

OFF-GRID PV INVERTERS

EssenSolar & Expert series



Solution on Unstable or
Remote Area without Utility

1kW-5kW

FSP Off-Grid 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 anymode. 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.

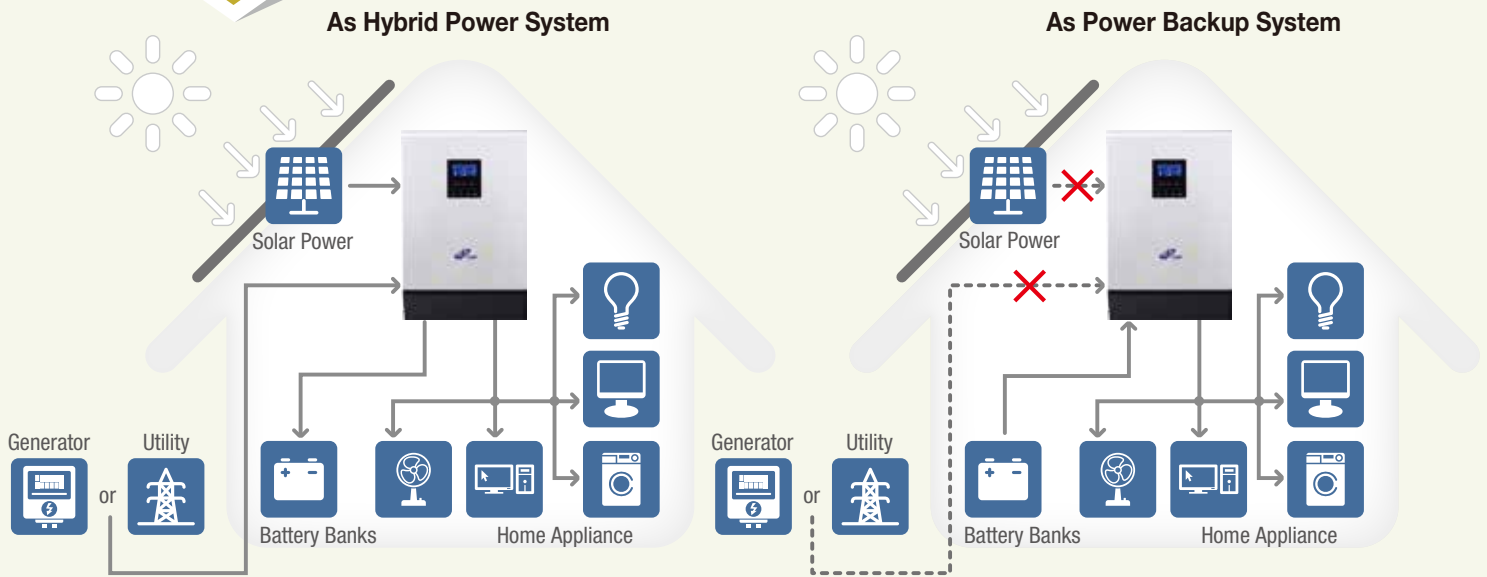
GENERAL FEATURES

- 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 AnyMode 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

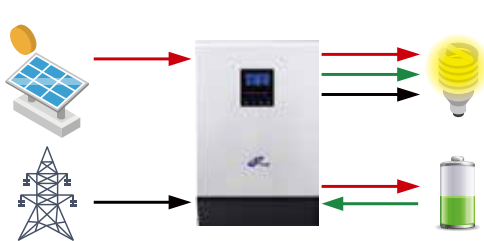
Programmable Power Source Priority function.
More Flexible, More Independent for energy usage and storage.

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 →

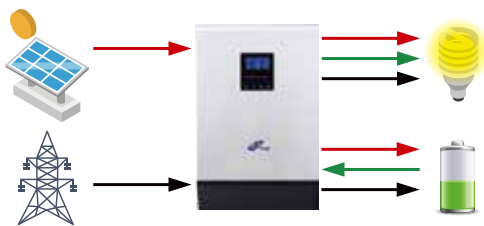
Output source Priority is Solar-> Bat-> Utility
Charging source priority is Solar Power Only

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.



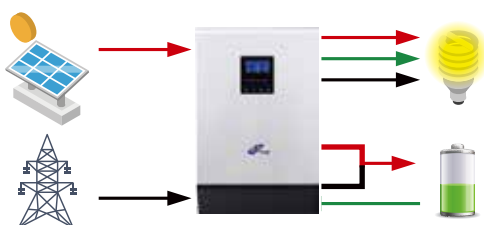
Output source is Utility first
Charging source priority is solar first

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

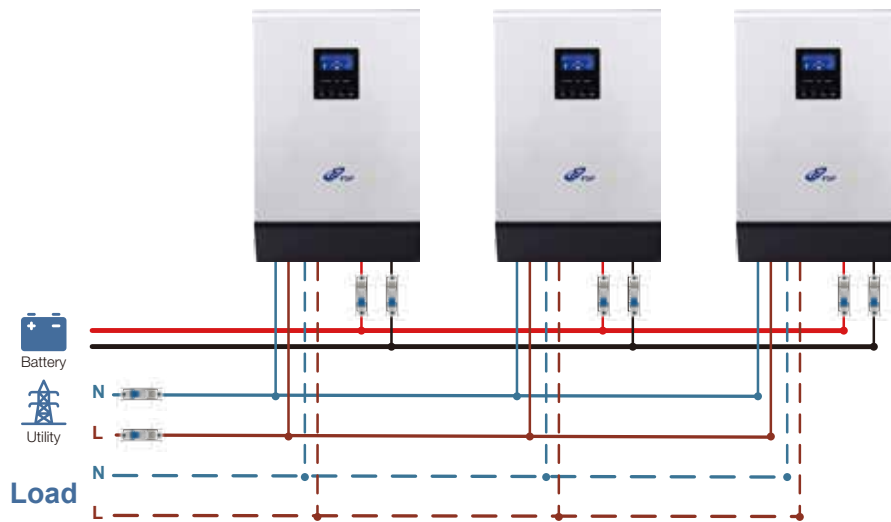
Single Phase Parallel and 3 Phase AnyMode

(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 AnyMode. The Power capacity can satisfy most of household energy demand.

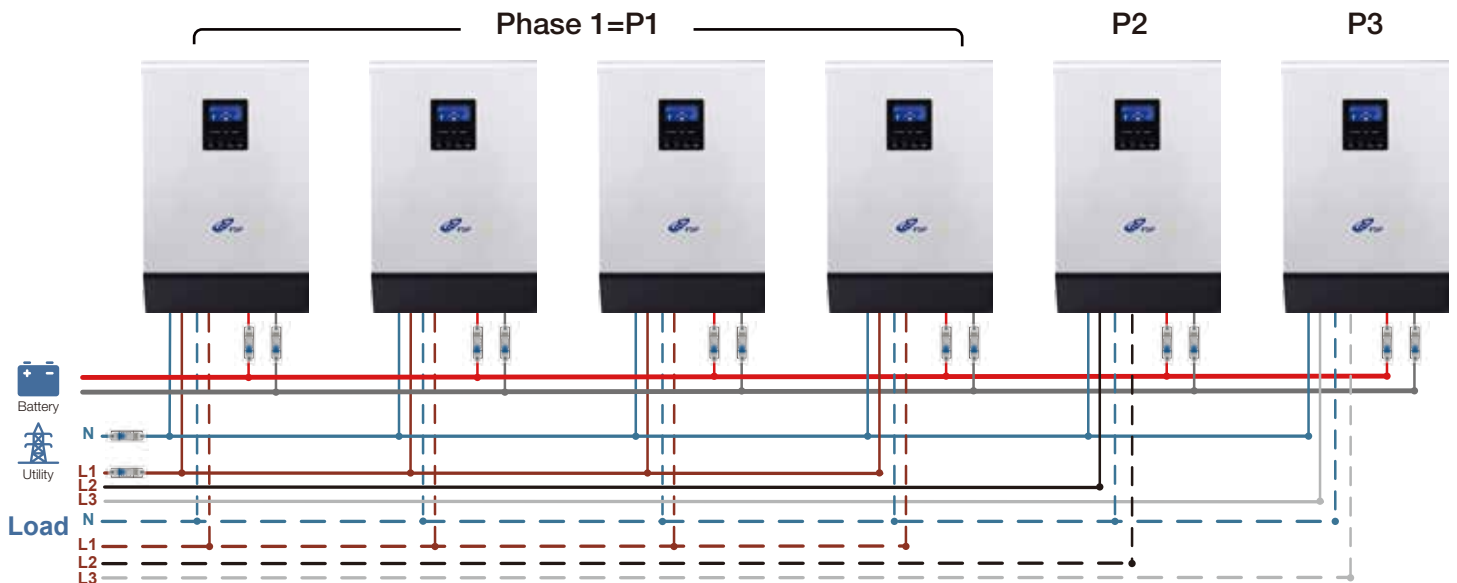
Parallel 3 units in Single Phase

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 AnyMode

FSP Off-Grid (EssenSolar & Expert series) supports 3 Phase AnyMode. 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	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 (Battery to AC)	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	12Vdc	24Vdc	24Vdc	48Vdc	48Vdc
Over charge protection	15.5Vdc	31Vdc	30Vdc	66Vdc	66Vdc
Battery floating voltage	13.5Vdc	27Vdc	27Vdc	54Vdc, max. 64Vdc	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

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