/ SCS 3450 UP-US / SCS 3600 UP-US / SCS 3800 UP-US / SCS 3950 UP-US

Sunny Central Storage UP-US

3450 / 3600 / 3800 / 3950

Battery inverters for large scale storage systems

/ 3+GW of hybrid and storage systems worldwide

Efficient
- High power density
- Max. efficiency of 98.8%
- 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

With an output of up to 3960 kVA and system voltages up to 1500 V DC, the SMA Sunny Central Storage allows for more efficient and flexible system design for battery power plants.

A separate voltage supply and additional space are available for the installation of customer equipment. The intelligent cooling system OptiCool ensures smooth operation even in extreme ambient temperature.

SUNNY CENTRAL STORAGE
3450 UP-US / 3600 UP-US

Technical Data	SCS 3540 UP-US	SCS 3600 UP-US
Battery side (DC)		
Operating DC voltage range V_{DC}	880 V to 1500 V	921 V to 1500 V
Max. DC current $I_{DC, max}$	4750 A	
Fuse characteristic for battery connection–pre-arcing integral limit single DC busbar/ split busbar[12) 14)]	10.75 MA^2s / 8.0 MA^2s	
Single DC busbar 36 connections per pole / split DC busbar 12/12/12 connections per pole / fused single DC busbar 22 connections per pole[15)]	● / ○ / ○	
DC connection	with terminal lug	
Grid side (AC)		
Nominal AC apparent power at 1200 Vdc and cos φ=1.0 and 25°C	3450 kW	3620 kW
AC apparent power at 1200 Vdc (at 25°C / at 40°C /at 50°C)[3) 13)]	3450 kVA / 3140 kVA / 2930 kVA	3620 kVA / 3290 kVA / 3075 kVA
Max. AC current $I_{AC, max}$ (at 25°C / at 40°C /at 50°C)	3320 A / 3020 A / 2820 A	
Max. total harmonic distortion	< 3% at nominal power	
Nominal AC voltage / nominal AC voltage range[1) 8)]	600 V / 480 V to 720 V	630 V / 504 V to 756 V
AC power frequency / range	50 Hz / 47 Hz to 53 Hz 60 Hz / 57 Hz to 63 Hz	
Min. short-circuit ratio at the AC terminals[9)]	> 2	
Cos φ at rated active power/cos φ at rated apparent power/displacement cos φ adjustable[8) 10)]	1 / 0.8 overexcited to 0.8 underexcited / 0.0 overexcited to 0.0 underexcited	
AC connection	with busbar system (three busbars, one per line conductor)	
Efficiency		
Max. efficiency[2)]	98.8%	
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 (optional)	Surge arrester, class I	
Lightning protection (according to IEC 62305-1)	Lightning Protection Level III	
Insulation monitoring	●	
Degree of protection: electronics / air duct / connection area (as per UL 50E)	UL Type 3R / Type 1 / Type 1	
General Data		
Dimensions (W / H / D)	2815 mm / 2318 mm / 1588 mm (110.8 in / 91.3 in / 62.5 in)	
Weight	< 3700 kg / <8200 lbs	
Self-consumption (max.[4)] / partial load[5)] / average[6)])	< 8100 W / < 1800 W / < 2000 W	
Self-consumption (standby)	< 370 W	
Auxiliary power supply: integrated 8.4 kVA transformer / external	● / ○	
Noise emission[7)]	65.0 dB(A)	
Operating temperature range (optional)[8) 15)]	(−37°C) −25°C to 60°C / (−34.6°F) −13°F to 140°F	
Temperature range (standby)	−40°C to 60°C / −40°F to 140°F	
Temperature range (storage)	−40°C to 70°C / −40°F to 158°F	
Max. permissible value for relative humidity (condensing / non-condensing)	95% to 100% (2 month/year) / 0% to 95%	
Maximum operating altitude above MSL[8)] 1000 m / 2000 m[11)]	● / ○	
Fresh air consumption	6500 m³/h	
Features		
Grid forming / black start ready without grid forming	○ / ○	
DC connection	Terminal lug on each input (without fuse)	
AC connection	With busbar system (three busbars, one per line conductor)	
Communication	Ethernet, Modbus Master, Modbus Slave	
Communication with SMA string monitor (transmission medium)	Modbus TCP / Ethernet (FO MM, Cat-5)	
Enclosure / roof color	RAL 9016 / RAL 7004	
Supply transformer for external loads	○ (2.5 kVA)	
Certifications and approvals	UL 62109-1, UL 1741 (Chapter 31 CRD 6), NERC, UL 1741-SA + SB, IEEE 1547-2018, IEEE 1547 a-2020, IEEE 1547.1-2020, MIL-STD-810G, UL 1998, CAN/CSA C22.2 107.1 2016	
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	
Quality standards and directives complied with	VDI/VDE 2862 page 2, DIN EN ISO 9001	
● Standard features ○ Optional – not available		
Type designation	SCS 3450 UP-US	SCS 3600 UP-US

1) At nominal AC voltage, nominal AC power decreases in the same proportion
2) Efficiency measured without internal power supply
3) AC apparent power at higher DC voltages on request
4) Self-consumption at rated operation
5) Self-consumption at < 75% Pn at 25°C
6) Self-consumption averaged out from 5% to 100% Pn at 25°C
7) Sound pressure level at a distance of 10 m
8) Values apply only to inverters. Permissible values for SMA MV solutions from SMA can be found in the corresponding data sheets.
9) A short-circuit ratio of < 2 requires a special approval from SMA
10) Max. power values (S/P/Q) can be requested based on project specific design
11) Earlier temperature-dependent de-rating and reduction of DC open-circuit voltage
12) Battery short circuit disconnection has to be done on the battery side with ultra rapid battery group fuses, e.g. fuse type aR/aBat & DC time constant Tau (L/R) <=1ms. To fulfill UL requirements, SQB-DC154 aR series fusing from SIBA GmbH must be used, with a minimum of 1 fuse or a maximum of 2 fuses per split DC rail.
13) Depending on the ratio of reactive power (cos φ), additional power derating may occur
14) Please check the manual for further information
15) Fused DC input equipped with optional 750 A, 900 A, or 1250 A fuses

SUNNY CENTRAL STORAGE
3800 UP-US / 3950 UP-US

Technical Data	SCS 3800 UP-US	SCS 3950 UP-US
Battery side (DC)		
Operating DC voltage range V_{DC}	962 V to 1500 V	1003 V to 1500 V
Max. DC current $I_{DC, max}$	4750 A	
Fuse characteristic for battery connection–pre-arcing integral limit single DC busbar/ split busbar[12) 14)]	10.75 MA^2s / 8.0 MA^2s	
Single DC busbar 36 connections per pole / split DC busbar 12/12/12 connections per pole / fused single DC busbar 22 connections per pole[15)]	● / ○ / ○	
DC connection	with terminal lug	
Grid side (AC)		
Nominal AC apparent power at 1200 Vdc and cos φ=1.0 and 25°C	3800 kW	3960 kW
AC apparent power at 1200 Vdc (at 25°C / at 40°C /at 50°C)[3) 13)]	3800 kVA / 3455 kVA / 3230 kVA	3960 kVA / 3610 kVA / 3365 kVA
Max. AC current $I_{AC, max}$ (at 25°C / at 40°C /at 50°C)	3320 A / 3020 A / 2820 A	
Max. total harmonic distortion	< 3% at nominal power	
Nominal AC voltage / nominal AC voltage range[1) 8)]	660 V / 528 V to 759 V	690 V / 552 V to 759 V
AC power frequency / range	50 Hz / 47 Hz to 53 Hz 60 Hz / 57 Hz to 63 Hz	
Min. short-circuit ratio at the AC terminals[9)]	> 2	
Cos φ at rated active power/cos φ at rated apparent power/displacement cos φ adjustable[8) 10)]	1 / 0.8 overexcited to 0.8 underexcited / 0.0 overexcited to 0.0 underexcited	
AC connection	with busbar system (three busbars, one per line conductor)	
Efficiency		
Max. efficiency[2)]	98.8%	
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 (optional)	Surge arrester, class I	
Lightning protection (according to IEC 62305-1)	Lightning Protection Level III	
Insulation monitoring	●	
Degree of protection: electronics / air duct / connection area (as per UL 50E)	UL Type 3R / Type 1 / Type 1	
General Data		
Dimensions (W / H / D)	2815 mm / 2318 mm / 1588 mm (110.8 in / 91.3 in / 62.5 in)	
Weight	< 3700 kg / <8200 lbs	
Self-consumption (max.[4)] / partial load[5)] / average[6)])	< 8100 W / < 1800 W / < 2000 W	
Self-consumption (standby)	< 370 W	
Auxiliary power supply: integrated 8.4 kVA transformer / external	● / ○	
Noise emission[7)]	65.0 dB(A)	
Operating temperature range (optional)[8) 15)]	(−37°C) −25°C to 60°C / (−34.6°F) −13°F to 140°F	
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Max. permissible value for relative humidity (condensing / non-condensing)	95% to 100% (2 month/year) / 0% to 95%	
Maximum operating altitude above MSL[8)] 1000 m / 2000 m[11)]	● / ○	
Fresh air consumption	6500 m³/h	
Features		
Grid forming / black start ready without grid forming	○ / ○	
DC connection	Terminal lug on each input (without fuse)	
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Communication	Ethernet, Modbus Master, Modbus Slave	
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Enclosure / roof color	RAL 9016 / RAL 7004	
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● Standard features ○ Optional – not available		
Type designation	SCS 3800 UP-US	SCS 3950 UP-US

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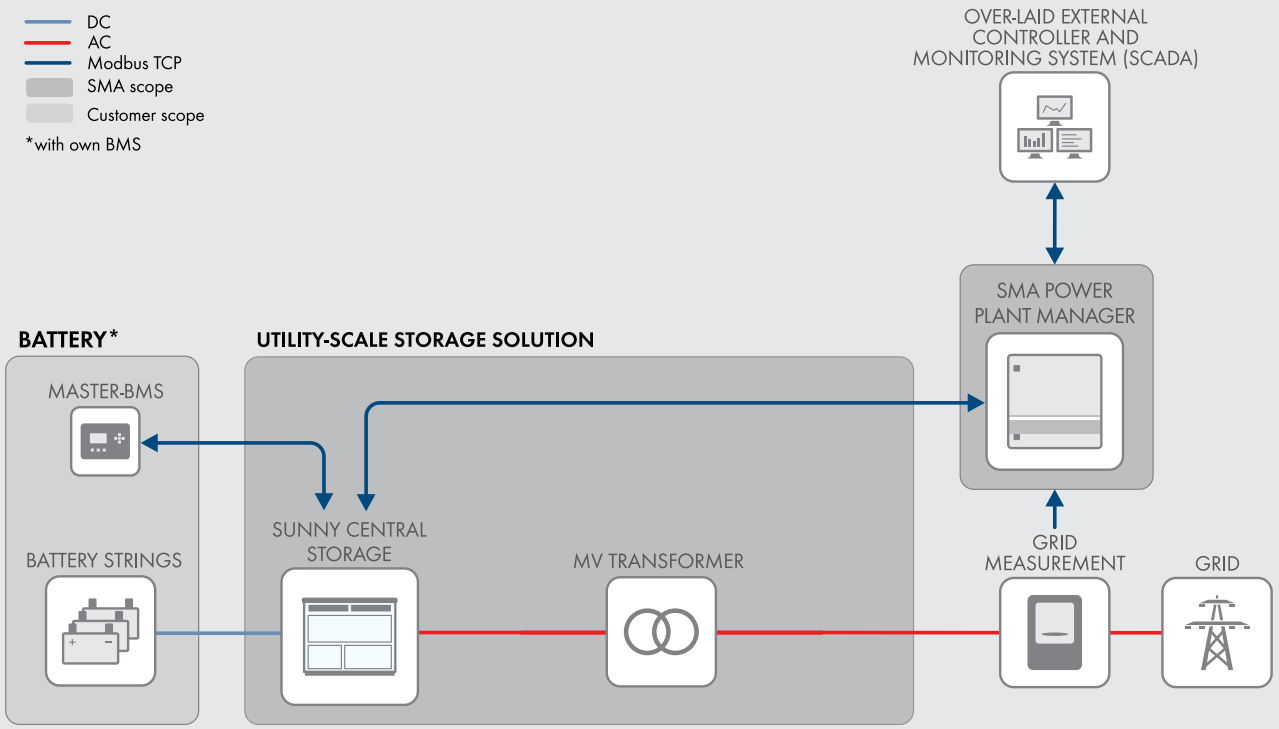
13) Depending on the ratio of reactive power (cos φ), additional power derating may occur
14) Please check the manual for further information
15) Fused DC input equipped with optional 750 A, 900 A, or 1250 A fuses

SYSTEM DIAGRAM



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

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