

SH5.0RS/SH6.0RS/SH8.0RS/SH10RS

SH5T/SH10T/SH15T/SH20T/SH25T

## Hybrid Inverter + EB (EnergyBridge) System Application Note (AU)



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## About This Manual

This document mainly describes the application scenarios for a 1-phase/3-phase hybrid inverter + EB (EnergyBridge). It also describes the components and related materials in the hybrid system. User can visit [support.sungrowpower.com](https://support.sungrowpower.com) to get the user manual for each component.

### Validity

This manual is valid for the following inverter models:

Model	Hereinafter Referred to as
SH5T/ SH10T/ SH15T/ SH20T/ SH25T	SH5-25T
SH5.0RS / SH6.0RS/SH8.0RS / SH10RS	SH5.0-10RS

### Abbreviations

- CT: Current Transformer
- PV: Photovoltaic
- ESS: Energy Storage System
- EB.: EnergyBridge

# 1 Application Scenarios

Currently, EB is only supported in single-hybrid inverter system for **whole home backup** and **retrofit scenarios** (it is not supported in other scenarios).

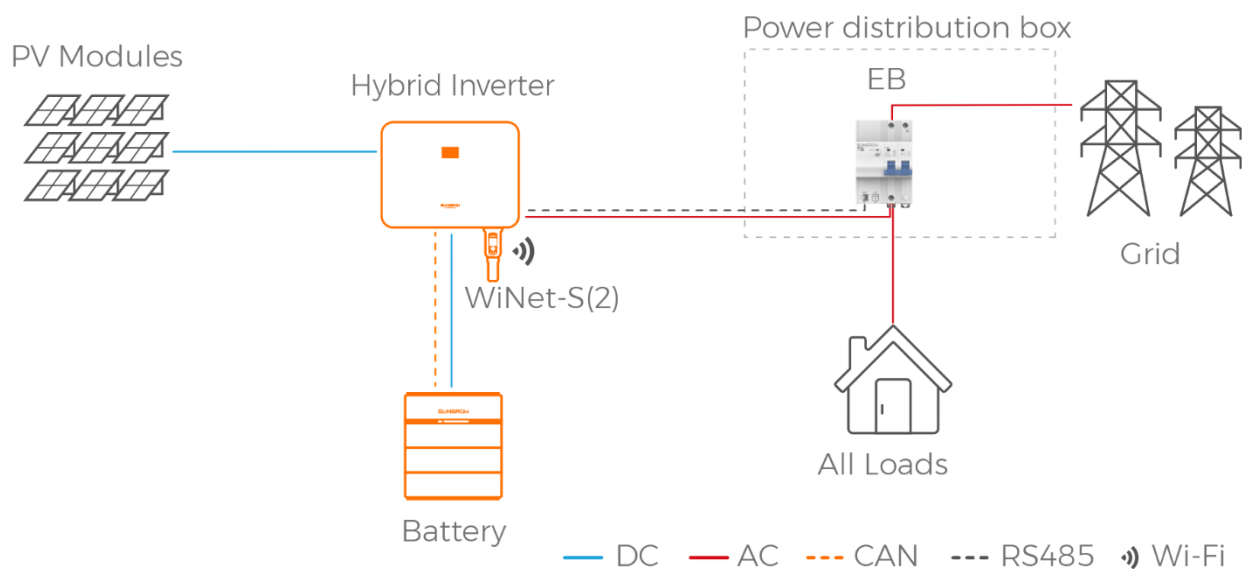
Systems involving multiple hybrid inverters, EV chargers, diesel generators, or other complex configurations are not yet supported.

Note:

- EB is not supported if the system is connected to a diesel generator.
- EB is not supported if batteries are not used for a long term.

## 1.1 Whole Home Backup

The system networking is as follows:



**Figure 1. Whole home backup**

### 1.1.1 System Features

- The system can perform on-grid/off-grid switching.
- No need to install smart energy meter and CT.
- Nonstop power supply to whole home loads during hybrid system maintenance.

### 1.1.2 Firmware version requirements

The system components need to be upgraded to the following versions:

Components	Firmware
SH5.0RS / SH6.0RS	SUNSTONE-H_B000.V002.P066 and later
SH8.0 / 10RS	SUNSTONE-H_B000.V002.P063 and later
SH5T/10T	PEARL-H_B001.V001.P038 and later
SH15-25T	PEARL-H_B000.V000.P068 and later
WiNet-S	WINET-SV200.001.00.P043 and later
WiNet-S2	WINET-SV300.001.03.P031 and later
iSolarCloud APP	2.1.6.20260507 and later

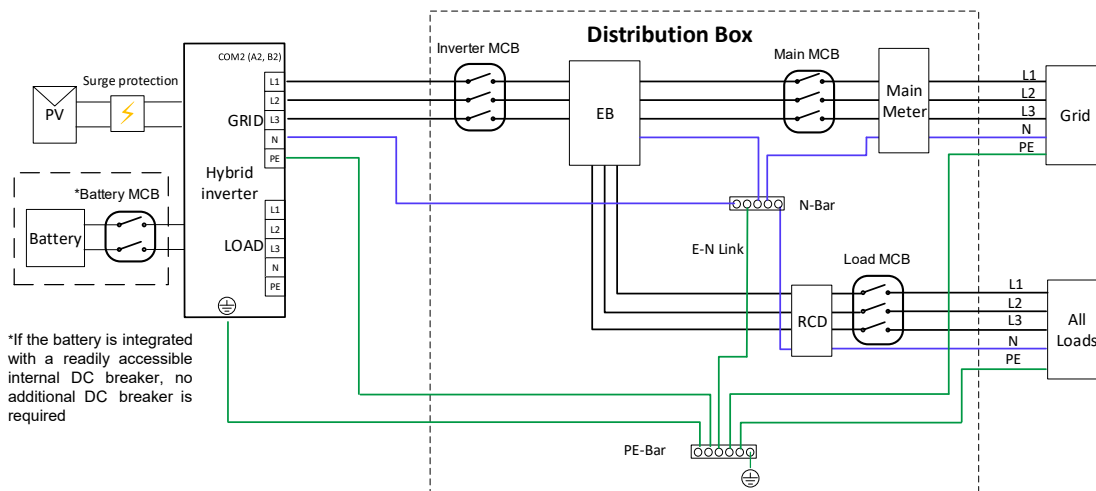
### 1.1.3 System Requirement

- EB is only used in single-hybrid inverter scenarios.
- Select the EB model based on the type of power grid. Use EB80T for three-phase grid and EB80S for single-phase grid.
- **The GRID port and BACKUP/LOAD port of hybrid inverter are both energized during on-grid- and off-grid operation. Note: Do not connect any cables or loads to the BACKUP/LOAD port, and keep the dust cover on.**
- When wiring the EB, first disconnect the inverter-side MCB and the main household breaker to ensure the system is de-energized.
- Enable the backup mode before system use.
- The communication distance between EB and the inverter shall not exceed 100m.
- When operating off-grid, the total power of the loads cannot exceed the load capacity of the GRID port. If it does, the inverter will shut down. You will need to manually shut down some loads and then restart the inverter, or replace with an inverter of higher rated power.
- The rated current of EB is related to its model. For example, the maximum rated current of EB80T or EB80S is 80A (below 30 °C). If the current exceeds this limit, it cannot be used.

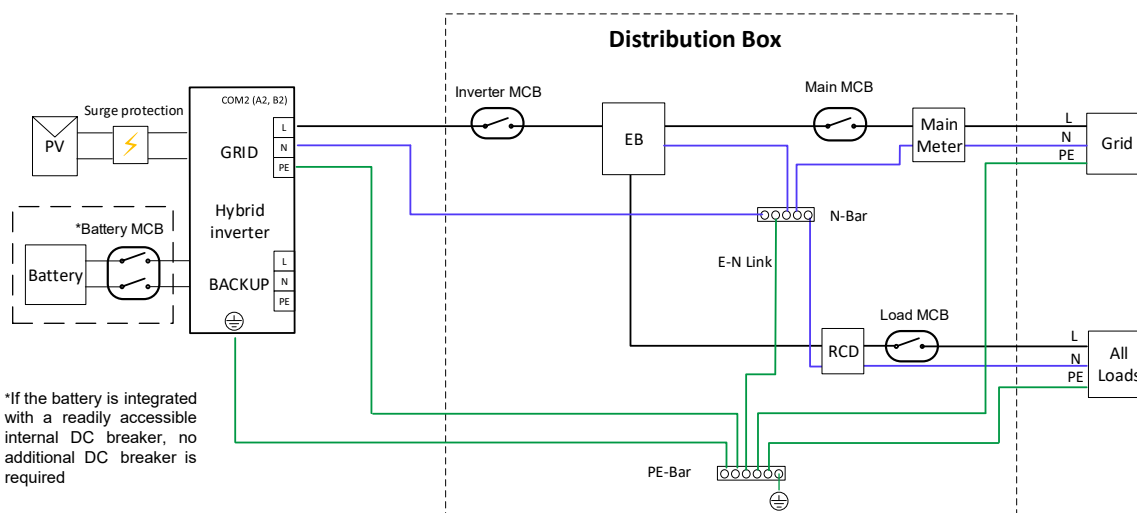
The variation of EB current with temperature is shown in the following table:

Temperature derating factor							
Temperature(°C)	-25 - 30	35	40	45	50	55	60
Rated current (A)	80	78	76	74	72	70	68

- The AC wiring diagram is shown below, taking a three-phase system as an example, for reference only:



**Figure 2. Whole home backup AC cable connection diagram (Australia) 3-phase system**

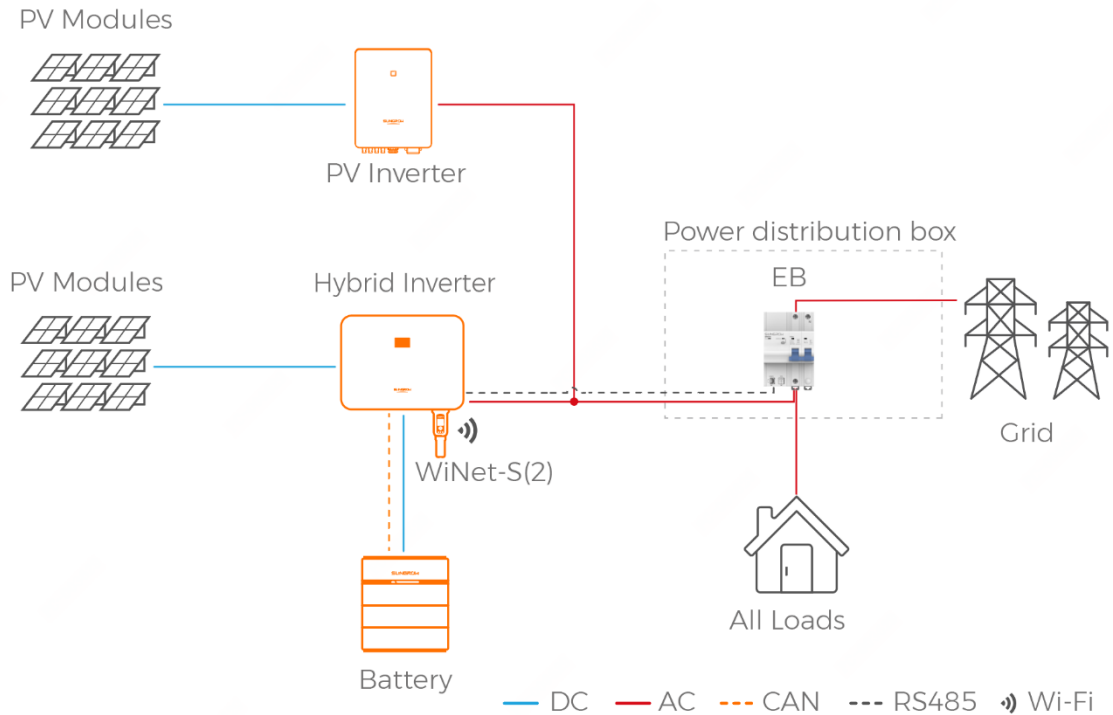


**Figure 3. Whole home backup AC cable connection diagram (Australia)- 1-phase system**

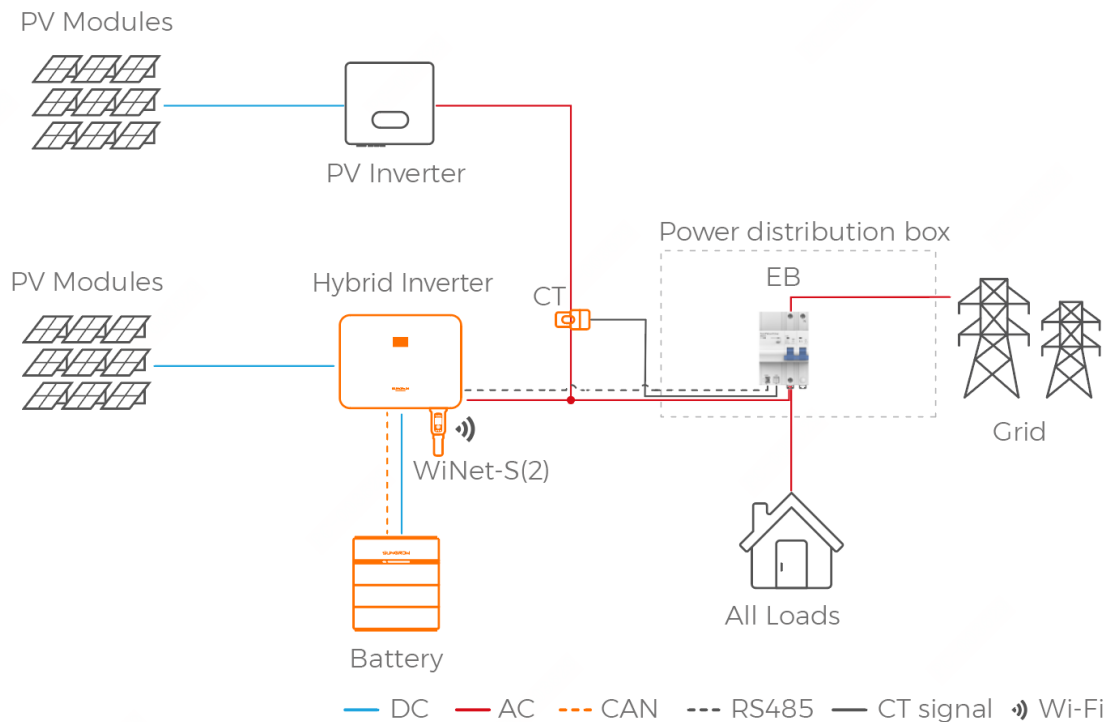
Note: If a single-phase hybrid inverter uses EB80T, connect its L terminal to EB's L1.

## 1.2 Retrofit Scenarios

The retrofit scenarios are divided into Sungrow PV inverter retrofit scenario and third-party PV inverter retrofit scenario. Third-party PV inverter retrofit requires connection to a channel external CT2. The system networking is shown below:



**Figure 4. Sungrow PV inverter retrofit scenario**



**Figure 5. Third-party PV inverter retrofit scenario**

## 1.2.1 System Features

- Optional PV modules to the hybrid and lower the system cost.
- Retrofit any functional PV system, SUNGROW or a third-party.
- Even if the grid fails and the system operates off-grid, the existing PV inverter can work normally when the battery is not fully charged (SOC < 80%).
- The hybrid inverter enables **Frequency Shift Power Control**. When the system is operating off-grid and the battery is nearly full (SOC > 90%), the PV inverter will limit output power accordingly until shutdown.

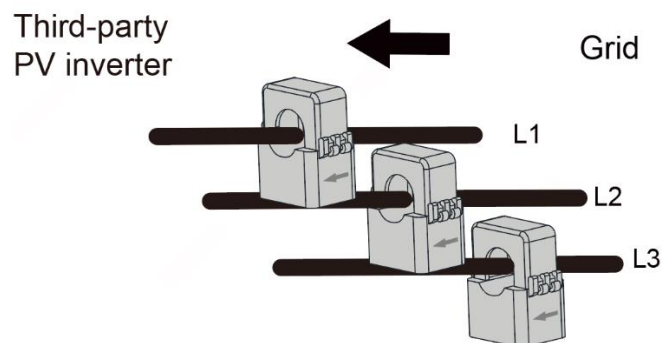
## 1.2.2 Firmware version requirements

For detailed requirements, please refer to: [1.1.2 Firmware version requirements](#)

## 1.2.3 System Requirement

Please refer to [1.1.3 System Requirement](#) in [1.1 Whole Home Backup](#) for the requirements of this scenario. In addition, this scenario also has the following requirements.

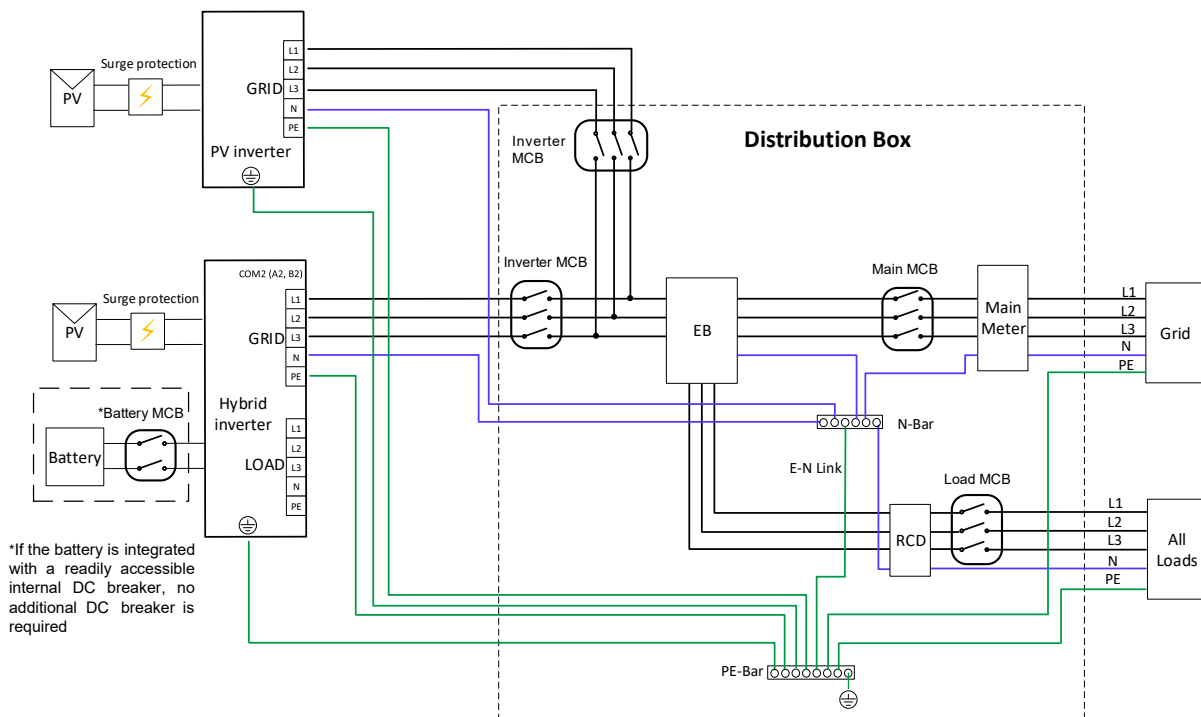
- For third-party retrofit scenarios, an external voltage-type CT needs to be connected to the EB, with the direction pointing from the grid to the PV inverter. Currently, the EB only supports CT specifications of 100A/333mV, as shown in the figure below:



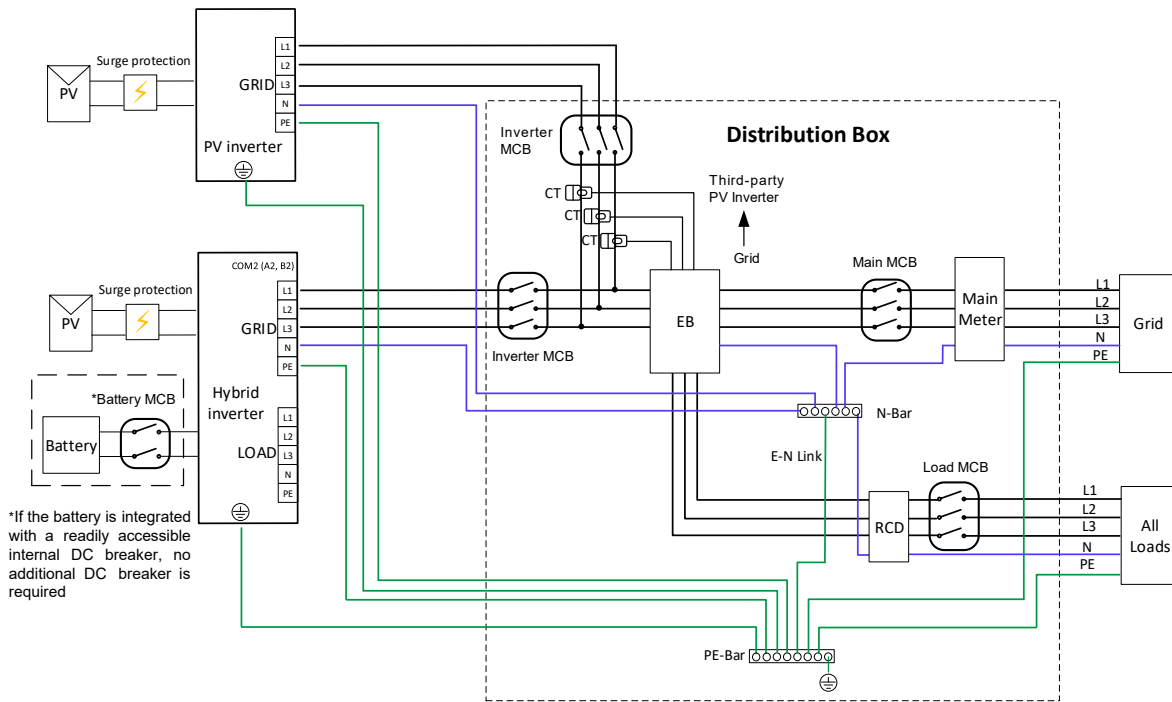
- For a SUNGROW PV retrofit system, external CT cannot be connected. The hybrid inverter and the PV inverter must be in the same plant.
- The maximum AC power of the existing PV inverter should be less than or at most equal to the smaller one of the rated AC output power of hybrid inverter and the rated DC power of the configured battery.
- The existing PV inverter should be capable of regulating the generated power according to frequency shift and the **Power Reduction at Over-frequency** function

should be enabled.

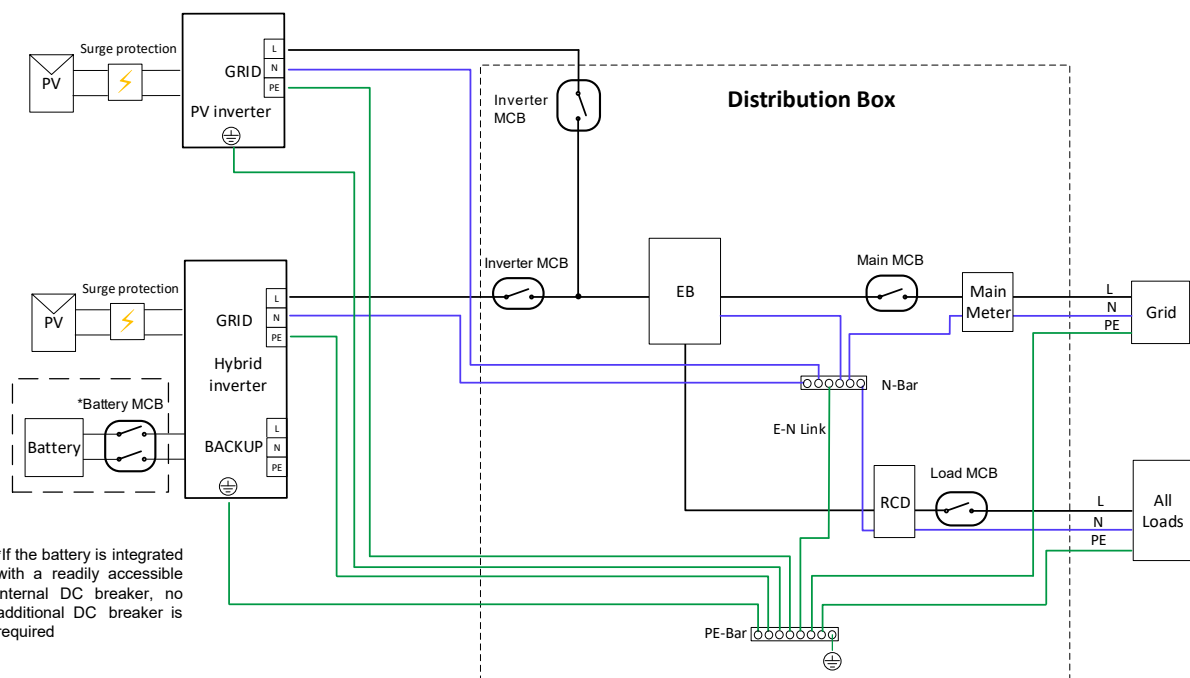
- For the hybrid inverter, both the **Power Reduction at Over-frequency** function and the **Frequency Shift Power Control** function should be enabled.
- The country code setting, power company setting and parameters for **Power Reduction at Over-frequency** must be exactly the same on the PV inverter and on the hybrid inverter.
- The AC wiring diagram is shown below, taking a three-phase system as an example, for reference only:



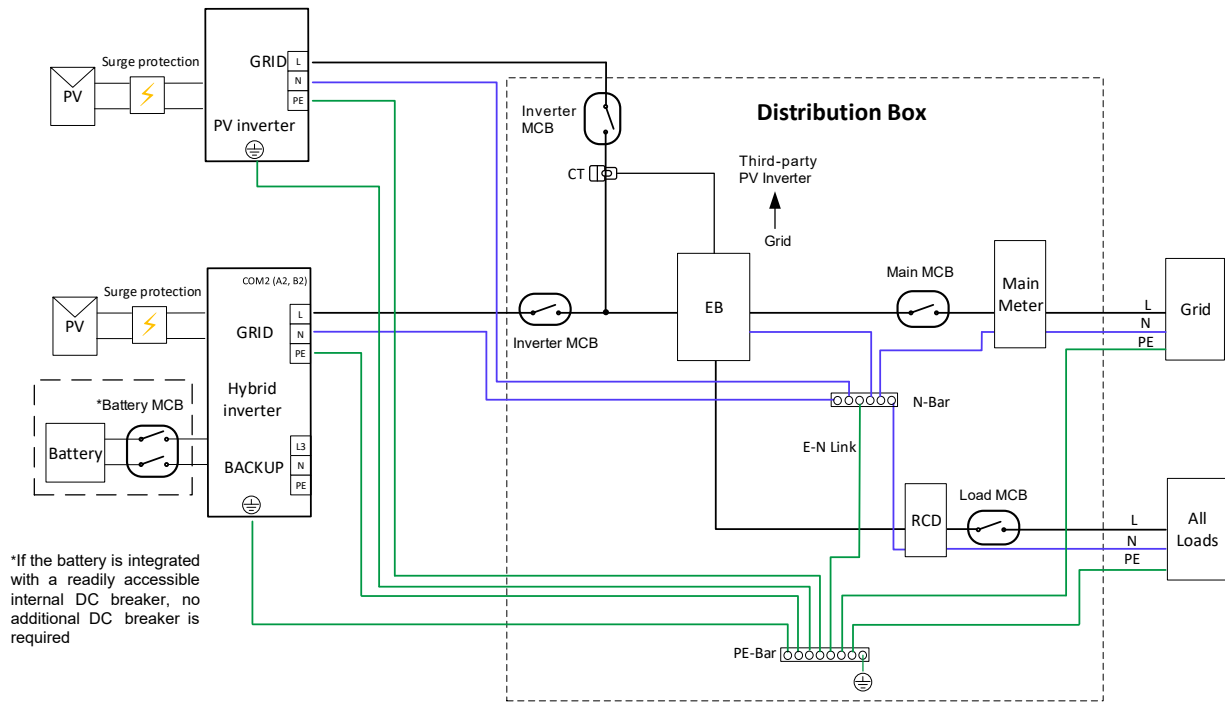
**Figure 6. Sungrow PV inverter retrofit system AC cable connection diagram (Australia) 3-phase system**



**Figure 7. Third-party PV inverter retrofit system AC cable connection diagram (Australia) 3-phase system**



**Figure 8. Sungrow PV inverter retrofit system AC cable connection diagram (Australia)- 1-phase system**



**Figure 9. Third-party PV inverter retrofit system AC cable connection diagram (Australia)- 1-phase system**

Note: If a single-phase hybrid inverter uses EB80T, connect its L terminal to EB's L1.

## 2 On-grid/off-grid switching description

- When the grid is abnormal (including power outage, undervoltage, overfrequency, underfrequency, etc.), the inverter controls the EB to open (disconnect), and the system operates in backup mode;
- When the grid is restored, the EB detects the voltage, phase and other information of the grid and the inverter side, and transmits the information to the inverter. After the inverter adjusts its own voltage, phase and other information to synchronize with the grid, the inverter controls the EB to close, and the system operates in on-grid mode.

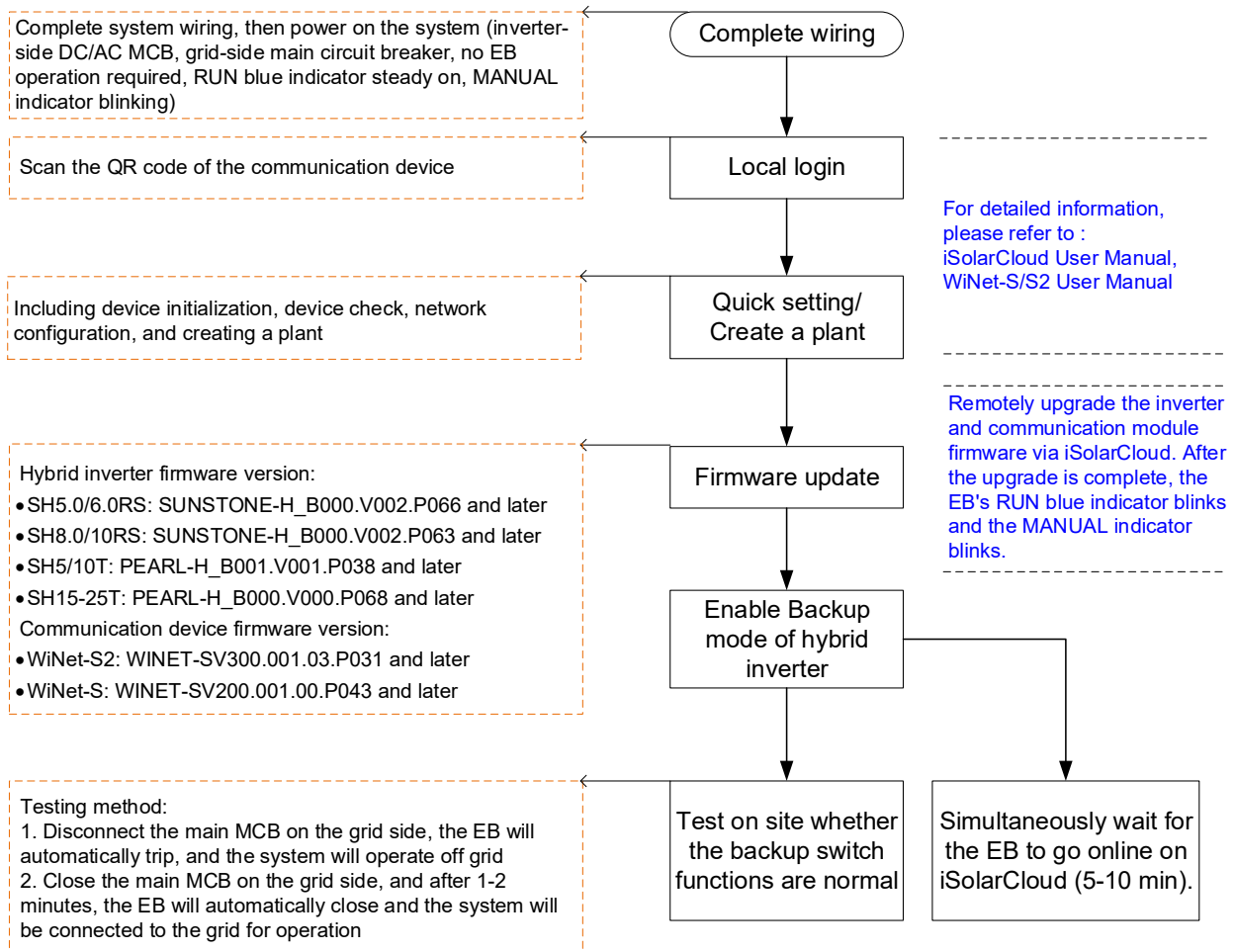
## 3 How to use EB as a bypass switch

- When the inverter system needs maintenance, disconnect the MCB on the inverter side. If the EB is tripped (open), after disconnecting the inverter MCB, the EB will automatically close. If the EB does not close automatically, press the Manual button for 2 seconds. After the Manual indicator remains steady on, manually close the EB switch. The grid will then supply power to loads normally, and the inverter will be bypassed.
- After the inverter system resumes operation, power on the inverter and close the inverter-side MCB. The EB will then be controlled by the inverter again. If the EB was previously closed manually (Manual indicator steady on), press the Manual button for 2 seconds to restore inverter control of EB, and the system will operate normally.

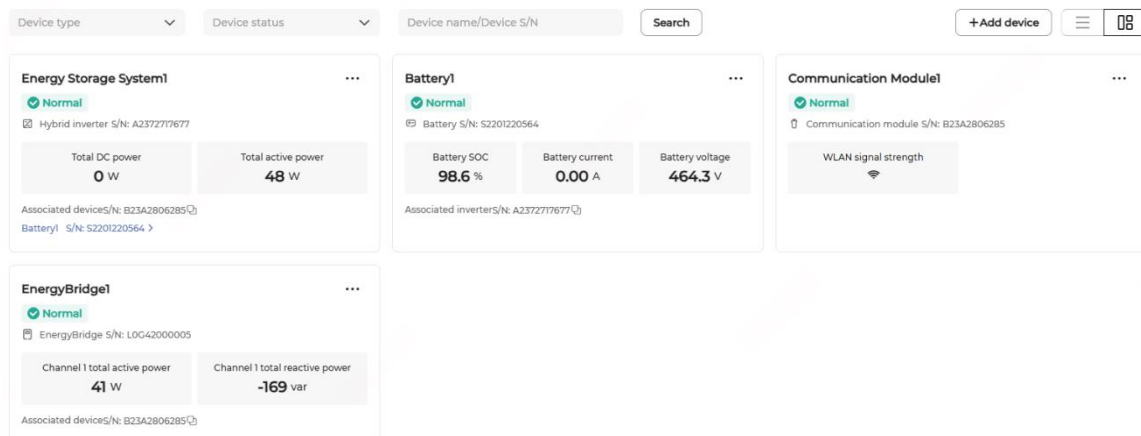
## 4 How to use EB as a circuit breaker

- When overcurrent or short circuit occurs, the EB automatically trips to protect the circuit, and the Manual indicator blinks fast (0.05s). After checking that the circuit is safe, press and hold the Manual button for 2 seconds until the Manual indicator stays steady on, then manually close the EB switch, and press the Manual button again for 2 seconds. The EB will then return to inverter control.
- If the EB is manually opened, follow the same procedure above.

## 5 Method for adapting existing hybrid inverters to EB



● After EB is online, interface:



## 6 Advice on using the EB in a switchboard

- **Overview:**

Sungrow are often asked whether the new EB (Energy Bridge) can be used as a main switch.

- **Sungrow's official response is:**

Our interpretation of AS/NZS3000-2018 (2.3.2.2.1) indicates that the EB does not comply with it being as a main switch under this clause.

- **Installer's interpretation:**

Sungrow understands that the standards are 'interpretive' and that the installer on the job may interpret this clause differently.

The final decision is therefore up to the installer and how he/she interprets the relevant standards.