



Three-phase Hybrid Inverter Introduction

Prepared by Kyle Zhang

Model	SUN-8K-SG04LP3	SUN-10K-SG04LP3	SUN-12K-SG04LP3
Battery Input Data			
Battery Type	Lead-acid or Li-Ion		
Battery Voltage Range (V)	40~60V		
Max. Charging Current (A)	190A	210A	240A
Max. Discharging Current (A)	190A	210A	240A
Charging Curve	3 Stages / Equalization		
External Temperature Sensor	Yes		
Charging Strategy for Li-Ion Battery	Self-adaption to BMS		
PV String Input Data			
Max. DC Input Power (W)	10400W	13000W	15600W
PV Input Voltage (V)	550V (150V~800V)		
MPPT Range (V)	200V-650V		
Start-up Voltage (V)	160V		
PV Input Current (A)	13A+13A	26A+13A	26A+13A
No.of MPPT Trackers	2		
No.of Strings Per MPPT Tracker	1+1	2+1	2+1
AC Output Data			
Rated AC Output and UPS Power (W)	8000W	10000W	12000W
Max. AC Output Power (W)	8800W	11000W	13200W
Peak Power (off grid)	2 times of rated power, 10 S		
AC Output Rated Current (A)	12A	15A	18A
Max. AC Current (A)	18A	23A	27A
Max. Continuous AC Passthrough (A)	50A		
Output Frequency and Voltage	50/60Hz; 230/400Vac (Three phase)		
Grid Type	Three Phase		
Current Harmonic Distortion	THD<3% (Linear load<1.5%)		
Efficiency			
Max. Efficiency	97.60%		
Euro Efficiency	97.00%		
MPPT Efficiency	99.90%		

SUN 8/10/12K-SG



Efficiency

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Protection

PV Input Lightning Protection	Integrated
Anti-islanding Protection	Integrated
PV String Input Reverse Polarity Protection	Integrated
Insulation Resistor Detection	Integrated
Residual Current Monitoring Unit	Integrated
Output Over Current Protection	Integrated
Output Shorted Protection	Integrated
Output Over Voltage Protection	Integrated
Surge protection	DC Type II / AC Type II

Certifications and Standards

Grid Regulation	IEC61727, IEC62116, IEC60068, IEC61683, NRS 097-2-1
Safety EMC / Standard	IEC62109-1/-2, IEC61000-6-1, IEC61000-6-3, IEC61000-3-11, IEC61000-3-12

General Data

Operating Temperature Range (°C)	-25~60°C, >45°C Derating
Cooling	Smart cooling
Noise (dB)	<45 dB
Communication with BMS	RS485; CAN
Weight (kg)	36.8
Size (mm)	422W×658H×281D
Protection Degree	IP65
Installation Style	Wall-mounted
Warranty	5 years

SUN 8/10/12K-SG



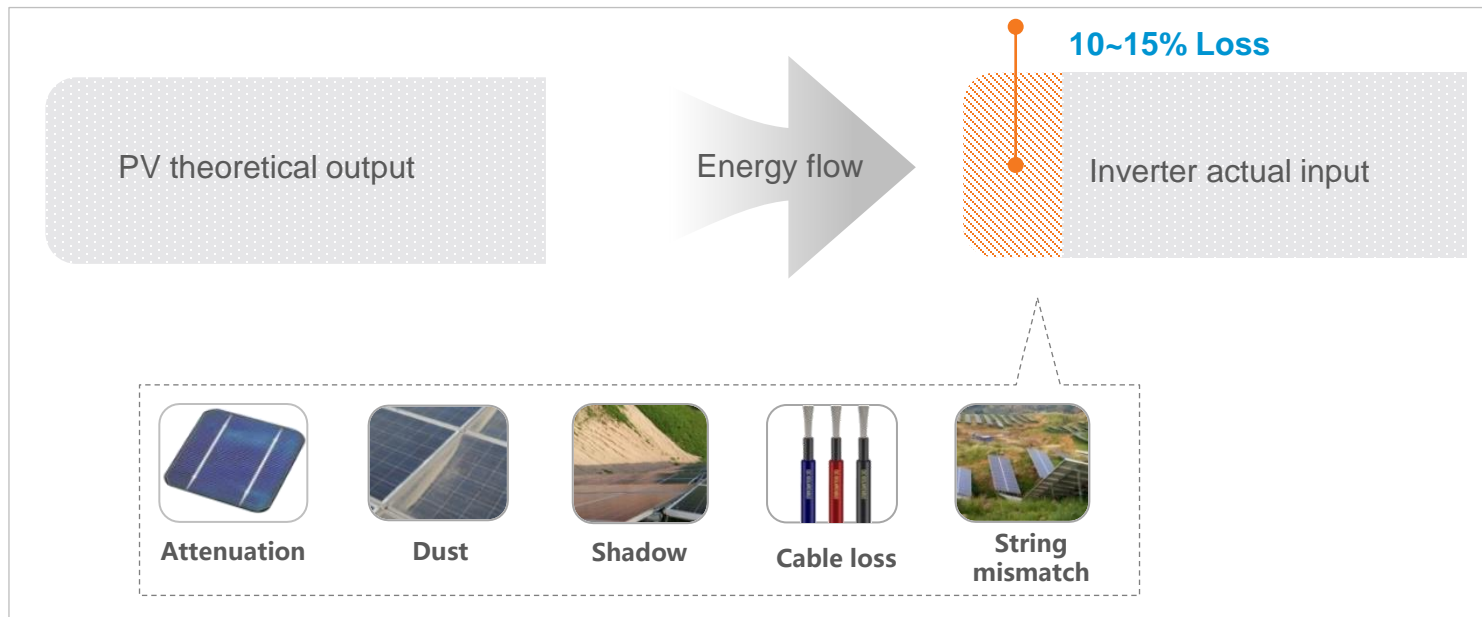
➤ SUN 8/10/12K-SG Advantages at a Glance

- A full range of products 8/10/12KW with output voltage of 230V/400Vac.
- More higher charging and discharging power of 240A & 12000W for 12KW model.
- 48V low voltage battery, built-in transformer for electrical isolation more safer.
- Max. DC input current is 13A/string, the DC/AC ratio of 1.3.
- Independent Grid port, diesel generator port and backup load port, easy connection.
- *Built-in DG control interface, and support DG charges the battery ensuring the system works within 7*24H.
- 2 kinds of AC couple method to update existing solar system to energy storage system.
- *Max. 16 units parallel operation without additional accessory.
- “Time of use” function, support 6 different time periods for charging and discharging battery.
- 4ms fast transfer from on-grid to off-grid mode, ensuring the traditional fixed frequency air conditioner works well
- Colorful touch screen and buttons, easy operation and maintenance.
- Smart load application, expanding application scenario
- Grid peak-shaving function, improving self-consumption ratio of solar energy

*Note: this function will be available in July 2021

DC/AC ratio up to 1.3, saving equipment investment

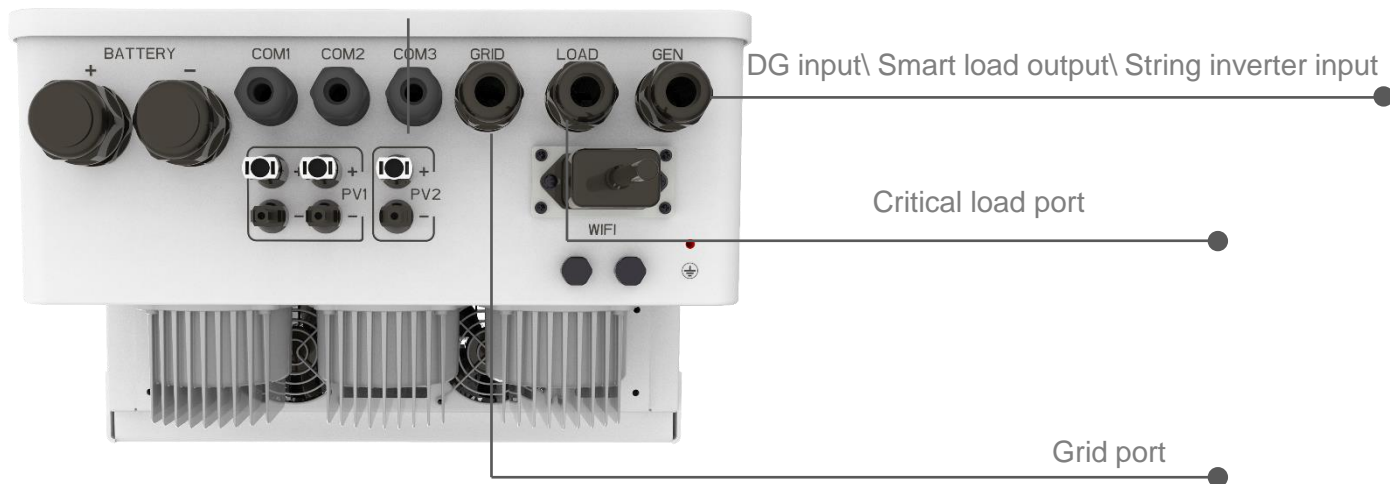
- Max. DC input current of 13A/string, compatible with different kinds PV modules
- Under some special conditions such as low irradiation, more solar panel connected will efficiently increase power generation.



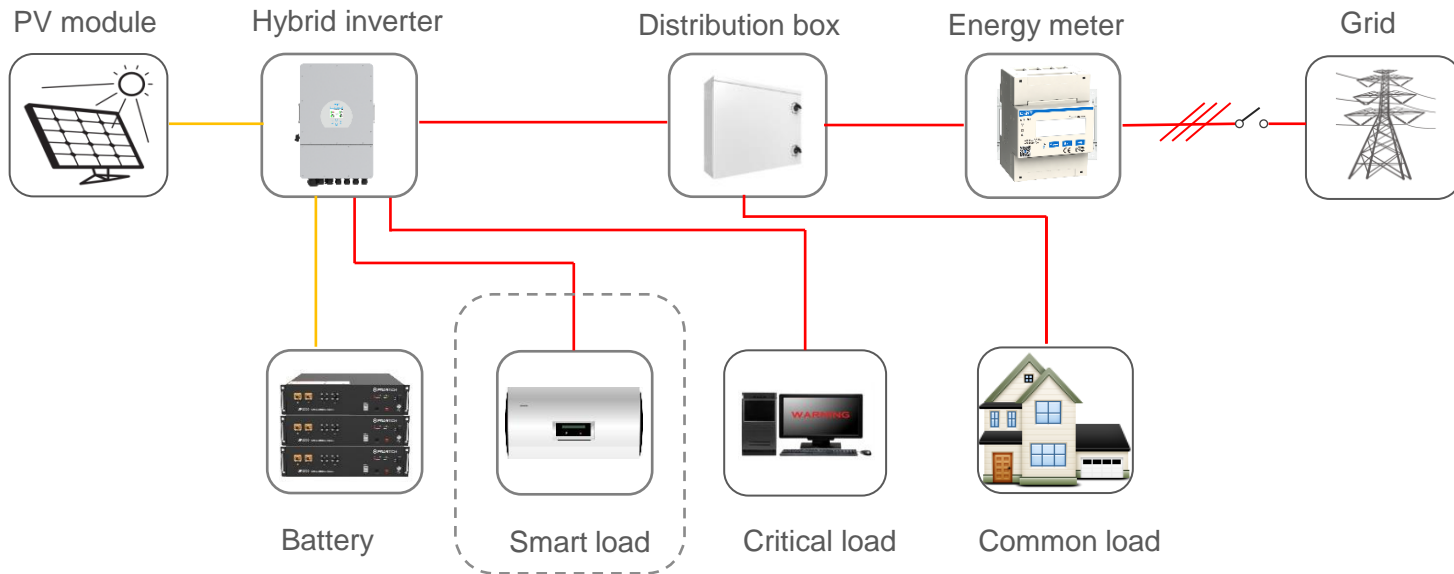
Independent Backup Load Port

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- Integrating independent grid port, diesel generator port and load port, more flexible and powerful.
- The diesel generator port also can be used as input or output port. As an input, it can connect microinverter or string inverter. When as a output, it can be used to power the load (Smart load)
- Built-in ON/OFF switch, easily cuts off output when emergency situation, more safe and reliable.

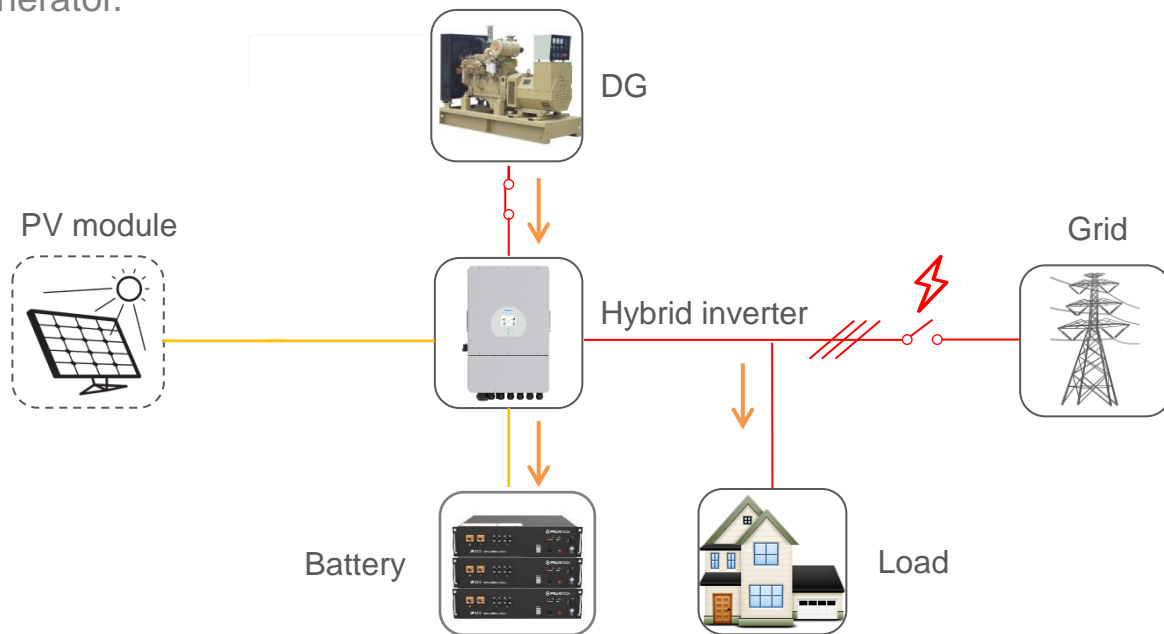


- The diesel generator port can be used as an output port. When as an output port, it can be used to power the load (smart load)



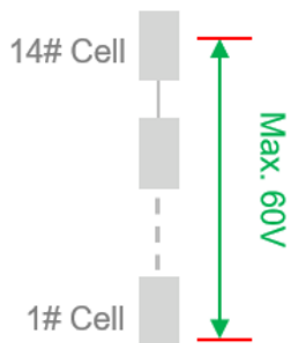
Supports diesel generator charges battery

- When utility grid cuts off, the hybrid inverter is able to start DG to supply load and charge battery. Built-in dry contact signal, the hybrid inverter is able to start or turn off the diesel generator.

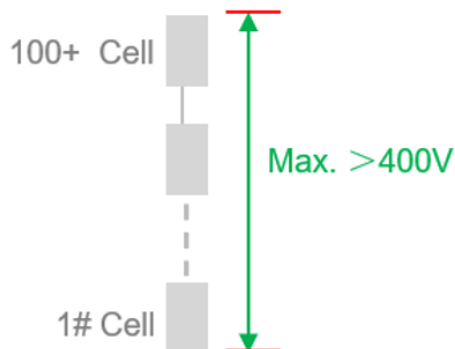


*Note: this function will be available in July 2021

- Compared with high voltage of 300V/400V battery system, 48V battery is safer and more reliable. E.g., for 48V battery, normally it adopts 14pcs cells in series (NMC) only. With the built-in transformer, Deye hybrid inverter isolates the battery from the grid, which improve the battery safety.
- For rated voltage of 400V battery, it needs more than 100pcs cells in series. The cell voltage balance is huge challenge for the battery system. Also, the battery capacity can't be expanded easily since the cell balance issue.

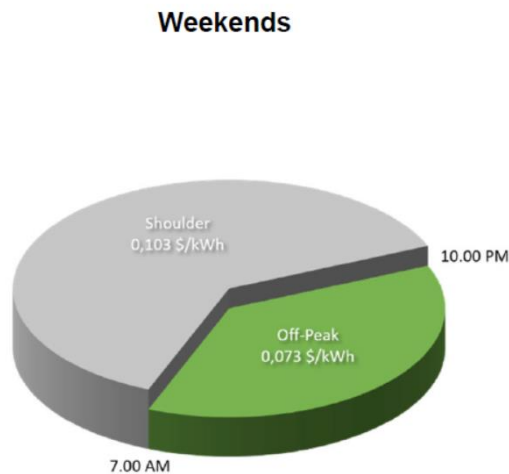
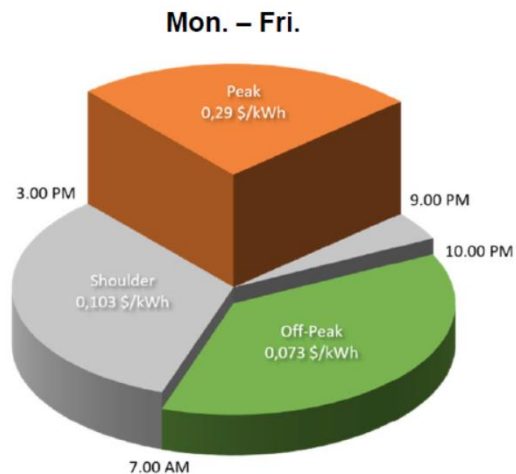


48V Low voltage battery



400V High voltage battery

- “Time of use”, time-dependent electricity tariffs, customers pay different prices for their energy consumption at different times of the day. Below figure shows typical time-of-use tariffs applied in Australia.
- For this situation, Deye hybrid inverter allows users to set time windows for charging and discharging the energy storage system. In this way, the behavior of the hybrid inverter can be adjusted in line with the time-dependent electricity tariffs, reducing electricity bills.



Time of use interface

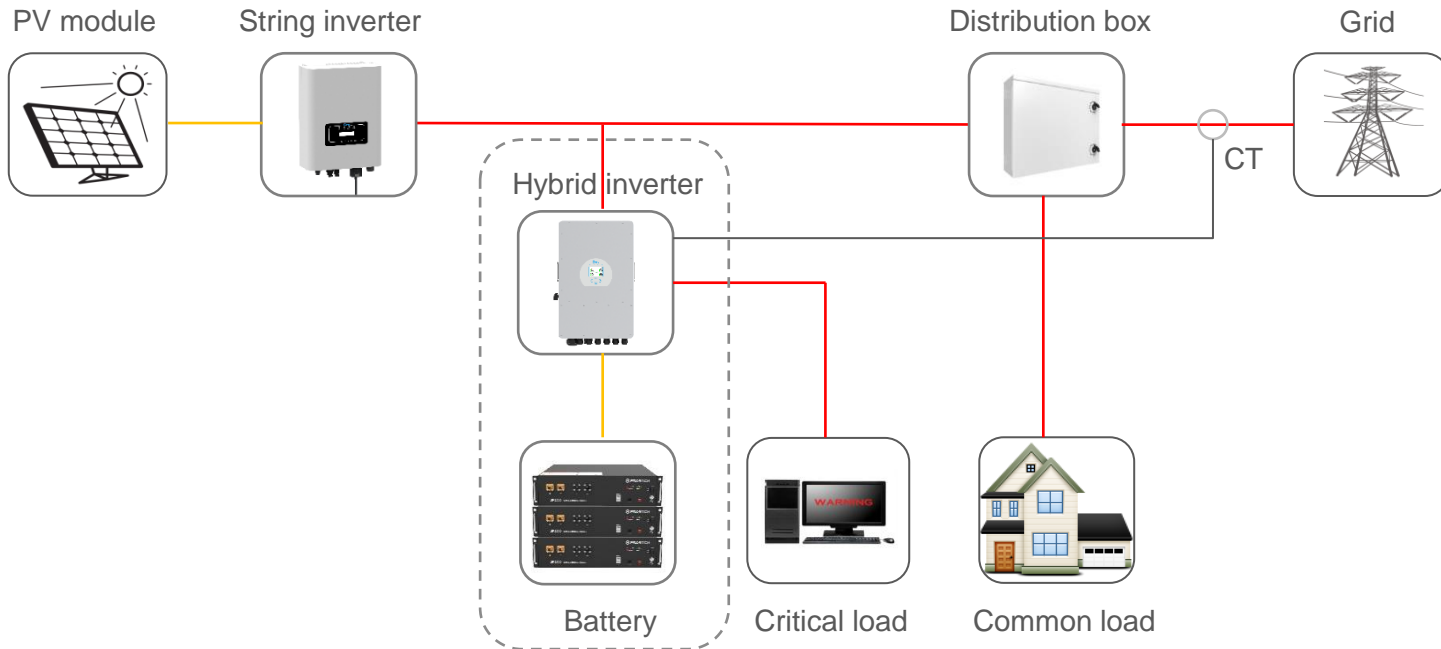
System Work Mode

Grid Charge	Gen	Time	Batt
<input type="checkbox"/>	<input type="checkbox"/>	01:00 ~ 5:00	80%
<input type="checkbox"/>	<input type="checkbox"/>	05:00 ~ 9:00	80%
<input type="checkbox"/>	<input type="checkbox"/>	09:00 ~ 13:00	80%
<input type="checkbox"/>	<input type="checkbox"/>	13:00 ~ 17:00	80%
<input type="checkbox"/>	<input type="checkbox"/>	17:00 ~ 21:00	80%
<input type="checkbox"/>	<input type="checkbox"/>	21:00 ~ 01:00	80%

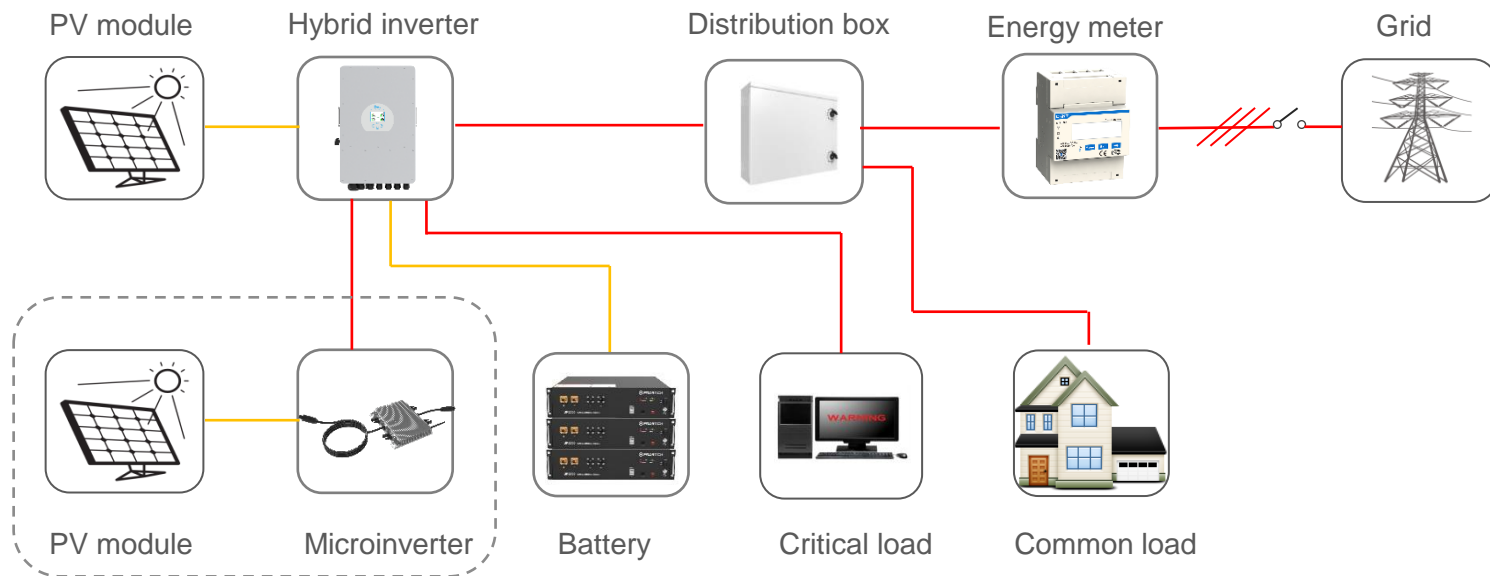
Time Of Use

Work Mode2

- Update the existing solar system to energy storage system, which is applicable to area with low FIT and high energy price, and the hybrid inverter working as battery charge controller in the system.
- In this mode, an external CT is needed to detect energy flow direction.

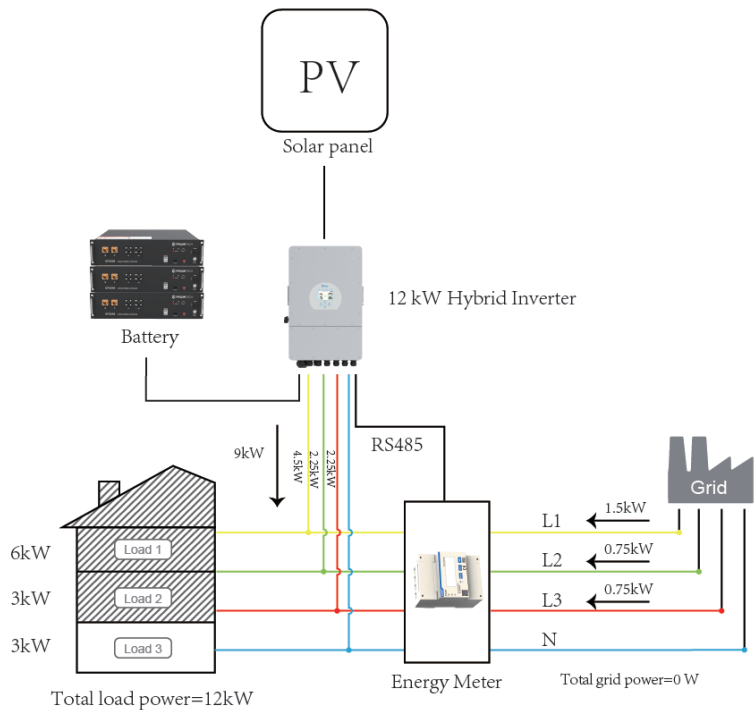


- Update the existing solar system to energy storage system. This solution is more flexible even during the grid is not present, the whole system is still able to run.
- System allows string inverter output energy to charge the battery or supply load.

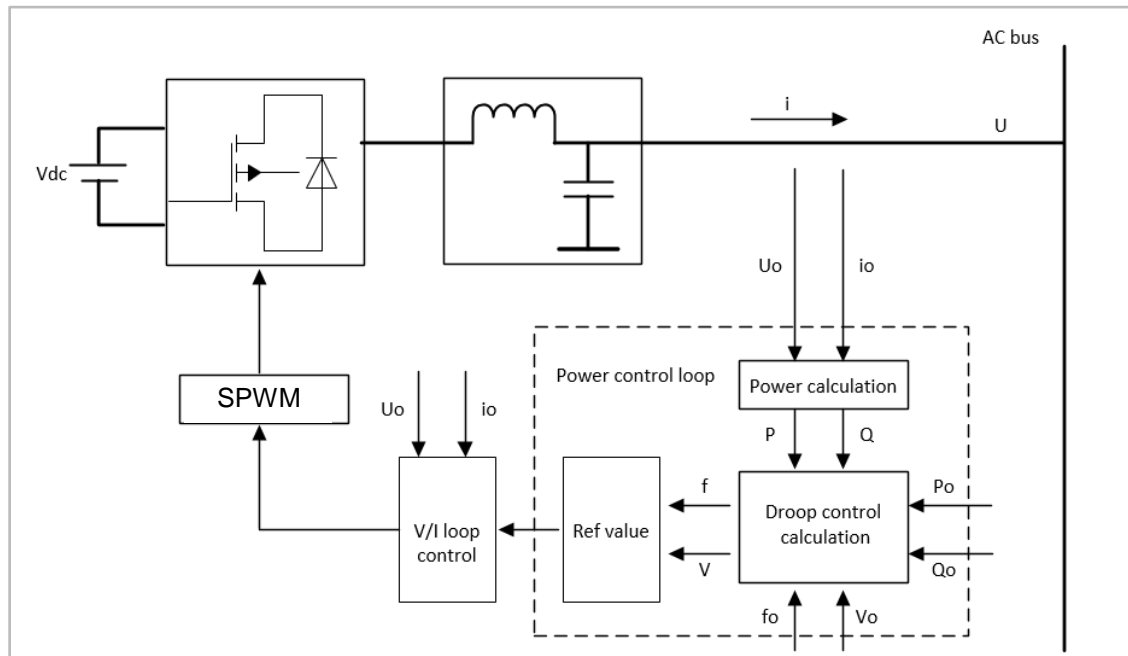
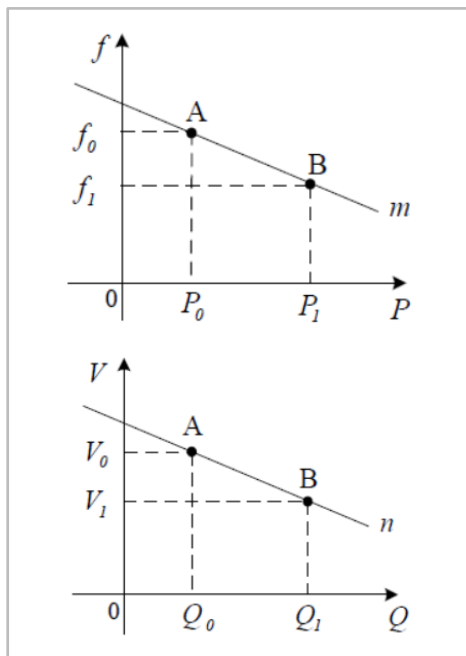


100% Unbalanced Output

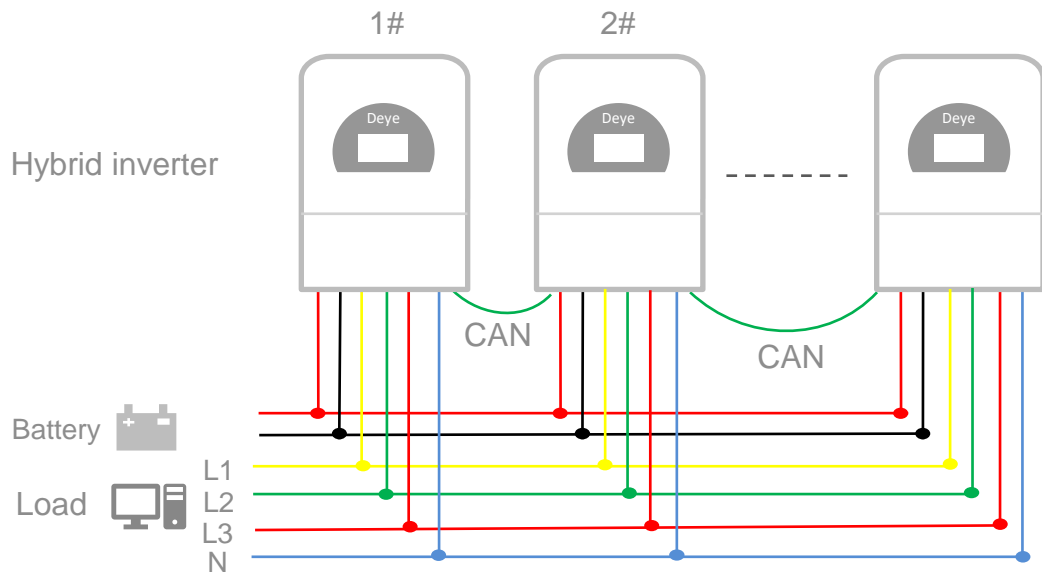
- The series inverter supports unbalanced output.
- Each phase Max. output power is up to 50%Pn. E.g. for the 12KW hybrid inverter, the A phase Max. output power can reach to 6KW.



- Adopts frequency droop control technology to ensure system reliability and stability.
- With the droop characteristics of traditional diesel generators, and it can adjust the output power by changing the frequency and voltage.



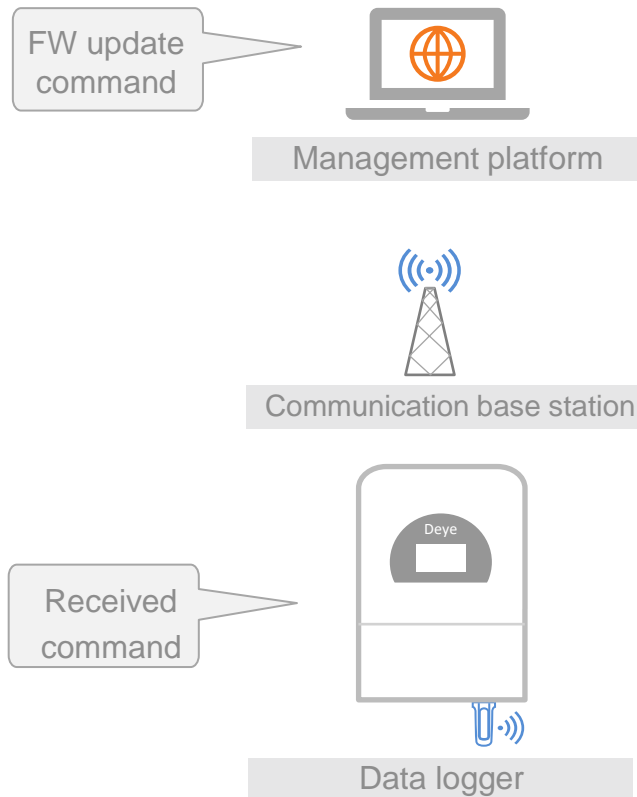
■ Three-phase system diagram



- The above diagram only shows the load port connection method. The grid port connection method is same with load port connection method.

*Note: Parallel function will be available in July 2021

■ Support set parameters and FW update remotely



Short time for FW update

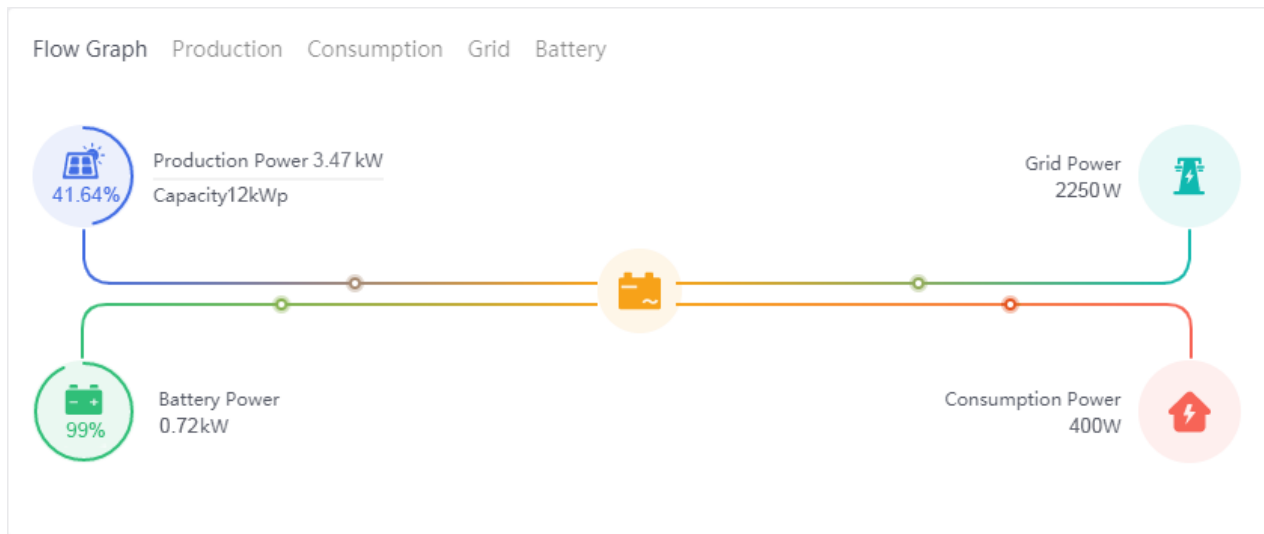
- Remotely inverter parameter setting and software upgrade within 20 minutes



Save time, save cost

- Not need O&M engineer on site to check and operation

- Check your solar station by your mobile phone and PC at any time and any where.
- For distributor and installer, they can find and fix problems before end user complaint



- Record fault codes with date, also check and set parameters remotely.

Inverter:2012264171



Online

2021/05/11 13:01:01 UTC+08:00

Details **Alert** Architecture

Total 1 Alert(s) Last 7 Days ? ▼

Alert Name	Importance	Influence	Last Trigger Time
Grid Mode change...	Warnings	Production	19:10:58 2021/05/06 UTC+08:00

Online

2021/05/11 13:14:19 UTC+08:00

Batch Command Single Command Customized Command Control Log

System Work Mode-1

Set from-- [Collapse](#)

System Work Mode:

Please Select ^

Time of use:

Please Select v

Max Sell Power:

0~9000

W

Energy Pattern:

Please Select ^

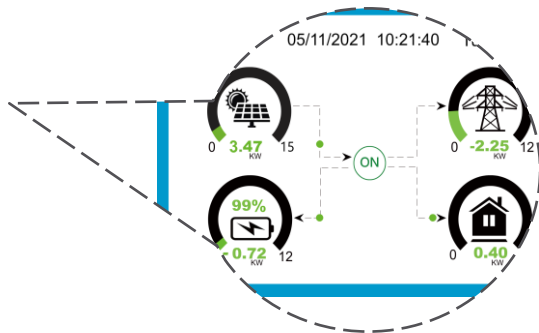
Zero export power:

0~500

Read

Setup

- **Local colorful touch LCD screen** with buttons, more reassurance after seeing the data
- Graphic shows the system energy flow direction real-time, easy understand.



PV Status



Grid Status



Battery Status

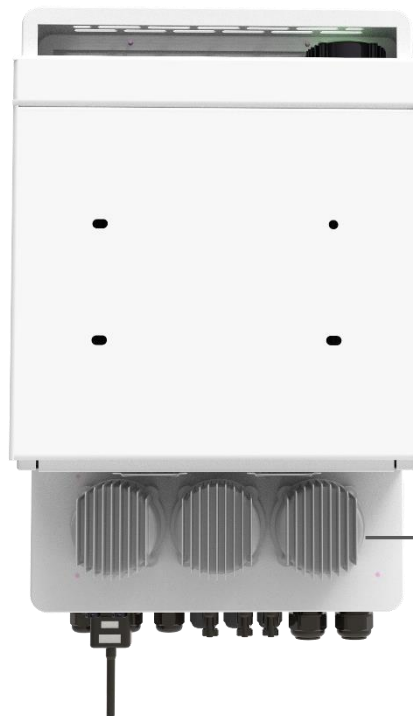


Load Status

IP65 Protection Degree

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- Full series IP65 protection degree, sufficient heat dissipation, adapt to harsh environment, high reliability.



External fully enclosed glue-filled inductor, greatly inducing heat and noise from inductor



THANK YOU !