

# SUNNY CENTRAL 500HE / 630HE



SC 500HE-11 / SC 630HE-11

## High-yield

- Outstanding specific price
- Efficiency of more than 98%

## Flexible

- Extended input voltage range for flexible system design
- Integrated DC recombiner for direct connection of the string monitors

- Connection of up to two additional external DC recombiners for diverse system configurations

## Reliable

- Smart Grid Management features static and dynamic grid support
- Perfect monitoring of all PV strings in the field

## SUNNY CENTRAL 500HE / 630HE

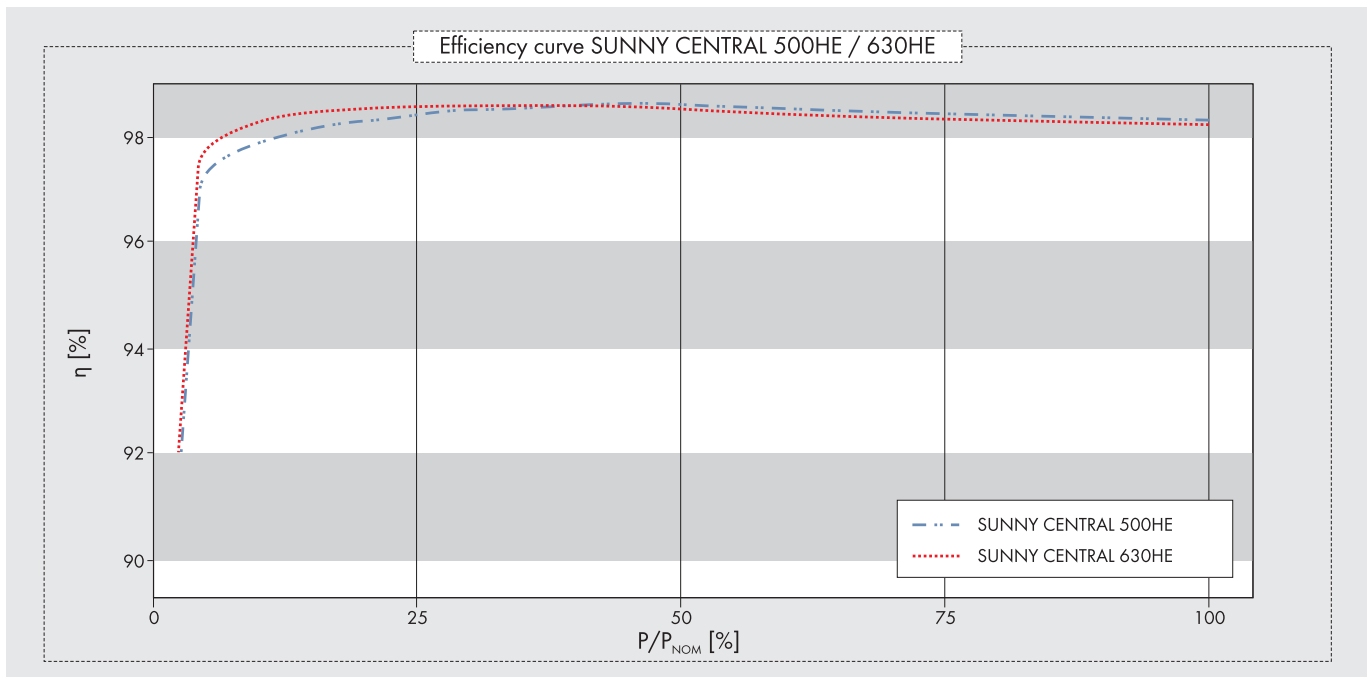
Smart Grid Management included

More power with lower system costs, high flexibility for system design and the best future prospects: the successful HE series, the Sunny Central 500HE and 630HE feature first class state-of-the-art technology and field-proven Smart Grid Management. The integrated DC recombiner simplifies the system technology in the field with reduced installation costs. An investment that pays off in the future.

# Technical Data

## Sunny Central 500HE / 630HE

	Sunny Central 500HE	Sunny Central 630HE
<b>Input data</b>		
Nominal power DC	509 kW	642 kW
Max. PV power (recommended)	560 kWp <sup>1)</sup>	705 kWp <sup>1)</sup>
PV voltage range, MPPT	450 V - 820 V <sup>5)</sup>	510 V - 820 V <sup>5)</sup>
Max. DC voltage	1000 V	1000 V
Max. DC current	1242 A	1422 A
Voltage ripple, PV voltage	< 3%	< 3%
Number of fused DC inputs	8 plus 2 additional connections for external DC main distribution board (SMB)	
<b>Output data</b>		
Nominal AC output @ 50 °C	500 kVA	630 kVA
Max. AC power @ 25 °C	550 kVA	700 kVA
Nominal AC voltage ± 10%	270 V	315 V
Nominal AC current	1070 A	1155 A
AC grid frequency	50 Hz / 60 Hz	50 Hz / 60 Hz
Harmonic distortion of grid current	< 3% at nominal power	< 3% at nominal power
Adjustable power factor (cos φ)	0.9 leading ... 0.9 lagging	
<b>Efficiency<sup>2)</sup></b>		
Maximum efficiency	98.6%	98.6%
Weighted Efficiency	98.4%	98.4%
<b>Dimensions and Weight</b>		
Width / Height / Depth in inches (W / H / D)	63.0 + 47.2/83.5/33.5	63.0 + 47.2/83.5/33.5
Weight approx. (lb)	4189	4189
<b>Power consumption</b>		
Internal consumption in operation / day	< 1500 W <sup>4)</sup>	< 1500 W <sup>4)</sup>
Internal consumption in standby / night	< 100 W	< 100 W
External auxiliary voltage / grid structure	3 x 400 V, 50/60 Hz / TN-S, TN-C or TT grid	3 x 400 V, 50/60 Hz / TN-S, TN-C or TT grid
<b>SCC (Sunny Central Control) interfaces</b>		
Communication (NET Piggy Back, optional)	Analog, ISDN, Ethernet	Analog, ISDN, Ethernet
Analog inputs	1 x Ain <sup>3)</sup>	1 x Ain <sup>3)</sup>
Overvoltage protection for analog inputs	Optional	Optional
Sunny String-Monitor connection (COM1)	RS485	RS485
PC interface (COM3)	RS232	RS232
Electrically separated relay (ext. signal)	1	1

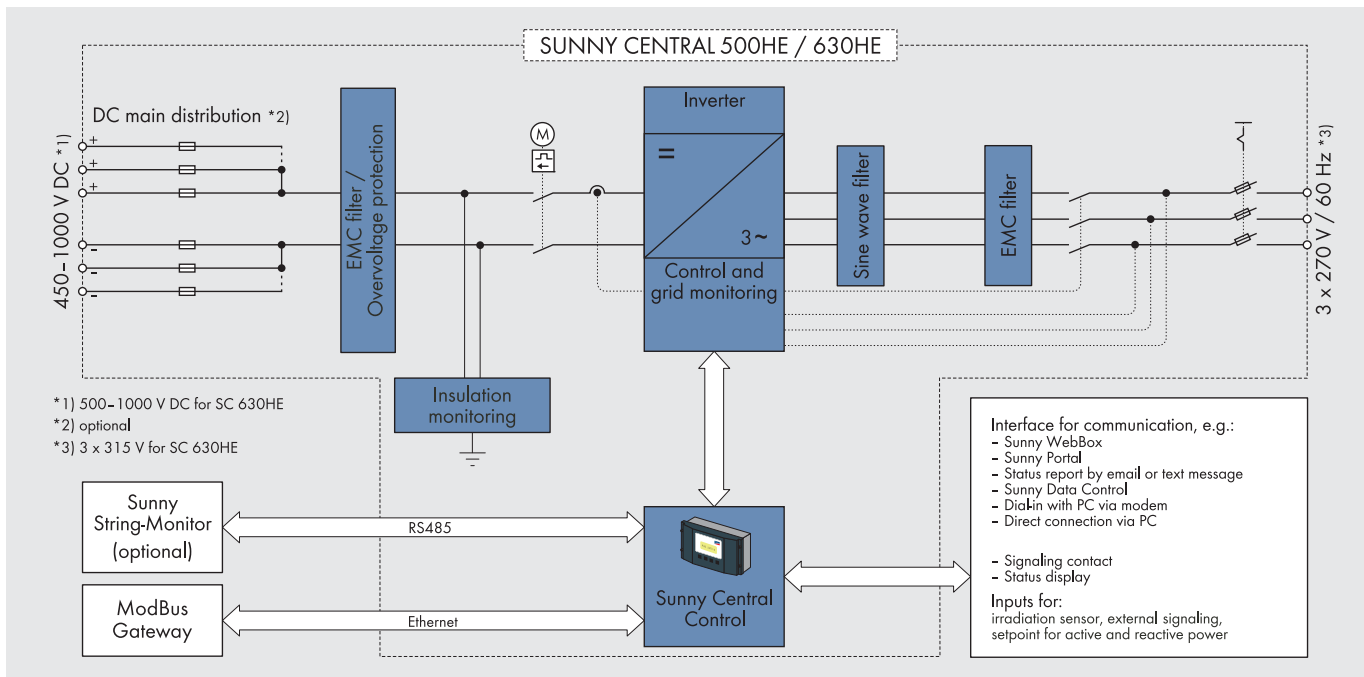


	Sunny Central 500HE	Sunny Central 630HE
<b>Features</b>		
Display (SCC)	Yes	Yes
Ground fault monitoring	Yes	Yes
Heating	Yes	Yes
Emergency stop	Yes	Yes
Power switch AC side	SI load disconnect switch	SI load disconnect switch
Power switch DC side	Load disconnect switch with motor	Load disconnect switch with motor
Monitored overvoltage protectors AC / DC	Yes / Yes	Yes / Yes
Monitored overvoltage protectors for aux. supply	Yes	Yes
<b>Standards</b>		
EMC	EN 61000-6-2, EN 61000-6-4	EN 61000-6-2, EN 61000-6-4
Grid monitoring	in acc. with BDEW directive	in acc. with BDEW directive
IEEE conformity	IEEE 1547, 519	IEEE 1547, 519
<b>Protection rating and ambient conditions</b>		
Protection rating as per EN 60529	IP20 (indoor)	IP20 (indoor)
Protection rating per EN 60721-3-3	Classification of	Classification of
Ambient Conditions: fixed location, protection against wind and weather	<ul style="list-style-type: none"> <li>chem. active substances: 3C1L</li> <li>mechanically active substances: 3S2</li> </ul>	<ul style="list-style-type: none"> <li>chem. active substances: 3C1L</li> <li>mechanically active substances: 3S2</li> </ul>
Permissible ambient temperatures	-4 °F to 122 °F	-4 °F to 122 °F
Relative humidity, non condensing	15% ... 95%	15% ... 95%
Max. altitude above sea level	1000 m	1000 m
Fresh air consumption	6200 m <sup>3</sup> /h	6200 m <sup>3</sup> /h
Type designation	SC 500HE-11	SC 630HE-11

HE: High Efficiency, inverter without galvanic isolation for connection to a medium-voltage transformer (taking into account the SMA specification for the transformer)

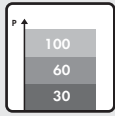
- 1) Specifications apply to irradiation values below STC
- 2) Efficiency measured without an internal power supply at  $U_{DC} = 500 V$
- 3) 2 x input to external nominal value specification for active and reactive power, 1 x external alarm input, 1 x irradiation sensor, 1 x pyranometer
- 4) Internal consumption at nominal power
- 5)  $U_{DC, min}$  at  $U_{AC, nom} \pm 5\%$  and  $\cos \phi = 1$

**Please also read:** Transport instructions for Sunny Central and the Sunny Central installation guide



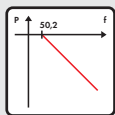
# Smart Grid Management included

SMA central inverters in the new Sunny Central MV stations fulfill the following specifications typically required with utility-scale applications:



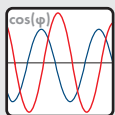
## Power limitation peak shaving / grid safety management

In order to avoid short-term grid overload, the grid operator presets a nominal active power value which the inverter will implement within 60 seconds. The nominal value is transmitted to the inverters via a ripple control receiver in combination with the SMA Power Reducer Box. Typical limit values are 100, 60, 30, or 0 percent of the nominal power.



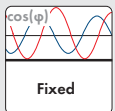
## Frequency-dependent control of active power

Starting at a defined grid frequency, the inverter will automatically reduce the fed-in active power along a preset characteristic curve and thereby contribute to the stabilization of the grid frequency.



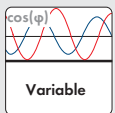
## Grid support through reactive power

In order to keep the grid voltage constant, Sunny Central HE inverters supply leading or lagging reactive power to the grid. For this, there are three options:



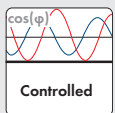
### a) Fixed presetting of the reactive power by the grid operator

The grid operator presets a fixed reactive power value or a fixed phase shift between  $\cos(\varphi)$   $\cos(\varphi)_{\text{leading}} = 0.9$  and  $\cos(\varphi)_{\text{lagging}} = 0.9$ .



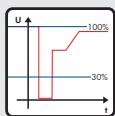
### b) Dynamic presetting of the reactive power by the grid operator

The grid operator presets a dynamic phase shift - any value between  $\cos(\varphi)_{\text{leading}} = 0.9$  and  $\cos(\varphi)_{\text{lagging}} = 0.9$ . It is transmitted either through a communication unit or via a standardized current signal ( $I = 4 \dots 20$  mA) in accordance with DIN IEC.



### c) Control of the reactive power through a characteristic curve

Either the reactive power or the phase shift is controlled by a pre-defined characteristic curve - depending on the fed-in active power or grid voltage.



## Monitored dynamic grid support LVRT (Low Voltage Ride Through)

Until now, PV systems have had to disconnect from the grid immediately even during short grid voltage losses. The result is that, if there are grid disturbances, basically all feed-in systems shut down in cascades and further increase the imbalance of the grid. Using the monitored dynamic grid support, the new Sunny Central HE devices can feed in immediately after short-term voltage losses - as long as the nominal voltage exceeds fixed values. (Optional)