

Vertex S

BACKSHEET MONOCRYSTALLINE MODULE

PRODUCT: TSM-DE09.08
POWER RANGE: 390-405 W

405 W+

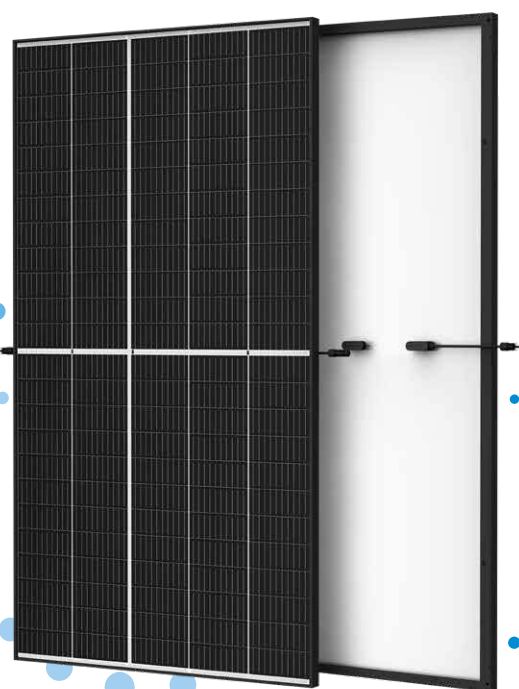
MAXIMUM POWER OUTPUT

0/+5 W

POSITIVE POWER TOLERANCE

21.1 %

MAXIMUM EFFICIENCY



Small in size, big on power

- Generates up to 405 W, 21.1 % module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping, lower series resistance, improved current collection and enhanced reliability
- Excellent low light performance (IAM) with cell process and module material optimization



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
- Reduces installation cost with higher power bin and efficiency
- Flexible installation solutions for system deployment



High Reliability

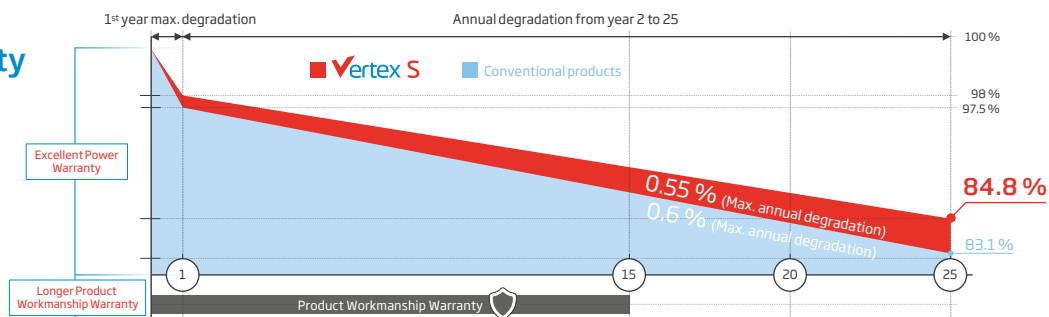
- 6,000 Pa snow load (test load)
- 4,000 Pa wind load (test load)

Extended Vertex S Warranty

2 %
1st year max. degradation

0.55 %
Max. annual degradation from year 2 to 25

15 Years
Product Workmanship Warranty



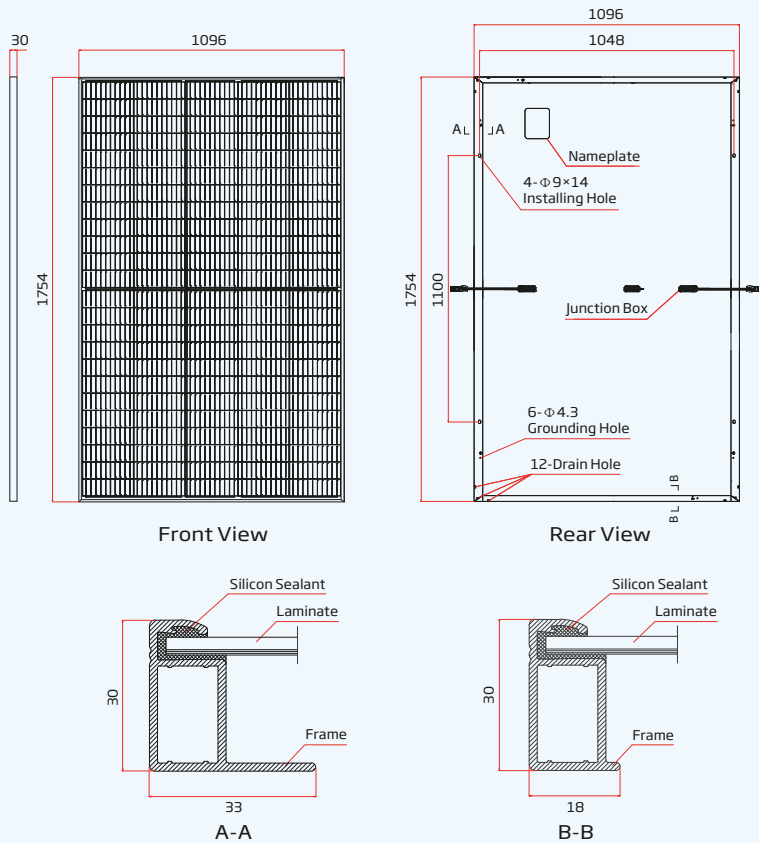
Comprehensive Product and System Certificates



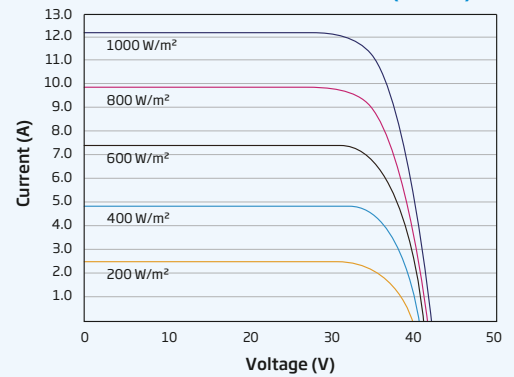
IEC61215/IEC61730/IEC61701/IEC62716
ISO 9001: Quality Management System
ISO 14001: Environmental Management System
ISO14064: Greenhouse Gases Emissions Verification
ISO45001: Occupational Health and Safety Management System

Trinasolar

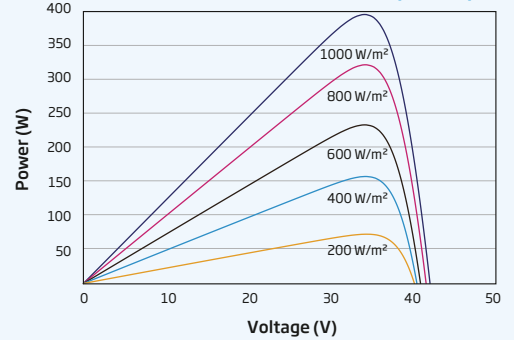
DIMENSIONS OF PV MODULE (mm)



I-V CURVES OF PV MODULE (395 W)



P-V CURVES OF PV MODULE (395 W)



ELECTRICAL DATA (STC)

	TSM-390 DE09.08	TSM-395 DE09.08	TSM-400 DE09.08	TSM-405 DE09.08
Peak Power Watts- P_{MAX} (Wp)*	390	395	400	405
Power Tolerance- P_{MAX} (W)	0/+5	0/+5	0/+5	0/+5
Maximum Power Voltage- V_{MPP} (V)	33.8	34.0	34.2	34.4
Maximum Power Current- I_{MPP} (A)	11.54	11.62	11.70	11.77
Open Circuit Voltage- V_{OC} (V)	40.8	41.0	41.2	41.4
Short Circuit Current- I_{SC} (A)	12.14	12.21	12.28	12.34
Module Efficiency η_m (%)	20.3	20.5	20.8	21.1

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

ELECTRICAL DATA (NOCT)

	TSM-390 DE09.08	TSM-395 DE09.08	TSM-400 DE09.08	TSM-405 DE09.08
Maximum Power- P_{MAX} (Wp)	295	298	302	306
Maximum Power Voltage- V_{MPP} (V)	31.8	32.0	32.2	32.5
Maximum Power Current- I_{MPP} (A)	9.26	9.32	9.38	9.41
Open Circuit Voltage- V_{OC} (V)	38.4	38.6	38.8	38.9
Short Circuit Current- I_{SC} (A)	9.78	9.84	9.90	9.95

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

MECHANICAL DATA

Solar Cells	Monocrystalline
No. of cells	120 cells
Module Dimensions	1754×1096×30 mm
Weight	21.0 kg
Glass	3.2 mm, High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	EVA/POE
Backsheet	White
Frame	30 mm Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0 mm² Landscape: 1100/1100 mm Portrait: 280/280 mm*
Connector	TS4/MC4 EV02*

*Special order only

TEMPERATURE RATINGS

NOCT(Nominal Operating Cell Temperature)	43 °C (±2 K)
Temperature Coefficient of P_{MAX}	-0.34 %/K
Temperature Coefficient of V_{OC}	-0.25 %/K
Temperature Coefficient of I_{SC}	0.04 %/K

WARRANTY

15 year Product Workmanship Warranty
25 year Power Warranty
2% first year Degradation
0.55 % Annual Power Degradation

(Please refer to the applicable limited warranty for details)

MAXIMUM RATINGS

Operational Temperature	-40 to +85 °C
Maximum System Voltage	1500 V DC (IEC)
Max Series Fuse Rating	20 A

PACKAGING CONFIGURATION

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

Trina Solar INTRODUCTION OF **670W** VERTEX MODULE

Vertex

High Power

670W

High Efficiency

21.6%

Mechanical data

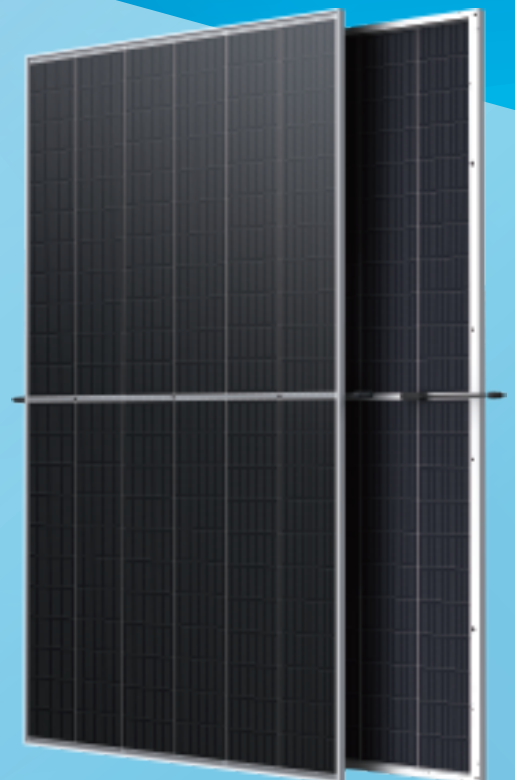
Size: 2384*1303mm

Weight: 33.9kg

Electrical Data

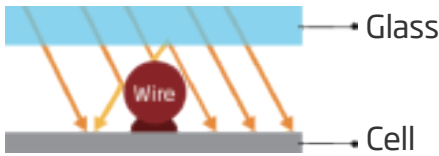
Low voltage concept design

Voc: 45.7V Isc: 18.5A

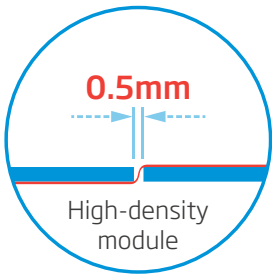
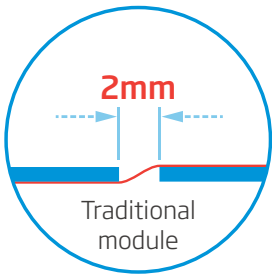


210,The Future from Now On!

Vertex module with 670W+ power
and 21.6%+ efficiency

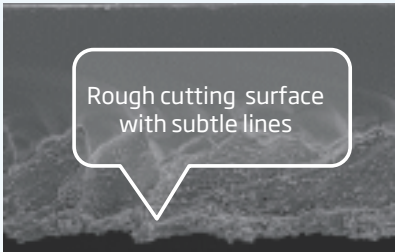


Multi-busbar technology,improving optical utilization rate with higher electricity performance,
Module power increase **2~3%**, efficiency increase **0.4~0.6%**

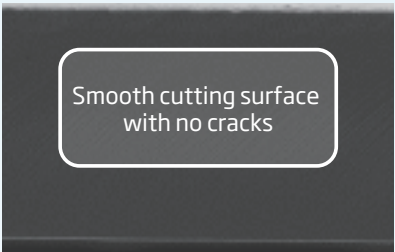


High density encapsulation technology, optimizing power output with good balance between
reliability and efficiency, module efficiency increase **0.2~0.3%**

Non-destructive Cutting(NDC) Technology



Cross-section from
conventional cutting



Cross-section from NDC

Achieving better cell strength, lower micro-cracks riskfor better product reliability

LOWER VOLTAGE BRINGS HIGHER STRING POWER **34%**

Module Type	String Module Number	Module Pmax	String Power	Higher Power
210	28	670W	18,760	34%
182	26	540W	14,040	-

670W

String Power
18,760W

28 pcs/string
53.3 Strings/MW

Rack Steel
33.76 ton/MW

VS

540W

String Power
14,040W

26 pcs/string
71.4 Strings/MW

Rack Steel
37.15 ton/MW

HIGHER STRING POWER BRINGS LOWER COST

CUSTOMER VALUE OF 670W VERTEX MODULES



Case study

Location: Minnesota
Project Capacity: 100MW
Inverter: String Inverter
Capacity ratio: 1.2
Fixed Tilt



-15%
Racks



-17%
Foundation



-11%
Cable

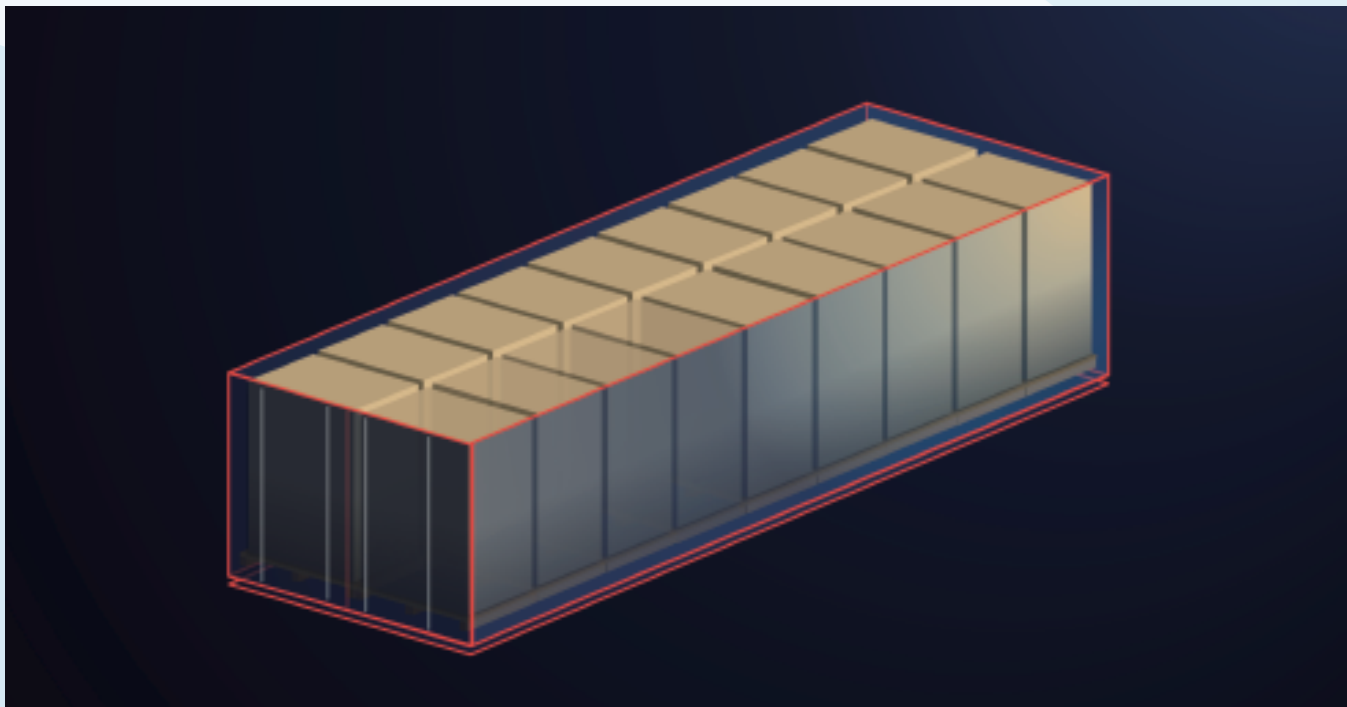
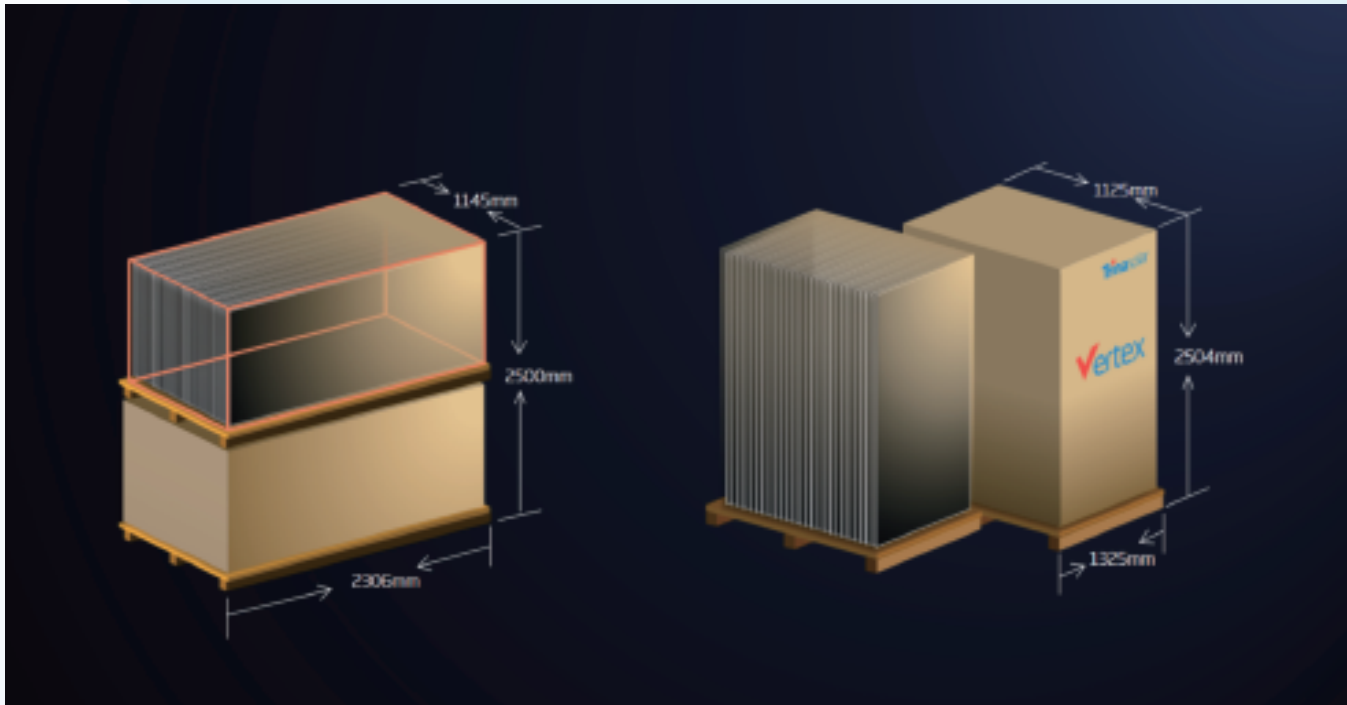


-7%
installation

	Module Type Power	Reference module 540W	Vertex 670W
BOS(\$/W)	Racks	BL	-0.0035
	Foundation	BL	-0.0015
	Cable	BL	-0.0027
	installation	BL	-0.0053
	Sum	BL	-0.013
LCOE			~ -1.2%

*Source: Authority expert.

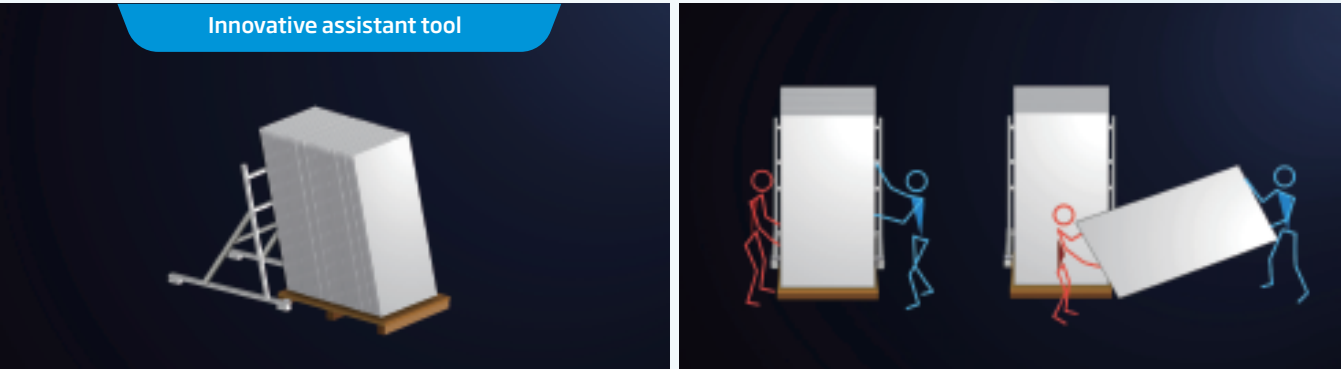
Logistic cost reduce **12%** per container



Category	Module Power	Piece per Pallet	Pallet NO. per Container	Power per Container
Other Module	540W	31	20	334,800W
Vertex Module	670W	31	18	373,860W

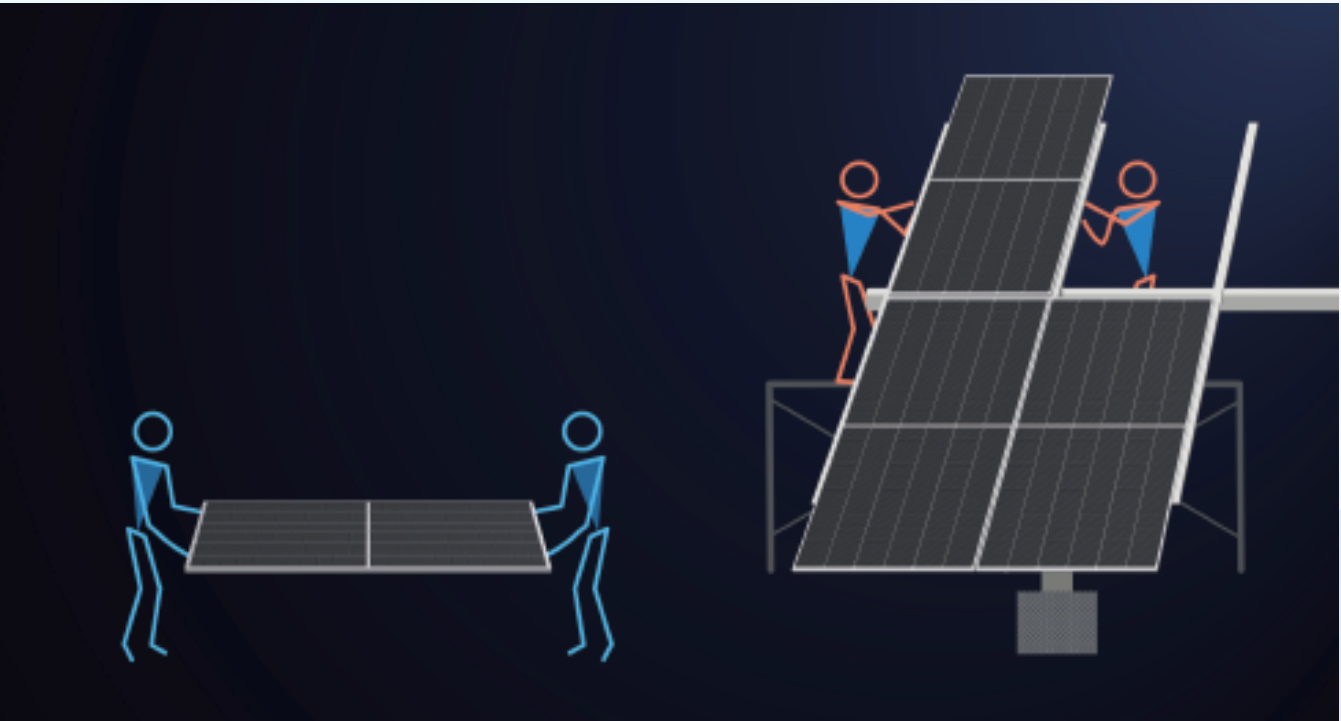
+390,60W (+12%)

Easy for unpacking and prevent module from falling down



Manual handling

4 crews/group, same staffing as traditional installation

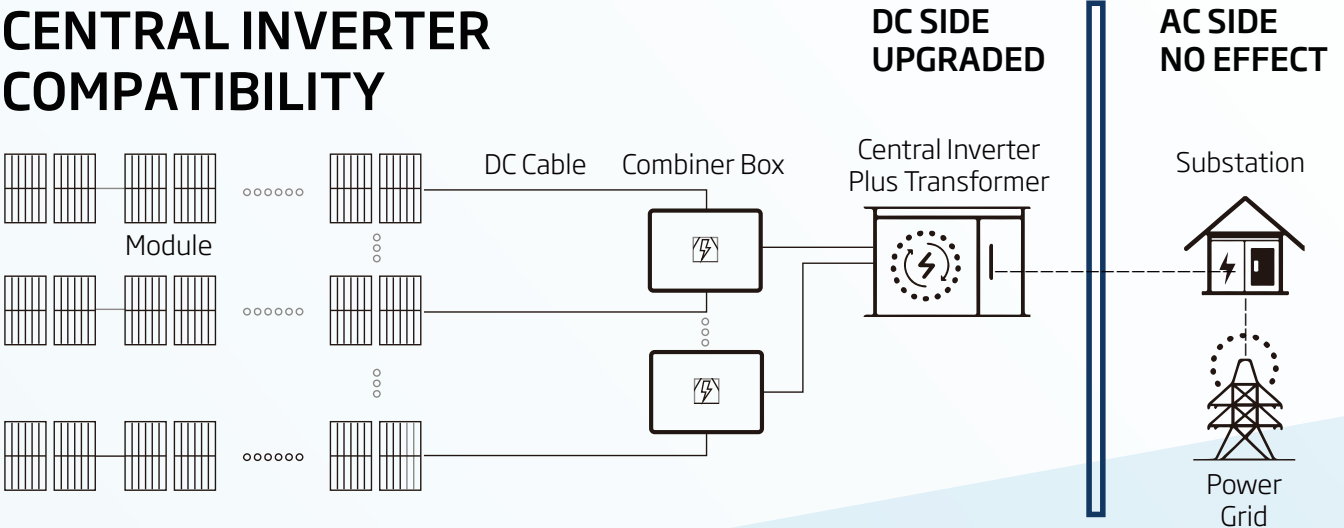


-24%
Module installation Quantity
Installation cost reduction 5-7%

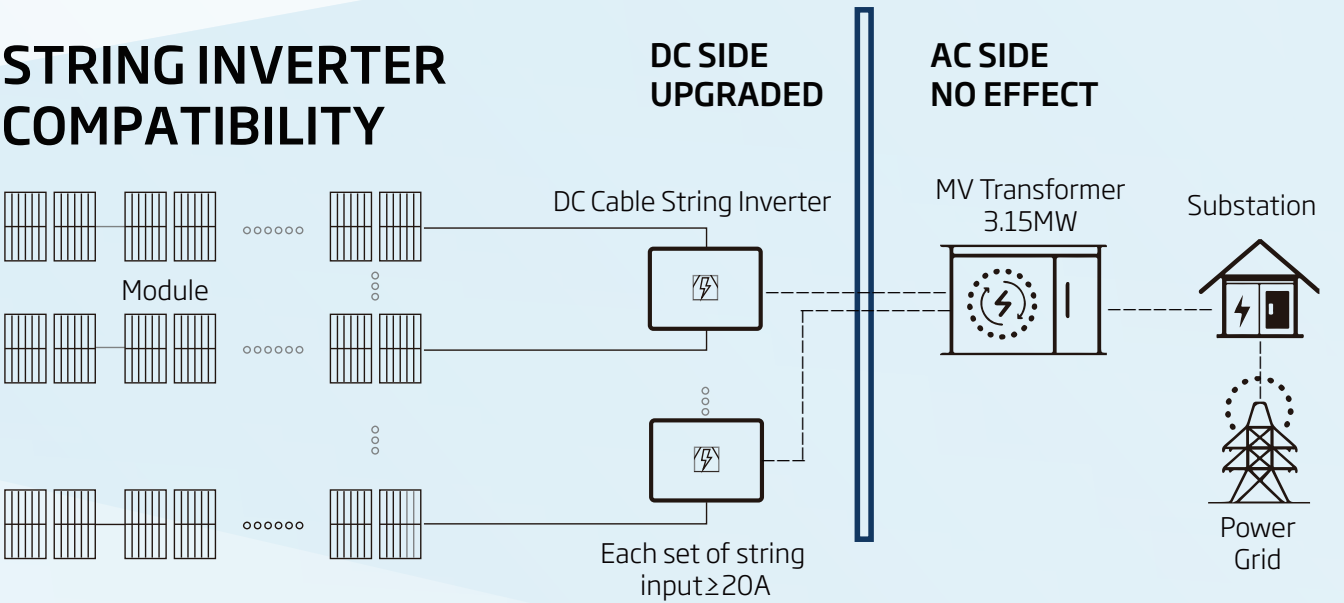
ECOSYSTEM IS COMPLETELY IN PLACE

TYPE		BRAND	MODEL
INVERTER	Central	SUNGROW	1600/2500/3125KW
	String	SUNGROW	SG225HX/SG250HX
		HUAWEI	SUN2000-196KTL-H0/SUN2000-196KTL-H3
		SMA	Sunny Tripower 150-20
		SINENG	SP-225-H/SP-250K-H
COMBINER BOX		LongMax, Bentek, ConnectPV Shoals, SolarBOS	1500V High Current
CABLE		4MM²/6MM²	

CENTRAL INVERTER COMPATIBILITY



STRING INVERTER COMPATIBILITY



MECHANICAL LOADING

Compatible with Fixed-tilt and Tracker

Frame design optimization



Conventional Module frame

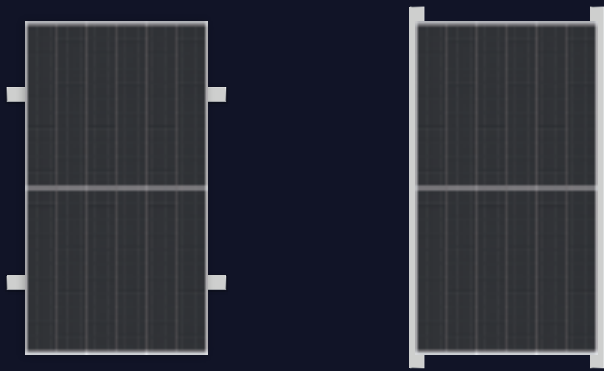
670W Vertex Module frame

Optimal Design:
Optimized frame profile design;
Strengthened material;
Reinforced supporting bar for backsheet module;
Excellent loading performance suits diversified scenarios.

TÜVRheinland®
Precisely Right.

IEC 61215, IEC 61730
Received certification in Jan 2021.

Fix-tilt



Static loading
+5400Pa/-2400Pa

Static loading
+3600Pa/-2400Pa

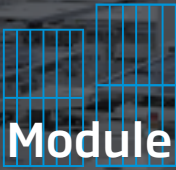
Tracker



Static loading
+2400Pa/-2400Pa

Company Name	Brand/Product Type	210 Modules
Arctech Solar Holdings Co., Ltd.	Skyline/Skysmart II	✓
Array Technologies Inc	DuraTrack HZ v3	✓
GameChange Solar LP	GENIUS TRACKER™ 1P/ GENIUS TRACKER™ 2P	✓
IDEEMATEC Deutschland GmbH	H4PLUS™	✓
Nextracker Inc.	Nextracker products	✓
PV HARDWARE SOLUTIONS, S.L.U	Independent row: Monoline™ (all its versions 1V, 3H and 2V); Multi-row: Axone™, Axone Duo™)	✓
SOLTEC ENERGIAS RENOVABLES S.L.	SF7 & SF8	✓
Trina Solar Co., Ltd	TrinaTracker (Vanguard™/Agile™)	✓
FTC Solar	Voyager/Voyager+	✓
Soltigua	Soltigua products	✓

Vertex Module Capacity in 2021

Module

50+
GW





Power Beyond Solar

Uif!Xpsme!Mfbejoh!QW!boe!Joufhsbufe!Tnbsu!Fofshz!Tpmvujpo!Qspwjefs



Trina Solar
Official Website



Vertex Product
Information

For more information regarding Vertex module,
please follow our social media accounts or
scan the QR codes to visit us at our website.