



Solarna Elektrana 1MW - Oprema

„Sunce je neiscrpan izvor energije koji čeka da ga iskoristimo. Naša budućnost zavisi od toga koliko brzo i mudro budemo koristili ovaj besplatni dar prirode.“ - prof. dr Branko Lalović (1928–1988), fizičar

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SADRŽAJ

Solarni Paneli

Ponuda sadrži solarne panele najnovije tehnologije n-type snage 715W renomiranih svjetskih proizvođača sa TIER1 liste. U ponudi su JA Solar 715W n-type ili Trina Vertex 715W n-type. **30 godina garancija na učinak.**

Inverteri

Sungrow kao najveći svjetski proizvođač nudi odlične invertere za evropsko tržište. SG125CX-P2 snage 125kW i izlaznog napona 400V odlično će se uklopiti u svaki veći projekat. **5 godina garancije sa mogućnošću produženja.**

Konstrukcija

Kombinacija čelik aluminium, konstrukcija domaće proizvodnje sa EUR1, izrađena od nosećih čeličnih profila toplocinkovanih i horizontalnih aluminijumskih nosača legure 6063 T66. Uz konstrukciju isporučuje se i građevinski dio dokumentacije: statički i dinamički proračun za sneg i vetar za zadatu geografsku lokaciju. **20 godina garancije.**

Kablovi

- DC: TT ili KBE H1Z2Z2-K 1x6 mm² u dve boje: crvena i crna
- Konektori: Staubli m+ž 6mm² 1500V
- AC: TT 1x185mm² aluminijumski kabal za podzemne vodove
- Komunikacioni kabal: CAT6
- FeZn 25x4mm traka

AC Ormar

Kompletno opremljen ormar na 4 pozicije po 250kW sa noark opremom, motornim pogonom, kompletnom zaštitom na 0.4kV, šemiran i sklopljen po industrijskim standardima.

Komunikacija

COM100 Communication box Sungrow, sadrži u sebi logger 3000 up to 8 devices
SCADA: RTU Elseta u TS + 4xIOMOD 8DI8DO + Teltonika modem
UPS + Software za komunikaciju preko IEC104

Sertifikacija: IEC61215 / IEC61730 / ISO 9001 / ISO 45001 / TÜV Certified.

NORMATIVI

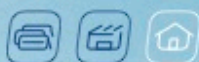
Oprema po stavkama

Za potrebe izrade solarne elektrane ukupne instalisane snage 1MW, normativna potreba za materijalom može se pronaći u tabeli. Obzirom da geografske lokacije i uslovi na terenu nisu idealni, moguća je korekcija po zahtevu konkretnog projekta.

Arrival	Jed	Količina
JA Solar 715W n-type/Trina Vertex 715W n-type	kom	1.400
Sungrow SG125CX-P2 AFI 400V	kom	8
COM100 Communication box Sungrow	kom	1
Konstrukcija AL-Fe-Zn APlus tehno 2 reda	kW	1.000
KBE H1Z2Z2-K 1x6 mm ² R1000 (red) 1500V DC (TUV)	m	5.000
KBE H1Z2Z2-K 1x6 mm ² R1000 (black) 1500V DC (TUV)	m	5.000
Staubli m+ž 6mm ² 1500V	kom	350
Al kabel 1x185mm ²	m	2.000
FeZn 25x4mm traka	kg	500
CAT6 kabal	m	500
Kompletno opremljen ormar 250kW noark (opciono 1MW) Motorni pogon, kompletna zaštita 0.4kV, šemiran po ind. stanardu	kom	4
SCADA: RTU Elseta u TS + 4xIOMOD 8DI8DO + Teltonika modem UPS + Software za komunikaciju preko IEC104	kom	1

Harvest the Sunshine

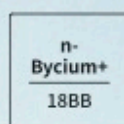
715W



JA SOLAR

JAM66D46 LB n-type Double Glass Bifacial Modules

Premium Cells



MBB Half-Cell
Technology

26%



Cell Conversion
Efficiency

Premium Modules



Higher power
generation better LCOE



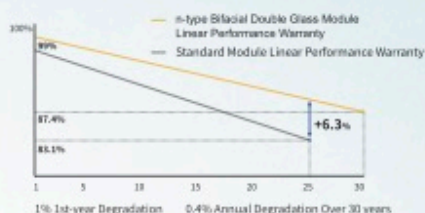
n-type with very
Lower LID



Better Temperature
Coefficient



Better low irradiance
response



12-year product
warranty



30-year linear power
output warranty

Comprehensive Certificates

- IEC 61215, IEC 61730, UL 61215, UL 61730
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- ISO 45001: 2018 Occupational health and safety management systems
- IEC 62941: 2019 Terrestrial photovoltaic (PV) modules - Quality system for PV module manufacturing



DEEP BLUE 4.0 Pro

Vertex N

N-type i-TOPCon bifacial dual glass
Monocrystalline module

PRODUCT: TSM-NEG21C.20

POWER RANGE: 695-720W

720W

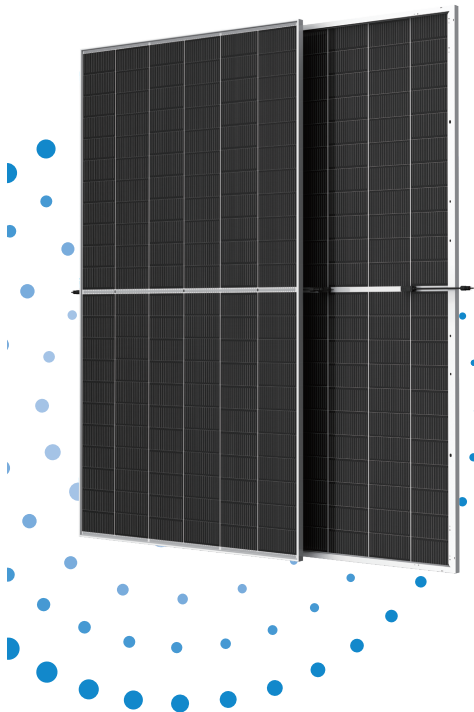
MAXIMUM POWER OUTPUT

0~+5W

POSITIVE POWER TOLERANCE

23.2%

MAXIMUM EFFICIENCY



High customer value

- Standardized module size with flagship module power, 35W higher compared with conventional technology
- Low voltage design with higher string power, effectively reducing BOS (Balance of System) and LCOE (Levelized Cost of Energy) by 2%~6%
- Higher container space utilization effectively reduces the freight cost
- Certified Low-Carbon Footprint
- The Star of LCOE



High power up to 720W

- Up to 23.2% module efficiency, on 210 innovation platform
- Patented i-TOPCon technology with continuous efficiency improvement, including contact resistance reduction, rear reflection enhancement and edge quality repairment



High reliability

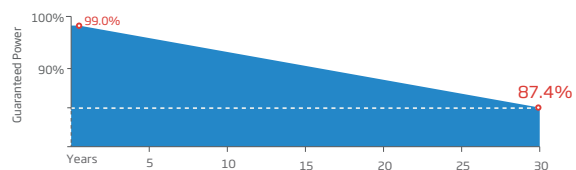
- Minimized micro-cracks with innovative non-destructive cutting technology and high-density packaging
- Reduced risks of hot-spot with half-cut technology
- Certified high resistance against salt, ammonia, sand, PID, LID, LeTID
- Sustainable in harsh environments and extreme weather conditions



High energy yield

- Excellent low irradiation performance, validated by 3rd party
- Lower temperature coefficient (-0.29%/°C)
- Higher bifaciality, with up to 10%~20% additional power gain from back side depending on albedo
- Reliable dual-glass structure with 30-year power guarantee

Trina Solar's Vertex Bifacial Dual Glass Performance 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

Trinasolar

SG125CX-P2

Multi-MPPT String Inverter for 1000 Vdc System



HIGH YIELD

- 12 MPPTs with max. efficiency 98.5%
- DC 15A current input, compatible with over 500W+ PV module
- Dynamic shading optimization mode



SMART O&M

- Key component diagnosis and protection
- Smart IV Curve Diagnosis
- Grid fault record function, easy for remote O&M



LOWER INVESTMENT

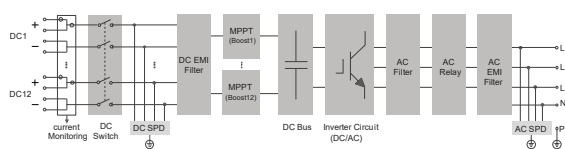
- Compatible max. 240mm² Al AC cables
- Drawer-style cable sealing plate support AC cable pre-assembly



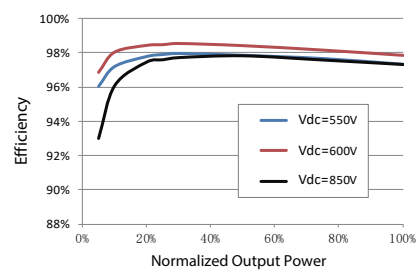
PROVEN SAFETY

- IP66 protection and C5 Anti-corrosion
- DC Type I+II SPD, AC Type II SPD
- Support AFCI 2.0 function

CIRCUIT DIAGRAM



EFFICIENCY CURVE



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Type designation	SG125CX-P2
Input (DC)	
Recommended max. PV input power	175 kW
Max. PV input voltage *	1100 V
Min. PV input voltage / Startup input voltage	180 V / 200 V
Rated PV input voltage	600 V
MPPT voltage range **	180 V – 1000 V
No. of independent MPP inputs	12
No. of PV strings per MPPT	2
Max. PV input current	360 A (30 A * 12)
Max. DC short-circuit current	480 A (40 A * 12)
Max. current for DC connector	30 A
Output (AC)	
Rated AC output power	125 kW
Max. AC output apparent power	125 kVA
Max. AC output current	181.1 A
Rated AC output current(at 230V)	181.1 A
Rated AC voltage	3 / N / PE, 220 V / 380 V; 230 V / 400 V
AC voltage range	320 V – 480 V
Rated grid frequency	50 Hz / 60 Hz
Grid frequency range	45 Hz – 55 Hz / 55 Hz – 65 Hz
Harmonic (THD)	< 3 % (at rated power)
Power factor at rated power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging
Feed-in phases / AC connection	3 / 3-N-PE
Efficiency	
Max. efficiency / European efficiency	98.5% / 98.3%
Protection & function	
Grid monitoring	Yes
DC reverse polarity protection	Yes
AC short-circuit protection	Yes
Leakage current protection	Yes
Surge protection	DC Type I + II / AC Type II
Ground fault monitoring	Yes
DC switch	Yes
PV string current monitoring	Yes
Arc fault circuit interrupter (AFCI)	Yes
PID recovery function	Yes
Optimizer compatibility ***	Optional
RSD compatibility ***	Optional
General data	
Dimensions (W * H * D)	1020 mm * 795 mm * 360 mm
Weight	≤ 93 kg
Mounting method	Wall-mounting bracket
Topology	Transformerless
Degree of protection	IP66
Night power consumption	< 5 W
Corrosion	C5
Operating ambient temperature range	-30 °C - 60 °C
Allowable relative humidity range (non-condensing)	0 % - 100 %
Cooling method	Smart forced air cooling
Max. operating altitude	4000 m
Display	LED, Bluetooth+APP
Communication	RS485 / WLAN (optional) / Ethernet (optional)
DC connection type	EVO2 (Max. 6 mm ²)
AC connection type	OT / DT terminal (Max. 240 mm ²)
AC cable specification	Outside diameter 30 mm - 60 mm
Grid compliance	IEC 62109-1, EN/IEC 61000-6-1/2/3/4, IEC 61727, IEC 62116, EN 50549-1/2, UTE C15-712-1, VDE V 0126-1-1, VDE-AR-N 4105:2018, VFR 2019, NC RfG, G99, UNE 217002, NTS, CEI 0-21 2019, CEI0-16 2019, NRS-097-2-1, IEC 63027
Grid support	Q at night function, LVRT, HVRT, active & reactive power control and power ramp rate control/ramp rate control

* Input voltage exceeding the MPPT operating voltage range triggers inverter protection

** Please refer to the user manual for the full load MPPT voltage range

*** For optimizer & RSD compatibility, please consult Sungrow before placing an order

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A+ SOLAR – ZEMLJANI (PODNI) SISTEM

KONSTRUKCIJA ČELIK + ALUMINIJ

APLIKACIJA

Tlo | zemlja

NAGIB MODULA

Prema zahtjevima projekta

MATERIJAL NOSIVIH PROFILA

Konstruktivni čelik S235 / S355

Aluminij EN AW 6063 T66

MATERIJAL VEZNIH KOMONENTI

Nehrđajući čelik A2/A4

Aluminij (EN AW 6063 T66)

TIPOVI MODULA

Svi monofacijalni i bifacijalni moduli, uokvireni ili laminirani. Optimizirana bifacijalnost sukladno zahtjevima proizvođača modula

ORIJENTACIJA MODULA

Portretna | okomita

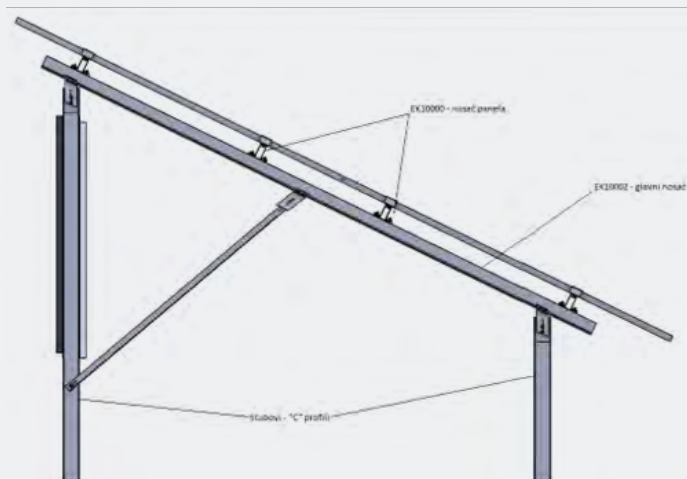
Pejzažna | vodoravna

TEMELJENJE POTKONSTRUKCIJE

Zemljani vijci | Betonski temelji

RAZMAK STUPOVA

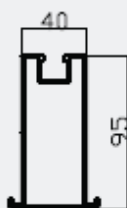
Prema statičkom proračunu



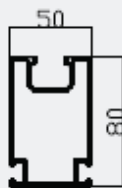
Rješenje koje kombinira implementaciju čelika i aluminija za ugradnju fotonaponskih elektrana na tlu. Kombinacija ova 2 metala omogućuje ekonomično, dugotrajno i jednostavno rješenje za sve vaše potrebe.

Sistem je prilagodljiv s obzirom na vanjske uvjete kao što su nagib, vanjsko opterećenje, vrsta i granice terena.

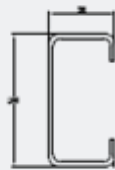
Čelični nosivi profili omogućuju visoku nosivost i izdržljivost konstrukcije, dok aluminijски nosači panela omogućuju laku montažu i postavljanje panela, te dugotrajnost cijele konstrukcije.



EK10000



EK10002



PRIMJER NOSIVOG
PROFILA

KBE SOLAR DB+



★ H1Z2Z2-K / EN 50618

★ IEC 131 / IEC 62930

★ TÜV 2 PfG 1169/10.19

1.500 V_{DC} / 1.800 V_{DC} max.

UV-Stabilität / UV-stability

erdverlegbar / direct burial

höhere Wasserbeständigkeit/
higher water resistance

Brandklasse D_{ca} nach BauPVO/
flammability class D_{ca} acc. CPR



MADE IN GERMANY

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Female and male cable coupler MC4

As individual part with open crimp contact (including insulating part)



Female cable coupler PV-KBT4...



Male cable coupler PV-KST4...

- In accordance with NEC 2023, requires a tool to open.
- Proven MULTILAM technology with high long-term stability, which ensures consistently low performance loss throughout the entire service life of the plug connector.
- Approved for DC 1100 V (IEC)¹⁾ and DC 1500 V (UL).
- Tried and tested plug connectors, over 25 years of experience in the field.
- Available for assembly with cross-sections up to 10 mm².
- Also available as ready made leads according to customer's specification.
- To be used with suitable mated connectors from the MC4 product family and suitable lead.

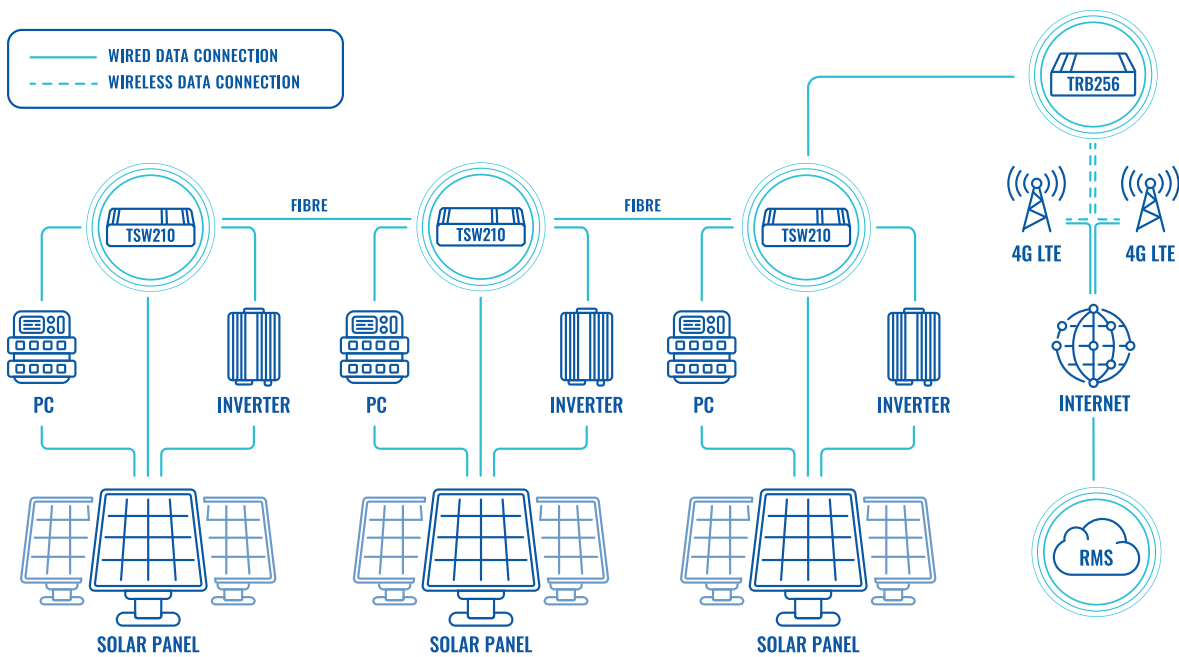
Technical data

Technical data	
Ambient temperature range	-40 °C...+85 °C (TÜV/UL)
Upper limiting temperature	105 °C
Degree of protection, mated	IP65/IP68 (1 m, 1 h)
Degree of protection, unmated	IP2X
Degree of pollution	3
Max. contact resistance of the connector	0.25 mΩ
Rated Impulse Voltage	16 kV
Contact system	MULTILAM
Type of connection	Crimping
Contact material	Copper, tin plated
Insulation material	PC/PA
Locking system	Locking Type
Fire protection class	UL94:V-0
Ammonia resistance (acc. to DLG)	yes
Salt mist spray test, degree of severity 6	yes
TÜV Rheinland certifications number	R 60127190
TÜV Rheinland 2 PfG 2330	R 60087448
UL-File number (UL6703 and CSA C22.2 No. 182.5) (cULus Listed and UL Recognized)	E343181
CQC number of certificate	CQC20024256431
JET number of certificate	B19T0013

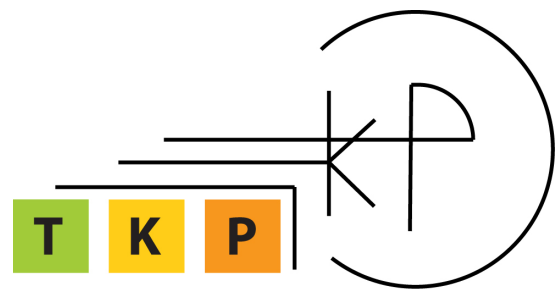
¹⁾ The IEC voltage expansion for MC4 cable couplers up to DC 1100 V applies to 2.5 mm², 4.0 mm² and 6.0 mm² cable cross sections used in the end application. However, the 10 mm² cross-section remains at DC 1000 V.

²⁾ Original MC4





REFERENCE



ZAVRŠNE NAPOMENE

Ponuda uključuje:

- Navedenu opremu isporučenu na gradilište ili drugu lokaciju po želji kupca
- Sertifikate i ateste za kompletnu opremu iz ponude
- Građevinski dio dokumentacije za konstrukciju
- Pisanu garanciju za sve komponente iz ponude

Ponuda ne uključuje:

- Trafostanicu
- Izradu projektne tehničke dokumentacije
- Izvođenje radova
- Puštanje u rad

Prelazne odredbe:

Po želji kupca moguća izrada projektne tehničke dokumentacije, izvođenje radova i puštanje u rad elektrane.

Za dodatne informacije kontaktirati:

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