.com

PARTNER INFORMATION



Stringwechselrichter (SUN2000-36KTL)



Intelligent

- 4 MPPTs zur flexiblen Anpassung an verschiedene Layouts
- Intelligente Überwachung und schnelle Fehlersuche für 8 Strings
- Power Line Communication (PLC) wird unterstützt

Effizient

- Max. Wirkungsgrad 98,8 %, europäischer Wirkungsgrad 98,6 %

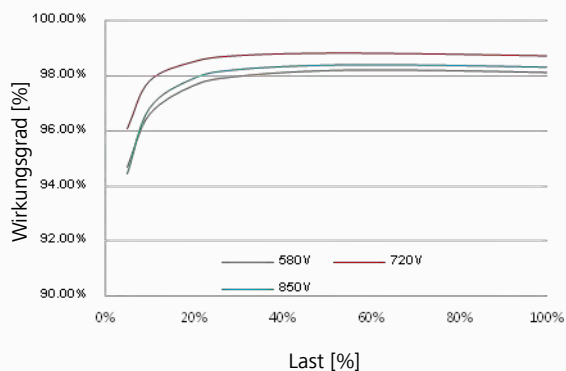
Sicher

- Integrierter DC-Trennschalter, sicher und praktisch für die Wartung
- Überspannungsableiter Typ II für DC und AC
- Erdschlussschutz
- FI-Schutzschalter

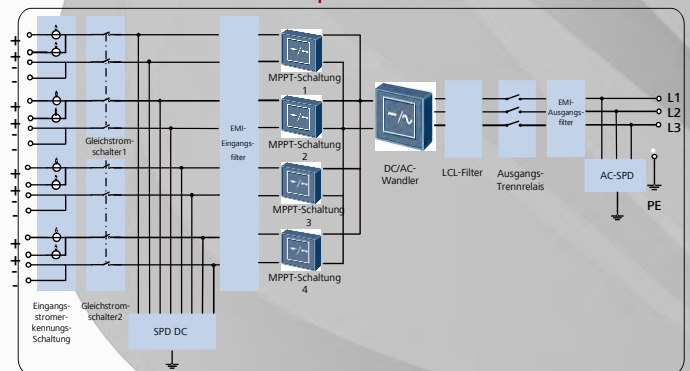
Zuverlässig

- Kühlung durch natürliche Konvektion macht externe Lüfter überflüssig
- Schutzart IP65

Wirkungsgradkurve



Schaltplan



SUN2000-36KTL



Stringwechselrichter (SUN2000-36KTL)



Technische Daten	SUN2000-36KTL
	Wirkungsgrad
Max. Wirkungsgrad	98.8%
Europäischer Wirkungsgrad	98.6%
	Eingang
Max. nutzbare DC-Leistung	40.800 W
Max. Eingangsspannung	1.100 V
Max. Strom pro MPPT	22 A
Max. Kurzschlussstrom pro MPPT	30 A
Min. Betriebsspannung / Start-Eingangsspannung	200 V / 250 V
MPPT-Spannungsbereich bei Volllast	480 V bis 850 V bei 380 V AC/400 V AC 580 V bis 850 V bei 480 V AC
MPPT-Betriebsspannungsbereich	200 V bis 1.000 V
Eingangs-Nennspannung	620 V bei 380 V AC/400 V AC 720 V bei 480 V AC
Max. Anzahl Eingänge	8
Anzahl MPP-Tracker	4
	Ausgang
AC-Nennwirkleistung	36.000 W
Max. AC-Scheinleistung	40.000 VA
Max. AC-Wirkleistung (cosφ=1)	Standard 40.000 W; 36.000 W optional in Einstellungen
Ausgangs-Nennspannung	220 V/380 V, 230 V/400 V, Standard 3 W+N+PE; 3 W+PE optional in Einstellungen 277 V/480 V, 3 W+PE
AC-Nenn-Netzfrequenz	50 Hz/60 Hz
Max. Ausgangsstrom (bei 380 V/400 V/480 V)	60,8 A/57,8 A/48,2 A
Einstellbarer Leistungsfaktor	0,8 nacheilend... 0,8 voreilend
Max. harmonische Gesamtverzerrung	< 3%
	Schutz
Trennvorrichtung, eingangsseitig	Ja
Schutz vor Inselbildung	Ja
DC-Verpolungsschutz	Ja
Überwachung auf Stringfehler an der Photovoltaikanlage	Ja
DC-Überspannungsableiter	Typ II
AC-Überspannungsableiter	Typ II
Isolationsüberwachung	Ja
Fehlerstromerkennung	Ja
	Kommunikation
Display	LED-Anzeigen
USB/Bluetooth +App	Ja
RS485	Ja
PLC	Ja
Fast Ethernet	Optional
	Allgemeines
Abmessungen (B x H x T)	930 x 550 x 260 mm (36,6 x 21,7 x 10,2 Zoll)
Gewicht	55 kg (121 lb.)
Betriebstemperaturbereich	-25 °C bis 60 °C (-13 °F bis 140 °F)
Kühlung	Natürliche Konvektion
Betriebshöhe	0 Bis 4.000 m (13.123 ft)
Relative Luftfeuchtigkeit	0 ~ 100%
DC-Steckverbinder	Amphenol H4
AC-Steckverbinder	Wasserdichte PG-Verschraubung + OT-Steckverbinder
Schutzart	IP65
Eigenverbrauch bei Nacht	< 1 W
Topologie	Transformatorlos
	Normenkonformität
Sicherheit/EMC	EN/IEC 61000-1, EN/IEC 61000-2, EN/IEC 61000-3, EN/IEC 61000-4, EN/IEC 62109-1, EN/IEC 62109-2
Netzcode	IEC 61727, IEC62116, VDE-AR-N4105, VDE 0126-1-1, BDEW 2008, G59/3, UTE C 15-712-1, CEI 0-16, CEI 0-21, EN-50438 Türkei

Immer verfügbar für höchste Erträge



www.huawei.com/solar

String Inverter (SUN2000-17/20KTL)



Smart

- 3 MPPTs for versatile adaptations to different module types or quantities built up with different alignments
- 6 strings intelligent monitoring and 80% time saving for fault detection
- RS485 and USB ports for connectivity and data management
- Local graphic LCD display and remote monitoring

Efficient

- Max. efficiency 98.6%, European efficiency 98.3%
- Easy to install with the weight of 48kg

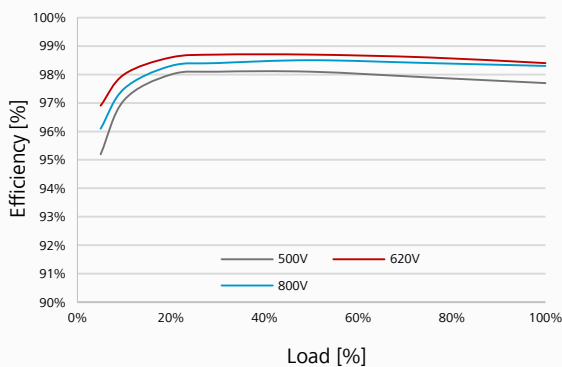
Safe

- DC disconnect integrated, safe and convenient for maintenance
- Type II surge arresters for both DC and AC
- Ground fault protection
- Residual Current Detection (RCD) protection

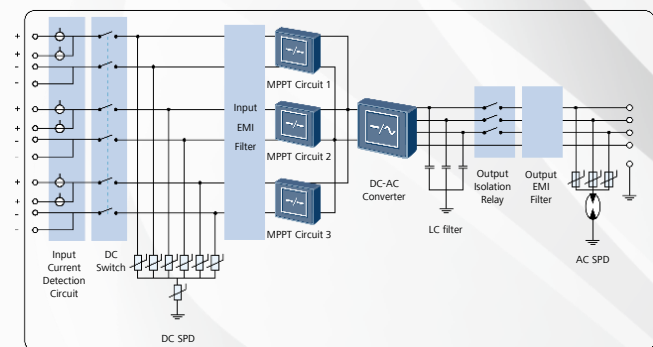
Reliable

- No need for external fans with natural cooling technology
- Protection rating of IP65

Efficiency Curve



Circuit Diagram



SUN2000-17/20KTL



String Inverter (SUN2000-17/20KTL)



Technical Specifications	SUN2000-17KTL	SUN2000-20KTL
Efficiency		
Max. Efficiency	98.6%	98.6%
European Efficiency	98.3%	98.3%
Input		
Max. DC Usable Power	19,100 W	22,500 W
Max. Input Voltage	1,000 V	1,000 V
Max. Current per MPPT	18 A	18 A
Max. Short Circuit Current per MPPT	25 A	25 A
Min. Operating Voltage / Start Input Voltage	200 V / 250 V	200 V / 250 V
Full Power MPPT Voltage Range	400 V ~ 800 V	480 V ~ 800 V
MPPT Operating Voltage Range	200 V ~ 950 V	200 V ~ 950 V
Rated Input Voltage	620 V	620 V
Max. Number of Inputs	6	6
Number of MPP Trackers	3	3
Output		
Rated AC Active Power	17,000 W	20,000 W
Max. AC Apparent Power	18,700 VA	22,000 VA
Max. AC Active Power (cosφ=1)	18,700 W	22,000 W
Rated Output Voltage	220V / 380V, 230V / 400V, 3W+N+PE	220V / 380V, 230V / 400V, 3W+N+PE
Rated AC Grid Frequency	50 Hz / 60 Hz	50 Hz / 60 Hz
Max. Output Current	28.4 A	33.4 A
Adjustable Power Factor	0.8 LG ... 0.8 LD	0.8 LG ... 0.8 LD
Max. Total Harmonic Distortion	< 3%	< 3%
Protection		
Input-side Disconnection Device	Yes	Yes
Anti-Islanding Protection	Yes	Yes
AC Overcurrent Protection	Yes	Yes
DC Overcurrent Protection	Fuseless	Fuseless
DC Reverse-Polarity Protection	Yes	Yes
PV-array String Fault Monitoring	Yes	Yes
DC Surge Arrester	Type II	Type II
AC Surge Arrester	Type II	Type II
Insulation Monitoring	Yes	Yes
Residual Current Detection	Yes	Yes
Communication		
Display	Graphic LCD	Graphic LCD
RS485	Yes	Yes
USB	Yes	Yes
General		
Dimensions (W×H×D)	520 x 610 x 255 mm (20.5 x 24.0 x 10.0 inch)	520 x 610 x 255 mm (20.5 x 24.0 x 10.0 inch)
Weight	48 kg (105 lb.)	48 kg (105 lb.)
Operation Temperature Range	-25 °C ~ 60 °C (-13°F ~ 140°F)	-25 °C ~ 60 °C (-13°F ~ 140°F)
Cooling	Natural Convection	Natural Convection
Max. Operating Altitude Without Derating	3,000 m (9,842 ft.)	3,000 m (9,842 ft.)
Relative Humidity	0~100%	0~100%
DC Connector	Amphenol H4	Amphenol H4
AC Connector	Amphenol C16/3	Amphenol C16/3
Protection Rating	IP65	IP65
Internal Consumption at Night	< 1 W	< 1 W
Topology	Transformerless	Transformerless
Noise Emission (Typical)	<29 dB	<29 dB
Standards Compliance		
Safety / EMC	EN/IEC 61000-6-1, EN/IEC 61000-6-2, EN/IEC 61000-6-3, EN/IEC 61000-6-4, EN/IEC 62109-1, EN/IEC 62109-2	
Grid Code	IEC 61727, IEC 62116, NB/T 32004-2013, VDE-AR-N-4105, VDE 0126-1-1, BDEW, G59/3, UTE C 15-712-1, CEI 0-16, CEI 0-21, C10/11, EN 50438-Ireland, EN 50438-Turkey, AS 4777, PEA (Only 20KTL), MEA (Only 20KTL), NRS 097-2-1	

Always Available for Highest Yields



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