
Power Optimizer

For North America

S440 / S500B / S650B



POWER OPTIMIZER

PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Detects abnormal PV connector behavior, preventing potential safety issues
- Module-level voltage shutdown for installer and firefighter safety
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch loss, from manufacturing tolerance to partial shading
- Faster installations with simplified cable management and easy assembly using a single bolt
- Flexible system design for maximum space utilization
- Compatible with bifacial PV modules
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)

/ Power Optimizer

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| | S440 | S500B | S650B | |
|--|---|-------------------------------------|-----------|---------|
| INPUT | | | | |
| Rated Input DC Power ⁽¹⁾ | 440 | 500 | 650 | W |
| Absolute Maximum Input Voltage (Voc) | 60 | 125 | 85 | Vdc |
| MPPT Operating Range | 8 – 60 | 12.5 – 105 | 12.5 – 85 | Vdc |
| Maximum Short Circuit Current (Isc) of Connected PV Module | 14.5 | 15 | | Adc |
| Maximum Efficiency | 99.5 | | | % |
| Weighted Efficiency | 98.6 | | | % |
| Overvoltage Category | II | | | |
| OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER) | | | | |
| Maximum Output Current | 15 | | | Adc |
| Maximum Output Voltage | 60 | 80 | | Vdc |
| OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREEDGE INVERTER OR INVERTER OFF) | | | | |
| Safety Output Voltage per Power Optimizer | 1 ± 0.1 | | | Vdc |
| STANDARD COMPLIANCE | | | | |
| Photovoltaic Rapid Shutdown System | NEC 2014, 2017 & 2020 | | | |
| EMC | FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3 | | | |
| Safety | IEC62109-1 (class II safety), UL1741 | | | |
| Material | UL94 V-0, UV Resistant | | | |
| RoHS | Yes | | | |
| Fire Safety | VDE-AR-E 2100-712:2013-05 | | | |
| INSTALLATION SPECIFICATIONS | | | | |
| Maximum Allowed System Voltage | 1000 | | | Vdc |
| Dimensions (W x L x H) | 129 x 155 x 30 / 5.07 x 6.10 x 1.18 | 129 x 165 x 45 / 5.07 x 6.49 x 1.77 | | mm / in |
| Weight | 720 / 1.6 | 790 / 1.74 | | gr / lb |
| Input Connector | MC4 ⁽²⁾ | | | |
| Input Wire Length | 0.1 / 0.32 | | | m / ft |
| Output Connector | MC4 | | | |
| Output Wire Length | (+) 2.3, (-) 0.10 / (+) 7.54, (-) 0.32 | | | m / ft |
| Operating Temperature Range ⁽³⁾ | -40 to +85 | | | °C |
| Protection Rating | IP68 / NEMA6P | | | |
| Relative Humidity | 0 – 100 | | | % |

(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) Power de-rating is applied for ambient temperatures above +85°C / +185°F for S440, and for ambient temperatures above +75°C / 167°F for S500B. Refer to the [Power Optimizers Temperature De-Rating Technical Note](#) for more details.

| PV System Design Using a SolarEdge Inverter | SolarEdge Home Wave/Hub - Single Phase | Three Phase for 208V Grid | Three Phase for 277/480V Grid | |
|---|--|---|-------------------------------|-------------------|
| Minimum String Length (Power Optimizers) | S440: 8 S500B, S650B: 6 | 10 8 | 18 14 | |
| Maximum String Length (Power Optimizers) | 25 | | | 50 ⁽⁴⁾ |
| Maximum Nominal Power per String | 5700 | 6000 | 12750 | W |
| Maximum Allowed Connected Power per String ⁽⁵⁾ (In multiple string designs, the maximum is permitted only when the difference in connected power between strings is 1,000W or less) | SE6000H: 5700 SE7600H and above: 6000 | One string: 7200 Two strings or more: 7800 | 15000 | W |
| Parallel Strings of Different Lengths or Orientations | Yes | | | |

(4) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement.

(5) If the inverters rated AC power ≤ maximum nominal power per string, then the maximum power per string will be able to reach up to the inverters maximum input DC power. Refer to the [Single String Design Guidelines Application Note](#) for more details.

(6) It is not allowed to mix S-series and P-series Power Optimizers in new installations.

