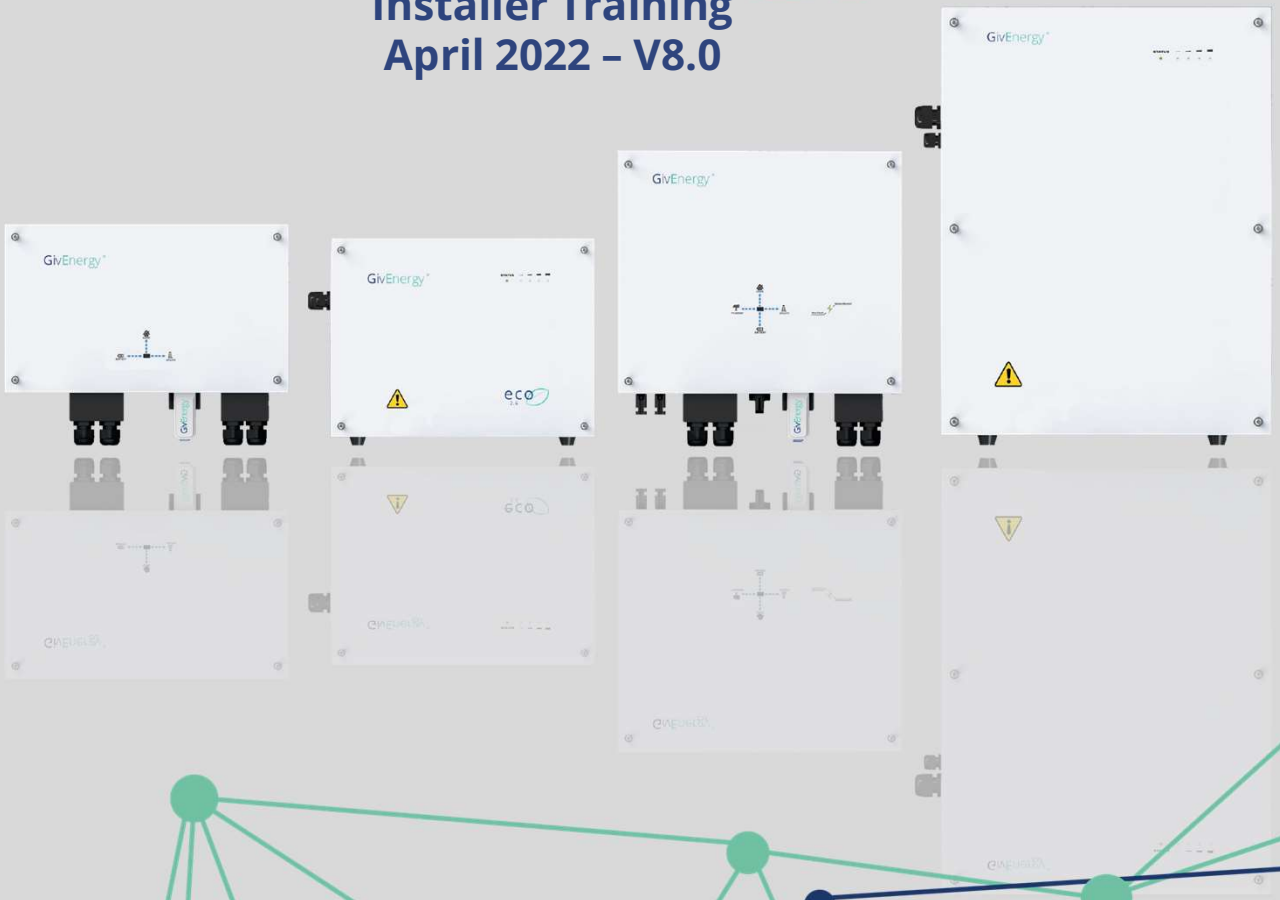
GivEnergy®

Installer Training
April 2022 – V8.0



Who are we?

- Part of a conglomerate of electrical product manufacturing companies.
- We've been manufacturing energy storage products for nearly 10 years
- GivEnergy facilities in HK, China, UK and now Australia.
- Small domestic right through to grid scale energy storage systems
- Final assembly of our battery systems to commence in the UK soon
- One of the largest energy storage companies in the UK

GivEnergy®

UK based technical support

General questions and enquiries

01377 252 874 (Option 2)

support@givenergy.co.uk

Mon - Fri	9am – 5pm
Emergencies	24/7

Commissioning

01377 252 874 (Option 1)

support@givenergy.co.uk

Mon – Fri	8.30am – 10.00pm
Sat	9.00am – 5.00pm
Sun	9.00am – 5.00pm

Knowledge Base

http://kb.givenergy.cloud

GivEnergy®

Where to buy

Segen

EDMUNDSON ELECTRICAL

GREENTECH

Smith Bros (CAER CONAN) WHOLESALE LTD

bublshop distributors in expertise

MIDSUMMER

I.T.S. TECHNOLOGIES RENEWABLE ENERGY SPECIALISTS

Renewables Amco

Please note that other distributors are available

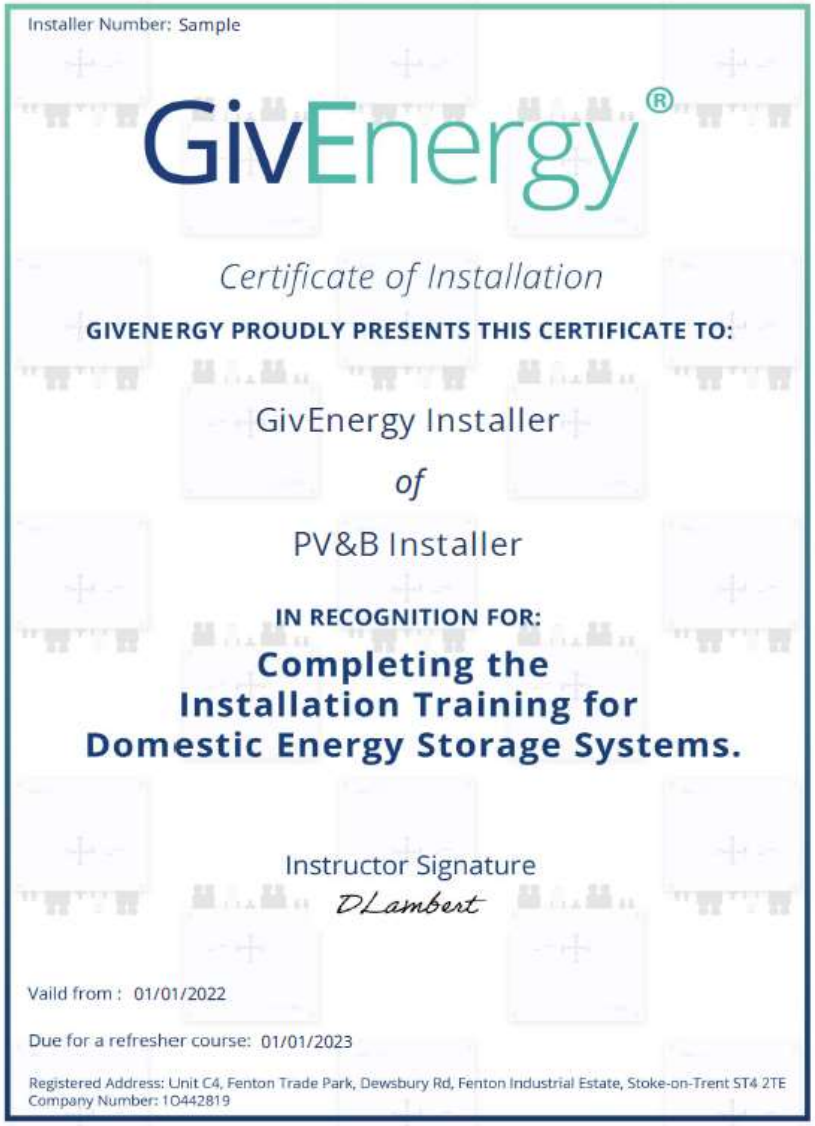
Recording your attendance

At the end of this training you will get a copy of this manual, some useful guides and a training certificate.

To do so we will need your **name**, **email** and **company** details – Please provide these by email directly, the email address is the same as the one the training invite was sent from.

Please note

It is a requirement that all people attending this course and installing our products are trained and qualified electricians, preferably with previous solar / battery installation experience. Note that if we are made aware of non qualified individuals installing GivEnergy equipment then warranties may be void and we reserve the right to remove associated parties from our approved installer program.



Installer Number: Sample

GivEnergy®

Certificate of Installation

GIVENERGY PROUDLY PRESENTS THIS CERTIFICATE TO:

GivEnergy Installer

of

PV&B Installer

IN RECOGNITION FOR:

Completing the Installation Training for Domestic Energy Storage Systems.

Instructor Signature

DLambert

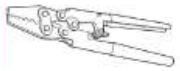
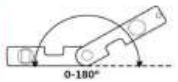
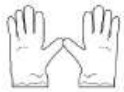
Vaild from : 01/01/2022

Due for a refresher course: 01/01/2023

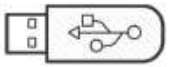
Registered Address: Unit C4, Fenton Trade Park, Dewsbury Rd, Fenton Industrial Estate, Stoke-on-Trent ST4 2TE
Company Number: 10442819

Tools and equipment required

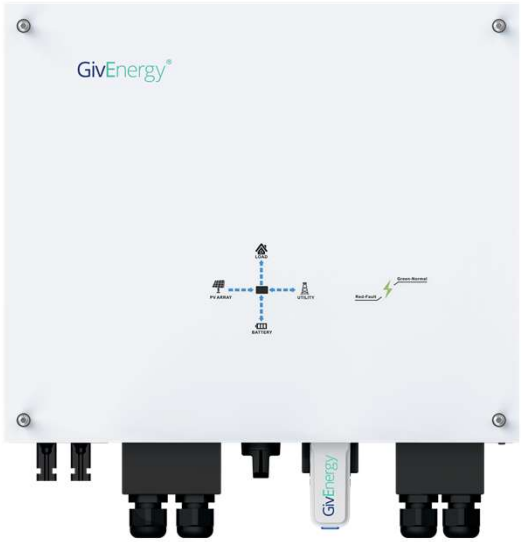
Standard equipment

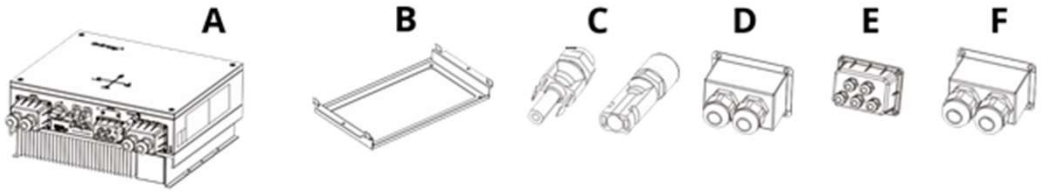
No.	Tool	Model	Function
1		Hammer drill, masonry and wood bits inc hole saw.	Used to drill holes for mounting brackets
2		VDE Screwdriver set	Electrical Connections
3		Wire Stripper	Strip Wire
4		Allen Keys	To Remove battery front panels
5		Crimping Tools	For ferrules and ring terminals
6		Multi- Meter	Checking Connections
7		Marker Pen	To Plot Brackets
8		Tape measure	To ensure correct clearance
9		Level	To ensure mounting brackets are level
10		Cut resistant gloves	To protect hands from sharp edges

Additional equipment

No.	Tool	Model	Function
1		USB Stick	Update Inverter and battery Firmware
2		Laptop	Checking Web Portal
3		DC Clamp meter	Testing
4		RS485-USB Adaptor	Software Update

What is in the box





Item	Name	Quantity
A	Inverter	1
B	Mounting Frame	1
C	MC4 Connector pack	1
D	BAT Wire Cover	1
E	BMS, RS485 Come Wire Cover	1
F	AC Output Cover	1

Hybrid and AC Coupled versions both have Emergency Power Supply (EPS)

Hybrid and AC Coupled inverter specifications

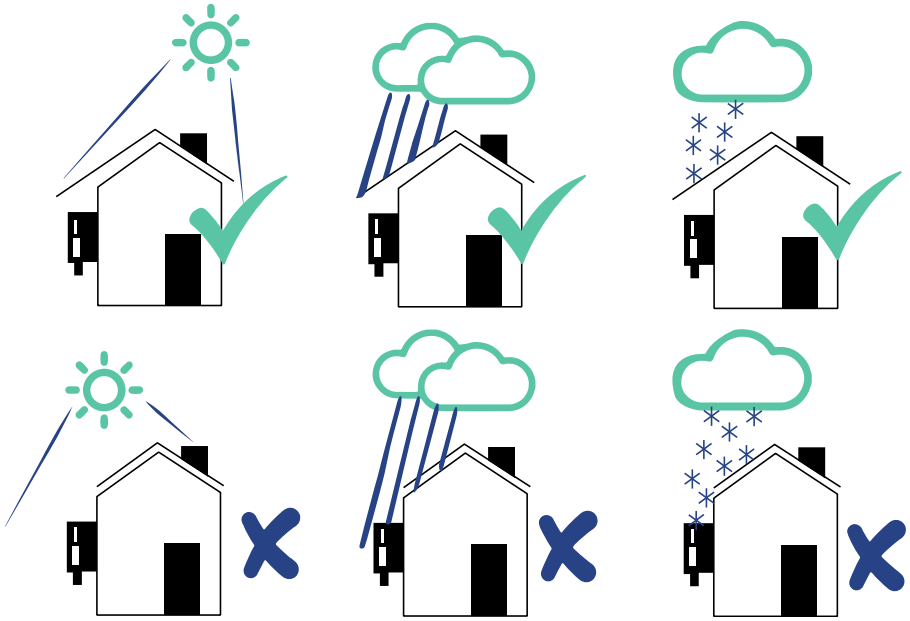
	Hybrid Gen1 3.6 / 5.0	Hybrid Gen2 3.6 / 5.0	AC Coupled 3.0
Max DC power	4.7 / 6.5kWp	4.7 / 6.5kWp	-
Min/Max DC voltages	100 – 580v	150 – 600V	
Start up voltages	120v	150V	
MPPT voltage range	120 – 550v	150 – 550V	
Maximum input current per string	11A / 11A	11	
Number of MPPT's	2	2	
Nominal AC output	3680w	5000w	3000w
Max output current	16.4A	22.8A	13A
Voltage range	180 – 280v		
EPS output (battery only)	2600w	3600w	3000w
EPS output (solar and battery)	3680w	5000w	-
Maximum battery charge/discharge	2600w	3600w	3000w
IP rating	IP65		
Dimensions W / H / D	480 / 440 / 260	480 x 410 x 210	480 x 290 x 260
Weight	32Kg	27.5Kg	19Kg
Connectivity	WiFi, 4G	WiFi, 4G, LAN	WiFi, 4G

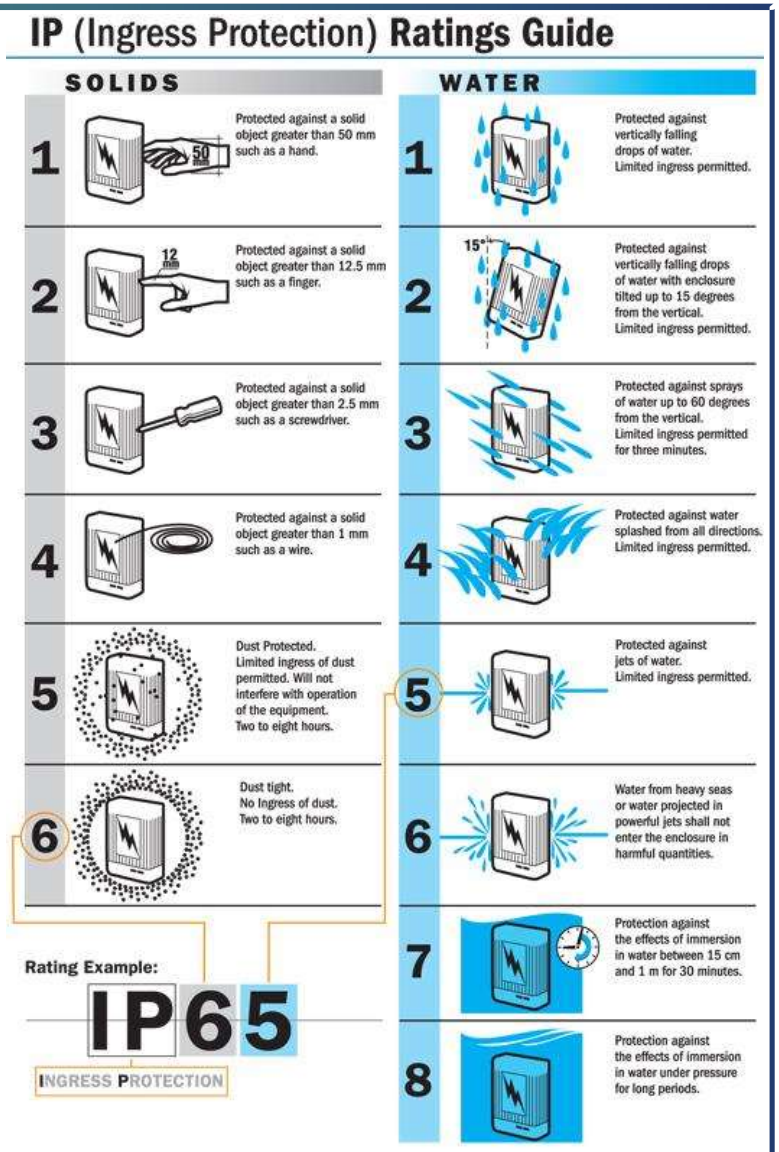
Mounting

All system are IP65 meaning they can be installed outdoors.

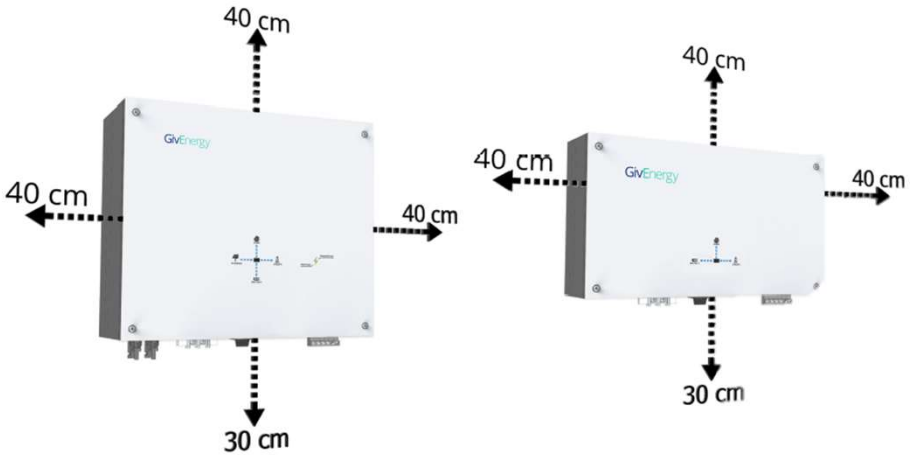
When installing outdoors systems must be protected against direct rain, sun and snow.

www.manomano.co.uk
Search for “Canopy”

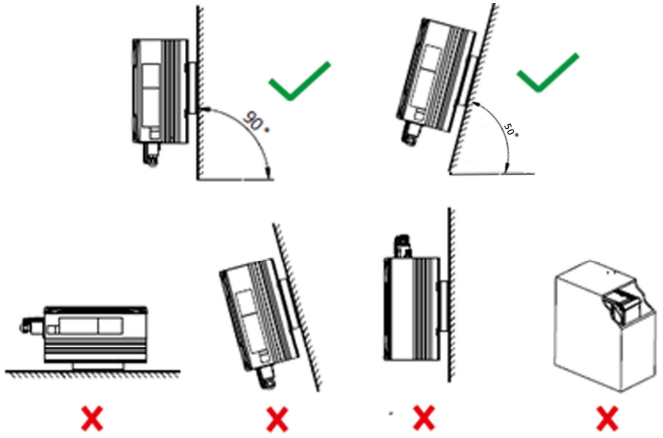




Mounting



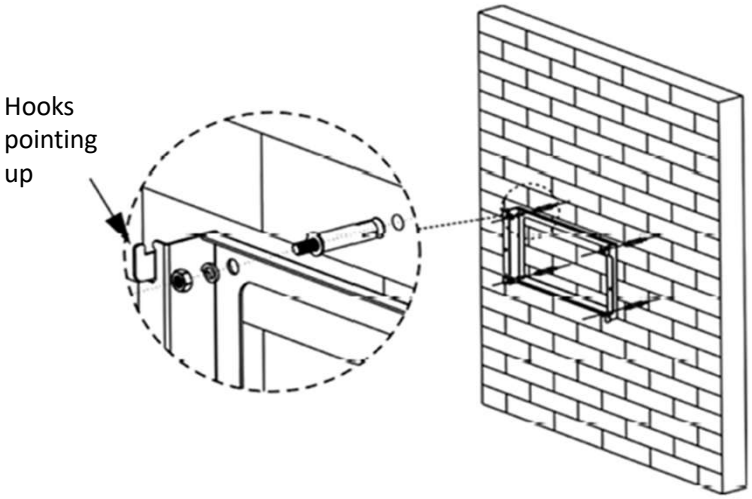
Inverter should be installed with the minimum clearances as shown to the left.



Inverters should in a vertical position, a 50˚ backwards tilt is permitted.

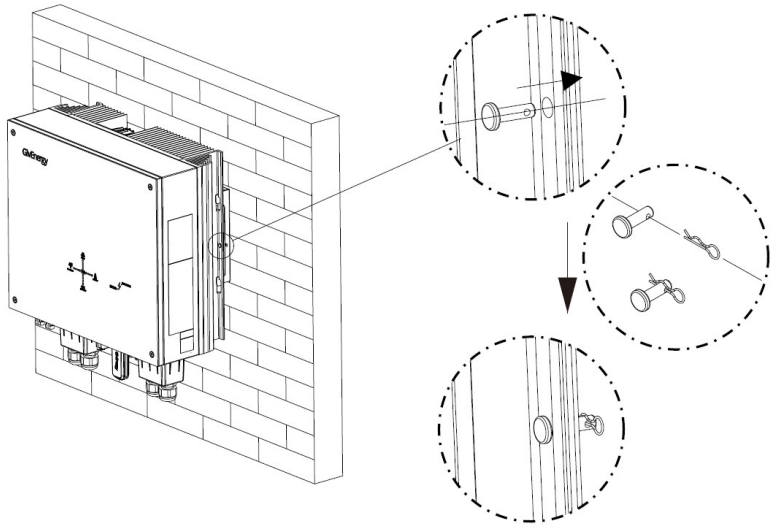
Mounting

Brackets should be installed with the hooks pointing upwards and secured using the fixings provided.



Once the inverter is securely mounted onto the bracket a locking pin should be installed on the left hand right hand side. The pin should be inserted from the front and then secured using the ‘R clip’.

A set of long nose pliers may help with this.



Electrical connections

1 – 2 x MC4 inputs

2 – Battery terminals

3 – PV DC switch

4a – CT, Meter and battery data connections
4b – USB port for WiFi/3G dongle

5 – EPS terminals

6 – Grid terminals

Electrical connections

1 – Battery terminals

2a – CT, Meter and battery data connections
2b – USB port for WiFi/3G dongle

3 – EPS terminals

4 – Grid terminals

Electrical connections – AC

Find our RCD declaration on our knowledge base

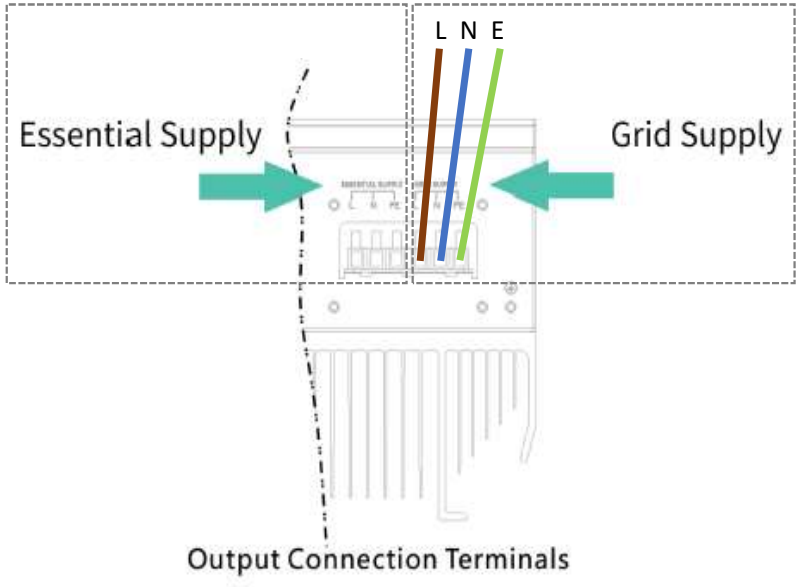
	Maximum output	Overcurrent protection	RCD protection *(If required**)*	Minimum cable size*
Hybrid 3.6kW	16.4A	C20	Type A 30mA	2.5mm
Hybrid 5.0kW	22.8A	C32		4.0mm
AC Connect 3.0kW	13A	C20		2.5mm

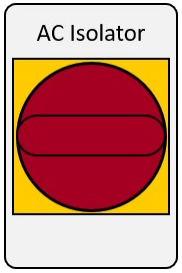
**This is the minimum size cable, large CSA may be required – Refer to BS7671*
***See separate RCD declaration*

RCD's

All GivEnergy inverters must be on their own RCD that is not shared with any other circuits.

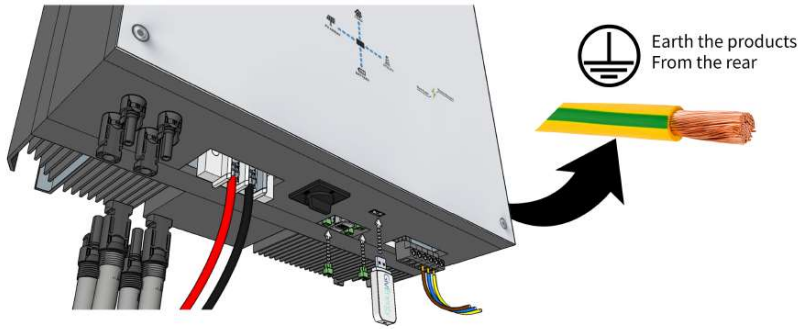
This applies to all points of the installation and special attention must be taken when installing in buildings remote from the incoming electrical supply.





Local isolation

All inverters must have local AC isolation for maintenance purposes



All inverters must have local AC isolation for maintenance purposes

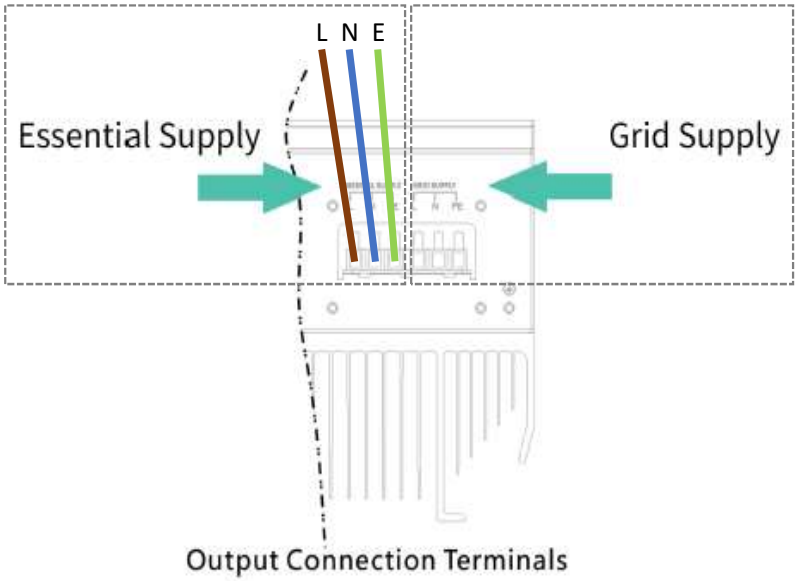
Electrical connections – EPS

All inverters come with the option for an EPS connection, this can be used to provide power in the event of a grid outage. The EPS terminals are powered from the grid supply whenever it is available when the inverter detects a grid outage it will automatically switch to take power from the batteries and solar (if available).

Electrical connections

The EPS connection can be found under the same cover as the AC input, the output cable must be protected as near as possible to the inverter.

- Double pole RCD protection at a maximum of 30mA
- Overload protection between 6 – 25A

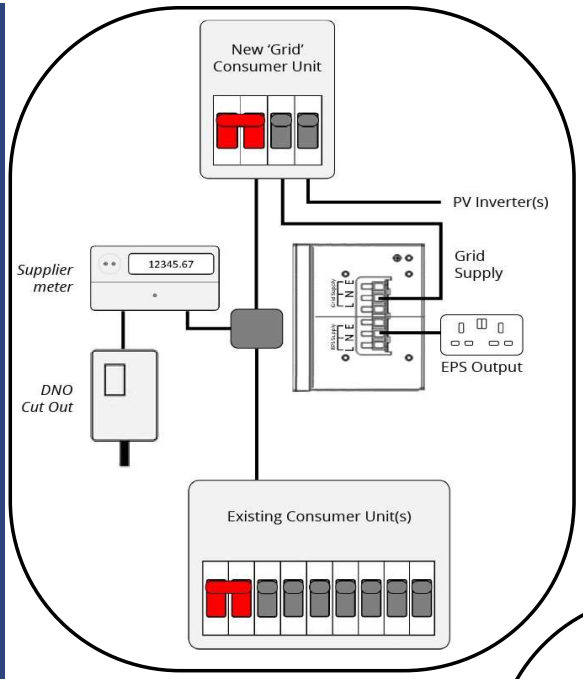


Earthing

- The back-up supply must not rely on earthing provided by the grid.
- An earth rod should be installed to protect the backup circuits.
- The earth electrode resistance should be lower than 200Ω.
- *If using an existing earth rod this should be checked for its suitability.*

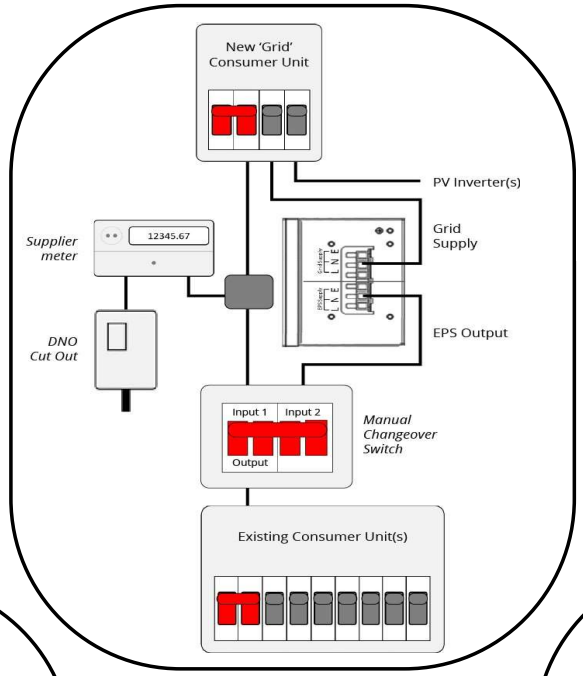
Maximum output (kW)	Hybrid 3.6	Hybrid 5.0	AC 3.0
2.6kWh battery only	1.3	1.3	1.3
5.2, 8.2kWh batteries only	2.6	2.6	3.0
All batteries with solar	3.6	5.0	-

More information is available on our knowledge base.



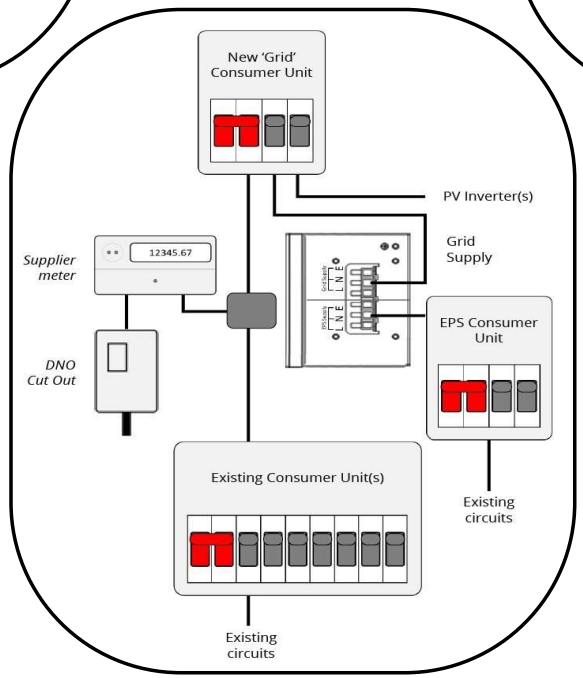
Method 1

Socket connected directly to EPS output terminals



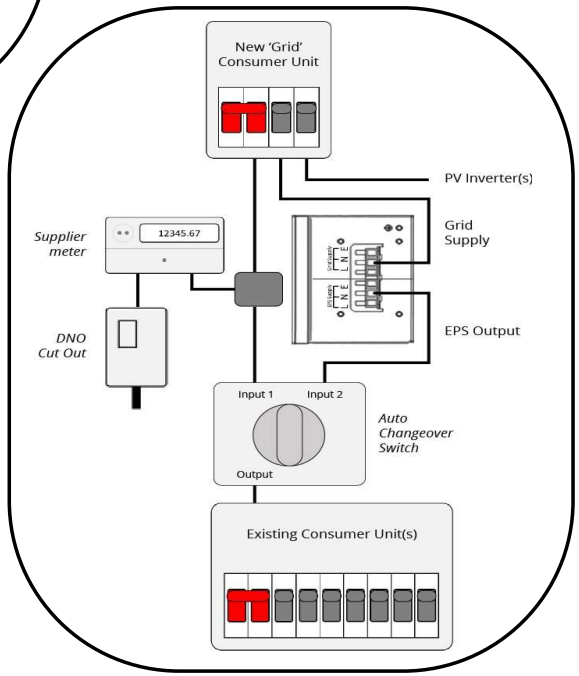
Method 3

Full property backup with manual changeover switch



Method 2

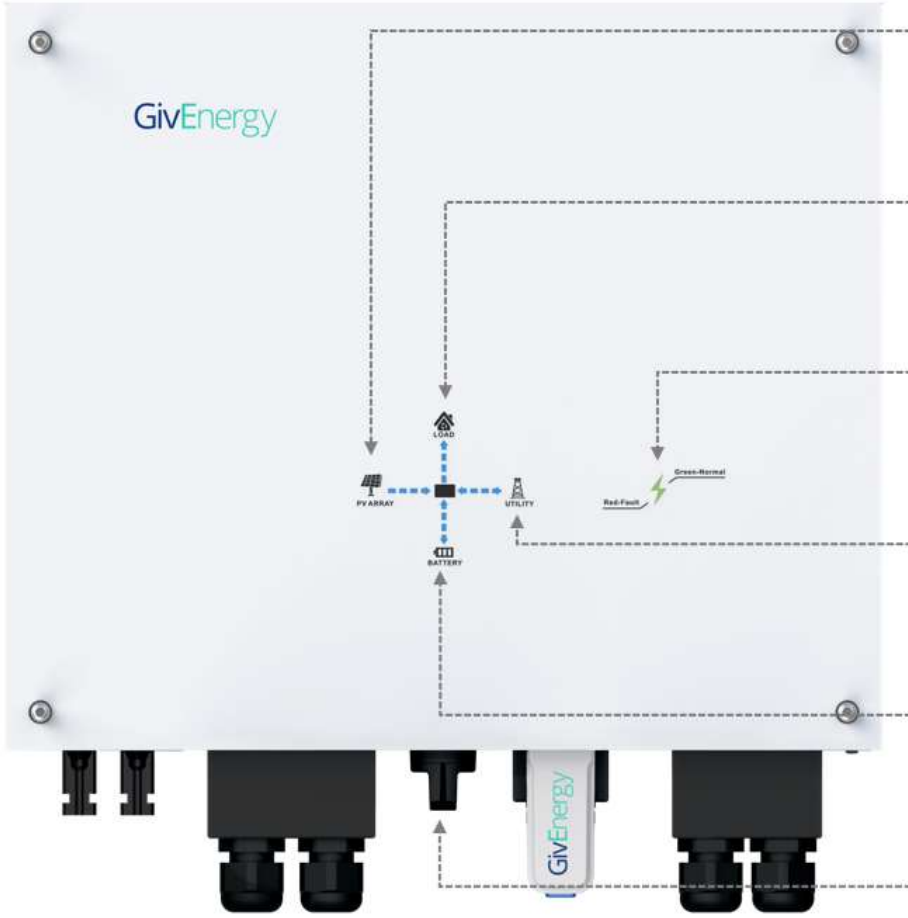
EPS consumer unit supplying dedicated EPS circuits



Method 4

Full property backup with auto changeover switch

Lights and operation - Hybrid



1

Solar PV
When solar PV generation is detected the inverter will indicate that the energy is being converted from DC to AC energy and can be used within the home.

2

Home demand
This is a calculation made by our smart energy management system and is lit up when a load is detected within the property.

3

Inverter status
Green (Solid)- Normal
Green (Flashing) – The system waiting for available power
Yellow – Communications issue
Red - Fault

4

Grid
When energy is being imported from the grid the arrows pointing toward the centre will be lite. When energy is being export to the grid the arrows point toward the gird will be lit.

5

Battery
When the battery is being charged the arrows will point toward the battery pack. When the battery is discharging the arrows will point towards the inverter.

6

Solar PV DC Switch

Lights and operation – AC Coupled

1 **Home demand**
This is a calculation made by our smart energy management system and is lit up when a load is detected within the property.

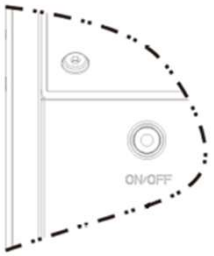
2 **Inverter status**
Green (Solid)- Normal
Green (Flashing) – The system waiting for available power
Yellow – Communications issue
Red - Fault

3 **Grid**
When energy is being imported from the grid the arrows pointing toward the centre will be lite. When energy is being export to the grid the arrows point toward the gird will be lit.

4 **Battery**
When the battery is being charged the arrows will point toward the battery pack. When the battery is discharging the arrows will point towards the inverter.

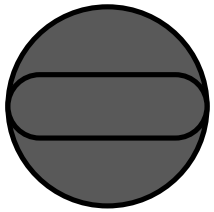
Shutdown instructions

Isolate battery by pressing the On/Off switch on the side for 5 seconds

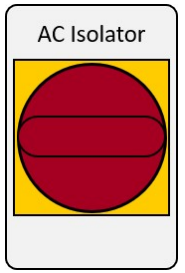


Turn off the battery DC isolator

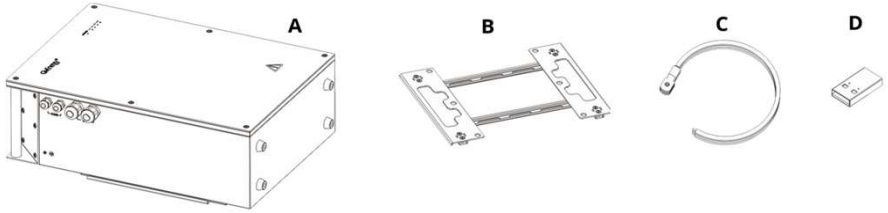
Turn off the PV with the external isolator first (if fitted) then the built in isolator



Turn off the AC



What is in the box



Item	Name	Quantity
A	Battery	1
B	Mounting Frame	1
C	Cable Pack (2m x Positive, Negative and data)	2
D	USB Memory Stick	1

Batteries

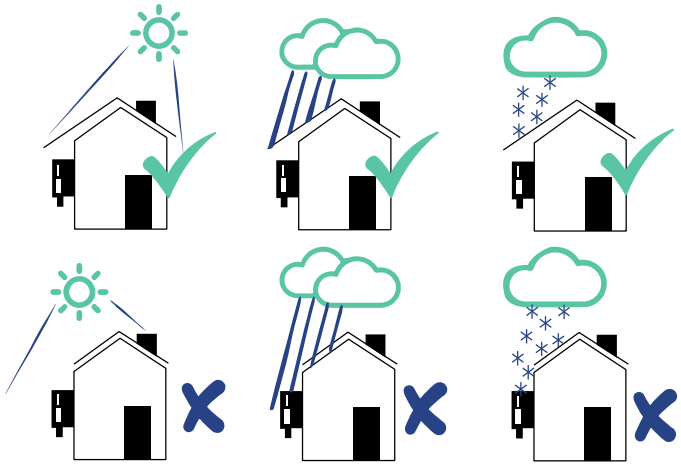
Battery specifications

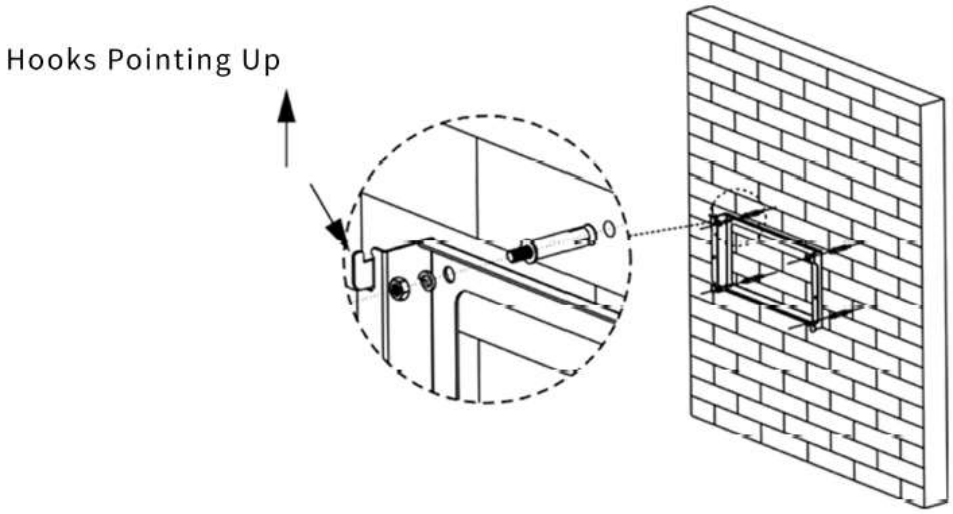
	2.6kWh	5.2kWh	8.2kWh	9.5kWh
Capacity	51Ah	102Ah	160Ah	186Ah
Voltage	51.2V			
Operating voltage	43.2 – 58.4V			
Maximum current	30A / 30A	60A / 60A	80A / 80A	
Maximum charge/discharge rate (Hybrid)	1250w*/2600w	2600w	2600 / 3600w**	
Maximum charge/discharge rate (AC Coupled)	1250w*/3000w	3000w	3000w	
Maximum DOD	90%	90%	100%	100%
IP rating	IP65			
Operating temperature	-10 – 50˚C			
Dimensions W / H / D	480 / 300 / 235	480 / 515 / 205	480 / 620 / 198	480 / 800 / 223
Weight	30Kg	54Kg	94Kg	110Kg

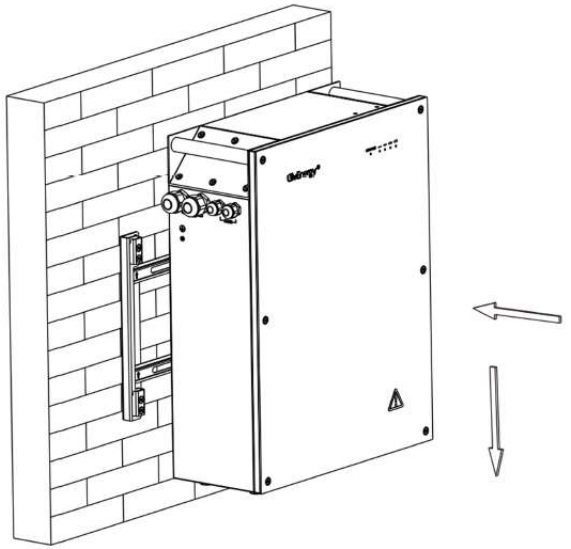
*A single 2.6kWh battery is limited to a maximum charge/discharge rate of 1250w on any inverter
**With Gen 2 Hybrid inverter only

Mounting batteries

- All batteries must be secured to the wall even if the weight of the battery is sat on the floor using the fixings provided.
- Wall depth should be at least 120mm.
- Batteries should not have the weight hung on a wall bracket when fixing to plasterboard or Thermolite blocks.
- Batteries must be mounted at least 50mm from ground level when outside or in areas at risk of flood.

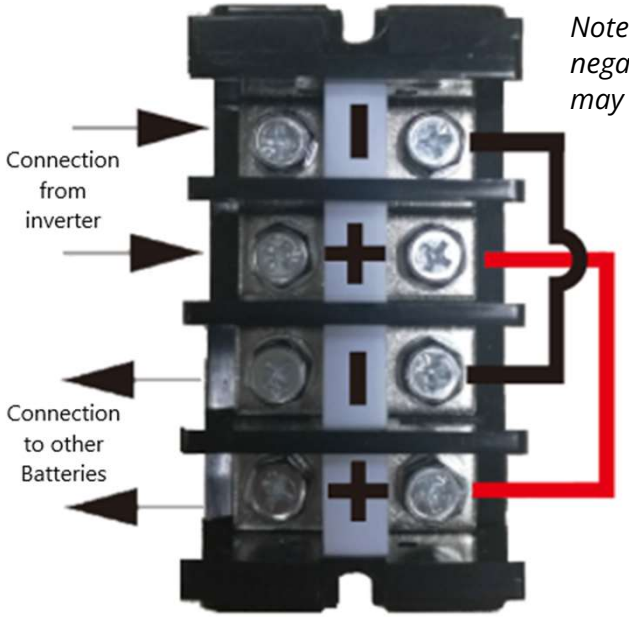






Cable inlet glands must be blanked off when not used

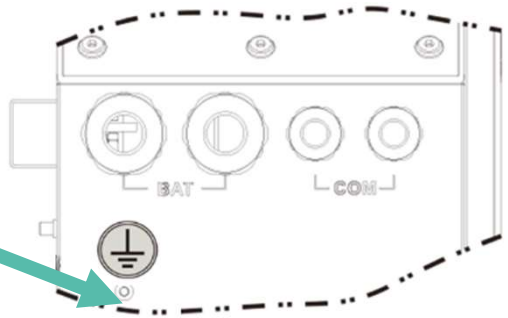
(Blanks provided)



Note: Positive and negative connections may laid out differently.

DO NOT
Use impact drivers on the battery covers or terminals

All batteries must be earth bonded together back to the inverter.



The cables supplied in the battery boxes should be used whenever possible. If a longer length is required 16mm2 Tri-rated cable must be used and can be up to a maximum length of;

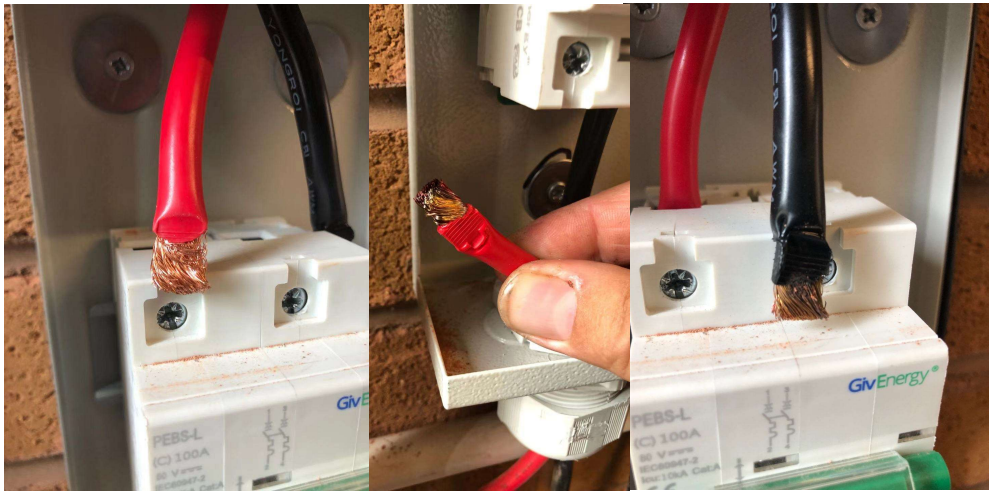
- 5m maximum length (Single battery)
- 2m between batteries (Cables provided)

A DC MCB is required between the inverter and (master) battery, this will be rated at 100A

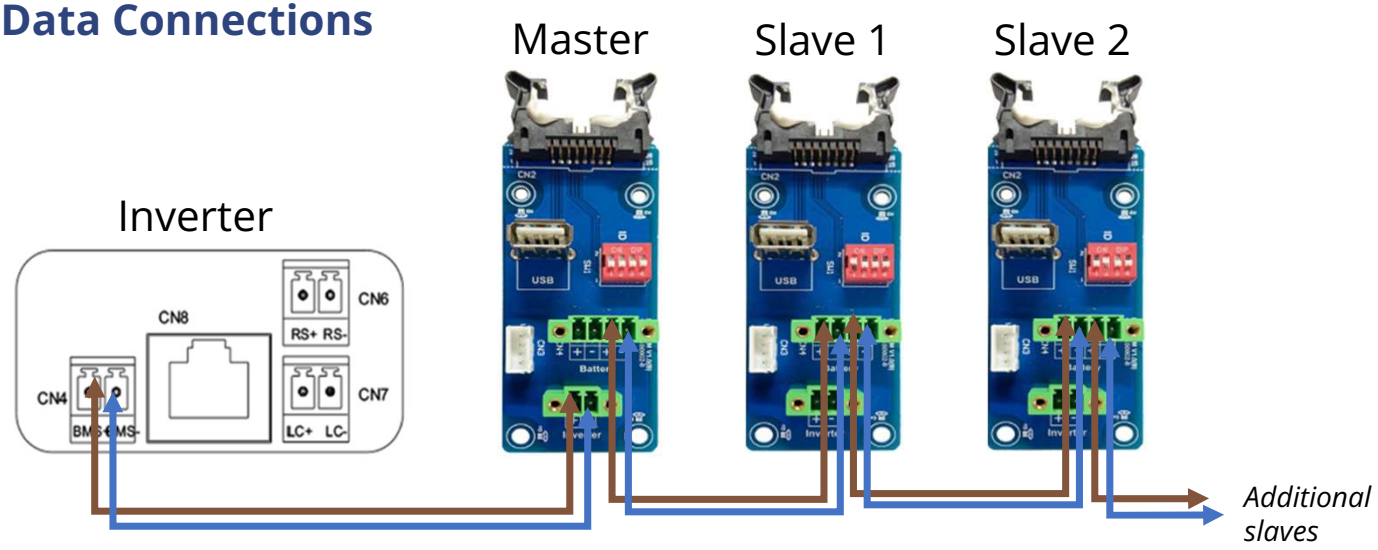
Tight and sound connection are vital to ensure correct operation and reliability of the installation. The ferrules provided must be used to ensure that the cable doesn't end up clamped on its outer insulation.

Connection should be tightened to 3.5Nm.

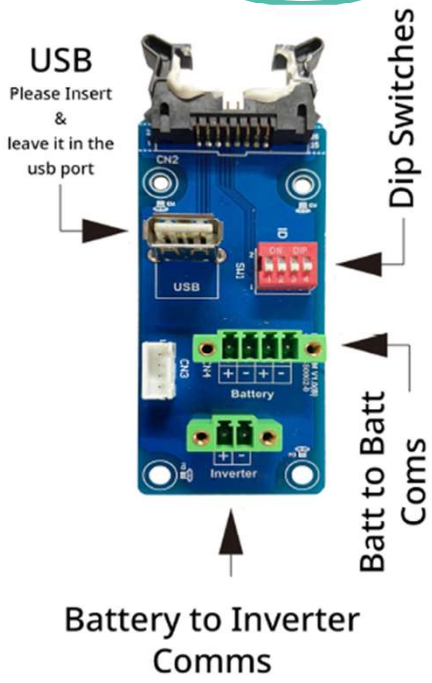
An enclosure will need to be provided that is suitably IP rated for the installation environment.



Data Connections



It is vital that the USB stick is fitted to the port to allow for remote firmware updates in the future.



Multiple battery dip switch settings

Battery	ID	Description
Master		0, 0, 0, 0
Slave 1		1, 0, 0, 0
Slave 2		0, 1, 0, 0
Slave 3		0, 0, 1, 0
Slave 4		0, 0, 0, 1

Size of batteries

When installing multiple batteries the largest must be closest to inverter

Metering

EM115 Meter

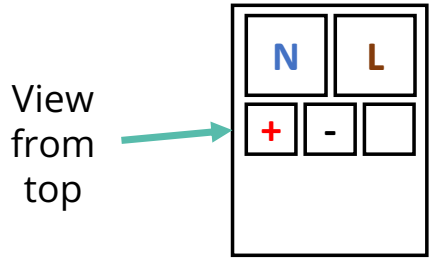
Every system will need at least 1 EM115 (ID1) meter installing to monitor the import and export of the building.

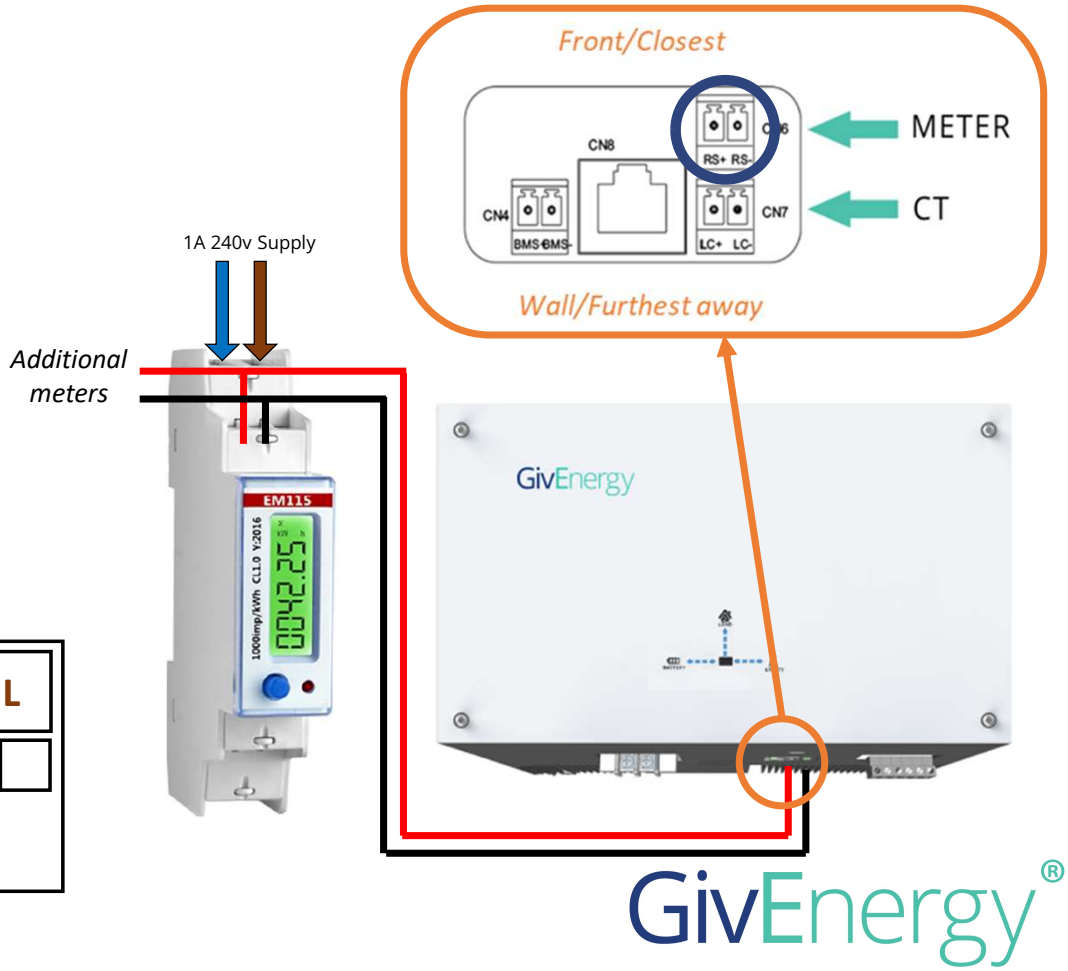
Every EM115 meter needs a power supply or voltage reference point.
This could be a dedicated supply from a 6A MCB for example.

Every EM115 meter will need a data connection back to the inverters meter communication port. This is on the right hand side at the front or closest to you.
Data connection should be twisted pair cable, for example cat5/6 ethernet or Belden type cable.

If installing multiple meters both the data and power supply can be linked together in series.

EM115 meter come with a split core CT that has a 2m cable
*This must **not** be cut down or extended*

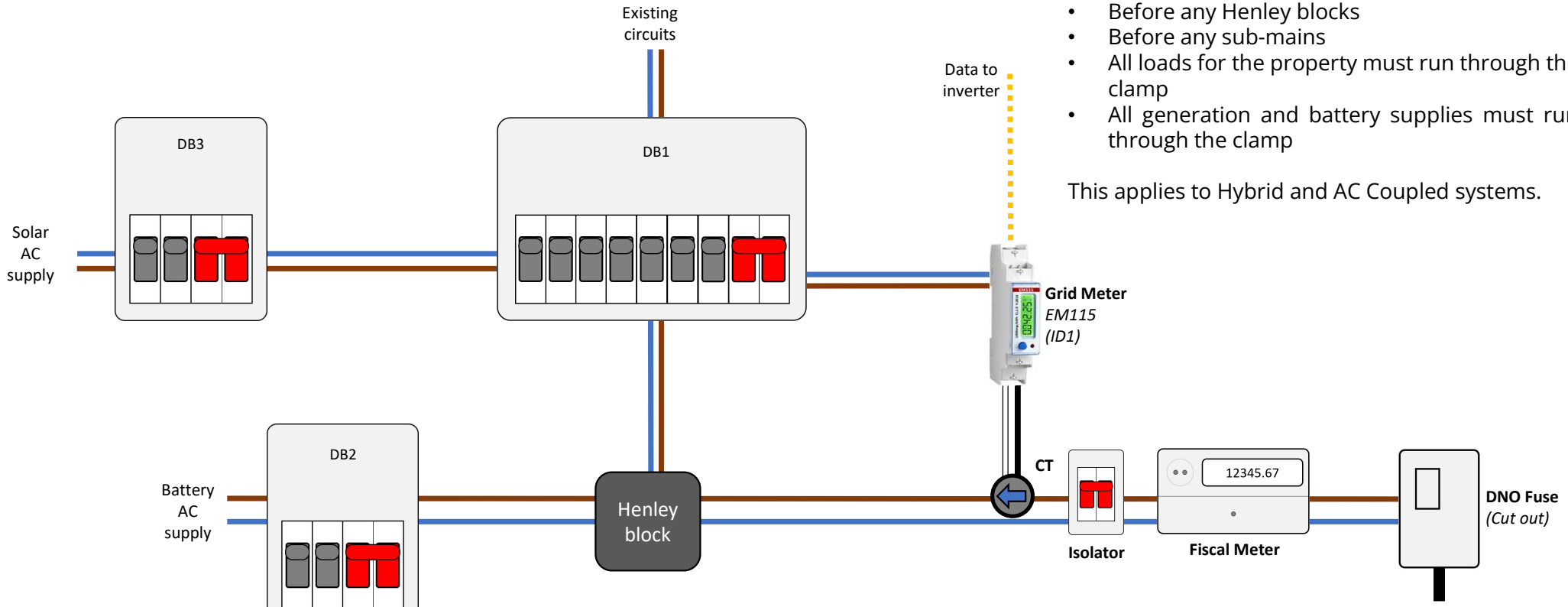




GivEnergy®

Metering

EM115 ID1 Grid (Import/Export) meter - CT clamp positioning



Clamp location;

- Next to the incoming supply
- Before any Henley blocks
- Before any sub-mains
- All loads for the property must run through the clamp
- All generation and battery supplies must run through the clamp

This applies to Hybrid and AC Coupled systems.

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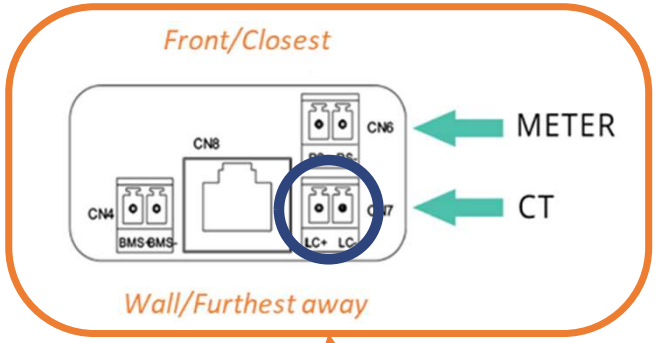
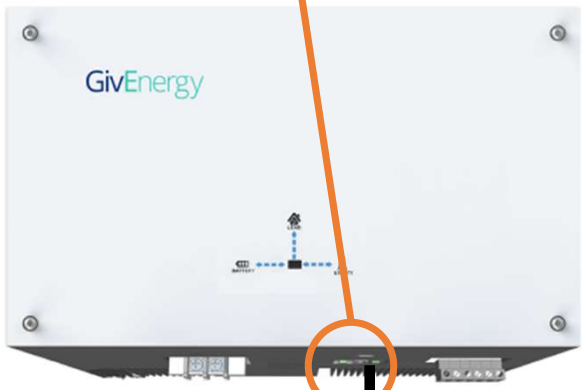
AC Coupled inverters - Blue CT Clamp

The Blue CT clamp allows one source of generation to be monitored, it can be found in the box with all AC Coupled inverters and comes with a 5m cable

This clamp does not require a meter and wires directly back to the inverter.
The 5m cable must not be cut down or extended!

Solid black cable is negative/-
Black with white stripe is positive/+





Inverter

Grid

GivEnergy®

Metering

EM115 Meter

ID1

Grid - Import/Export meter

Used for Hybrid and AC Coupled systems

ID2

PV monitoring meter

Used for AC Coupled systems to monitor a single or first PV system

ID3

PV monitoring meter

Used for AC Coupled systems to monitor a second PV system

GivEnergy®

Metering

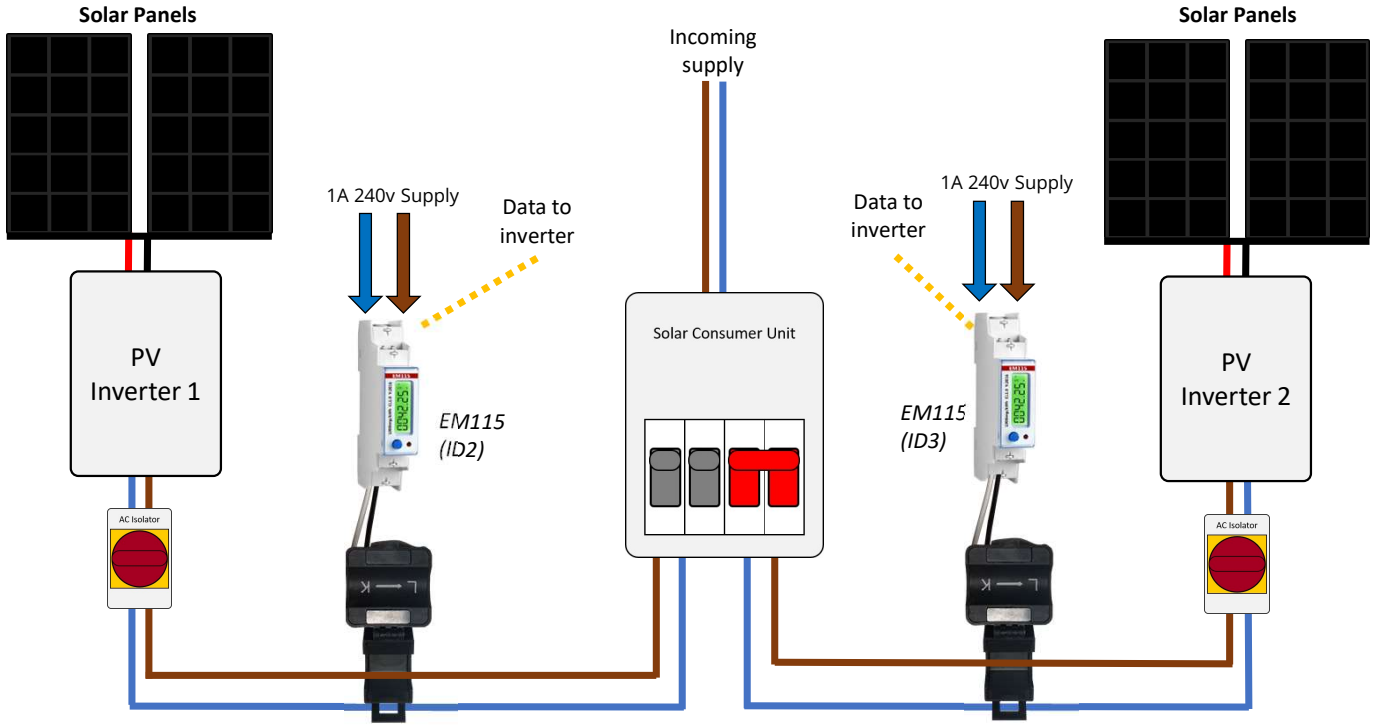
EM115 ID2 and ID3 (PV) meter

When the Blue CT clamp is not suitable or multiple generation sources need to be monitored a ID2 EM115 meter can be installed.

An ID3 EM115 meter can be used to monitor a second source of generation.

These are exactly the same meter as the ID1 grid import/export meter with a different ID number.

Note that to change the ID of the meter a laptop with the correct software and a RS485-USB adapter will be required.



GivEnergy®

Metering

CT clamp directions

Grid (ID1)

PV (ID2 & 3)

Blue CT (PV)

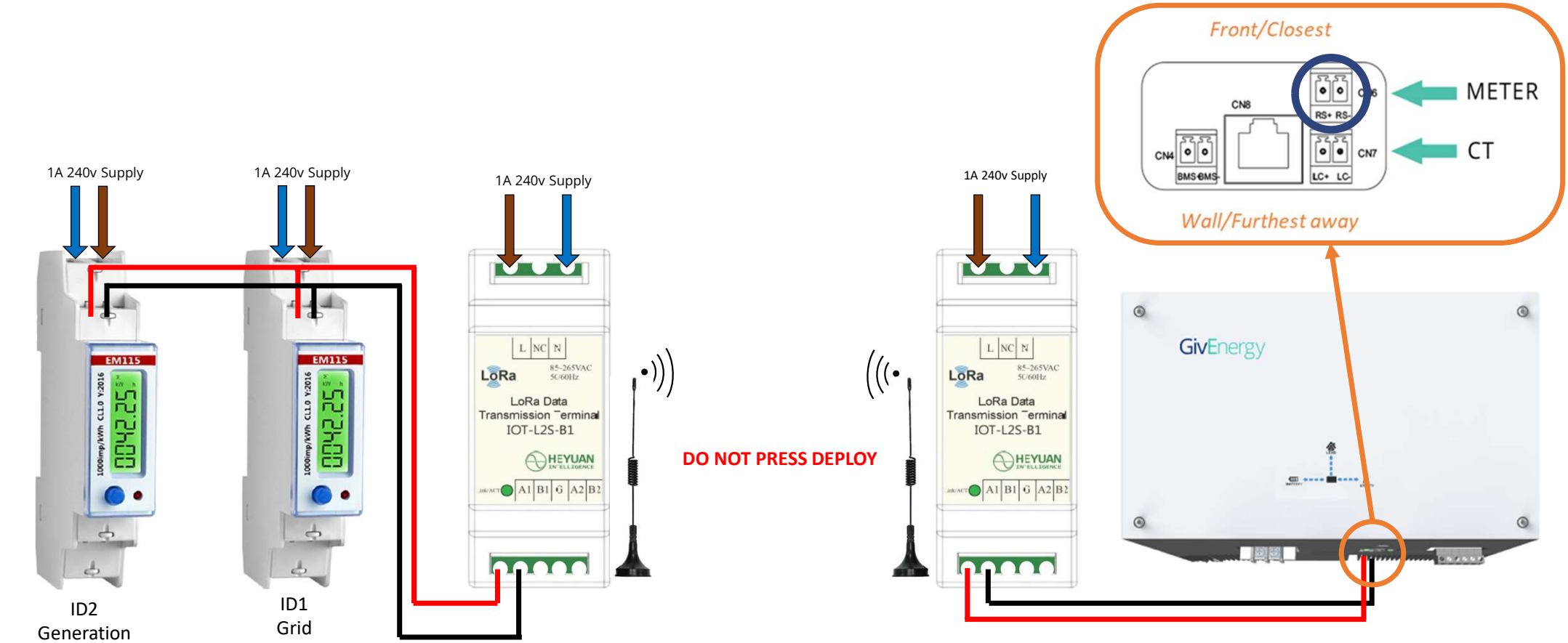
CT clamp cables must not be cut down or extended!

Arrow always points towards load

GivEnergy®

Metering

LoRa devices



- LoRa units come in pairs and are pre-tuned to each other
- 1 LoRa sender can send multiple meters data to a single receiver.
- Wireless frequency can be altered if single has interference.

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Getting a GivEnergy company account

You can get a company account setup via your distributor – Please speak to them.

Note: If you are purchasing from Segen you will need to get an account directly from us, please send an email to support@givenergy.co.uk with your company information for us to create you an account.

Once logged in you will need to create an Engineer Account for each of your installers/on-site engineers.

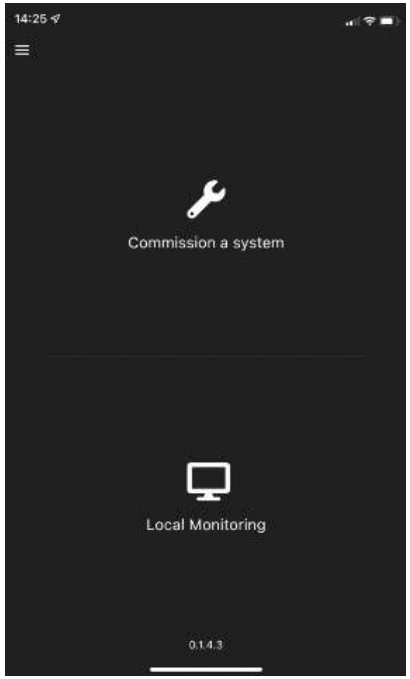
Portal Hierarchy

GivEnergy > Distributor > Company > Engineer > End User

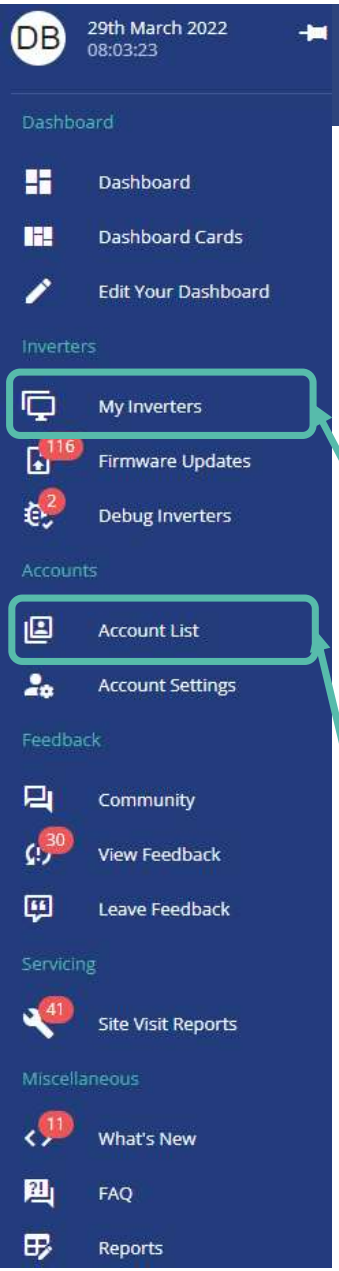
GivEngineer App

The GivEngineer app is now available for download, once you have an account this will allow you to complete all of the following steps on the app.

An **Engineer** login is required to use the GivEngineer app



Monitoring communications



2 – Link a dongle

- Enter dongle serial number and verify code along with selecting customers account from list.

1 - Create an Account

- Logged in as a Company
  - Create Engineers account
- Logged in as a Engineer
  - Create End User account

Commissioning and setup

Before commissioning a system the end user account must be setup on the GivEnergy portal and the serial number of the dongle added to the account.

We will not be able to offer commissioning support unless the end user account is created.

All systems **MUST** be commissioned before leaving site to ensure correct operation, if a system is part installed (i.e. Hybrid without a battery) then this should still be commissioned.

4G Dongles

Ensure the Sim Card is inserted correctly in the dongle then simply plug the dongle into the inverter

WiFi dongles

The GivEngineer app will take you through the steps required to tune the dongle in to the end users WiFi network.

If the app isn't available then please follow the WiFi Comms Guide on the Knowledge Base.

Important note on WiFi dongles

- Note that the WiFi dongle network **must** be password protected to ensure the security of the clients WiFi network.
- Most dongles are 2.4gHz only
- A single strength of 50% or greater is recommended for a reliable connection.

Dongle available in WiFi or 4G versions

Need help?

Call GivEnergy commissioning line - 01377 252 874 (Option 1)

GivEngineer app not allowing you to commission, or need some help?

Call us as early as you can as the commissioning call should normally take 5 – 10 minutes.

Information we will need from you;

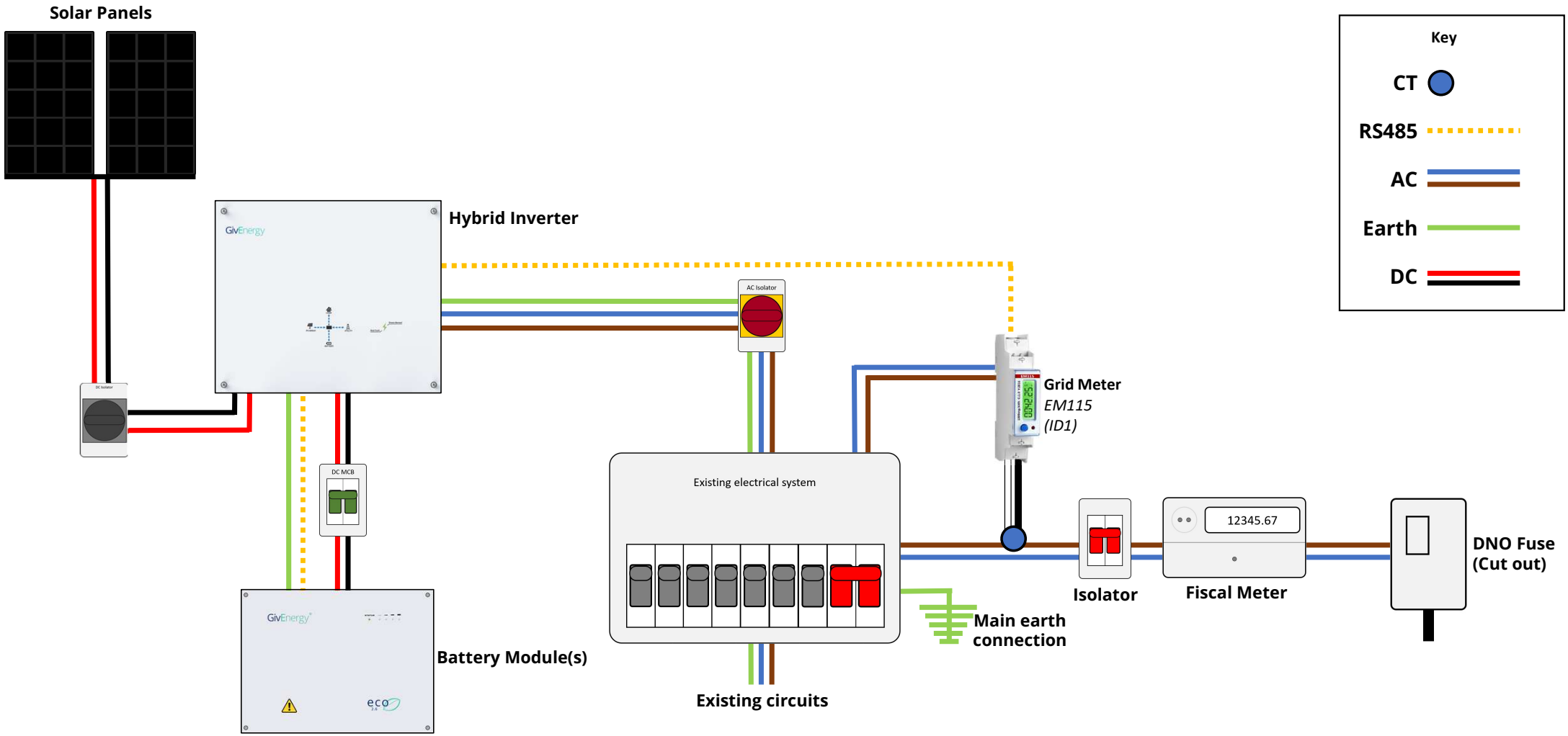
- Username of the customers GivEnergy account
- Metering configuration
- Amount and size(s) of batteries
- If the EPS is being used and if so how
- For Hybrid inverters
    - Make/Model/Wattage and quantity of panels
    - How many panels per string and number of strings
- For AC Coupled inverters
    - Size of new/existing PV inverter(s)

Operating hours

Mon – Fri	8.30am – 10.00pm
Sat	9.00am – 5.00pm
Sun	9.00am – 5.00pm

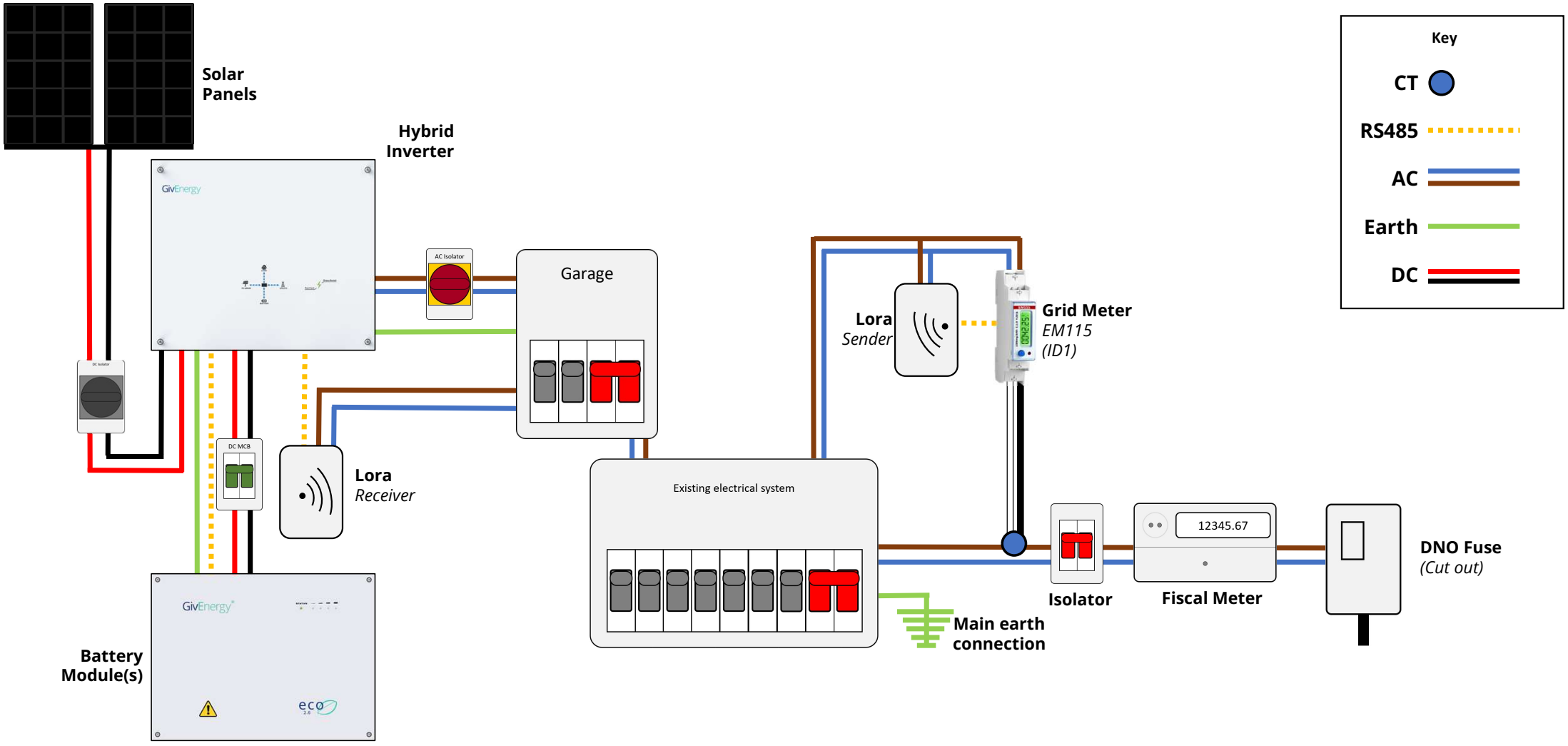
Schematics

Hybrid with EM115



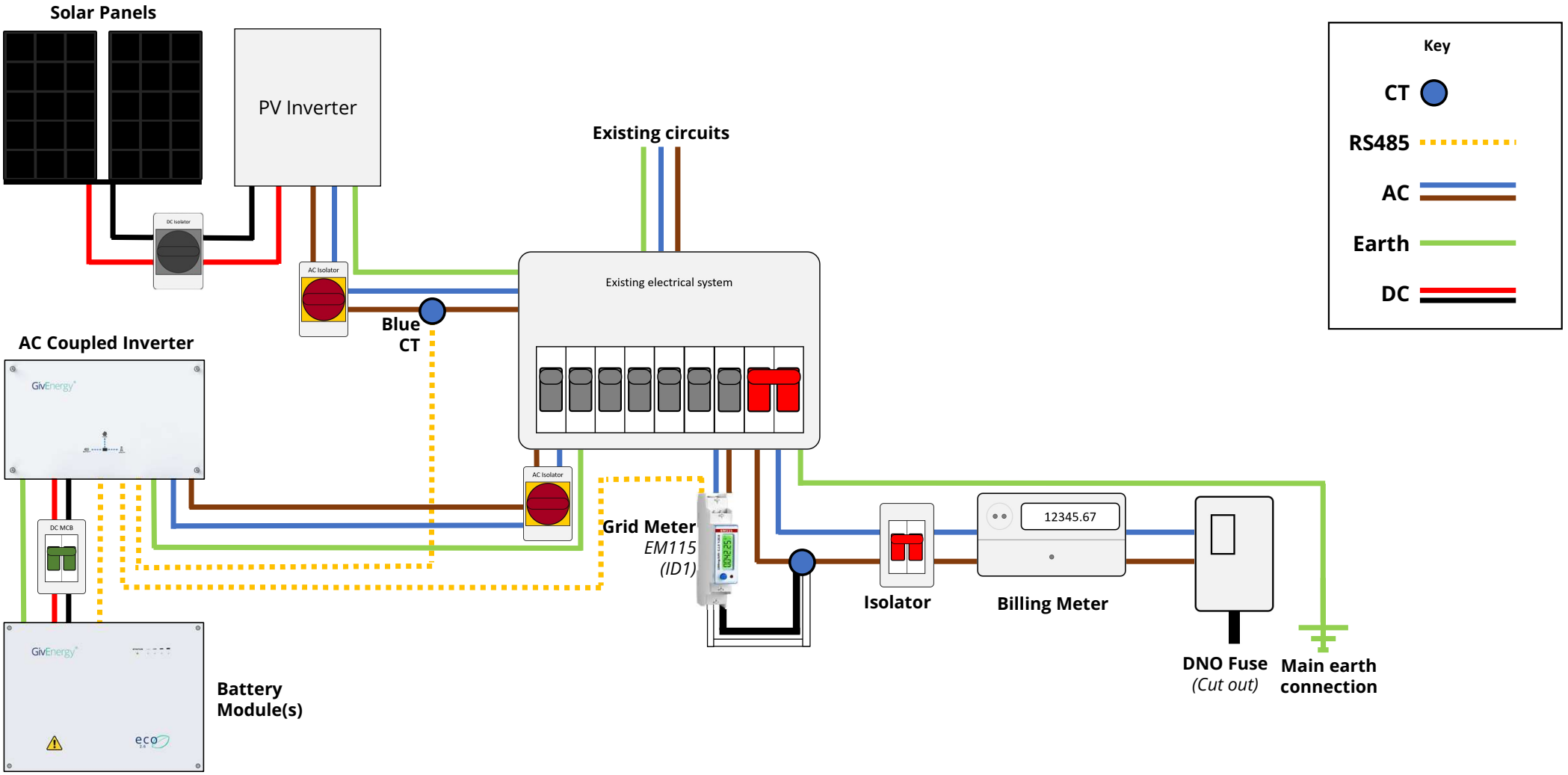
Metering

Hybrid with EM115 (LoRa)



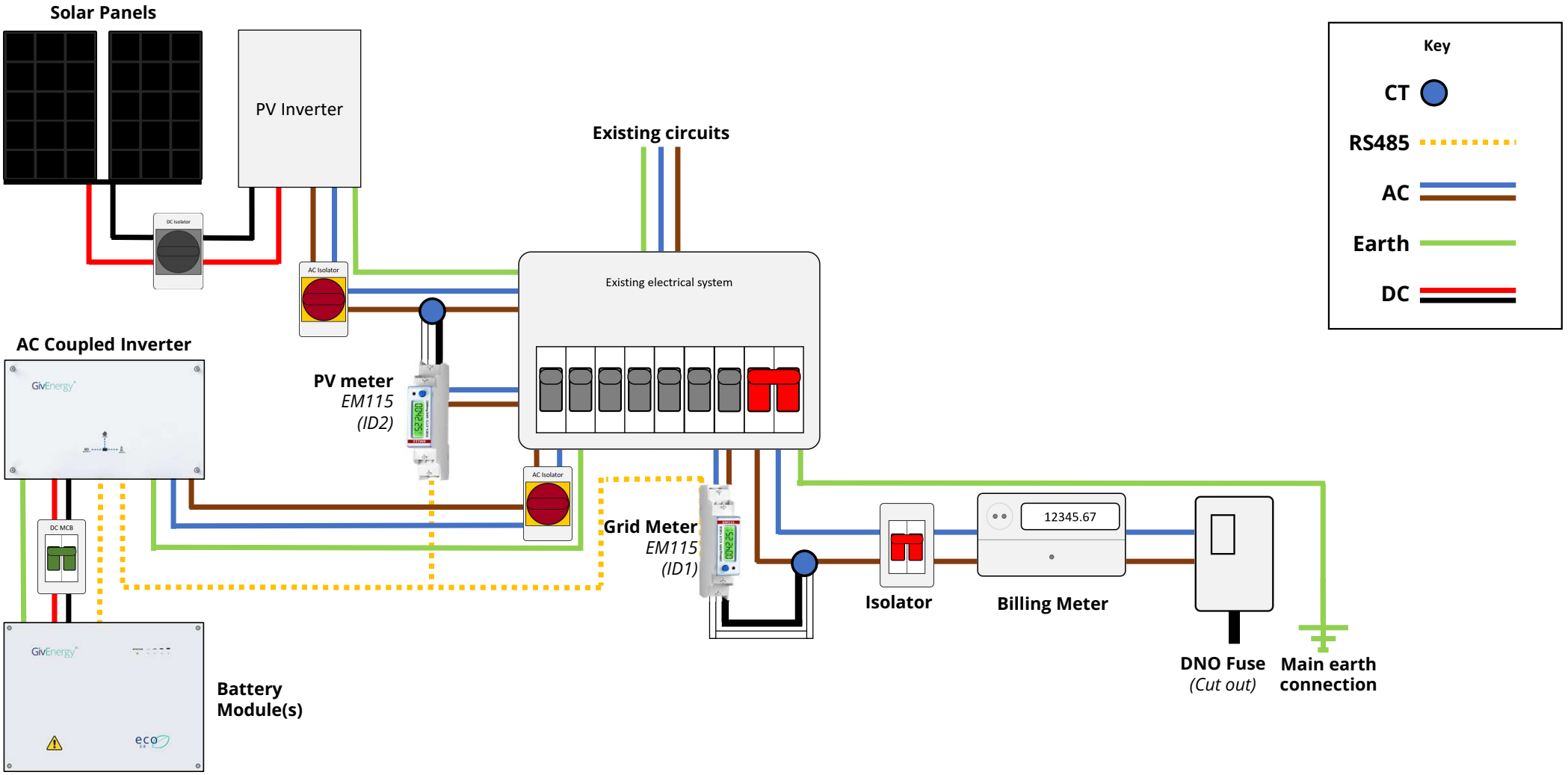
Schematics

AC Coupled with EM115 and Blue CT



Schematics

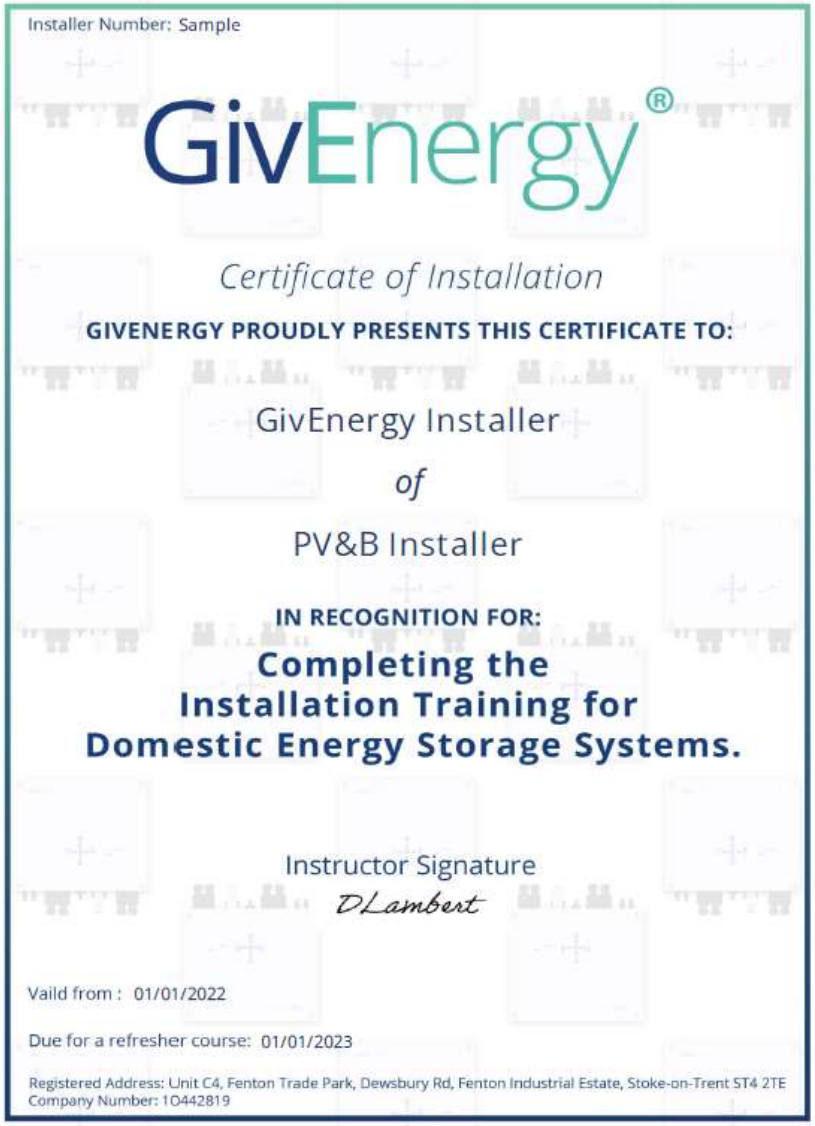
AC Coupled with 2 x EM115



Recording your attendance

At the end of this training you will get a copy of this manual, some useful guides and a training certificate.

To do so we will need your **name**, **email** and **company** details – Please provide these by email directly, the email address is the same as the one the training invite was sent from.



Installer Number: Sample

GivEnergy®

Certificate of Installation

GIVENERGY PROUDLY PRESENTS THIS CERTIFICATE TO:

GivEnergy Installer

of

PV&B Installer

IN RECOGNITION FOR:

Completing the Installation Training for Domestic Energy Storage Systems.

Instructor Signature

DLambert

Vaild from : 01/01/2022

Due for a refresher course: 01/01/2023

Registered Address: Unit C4, Fenton Trade Park, Dewsbury Rd, Fenton Industrial Estate, Stoke-on-Trent ST4 2TE
Company Number: 10442819