

SUNNY CENTRAL STORAGE

2200-US / 2475-US / 2500-EV-US / 2750-EV-US



SCS-2200-US-10 / SCS-2475-US-10 / SCS-2500-EV-US-10 / SCS-2750-EV-US-10



Efficient

- High power density
- Max. efficiency is 98.7%
- Lower transportation costs (up to 4 inverters in a standard shipping container)

Robust

- Proven OptiCool™ technology for intelligent, effective cooling
- Can be installed worldwide outdoors in any ambient condition

Flexible

- Conforms to all relevant grid requirements worldwide
- Four quadrant operation for full reactive power support
- Stand-alone device or a medium-voltage block solution

Versatile

- Integrated battery communication
- Customized monitoring and control of inverters
- Grid management functions for dynamic grid support
- Integrated voltage supply for internal consumption and external loads

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A full power class lineup for 1,000 and 1,500 V applications

Grid-connected storage systems enable the integration of large amounts of intermittent renewable energy into the utility grid while ensuring maximum grid stability. The Sunny Central Storage is the central component of the SMA system solution for integration of large-scale storage systems. It is designed to compensate for fluctuations in solar energy generation and offers comprehensive grid management services such as automatic frequency control. The battery inverter is optimized for continuous operation at nominal load and temperature of -25°C to $+50^{\circ}\text{C}$. Thanks to its wide DC voltage range, it is compatible with various types of battery technologies. The Sunny Central Storage is also available as a medium-voltage block solution.

SUNNY CENTRAL STORAGE

2200-US / 2475-US

Technical Data	SCS 2200-US	SCS 2475-EV-US
Battery side (DC)		
DC Voltage range (at 25 °C / at 50 °C) ¹⁾	570 V to 950 V / 950 V	634 V to 1000 V / 1000V
Minimal / Maximal DC voltage	545 V / 1000 V ²⁾	614 V / 1000 V
Max. DC current (at 25 °C / at 50 °C)	3960 A / 3600 A	3960 A / 3600 A
Max. interruption current capability ³⁾	6400 A	6400 A
Max. DC power	2235 kW	2515 kW
Number of DC cables per polarity	26	
Grid side (AC)		
Max. AC power (at 25 °C / at 50 °C)	2200 kVA / 2000 kVA	2475 kVA / 2250 kVA
Max. AC current (at 25 °C / at 50 °C)	3300 A / 3000 A	3292 A / 2993 A
Max. total harmonic distortion	< 3% at nominal power	
Nominal AC voltage / nominal AC voltage range	385 V / 308 V to 462 V	434 V / 347 V to 520 V
AC power frequency / range	50 Hz / 47 Hz to 53 Hz 60 Hz / 57 Hz to 63 Hz	
Power factor at rated power / displacement power factor adjustable	1 / 0 underexcited to 0 overexcited ¹⁰⁾	
Efficiency		
Max. efficiency ⁴⁾ / European efficiency ⁴⁾ / CEC efficiency ⁵⁾	98.6% / 98.4% / 98.0%	
Protective Devices		
Input-side disconnection point	DC load-break switch	
Output-side disconnection point	AC circuit breaker	
DC overvoltage protection	Surge arrester, type I	
Lightning protection (according to IEC 62305-1)	Lightning Protection Level III	
Ground-fault monitoring / remote ground-fault monitoring	○ / ○	
Insulation monitoring	●	
Degree of protection: electronics / air duct & connection area (UL 50)	Type 3R / Type 1	
General Data		
Dimensions (W / H / D)	2780 mm / 2318 mm / 1588 mm	
Weight	< 3400 kg	
Self-consumption (max. ⁶⁾ / partial load ⁷⁾ / average ⁸⁾	< 8100 W / < 1800 W / < 2000 W	
Self-consumption (standby)	< 300 W	
Auxiliary power supply: integrated 8.4 kVA transformer / external	○ / ○	
Operating temperature range	-25 °C to 60 °C	
Noise emission ⁹⁾	66.4 dB(A)	
Temperature range (standby)	-40 °C to 60 °C	
Temperature range (storage)	-40 °C to 70 °C	
Max. permissible value for relative humidity (condensing / non-condensing)	95% to 100% [2 month/year] / 0% to 95%	
Maximum operating altitude above MSL 2000 m / 3000 m	● / ○ (with power reduction)	
Fresh air consumption	6500 m ³ /h	
Features		
DC connection	Terminal lugs on each input (without fuse) with NEMA lug hole pattern	
AC connection	With busbar system (three busbars, one per line conductor)	
Communication	Modbus TCP	
Enclosure / roof color	RAL 9016 / RAL 7004	
Display	○ HMI touchscreen (10.1")	
Supply transformer for external loads	○ (2.5 kVA)	
Certification and approvals	UL 1741, UL 1741 SA ¹¹⁾ , IEEE 1547, UL 1998, UL 840 Cat. IV	
EMC standards	IEC / EN 61000-6-4, IEC / EN 61000-6-2, EN 55022, CISPR 22:2008 modified class A, FCC Part 15 Class A	
● Standard features ○ Optional		
Type designation	SCS-2200-US-10	SCS-2475-EV-US-10

- 1) Another voltage range can be offered on request
- 2) With power derating
- 3) Battery short circuit disconnection has to be done on the battery side
- 4) Efficiency measured without internal power supply
- 5) Efficiency measured with internal power supply, test configuration similar to PV inverter

- 6) Self-consumption at rated operation
- 7) Self-consumption at < 75% P_n at 25 °C
- 8) Self-consumption averaged out from 5% to 100% P_n at 25 °C
- 9) Sound pressure level at a distance of 10 m
- 10) Depending on the DC voltage
- 11) Only for PF 1 / 0.8 underexcited to 0.8 overexcited

SUNNY CENTRAL STORAGE

2500-EV-US / 2750-EV-US

Technical Data	SCS 2500-EV-US	SCS 2750-EV-US
Battery side (DC)		
DC Voltage range (at 25 °C / at 50 °C) ¹⁾	850 V to 1425 V / 1250 V	875 V to 1425 V / 1275 V
Minimal / Maximal DC voltage ²⁾	778 V / 1500 V	849 V / 1500 V
Max. DC current (at 25 °C / at 50 °C)	3000 A / 2700 A	3206 A / 2700 A
Max. interruption current capability ³⁾	6400 A	6400 A
Max. DC power	2540 kW	2795 kW
Number of DC cables per polarity	26	
Grid side (AC)		
Max. AC power (at 25 °C / at 50 °C)	2500 kVA / 2250 kVA	2750 kVA / 2500 kVA
Max. AC current (at 25 °C / at 50 °C)	2624 A / 2362 A	2646 A / 2405 A
Max. total harmonic distortion	< 3% at nominal power	
Nominal AC voltage / nominal AC voltage range	550 V / 440 V to 660 V	600 V / 480 V to 660 V
AC power frequency / range	50 Hz / 47 Hz to 53 Hz 60 Hz / 57 Hz to 63 Hz	
Power factor at rated power / displacement power factor adjustable	1 / 0 underexcited to 0 overexcited ¹⁰⁾	
Efficiency		
Max. efficiency ⁴⁾ / European efficiency ⁴⁾ / CEC efficiency ⁵⁾	98.6% / 98.3% / 98.0%	98.7% / 98.6% / 98.5%
Protective Devices		
Input-side disconnection point	DC load-break switch	
Output-side disconnection point	AC circuit breaker	
DC overvoltage protection	Surge arrester, type I	
Lightning protection (according to IEC 62305-1)	Lightning Protection Level III	
Ground-fault monitoring / remote ground-fault monitoring	○ / ○	
Insulation monitoring	●	
Degree of protection: electronics / air duct & connection area (UL 50)	Type 3R / Type 1	
General Data		
Dimensions (W / H / D)	2780 mm / 2318 mm / 1588 mm	
Weight	< 3400 kg	
Self-consumption (max. ⁶⁾ / partial load ⁷⁾ / average ⁸⁾	< 8100 W / < 1800 W / < 2000 W	
Self-consumption (standby)	< 370 W	
Auxiliary power supply: integrated 8.4 kVA transformer / external	○ / ○	
Operating temperature range	-25 °C to 60 °C	
Noise emission ⁹⁾	64.3 dB(A)	
Temperature range (standby)	-40 °C to 60 °C	
Temperature range (storage)	-40 °C to 70 °C	
Max. permissible value for relative humidity (condensing / non-condensing)	95% to 100% [2 month/year] / 0% to 95%	
Maximum operating altitude above MSL 2000 m / 3000 m	● / ○ (with power reduction)	
Fresh air consumption	6500 m ³ /h	
Features		
DC connection	Terminal lugs on each input (without fuse) with NEMA lug hole pattern	
AC connection	With busbar system (three busbars, one per line conductor)	
Communication	Modbus TCP	
Enclosure / roof color	RAL 9016 / RAL 7004	
Display	○ HMI touchscreen (10.1")	
Supply transformer for external loads	○ (2.5 kVA)	
Certification and approvals	UL 62109-1, UL 1741 Chapter 13 CRD 61, UL 1741 SA ¹¹⁾ , IEEE 1547, UL 1998	
EMC standards	IEC / EN 61000-6-4, IEC / EN 61000-6-2, EN 55022, CISPR 22:2008 modified class A, FCC Part 15 Class A	
● Standard features ○ Optional		
Type designation	SCS-2500-EV-US-10	SCS-2750-EV-US-10

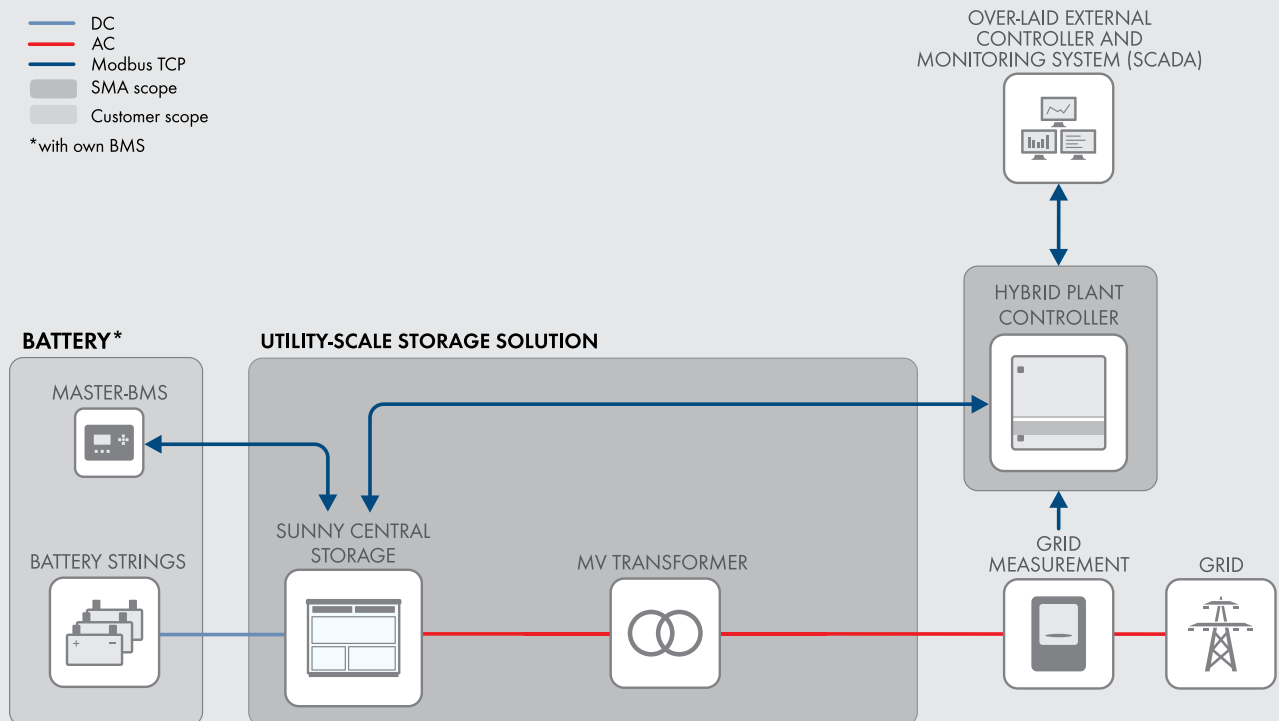
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- 2) With power derating
- 3) Battery short circuit disconnection has to be done on the battery side
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- 5) Efficiency measured with internal power supply, test configuration similar to PV inverter, preliminary

- 6) Self-consumption at rated operation
- 7) Self-consumption at < 75% P_n at 25 °C
- 8) Self-consumption averaged out from 5% to 100% P_n at 25 °C
- 9) Sound pressure level at a distance of 10 m
- 10) Depending on the DC voltage
- 11) Only for PF 1 / 0.8 underexcited to 0.8 overexcited

SUNNY CENTRAL STORAGE APPLICATIONS

- Provides ancillary grid services
- Supports the growth of renewable energy in public grids
- Increases fuel saving potential in PV hybrid diesel systems

- DC
- AC
- Modbus TCP
- SMA scope
- Customer scope
- *with own BMS



By combining several of these schemes, higher power systems can be realized

Grid-connected functions

- Setpoints for active and reactive power
- Static grid support Q(U), P(f) on request
- Dynamic grid support (FRT)
- Active islanding detection (AID)
- High compatibility with different battery types

Compatible with energy management system functionalities

- External static grid supporting functions
- Ramp-rate control of PV power
- Peak shaving
- Energy shifting
- Genset optimization control
- Reducing necessary spinning reserve of gensets
- Battery start-up and stop sequence
- Operates the battery within optimal operation window