The new Sunny Central: more power per cubic meter

With an output of up to 4600 kVA and system voltages of 1500 V DC, the SMA central inverter allows for more efficient system design and a reduction in specific costs for PV and battery power plants. A separate voltage supply and additional space are available for the installation of customer equipment. True 1500 V technology and the intelligent cooling system OptiCool ensure smooth operation even in extreme ambient temperature as well as a long service life of 25 years.
## Technical Data

### DC side
- **MPP voltage range** \( V_{DC} \) (at \( 25^\circ C \) / at \( 50^\circ C \))
  - SC 4000 UP: 880 to 1325 V / 1100 V
  - SC 4200 UP: 921 to 1325 V / 1100 V
- **Min. DC voltage** \( V_{DC, min} \)
  - SC 4000 UP: 849 V
  - SC 4200 UP: 891 V
- **Max. DC voltage** \( V_{DC, max} \)
  - SC 4000 UP: 1500 V
  - SC 4200 UP: 1500 V
- **Max. DC current** \( I_{DC,max} \)
  - SC 4000 UP: 4750 A
  - SC 4200 UP: 4750 A
- **Max. short-circuit current** \( I_{SC} \)
  - SC 4000 UP: 6400 A
  - SC 4200 UP: 6400 A
- **Number of DC inputs**
  - SC 4000 UP: Busbar with 26 connections per terminal, 24 double pole fused (32 single pole fused)
  - SC 4200 UP: 18 double pole fused (36 single pole fused) for PV and 6 double pole fused for batteries
- **Max. number of DC cables per DC input**
  - SC 4000 UP: 2 x 800 kcmil, 2 x 400 mm²
- **Integrated zone monitoring**
- **Available PV fuse sizes** (per input)
- **Available battery fuse size** (per input)
  - SC 4000 UP: 750 A

### AC side
- **Nominal AC power at** \( \cos \phi = 1 \) (at \( 25^\circ C \) / at \( 50^\circ C \))
  - SC 4000 UP: 4000 kVA / 3400 kVA
  - SC 4200 UP: 4200 kVA / 3570 kVA
- **Nominal AC power at** \( \cos \phi = 0.8 \) (at \( 25^\circ C \) / at \( 50^\circ C \))
  - SC 4000 UP: 3200 kW / 2720 kW
  - SC 4200 UP: 3360 kW / 2856 kW
- **Nominal AC current** \( I_{AC, nom} \) (at \( 25^\circ C \) / at \( 50^\circ C \))
  - SC 4000 UP: 3850 A / 3273 A
  - SC 4200 UP: 3850 A / 3273 A
- **Max. total harmonic distortion**
  - SC 4000 UP: < 3% at nominal power
  - SC 4200 UP: < 3% at nominal power
- **Nominal AC voltage / nominal AC voltage range**
  - SC 4000 UP: 600 V / 480 V to 720 V
  - SC 4200 UP: 630 V / 504 V to 756 V
- **AC power frequency / range**
  - SC 4000 UP: 50 Hz / 47 Hz to 53 Hz
  - SC 4200 UP: 60 Hz / 57 Hz to 63 Hz
- **Min. short-circuit ratio at the AC terminals**
  - SC 4000 UP: > 2
- **Power factor at rated power / displacement power factor adjustable**
  - SC 4000 UP: 1 / 0.8 overexcited to 0.8 underexcited
- **Efficiency**
  - SC 4000 UP: 98.8% / 98.6% / 98.3%
  - SC 4200 UP: 98.8% / 98.7% / 98.5%

### Protective Devices
- **Input-side disconnection point**
- **Output-side disconnection point**
- **DC overvoltage protection**
  - Surge arrester, type I & II
- **AC overvoltage protection**
  - Surge arrester, class I & II
- **Lightning protection** (according to IEC 62305-1)
  - Lightning Protection Level III
- **Ground-fault monitoring / remote ground-fault monitoring**
  - SC 4000 UP: ○ / ○
  - SC 4200 UP: ○ / ○
- **Degree of protection: electronics / air duct / connection area** (as per IEC 60529)
  - SC 4000 UP: IP54 / IP34 / IP34

### General Data
- **Dimensions** (W / H / D)
  - SC 4000 UP: 2815 / 2318 / 1588 mm (110.8 / 91.3 / 62.5 inch)
- **Weight**
  - SC 4000 UP: < 3700 kg / < 8158 lb
- **Self-consumption**
  - SC 4000 UP: (max.\( n \) / partial load\( n \) / average\( n \))
  - SC 4000 UP: < 370 W
- **Internal auxiliary power supply**
  - SC 4000 UP: ○ Integrated 8.4 kVA transformer
- **Operating temperature range**
  - SC 4000 UP: −25°C to 60°C / −13°F to 140°F
  - SC 4200 UP: −25°C to 60°C / −13°F to 140°F
- **Noise emission**
  - SC 4000 UP: 63.0 dB(A)*
- **Temperature range (standby)**
  - SC 4000 UP: −40°C to 60°C / −40°F to 140°F
  - SC 4200 UP: −40°C to 70°C / −40°F to 158°F
- **Max. permissible value for relative humidity (condensing / non-condensing)**
  - SC 4000 UP: 95% to 100% (2 month/year) / 95% to 100%
- **Maximum operating altitude above MSL**
  - SC 4000 UP: 3000 m
  - SC 4200 UP: 2000 m
- **Fresh air consumption**
  - SC 4000 UP: 6500 m³/h

### Features
- **DC connection**
- **AC connection**
  - SC 4000 UP: Terminal lug on each input (without fuse)
  - SC 4200 UP: Terminal lug on each input (without fuse)
- **Communication**
- **Enclosure / roof color**
- **Supply for external loads**
- **Standards and directives complied with**
- **EMC standards**
  - IEC 55011, IEC 61000-6-2, FCC Part 15 Class A
- **Quality standards and directives complied with**
  - VDI/VDE 2842 page 2, DIN EN ISO 9001
- **Type designation**
  - SC 4000 UP: SC 4000 UP
  - SC 4200 UP: SC 4200 UP
### Technical Data

#### DC side

<table>
<thead>
<tr>
<th>SC 4400 UP</th>
<th>SC 4600 UP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MPP voltage range</strong> ( V_{DC} ) ( (\text{at } 25^\circ \text{C} / \text{at } 50^\circ \text{C}) )</td>
<td>962 to 1325 V / 1100 V</td>
</tr>
<tr>
<td><strong>Min. DC voltage ( V_{DC, \text{min}} )</strong> / <strong>Start voltage ( V_{DC, \text{start}} )</strong></td>
<td>934 V / 1112 V</td>
</tr>
<tr>
<td><strong>Max. DC voltage ( V_{DC, \text{max}} )</strong></td>
<td>1500 V</td>
</tr>
<tr>
<td><strong>Max. DC current ( I_{DC, \text{max}} )</strong></td>
<td>4750 A</td>
</tr>
<tr>
<td><strong>Max. short-circuit current ( I_{SC, \text{SC}} )</strong></td>
<td>6400 A</td>
</tr>
</tbody>
</table>

#### AC side

| **Nominal AC power at** \( \cos \varphi = 1 \) \( (\text{at } 25^\circ \text{C} / \text{at } 50^\circ \text{C}) \) | 4400 kVA / 3740 kVA | 4600 kVA / 3910 kVA |
| **Nominal AC power at** \( \cos \varphi = 0.8 \) \( (\text{at } 25^\circ \text{C} / \text{at } 50^\circ \text{C}) \) | 3520 kW / 2992 kW | 3680 kW / 3128 kW |
| **Nominal AC current \( I_{AC, \text{nom}} \) (at 25°C / at 50°C)** | 3850 A / 3273 A | 3850 A / 3273 A |
| **Max. total harmonic distortion** | < 3% at nominal power | < 3% at nominal power |
| **Nominal AC voltage / nominal AC voltage range** | 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 |

#### Protective Devices

- **Input-side disconnection point**: DC load break switch
- **Output-side disconnection point**: AC circuit breaker
- **DC overvoltage protection**: Surge arrester, type I & II
- **AC overvoltage protection**: Surge arrester, class I & II
- **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)**: IP54 / IP34 / IP34

#### General Data

| **Dimensions** \( [W / H / D] \) | 2815 / 2318 / 1588 mm (110.8 / 91.3 / 62.5 inch) |
| **Weight** | < 3700 kg / < 8158 lb |
| **Self-consumption (max.\(^{\text{a}}\) / partial load\(^{\text{b}}\) / average\(^{\text{c}}\))** | < 8100 W / < 1800 W / < 2000 W |
| **Self-consumption (standby)** | < 370 W |
| **Internal auxiliary power supply** | ○ Integrated 8.4 kVA transformer |
| **Operating temperature range** | \(-25^\circ \text{C to } 60^\circ \text{C} / -13^\circ \text{F to } 140^\circ \text{F}\) |
| **Noise emission** | 63.0 dB(A)\(^{\text{d}}\) |
| **Temperature range (standby)** | \(-40^\circ \text{C to } 70^\circ \text{C} / -40^\circ \text{F to } 158^\circ \text{F}\) |
| **Temperature range (storage)** | \(-40^\circ \text{C to } 70^\circ \text{C} / -40^\circ \text{F to } 158^\circ \text{F}\) |
| **Max. permissible value for relative humidity** | 95% to 100% (2 month/year) / 0% to 95% |
| **Maximum operating altitude above MSL** | 1000 m / 2000 m / 3000 m\(^{\text{e}}\) |
| **Fresh air consumption** | 6500 m³/h |

#### Features

- **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
- **Enclosure / roof color**: RAL 9016 / RAL 7004
- **EMC standards**: ○ (2.5 kVA)
- **Quality standards and directives complied with**: ○ CE, IEC / EN 62109-1, IEC / EN 62109-2, A8 & N 4110, IEE1547, UL 840 Cat. IV, Arrêté du 23/04/08
- **Standards and directives complied with**: IEC 55011, IEC 61000-6-2, FCC Part 15 Class A
- **Type designation**: ○ Standard features / ○ Optional / — not available / * preliminary

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1. At nominal AC voltage, nominal AC power decreases in the same proportion
2. Efficiency measured without internal power supply
3. Efficiency measured with internal power supply
4. Self-consumption at rated operation
5. Self-consumption at < 75% \( \text{Pn} \) at 25°C
6. Self-consumption averaged out from 5% to 100% \( \text{Pn} \) 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. Depending on the DC voltage
11. Earlier temperature-dependent de-rating and reduction of DC open-circuit voltage
SYSTEM DIAGRAM

PV POWER PLANT
SMA Utility Power System
SMA POWER PLANT MANAGER
MV Power Station
DC COMBINER
SUNNY CENTRAL
MV TRANSFORMER
MV SWITCHGEAR
POINT OF INTERCONNECTION
UTILITY GRID

TEMPERATURE BEHAVIOR (at 1000 m)

Power [kW]

-50 -45 -40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40 45 50 55 60


SC 4000 UP  SC 4400 UP  SC 4200 UP  SC 4600 UP

Maximum power range Derating level 1 Derating level 2

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