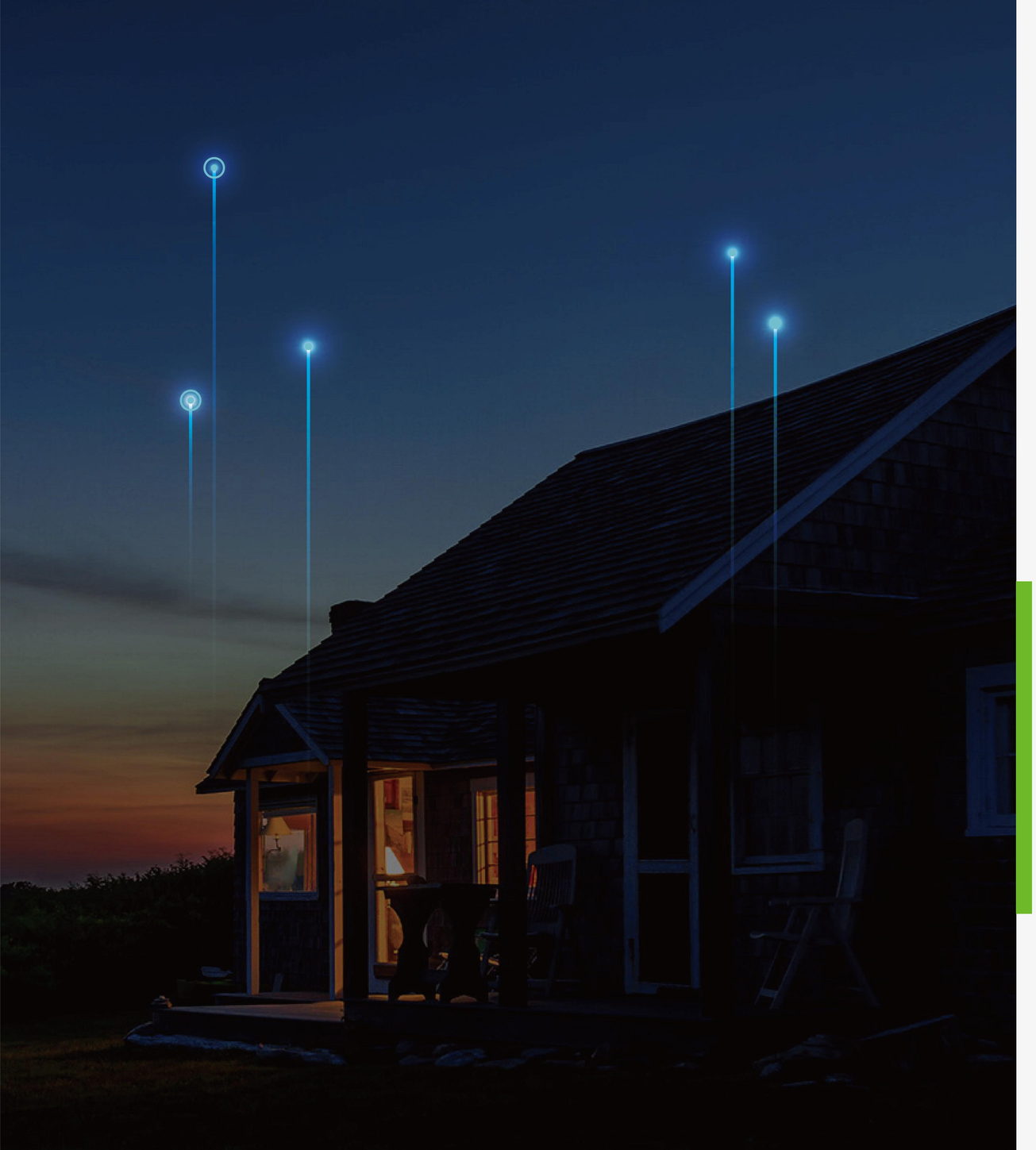
SPE Series Hybrid Solar Inverter

SHENZHEN GROWATT NEW ENERGY CO.,LTD



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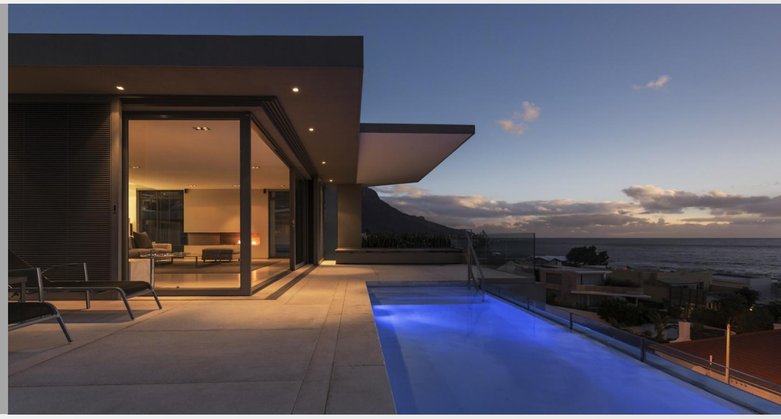
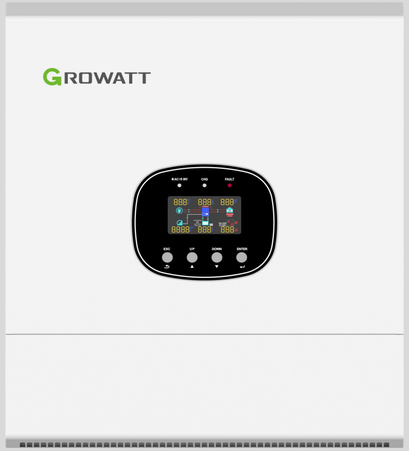
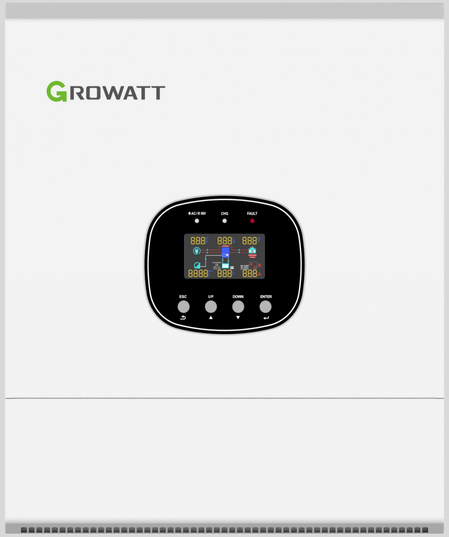
Product Overview



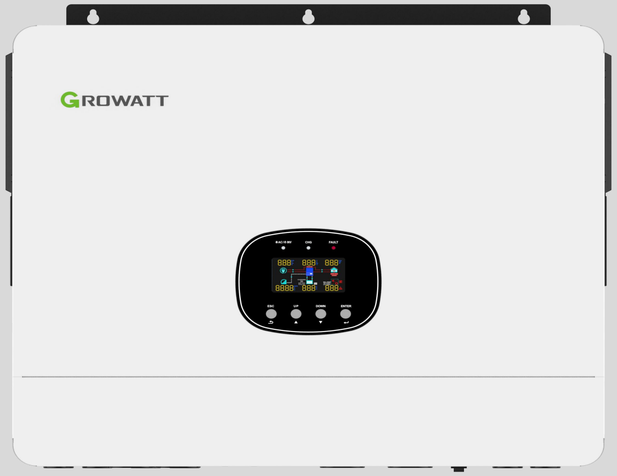
SPE Series Hybrid Inverters



SPE 3500-4500TL HVM-G2



SPE 6000TL HVM-G2



SPE 12000 ES

Safe & Reliable
BLVD, Lower self-consumption
Timing charging and output control

High Yields
Lower self-consumption
Up to 9 units in parallel for capacity extension

Smart Management
Remote Control and Smart Scheduling
thru the Shinephone APP

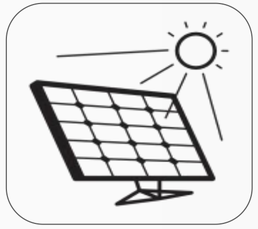
Key Advantages

Model / Parameters	SPF 3000-5000 ES	SPE 3500-6000TL HVM-G2	SPE 12000ES	Benefits
Maximum PV array open circuit voltage	450V	**500V**	**550V**	Each string can be connected to more modules,PV input power up to 8000W
No. of MPP trackers	1	**2**	**2**	PV module strings can be installed at different orientations
Max. PV input current	22A	**32A(16/16)**	**52A(27/27)**	More PV strings can be connected to increase input capacity, compatible with 500+ PV module
AC input source	Utility power or generator	**Utility power and generator**	**Utility power and generator**	No need for the extra ATS device to connect between inverter and the AC source
Air flow	Without filter	Without filter	**Dust-proof design**	Prevent inverter faults caused by the excessive dust and easy for maitenance
Parallel capacity	6	**9**	**9**	The system output power is increased to meet the needs of customers with larger loads.
Grid-tied function	NO	**Yes**	**Yes**	Customers can enable the grid-tiedfunction according to the actual demand, and then feed the excess PV energy to the grid for profit.
AC output terminal	One	**One (3.5-4.5K)** **Two (6K)**	**Two**	The inverter has two output ports, one is connected to the common load, and the other is connected to the important load. inverter can automatically disconnect the common load and extend the backup time of the important load
Generator control	NO	**Yes**	**Yes**	Customers can control the working time and current of the DG according to the actual needs to save the fuel costs.
BLVD function	NO	**Smart load (3.5-4.5K)** **Yes (6K)**	**Yes**	Customers can adjust the working hours of non-essential loads according to actual needs

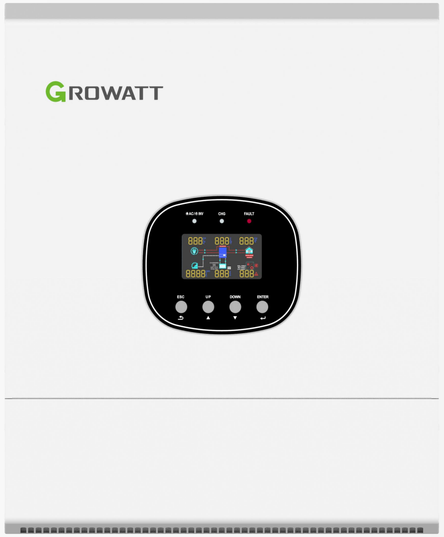
Hybrid Energy Storage System

Hybrid energy storage system generally consist of PV modules, hybrid inverter, battery, generator and utility power, monitoring devices ,electrical appliances.

PV modules



Battery



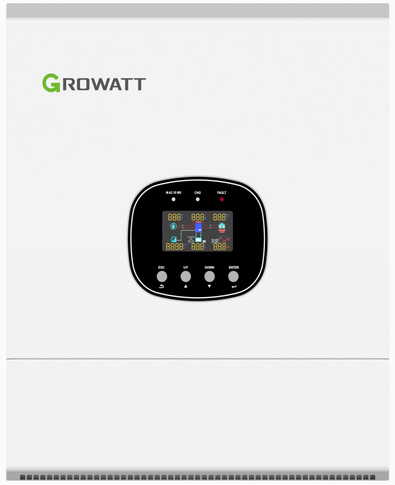
Hybrid inverter with
built-in MPPT charger controller

Utility

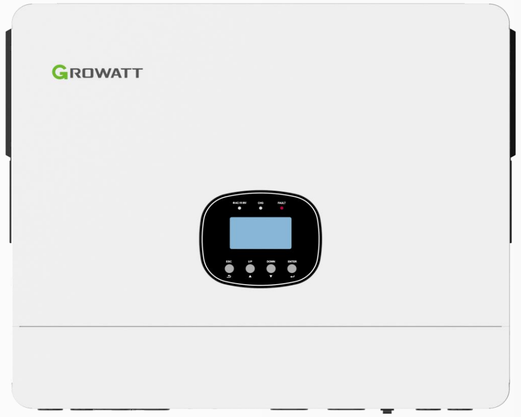
Generator

AC loads

SPE Sereis Inverter



SPE 3500-6000TL HVM-G2



SPE 12000ES

Key Features

1. Dual MPP trackers
2. Plug-and-Play terminal for PV port
3. Two AC input terminals with integrated transfer switch
4. Load segment control to maximize battery runtime for critical load
5. PV input voltage up to 550VDC
6. Adjustable inverter charging and output time
7. Equalization charging function
8. Configurable output and charging priority
9. SUB working mode
10. Parallel operation available up to 9 units
11. Compatible with lithium battery
12. Work with battery or without battery
13. Featuring Grid-Tied Function for Peak Shaving

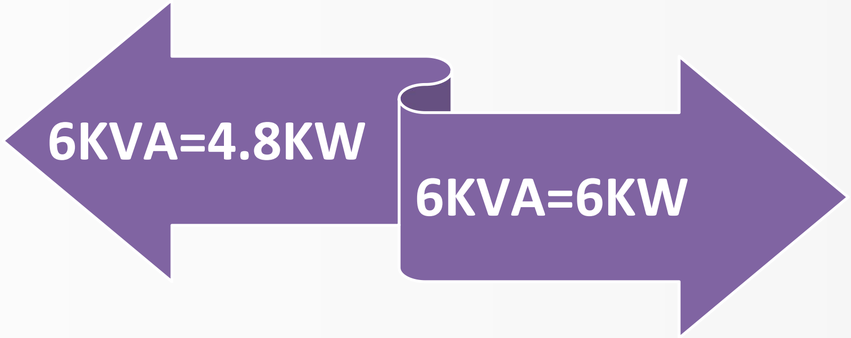
02

Higher Yield

Power Factor 1.0

More Powerful

Output power factor: 1.0 (6KVA & 6KW)



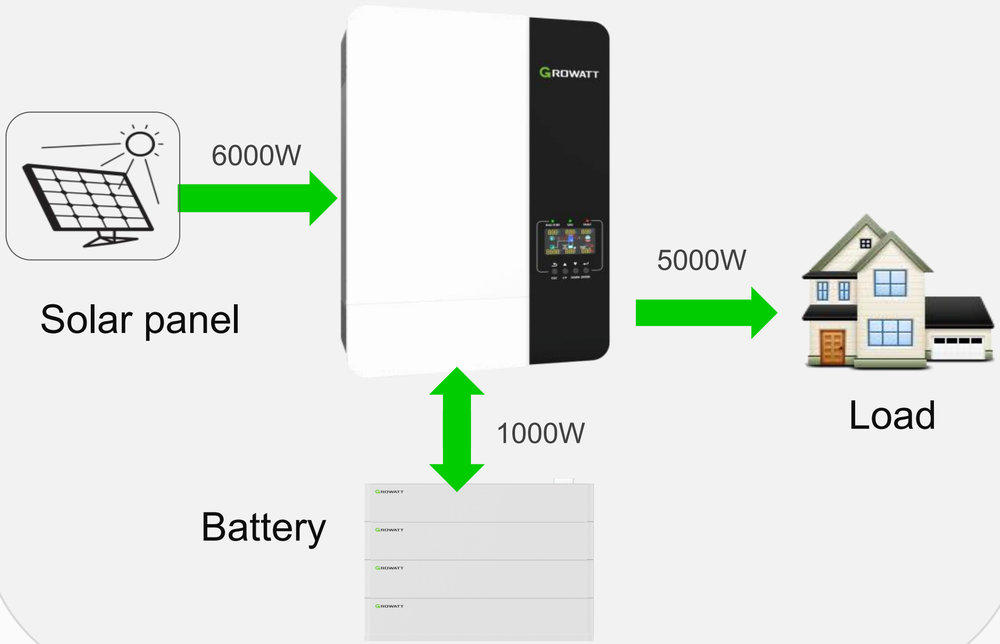
Power factor : 0.8	Power factor : 1.0
6KW Load, Over-load 125%, inverter stop working	6KW load,Inverter 100% load, still work normally

More Powerful PV Input

The maximum 8KW PV output capability for SPE series ,when solar power is sufficient the 6kw output power for loads and the excess 2kw power will charging for the battery.

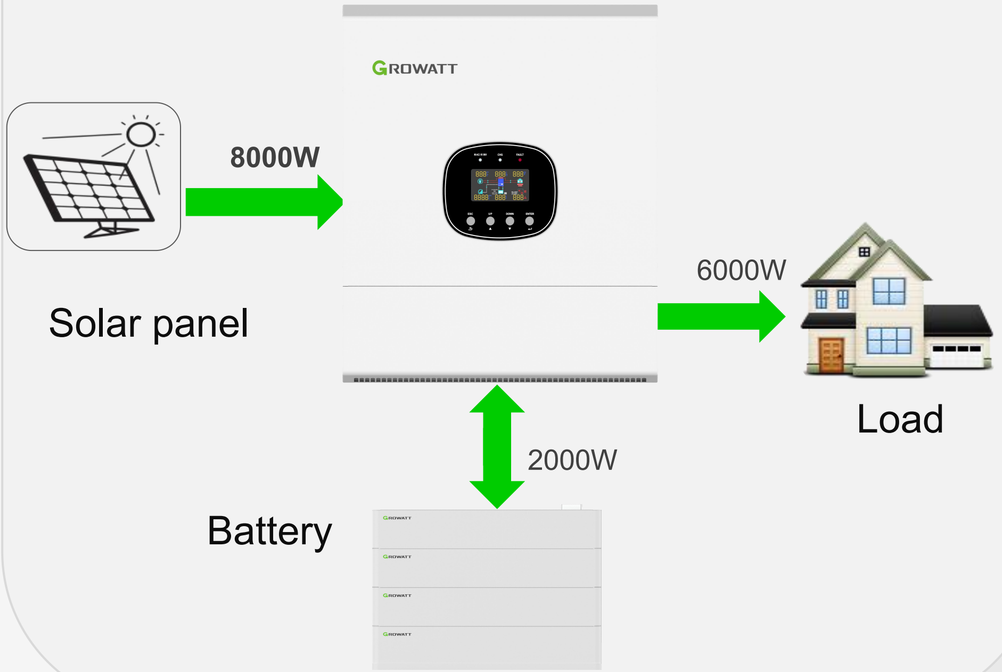
SPF 5000ES

Maximum 6000Wp PV input



SPE 6000TL HVM-G2

Maximum 8000Wp PV input



Higher PV Input Voltage and Current

Inverter configuration：

Max. PV input current and open circuit voltage

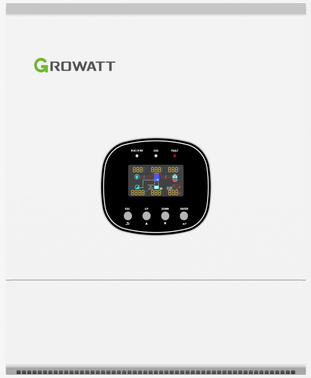
- ES series inverter: 22A / 450V(One MPPT)
- SPE series G2 inverter: 32A / 500V (Two MPPTs)

Maximum Power-PMAX (Wp)	401	405	409	413	417	420
Maximum Power Voltage-VMPP (V)	28.6	28.8	29.0	29.2	29.3	29.5
Maximum Power Current-IMPP (A)	14.01	14.06	14.10	14.15	14.19	14.23
Open Circuit Voltage-Voc (V)	35.0	35.1	35.3	35.5	35.7	35.9
Short Circuit Current-Isc (A)	14.76	14.80	14.84	14.88	14.92	14.96

SPF 5000 ES

Max. PV current 22A configuration(420W)

- 12PCS in series :
  5040W input (5040W output)
- 7PCS in series, 2string for parallel : 5880W input (4543W output)
- **10PCS in series, 2string for parallel : 8400W input (6000W output)**



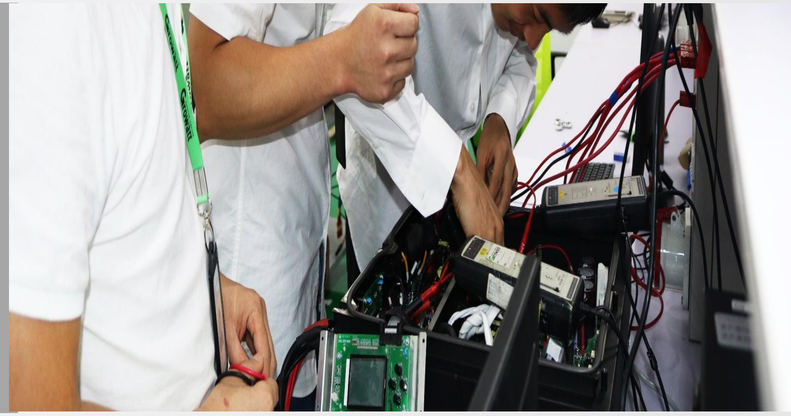
SPE 6000TL HVM-G2

Max. PV current 32A configuration(420W)

- 7PCS in series, 2string for parallel : 5880W input (5880W output)
- **10PCS in series, 2string for parallel : 8400W input (8000W output)**

03

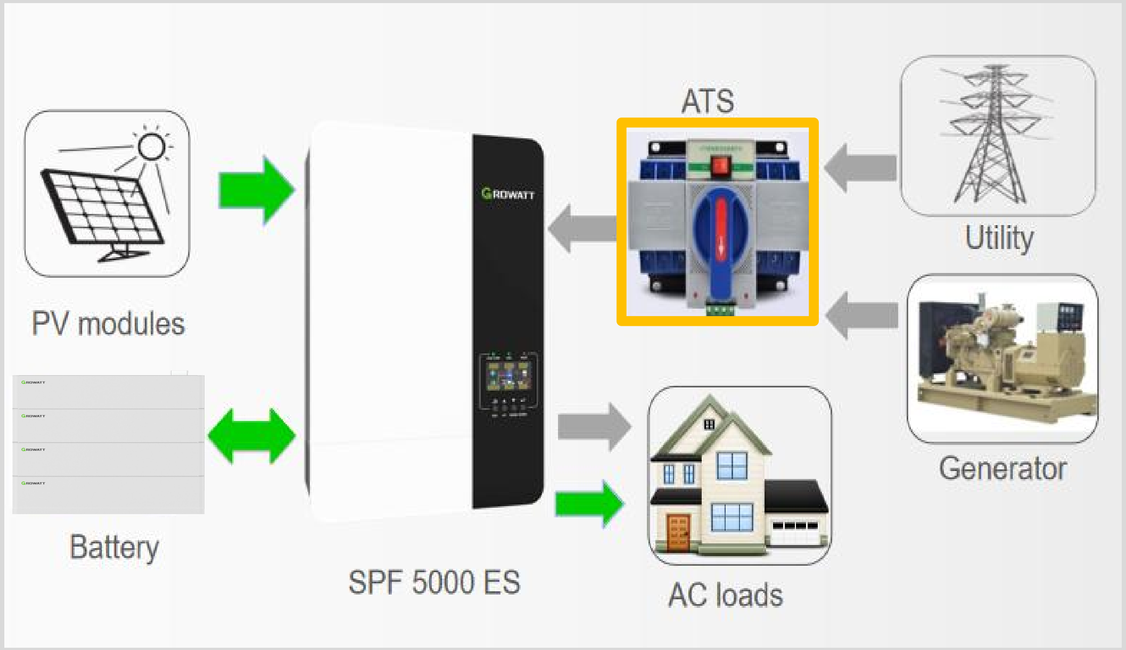
Scalable & Flexible

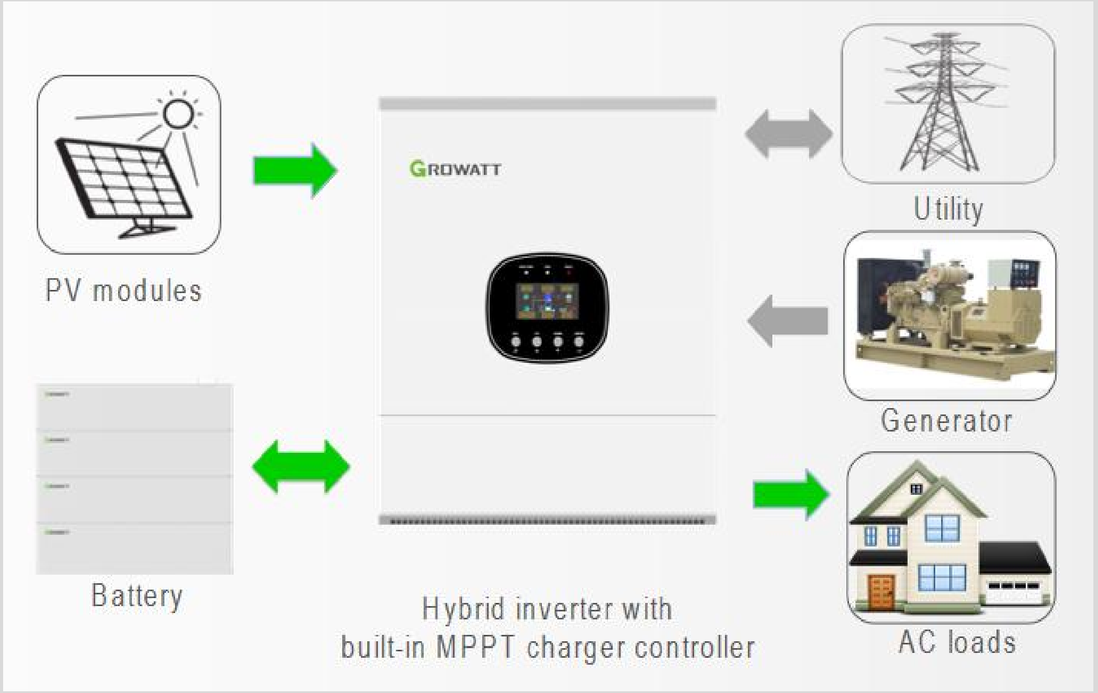


Two AC Input Terminals

SPE inverter has two AC input terminals with an integrated ATS device which can meet multiple AC source input requirements. meanwhile,The inverter can control the working time of the generator

General ES inverter only has one AC input terminal ,so an extra ATS device is needed to connect between the inverter and the AC source when there are two AC source inputs.





SPE inverter has two input terminals, so it can connect two AC source inputs at the same time and then can save the cost of an extra ATS device.

Dual MPP Trackers

PV module installation

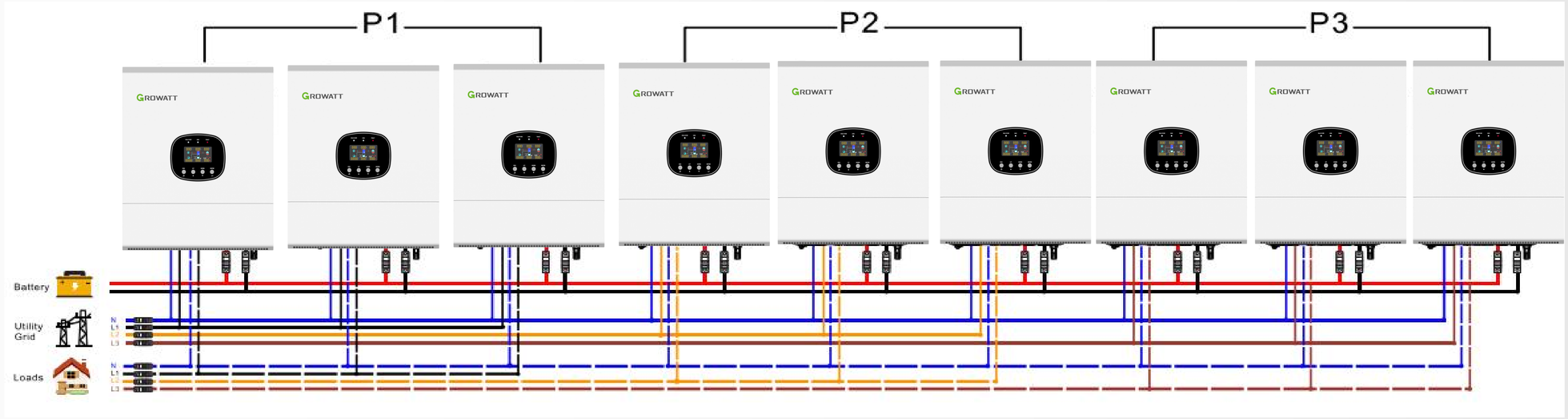
General ES inverter only one MPP tracker,the PV modules installation only suitable for the same orientation

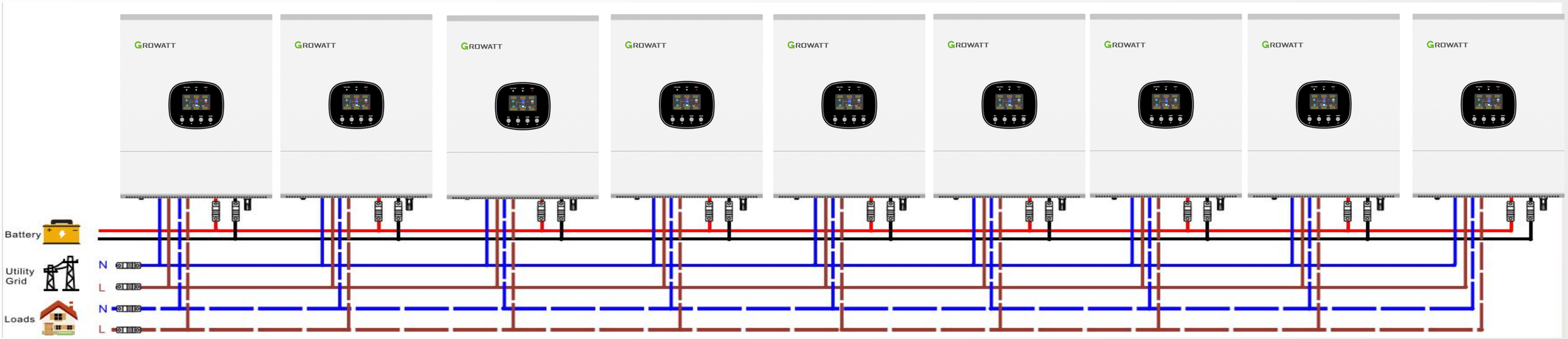
SPE series inverter has two MPPTs design which can meet multi-orientation installation requirements.

Parallel Extension

Parallel operation up to 9 units, the maximum system capacity would be 108kW, also support to configure three-phase system, provide customer enough flexibility.

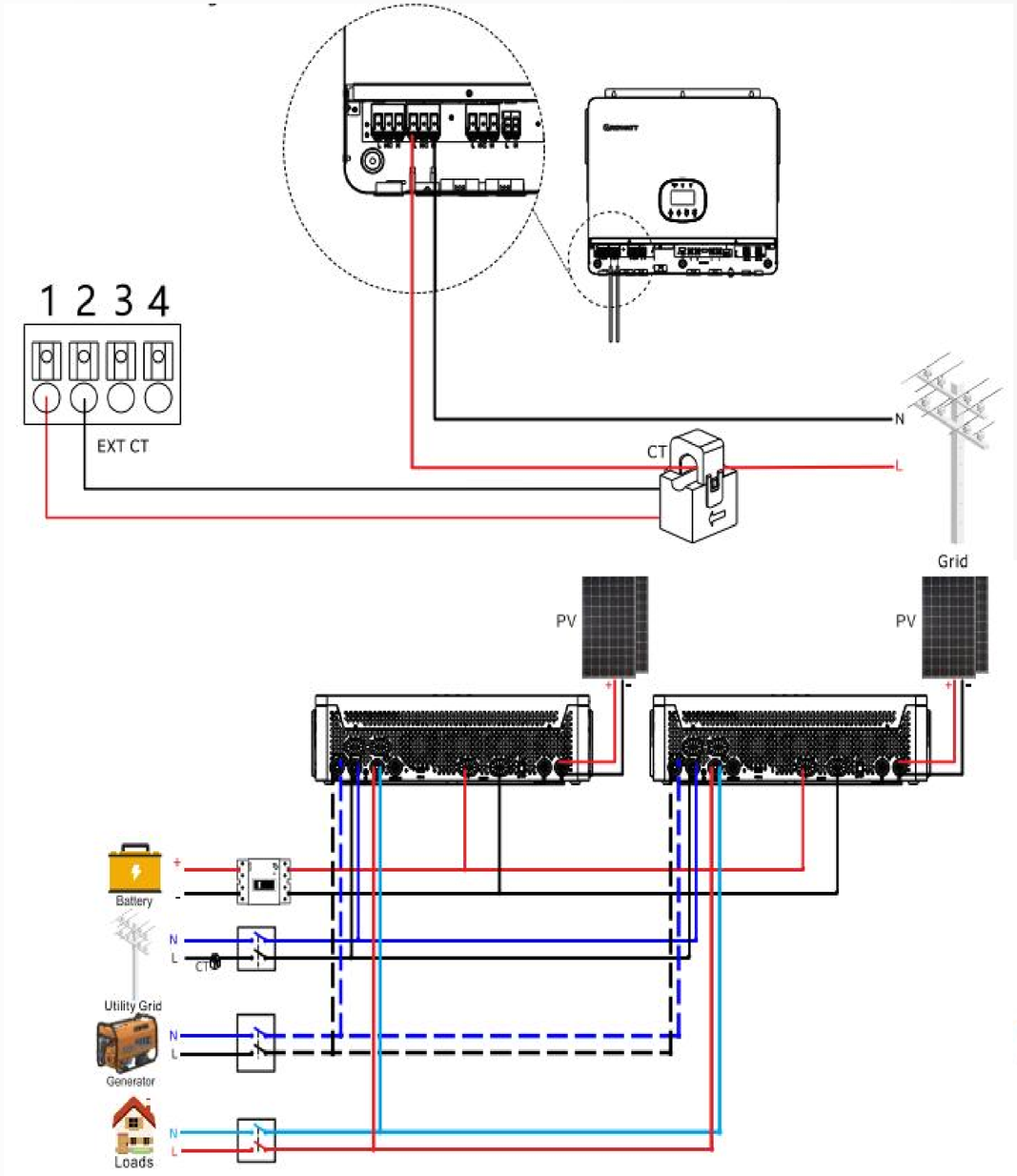
Three-phase system





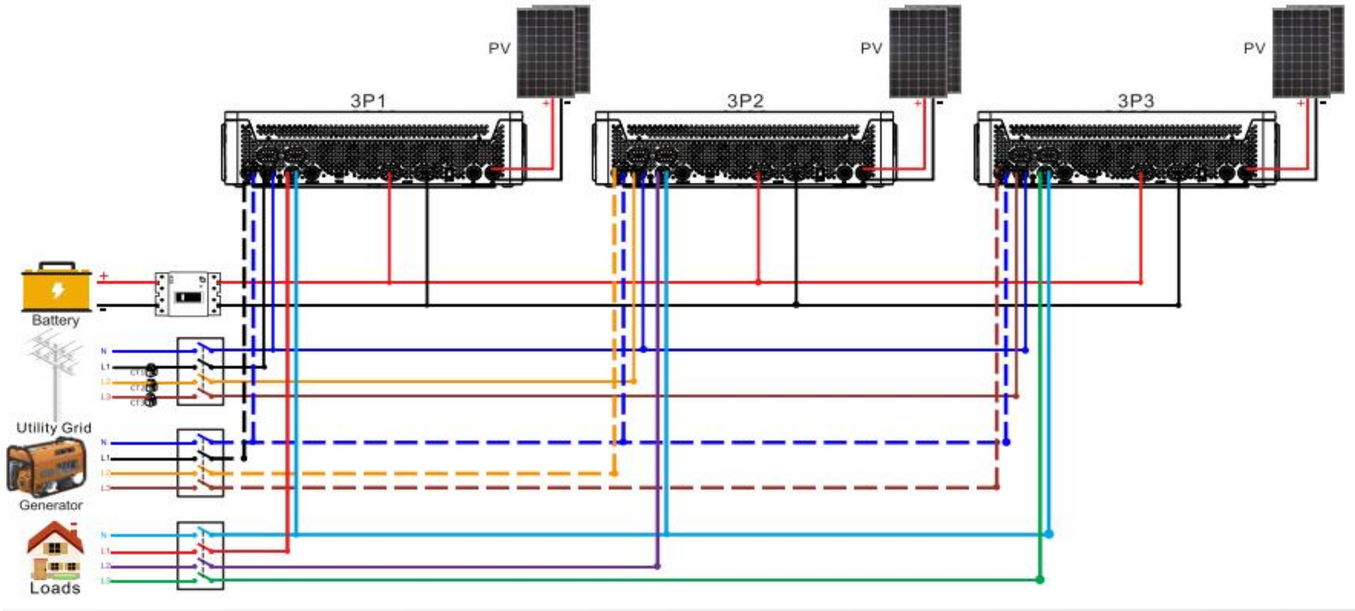
Single-phase system

Parallel Operation Export Control



Installers need to select the appropriate size of CT based on different parallel systems.
Only one CT is required for a single-phase parallel system and three CT is required for a three-phase parallel system.
The specifications are as follows

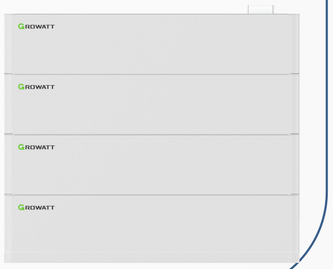
Part number	CT specification	Recommender system	Property
013.SK0000500	100A-50mA / 2000:1 / 4m	Single system or 3 Pcs three-phase parallel system	South African single camera standard
013.SK0002500	100A-50mA / 2000:1 / 10m	Single system or 3 Pcs three-phase parallel system	North American single camera standard
013.SK0002800	250A-62.5mA / 4000:1 / 10m	2-3 Pcs Single phase parallel or 6 Pcs three-phase parallel system	Additional purchase
013.SK0002900	500A-66.7mA / 7500:1 / 10m	4-6 Pcs Single phase parallel	Additional purchase



CAN/RS485 Communication with Lithium Battery

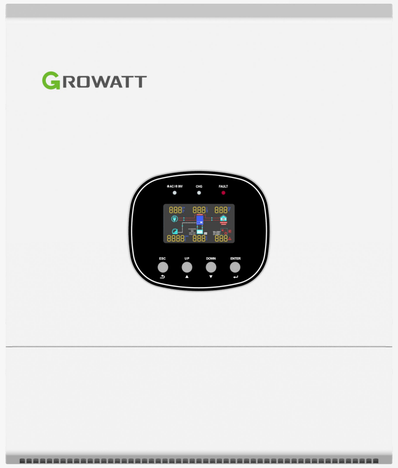
Inverter built-in BMS port which includes RS485 and CAN communication, and then easy to connect to different communication methods of lithium batteries.

ARK Battery



AXE Battery

CAN



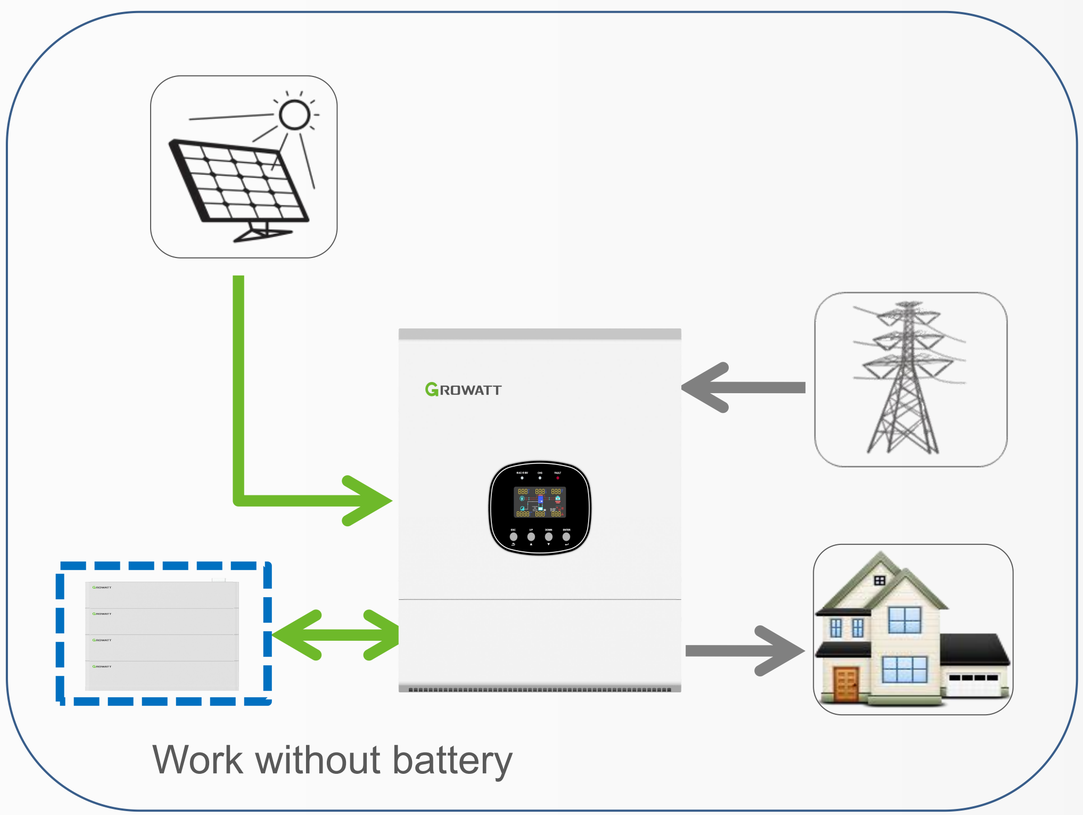
BMS port (RS485 /CAN)

RS485

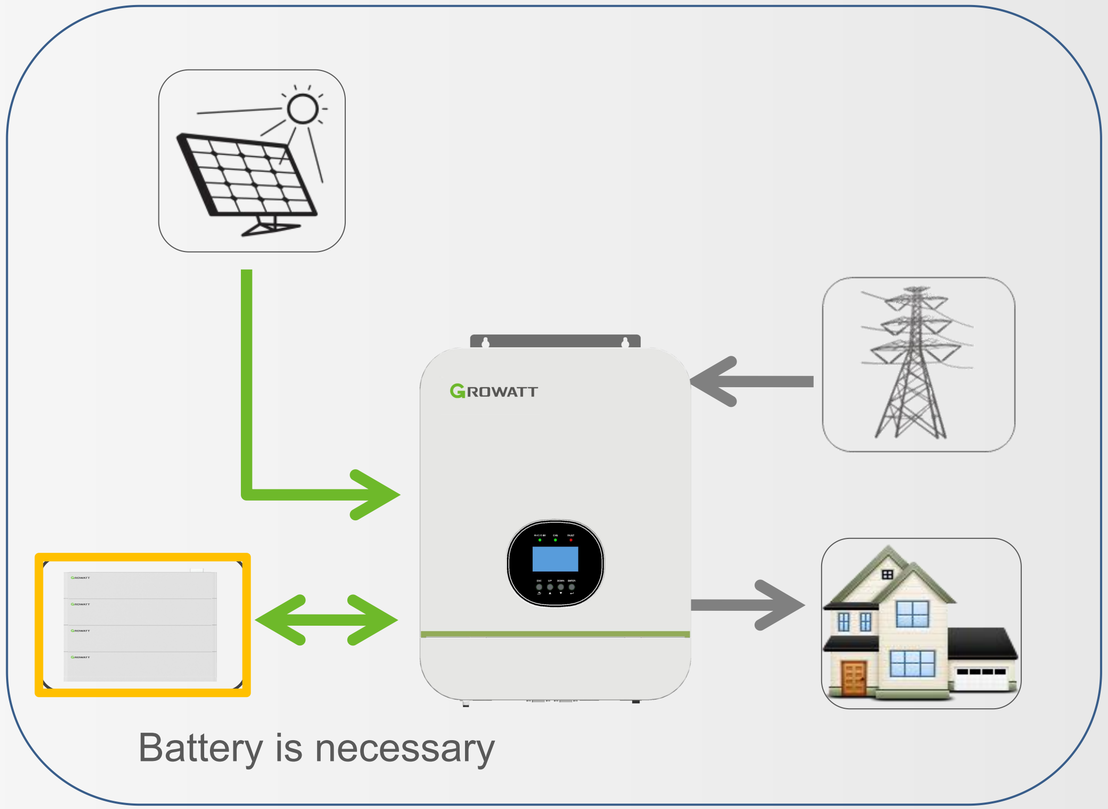
Hope Battery

Work Without Battery Brings Full Flexibility

Help customers to reduce the initial investment cost of the system, the new SUB mode also enables the inverter could work without the battery then solar and utility joint power to loads if solar is insufficient.



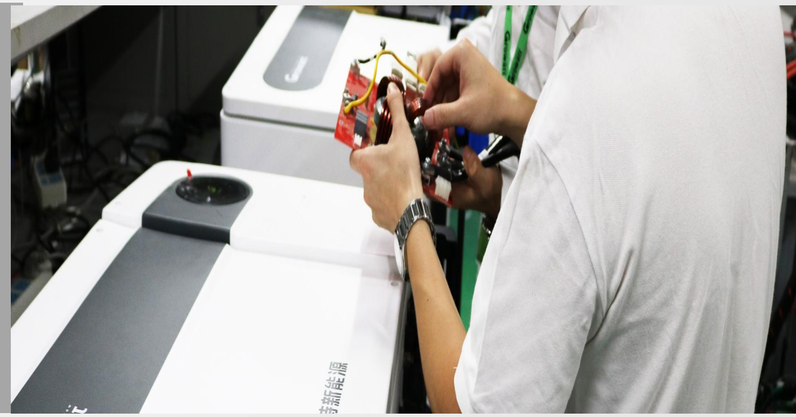
SPE series inverter



Old version inverter

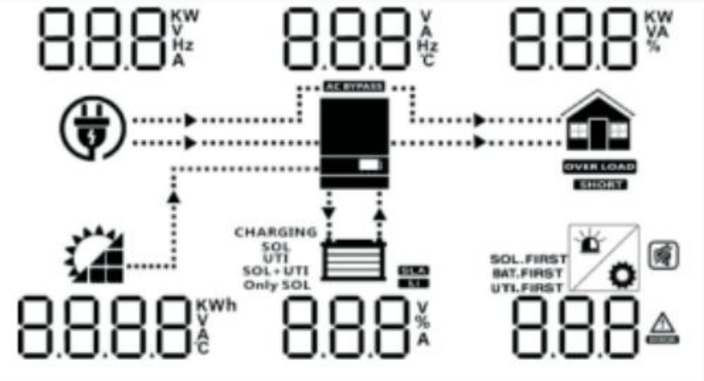
04

Smart & Reliable



Convenient HMI

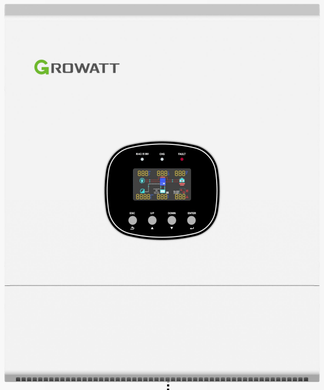
Colorful LCD display



1. Input information (PV voltage, AC voltage, frequency, PV generation, battery voltage, charger current)

2. Output information (voltage, load percentage, frequency, load in VA, load in watt, discharging current)

SPE series



USB cable

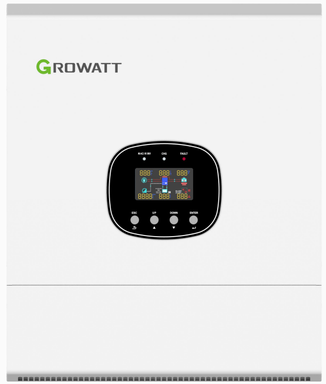
PC install monitoring software

PVkeeper platform
for local configuration or monitoring.

Smart Management

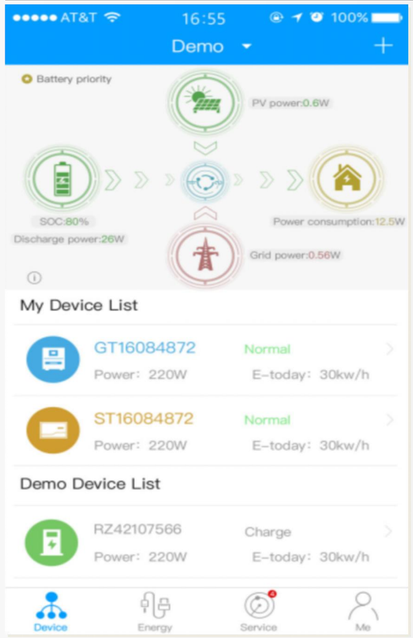
Remote monitoring,
Support remote FW upgrade

WIFI, GPRS communication port for remote monitoring



WIFI-F Pro

4G-F

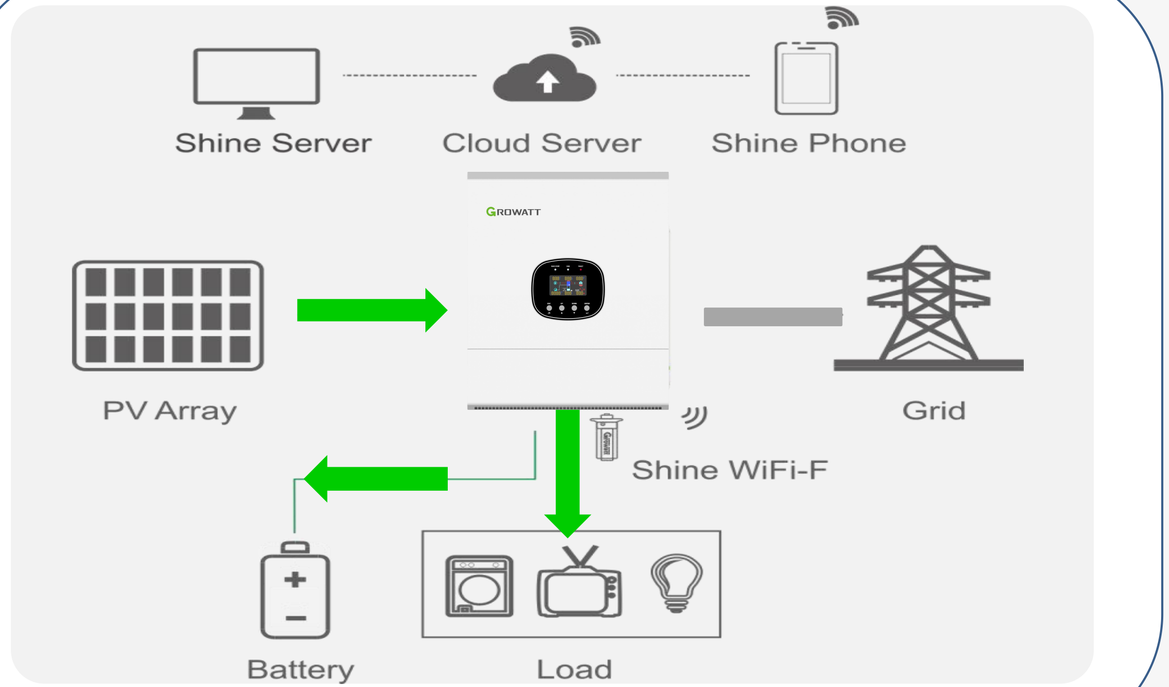


ShinePhone APP

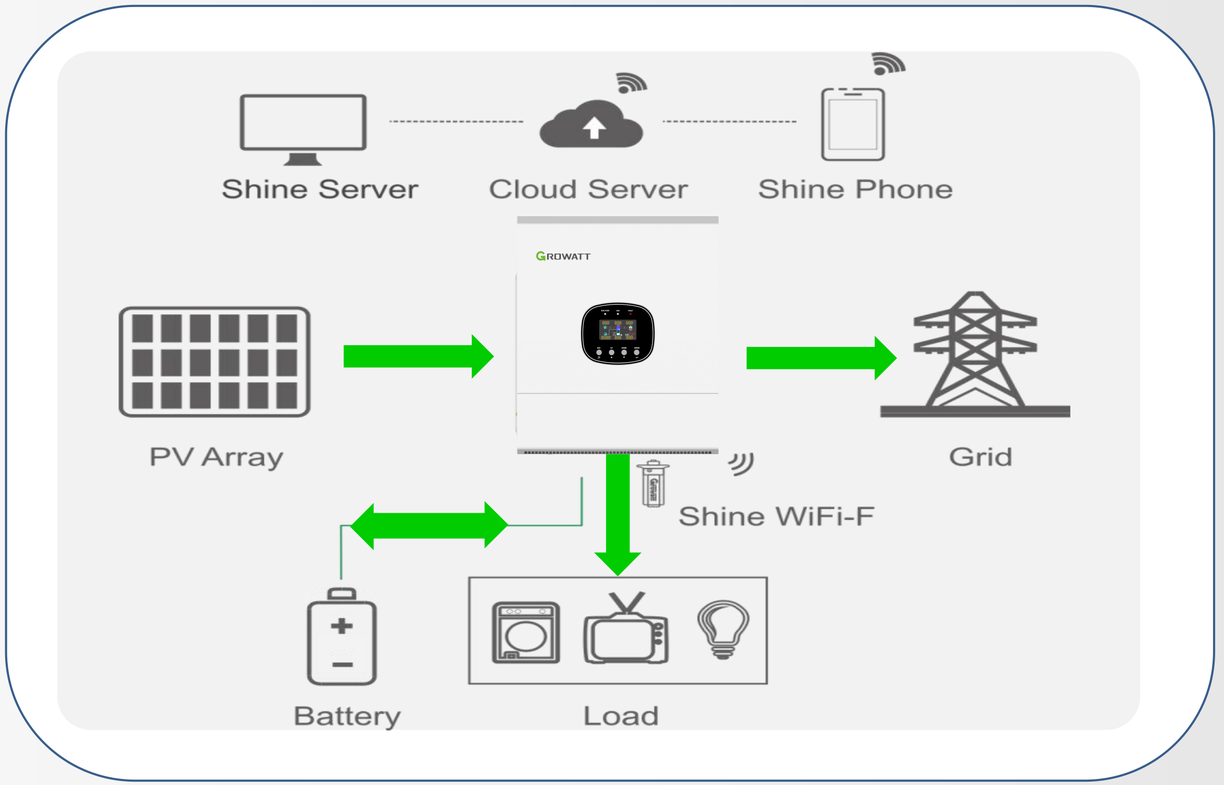
ShineServer

Export Power Function

The export function can be enabled for SPE series inverters.
After this function is enabled, the inverters can set solar export power and battery discharge power to grid based on user requirements..



Feed to grid function disable

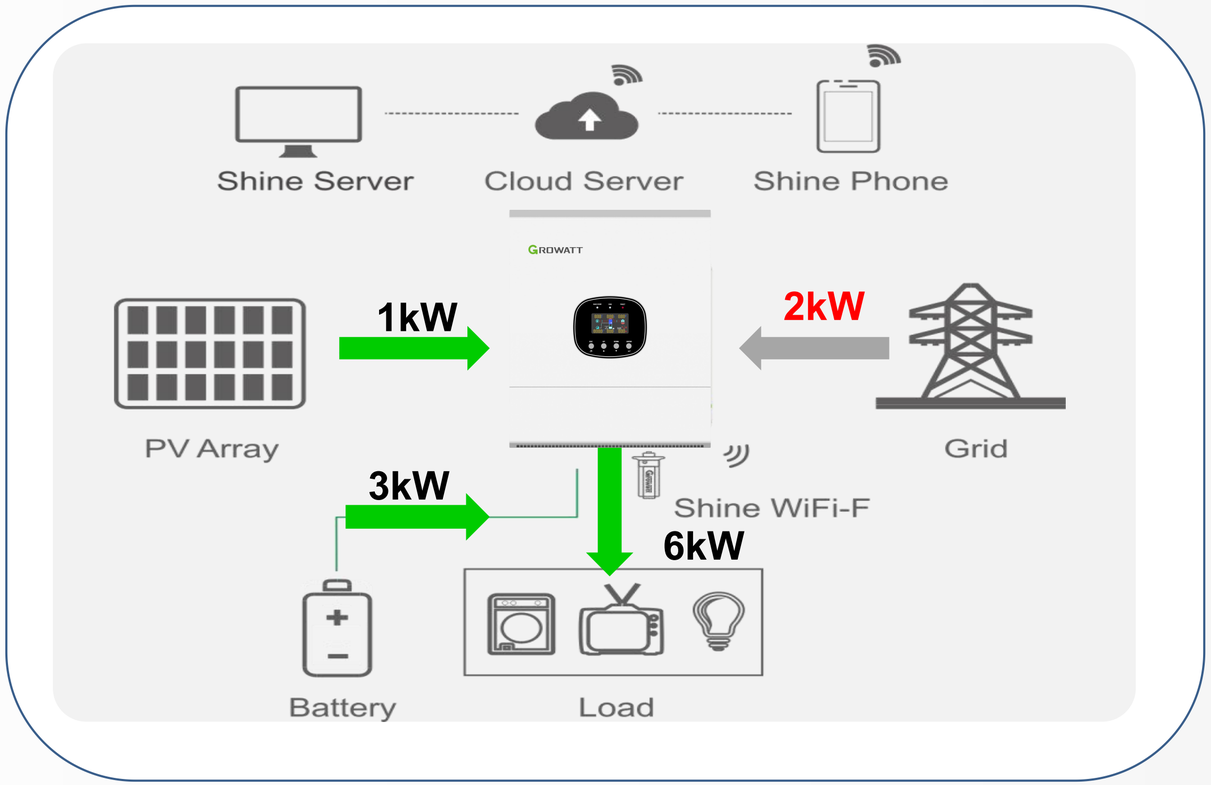


Feed to grid function enable

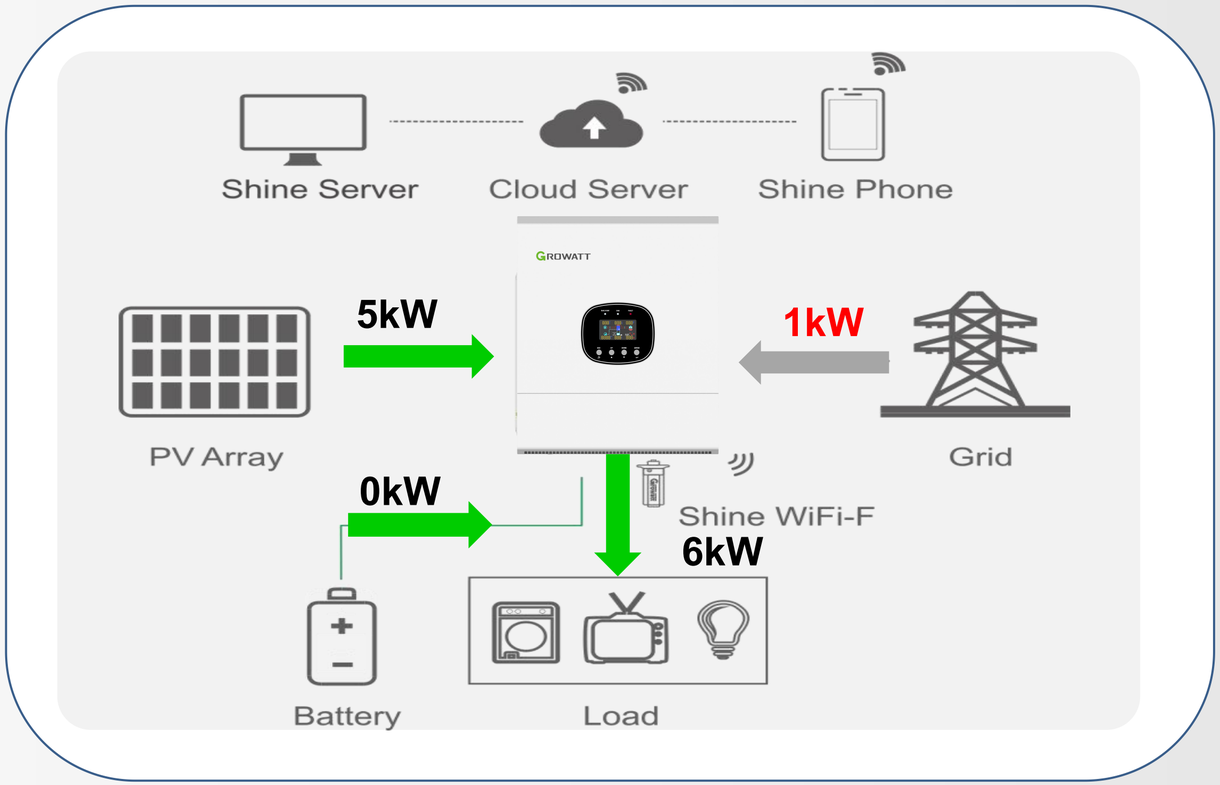
Grid Peak Power Control

Users can set up inverters to access power from the grid based on grid requirements to achieve peak-shaving functions.

NOTE:The maximum peak power can be set to twice the rated power of the inverter



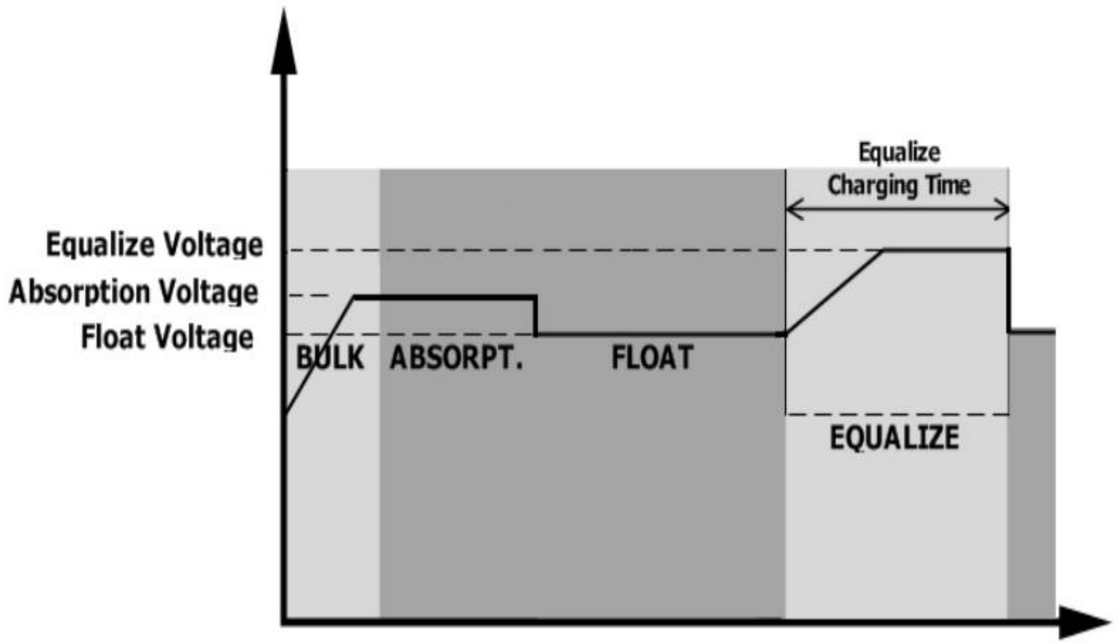
Grid peak power set to 2kW



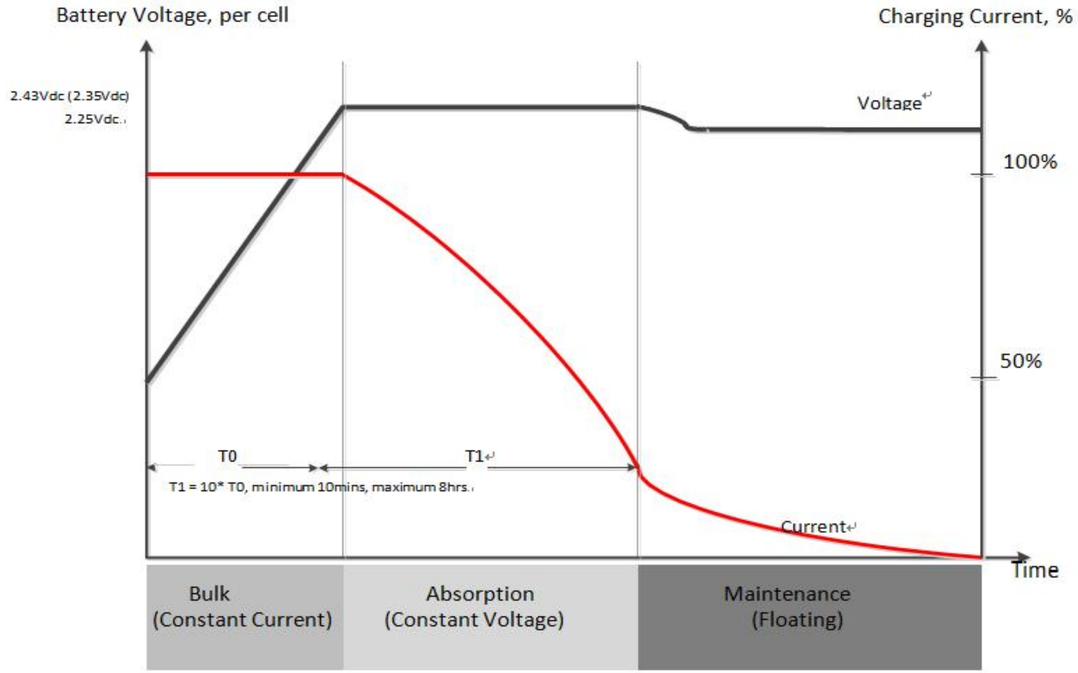
Grid peak power set to 2kW

Equalization Charging

Inverter can enable battery equalization function which can set charge interval time and charge voltage to activating lead-acid battery characteristics then extend lead-acid battery life.



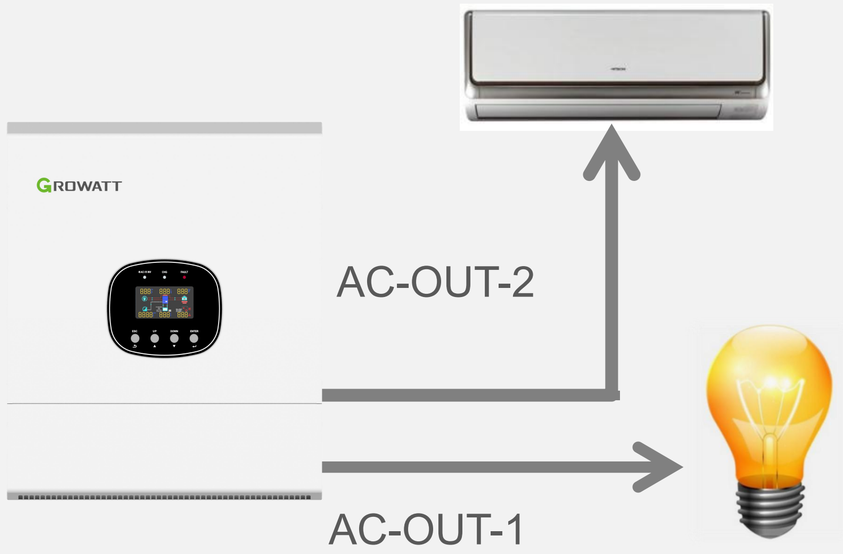
SPE series inverters



General inverter

BLVD Function

BLVD (battery low voltage disconnection) when batter low voltage or inverter overload occurs, the inverter will turn off AC-OUT-2 output automatically to protect AC-OUT-1 emergency load.
Load segment control to maximize battery runtime for critical devices.
Note:The inverter activates the BLVD function based on the battery SOC and time Settings

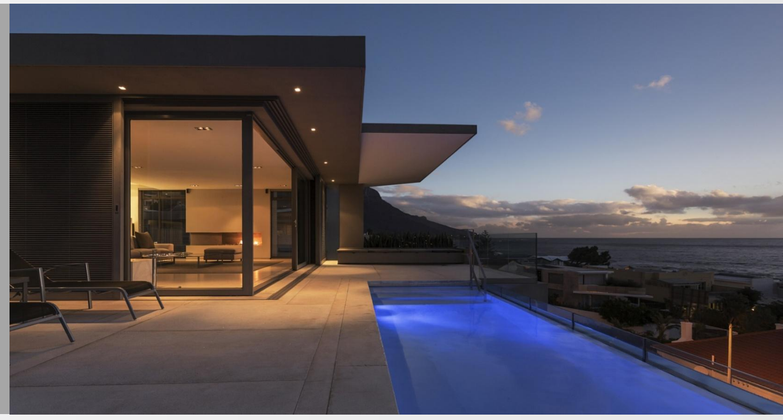


SPE series

Old version inverter only with one AC output

05

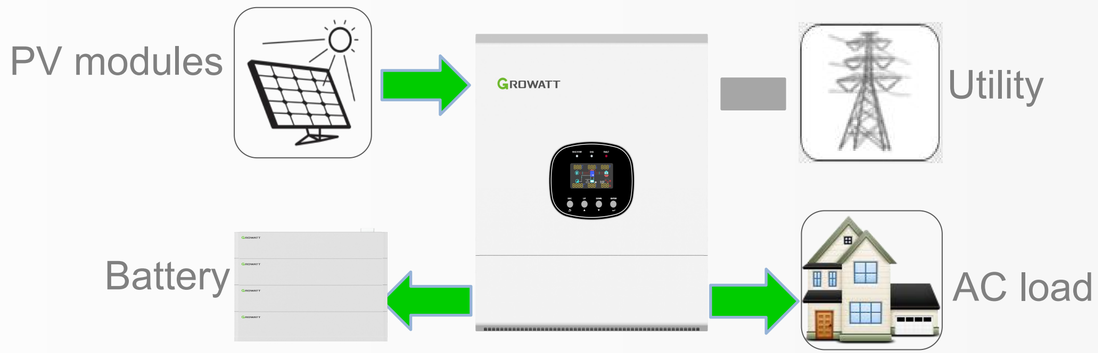
Application Scenarios



Multiple Work Modes

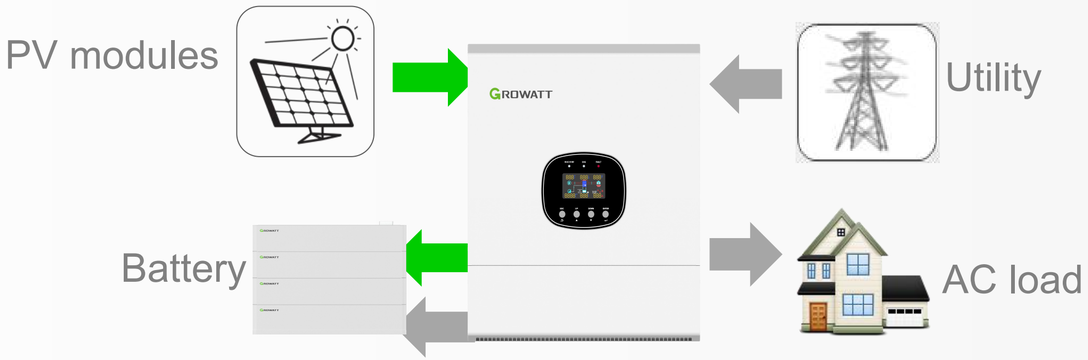
Working mode: (output SOL: solar first ; charging SNU: solar and utility power)

1. Solar power is sufficient

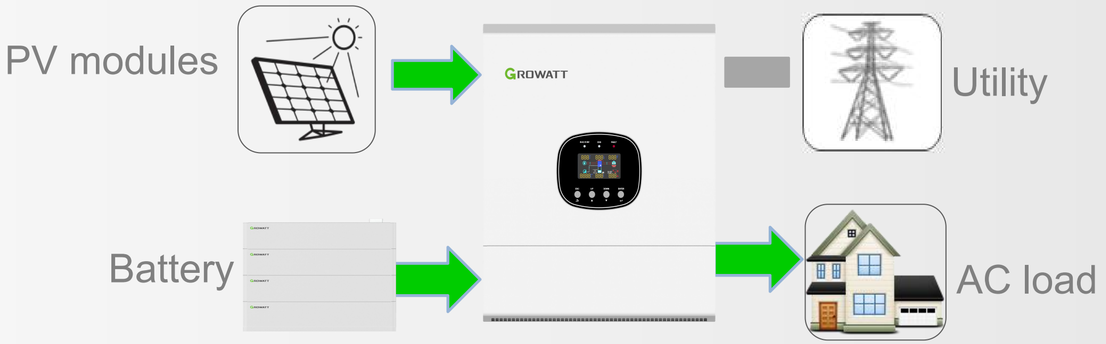


2. Solar power is not sufficient

3. Battery discharge low voltage back to utility mode (44-51.2 Vdc can set)



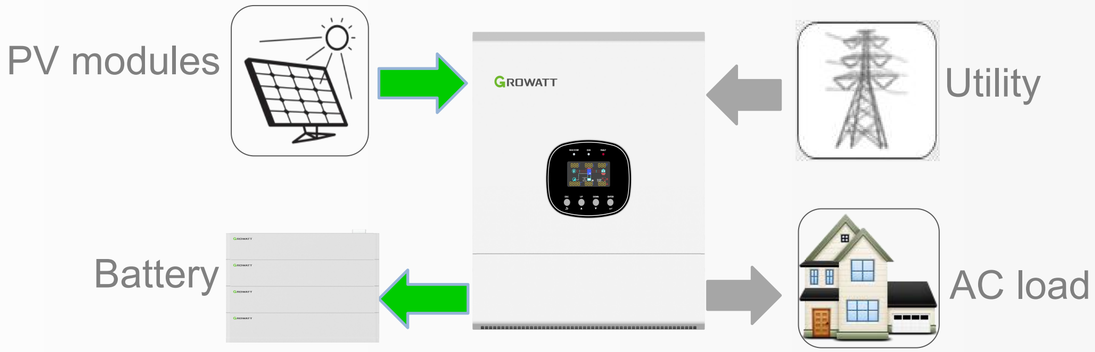
4. Utility charging voltage back to battery mode (48-58 Vdc can set)



Multiple Work Modes

Working mode: (output UTI: utility first ; charging SOC : solar first)

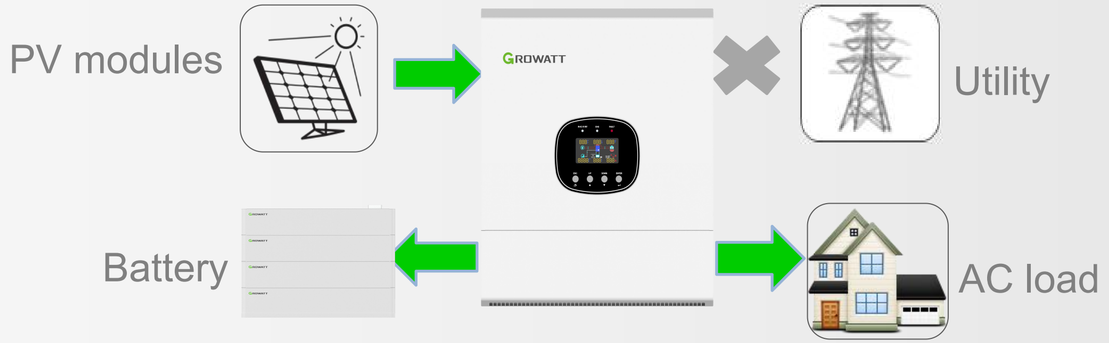
1. Solar power is sufficient



2. Solar power is not sufficient

3. Solar power is not available

4. Utility power is not available

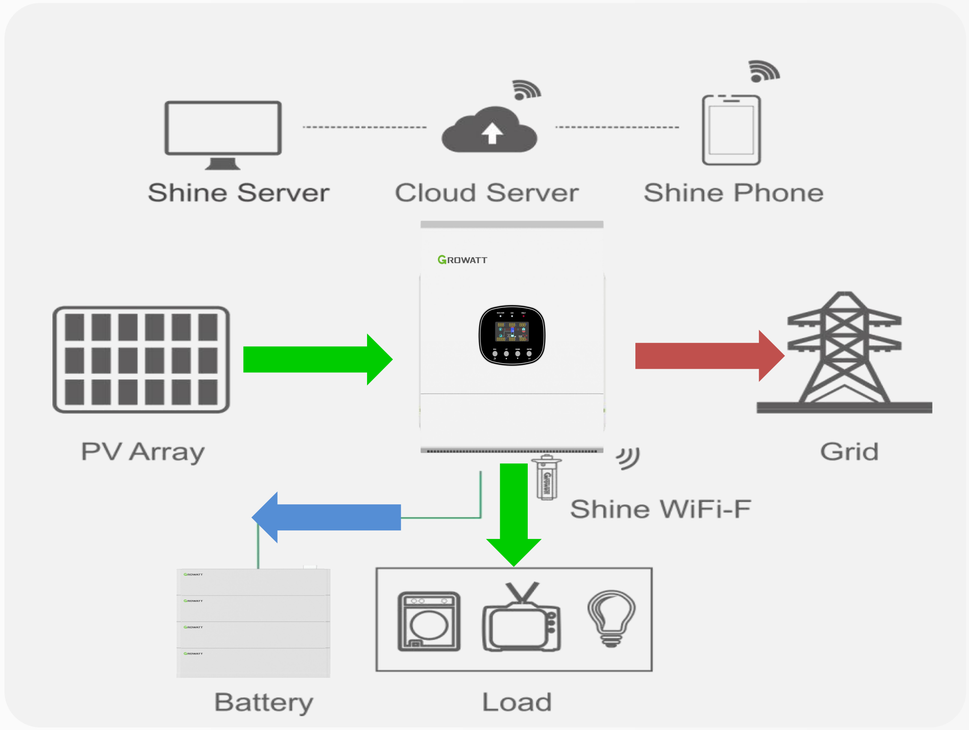


Application Scenario 1 -- Export power

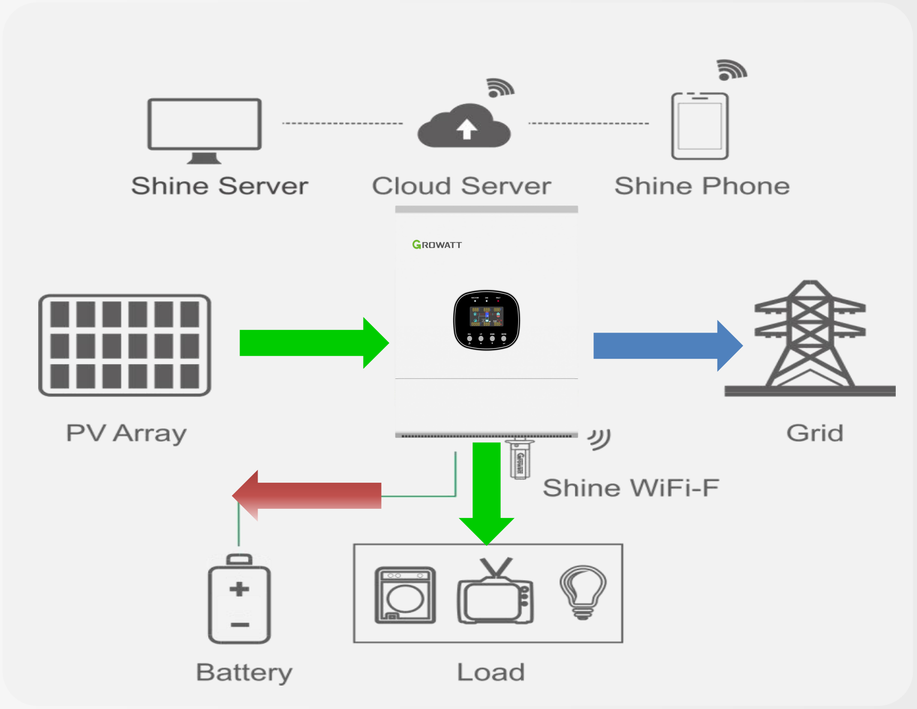
Priority mode : SUB

1. Set output priority mode to SUB from program 01
2. Set battery charging mode to SNU from program 14
3. Set solar power priority mode from program 55
4. Enable feed to grid function from program 67

Customers can set the priority of solar energy export or battery charging according to actual needs



LUB function



LBU function

Frist priority：

Second priority:

Third priotrity:

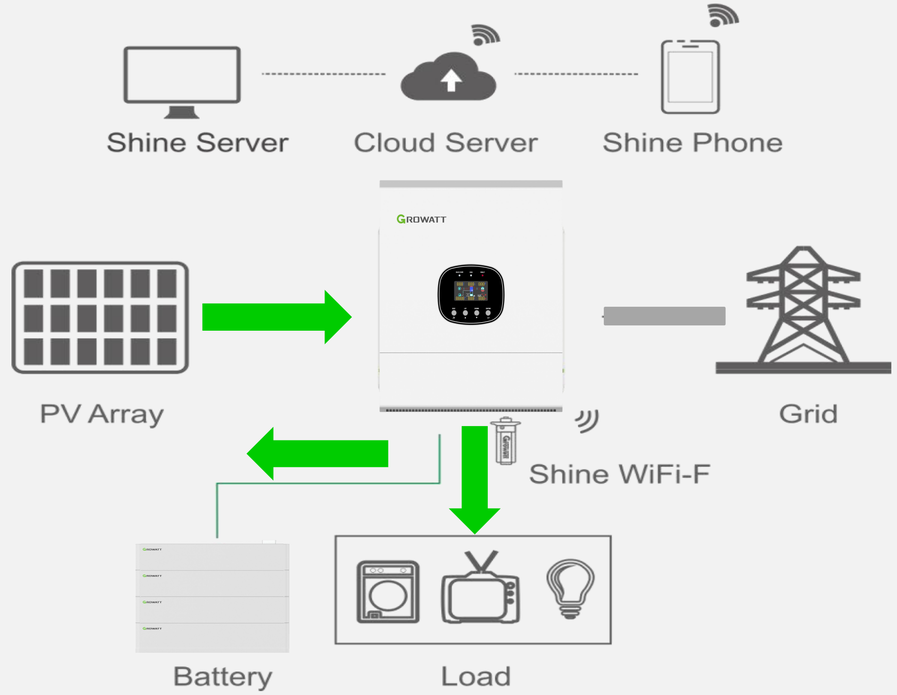
Application Scenario 2 -- Power Backup

Priority mode : SUB

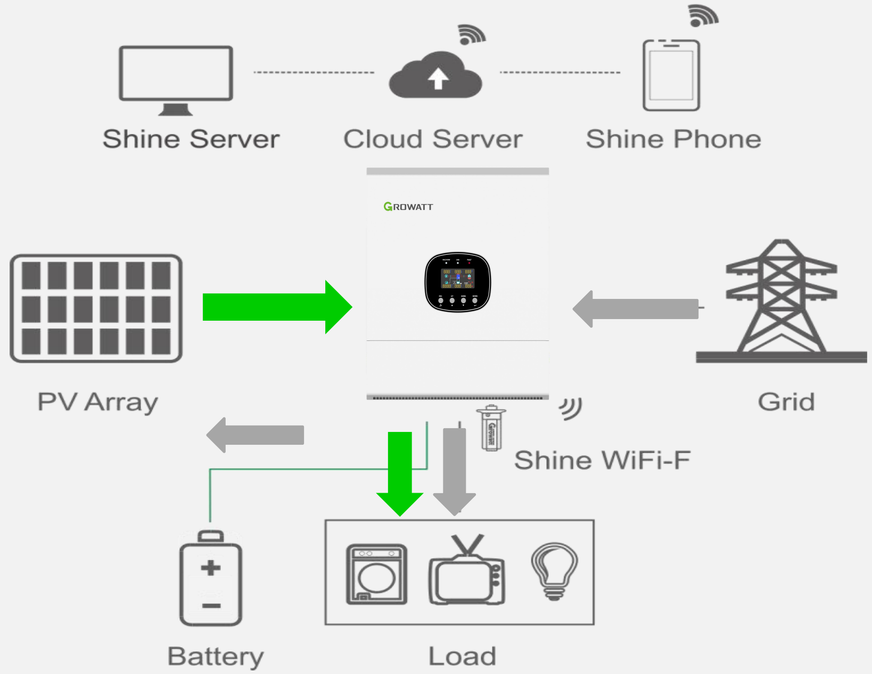
1. Set output priority mode to SUB from program 01
2. Set battery charging mode to SNU from program 14

Solar power is sufficient (supply power to load and also charge the battery). When solar power is not sufficient, utility power to the load and charge of the battery also

Solar power is sufficient



Solar power is not sufficient



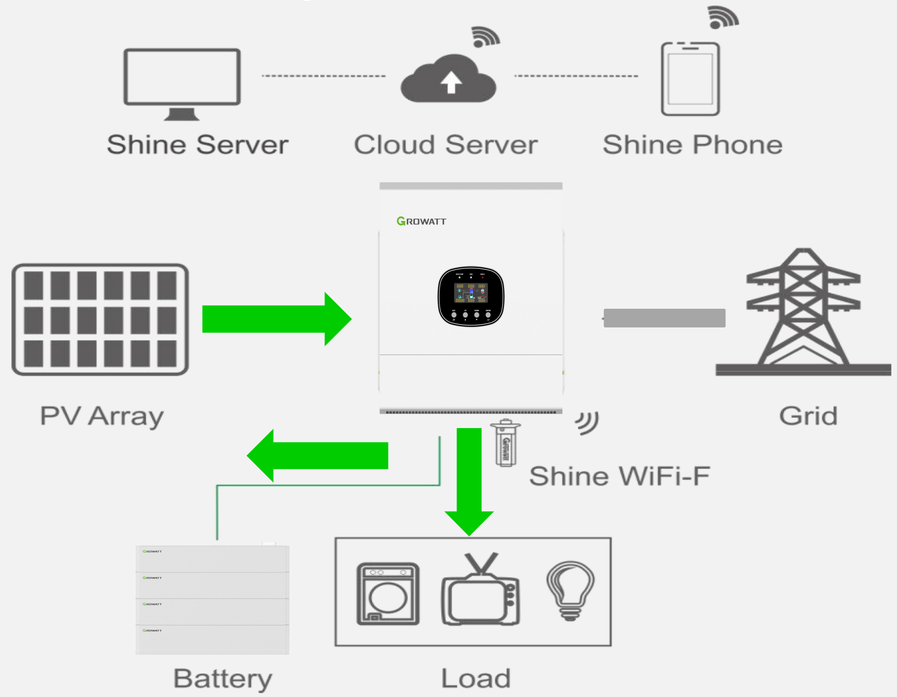
Application Scenario 3 -- Reduce the Electricity Bill

Priority mode : SBU

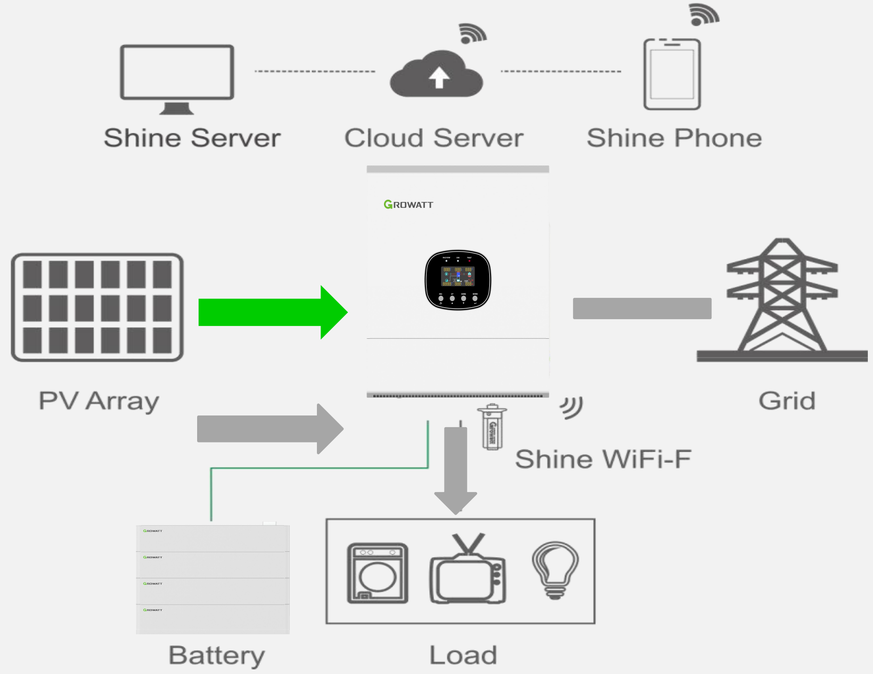
1. Set output priority mode to SBU from program 01
2. Set battery charging mode to OSO from program 14

Solar power is sufficient (supply power to load and also charge the battery). When solar power is not sufficient, solar and battery supply power to the load

Solar power is sufficient



Solar power is not sufficient



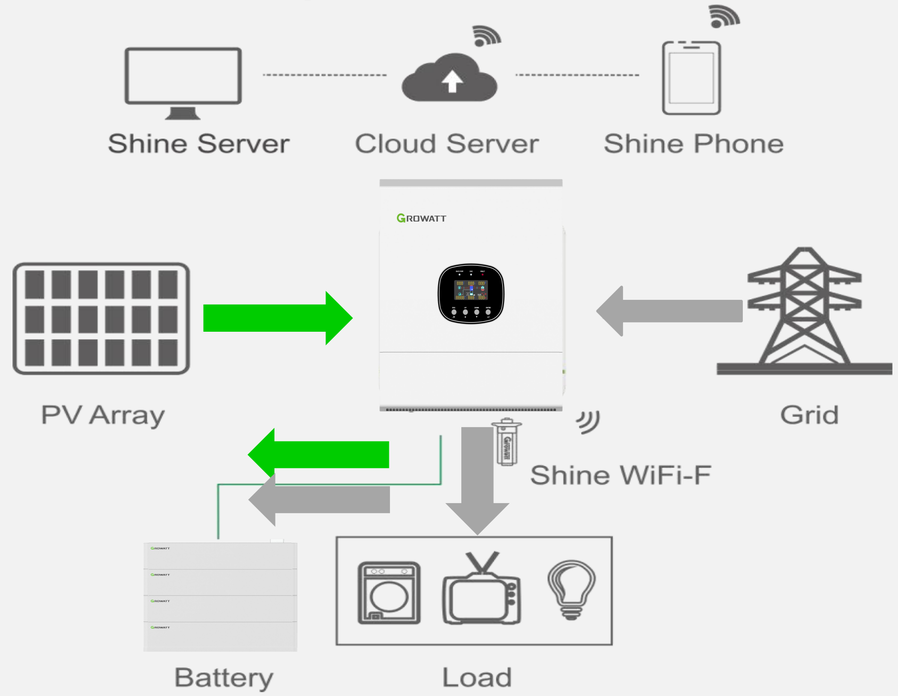
Application Scenario 4 -- Lack of Sunlight Season

Priority mode : UTI

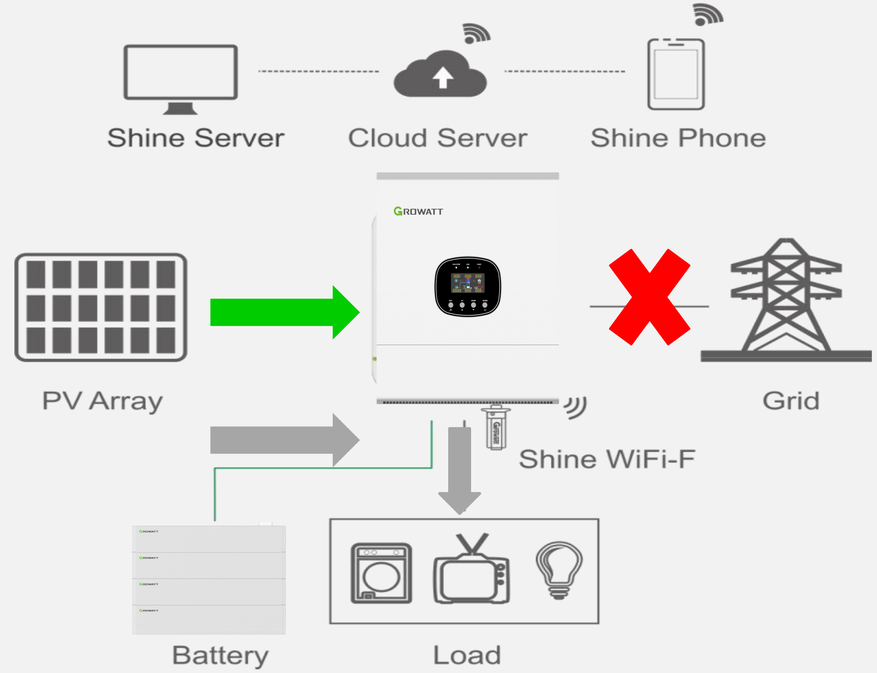
1. Set output priority mode to UTI from program 01
2. Set battery charging mode to SNU from program 14

Solar power is sufficient (Utility power to load and also charge the battery). When utility power is not available, solar and battery supply power to the load.

Solar power is sufficient



Utility power is not available

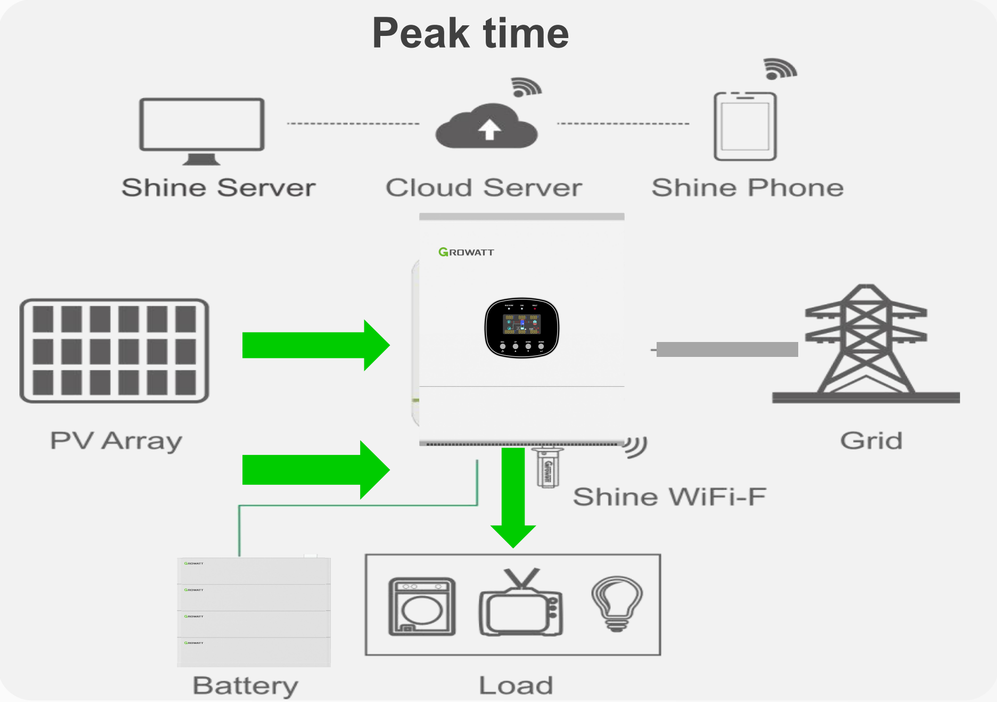


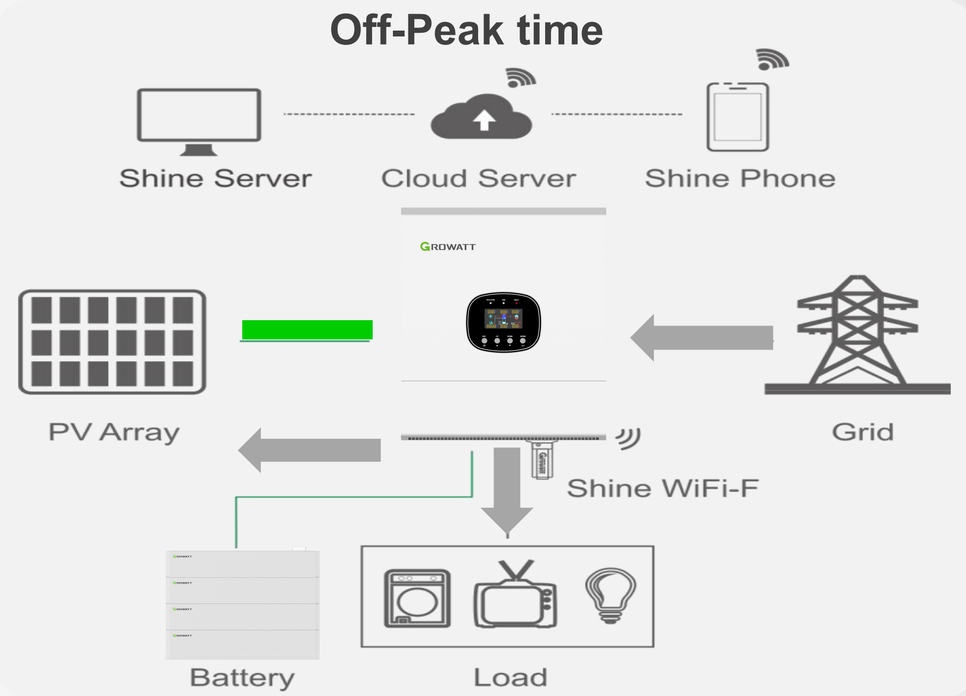
Application Scenario 5 -- Off-Peak Charging

Charging time setting (all output modes are available)

1. set output priority mode from program 01
2. setting utility power charging battery time from program 49

The time of output power support and battery charging can be set during off-peak or peak time





THANKS

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