Installing SolShare with Three-Phase Tenancies
Version B.2

DISCLAIMER

This document is intended to provide guidance on how to design a safe and effective shared solar system with SolShare in buildings with three-phase tenancies. This document does not override the local electrical safety standards and wiring rules. It is the responsibility of the installer to ensure the installation meets the relevant electrical safety and wiring standards.

BACKGROUND

Most tenancies, especially residential tenancies, in multi-tenant buildings in Australia are single-phase. However, some buildings may have three-phase tenancies instead, and many buildings have a three-phase common area meter. When installing a shared solar system with SolShare in these buildings, there are a number of options available to the system designer to connect these tenancies to solar.

OPTION 1: CONNECT ALL THREE PHASES TO SOLSHARE

Where a building has three-phase tenancies, you may opt to connect all three of these phases to SolShare. This may be advantageous for commercial buildings or those residential buildings where tenancies have high solar requirements. In doing so, you will be using three of the 15 available output connections on a SolShare.
As such, a **maximum of 5 x three-phase tenancies can be connected to each SolShare when all three phases are connected to that SolShare**.

OPTION 2: CONNECT ONE OF THREE PHASES TO SOLSHARE

There are occasions, often for residential apartment buildings, when connecting all three phases of a three-phase tenancy to SolShare may be unnecessary and without major downsides. This is because in Australia:

- Three-phase apartments will typically have a dominant phase that powers all the single-phase appliances and outlets, with the other two phases only used to power any three-phase appliances (typically these might include an instantaneous hot water system, air-conditioning unit, etc.).

- Net metering is applied to three-phase tenancy meters. Net metering is the term used when a three-phase meter is charged or paid for electricity only on the sum of current activity on all its three phases, rather than what is occurring on individual phases. Therefore, even if solar is only connected to one phase, and an excess of solar is exported on that one phase, then *financially*, this means that the tenant is no worse off than having had the solar feed all three phases. An example with multiple scenarios is provided in the last section of this document.

As such, the SolShare can be connected to up to 15 x three-phase tenancies when each tenancy has a single-phase connection (typically the dominant phase) to solar.

This also significantly reduces the number of SolShares required for a multi-tenant building compared to Option 1.

It is important to note that phase allocations still apply – each SolShare can supply solar to up to 5 tenancies with a red (or L1) phase solar connection, up to 5 tenancies with a white (or L2) phase connection, and up to 5 tenancies with a blue (or L3) phase connection.

An example SLD of this set-up is shown below:
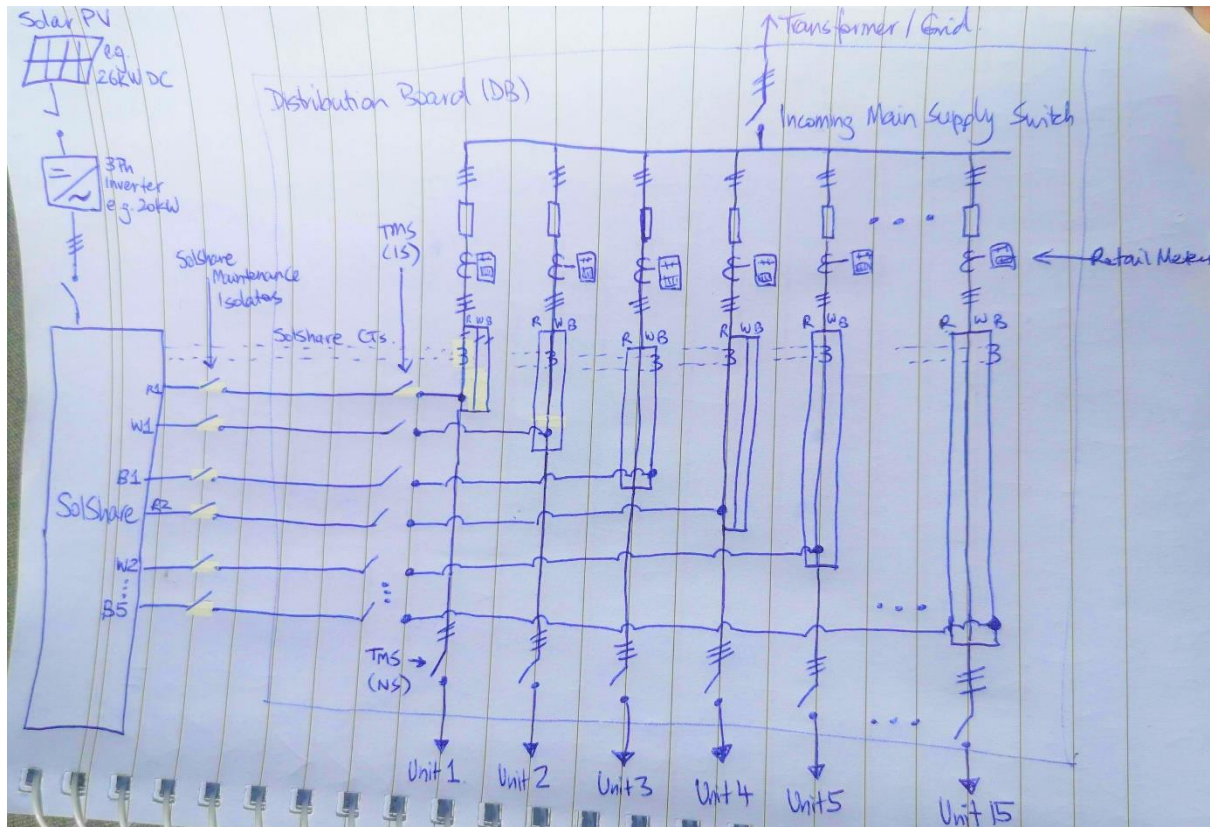
OPTION 3: COMBINATION OF OPTION 1 AND OPTION 2

The SolShare is flexible around the combination of single- and three-phase tenancies connected to the SolShare outputs. Should there be three-phase tenancies with differing solar needs, you can opt to connect a combination of connections.

For example, one SolShare may use 14 of its 15 output connections with:

- 6 connections (all three phases connected for 2 x three-phase tenancies), and
- 5 connections (only the single dominant phase for 5 x three-phase tenancies), and
- 3 connections (3 x single-phase tenancies)

SOLCENTRE MONITORING PORTAL CONSIDERATIONS

Please note that for any SolShares that are supplying solar to only one phase of a three-phase tenancy (Options 2 or 3 above), the SolShare CT will only be measuring the current on that phase that is connected to solar. These SolShare CTs are also used to provide the data for the energy demand of the tenancy loads in Allume's SolCentre Monitoring Portal.

As such, please note that the energy demand of the tenancy load shown in the SolCentre Monitoring Portal will only reflect the demand on that phase connected to solar, rather than the sum of the demand on all three phases. Therefore, the total tenancy load's energy demand will likely not correspond to other sources, such as that tenancy's electricity bill.

Where a three-phase tenancy has all phases connected to solar (Option 1 above), the SolShare CTs will be measuring the current on all three phases, and therefore, the SolCentre Monitoring Portal will accurately reflect the energy demand of the tenancy.

EXAMPLE OF NET METERING ON THREE-PHASE TENANCY

Below are several scenarios of snapshots in time of an apartment with L1 phase as the dominant phase (all single-phase appliances connected to L1 phase, and three-phase loads connected as well). L2 and L3 phases only carry the load for three-phase appliances like instantaneous hot water and air conditioning. Solar is connected to L1 phase via SolShare.

Scenario #1
Some single-phase appliances are on. All three-phase appliances off. Solar supply.

Phase	Load consumption (kW)	Solar supply (kW)	Grid import (+ve) / export (-ve) (kW)
L1	1	1.5	-0.5
L2	0	N/A	0
L3	0	N/A	0
Total	1	1.5	-0.5
Result	Tenant is exporting net of 0.5kW to the grid (and paid feed-in-tariff for this)		

Scenario #2
Some single-phase appliances are on. Three-phase appliances are on. Solar supply.

Phase	Load consumption (kW)	Solar supply (kW)	Grid import (+ve) / export (-ve) (kW)
L1	1	1.5	-0.5
L2	0.5	N/A	0.5
L3	0.5	N/A	0.5
Total	2	1.5	0.5
Result	Tenant is importing net of 0.5kW from the grid (and pays grid electricity rates)		

Scenario #3
Some single-phase appliances are on. Three-phase appliances are on. Low solar supply.

Phase	Load consumption (kW)	Solar supply (kW)	Grid import (+ve) / export (-ve) (kW)
L1	1	0.5	0.5
L2	0.5	N/A	0.5
L3	0.5	N/A	0.5
Total	2	0.5	1.5
Result	Tenant is importing net of 1.5kW from the grid (and pays grid electricity rates)		