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2020-2021 / Ver. 1

FSP

PV Inverters

HYBRID INVERTERS WITH BATTERY BACKUP
OFF GRID INVERTERS WITH BATTERY BACKUP

POWER
NEVER ENDS

About FSP Group

FSP Group is the leading power supply manufacturer in the world.
Since established in 1993, the company has been committed to its R&D capability, production capacity and product quality to stand out from the competitive market.

FSP Group provides a great variety of products related to power and electronics technology, such as adapter, open frame, LED Lighting, Medical, LCD TV, Industrial / Desktop computers and Servers to fulfil our OEM / ODM customers' needs. And FSP Group is now making more efforts to develop better environment friendly products, including PV Inverter, UPS and ESS products.

FSP Group's global presence in Taiwan, Brazil, China, Germany, Sweden, France, India, Japan, Korea, Russia, Turkey, UK, and USA has made it easier to provide immediate support. As FSP Group is aiming to create a win-win situation, we treat our customers as friends by providing customized products and excellent service.

For FSP Group, making Power never ends will be our sustainable goal.

Our vision:
To be the global leading provider of green energy solutions, touch people's life, contribute to the better environment.

Our mission:
Providing the best value to customers, employees and shareholders by our innovative service and high quality products.

POWER
NEVER ENDS

INDEX

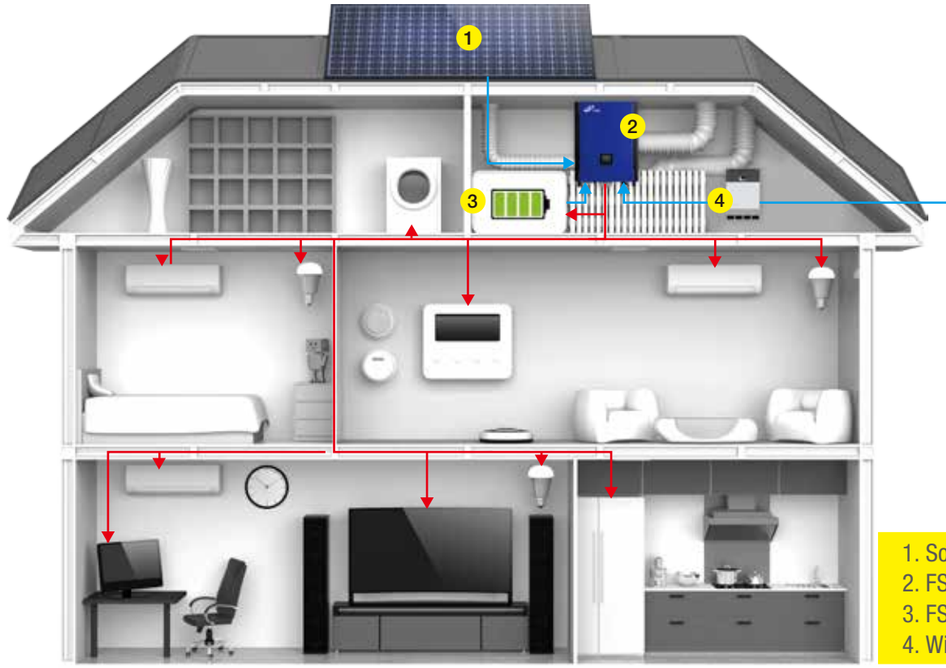
HYBRID PV INVERTERS

HySpirit Series

Hybrid Inverter with Battery Backup

Smart Energy for Smart Home

4kW-10kW



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

Smart | Efficient | Quality | User Friendly | Cost Effective

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

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.

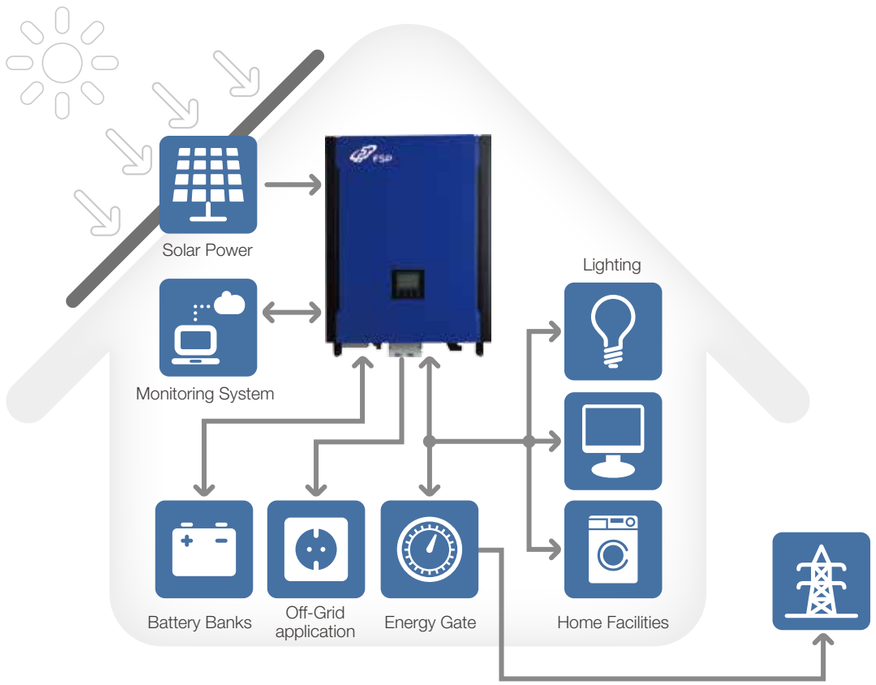
Self consumption priority/ Load shifting

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-gird 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%

Easy monitoring:

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

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

Certifications:

CE

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%		91%
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

OFF-GRID PV INVERTERS

EssenSolar & Expert series

Solution on Unstable or
Remote Area without Utility

1kW-5kW

FSP Off-Gird Inverters: EssenSolar & Expert series

An ideal Off-Grid inverter for households, FSP Off-Grid (EssenSolar & Expert series) with specific AC and built-in high efficiency MPPT Solar charger, Dual charging sources (utility+solar) up to 140A, satisfying battery charging under different weather conditions and ensuring your power continuously.

Wide input range from 90-280Vac will overcome most of grid power instabilities. Design as true sine wave off-grid inverter with 1kVA to 5kVA rating, 4/5kVA parallel function up to 45kVA (single phase) suitable for different applications and supporting 3-Phase power system in any mode. FSP Off-Grid (EssenSolar & Expert series) with user-friendly control panel is an adjustable power source for optimal settings according to end users needs. The unit also offers USB Port for PC monitoring purpose.

As non-household application, It's able to provide power e.g. for a water pump.

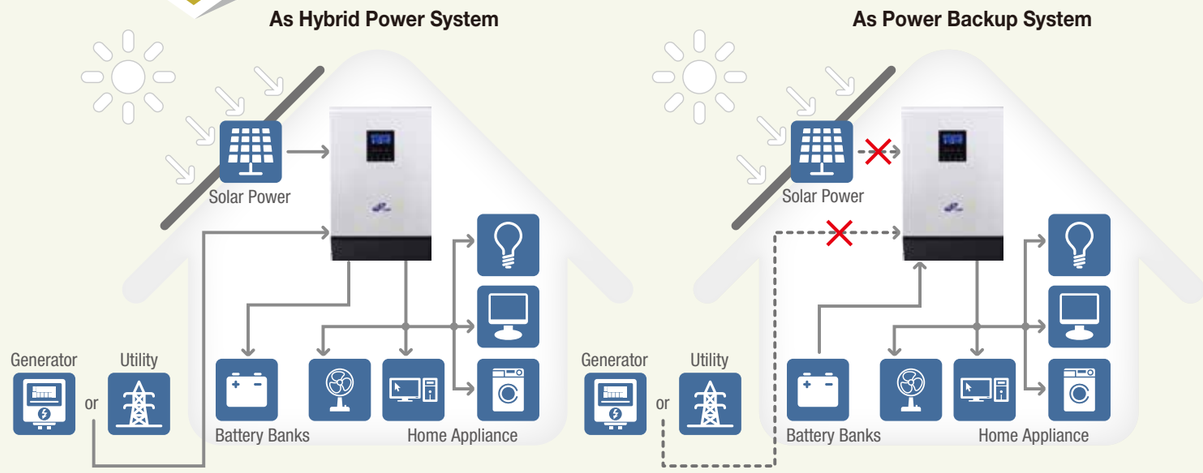
GENERAL FEATURES

- High frequency pure sine wave
- Wide AC input range 90-280 Vac
- Built in Solar and AC Dual charger, charging Ability up to 140A
- Built-in dry-contact for Generator
- Double surge capacity over rating power
- 4k/5kVA parallel function support single Phase up to 45kVA
- 3Phase any mode support/ unbalanced 3 phase power system
- Intuitive LCD Display
- Programmable Source Priority
- User defined Bulk/Floating Charger voltage
- Free monitoring software

Ideal Off-Grid Inverter EssenSolar & Expert Series

Programmable Power Source Priority function.
More Flexible, More Independent for energy usage and storage.

The Principle of FSP Off-Grid Inverters



FSP Off-Grid Inverters/ Smart Power Priority

FSP Off-Grid inverters designed for power and charging source priority, can be set up by LCD panel according to the power consumption demand, storing and/or consuming energy are also user-defined.

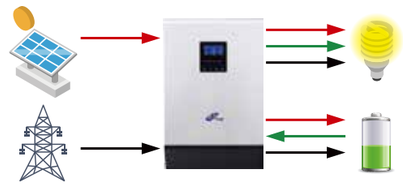
O/P Source Priority 1 → 2 → 3 →

Output source Priority is Solar-> Bat-> Utility
Charging source priority is Solar Power Only

Solar energy is sufficient to charge the battery and carry the loads. Once solar power is low, system will switch to battery mode automatically until battery reaches low warning then system transfers to utility.

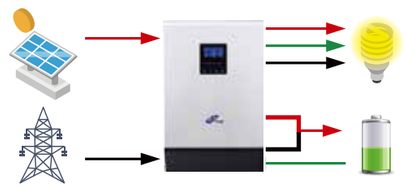
Output source is Utility first
Charging source priority is solar first

Utility will feed output loads, Solar power will charge the battery until solar power ceases. Solar and battery energy will be used when utility fails.
Power source priority is Utility -> Solar & Battery
Charging source priority is Solar -> Utility



Output source & Charger source priority is solar first

When Solar energy is sufficient to charge the battery and feed the loads, utility will stand by until Solar power ceases or battery voltage drops to user's setting.
Power source priority is Solar -> Battery or Utility
Charging source priority is Solar -> Utility



Output source is Solar-Bat-Utility
Charging source priority is Solar & Utility (4/5k only)

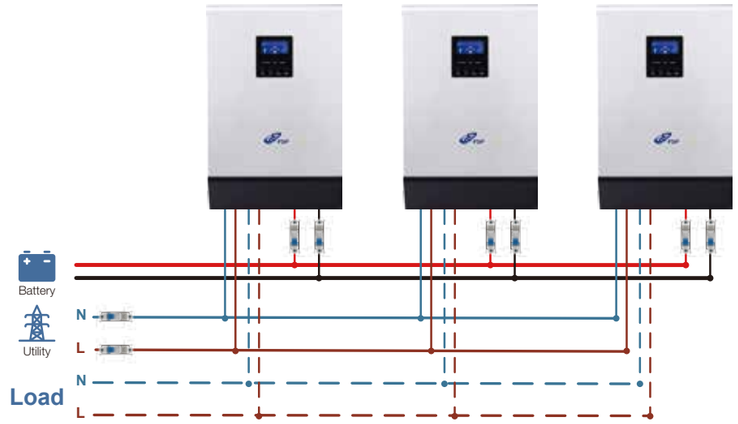
System will adapt Solar and utility both source to charge battery at the same time. Once solar power is low, system will switch to battery mode automatically until reach low bat warning then transfer to utility.
Power source priority is Solar -> Battery -> Utility
Charge source priority is Solar & Utility

Single Phase Parallel and 3 Phase Any Mode
(Balanced/ unbalanced 3 phase power system)

High expansion ability: FSP Off-Grid (EssenSolar & Expert series) 4kVA and 5kVA design can be expanded to 45kVA in parallel mode, single phase, and also specifically supports 3 Phase any mode. The Power capacity can satisfy most of household energy demand.

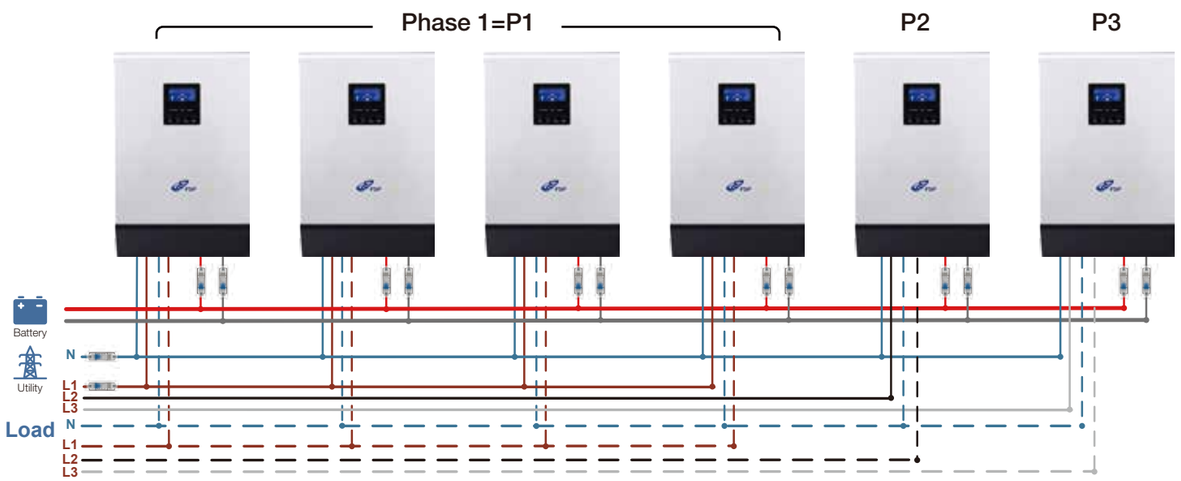
Parallel 3 units in Single Phase

Up to 45kVA parallel ability: FSP Off-Grid (EssenSolar & Expert series) will achieve expansion function by parallel kits in order to get more power capacity. (The drawing presents 3 units in parallel, power capacity is 15kVA in total.)



Parallel 6 units in 3 Phase any mode

FSP Off-Grid (EssenSolar & Expert series) supports 3 Phase any mode. By consulting and measurement user can define which phase needs more power support, e.g. P1 = Phase 1, consuming most of the power in the house, system can install Max 7pcs in L1 to get 35kVA power.



EssenSolar Off Grid Inverter

- Scalable: Parallel operation up to 9 units only available for 3kVA & 5kVA
- Output power factor = 1
- Selectable input voltage range for PC or home appliances
- Built-in MPPT charger controller and selectable charging current based on your applications
- Smart battery charging algorithm to optimize battery life
- Configurable AC/Solar input priority via LCD panel
- Mains or generators compatible
- Auto restart while AC back and cold start function available
- Inverter running without battery, only FS model available
- Various operations, available for balanced 3 phase or unbalanced 3 phase

MODEL NUMBER	FSP102PV-230F-12	FSP202PV-230F-24	FSP302PV-230F-24	FSP502PV-230F-48	FSP502PV-230FS-48
Grid system	Single Phase, 230Vac				
Rated power	1,000VA/ 1,000W	2,000VA/ 2,000W	3,000VA/ 2,400W	5,000VA/ 5,000W	5,000VA/ 5,000W
Parallel capability	No		Yes, 9 units		
Max. PV input power	500W	600W	1,000W	4,000W	4,500W
MPPT voltage range (Full Power)	15 - 80Vdc	30 - 66Vdc	30 - 80Vdc	60 - 115Vdc	120 - 430Vdc
Max. PV input current	33A	20A	33A	66A	37.5A
Max. PV voltage (OC)	102Vdc	75Vdc	100Vdc	145Vdc	450Vdc
Number of MPPT	1				
INPUT CHARACTERISTIC					
AC voltage	Single Phase, 230Vac				
Selectable Voltage Range	170-280 Vac (For PC/ SPS applications) 90-280 Vac (For home facilities)				
Frequency range	50 Hz/ 60 Hz (Auto)				
OUTPUT CHARACTERISTIC					
AC voltage regulation @ backup mode	230Vac ± 5%				
Surge ability	2,000VA	4,000VA	6,000VA	10,000VA	10,000VA
Transfer time	10 ms (For PC/ SPS) ; 20 ms (For home facilities)				
Output waveform	Pure sinewave				
Efficiency (Line mode)	95%				
Efficiency (Peak)	90 - 93%	93%	90%	93%	90%
CHARGING CHARACTERISTIC					
Max. charging power	720W	1,320W	2,400W	6,720W	3,840W
Max. charging current	60A	55A	100A	140A	80A
Max. PV charging current	40A	25A	40A	80A	80A
Max. AC charging current	20A	30A	60A	60A	80A
Nominal Battery voltage	12/24/48Vdc	24Vdc	24Vdc	48Vdc	48Vdc
Over charge protection	15.5Vdc	31Vdc	30Vdc	60Vdc	66Vdc
Battery floating voltage	13.5Vdc	27Vdc	27Vdc	54Vdc, max. 58Vdc	54Vdc
Rated backup time w/ 24V or 48V/100Ah (min)	50	50	28	40	40
Max. Efficiency (PV to Battery)	98%				
Standby power consumption	<2W				
PHYSICAL & ENVIRONMENT DATA					
Operating temp range	0 °C - 55 °C				
Storage temp range	-15 °C - 60 °C				
Humidity	5 - 95% RH, non-condensing				
Altitude	0 - 1000m				
Dimensions (W x H x D)	240 x 316 x 95	272 x 355 x 100	272 x 385 x 100 mm	295 x 468 x 120 mm	295 x 468 x 120 mm
Net weight	5.2 kg	7.0 kg	7.5 kg	13.5 kg	11.0 kg
Protect function	Overload, short circuit, over voltage, high temperature				
Cooling	Air forced				
Enclosure environmental rating	IP20				
INTERFACE					
HMI	LCD display				
Communication port	USB		USB/ RS232		
Dry contact port	Yes				
Optional accessories	Remote control panel, Parallel kits (Only for 3k/5k parallel model)				
FEATURES					
Monitoring software	Yes				
Compliance	IEC 55022 Class A, IEC 62109, IEC 60950				
Certification	CE				

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

Expert Off Grid Inverter

- Scalable: Parallel operation up to 9 units only available for 4k & 5kVA
- Output power factor = 1
- Selectable input voltage range for PC or home appliances
- Smart battery charging algorithm to optimize battery life
- Configurable AC/Solar input priority via LCD panel
- Mains or generators compatible
- Auto restart while AC back and cold start function available
- Various operations, available for balanced 3 phase or unbalanced 3 phase

MODEL NUMBER	FSP102PV-230FW-12	FSP202PV-230FW-24	FSP302PV-230FW-24	FSP402PV-230FW-48	FSP502PV-230FW-48
Grid system	Single Phase, 230Vac				
Rated power	1,000VA/ 1,000W	2,000VA/ 2,000W	3,000VA/3,000W	4,000VA/ 4,000W	5,000VA/ 5,000W
Parallel ability	No			Yes, 9 units	
Max. PV input power	600W	1,200W		2,400W	
Operation Voltage range	15 - 18Vdc	30 - 32Vdc		60 - 72Vdc	
Max. PV input current	40A				
Max. PV voltage (OC)	50Vdc	60Vdc		90Vdc	
Number of MPPT	0				
INPUT CHARACTERISTIC					
AC voltage	Single Phase, 230Vac				
Selectable Voltage Range	170-280 Vac (For PC/ SPS applications), 90-280 Vac (For Home facilities)				
Frequency range	50 Hz/ 60 Hz (Auto)				
OUTPUT CHARACTERISTIC					
AC voltage regulation @ backup mode	230Vac ± 5%				
Surge ability	2,000VA	4,000VA	6,000VA	8,000VA	10,000VA
Transfer time	10 ms (For PC/ SPS) ; 20 ms (For home facilities)				
Output waveform	Pure sinewave				
Efficiency (Peak)	90%	93%			
CHARGING CHARACTERISTIC					
Max. charging power	600W	1200W		2400W	
Max. charging current	50A			110A	
Max. PV charging current	50A				
Max. AC charging current	20A	30A		60A	
Nominal Battery voltage	12Vdc	24Vdc		48Vdc	
Over charge protection	15.5Vdc	31Vdc		60Vdc	60Vdc
Battery floating voltage	13.5Vdc	27Vdc		54Vdc	54Vdc
Rated backup time w/ 12V/24V/48V/ 100Ah (min)	50	50	28	50	40
Standby power consumption	<2W				
PHYSICAL & ENVIRONMENT DATA					
Operating temp range	0 °C - 55 °C				
Storage temp range	-15 °C - 60 °C				
Humidity	5 - 95% RH, non-condensing				
Altitude	0 - 1000m				
Dimensions (W x H x D)	240 x 316 x 95 mm	272 x 355 x 100 mm		295 x 455 x 155 mm	
Net weight	5.0 kg	6.4 kg	6.9 kg	9.8 kg	
Protect function	Overload, short circuit, over voltage, high temperature				
Cooling	Air forced				
Enclosure environmental rating	IP20				
INTERFACE					
HMI	LCD display				
Communication port	USB			USB/ RS232	
Dry contact port	Yes				
Optional accessories	Remote control panel, Parallel kits (Only for 4k & 5k model)				
FEATURES					
Monitoring software	Yes				
Compliance	IEC 55022 Class A ; IEC 60950				
Certification	CE				

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

EssenSolar C Off Grid Inverter

- Pure sinewave PV inverter
- Output power factor = 1 & wide MPPT range
- Selectable input voltage range for PC or home appliances
- Smart battery charging algorithm to optimize battery life.
- Configurable AC/Solar input priority via LCD panel
- Compatible to mains or generators
- Auto restart while AC back and cold start function available
- Inverter running without battery, CFS model available
- Anti-Dust kits (optional) for harsh environment

Model Number	FSP302PV-230CF-24	FSP302PV-230CFS-24	FSP502PV-230CF-48	FSP502PV-230CFS-48
Grid system	Single Phase, 230Vac			
Rated power	3,000VA/ 3,000W		5,000VA/5,000W	
Parallel Capability	No			
Max. PV input power	1,000W	4,000W	3,000W	4,000W
MPPT voltage range	30 - 80Vdc	120 - 450Vdc	60 - 115Vdc	120 - 450Vdc
Max. PV input current	33A	33A	50A	33A
Max. PV voltage (OC)	102Vdc	500Vdc	145Vdc	500Vdc
Number of MPPT	1			
Input Characteristic				
AC voltage	Single Phase, 230Vac			
Selectable Voltage Range	170-280 Vac (For PC/ SPS applications) 90-280 Vac (For Home facilities)			
Frequency range	6,000VA	50 Hz/ 60 Hz (Auto)		10,000VA
Output Characteristic				
AC voltage regulation @ backup mode	230Vac ± 5%			
Surge ability				
Transfer time	10 ms (For PC/ SPS) ; 20 ms (For home facilities)			
Output waveform	Pure sinewave			
Peak Efficiency	90 - 93%			
Charging Characteristic				
Max. charging power	1,440W	1,920W	5,760W	3,840W
Max. charging current	60A	80A	120A	80A
Max. PV charging current	40A	80A	60A	80A
Max. AC charging current	25A	60A		
Nominal Battery voltage	24Vdc		48Vdc	
Over charge protection	33Vdc		63Vdc	
Battery floating voltage	27Vdc		54Vdc	
Rated backup time w/ 100Ah (min)	28		40	
Standby power consumption	<2W			
Operating ambient temp range	-10 °C - 50 °C			
Humidity	5 - 95% RH, non-condensing			
Altitude	0 - 1000m*			
Dimensions (W x H x D)	285 x 334 x 100 mm	300 x 440 x 100 mm		
Net weight	6.5kg	9.0kg	9.7kg	10.0kg
Protect function	Overload, short circuit, over voltage, high temperature			
Cooling	Air forced			
Enclosure environmental rating	IP20			
Interface				
HMI	LCD display			
Communication port	USB/ RS232			
Dry contact port	NA			
Features				
Monitoring software	Yes			
Compliance	IEC 55022 Class A, IEC 60950			
Certification	CE			

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Expert C Off Grid Inverter

- Pure sinewave PV inverter with Output power factor = 1
- Selectable input voltage range for PC or home appliances
- Smart battery charging algorithm to optimize battery life
- Configurable AC/Solar input priority via LCD panel
- Compatible to mains or generators
- Auto restart while AC back and cold start function available
- Overload and short circuit protection
- Anti-Dust kits (optional) for harsh environment

Model Number	FSP102PV-230CFW-12	FSP202PV-230CFW-24	FSP302PV-230CFW-24	FSP502PV-230CFW-48
Grid system	Single Phase, 230Vac			
Rated power	1,000VA/ 1,000W	2,000VA/ 2,000W	3,000VA/3,000W	5,000VA/ 5,000W
Parallel capability	No			
Max. PV input power	600W	1,200W		2,400W
Operation voltage range	15 -18Vdc	30 -32Vdc	30 -32Vdc	60 -72Vdc
Max. PV input current	40A	40A	40A	40A
Max. PV voltage (OC)	55Vdc	80Vdc		105Vdc
Number of MPPT	0			
Input Characteristic				
AC voltage	Single Phase, 230Vac			
Selectable Voltage Range	170-280 Vac (For PC/ SPS applications) 90-280 Vac (For Home facilities)			
Frequency range	50 Hz/ 60 Hz (Auto)			
Output Characteristic				
AC voltage regulation @ backup mode	230Vac ± 5%			
Surge ability	2,000VA	4,000VA	6,000VA	10,000VA
Transfer time	10 ms (For PC/ SPS) ; 20 ms (For home facilities)			
Output waveform	Pure sinewave			
Peak Efficiency	90 - 93%			
Charging Characteristic				
Max. charging power	600W	1,200W	1,680W	5,760W
Max. charging current	50A		70A	120A
Max. PV charging current	50A			60A
Max. AC charging current	20A		25A	60A
Nominal Battery voltage	12Vdc	24Vdc		48Vdc
Over charge protection	16Vdc	31Vdc	33Vdc	63Vdc
Battery floating voltage	13.5Vdc	27Vdc		54Vdc
Rated backup time w/ 100Ah (min)	50		28	40
Standby power consumption	<2W			
Operating ambient temp range	-10 °C - 50 °C			
Humidity	5 - 95% RH, non-condensing			
Altitude	0 - 1000m*			
Dimensions (W x H x D)	225 x 320 x 88 mm		285 x 334 x 100 mm	300 x 440 x 100 mm
Net weight	5.0kg	5.0kg	6.3kg	8.5kg
Protect function	Overload, short circuit, over voltage, high temperature			
Cooling	Air forced			
Enclosure environmental rating	IP20			
Interface				
HMI	LCD display			
Communication port	USB/ RS232			
Dry contact port	NA			
Features				
Monitoring software	Yes			
Compliance	IEC 55022 Class A, IEC 60950			
Certification	CE			

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EssenSolar C Plus Off Grid Inverter

- Pure sinewave PV inverter with Output power factor = 1
- Wide MPPT range
- Detachable LCD controller
- Built-in Bluetooth for mobile monitoring(Android).
- Compatible with Lithium iron battery, reserved comm. port for BMS (RS485, CAN-BUS or RS232)
- Configurable timer and priorities on AC/PV output source
- Easy maintenance, replaceable fan design & USB On-the-GO function
- Compatible to mains or generators
- Auto restart while AC back and cold start function available

Model Number	FSP302PV-230CFE-24	FSP502PV-230CFE-48
Grid system	Single Phase, 230Vac	
Rated power	3,000VA/ 3,000W	5,000VA/ 5,000W
Parallel Capability	No	
Max. PV input power	4,000W	5,000W
MPPT voltage range	120 - 450Vdc	
Max. PV input current	33A	41A
Max. PV voltage (OC)	500Vdc	
Number of MPPT	1	
Input Characteristic		
AC voltage	Single Phase, 230Vac	
Selectable Voltage Range	170-280 Vac (For PC/ SPS applications) 90-280 Vac (For Home facilities)	
Frequency range	50 Hz/ 60 Hz (Auto)	
Output Characteristic		
AC voltage regulation @ backup mode	230Vac ± 5%	
Surge ability	6,000VA	10,000VA
Transfer time	10 ms (For PC/ SPS) ; 20 ms (For home facilities)	
Output waveform	Pure sinewave	
Peak Efficiency	90 - 93%	
Charging Characteristic		
Max. charging power	1,920W	3,840W
Max. charging current	80A	80A
Max. PV charging current	80A	80A
Max. AC charging current	60A	60A
Nominal Battery voltage	24Vdc	48Vdc
Over charge protection	33Vdc	63Vdc
Battery floating voltage	27Vdc	54Vdc
Rated backup time w/ 100Ah (min)	28	40
Standby power consumption	<2W	
Operating ambient temp range	-10°C - 50°C	
Humidity	5 - 95% RH, non-condensing	
Altitude	0 - 1000m*	
Dimensions (W x H x D)	300 x 400 x 115 mm	
Net weight	9.0kg	10.0kg
Protect function	Overload, short circuit, over voltage, high temperature	
Cooling	Air forced	
Enclosure environmental rating	IP20	
Interface		
HMI	LCD display	
Communication port	USB/ RS232/ RS485/ BT	
Dry contact port	Yes	
Features		
Monitoring software	Yes	
Compliance	IEC 55022 Class A ; IEC 60950,	
Certification	CE	

*Power derating 1% per 100m while higher than 1000m
*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
- Supports 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 status 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 status 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 ±1.5°C accuracy
- Relative humidity measurement from 10 to 90% RH with ±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