



# Commercial Power Saving Solutions 2020





## Market growth

### Market growth

Over 9,000MWh of battery energy storage could be deployed in Britain over the next five years as the sector enjoys a trend towards “explosive growth”, a market analyst has said. Lauren Cook at Solar Media’s Market Research division spoke to Energy-Storage.News this week on the publication of ‘UK Battery storage: Opportunities & Market Entry Strategies for 2018-2022’, a new report. Cook found that in just 12 months, the UK’s pipeline for new battery storage projects has grown by over 240%, with forecasted installations in 2018 set to rise more than 200% year-on-year. Opportunities are being created by a range of drivers including a national commitment to phase out coal, falling technology costs and more than 30GW of wind and solar capacity ripe for colocation with batteries. According to Cook, this means the UK could quickly becoming a market of strategic focus for international players. “The market is growing and it’s changing rapidly. There’s now projects completed on the ground. Once global companies start to see it’s not just a speculative market, it will make sense for them to think about how to enter the market and what the opportunities are for them. “They will then need to know who is active in the market, who has these opportunities and who they will have to work with to take advantage of those opportunities.”

Going beyond the deployment figures, Solar Media Market Research also looked extensively at business models, another aspect of the industry analyst Cook said is changing fast. With an emphasis on projects earning long-term revenues, it is becoming commonplace to speak of a “revenue stack” – earning multiple

revenues streams for providing a range of services. However, Cook said, there is no such thing as a “typical” stack in the market today. “I’m not sure there’s any such thing as a typical stack because there are many factors involved, but if you look at the timeline from the EFR of 2016 you had those projects were successful, those projects then went on to apply for the Capacity Market (CM), T-1 and T-4 in early 2017,” Cook said. “Some of those were successful, some of those weren’t. We then saw the FFR auctions happening throughout 2017. Those projects also participated in those auctions, new projects also came in. “Then I think the most recent phase of the Capacity Market – so again, the T-1 and the T-4 - was just another opportunity to add to those stacks. So you might see projects with an EFR contract, they may also have a T-1, they may also look to get a T-4 in the future, because of the different lengths of contracts – you can simultaneously run some contracts but you may want to have consecutive CM contracts. So you might see T-1 as a way of filling the time between a project becoming operational and the T-4 contract beginning. It’s not just about stacking them in one moment – so having multiple sources at one point in time – it’s about stacking the revenue streams across the lifetime of the project and having long-term revenue.”

In megawatt-hours, battery energy storage capacities installed in the UK by the end of 2022 will be 50 times what they were as 2017 ended. The report also covers a predicted trend towards longer duration storage in future, comprehensive evaluations of leading players in the industry and analysis of stakeholders.

## Industrial Power Saver

	50 kWh	100 kWh	100 kWh	200 kWh	300kWh	500 kWh
Phase	Single	Single	3 Phase	3 Phase	3 Phase	3 Phase
Kit Model Number	SSOGPRO50	SSOGPRO100	SSOGPRO1003P	SSOGPRO2003P	SSOGPRO3003P	SSOGPRO5003P
Inverter	6 x SS Storage inverter	12 x SS Storage inverter	12 x SS Storage inverter	24 x SS Storage inverter	36 x SS Storage inverter	60 x 6 x SS Storage inverter
Peak Battery Charger current	1000 Amp 48V	2000 Amp 48V	2000 Amp 48V	4000 Amp 48V	6000 Amp 48V	10,000 Amp 48V
Battery Bank	50 kWh	100 kWh	100 kWh	200 kWh	300kWh	500 kWh
Battery Inter Connect	Included for each inverter	Included for each inverter	Included for each inverter	Included for each inverter	Included for each inverter	Included for each inverter
Battery Isolator	Included for each inverter	Included for each inverter	Included for each inverter	Included for each inverter	Included for each inverter	Included for each inverter
Battery Cabinets	5	10	10	20	30	50
No of Batteries	20 Cells	40 Cells	40 Cells	80 Cells	120 Cells	200 Cells
Max Bus Power	54 kW	108 kW	108 kW	216 kW	324 kW	540 kW
Max AC Bus Current	240 Amp	480 Amp	160 Amp per Phase	320 Amp per Phase	640 Amp per Phase	1280 Amp per phase
AC Isolator	Included for each inverter feed onto a common Bus	Included for each inverter feed onto a common Bus	Included for each inverter feed onto a common Bus	Included for each inverter feed onto a common Bus	Included for each inverter feed onto a common Bus	Included for each inverter feed onto a common Bus
AC Cables	Not Included	Not Included	Not Included	Not Included	Not Included	Not Included



# Hybrid Systems

Hybrid Solar Power Systems are becoming more popular in the domestic market around the world. What are they and what are the advantages?

The term 'Hybrid' means a combination of solar and energy storage which is also connected to the grid.

Hybrid systems generate power in the same way as a common grid tie solar system but use special hybrid inverters and batteries to store energy for later use. This ability to store energy enables most hybrid systems to also operate as a back-up power supply in the same way as a UPS system. Advantages of Hybrid Solar Systems.

The Sunsynk Parity Inverter with Storage is just that, and an important addition to any modern premises. It combines several functions within one shell such as charge controller, inverter, battery charger, programmable power management and uninterrupted power supply. Its convenient LCD display offers the user a configurable and accessible button operation and once the Wifi dongle has been attached the user can monitor and adjust remotely the inverter's functions to make the most of installed power generation and storage.

There are several advantages of the Parity Inverter and these can be summarised as; It can be programmed to store mains power when the mains grid is at its cheapest. It will manage the amount of DC power stored into the batteries. The batteries will not be allowed to run below their DoD.

You can remotely switch power for your household appliances to come from either the batteries or the mains. It will manage power generated by solar panels.

The inverter can be programmed to act as an Uninterrupted Power Supply. Once it is storing electricity while the grid is cheapest, the user will be able to save up to 65% on power bills.

The inverter can also be mounted with engine systems to channel power from the alternator to battery storage to be used by the driver when the machine is not required to be driven / operated.



## Hybrid

allows you to store excess power when grid power is off-peak. You can use stored solar power during evening times. This is called 'load shifting'. The system provides back-up power when required. It can reduce power consumption from the grid. It provides advanced energy management known as 'peak shaving'. It is less expensive than an Off-Grid system.

The system can be programmed to accept solar power when grid power is at peak expense.

Sunsynk provide a range of Hybrid Inverters that are useful for both the domestic and marine environments. In addition to providing inverters whole systems can be purchased and our staff can advise on the best set up for your own personal needs.

## The Sunsynk Parity Inverter

Sunsynk have foreseen the development of renewable energy and the need for people's property to incorporate a managed battery storage system into their household. The Sunsynk Parity Inverter with Storage is just that, and an important addition to any modern premises.

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# Battery Material

## Combining both Solar and LED Technology

Different materials have different impacts on the discharge rate and the lifespan of the product. For example, lithium-ion batteries can discharge 70%-90% of the total amount of storage while lead-acid can only discharge around 50%. And lithium-ion batteries have at least double the lifespan of lead-acid batteries. Higher discharge rate and longer lifespan will typically result in higher prices.

## Capacity

Storage capacity refers to the total amount of energy your solar battery can store, and usable capacity means the amount one can use, which is usually calculated by depth of discharge (DoD). The amount of storage capacity and usable capacity, measured in kilowatt hours (kWh), directly influences how much your solar battery storage system will cost. Larger capacity means it can store more energy and support a larger area, thus, it will result in a higher price.

## Lifespan

The life cycle is an important indicator of a solar battery storage system's lifespan. The more cycles a solar battery can provide, the longer time it can perform normally. Considering the lifespan of solar panels is around 25 years, replacing a new solar battery may add up to the future costs.

## Installation

Installation cost of solar battery storage systems varies slightly based on the size. It may be covered by the solar battery storage system costs of some brands. Generally speaking, it is more economical to set up your solar battery system while installing solar panels.

## What Is the Lifespan of a Solar Battery?

The average lifespan of a solar battery storage system is around 5 to 7.5 years for lead-acid and 11-15 years for lithium-ion batteries. However, all batteries are vulnerable if they are over-discharged or exposed to extreme weather.

## Depth of Discharge (DoD)

DoD means how much you can use the battery before recharging it. Just as it may be harmful for your phone's battery to have only 2% remaining, the same goes for a solar battery storage system.

If you use up 100% of its charge or exceed its DoD limit before recharging it, the lifespan will be shortened significantly. For example, if you buy a solar battery storage system that has a capacity of 5kW energy storage and 80% DoD, remember to charge it before using up the entire 4kW in order to extend the life of the battery.



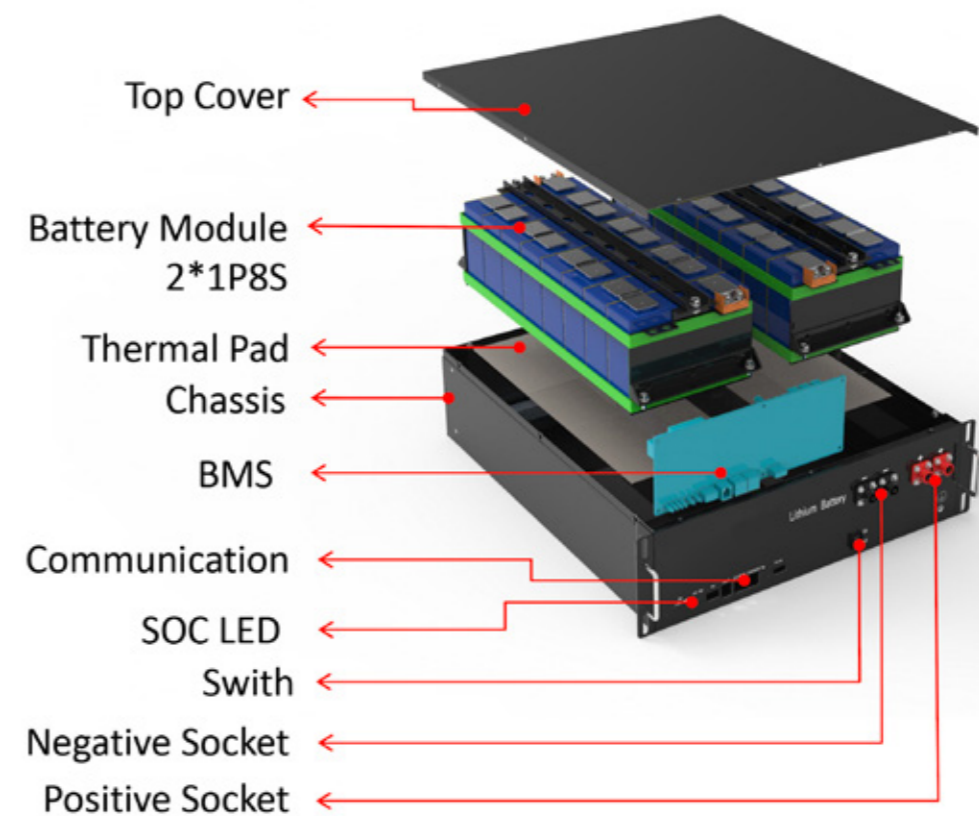
# Lithium Phosphate Batteries



## Lithium-Ion Batteries

Cell	100Ah, LFP	Max. discharging current peak	200A, (2C, 30s, 25°C ± 2°C)
Module	1P16S		SOC ≥ 40%
Rated energy	5.12Vdc	Communication	CAN/RS485
Rated voltage	51.2Vdc	Rated energy	5.12Vdc
Working voltage range	44.8~58.4 Vdc	Dimension (LDH)	440* 530* 132mm
Rated charging/discharging current	0.5C	Weight	~50kg
Max. Dis-charging current	1C (100A)	IP Level	IP20

Order Code: Sunsynk-100 AH-345789





# 200AH AGM Batteries

## SUN-200AH

With our solar systems we recommend the use of the gel batteries due to their stable properties. A modern gel battery is a Valve Regulated Lead Acid (VRLA) battery with a gelled electrolyte. The sulphuric acid is mixed with fumed silica which makes the resulting mass gel-like and immobile. Unlike a flooded wet-cell lead acid battery, these batteries do not need to be kept up-

right. Gel batteries are maintenance free since it is a sealed battery and no emission of gasses occurs so the volume of electrolyte released is minor. This means that a gel battery lasts 2-3 times longer than a normal flooded battery.

In addition, another advantage is that gel batteries are more acid-starved than other batteries which protects the batteries' plates. This makes gel batteries the best suited for deep discharge applications.

The ideal gel battery supplied by Sunsynk® is the 12V 200Ah gel battery.

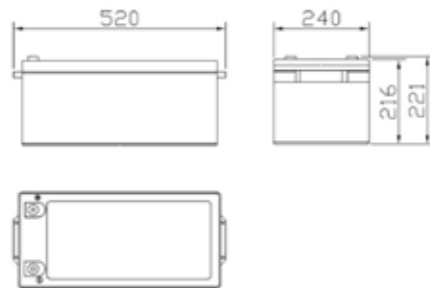
### LAST LONGER THAN NORMAL LEAD ACID

#### General characteristics

- (1) High Reliability and Quality
- (3) Good deep discharge cycle capability

- (2) Excellent Recovery from Deep Discharge
- (4) Longer Service Life

#### Outer Dimensions



#### Dimensions and Weight

Length ( mm / inch )	522 / 20.55
Width ( mm / inch )	240 / 9.45
Height ( mm / inch )	216 / 8.50
Total Height ( mm / inch )	242 / 9.53
Approx.Weight( Kg / lbs )	59/ 129.8

#### Performance Characteristics

Nominal Voltage	12V
Design Life	10-12 years
Nominal Capacity 77°F(25°C)	
10 hour rate(20A,10.8V)	200Ah
3 hour rate (53.0A,10.2V)	159Ah
1 hour rate(130A,9.6V)	130Ah
Self-Discharge	3% of capacity declined per month at 20°C(average)
Internal Resistance	
Fully Charged battery 77°F(25°C)	3mΩ
Operation Temperature Range	
Discharge	-20-60°C
Charge	-10-60°C
Storage	-20-60°C
Max.Discharge Current 77°F(25°C)	1800A(5s)
Short Circuit Current	4433A

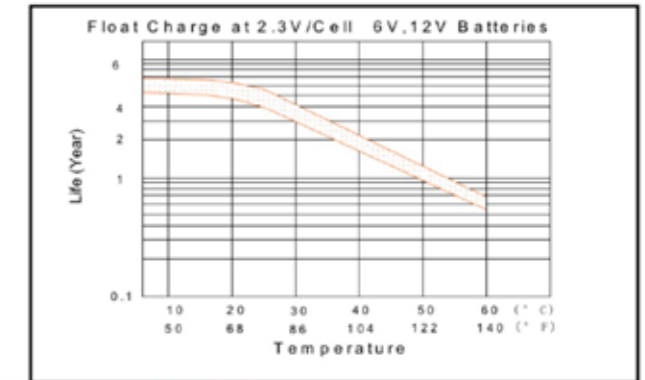
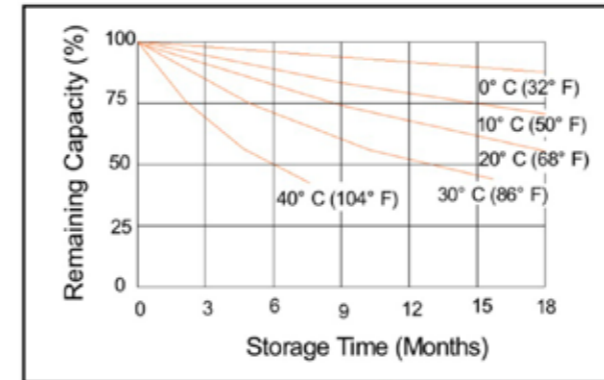
#### Battery Construction

COMPONENT	Positive plate	Negative plate	Container	Cover	Safety valve	Terminal	Separator	Electrolyte
RAW MATERIAL	Lead dioxide	Lead	ABS	ABS	Rubber	Copper	Fiberglass	Sulfuric acid

#### Charging Methods

Application	Charging method	Charging Voltage at 25°C	Temperature compensation coefficient of charging voltage	Max.charging current	Charging time 25°C(h)		Temp (°C)
					100% discharge	50% discharge	
For standby power source	Constant voltage & Constant Current	13.4-13.8V	-18 mV/°C	60A	24	20	0-40 (32-104°F)
For cycle service	Charging (with current restriction)	14.5-15.0V	-30 mV/°C	60A	16	10	

\*Temperature compensation of charging voltage is not needed when using the batteries within 15°C to 35°C range.

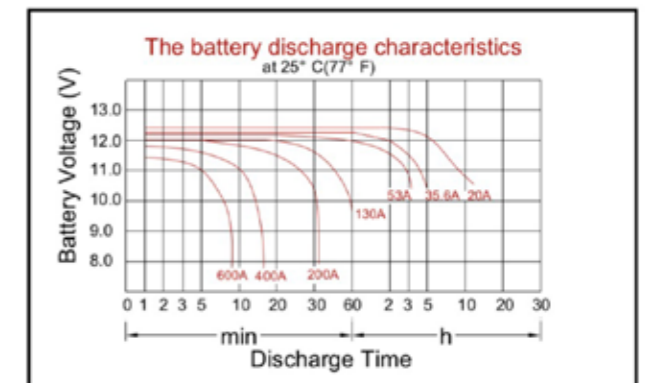
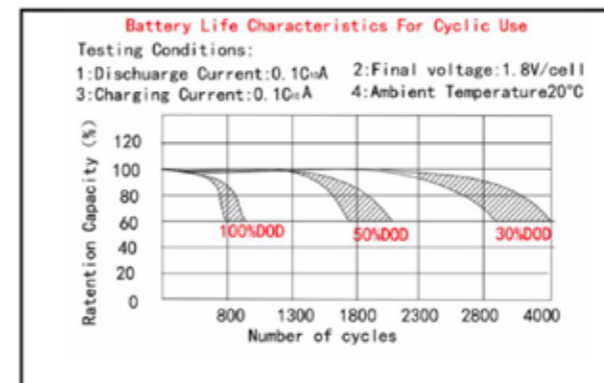
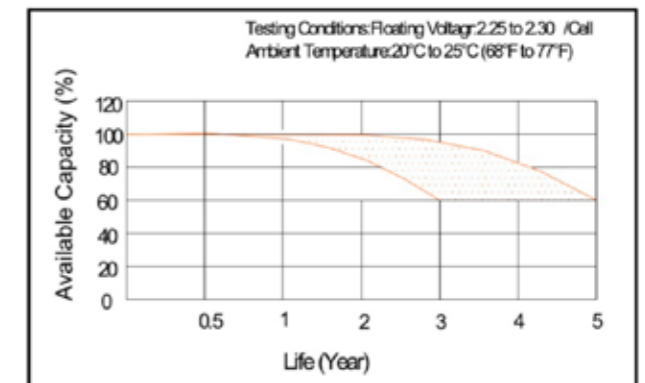
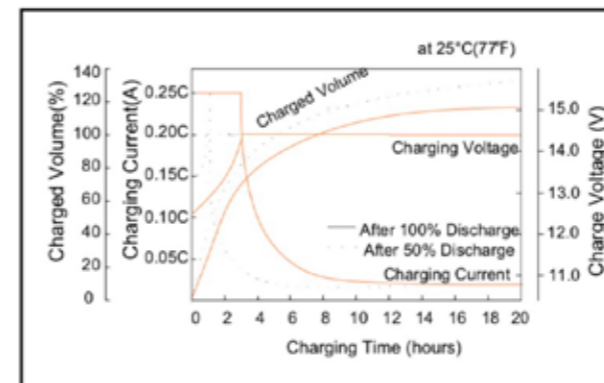


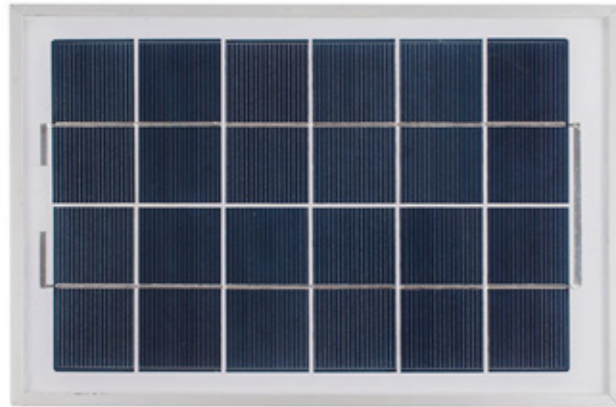
#### Discharge Constant Current (Amperes at 77°F25°C)

End Volatage	1h	2h	3h	4h	5h	6h	8h	9h	10h
9.6	132	75.1	56	45.1	38.1	32.7	26	23.3	21.5
9.9	125	73.1	55.7	43.7	36.7	31.3	25.2	23.1	21.2
10.2	123	71.3	54.5	43.1	36	31.1	24.8	22.7	21.2
10.5	121	70.8	53.9	41.9	35.1	30.4	24	22.1	20.7
10.8	115	66.8	50.8	40.4	34.5	29.7	23.7	21.5	20

#### Discharge Constant Power (Watts/cell at 77°F25°C)

End Volatage	1h	2h	3h	4h	5h	6h	8h	9h	10h
9.6	1491	851	633	508	431	371	291	264	244
9.9	1415	815	615	495	421	364	287	261	241
10.2	1367	804	612	492	419	360	287	260	240
10.5	1332	775	588	477	412	351	280	253	237
10.8	1251	751	581	471	407	348	273	251	231





# Solar Panels

## Our solar panels

Our Solar Panels are made of polycrystalline and once integrated with our inverters will turn sunlight into electricity that can be used in your house or fed back into the grid. They can be mounted on individual fixing kits or onto large frames and once functioning, they will continue to provide power for over 25 years.

## Features:

- Polycrystalline Solar Panel
- Weatherproof
- 18% Cell Efficiency

### 100 Watt Solar Panel

Polycrystalline Solar Panel  
 Size: 678 x 1008 x 35mm  
 Weight: 8.2kg

Order Code: SUN100PAN

### 270 Watt Solar Panel

Polycrystalline Solar Panel  
 Size: 1640 x 992 x 35mm  
 Weight: 18.6kg

Order Code: SUN270PAN

### 320 Watt Solar Panel

Polycrystalline Solar Panel  
 Size: 1956 x 992 x 40mm  
 Weight: 23kg

Order Code: SUN320PAN





## Solar Fixing Systems

In order to install a working PV system, Sunsynk supply fixing kits, which are matched to the 320W solar panel however, should smaller panels be purchased, we can supply the appropriate kits as well.

### SOLAR FIXING KITS

Matched with the panels are the solar cables and isolators which are essential to any system.

- Fixing kits (bracket, end clamp & roof hook) for 100W / 250W & 320W panels
- Mains circuit breakers (MCB) - 20A & 63A
- Cabling 4-10mm solar cable / 14mm / 35mm & 50mm battery hook up cables
- Connectors MC4 male / female & 'O' connectors



100W Fixing Kit

**SUN100FIX1**

Including rails, screws & fixtures



270W Fixing Kit

**SUN270FIX1**

Including rails, screws & fixtures



320W Fixing Kit

**SUN320FIX1**

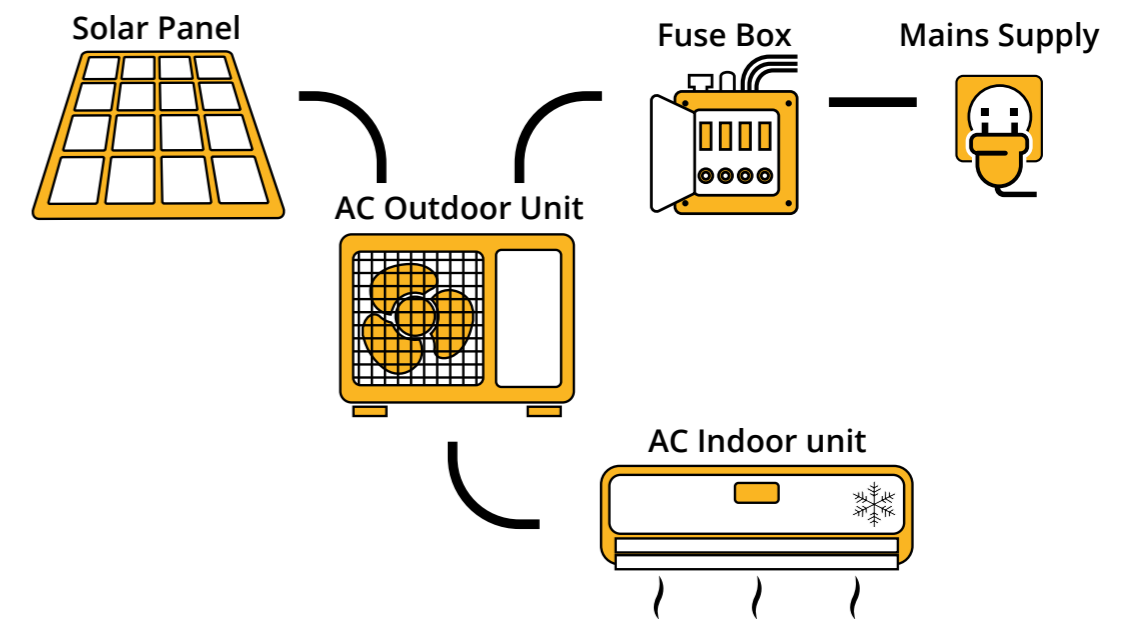
Including rails, screws & fixtures





## Solar Powered Hybrid Air Conditioning Units

### Sunsynk Hybrid Air Conditioning System



#### ACDC Solar Inverter Air Conditioner

You are probably thinking what's the point and expect to see big batteries and inverters but none of this they are simply hybrid AC units. During the day the solar array powers the inverter AC you have free heating or cooling, at

night the unit simply switches to mains power. Installation same as any AC A 12,000 BTU this only needs 3 panels to run of a daytime and st night is also super efficiency thanks to the digital inverter tech.





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