

# SUNNY BOY 1.5 / 2.5

SB 1.5-1VL-40 / SB 2.5-1VL-40



## Flexible

- Broad input voltage range
- Integrated WLAN and Speedwire/ Webconnect interface with Webconnect function
- Wired or wireless communication

## Communicative

- New communication concept with integrated web server
- System data monitoring possible via WebUI on all smartphones and tablets
- Pulsating LED

## Future-Proof

- OptiTrack Global Peak
- Maintenance free, thanks to convection cooling
- Zero feed-in ready
- Direct SMA Energy Meter connection

## Easy to Use

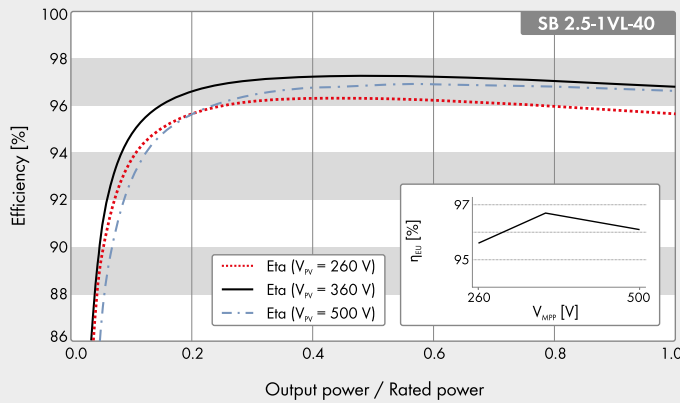
- SUNCLIX DC plug-in system
- Easy installation, low weight and size, transformerless
- Easy commissioning via WebUI

## SUNNY BOY 1.5 / 2.5

The new standard for small PV systems

The new Sunny Boy 1.5 / 2.5 is the perfect inverter for customers with small PV systems. Thanks to its broad input voltage range of 80 V to 600 V, its versatility, flexibility in module compatibility and low weight for easy installation are impressive. After smooth commissioning via WebUI, the Sunny Boy 1.5 / 2.5 is ideal for local monitoring via the device's own wireless home network or for online monitoring with Sunny Portal or Sunny Places.

## Efficiency Curve



● Standard features ○ Optional – Not available  
 Data at nominal conditions  
 Last revision: December 2015

Technical Data	Sunny Boy 1.5	Sunny Boy 2.5
<b>Input (DC)</b>		
Max. DC power (at $\cos \varphi = 1$ )	1600 W	2650 W
Max. input voltage	600 V	600 V
MPP voltage range	160 V to 500 V	260 V to 500 V
Rated input voltage	360 V	360 V
Min. input voltage / initial input voltage	50 V / 80 V	50 V / 80 V
Max. input current	10 A	10 A
Max. input current per string	10 A	10 A
Number of independent MPP inputs / strings per MPP input	1 / 1	1 / 1
<b>Output (AC)</b>		
Rated power (at 230 V, 50 Hz)	1500 W	2500 W
Max. apparent AC power	1500 VA	2500 VA
Nominal AC voltage	220 V / 230 V / 240 V	220 V / 230 V / 240 V
Nominal AC voltage range	180 V to 280 V	180 V to 280 V
AC power frequency/range	50 Hz, 60 Hz / -5 Hz to +5 Hz	50 Hz, 60 Hz / -5 Hz to +5 Hz
Rated power frequency/rated grid voltage	50 Hz / 230 V	50 Hz / 230 V
Max. output current	7 A	11 A
Power factor at rated power	1	1
Adjustable displacement power factor	0.8 overexcited to 0.8 underexcited	
Feed-in phases/connection phases	1 / 1	1 / 1
<b>Efficiency</b>		
Max. efficiency / European weighted efficiency	97.2 % / 96.1 %	97.2 % / 96.7 %
<b>Protective Devices</b>		
DC-side disconnection point	●	●
Ground fault monitoring / grid monitoring	● / ●	● / ●
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated	● / ● / -	● / ● / -
All-pole sensitive residual-current monitoring unit	●	●
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)	I / III	I / III
Reverse current protection	Not required	Not required
<b>General Data</b>		
Dimensions (W / H / D)	460 / 357 / 122 mm (18.1 / 14.1 / 4.8 inches)	
Weight	9.2 kg (20.3 lbs)	
Operating temperature range	-40 °C to +60 °C (-40 °F to +140 °F)	
Noise emission, typical	<25 dB	<25 dB
Self-consumption (at night)	2.0 W	2.0 W
Topology	Transformerless	Transformerless
Cooling method	Convection	Convection
Degree of protection (according to IEC 60529)	IP65	IP65
Climatic category (according to IEC 60721-3-4)	4K4H	4K4H
Maximum permissible value for relative humidity (non-condensing)	100 %	100 %
<b>Features</b>		
DC connection / AC connection	SUNCLIX / connector	SUNCLIX / connector
Display	-	-
Interfaces: RS485, Bluetooth®, Speedwire / Webconnect, WLAN	- / - / ● / ●	- / - / ● / ●
Integrated web server	●	●
Warranty: 5 / 10 / 15 / 20 / 25 years	● / ○ / ○ / ○ / ○ / ○	● / ○ / ○ / ○ / ○ / ○
Certificates and approvals (others available upon request)	AS4777.3, C10/11/2012, CEI0-21Int, EN50438, G83/2, IEC61727, IEC62116, IEC62109, NBR16149, NEN-EN50438, NRS097-2-1, VDE-AR-N4105, VDE 0126-1-1, VFR2014	
Type designation	SB 1.5-1VL-40	SB 2.5-1VL-40

SB 3000TL-21 / SB 3600TL-21 / SB 4000TL-21 / SB 5000TL-21



**Efficient**

- Maximum efficiency of 97 %
- Multistring technology in all power classes
- Cost savings resulting from fewer parallel strings
- Shade management with OptiTrac Global Peak

**Flexible**

- Maximum DC input voltage of 750 V
- Integrated grid management functions and reactive power provision

**Easy to Use**

- Fanless
- Simplified wall mounting
- SUNCLIX DC plug-in system
- Fast connection without tools

**Communicative**

- Simple country configuration
- Bluetooth® and Speedwire/Webconnect technology as standard

## SUNNY BOY 3000TL / 3600TL / 4000TL / 5000TL With Reactive Power Control

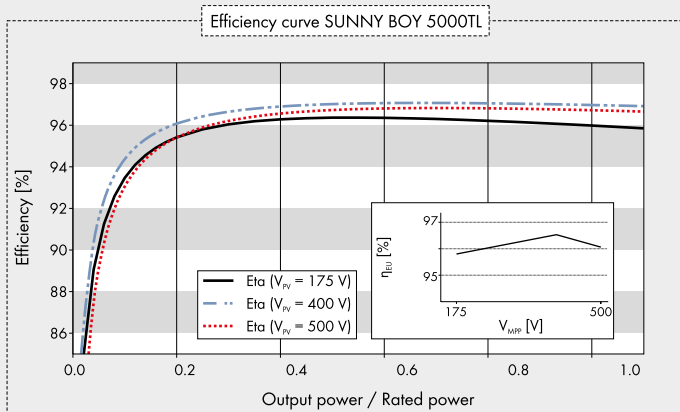
The same. Only better. The universal Sunny Boy.

Getting better all the time. The new transformerless Sunny Boy is the ideal solution, especially for demanding PV arrays and partly shaded systems. Version 20 of the successful Sunny Boy offers a further array of advantages. It's more flexible in its range of applications, provides even more efficient yields and it's easier to use. The high DC voltage of 750 V creates a cost advantage, since fewer parallel strings are required. In addition, the integrated grid management functions make the device suitable for universal applications and allow them to actively support the grid.

# SUNNY BOY 3000TL / 3600TL / 4000TL / 5000TL

## With Reactive Power Control

Technical Data	Sunny Boy 3000TL	Sunny Boy 3600TL
<b>Input (DC)</b>		
Max. DC power (at $\cos \varphi = 1$ )	3200 W	3880 W
Max. input voltage	750 V	750 V
MPP voltage range / rated input voltage	175 V to 500 V / 400 V	175 V to 500 V / 400 V
Min. input voltage / initial input voltage	125 V / 150 V	125 V / 150 V
Max. input current input A / input B	15 A / 15 A	15 A / 15 A
Max. input current per string input A / input B	15 A / 15 A	15 A / 15 A
Number of independent MPP inputs / strings per MPP input	2 / A:2; B:2	2 / A:2; B:2
<b>Output (AC)</b>		
Rated power (at 230 V, 50 Hz)	3000 W	3680 W
Max. AC apparent power	3000 VA	3680 VA
Nominal AC voltage / range	220 V, 230 V, 240 V / 180 V to 280 V	220 V, 230 V, 240 V / 180 V to 280 V
AC power frequency / range	50 Hz, 60 Hz / -5 Hz to +5 Hz	50 Hz, 60 Hz / -5 Hz to +5 Hz
Rated power frequency / rated grid voltage	50 Hz / 230 V	50 Hz / 230 V
Max. output current	16 A	16 A
Power factor at rated power	1	1
Adjustable displacement power factor	0.8 lagging to 0.8 leading	0.8 lagging to 0.8 leading
Feed-in phases / connection phases	1 / 1	1 / 1
<b>Efficiency</b>		
Max. efficiency / European Efficiency	97 % / 96 %	97 % / 96,4 %
<b>Protective Devices</b>		
Input-side disconnection point	●	●
Ground fault monitoring / grid monitoring	● / ●	● / ●
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated	● / ● / -	● / ● / -
All-pole sensitive residual-current monitoring unit	●	●
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)	I / III	I / III
<b>General Data</b>		
Dimensions (W / H / D)	490 / 519 / 185 mm (19.3 / 20.4 / 7.3 inch)	
Weight	26 kg (57.3 lb)	
Operating temperature range	-25 °C to +60 °C (-13 °F to +140 °F)	
Noise emission (typical)	25 dB(A)	25 dB(A)
Self-consumption (at night)	1 W	1 W
Topology	Transformerless	Transformerless
Cooling method	Convection	Convection
Degree of protection (according to IEC 60529)	IP65	IP65
Climatic category (according to IEC 60721-3-4)	4K4H	4K4H
Maximum permissible value for relative humidity (non-condensing)	100%	100%
<b>Features</b>		
DC connection / AC connection	SUNCLIX / spring-cage terminal	SUNCLIX / spring-cage terminal
Display	Graphic	Graphic
Interfaces: RS485 / Bluetooth® / Speedwire / Webconnect	○ / ● / ●	○ / ● / ●
Multifunction relay / Power Control Module	○ / ○	○ / ○
Warranty: 5 / 10 / 15 / 20 / 25 years	● / ○ / ○ / ○ / ○ / ○	● / ○ / ○ / ○ / ○ / ○
Certificates and approvals (others available upon request)	AS 4777, C10/11, CE, CEI 0-21, EN 50438 <sup>1</sup> , G59/3, G83/2, IEC 61727, MEA <sup>4</sup> , NEN-EN50438, NRS 097-2-1, PEA <sup>4</sup> , PPC, PPDS, RD1699, RD 661, SI 4777, UTE C15-712, VDE-AR-N 4105, VDE0126-1-1, VFR 2013, VFR 2014	
As of December 2015		
● Standard features ○ Optional features – Not available, Data at nominal conditions		
Type designation	SB 3000TL-21	SB 3600TL-21



### Accessory



RS485 interface  
DM-485CB-10



Speedwire / Webconnect  
interface SWDM-10



Multifunction relay  
MFR01-10



Additional fan kit  
FANKIT01-10



SMA Power Control  
Module  
PWCMOD-10

<sup>1</sup> Does not apply to all national appendices of EN 50438

<sup>2</sup> 4600 VA according to VDE-AR-N 4105 <sup>3</sup> 4825 W according to VDE-AR-N 4105

<sup>4</sup> Only SB 3600TL-21, SB 5000TL-21

Technical Data	Sunny Boy 4000TL	Sunny Boy 5000TL
<b>Input (DC)</b>		
Max. DC power (at $\cos \varphi = 1$ )	4200 W	5250 W <sup>3</sup>
Max. input voltage	750 V	750 V
MPP voltage range / rated input voltage	175 V to 500 V / 400 V	175 V to 500 V / 400 V
Min. input voltage / initial input voltage	125 V / 150 V	125 V / 150 V
Max. input current input A / input B	15 A / 15 A	15 A / 15 A
Max. input current per string input A / input B	15 A / 15 A	15 A / 15 A
Number of independent MPP inputs / strings per MPP input	2 / A:2; B:2	2 / A:2; B:2
<b>Output (AC)</b>		
Rated power (at 230 V, 50 Hz)	4000 W	4600 W
Max. AC apparent power	4000 VA	5000 VA <sup>2</sup>
Nominal AC voltage / range	220 V, 230 V, 240 V / 180 V to 280 V	220 V, 230 V, 240 V / 180 V to 280 V
AC power frequency / range	50 Hz, 60 Hz / -5 Hz to +5 Hz	50 Hz, 60 Hz / -5 Hz to +5 Hz
Rated power frequency / rated grid voltage	50 Hz / 230 V	50 Hz / 230 V
Max. output current	22 A	22 A
Power factor at rated power	1	1
Adjustable displacement power factor	0.8 lagging to 0.8 leading	0.8 lagging to 0.8 leading
Feed-in phases / connection phases	1 / 1	1 / 1
<b>Efficiency</b>		
Max. efficiency / European Efficiency	97 % / 96.4 %	97 % / 96.5 %
<b>Protective Devices</b>		
Input-side disconnection point	●	●
Ground fault monitoring / grid monitoring	● / ●	● / ●
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated	● / ● / -	● / ● / -
All-pole sensitive residual-current monitoring unit	●	●
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)	I / III	I / III
<b>General Data</b>		
Dimensions (W / H / D)	490 / 519 / 185 mm (19.3 / 20.4 / 7.3 inch)	
Weight	26 kg (57.3 lb)	
Operating temperature range	-25 °C to +60 °C (-13 °F to +140 °F)	
Noise emission (typical)	25 dB(A)	25 dB(A)
Self-consumption (at night)	1 W	1 W
Topology	Transformerless	Transformerless
Cooling method	Convection	Convection
Degree of protection (according to IEC 60529)	IP65	IP65
Climatic category (according to IEC 60721-3-4)	4K4H	4K4H
Maximum permissible value for relative humidity (non-condensing)	100 %	100 %
<b>Features</b>		
DC connection / AC connection	SUNCLIX / spring-cage terminal	SUNCLIX / spring-cage terminal
Display	Graphic	Graphic
Interfaces: RS485 / Bluetooth® / Speedwire / Webconnect	○ / ● / ●	○ / ● / ●
Multifunction relay / Power Control Module	○ / ○	○ / ○
Warranty: 5 / 10 / 15 / 20 / 25 years	● / ○ / ○ / ○ / ○ / ○	● / ○ / ○ / ○ / ○ / ○
Certificates and approvals (others available upon request)	AS 4777, C10/11, CE, CEI 0-21, EN 50438 <sup>1</sup> , G59/3, G83/2, IEC 61727, MEA <sup>4</sup> , NEN-EN50438, NRS 097-2-1, PEA <sup>4</sup> , PPC, PPDS, RD 1699, RD 661, SI 4777, UTE C15-712, VDE-AR-N 4105, VDE0126-1-1, VFR 2013, VFR 2014	
● Standard features ○ Optional features – Not available, Data at nominal conditions		
Type designation	SB 4000TL-21	SB 5000TL-21

[www.SunnyPortal.com](http://www.SunnyPortal.com)

Professional PV system monitoring, management and data display



[www.SMA-Solar.com](http://www.SMA-Solar.com)

**SMA Solar Technology**

# SUNNY TRIPOWER

## 5000TL / 6000TL / 7000TL / 8000TL / 9000TL



STP 5000TL-20 / STP 6000TL-20 / STP 7000TL-20 / STP 8000TL-20 / STP 9000TL-20



### Economical

- Maximum efficiency of 98%
- Shade management with OptiTrac Global Peak
- Active temperature management with OptiCool

### Flexible

- DC input voltage of up to 1,000 V
- Integrated grid management functions
- Reactive power supply
- Module-tailored plant design with Optiflex

### Communicative

- SMA Webconnect Portal communication
- *Bluetooth*<sup>®</sup> communication
- Simple country configuration
- Multi-function relay as standard

### Simple

- Three-phase feed-in
- Cable connection without tools
- SUNCLIX DC plug-in system
- Integrated ESS DC switch-disconnector
- Easy wall mounting

## SUNNY TRIPOWER

### 5000TL / 6000TL / 7000TL / 8000TL / 9000TL

The three-phase inverter for your home

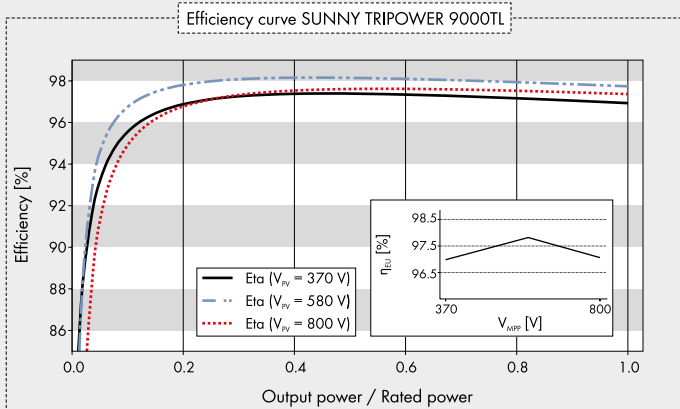
At home with leading-edge technology and top yields: The Sunny Tripower PV plant with 5 to 9 kW of power is setting new standards for home systems. It features an asymmetric multi-string and Optiflex technology to ensure the highest in flexibility while combining peak efficiency with the OptiTrac Global Peak system to generate the highest in yields. In addition to communication via the external *Bluetooth*-antenna, the PV plant comes with a direct Sunny Portal connection via SMA Webconnect as standard – and now for the first time without data loggers. In addition, the “small” Sunny Tripower comes with integrated grid management functions, is capable of reactive power supply and is suitable for operation with a 30 mA RCD.

# SUNNY TRIPOWER

## 5000TL / 6000TL / 7000TL / 8000TL / 9000TL

Technical data	Sunny Tripower 5000TL	Sunny Tripower 6000TL
<b>Input (DC)</b>		
Max. DC power (@ $\cos \phi = 1$ )	5100 W	6125 W
Max. input voltage	1000 V	1000 V
MPP voltage range / rated input voltage	245 V ... 800 V / 580 V	295 V ... 800 V / 580 V
Min. input voltage / initial input voltage	150 V / 188 V	150 V / 188 V
Max. input current input A / input B	11 A / 10 A	11 A / 10 A
Max. input current per string input A / input B	11 A / 10 A	11 A / 10 A
Number of independent MPP inputs / strings per MPP input	2 / A:2; B:2	2 / A:2; B:2
<b>Output (AC)</b>		
Rated power (@ 230 V, 50 Hz)	5000 W	6000 W
Max. apparent AC power	5000 VA	6000 VA
AC nominal voltage	3 / N / PE; 220 V / 380 V 3 / N / PE; 230 V / 400 V 3 / N / PE; 240 V / 415 V	3 / N / PE; 220 V / 380 V 3 / N / PE; 230 V / 400 V 3 / N / PE; 240 V / 415 V
Nominal AC voltage range	160 V – 280 V	160 V – 280 V
AC power frequency / range	50 Hz, 60 Hz / –5 Hz ... +5 Hz	50 Hz, 60 Hz / –5 Hz ... +5 Hz
Rated power frequency / rated grid voltage	50 Hz / 230 V	50 Hz / 230 V
Max. output current	7.3 A	8.7 A
Power factor at rated power	1	1
Adjustable displacement power factor	0.8 overexcited ... 0.8 underexcited	0.8 overexcited ... 0.8 underexcited
Feed-in phases / connection phases	3 / 3	3 / 3
<b>Efficiency</b>		
Max. efficiency / European Efficiency	98% / 97.1%	98% / 97.4%
<b>Protective devices</b>		
DC disconnect device	●	●
Ground fault monitoring / grid monitoring	● / ●	● / ●
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated	● / ● / –	● / ● / –
All-pole-sensitive residual-current monitoring unit	●	●
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)	I / III	I / III
<b>General data</b>		
Dimensions (W/H/D)	470 / 730 / 240 mm (18.5 / 28.7 / 9.5 inches)	470 / 730 / 240 mm (18.5 / 28.7 / 9.5 inches)
Weight	37 kg (81.6 lb)	37 kg (81.6 lb)
Operating temperature range	–25 °C...+60 °C (–13 °F...+140 °F)	–25 °C...+60 °C (–13 °F...+140 °F)
Noise emission (typical)	40 dB(A)	40 dB(A)
Self-consumption (night)	1 W	1 W
Topology / cooling concept	Transformerless / OptiCool	Transformerless / OptiCool
Degree of protection (according to IEC 60529)	IP65	IP65
Climatic category (according to IEC 60721-3-4)	4K4H	4K4H
Maximum permissible value for relative humidity (non-condensing)	100%	100%
<b>Features</b>		
DC connection / AC connection	SUNCLIX / Spring clamp terminal	SUNCLIX / Spring clamp terminal
Display	Graphic	Graphic
Interface: RS485, Bluetooth, Speedwire/Webconnect	○ / ● / ●	○ / ● / ●
Multi-function relay / Power Control Module	● / ○	● / ○
Warranty: 5 / 10 / 15 / 20 / 25 years	● / ○ / ○ / ○ / ○	● / ○ / ○ / ○ / ○
Certificates and approvals (additional on request)	AS 4777, C10/11, CE, CEI 0-21 (>6 kWp), EN 50438 <sup>1</sup> , G59/2, G83/1-1, IEC 61727, MEA <sup>2</sup> , NEN EN 50438, NRS 097-2-1, PEA <sup>3</sup> , PPC, PPDS, RD1699, RD 661/2007, SI 4777, UTE C15-712-1, VDE-AR-N 4105, VDE0126-1-1	
Type designation	STP 5000TL-20	STP 6000TL-20





### Accessories



Interface RS485  
485BRD-10



Power Control Module  
PWCBRD-10

<sup>1</sup> Does not apply to all national appendices of EN 50438

<sup>2</sup> Only STP 9000TL-20

● Standard features   ○ Optional features   – Not available  
Preliminary information – last updated: November 2013  
Data at nominal conditions

Sunny Tripower 7000TL	Sunny Tripower 8000TL	Sunny Tripower 9000TL	
7175 W	8200 W	9225 W	
1000 V	1000 V	1000 V	
290 V ... 800 V / 580 V	330 V ... 800 V / 580 V	370 V ... 800 V / 580 V	
150 V / 188 V	150 V / 188 V	150 V / 188 V	
15 A / 10 A	15 A / 10 A	15 A / 10 A	
15 A / 10 A	15 A / 10 A	15 A / 10 A	
2 / A:2; B:2	2 / A:2; B:2	2 / A:2; B:2	
7000 W	8000 W	9000 W	
7000 VA	8000 VA	9000 VA	
3 / N / PE; 220 V / 380 V	3 / N / PE; 220 V / 380 V	3 / N / PE; 220 V / 380 V	
3 / N / PE; 230 V / 400 V	3 / N / PE; 230 V / 400 V	3 / N / PE; 230 V / 400 V	
3 / N / PE; 240 V / 415 V	3 / N / PE; 240 V / 415 V	3 / N / PE; 240 V / 415 V	
160 V - 280 V	160 V - 280 V	160 V - 280 V	
50 Hz, 60 Hz / -5 Hz ... +5 Hz	50 Hz, 60 Hz / -5 Hz ... +5 Hz	50 Hz, 60 Hz / -5 Hz ... +5 Hz	
50 Hz / 230 V	50 Hz / 230 V	50 Hz / 230 V	
10.2 A	11.6 A	13.1 A	
1	1	1	
0.8 overexcited ... 0.8 underexcited	0.8 overexcited ... 0.8 underexcited	0.8 overexcited ... 0.8 underexcited	
3 / 3	3 / 3	3 / 3	
98% / 97.5%	98% / 97.6%	98% / 97.6%	
●	●	●	
● / ●	● / ●	● / ●	
● / ● / -	● / ● / -	● / ● / -	
●	●	●	
I / III	I / III	I / III	
470 / 730 / 240 mm (18.5 / 28.7 / 9.5 inches)	470 / 730 / 240 mm (18.5 / 28.7 / 9.5 inches)	470 / 730 / 240 mm (18.5 / 28.7 / 9.5 inches)	
37 kg (81.6 lb)	37 kg (81.6 lb)	37 kg (81.6 lb)	
-25 °C...+60 °C (-13 °F...+140 °F)	-25 °C...+60 °C (-13 °F...+140 °F)	-25 °C...+60 °C (-13 °F...+140 °F)	
40 dB(A)	40 dB(A)	40 dB(A)	
1 W	1 W	1 W	
Transformerless / OptiCool	Transformerless / OptiCool	Transformerless / OptiCool	
IP65	IP65	IP65	
4K4H	4K4H	4K4H	
100%	100%	100%	
SUNCLIX / Spring clamp terminal	SUNCLIX / Spring clamp terminal	SUNCLIX / Spring clamp terminal	
Graphic	Graphic	Graphic	
○ / ● / ●	○ / ● / ●	○ / ● / ●	
● / ○	● / ○	● / ○	
● / ○ / ○ / ○ / ○	● / ○ / ○ / ○ / ○	● / ○ / ○ / ○ / ○	
AS 4777, C10/11, CE, CEI 0-21 (>6 kWp), EN 50438 <sup>1</sup> , G59/2, G83/1-1, IEC 61727, MEA <sup>2</sup> , NEN EN 50438, NRS 097-2-1, PEA <sup>2</sup> , PPC, PPDS, RD1699, RD 661/2007, SI 4777, UTE C15-712-1, VDE-AR-N 4105, VDE0126-1-1			
STP 7000TL-20	STP 8000TL-20	STP 9000TL-20	

# www.SunnyPortal.com

Professional management, monitoring and presentation of PV plants



www.SMA-Solar.com

SMA Solar Technology

# SUNNY TRIPOWER

## 10000TL / 12000TL / 15000TL / 17000TL



STP 10000T-10 / STP 12000TL-10 / STP 15000TL-10 / STP 17000TL-10



### Economical

- Maximum efficiency of 98.2%
- SMA OptiTrac Global Peak MPP tracking for best MPP tracking efficiency
- Bluetooth® communication

### Reliable

- Triple protection with Optiprotect: Electronic string fuse  
Self-learning string failure detection  
DC surge arrester (Type II) can be integrated

### Flexible

- DC input voltage up to 1,000 V
- Integrated grid management functions
- Custom plant design with Optiflex

### Simple

- Three-phase feed-in
- Cable connection without tools
- SUNCLIX DC plug-in system
- Easily accessible connection area

## SUNNY TRIPOWER

### 10000TL / 12000TL / 15000TL / 17000TL

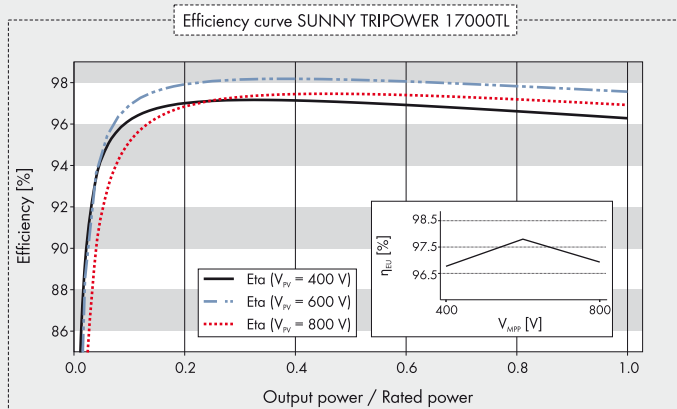
The three-phase inverter for easy plant design

Full of pioneering technology: highly flexible plant design with the three-phase Sunny Tripower inverter. Thanks to Optiflex technology, two MPP inputs and a broad input voltage range, it is suited to almost any module configuration. It meets any requirement such as reactive power supply, grid support thus reliably participating in grid management. The safety concept Optiprotect with its self-learning string-failure detection, electronic string fuse and integrable DC surge arrester type II, ensures maximum availability.

# SUNNY TRIPower

## 10000TL / 12000TL / 15000TL / 17000TL

Technical Data	Sunny Tripower 10000TL	Sunny Tripower 12000TL
<b>Input (DC)</b>		
Max. DC power (@ $\cos \phi=1$ )	10200 W	12250 W
Max. input voltage	1000 V	1000 V
MPP voltage range / rated input voltage	320 V - 800 V / 600 V	380 V - 800 V / 600 V
Min. input voltage / initial input voltage	150 V / 188 V	150 V / 188 V
Max. input current input A / input B	22 A / 11 A	22 A / 11 A
Max. input current per string input A <sup>2</sup> / input B <sup>2</sup>	33 A / 12.5 A	33 A / 12.5 A
Number of independent MPP inputs / strings per MPP input	2 / A:4; B:1	2 / A:4; B:1
<b>Output (AC)</b>		
Rated power (@ 230 V, 50 Hz)	10000 W	12000 W
Max. apparent AC power	10000 VA	12000 VA
Nominal AC voltage	3 / N / PE; 220 / 380 V 3 / N / PE; 230 / 400 V 3 / N / PE; 240 / 415 V	3 / N / PE; 220 / 380 V 3 / N / PE; 230 / 400 V 3 / N / PE; 240 / 415 V
Nominal AC voltage range	160 V - 280 V	160 V - 280 V
AC power frequency / range	50 Hz, 60 Hz / -6 Hz ... +5 Hz	50 Hz, 60 Hz / -6 Hz ... +5 Hz
Rated grid frequency / rated grid voltage	50 Hz / 230 V	50 Hz / 230 V
Max. output current	16 A	19.2 A
Power factor at rated power	1	1
Adjustable displacement factor	0.8 overexcited... 0.8 underexcited	0.8 overexcited... 0.8 underexcited
Phase conductors / connection phases	3 / 3	3 / 3
<b>Efficiency</b>		
Max. efficiency / European efficiency	98.1% / 97.7%	98.1% / 97.7%
<b>Protection</b>		
Input-side disconnection device	●	●
Ground-fault monitoring / grid monitoring	● / ●	● / ●
DC surge arrester Type II, can be integrated	○	○
DC reverse-polarity protection / AC short-circuit current capability / galvanically isolated	● / ● / -	● / ● / -
All-pole sensitive residual current monitoring unit	●	●
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)	I / III	I / III
<b>General Data</b>		
Dimensions (W / H / D)	665 / 690 / 265 mm (26.2 / 27.2 / 10.4 in)	665 / 690 / 265 mm (26.2 / 27.2 / 10.4 in)
Weight	59 kg (130.07 lb)	59 kg (130.07 lb)
Operating temperature range	-25 °C...+60 °C (-13 °F...+140 °F)	-25 °C...+60 °C (-13 °F...+140 °F)
Noise emission (typical)	51 dB(A)	51 dB(A)
Self-consumption at night	1 W	1 W
Topology / cooling concept	Transformerless / OptiCool	Transformerless / OptiCool
Degree of protection (according to IEC 60529)	IP65	IP65
Climatic category (according to IEC 60721-3-4)	4K4H	4K4H
Maximum permissible value for relative humidity (non-condensing)	100%	100%
<b>Features</b>		
DC terminal / AC terminal	SUNCLIX / Spring-type terminal	SUNCLIX / Spring-type terminal
Display	Graphic	Graphic
Interface: RS485, Bluetooth®, Speedwire/Webconnect	○ / ● / ○	○ / ● / ○
Multi-function relay / Power Control Module	○ / ○	○ / ○
Warranty: 5 / 10 / 15 / 20 / 25 years	● / ○ / ○ / ○ / ○ / ○	● / ○ / ○ / ○ / ○ / ○
Certificates and approvals (more available on request)	AS 4777, BDEW 2008, C10/11, CE, CEI 0-21, EN 50438 <sup>1</sup> , G59/2, IEC61727, IEC 62109-1/2, NEN EN 50438, PPC, PPDS, RD 1699, RD 661/2007, SI4777, UTE C15-712-1, VDE 0126-1-1, VDE-AR-N 4105	
Type designation	STP 10000TL-10	STP 12000TL-10



### Accessories



RS485 interface  
DM-485CB-10



DC surge arrester (Type II),  
input A  
DCSPD KIT1-10



DC surge arrester (Type II),  
inputs A and B  
DCSPD KIT2-10



Power Control Module  
PWCMOD-10



Multi-function relay  
MFR01-10



Speedwire/Webconnect  
interface SWDM-10

<sup>1</sup> Does not apply to all national deviations of EN 50438

<sup>2</sup> To be observed in case of a short circuit in the electronic string fuse

● Standard features ○ Optional features – Not available

Data at nominal conditions  
Provisional data, as of July 2013

Technical Data	Sunny Tripower 15000TL	Sunny Tripower 17000TL
<b>Input (DC)</b>		
Max. DC power (@ cos φ=1)	15340 W	17410 W
Max. input voltage	1000 V	1000 V
MPP voltage range / rated input voltage	360 V – 800 V / 600 V	400 V – 800 V / 600 V
Min. input voltage / initial input voltage	150 V / 188 V	150 V / 188 V
Max. input current input A / input B	33 A / 11 A	33 A / 11 A
Max. input current per string input A <sup>2</sup> / input B <sup>2</sup>	40 A / 12.5 A	40 A / 12.5 A
Number of independent MPP inputs / strings per MPP input	2 / A:5; B:1	2 / A:5; B:1
<b>Output (AC)</b>		
Rated power (@ 230 V, 50 Hz)	15000 W	17000 W
Max. apparent AC power	15000 VA	17000 VA
Nominal AC voltage	3 / N / PE; 220 / 380 V 3 / N / PE; 230 / 400 V 3 / N / PE; 240 / 415 V	3 / N / PE; 220 / 380 V 3 / N / PE; 230 / 400 V 3 / N / PE; 240 / 415 V
Nominal AC voltage range	160 V – 280 V	160 V – 280 V
AC power frequency / range	50 Hz, 60 Hz / –6 Hz ... +5 Hz	50 Hz, 60 Hz / –6 Hz ... +5 Hz
Rated grid frequency / rated grid voltage	50 Hz / 230 V	50 Hz / 230 V
Max. output current	24 A	24.6 A
Power factor at rated power	1	1
Adjustable displacement factor	0.8 overexcited... 0.8 underexcited	0.8 overexcited... 0.8 underexcited
Phase conductors / connection phases	3 / 3	3 / 3
<b>Efficiency</b>		
Max. efficiency / European efficiency	98.2% / 97.8%	98.2% / 97.8%
<b>Protection</b>		
Input-side disconnection device	●	●
Ground-fault monitoring / grid monitoring	● / ●	● / ●
DC surge arrester Type II, can be integrated	○	○
DC reverse-polarity protection / AC short-circuit current capability / galvanically isolated	● / ● / –	● / ● / –
All-pole sensitive residual current monitoring unit	●	●
Protection class (according to IEC 62103) / overvoltage category (according to IEC 60664-1)	I / III	I / III
<b>General Data</b>		
Dimensions (W / H / D)	665 / 690 / 265 mm (26.2 / 27.2 / 10.4 in)	665 / 690 / 265 mm (26.2 / 27.2 / 10.4 in)
Weight	59 kg (130.07 lb)	59 kg (130.07 lb)
Operating temperature range	–25 °C ... +60 °C (–13 °F ... +140 °F)	–25 °C ... +60 °C (–13 °F ... +140 °F)
Noise emission (typical)	51 dB(A)	51 dB(A)
Self-consumption at night	1 W	1 W
Topology / cooling concept	Transformerless / OptiCool	Transformerless / OptiCool
Degree of protection (according to IEC 60529)	IP65	IP65
Climatic category (according to IEC 60721-3-4)	4K4H	4K4H
Maximum permissible value for relative humidity (non-condensing)	100%	100%
<b>Features</b>		
DC terminal / AC terminal	SUNCLIX / Spring-type terminal	SUNCLIX / Spring-type terminal
Display	Graphic	Graphic
Interface: RS485, Bluetooth®, Speedwire/Webconnect	○ / ● / ○	○ / ● / ○
Multi-function relay / Power Control Module	○ / ○	○ / ○
Warranty: 5 / 10 / 15 / 20 / 25 years	● / ○ / ○ / ○ / ○ / ○	● / ○ / ○ / ○ / ○ / ○
Certificates and approvals (more available on request)	AS 4777, BDEW 2008, C10/11, CE, CEI 0-21, EN 50438 <sup>1</sup> , G59/2, IEC61727, IEC 62109-1/2, NEN EN 50438, PPC, PPDS, RD 1699, RD 661/2007, SI4777, UTE C15-712-1, VDE 0126-1-1, VDE-AR-N 4105	AS 4777, BDEW 2008, C10/11, CE, CEI 0-21, EN 50438 <sup>1</sup> , G59/2, IEC61727, IEC 62109-1/2, NEN EN 50438, PPC, PPDS, RD 1699, RD 661/2007, SI4777, UTE C15-712-1, VDE 0126-1-1, VDE-AR-N 4105
Type designation	STP 15000TL-10	STP 17000TL-10

# www.SunnyPortal.com

Professional management, monitoring and presentation of PV plants



**SUNNY PORTAL** | English

- Comfortable plant management for beginners and professionals
- Display of yield, power and status messages via mobile phone
- Free data storage

**PORTAL OVERVIEW**

	Yesterday	Total
PLANT:	54,833	
TOTAL ENERGY (TWh)	7.51	
AVOIDED CO <sub>2</sub> (Mt)	5.26	lb.

**Your Solar Plant**  
Herzlake, Germany

September 22, 2010

Power [kW]

Total Yield: 55784 kWh

www.SMA-Solar.com

SMA Solar Technology



#### Efficient

- Maximum efficiency of 98.4%

#### Safe

- DC surge arrester (SPD type II) can be integrated

#### Flexible

- DC input voltage of up to 1000 V
- Multistring capability for optimum system design
- Optional display

#### Innovative

- Cutting-edge grid management functions with Integrated Plant Control
- Reactive power available 24/7 (Q on Demand 24/7)

## SUNNY TRIPOWER 20000TL / 25000TL

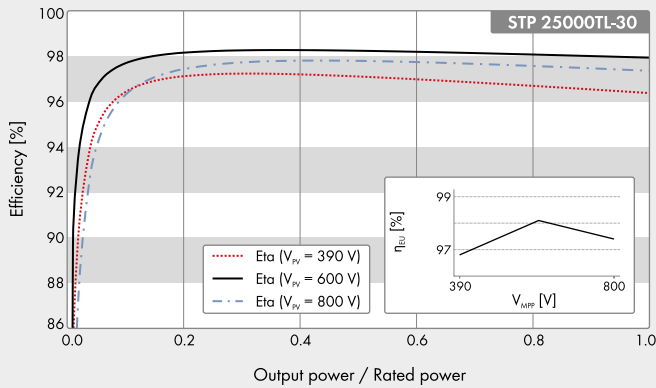
The versatile specialist for large-scale commercial plants and solar power plants

The Sunny Tripower 20000TL/25000TL is the ideal inverter for large-scale commercial and industrial plants. Not only does it deliver extraordinary high yields with an efficiency of 98.4%, but it also offers enormous design flexibility and compatibility with many PV modules thanks to its multistring capabilities and wide input voltage range.

The future is now: the Sunny Tripower 20000TL/25000TL comes with cutting-edge grid management functions such as Integrated Plant Control, which allows the inverter to regulate reactive power at the point of common coupling. Separate controllers are no longer needed, lowering system costs. Another new feature—reactive power provision on demand (Q on Demand 24/7).



## Efficiency curve



## Accessories



RS485 interface  
DM-485CB-10



Power Control Module  
PWCMOD-10



DC surge arrester (Type II), inputs A and B DCSPD  
KIT3-10



Multifunction relay  
MFR01-10

● Standard features ○ Optional features – Not available  
Data at nominal conditions  
State: January 2016

## Technical Data

### Input (DC)

Max. DC power (at $\cos \varphi = 1$ ) / DC rated power
Max. input voltage
MPP voltage range / rated input voltage
Min. input voltage / start input voltage
Max. input current input A / input B
Number of independent MPP inputs / strings per MPP input

### Output (AC)

Rated power (at 230 V, 50 Hz)
Max. AC apparent power
AC nominal voltage
AC voltage range
AC grid frequency / range
Rated power frequency / rated grid voltage
Max. output current / Rated output current
Power factor at rated power / Adjustable displacement power factor
THD
Feed-in phases / connection phases

### Efficiency

Max. efficiency / European Efficiency
---------------------------------------

### Protective devices

DC-side disconnection device
Ground fault monitoring / grid monitoring
DC surge arrester (Type II) can be integrated
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated
All-pole sensitive residual-current monitoring unit
Protection class (according to IEC 62109-1) / overvoltage category (according to IEC 62109-1)

### General data

Dimensions (W / H / D)
Weight
Operating temperature range
Noise emission (typical)
Self-consumption (at night)
Topology / cooling concept
Degree of protection (as per IEC 60529)
Climatic category (according to IEC 60721-3-4)
Maximum permissible value for relative humidity (non-condensing)

### Features / function / Accessories

DC connection / AC connection
Display
Interface: RS485, Speedwire/Webconnect
Data interface: SMA Modbus / SunSpec Modbus
Multifunction relay / Power Control Module
OptiTrack Global Peak / Integrated Plant Control / Q on Demand 24/7
Off-Grid capable / SMA Fuel Save Controller compatible
Guarantee: 5 / 10 / 15 / 20 / 25 years
Certificates and permits (more available on request)

\* Does not apply to all national appendices of EN 50438

### Sunny Tripower 20000TL

20440 W / 20440 W
1000 V
320 V to 800 V / 600 V
150 V / 188 V
33 A / 33 A
2 / A:3; B:3

### Sunny Tripower 25000TL

25550 W / 25550 W
1000 V
390 V to 800 V / 600 V
150 V / 188 V
33 A / 33 A
2 / A:3; B:3

### 20000 W

20000 VA

3 / N / PE; 220 V / 380 V  
3 / N / PE; 230 V / 400 V  
3 / N / PE; 240 V / 415 V

180 V to 280 V

50 Hz / 44 Hz to 55 Hz  
60 Hz / 54 Hz to 65 Hz

50 Hz / 230 V

29 A / 29 A

36.2 A / 36.2 A

1 / 0 overexcited to 0 underexcited

≤ 3 %

3 / 3

98.4% / 98.0%

98.3% / 98.1%

●  
● / ●  
○  
● / ● / -  
●  
I / AC: III; DC: II

661 / 682 / 264 mm (26.0 / 26.9 / 10.4 inch)

61 kg (134.48 lb)

-25 °C to +60 °C (-13 °F to +140 °F)

51 dB(A)

1 W

Transformerless / Opticool

IP65

4K4H

100%

SUNCLIX / spring-cage terminal

○

○ / ●

● / ●

○ / ○

● / ● / ●

● / ●

● / ○ / ○ / ○ / ○

ANRE 30, AS 4777, BDEW 2008, C10/11:2012, CE, CEI 0-16, CEI 0-21, EN 50438\*, G59/3, IEC 60068-2-x, IEC 61727, IEC 62109-1/2, IEC 62116, MEA 2013, NBR 16149, NEN EN 50438, NRS 097-2-1, PEA 2013, PPC, RD 1699/413, RD 661/2007, Res. n°7:2013, SI4777, UTE C15-712-1, VDE 0126-1-1, VDE-AR-N 4105, VFR 2014

Type designation

STP 20000TL-30

STP 25000TL-30



# SUNNY TRIPOWER 60

STP 60-10



## Efficient

- Maximum efficiency of 98.8%
- Superior power density: 60 kVA with only 75 kg of weight

## Safe

- Highest PV system availability with 60-kW units
- SMA Inverter Manager as central control unit

## Flexible

- DC input voltage of up to 1,000 V
- Flexible DC solutions with PV array junction boxes

## Innovative

- Cutting-edge system design

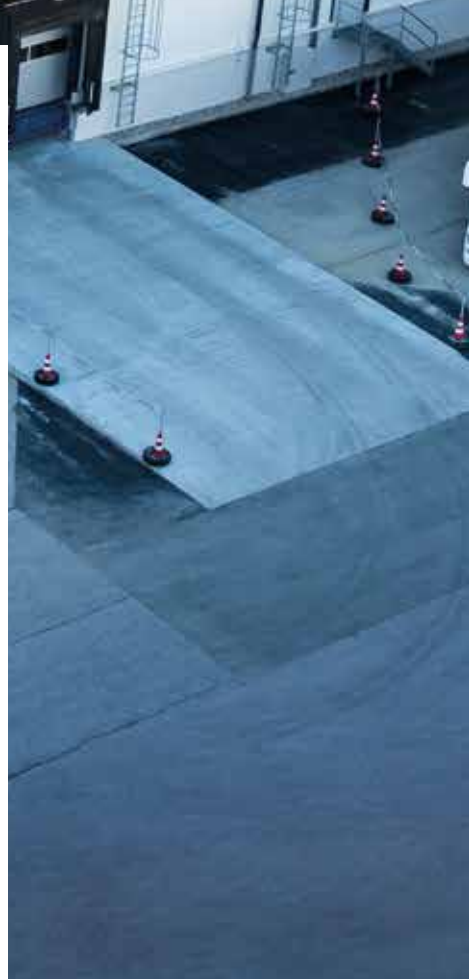
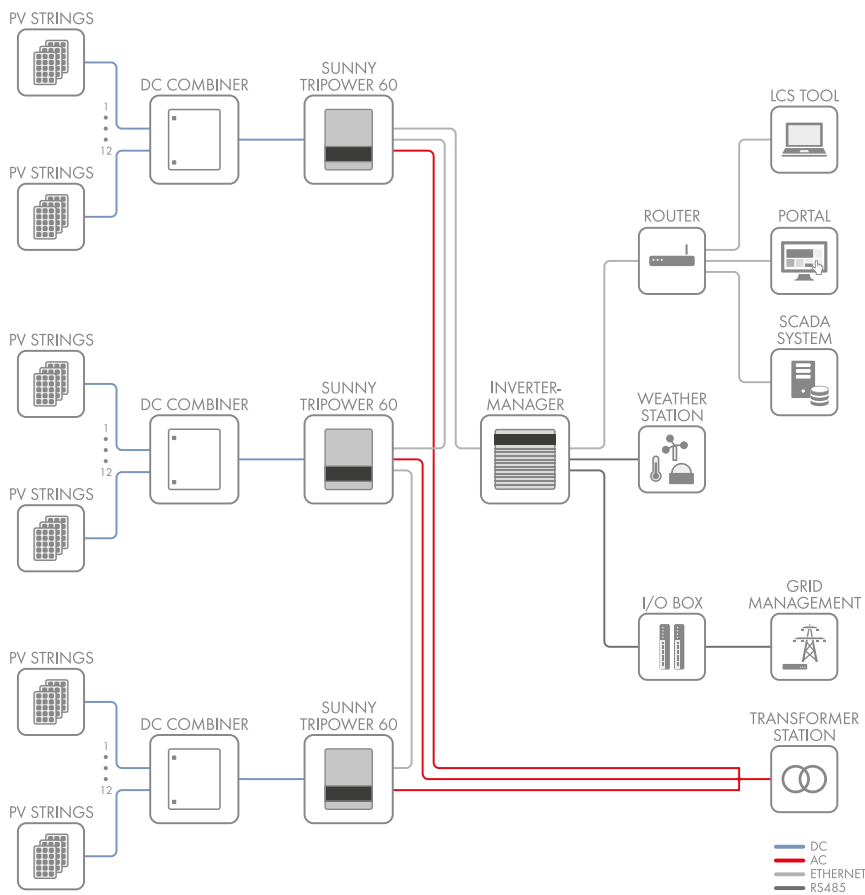
## SUNNY TRIPOWER 60

### The Best of Two Worlds

The new Sunny Tripower 60 is part of an innovative, global system solution for commercial and industrial PV plants. This solution combines the advantages of a decentralized system layout with the benefits of centralized inverter designs in order to get the best of two worlds. High efficiency, flexible system design, easy installation, simple commissioning and low maintenance requirements contribute decisively to reducing the operating costs for the entire system.



## THE SMART SUNNY TRIPOWER SYSTEM PHILOSOPHY





# FLEXIBLE SYSTEM DESIGN

## With Maximum Efficiency

The new SMA system solution consists of four components: highly efficient inverters, the flexible combiner boxes, the central SMA inverter manager and the LCS commissioning tool. It is precisely this systemized approach that makes the Sunny Tripower 60 so unique and guarantees a high level of performance along with maximum flexibility in system planning and design.

### **Sunny Tripower 60 inverters with impressive design**

No other inverter weighing only 75 kg with an output of 60 kVA offers this. With its compact design, the Sunny Tripower 60 requires little space, reduces on-site preparation work, simplifies installation and lowers maintenance costs.

### **Innovative system management with the SMA Inverter Manager**

The SMA inverter manager is the central communications component and sole interface for the entire system control. It handles all the important inverter and system management functions for up to 42 inverters in

one system (up to 2.5 MW).

Based on the Modbus TCP and SunSpec Alliance Communication, it can be easily integrated into a superior communication system while also ensuring data exchange with external providers. Moreover, the SMA inverter manager handles grid management function exchanges with the grid operator.

### **Easy commissioning with the LCS commissioning tool**

The specially developed LCS tool (Local Commissioning and Service Tool) makes commissioning easy, saves time and reduces costs. The inverter is configured by simply selecting the system-specific configuration files and then transmitting them to all inverters. Furthermore, by reading the status, current values and incidents at the inverter level can make troubleshooting and bug-fixing considerably easier.

### **External Combiner Box for flexible system design**

The module strings are connected to the inverters using the external PV array junction boxes.\* This allows the system to flexibly adapt to various regional standards and the generator configuration. This new design decisively contributes to reducing system costs.

#### SYSTEM INFORMATION

##### **Perfect interaction between Sunny Tripower system components**

The SMA inverter manager functions as a central interface for up to 42 inverters in the system and handles necessary local adjustments.

External combiner boxes ensure an optimal connection between the PV array and inverter.

Summary: The Sunny Tripower 60 together with the system components is the innovative solution for medium to large-scale power ranges and offers users the best of two worlds.

\*Different configurations can be delivered upon request



## Technical Data, as of February 2015

### Input (DC)

Max. input voltage
MPP voltage range
Min. input voltage
Max. input current / short-circuit current
Number of independent MPP inputs / strings per MPP input
DC rated power input

### Output (AC)

Rated power at nominal voltage
Max. AC apparent power
Max. reactive power
Nominal AC voltage
Nominal AC voltage range
AC power frequency / range
Rated power frequency / rated grid voltage
Max. output current
Power factor at rated power/displacement power factor adjustable
Feed-in phases / connection phases

### Efficiency

Max. Efficiency / Euro-eta / CEC @ 400 Vac / CEC @ 480 Vac
--

### Protective devices

DC-side disconnection device
Ground fault monitoring / grid monitoring
Type I DC surge arrester / type I AC surge arrester
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated
All-pole sensitive residual-current monitoring unit
Protection class (as per IEC 61140) / overvoltage category (as per IEC 60664-1)

### General Data

Dimensions (W / H / D) / weight
Operating temperature range
Noise emission, typical
Self-consumption (at night)
Topology / cooling concept / degree of protection (IEC 60529/ UL50E) / climatic category (IEC 60721-3-4)
Max. permissible value for relative humidity (non-condensing)

### Features

DC connection / AC connection
-------------------------------

### Display

### Interface

● Standard features ○ Optional features – Not available, Data at nominal conditions

## Sunny Tripower 60

1000 V
570 V - 800 V @400 Vac, 685 V - 800 V @480 Vac
565 V @400 Vac, 680 V @480 Vac
110 A / 150 A
1/1 (split up by external PV array junction box)
630 Vdc @ 400 Vac, 710 Vdc @ 480 Vac

60000 W
60000 VA
60000 Var
3 / PE, 400 V - 480 V, ±10 %
400 V - 480 V
50 Hz / 60 Hz ±10 %
50 Hz, 60 Hz / 400 V, 480 V
3 x 87 A
1 / 0.8 overexcited to 0.8 underexcited
3 / 3

98.8 % / 98.3 % / 98.0 % / 98.5 %
-----------------------------------

●
● / ●
Type II / type II + III (combined)
● / ● / -
●
I / AC: III; DC: II

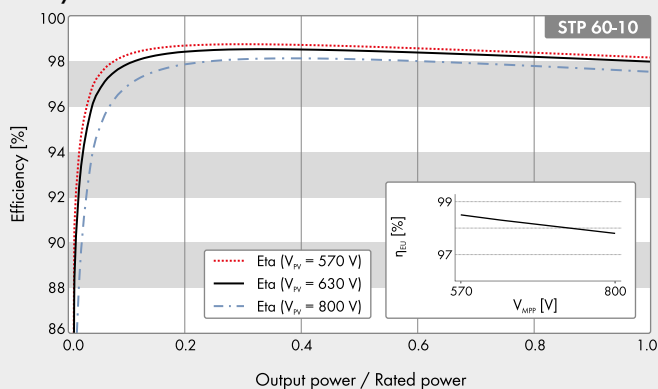
570 / 740 / 300 mm (22.4 / 29.1 / 11.8 inch) / 75 kg (165.3 lbs)
-25 °C to +60 °C (-13 °F ... +140 °F)
58 dB(A)
3W
Transformerless / active / IP65 / 3R, 4K4H
95 %

Screw terminal / screw terminal
---------------------------------

### Graphic

using external SMA Inverter Manager: SunSpec Modbus TCP

### Efficiency Curve



### Ordering Codes

**STP 60:**  
 STP60-10: EU version with integrated DC disconnect  
 STP60-10-US: US version with integrated DC disconnect

### SMA inverter manager:

IM-10: SMA inverter manager for up to 42 inverters

### SMA Digital I/O Box:

IM-DIO-10: SMA Digital I/O Box with 6 digital inputs

### Certificates and approvals

**STP 60:** IEC 62109-1/IEC 62109-2 (Class I, grounded-communication Class II, PELV), UL1741-w. Non-Isolated EPS Interactive PV Inverters, IEEE 1547

**SMA Inverter Manager:** UL 508, UL 60950-1, CSA C22.2 No. 60950-1-07, EN 60950-1, EN 55022 Class A, EN 61000-3-2 Class D, EN 61000-3-3, EN 55024, FCC Part 15, Subpart B Class A

### SMA Inverter Manager

### Voltage Supply

Input voltage
Power consumption

### General Data

Dimensions (W / H / D) / weight
Degree of protection / assembly
Operating temperature range / relative humidity

### Interfaces

User interface
Sensor interface
Active/reactive power setpoint)
Interface to inverter
Interface to external network
Interface to remote control

9 - 36 Vdc
< 20 W
160 / 125 / 49 mm (6.3 / 4.9 / 1.9 inch) / 940 g (2 lbs)
IP21 / DIN top-hat rails or wall mounting
-40 °C to +85 °C / 5 % ... 95 % (non-condensing)
LCS tool for PC
RS485 for SunSpec Alliance compatible weather stations
Constant value, curve, remotely controlled
1 Ethernet port (RJ45)
1 Ethernet port (RJ45) Modbus TCP, SunSpec Alliance
6 x DI, Modbus TCP via external I/O module



Now also available for applications > 63 A thanks to external current transformers.

### Easy to Use

- Quick plug and play installation
- Graphic visualization of current measured values in Sunny Portal

### Flexible

- Space-saving DIN rail mounting in household distribution thanks to compact enclosure
- Flexible use in applications >63 A thanks to external current transformers

- Suitable for universal use regardless of existing energy meter

### High Performance

- Fast three-phase, bidirectional reading of measured values for effective energy management
- Fast Speedwire communication

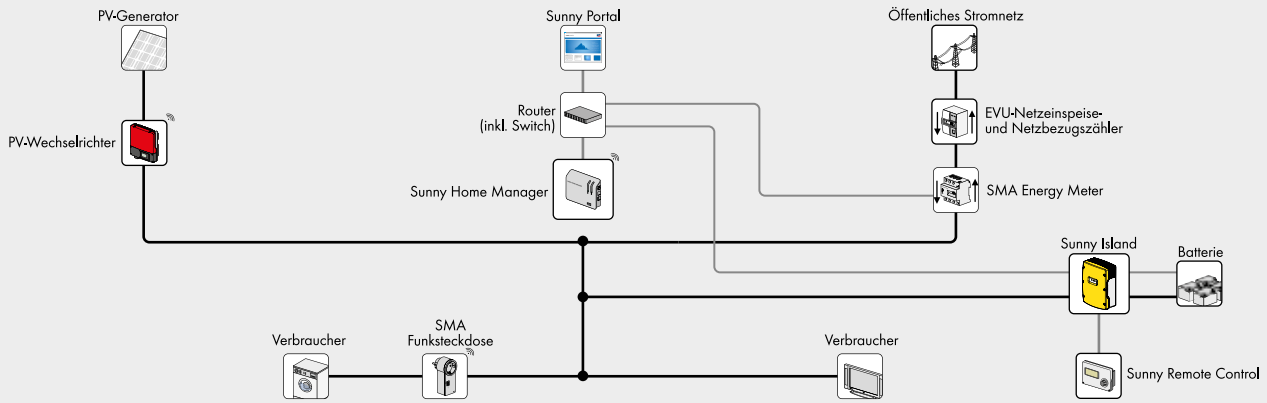
## SMA ENERGY METER

Universal recording of measured values for intelligent energy management

The powerful measurement solution for intelligent energy management within the SMA Smart Home: The SMA Energy Meter takes phase-accurate and balanced electrical measured values, such as a grid feed-in and purchased electricity meter, and communicates these values via Speedwire. Thanks to its ability to quickly acquire bidirectional measured values, the SMA Energy Meter is the ideal supplier of data for intelligent energy management within the SMA Smart Home. All PV generation data, purchased electricity and grid feed-in can be transmitted via standard Ethernet cable to the Sunny Home Manager, for example, or, in the future, to the Sunny Boy Smart Energy. This, in turn, facilitates optimal energy monitoring, effective load and battery management and reliable active power limitation at the grid feed-in point while taking self-consumption into account.

\* Can also be used in single-phase systems.

## Storage application example



### Technical data

#### Communication

Fieldbus

#### Max. radio range

Speedwire / fast Ethernet

#### Inputs (voltage and current)

Nominal voltage

Frequency

Nominal current / limiting current per line conductor

Start-up current

Connection cross-section

Torque for screw terminals

#### Ambient conditions in operation

Ambient temperature

Storage temperature range

Protection class (according to IEC 62103)

Degree of protection (according to IEC 60529)

Max. permissible value for relative humidity (non-condensing)

#### General data

Dimensions (W / H / D)

Individual units

Weight

Mounting location

Mounting type

Status display

Self-consumption

Measurement accuracy

Sampling frequency

Languages of the manual

#### Features

Warranty

Certificates and permits (more available on request)

### SMA Energy Meter

Speedwire, 10/100 Mbit/s

100 m (between two devices)

230 V / 400 V

50 Hz, 60 Hz / ±5%

5 A / 63 A (>63 A can be connected via external current transformers)

<25 mA

1.0 mm<sup>2</sup> to 25 mm<sup>2</sup>

2.0 Nm

-25 °C to +40 °C (-13 °F ... +104 °F)

-25 °C ... +70 °C (-13 °F ... +158 °F)

II

IP2X

5% - 95%

88 / 70 / 65 mm

(3.46 / 2.76 / 2.56 inch)

4

0.3 kg (0.66 lb)

Switch or meter cabinet

Top-hat rail mounting

2 LEDs

<2 W

1%

<1 Hz

German, English, Italian, French, Spanish, Dutch, Portuguese, Greek

2 years

[www.SMA-Solar.com](http://www.SMA-Solar.com)

Last updated: February 2014

● Standard features ○ Optional features – Not available / Data at nominal conditions

Type designation

EMETER-10

# SUNNY HOME MANAGER

HM-BT-10, HM-BT-10-SET



## Innovative

- Active power limitation at the grid-connection point
- Load analysis for each individual load
- Enhanced battery charging for storage systems with Sunny Boy Smart Energy or Sunny Island inverters

## Easy to Use

- Visualization for up to 23 household loads
- Active energy management for up to 12 loads via radio-controlled socket or direct connection
- Easy commissioning with the PV System Setup Assistant

## Transparent

- Basic system monitoring via Sunny Portal
- Overview for all household energy flows
- Visualization of weather and PV forecast data

## Flexible

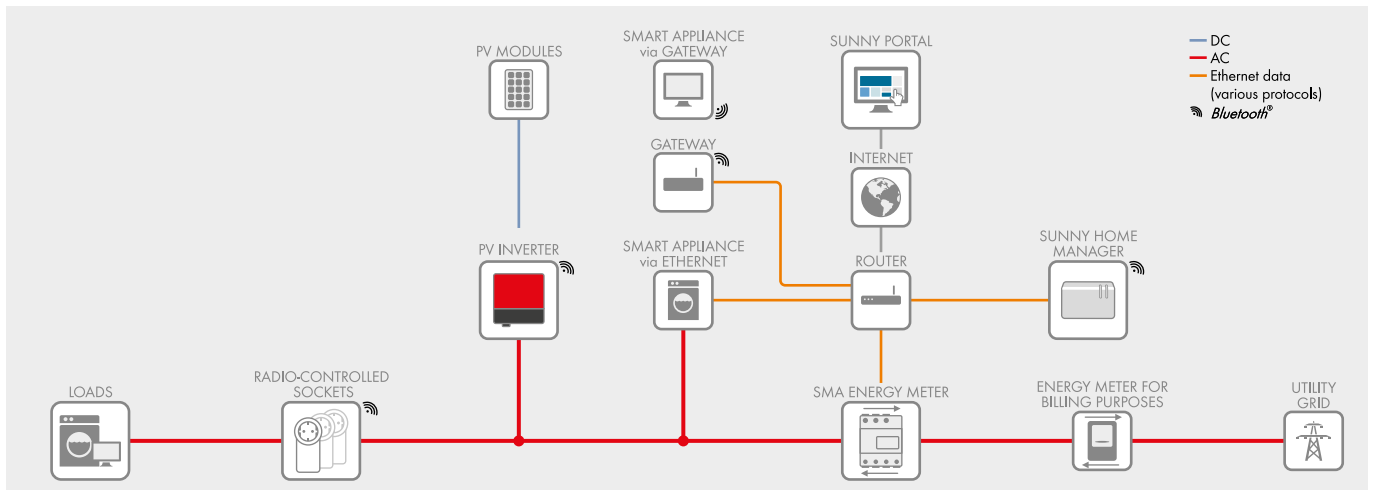
- Perfect utilization of the PV energy by load-dependent control (heat pumps and electric vehicle charging stations)
- Automated integration of directly controllable loads via Ethernet communication

## SUNNY HOME MANAGER

The control center for smart energy management\*

The Sunny Home Manager is the ideal solution for smart energy management within the SMA Smart Home thanks to its standard access to Sunny Portal. It provides an overview of all important energy flows in the household, automatic load control and storage system integration. By using local PV generation forecasts and recording the load profiles of household appliances, PV energy can be used more efficiently, thereby significantly increasing self-consumption. Additionally, active power for PV feed-in can be limited to 70 percent (or 60 percent for battery systems), which is required in Germany. In short: Energy management with the Sunny Home Manager allows for higher self-consumption and efficient use of the locally generated PV power.

\* Radio-controlled sockets are not available in all countries.



Technical Data	Sunny Home Manager
<b>Communication</b>	
Load communication	Direct via Ethernet / Plugwise radio-controlled socket via Ethernet-ZigBee / SMA radio-controlled socket via Bluetooth®
Inverter communication	Bluetooth® / Speedwire
Sunny Portal communication	Ethernet
<b>Connections</b>	
Inverter	See inverter communication
Ethernet	10 / 100 Mbit, RJ45
Energy meter	SMA Energy Meter via Ethernet / three 2 x 4-pole plugs for connection of SO cable or DO optical probes
<b>Max. number of connected devices (in addition to the SMA Energy Meter)</b>	
Total number of devices in the system	up to 24
Number of devices as loads under active energy management	up to 12
<b>Max. radio range</b>	
Bluetooth in free-field conditions	Up to 100 m (can be extended with an SMA radio-controlled socket)
Speedwire	100 m
<b>Voltage supply</b>	
Voltage supply	External plug-in power supply
Input voltage	100 V to 240 V AC, 50 / 60 Hz
Power consumption	< 6 W (max. 14.3 W)
<b>Ambient conditions in operation</b>	
Ambient temperature	-25 °C to +60 °C (-13 °F to +140 °F)
Degree of protection (according to EN IEC 60529)	IP20
Max. permissible value for relative humidity (non-condensing)	5% to 95%
<b>General data</b>	
Dimensions (W/H/D)	170 / 124.5 / 41.5 mm (6.7 / 4.9 / 1.6 inch)
Weight	0.22 kg (0.5 lb)
Mounting location	Indoors
Deployment options	Top-hat rail mounting, wall mounting
Status display	2 LEDs
Language of the manual	German, English, Italian, Spanish, French, Dutch, Portuguese
<b>Features</b>	
Operation	Via Sunny Portal
Update function	Manually or automatically for the Sunny Home Manager and the connected SMA devices
Warranty	5 years
Certificates and approvals	www.SMA-Solar.com
<b>Accessory</b>	
SMA Energy Meter	Precise three-phase measurement of purchased electricity and grid feed-in, necessary for Sunny Boy Smart Energy and Sunny Island. Connection via Ethernet in the local network.
Radio-controlled sockets for load control and power measurement	Plugwise radio-controlled socket sets with Stretch (firmware version 2.7.7, and higher), communication via Ethernet/ZigBee, input voltage 100 V to 240 V (50/60 Hz), switching power: 16 A (max. 3,680 W resistive), country-specific version of type F, E, G, I, Plugwise components are available via local Plugwise sales channels  SMA Bluetooth radio-controlled socket including SMA Bluetooth repeater function, Input voltage 100 V to 240 V (50/60 Hz), Switching power: 16 A (max. 3680 W resistive), country-specific versions of type F, E
State: January 2016	
Type designation	HM-BT-10, HM-BT-10-SET



# SMA CLUSTER CONTROLLER

CLCON-10/CLCON-S-10



## Easy to Use

- Central monitoring and control of string inverters
- Standardized Modbus interface for use with superior communication devices

## Versatile

- Complies with national and international requirements for grid integration
- Analog and digital interfaces for active and reactive power setpoints

## Professional

- Optimized for industrial applications with robust enclosure and high-quality components
- Sensor technology integration

## Safe

- Immediate email notification in the event of a failure
- Remote monitoring and maintenance via the integrated user interface and Sunny Portal

## SMA CLUSTER CONTROLLER

Professional monitoring and control for decentralized PV systems

Combined with highly efficient SMA inverters, the SMA Cluster Controller is the central communication unit for system monitoring, recording data and controlling large-scale PV plants.

Through a variety of analog and digital in and outputs as well as fast data exchange via an Ethernet-based data interface (e.g., Modbus TCP), a wide range of applications can be realized, from feed-in management to sensor technology integration.

Alongside the standard solution for large-scale commercial PV plants equipped with up to 75 devices, SMA now also offers a version for small-scale commercial PV systems with up to 25 devices.

The SMA Cluster Controller is the professional system interface for power supply companies, direct marketers, service technicians and PV system operators.

Technical Data	SMA Cluster Controller
<b>Communications</b>	
Inverter	Speedwire, 10/100 Mbit/s
Data network (LAN)	Fast Ethernet, 10/100 Mbit/s
Data interfaces	HTTP, FTP, Modbus TCP/UDP, SMTP, Sunny Portal
<b>Connections</b>	
Inverters/data network (LAN)	2 ports/10BASE-T or 100BASE-TX, RJ45, switched
Data storage	2 USB 2.0 high-speed ports, type A
Voltage supply/analog and digital signals	Connector/push-in spring-cage terminal
<b>Max. number of SMA devices</b>	
Speedwire	75/25*
<b>Maximum radio ranges</b>	
Speedwire/LAN	100 m (between two devices)
<b>Voltage supply</b>	
Voltage supply	External power supply unit (available as an accessory)
Input voltage	18 V DC to 30 V DC
Power consumption	Typ. 12 W/max. 30 W
<b>Ambient conditions in operation</b>	
Ambient temperature	-25 °C to +60 °C (-13 °F to +140 °F)
Relative humidity	4% to 95%, non-condensing
Elevation above MSL	0 m to 3,000 m
<b>Display</b>	
Type	LC display, monochromatic, back-lit
Display languages	German, English
<b>Battery</b>	
Internal	1.7 GB as ring buffer
External	USB mass storage (optional, available as an accessory)
<b>USB interfaces</b>	
Quantity/specification/ports	2/USB 2.0 high-speed/type A
<b>Digital inputs</b>	
Quantity	8
Use	Setpoints for active and reactive power
<b>Analog inputs</b>	
Quantity	3 x current signal, 1 x voltage signal
Measurement range	0 mA to 20 mA or 0 V to +10 V
Use	Irradiation measurement, setpoints for active/reactive power or current/voltage measurement
<b>Temperature measurement</b>	
Quantity/sensor type	2 / PT100 / PT1000 (two or four-cable connection)
Measurement range	-40 °C to +85 °C (-40 °F to +185 °F)
Use	Measurement of ambient and cell temperature
<b>Digital outputs</b>	
Quantity/design	3/potential-free relay contacts
Max. load tolerance	48 V DC/30 W
Use	Error message, warning and active power limitation
<b>Analog outputs</b>	
Number/signal current	2/4 mA to 20 mA
Use	Feedback of the active and reactive power setpoints
<b>General data</b>	
Dimensions (W/H/D)	275/133/71 mm (10.8/5.2/2.8 inch)
Weight	0.9 kg (2.0 lb)
Installation site/degree of protection provided by enclosure	Indoors/IP20
Mounting type	Top-hat rail mounting
Status display	LC display, LEDs
Software languages, languages of the manual	German, English, Italian, Spanish, French, Dutch, Portuguese, Greek, Czech
<b>Features</b>	
Operation	Integrated web server, display, keypad
Time	Real-time clock (RTC) with maintenance-free buffering
Advanced functions using the Sunny Portal	PV system and yield monitoring, measured value processing, performance analysis, presentation, status reports, mobile data access
Warranty	5 years
Certificates and approvals	www.SMA-Solar.com
<b>Accessories (optional)</b>	
Top-hat rail power supply unit	Input: 100 V to 240 V AC / 45 to 65 Hz, Output: 24 V DC/2.5 A
USB flash drive	4 GB or 8 GB, highly reliable industrial quality
Type designation	CLCON-10/*CLCON-S-10

# SUNNY ISLAND 6.0H / 8.0H FOR OFF-GRID AND ON-GRID APPLICATIONS



SI6.0H-11 / SI8.0H-11



## Flexible

- For self-consumption and battery backup systems in on-grid and off-grid applications
- All lead-acid and many lithium-ion batteries can be used

- Ideal for retrofits or modular expansions of single-phase and three-phase systems

## Efficient

- Maximum efficiency of up to 96 %
- High efficiency of overall system
- Easy and fast installation and commissioning

## Reliable

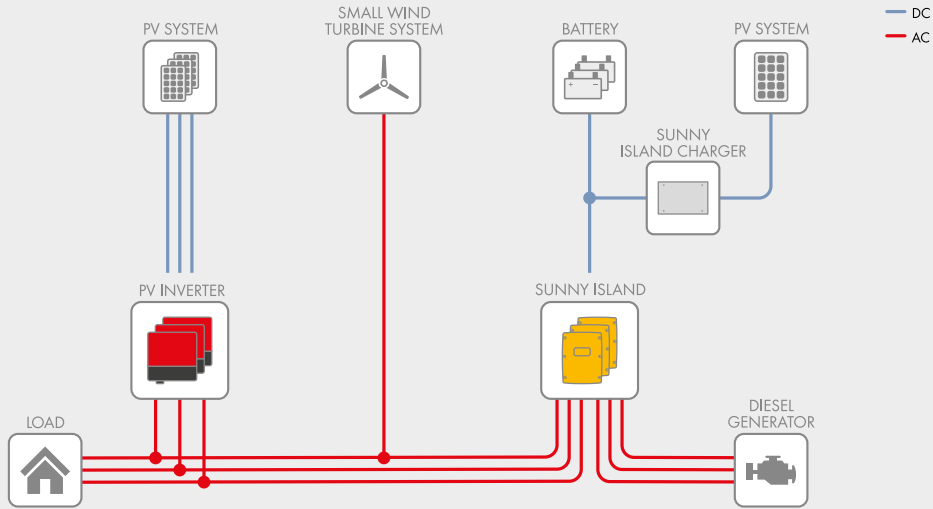
- Proven safety thanks to external certification
- Long battery service life thanks to intelligent battery management
- Reliable operation thanks to extreme overload capacity

## SUNNY ISLAND 6.0H / 8.0H

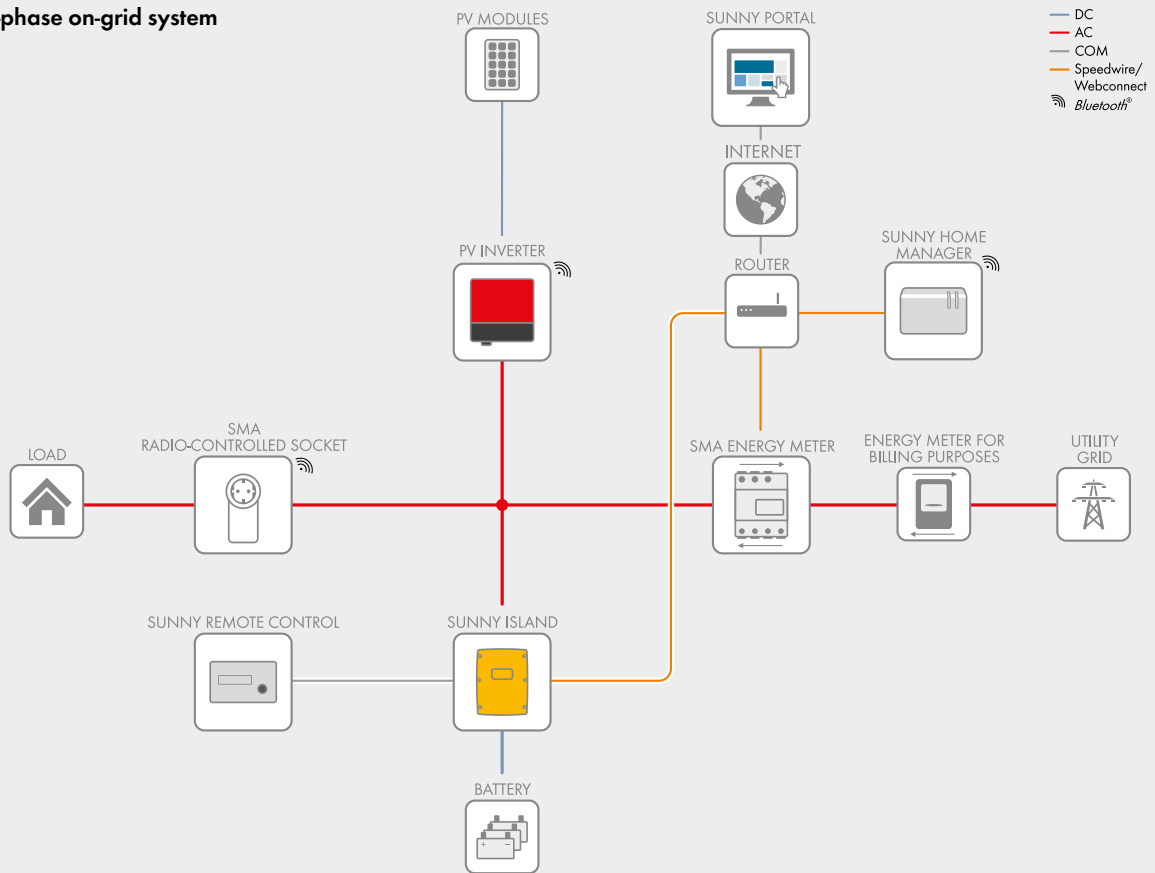
The all-rounder for on-grid and off-grid

The Sunny Island 6.0H / 8.0H supports a wide range of on-grid and off-grid applications with compelling product features – from operation in remote off-grid areas to home energy management. Users can benefit from more than 25 years of SMA experience in the field of battery inverters. The high protection class, wide temperature range and exceptional overload capacity provide the kind of security needed for off-grid use. Intelligent load and energy management keeps the system running, even in critical situations. And being a core element in the SMA Flexible Storage System for new and existing PV systems, the Sunny Island 6.0H / 8.0H stores generated solar energy and works with the Sunny Home Manager to intelligently manage home energy consumption. The Quick Configuration Guide and intuitive user interface help ensure an easy, convenient installation in any application scenario. That makes the Sunny Island 6.0H / 8.0H the ultimate all-purpose product solution – for on-grid and off-grid.

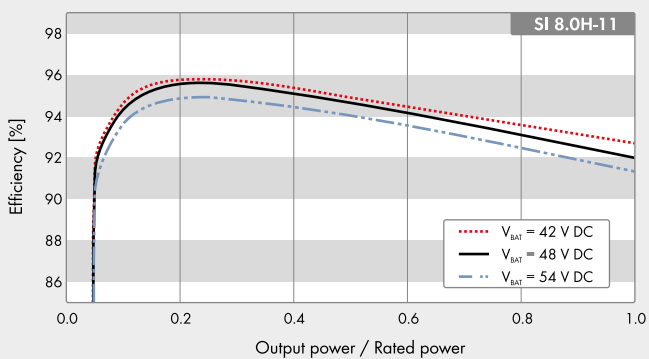
### Three-phase off-grid system



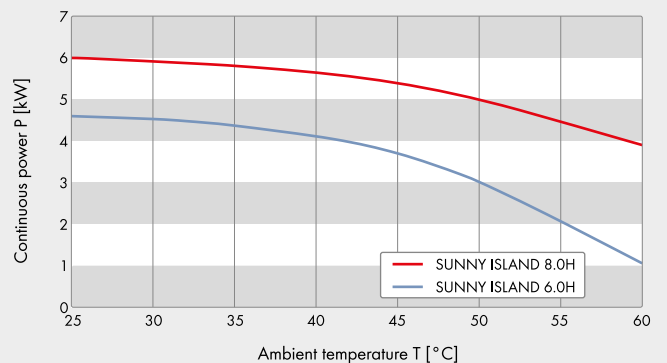
### Single-phase on-grid system



### Efficiency curve



### Power-temperature curve



# SUNNY ISLAND 6.0H / 8.0H

Technical Data	Sunny Island 6.0H	Sunny Island 8.0H
<b>Operation on the utility grid or generator</b>		
Rated grid voltage / AC voltage range	230 V / 172.5 V to 264.5 V	230 V / 172.5 V to 264.5 V
Rated grid frequency / permitted frequency range	50 Hz / 40 Hz to 70 Hz	50 Hz / 40 Hz to 70 Hz
Maximum AC current for increased self-consumption (grid operation)	20 A	26 A
Maximum AC power for increased self-consumption (grid operation)	4,6 kVA	6 kVA
Maximum AC input current	50 A	50 A
Maximum AC input power	11500 W	11500 W
<b>Stand-alone or emergency power operation</b>		
Rated grid voltage / AC voltage range	230 V / 202 V to 253 V	230 V / 202 V to 253 V
Rated frequency / frequency range (adjustable)	50 Hz / 45 Hz to 65 Hz	50 Hz / 45 Hz to 65 Hz
Rated power (at Unom, from / 25°C / cos φ = 1)	4600 W	6000 W
AC power at 25°C for 30 min / 5 min / 3 sec	6000 W / 6800 W / 11000 W	8000 W / 9100 W / 11000 W
AC power at 45°C permanently	3700 W	5430 W
Rated current / maximum output current (peak)	20 A / 120 A	26 A / 120 A
Total harmonic distortion output voltage / power factor at rated power	< 4 % / -1 to +1	< 4 % / -1 to +1
<b>Battery DC input</b>		
Rated input voltage / DC voltage range	48 V / 41 V to 63 V	48 V / 41 V to 63 V
Maximum battery charging current / rated DC charging current / DC discharging current	110 A / 90 A / 103 A	140 A / 115 A / 130 A
Battery type / battery capacity (range)	Li-Ion*, FLA, VRLA / 100 Ah to 10000 Ah (lead-acid) 50 Ah to 10000 Ah (Li-Ion)	Li-Ion*, FLA, VRLA / 100 Ah to 10000 Ah (lead-acid) 50 Ah to 10000 Ah (Li-Ion)
Charge control	IUoU charge procedure with automatic full charge and equalization charge	
<b>Efficiency / self-consumption of the device</b>		
Maximum efficiency	95,8 %	95,8 %
No-load consumption / standby	25,8 W / 6,5 W	25,8 W / 6,5 W
<b>Protective devices (inverter)</b>		
AC short-circuit / AC overload	● / ●	● / ●
DC reverse polarity protection / DC fuse	- / -	- / -
Overtemperature / battery deep discharge	● / ●	● / ●
Overvoltage category as per IEC 60664-1	III	III
<b>General data</b>		
Dimensions (W / H / D)	467 mm / 612 mm / 242 mm (18.4 inch / 21.1 inch / 9.5 inch)	
Weight	63 kg (138.9 lb)	
Operating temperature range	-25°C to +60°C (-13°F to +140°F)	
Protection class as per IEC 62103	I	I
Climatic category as per IEC 60721	3K6	3K6
Degree of protection as per IEC 60529	IP54	IP54
<b>Features / function</b>		
Operation and display / multifunction relay	External via SRC-20 / 2	External via SRC-20 / 2
Three-phase systems / battery backup function	● / ●	● / ●
State of charge calculation / full charge / equalization charge	● / ● / ●	● / ● / ●
Battery temperature sensor / data cables	● / ●	● / ●
Certificates and approvals	www.SMA-Solar.com	www.SMA-Solar.com
Warranty	5 years	5 years
<b>For off-grid applications</b>		
Automatic rotating magnetic field detection / generator support	● / ●	● / ●
Parallel connection / Multicluster	● / ●	● / ●
Integrated soft start	●	●
<b>Accessory</b>		
<b>For off-grid applications</b>		
Battery fuse**	○	○
Interface SI-COMSMA (RS485) / SI-SYSCAN (Multicluster)	○ / ○	○ / ○
Interface SWDMSI-10 (Speedwire)	○	○
Sunny Island Charger SIC50-MPT** / SMA Cluster Controller	○ / ○	○ / ○
<b>For on-grid applications</b>		
Interface SI-COMSMA (RS485) / Interface SWDMSI-10 (Speedwire)	○ / ○	○ / ○
Sunny Home Manager / SMA Energy Meter / automatic transfer switch for battery backup**	○ / ○ / ○	○ / ○ / ○
● Standard features ○ Optional features – Not available		
* see „List of Approved Lithium-Ion Batteries“ at www.SMA-Solar.com		
** procurement via external supplier		
All specifications, last updated: October 2016		
Type designation	SI6.0H-11	SI8.0H-11

# SUNNY DESIGN

System design made easy

