



/ MVPS 4000-S2-US / MVPS 4200-S2-US / MVPS 4400-S2-US / MVPS 4600-S2-US



Medium Voltage Power Station

4000-S2-US / 4200-S2-US /
4400-S2-US / 4600-S2-US

Turnkey solution for PV, storage, and
PV plus storage power plants



Robust

- Complete station is UL listed for higher safety and lower risk
- Station and all individual components type-tested for maximum reliability
- Optimally suited to extreme ambient conditions with galvanized base frame

Simple Integration

- Plug and play concept
- Completely pre-assembled for easy set-up and commissioning

Cost-Effective

- Fully integrated transformer and switchgear simplifies logistics
- Minimum O&M requirements create lowest cost of ownership

Flexible

- One product for all markets and applications
- Ideally suited for PV applications, PV plus storage (DC coupled) and storage applications (AC coupled)

With the power of the SMA's robust central inverters, the Sunny Central UP or Sunny Central Storage UP, and with perfectly integrated medium-voltage components, the Medium Voltage Power Station (MVPS) offers high power density in a turnkey solution available worldwide.

The solution is the ideal choice for next-generation PV power plants and battery-storage power plants operating at 1500 V DC. Delivered pre-configured on a 20-foot container-integrated skid, the solution is easy to transport and quick to commission. The UL1741-listed MVPS combines rigorous plant safety with maximum energy yield and minimized operating risk.

MEDIUM VOLTAGE POWER STATION

4000-S2-US / 4200-S2-US

| Technical Data | MVPS 4000-S2-US | MVPS 4200-S2-US |
|---|--|--|
| Input (DC) | | |
| Available inverters | 1 x SC 4000 UP-US or 1 x SCS 3450 UP-US or 1 x SCS 3450 UP-XT-US | 1 x SC 4200 UP-US or 1 x SCS 3600 UP-US or 1 x SCS 3600 UP-XT-US |
| Max. input voltage | 1500 V | 1500 V |
| Number of DC inputs | dependent on the selected inverter | |
| Integrated zone monitoring | ○ | |
| Available DC fuse sizes (per input) | 200 A, 250 A, 315 A, 350 A, 400 A, 450 A, 500 A | |
| Output (AC) on the medium-voltage side | | |
| Rated power with SC-UP-US (at -25 °C to +35 °C / 40 °C optional 50 °C) ¹⁾ | 4000 kVA / 3600 kVA | 4200 kVA / 3780 kVA |
| Rated power with SCS-UP-US (at -25 °C to +25 °C / 40 °C optional 50 °C) ¹⁾ | 3450 kVA / 2930 kVA | 3620 kVA / 3075 kVA |
| Charging power with SCS-UP-XT-US (at -25 °C to +25 °C / 40 °C optional 50 °C) ¹⁾ | 3590 kVA/3000 kVA | 3770 kVA / 3150 kVA |
| Discharging power with SCS-UP-XT-US (at -25 °C to +25 °C / 40 °C optional 50 °C) ¹⁾ | 4000 kVA / 3400 kVA | 4200 kVA / 3570 kVA |
| Typical nominal AC voltages | 12 kV to 34.5 kV | 12 kV to 34.5 kV |
| AC power frequency | 50 Hz / 60 Hz | 50 Hz / 60 Hz |
| Transformer vector group Dy11 / YNd11 / YNy0 | ● / ○ / ○ | ● / ○ / ○ |
| Transformer cooling methods | KNAN ²⁾ | KNAN ²⁾ |
| Transformer efficiency: Standard / Eco Design 1 / Eco Design 2 | ● / ○ / ○ | ● / ○ / ○ |
| Max. total harmonic distortion | < 3% | |
| Reactive power feed-in (up to 60% of nominal power) | ○ | |
| Power factor at rated power / displacement power factor adjustable | 1 / 0.8 overexcited to 0.8 underexcited | |
| Inverter efficiency | | |
| Max. efficiency ³⁾ / European efficiency ³⁾ / CEC weighted efficiency ⁴⁾ | 98.7% / 98.6% / 98.5% | 98.7% / 98.6% / 98.5% |
| Protective devices | | |
| Input-side disconnection point | DC load-break switch | |
| Output-side disconnection point | Medium-voltage vacuum circuit breaker | |
| DC overvoltage protection | Surge arrester type I | |
| Galvanic isolation | ● | |
| Internal arc classification medium-voltage control room (according to IEC 62271-202) | IAC A 25 kA 1 s | |
| General data | | |
| Dimensions equal to 20-foot HC shipping container (W / H / D) | 6058 mm / 2896 mm / 2438 mm | |
| Weight | < 18 t | |
| Self-consumption (max. / partial load / average) ¹⁾ | < 8.1 kW / < 1.8 kW / < 2.0 kW | |
| Self-consumption (stand-by) ¹⁾ | < 370 W | |
| Degree of protection according to IEC 60529 | Control rooms IP23D, inverter electronics IP54 | |
| Environment: standard / harsh | ● / ○ | |
| Degree of protection according to IEC 60721-3-4 (4C1, 4S2 / 4C2, 4S4) | ● / ○ | |
| Maximum permissible value for relative humidity | 95% (for 2 months/year) | |
| Max. operating altitude above mean sea level 1000 m / 2000 m | ● / ○ | |
| Fresh air consumption of inverter | 6500 m ³ /h | |
| Features | | |
| DC terminal | Terminal lug | |
| AC connection | Outer-cone angle plug | |
| Tap changer for MV-transformer: without / with | ● / ○ | |
| Shield winding for MV-Transformer: without / with | ● / ○ | |
| Station enclosure color | RAL 7004 | |
| Transformer for external loads: without / 10 / 20 / 30 / 40 / 50 / 60 kVA | ● / ○ / ○ / ○ / ○ / ○ / ○ | |
| Medium-voltage switchgear: without / 1 panel / 3 panels | ● / ○ / ○ | |
| 2 cable feeders with load-break switch, 1 transformer feeder with circuit breaker, internal arc classification IAC A FL 25 kA 1s according to IEC 62271-200 | ● / ○ / ○ | |
| Short circuit rating medium voltage switchgear (25 kA 1s) | ● | |
| Integrated oil containment: without / with | ● / ○ | |
| Industry standards (for other standards see the inverter datasheet) | IEC 60076, IEC 62271-200, IEC 62271-202, EN50588-1 IEEE 1547-2018 ⁵⁾ , IEEE C37.100.1, IEEE C57.12, C37.20.9, UL 1741 listed, CSC Certificate, UL 347 | |
| ● Standard features ○ Optional features – Not available | | |
| Type designation | MVPS-4000-S2-US | MVPS-4200-S2-US |

1) Data based on inverter. Further details can be found in the data sheet of the inverter. Cold weather -37° is an option.

2) KNAN = Natural ester fluid with natural air cooling

3) Efficiency measured at inverter without internal power supply

4) Efficiency measured at inverter with internal power supply

5) Harmonics are within IEEE 1547-2018 limits with at least two inverters in operation.

MEDIUM VOLTAGE POWER STATION

4400-S2-US / 4600-S2-US

| Technical Data | MVPS 4400-S2-US | MVPS 4600-S2-US |
|---|--|--|
| Input (DC) | | |
| Available inverters | 1 x SC 4400 UP-US or 1 x SCS 3800 UP-US or 1 x SCS 3800 UP-XT-US | 1 x SC 4600 UP-US or 1 x SCS 3950 UP-US or 1 x SCS 3950 UP-XT-US |
| Max. input voltage | 1500 V | 1500 V |
| Number of DC inputs | dependent on the selected inverter | |
| Integrated zone monitoring | ○ | |
| Available DC fuse sizes (per input) | 200 A, 250 A, 315 A, 350 A, 400 A, 450 A, 500 A | |
| Output (AC) on the medium-voltage side | | |
| Rated power with SC-UP-US (at -25 °C to +35 °C / 40 °C optional 50 °C) ¹⁾ | 4400 kVA / 3960 kVA | 4600 kVA / 4140 kVA |
| Rated power with SCS-UP-US (at -25 °C to +25 °C / 40 °C optional 50 °C) ¹⁾ | 3800 kVA / 3230 kVA | 3960 kVA / 3365 kVA |
| Charging power with SCS-UP-XT-US (at -25 °C to +25 °C / 40 °C optional 50 °C) ¹⁾ | 3950 kVA / 3300 kVA | 4130 kVA / 3455 kVA |
| Discharging power with SCS-UP-XT-US (at -25 °C to +25 °C / 40 °C optional 50 °C) ¹⁾ | 4400 kVA / 3740 kVA | 4600 kVA / 3910 kVA |
| Typical nominal AC voltages | 12 kV to 34.5 kV | 12 kV to 34.5 kV |
| AC power frequency | 50 Hz / 60 Hz | 50 Hz / 60 Hz |
| Transformer vector group Dy11 / YNd11 / YNy0 | ● / ○ / ○ | ● / ○ / ○ |
| Transformer cooling methods | KNAN ²⁾ | KNAN ²⁾ |
| Transformer efficiency: Standard / Eco Design 1 / Eco Design 2 | ● / ○ / ○ | ● / ○ / ○ |
| Max. total harmonic distortion | < 3% | |
| Reactive power feed-in (up to 60% of nominal power) | ○ | |
| Power factor at rated power / displacement power factor adjustable | 1 / 0.8 overexcited to 0.8 underexcited | |
| Inverter efficiency | | |
| Max. efficiency ³⁾ / European efficiency ³⁾ / CEC weighted efficiency ⁴⁾ | 98.7% / 98.6% / 98.5% | 98.7% / 98.6% / 98.5% |
| Protective devices | | |
| Input-side disconnection point | DC load-break switch | |
| Output-side disconnection point | Medium-voltage vacuum circuit breaker | |
| DC overvoltage protection | Surge arrester type I | |
| Galvanic isolation | ● | |
| Internal arc classification medium-voltage control room (according to IEC 62271-202) | IAC A 25 kA 1 s | |
| General data | | |
| Dimensions equal to 20-foot HC shipping container (W / H / D) | 6058 mm / 2896 mm / 2438 mm | |
| Weight | < 18 t | |
| Self-consumption (max. / partial load / average) ¹⁾ | < 8.1 kW / < 1.8 kW / < 2.0 kW | |
| Self-consumption (stand-by) ¹⁾ | < 370 W | |
| Degree of protection according to IEC 60529 | Control rooms IP23D, inverter electronics IP54 | |
| Environment: standard / harsh | ● / ○ | |
| Degree of protection according to IEC 60721-3-4 (4C1, 4S2 / 4C2, 4S4) | ● / ○ | |
| Maximum permissible value for relative humidity | 95% (for 2 months/year) | |
| Max. operating altitude above mean sea level 1000 m / 2000 m | ● / ○ | |
| Fresh air consumption of inverter | 6500 m ³ /h | |
| Features | | |
| DC terminal | Terminal lug | |
| AC connection | Outer-cone angle plug | |
| Tap changer for MV-transformer: without / with | ● / ○ | |
| Shield winding for MV-Transformer: without / with | ● / ○ | |
| Station enclosure color | RAL 7004 | |
| Transformer for external loads: without / 10 / 20 / 30 / 40 / 50 / 60 kVA | ● / ○ / ○ / ○ / ○ / ○ / ○ | |
| Medium-voltage switchgear: without / 1 panel / 3 panels | ● / ○ / ○ | |
| 2 cable feeders with load-break switch, 1 transformer feeder with circuit breaker, internal arc classification IAC A FL 25 kA 1s according to IEC 62271-200 | ● / ○ / ○ | |
| Short circuit rating medium voltage switchgear (25 kA 1s) | ● | |
| Integrated oil containment: without / with | ● / ○ | |
| Industry standards (for other standards see the inverter datasheet) | IEC 60076, IEC 62271-200, IEC 62271-202, EN50588-1 IEEE 1547-2018 ⁵⁾ , IEEE C37.100.1, IEEE C57.12, C37.20.9, UL 1741 listed, CSC Certificate, UL 347 | |
| ● Standard features ○ Optional features – Not available | | |
| Type designation | MVPS-4400-S2-US | MVPS-4600-S2-US |

1) Data based on inverter. Further details can be found in the data sheet of the inverter. Cold weather -37° is an option.

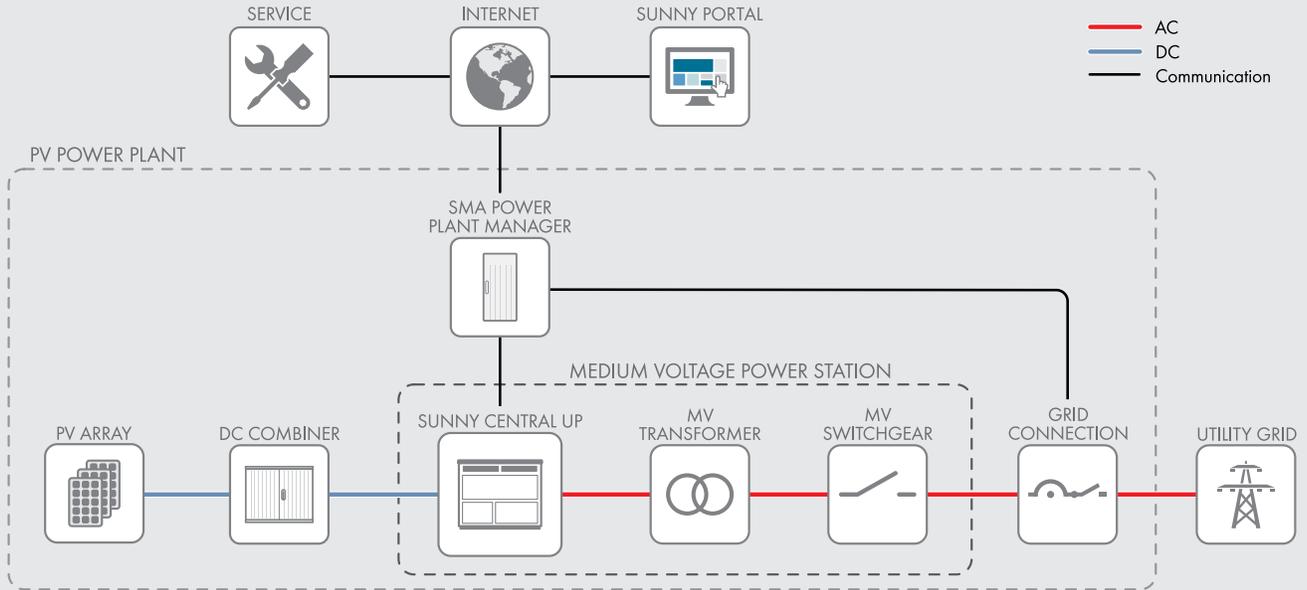
2) KNAN = Natural ester fluid with natural air cooling

3) Efficiency measured at inverter without internal power supply

4) Efficiency measured at inverter with internal power supply

5) Harmonics are within IEEE 1547-2018 limits with at least two inverters in operation.

PV system diagram



Storage system diagram

