

# SolShare Design and Installation Guide

## UK

Version E2 for SOLSHARE-3P-35A-03  
 Referred to in the document as 'SolShare'

### 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 the 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.

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## A. POWER INPUT

The SolShare power input is three-phase. The supply should come from a three-phase, grid-tied inverter. Input supplies outside of this have not been tested or approved for use with SolShare.

The SolShare 35 is rated to 35 amps per phase. The total input (including from the inverter and any AC-coupled batteries) must not exceed the maximum current rating of the SolShare. Please refer to '[N: BATTERY INTEGRATION](#)' for more information on batteries.

Typically, the input of a SolShare will be connected to the output of a three-phase inverter. However, as long as the total input per SolShare does not exceed 35 amps per phase, other options include 3 x single-phase inverters, or the gateway of multiple string inverters.

Please consult Allume's '[SolShare35\\_Datasheet](#)' for further technical details.

## B. INSTALLATION LOCATION

There must be a 500 mm clearance both above and below the SolShare enclosure, and 150 mm either side. If not, the SolShare cannot be accessed for service and maintenance. Please consult Allume's '[SolShare35\\_Datasheet](#)' and '[SolShare\\_Installation\\_Manual\\_UK](#)' for further details on dimensions and clearances.

The SolShare has been tested and certified for IP56, qualifying it for installation in an outdoor, unconditioned environment. However, it should not be installed in direct sunlight or in the path of falling debris, such as under a tree, unless protected by a shade or canopy.

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 solar point of supply as possible.

## C. OUTPUT CONNECTIONS – PHASE MATCHING

A SolShare unit has 15 single-phase outputs: 5 on L1; 5 on L2; and 5 on L3.

Each flat **must** be on the same phase as the SolShare output phase. For example, if a flat is on L2 phase, it must connect to an L2 output from the SolShare.

There must be at least one connection made to each of **L1-1**, **L2-1**, and **L3-1**. It is highly recommended to have at least 2 connections per phase.

Three single-phase outputs can be combined to connect to a three-phase unit. The most common example of this is if the three-phase Landlord supply is also being connected to the SolShare.

Not all of the 15 outputs need to be used.

Example configurations:

- 11 single-phase connections. 4 connections not used.
- 4 single-phase & 2 three-phase connections. 5 connections not used.
- 4 three-phase connections. 3 connections not used.

## D. DNO J TYPE FUSE

The J type fuse located within the heavy duty cut out **must** be no lower than 250A. If it is, the SolShare **cannot be installed**. The size of this fuse must be noted and detailed on the G98/99.

## E. SOLAR POINT OF SUPPLY (POS)

The SolShare outputs should be connected directly downstream from the flat's *Meter Isolator* and upstream from the *Apartment Main Switch*.

Where possible, it is recommended that a three-pole breaker be used to combine the *Meter Isolator* and *Tenancy Main Switch (Inverter Supply)*. Where not possible, the *Tenancy Main Switch (Inverter Supply)* should be located next to the *Meter Isolator* and have labelling to state that there are multiple supplies.

Please refer to 'G: SWITCHGEAR' and 'O: EXAMPLE SLD' for more information on recommended system design.

## F. NEUTRAL AND EARTH CONNECTION

### F.1. EARTH

INPUT: An earth cable must connect the inverter's earth output to the SolShare's earth bar.

OUTPUT: An earth cable must connect the SolShare earth bar to a common earthing terminal within the building.

### F.2. NEUTRAL

INPUT: The neutral from the inverter should be connected to the SolShare's input neutral terminal.

OUTPUT: Only **one neutral** is connected to the SolShare output. The neutral cable must connect from the SolShare's output neutral terminal to the main neutral terminal at the building's multi service distribution board. It should not be connected to an individual flat's neutral.

If there are multiple multi service distribution boards, a SolShare's outputs should only be connected to flats that are connected to the same multi service distribution board.

If the building does not have a multi service distribution board, it is highly likely that the SolShare **cannot be installed**. Please contact Allume if you believe this to be the case.

## G. METERING

### G.1. RETAIL ELECTRICITY METERS

Each flat must be fitted with a bi-directional capable meter.

### G.2. SOLSHARE CT METERING

15 current transformers (CTs) are supplied with each SolShare, one corresponding to each output connection. These CTs must be clipped on the incoming supply to each participating unit, between their meter and the POS of the solar. Please consult Allume's '[SolShare\\_Installation\\_Manual\\_UK](#)' and '[O: EXAMPLE SLD](#)' for further detail.

The standard CTs are rated at 120 A and supplied with 10 m tails, which must wire back to the SolShare's CT terminals. The tails on the CTs can be extend with 24 AWG gauge cable up to a total length of 100 meters.

## H. SWITCHGEAR

Please refer to 'O: [EXAMPLE SLD](#)' the end of this document for context on switchgear placement.

### H.1. INVERTER AC ISOLATOR

As with a traditional solar system, each SolShare solar system must have a single point of isolation. This should be labelled the *Inverter AC Isolator*. The SolShare's input will be fed from the *Inverter AC Isolator*.

### H.2. SOLSHARE MAINTENANCE CIRCUIT BREAKERS (GRID)

A *SolShare Maintenance Circuit Breaker* should be installed for each output between the SolShare output and the *Tenancy Main Switch (Inverter Supply)*. The *SolShare Maintenance Circuit Breaker* should be located directly underneath or in close proximity to the SolShare.

The *SolShare Maintenance Circuit Breakers* should be rated appropriately for the maximum current of the solar system as at points in time the SolShare may direct all current to one unit on each phase.

Single-phase connections should use a single-pole *SolShare Maintenance Circuit Breaker*. Three-phase connections should use a three-pole *SolShare Maintenance Circuit Breaker*.

Only once all these isolators are open, along with the *Inverter Supply Main Switch*, will the SolShare be isolated.

### H.3. METER ISOLATORS

Each flat must have a *Meter Isolator* downstream from the meter. The *solar point of supply* for each flat should be downstream from the *Meter Isolator* and upstream from the *Apartment Main Switch* that's contained within the consumer unit.

Where possible, it is recommended that a three-pole breaker be used to combine the *Meter Isolator* and *Tenancy Main Switch (Inverter Supply)*. Where not possible, the *Tenancy Main Switch (Inverter Supply)* should be located next to the *Meter Isolator* and have labelling to state that there are multiple supplies. Please consult Allume's '[0415\\_Allume\\_SolShare\\_Labelling\\_Advice\\_UK](#)' document for more information on labelling.

### H.4. TENANCY MAIN SWITCHES (INVERTER SUPPLY)

Each connected unit requires its own *Tenancy Main Switch (Inverter Supply)*. This will need to be wired between the *SolShare Maintenance Circuit Breaker* and the *solar point of supply* of that unit.

Where possible, it is recommended that a three-pole breaker be used to combine the *Meter Isolator* and *Tenancy Main Switch (Inverter Supply)*. Where not possible, the *Tenancy Main Switch (Inverter Supply)* should be located next to the *Meter Isolator* and have labelling to state that there are multiple supplies. Please consult Allume's '[0415\\_Allume\\_SolShare\\_Labelling\\_Advice\\_UK](#)' document for more information on labelling.

When combining the *Tenancy Main Switch (Inverter Supply)* with the *Meter Isolator*, the rating should be determined by the grid supply.

### H.5. APARTMENT MAIN SWITCHES

Each flat must have a *Main Switch* located within its consumer unit within the flat.

## I. CABLING

The thermal capacity of all cabling must be designed to ensure that the DNO fuse acts within 5 seconds if there is a fault.

### I.1. SOLSHARE OUTPUT → SOLSHARE MAINTENANCE CIRCUIT BREAKER

All cables from the *SolShare* to the *SolShare Maintenance Circuit Breakers* must be the **same thermal capacity** as the input cabling between the *inverter* and the *SolShare input*. This is because at points in time the *SolShare* may direct all current to one unit on each phase.

The thermal capacity of the AC output cable of the inverter should be sized in the same way as is done for a standard solar installation, considering max current, length, temperature, cable specifications, cable spacing etc. This cable will form the input to the *SolShare*.

### I.2. SOLSHARE MAINTENANCE CIRCUIT BREAKER → SOLAR POINT OF SUPPLY

The thermal capacity of the cables from the *SolShare Maintenance Circuit Breaker* to the *Solar Point of Supply* **must** maintain the appropriate Earth Fault Loop impedance to allow for a <5 second disconnect time of the DNO fuse during a fault scenario at the *SolShare* output.

It **must not** be determined by the solar PV.

Please contact Allume and/or refer to Wiring Regulations (BS 7671) if unsure on how to appropriately calculate this.

If the cable gauge is deemed too large to be practical, additional circuit breakers can be installed before the solar point of connection. Please contact Allume for more information on this.

### I.3. CT CABLING

The *SolShare* has a CTs for each connection. These must run from the *SolShare* to each of the *solar point of supply* (POS). The CTs are provided with 10-meter cable lengths and can be extended by up to 100 meter total via 24 AWG gauge cable.

Each CT tail comes with an identifier printed on the cable (e.g. L1-1) for ease of installation. It is highly recommended that any CT extension is clearly labelled with the flat number as the CTs must be connected into the *SolShare* correctly. If not, the *SolShare* **will not** be able to be commissioned.

## J. POWER DISTRIBUTION PER PHASE

A three-phase inverter splits the generated power across its three phases. For example, a 15 kW three-phase inverter will supply 5kW of power on each phase. The *SolShare* distributes the power on each phase separately, with up to: 5 outputs on L1, 5 outputs on L2, and 5 outputs on L3.

The available power generated on a phase can only be shared between flats on that phase. This should be considered when designing the system.

See section '[H: SOLAR ALLOCATION – SAP/EPC CONTRIBUTION](#)' for more information on this.

## K. 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 should be provided by the installer. Please consult Allume's '0415\_Allume\_SolShare\_Labelling\_Advice\_UK' document for more information on labelling.

## L. SOLAR ALLOCATION & SAP / EPC CONTRIBUTION

When commissioning the SolShare, you must allocate the proportion of the solar system that is to be associated to each connection. You can adjust this to suit the customer's needs. For example, the customer may want more solar apportioned to a three-bed over a one. Alternatively, they may want to allocate more solar to a flat that needs a larger increase in its SAP score to achieve a specific EPC rating. It's useful to know this information when designing a system for a project, as it will help to determine the optimal system size.

You must take into consideration that power can only be apportioned within a phase. See section '[J: POWER DELIVERY PER PHASE](#)' for more information on this.

### Example

Here's an example of a 20 kWp system connected to 11 single-phase flats and a three-phase Landlord supply. The kWp in the last column is what each connection will have associated to it for the SAP assessment.

Note that there are only 4 connections on L2 so they are able to have a higher solar allocation.

Total system size (kWp)	Phase	System size per phase (kWp)	Connections	Connection allocation	kWp associated to the connection
20.00	L1	6.67	Landlord supply	20%	1.33
			Flat 1	20%	1.33
			Flat 4	20%	1.33
			Flat 7	20%	1.33
			Flat 10	20%	1.33
	L2	6.67	Landlord supply	25%	1.67
			Flat 2	25%	1.67
			Flat 5	25%	1.67
			Flat 8	25%	1.67
			No connection	0%	0.00
	L3	6.67	Landlord supply	20%	1.33
			Flat 3	30%	2.00
			Flat 6	25%	1.67
			Flat 9	15%	1.00
			Flat 11	10%	0.67

To take some examples for the SAP assessment:

- **Flat 1** will have a **1.33 kWp** system associated to it
- **Flat 3** will have a **1.33 kWp** system associated to it
- **Flat 9** will have a **1.33 kWp** system associated to it
- The three-phase **Landlord supply** will have a **4.33 kWp** system associated to it

## M. MORE THAN 15 CONNECTIONS / MULTIPLE SOLSHARES

When designing a system that requires more than 15 connections, multiple SolShares can be used.

Each SolShare system will be completely separate and require its own set of panels and inverter.

It is possible to connect multiple inverters to one SolShare, as long as the input capacity does not exceed 35A per phase.

Do not connect more than 1 SolShare to 1 inverter as this may cause overloading.

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

If there are multiple multi service distribution boards within the building, a SolShare must only connect to flats that are connected to the same multi service distribution board as the SolShare's neutral.

## N. WI-FI ACCESS POINT

A Wi-Fi internet network must be made available at the SolShare's installation location.

The SolShare cannot be commissioned nor provide ongoing data monitoring and fault notification without an internet connection. The SolShare does not support a wired internet connection.

### Wi-Fi Router Requirements

- Frequency = 2.4GHz (the SolShare is **not compatible** with 5GHz)
- Data Usage = 250MB/month
- Permanent and stable internet connection

Allume recommend using a wireless cellular router with a fixed IP SIM card.

## O. BATTERY INTEGRATION

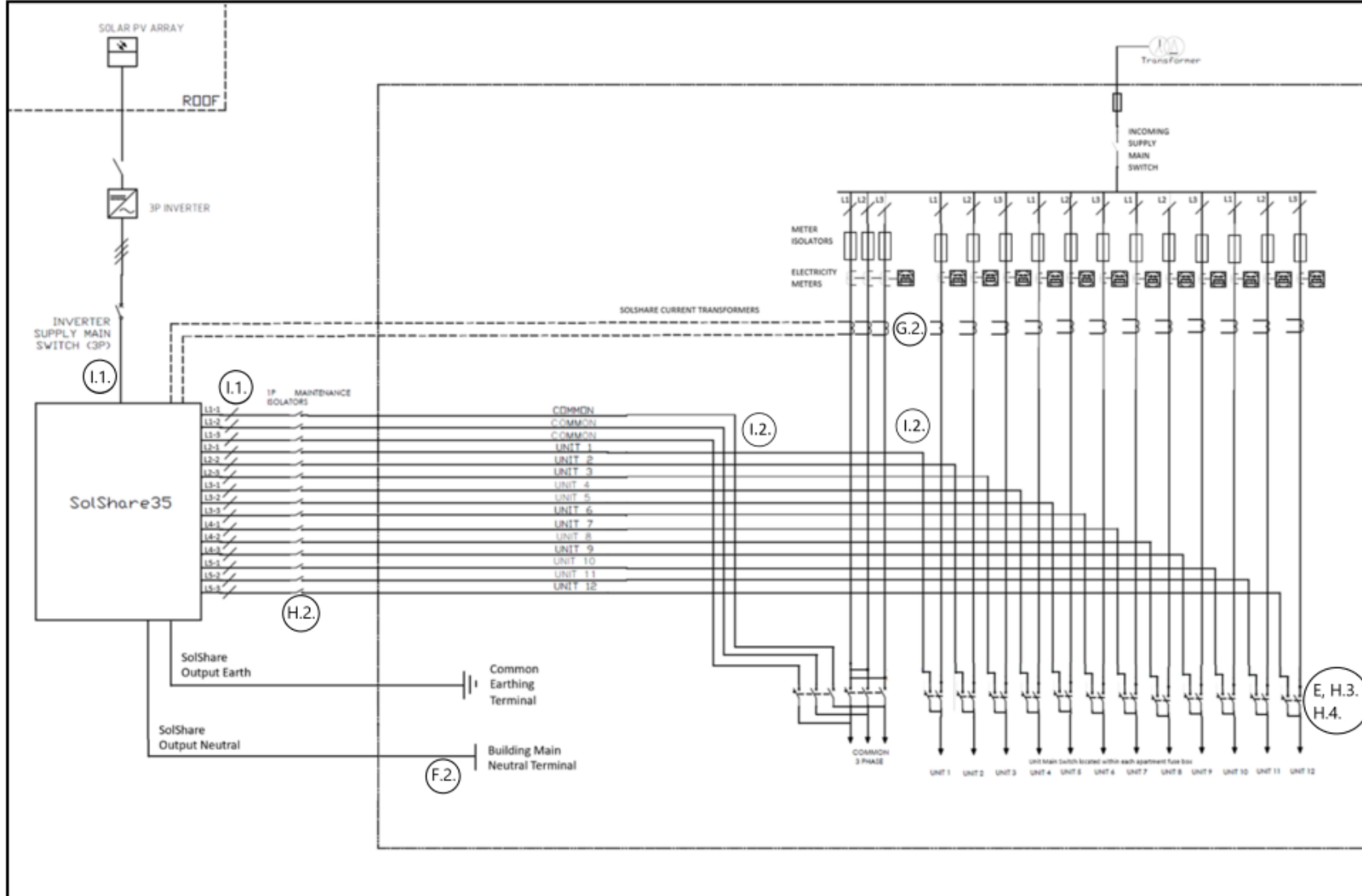
SolShare systems can include batteries. Allume recommend communal DC coupled batteries. However, communal AC and individual AC batteries are also possible.

Please contact Allume for more information on battery integration.

## P. EXAMPLE SLD

The template SLD included on the following page shows a typical SolShare installation that is connected to 12 single-phase apartments and one three-phase landlord power.

This must be altered to suit each installation. Notes are included in the SLD to annotate key considerations of your design.



Document & SLD Reference	Note
C	Each flat must be on the same phase as the SolShare output phase. For example, if a flat is on L2 phase, it must connect to an L2 output from the SolShare.
F.2.	The SolShare output neutral must connect to the main neutral terminal at the building's multi service distribution board.
G.2.	The SolShare's CTs must be clipped on the incoming supply to each participating unit, between their meter and the POS of the solar.
E, H.3. H.4.	Where possible, it is recommended that a 3-pole breaker be used to combine the <i>Meter Isolator</i> and <i>Tenancy Main Switch (Inverter Supply)</i> . Where not possible, the <i>Tenancy Main Switch (Inverter Supply)</i> should be located next to the <i>Meter Isolator</i> and have labelling to state that there are multiple supplies.
H.2.	A <i>SolShare Maintenance Circuit Breaker</i> should be installed for each output between the SolShare output and the <i>Tenancy Main Switch (Inverter Supply)</i> .
I.1.	All cables from the SolShare to the <i>SolShare Maintenance Circuit Breakers</i> must be the same gauge as the cable between the <i>inverter</i> and the <i>SolShare input</i> .
I.2.	The cable gauge from the <i>SolShare Maintenance Circuit Breaker</i> to the <i>Solar Point of Supply</i> must be rated appropriately for the grid supply.

  
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