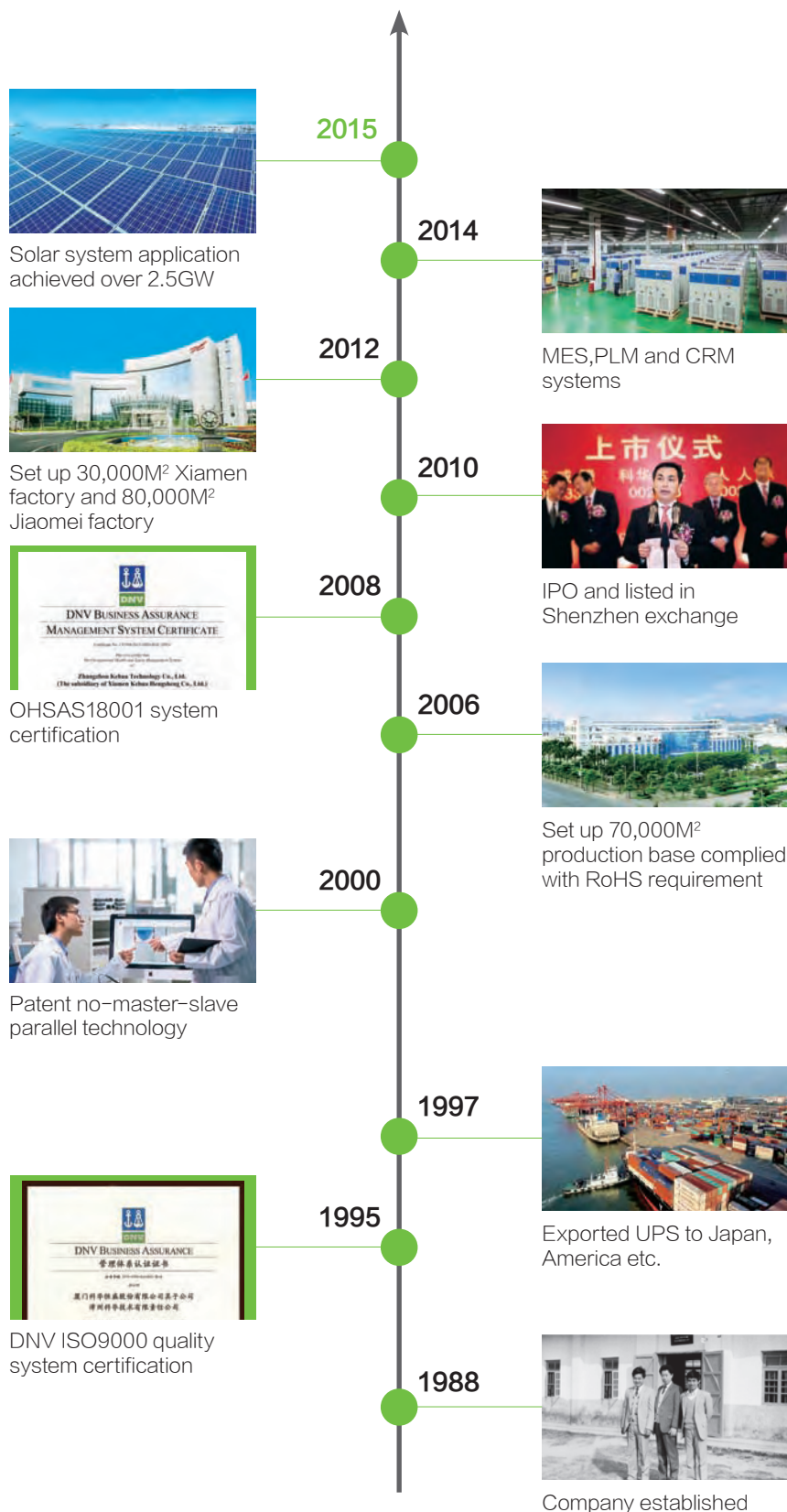




Renewable Energy Solution



History





Kehua Tech – Power Solution Specialist

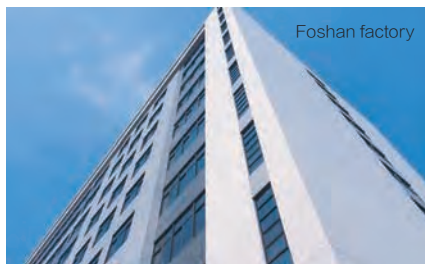
Stock No.: 002335

KEHUA Group, as the leading power solution provider in mainland China, was founded in 1988. On Jan.13th, 2010, Kehua officially went public and was listed on Shenzhen Stock Exchange, which represented another milestone in company history.

Till now Kehua owns 8 subsidiaries, 5 production bases, 3 R&D centers, 1 EMC test center and a UL witness Test Data Program. There are more than 50 offices in domestic market, totally over 2000 employees in this team, including over 250 engineers and 3 national experts in power industry.

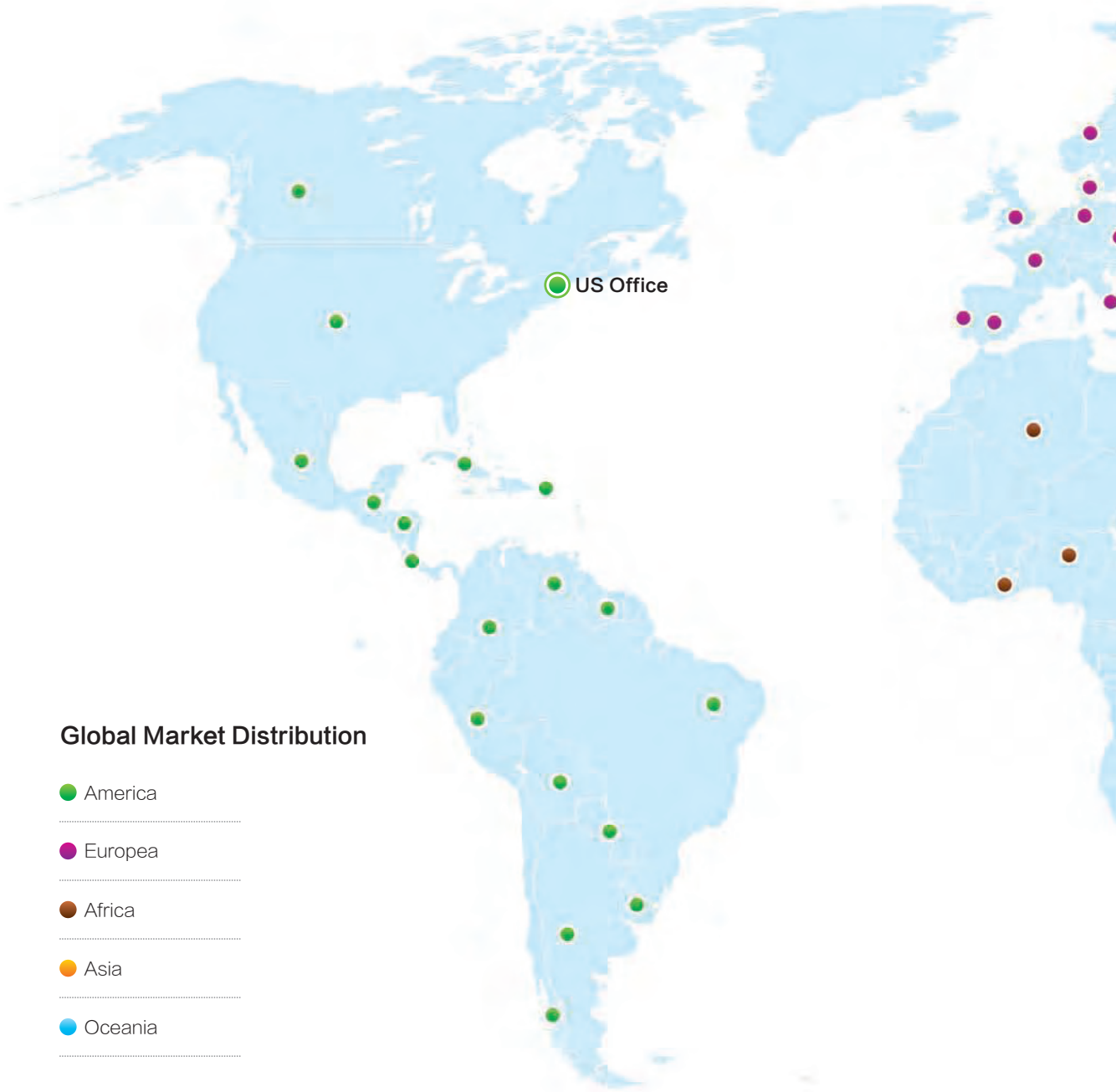
With more than 27 years experience in power market, Kehua's products have been installed in more than 80 countries and regions. Products could match the certificates of CE, SAA, TUV and others for different market request.

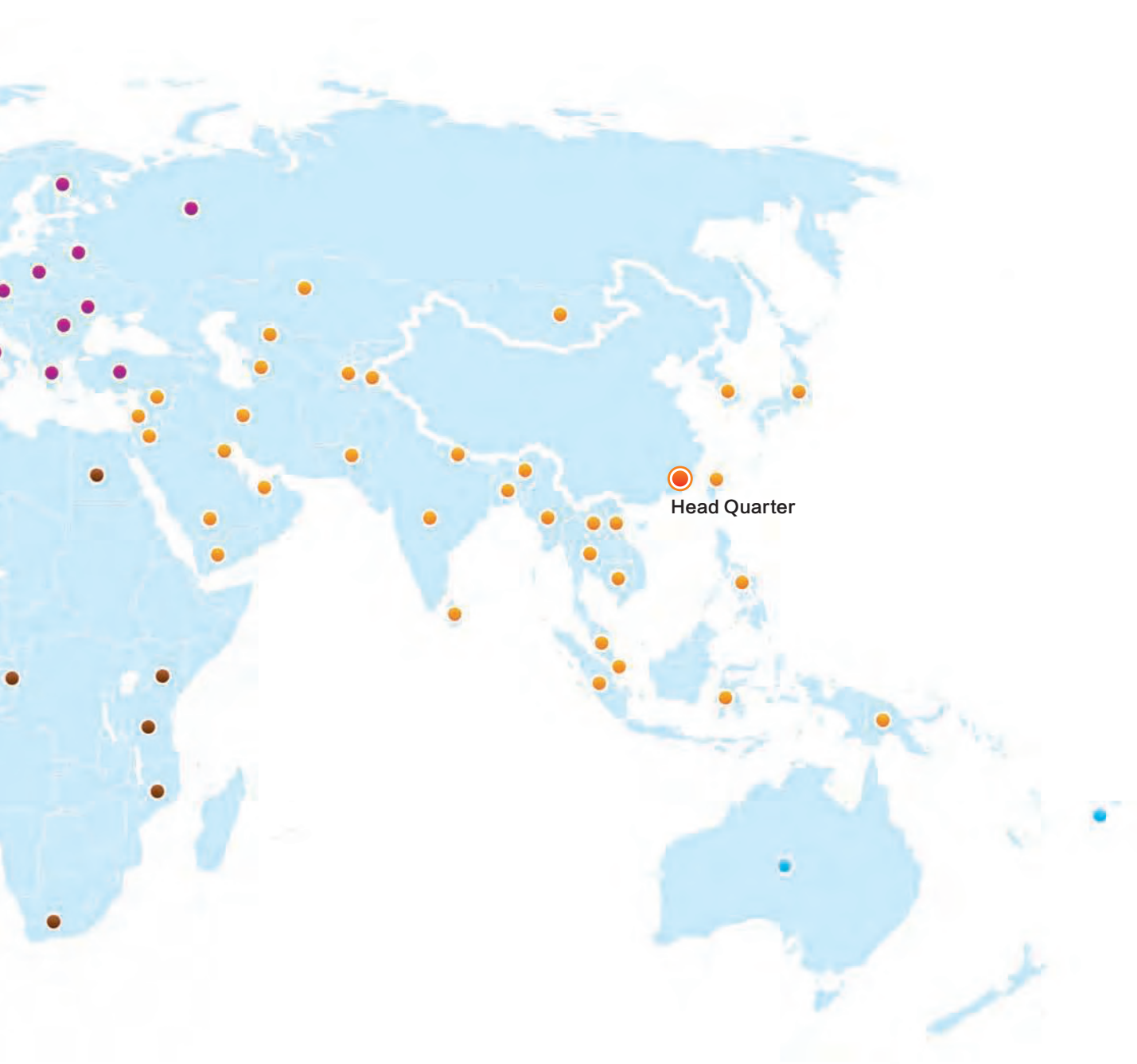
The Renewable Energy Solutions we supply include: Large PV Power Plant, Distributed Power Solution, Off grid PV System, Energy Storage System and EV Charger.



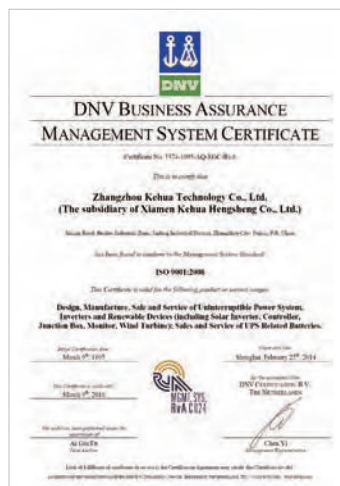
Global Marketing Strategy

In 1997, KEHUA started overseas business by exporting products to Japan and America. Today, KEHUA products have reached five continents, serving users in over 80 countries and regions, and keep devoting in the exploration of international market.





Qualifications





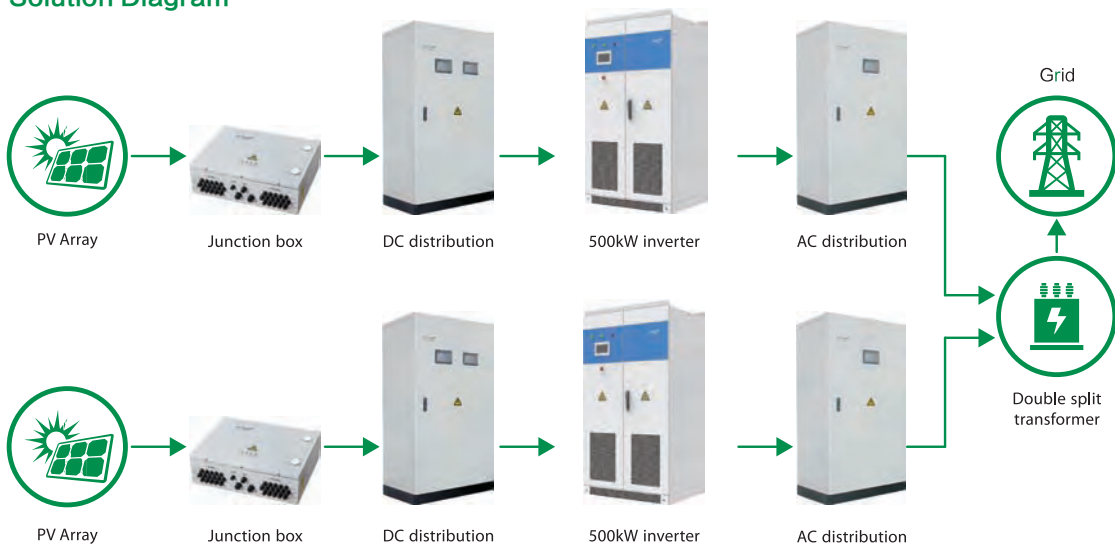
Large PV Power Plant Solution

Large photovoltaic power station can mainly be used in the place where has rich solar and land resources. The installed capacity is usually more than 10 MW, and it undertakes the task of power supply with the high voltage area of utility connection.

Outdoor Container Solution Diagram



Indoor Solution Diagram

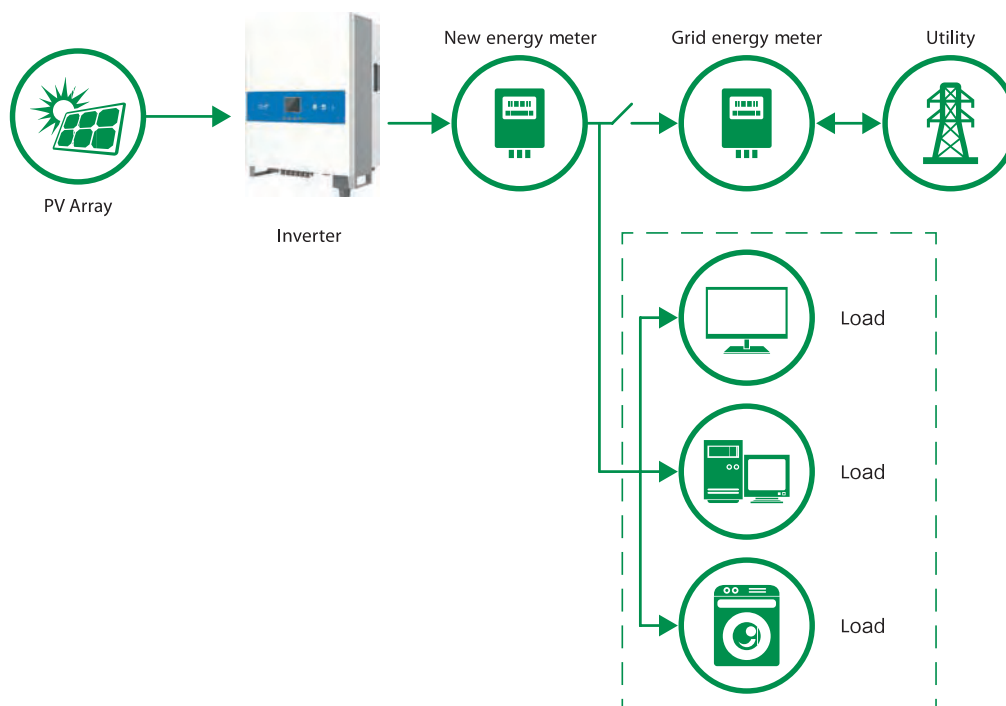


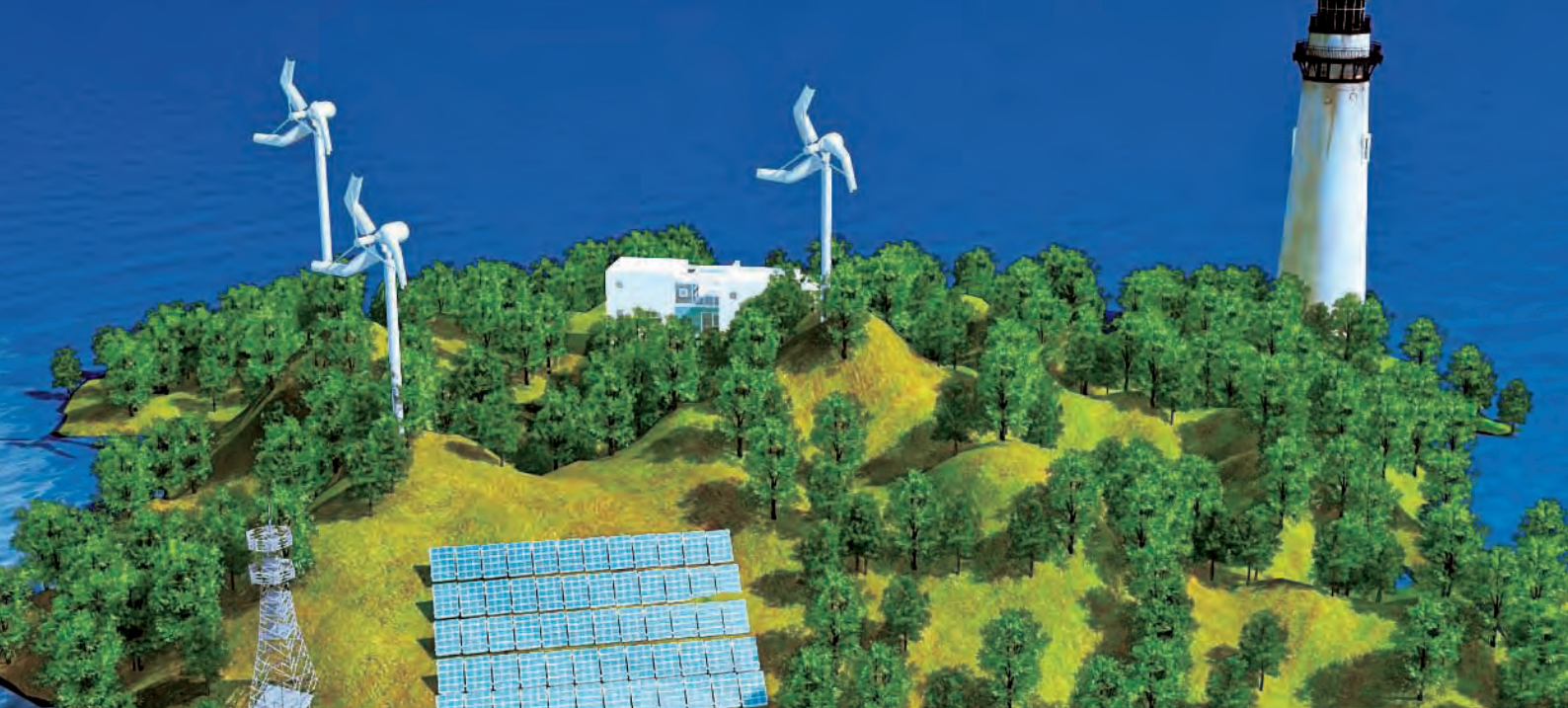


Distributed PV Power Solution

Distributed photovoltaic power station can make full use of idle roofs, beaches, agricultural greenhouses, etc., by connecting to the user's grid, it can maximize self-consumption and release power transmission pressure.

Solution Diagram

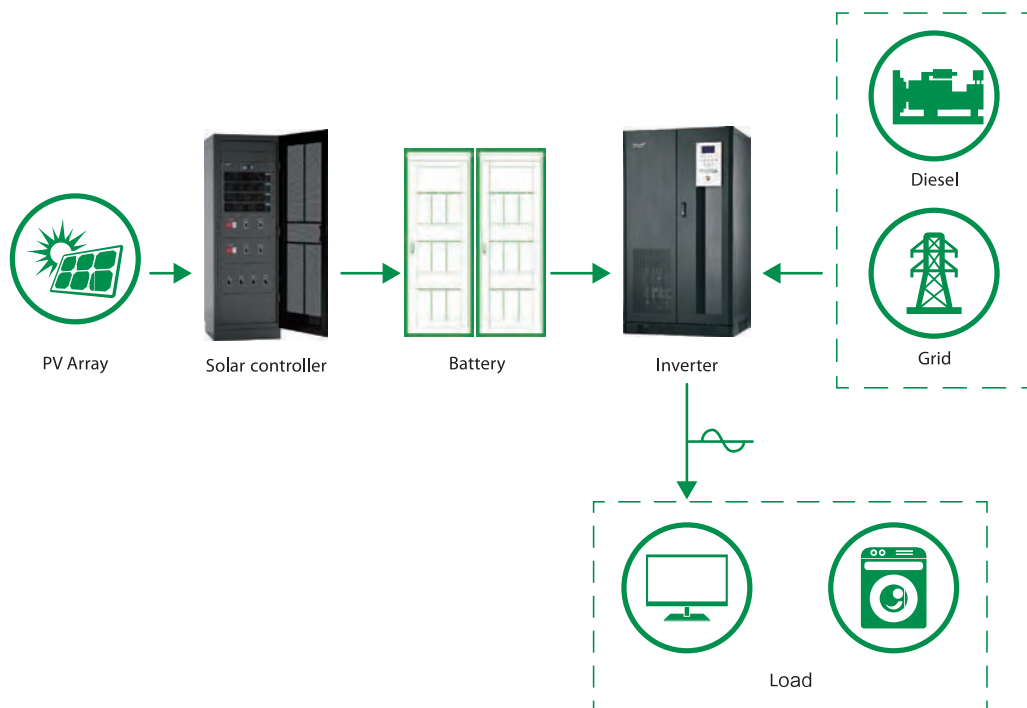




Off-grid PV Power Solution

Off-grid system is the stand-alone system without the support of grid or with the grid only as back-up source. It's mainly used for port lighting systems, communication bases and households in regions without electricity, highway monitoring systems, pasturing areas, islands and so on.

Solution Diagram

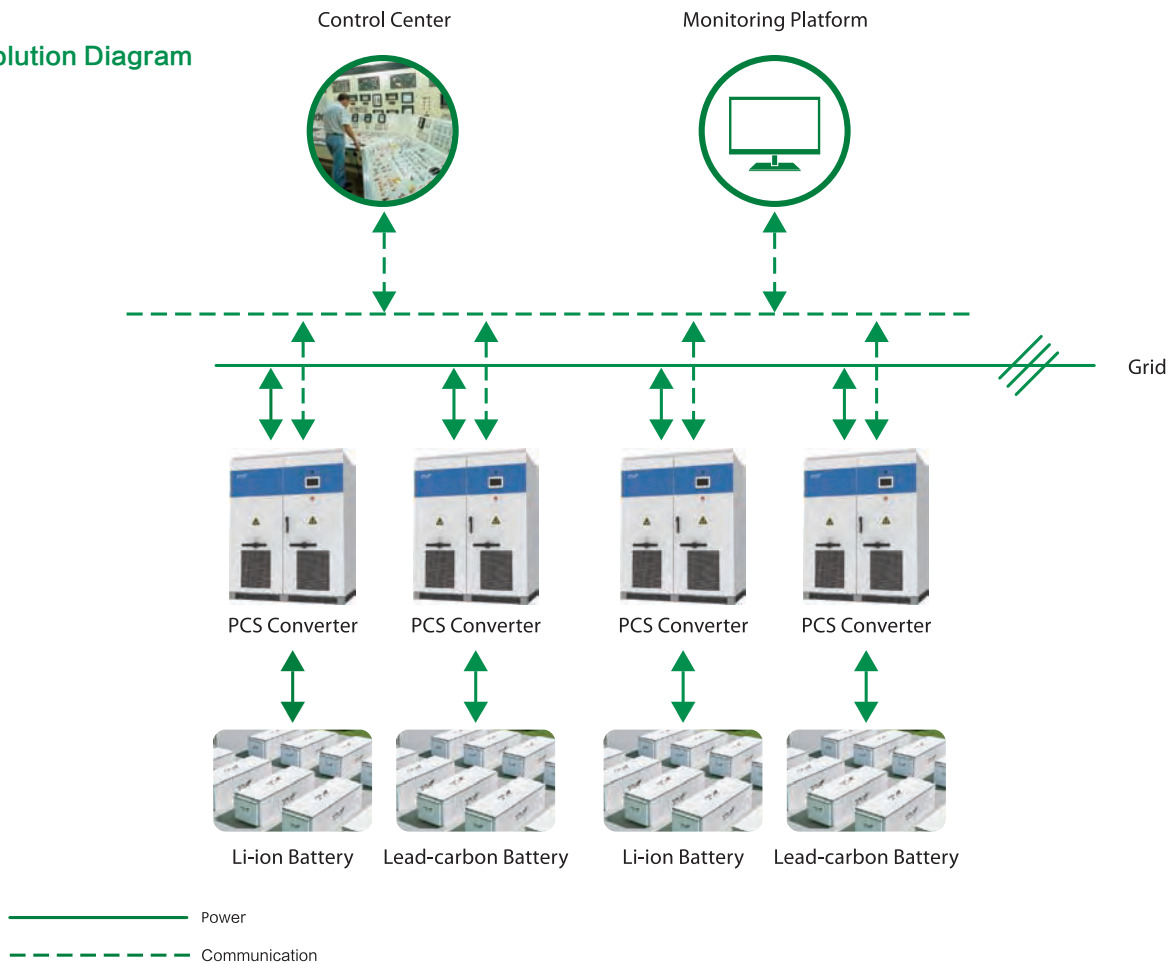




Energy Storage Solution

Energy storage system is mainly consist of the bidirectional converter and batteries, to realize the grid power peak shaving, stabilize the volatility, increase electric quality and economic benefit, and also supply back-up power for loads.

Solution Diagram





Three-phase Off-grid Inverter

- » High efficiency up to 95%
- » ECO mode efficiency more than 99%
- » Full load adaptation, with output transformer, 100%
- » Customized design all-in-one solution including monitor etc.

High Reliability:

- Standard output isolation transformer
- Independent cooling air duct
- No-master-slave N+X parallel technology

Excellent Performance:

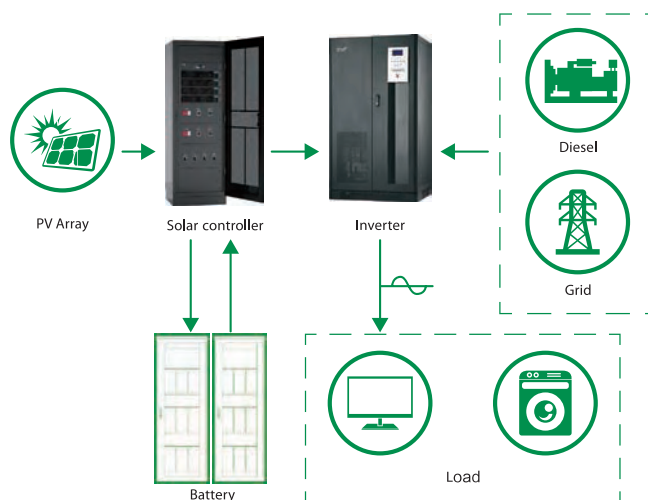
- Super wide input voltage and frequency range
- Double DSP and full digital control
- Allow 3 phase loads 100% unbalance

High Efficiency:

- Inverter efficiency up to 95%
- ECO mode efficiency more than 99%

Smart Management:

- User-friendly-Interface 10 inch touch screen
- Intelligent RS232/RS485
- 8+6 dry contact communication signals



Value-added Service:

- Customizable design
- Battery monitor system-MMBM
- IP grade upgraded
- User-friendly-Interface 10 inch touch screen



Three-phase Off-grid Inverter

Technical Specification:

Model	10K	20K	30K	40K	50K	60K	80K	100K	120K	160K	200K	300K	400K	500K
Specification														
Input														
Battery Voltage (VDC)	348V										384V			
Output														
Rated Power (kVA)	10	20	30	40	50	60	80	100	120	160	200	300	400	500
Phase	3φ4W+GND													
Voltage (Vac)	L-N: 230 L-L: 400 (200,208,220 are available for customization)													
Frequency (Hz)	50±0.2%													
Wave Form	Sine wave, THD<3% at linear load													
Maximum efficiency	95%													
Overload Capacity	125% of rated load last for 10 minutes, 150% of rated load last for 1 second													
LCD Display	Output voltage, frequency, Battery voltage, Load, DC current etc.													
LED Display	Work status of inverter, fault indication and overloading													
Communication	RS232/RS485, dry connection communication signal													
Protection	Output short circuit, Overload, Over-temperature, battery low voltage, Output over/low voltage													
IP Grade	IP20													
Noise (dB)	<65													
Cooling	Fans													
Operating Temperature (°C)	-20°C ~ +40°C													
Relative Humidity	0 ~ 95%, No condensation													
Dimension (WxD×H) (mm)	500×800×1180			800×800×1600			1000×800×1800		1000×800×1800		1400×1000×1850	1600×1000×1850		3000×1000×1800
Weight (Kg)	195	240	290	450	470	490	690	725	775	980	1280	1830	2050	4500

• Specifications are subject to change without prior notice.

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Single Phase Off-grid Inverter

- » Input/output double isolation
- » N+X redundant design

Easy for Use:

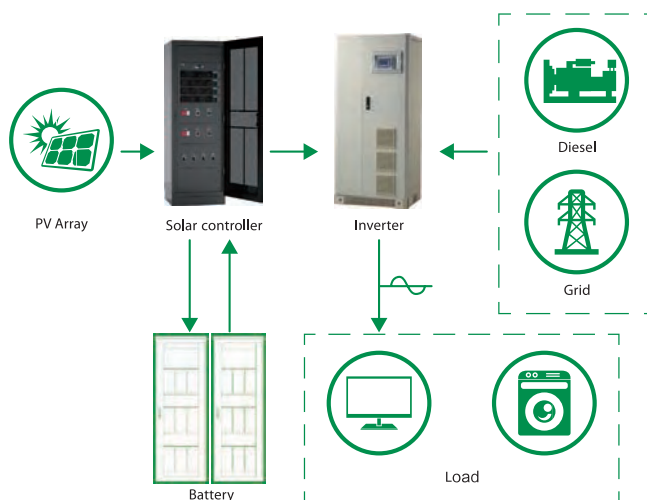
- With internal battery breakers and load breakers
- Front access, easy maintenance

Excellent Performance:

- No-master-slave parallel technology
- Intelligent battery charging control, extend the battery lifetime
- Wide working temperature range, -25 ~ +55°C

Friendly Interface:

- LCD screen with perfect data and system status logs
- RS485/RS232 communication, easy monitoring
- Full dry contact communication function, with battery low alarm, load control, etc
- Optional touch screen monitor for user-friendly management



High Reliability:

- Adopt DSP chips, input/output double isolation
- N+X redundant design, avoid single point of failure
- Perfect protection function



Single Phase Off-grid Inverter

PV Inverter SPO11 series 10-60kVA specification:

Item	Item	SPO1110	SPO1120	SPO1130	SPO1140	SPO1150	SPO1160
Input							
DC input (VDC)	220						
Output							
Power (kVA/kW)	10/8	20/16	30/24	40/32	50/40	60/48	
Voltage range (Vac)	220±2%						
Frequency (Hz)	50±1% (battery mode)						
Waveform	THD≤3% (linear load)						
Bypass switching time (ms)	0						
Battery efficiency	≥90%(100% linear load)						
Over load	105% load: 10 min, 125% load: 1 min						
Wire splice	Terminal block						
Current sharing	≤5% (parallel mode only)						
Others							
Maintenance bypass	Available(cancelled in parallel mode)						
Back-up time	Settable						
Parallel	Expand at will / N+1 redundancy (parallel mode only)						
LCD interface	Frequency, output voltage, battery voltage, load, etc						
LED display	Working status						
Alarm	Overload, battery low voltage, failure						
Communication	Dry-contact/RS232/RS485						
Protection	Battery low voltage, over load, over temperature, output short circuit, output over voltage						
SPD (optional)	Three phase lightning protection unit match IEC1312 standard.						
EMC	Match EN50091						
Noise (dB)	<65 (1 meter distance)						
Cooling	Forced Air Cooling						
Temperature (°C)	-25~55						
Relative humidity	0~95% (no condensation)						
Dimension(W×D×H)(mm)	800×600×1600						
Weight (kg)	235	276	286	302	315	320	

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PV Controller

SPC048 Series

- » MPPT function, high efficiency
- » Modular design, easy for expansion
- » Integrated power distribution

Excellent Performance:

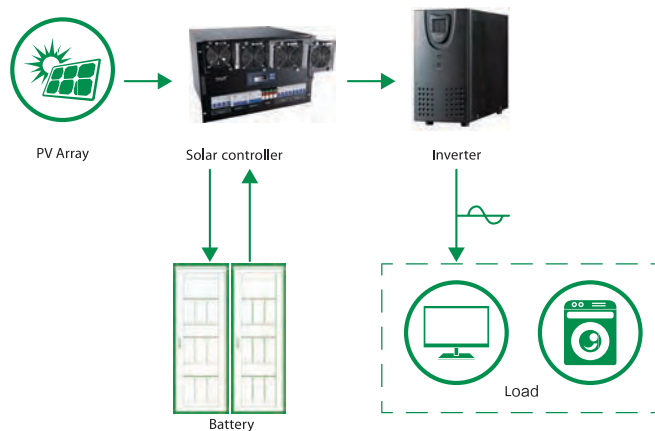
- Full DSP control technology
- MPPT function, maximize the utilization of solar panels
- Low power dissipation, zero night-time dissipation
- Wide input range, flexible solar panel configuration
- Wide working temperature range

High Reliability:

- Modular design, flexible expansion and easy maintenance
- Full alarm and protection function
- Load prioritize shut down control function
- PCB boards feature with anti-corrosion paint coating

Smart Management:

- RS485/RS232 communication, easy monitoring
- Full dry contact communication function
- Intelligent battery charging control, extend the battery lifetime



MPPT controller Specification:

	SPC048100-M	SPC048150-M	SPC048200-M
MPPT module capacity	50A MPPT modulex2	50A MPPT modulex3	50A MPPT modulex4
PV input (switch)	2 strings (63A x 2)	3 strings (63A x 3)	4 strings (63A x 4)
PV input current	Max.2 x 40A	Max.3 x 40A	Max.4 x 40A
PV input voltage range	50V ~ 150V		
Battery strings (switch)	2 strings x 100A (detect total current)		
Output strings (switch)	Critical load: 4 strings (63 A+50 A +32 A +20 A) subordinate load: 44 strings (63 A+50 A +32 A +20 A)		
output voltage	44.0 Vdc~58.0 Vdc, typical value: 54.0 Vdc		
MPPTcontroller outputcurrent	Max.100A	Max.150A	Max.200A
Efficiency	≥95%	≥95%	≥95%
IP grade	IP20		
Working temperature	-20°C ~ 55°C (more than 40°C, derating)		
Storage temperature	-40°C ~ 70°C		
Relative humidity	5% ~ 95%		
Altitude	<5500m, (more than 3000m,derating)		
Dimension (W*D*H)	487 x 426.3 x 352.5 (mm)		

MPPT module Specification:

Item	Specification
Capacity	50A
Input voltage range	50~150Vdc (Max. open circuit voltage:150Vdc)
Input current	Max. 40A
Output voltage range	44.0Vdc~58.0Vdc, typical value :54V
Outputcurrent	Max. 50A
MPPT tracking accuracy	>99%
Max. efficiency	≥95%
Stand-by power consumption	<5W
Cooling	Forced air cooling
Noise	<60dB
Installation	Install slot, hot swappable
IP grade	IP20
Working temperature	-20°C ~ 55°C
Storage temperature	-40°C ~ 70°C
Relative humidity	5% ~ 95%
Altitude	<5500m, (more than 3000m,derating)
Dimension (W x D x H)	108.5 x 362.8 x 111 (mm)

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Off-Grid Inverter

48V Series (Transformerless)

- » Motor load acceptable
- » Modular & rack design
- » Telecom standard level

Easy for Use:

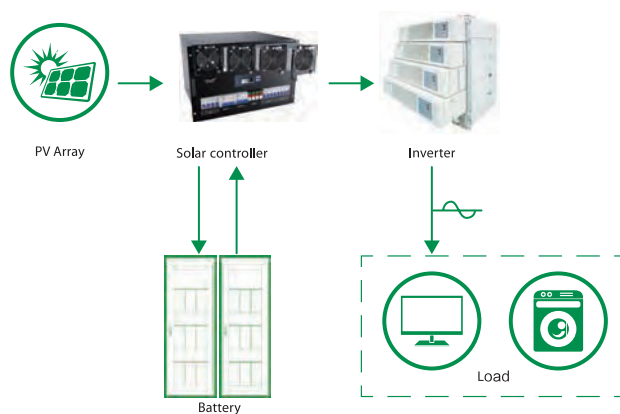
- Can start-up motor load like air condition
- Modular design, high flexibility and easy maintenance
- Rack type, easy installation and operation

Excellent Performance:

- Adopt telecommunication strict standard
- Modular design, flexible and easy maintenance
- Strong overload capacity

High Reliability:

- System with perfect protection function
- N+1 modular redundant design, hot swappable
- Advanced IGBT with high reliability
- More than 16 years telecom application experience



Friendly Interface:

- DB9 dry contacts and RS232 communication
- Easy operation for ON/OFF switch
- LEDs real time show the system working status
- Elegant appearance design



Technical Specification:

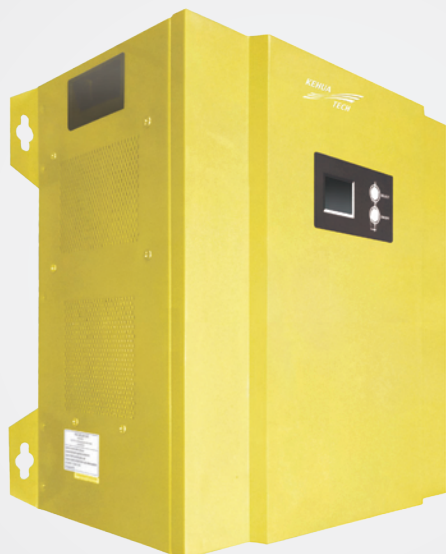
Model	1000	2000	3000	6000	9000	12000
DC Input Data						
Rated DC Input current (A)	17	34	50	100	150	200
Rated DC Voltage (VDC)	48					
DC Voltage Starting Range(VDC)	40~57					
AC Output Data						
Rated AC Output Power (VA/W)	1000/700	2000/1400	3000/2100	6000/4200	9000/6300	12000/8400
Rated Output Voltage (V)	220/230/240±1% (110/120/127 are available for customization)					
Rated Output Current (A)	4.5	9.0	13.6	37.3	40.9	54.5
Rated Output Frequency (Hz)	50±1%					
Harmonic Distortion	THD<3 (Linear Load)					
Power Factor	0.7					
Overload Capacity	105%~125% for 80s; 126%~150% for 1s					
Inverter Efficiency	83%		88%	87%		
Peak Factor	3:1					
Others						
Protection Level	IP20					
Operating Ambient Temperature	-20°C~ 40°C					
Operating Ambient Humidity	0~95%					
Reference Dimension (W x D x H) (mm)	440x286x1U	440x358x2U		445x335x445		
Reference Weight (kg)	5	9.5	13.5	32	41	49
Communication Port	RS232					

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Off Grid Inverter/Charger

KI-B Series (1.5-10KVA)

- » Wide input voltage range
- » Big charge current and settable (LCD)
- » Intelligent generator management
- » PV mode and AC mode settable (LCD)

Excellent performance:

- Pure sine wave inverter with charger
- High charge current and settable
- Wide grid input range
- Generator manageable and settable
- PV first or AC first settable
- High system efficiency up to 95%

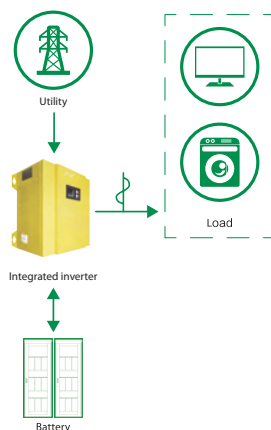
High reliability:

- With IP31 protection level
- Isolation transformer
- Digital control technology

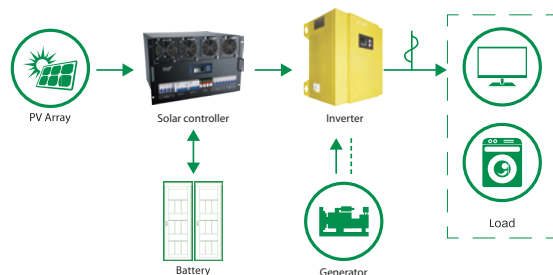
Easy for use:

- Friendly LCD displaying and setting
- Wall-mounted type design
- Intelligent battery management
- Intelligent RS232 communication port

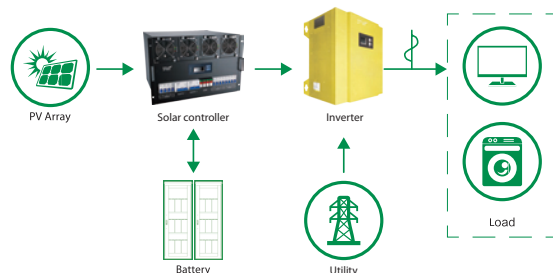
1. Home use solution



2. Solar Off grid solution with generator



3. Solar off grid solution with utility



Application



Home use
backup power



Commercial
backup power



Home use
off grid solar
inverter system



Communication
base solar energy
off grid system

Model	KI1500L	KI2500L	KI3500L	KI6000L	KI10000L
Input					
Voltage(Vac)	150-285				
Frequency(Hz)	50±5%				
Output					
Capacity (W)	1200	2000	2800	4800	8000
Voltage (Vac)	230±10%,				
Frequency(Hz)	50±0.5% (battery mode)				
Waveform	Pure sine wave, THD≤3% (linear load)				
Efficiency (DC-AC)	85%		90%		
Efficiency (AC-AC)	95%				
Transfer time (ms)	6 (typical)				
Overload	<105% long time working, 105%~115% load for 30s, >115% load for 3s				
Battery					
Voltage (VDC)	12V×2=24		12V×4=48		12V×8=96
BATT Type	External				
Charging Current(A)	40A Max, settable	50A Max, settable		75A Max, settable	
Battery Self-testing	Automatically alarm and estimate battery status in battery abnormal status				
Others					
Communication	RS232				
Display	LCD Display indicates frequency, voltage, load, battery voltage, etc. LED indicates running status				
Alarm	Overload, abnormal AC input, low battery, UPS failure				
Protection	Low battery, overload, over temperature, short circuit, etc.				
Noise (dB)	< 55			< 60	
Protection level	IP31				
Working Temperature	-20~60℃ (it needs derating if more than 40℃)				
Relative Humidity	0 ~ 95%, No condensation				
Weight (kg)	34	41	50	56	100
Dimension (mm) (W x D x H)	450 x 290 x 288		450 x 288 x 500		720 x 288 x 500

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MPPT Solar Controller

220V/348V/384V Series

- » High efficiency, up to 98.4%
- » Modular design
- » Full digital control technology

Easy for Use:

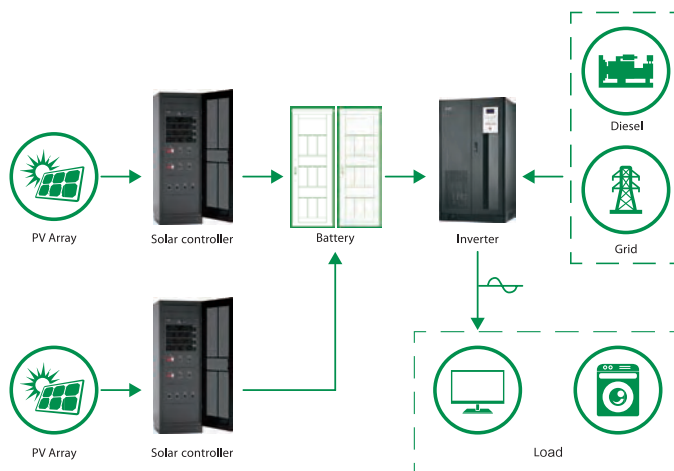
- With internal PV breakers, battery breakers and load breakers
- Modular design, high flexibility and easy maintenance

Excellent Performance:

- Wide input range, flexible solar panel configuration
- MPPT function, maximize the utilization of solar panels
- Peak efficiency, up to 98.4%
- Intelligent battery charging control, extend the battery lifetime
- Wide working temperature range, -25 ~ +55°C

High Reliability:

- Adopt DSP chips, full digital control technology
- N+X modular redundant design
- Optional integrated controller + inverter solution



Friendly Interface:

- LCD screen with PV generation and system status logs
- RS485/RS232 communication, easy monitoring
- Full dry contact communication function, with generator start control, battery low alarm, primary load control, secondary load control, etc.
- Optional touch screen monitor for user-friendly management



Item		SPC384300-M	SPC348300-M	SPC220300-M
Input	PV input voltage(VDC)	420~850	420~850	270~550
	PV full load working voltage(VDC)	500~700	440~700	270~430
	Max PV input current(A)	240	240	240
	PV input rated power(kW)	29×4	26×4	16×4
Output	Battery voltage range(VDC)	336~464	304~420	189~260
	Battery rated voltage(VDC)	384	348	220
	Rated output current (A)	300		
Others	Working ambient temperature (°C)	-20~55		
	Working altitude (m)	3000m,>1000m derating use		
	IP Grade	IP20		
	Dimension (W x D x H) (mm)	600×600×1800		

MPPT module parameter:

Item		SPC384300-M	SPC348300-M	SPC220300-M
Input	PV input voltage(VDC)	420~850	420~850	270~550
	PV full load working voltage(VDC)	500~700	440~700	270~430
	Max PV input current(A)	60	60	60
	PV input rated power(kW)	29	26	16
	MPPT tracking precision(MAX)(%)	≥99.5		
Output	Battery voltage range(VDC)	336~464	304~420	189~260
	Battery rated voltage(VDC)	384	348	220
	Battery rated current (A)	75	75	75
	Module maximum efficiency(%)	≥98.5	≥98.4	≥98.0
	Output ripple voltage coefficient(%)	≤±1.5		
Others	Stand-by power consumption(W)	12		
	Power consumption at night(W)	0		
	Night reverse discharge current(A)	0		
	Cooling	Air cooling		
	Noise(dB)	≤60		
	Dimension (W x D x H) (mm)	440×430×89(2U)		

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Applications

Large PV Power Plant Solution

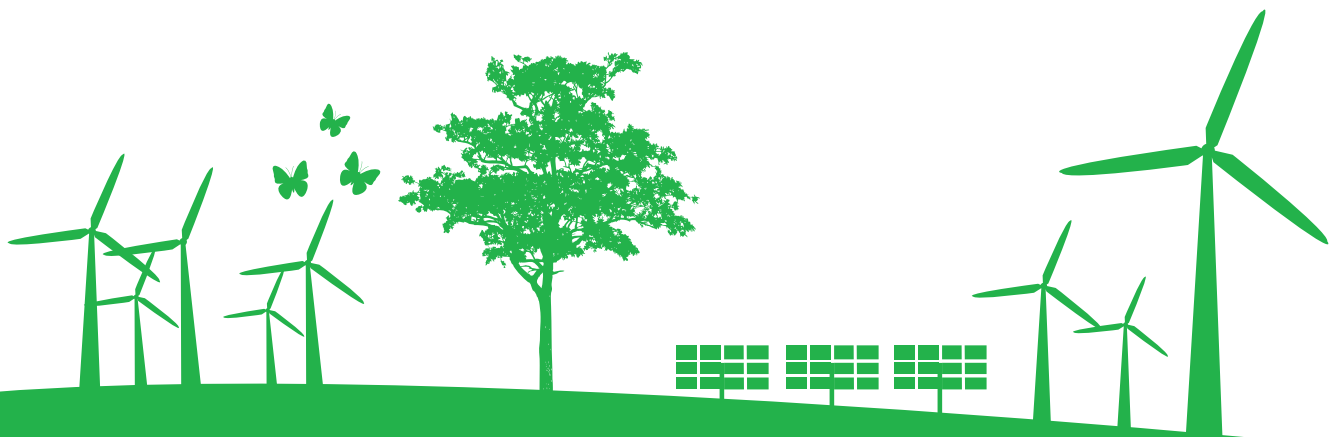
- Anhui JinZhai 150MW PV ground station
- Hainan East 100MW PV ground station
- Jiangsu Jinhua 47MW fishing lake power station
- Ningxia Zhongwei Hannan 20MW PV ground station

Distributed PV Power Solution

- Guangdong Shunde 30 MW roof PV power station
- Mongolia Chery Auto factory 20 MW roof PV power station
- Gansu Lanzhou industrial park of 15 MW roof PV power station
- Shandong Chang Lin group 7.39MW roof PV power station

Off-Grid PV Power & Energy Storage Solutions

- Mongolia gorge scenic area MW level off-grid power station
- 1.2MW container off-grid system for Uzbekistan
- Island 160kWh energy-storage power station in Australia
- Xiamen factory energy internet storage project





Grid-tied PV inverter

SPI20~40k-B Series

- » High efficiency, up to 98.6%
- » Easy monitoring
- » Advanced design for reliability assurance

Efficient and flexible:

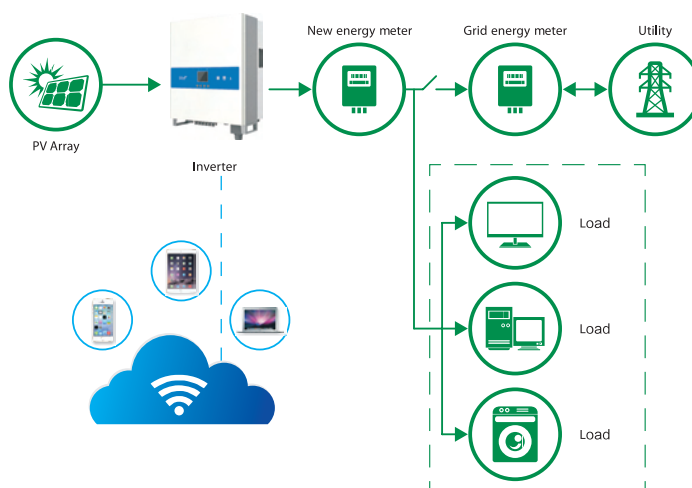
- Wide MPPT range 320~950V
- Peak efficiency up to 98.6%, transformerless
- 2 independent MPPT and 6 input strings
- Precise MPPT algorithm achieve 99.9%, more generation

Excellent Performance:

- Power factor adjustable (0.8 leading...0.8 lagging)
- Grid-friendly with LVRT and accept grid dispatching
- IP65 for outdoor application
- Operating temperature range, -25~60°C
- Less noise emission, <29dB (natural cooling)

High Reliability:

- Double working power double resource supply for redundant
- Best components ensure reliability and long life
- DC reverse connection & AC short circuit protection
- Sensitive current leakage protection
- DC & AC lightning protection



User Friendly:

- 3.5-inch high-end intelligent color LCD
- RS485/Wi-Fi/SNMP/USB for option, easy monitoring
- Plug and play connection unit
- Wall mounted, quick installation and easy maintenance



Specification:

Item	SPI20K-B2	SPI30K-B2	SPI40K-BHV
Input			
Max. PV input power(W)	22000	34000	45000
Max. PV input voltage(Vdc)	1000		
Startup voltage(Vdc)	280	350	
MPP voltage range(Vdc)	320~950	200~850	
No. of MPPTs	2	4	
Max. number of PV strings	6	8	
MPPT efficiency	99.9%		
Output			
Nominal AC output power(W)	20000	30000	40000
Rated AC output current(A)	28.9	43.3	48.1
Nominal AC voltage(Vac)	380/400		480
Grid voltage range(Vac)	304~460(adjustable)		384~576(adjustable)
Grid frequency range	47~52Hz or 57~62Hz(adjustable)		
THDi	<3%		
Power factor	0.8 leading...0.8 lagging		
General Data			
Max. efficiency	98.3%	98.6%	
European efficiency	98.0%	98.3%	
Standby consumption	<5W		
Night power consumption	<1W		
Display	3.5" LCD color screen	7.0" LCD color screen(optional)	
Ingress protection	IP65		
DC connection type	MC4 Connector		
AC connection type	Terminal connectors		
Warranty	5~10Years		
Operating temperature	-25~60℃		
Cooling concept	Natural convection		
Noise	<30dB		
Dimensions (W x H x D)	510 x 630 x 265mm	530 x 700 x 356mm	530 x 700 x 356mm
Weight(kg)	38	58	58
Communication	RS485, Wifi/GPRS(optional) interface		
Protection			
Anti-islanding protection	Yes		
LVRT	Yes		
DC reverse connection protection	Yes		
AC short circuit protection	Yes		
Leakage current protection	Yes		
DC switch	Yes(option)		
Overcurrent protection	Yes		
PV fault detect	Yes(option)		
DC lightning protection	Yes		
AC lightning protection	Yes		
Over temperature alarm/protection	Yes		

Xiamen Kehua Hengsheng Co., Ltd.

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Central Inverter

SPI Series (10-630kW)

- » High efficiency up to 99%
- » High reliability with DSP control
- » High adaptability with output isolation transformer

High Reliability:

- With isolation transformer for SPI-A series
- Water, Dust & Corrosion resistant coating for control board
- DSP control technology
- Anti-islanding protection
- LVRT function, strong adaptability to the grid

Green Saving:

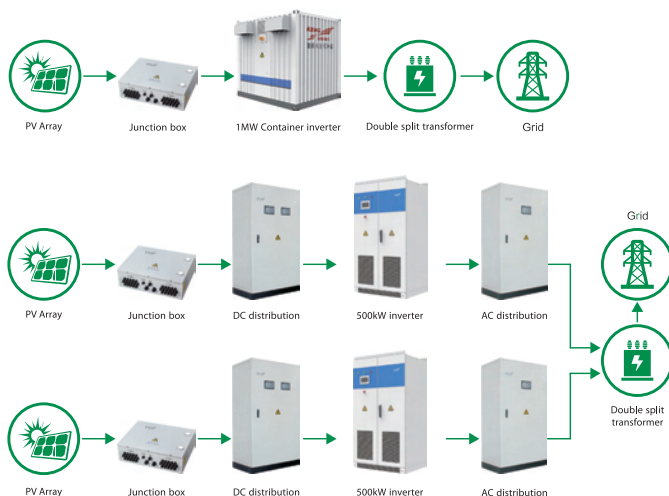
- Peak efficiency up to 99%
- MPPT efficiency more than 99%

Intelligent Management:

- Active and reactive power scheduling
- Power factor 0.9 lead~ 0.9 lags adjustable continuously

Flexible Design:

- Convenient wiring compartment and cable connection
- Compact design, light weight, high power density, easy to install



Value-added Service:

- SPI monitor software
- SPB series Junction box
- IP grade upgraded
- Anti reflux controller
- Customer design air duct for different room



Technical Specification:

Model	SPI10K-A	SPI20K-A	SPI30K-A	SPI50K-A	SPI100K-A	SPI250K-A	SPI500K-B	SPI630K-B
Input Data								
Max. PV Array Power (kW)	11	22	33	55	110	275	550	700
Max. PV Array Open Circuit Voltage (VDC)	880					1000		
Max. DC Current (A)	24.5	49	94	125	245	600	1200	1400
MPPT Range (V)	450~850					460~850		500~850
Output Data								
Rated Output Power (kW)	10	20	30	50	100	250	500	630
Rated Grid Voltage (V)	380						315	
Rated AC Frequency (Hz)	50/60Hz							
Total harmonic distortion THD	<2.6%	<2.5%	<2.4%	<2.6%	<2.4%	<3%	<3%	<3%
Power factor	>0.99(@full load, adjustable)							
Efficiency								
The maximum Efficiency	94.8%	95.1%	95.4%	96.2%	96.6%	98.2%	99.0%	99.0%
Europe Efficiency	94.1%	94.6%	94.8%	95.7%	96.2%	97.8%	98.8%	98.8%
Others								
IP Grade	IP20							
Environment temperature	-25℃ ~ +55℃							
Humidity	0~95%, no condensation							
Altitude	<3000m (>3000m, derating)							
Protection	DC input overvoltage, low voltage protection, over temperature protection, output overvoltage, island fault protection							
Communication ports	RS485/Ethernet (optional) / GPRS (optional)							
Dimension (WxDxH) (mm)	600×600×1250			800×800×1800		1000×800×2000	1100×800×2000	1400×800×2000
Weight (kg)	210	238	480	510	750	1500	1000	1200

- 120V/208V 277V/480V On-grid inverter for South and North American Markets are available for customization.
- Specifications are subject to change without prior notice.

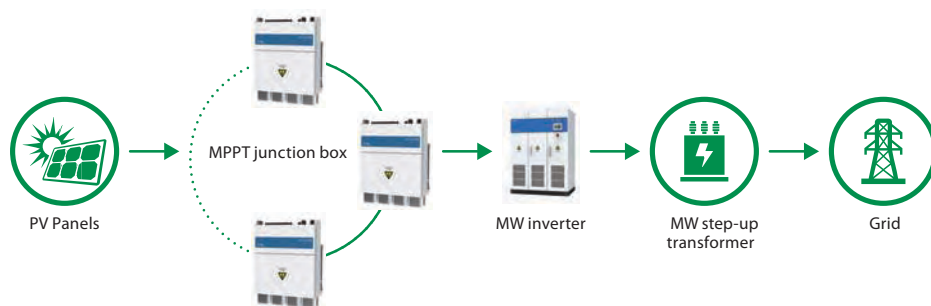
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Central-Distributed PV Solution



Higher
Efficiency



Cost
Reduction



Increase
Productivity



Complex
Environment



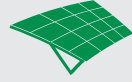
No
Resonance



Central-Distributed PV Solution

+3%↑

Efficiency 3% higher than the centralized solution



Suitable for complex environment like uneven ground

-10%↓

System cost is 10% lower than string inverter solution



Compared with string inverter solution, no multimachine parallel harmonic, no resonance, easy dispatching

**48
MPPT**

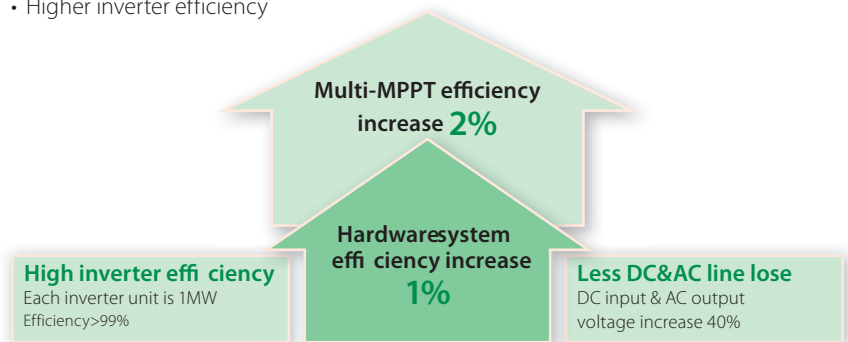
1MW with 48 MPPT, increase power generation



Yield 50,000kWh/MW/Year more

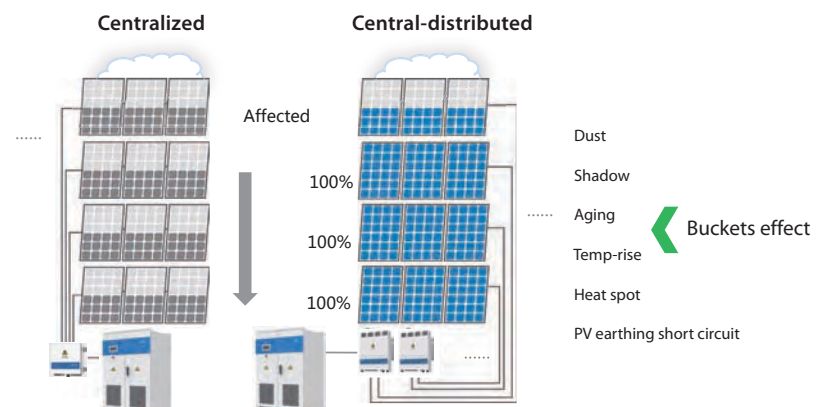
Higher System Efficiency:

- Multi-MPPT with higher MPPT efficiency
- DC input & AC output voltage increase 40%
- Reduce the DC&AC line loss
- Higher inverter efficiency



Reduce the system mismatch cause by single string fault:

- If one string PV panels is affected by dust, shadow, aging, heat spot or short circuit... for centralized inverter station, there is buckets effect
- For Central-Distributed solution, other parts of the system will not be affected





Excellent Central Inverter:

- Efficiency up to 99.2%, compact design, high power density
- Three-level circuit topology + high reliable drive technology
- High altitude design, working temperature range: -40°C~ +60°C
- Grid-friendly with LVRT and easy dispatching
- Best components ensure reliability and long life
- Efficient patent thermal design, intelligent fan speed control
- Inverter fault wave record function, failure rapid positioning

Specification	SPI1000K-BS
DC side	
Max. PV Array Power (kW)	1123
Max. PV Array Open Circuit Voltage (VDC)	1000
Max. DC Current (A)	1404
Integrated DC Distribution Strings	12~14
Input Voltage Range (V)	720~950
AC side	
Rated Output Power (kW)	1000
Max Output Power (kW)	1100
Rated Output Voltage (V)	520
Output Voltage Range(V)	442~572
Rated AC Frequency (Hz)	50/60
THDi	<3%
Power Factor	>0.99 / -0.9~+0.9adjustable
Isolation Type	Transformerless
Efficiency	
Maximum Efficiency	99.2%
Europe Efficiency	98.9%
Others	
IP Grade	IP20
Environment Temperature	-40°C ~ +60°C
Humidity	0~95%, no condensation
Altitude	3000m (>3000m derating)
Cooling	Forced air cooling(fans speed control)
Communication Ports	RS485/Ethernet (optional) / GPRS (optional)
Dimension(WxDxH) (mm)	1400x800x2000
Weight (kg)	1100

Central-Distributed PV Solution



Excellent Smart MPPT Junction Box:

- Multi-channel MPPT control design, improve system efficiency
- PV panels fault detection function and auto isolation from grid, ensure the safe operation and maximum power output
- Intelligent self-checking, fault detection and safety protection function
- Each MPPT branch intelligent blocking(anti-reverse) function
- No external fan, natural cooling; internal fan using uniform temperature design, prolong the lifetime of junction box
- Advanced SIC technology, higher efficiency

Specification	SPC1000120-B
Input	
Number of MPPTs	4
Number of PV Strings per MPPT	4
Max. Input Power per String	6kW
Rated Input Power per String	5.5kW
Input Voltage Range	250~950Vdc
Output	
Rated Output Voltage	820Vdc
Output Voltage Range	720~980Vdc
Max. Output Current	120A
Features	
Maximum Efficiency	99.7% (bypass), 99.5% (rated PV voltage is 600V)
IP Grade	IP65
Cooling	Natural cooling
Others	
Working Temperature	-35 °C ~+60 °C
Communication	RS485
Dimension(WxDxH)	750x280x930(mm)
Weight	70(kg)
Installation	Wall-mounted

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MW⁺ Inverter Container Solution

- » Turnkey solution, easy transportation and deploy
- » IP54, robust for 25 years lifetime design
- » Intensive, efficiency up to 99%

Intensive Turnkey Solution:

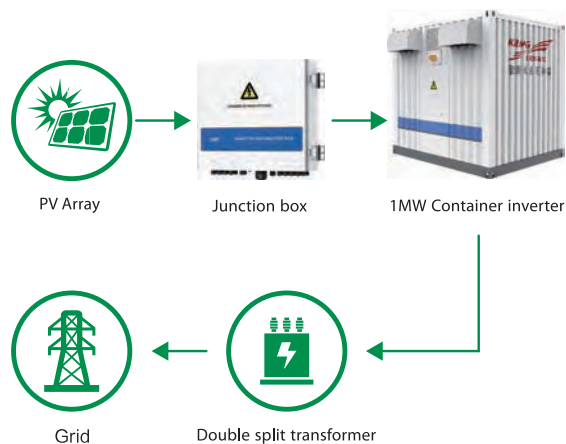
- 7ft shipping container for 1MW, only 5m²
- Integrate two high power density inverters
- Integrate lighting, cooling, security, fire-fighting
- Integrate DC power distribution in inverters
- Easy transportation and deploy

Excellent Design:

- Special sand, dust, water proof design, IP54
- Strong ventilation ensure best cooling
- Inverters front- easy maintenance design
- Washable filter, low wind resistance outlet
- Safety with access door and emergency exit

Strong Robust:

- Integrate 50mm rock-wool heat-insulating layer
- Standard shipping COR-TENA steel container
- Good mechanical strength and anti-corrosion
- External with high-end 3 layer protective coating
- 25 years lifetime design



MW⁺ Inverter Container Solution

Specification	SPI1000K-B	SPI1260-B
DC side		
Max. PV Array Power (kW)	1100	1400
Max. PV Array Open Circuit Voltage (VDC)	1000	
Max. DC Current (A)	2400	2800
Integrated DC Distribution Strings	2 x 8	2 x 10
MPPT Range (V)	500~850 (full load)	
Start-up Voltage (VDC)	520	
MPPT efficiency	99.9%	
AC side		
Rated Output Power (kW)	1000	1260
Rated Output Voltage (V)	315	
Rated AC Frequency (Hz)	50/60	
Max Output Current (A)	2020	2566
THDi	<3%	<3%
Power Factor	>0.99 / -0.9~+0.9adjustable	
Isolation Type	Transformerless	
Efficiency		
Maximum Efficiency	99.0%	
Europe Efficiency	98.7%	
Others		
IP Grade	IP54	
Environment Temperature	-25°C ~ +55°C	
Humidity	0~95%, no condensation	
Altitude	<3000m (>3000m derating)	
Cooling	Forced air cooling (fans speed control)	
Communication Ports	RS485/Ethernet (optional) / GPRS (optional)	
Dimension(WxDxH) (mm)	3029 x 2438 x 2896	4200 x 2438 x 2896
Weight (kg)	6500	6900

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Energy Storage System

SPH Series (2-5kW)

- » All-in-one solution
- » Lower your electric bills
- » Maximize self-consumption
- » Help for energy independence

Intelligent Communication:

- Monitoring through WiFi
- Cloud-base Monitoring Service
- RS485 and USB communication ports

Smart Energy Management:

- Smart self EMS for all operating mode
- Daily/Monthly/Total energy generation logs
- Full protection function
- Maximize self-consumption, lower your bills

Lithium-ion Battery:

- 10 years plus lifetime
- Capacity modularly extended from 2 to 9.6kWh
- Accordant appearance for whole system
- Intelligent BMS

Backup Power:

- Load power backed-up at grid interruption
- User-adjustable charging setting for different battery
- Battery DC/AC efficiency: 94.8%

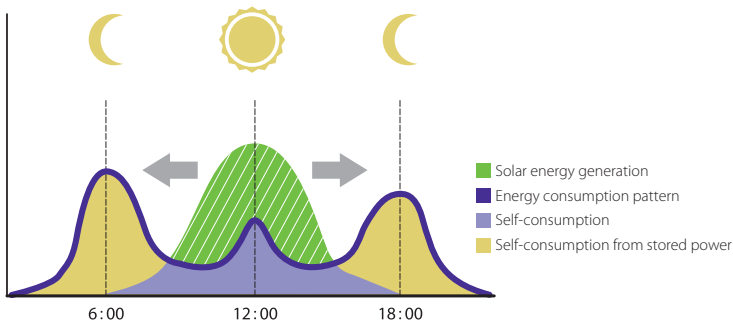


Value-added Services:

- Maximize self-consumption via internal sensing, can also add CT or Smart Meter to increase precision for option
- Lead-acid battery for option
- Power distribution cabinet



Energy Storage System



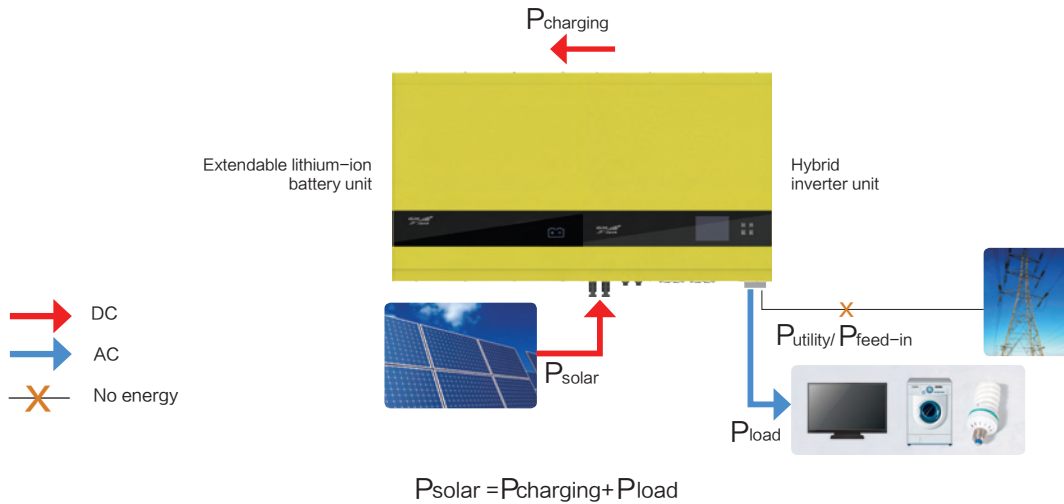
Save money for home energy management:

Kehua SPH allows to store the low price energy for nighttime when needed. With energy bills ever increasing, self-consumption by using intelligent functions for controlling setting can save money by generating your own electricity at fixed cost.

- Smart energy management, export control
- Time-of-use shifting
- Increased solar energy self-consumption
- Decreased electricity bill

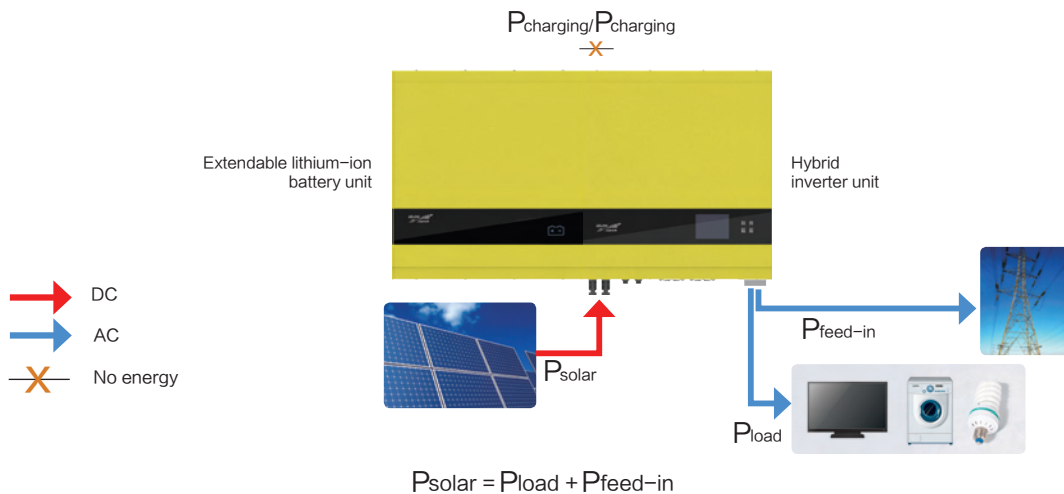
Morning mode:

- the sunshine is sufficient in the morning, then household-generated energy is used for self-consumption first.



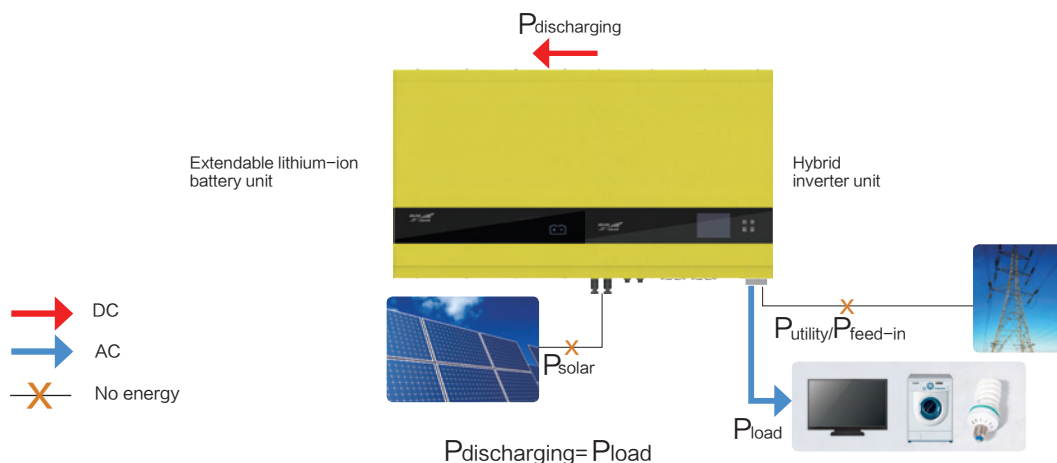
Noon mode:

- the sunshine is strong at noon, there is excess household-generated energy for feed-in to grid after battery is fully charged.

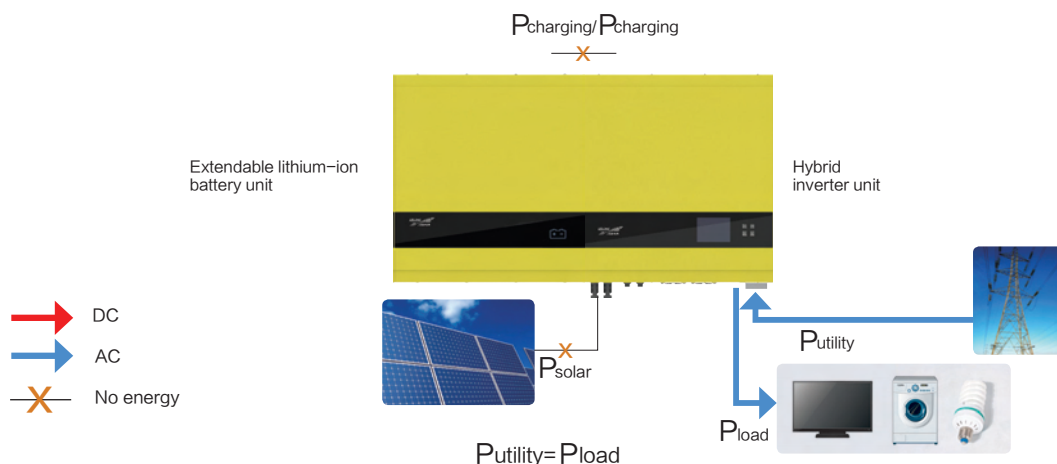


Evening mode:

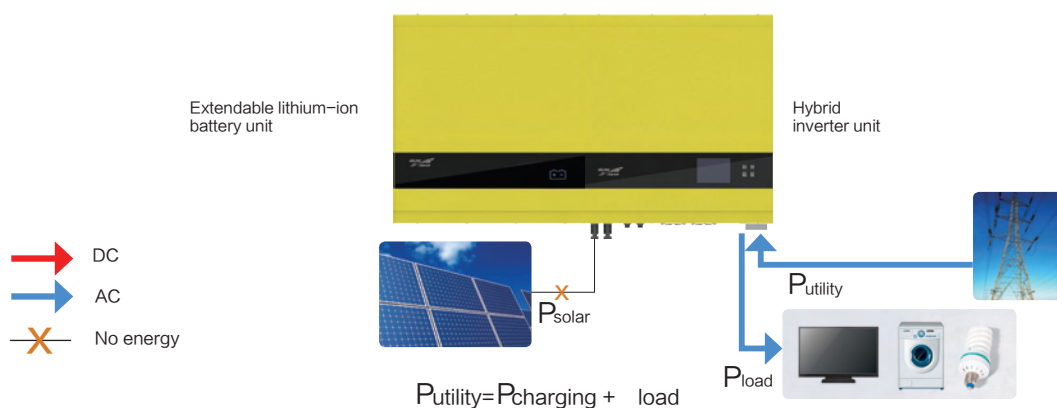
- the battery delivers the energy to the load after sunset.

**Night mode:**

- the battery capacity is insufficient, then the utility helps to supply power to the load.

**Energy storage mode:**

- If the electricity price is lower in nighttime than daytime and the battery capacity is insufficient, then user can use the utility to recharge the battery in nighttime and supply power to loads in daytime.



Model	SPH2000-B	SPH3000-B	SPH3600-B	SPH5000-B
Input Data				
Maximum PV Input Power(W)	2200	3300	4000	5500
Maximum PV Voltage(VDC)	480			
MPPT Voltage Range(VDC)	200~480			160~480
Start-up Voltage(VDC)	120			
MPPT Number	2			
String Maximum Input Current(A)	6	9	10	13.8
Battery (Lithium-ion) & Charger				
Battery Capacity(Wh)	2000 (can extend to 9.6kWh)			
Maximum Charging Current(A)	7	10	10	5500
Maximum Discharging Power (W)	2200	3300	3600	5500
Rated Battery Voltage(V)	192			
Battery Voltage Range(V)	175-226			
On-grid Output				
Rated Output Power	2000	3000	3600	5000
Rated Grid Voltage(V)	220/230/240			
Grid Voltage Range(V)	187-264			
Maximum Output Current(A)	8.7	13.2	16	25
THDi (Full Load)	<3%			
Rated Grid Frequency(Hz)	50/60			
Grid Frequency Range(Hz)	47.5-52.5 / 57.5-62.5			
PF	1/±0.8 (adjustable)			
Max Efficiency	96.5%	96.5%	96.5%	97.0%
Off-grid Output				
Rated Output Power(W)	2000	3000	3600	5000
Rated Grid Voltage(V)	220/230/240			
Frequency(Hz)	50/60			
Over Load Capacity	105% continuity; 106-130% for 1min			
THDu	<3% (linear load)			
Efficiency (Max)	94.8%			
Others				
Dimension, WxDxH(mm)	480x438x144			480x550x144
Weight(KG)	20	20	20	25
Communication Interface	RS485(PC)/RS485(Meter)/Wifi			
Relative Humidity	0 ~ 90% ,No condensation			
Noise(dB)	<55			
Operating Temperature(°C)	-20 to 50 (>40 , power derating)			
IP Grade	IP20			IP21
Altitude(m)	0 ~ 2000 (>2000, power derating)			
Certificate	VDE0126-1-1, VDE-AR-N4105, G83; IEC62109-1, IEC62109-2; EN61000-6-3, EN61000-6-2			
Topology	Transformerless			

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Three-phase Energy Storage Converter

- » Grid Voltage & frequency regulation
- » Peak shaving, schedule power consumption
- » Supply backup power during electricity outage
- » Smooth renewable power

High Reliability:

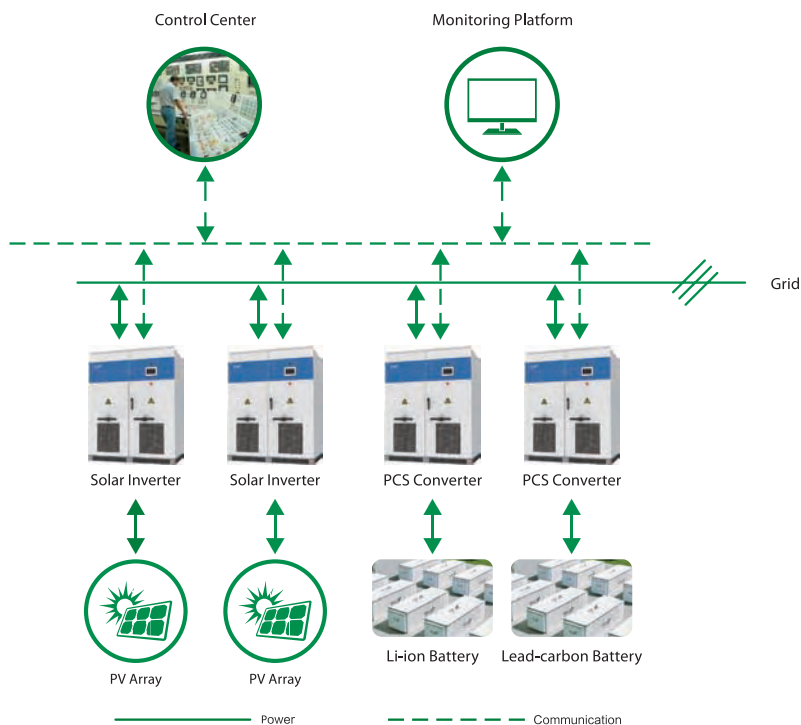
- Efficient heat sink design, best cooling
- Unique IGBT parallel technology + Laminated Busbar
- Twin channel dual power redundant
- Film capacitor for the DC Bus, long life guarantee
- Intelligent fan speed control and fault detection

Excellent Performance:

- High efficiency up to 99%
- Strong environmental adaptability
- Low voltage ride through (LVRT) function
- SVG, reactive power compensation
- Wide voltage and frequency

Value-added Service:

- Support grid scheduling
- Container for outdoor use
- Parallel to MW level
- Built-in isolation transformer



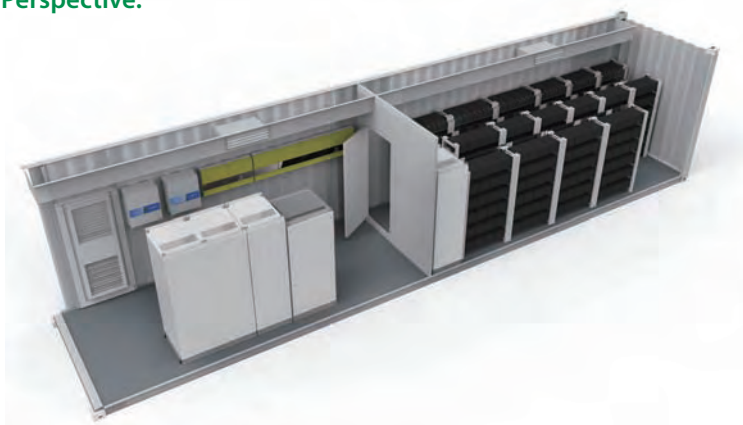
Three-phase Energy Storage Converter

Technical Specification:

Model	PCS100K-A		PCS250K-A		PCS500K-B	
Specification	Input					
DC voltage range (VDC)	500-850					
Max input current (A)	245		600		1200	
Output						
Rated output power (kVA)	100		250		500	
Rated grid voltage (V)	380V (3L+1PE)					
Rated frequency (Hz)	50/60					
THDi	<3%					
Power factor	0.99/-0.9~+0.9 adjustable					
Others						
Max efficiency	95.5%		98.0%		99.0%	
Noise (dB)	<65					
Working Ambient Temperature (°C)	-25~+55					
Working Ambient humidity	0~95%					
Cooling	Forced cooling					
Installation Altitude (m)	Derating use above 3000m					
Display	Touch screen					
Communication	RS485					
IP Grade	IP20					
Dimension (W x D x H) (mm)	800×800×2000 With transformer		1000×800×2000 With transformer		1100×800×2000 Without transformer	
Weight (kg)	1000		1400		1000	

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Energy Storage Container Perspective:



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Solar On-grid Inverter with Transformer

- » Integrated isolation transformer
- » Strong adaptability to different grid voltage
- » IP65, good robustness

Flexible Application:

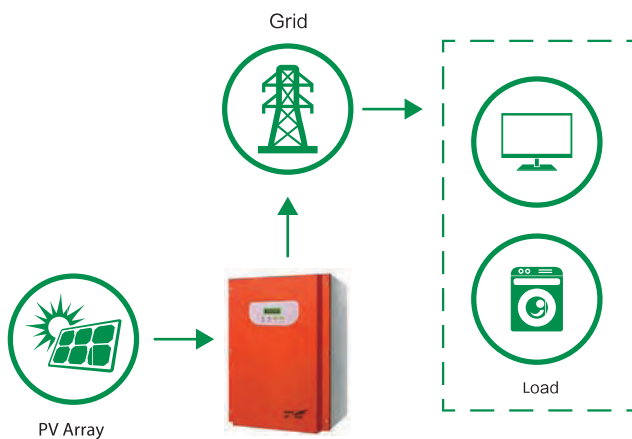
- Strong adaptability to different grid voltage e.g. 110/127/220/230Vac, 50/60Hz
- Customized grid/frequency voltage range
- IP65, easy for outdoor use
- Wide working temperature range: -20~50°C

Safe and Reliable:

- Integrated isolation transformer
- PV totally isolation from grid for safe
- Active islanding and other complete protection
- Good robustness for different application

Easy for Use:

- LCD display all information and easy operation
- MPPT function, Full digital control
- Good mechanical strength and anti-corrosion
- Simplified wall-mounting, plug and play



Solar On-grid Inverter with Transformer

Technical Specification:

Model		SPI1500-A	SPI2000-A	SPI3000-A	SPI4000-A	SPI5000-A	SPI6000-A
Specification							
Rated output capacity(W)		1500	2000	3000	4000	5000	6000
Input	Maximum Input Power(W)	1650	2200	3300	4400	5500	6600
	Maximum Input voltage(VDC)	450				600	
	Maximum input current (A)	7.5	10	15	20	17	24
	MPPT voltage range(VDC)	250~430				250~580	
	Input Strings	1		2		4	
Output	Output voltage range (V)	110/127/220/230					
	Output frequency (Hz)	50/60					
	Power Factor(PF)	>0.99					
	THDI	<3%					
	Maximum output power(W)	1550	2100	3150	4200	5250	6300
	Maximum Efficiency	≥ 94%					
Panel display		LCD displays running information, LED indicates running status					
Communications interface		RS485					
Alarm		DC over/low voltage, AC over/low voltage					
Protection		Input over/low voltage, over temperature, Output over/low voltage, anti-island fault etc.					
EMC		Meet EN6000-1:2007, EN6000-3:2007					
DC input impedance requirement		>2MΩ (500VDC)					
Cooling		Air cooling					
Noise(dB)		<50dB					
Working Temperature		-20°C~ +50°C					
Relative Humidity		0~95%, No condensation					
Altitude		≤1500m					
Dimension (mm)(WxDxH)		460×395×220		395×520×260		440×580×300	
Weight(kg)		34	36	51	53	64	66

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Solar On-grid Inverter without Transformer

- » High efficiency > 97%
- » Modular design
- » Full digital control technology

Easy for Use:

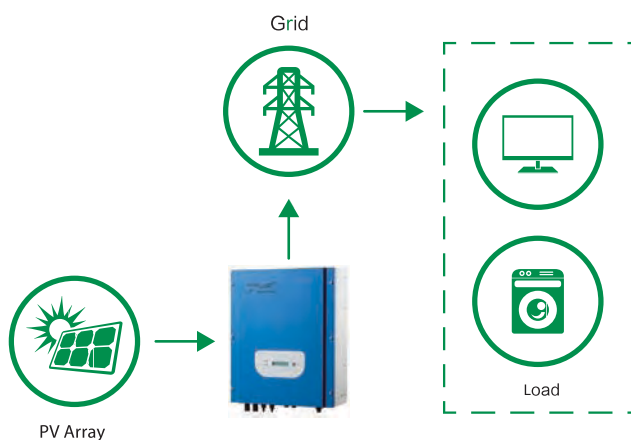
- LCD display all information and easy operation
- IP 65, capable for outdoor use

Excellent Performance:

- Power factor > 0.99
- Cause no harmonic pollution to grid
- Wide input range, flexible solar panel configuration
- MPPT function, maximize the utilization of solar panels
- High efficiency > 97%
- Wide working temperature range, -20~ +60°C

High Reliability:

- Adopt DSP chips, full digital control technology
- Adopt active islanding Protection
- Automatic load limit function to protect the equipment
- DC Input Over-Voltage Alarm & Protection



Solar On-grid Inverter without Transformer

Technical Specification:

Model	SPI1500-B	SPI2000-B	SPI3000-B	SPI4000-B	SPI4600-B
Input Data					
Max. DC Input Power (W)	1800	2400	3500	4600	5200
Max. DC Input Voltage (VDC)	500				
Max. DC Input Current (A)	9	11	14	20	22
MPPT Voltage Range (V)	150~450				
Max. Number of String	1		2		
Output Data					
Rated AC Output Power (W)	1500	2000	3000	4000	4600
Max. Output Power (W)	1650	2200	3300	4400	5060
Rated AC Voltage(Single Phase)(V)	220/230/240 (110/120/127 are available for customization)				
Rated AC Frequency (Hz)	50/60				
Total Harmonic Distortion	≤3% (At full load operation)				
Power Factor	>0.99 (At full load operation)				
Efficiency					
Max. Efficiency	≥97.2%				
Europe Efficiency	≥96.3%				
Others					
IP Grade	IP65				
Operating Ambient Temperature(°C)	-20~60				
Operating Ambient Humidity	0~95%				
Protection	DC over-voltage protection, Low voltage protection, Over temperature protection, Output over-voltage protection, Anti-islanding protection				
Communication Port	RS485				
Reference Dimension (W x D x H) (mm)	335x410x150		410x510x160		
Reference Weight (kg)	15		24		

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Central Inverter Low Voltage

- » High efficiency, up to 96.6%
- » DSP control technology digital optical driving technology
- » High adaptability with output isolation transformer

High Reliability:

- With isolation transformer for SPI-A series
- Water, Dust & Corrosion resistance design for control board
- DSP control technology digital optical driving technology
- LVRT function, strong adaptability to the grid

Green Saving:

- High efficiency up to 96.6%
- MPPT efficiency more than 99%
- Low interference to grid, output THDI: <2.6%; PF: 0.99

Intelligent Management:

- Support SVG function, realize reactive power compensation at night
- Active and reactive power scheduling
- Power factor ahead 0.9 ~ lags 0.9 adjustable continuously

Flexible Design:

- Super wide MPPT voltage range, DC input voltage up to 880V
- Convenient wiring compartment and cable connection
- High power density, easy to install and maintenance

Add Value:

- SPI monitor software
- Environmental monitor
- SPB series Junction box
- Anti-reflux controller
- On-grid inverter for markets is available for customization



Central Inverter Low Voltage

Index	SPI50KA-A	SPI70KA-A	SPI100KA-A
Input Data			
The maximum DC input power (KW)	55	77	110
The maximum DC input voltage (VDC)	880		
The maximum DC input current (A)	125	171.5	245
MPPT range (V)	450~850		
Output Data			
Rated AC output power (KW)	50	70	100
Rated grid voltage (V)	120 (L1, L2, L3, N)		
Allow grid voltage (V)	160 ~ 220 (L-L)		
Rated AC Frequency (Hz)	50/60Hz		
Total harmonic distortion THD	<2.6%	<2.5%	<2.4%
Power factor	>0.99 (full load)		
Efficiency			
The maximum Efficiency	96.20%	96.40%	96.60%
Europe Efficiency	95.40%	95.60%	95.80%
Others			
IP Grade	IP20		
Environment temperature	-25°C~ +55°C (>40°C derating)		
Humidity	0~95%		
Altitude	<2000m (>2000m derating)		
Protection	DC input overvoltage, low voltage protection, over temperature protection, output overvoltage, island fault protection		
Dimension(WxDxH)(mm)	800×800×1850		
Weight(kg)	510	740	750

- Specifications are subject to change without prior notice.
- 277V/480V On-grid inverter for South and North American Markets are available for customization.

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PV Junction Box

- » Strong robustness, long life span design
- » Ip65, excellent severe environment applicability
- » Easy maintenance, intelligent monitoring

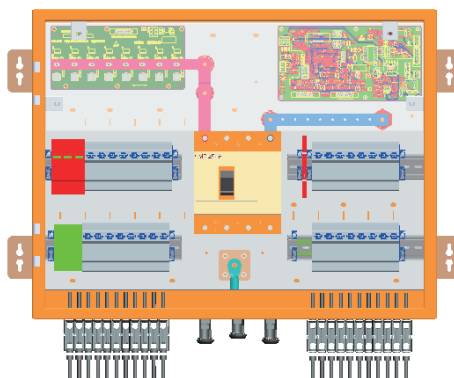
In order to reduce the connecting line between PV modules and inverters, convenient maintenance, improve reliability, you will need a junction box between the inverter PV panels; Advanced digital technology, realize the junction box electrical monitoring data communications.

Safe and Reliable:

- With special PV lightning protection device
- With temperature detection, automatic tripping function
- Class C high-voltage DC lightning protection and failure alarm function

Flexible:

- 8/16 strings series products
- IP65, outdoor application design
- Don't need external auxiliary power supply, meet application requirements without utility
- Can detect the state of the output breaker(option)
- Cut off the junction output (option)



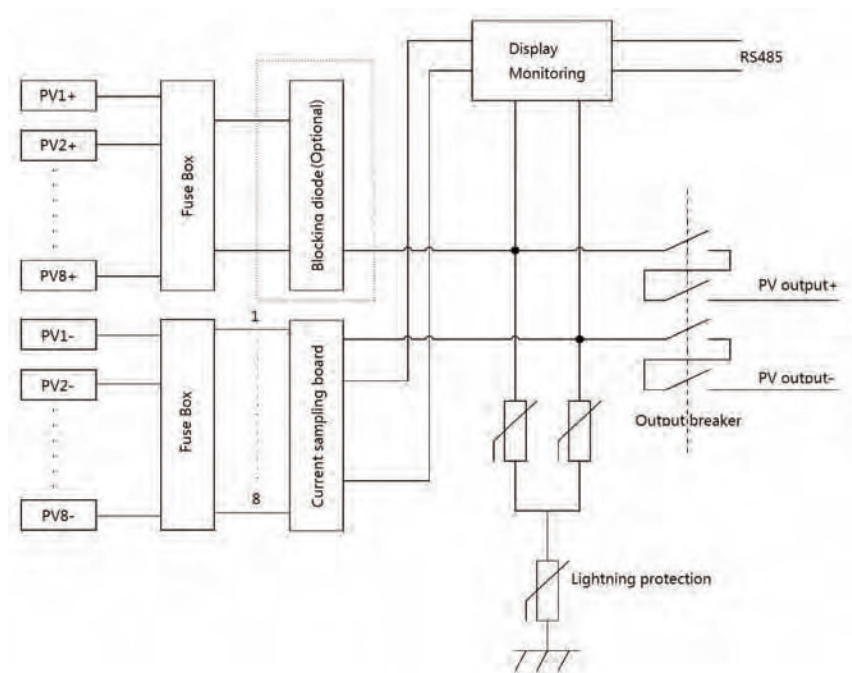
Easy Maintenance, Save Power Plant Operations Costs:

- With digital display function, can view the monitoring information and set parameters
- With special fuse over-current protection, on-line maintenance available
- RS485 communication function



PV Junction Box

Diagram



Specification

Item	Parameter	
PV input voltage (VDC)	<1000	
PV input string number	8	16
Max string current (A)	10	
IP grade	IP65	
Altitude (m)	<4000	
Working temp (°C)	-30 ~ +60	
Storage temp (°C)	-40 ~ +70	
Humidity	<95%	
Communication	RS485	
Dimension (W x H x D) (mm)	470 × 470 × 180mm 600 × 430 × 180mm(with blocking diode)	600 × 470 × 180mm 600 × 550 × 180mm (with blocking diode)

- Specifications are subject to change without prior notice.

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Large PV Power Plant Applications

- Anhui JinZhai 150MW PV ground station



- Hainan East 100MW PV ground station



- Jiangsu Jinhua 47MW fishing lake power station



- Ningxia Zhongwei Hannan 20MW PV ground station



Distributed PV Power Applications

- Guangdong Shunde 30 MW roof PV power station



- Mongolia Chery Auto factory 20 MW roof PV power station



- Gansu Lanzhou industrial park of 15 MW roof PV power station



- Shandong Chang Lin group 7.39MW roof PV power station



Off-Grid PV Power & Energy Storage Applications

- Mongolia gorge scenic area MW level off-grid power station



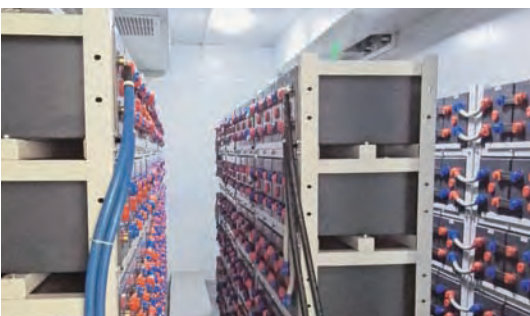
- 1.2MW container off-grid system for Uzbekistan



- Island 160kWh energy-storage power station in Australia



- Xiamen factory energy internet storage project





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