SMA Sunny Island – Maximum own consumption

Storage system

Due to the Sunny Island system, solar energy will always be available when needed – even after sundown or if the sun is hidden behind a cloud cover. By means of its battery management, the system automatically charges and discharges the connected battery. Only if the battery is fully charged and no household consumer needs power will the PV inverter feed generated power into the public grid.

SMA Smart Home

Intelligent household energy management is very easy with SMA Smart Home: It combines PV system, consumers and solar store and completely automatically controls all energy flows. Its central component is the Sunny Home Manager. It bundles all generation and consumption data, analyses them and clearly displays the most important values.

Hoppecke batteries

Due to their high charge and discharge load, Hoppecke's sealed lead-gel batteries are optimally suitable for solar power storage. Thanks to the gel technology, OPzV tubular plate batteries have a cycle life of about 2500 cycles with a 50 % depth of discharge.

Advantages in brief

- Power supply through own solar energy
- High degree of independence from the public grid will be possible
- Intelligent load and energy management for higher own consumption rates and more independence
- Suitable for retrofitting of existing systems or for new systems
- Feeding excess electric power into the public grid
- Maintenance-free batteries

The Sunny Island system is characterised by a particularly high degree of efficiency.

Generated solar energy is efficiently buffer-stored in extremely deep cycle Hoppecke batteries.

Art. No.	0600373

Model	Sunny Island 6.0H
AC nominal power	4600 W
AC output 25 °C (30 min / 5 min / 3 s)	6000 W / 6800 W / 11000 W
Number of phases	1
Output voltage	Sine wave
Line voltage	230 V (202 V – 253 V)
Frequency	50 Hz (45 Hz – 65 Hz)
AC output current	20 A
Max. AC output current (peak)	120 A
Harmonic distortion (output voltage)	< 4 %
Power factor at nominal power	-1 to +1
AC input voltage	230 V (172.5 V – 264.5 V)
Input frequency	50 Hz (40 Hz – 70 Hz)
Max. AC input current	50 A
Max. AC input power	11500 W
DC input voltage batteries	48 V (41 V – 63 V)
Max. battery charging current	110 A
Nominal DC charging current battery	100 A
Battery type	FLA, VRLA
Battery capacity	100 Ah – 10000 Ah
Charge control	IUoU charging process with automatic full and equalising charge
Max. efficiency	95 %
Power consumption (without load / standby)	< 26 W / < 4 W
AC short circuiting / AC overload	Yes / Yes
DC reverse polarity protection / DC fuse	No / No
Excess temperature / Exhaustive battery discharge	Yes / Yes
Overvoltage category	III
Capable of emergency power	Yes
Operating temperature	-25 to +60 °C
Protection mode	IP54
Multi-function relay	2
Paraller connection	Yes
Battery temperature sensor	Yes
Data communication	Yes
Display	Externally via SRC-20
Dimensions (W / H / D)	467 mm / 612 mm / 242 mm
Weight	63 kg
Warranty *	5 years
Norms	EN 61000-6-1:2007, EN 61000-6-2:2005, EN 61000-6-3:2007, EN 61000-6-4:2007, EN 61000-3-12:2005, EN 55022:2006 + A1:2007, EN 50178:1997, EN 62109-1:2010, protection class I, climatic category 3K6

* - Can optionally be extended to 10 / 15 / 20 / 25 years

Continued on next page

Hoppecke batteries

Art. No.	0303083	0303084	0303085
			
Model	Hoppecke sun.power pack 4.9 kWh – SMA SI 6.0H	Hoppecke sun.power pack 7.4 kWh – SMA SI 6.0H	Hoppecke sun.power pack 9.8 kWh – SMA SI 6.0H
Storage capacity of batteries	4.9 kWh	7.4 kWh	9.8 kWh
System voltage	48 V	48 V	48 V
Battery capacity (C10)	103 Ah	154 Ah	205 Ah
Battery	12 V 2 OPzV sun.power 120	12 V 2 OPzV sun.power 180	6 V 2 OPzV sun.power 250
Number of batteries	4 pc.	4 pc.	8 pc.
Number of cycles (at 20 °C, 50 % DoD)	2500 (approx.)	2500 (approx.)	2500 (approx.)
Included in delivery	4 x 12 V 2 OPzV sun.power 120, installation rack, battery connection lines, Hoppecke battery fuse in ISO housing and fuse links	4 x 12 V 2 OPzV sun.power 180, installation rack, battery connection lines, Hoppecke battery fuse in ISO housing and fuse links	8 x 6 V 2 OPzV sun.power 250, 2 x installation rack with 4 batteries each, battery connection lines, Hoppecke battery fuse in ISO housing and fuse links
Dimensions (W / H / D)	890 mm / 870 mm / 260 mm	890 mm / 870 mm / 260 mm	2 x 660 mm / 870 mm / 260 mm
Weight	275 kg	370 kg	495 kg
Warranty	2 years	2 years	2 years

Accessories

Art. No.	Model	Description	Belongs to Art. No.
0201590	SMA Sunny Home Manager	Energy management incl. monitoring	0600373
0600375	SMA SRC20 Remote Control	Remote control	0600373
0600378	SMA SI Speedwire data module	Speedwire data module	0600373

Kaco Powador-gridsave eco – The intelligent energy storage manager

Modular and flexible

As an intelligent energy storage management system, the Kaco Powador-gridsave eco is modular and flexible and can be used both for existing and new installations. Thanks to its efficient control technology, it mediates between inverter, solar system, battery and public power grid and thus enables the optimum efficiency of the entire system. It thus realizes the highest possible own consumption of own generated energy.

Emergency power supply

In case of interruption or failure of the public grid, the Powador-gridsave eco presents the basis for a reliable emergency power supply. Virtually uninterrupted, it switches from the operating condition of its own consumption optimisation to emergency power operation and thus allows the use of energy stored in the connected batteries.

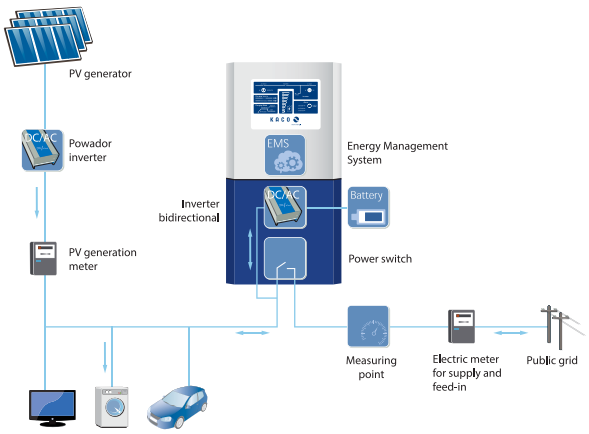
Home energy management

The Kaco Powador-gridsave eco provides the optimum solution in the area of home energy management. In one unit, it combines an energy management system for regulating the feed-in performance and for communicating with the inverter, the load management, the bi-directional inverters with a battery loading management and monitoring, as well as the mains isolation facility for separating the system from the public power grid. The monitoring software included in the scope of supply provides convenient and simple access to the system and all parameters.

Advantages in brief

- Modular and flexible application due to variable battery capacity
- Optimum supplement for existing solar systems by AC coupling
- Very high peak performances
- Convenient visualization via PC access
- Grid monitoring with changeover to emergency power mode operation in case of grid failure

The Kaco Powador-gridsave eco provides the optimum solution for around-the-clock supply with environmentally friendly and safe solar power.



The intelligent energy storage manager allows efficient regulation of feed-in performance and communication with the inverter.

KACO new energy.

Art. No.	1700005

Model	Kaco Powador-gridsave eco package - 9.6 kWh
Recommended max. output of the AC-coupled inverter	10 kW
AC nominal power	5 kW
AC peak output (< 30 s)	12 kW
AC rated voltage	230 V
AC rated current	22 A
Nominal frequency	50 / 60 Hz
Number of phases	1
Harmonic distortion	< 3 %
Capable of emergency power	Yes
Max. current grid switchover	32 A
Changeover time grid switchover	< 30 ms
DC battery voltage (nominal)	48 V
DC input voltage PV	40 - 68 V
DC rated current (25 °C)	104 A
Battery	Hoppecke 12 V 3OPzV bloc 200
Number of batteries	4 pc.
Storage capacity of batteries (C100)	9.6 kWh
Max. efficiency	96 %
Protection mode	IP43
Display	LED
Data communication	RS485, RS232, Ethernet via external interface converter, USB
Included in delivery	Powador-gridsave eco - INT, 4 x 12 V 3OPzV bloc solar.power (total capacity 200 Ah), battery rack, connection set battery safety unit and installation set with external 3-phase measuring point, Powador protect, 2 external coupling relays, power switch and RCD
Compatible inverters *	Kaco Powador series 00 and 02
Dimensions (W / H / D)	375 mm / 690 mm / 220 mm
Weight	40 kg
Warranty	2 years
Norms	IEC 62040-1-1:2002, EN 61000-6-3:2007, VDE-AR-N 4105 when using Powador protect

* - Not included in the scope of supply; for compatibility, update is possibly required

KACO new energy.

TRITEC

Bosch BPT-S 5 Hybrid – Solar inverter with integrated battery

Storage system from Bosch

The BPT-S 5 Hybrid enables the flexible use of solar power in terms of time because unused volumes can be stored. In addition to feeding solar power with optimum efficiency into the public power grid, the hybrid allows the improvement of own consumption and bridging over grid power failures.

Integrated energy management system

The BPT-S 5 Hybrid is the combination of a transformerless 5 kW inverter, a lithium ion battery with a capacity ranging from 4.4 kWh up to 13.2 kWh and a management system with a colour touch display. As needed, the energy produced by the PV system will be either directly consumed in the household, stored in the battery, or directly supplied into the public power grid.

Optimization of own PV consumption

Due to the BPT-S 5 Hybrid energy storage, PV power can be utilized with a time delay. It is accordingly possible, without any problem, to use at night the battery power which had been collected during the day. This provides much greater independence from the public power grid.

Intelligent system management

The system is equipped with a comprehensive monitoring system. It has a system management available which controls and monitors the energy flows and the function of components. The battery management takes care of the optimum charge and discharge of the lithium ion battery and thus ensures a long service life.

Advantages in brief

- Integrated energy management system with 5 kW nominal output and a capacity from 4.4 kWh up to 13.2 kWh
- Grid feed-in with an efficiency of 97.7 %
- Powerful lithium ion batteries designed for a service life of up to 20 years
- Highly efficient DC coupling

For individual power demand, the BPT-S 5 Hybrid is available in five storage sizes.

All components are perfectly coordinated with each other and together form a fully integrated system of a compact format.

BOSCH
Invented for life

Art. No.	1700007	1700008	1700009	1700010	1700011
					
Model	BPT-S 5 Hybrid 4.4 kWh	BPT-S 5 Hybrid 6.6 kWh	BPT-S 5 Hybrid 8.8 kWh	BPT-S 5 Hybrid 11.0 kWh	BPT-S 5 Hybrid 13.2 kWh
AC nominal power *	5000 W	5000 W	5000 W	5000 W	5000 W
Number of phases	1	1	1	1	1
Output voltage	Sine wave	Sine wave	Sine wave	Sine wave	Sine wave
Line voltage	230 V	230 V	230 V	230 V	230 V
Frequency	50 Hz (47.5 - 51.5 Hz)	50 Hz (47.5 - 51.5 Hz)	50 Hz (47.5 - 51.5 Hz)	50 Hz (47.5 - 51.5 Hz)	50 Hz (47.5 - 51.5 Hz)
Max. AC output current (peak)	22 A	22 A	22 A	22 A	22 A
Harmonic distortion (output voltage)	< 3 %	< 3 %	< 3 %	< 3 %	< 3 %
Power factor at nominal power	0.7 (leading) - 0.7 (lagging)	0.7 (leading) - 0.7 (lagging)	0.7 (leading) - 0.7 (lagging)	0.7 (leading) - 0.7 (lagging)	0.7 (leading) - 0.7 (lagging)
Recommended PV system power	5 kWp	5 kWp	5 kWp	5 kWp	5 kWp
DC inputs PV	1	1	1	1	1
Independent MPP trackers	1	1	1	1	1
DC input voltage PV	240 - 940 V	240 - 940 V	240 - 940 V	240 - 940 V	240 - 940 V
MPP voltage range	275 - 750 V	275 - 750 V	275 - 750 V	275 - 750 V	275 - 750 V
Max. DC input current PV	19 A	19 A	19 A	19 A	19 A
Battery technology	Lithium ion	Lithium ion	Lithium ion	Lithium ion	Lithium ion
Battery voltage nominal	96 V	144 V	192 V	240 V	288 V
Storage capacity of batteries	4.4 kWh	6.6 kWh	8.8 kWh	11.0 kWh	13.2 kWh
Max. depth of discharge (DOD)	50 %	50 %	50 %	50 %	50 %
Expected service life	15 years	15 years	15 years	15 years	15 years
Max. charge & discharge power	2.50 kW	3.75 kW	5.00 kW	5.00 kW	5.00 kW
Capable of emergency power	Limited, only in case of available PV power	Limited, only in case of available PV power	Yes	Yes	Yes
Max. output power emergency power operation	2.50 kW	3.75 kW	5.00 kW	5.00 kW	5.00 kW
Emergency power relay	24 V DC / 0.5 A	24 V DC / 0.5 A	24 V DC / 0.5 A	24 V DC / 0.5 A	24 V DC / 0.5 A
Number of phases feed-in emergency power supply	1	1	1	1	1
Operating temperature	-10 to +40 °C	-10 to +40 °C	-10 to +40 °C	-10 to +40 °C	-10 to +40 °C
Protection mode	IP20	IP20	IP20	IP20	IP20
Data communication	CAN, USB, RS485, LAN, V-CAN	CAN, USB, RS485, LAN, V-CAN	CAN, USB, RS485, LAN, V-CAN	CAN, USB, RS485, LAN, V-CAN	CAN, USB, RS485, LAN, V-CAN
Dimensions (W / H / D)	597 mm / 1693 mm / 706 mm	597 mm / 1693 mm / 706 mm	597 mm / 1693 mm / 706 mm	597 mm / 1693 mm / 706 mm	597 mm / 1693 mm / 706 mm
Weight	222.0 kg	242.0 kg	262.0 kg	280.5 kg	299.0 kg
Warranty **	5 years	5 years	5 years	5 years	5 years
Norms	Protection class I according to IEC 62103; grid monitoring VDE 0126-1-1, VDE-AR-N 4105, CEI-021; EMV EN 61000-6-2, EN 61000-6-3; grid reaction, IEC 61000-3-2/-3-12, IEC 61000-3-3/-3-11; system EN 62109-1, EN 62040-1; battery EN 61010-1, VDE 0411-1, UN 38.3, CE conformity, BG test label	Protection class I according to IEC 62103; grid monitoring VDE 0126-1-1, VDE-AR-N 4105, CEI-021; EMV EN 61000-6-2, EN 61000-6-3; grid reaction, IEC 61000-3-2/-3-12, IEC 61000-3-3/-3-11; system EN 62109-1, EN 62040-1; battery EN 61010-1, VDE 0411-1, UN 38.3, CE conformity, BG test label	Protection class I according to IEC 62103; grid monitoring VDE 0126-1-1, VDE-AR-N 4105, CEI-021; EMV EN 61000-6-2, EN 61000-6-3; grid reaction, IEC 61000-3-2/-3-12, IEC 61000-3-3/-3-11; system EN 62109-1, EN 62040-1; battery EN 61010-1, VDE 0411-1, UN 38.3, CE conformity, BG test label	Protection class I according to IEC 62103; grid monitoring VDE 0126-1-1, VDE-AR-N 4105, CEI-021; EMV EN 61000-6-2, EN 61000-6-3; grid reaction, IEC 61000-3-2/-3-12, IEC 61000-3-3/-3-11; system EN 62109-1, EN 62040-1; battery EN 61010-1, VDE 0411-1, UN 38.3, CE conformity, BG test label	Protection class I according to IEC 62103; grid monitoring VDE 0126-1-1, VDE-AR-N 4105, CEI-021; EMV EN 61000-6-2, EN 61000-6-3; grid reaction, IEC 61000-3-2/-3-12, IEC 61000-3-3/-3-11; system EN 62109-1, EN 62040-1; battery EN 61010-1, VDE 0411-1, UN 38.3, CE conformity, BG test label

* - For Germany: 4600 W

** - Can optionally be extended

BOSCH Invented for life

TRITEC

Kostal Piko BA – The energy storage system for numerous applications

Intelligent and powerful

The Kostal Piko BA energy storage system combines the best inverter technology with an intelligent energy management and a high-quality as well as powerful battery system. Optimum coordination of all components and their high quality bring about a system which achieves best efficiencies and ensures many years of efficient utilization.

Innovative inverter technology

With a module power between 4 and 11 kWp, the Piko BA provides charge regulator and inverter in one housing. Controlled by an intelligent energy management system, the Piko BA achieves a maximum efficiency of 96.5 %. While feed-in is effected on a demand-oriented basis, the integrated CAN interface enables the connection to the battery management system of the external storage – thus the system is optimally equipped for novel storage technologies. The overall Piko BA package is rounded off by the integrated communications and monitoring package, as well as the two independent MPP trackers.

Energy storage at a high level

The Piko battery is the optimum energy storage for the direct consumption of photovoltaic energy. High energy yield, long life, small space requirement, as well as a modular design for simple installation – all that results in a complete storage solution from one source. Moreover, operating costs are saved thanks to the system's maintenance-free battery technology. Optimum storage and management of the generated energy is ensured together with the integrated battery management system.

Advantages in brief

- High-quality individual components, optimally adjusted to each other
- Three-phase storage system
- High efficiency due to the energy management of the Piko BA inverter and charge regulator
- Energy storage with an integrated battery management system for high energy yields
- Home consumption recording with the Piko BA sensor

Energy for home consumption, for storage or for grid feed-in – very simple with the intelligent Piko BA system.

Home consumption is recorded by analogue current measurement of the Piko BA sensor.

KOSTAL

Art. No.	1700001

Model	Kostal Piko BA
AC nominal power	10000 W
Number of phases	3
Output voltage	Sine wave
Line voltage	230 V (184 - 264.5 V)
Frequency	50 Hz
AC rated current	14.5 A
Short circuit current (peak)	20 A
Harmonic distortion (output voltage)	< 3 %
Power factor at nominal power	0.9 - 1 - 0.9
Recommended PV system power	4 - 11 kWp
DC inputs	2
Independent MPP trackers	2
DC input voltage PV	180 - 950 V
MPP voltage range (one-tracker operation / two-tracker operation)	180 - 850 V / 440 - 850 V
Max. DC input current PV	12 A
DC input voltage batteries	228 V (211 - 314 V)
Max. battery charging current	12 A
Max. battery discharge current	12 A
Max. efficiency	96.5 %
Capable of emergency power	Yes
Operating temperature	-20 to +60 °C
Protection mode	IP55
Electronic isolation unit	Integrated
Data communication	RS485, 2 x Ethernet, S0, 4 x analogue inputs, CAN interface
Connection (input / output)	MC4 / spring-loaded terminal strip
Dimensions (W / H / D)	520 mm / 450 mm / 230 mm
Weight	33 kg
Warranty *	5 years
Norms	Protection class I according to IEC 62103, overvoltage category II according to IEC 60664-1 input side, overvoltage category III according to IEC 60664-1 output side

* - Can optionally be extended to 10 / 20 years

Continued on next page

Accessories

Art. No.	1700004	1700002
		
Model	Kostal Piko Battery	Kostal Piko BA Sensor
Battery type	Hoppecke 12 V OPzV blocsolar.power 70	-
Battery technology	Maintenance-free, cycle-optimized lead-gel battery	-
Number of cycles (50 % DoD)	2500	-
Storage capacity of batteries (C10)	11.6 kWh	-
Max. output power	2.7 kW (approx.)	-
Number of batteries	19 pc. (each 12 V nominal voltage)	-
Rated voltage	228 V	-
Battery capacity (C100)	70 Ah	-
Ventilation	Inlet and outlet air vent with 154 cm² cross-sectional area	-
Operating temperature	+10 to +30 °C	-
Protection mode	IP21	-
Weight	850 kg (approx.)	-
Rated current primary	-	50 A
Rated current secondary	-	1 A
Burden	-	1 VA
Accuracy class	-	1
Max. line diameter	-	13.5 mm
Dimensions (W / H / D)	900 mm / 1584 mm / 388 mm	105 mm / 90 mm / 54 mm
Norms	IEC 60896-21, IEC 61427	EN 60715

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