



/ SCS-1900-10 / SCS-2200-10 / SCS-2475-10 / SCS-2900-10



Sunny Central Storage

1900 / 2200 / 2475 / 2900

Battery inverter for large-scale storage systems



Efficient

- High power density
- Max. efficiency is 98.6%
- 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 turnkey solution with medium-voltage block

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

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 fluctuations in solar energy generation and offers comprehensive grid management services, e.g., 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 designed to work with the SMA Power Plant Manager and is also available as turnkey solution with the SMA medium-voltage systems.

SUNNY CENTRAL STORAGE 1900 / 2200

Technical Data	SCS 1900	SCS 2200
Battery side (DC)		
DC Voltage range for max. AC power (at 25 °C / at 50 °C) ¹⁾	500 V to 950 V / 950 V	570 V to 950 V / 950 V
Minimal / Maximal DC voltage ²⁾	477 V / 1100 V	545 V / 1100 V
Max. DC current (at 25 °C / at 50 °C)	4060 A / 3690 A	4120 A / 3745 A
Fuse characteristic for battery connection - fuse arcing time limit / energy limit ^{3) 15)}	<1 ms / 40 cal/cm ²	
Number of DC cables per polarity	26	
Grid side (AC)		
Max. AC power (at 25 °C / at 40 °C / at 50 °C) ¹²⁾	1900 kVA / 1796 kVA / 1727 kVA	2200 kVA / 2080 kVA / 2000 kVA
Max. AC current (at 25 °C / at 40 °C / at 50 °C)	3255 A / 3078 A / 2960 A	3300 A / 3120 A / 3000 A
Nominal AC voltage / AC voltage range ¹⁶⁾	337 V / 270 V to 404 V	385 V / 308 V to 462 V
AC power frequency / range	50 Hz / 47 Hz to 53 Hz 60 Hz / 57 Hz to 63 Hz	
Cos Phi at rated power / displacement Cos Phi adjustable ^{10) 14)}	1 / 0.0 overexcited to 0.0 underexcited	
Max. total harmonic distortion	< 3% at nominal power	
Min. short-circuit ratio at the AC terminals	2	
Efficiency		
Max. efficiency ⁴⁾ / European efficiency ⁴⁾	98.6% / 98.3%	98.6% / 98.4%
Protective Devices		
Input-side disconnection point	DC load-break switch	
Output-side disconnection point	AC circuit breaker	
DC overvoltage protection	Surge arrester, type I	
AC overvoltage protection	○ Surge arrester, class 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 (as per IEC 60529)	IP65 / IP34 / IP34	
General Data		
Dimensions (W / H / D)	2780 mm / 2318 mm / 1588 mm	
Weight	< 3400 kg	
Self-consumption (max. ⁵⁾ / partial load ⁶⁾ / average ⁷⁾	< 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 ⁸⁾	< 64.7 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 ⁹⁾ 1000 m / 2000 m ¹¹⁾ / 3000 m ¹¹⁾	● / ○ / ○	
Fresh air consumption	6500 m³/h	
Features		
DC connection	Terminal lugs on each input (without fuse)	
AC connection	With busbar system (three busbars, one per line conductor)	
Communication	Ethernet, Modbus Master, Modbus Slave	
Enclosure / roof color	RAL 9016 / RAL 7004	
Display	● Identifier lights / ○ HMI touchscreen (10.1")	
Supply transformer for external loads	○ (2.5 kVA)	
Standards and directives complied with	CE, IEC / EN 62109-1, IEC / EN 62109-2	
EMC standards	IEC / EN 61000-6-4, IEC / EN 61000-6-2, EN 55022	
● Standard features ○ Optional		
Type designation	SCS-1900-10	SCS-2200-10

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) Self-consumption at rated operation

6) Self-consumption at < 75% P_n at 25 °C

7) Self-consumption averaged out from 5% to 100% P_n at 25 °C

8) Sound pressure level at a distance of 10 m

9) Values apply only to inverters. Permissible values for SMA MV solutions from SMA can be found in the corresponding data sheets.

10) Depending on the DC voltage

11) Earlier temperature-dependent derating

12) Measured at cos φ 0.8 underexcited to 0.8 overexcited

13) Additional apparent power derating might apply for a combination of the following conditions: > 45 °C, > 1080 V DC, power factor < 0.9 underexcited and > 900 m MSL

14) Max reactive power is limited to 60% of the max apparent power

15) Released energy limit in an event of error

16) Below nominal AC voltage, AC power decreases in the same proportion

SUNNY CENTRAL STORAGE 2475 / 2900

Technical Data	SCS 2475	SCS 2900 ¹³⁾
Battery side (DC)		
DC Voltage range for max. AC power (at 25 °C / at 50 °C) ¹⁾	634 V to 1000 V / 1000 V	760 V to 1100 V / 1100 V
Minimal / Maximal DC voltage ²⁾	614 V / 1100 V	740 V / 1100 V
Max. DC current (at 25 °C / at 50 °C)	4110 A / 3735 A	4055 A / 3686 A
Fuse characteristic for battery connection - fuse arcing time limit / energy limit ^{3) 15)}	1 ms / 40 cal/cm²	
Number of DC cables per polarity	26	
Grid side (AC)		
Max. AC power at 1000 VDC (at 25 °C / at 40 °C / at 50 °C) ¹²⁾	2475 kVA / 2340 kVA / 2250 kVA	2940 kVA / 2780 kVA / 2670 kVA
Max. AC power at 1100 VDC (at 25 °C / at 40 °C /at 50 °C) ¹²⁾	–	2940 kVA / 2670 kVA / 2250 kVA
Max. AC current (at 25 °C / at 40 °C / at 50 °C)	3292 A / 3113 A / 2993 A	3265 A / 3087 A / 2968 A
Nominal AC voltage / AC voltage range ¹⁶⁾	434 V / 347 V to 520 V	520 V / 416 V to 624 V
AC power frequency / range	50 Hz / 47 Hz to 53 Hz 60 Hz / 57 Hz to 63 Hz	
Cos Phi at rated power / displacement Cos Phi adjustable ^{10) 14)}	1 / 0.0 overexcited to 0.0 underexcited	
Max. total harmonic distortion	< 3% at nominal power	
Min. short-circuit ratio at the AC terminals	2	
Efficiency		
Max. efficiency ⁴⁾ / European efficiency ⁴⁾	98.6% / 98.4%	max. eta 98.6%
Protective Devices		
Input-side disconnection point	DC load-break switch	
Output-side disconnection point	AC circuit breaker	
DC overvoltage protection	Surge arrester, type I	
AC overvoltage protection	○ Surge arrester, class 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 (as per IEC 60529)	IP65 / IP34 / IP34	
General Data		
Dimensions (W / H / D)	2780 mm / 2318 mm / 1588 mm	
Weight	< 3400 kg	
Self-consumption (max. ⁵⁾ / partial load ⁶⁾ / average ⁷⁾	< 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 ⁸⁾	< 64.7 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 ⁹⁾ 1000 m / 2000 m ¹¹⁾ / 3000 m ¹¹⁾	● / ○ / ○	
Fresh air consumption	6500 m³/h	
Features		
DC connection	Terminal lugs on each input (without fuse)	
AC connection	With busbar system (three busbars, one per line conductor)	
Communication	Ethernet, Modbus Master, Modbus Slave	
Enclosure / roof color	RAL 9016 / RAL 7004	
Display	● Identifier lights / ○ HMI touchscreen (10.1")	
Supply transformer for external loads	○ (2.5 kVA)	
Standards and directives complied with	CE, IEC / EN 62109-1, IEC / EN 62109-2	
EMC standards	IEC / EN 61000-6-4, IEC / EN 61000-6-2, EN 55022	
● Standard features ○ Optional		
Type designation	SCS-2475-10	SCS-2900-10

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) Self-consumption at rated operation

6) Self-consumption at < 75% P_n at 25 °C

7) Self-consumption averaged out from 5% to 100% P_n at 25 °C

8) Sound pressure level at a distance of 10 m

9) Values apply only to inverters. Permissible values for SMA MV solutions from SMA can be found in the corresponding data sheets.

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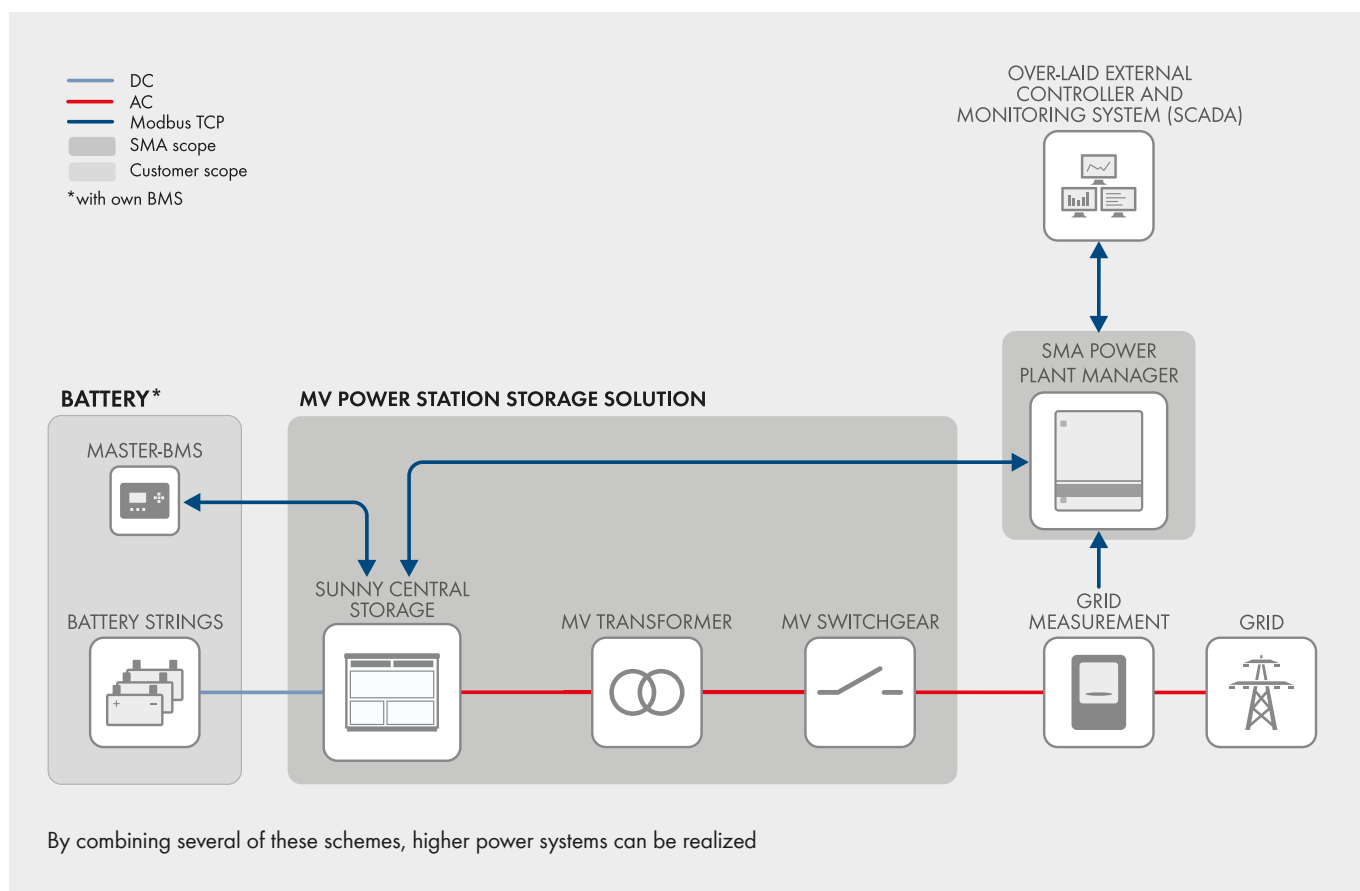
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15) Released energy limit in an event of error

16) Below nominal AC voltage, AC power decreases in the same proportion

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



Grid-connected functions

- Setpoints for active and reactive power
- Static grid support $Q(U)$, $P(f)$
- 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
- Grid Forming
- Black Start