SolShare 2 system design guide

For SolShare system designers and installers

ⓘ NOTICE

This document is intended to provide guidance on how to design a safe and effective shared solar system using SolShare. This document does not override any local electrical safety standards, regulations 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.

What's in this guide?

ⓘ TIP

You can always access the most up-to-date versions of any documents (including this document) in the Resource Library on Allume's website at https://allumeenergy.com/au/resource-library/.

ⓘ TIP

A summary design checklist has been provided in Section 12 to assist system designers in considering the key aspects of system design with SolShare.

Overview of a typical SolShare 2 installation

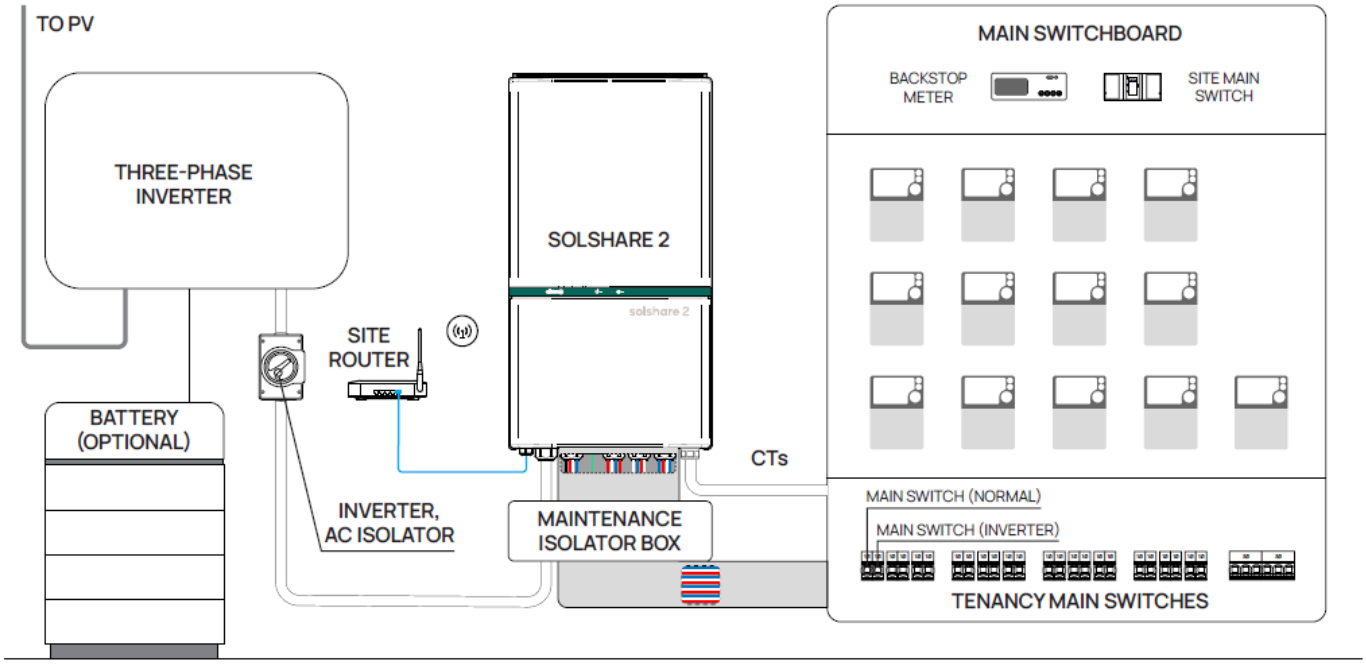


Figure 1: Overview of a typical SolShare installation

1. Installation location and clearances

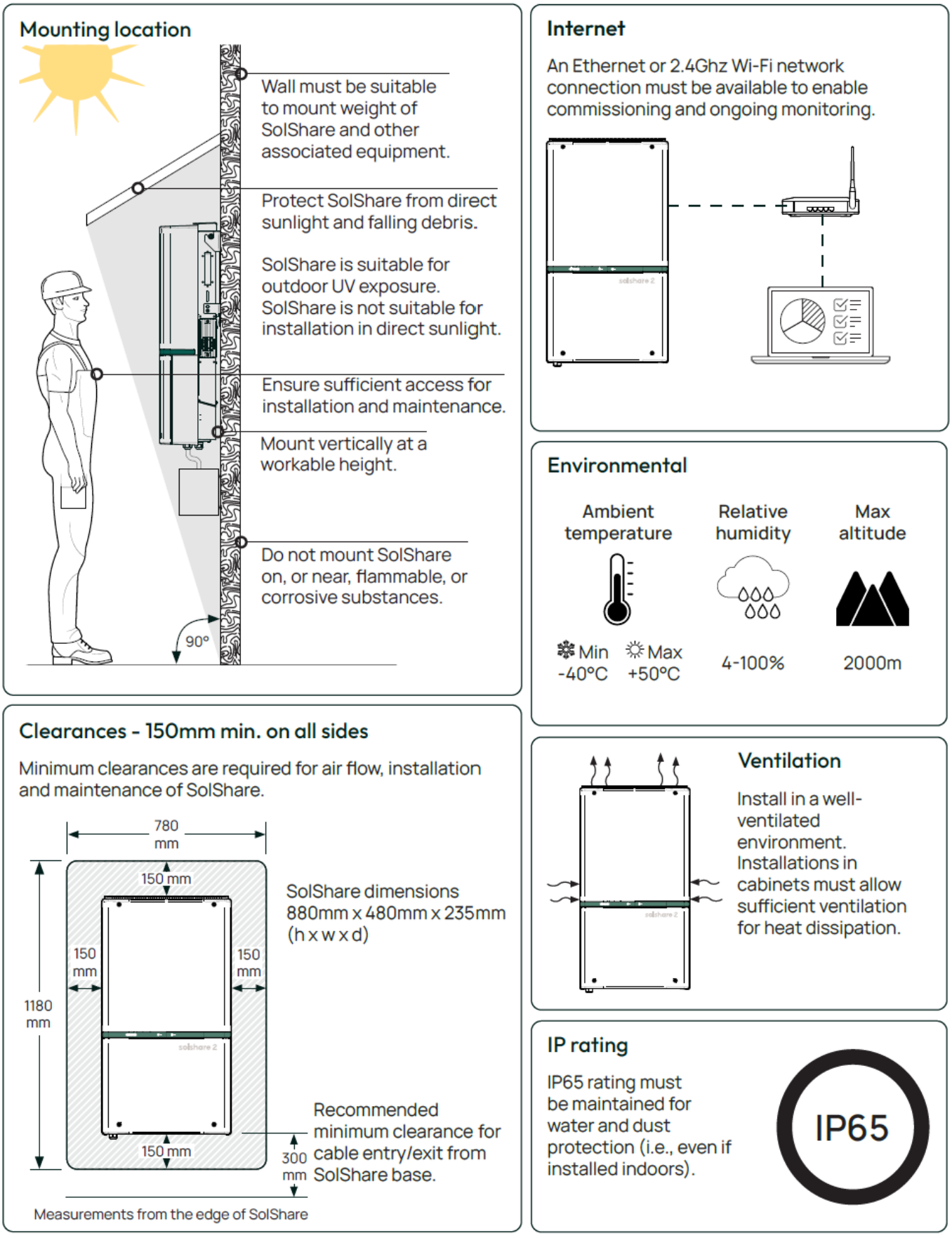


Figure 2: SolShare location requirements

ⓘ TIP

SolShare should be installed close to the main switchboard (MSB). To minimise cabling cost and reduce the likelihood of CT cable extensions being required, it is recommended that SolShare be installed as close to the location of the tenancy MAIN SWITCHES (NORMAL) as possible (e.g. adjacent to the MSB).

ⓘ TIP

SolShare can be installed inside or outside. SolShare 's IP65 rating must be maintained for water and dust protection (even if installed indoors).

ⓘ TIP

SolShare does not require a dedicated enclosure or cabinet. For heat dissipation, 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 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 SolShare and the cabinet/enclosure door.

ⓘ TIP

More information is available in the Installation manual.

2. Electrical connections and cabling

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

The gauge of the AC cable between the inverter and SolShare 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.

ⓘ NOTICE

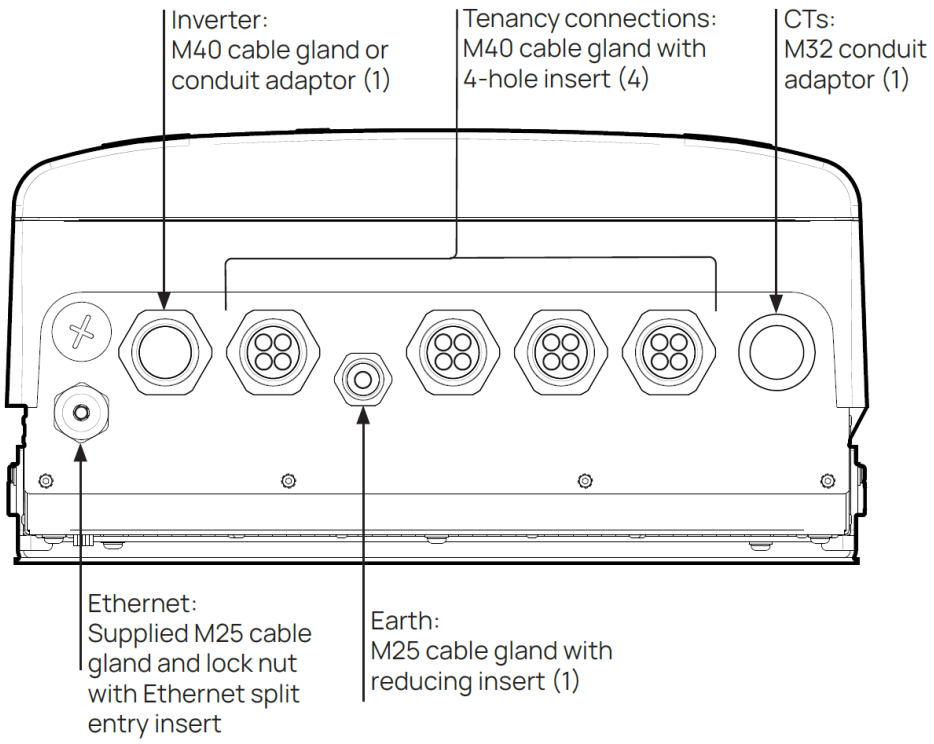
All tenancy connection cables of SolShare must be rated for total maximum per-phase generation capacity of inverter/s connected to SolShare, as at points in time SolShare may direct all current to one tenancy on each phase.

ⓘ NOTICE

Suitable weatherproofing for the installation environment to maintain SolShare's IP65 rating must be used at all cable entries into SolShare (e.g. glands).

SolShare's panel hole dimensions are:

- Panel thickness: 3mm
- Hole diameters as shown below:



2.1. Input from inverter

ⓘ NOTICE

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 SolShare: 50.9A per phase.

Typically, the input to each SolShare will be connected to the output of one three-phase string inverter (rated at 30kW or less). Microinverters can also be used as the input into 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.

2.2. Tenancy connections (SolShare outputs)

Each SolShare has 15 single-phase tenancy connections (5 tenancy connections per phase) available. Not all 15 tenancy connections need to be connected to tenancies or other multi-tenant building loads. These tenancy connections 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)

ⓘ NOTICE

SolShare's tenancy connections must be configured such that:
• L1-1, L2-1 and L3-1 have connections (at least two connections per phase recommended)
• The phase of each tenancy's solar connection from SolShare matches the phase of its grid supply
• All tenancy connection cables of SolShare must be sized to carry the maximum output current per phase of the inverter, as at points in time SolShare may direct all current to one tenancy on each phase.

ⓘ NOTICE

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 MAIN SWITCH (NORMAL). This is shown in the example SLD provided at the end of this document. See Section 3 for more information about switchgear requirements.

ⓘ NOTICE

Each SolShare tenancy connection must provide the sole supplementary supply to the corresponding phase of its connected tenancy. No other supplementary supplies (such as an existing solar system) should be connected to any phase/s connected to SolShare of a tenancy or other multi-tenant load.

ⓘ TIP

SolShare can connect to one or two phases of a three-phase 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 Installing SolShare with three-phase tenancies document.

2.3. Neutral connection

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

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

2.4. Earth connection

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

3. Switchgear

All switchgear must be installed as per the requirements of relevant standards, including AS/NZS 4777.1:2024. The example SLD available at the end of this document gives some context on the following switchgear categories.

3.1. INVERTER ISOLATOR

ⓘ NOTICE
INVERTER ISOLATOR must provide suitable overcurrent protection for compliance with AS/NZS 4777.1:2024.

Each shared solar system must have a point of isolation between a SolShare and its connected inverter, labelled as the INVERTER ISOLATOR. SolShare's input will be fed from the INVERTER ISOLATOR.

3.2. Tenancy MAIN SWITCHES (NORMAL)

Tenancy MAIN SWITCHES (NORMAL) are the main switches for each tenancy allowing isolation from the grid.

Typically, tenancy MAIN SWITCHES (NORMAL) are already present in the multi-tenant building's switchboard. Centrally located tenancy MAIN SWITCHES (NORMAL) on the load side of each tenancy's meter are required for SolShare connection. These switches are the point of connection for SolShare tenancy connections. 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) included.

SolShare's tenancy connections will each connect to a tenancy's MAIN SWITCHES (NORMAL) via the maintenance isolator box.

3.3. Tenancy MAIN SWITCHES (INVERTER)

Each tenancy connected to solar via SolShare requires its own individual tenancy MAIN SWITCH (INVERTER). This breaker will need to be wired between the maintenance isolator box and the solar POC of that tenancy. The tenancy MAIN SWITCH (INVERTER) must be grouped with the tenancy MAIN SWITCH (NORMAL) for each tenancy.

The tenancy MAIN SWITCHES (INVERTER) must be sized above the maximum current output of the inverter.

3.4. SOLSHARE, AC ISOLATORS (GRID)

ⓘ NOTICE
Each SolShare tenancy connection must have a separate means of isolation externally and adjacent to SolShare for compliance with AS/NZS 4777.1:2024. These are typically referred to as SOLSHARE, AC ISOLATORS (GRID).

SOLSHARE, AC ISOLATORS (GRID) are typically installed in a maintenance isolator box directly below SolShare (observing minimum clearances) for optimal cable entry into SolShare. Other terminations and switches, such as INVERTER ISOLATOR may also be included in maintenance isolator box.

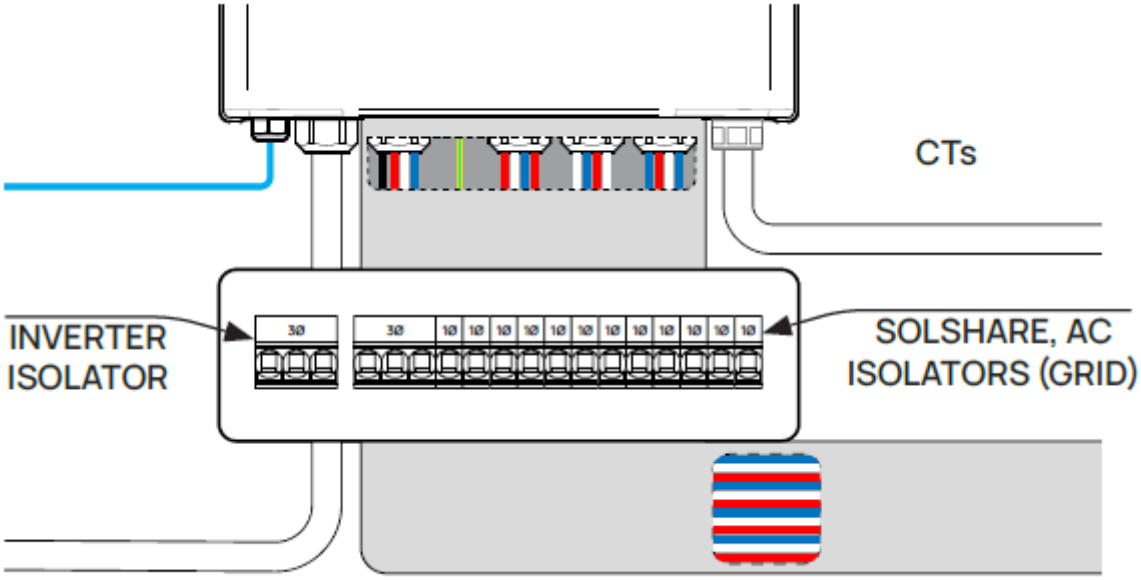


Figure 3: An example maintenance isolator box

ⓘ TIP
If you have experience with SolShare 1, please note that SolShare 2 does not require external contactors as airgap isolation is now contained within SolShare 2.

4. Interface protection

As with other solar installations more generally, interface protection may be required in installations involving an inverter power sharing device (IPSD), such as SolShare, based on rules and guidance set out by the relevant DNSP, Australian/New Zealand Standards or other regulations. In some jurisdictions, solar installations with SolShare that have more than 30kVA of inverter output capacity per site may require interface protection. In others, interface protection is required if a site has a total of more than 200kVA inverter output capacity. Check your local DNSP's requirements for applicability to your project.

ⓘ TIP
Allume's DNSP interconnection guide provides guidance around the total site kVA requirements for interface protection for sites with SolShare for individual DNSPs.

4.1. Australia (not including South Australia)

When installing interface protection with one or more SolShares, an interface/network protection contactor should be placed between the inverter and each SolShare. An interface/network protection relay is included to monitor the incoming supply and control the network protection contactor/s. To save cost, a single interface/network protection relay can be used to control multiple contactors, forming a multichannel interface protection system. Multichannel interface protection can be used in installations with more than one SolShare. The contactor and network protection relay do not need to be co-located.

An example SLD showing an installation with interface protection is available at the end of this document.

4.2. Within South Australia Power Networks (SAPN)

For installations where network protection is required in South Australia, SAPN may require the use of certified interface protection (as opposed to the certification being required on the network/interface protection relay only). This typically makes it more challenging to install distributed multi-channel interface protection like the one described in the section above. Allume recommends reaching out to an interface protection manufacturer (such as CleanTech Controls or Greenwood) for information on certified multi-channel interface protection suitable for use in South Australia.

The Office of the Technical Regulator (OTR) has also provided an exemption to protection requirements in certain conditions, namely, for multi-tenant buildings with multiple NMIs where the total inverter nameplate does not exceed 200kVA and each NMI is associated with at most 30kVA of inverter capacity.

5. Metering

5.1. 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.

5.2. SolShare current transformers (CTs)

Each SolShare is supplied with 15 x 120A CTs, with each CT having the following characteristics:

- Dimensions (outer): 46 x 60 x 19mm.
- Internal hole diameter: 15mm (designed to clip over cable gauges of 25mm² or smaller).
- Maximum CT cable length (10m supplied CT cable + extension): 100m.

Each CT corresponds to one SolShare tenancy connection and should be located to measure grid import/export for that connection's tenancy (CTs typically clipped between the tenancy's meter and its tenancy MAIN SWITCH (NORMAL)). Indicative CT placement is shown in the SLDs at the end of this document.

Each CT is supplied with 10m of CT cable attached. If CT cables need to be extended for an installation, shielded, twisted pair, 0.25mm² (or larger) cabling must be used to extend the lengths, with a splicing connector or similar. The shielding must be grounded at SolShare.

ⓘ TIP
More information about how to extend CT cables is available in Section 8.3 of the Installation manual.

5.3. 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 National Metering Identifier (NMI)).

ⓘ NOTICE
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, typically measuring around the building's incomer**.

6. Internet connection

SolShare must be connected to the internet for commissioning and ongoing operation. SolShare supports two methods of internet communications:

- Recommended: Ethernet (wired)
- Wi-Fi (2.4GHz only)

ⓘ TIP
More information is available in the SolShare internet guide.

7. Labelling

A label kit is provided with each SolShare. This label kit contains those labels specific to SolShare. Other labels for other parts of the solar system must be provided by the installer.

ⓘ TIP
More information is available in the SolShare labelling advice document.

8. Custom solar allocations

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. Solar is shared between tenants connected to the same phase outputs of a SolShare (no sharing is done between phases).

Custom solar allocation is the most popular way of sharing solar among multiple tenancies. If you are planning to use the custom allocation sharing mode for a SolShare installation, you can use the Custom allocation calculator to find the best way of implementing the allocation percentages the building intends to use. This calculator takes into account the important phase assignments of each tenancy or connection, and also provides some tips on how to better achieve the intended percentage allocations.

ⓘ TIP
Confirming the intended actual solar allocations per tenancy with the building's owners can be key to ongoing project success. Ensure this is done PRIOR to installation work commencing, as changing allocations can sometimes result in significant design or installation configuration changes.

9. Multiple SolShares in a system

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 SolShares in proportion to the respective PV generation connected to each SolShare, and the solar allocation that each tenant should receive.

An example SLD containing multiple SolShares is available at the end of this document. For more information about providing interface protection for larger solar systems, see Section 4.

10. DNSPs

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

ⓘ TIP
In-depth instructions on how to apply for interconnection with the various Australian DNSPs is available in the DNSP interconnection guide.

11. 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 connections, which solar sharing mode to choose and whether to connect the common light and power to SolShare.

ⓘ TIP
Download the Pre-installation checklist for information on what needs handing over to installation teams prior to starting work onsite.

12. Design checklist

12.1. Key design considerations

All solar system installations with SolShare must:

- ☐ Comply with all relevant regulations and standards
- ☐ Connect each SolShare to a dedicated three-phase inverter/s with a total maximum output current of 50.9A per phase
- ☐ Connect to each SolShare's tenancy connections (can be a mix of single- and three-phase connections):
    - ☐ at most 5 connections on L1 (red) phase
    - ☐ at most 5 connections on L2 (white) phase
    - ☐ at most 5 connections on L3 (blue) phase
- ☐ Size SolShare output cables to carry the maximum output current per phase of the connected inverter/s, as at any one point in time, SolShare may direct all current to one tenancy on each phase
- ☐ Match the phase of each tenancy's solar supply to the phase of that tenancy's grid connection
- ☐ Locate the solar point of connection (POC) for each tenancy on the load side of that tenancy's MAIN SWITCH (NORMAL)
- ☐ Utilise a tenancy MAIN SWITCH (INVERTER) for each tenancy with a solar connection
- ☐ Provide a single connection to neutral for each SolShare
- ☐ Provide a single connection to earth for each SolShare
- ☐ Utilise one SolShare CT per tenancy connection (CTs provided with SolShare) to measure grid import/export for that tenancy (clipped on the grid side of the tenancy's MAIN SWITCH (NORMAL))

Where applicable, SolShare systems must also:

- ☐ Utilise interface protection (required at sites with total inverter output over 30kVA or over 200kVA – check your local DNSP's guidance)
- ☐ Locate emergency backstop-compliant metering solutions to measure the grid connection of the entire site (in locations that require emergency backstop)
- ☐ Locate battery CTs such that they most effectively measure the loads connected to that battery
- ☐ Size generation and allocate tenancies to SolShare tenancy connections such that any target allocations of solar generation can most effectively be achieved (where specific tenancy solar allocations are required)

12.2. Installation considerations

- ☐ All solar system installations with SolShare must:
- ☐ Adhere to SolShare's site requirements and minimum clearances (see SolShare Installation Manual)
- ☐ Provide a strong and stable internet connection for each SolShare
- ☐ Utilise suitable glands or other seals at cable entry to maintain SolShare's IP65 rating

13. Example SLDs

13.1. Appendix A: Example SLD for single SolShare

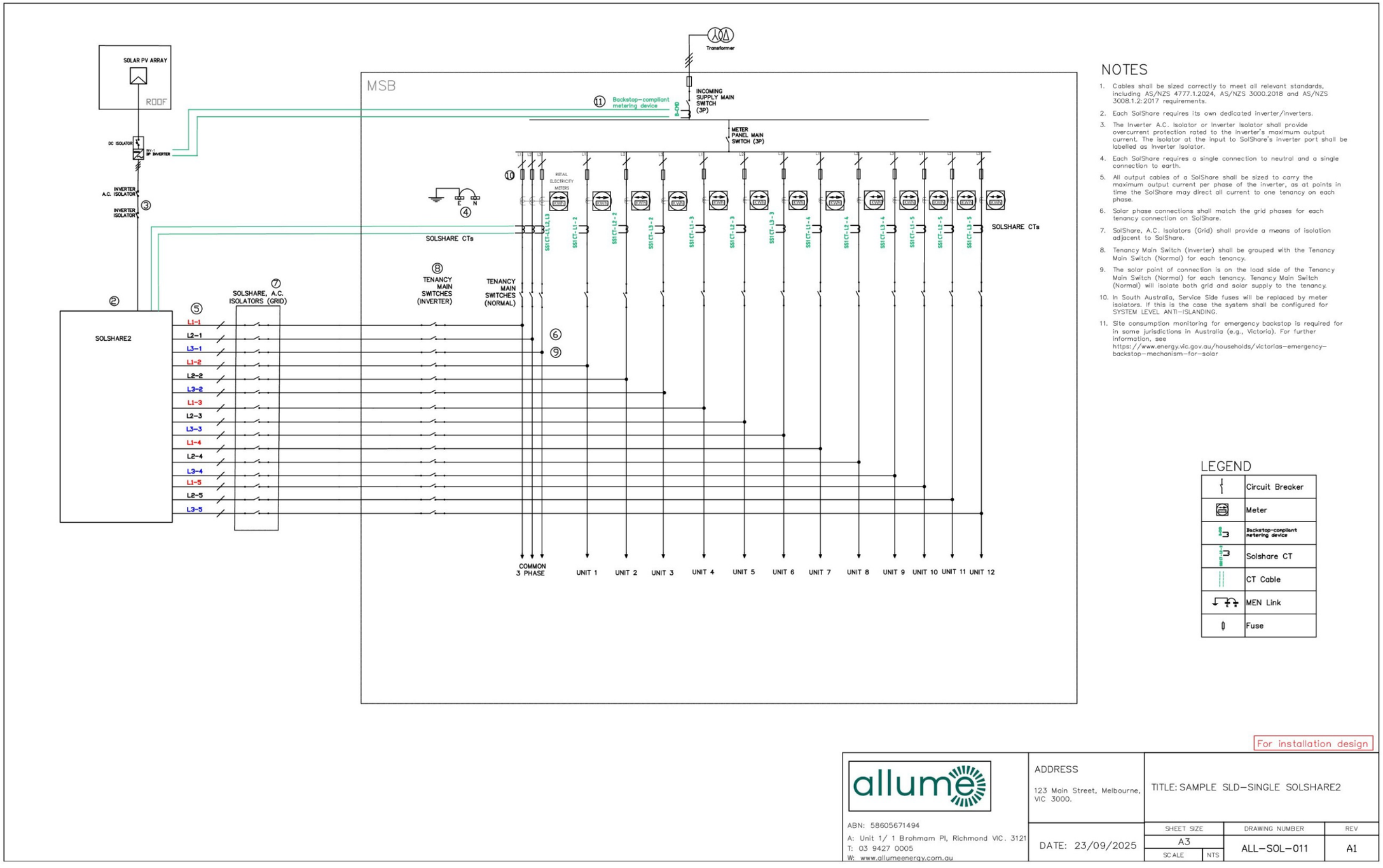
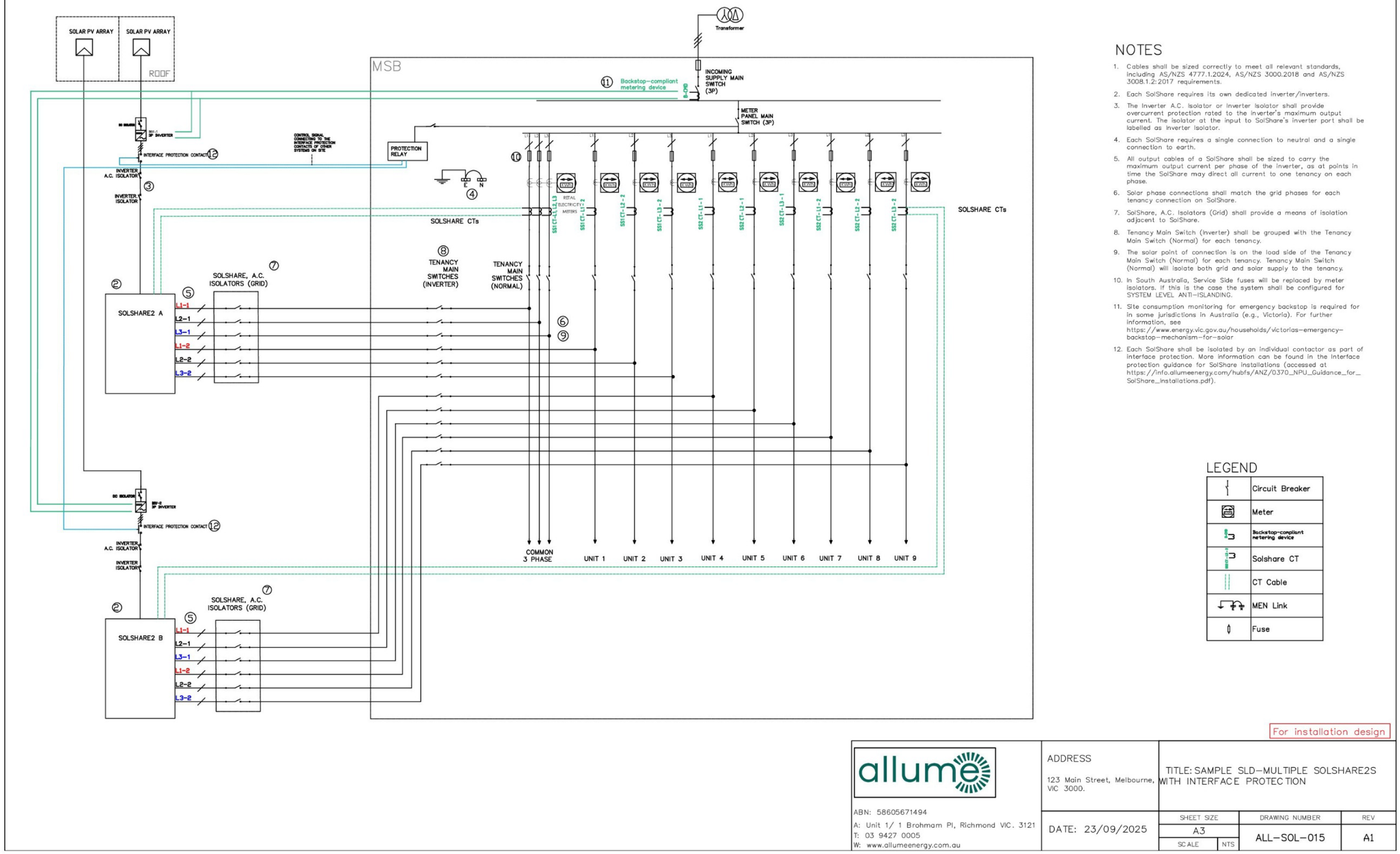


Figure 4: Three-phase common light and power connection + 12 single-phase tenancies

13.2. Appendix B: Example SLD for interface protection with two SolShares



NOTES

1. 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.
2. Each SolShare requires its own dedicated inverter/inverters.
3. The Inverter A.C. Isolator or Inverter Isolator shall provide overcurrent protection rated to the inverter's maximum output current. The isolator at the input to SolShare's inverter port shall be labelled as Inverter Isolator.
4. Each SolShare requires a single connection to neutral and a single connection to earth.
5. 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.
6. Solar phase connections shall match the grid phases for each tenancy connection on SolShare.
7. SolShare, A.C. Isolators (Grid) shall provide a means of isolation adjacent to SolShare.
8. Tenancy Main Switch (Inverter) shall be grouped with the Tenancy Main Switch (Normal) for each tenancy.
9. The solar point of connection is on the load side of the Tenancy Main Switch (Normal) for each tenancy. Tenancy Main Switch (Normal) will isolate both grid and solar supply to the tenancy.
10. 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.
11. Site consumption monitoring for emergency backstop is required for in some jurisdictions in Australia (e.g., Victoria). For further information, see https://www.energy.vic.gov.au/households/victorias-emergency-backstop-mechanism-for-solar
12. Each SolShare shall be isolated by an individual contactor as part of interface protection. More information can be found in the Interface protection guidance for SolShare installations (accessed at https://info.allumeenergy.com/hubfs/ANZ/0370_NPU_Guidance_for_SolShare_Installations.pdf).

LEGEND

	Circuit Breaker
	Meter
	Backstop-compliant metering device
	Solshare CT
	CT Cable
	MEN Link
	Fuse

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-MULTIPLE SOLSHARE2S WITH INTERFACE PROTECTION

DATE: 23/09/2025

SHEET SIZE		DRAWING NUMBER	REV
A3		ALL-SOL-015	A1
SCALE	NTS		

Figure 5: Three-phase common light and power connection + 9 single-phase tenancies