Battery guidance for SolShare installations

Batteries can be installed with the SolShare in shared solar systems. There are multiple configurations and other aspects of battery control to consider before choosing the best solution for a particular site.

This document is intended to provide technical guidance on how to design a safe and effective shared solar system with the SolShare and batteries/energy storage. This document does not override local electrical safety standards and wiring rules. It is the responsibility of the installer to ensure the shared solar installation meets the relevant electrical safety and wiring standards in the installation locality.

Consult the *0186_DNSP Interconnection Guide* document (available from Allume's Resource Library) for more information on any additional requirements from DNSPs around installing batteries with the SolShare.

I/ Important considerations

IMPORTANT
In scenarios where batteries are intended for shared use between multiple tenancies, batteries are installed on the input side of the SolShare. Sections II/A and II/ 0 in this document show examples of this. It should be noted that the SolShare is not designed for reverse power flows (i.e. power flows from SolShare outputs to SolShare inputs).

IMPORTANT
In a scenario where battery storage will be installed on the input side of the SolShare (see Sections II/A and II/ 0 in this document), the system must be designed to have common light and power connected to the L1-1, L2-1 and L3-1 output terminals of the SolShare. This is to enable grid charge for the batteries via those connections as required.

It is prohibited in Australia to charge batteries from 1 NMI and discharge into a different NMI. Due to the sharing nature of SolShare, batteries installed with SolShare and intended for shared use between tenants cannot be charged from the grid via a tenant NMI and must only be charged from onsite generation (i.e. solar) or common NMI connection.

Where possible, limit grid charge to the minimum.

IMPORTANT
The SolShare requires a 3-phase AC input. The maximum total AC input current to each SolShare is 35A per phase (i.e. approx. maximum 3-phase input power of 22kW). Therefore, the sum of the maximum output power of all inverters and AC-coupled batteries connected to the input of the SolShare needs to be 22kW.

IMPORTANT
As with any battery system, any DC-coupled battery will require a hybrid (solar + battery) inverter. Any AC-coupled battery system can utilise a uni-directional solar inverter.

IMPORTANT
It is important for optimal battery operation (i.e., when to charge and discharge) that the measured load includes the load of all units (on that phase) that are connected to that battery (via the SolShare). This arrangement is most easily implemented in SolShare installations when there is only 1 SolShare for an incomer and all loads (apartments + common light and power) are connected to the SolShare. See Section 0 for more information.

II/ Battery configurations with SolShare

Both AC- and DC-coupled batteries can be installed with the SolShare. The following sections highlight the various possible configurations.

A. DC-coupled battery with hybrid 3-phase inverter (recommended configuration)

- Battery examples: BYD, Sungrow, GoodWe, Sigenergy
- 3-phase hybrid inverter examples: Sungrow SH20T, GoodWe GW20K-ET, Sigen Hybrid 20.0 TP
- Positives: Inverter can be sized for SolShare, simple design, Solar PV can be oversized to account for battery storage on site.

IMPORTANT
Refer to the *SolShare SLD Examples* document (available on Allume's Resource Library) for important information regarding isolation points and CT placement.

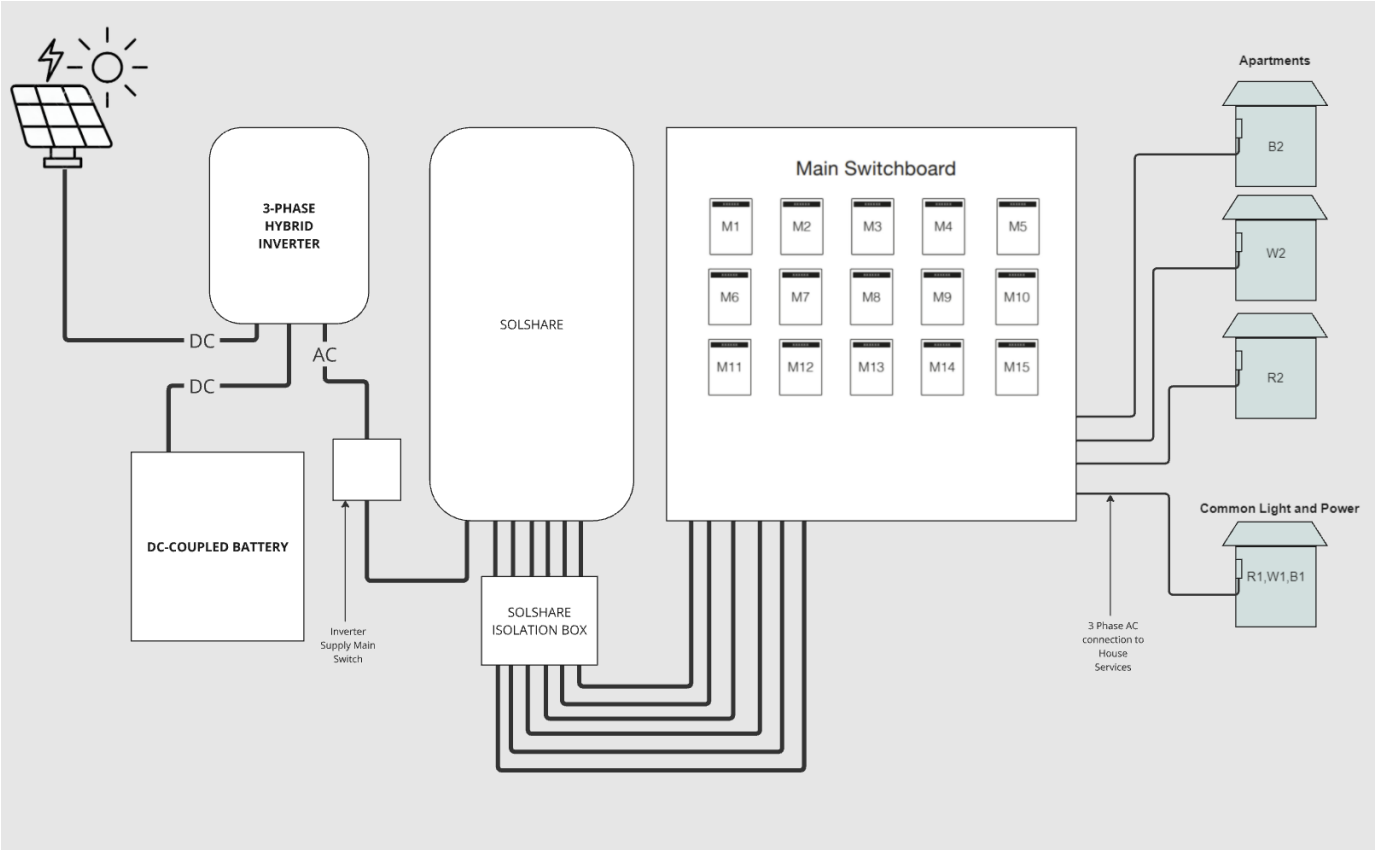

Figure 1: Example of a DC-coupled system with SolShare using a 3-phase hybrid Inverter and DC-coupled battery

B. PV + DC-coupled, 1 x 3 phase battery

- Battery examples: BYD, Sungrow, GoodWe
- Positives: Good option to retrofit onto an existing small PV system.

IMPORTANT
Refer to the *SolShare SLD Examples* document (available on Allume's Resource Library) for important information regarding isolation points and CT placement.

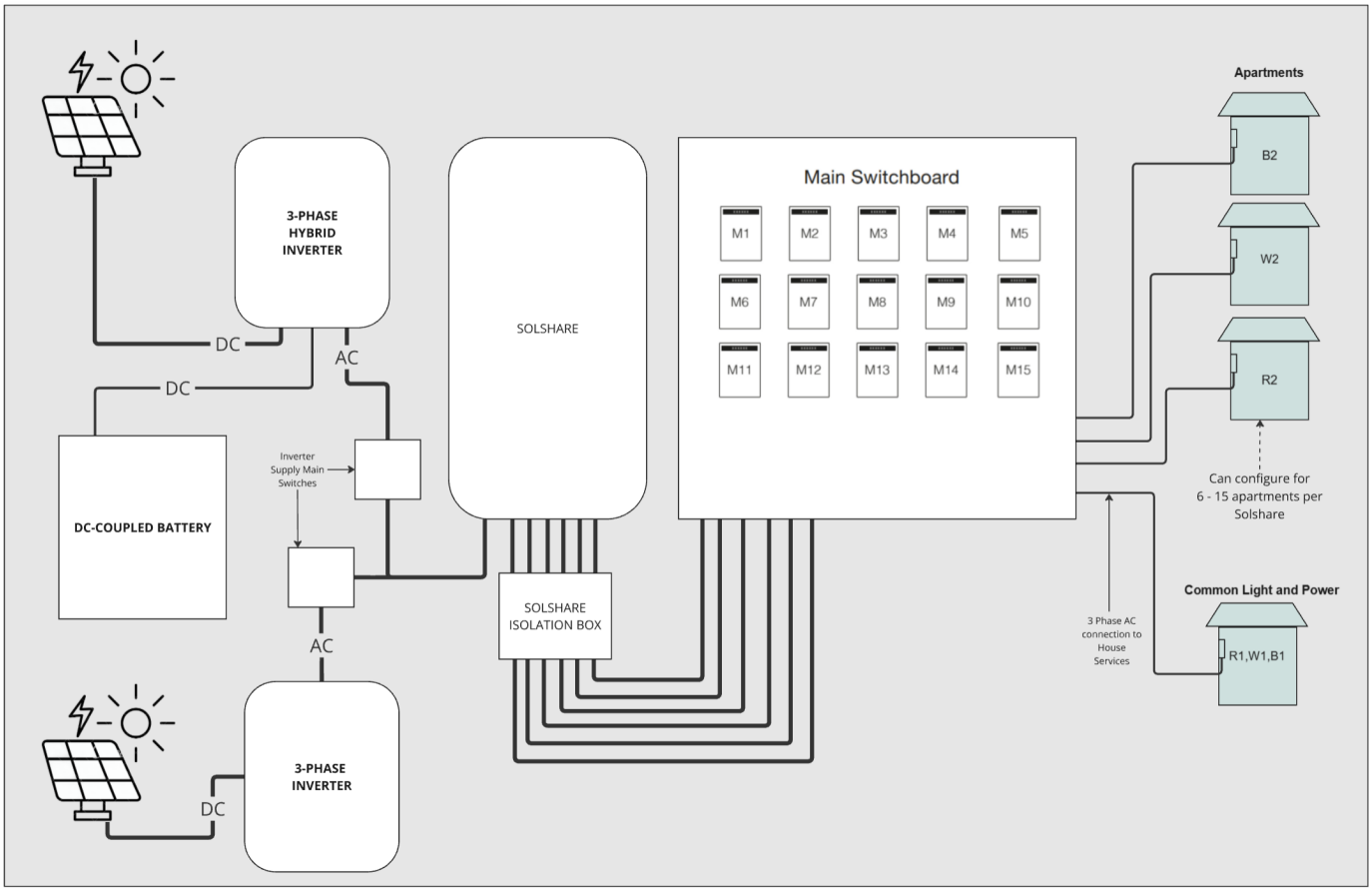

Figure 2: An example of a PV + separate PV/DC-coupled system with SolShare

C. AC-coupled battery for use by single tenancy

- Examples for single-phase tenancies: Sonnen Batterie Eco, Tesla Powerwall 2
- Positives: Good option to retrofit or install when not all tenants want to invest in batteries
- Note: This is the only battery configuration where batteries can be installed on the output side of the SolShare because each battery is only accessed by 1 tenancy.
- NOTE: It is highly recommended that the SolShare sharing mode be set to Custom Allocation to best enable batteries in this configuration to charge from solar. More information can be found in the *Solar Sharing Modes* document (available from Allume's Resource Library).

IMPORTANT
Refer to the *SolShare SLD Examples* document (available on Allume's Resource Library) for important information regarding isolation points, CT placement and battery point of connection in relation to the Tenancy Main Switch (Normal Supply) and the Tenancy Main Switch (Inverter Supply) of each tenancy.

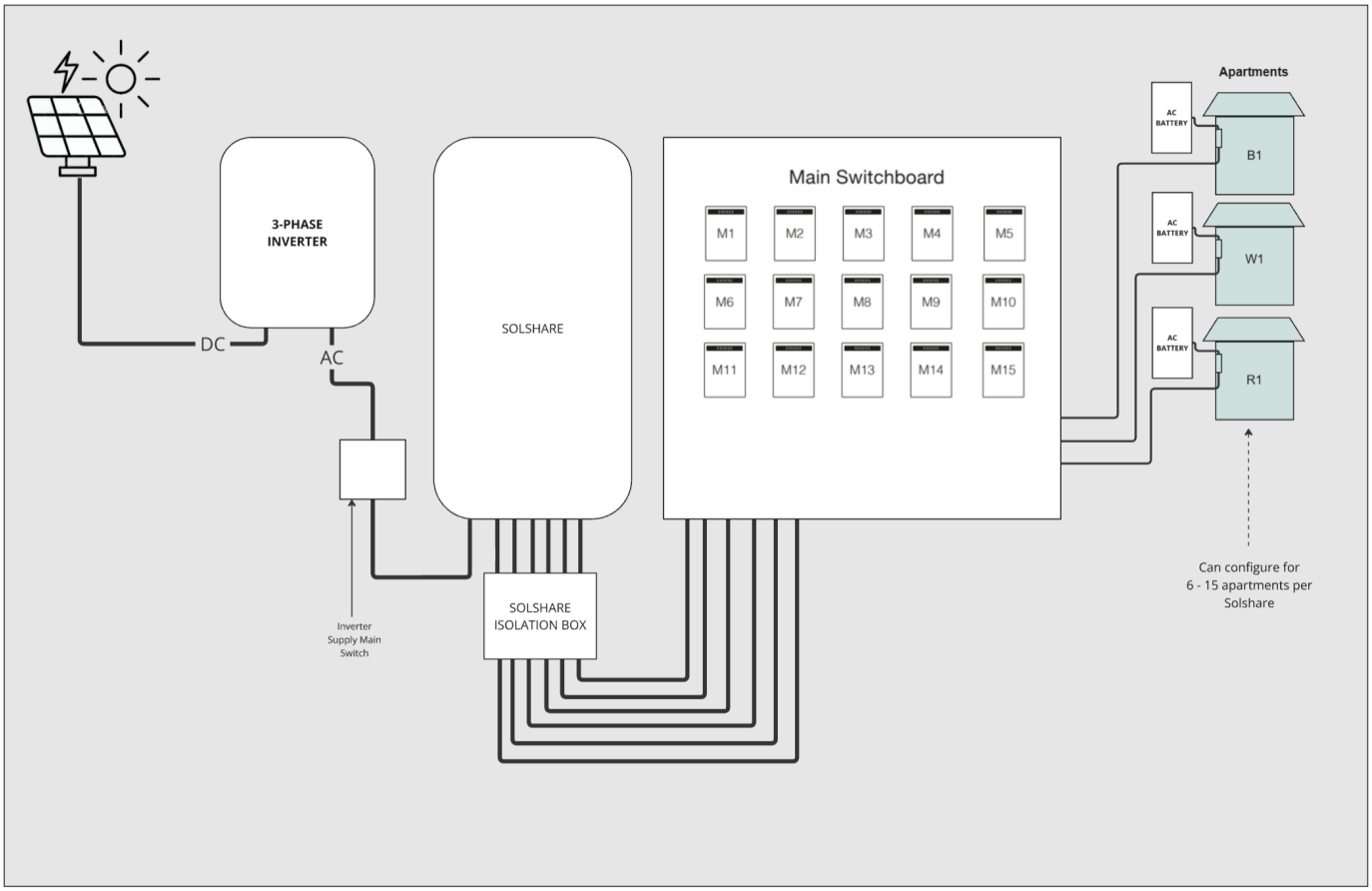

Figure 3: An example of a SolShare installation with three tenancies utilising their own respective batteries

III/ Battery CTs and load monitoring

The SolShare does not currently support communications with battery systems and/or inverters. As such, the signals to charge/discharge a battery, as well as the information needed to decide this (e.g., current load power draw) must be provided by components other than the SolShare.

Most batteries are supplied with a meter including one, or a set, of current transformers (CTs) with which to measure load in real time. This meter is used as an input to charging algorithms, informing the battery management systems (BMS) when to start the battery charging or discharging.

It is important for optimal battery operation (i.e., when to charge and discharge) that the measured load includes **all units that are connected to that battery (via the SolShare)**.

This arrangement is most straightforward in SolShare installations when:

- A battery is only used for 1 tenancy (see configuration in Section II/C); or
- A battery is shared among multiple tenants (see configurations in Sections II/A and II/B) and there is **only 1 SolShare for an incomer** and **all loads (apartments + common light and power) are connected to the SolShare**.

If an installation does not fit into either of these scenarios, then it may be difficult to measure the correct loads in practice, so it is the responsibility of the installer to decide how best to balance optimal battery operation and practical CT placement considerations.