



REGIONE
PUGLIA



PROVINCIA
DI FOGGIA



COMUNE
DI CANDELA



COMUNE
DI ASCOLI SATRIANO

Realizzazione di impianto agrivoltaico con produzione agricola e produzione di energia elettrica da fonte rinnovabile fotovoltaica da ubicarsi in località Posta Fissa in agro di Candela (FG) e delle relative opere di connessione alla Stazione elettrica SE Camerelle nel Comune di Ascoli Satriano (FG)

Potenza nominale cc: 30,39 MWp - Potenza in immissione ca: 30,00 MVA

ELABORATO

COMPONENTI PRINCIPALI - DATA SHEET

IDENTIFICAZIONE ELABORATO

Livello progetto	Codice Pratica	documento	codice elaborato	n° foglio	n° tot. fogli	Nome file	Data	Scala
PD		R	2.13			R_2.13_DATASHEET.pdf	12/2021	n.a.

REVISIONI

Rev. n°	Data	Descrizione	Redatto	Verificato	Approvato
00	17/12/2021	1° Emissione	PETRELLI	SPINELLI	AMBRON

PROGETTAZIONE:

MATE System Unipersonale srl

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PROPONENTE:
LUMINORA CANDELA S.R.L.
Via TEVERE n.°41 00198
ROMA

Il legale rappresentante
Dott. PABLO MIGUEL OTIN PINTADO



BACKSHEET MONOCRYSTALLINE MODULE

PRODUCT: TSM-DE21

PRODUCT RANGE: 635-670W

670W

MAXIMUM POWER OUTPUT

0~+5W

POSITIVE POWER TOLERANCE

21.6%

MAXIMUM EFFICIENCY



High customer value

- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance of System) cost, shorter payback time
- Lowest guaranteed first year and annual degradation;
- Designed for compatibility with existing mainstream system components
- Higher return on Investment



High power up to 670W

- Up to 21.6% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection



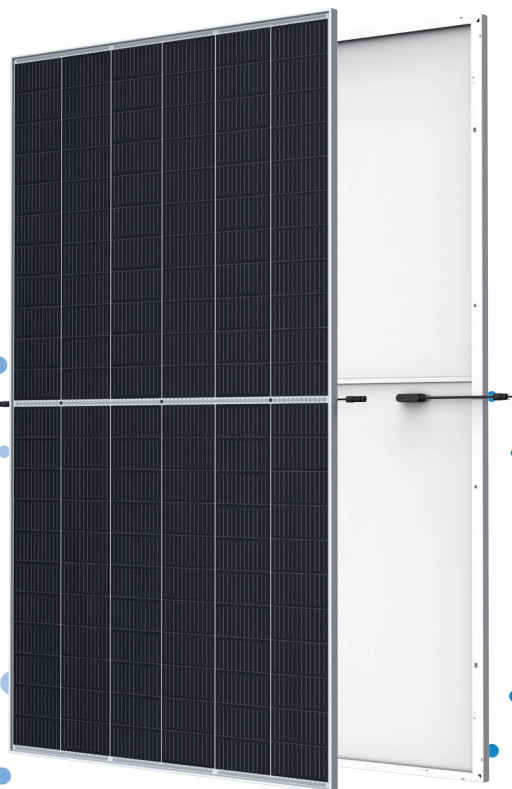
High reliability

- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load

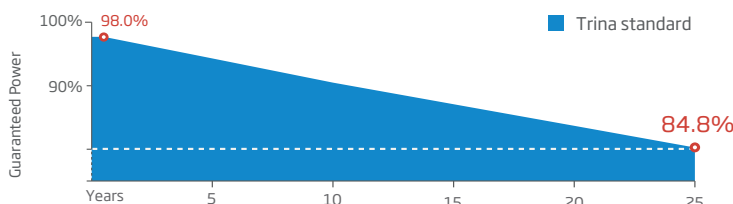


High energy yield

- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.34%) and operating temperature



Trina Solar's Backsheet Performance Warranty

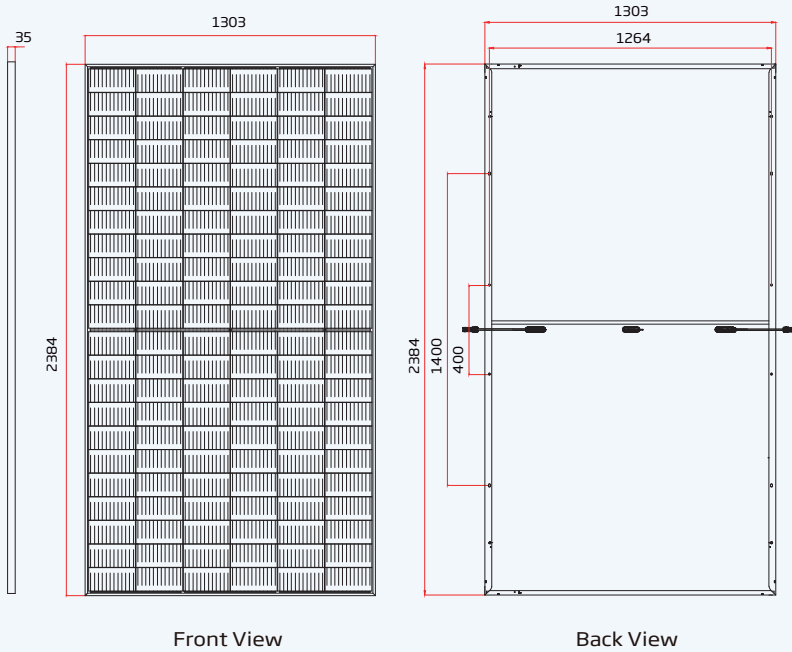
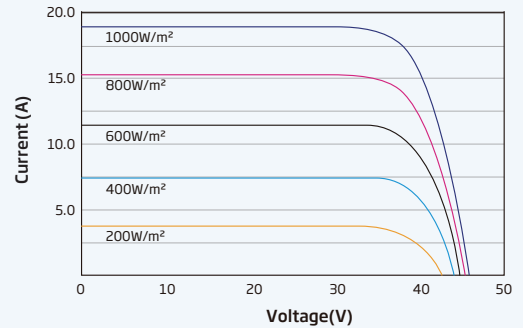
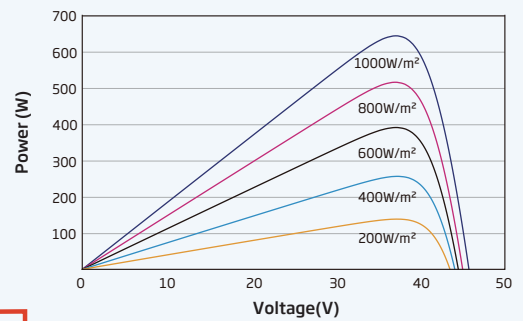


Comprehensive Products and System Certificates



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



DIMENSIONS OF PV MODULE(mm)

I-V CURVES OF PV MODULE(645W)

P-V CURVES OF PV MODULE(645W)


Preliminary

ELECTRICAL DATA (STC)

Peak Power Watts-P _{MAX} (Wp)*	635	640	645	650	655	660	665	670
Power Tolerance-P _{MAX} (W)	0 ~ +5							
Maximum Power Voltage-V _{MPP} (V)	36.8	37.0	37.2	37.4	37.6	37.8	38.0	38.2
Maximum Power Current-I _{MPP} (A)	17.26	17.30	17.35	17.39	17.43	17.47	17.51	17.55
Open Circuit Voltage-V _{OC} (V)	44.7	44.9	45.1	45.3	45.5	45.7	45.9	46.1
Short Circuit Current-I _{SC} (A)	18.30	18.34	18.39	18.44	18.48	18.53	18.57	18.62
Module Efficiency η _m (%)	20.4	20.6	20.8	20.9	21.1	21.2	21.4	21.6

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5. *Measuring tolerance: ±3%.

ELECTRICAL DATA (NOCT)

Maximum Power-P _{MAX} (Wp)	481	485	488	492	496	500	504	508
Maximum Power Voltage-V _{MPP} (V)	34.3	34.6	34.8	34.9	35.1	35.3	35.4	35.6
Maximum Power Current-I _{MPP} (A)	13.97	14.01	14.05	14.09	14.13	14.17	14.22	14.26
Open Circuit Voltage-V _{OC} (V)	42.1	42.3	42.5	42.7	42.9	43.0	43.2	43.4
Short Circuit Current-I _{SC} (A)	14.75	14.78	14.82	14.86	14.89	14.93	14.96	15.01

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

MECHANICAL DATA

Solar Cells	Monocrystalline
No. of cells	132 cells
Module Dimensions	2384×1303×35 mm (93.86×51.30×1.38 inches)
Weight	33.9 kg (74.7 lb)
Glass	3.2 mm (0.13 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	EVA
Backsheet	White
Frame	35mm(1.38 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm ² (0.006 inches ²), Portrait: 280/280 mm(11.02/11.02 inches) Length can be customized
Connector	MC4 EV02 / TS4*

*Please refer to regional datasheet for specified connector.

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P _{MAX}	-0.34%/°C
Temperature Coefficient of V _{OC}	-0.25%/°C
Temperature Coefficient of I _{SC}	0.04%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85°C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	30A

WARRANTY

12 year Product Workmanship Warranty
25 year Power Warranty
2% first year degradation
0.55% Annual Power Attenuation

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

Modules per box: 31 pieces
Modules per 40' container: 558 pieces



Solar inverter

PVS-350-TL

The new PVS-350-TL by FIMER is designed to satisfy the growing demand of multi-MPPT string inverters for utility PV systems, offering record-high AC capacity combined with a DC front-end optimized for the latest PV modules to maximize the ROI of ground mounted systems based on a decentralized architecture.

350 kW

High power density

This new multi-MPPT string inverter with a record-high capacity and power-to-weight ratio exceeding 3kW/kg, delivers up to 350 kVA at 800 Vac. This does not only reduce the logistics and installation costs but also the Electrical Balance of System costs for free field utility-scale ground mounted PV installations. MV stations of up to 15% higher capacity can be combined with PVS-350, increasing the single power block capacity and reducing the overall number of stations per MWac of installed power.

Future-proof Multi-MPPT 1500 Vdc platform

The inverter comes equipped with 12 MPPTs, each rated 45A Imp and 60A Isc. The MPPT design has been specifically optimized for the connection of 2 strings of the latest ultra-high power PV modules based on M10 (182x182mm) and G12 (210x210mm) cells. The DC/AC ratio can be optimized to fully exploit the benefits of this new module formats while offering maximum system yields ($\eta_{max} > 99\%$), enabling additional cost savings on trackers compared to traditional 166mm modules.

Installer friendly design

Quick and easy installation, the existing PV module's mounting systems can be used to install the inverters, thus saving time and costs on site preparation and hire of plant. The fuse and combiner free design avoids the need for external components, such as separate DC combiner boxes and AC first level combiners. This is also possible thanks to the integrated DC disconnect switch and to the segregated AC wiring compartment supporting both Al and Cu cables up to 400mm².

Protect and maximize the efficiency of your assets

Supported by the Aurora Vision cloud platform, the healthy status of the whole PV array can be controlled online through the single string-level I-V curve analysis performed on each inverter. This advanced diagnostic services can be combined with the integrated Arc Fault Detection and PID recovery options, ensuring assets' durability and the profitability of the PV system.

FIMER Digital Platform combining Cloud and Edge Technologies
The cloud and edge computing capabilities, big data analytics and FIMER's digital platform can help the customer to solve the

challenge of the new digital era.

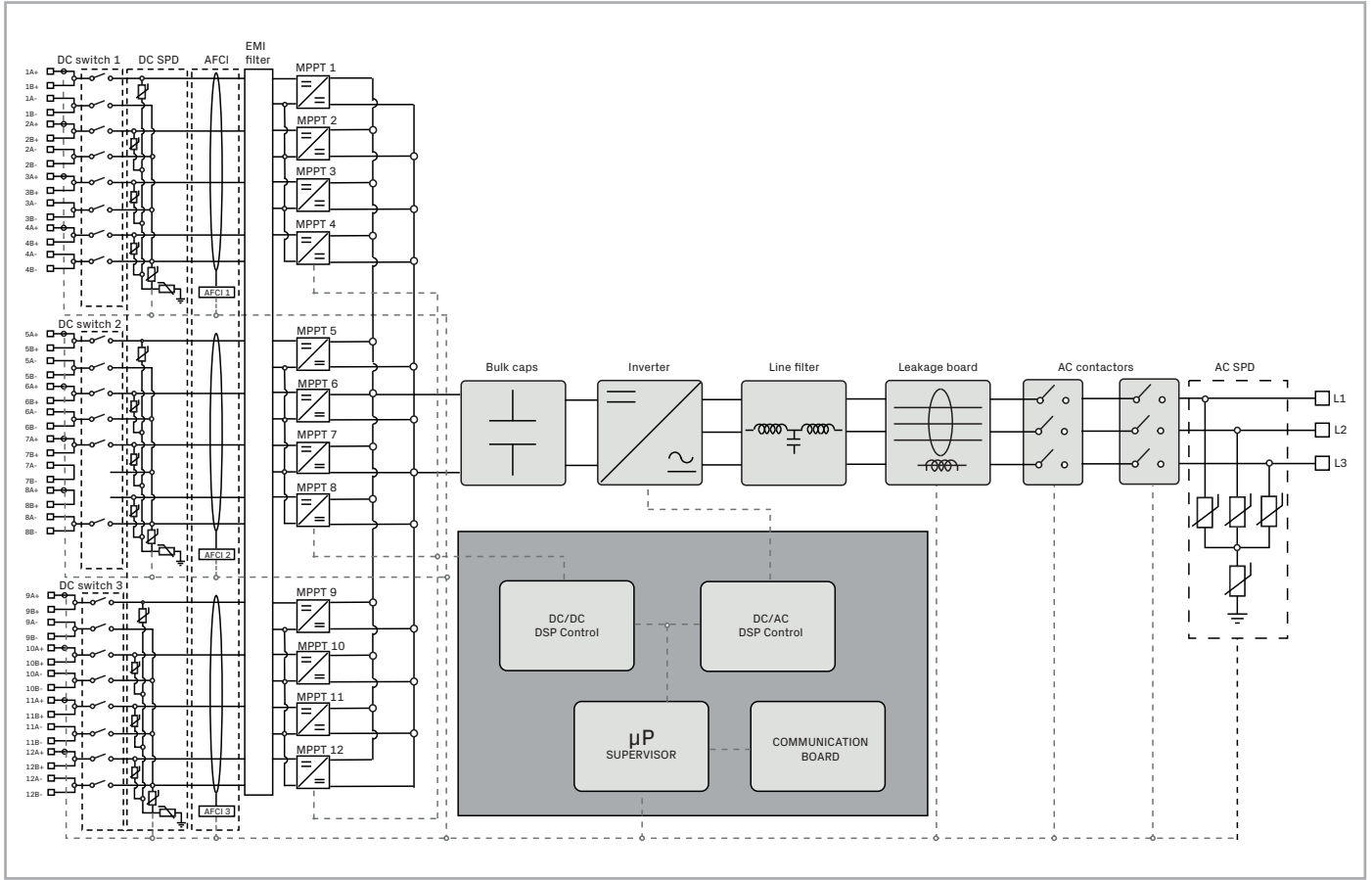
The FIMER Digital Platform consists of ICT technologies and a full set of functionalities and services properly combined at both cloud and edge level, able to provide the customer with a fully integrated future proof solution characterized by higher performance, higher reliability, maximized cyber security and always aligned with needs and expectations in terms of minimizing Total Cost of Ownership and facilitating maintenance activities in large scale distributed solar generators.

The new FIMER PVS-350 inverter integrates the latest standard IP-based technology; in addition, through the integration of an advanced smart cluster-level aggregator gateway many more functionalities and services can be enabled at plant level such as a fully scalable hierarchical plant controlling solution, effective integration with any 3rd party PPC or SCADA system and always according to any modern regulatory norms and grid operators standard (like IEC 61850, IEC 104, etc...). Additional premium services are also available to exploit the smart functionalities integrated in each unit (including DC string diagnosis, prognostic and predictive maintenance, scheduled FW upgrade and remote parameter setting and many others), allowing the system to easily meet the most demanding grid support requirements for systems of any size, as well as enabling both owner and aggregator to play the new solar game in the digital era.

Highlights

- The most powerful string inverter in Utility (350 kVA); Power to weight ratio > 3kW/kg
- 12 MPPT/45A – Optimized for the latest generation Ultra-High power PV modules (182mm & 210mm)
- Maximum Energy Yield, $\eta_{max} > 99\%$
- String diagnosis through online IV curve analysis
- Fuse-free design
- Remote firmware upgrade and Multi inverter commissioning
- Segregated AC wiring compartment, support both Al and Cu Cable up to 400mm²
- DC Series Arc Fault Circuit Interrupter
- PID recovery function (optional)
- Support Q@night function

Block diagram PVS-350-TL



Technical data and types

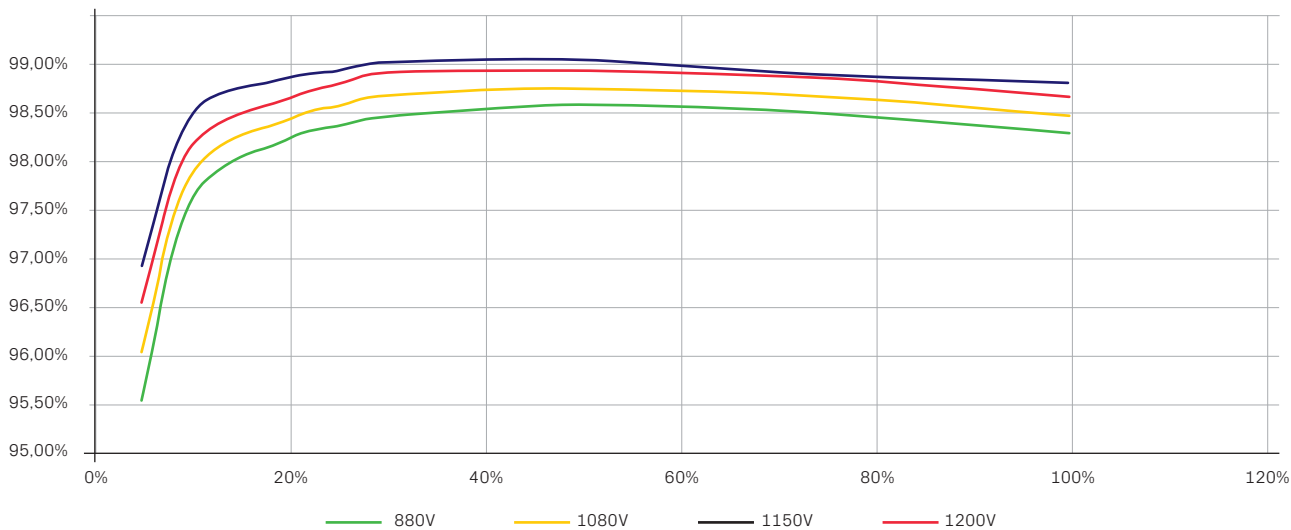
Type code	PVS-350-TL
Input side	
Absolute maximum DC input voltage ($V_{max,abs}$)	1500 V
Start-up DC input voltage (V_{start})	600...1000 V
Operating DC input voltage range ($V_{dmin}...V_{dmax}$)	0.7 x $V_{start}...1500$ V (min 500 V)
Rated DC input voltage (V_{dcr})	1080 V
Number of independent MPPT	12
Maximum DC input current for each MPPT ($I_{MPPT,max}$)	45 A
Maximum input short circuit current for each MPPT	60 A
Number of DC inputs pairs for each MPPT	2
DC connection type	MC4-Evo2
Input protection	
DC Series Arc Fault Circuit Interrupter	Standard
Reverse polarity protection	Yes, from limited current source
Input over voltage protection for each MPPT - Type 2 surge arrester	Yes, with monitoring
Input over voltage protection for each MPPT - Type 1+2 surge arrester	Optional, with monitoring
Photovoltaic array isolation control (Insulation Resistance)	Yes, acc. to IEC 62109-2
Residual Current Monitoring Unit (leakage current protection)	Yes, acc. to IEC 62109-2
DC switch	Yes
String current monitoring	Yes
Output side	
AC grid connection type	Three phase 3W+PE
Rated AC power ($P_{ac,r}$)	333000 W
Maximum AC output power ($P_{ac,max}$ @ $\cos\phi=1$)	350000 W
Maximum apparent power (S_{max})	350000 VA
Rated AC grid voltage ($V_{ac,r}$)	800 V
Rated AC output current ($I_{ac,max}$)	240.3 A
Maximum AC output current ($I_{ac,max}$)	253 A
Rated output frequency (f_r)	50 Hz / 60 Hz
Nominal power factor and adjustable range	> 0.995, 0.8 inductive/capacitive with maximum S_{max}
Total current harmonic distortion	< 3%
Max DC Current Injection (% of I_n)	< 0.5% I_n
Maximum AC Cable / single core (multi core)	4x1x400mm ² (4x300mm ²)
AC connection type	Type Terminal block M12 cable lug
Output protection	
Anti-islanding protection	According to local standard
Output overvoltage protection - Type 2 surge protection device	Yes, with monitoring
Operating performance	
Maximum efficiency (η_{max})	≥99,02 %
Weighted efficiency (EURO)	≥98,85 %
Communication	
Communication interface	Ethernet, RS-485
Local user interface	4 LEDs, Web User Interface, Mobile APP
Communication protocol	Modbus RTU/TCP (Sunspec compliant)
Commissioning tool	Web User Interface / Mobile APP
Monitoring	Plant Portfolio Platform
FW update	locally/remotely
Parameter upgrade	interface locally/remotely
Environmental	
Operating ambient temperature range	-25...+60°C
Relative humidity	4%...100% condensing
Maximum operating altitude	4000 m

Technical data and types

Type code	PVS-350-TL
Physical	
Environmental protection rating	IP 66
Cooling	Forced air cooling
Dimension (H x W x D)	740 x 1100 x 490 mm
Weight	≤110kg
Safety	
Isolation level	Transformerless
Marking	CE
Safety and EMC standard (planned)	IEC/EN 62109-1, IEC/EN 62109-2, EN 61000-6-2, EN 61000-6-4, EN55011:2017
Optional available	
Online IV curve analysis	Optional
Q@night	Optional
PID Recovery	Optional

Notes:
 1) External AC protection is mandatory

Efficiency Curves





For more information
please contact
your local FIMER
representative or visit:

fimer.com

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TECHNICAL DATASHEET



Single-Axis Tracker

MAIN FEATURES

Tracking System	Horizontal Single-Axis with independent rows	
Tracking Range	up to $\pm 60^\circ$	
Drive System	Enclosed Slewing Drive, DC Motor	
Power Supply	AC/DC Universal Input Optional: Self-Powered PV Series	
Tracking Algorithm	Astronomical with TeamTrack Backtracking	
Communication	RS-485 cable not included in Soltec scope	
Wire	RS-485 Full Wired	
Wireless optional:	Hybrid Radio + RS-485 Cable	Full Wireless
Wind Resistance	Per Local Codes	
Land Use Features		
Independent Rows	YES	
Slope North-South	up to 17%	
Slope East-West	Unlimited	
Ground Coverage Ratio	Configurable. Typical range: 30-50%	
Foundation	Driven Pile Ground Screw Concrete	
Temperature Range		
Standard	- 4°F to +131°F -20°C to +55°C	
Extended	-40°F to +131°F -40°C to +55°C	
Availability	>99%	
Modules	Bifacial	

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B&V Bankability report
DNV GL Technology
Review available
RWDI WIND TUNNEL TESTED

2 year background
industrial operation



MODULE CONFIGURATIONS Aproximate Dimentions

	Length	Height	Width		Length	Height	Width
2x27	28.1 m (92' 3")	4.21 m (13' 10")	4.17 m (13' 8")	2x40.5	42.4 m (139' 3")	4.21 m (13' 10")	4.17 m (13' 8")

SERVICES

Pull Test Plan	Commissioning Plan
Factory Support Plan	Operation & Maintenance Plan
Onsite Advisory Plan	Tracker Monitoring System Plan
Construction Plan	Solmate Customer Care

MAINTENANCE ADVANTAGES

Self-lubricating Bearings
Face to Face Cleaning Mode
2x Wider Aisles

WARRANTY

Structure 10 years (extendable)
Motor 5 years (extendable)
Electronics 5 years (extendable)

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