

SolShare Design and Installation Guide UK

Version J3 for SOLSHARE-3P-35A-04
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 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.

Please contact Allume if you would like to design outside of the recommendations contained within this document.

INDEX

INVERTER TO SOLSHARE INFORMATION	3
A. POWER INPUT FROM INVERTER TO SOLSHARE	3
B. INVERTER GRID CONNETION	3
C. CABLING	3
D. GENERATION METER	3
E. AC ISOLATOR	3
SOLSHARE TO FLATS INFORMATION	4
F. MULTI SERVICE DISTRIBUTION BOARD	4
G. EARTH CONNETION	6
H. NEUTRAL CONNECTION	6
I. LIVE CABLE	6
Single Live	6
Max power delivery	6
Eddy currents	6
J. SOLSHARE MAINTENANCE ISOLATION	7
K. SOLAR POINT OF CONNECTION (POC)	8
Meters co-located or outside of flats	8
Meters in the flats	8
L. OUTPUT CONNECTIONS	9
Phase matching	9
Power Distribution per Phase	9
Solar allocation & SAP / EPC contribution	9
GENERAL	11
M. INSTALLATION LOCATION	11
N. CT PLACEMENT	11
O. MORE THAN 15 CONNECTIONS / MULTIPLE SOLSHARES	11
P. WI-FI ACCESS POINT	12
Q. DNO J TYPE FUSE	12
R. BATTERY INTEGRATION	12
S. LABELLING	12
APPENDIX	12
EXAMPLE SLD (GUIDANCE ONLY) – METERS OUTSIDE FLATS	13
EXAMPLE SLD (GUIDANCE ONLY) – METERS INSIDE FLATS	14

INVERTER TO SOLSHARE INFORMATION

A. POWER INPUT FROM INVERTER TO SOLSHARE

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

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 SolShare.

WARNING: Oversizing the system will damage the SolShare and void warranty.

Please consult Allume's '[SolShare35_Datasheet](#)' for further technical details.

B. INVERTER GRID CONNETION

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

C. CABLING

The 3-phase, earth and neutral from the inverter should be terminated into the Live - Neutral - Earth connections inside the SolShare.

The cable gauge from the inverter to the SolShare should be sized to carry maximum inverter output and factor in usual factors like voltage drop as per relevant wiring standards.

D. GENERATION METER

The generation meter should be located between the inverter and SolShare.

E. 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.

SOLSHARE TO FLATS INFORMATION

F. MULTI SERVICE DISTRIBUTION BOARD

Flats that are connected to the SolShare must all be supplied from the **SAME** DNO electrical cut out.

Figure 1 below shows an **incorrect** installation scenario where a SolShare is feeding flats that are supplied by different incomers.

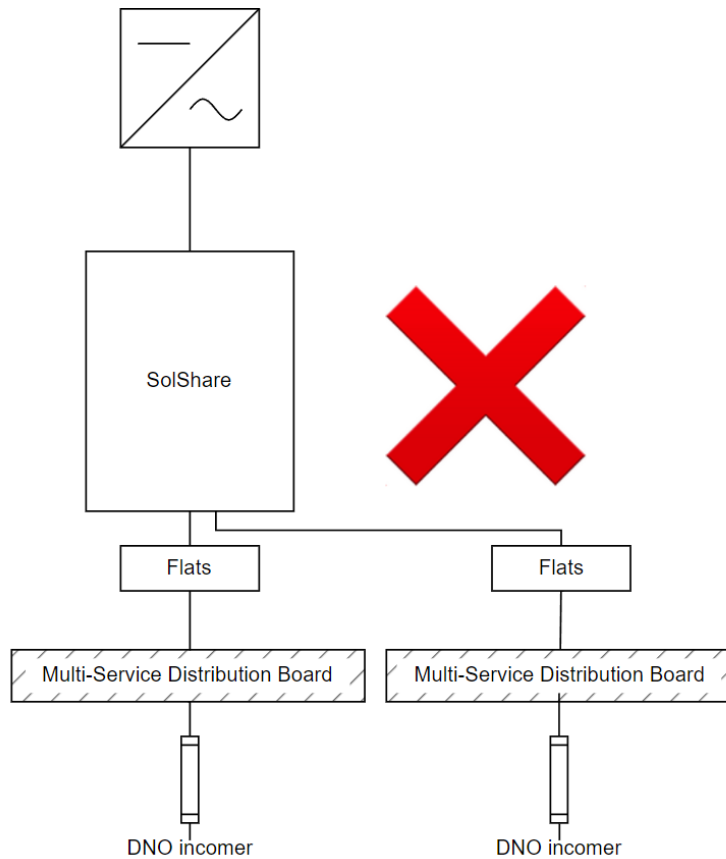


Figure 1: An incorrect installation where SolShare is connected to flats being supplied by different incomers.

If there are multiple incomers as shown in in Figure 1, then there must be additional SolShares (at least 1 for each incomer). A correct installation is shown in Figure 2.

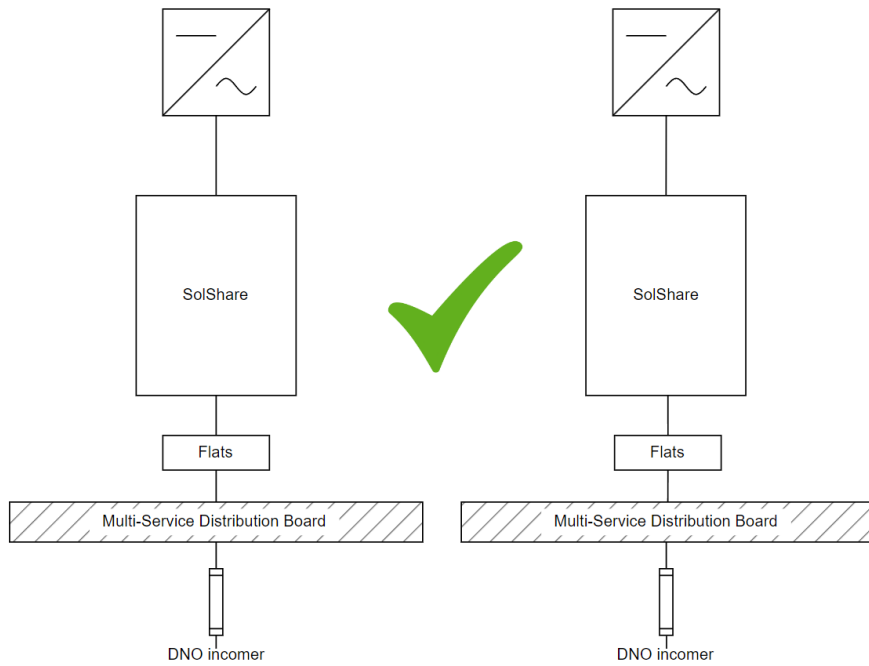


Figure 2: A correct installation where SolShares are connected to flats being supplied by the same incomer

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. Figure 3 shows multiple MSDBs being supplied by the same incomer.

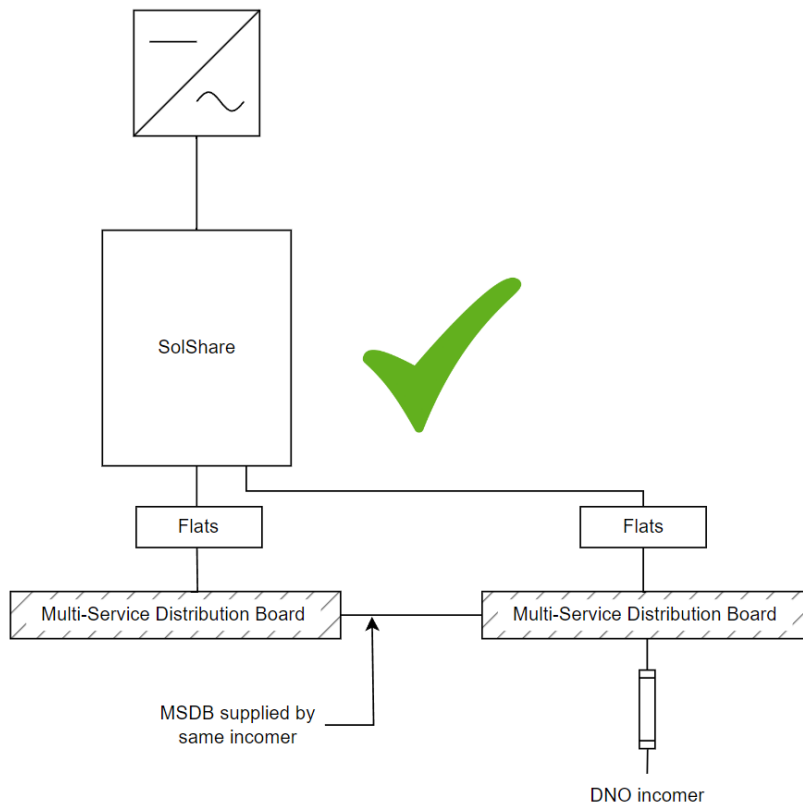


Figure 3: Flats are supplied by different MSDBs, but the same incomer.

G. EARTH CONNETION

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.

H. 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 Multi-Service Distribution Board or DNO cutout) that is supplying the flats that the SolShare is connected to.

It **MUST NOT** be connected to a flat's neutral.

Refer to F. MULTI SERVICE DISTROBUTION BOARD section for more info.

If gaining a dedicated neutral connection in the MSDB 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.

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.

I. LIVE CABLE

Single Live

ONLY a single live cable is required to connect from SolShare to each flats solar point of connection. There is no neutral paired with the live to the flat, only a single neutral for the entire system as described in *Section H*.

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.

Eddy currents

SolShare runs a single live, without a neutral to each flat. Care should be taken during design to consider non-ferrous cable protection.

J. SOLSHARE MAINTENANCE ISOLATION

For safe and easy maintenance, SolShare needs dedicated isolation from each flat. We recommend installing a lockable consumer unit directly below the SolShare for convenient access. Figure 4 below shows SolShare installed with maintenance isolation box directly below.

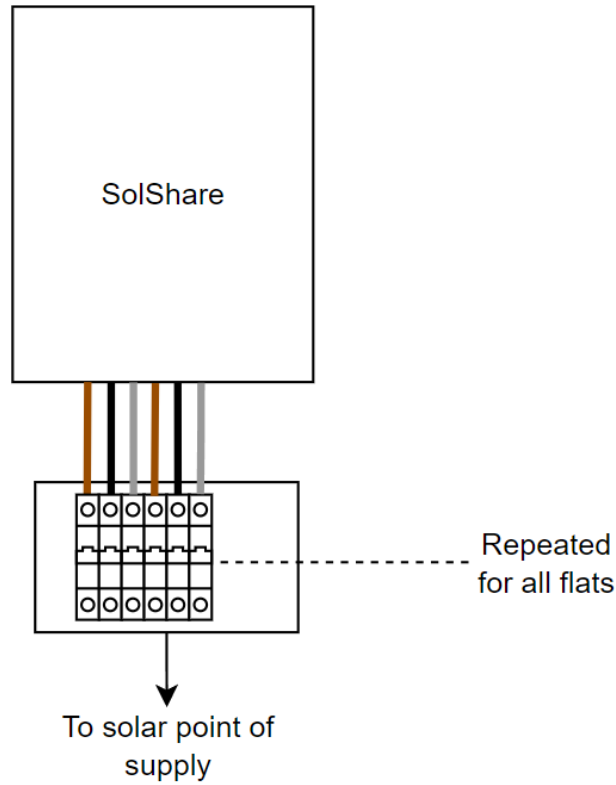


Figure 4: SolShare maintenance isolation.

K. SOLAR POINT OF CONNECTION (POC)

This section contains guidance on how to make the solar point of connection based on the flat's energy meter location. In some situations, the installer may choose to install differently. It is responsibility of the installer to ensure that all relevant wiring standards are met.

Meters co-located or outside of flats

- **Three-pole isolator (meter isolator)** – The typical two-pole meter isolator is replaced with a three-pole isolator to create the solar point of connection. When isolated it must disconnect the flat from the DNO supply, and solar. This is arrow 1 on Figure 5 in Appendix.
- **Cable sizing** – The solar output cable (arrow 2 on Figure 5 in Appendix) **must** be rated to carry full capacity of DNO fuse. This is because a fault on this cable will be supplied by the DNO incomer.
- **Maintenance circuit breakers** – The isolation in the maintenance box (described in Section I) must be circuit breakers. The circuit breakers must be rated to carry the maximum current of a single phase of the inverter.

Meters in the flats

- **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. This is shown in Figure 6 by arrow 1.
 - A circuit breaker must be installed for cable protection of the solar output cable. This is shown in Figure 6 by arrow 2.
- **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.

L. 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 has an L2 supply from the grid, 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 used to connect to a three-phase unit. The most common example of this is if the three-phase Landlord supply is being connected to SolShare.

Not all of the 15 outputs need to be used.

Example configurations:

- 11 single-phase connections. 4 connections not used.
- 9 single-phase & 1 three-phase connections. 4 connections not used.
- 4 three-phase connections. 3 connections not used.

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. 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.

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

Here's an example of a 22.50 kWp system connected to 11 single-phase flats and a three-phase Landlord supply. The kWp in the penultimate 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	Indicative SAP Uplift
22.50	L1	7.50	Landlord supply	20%	1.50	N/A
			Flat 1	20%	1.50	9
			Flat 4	20%	1.50	9
			Flat 7	20%	1.50	9
			Flat 10	20%	1.50	9
	L2	7.50	Landlord supply	25%	1.88	N/A
			Flat 2	25%	1.88	12
			Flat 5	25%	1.88	12
			Flat 8	25%	1.88	12
			No connection	0%	0.00	N/A
	L3	7.50	Landlord supply	20%	1.50	N/A
			Flat 3	30%	2.25	14
			Flat 6	25%	1.12	7
			Flat 9	15%	1.88	12
			Flat 11	10%	0.75	5

To take some examples for the SAP assessment:

- **Flat 1** will have a **1.50 kWp** system associated to it.
- **Flat 3** will have a **2.25 kWp** system associated to it.
- **Flat 9** will have a **1.88 kWp** system associated to it.

The three-phase **Landlord supply** will have a **4.33 kWp** system associated to it.

GENERAL

M. 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.

N. CT PLACEMENT

The SolShare has a CT for each output connection. These must run from the SolShare to each connected flat and placed anywhere on the live cable, upstream (grid side) from 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.

The CT can't be connected around armoured cable.

If the solar POS is within the consumer unit, the CT can also be housed inside the consumer unit.

The CT extension cable shielding must be earthed.

O. 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.

P. WI-FI ACCESS POINT

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

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 (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.

Q. DNO J TYPE FUSE

The J type fuse located within the heavy duty cut out must be identified and reported to the DNO during the G99 submission and reported to Allume if it is less than 250A.

R. BATTERY INTEGRATION

SolShare systems can include batteries. Allume recommend communal DC coupled batteries. However, communal AC (the additional current output must be considered for SolShare's maximum current rating of 35A per phase) and individual AC batteries are also possible.

Please contact Allume for more information on battery integration.

S. 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 should be provided by the installer. Please consult Allume's '[0415_Allume_SolShare_Labelling_Advice_UK](#)' document for more information on labelling.

APPENDIX

On following pages

EXAMPLE SLD (GUIDANCE ONLY) – METERS OUTSIDE FLATS

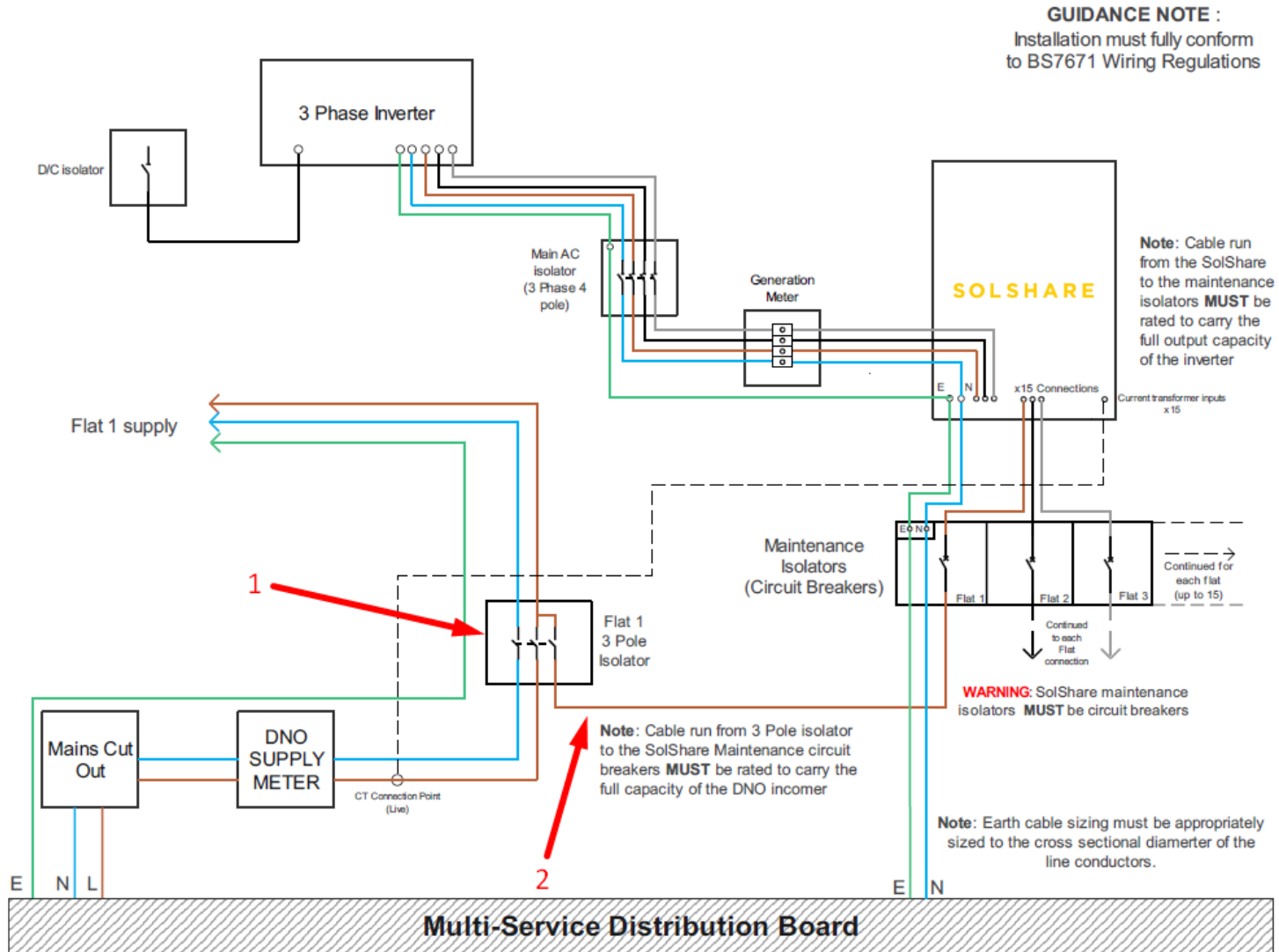


Figure 5: SLD example when energy meters are located outside of the flats.

EXAMPLE SLD (GUIDANCE ONLY) – METERS INSIDE FLATS

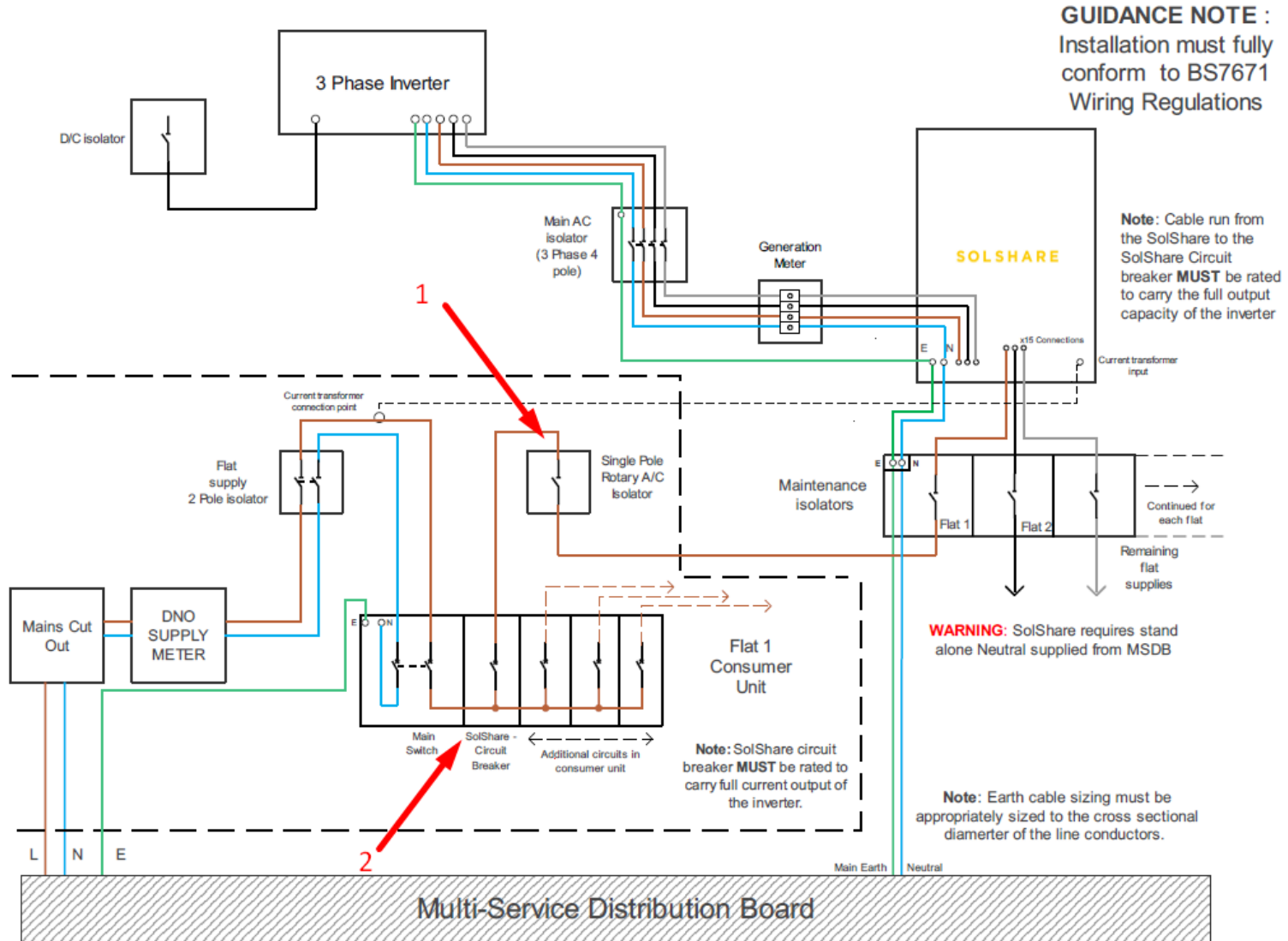


Figure 6: SLD example when energy meters are inside the flats.