

455 W

MAXIMUM POWER OUTPUT

0/+5 W

POSITIVE POWER TOLERANCE

22.8 %

MAXIMUM EFFICIENCY



Small in size, bigger on power

- Generates up to 455 W, 22.8 % 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

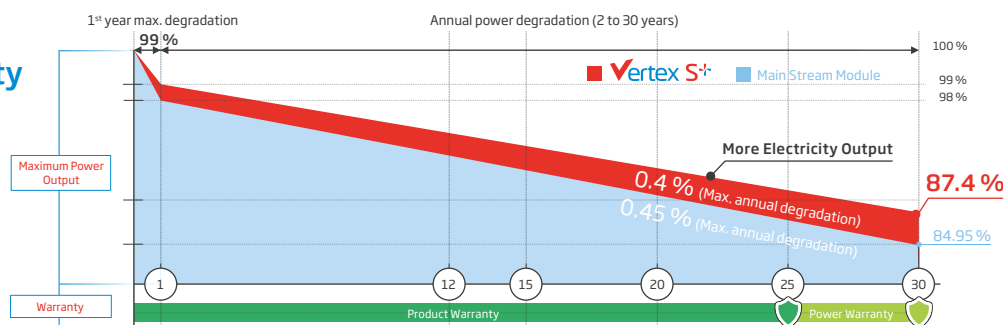
- Designed for compatibility with existing mainstream inverters, optimizers and mounting systems
- Perfect size and low weight for easy handling. Optimized transportation cost
- Flexible installation solutions for system deployment

Extended Vertex S⁺ Warranty

1 %
1st year max. degradation

0.4 %
Max. annual degradation from year 2 to 30

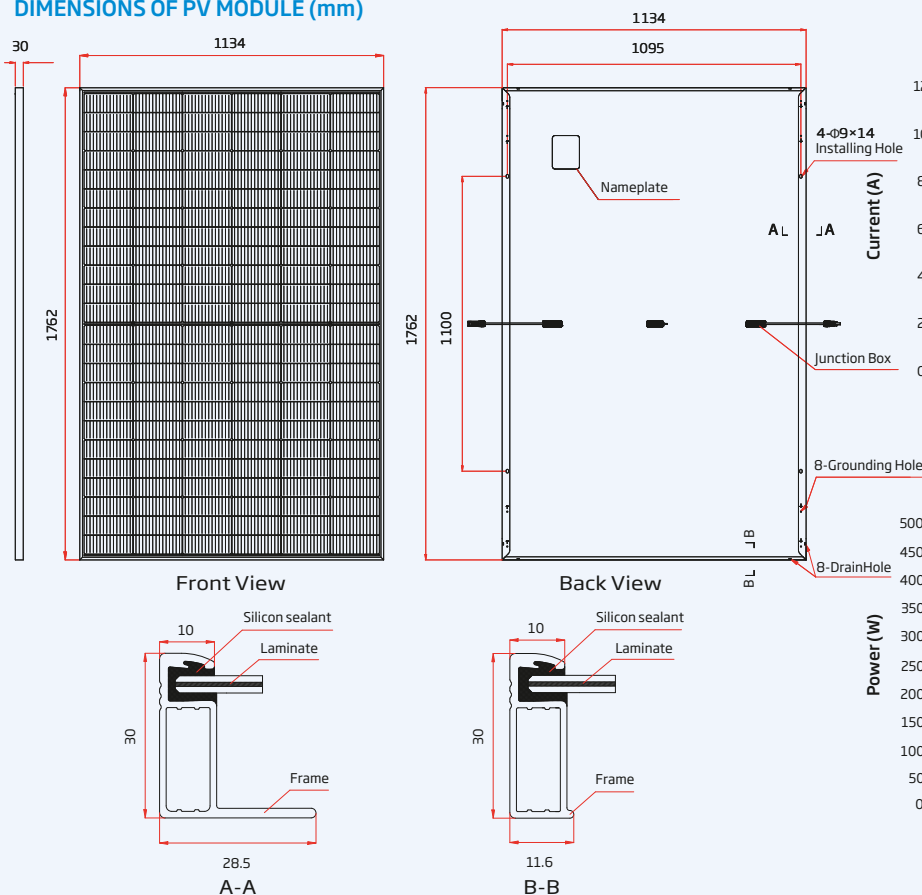
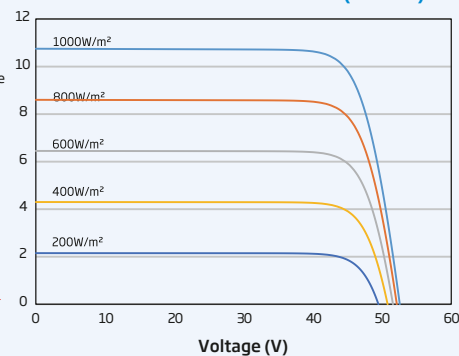
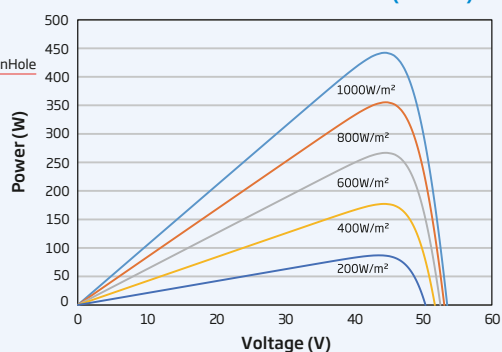
25 Years
Product Workmanship Warranty



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

DIMENSIONS OF PV MODULE (mm)

I-V CURVES OF PV MODULE (445 W)

P-V CURVES OF PV MODULE (445 W)

ELECTRICAL DATA (STC)

	TSM-430 NEG9R.28	TSM-435 NEG9R.28	TSM-440 NEG9R.28	TSM-445 NEG9R.28	TSM-450 NEG9R.28	TSM-455 NEG9R.28
Peak Power Watts-P _{MAX} (Wp)*	430	435	440	445	450	455
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
Maximum Power Current-I _{MPP} (A)	9.96	9.99	10.01	10.05	10.09	10.11
Open Circuit Voltage-V _{OC} (V)	51.4	51.8	52.2	52.6	52.9	53.4
Short Circuit Current-I _{SC} (A)	10.59	10.64	10.67	10.71	10.74	10.77
Module Efficiency η_m (%)	21.5	21.8	22.0	22.3	22.5	22.8

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

ELECTRICAL DATA (NOCT)

	TSM-430 NEG9R.28	TSM-435 NEG9R.28	TSM-440 NEG9R.28	TSM-445 NEG9R.28	TSM-450 NEG9R.28	TSM-455 NEG9R.28
Maximum Power-P _{MAX} (Wp)	329	333	337	341	344	348
Maximum Power Voltage-V _{MPP} (V)	40.7	41.0	41.4	41.7	42.0	42.3
Maximum Power Current-I _{MPP} (A)	8.08	8.12	8.14	8.17	8.19	8.22
Open Circuit Voltage-V _{OC} (V)	48.7	49.1	49.5	49.9	50.2	50.6
Short Circuit Current-I _{SC} (A)	8.54	8.58	8.60	8.63	8.66	8.68

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, High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	POE/EVA
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 / MC4 EV02*

*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

Three Phase Inverter with Synergy Technology For Europe

SE50K / SE66.6K / SE90K / SE100K



INVERTERS

Powered by unique pre-commissioning process for rapid system installation

- / Pre-commissioning feature for automated system validation and wiring during site installation and prior to grid connection
- / Easy two-person installation with lightweight, modular design (each inverter consists of two or three Synergy Units and one Synergy Manager)
- / Independent operation of each Synergy Unit enables higher uptime and easy serviceability
- / Built-in thermal sensors detect faulty wiring, ensuring enhanced protection and safety
- / Designed to automatically reduce high DC voltage to touch-safe levels upon grid/inverter shutdown, with SafeDC™ and optional rapid shutdown
- / Built-in arc fault protection
- / Built-in PID mitigation for maximized system performance
- / Monitored* and field-replaceable surge protection devices to better withstand surges caused by lightning or other events
- / Streamlined cabling and lower BoS costs with single DC connection option
- / Optional integrated DC safety switch eliminates the need for external DC isolators
- / Built-in module-level monitoring with Ethernet or cellular communication for full system visibility

*Applicable only for DC and AC SPDs

/ Three Phase Inverter with Synergy Technology

For Europe

SE50K / SE66.6K / SE90K / SE100K

Applicable to inverter with part number	SExxK-xxx0lxxxx				Units
	SE50K ⁽¹⁾ For 400V Grid	SE66.6K For 400V Grid	SE90K For 400V Grid	SE100K For 400V Grid	
OUTPUT					
Rated AC Active Output Power	50,000 ⁽²⁾	66,600	90,000	100,000	W
Maximum AC Apparent Output Power	50,000 ⁽²⁾	66,600	90,000 ⁽³⁾	100,000	VA
AC Output Voltage – Line to Line / Line to Neutral (Nominal)	380 / 220; 400 / 230				Vac
AC Output Voltage – Line to Line Range / Line to Neutral Range	304 – 437 / 176 – 253; 320 – 460 / 184 – 264.5				Vac
AC Frequency	50/60 ± 5%				Hz
Maximum Continuous Output Current (per Phase)	72.5	96.5 ⁽⁴⁾	130.5 ⁽⁵⁾	145 ⁽⁶⁾	Aac
AC Output Line Connections	3W + PE, 4W + PE				
Supported Grids	WYE: TN-C, TN-S, TN-C-S, TT, IT; Delta: IT				
Maximum Residual Current Injection ⁽⁷⁾	200		300		mA
Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds	Yes				
Total Harmonic Distortion	≤ 3				%
Power Factor Range	± 0.2 to 1				
INPUT					
Maximum DC Power (Module STC) Inverter / Synergy Unit	87,500 / 43,750	116,550 / 58,275	157,500 / 52,500	175,000 / 58,300	W
Transformer-less, Ungrounded	Yes				
Maximum Input Voltage DC+ to DC-	1000				Vdc
Operating Voltage Range	680 – 1000				Vdc
Maximum Input Current	2 x 36.25	2 x 48.25	3 x 43.5	3 x 48.25	Adc
Reverse-Polarity Protection	Yes				
Ground-Fault Isolation Detection	167 kΩ sensitivity per Synergy Unit ⁽⁸⁾				
Maximum Inverter Efficiency	98.3				%
European Weighted Efficiency	98				%
Nighttime Power Consumption	< 8		< 12		W
ADDITIONAL FEATURES					
Supported Communication Interfaces ⁽⁹⁾	2 x RS485, Ethernet, Wi-Fi (optional), Cellular (optional)				
Smart Energy Management	Export limitation				
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi access point for local connection				
Arc Fault Protection	Built-in, user configurable (according to UL 1699B)				
Rapid Shutdown	Optional (automatic upon AC Grid Disconnect)				
PID Rectifier	Nighttime, built-in				
RS485 Surge Protection (ports 1 + 2)	Type II, field replaceable, integrated				
DC Surge Protection	Type II, field replaceable, integrated				
AC Surge Protection	Type II, field replaceable, optional				
DC Fuses (Single Pole)	Optional, 25 A / 30 A				
DC Disconnect Switch	Optional				
Pre-Commissioning	Built-in ⁽¹⁰⁾				
STANDARD COMPLIANCE					
Safety	IEC-62109-1; IEC-62109-2; AS3100				
Grid Connection Standards ⁽¹¹⁾	EN 50549-1; EN 50549-2; VDE-AR-N 4105; VDE-AR-N 4110; VDE V 0126-1-1; CEI 0-21, CEI 0-16; TOR Erzeuger Typ A+B; G99 Type A+B; G99 (NI) Type A+B; VFR 2019				
Emissions	IEC 61000-6-2; IEC 61000-6-3 Class A; IEC 61000-3-11; IEC 61000-3-12				
RoHS	Yes				

(1) Not available in all countries. For details about the supported inverters in your country, see [Countries Supported by the SolarEdge Inverters](#).

(2) 49,990 in the UK.

(3) When using country settings that follow VDE-AR-N 4110, the Maximum AC Apparent Output Power is 100,000 VA.

(4) When using country settings that follow VDE-AR-N 4110, the Maximum Continuous Output Current per Phase is 107.4 A.

(5) When using country settings that follow VDE-AR-N 4110, the Maximum Continuous Output Current per Phase is 145 A.

(6) When using country settings that follow VDE-AR-N 4110, the Maximum Continuous Output Current per Phase is 161.1 A.

(7) If an external RCD is required, its trip value must be ≥ 200 mA for SE50K and SE66.6K; ≥ 300 mA for SE90K and SE100K.

(8) Where permitted by local regulations.

(9) For specifications of the optional communication options, visit the [Communication page](#) on the SolarEdge website or download the relevant product datasheet from the [Knowledge Center](#).

(10) Not available for P/Ns SExxK-xxxxBPxx.

(11) For all standards and certificates download, refer to the [Certificates category](#) in the Knowledge Center.

/ Three Phase Inverter with Synergy Technology

For Europe

SE50K / SE66.6K / SE90K / SE100K

Applicable to inverter with part number	SExxK-xxx0lxxxx				
	SE50K For 400V Grid	SE66.6K For 400V Grid	SE90K For 400V Grid	SE100K For 400V Grid	Units
INSTALLATION SPECIFICATIONS					
Number of Synergy Units per Inverter	2		3		
AC Wire Cross Section and Outer Diameter: Line/PE (Aluminum or Copper)	Cross section up to 120 / 70 mm ² ; outer diameter 30-50 / 12-20 mm				
DC Input: Inverter / Synergy Unit ⁽¹²⁾⁽¹³⁾	8 / 4 MC4 pairs		12 / 4 MC4 pairs		
	Gland, 2 pairs / 1 pair, cross section 25 – 70 mm ² , aluminum or copper Cable outer diameter 12 – 20 mm		Gland, 3 pairs / 1 pair, cross section 25 – 70 mm ² , aluminum or copper Cable outer diameter 12 – 20 mm		
Dimensions (H x W x D)	Synergy Unit: 558 x 328 x 273 Synergy Manager: 360 x 560 x 295				mm
Weight	Synergy Unit: 32 Synergy Manager: 18				kg
Operating Temperature Range	-40 to +60 ⁽¹⁴⁾				°C
Cooling	Fan (user replaceable)				
Noise	< 67				dBA
Protection Rating	IP65 – outdoor and indoor				
Mounting	Brackets provided				

(12) DC input is available with MC4 or Gland connection under the inverter part number. For more information, contact SolarEdge.

(13) Only MC4 connectors manufactured by Staubli are approved for use.

(14) For power de-rating information refer to the [Temperature Derating](#) technical note.

Accessories - SPDs (purchased separately)	
Accessory	P/N
AC SPD kit for Synergy Manager (5 units per box)	SE-AC-SPD-SM

SolarEdge is a global leader in smart energy technology. By leveraging world-class engineering capabilities and with a relentless focus on innovation, SolarEdge creates smart energy solutions that power our lives and drive future progress.

SolarEdge developed an intelligent inverter solution that changed the way power is harvested and managed in photovoltaic (PV) systems. The SolarEdge DC optimized inverter maximizes power generation while lowering the cost of energy produced by the PV system.

Continuing to advance smart energy, SolarEdge addresses a broad range of energy market segments through its PV, storage, EV charging, UPS, and grid services solutions.

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CE RoHS

solaredge

Power Optimizer

S1000 / S1200



POWER OPTIMIZERS

SolarEdge's most advanced, cost-effective Power Optimizer for commercial and large field installations

Greater Energy Yields

- High efficiency (99.5%) with module-level MPPT, for maximized system energy production and revenue, and fast project ROI
- Supports high power and bifacial PV modules, and high string current for more power per string

Maximum Protection with Built-In Safety

- Designed to automatically reduce high DC voltage to touch-safe levels, upon grid/inverter shutdown, with SafeDC™
- Includes SolarEdge Sense Connect, allowing continuous monitoring to detect overheating due to installation issues or connector-level wear and tear

Lower BoS Costs

- Flexible system design enables maximum space utilization and up to 2x longer string lengths, 50% less cables, fuses and combiner boxes
- Supports connection of two PV modules in series with easy cable management and fast installation times

Simpler O&M

- Module-level system monitoring enabling pinpointed fault detection and remote, time-saving troubleshooting

/ Power Optimizer

S1000 / S1200

Power Optimizer Model (Typical Module Compatibility)	S1000 (for up to 2 x high power or bifacial modules)	S1200	Units
INPUT			
Rated Input DC Power ⁽¹⁾	1000	1200	W
Absolute Maximum Input Voltage (Voc)	125		Vdc
MPPT Operating Range	12.5 – 105		Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	15		Adc
Maximum Efficiency	99.5		%
Weighted Efficiency	98.8		%
Overvoltage Category	II		
OUTPUT DURING OPERATION			
Maximum Output Current	18	20	Adc
Maximum Output Voltage	80		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)			
Safety Output Voltage per Power Optimizer	1±0.1		Vdc
STANDARD COMPLIANCE			
EMC	FCC Part 15, IEC 61000-6-2, and IEC 61000-6-3 – Class B, EN 55011		
Safety	IEC 62109-1 (class II safety), UL 3741		
Material	UL 94 V-0, UV Resistant		
RoHS	Yes		
Fire Safety	VDE-AR-E 2100-712:2013-05		
INSTALLATION SPECIFICATIONS			
Compatible SolarEdge Inverters	All commercial three phase inverters		
Maximum Allowed System Voltage	1000		Vdc
Dimensions (W x L x H)	129 x 165 x 52 / 5.08 x 6.49 x 2.047	129 x 165 x 59 / 5.08 x 6.49 x 2.32	mm / in
Weight (including cables)	1064 / 2.3	1106 / 2.4	gr / lb
Input Connector	MC4 ⁽²⁾		
Input Wire Length	Short Input: 0.1 / 0.32 Long Input: 1.3 / 4.26 ⁽³⁾	Short Input: 0.1 / 0.32 Long Input: 1.6 / 5.24 ⁽³⁾	m / ft
Output Connector	MC4		
Output Wire Length	(+) 4.7 (-) 0.10 / (+) 15.41 (-) 0.32	(+) 5.3 (-) 0.10 / (+) 17.38 (-) 0.32	m / ft
Operating Temperature Range ⁽⁴⁾	-40 to +85 / -40 to +185		°C / °F
Protection Rating	IP68 / NEMA6P		
Relative Humidity	0 – 100		%
Maximum Operating Altitude	2000		m

(1) Rated power of the module at STC will not exceed the power optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed.

(2) For other connector types please contact SolarEdge.

(3) For S-Series models with long input cables (1.3m / 4.26ft or 1.6m / 5.24ft), the Sense Connect feature is only enabled on the output cable connectors.

(4) For ambient temperatures above +65°C / +149°F power derating is applied.

S1000 Mechanical Drawing	S1200 Mechanical Drawing

* When installing SolarEdge power optimizers, maintaining clearance is required. Refer to the [Power Optimizer Clearance Application Note](#) for more details.

/ PV System Design

S1000

PV System Design Using a SolarEdge Inverter ⁽¹⁾⁽²⁾⁽³⁾		230/400V Grid SE15K ⁽⁴⁾	230/400V Grid SE16K ⁽⁵⁾ , SE17K ⁽⁵⁾ , SE25K*	230/400V Grid SE27.6K*	230/400V Grid SE30K*	230/400V Grid SE33.3K*	277/480V Grid SE40K*	Units
Compatible Power Optimizers		S1000						
Minimum String Length	Power Optimizers	14	14	14	15	14	15	
	PV Modules	27	27	27	29	27	29	
Maximum String Length	Power Optimizers ⁽⁶⁾	30	30	30	30	30	30	
	PV Modules	60	60	60	60	60	60	
Maximum Continuous Power per String [W]		13,950	13,500	13,950	15,300	13,500	15,300	W
Maximum Allowed Connected Power per String ⁽⁷⁾	1 string: 16,200	1 string: 15,750	1 string: 16,200	1 string: 17,550	2 strings: 15,750	1 – 2 strings: 17,550		
	2 strings or more: 18,950	2 strings or more: 18,500	2 strings or more: 18,950	2 strings or more: 20,300	3 strings or more: 18,500	3 strings or more: 20,300		
Parallel Strings of Different Lengths or Orientations		Yes						
Maximum Difference in Number of Power Optimizers Allowed Between the Shortest and Longest String Connected to the Same Inverter Unit		5 Power Optimizers						

*The same rules apply for Synergy units of equivalent power ratings, that are part of the modular Synergy Technology inverter.

(1) S1000 cannot be mixed with S1200 in the same string. For P-series compatibility please refer to the [SolarEdge Power Optimizer Inter-Compatibility Technical Note](#).

(2) For each string, a Power Optimizer may be connected to a single PV module if:

- 1) Each Power Optimizer is connected to a single PV module (the entire string has a 1:1 configuration).
- 2) It is the only Power Optimizer connected to a single PV module.

(3) For SE15K and above, the minimum STC DC connected power should be 11KW.

(4) SE15K is compatible with S1000 only in India.

(5) SE16K and SE17K are compatible with S1000 only in Taiwan, South Africa, India, and Israel.

(6) When connecting to inverters that support Rapid Shutdown, each string must contain fewer than 28 power optimizers to meet NEC Rapid Shutdown requirements.

(7) To connect more STC power per string, design your project using [SolarEdge Designer](#).

S1200

PV System Design Using a SolarEdge Inverter ⁽⁸⁾⁽⁹⁾⁽¹⁰⁾		230/400V Grid SE15K ^{(11)*}	230/400V Grid SE16K ⁽¹²⁾ , SE17K ⁽¹²⁾ , SE25K*	230/400V Grid SE27.6K*	230/400V Grid SE30K, SE33.3K ⁽¹³⁾	277/480V Grid SE40K*	Units
Compatible Power Optimizers		S1200					
Minimum String Length	Power Optimizers	14	14	14	15	15	
	PV Modules	27	27	27	29	29	
Maximum String Length	Power Optimizers ⁽¹⁴⁾	30	30	30	30	30	
	PV Modules	60	60	60	60	60	
Maximum Continuous Power per String [W]		15,500	15,000	15,500	17,000	17,000	W
Maximum Allowed Connected Power per String ⁽¹⁵⁾		1 string or more: 20,500	1 string: 17,250	1 string: 17,750	1 string: 19,250	1 – 2 strings: 19,250	
			2 strings or more: 20,000	2 strings or more: 20,500	2 strings or more: 23,000	3 strings or more: 23,000	
Parallel Strings of Different Lengths or Orientations		Yes					
Maximum Difference in Number of Power Optimizers Allowed Between the Shortest and Longest String Connected to the Same Inverter Unit		5 Power Optimizers					

*The same rules apply for Synergy units of equivalent power ratings, that are part of the modular Synergy Technology inverter.

(8) S1200 cannot be mixed with any other power optimizer in the same string.

(9) For each string, a Power Optimizer may be connected to a single PV module if:

- 1) Each Power Optimizer is connected to a single PV module (the entire string has a 1:1 configuration).
- 2) It is the only Power Optimizer connected to a single PV module.

(10) For SE15K and above, the minimum STC DC connected power should be 11KW.

(11) SE15K is compatible with S1200 only in India.

(12) SE16K and SE17K are compatible with S1200 only in Taiwan, South Africa, India, and Israel.

(13) To connect an S1200 power optimizer with an SE33.3K inverter, you must toggle the Fixed String Voltage from 750Vdc to 850Vdc via SolarEdge SetApp. For details, see [this application note](#).


(14) When connecting to inverters that support Rapid Shutdown, each string must contain fewer than 28 power optimizers to meet NEC Rapid Shutdown requirements.

(15) To connect more STC power per string, design your project using [SolarEdge Designer](#).

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