

BPT-S 5 Hybrid

Battery-storage solar inverter system

Specifications



BOSCH



- ▶ **Integrated energy management system with 5 kW power capacity and a capacity of 4.4 kWh up to 13.2 kWh**
- ▶ **Feed-in with efficiency factor of 97.7 %**
- ▶ **High-performance lithium ion batteries**
- ▶ **Highly efficient DC coupling**



2011



NOMINEE



achieved for:
Innovation
Design
Functionality



honored as:
BEST PRODUCT OF THE YEAR
2011

* Awards for 2011 model

The BPT-S 5 Hybrid allows flexible use of solar power by storing the surplus energy. Along with feeding solar power into the public grid with the highest level of efficiency, it also ensures the optimum use of self-generated power and bridge power outage events.

Integrated energy management system

The BPT-S 5 Hybrid is a combination of a transformerless 5 kW inverter, a lithium-ion battery with a capacity from 4.4 kWh up to 13.2 kWh and a management system with a colour touch screen display. According to the requirements the energy produced by the PV plant is consumed directly, stored in the battery or fed into the public grid. Only if neither the PV plant nor the battery are able to supply sufficient energy, mains power is used.

Optimising own PV consumption

With the help of the save option of the BPT-S 5 Hybrid, the use of PV electricity can be time-delayed. This makes it possible to use the battery electricity generated in the day at night. The internal consumption of PV electricity in a 4-person household can therefore – compared to a PV system without a storage system – be increased from approx. 30% to approx. 70%. Thanks to the high charge

performance of 5 kW even daytime peak loads are covered. During the summer months it is thus possible to achieve 100% independence from the public electricity grid.

Intelligent system management

The BPT-S 5 Hybrid is equipped with a comprehensive monitoring system. The large touch screen display shows all of a household's electricity consumption data and the status and output data of the PV system and battery – clearly and in real time. The system has an intelligent system management function that controls and monitors energy flows and checks all components are working. The battery management system ensures that the lithium-ion batteries are charged and discharged in the optimum manner and thus last for a long time. Furthermore, the system can be monitored with e.Web and the e.UserApp regardless of location and without further accessories.

BPT-S 5 Hybrid | Specifications



System	4.4 kWh	6.6 kWh	8.8 kWh	11 kWh	13.2 kWh
Input Data					
Recommended DC output	5 kW	5 kW	5 kW	5 kW	5 kW
Max. DC input voltage (V_{dcmax})	940 V	940 V	940 V	940 V	940 V
Min. DC input voltage (V_{dcmin})	240 V	240 V	240 V	240 V	240 V
Max. MPP voltage (V_{mppmax})	750 V	750 V	750 V	750 V	750 V
Min. MPP voltage (V_{mppmin})	275 V	275 V	275 V	275 V	275 V
Max. input electricity (I_{dcmax})	19 A	19 A	19 A	19 A	19 A
Number of MPP trackers	1	1	1	1	1
Design of connection	Screw terminals (16 mm ² cross-section)				
Number of DC inputs	1	1	1	1	1
MPP precision	> 99 %	> 99 %	> 99 %	> 99 %	> 99 %
Output Data					
Nominal grid voltage ($V_{ac,r}$)	230 V	230 V	230 V	230 V	230 V
Max. output electricity (I_{acmax})	22 A	22 A	22 A	22 A	22 A
Power output ($S_{ac,r}$)	5 kVA ^{1,2}	5 kVA ^{1,2}	5 kVA ^{1,2}	5 kVA ^{1,2}	5 kVA ^{1,2}
Max. apparent power (S_{acmax})	5 kVA ^{1,2}	5 kVA ^{1,2}	5 kVA ^{1,2}	5 kVA ^{1,2}	5 kVA ^{1,2}
Nominal frequency (f_r)	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
Max. / Min. frequency (f_{max}) / (f_{min})	51.5 Hz / 47.5 Hz	51.5 Hz / 47.5 Hz	51.5 Hz / 47.5 Hz	51.5 Hz / 47.5 Hz	51.5 Hz / 47.5 Hz
Power factor ($\cos \phi$)	0.7 over-excited / 0.7 under-excited				
Type of infeed	single-phase	single-phase	single-phase	single-phase	single-phase
Design of connection	Screw terminal (4 mm ² cross-section)				
Required grid config.	TN grid / TT grid	TN grid / TT grid	TN grid / TT grid	TN grid / TT grid	TN grid / TT grid
Distortion factor (for power output)	≤ 3 %	≤ 3 %	≤ 3 %	≤ 3 %	≤ 3 %
Efficiency					
Max. efficiency (inverter)	97.7 %	97.7 %	97.7 %	97.7 %	97.7 %
Total system efficiency	90 %	90 %	90 %	90 %	90 %
Emergency power mode efficiency	94 %	94 %	94 %	94 %	94 %
Battery Data					
Nominal voltage ($V_{dc,r}$)	96 V	144 V	192 V	240 V	288 V
Max. output voltage ($V_{batdcmax}$)	112 V	168 V	224 V	280 V	336 V
Storage capacity	4.4 kWh	6.6 kWh	8.8 kWh	11 kWh	13.2 kWh
Battery type	Lithium ion (NCA ³)				
DOD	50 %	50 %	50 %	50 %	50 %
Max. charging and discharging	2.5 kW	3.75 kW	5 kW	5 kW	5 kW
Emergency power supply					
Emergency power compatible	restricted ⁴	restricted ⁴	Yes	Yes	Yes
Nominal voltage	230 V	230 V	230 V	230 V	230 V
Nominal current	13 A	13 A	13 A	13 A	13 A
Max. output current	22 A	22 A	22 A	22 A	22 A
Max. apparent output power	2.5 kW	3,75 kW	5 kW	5 kW	5 kW
Nominal frequency (f_r)	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
Emergency power relay control	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
Design of connection	Screw terminals (10 mm ² cross-section)				
Type of infeed	single-phase	single-phase	single-phase	single-phase	single-phase

¹ adjustable to 4.6 kVA

² Integrated lockable export control capability. If required the surplus energy export parameter can be set to 0%

³ Lithium nickel cobalt aluminum oxide (LiNiCoAlO₂)

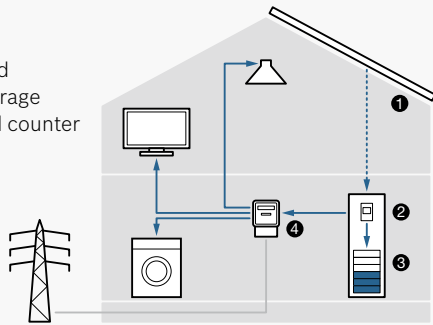
⁴ only with existing PV power

System	4.4 kWh	6.6 kWh	8.8 kWh	11 kWh	13.2 kWh
Stand-by supply					
Nominal voltage	230 V	230 V	230 V	230 V	230 V
Nominal frequency	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
Power consumption in standby	6.0 VA	6.0 VA	6.0 VA	6.0 VA	6.0 VA
Design of connection	Screw terminals (10 mm ² cross-section)				
Environmental conditions					
Temperature range	-10 °C / +40 °C	-10 °C / +40 °C	-10 °C / +40 °C	-10 °C / +40 °C	-10 °C / +40 °C
Max. temperature for continuous power output	+40 °C	+40 °C	+40 °C	+40 °C	+40 °C
Relative humidity (non-condensing)	0–70 %	0–70 %	0–70 %	0–70 %	0–70 %
Installation altitude above sea level	≤ 2,000 m	≤ 2,000 m	≤ 2,000 m	≤ 2,000 m	≤ 2,000 m
Safety / protection equipment					
Type of protection	IP 20	IP 20	IP 20	IP 20	IP 20
Protection class	Class I, according to IEC 62103				
Ground fault monitoring	Yes	Yes	Yes	Yes	Yes
Overload behaviour	Operating point adjustment				
Overload behaviour in emergency power mode	Switch off after < 5 sec	Switch off after < 5 sec	Switch off after < 5 sec	Switch off after < 5 sec	Switch off after < 5 sec
Excess temperature behaviour	Derating	Derating	Derating	Derating	Derating
Excess temperature behaviour in emergency power mode	Switch off	Switch off	Switch off	Switch off	Switch off
DC input surge diverter	Varistores (type 3 surge protection)				
AC output surge diverter	Varistores (type 3 surge protection)				
Integrated type B fault current switch, sensitive to universal current	Yes	Yes	Yes	Yes	Yes
DC circuit breaker	yes, external (scope of supply)				
Grid monitoring					
Switch time to emergency power mode	10 sec	10 sec	10 sec	10 sec	10 sec
Reaction time to grid faults	< 200 milliseconds				
Fulfilled requirements / clearance at hand	VDE 0126-1-1 Deutschland; VDE-AR-N 4105; CEI-021; AS 4777.2:2005; AS 4777.3:2005; AS/NZS 3100:2009 Inc A1-2				
Standards					
Interference emission (EMV)	DIN EN 61000-6-3:2011-09				
Interference-resistance (EMV)	DIN EN 61000-6-2:2006-03				
System perturbation	IEC 61000-3-2 / -3-12 ; IEC 61000-3-3 / -3-11				
System	IEC 62109-1:2011, IEC 62109.2:2011, IEC 62040-1:2008; EN 62040-1:2008; AS 62040.1.1:2003				
Battery	DIN EN 61010-1; VDE 0411-1:2011-07, UN 38.3				
CE / RCM compliant	Yes	Yes	Yes	Yes	Yes
BG test mark	Yes	Yes	Yes	Yes	Yes
Other					
Display	Graphic representation with touch display				
Communications interfaces	CAN, USB, RS 485, LAN, V-CAN				
Topology	transformerless	transformerless	transformerless	transformerless	transformerless
Voluntary warranties	5 years, optionally extendable				
Dimensions / weight					
Dimensions in mm (W x H x D)	597 x 1,693 x 706	597 x 1,693 x 706	597 x 1,693 x 706	597 x 1,693 x 706	597 x 1,693 x 706
Weight (incl. battery)	222 kg	242 kg	262 kg	280.5 kg	299 kg

Function

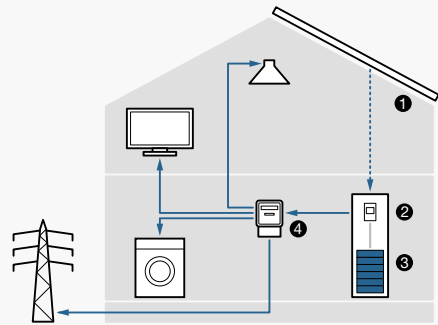
Morning

- ① PV generator
- ② BPT-S 5 Hybrid
- ③ Integrated storage
- ④ Allocation and counter



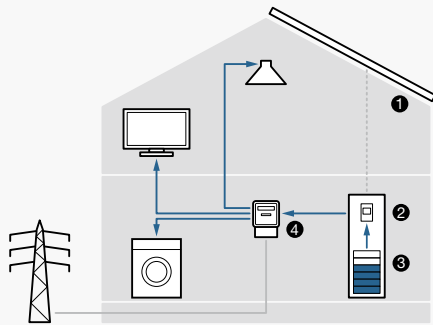
PV generated (1) energy is used first and foremost to optimise your own consumption. Any surplus energy is used to charge the integrated lithium ion batteries (3).

Afternoon



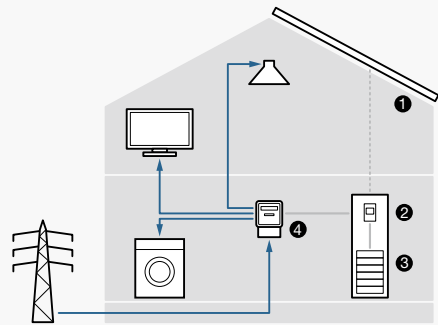
When the batteries are fully charged, the system provides energy for your own consumption and any surplus is fed into the public grid.

Evening



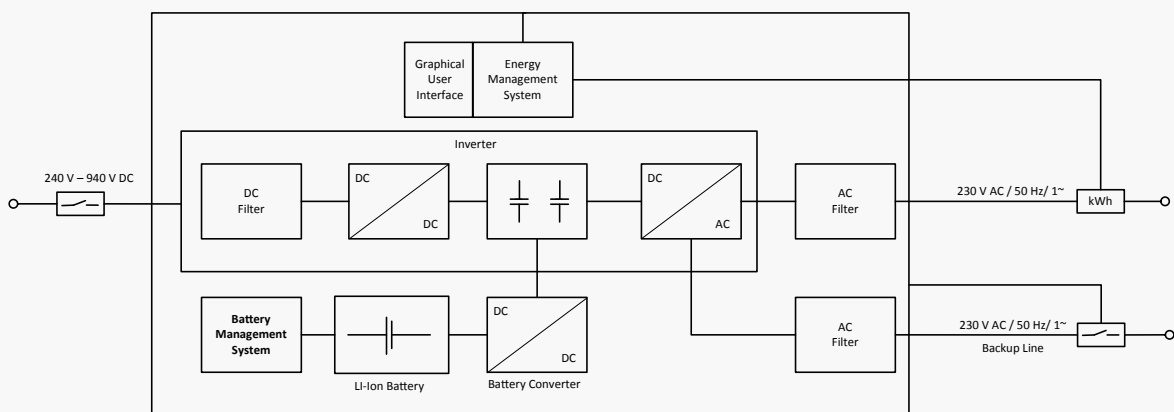
The system switches to battery energy after sunset. BPT-S 5 Hybrid allows you to produce 70% or more of your own consumption.

Night



Should the battery capacity be insufficient, electricity is obtained from the public grid.

Efficiency



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