

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.

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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/uk/resource-library-uk/>.

TIP

If you have any further questions, contact the Allume support team by phone on +44 20 8156 2818 or by email at uk.support@allumeenergy.com.

1. Installation location and clearances

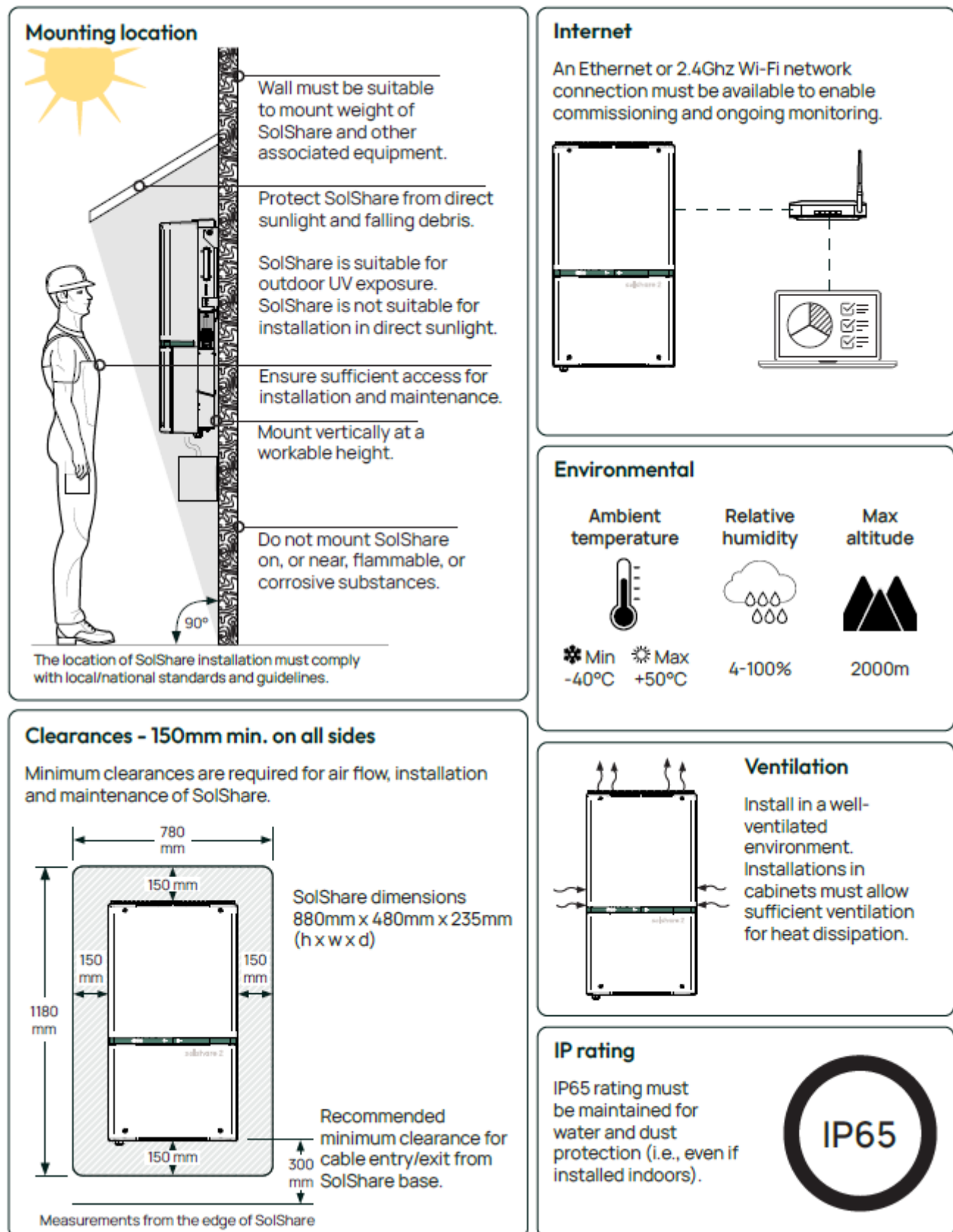


Figure 1: SolShare location requirements



① TIP

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 solar point of connection as possible.

① TIP

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

① 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.

① TIP

More information is available in the [Installation manual](#).



2. Inverter to SolShare

2.1. Power input from inverter

① NOTICE

The input to each SolShare is three-phase AC power from a dedicated inverter/s. The total input (including from the inverter and any batteries) 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 30kVA 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.

Connections from the inverter should be terminated into INVERTER L1, L2, L3, N and earth.

① TIP

More information is available in the [Installation manual](#).

2.2. Inverter's grid connection

The inverter receives its grid connection via SolShare. It does not need an independent connection to the grid, nor does it need to be connected to the Landlord supply.

2.3. Inverter AC isolator

The AC isolator (the single point of isolation for the entire solar system) should be located between the inverter and the SolShare. The location of this should be detailed in the site pack for safety of isolation.



2.4. Cabling

As with all cabling, cables for the inverter input to SolShare must comply with relevant regulations and standards.

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

At times, the full per-phase output of the inverter (up to 50.9A) connected to SolShare can be directed to one flat (or landlord). All cables and overcurrent protection between SolShare and solar point of connection must be rated for any relevant regulations, and for total per-phase generation capacity of inverter/s. Ensure cabling and enclosures comply with BS7671.

ⓘ 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).

ⓘ TIP

More information is available in the [Installation manual](#).

2.5. Generation meter

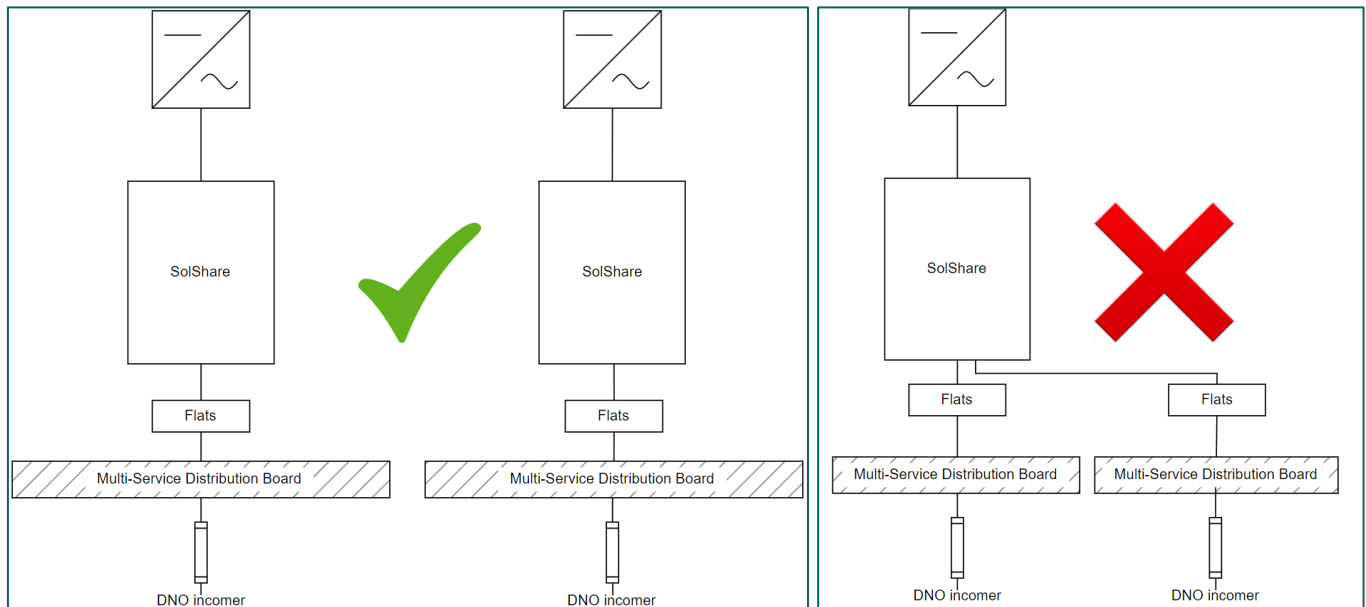
A single generation meter is needed to measure the generation of the inverter/s.

3. SolShare to flats

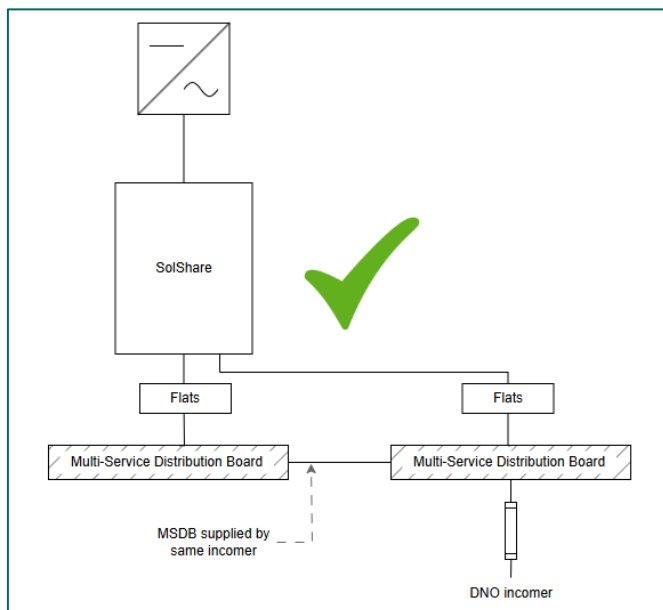
3.1. Multi-service distribution board (MSDB)

Flats that are connected to the SolShare must all be supplied from the **same** DNO electrical cut out. If there are multiple incomers, then there must be additional SolShares (at least 1 for each incomer).

Example of correct and incorrect installations:



If there are multiple MSDBs, it is recommended to pair a SolShare with each MSDB. If your design requires you to split connections over multiple MSDBs, they **MUST** be supplied from the same DNO cut out, as shown in the image below:





3.2. Earth connection

A single earth cable must connect the SolShare earth bar to a common earthing terminal within the building.

The earth cable must be rated appropriately for the inverter.

3.3. Neutral connection

SolShare only has one neutral output that must be sized to the output capacity of the inverter.

The SolShare neutral must come from the source (i.e. the MSDB or DNO cutout) that is supplying the flats that the SolShare is connected to. If gaining a dedicated neutral connection in the MSDB or DNO cutout is not possible, you can contact the DNO who will come to site to provide you with one. We recommend requesting this when submitting the G99 to reduce the likelihood of delaying project timelines.

NOTICE

SolShare requires a single connection to the building main neutral. Do not connect to any individual flat's neutral.

3.4. Live cable connections

Live conductor

The cable from the SolShare output to the flat (or landlord) must have only the live conductor connected; the neutral should remain unconnected. Because the neutral is absent, it is crucial to select an appropriate cable without ferrous armouring (eddy currents).

Max power delivery

SolShare can direct all the power generated on one phase to a single flat. This should be considered while designing cabling and switch gear for a SolShare system.

3.5. Maintenance isolator board

① NOTICE

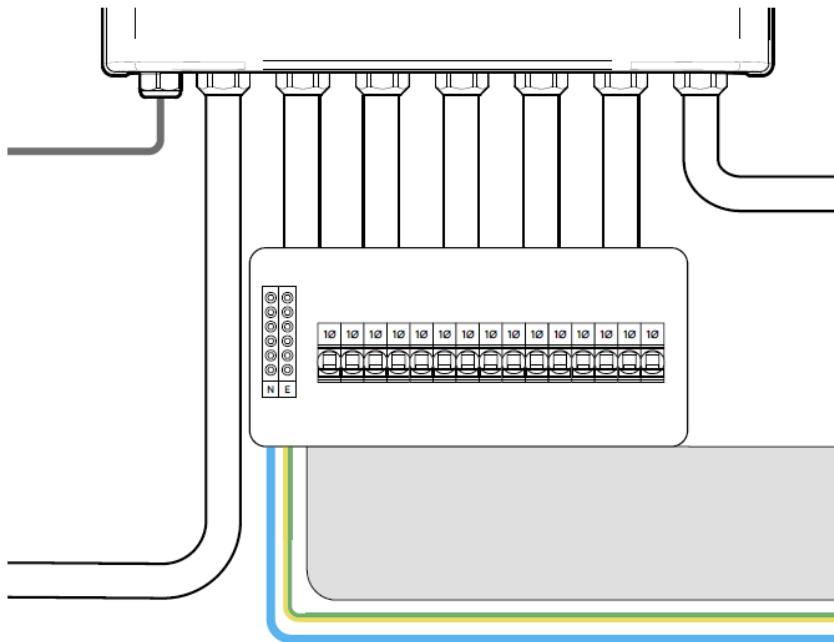
IP rating of SolShare must be maintained for dust and water protection. Suitable glands, plugs or other seals must be used at cable entry holes.

① NOTICE: SolShare maintenance isolation

Each connected SolShare output must have a dedicated MCB rated to the per-phase generation capacity of the inverter.

For safe and easy maintenance, SolShare needs dedicated isolation from each flat. It is required to install a lockable enclosure unit directly below SolShare.

The isolation in the maintenance box must be miniature circuit breakers (MCB). The MCB must be rated to carry the per-phase generation of the inverter.



① TIP

More information is available in the [Installation manual](#).

3.6. Solar point of connection

NOTICE

Ensure that the solar point of connection is on the grid side of any RCD, RCM or RCBO.

The location and connection method of the solar point of connection can depend on the location of the electricity meter. This section provides suggested methods for creating the solar point of connection; however, the designer may choose to specify a different connection method.

It is responsibility of the installer to ensure that all relevant wiring standards are met.

3.6.1. Meters in the flats (example SLD shown in Appendix)

Consumer unit connection

Two points of isolation/circuit protection are required for the consumer unit:

- A rotary isolator must be installed locally as per standard solar regulations.
- A circuit breaker must be installed for cable protection of the solar output cable.

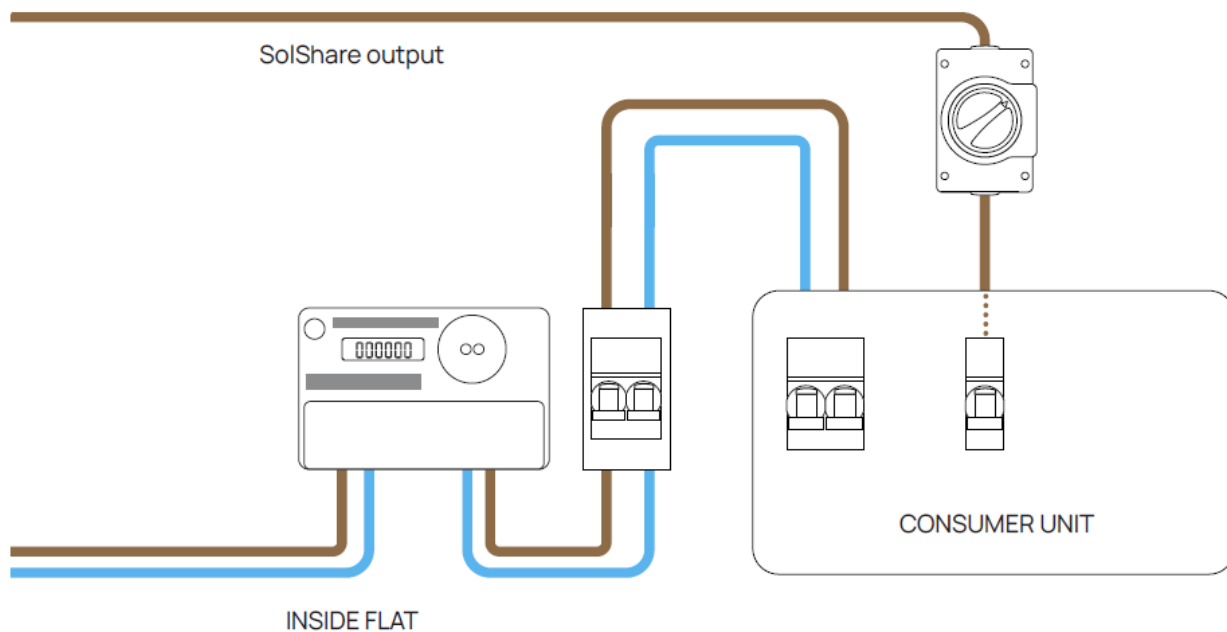
Cable sizing

Solar output cable from SolShare to the flat must be rated to carry the full inverter supply. This is because SolShare can direct all available power on one phase to a connection.

RCDs

The solar point of connection must be made on the grid side of any RCD. If installed incorrectly, the single live solar cable from SolShare will cause the RCD to operate.

Example solar point of connection: electricity meter located inside flats



3.6.2. Meters co-located or outside flats (example SLD shown in Appendix)

Fused isolator board

The solar point of connection is recommended to be made using a custom board that contains:

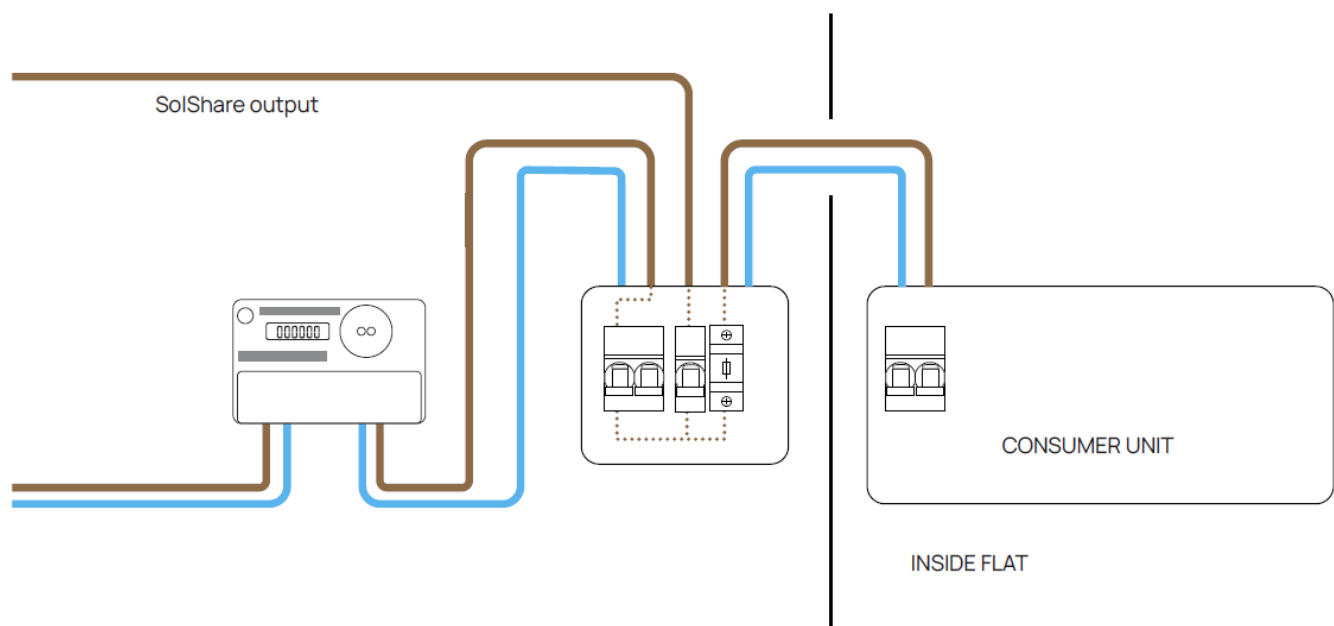
- MCB appropriately sized to protect the solar supply cable.
- A fuse located on the combined solar and grid path to protect the cable carrying dual supplies to the flat.

When isolating the flat, both MCB and main switch must be turned OFF.

Cable sizing

Solar output cable from SolShare to the flat must be rated to carry the full inverter supply. This is because SolShare can direct all available power on one phase to a connection.

Example solar point of connection: electricity meter located outside flat/meters co-located



3.7. Phase matching

Each SolShare has 15 single-phase output connections (5 output connections per phase) available. Not all 15 output connections need to be connected to flats or landlord supplies. These output 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)

① NOTICE

SolShare's output 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 flat's solar connection from SolShare matches the phase of its grid supply
- All output 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 flat on each phase.

3.8. Power distribution per phase

A three-phase inverter splits the generated power across its three phases. For example, a 30 kVA three-phase inverter will supply 10 kVA of power on each phase. SolShare distributes the power on each phase separately, with up to five outputs on L1, five outputs on L2, and five 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. The phase arrangement of the flats has an impact on the possible split of the solar generation. The table on the next page demonstrates how the number of flats on a phase affects the available solar allocation.

3.9. Minimising phase imbalance and export

A SolShare system shall be designed in accordance with G99 clause 7.5.3. To minimise the phase imbalance of export to the grid, the design should ensure that flats are distributed as evenly as practical across the phases. For example, allocating five flats to L1 and L2, but only one flat to L3 alongside a 30kVA inverter, is highly likely to cause an imbalance.

Furthermore, SolShare is designed to limit export to 32A per connection. Therefore, a 30kVA inverter with only one connection on a given phase will likely result in the 32A export limit being exceeded, causing the SolShare system to frequently halt production.

3.10. Solar allocation & SAP / EPC contribution

When designing a SolShare solar system, one of the most powerful elements is the ability to allocate a specific proportion of the system to each flat. This allows for maximum benefit from the available kWp and maximise SAP score / EPC uplift. 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. The most common purpose for this is to allocate the kWp based on the SAP score uplift requirements. It is important to know what the specific kWp requirements are when designing a system for a project, as it will help to determine the optimal system size.

Example kWp for input into SAP assessment

Here's an example of a 22.5 kWp system connected to 11 single-phase flats and a three-phase landlord supply. The kWp in the last column is the value that each connection has associated to it. This value will be shown on each flat's individual MCS certificate and will be used for the SAP assessment.

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

Total system size (kWp)	Phase	System size per phase (kWp)	Connections	Connection allocation	kWp associated to the connection
22.5	L1	7.5	Landlord supply	20%	1.50
			Flat 1	20%	1.50
			Flat 4	20%	1.50
			Flat 7	20%	1.50
			Flat 10	20%	1.50
	L2	7.5	Landlord supply	25%	1.88
			Flat 2	25%	1.88
			Flat 5	25%	1.88
			Flat 8	25%	1.88
			No connection	0%	0.00
	L3	7.5	Landlord supply	20%	1.50
			Flat 3	30%	2.25
			Flat 6	25%	1.12
			Flat 9	15%	1.88
			Flat 11	10%	0.75

To take some examples for the SAP assessment:

- **Flat 1** will have a **1.50** kWp system associated with it
- **Flat 3** will have a **2.25** kWp system associated with it
- **Flat 9** will have a **1.88** kWp system associated with it
- The three-phase **Landlord supply** will have a **4.33** kWp system associated with it.

① TIP

You must apply for an individual MCS certificate for each flat, not a single MCS certificate for the entire system.



4. Placement of CTs

Each SolShare is supplied with 15 x 120A clip-on split core current transformers (CTs) with locking pin. One CT must be installed for each SolShare output connection used. These must run from SolShare to each connected flat and can be placed anywhere on the live cable, upstream (grid side) from the solar point of connection.

Each CT is supplied with 10m of CT cable attached which can be extended up to 100m with shielded, twisted pair cables (0.25mm² or larger) where cable run length between SolShare and the solar point of connection is more than 10m.

Each CT 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.

CTs cannot be connected around armoured cable.

If the solar point of connection is within the consumer unit, CTs can also be housed inside the consumer unit.

① TIP

SolShare has been configured to operate with the CTs provided. Use only the CTs provided with SolShare.

① NOTICE

The shielding of any extended CT cables must be earthed.

① TIP

More information is available in the [Installation manual](#).



5. Number of SolShares for your site

A single SolShare can connect to a maximum of 15 single-phase flats. When designing a system that requires more than 15 connections, multiple SolShares can be used. However, there are also other site-specific factors which can mean more SolShares are required. For example, the number of flats on a phase, the location of flats throughout the building, and the DNO incomer/MSDB arrangement.

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 50.9A per phase.

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

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)

① NOTICE

It is a condition of warranty that SolShare is always connected to the internet throughout the warranty period.

① TIP

More information is available in the [SolShare internet guide](#).

7. DNO J type fuse

SolShare has protection for any J type (building distribution) fuse. This protection is automatically applied to SolShare.

① TIP

If you have any further questions, contact the Allume support team by phone on +44 20 8156 2818 or by email at uk.support@allumeenergy.com.

8. Battery integration

Integrating communal DC-coupled batteries may be possible with SolShare, depending on the specific site layout. If you are considering a battery installation, you must inform Allume via uk.info@allumeenergy.com to discuss the project and confirm technical feasibility for the proposed site.



There are many site variables that influence how well-suited a site is for battery storage, and which battery type is best. Without a discussion with the Allume team, there is a significant risk to the success and functionality of the installation.

① TIP

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9. Labelling

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

① TIP

More information is available in the [SolShare labelling advice](#) document.

10. Other energy measuring devices

SolShare systems are compatible with a range of complementary solar technologies, including PV diverters, smart hot water tanks, and storage heaters. These technologies often rely on energy measurement (e.g. using CTs) to function correctly. Please follow the manufacturer's instructions for CT placement. For instance, if the CT needs to measure exported energy, it should be installed on the grid side of the solar point of connection.

In a SolShare installation, the solar point of connection may be located before the consumer unit, such as in risers or a plant room. Therefore, if an energy-measuring technology's CT needs to measure exported energy, it must be installed to measure grid before the SolShare connection.

① TIP

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