

HYBRID PV INVERTERS

HySpirit Series



Hybrid Inverter with Battery Backup
Smart Energy for Smart Home

4kW-10kW

FSP HySpirit series

Offers a more intelligent power solution for our customers to reduce the energy bill and make a contribution to our homeland, to our earth. Your energy can be used as efficiently, as smart as possible under current power consumption environment.

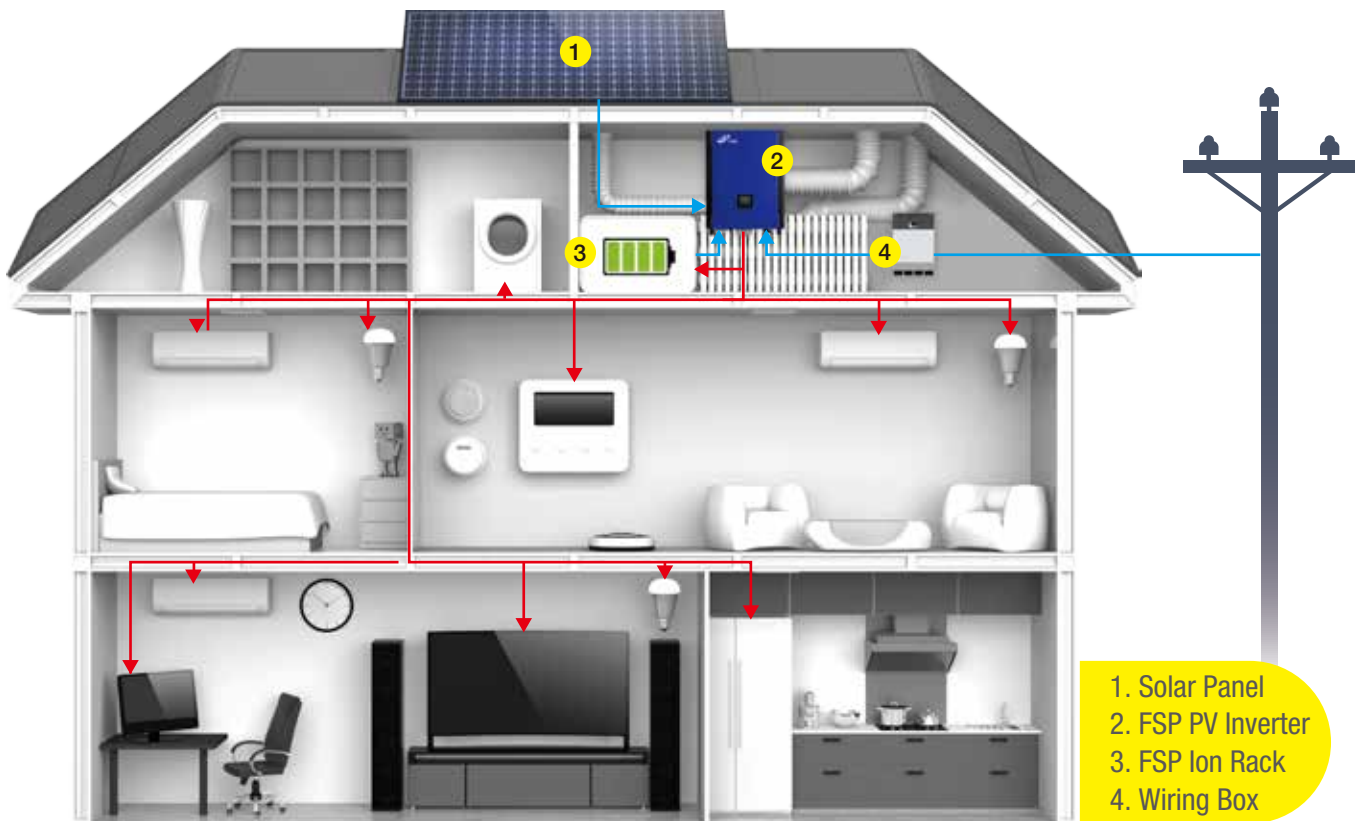
YOUR ENERGY, YOUR ARRANGEMENT!

By the unique optimum technology of FSP HySpirit Series you can control whether or how to use your energy, to store the generated power into battery or feed into the grid. Moreover, if grid power failed, by the brilliant ability of FSP HySpirit Series, the load will be handled smartly by direct support from solar, by combining solar & storage energy or withdrawing storage power only.

Multiple communication methods for different applications: FSP HySpirit Series implements USB, RS232 ports and also fits with intelligent slot for SNMP card monitoring or Modbus Card for smart meter compensation applicable to keep your electricity meter at zero.

GENERAL FEATURES

- Just ONE integrated design of Grid-tied & Off-Grid function
- HySpirit implements AC I/P breaker and DC switch
- Solar Energy Storage
- Optimized Self-Consumption & peak load shifting
- Power securing during Grid Failure
- Back-up function
- Intuitive LCD Display
- SNMP, Modbus AS400 Support
- Certified VDE0126 & VDE4105
- 4k, 5k & 10kW Model Parallel function available, up to 6pcs



1. Solar Panel
2. FSP PV Inverter
3. FSP Ion Rack
4. Wiring Box



Smart



Efficient



Quality



User Friendly



Cost Effective



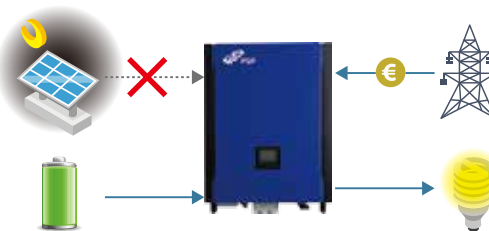
Feed-in priority

HySpirit series, an intelligent design for more options to utilize Solar Energy, it is not just conventional PV inverter Feed-in only, but also energy storage and Loads supporting.



Self consumption priority/ Load shifting

Depend on your cost demand, HySpirit can offer you a difference choice for self-consumption or load shifting automatically via battery banks and/or Solar power without utility power to save your money and/or reduce energy bill.



Alike Uninterruptible Power Supply

Off-grid operation is also available for HySpirit. When utility is outage or disconnection, it will switch to backup mode and keep supporting power to your facilities.

FSP Green Energy Solution for Smart Home



FSP HySpirit series Compensation Mode:

Modbus Card for energy gate compensation applicable to keep your electricity meter at zero.

All the loads are connected with Grid and FSP HySpirit which is an auxiliary power. At daytime, Solar Power is sufficient to feed into grid and store energy at the same time.

At night time, FSP HySpirit will consume the power constantly from batteries to your home appliances in order to reduce your energy bill.

Safety and efficiency:

- Scalable and flexible to extend the power system
- Peak efficiency 96%; EU efficiency 95%

Quality assurance:

Quality, continual improvement and customer satisfaction are personal responsibility of each engineering team.

- FSP strict selected components from top globe vendors
- Solid phase-gate quality control and monitoring

Easy monitoring:

- User friendly LCD display window
- Communication via Modbus, SNMP and relay cards.
- Real time remote control

Certifications:



VDE-AR-N 4105
VDE 0126-1-1
SAA, EN62109

IEC62040,
IEC 61000-6-3,
IEC 61000-6-2



HySpirit Grid-tied & Off Grid Inverter

- Programmable multiple operation modes: Grid-tie, off-grid and grid-tie with backup
- Pure sinewave and programmable priority for Battery or Grid
- Self-consumption and Feed-in to the grid
- Peak load shifting operation
- Alike UPS application
- User-adjustable charging current and voltage
- Monitoring software for real-time status display and control
- Parallel operation up to 6 units only available for 4k, 5k & 10k model

MODEL NUMBER	FSP402PV-230H-48	FSP502PV-230H-48	FSP552PV-230H-48	FSP103PV-230TH-48
Grid system	Single Phase, 230Vac			Three Phase, 230/400Vac
Rated power	4,000W	5,000W	5,500W	10,000W
Parallel capability	Yes	Yes	No	Yes
Max. PV input power	5,000W	10,000W	6,500W	14,800W
Operating PV voltage range	116 - 580Vdc	250 - 900Vdc	120 - 500Vdc	320 - 900Vdc
MPPT voltage range (Full Power)	280 - 500Vdc	500 - 850Vdc	250 - 450Vdc	400 - 800Vdc
Number of MPPT	1	2		
Max. PV input current	18A	20 A (10A per MPPT)	26 A (13A per MPPT)	37.2 A (18.6A per MPPT)
Max. input current (AC)	40A			
GRID-TIED CHARACTERISTIC				
Output voltage range	184 – 264Vac			184 – 264Vac per phase
Nominal output current	17.4A	21.7A	23.9A	14.5A per phase
Power factor range	0.9 lead – 0.9 lag			
THDi	3%	< 4%		
Efficiency (PV to Grid)	>96%			
EU efficiency (PV to Grid)	>95%			
OFF-GRID CHARACTERISTIC				
AC start up voltage	120 -140Vac			120 -140Vac per phase
Bypass voltage range	170 - 280Vac			170 - 280Vac per phase
Auto wake up voltage	180Vac			180Vac per phase
Max. AC input current	40A			
Output waveform	Pure sinewave			
THDv	< 4%			
Efficiency (PV to AC)	93%			91%
Efficiency (Battery to AC)	91%	93%		
CHARGING CHARACTERISTIC				
Max. charging power	4,000W	4,800W	2,880W	9,600W
Max. charging current	10 - 80A default 60A	100A	60A	10 – 200A programmable default 60A
Nominal Battery voltage	48Vdc			
Battery voltage range	40 – 60Vdc			
Max. discharging Current	110A	134A	148A	275A
Grid bypass power consumption	20W	26W	32W	54W
PHYSICAL & ENVIRONMENT DATA				
Operating ambient temp range	0 °C to 40 °C	-10 °C - 55 °C*	0 °C to 40 °C	-10 °C - 55 °C*
Humidity	0 - 90%, non-condensing			
Altitude	0 - 2000m**			
Dimensions (W x H x D)	438 x 535 x 117 mm	460 x 600 x 204 mm	450 x 445 x 110 mm	500 x 622 x 168 mm
Net weight	16.3kg	29kg	16kg	45 kg
Protect function	Overload, short circuit, over / under voltage, high temperature			
Cooling	Air forced			
Enclosure environmental rating	IP20			
INTERFACE				
HMI	LCD display			
Comm. port	USB/ RS232		USB/ RS232 and CAN	
Dry contact	Yes	NA	Yes	
Optional smart card	SNMP, Modbus, and AS400			
FEATURES				
Monitoring software	SolarPower			
Compliance	IEC 61000-6-3, IEC 61000-6-2, VDE V 0126-1-1, VDE-AR-N 4105, EN62109 , IEC62040			

*Power derating above 50°C

** Power derating 1% per 100m while higher than 1000m, Max. 2000m
Product specification are subject to change w/o further notice

PV Inverter Remote Monitoring and Management

FSP provides complete connectivity solutions with comprehensive products and software package.

These connectivity products ensure communication compatibility with a variety external devices through SNMP and Modbus.

SNMP web card

- Allows control and monitoring of multiple inverters via RJ-45 networking
- Real-time dynamic graphing of PV inverters status
- Warning notifications via audible alarm, broadcast, mobile messenger, e-mail and SNMP traps
- Historic data log stored in centralized PC database
- Simple firmware upgrade with one click
- Password authorization and remote access management
- Supports EMD to monitor temperature, humidity and smoke

Modbus card

- Real-time control and monitoring of multiple inverters via RS-485 communication port
- Supports Modbus RTU protocol
- Provides Modbus functions including read Holding Registers and write Registers
- Provides surge protection

Modbus Box

- Supports to monitor off-grid inverter through modbus interface
- Supportss Modbus RTU protocol
- Integrated with WatchPower software
- Supports Essensolar & Expert series PV inverters

Modbus Web Box

- Web server embedded
- Supports up to 247 modbus devices
- The best fit solution for Mid-scale solar farm
- Supports HySpirit series PV inverters

GPRS/ 3G card

- Remote monitoring & access the staus of inverters from centralized server
- Built-in SIM card slot
- Data transmission to data center via Internet
- Event notifications via mobile messenger
- Historic data log stored in centralized PC database or email
- Easy firmware upgrade through network

Wi-Fi Card

- Remote monitoring & access the staus of inverters from centralized server
- Data transmission to data center via Wi-Fi
- Event notifications via mail trap
- Built-in web server
- Firmware upgrade automatically

EMD (Environmental Monitoring Device)

- P&P for simple installation with SNMP web card
- Monitor temperature and humidity to protect your precious equipment
- Allow 2 contact closure signals by user-defined
- Temperature measurement from 0 to 100°C with $\pm 1.5^\circ\text{C}$ accuracy
- Relative humidity measurement from 10 to 90% RH with $\pm 3\%$ accuracy
- Optional for smoke alarm



Rating

Series	Type	Phase (input/out)	1 kVA	2 kVA	3 kVA	4 kVA	5 kVA	5.5 kVA	10 kVA
HySpirit	Hybrid	3/3	—	—	—	—	—	—	●
HySpirit	Hybrid	1/1	—	—	—	●	●	●	—
Expert	Off grid	1/1	●	●	●	●	●	—	—
Essensolar	Off grid	1/1	●	●	●	—	●	—	—
Expert C	Off grid	1/1	●	●	●	—	●	—	—
Essensolar C	Off grid	1/1	—	—	●	—	●	—	—
Essensolar C plus	Off grid	1/1	—	—	●	—	●	—	—

note: ● Standard — None

Function

Function	HySpirit 3/3	HySpirit 1/1	Expert	Essensolar	Expert C	Essensolar C	Essensolar C Plus
PVI type	Hybrid/ Grid-tied		Off grid				
Output waveform	Pure Sinewave						
Power configuration (Input)	Three phase		Single phase				
Power configuration (Output, STD)	Three phase		Single phase				
Power configuration (Output, three phase)	Yes	—	Yes, with parallel kits		—		
Form factor	Wall mount						
Built-in MC4	●	●	—	—	—	—	—
Built-in PV switch	●	●	—	—	—	—	—
Parallel redundancy	●	●	● / ○	● / ○	—	—	—
Feed into grid	●	●	—	—	—	—	—
AC Charger	●	●	●	●	●	●	●
PV Charger with MPPT	●	●	—	●	—	●	●
PV Charger with PWM	—	—	●	—	●	—	—
Energy Storage	●	●	●	●	●	●	●
Without battery operation	●	●	—	● / ○	—	● / ○	●
intelligent slot	●	●	—	—	—	—	—
2nd LCD control panel (Optional)	—	—	●	●	—	—	●
Detachable LCD control panel	—	—	—	—	—	—	●
EMS port (External relay control)	●	● / ○	—	—	—	—	—
Emergency power off	●	● / ○	—	—	—	—	—
Battery thermal sensor	●	● / ○	—	—	—	—	—
Dry contact port	●	● / ○	●	●	—	—	●
USB/ RS232	●	●	●	●	●	●	●
Reserved comm. port CAN/ RS485	●	—	—	—	—	—	●
Application SW	SolarPower			WatchPower			

note: ● Standard ○ Option — None