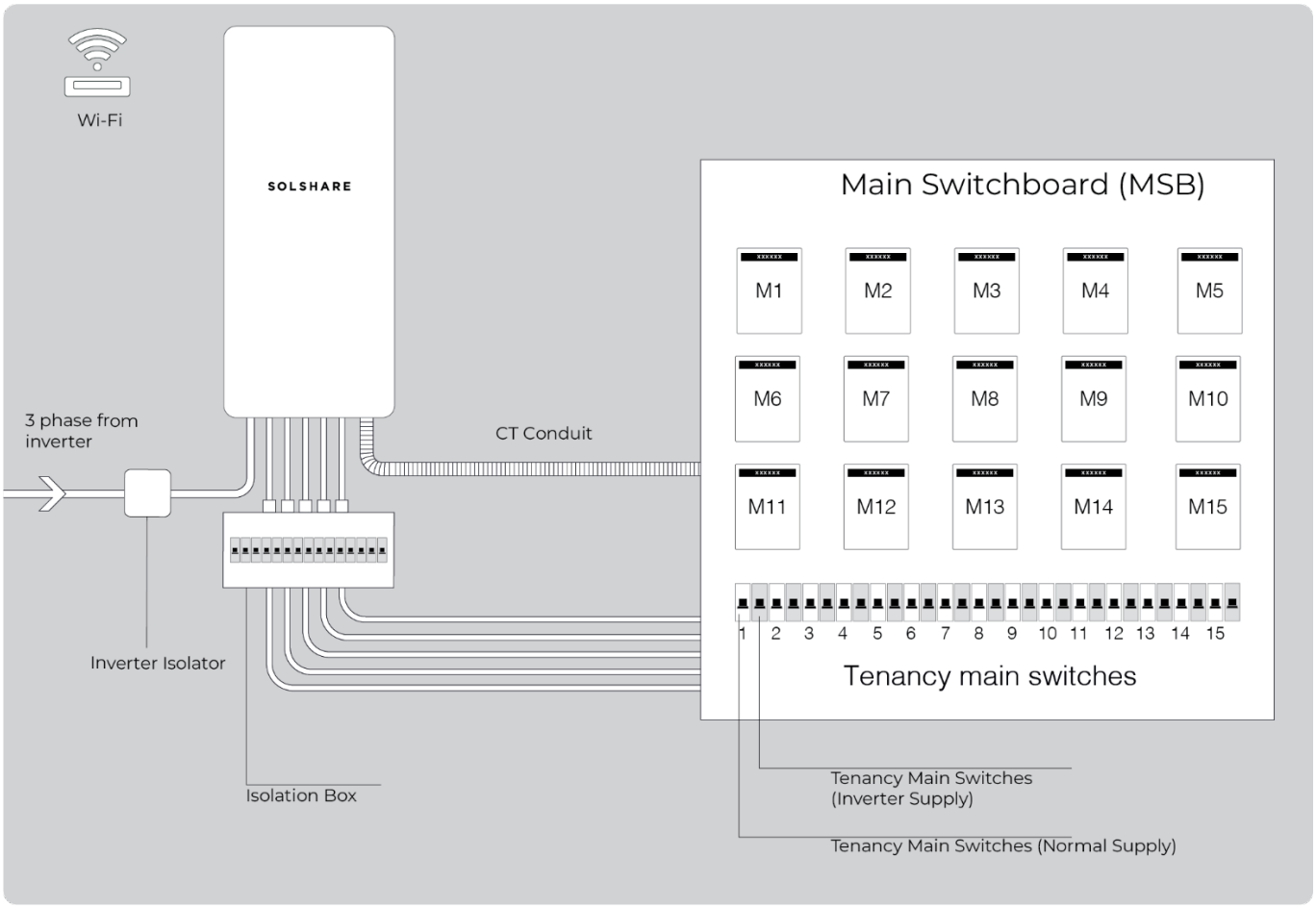
# SolShare System & SLD Design Guide

All referenced documents (including the most up-to-date version of this document) can be found at Allume's online Resource Library.

## Disclaimer

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

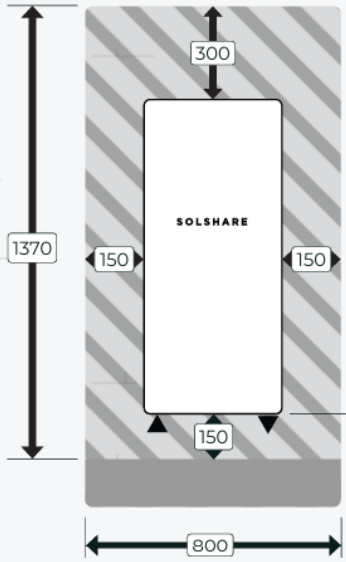


# I/ Installation location and clearances

The information below provides an overview of requirements for SolShare installation location and clearances. More information is available in 0925-SolShare installation manual.

Minimum clearances, shown below, are required for installation and maintenance of SolShare. **Failure to adhere to minimum clearances will void warranty.**

**NOTE:** The highlighted minimum clearances are **mandatory** for air flow and service.



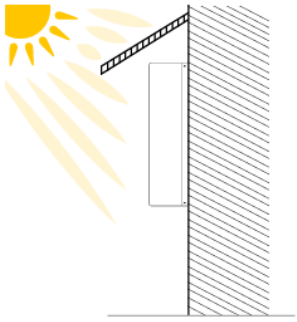

The mounting template provided with SolShare can be used to assist installation.

Recommended minimum clearance for cable entry/exit from SolShare base.

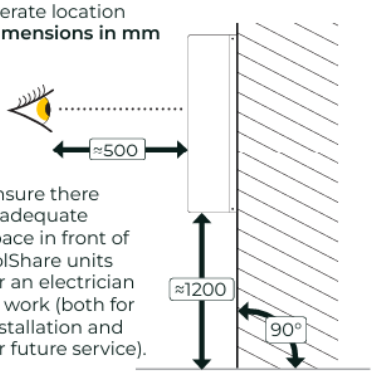
All dimensions in mm.
NOT TO SCALE

**SolShare dimensions (H x W x D):**
920 x 485 x 270

- Install in a well ventilated area.
- Install a shade cover over SolShare units when installed outdoors in direct sunlight or when in the path of debris (e.g. under a tree with falling leaves).



Install in an easy to observe and operate location
***dimensions in mm**

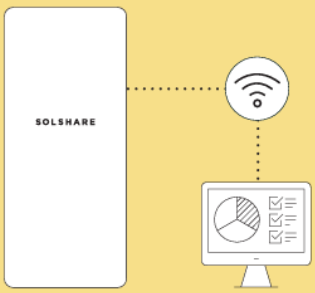



Ensure there is adequate space in front of SolShare units for an electrician to work (both for installation and for future service).

Mount vertically

**Internet communications**

A 2.4GHz Wi-Fi network must be available at the site to enable commissioning and ongoing monitoring.




**NOTE:** Where possible, do not install SolShare below a cable tray - this may affect SolShare's ability to connect reliably with the Wi-Fi at site.

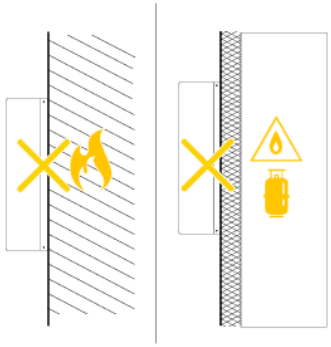
**Environmental boundaries**

Max ambient temperature:
**50°C (+122°F)**

Min ambient temperature:
**-10°C (-14°F)**

Relative humidity:
**0-90%**

Do not mount SolShare units on or near flammable material or gases



SolShare is IP56-rated with the use of suitable glands at cable entry.

To minimise cabling cost and prevent extension of CT tails being required, it is recommended that the SolShare be installed as close to the location of the *Tenancy Main Switches (Normal Supply)* as possible (e.g., adjacent to the MSB).

## A. Enclosures and cabinets

As an IP56-rated product, SolShare does not require a dedicated enclosure or cabinet. For heat dissipation, the SolShare should ideally be installed in an open room or outside undercover.

However, if the project requires installation in an enclosed area like a cabinet or enclosure (e.g., for security reasons), there should be:

- a vent directly above the SolShare to allow hot air to rise out of the enclosure
- a vent at the bottom to let cooler air into the enclosure
- Minimum 50mm clearance between the front of the SolShare and the cabinet/enclosure door (opening the cupboard/enclosure door must allow for the clearances required in the graphic above).

# II/ Electrical connections and cabling

As with all cabling, cables for the input and output connections to a SolShare must comply with AS/NZS3000 and other relevant regulations and standards. For the output cables, a cable tray is recommended to allow all output cables to be laid quickly and easily.

The gauge of the AC output cable of the inverter must be sized in the same way as is done for a standard solar installation, considering aspects such as maximum current, length, temperature, cable specifications and cable spacing. This cable will form the input to SolShare.

> **All output cables of the SolShare must be sized to carry the maximum output current per phase of the inverter**, as at points in time the SolShare may direct all current to one tenancy on each phase.

Suitable weatherproofing for the installation environment to maintain SolShare's IP56 rating must be used at all cable entries into SolShare (e.g., glands). SolShare's panel hole dimensions:

- panel thickness: 4mm
- hole diameter: 32mm

## A. Input from inverter

The input to each SolShare is three-phase AC power from a dedicated inverter/s. The total input must not exceed the maximum current rating of the SolShare**: 35A/phase**.

Typically, the input to each SolShare will be connected to the output of 1 three-phase string inverter (rated at 20kW or less). Microinverters can also be used as the input into the SolShare, if they form a three-phase input.

> SolShare allocates and distributes the power provided to it by the inverter. SolShare does not control generation from, or operation of, the inverter.

## B. Output connections

Each SolShare has 15 single-phase output connections (5 output connections per phase) available. These must be configured such that:

- Each SolShare's **L1**-1, **L2**-1 and **L3**-1 outputs have connections
- The phase of each SolShare output matches the phase of its tenancy's corresponding grid connection.

It is recommended that each SolShare has at least 2 connections (out of 5) per phase

Not all 15 outputs need to be connected to tenancies or other multi-tenant building loads (e.g., common light and power). These outputs can be connected in any combination of single- and/or three-phase connections, such as:

- 4 x three-phase connections (3 connections not used)
- 11 x single-phase connections (4 connections not used)
- 2 x three-phase & 4 x single-phase connections (5 connections not used)

In certain circumstances, the SolShare can connect to just one or two phases of a three-phase connected tenancy. In these cases, monitoring data for that tenancy's load will not match other data sources that reflect the full three-phase load (e.g., electricity bill).

More information is available in the 0733-Installing SolShare with three-phase tenancies document.

> **All output cables of the SolShare must be sized to carry the maximum output current per phase of the inverter**, as at points in time the SolShare may direct all current to one tenancy on each phase.

## C. Solar point of connection on load side

Due to the requirements of AS/NZS 4777.1, the solar point of connection (POC) for each tenancy must be on the **load side** of that tenancy's *Tenancy Main Switch (Normal Supply)*. This is shown in the example single-line diagram (SLD) provided at the end of this document.

See Section III/ for more information about switchgear requirements.

## D. Neutral connection

Each SolShare requires a **single connection to neutral**, regardless of the number of switchboard/s the SolShare is connected to. More information about wiring neutrals in the Isolation Box is available in the 0880-Isolation Box Wiring Guide.

The SolShare also provides an option to provide a neutral connection to the inverter, if the inverter does not have its own separate neutral connection.

## E. Earth connection

Each SolShare requires a **single connection to earth**, regardless of the number of switchboard/s the SolShare is connected to.

The SolShare also provides an option to provide an earth connection to the inverter, if the inverter does not have its own separate earth connection.

# III/ Switchgear

Please refer to the example SLD at the end of this document for context on the following switchgear categories. All switchgear must be installed as per the requirements of relevant standards, including AS/NZS 4777.1:2024.

## A. Inverter AC Isolator

Each shared solar system must have a single point of isolation between a SolShare and its connected inverter, labelled as the *Inverter AC Isolator*. The SolShare's input will be fed from the *Inverter AC Isolator*.

## B. Tenancy Main Switches (Normal Supply)

*Tenancy Main Switches (Normal Supply)* are the main switches for each tenancy allowing isolation from the grid. Typically, *Tenancy Main Switches (Normal Supply)* are already existing in the multi-tenant building's switchboard. Centrally located *Tenancy Main Switches (Normal Supply)* on the load side of each unit's meter are required for SolShare connection. These switches are the point of connection of the SolShare outputs. Typically, these are in an MSB adjacent to the meter panel. If this is not the case, then a switchboard will need to be installed with *Tenancy Main Switches (Normal Supply)* included.

SolShare's output connections will each connect to a *Tenancy Main Switches (Normal Supply)* via the Isolation Box (see Section VI/D).

## C. Tenancy Main Switches (Inverter Supply)

Each connected tenancy requires its own individual *Tenancy Main Switch (Inverter Supply)*. This breaker will need to be wired between the Isolation Box and the solar POC of that tenancy.

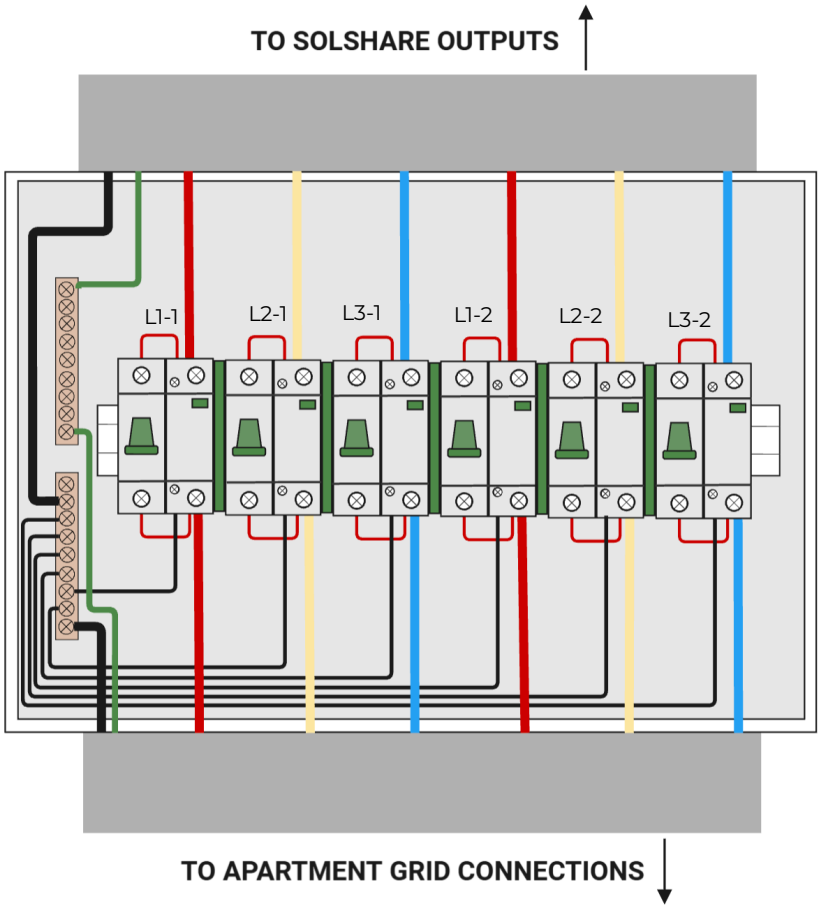
The *Tenancy Main Switch (Inverter Supply)* must be grouped with the *Tenancy Main Switch (Normal Supply)* for each tenancy.

The *Tenancy Main Switches (Inverter Supply)* must be sized above the maximum current output of the inverter, e.g., 40A if a 20kW system is installed.

## D. SolShare Isolation Box (Grid)

Each SolShare requires an Isolation Box to provide airgap isolation in line with regulations and standards, and to provide a means to isolate SolShare. Each Isolation Box comprises an enclosure, appropriately-rated normally open contactors and MCBs for control of the contactor coil connected for each output.

SolShare requires each output to be wired through its own external single pole contractor, ensuring air gap isolation when an individual tenancy is isolated from the grid. This contactor is normally open and is energized by a 230V coil. The voltage to power the coil is taken from the grid side of the contactor.




SolShare is isolated only once all these contactors and the *Inverter AC Isolator* are open.

More information is available in the 0880-Isolation box wiring guide.

# IV/ Interface protection

As with other solar installations more generally, interface protection may be required in installations involving a SolShare, based on rules set out by the relevant DNSP, Australian/New Zealand Standards or other regulations. In general, solar installations with SolShare that have more than 30kVA of inverter output per site require interface protection.

More information is available in the 0370-Interface protection guidance for SolShare installations document.

# V/ Metering

## A. Retail electricity meters

Each tenancy receiving solar should be fitted with a bi-directional capable 'smart' meter. This will enable these tenancies to receive a solar feed-in tariff (FiT) if available.

## B. SolShare CTs

Each SolShare is supplied with 15 x 120A current transformers (CTs). Each CT corresponds to one SolShare output connection and should be located to measure grid import/export for that output connection's tenancy (CTs typically clipped between the tenancy's meter and its *Tenancy Main Switch (Normal Supply)*). Each CT has the following characteristics:

- Dimensions (outer): 46 x 32 x 32mm
- Internal hole diameter: 17mm (designed to clip over cable gauges of 25mm$^2$ or smaller)
- Maximum CT tail length (10m supplied tail + extension): 100m

Each CT comes with 10m of tail connected to the CT. If CT tails need to be extended for an installation, shielded, twisted pair, 0.25mm$^2$ (or larger) cabling must be used to extend the lengths, with a splicing connector or similar. The shielding must be grounded at the SolShare.

More information is available in the 0754-Extending CT tails document.

## C. Metering devices for emergency backstop

Some states in Australia have requirements around their emergency backstop mechanisms. As with all solar installations requiring this, the emergency backstop functionality for those installations with SolShare is still handled by the inverter/s at the site (not handled by SolShare/s). It is important to place the inverter's metering devices for emergency backstop at a point in the electrical infrastructure that measures total grid connection of the entire site (not just for a single NMI).

> In states that have implemented emergency backstop mechanisms, site consumption monitoring is required for all solar installations, including installations with SolShare. Typically, this requires all inverters at site to have a permanent internet connection. A backstop-compliant metering solution must be installed **to measure the grid connection of the entire site**.

# VI/ Wi-Fi internet

> A strong and stable 2.4GHz Wi-Fi internet network must be made available at each SolShare's installation location.

SolShare cannot be commissioned (and ongoing monitoring cannot be provided) without an internet connection. SolShare does not support a wired internet connection. More information is available in the 0389-SolShare Wi-Fi FAQs document.

# VII/ Labelling

A label kit is provided with each SolShare. This label kit contains those labels specific to the SolShare. Other labels for other parts of the solar system must be provided by the installer. More information is available in the 0355-SolShare_labelling_advice document.

# VIII/ Sharing modes

The SolShare is a smart solar sharing device, sensing which tenants are using electricity, and sending solar generation to where it is needed most on a continual basis. This solar sharing is done between tenants connected to the same phase outputs of a SolShare (no sharing is done between phases).

During commissioning of SolShare, one of two solar sharing modes can be chosen. These are:

- **Demand-based Delivery mode:** The SolShare sends solar generation to any tenancy or connection using meaningful load, leading to optimal self-consumption of solar in the building. As such, higher energy consumers will receive more solar generation than low energy consumers.
- **Custom Allocation mode:** The SolShare follows the same logic as the Demand-based Delivery mode, but over the course of each calendar month, the SolShare will adjust sharing so that each connection or tenancy receives the pre-set custom allocation of solar energy (in kWh). These pre-set custom allocations are entered in the SolShare Commissioning App during the commissioning process and are typically expressed as a percentage of the total solar output on a phase. As such, it is important to consider which tenancies are connected to which phases to ensure the desired allocations can be best achieved. A three-phase connection (e.g., for common area meter) can be set with different percentages of solar allocation on each phase, which may aid in balancing the solar allocations for tenancies.
  Allume has made a 0756-Custom allocation calculator available for use.
  Example use cases include (insofar as the phase allocations of each tenancy allow):
    - All tenancies receive the same amount of solar allocation: SolShare can be set to assign each of the tenancies with the same percentage of solar.
    - 3-bedroom tenancies to each receive 12% of solar, and 1-bedroom tenancies to receive 7% of solar: SolShare can assign each of the tenancies with these allocations of solar.

The 0446-SolShare_solar_sharing_modes document provides more information about SolShare's various sharing mode options.

# IX/ Multiple SolShares

When designing a system that will use multiple SolShares (for example, if more than 15 tenancies are to be connected to solar), treat each SolShare system separately. Each SolShare requires its own dedicated inverter/s, and each tenancy must be connected to a single SolShare.

Since each SolShare system is treated separately, the tenancy loads should be distributed across the SolShares in proportion to the respective PV generation connected to each SolShare, and the solar allocation that each tenant should receive.

For more information about providing network protection for larger solar systems, see Section VII/.

# X/ DNSPs

Allume has provided in-depth instructions on how to apply for interconnection with the various Australian DNSPs in 0186-DNSP interconnection guide.

Most DNSPs require information about all NMIs to be connected to solar using SolShare at the time of interconnection application. Therefore, it is often helpful to start gathering tenancy NMIs early in the system design process.

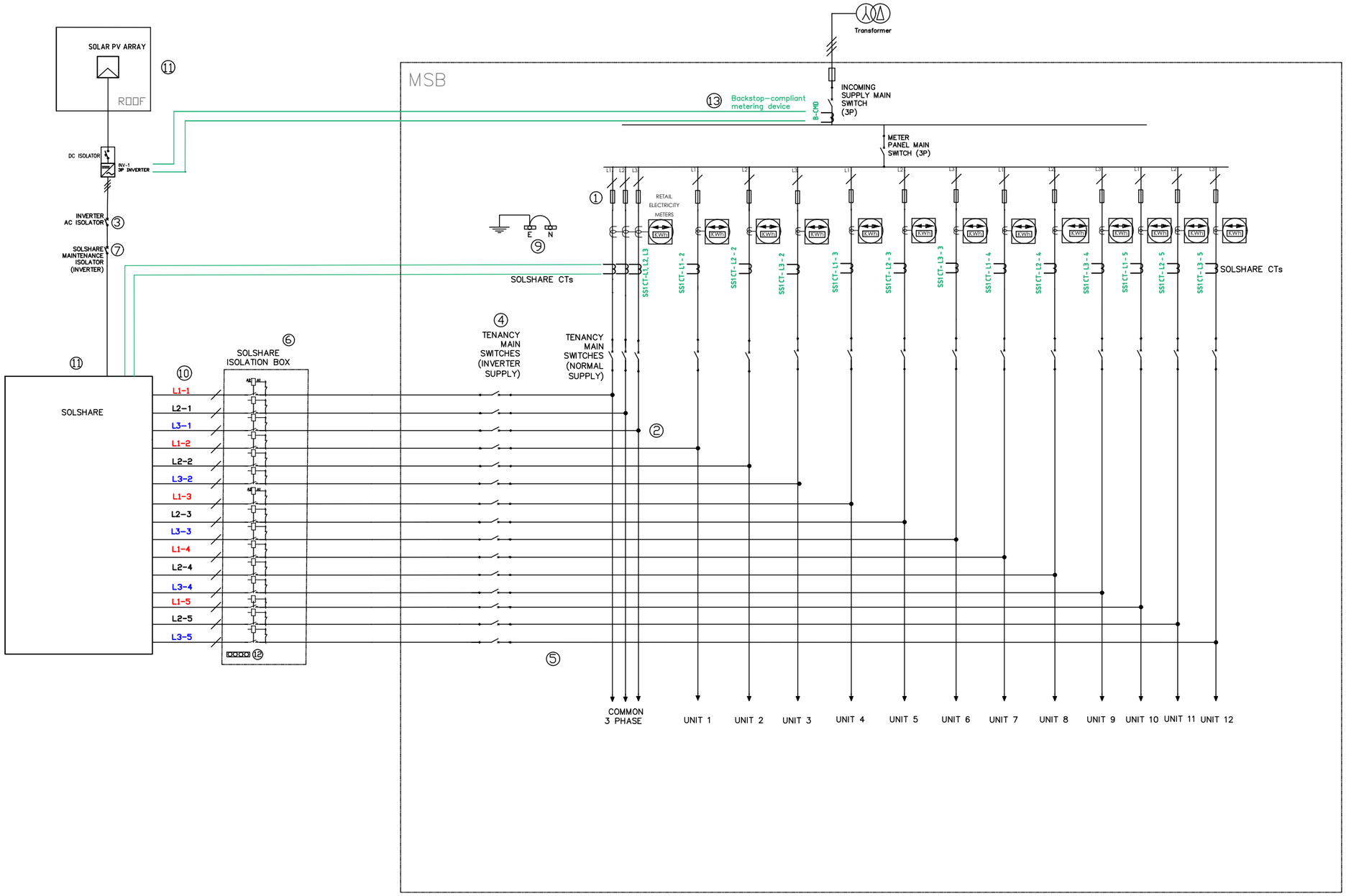
# XI/ Handover to installation team

During installation and commissioning of each SolShare, the installation team will need crucial information about required connections and configurations, such as which tenancies to connect to which SolShare outputs, which solar sharing mode to choose and whether to connect the common light and power to SolShare.

Ensure that all items in 0388-Pre-installation checklist are handed over to installation teams prior to starting work onsite.

# XII/ Example SLD

The example single line diagram (SLD) on the following page shows an example configuration for a typical single SolShare installation, supplying solar to a 3-phase common light and power connection, as well as 12 single-phase tenancies. Notes are included in the SLD with some key design considerations.




## NOTES

1. In South Australia Service Side fuses will be replaced by meter isolators. If this is the case the system shall be configured for SYSTEM LEVEL ANTI-ISLANDING.
2. The solar point of connection is on the load side of the Main Switch (Normal Supply) for each tenancy. Tenancy Main Switch (Normal Supply) will isolate both grid and solar supply to tenancy. Clear labelling must be included on the meter panel to indicate this wiring configuration (label provided with SolShare).
3. The Inverter AC Isolator shall be labelled clearly and be able to provide overcurrent protection rated to the inverter's maximum output current.
4. Tenancy Main Switches (Inverter Supply) shall be grouped with the Tenancy Main Switches (Normal Supply) for that connection/unit.
5. The cables shall be sized correctly to meet all relevant standards, including AS/NZS 4777.1.2024, AS/NZS 3000.2018 and AS/NZS 3008.1.2:2017 requirements.
6. SolShare Isolation Box shall be installed as per requirements in the SolShare isolation box – installation guide (accessed at https://info.allumeenergy.com/hubfs/ANZ/0880-SolshareIsolationBox-InstallationGuidance.pdf).
7. SolShare Maintenance Isolator (Inverter) is required if Inverter AC Isolator is not readily accessible from SolShare.
8. Inverter phase connections shall match the grid phases for each tenancy connection on the SolShare.
9. Each SolShare requires a single connection to neutral and a single connection to earth.
10. All output cables of a SolShare shall be sized to carry the maximum output current per phase of the inverter, as at points in time the SolShare may direct all current to one tenancy on each phase.
11. Each SolShare requires its own dedicated inverter/inverters.
12. The Neutral connection of the coil (A2) shall be terminated at the neutral bar in the isolation box and linked back to the main neutral.
13. Site consumption monitoring for emergency backstop is required for all Victorian installations. For further information see https://www.energy.vic.gov.au/households/victorias-emergency-backstop-mechanism-for-solar

## LEGEND

| | |
|---|---|
| | Circuit Breaker |
| | Meter |
| B-CMD | Backstop-compliant metering device |
| SS1(CT-) | Solshare CT |
| | CT Cable |
| | MEN Link |
| | Fuse |
| | Contactor Coil |
| | Neutral Bar |

For installation design

allume
ABN: 58605671494
A: Unit 1/ 1 Brohmam Pl, Richmond VIC. 3121
T: 03 9427 0005
W: www.allumeenergy.com.au

ADDRESS
123 Main Street, Melbourne, VIC 3000.

TITLE: SAMPLE SLD-SINGLE SOLSHARE

DATE: 01/07/2025

| SHEET SIZE | | DRAWING NUMBER | REV |
|---|---|---|---|
| A3 | | ALL-SOL35-001 | B2 |
| SCALE | NTS | | |