GOODWE
YOUR SOLAR ENGINE

Power Whenever You Need

Residential Energy Storage Solutions

Hybrid Inverter

ES Series | **EM Series**

Technical Data		GW3648D-ES	GW5048D-ES	GW3048-EM	GW3648-EM	GW5048-EM
Battery Input Data	Battery Type	Li-Ion or Lead-acid*1		Li-Ion or Lead-acid*1		
	Nominal Battery Voltage (V)	48		48		
	Max. Charging Voltage (V)	≤60 (Configurable)		≤60 (Configurable)		
	Max. Charging Current (A)*1	75	100	50		
	Max. Discharging Current (A)*1	75	100	50		
	Battery Capacity (Ah)*2	50~2000		50~2000		
	Charging Strategy for Li-Ion Battery	Self-adaption to BMS		Self-adaption to BMS		
PV String Input Data	Max. DC Input Power (W)	4600	6500	3900	4600	6500
	Max. DC Input Voltage (V)*3	580		550		
	MPPT Range (V)	125~550		100~500		
	Start-up Voltage (V)*4	150		150		
	MPPT Range for Full Load (V)	170~500		280~500	170~500	230~500
	Nominal DC Input Voltage (V)	360		360		
	Max. Input Current (A)	11/11		11	11/11	11/11
	Max. Short Current (A)	13.8/13.8		13.8	13.8/13.8	13.8/13.8
	No. of MPP Trackers	2		1	2	2
	No. of Strings per MPP Tracker	1		1		
AC Output Data (On-grid)	Nominal Apparent Power Output to Utility Grid (VA)	3680	4600	3000	3680	5000*5
	Max. Apparent Power Output to Utility Grid (VA)	3680*6	5100*6	3000*7	3680*7	5000*7
	Max. Apparent Power from Utility Grid(VA)	7360	9200	5300		
	Nominal Output Voltage (V)	230		230		
	Nominal Output Freqency (Hz)	50/60		50/60		
	Max. AC Current Output to Utility Grid (A)	16	24.5*8	13.6	16	22.8*8
	Max. AC Current From Utility Grid (A)	32	40	23.6		
	Output Power Factor	~1(Adjustable from 0.8 leading to 0.8 lagging)		~1(Adjustable from 0.8 leading to 0.8 lagging)		
	Output THDi (@Nominal Output)	<3%		<3%		
AC Output Data (Back-up)	Max. Output Apparent Power (VA)	3680	4600	2300		
	Peak Output Apparent Power (VA)*9	5520,10sec	6900,10sec	3500,10sec		
	Automatic Switch Time (ms)	—		10		
	Max. Output Current (A)	16	20	10		
	Nominal Output Voltage (V)	230 (±2%)		230 (±2%)		
	Nominal Output Freqency (Hz)	50/60 (±0.2%)		50/60 (±0.2%)		
	Output THDv (@Linear Load)	<3%		<3%		
Efficiency	Max. Efficiency	97.6%		97.6%		
	Max. Battery to Load Efficiency	94.0%		94.5%		
	Euro Efficiency	97.0%		97.0%		
Protection	Anti-islanding Protection	Integrated		Integrated		
	PV String Input Reverse Polarity Protection	Integrated		Integrated		
	Insulation Resistor Detection	Integrated		Integrated		
	Residual Current Monitoring Unit	Integrated		Integrated		
	Output Over Current Protection	Integrated		Integrated		
	Output Short Protection	Integrated		Integrated		
	Output Over Voltage Protection	Integrated		Integrated		
General Data	Operating Temperature Range (°C)	-25~60		-25~60		
	Relative Humidity	0~95%		0~95%		
	Operating Altitude (m)	≤4000		≤4000		
	Cooling	Natural Convection		Natural Convection		
	Noise (dB)	<25		<25		
	User Interface	LED & APP		LED & APP		
	Communication with BMS*10	RS485; CAN		RS485; CAN		
	Communication with Meter	RS485		RS485		
	Communicaiton with Portal	Wi-Fi		Wi-Fi		
	Weight (kg)	28	30	16	17	17
	Size (Width*Height*Depth mm)	516*440*184		347*432*175		
	Mounting	Wall Bracket		Wall Bracket		
	Protection Degree	IP65		IP65		
	Standby Self Consumption (W)	<13		<13		
	Topology	High Frequency Isolation		High Frequency Isolation		
Certifications & Standards	Grid Regulation	VDE-AR-N 4105, VDE0126-1-1, AS4777.2, G83/2, CEI 0-21, NRS 097-2-1, EN50438		AS/NZS 4777.2:2015, G83/2, G100, CEI 0-21, VDE4105-AR-N, VDE0126-1-1, NRS 097-2-1, RD1699, UNE206006, EN50438		
	Safety Regulation	IEC/EN62109-1&2, IEC62040-1		IEC/EN62109-1&2, IEC62040-1		
	EMC	EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4, EN 61000-4-16, EN 61000-4-18, EN 61000-4-29		EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4, EN 61000-4-16, EN 61000-4-18, EN 61000-4-29		

*1: Lead-acid battery use refers to Approved Battery Options Statement . The actual charge and discharge current also depends on the battery.
*2: Under off-grid mode, then battery capacity should be more than 100Ah.
*3: Maximum operating dc voltage is 530V.
*4: When there is no battery connected, inverter starts feeding in only if string voltage is higher than 200V.
*5: 4600 for VDE0126-1-1&VDE-AR-N4105 & CEI 0-21(GW5048-EM).
*6: 4600 for VDE 0126-1-1 &VDE-AR-N4105, 4950 for AS4777.2(GW5048D-ES); 4050 for CEI 0-21 (GW3648D-ES).
*7: For CEI 0-21 GW3048-EM is 3300, GW3648-EM is 4050, GW5048-EM is 5100; for VDE-AR-N4105 GW5048-EM is 4600.
*8: 21.7A for AS4777.2.
*9: Can be reached only if PV and battery power is enough.
*10: The standard configuration is CAN.

Retrofit Solution

SBP Series (AC-Coupled) | **BP Series** (DC-Coupled)

Technical Data		GW3600S-BP	GW5000S-BP	GW2500-BP
Battery Input Data	Battery Type	Li-Ion or Lead-acid*[1]		Li-Ion
	Nominal Battery Voltage (V)	48		48
	Max. Charging Voltage (V)	≤60 (Configurable)		≤60 (Configurable)
	Max. Charging Current (A)*[2]	75	100	50
	Max. Discharging Current (A)*[2]	75	100	50
	Battery Capacity (Ah)	50~2000*[3]		50~1000
	Charging Strategy for Li-Ion Battery	Self-adaption to BMS		Self-adaption to BMS
AC Output Data (On-grid)	Nominal Power Output (W)	3680	5000*[4]	—
	Max. Apparent Power Output (VA)*[5]	3680	5000	—
	Max. Apparent Power from Utility Grid (VA)	7360	9200	—
	Nominal Output Voltage (V)	230		—
	Nominal Ouput Frequency (Hz)	50/60		—
	Max. AC Current Output (A)	16	22.8*[6]	—
	Max. AC Current From Utility Grid (A)	32	40	—
	Output Power Factor	~1(Adjustable from 0.8 leading to 0.8 lagging)		—
	Output THDi (@Nominal Output)	<3%		—
AC Output Data (Back-up)	Max. Output Apparent Power (VA)*[7]	3680	5000	—
	Peak Output Apparent Power (VA)*[7]	4416, 10sec	5500, 10sec	—
	Automatic Switch Time (ms)	<10		—
	Nominal Output Voltage (V)	230 (±2%)		—
	Nominal Output Freqency (Hz)	50/60 (±0.2%)		—
	Max. Output Current (A)	16	22.8	—
	Output THDv (@Linear Load)	<3%		—
PV String Input Data	Max. DC Input Power (W)	—		6000
	Max. DC Input Voltage (V)	—		500
	Operating Voltage Range(V)*[8]	—		150~450
	Start-up Voltage (V)	—		120
	Max. Input Current (A)	—		25
	No. of PV String Input Connectors	—		1
DC Output Data	Output Voltage during Daytime	—		Follow the MPP Tracker of Inverter
	Rated Output Voltage at Night (V)	—		360
	Output Voltage Range (V)	—		250~360
	Max Output Current (A)	—		10
	No. of DC Output Connectors	—		1
Efficiency	Max. Efficiency	95.5%		96.5%
Protection	Anti-islanding Protection	Integrated		—
	Output Over Current Protection	Integrated		—
	Output Short Protection	Integrated		—
	Output Over Voltage Protection	Integrated		—
General Data	Operating Temperature Range (℃)	-25~60		-25~60
	Relative Humidity	0~95%		0~95%
	Operating Altitude (m)	≤4000		≤4000
	Cooling	Nature Convection		Natural Convection
	Noise (dB)	<25		<25
	User Interface	LED & APP		LED & APP
	Communicaiton with BMS*[9]	RS485; CAN		RS485; CAN
	Communicaiton with Meter	RS485		RS485
	Communicaiton with Portal	Wi-Fi		Wi-Fi
	Weight (kg)	18.5		8
	Size (Width*Height*Depth mm)	347*432*190		344*274.5*128
	Mounting	Wall Bracket		Wall Bracket
	Protection Degree	IP65		IP65
	Standby Self Consumption (W)	<15		<8
	Topology	High Frequency Isolation		High Frequency Isolation
Certifications & Standards	Grid Regulation	AS/NZS 4777.2:2015, G83/2, G100, CEI 0-21; RD1699; UNE206006; VDE4105-AR-N; VDE0126-1-1; EN50438		—
	Safety Regulation	IEC62477-1, IEC62040-1		CE
	EMC	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61000-4-16, EN 61000-4-18, EN 61000-4-29		CE

*[1]: Lead-acid battery use refers to Approved Battery Options Statement .
The actual charge and discharge current also depends on the battery.

*[2]: Charge & discharge current follows the command of BMS which doesn't exceed 50A. Note: Pylon US2000A default charge rate is 0.5C.
C means the battery capacity, such as the capacity is 50Ah, default charge current 0.5C is 0.5 * 50 = 25A

*[3]: Battery capacity could be not less than 100Ah where the back-up function is to be applied.

*[4]: 4600 for VDE0126-1-1&VDE-AR-N 4105 and CEI 0-21.

*[5]: For CEI 0-21 GW3648-EM is 4050, GW5048-EM is 5100; for VDE-AR-N4105 GW5048-EM is 4600.

*[6]: 21.7A for AS4777.2.

*[7]: Can be reached only if battery capacity is enough, otherwise will shut down.

[8]: PV voltage should be lower than 9 V_Battery - 20V (V_Battery means real-time voltage of battery) to allow battery charge or discharge.

*[9]: The standard configuration is CAN.

On & Off-grid Energy Storage Solutions (Newly Installed Systems)

Summary

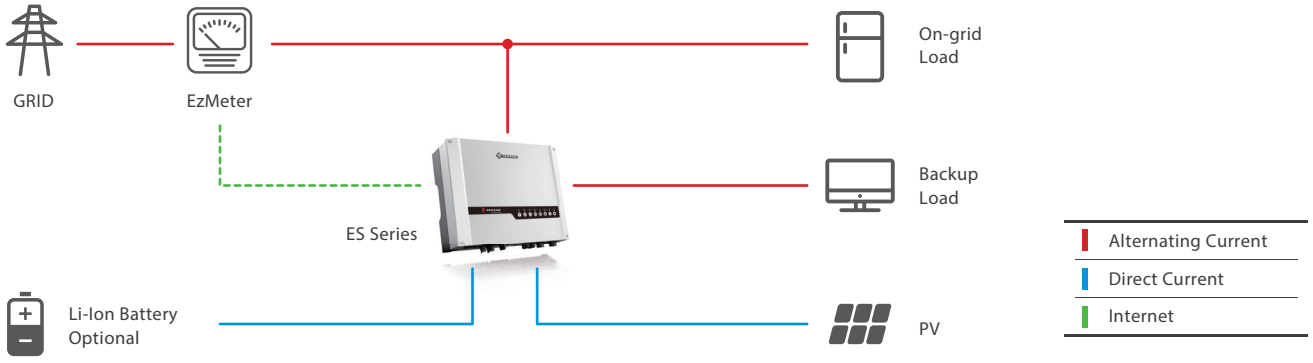
As a product intended for the new installation of PV storage generators, EM/ES series are aimed for boosting self-consumption in areas with high electrical rate and a relatively low FIT. For areas and regions where peak shaving can be applied and feed-in-power is restricted, this system would be a good fit.

Functional Introduction

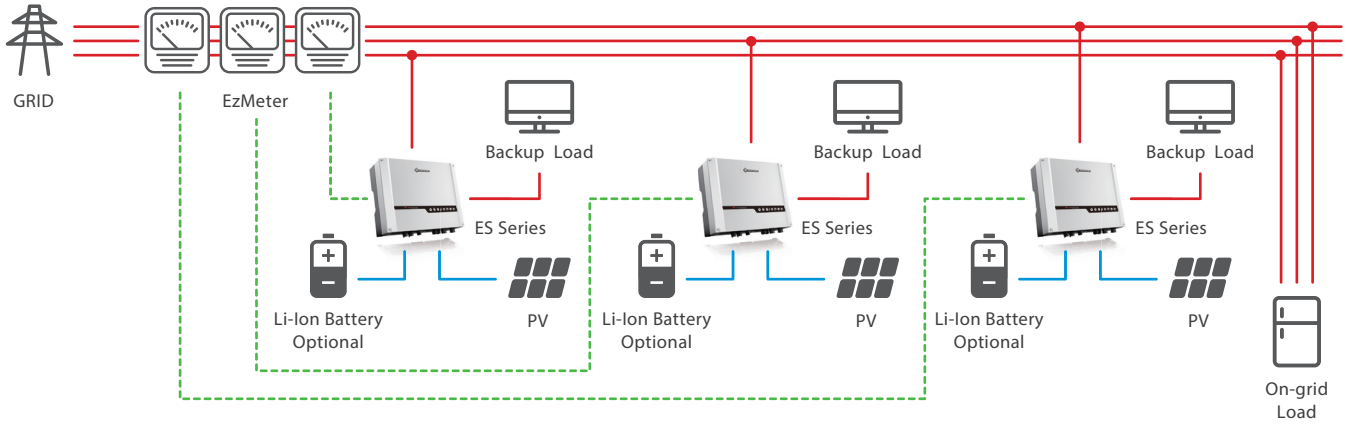
- Increasing Self-Consumption: During the day, the electricity from the PV array is used to optimize self-consumption. The excess is used to recharge the batteries and can be released to the loads at night. The highest proportion of self use is up to 95%.
- Peak Shaving: By setting the charging and discharging time, the battery can be charged using the lower electrical rate and discharged to loads when there is a high electrical rate.
- Power Supply for Important Loads: Connected to the backup side of the inverter, loads such as refrigerators, routers, lamps, computers and other small appliances can be powered. When grid fails the system automatically switches to back-up mode within milliseconds.

System Topology Illustration

01 Basic Application



02 Three-phase Application Proposal



Energy Storage Solutions

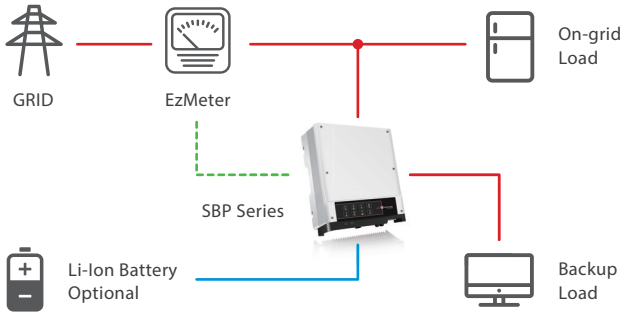
Summary

SBP product series is geared up for areas where there is considerable price gap between peaking and valley period or a limitation in power supply with no allowance for the installation of PV panels.

Functional Introduction

- Peak Shaving: Economic Mode allows you to set the time period on a flexible basis.
- Power Supply for Important Loads: Connected to the backup side of the inverter, loads such as refrigerators, routers, lamps, computers and other small appliances can be powered. When grid fails the system automatically switches to back-up mode within milliseconds.

System Topology Illustration



On-grid Retrofitting Storage Solutions Utilizing DC-coupling Approach

Summary

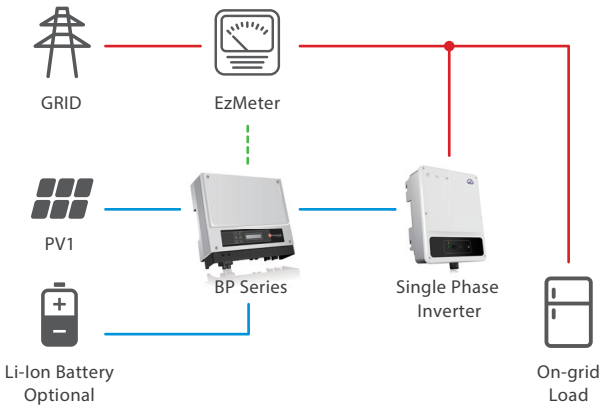
BP series, a product that aims for situations where there is a high electrical bill and a low FIT, is designed for upgrading to DC-coupled storage system based on the existing PV on-grid inverter, helping to reduce your bill by boosting self-consumption.

Functional Introduction

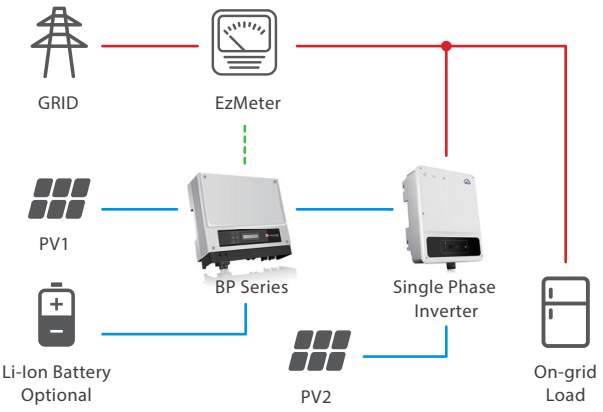
- Boosting Self-Consumption: With the electrical meter in place, it can automatically achieve self-consumption and offer better return on investment.

System Topology Map

01 System Upgrading Design for Single Phase & Single MPPT Inverters



02 System Upgrading Design for Single Phase & Dual MPPT Inverters



On-grid Retrofitting Storage Solutions Utilizing AC-coupling Approach

Summary

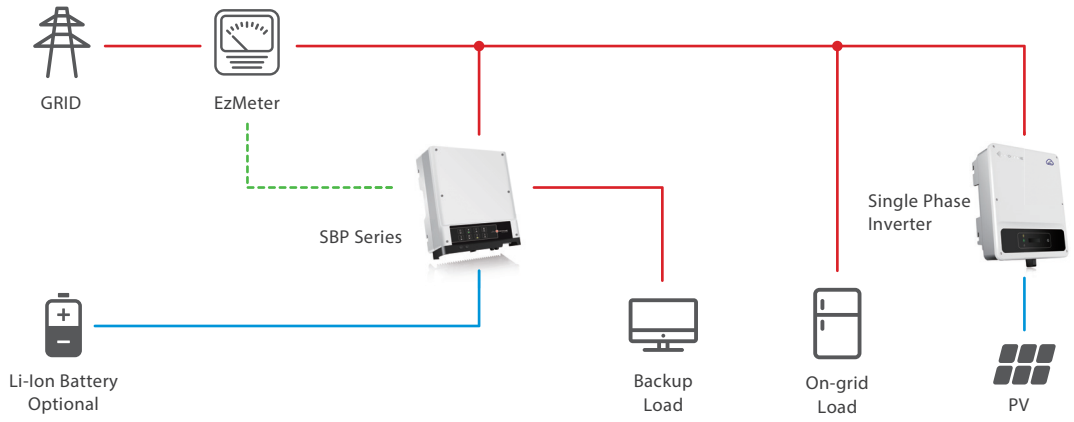
As a product intended for the retrofit of PV storage generators, SBP series is aimed for boosting self-consumption in areas with high electrical rate and a relatively low FIT as well as the availability of peak shaving. Compared with hybrid energy storage inverters, SBP is more cost-effective.

Functional Introduction

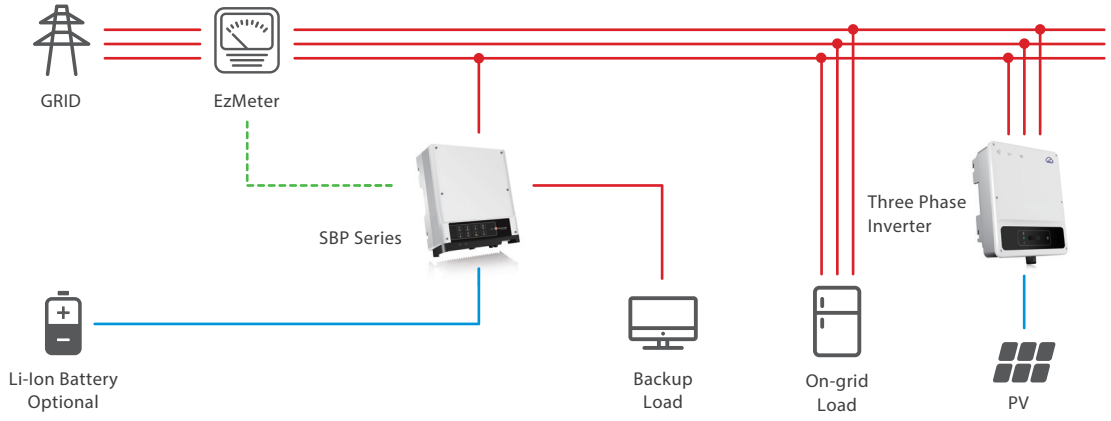
- Increasing Self-Consumption: During the day, the electricity from the PV array is used to optimize self-consumption. The excess is used to recharge the batteries and can be released to the loads at night. The highest proportion of self use is up to 95%.
- Peak Shaving: By setting the charging and discharging time, the battery can be charged using the lower electrical rate and discharged to loads when there is a high electrical rate.
- Power Supply for Important Loads: Connected to the backup side of the inverter, loads such as refrigerators, routers, lamps, computers and other small appliances can be powered. When grid fails the system automatically switches to back-up mode within milliseconds.

System Topology Map

01 System solutions integrating one single phase inverter



02 System solutions for a single three phase inverter



Off-grid System Solutions

Summary

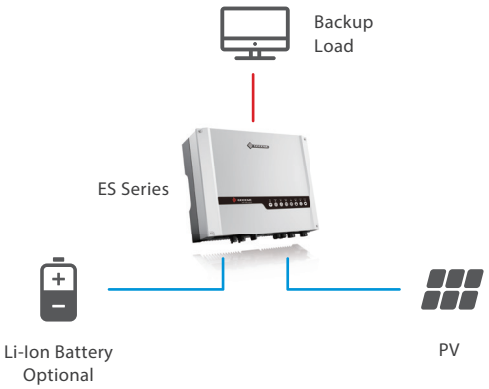
ES series is fit for areas like remote villages, powerless areas, ocean islands, and off-grid applications, ensuring household power demand needs are met.

Functional Introduction

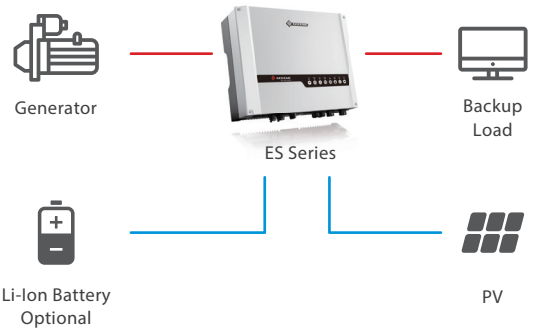
- Meeting power supply demand: the energy output from the PV side will be supplied to the load as a priority before the surplus energy flowed to the battery for charging, which shall be discharged for powering the load when there is no sufficient electrical supply from the PV side.

System Topology Map

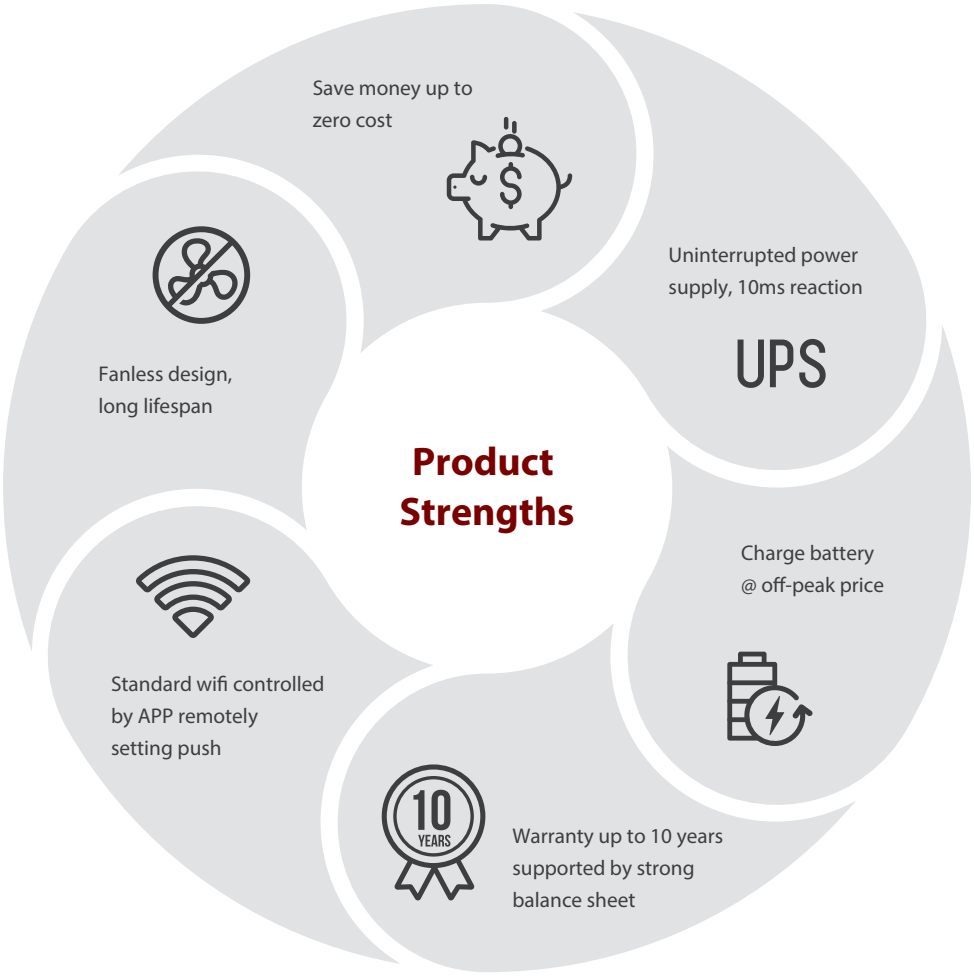
01 No Generator Application Proposal



02 Application Proposal with Generator included



Project Cases



GoodWe (China)
No.189 Kunlunshan Rd., SND, Suzhou, 215163, China
T: +86 512 6239 6771
service.chn@goodwe.com

GoodWe (Italy)
No. 17 Via Galimberti, Biella 13900, Italy
T: +39 (0) 15 4191921
service.it@goodwe.com

GoodWe (India)
No. B 402 Purva Apartment, Tawarepada Rd,
Gauripada, Maharashtra, India
T: +91 (0) 9769 3475 60
service.in@goodwe.com

GoodWe (Netherlands)
Franciscusdreef 42C, 3565AC Utrecht, the Netherlands
T: +31 (0) 30 737 1140
service.nl@goodwe.com

GoodWe (Germany)
Hauswiesenstraße 8, 86916 Kaufering, Germany
T: +49 (0) 800 998 1212
service.de@goodwe.com

GoodWe (Australia)
Level 14, 380 St. Kilda Rd, Melbourne, VIC, 3004, Australia
T: +61 3 9324 0559
service.au@goodwe.com

GoodWe (UK)
6 Dunhams Court, Dunhams Lane,
Letchworth Garden City, SG6 1WB UK
T:+ 44 (0) 333 358 3184
service@goodwe.co.uk

www.goodwe.com