

SolarEdge Solution Connection and Configuration Guide for Australia

Here is information on connecting the SolarEdge Home Battery ("the battery") to a SolarEdge inverter and connecting the inverter directly or via the DC Combiner. Also, we explain the wiring steps for the SolarEdge Backup Interface and how to configure the solution using SetApp after the commissioning.

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Revision History

Version 6.0 – May 2024

- Addition of 3Ph Residential Booster (AUB) Inverter
- Additional 3Ph SLD's.

Version 5.0 – March 2023

- Removal of LG Battery Option
- Additional 3Ph SLD's.

Version 4.0 – December 2022

- Update of Polarity Check.

Version 3.0 – July 2022

- Update of pre-startup Battery Polarity Check.
- CT Extension information
- 3Ph Metering Voltage reference connections
- Multiple Inverter Metering requirements
- Additional x2 SLD's 24-25.

Version 2.0 – June 2022

- Update of Figure 20: Genesis SE10000H-BPV maximum oversizing example.
- Additional x6 SLDs 18-23.
- CT setting clarification for Backup Interface
- EN line update for SolarEdge Home Battery when connected HD Wave/Genesis

Version 1.0 – May 2022

- First release of this document

Connecting Battery Communication and DC

For setting up communication between the battery and the inverter, SolarEdge strongly recommends using the SolarEdge Home Network.

On the Home Hub inverter, if for some reason the SolarEdge Home Network cannot be used, you can set up communication using an RS485 port, as explained in this section. On the 3Ph Booster (AUB) inverter the RS485 connection is not possible, on the SolarEdge Home Network shall be used.

If x3 batteries are to be installed on a single inverter either the DC Combiner or SolarEdge Branch Connectors can be used. Use the following cable types:

- DC - 6mm - 10mm CSA 600V insulated depending on route length.
- Communication - CAT6



WARNING!

Read carefully all handling and safety instructions in the installation guides that come with the battery and the inverter.



WARNING!

The inverter cover must be opened only after switching the inverter ON/OFF/P switch located at the bottom of the inverter to OFF. This disables the DC voltage inside the inverter. Wait five minutes before opening the cover.



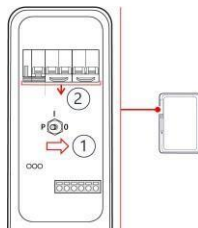
WARNING!

Ensure that the correct battery polarity is always observed. Turning on the battery with reverse polarity may permanently damage the battery



WARNING!

Before connecting the battery to the inverter, ensure the battery power is off.



SolarEdge Home Battery

1. Toggle off the battery ON/OFF/P switch.
2. Turn off the battery circuit breaker.

Single Phase Home Hub Inverter

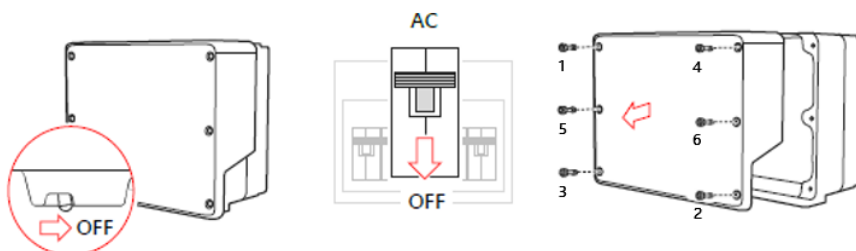


WARNING!

Read carefully all handling and safety instructions in the installation guides that come with the SolarEdge Home Network card and the inverter.

→ To connect communication via SolarEdge Home Network:

1. Remove the inverter cover.
2. Switch off the inverter ON/OFF/P switch and wait 5 minutes for the internal capacitors to discharge.
3. Switch off the AC circuit breaker on the main distribution panel.
4. Open the Allen screws of the inverter cover and carefully pull the cover horizontally before lowering it.
5. Open the inverter cover as shown below.



6. Connect the SolarEdge Home Network plug-into the socket on communication board.
7. Connect the antenna, pass antenna cable through communication gland.

8. Clip antenna (supplied) to heatsink fin.
9. Tie antenna cable to communication board bracket with plastic tie (supplied).
10. Replace the inverter cover and Connection Unit cover (DCD). Tighten screws to 8.4Nm.
11. Restart inverter and verify device in SetApp, select **Status > Communication > Home Network OK**.



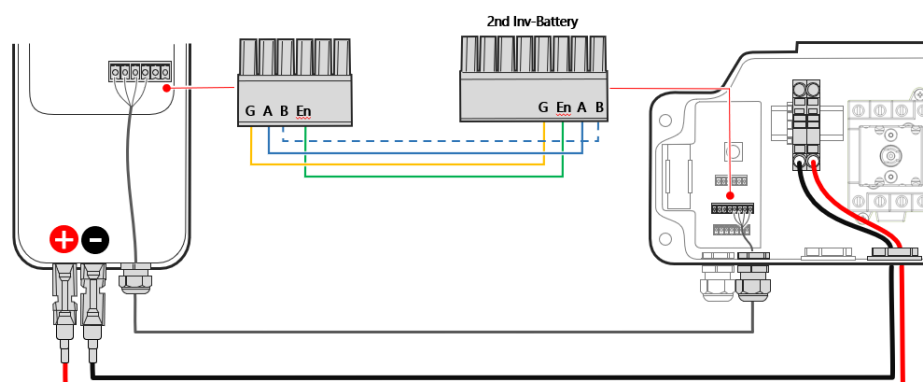
→ **To connect communication between the inverter and SolarEdge Home Battery via RS485:**

1. Connect the communication cable to the battery's RS485 connector as shown below.
2. Open Communication Gland 2 at the bottom of the inverter's Connection Unit.
3. Feed the other end of the communication cable through one of the gland openings
4. Remove the connector from the port labeled 2nd Inv-Battery on the communication board.
5. Connect the communication cable to the connector, as shown below.
6. If 2 or more batteries are being connected, daisy chain the connections between each battery.
7. Close Communication Gland 2 with a torque of 5 Nm.



NOTE

When connecting the SolarEdge Home Battery to an HD Wave or Genesis the EN line connection is not required.



→ **To connect DC cables:**

1. Connect the DC cables to the battery, as explained in the installation guide that comes with the battery.
2. Pass the other end of the DC cable through the Battery conduit of the inverter.
3. Connect the wires to the DC terminals.



WARNING!

Make sure to connect the cables at correct polarity. Connecting the cables at reverse polarity may result in damage to the inverter or battery.

Proceed with the battery installation, as explained in the battery installation guide.

Three Phase Booster (AUB) Inverter

**WARNING!**

Read carefully all handling and safety instructions in the installation guides that come with the SolarEdge Home Network card and the inverter.

→ **To connect communication via SolarEdge Home Network:**

1. Remove the inverter cover.
2. Switch off the inverter ON/OFF/P switch and wait 5 minutes for the internal capacitors to discharge.
3. Switch off the AC circuit breaker on the main distribution panel.
4. Open the Allen screws of the inverter cover and carefully pull the cover horizontally before lowering it.
5. Connect the SolarEdge Home Network plug-into the socket on communication board.
6. Connect the antenna, pass antenna cable through communication gland.
7. Clip antenna (supplied) to heatsink fin.
8. Tie antenna cable to communication board bracket with plastic tie (supplied).
9. Replace the inverter cover and Connection Unit cover (DCD). Tighten screws to 8.4Nm.
10. Restart inverter and verify device in SetApp, select **Status > Communication > Home Network OK**.

→ **To connect DC cables:**

1. Connect the DC cables to the battery, as explained in the installation guide that comes with the battery.
 2. NOTE: Only a single battery can be connected to the Three Phase Booster (AUB) Inverter.
3. Pass the other end of the DC cable through the Battery conduit of the inverter.
4. Connect the wires to the DC terminals.

**WARNING!**

Make sure to connect the cables at the correct polarity. Connecting the cables at reverse polarity may result in damage to the inverter or battery.

Proceed with the battery installation, as explained in the battery installation guide.

Connecting DC Combiner Cables

For installing x3 SolarEdge Home Batteries the DC Combiner can be used.

One, two or three SolarEdge Home Battery installations can be managed via the SolarEdge Branch Connectors instead.

Use the following cable types:

- **DC - 6mm - 10mm CSA 600V insulated depending on route length.**

**WARNING!**

Read carefully all handling and safety instructions in the installation guides that come with the DC Combiner, Battery and the inverter.

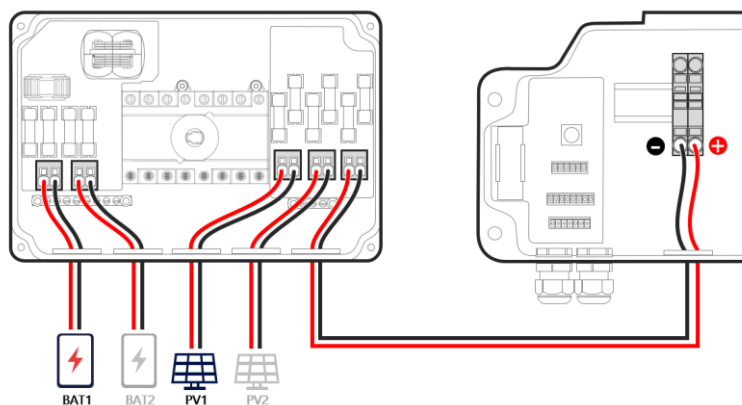
**WARNING!**

Before connecting the DC Combiner and battery to the inverter, ensure the battery and inverter power is off.

→ **To connect DC between the battery and the inverter via the DC Combiner:**

1. Open cover of the DC Combiner.
2. Open the conduit entries at the bottom of the DC Combiner and install conduits, as required by local regulations. Maximum supported conduit is diameter of 32 mm.
3. Connect the DC cable from the batteries as shown below.
4. Connect the DC cables from the PV array/s as shown below.
5. Connect the ground to the combiner box by connecting it to the inverter.

6. Close cover of the DC Combiner with a torque of 1.2 Nm.

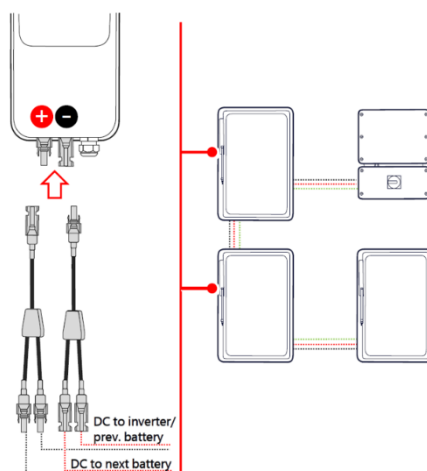


Connecting When the DC Combiner Is Not Used

The combining of multiple DC supplies will be required when the DC Combiner is not used as the DC terminal inside the inverter's DCD connection unit only has a single input.

If there are two or more PV Array's on the roof the recommendation is that these be combined into a single home run supply to the inverter, either at the roof or at a location prior to entering the inverter's DCD connection unit.

When two or three SolarEdge Home Battery batteries are to be installed ensure that the branch connectors are used.



As the inverter's DCD connection unit only has a single input, and there will be two DC connections to bring together, one the from Power Optimizers as well as one from the batteries, crimp the DC cables together using a two into one bootlace ferrule before inserting into the DC terminal. Ensure that there is sufficient length to enable full purchase within the DCD DC connector, with some bootlace ferrules it may be necessary to leave 4-6mm of cable protruding from the end.



Pre-startup Battery Polarity Check

Before energizing the battery ensure that the polarity of the DC connections is correct, +to+ and -to-.

Use the following cable types:

- Use a voltmeter set to DC

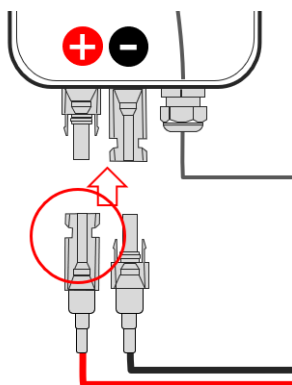


WARNING!

Startup of the Battery in reverse polarity may cause permanent failure of the battery not covered under warranty

→ To check the DC Polarity between the battery and the PV (Optimisers):

1. Ensure that the AC to the inverter is OFF.
2. Ensure that the DC Isolator on the DCD is in the OFF position
3. If a DC Combiner is connected ensure the DC Isolator is in the ON position.
4. With the MC4 connections at the Battery terminal removed, test for the nominal Safe DC string voltage. If a string contains x20 Optimizers then expect a 20Vdc result.
5. Ensure that the + plug (female negative MC4, see below highlighted) reads a + voltage value.

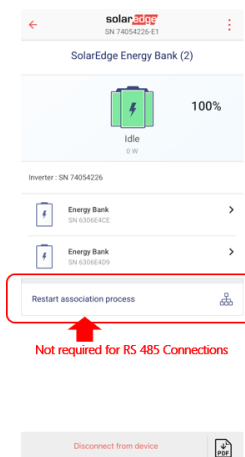


6. Repeat for all batteries connected.

Battery Association Note

When running through the battery commissioning stages please note that the 'Association' stage is only required for batteries connection via the SolarEdge Home Network' protocol.

For batteries connection via RS-485 the Association stage is not required.



Running a Battery Self-test

You can run a battery self-test only after finishing the battery installation and configuration (refer to the battery installation guide).

The purpose of the battery self-test is to check the battery's charge and discharge functionality.

→ To run a battery self-test:

1. Make sure the battery's circuit breaker switch is ON.
2. Switch the inverter ON/OFF/P switch to ON.
3. In SetApp, select Commissioning > Maintenance > Diagnostics > Self-Test Battery Self-Test > Run Test.
4. Wait for all tests to complete and check the results in the summary table.
5. If any of the tests have failed, see the table below for possible solutions:

Test Results	Solution
Charge failed	Check that the power and communication cables between the battery and inverter are properly connected.
Discharge failed	Check that the power and communication cables between the battery and inverter are properly connected.
Communication	Check that the communication cables between the battery and inverter are properly connected.
Inverter switch is off	Switch the inverter ON/OFF/P switch to ON.

→ To show the last test results:

- Select **Commissioning > Maintenance > Diagnostics > Self-Test > Battery Self-Test > Show Last Results.**

Connecting Backup Interface Communication Cables

For setting up the Backup Interface, for backup operation (on the Single Phase Home Hub Inverter only), a communication connection between the Backup Interface and the inverter needs to be made.

Use the following cable types:

- Communication - CAT6



WARNING!

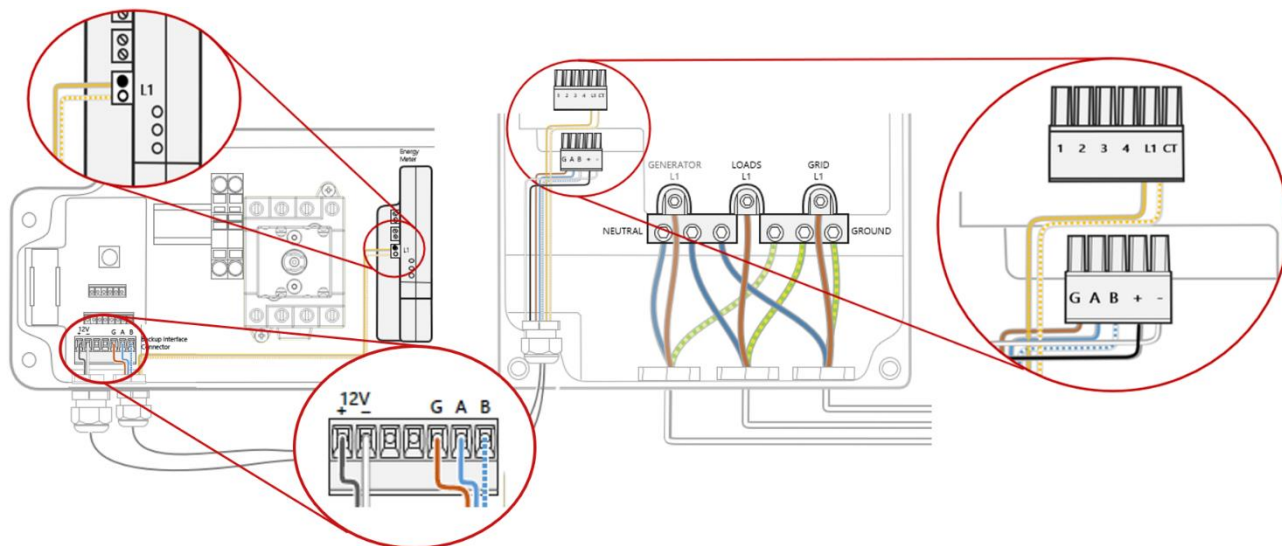
Read carefully all handling and safety instructions in the installation guides that comes with the Backup Interface and the inverter.



WARNING!

Before connecting the Backup Interface to the inverter, ensure the battery and inverter power is off.

As only x7 cores are required for all Backup Interface to Home Hub connections a single CAT6 cable with a minimum of x4 twisted pairs can be used.



■ CT Connections

Ensure that the following polarity for the CT connections are made:

Connection inside Backup Interface:

- L1 – Positive
- CT – Negative

Connection inside DCD Inbuilt Meter

- ● – Positive
- ○ – Negative

Single Phase Home Hub Inverter

→ To connect communication between the Backup Interface and the inverter:

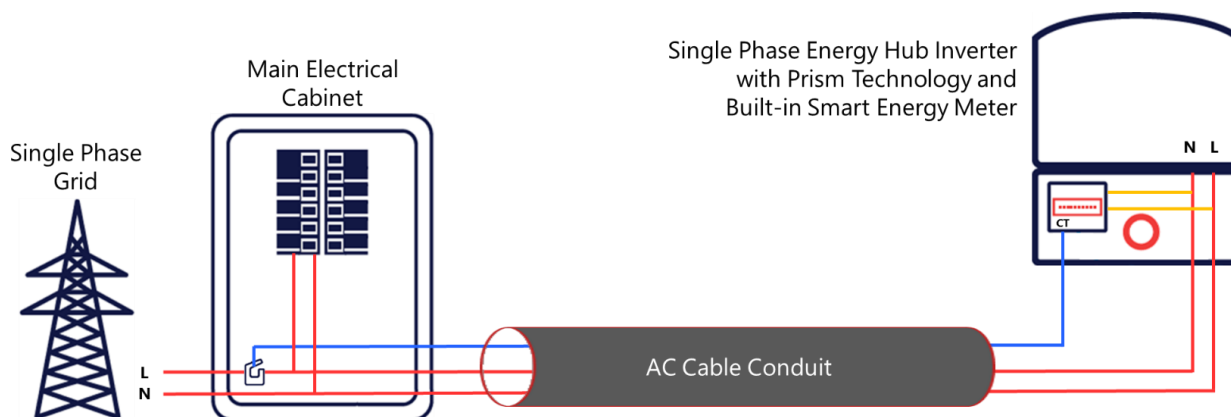
1. Open communication gland at the bottom of the Backup Interface and feed one other end of the communication cable through one of the gland openings at the bottom of the Backup Interface.
2. Connect the communication cable to the Backup Interface's RS485 connector as shown below. (Item 5)
3. Connect the 12V power supply connection to the Backup Interface's Modbus connector as shown below. (Item 4)
4. Connect the CT connection to the Backup Interface's CT terminal connector as shown below. (Item 6)
5. Open communication gland at the bottom of the inverter's Connection Unit.
6. Feed the other end of the communication cable through one of the gland openings.
7. Remove the connector from the port labeled Backup Interface on the communication board.
8. Connect the RS485 communication cable to the connector, as shown below.
9. Connect the 12V power supply connection to the connector, as shown below.
10. Connect the CT connection to the L1 terminal of the in-built Modbus meter within the inverter's Connection Unit, as shown below.
11. Close Communication Gland 2 with a torque of 5 Nm.

Current Transformer (CT) Installation

1. If the Backup Interface is not being installed, or if the CT within the Backup Interface is not being connected, this section describes the installation and extension process.
2. As the Home Hub inverter has a built in Modbus meter within the DC Connections module (DCD), in most cases when the CT is installed within the meter board the CT connection will need to be extended. A CAT6 shielded extension cable shall be used to connect the CT twisted pair to the meter. The extension cable is routed via the AC conduit, together with the AC wiring.
3. Wire the meter in accordance with the connection diagram in the scenario: Export/Import Energy Metering in a Single-Phase Grid Installation.

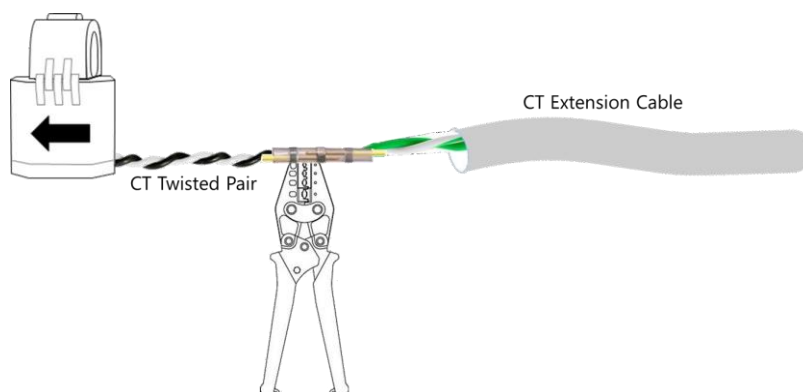
Export/Import Energy Metering in a Single Phase Grid Installation

In the single-phase grid example in the figure below, one CT is installed for Export/Import metering.



→ To install the CT:

1. Power off the inverter and disconnect its main circuit breaker.
2. Attach the CT to the relevant AC wire, in accordance with the connection diagram in the scenario: Export/Import Energy Metering in a Single-Phase Grid Installation.
3. When attaching the CT to the conductor to be measured, the arrow on the CT should point in the direction of the current source.
4. Cut the CT's black-and-white twisted wire pair to the required length (leaving some additional spare length) and connect the pair to the shielded CT extension cable, splicing them using a crimping tool, as shown in the figure below.



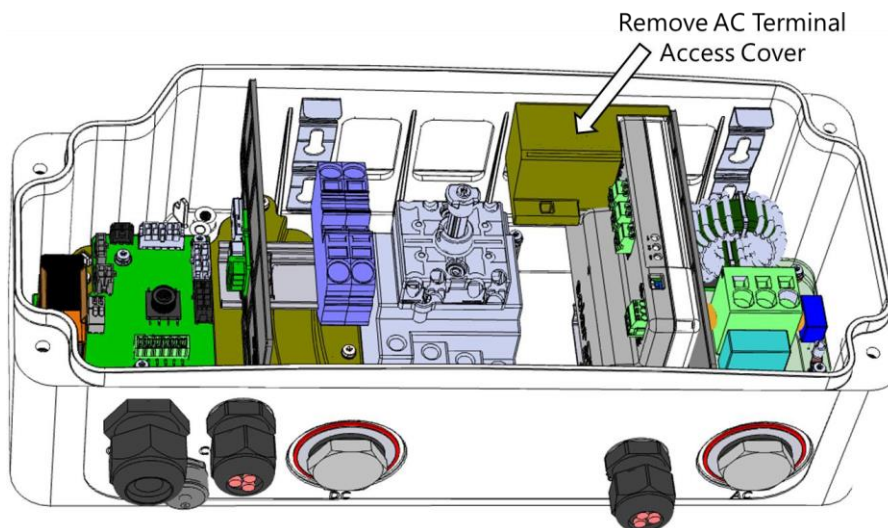
Do not use the method of twisting the wires and taping them together. This type of connection is not reliable, and the wires may eventually disconnect from each other.

CT's can be extended up to 100m. Connect the grid AC wiring – L and N – to the designated terminal blocks.

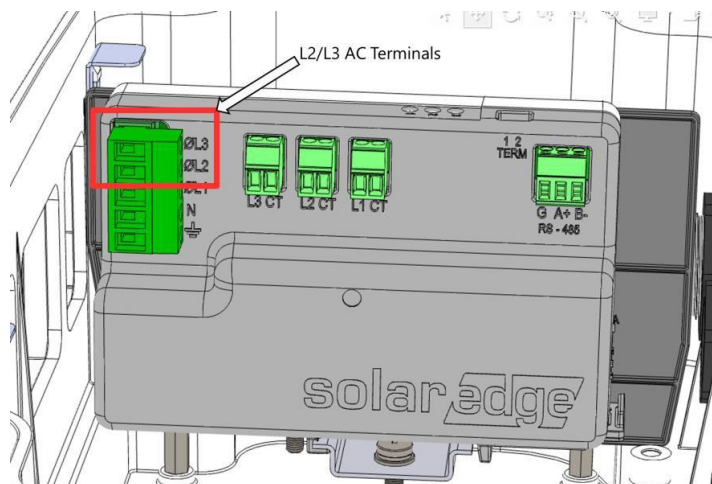
Home Hub 3Ph Metering Voltage Connections

When metering is required for a 3Ph site the following procedure is required to enable the additional voltage references.

To prepare the installation for use at a 3Ph site:



1. Remove the meter's AC terminal access cover.
2. Connect the L2 and L3 AC lines from the AC supply.



3. Replace AC terminal cover.
4. Fit two additional current transformers for L2 and L3.

Metering Connections for Multiple Home Hub Inverter Sites

7. When sites are being installed with multiple Home Hub inverters in leader/follower configuration, only the leader inverter requires a metering connection.
8. The Home Hub inverters come with a pre-installed Modbus meter, any follower inverter will have to have this meter either disabled and removed via SetApp, or alternatively physically disconnected inside the DCD by unplugging the RS485 terminal prior to turning on the inverter.

Setting Backup Interface CT Value

This section describes how to configure your system for correct metering configuration when connecting the inbuilt Home Hub meter to the CT terminal inside the Backup Interface.

- The default CT setting for the meter within the Home Hub is 70A. The CT value for the device within the Backup Interface is 100A and the default setting needs to be updated.
- Open SetApp and select **Commissioning > Site Communication > RS485-1 > Modbus Meter > CT Rating > 100A**.

Enabling Backup Applications

This section describes how to configure the Home-Hub inverter for backup application options. Before enabling backup applications, make sure to:

- Finish battery installation and configuration (refer to the battery installation guide).
- Run a battery self-test, as described above.

Backup Power Applications

The produced power stored in the battery maybe used during power outages. When there is a grid outage, the Backup Interface automatically detects the grid failure and switches into Backup mode, disconnecting from the grid. The Home Hub inverter will switch over to backup mode (approx. 3 seconds) and will supply power to the backed-up loads.

This application requires connection to the Backup Interface and backed-up loads (pre-selected dedicated loads or the entire home).

To start using backup applications, you first need to enable the Backup Configuration functionality. The Backup function is disabled by default and once enabled it will support the following two configurations:

- **Backup with Smart Energy Management** – Battery energy is used for maximizing self-consumption (MSC) or charge/discharge profile programming (for time of use arbitrage) and backup power applications.
- **Backup only** – energy stored in the battery is reserved and discharged only for backup power needs when there is no power from the grid.

If Backup Configuration is disabled, the system will continue to use the battery energy in MSC or charge/discharge profile programs, but it will NOT provide Backup to designated loads in case of a power outage.

→ To enable Backup Configuration:

- Open SetApp and select **Commissioning > Power Control > Energy Manager > Backup Configuration > Backup > Enable**.

After the Backup Configuration is enabled, the Backup Interface is automatically configured.

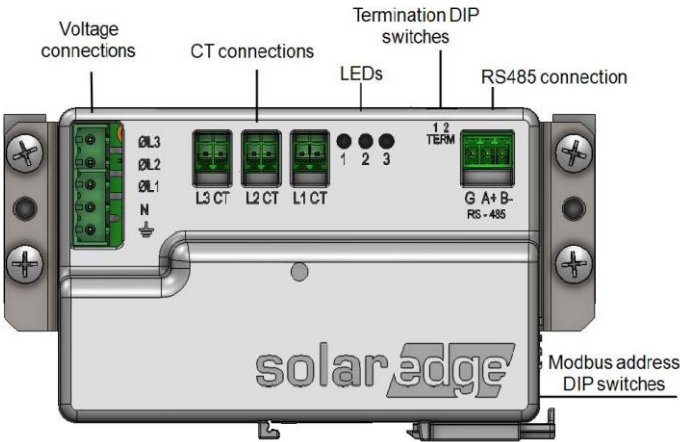
→ To enable a backup application:

1. Select **Power Control > Energy Manager > Energy Control**.
 2. Select one of the following applications:
- **Backup only** - Set the system to supply power to backed-up loads only in case of a power outage.
 - **Time of use** - Set a charge/discharge profile and the level of charging the battery from AC.
 - **Maximum Self Consumption (MSC)** - Set the system to maximize self-consumption, and then the level of stored energy to be reserved for backup.

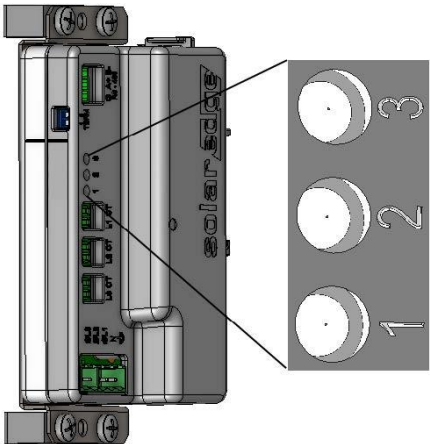
Three Phase Booster (AUB) Inverter Metering Connections

When metering a 3Ph site SolarEdge offers two metering options, one being via the Mobus meter, the second via the Inline meter.

→ **Modbus meter interface**

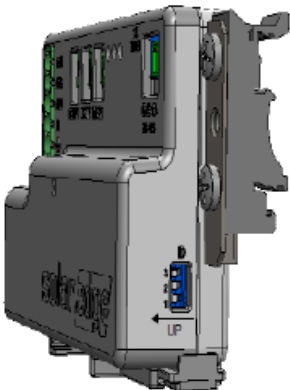


- **Voltage Connections** - for connection to the grid: Wye: L1, L2, L3, N, Ground.
- **CT Connections** - (L1 CT, L2 CT, L3 CT): for connection to current transformers.
- **RS485** - for connection to the inverter.
- **LEDs** - On the front of the unit to indicate current status.



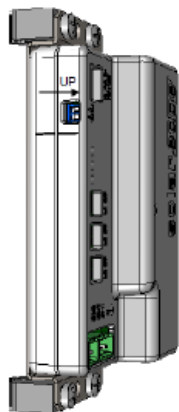
LED #	LED	Function	Indication
1	Green	Operational status	Blinking ON/OFF - normal operation
2	Yellow	RS485 Modbus communication	Blinking ON/OFF - communication OK
3	Yellow	Energy management	Single blink when the meter reads an energy change of ~1 kWh.

- **Modbus address DIP switches**- (ID 1, 2, 3): The Modbus address DIP switches are used to set the Modbus address of the meter. The addressing options are listed in the table below.



Modbus Address	Switch 1	Switch 2	Switch 3
0	Down	Down	Down
1	Up	Down	Down
2 (factory default)	Down	Up	Down
3	Up	Up	Down
4	Down	Down	Up
5	Up	Down	Up
6	Down	Up	Up
7	Up	Up	Up

- **Termination DIP switches-** (TERM 1, 2): used to set RS485 termination. termination options are listed in the table below.



RS485 Termination	TERM 1	TERM 2
Terminated	Down	Down
Not Terminated (factory default)	Up	Up

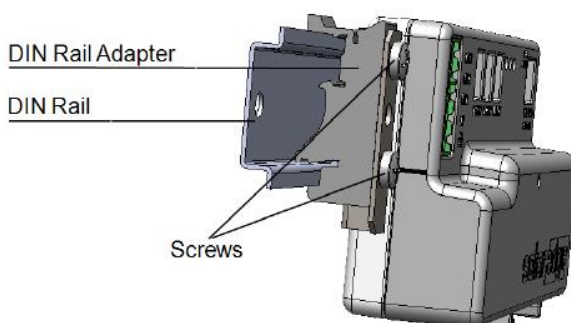
→ Modbus meter installation:

AC wire specifications: 1.3 to 2.0 mm diameter stranded wire, 600 V, type THHN, MTW, or THWN.

RS485 wiring specifications:

- Cable type: Min. 3-wire shielded twisted pair (a 4-wire cable may be used)
- Wire cross-section area: 0.2- 1 mm² (a CAT6 cable may be used)
- If using a cable longer than 10 meters in areas where there is a risk of induced voltage surges by lightning, it is recommended to use external surge protection devices.

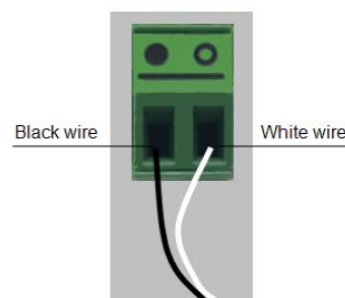
- **Mount on a DIN rail using clips-** The supplied kit includes two DIN-rail adapters and four screws.



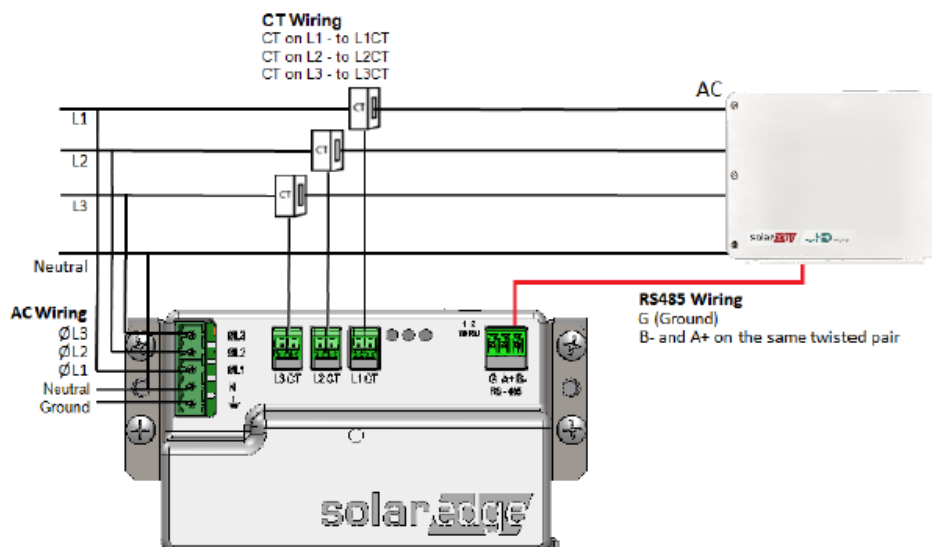
1. Attach the DIN-rail adapters to the DIN rail.
2. Connect the meter to the DIN-rail adapters and fasten them using the supplied screws.

■ Wiring the meter

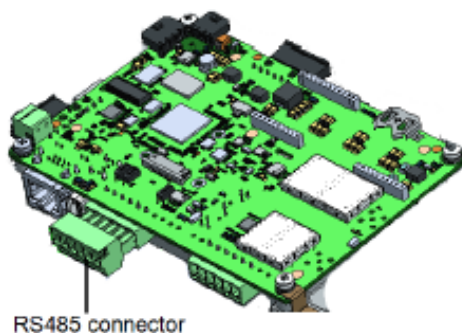
3. Verify that power is OFF before making connections.
4. Connect the AC side wires (meter input) to the grid connectors on the meter.
5. Connect the CT wires to the three 2-pin terminals on the meter.
6. Turn off AC power before clamping on current transformers.
7. Install the CTs around the conductor to be measured. Split-core CTs can be opened for installation around a conductor. A nylon cable tie may be secured around the CT to prevent accidental opening.
8. Install the CTs with the arrows pointing to the grid for consumption or export measurement.



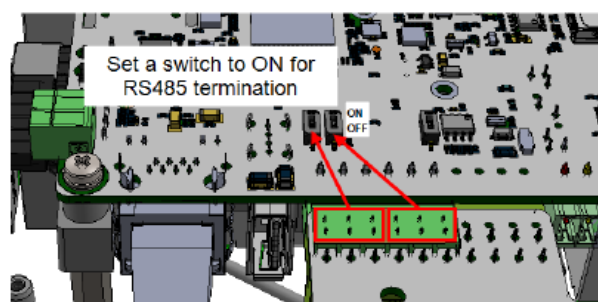
The meter communicates with the inverter/Commercial Gateway over an RS485 connection. Wire the meter in accordance with the three-phase connection diagrams below.



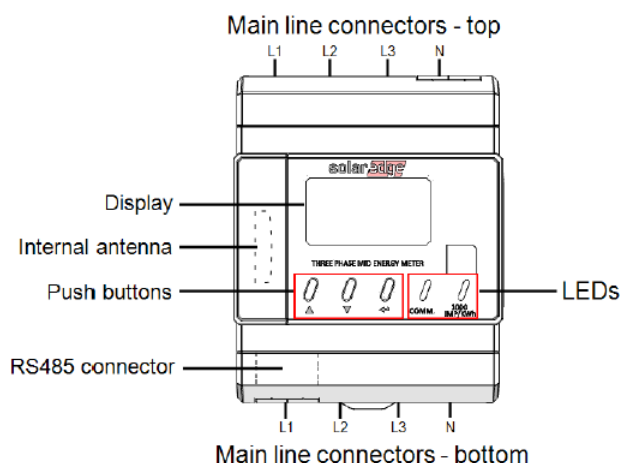
9. Connect the RS485 twisted pair cable to the 3-pin terminal on the meter: a.
10. Connect the wires to the A+ and B- terminals, and connect the shield to the G terminal. 5.
11. Set the meter's DIP switches as follows.
12. Set the termination DIP switches for Termination. Both switch 1 and switch 2 should be in the DOWN position.
13. Set the address DIP switches for Modbus Address 2: Set switch 2 to UP, and set switches 1 and 3 to DOWN.
14. Prepare to connect to one of the available RS485 ports of the device, as shown below:
15. Inverter RS485-1 - pull out the RS485 connector located on the communication board.



16. Connect the meter's RS485 G, A+, and B- connectors to the G, A, and B connectors in the inverter.
17. If the SolarEdge device is at the end of the RS485 bus, terminate as follows:
18. Inverter - Terminate by switching a termination DIP-switch inside the inverter to ON (top position).



→ Inline meter interface



- **Main line connectors:** - inputs/output terminal blocks
- **Internal antenna:** - for wireless connectivity with the inverter
- **RS485** - detachable connector for wired connectivity with the inverter.
- **Three push buttons:** - to operate the inline meter display.

Button	Function	Combination
Left	Up	Push the Left and Middle buttons simultaneously for 5 seconds in order to initiate an SolarEdge Home Network search session.
	Push the left button for 5 seconds in order to reset the meter.	
Middle	Down	
Right	Enter	

- **LEDs** - used to monitor meter status:
 - Orange: meter operation
 - Blue: SolarEdge Home Network/RS485 communication status

Function	LED	Indication
Energy measurements	Orange	Blinking rate of 1000 pulses per hour indicates 1 kWh of measured energy.
Communication status	Blue	■ Blinking: Meter is searching for a SolarEdge Home Network, or is not connected to RS485 bus.
		■ Lit: Meter is in the reboot state, or has successfully paired with the SolarEdge Home Network, or was successfully connected to the RS485 bus.
		■ Fast blinking during configuration of the inline meter.

Display - Used for basic configuration and operation of the meter, and for reapplying factory default settings.

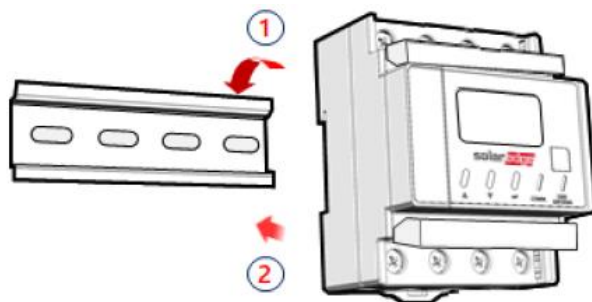
→ Inline meter installation

If an AC wiring extension is required, use the same type of AC wiring that is used in the cabinet.

RS485 wiring specifications:

- Cable type: Min. 3-wire shielded twisted pair (a 4-wire cable may be used)

- Wire cross-section area: 0.2- 1 mm² (a CAT6 cable may be used)
- If using a cable longer than 10 meters in areas where there is a risk of induced voltage surges by lightning, it is recommended to use external surge protection devices.
- **Mount on a DIN rail-** The inline meter is designed for permanent installation in indoor locations. It is intended for installation in switch cabinets or in small-installation distributors on a 35mm mounting rail as per DIN EN 60715.
- Mount the inline meter on the DIN rail as shown in the figure below. Fit the slot on the back of the meter over the DIN rail (see steps 1 and 2), and secure it in place on the DIN rail using the latching mechanism at the bottom of the meter.

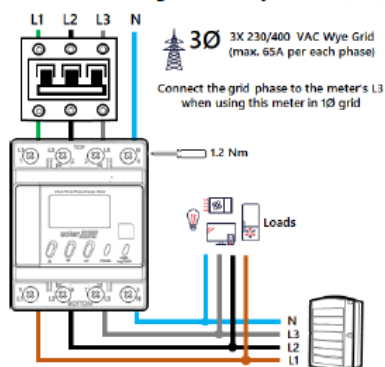


■ Wiring the meter

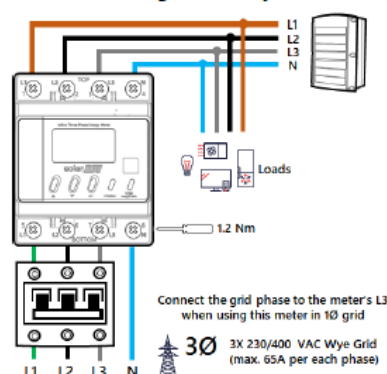
1. Turn off the AC power (main circuit breakers) before connecting the inline meter.
2. Using one of the below wiring schemes, connect the AC wiring to the terminal blocks at the top and the bottom of the inline meter

For Import/Export Metering

3Ø Meter Wiring - Accuracy class B (1%)

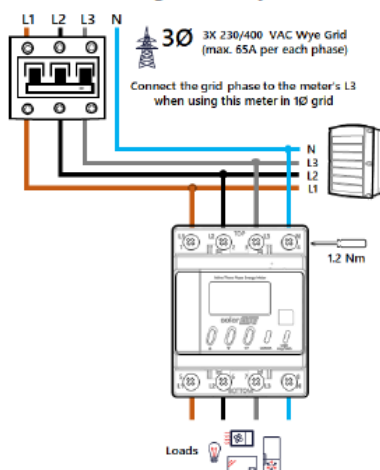


3Ø Meter Wiring - Accuracy class A (2%)

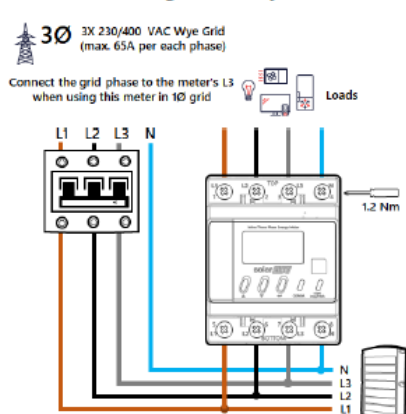


For Consumption Metering-

3Ø Meter Wiring - Accuracy class B (1%)



3Ø Meter Wiring - Accuracy class A (2%)



System Startup and Shutdown

→ To start up the system:

1. Turn ON the SolarEdge Home Battery MCB.
2. Move the SolarEdge Home Battery toggle to the ON position.
3. Switch to the ON position, the DC Isolator on the DC Combiner (If installed).
4. Switch to the ON position, the DC Isolator on the inverter DCD.
5. Move the SolarEdge inverter toggle to the ON position.
6. Switch to the ON position, the AC to the inverter at the adjacent AC isolator (if installed) and inside the main switch board.

→ To shut down the system:

1. Move the SolarEdge inverter toggle to the OFF position and wait until the green LED is blinking, indicating that the DC voltage is safe (<50V), or wait five minutes before continuing to the next step.
2. Switch to the OFF position, the AC to the inverter at the adjacent AC isolator (if installed) and inside the main switch board.
3. Switch to the OFF position the DC Isolator on the inverter DCD.
4. Switch to the OFF position the DC Isolator on the DC Combiner (If installed).
5. Move the SolarEdge Home Battery toggle to the OFF position.
6. Turn OFF the SolarEdge Home Battery MCB.

→ To shut down the system in case of emergency:

1. Switch to the OFF position, the AC to the inverter at the adjacent AC isolator (if installed) and inside the main switch board.
2. Switch to the OFF position the DC Isolator on the inverter DCD.
3. Switch to the OFF position the DC Isolator on the DC Combiner (If installed).
4. Turn OFF the SolarEdge Home Battery MCB.

The diagram illustrates the electrical connections for a Home Hub - Backup Interface - SolarEdge Home Battery system. The solar array (10 panels, 1000W each) is connected to the main switch board. The main switch board includes a meter and a backup interface. The backup interface is connected to the distribution board, which provides power to various loads: LIGHTS, LIGHTPOWER, POWER, OVEN, AIR CON, LAUNDRY, HOT WATER, and POWER. The distribution board is also connected to the home hub inverter, which is connected to the solar edge home battery. The system is grounded and includes an AC isolator.

FOR INFORMATION ONLY	
JOB NO. 001	SCALE: NTS
DRAWING NO. 001	
SHEET: 1 OF 1	

Figure 1: Home Hub, Backup Interface, SolarEdge Home Battery, Full Home Backup

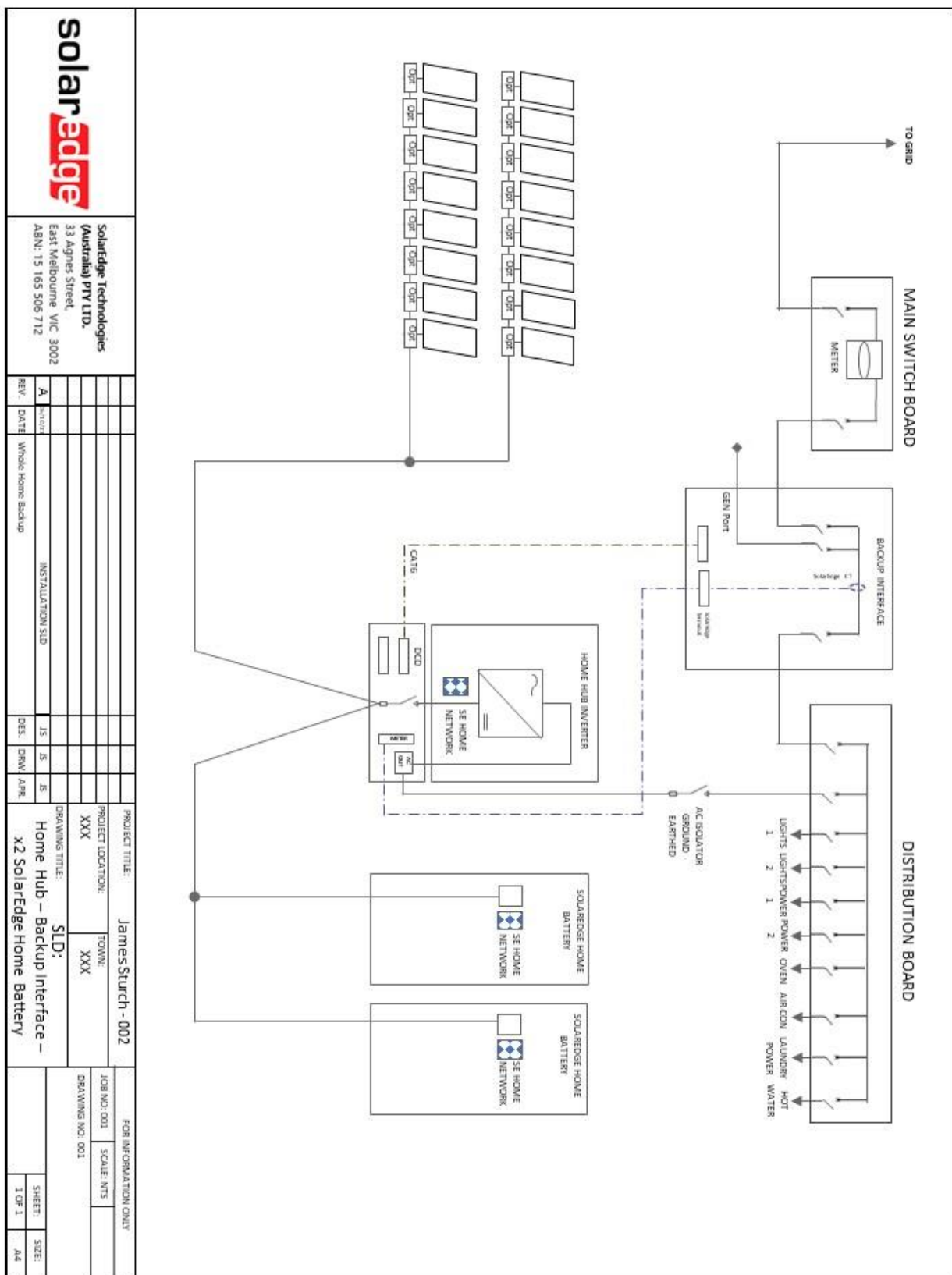


Figure 2: Home Hub, Backup Interface, Dual SolarEdge Home Batteries, Full Home Backup

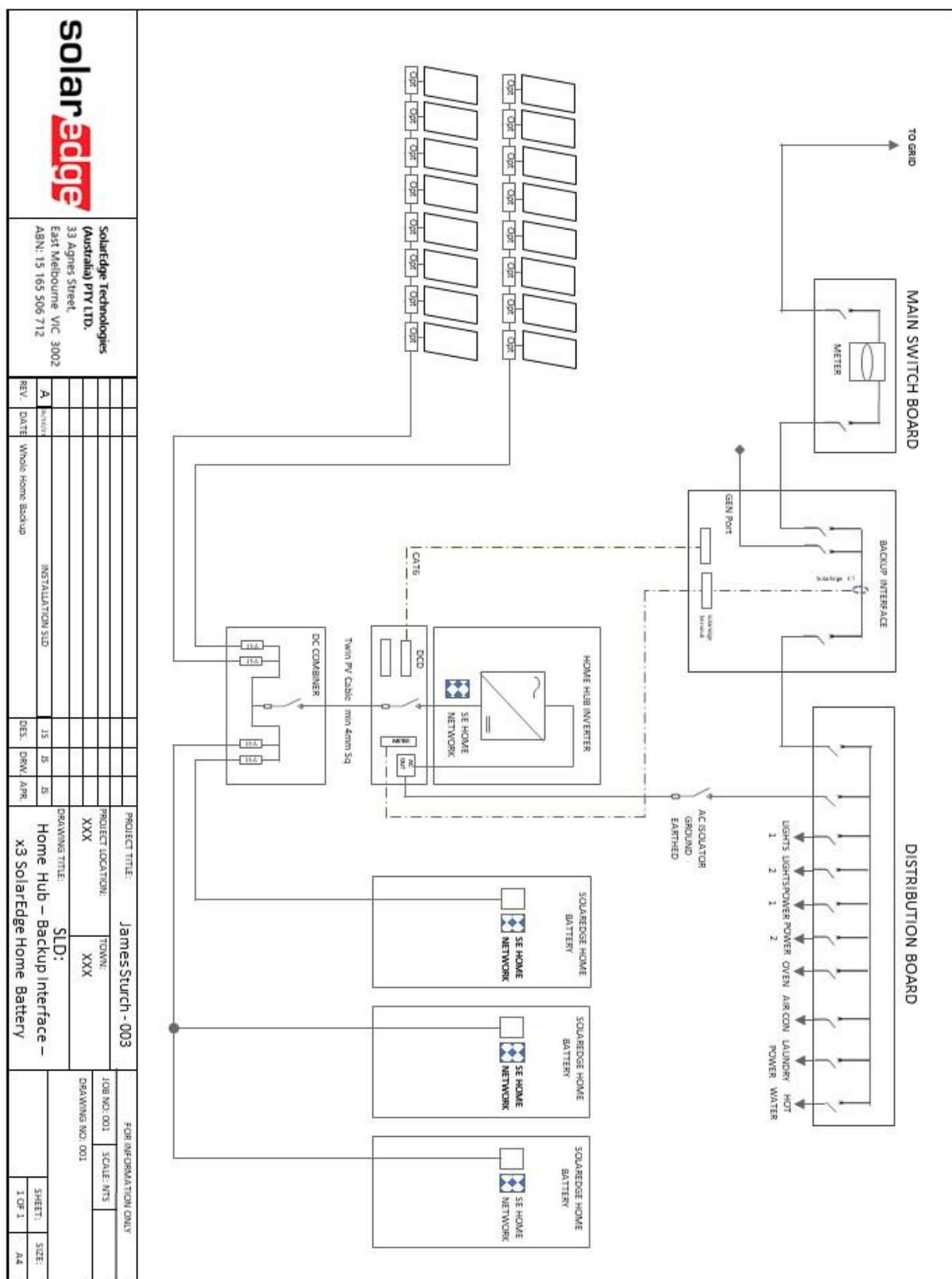


Figure 3: Home Hub, Backup Interface, Three SolarEdge Home Batteries, DC Combiner, Full Home Backup, Option A



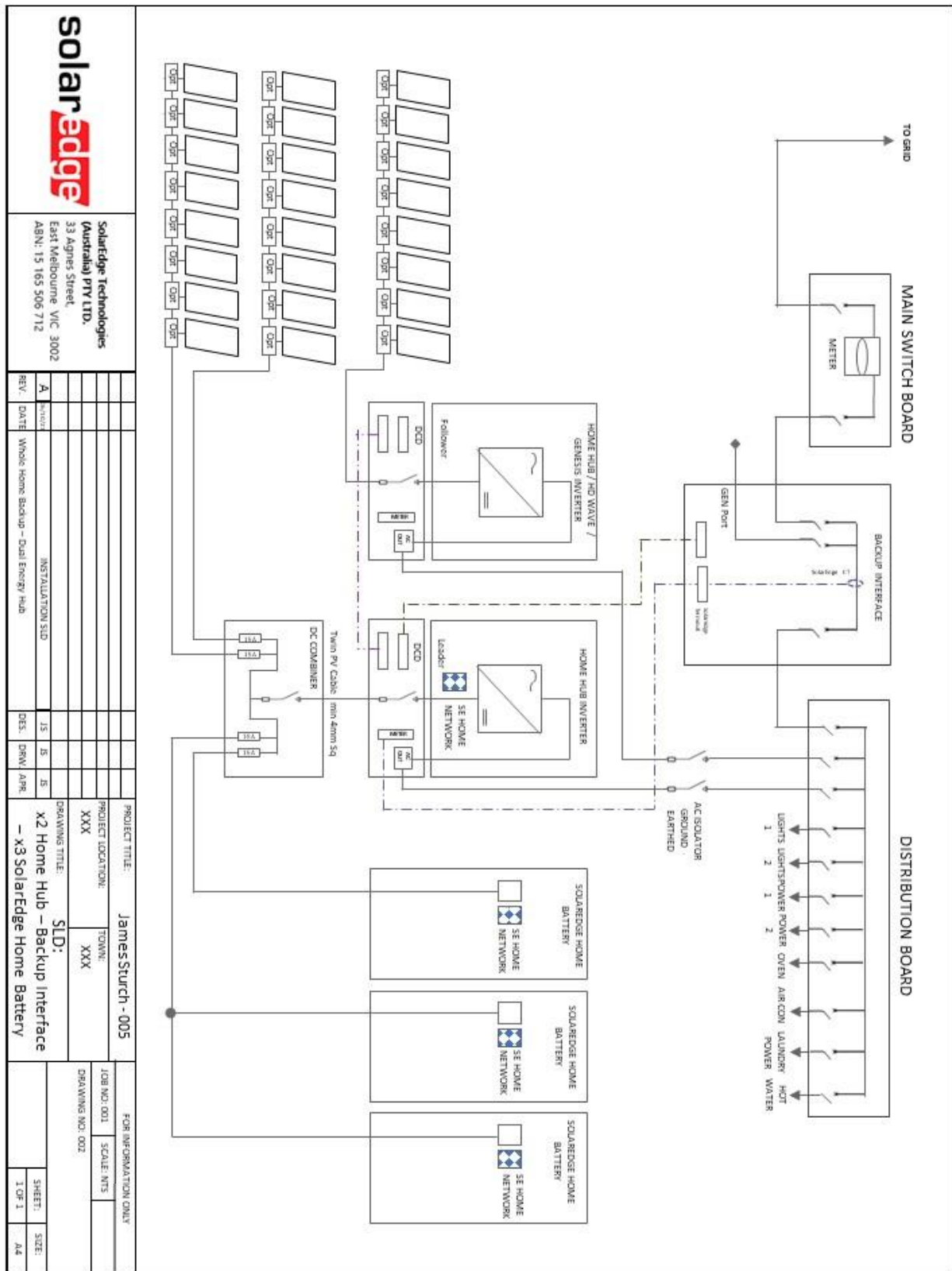


Figure 5: Twin Home Hub, Backup Interface, Three SolarEdge Home Batteries, DC Combiner, Full Home Backup, Option B

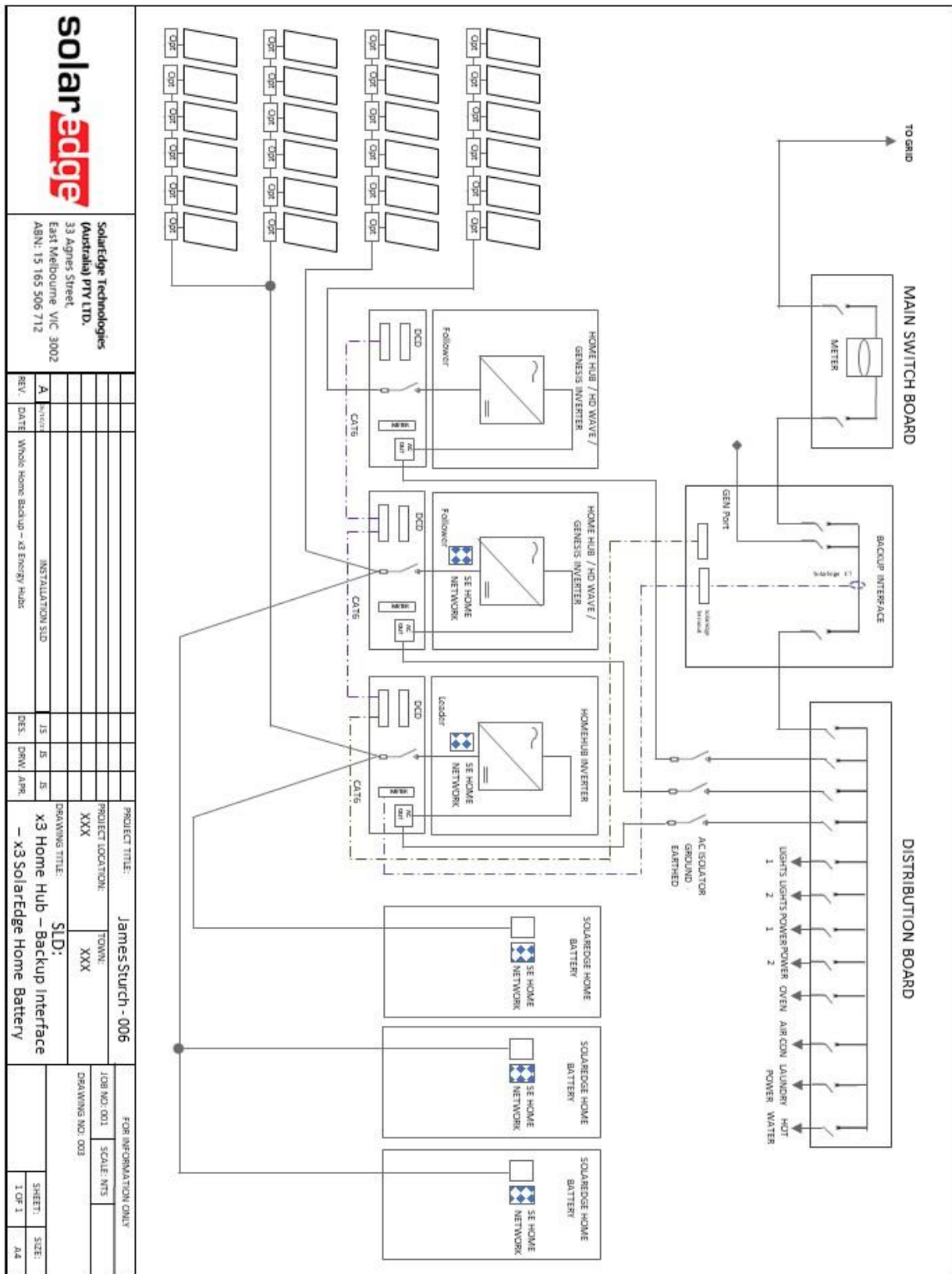


Figure 6: Three Home Hub, Backup Interface, Three SolarEdge Home Batteries, Full Home Backup, Option A

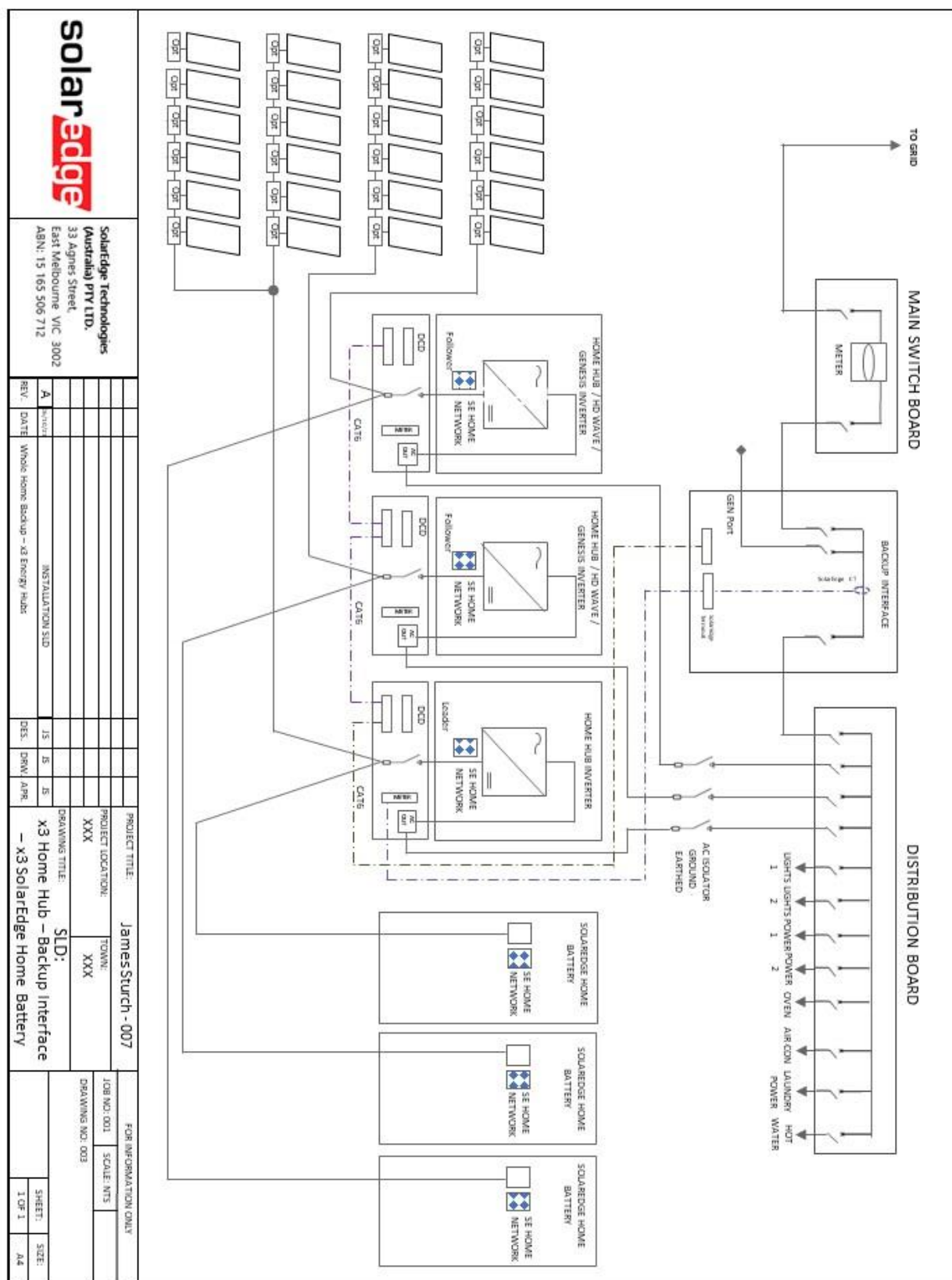


Figure 7: Three Home Hub, Backup Interface, Three SolarEdge Home Batteries, DC Combiner, Full Home Backup, Option B



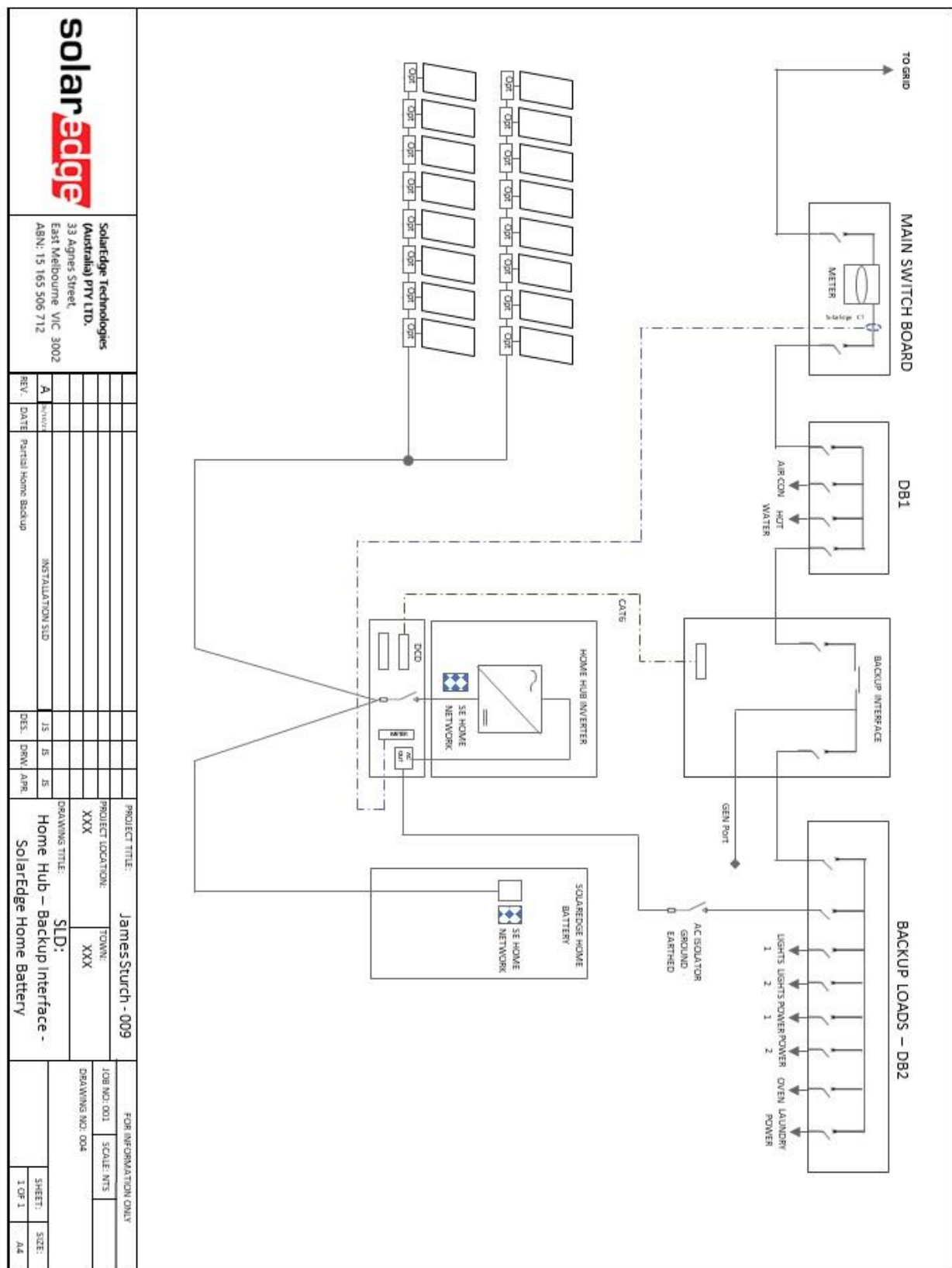


Figure 9: Home Hub, Backup Interface, and SolarEdge Home Battery, Partial Home Backup

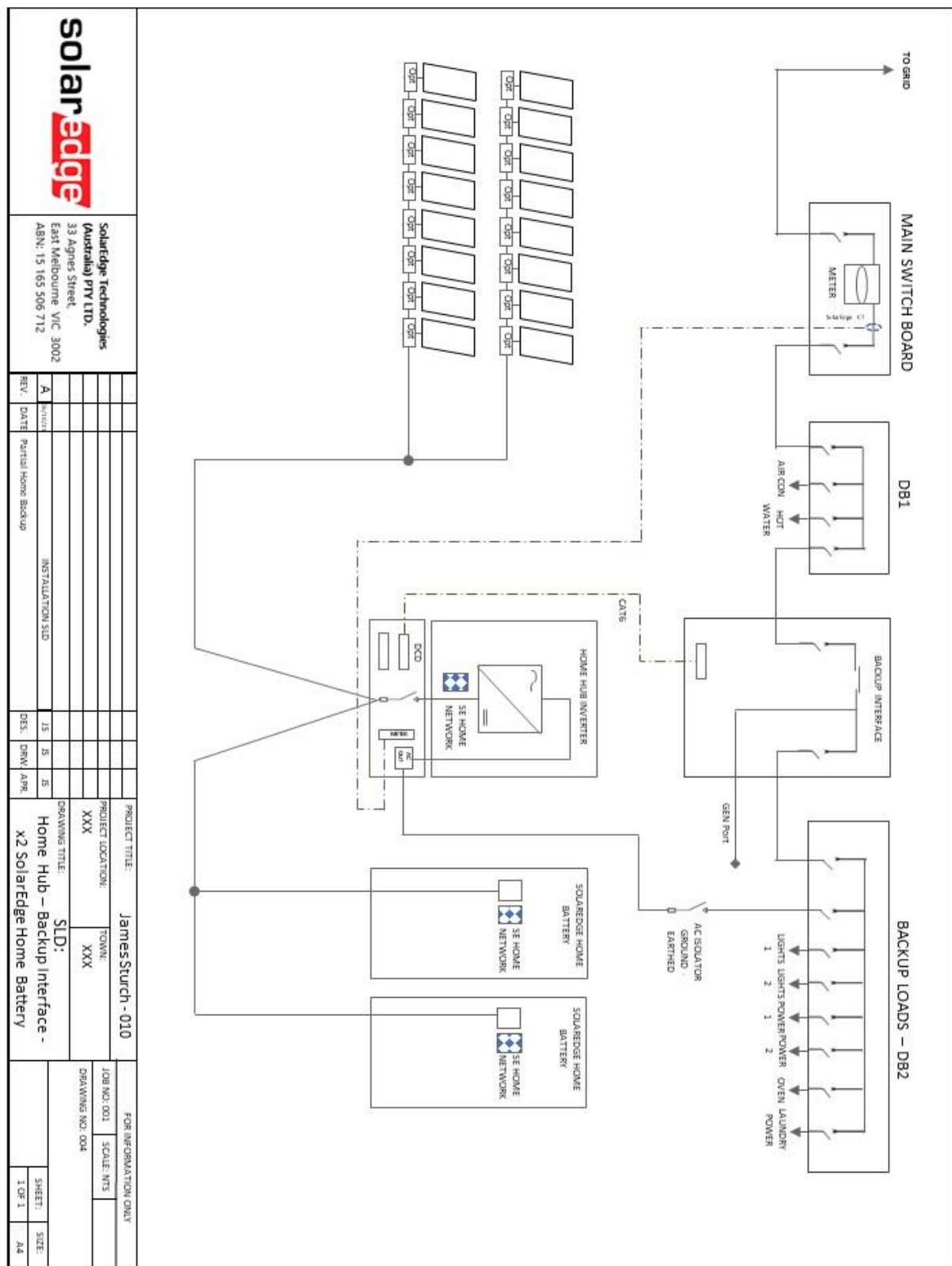


Figure 10: Home Hub, Backup Interface, Dual SolarEdge Home Batteries, Partial Home Backup

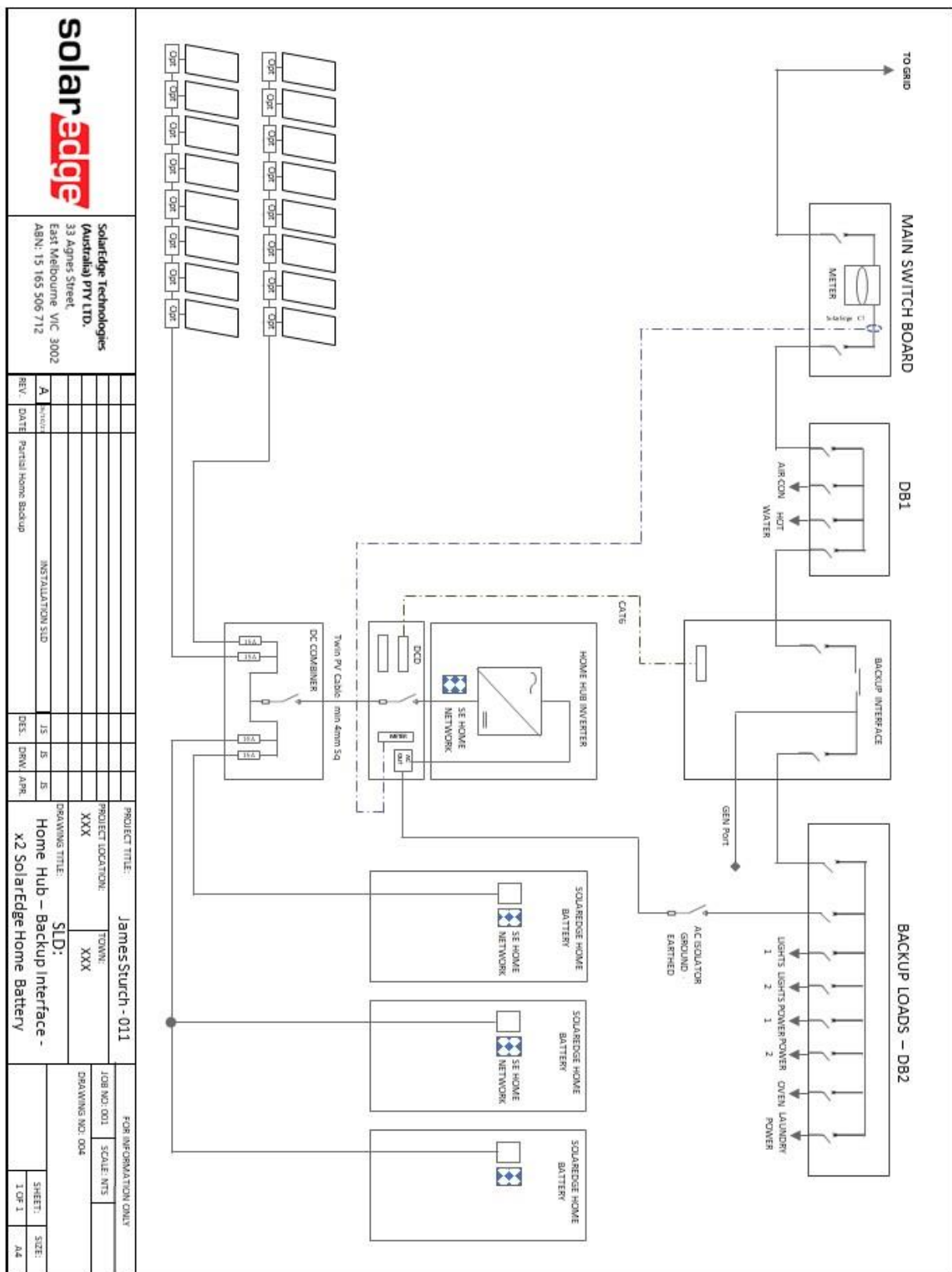


Figure 11: Home Hub, Backup Interface, Three SolarEdge Home Batteries, DC Combiner, Partial Home Backup

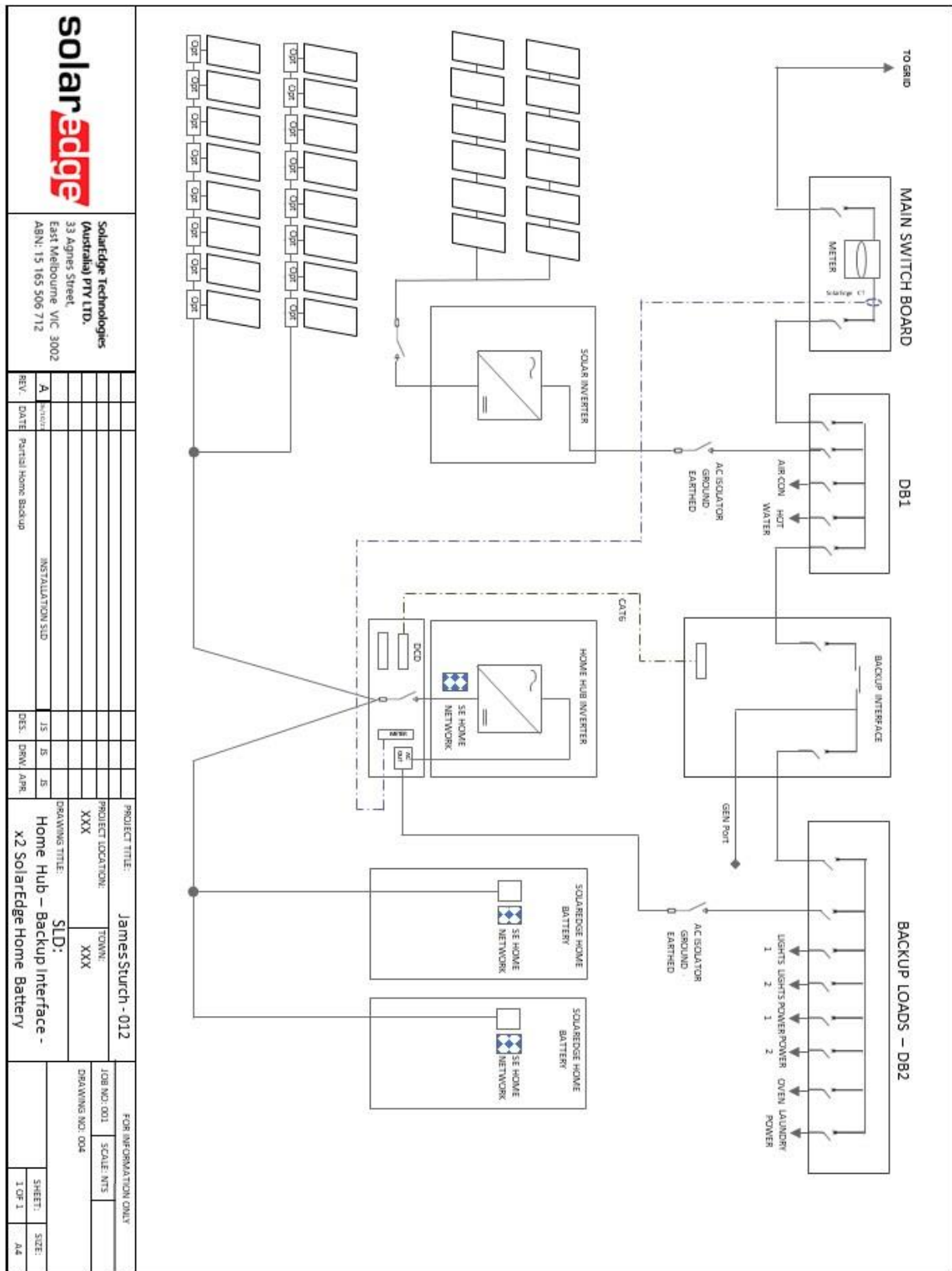


Figure 12: Home Hub, Backup Interface, Dual SolarEdge Home Batteries, Partial Home Backup and AC Coupled Inverter

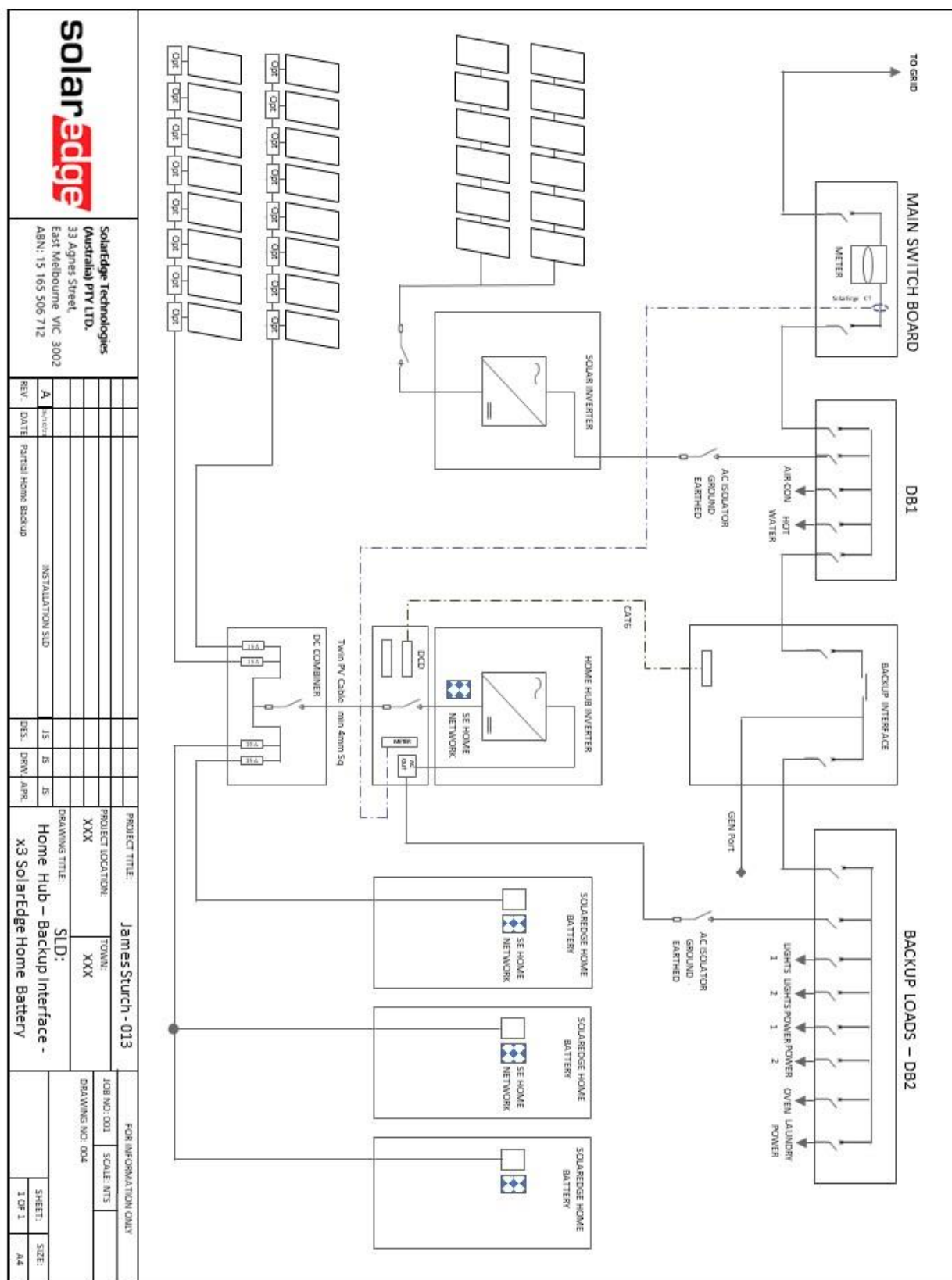


Figure 13: Home Hub, Backup Interface, Three SolarEdge Home Batteries, DC Combiner, Partial Home Backup and AC Coupled Inverter

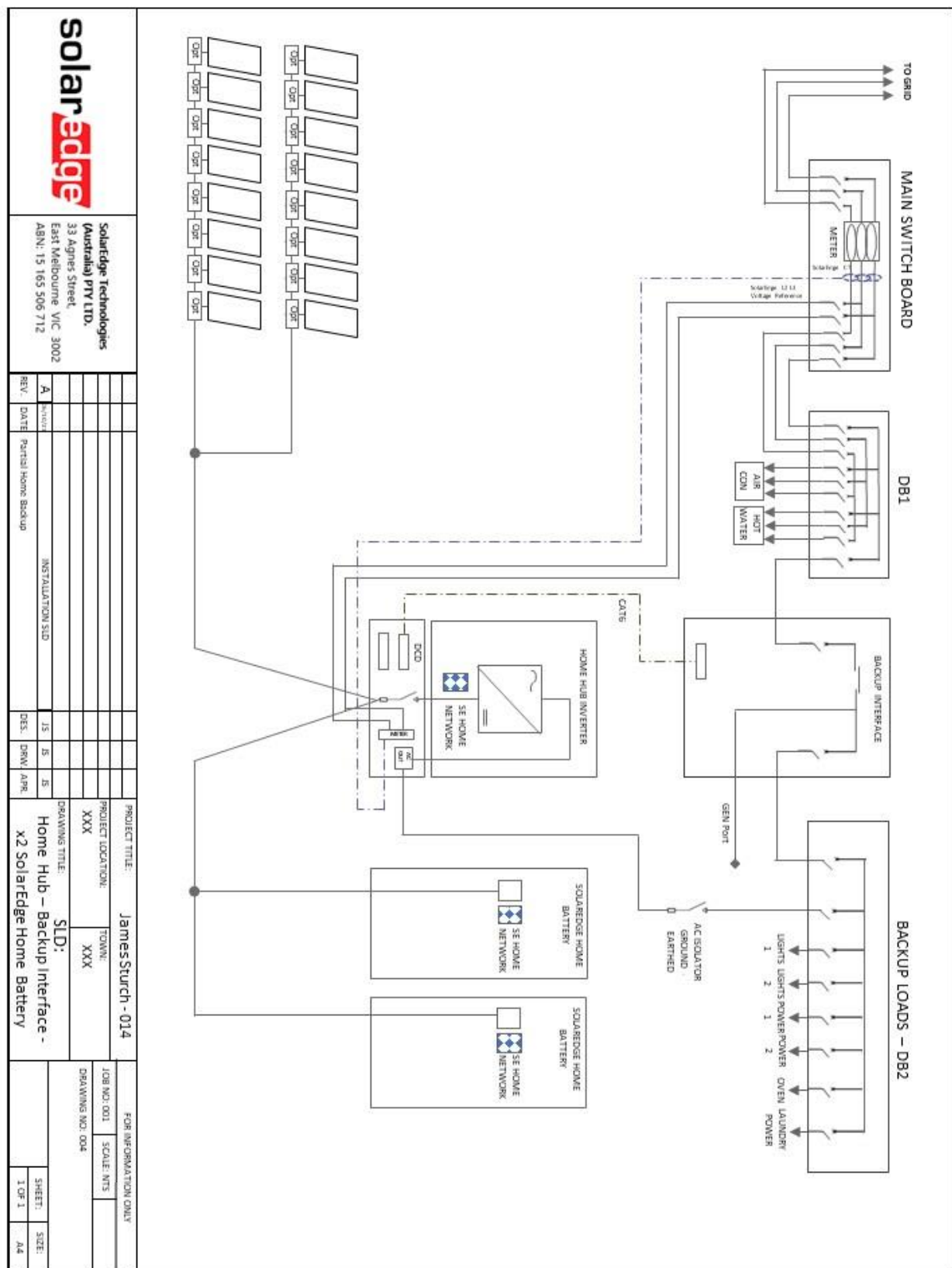


Figure 14: Home Hub, Backup Interface, Dual SolarEdge Home Batteries, Partial Home Backup, 3Ph Grid

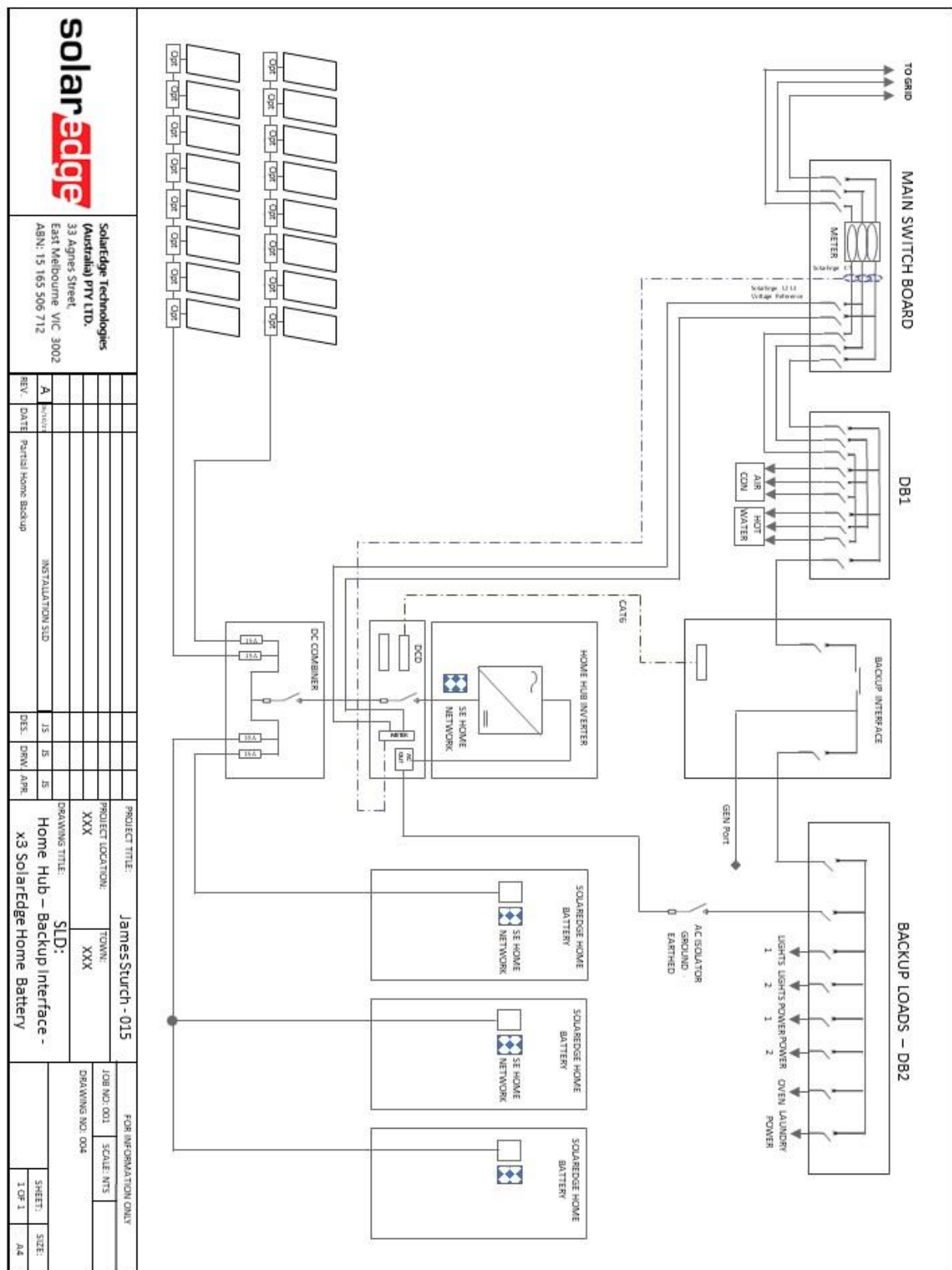


Figure 15: Home Hub, Backup Interface, Three SolarEdge Home Batteries, DC Combiner and Partial Home Backup, 3Ph Grid

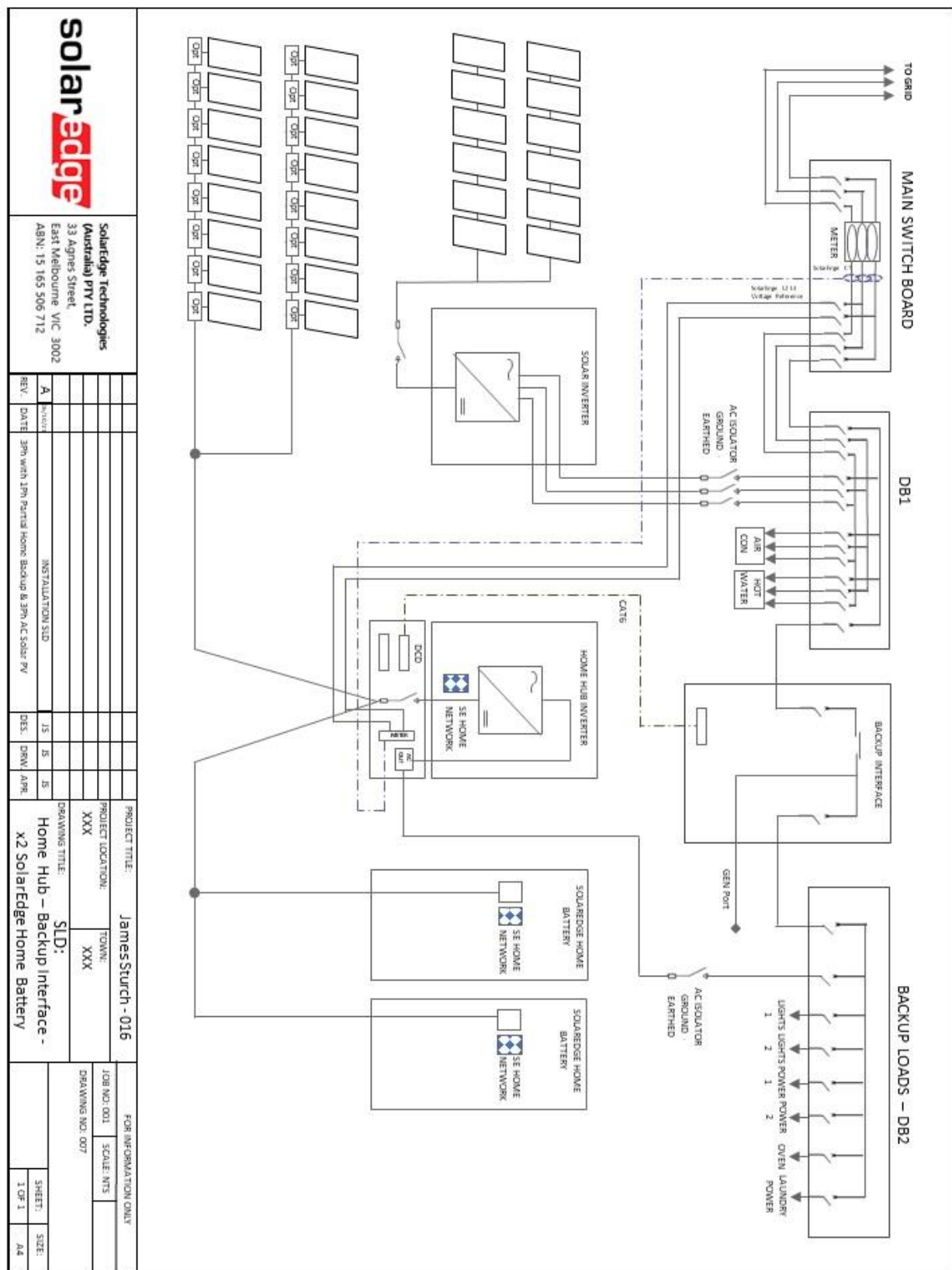


Figure 16: Home Hub, Backup Interface, Dual SolarEdge Home Batteries, Partial Home Backup, 3Ph Grid and AC Coupled Inverter

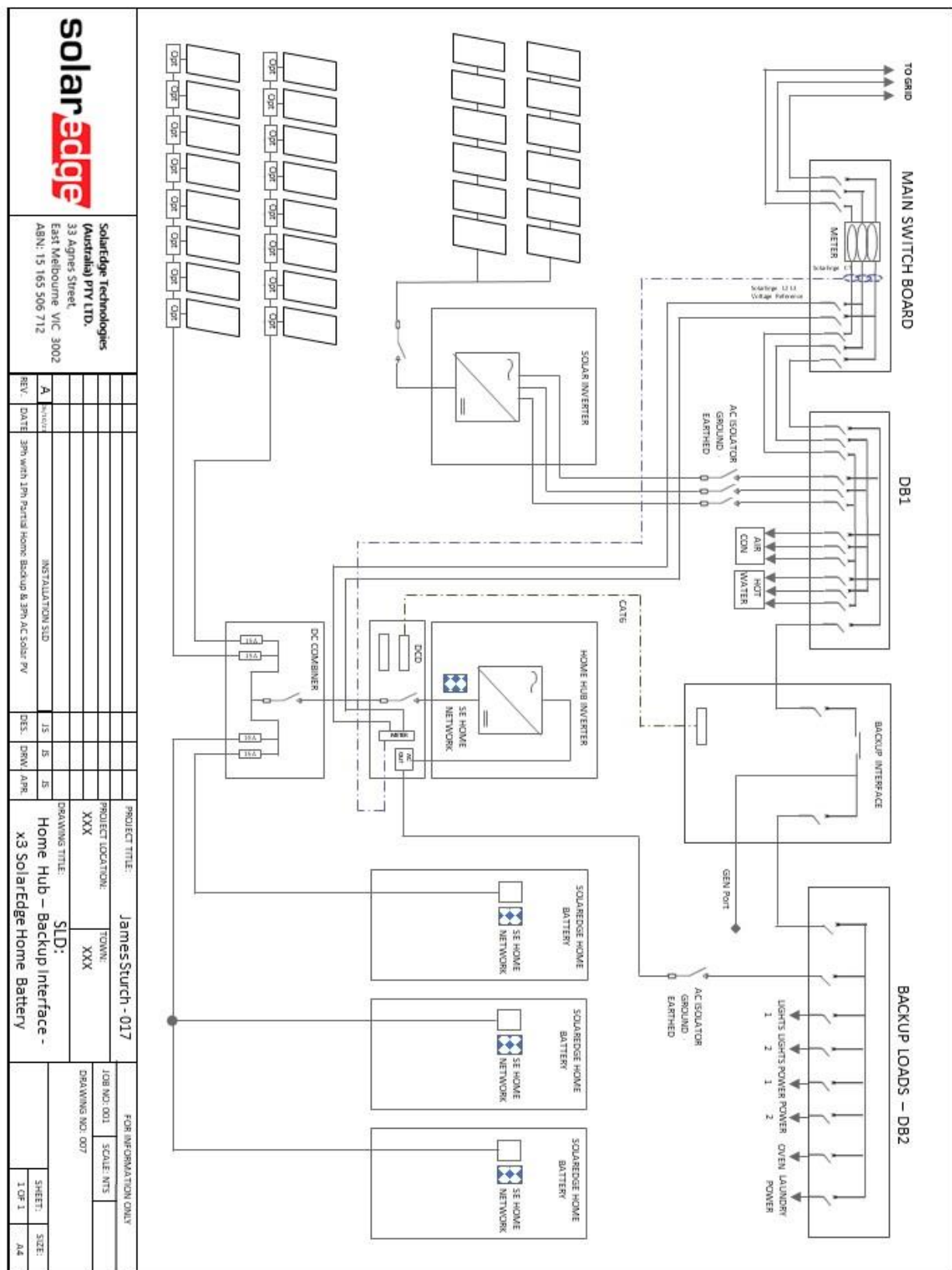


Figure 17: Home Hub, Backup Interface, Three SolarEdge Home Batteries, DC Combiner and Partial Home Backup, 3Ph Grid and AC Coupled Inverter

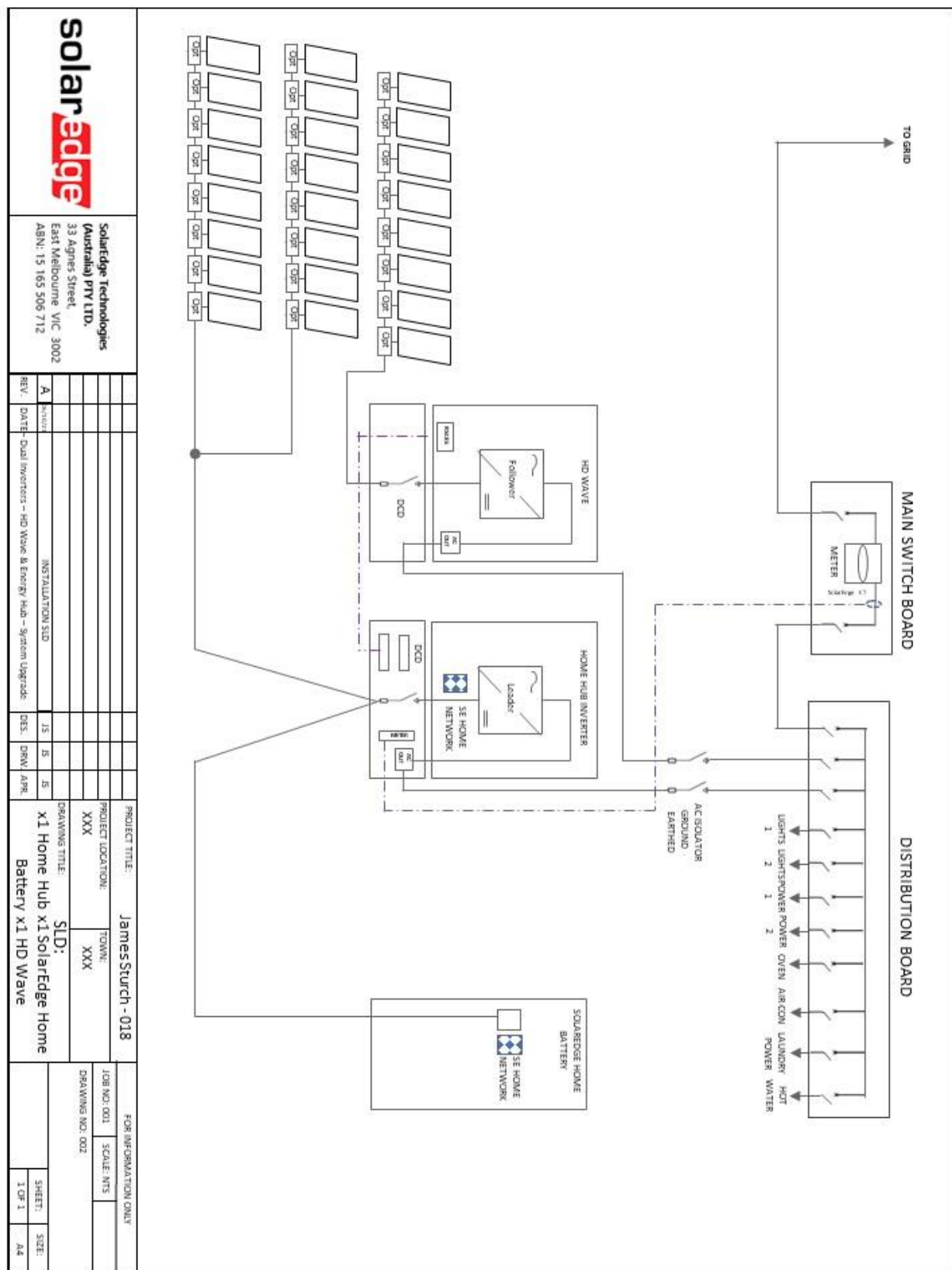


Figure 18: Home Hub, SolarEdge Home Battery additon to site with HD Wave, 1Ph Grid, metering option 1 – Existing CT

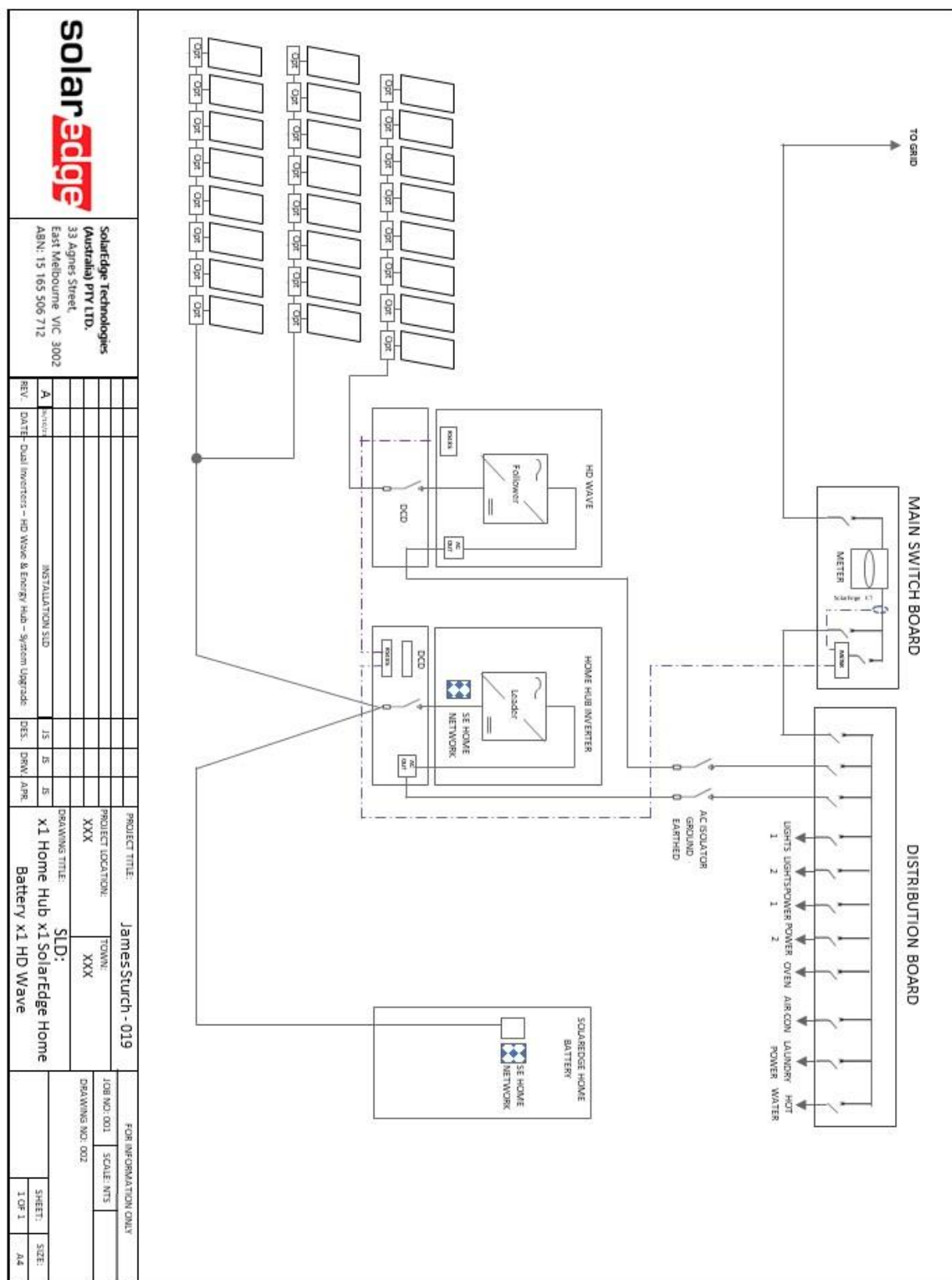
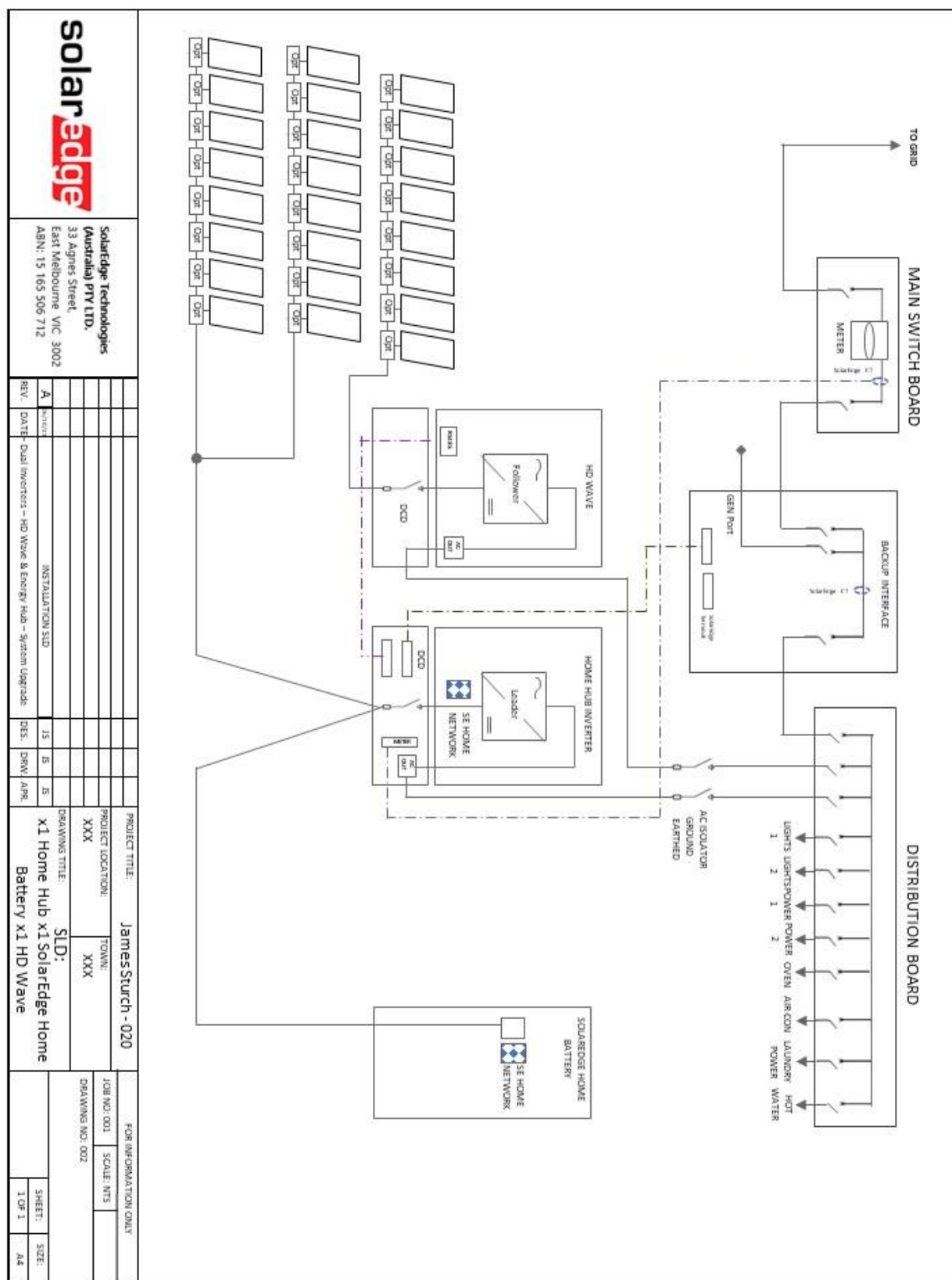
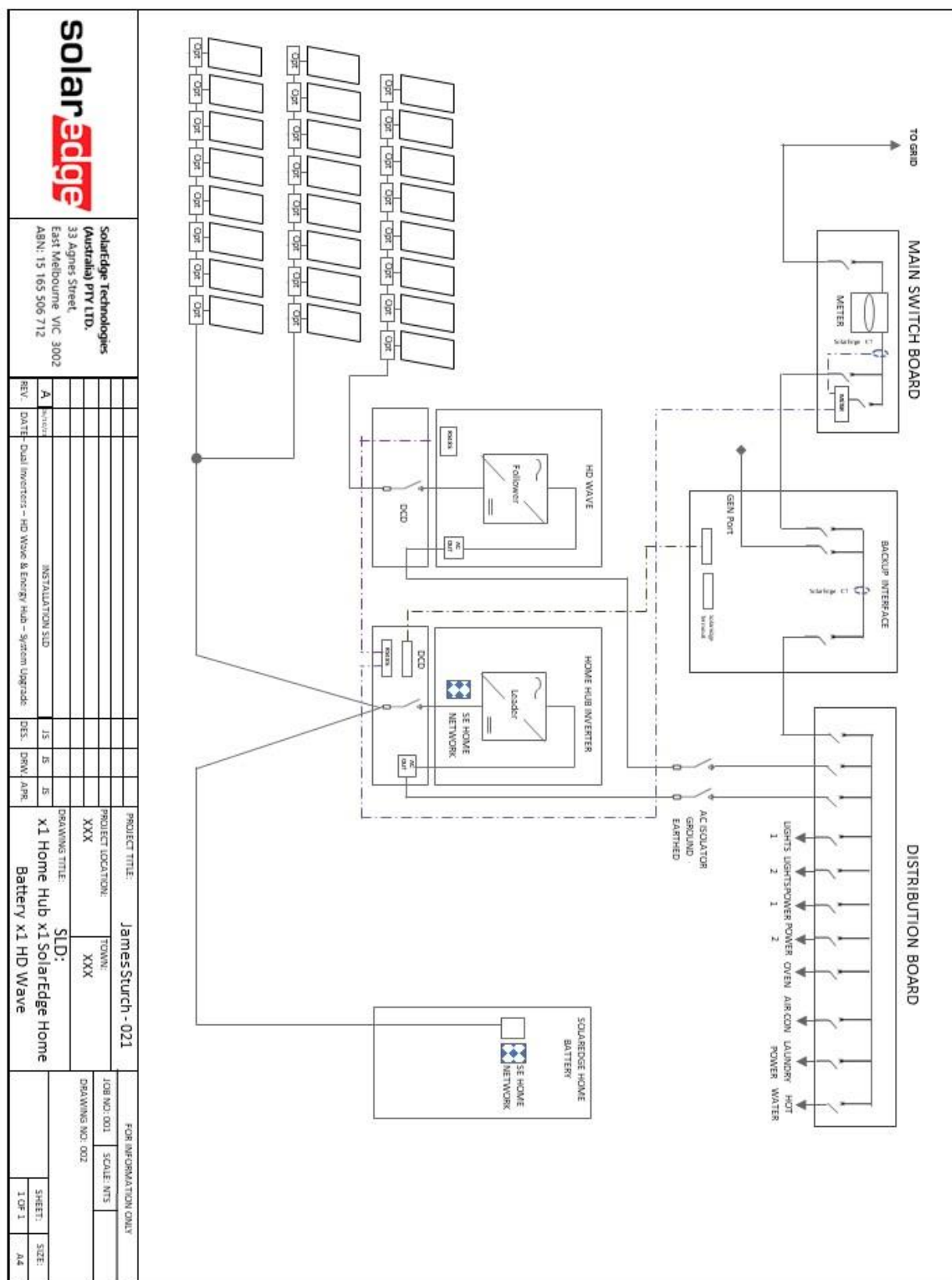


Figure 19: Home Hub, SolarEdge Home Battery addition to site with HD Wave, 1Ph Grid, metering option 2 – Existing metering



1 – Existing CT



– Existing Metering

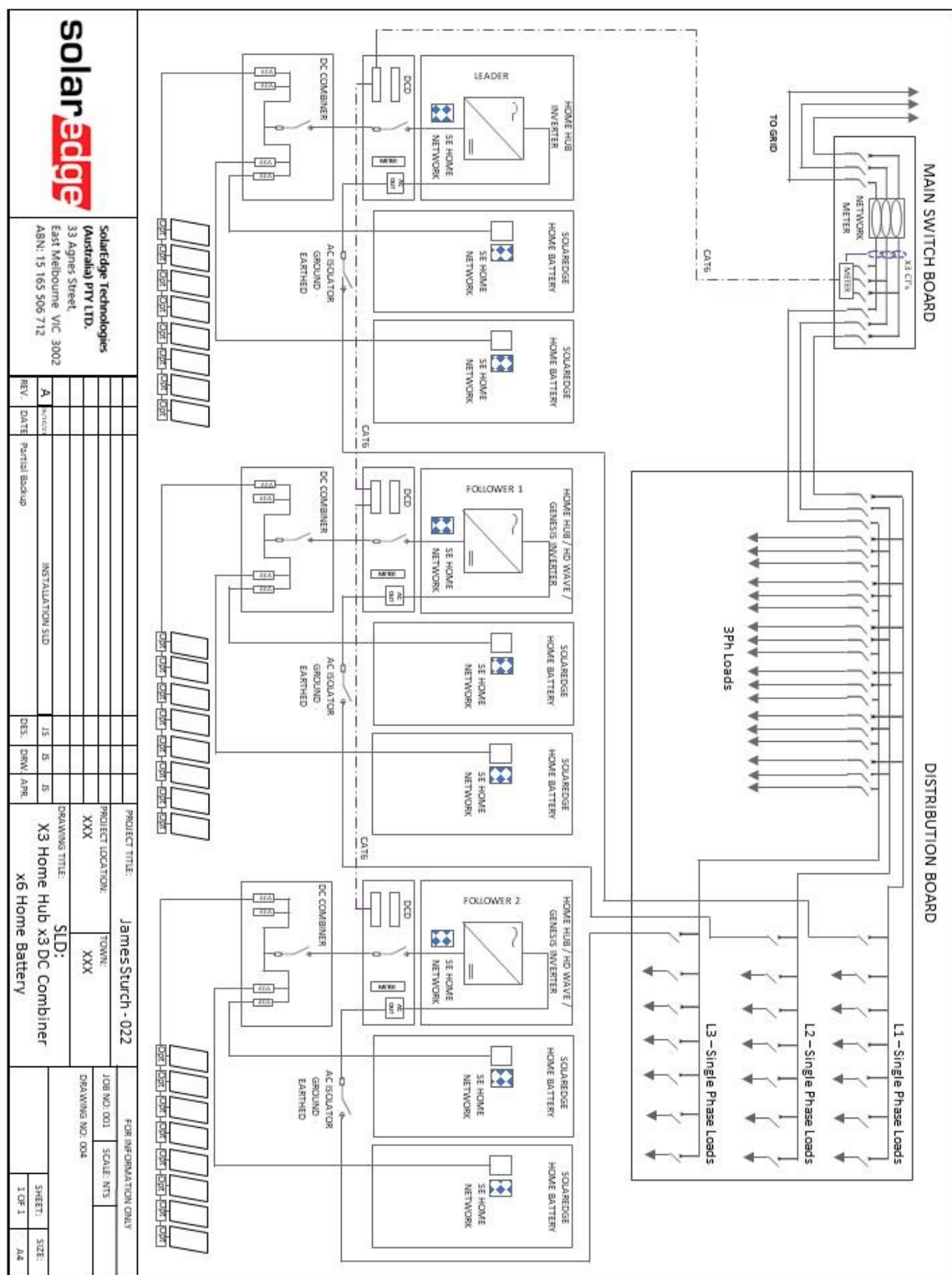


Figure 22: Three Home Hub's, x6 SolarEdge Home Batteries, 3Ph metering in the existing switch board.

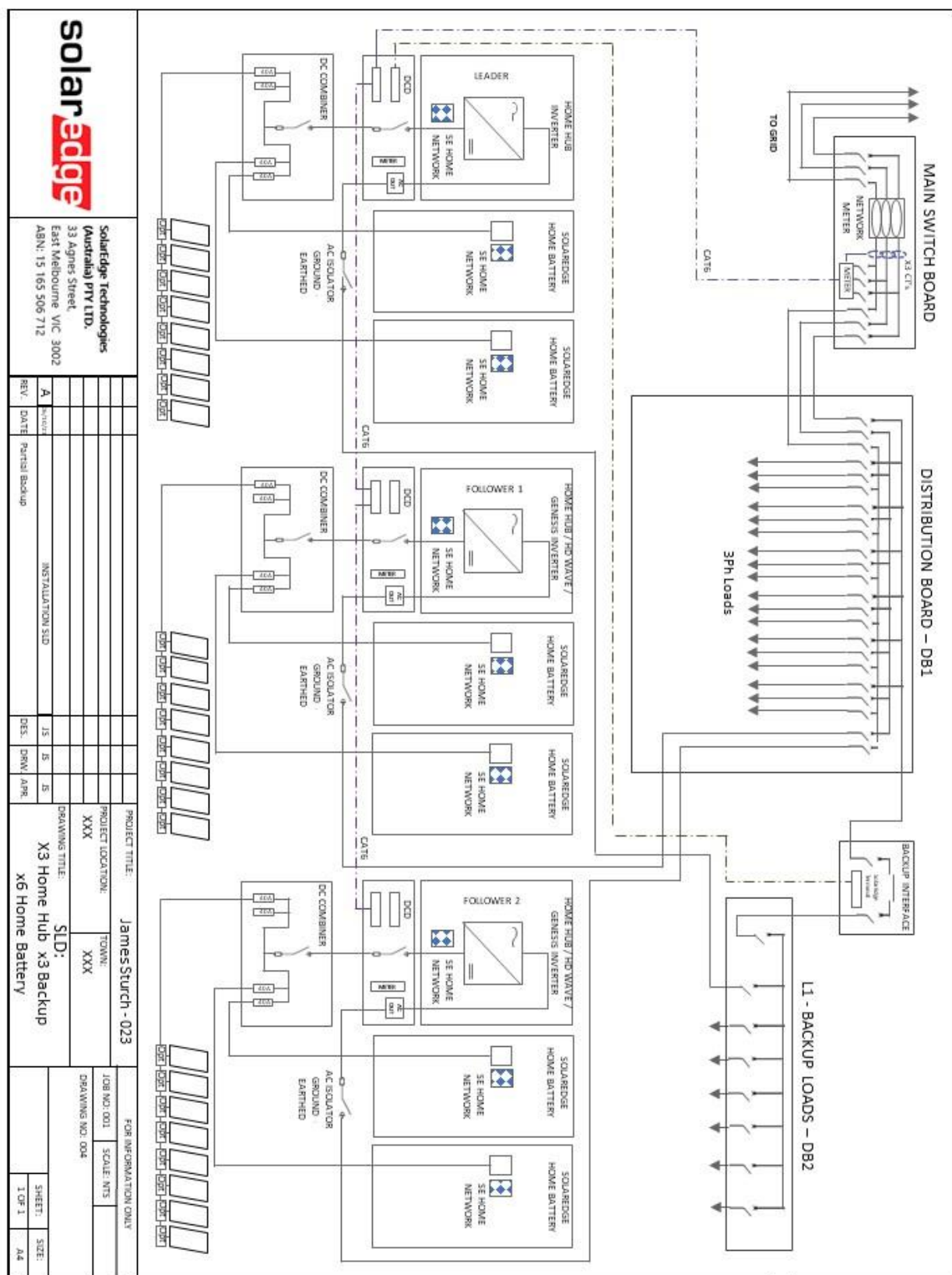


Figure 23: Three Home Hub's, x6 SolarEdge Home Batteries, 3Ph metering in existing switch board, partial backup on one phase only.

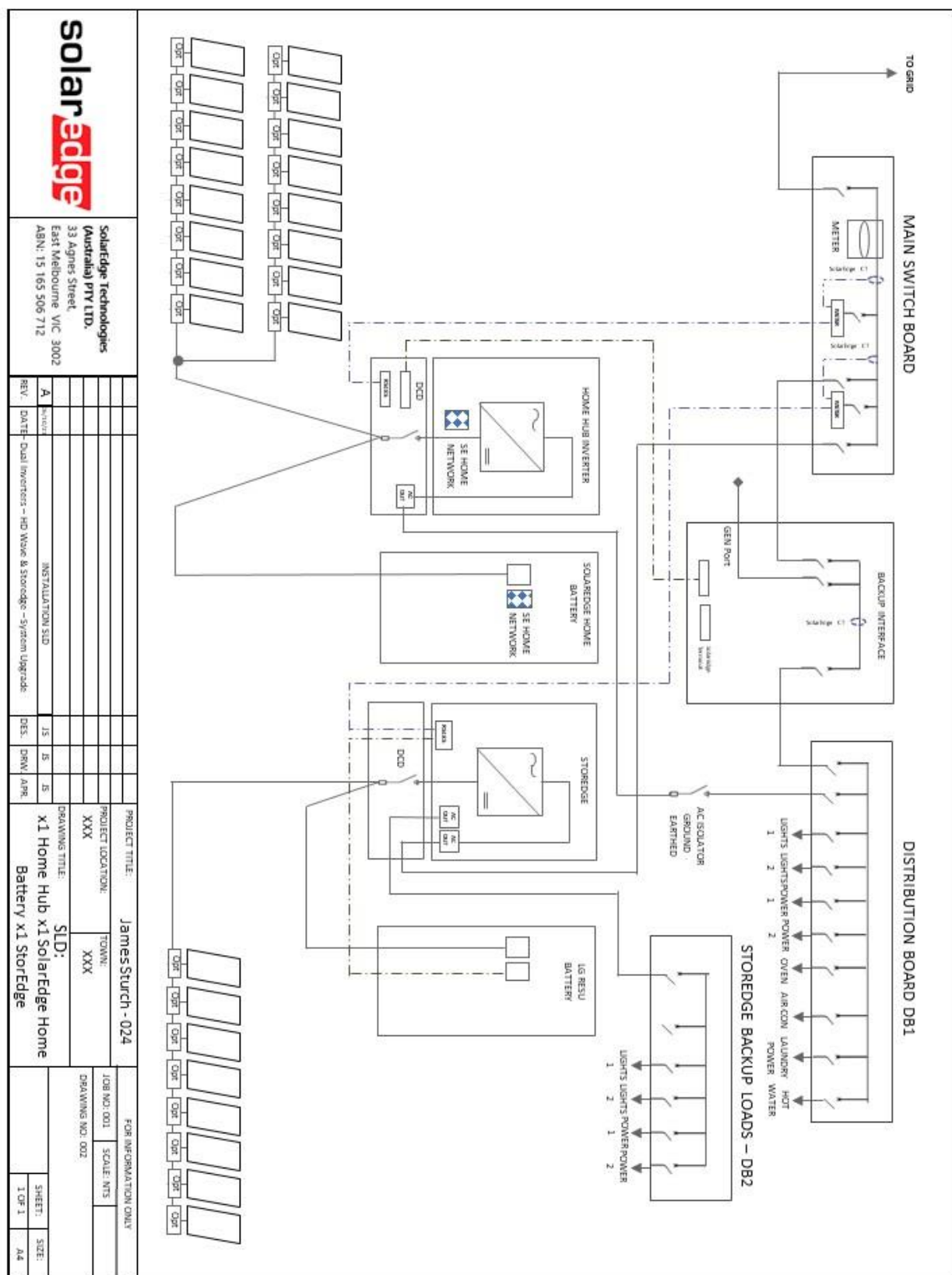
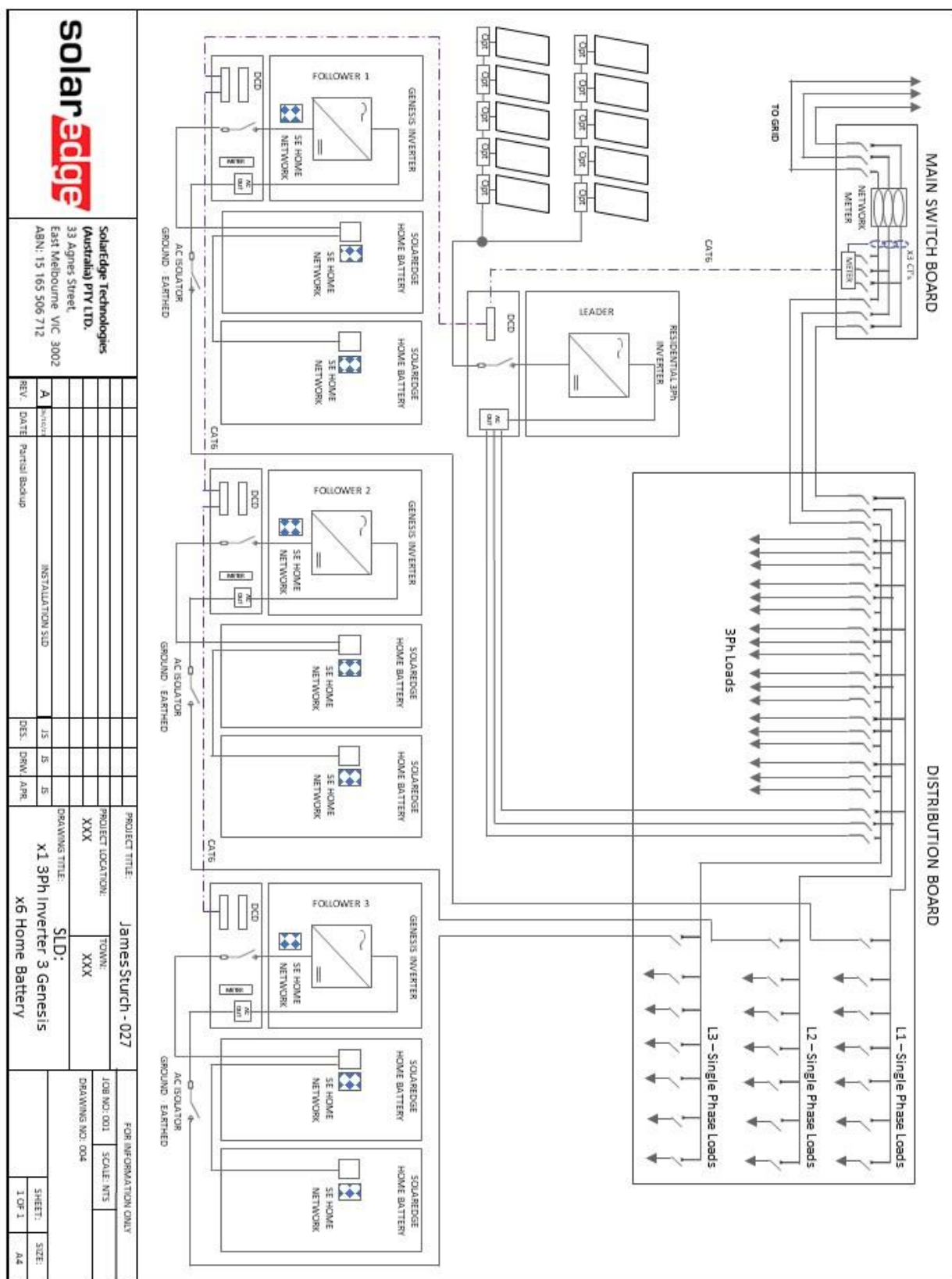


Figure 24: Home Hub, SolarEdge Home Battery Partial Backup, StorEdge, LG RESU Prime, Metering Option A.





3Ph Inverter (PV Connected) x3 Genesis inverters each with Dual Home Batteries, Metering via Modbus Meter.

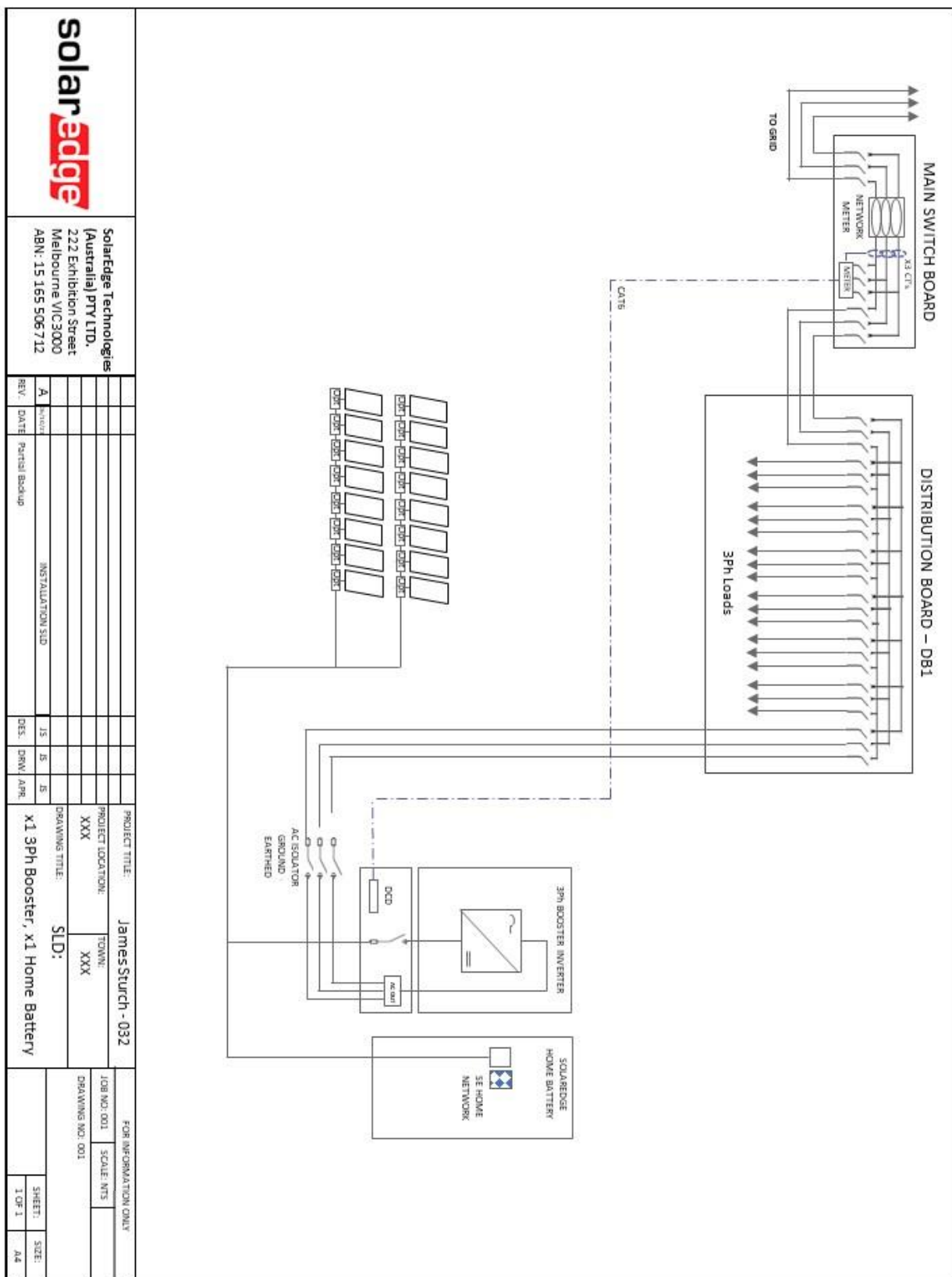


Figure 28:

3Ph Booster Inverter (PV Connected) Home Battery via Home Network, Metering via Modbus Meter.

AS/NZS 4777.2:2020 Residential STC kWp Calculations

New Labelling Requirements

To align with the new testing requirements and product definitions contained within AS/NZS 4777.2:2020. All SolarEdge inverters will have their labelling updated to reflect the new requirements illustrated in Table 1.

Depending upon additional hardware components installed, the inverter and overall system will fall into one of three definitions across two main categories:

1. Non-multiple mode inverters – incapable of providing backup. HD-Wave, HD- Wave Genesis, HD-Wave EV and Residential 3Ø inverters.
2. Multiple mode inverters – capable of providing backup. The Home Hub inverter with Backup Interface.

Inverter/System Definition	Backup	System Configuration	Product Code Suffix
PV & Battery Inverter	-	Solar + DC-Coupled Battery	SExxxxH AUB
Multiple Mode Inverter	Y	Solar + DC-Coupled Battery + Backup	SExxxxH-MM

Table 1: Definitions and corresponding Product Code suffix designations.

Guidance Relating to PV DC Oversizing of SolarEdge Systems

To SolarEdge inverters provide the ability to significantly oversize the system's PV array once a battery is connected to facilitate improved battery charging performance.

The following table details the maximum volume of PV DC Capacity and therefore number of STC's, which can be generated based on the inverter capacity and associated hardware components.

Home Hub Inverter	STC Calculation for PV Oversizing
PV only	133.3% x inverter AC output
PV + Battery	Up to 300% x inverter AC output (See Table 3) with battery
HD-Wave & Genesis	STC Calculation for PV Oversizing
PV only	133.3% x inverter AC output
PV + Battery	Up to 200% x inverter AC output (Inverter + DC Combiner)
3Ph Booster	STC Calculation for PV Oversizing
PV only	133.3% x inverter AC output
PV + Battery	133.3% x inverter AC output

Table 2: System Definition and STC Calculation for PV oversizing

Home Hub as a multiple mode inverter allows greater PV DC oversizing than the non-multiple mode inverters, such as the Genesis inverter.

When adding extra PV DC capacity for battery charging, we suggest using the following methodology:

1. Oversize the inverter by 133.3% in-line with CER recommendation.
2. Connect up to 5kW for each battery up to the maximum allowable level specified on the Energy Hub datasheet.

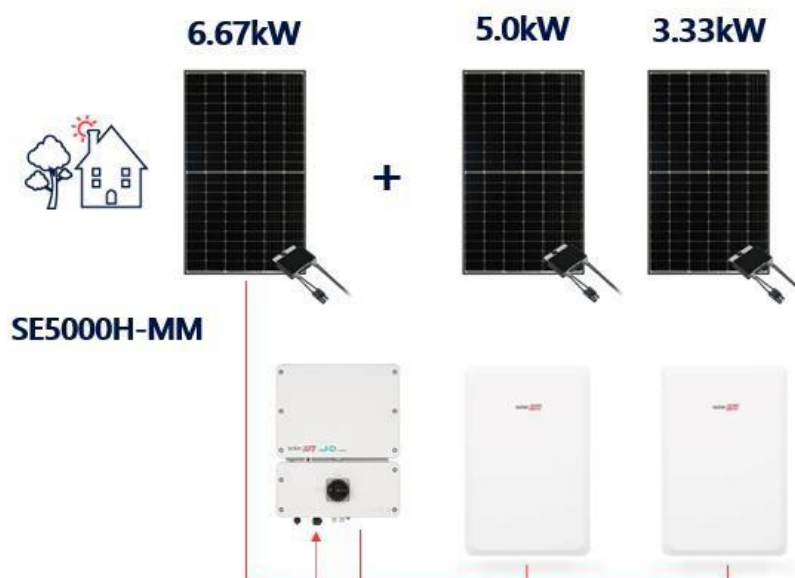


Figure 28: Home Hub SE5000H-MM maximum oversizing example

Guidance Relating to kWp Ratio for STC Calculations – SolarEdge Home Battery

The applicable volume of STC's is defined by the inverter type and its definition.

Home Hub as a multiple mode inverter that allows greater PV DC oversizing than the non- multiple mode inverters such as the Genesis inverter.

Non-multiple mode inverters do not specifically require a DC Combiner Box for battery connection, rather it is needed to facilitate extra PV STC claims for battery charging.

We suggest when making grid connection applications or STC claim submissions the inverter model specified contains the product code suffix that reflects the system's full capabilities. For example, Home Hub submissions specify "SE5000H-MM", for Genesis submissions, specify "SE5000-BPV".

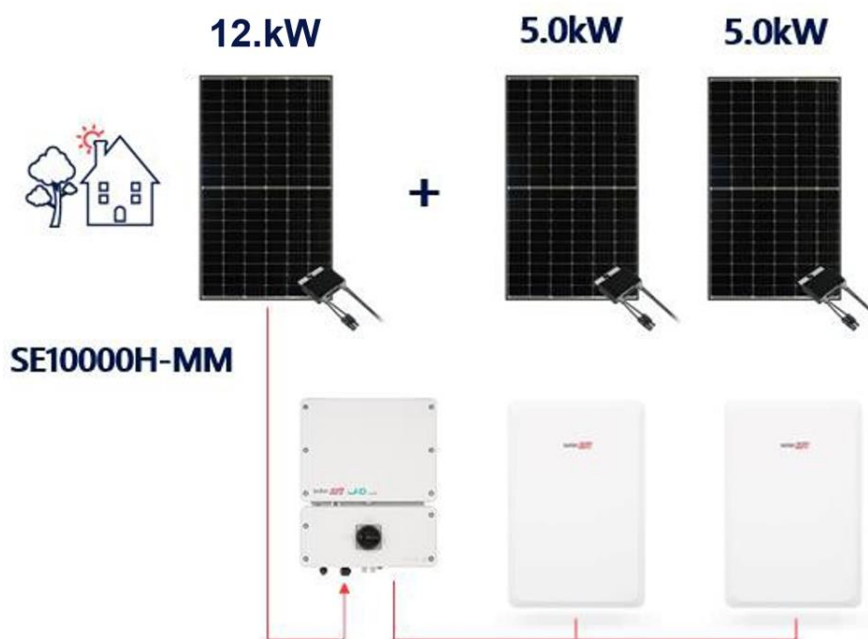


Figure 29: Home Hub SE10000H-MM maximum oversizing example

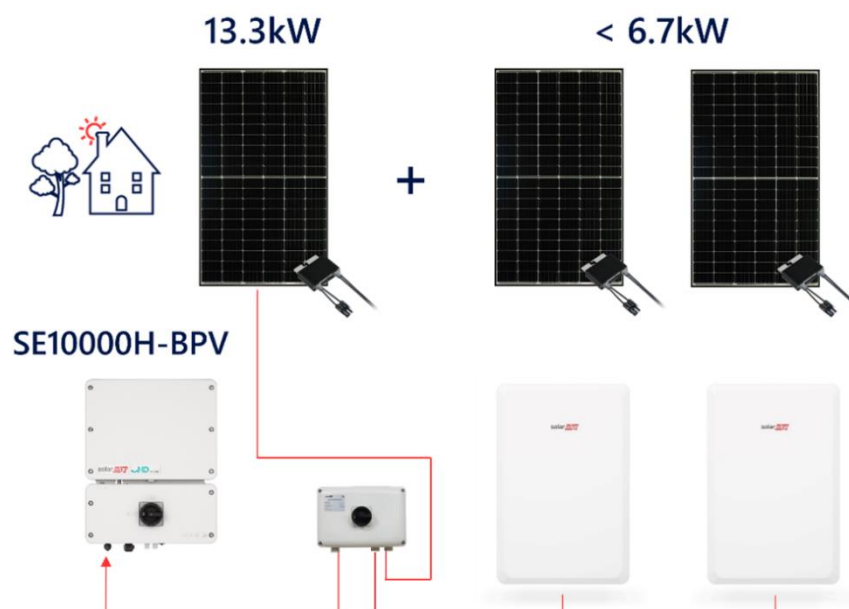


Figure 26: Genesis SE10000H maximum oversizing example.

Inverter	Inverter Model	DC Combiner	PV Only		PV Plus SolarEdge Home Battery					
			Battery No.	PV kWp	Battery No.	PV kWp	Battery No.	PV kWp	Battery No.	PV kWp
Home Hub	SE3000H-MM	Y*	0	4.0	1	9.0	2	9.0	3	9.0
	SE4000H-MM	Y*	0	5.33	1	10.33	2	12.0	3	12.0
	SE5000H-MM	Y*	0	6.67	1	11.67	2	15.0	3	15.0
	SE6000H-MM	Y*	0	8.0	1	13.0	2	18.0	3	18.0
	SE8250H-MM	Y*	0	11.0	1	16.0	2	21.0	3	22.0
	SE10000H-MM	Y*	0	13.33	1	18.33	2	22.0	3	22.0
HD Wave EV & Genesis	SE3000H	Y**	0	4.0	1	6.0	2	6.0	3	6.0
	SE5000H	Y**	0	6.67	1	10.0	2	10.0	3	10.0
	SE6000H	Y**	0	8.0	1	12.0	2	12.0	3	12.0
	SE8250H	Y**	0	11.0	1	16.0	2	16.5	3	16.5
	SE10000H	Y**	0	13.33	1	18.33	2	20.0	3	20.0
3Ph Booster	SE5K-AUB	N	0	6.75	1	6.75	N/A	N/A	N/A	N/A
	SE7K-AUB	N	0	9.45	1	9.45	N/A	N/A	N/A	N/A
	SE8.25K-AUB	N	0	11.135	1	11.135	N/A	N/A	N/A	N/A
	SE10K-AUB	N	0	13.5	1	13.5	N/A	N/A	N/A	N/A

(*) DC Combiner optional for connection of 3rd. SolarEdge Home Battery

(**) DC Combiner optional for additional STC's when adding SolarEdge Home Batteries

Table 3: Maximum PV Oversizing guidelines

Guidance Relating to RCD Requirements

PV System Residual Current Factors

In every PV installation, several elements contribute to the current leakage to protective earth (PE). These elements can be divided into two main types:

- **Capacitive discharge current** - Discharge current is generated mainly by the parasitic capacitance of the PV modules to PE. The module type, the environmental conditions (rain, humidity) and even the distance of the modules from the roof can affect the discharge current. Other factors that may contribute to the parasitic capacitance are the inverter's internal capacitance to PE and external protection elements such as lightning protection.

During operation, the DC bus is connected to the alternating current grid via the inverter. Thus, a portion of the alternating voltage amplitude arrives at the DC bus. The fluctuating voltage constantly changes the charge state of the parasitic PV capacitor (i.e. capacitance to PE). This is associated with a displacement current, which is proportional to the capacitance and the applied voltage amplitude.

- **Residual current** - if there is a fault, such as defective insulation, where an energized cable comes into contact with a grounded person, an additional current flows, known as a residual current.

Residual Current Device (RCD)

All SolarEdge inverters incorporate a certified internal RCD (Residual Current Device) to protect against possible electrocution in case of a malfunction of the PV array, cables or inverter (DC). The RCD in the SolarEdge inverter can detect leakage on the DC side. There are 2 trip thresholds for the RCD as required by the DIN VDE 0126-1-1 standard. A low threshold is used to protect against rapid changes in leakage typical of direct contact by people. A higher threshold is used for slowly rising leakage currents, to limit the current in grounding conductors for fire safety. The default value for higher speed personnel protection is 30mA, and 300mA per unit for lower speed fire safety.

Installation and Selection of an External RCD Device

Section 7.3.4.1 of AS/NZS 3000:2018 details the general requirements for the AC isolation switch in accordance with clause 2.3.2.2. Requirements of AS/NZS 4777 series are deemed to satisfy these requirements, however. Section 2.6.2.2 defines the specific types of RCD's and their application. There are 6 different types of RCD's available and complaint for installation depending upon the characteristic of supply, these being:

- **Type A RCD** - Residential sinusoidal waveforms.
- **Type A RCD** - Residential pulsating direct currents
- **Type I RCD** - Residual alternating currents not exceeding 10mA, interrupt time not exceeding 40ms
- **Type F RCD** - Composite residual, pulsating direct or high frequency leakage currents
- **Type B RCD** - Residual sinusoidal up to 1000Hz, alternating or pulsating, residual direct currents
- **Type S RCD** - Specifically designed where tripping is delayed after a pre-determined time

Mitigation of Nuisance Tripping

Section 2.6.3.2.3.3 of AS/NZS 3000:2018 details the requirements wherever a 30mA RCD shall be provided for final subcircuits with a rating not exceeding 32A. However, exceptions to these requirements apply as per clause 2.6.3.2.3.3 Exceptions 3 (II) which states that 'These requirements need not apply to the following'...' may cause spurious nuisance tripping through high leakage currents being generated in the normal operation of the equipment'.

Installation and Selection of an External RCD Device

Installation of an RCD must always be conducted in accordance with local electrical regulations and standards. SolarEdge recommends the use of a type-A RCD. Unless a lower value is required by the specific local electric regulations.

For Single Phase inverter installations SolarEdge suggests an RCD value between 30mA and 100mA. If an RCD is used, 100mA is required for installations above 20kWdc whereas a 30mA RCD is required for installations below 20kWdc.