

SC 400HE / 500HE / 630HE

High Yields

- > Best specific prices
- > Efficiencies above 98 percent

Flexible

- > Extended input voltage range for flexible system design
- > Integrated DC main distribution for direct connection of the string monitors
- > Versatile system configurations

Safe

- > Already fulfill today the requirements of the new medium-voltage directive, including static grid support
- > Perfect monitoring of all PV strings in the field



SUNNY CENTRAL 400HE / 500HE / 630HE

Grid Management Included

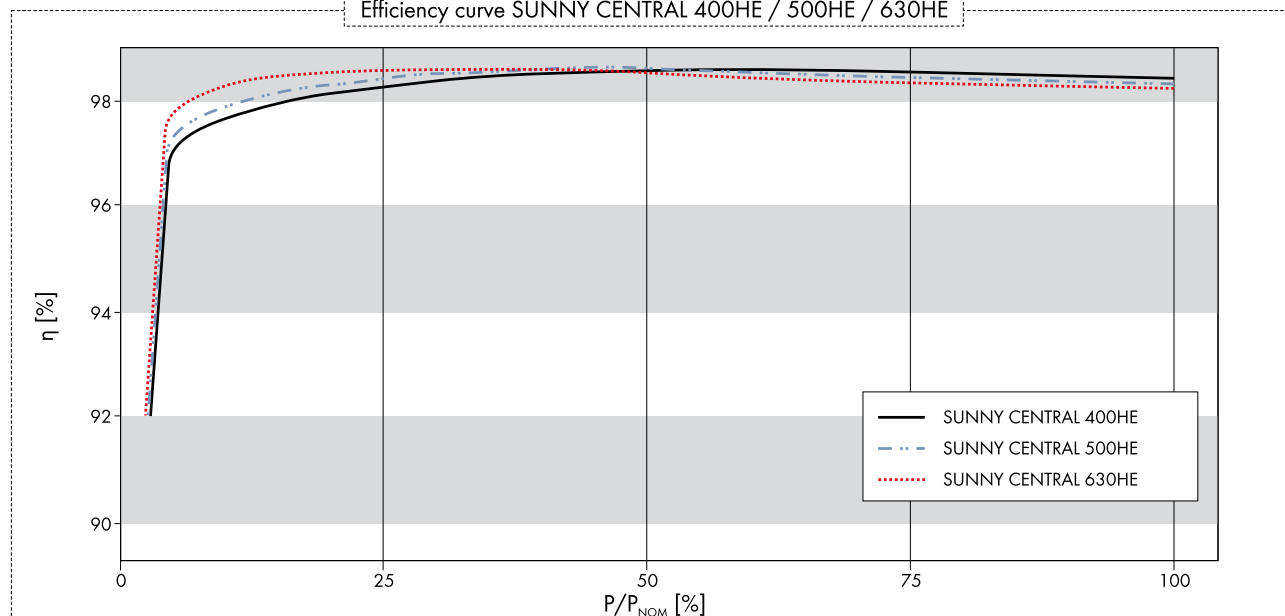
More power with lower system costs, high flexibility for system design and best future prospects: being the further development of the successful HE series, the Sunny Central 400HE, 500HE, and 630HE offer first class, state-of-the-art technology. Due to the expansion of the input voltage range, to up to 1000 volts, there is no additional cost for an EVR option. The integrated DC main distribution simplifies system technology in the field while reducing installation work. And: The new HE series inverters are the first to fulfill the requirements of the "Medium-voltage directive" valid from July 2010. The inverters stabilize the public grid, support grid voltage, and control electrical grid parameters. This makes for an investment which will continue to be worthwhile in the future.

Technical Data

SUNNY CENTRAL 400HE / 500HE / 630HE

	Sunny Central 400HE	Sunny Central 500HE	Sunny Central 630HE
Input Data			
Nominal power DC	408 kW	509 kW	642 kW
Max. PV power (recommended), (P _{PV})	450 kW _p ¹⁾	560 kW _p ¹⁾	705 kW _p ¹⁾
DC voltage range, MPPT (U _{DC})	450 V – 820 V ⁵⁾	450 V – 820 V ⁵⁾	500 V – 820 V ⁵⁾
Max. permissible DC voltage (U _{DC, max})	1000 V	1000 V	1000 V
Max. permissible DC current (I _{DC, max})	1000 A	1200 A	1350 A
Voltage ripple, PV voltage (U _{pp})	< 3 %	< 3 %	< 3 %
Number of fused DC inputs	2 ports for external DC main distributions (SMB) / 8 per potential		
Output Data			
Nominal AC output power (P _{AC})	400 kW ⁶⁾	500 kW ⁶⁾	630 kW ⁶⁾
Operating grid voltage ±10 % (U _{AC})	270 V	270 V	315 V
Nominal AC current (I _{AC, nom})	855 A	1070 A	1155 A
Operating range, grid frequency (f _{AC})	50 Hz / 60 Hz	50 Hz / 60 Hz	50 Hz / 60 Hz
Distortions of the grid current	< 3 % at nominal power	< 3 % at nominal power	< 3 % at nominal power
Phase shift (cos φ)	0.95 leading ... 0.95 lagging		
Efficiency ²⁾			
Max. efficiency P _{AC, max} (η)	98.6 %	98.6 %	98.6 %
Euro ETA (η)	98.4 %	98.4 %	98.4 %
Dimensions and Weight			
Width / Height / Depth in mm (W / H / D)	1600 + 1200/2120/850	1600 + 1200/2120/850	1600 + 1200/2120/850
Weight approx. (kg)	1900	1900	1900
Power Consumption			
Own consumption in operation (P _{day})	< 2800 W ⁴⁾	< 2900 W ⁴⁾	< 3000 W ⁴⁾
Standby operating consumption (P _{night})	< 100 W	< 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	3 x 400 V, 50/60 Hz / TN-S, TN-C or TT grid
External back-up fuse for auxiliary supply	B 20 A, 3-pole	B 20 A, 3-pole	B 20 A, 3-pole
SCC (Sunny Central Control) Interfaces			
Communication (NET Piggy Back, optional)	Analog, ISDN, Ethernet	Analog, ISDN, Ethernet	Analog, ISDN, Ethernet
Analog inputs	1 x PT 100, 3 x A _{in} ³⁾	1 x PT 100, 3 x A _{in} ³⁾	1 x PT 100, 3 x A _{in} ³⁾
Surge voltage protection for analog inputs	Optional	Optional	Optional
Sunny String-Monitor interface (COM1)	RS485	RS485	RS485
PC interface (COM3)	RS232	RS232	RS232
Electrically separated relay (ext. signal)	1	1	1

Efficiency curve SUNNY CENTRAL 400HE / 500HE / 630HE

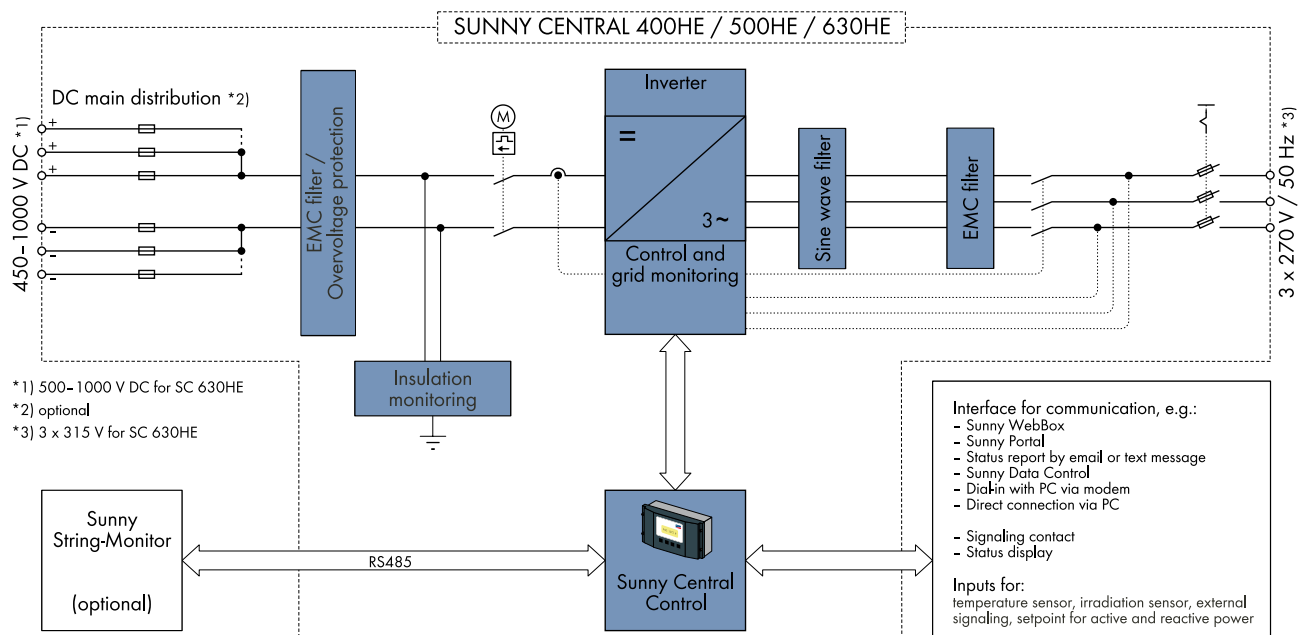


	Sunny Central 400HE	Sunny Central 500HE	Sunny Central 630HE
Features			
Display (SCC)	Yes	Yes	Yes
Ground fault monitoring	Yes	Yes	Yes
Heating	Yes	Yes	Yes
Emergency stop	Yes	Yes	Yes
Power switch AC side	SI load disconnection switch	SI load disconnection switch	SI load disconnection switch
Power switch DC side	Load disconnection switch with motor	Load disconnection switch with motor	Load disconnection switch with motor
Monitored surge voltage protectors AC / DC	Yes / Yes	Yes / Yes	Yes / Yes
Monitored overvoltage protectors for auxiliary supply	Yes	Yes	Yes
Standards			
EMC	EN 61000-6-2, EN 61000-6-4	EN 61000-6-2, EN 61000-6-4	EN 61000-6-2, EN 61000-6-4
Grid monitoring	In accordance with BDEW directive	In accordance with BDEW directive	In accordance with BDEW directive
CE conformity	Yes	Yes	Yes
Protection Rating and Ambient Conditions			
Protection rating as per EN 60529	IP20	IP20	IP20
Protection rating per EN 60721-3-3	Classification of	Classification of	Classification of
Environmental conditions:	• chemically active substances: 3C1L • mechanically active substances: 3S2	• chemically active substances: 3C1L • mechanically active substances: 3S2	• chemically active substances: 3C1L • mechanically active substances: 3S2
fixed location, with protection against wind and weather.			
Permissible ambient temperature (T)	-20 °C ... +50 °C	-20 °C ... +50 °C	-20 °C ... +50 °C
Relative humidity, not condensing (U _{AIR})	15 % ... 95 %	15 % ... 95 %	15 % ... 95 %
Max. altitude (above sea level)	1000 m	1000 m	1000 m
Fresh air consumption (V _{AIR})	6200 m³/h	6200 m³/h	6200 m³/h
Type designation	SC 400HE-11	SC 500HE-11	SC 630HE-11

HE: High Efficiency, inverter without electric separation for connection to a medium-voltage transformer (taking into account the SMA specifications for the transformer)

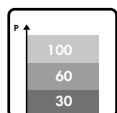
- 1) Specifications apply to irradiation values below STC
- 2) Efficiency measured without an internal power supply at $U_{DC} = 500$ V
- 3) Terminal for an analog sensor provided by the customer in two-wire and four-wire version
- 4) Own consumption measured in clock-rate operation with activated AC fans, activated DC fans and stack fans with 100 %
- 5) $U_{DC \min}$ for $U_{AC, \text{nom}} \pm 5\%$ and $\cos \varphi = 1$
- 6) P_{nom} for $U_{AC, \text{nom}} \pm 5\%$ and $\cos \varphi = 1$

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



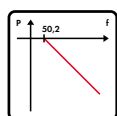
Grid management included

SMA central inverters in the new Sunny Central MV stations fulfill the following specifications of the BDEW medium-voltage directive:



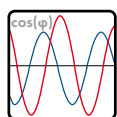
Power limitation in accordance with EEG paragraph 6 / Grid safety management

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.



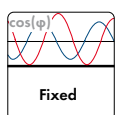
Frequency-dependent control of active power

Starting at a grid frequency of 50.2 Hz, 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.



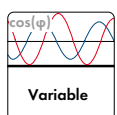
Static grid support through reactive power

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:



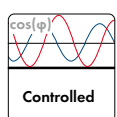
a) Fixed presetting of the reactive power by the grid operator

The grid operator presets a fixed reactive power value or a fixed phase shift between $\cos(\varphi)_{\text{leading}} = 0.95$ and $\cos(\varphi)_{\text{lagging}} = 0.95$.



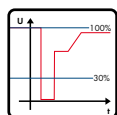
b) Dynamic presetting of the reactive power by the grid operator

The grid operator presets a dynamic phase shift - any value between $\cos(\varphi)_{\text{leading}} = 0.95$ und $\cos(\varphi)_{\text{lagging}} = 0.95$. 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)