GoodWe Storage Solutions

Requirements for Battery Install.

Grid Connect Battery Backup System

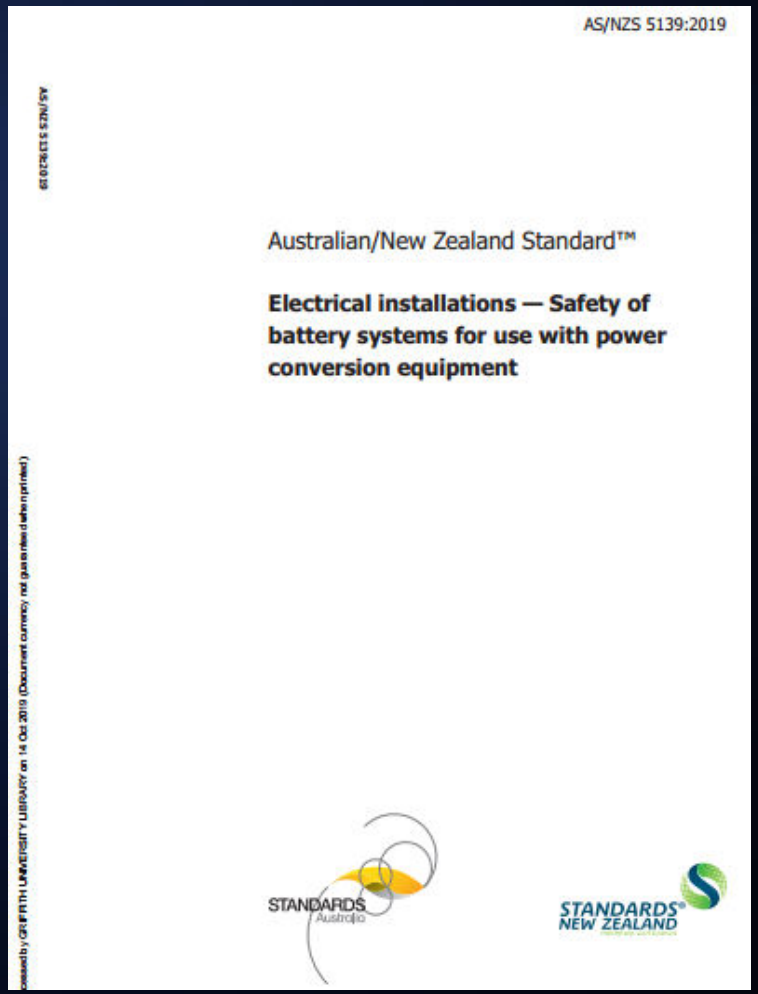
When installing a grid connect battery backup system the installation **shall** be performed by a person with CEC grid connected install accreditation with battery backup endorsement.

Note: The installation of battery storage has additional safety risks associated with their installation.

- Electric shock hazard
- Energy hazard
- Chemical hazard

In order to install Grid Connected Battery Storage, you **must** be endorsed to do so.
To become endorsed to install grid-connected battery storage, accreditation must also be held for the design and install of grid-connected (GC) photovoltaic systems

Standards Compliance



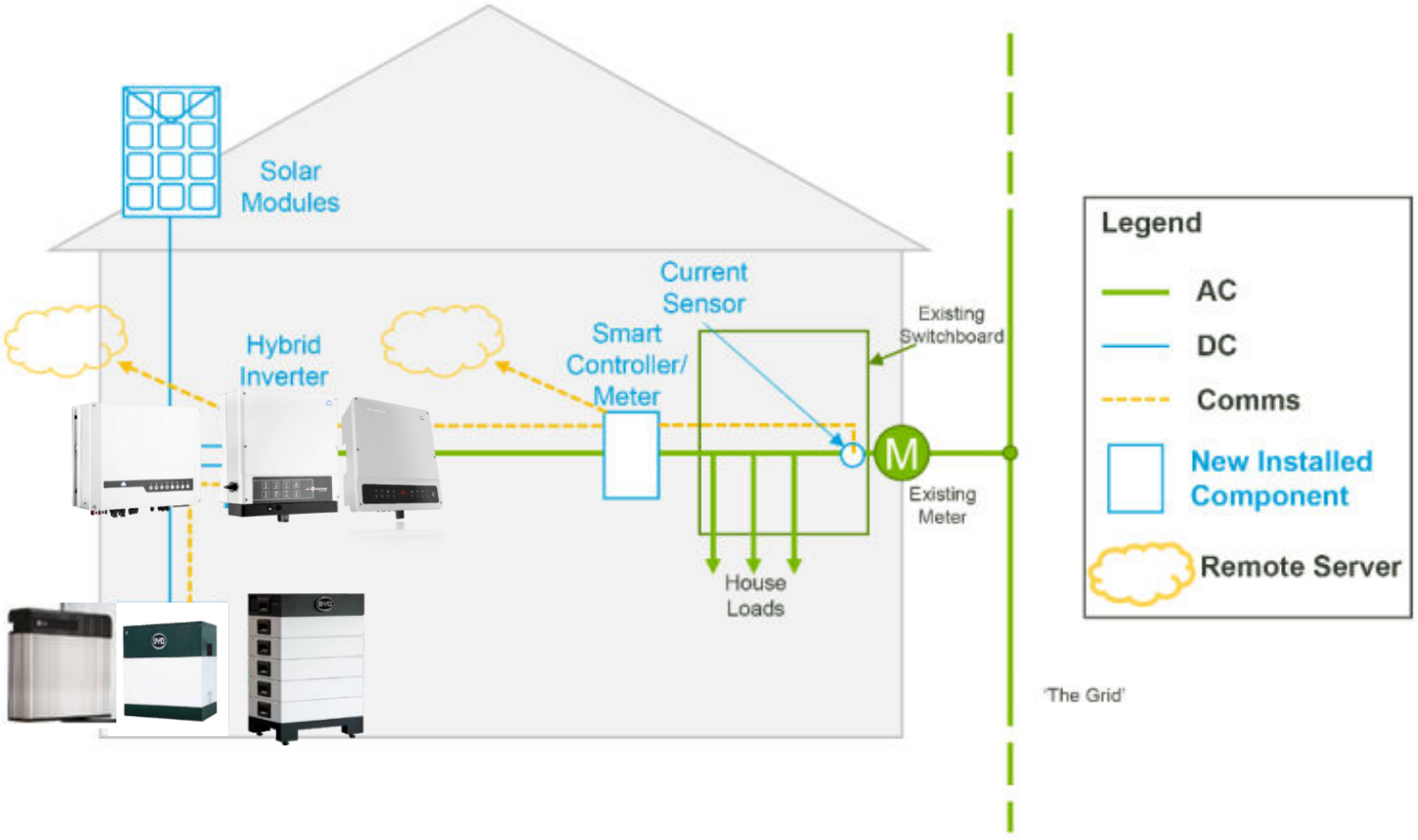
AS/NZS 3000, Best Practice Guide, AS/NZS 5139

Goodwe storage inverter with external battery belongs to BS (section 5 in AS/NZS 5139)

01

Available solutions

Single Phase House



Premier solution:
GW5048D-ES

- 100A charge/discharge with 20A
- back up plus Low Voltage BYD or LG

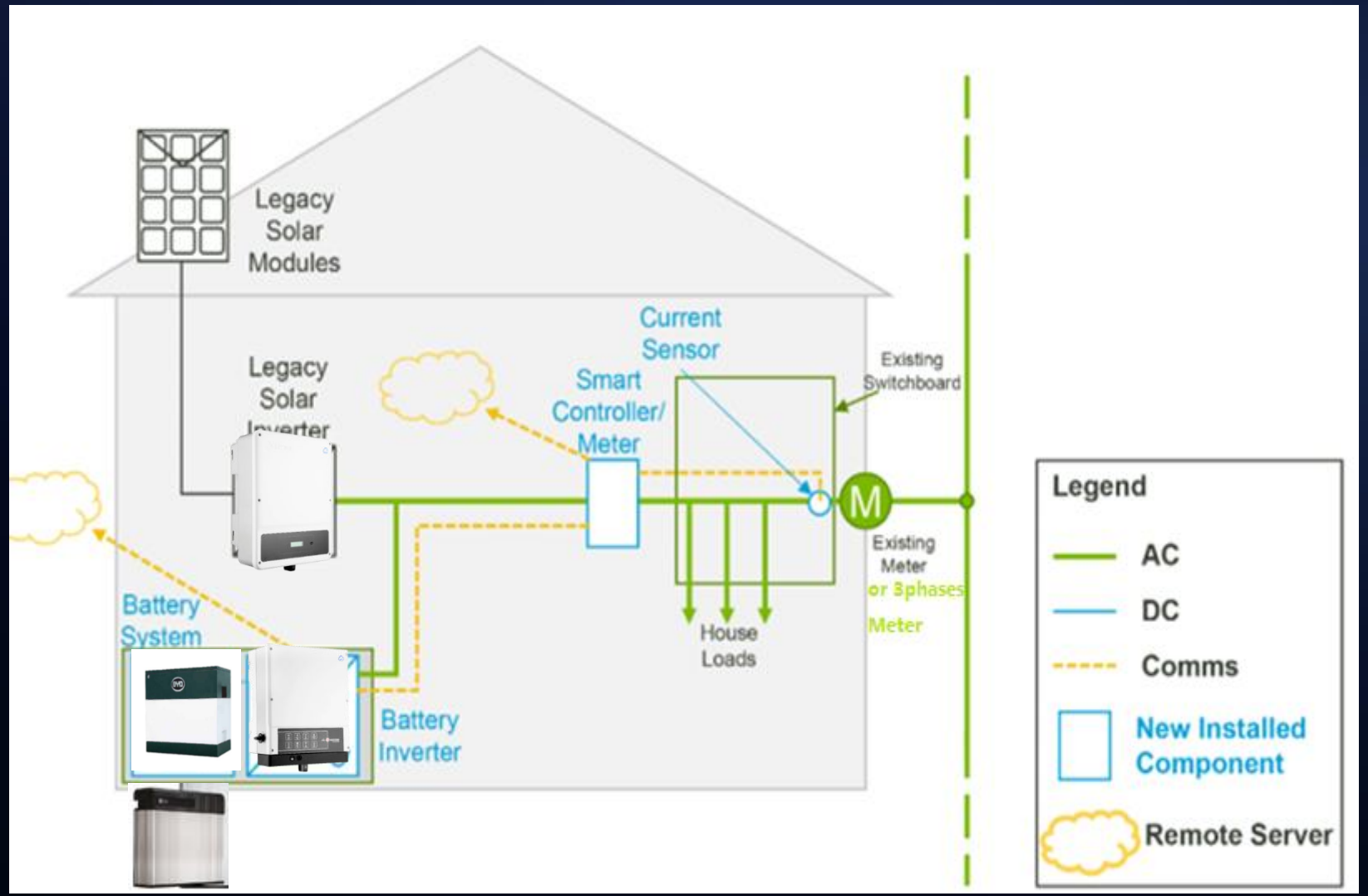
Economic solution:
GW3048-EM or **GW5048-EM**

- 50A charge/discharge with 10A
- back up plus Low Voltage BYD or LG

High Voltage battery solution:
GW3600-EH or **GW5000-EH**

- 20A back up with High Voltage BYD

Existing Solar (single or three phases)



Single phase AC Retrofit:

SBP5000

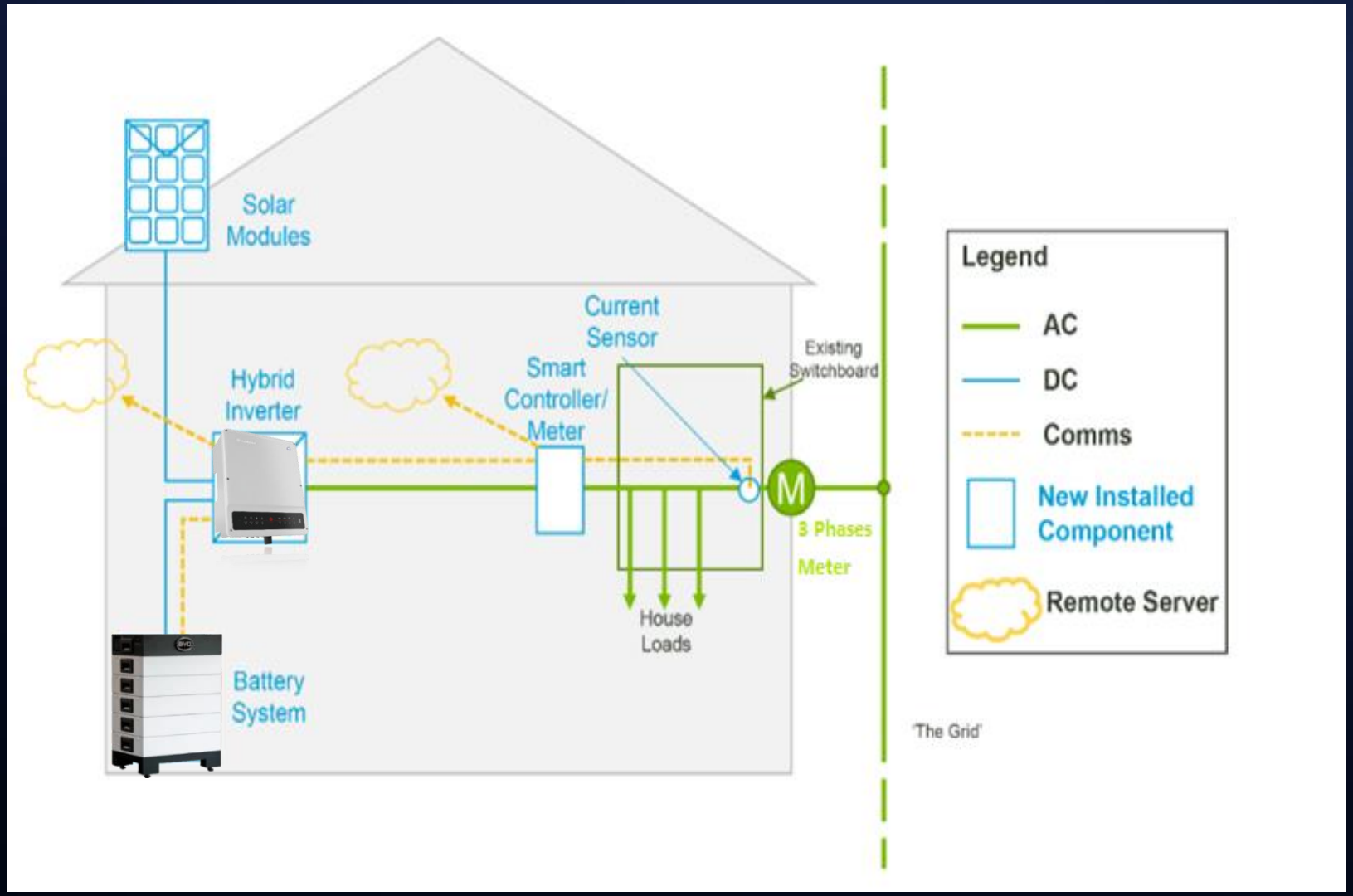
- 100A charge/discharge with 20A back up
- Low Voltage BYD and LG

Three phases AC Retrofit:

GW5000S-BP

- 100A charge/discharge with 20A back up with GM3000
- LV BYD and LG

Three Phases House



Three phases Solution:

GW5KL-ET or **GW10kL- ET**

- 5kW or 10kW back up power
- High Voltage BYD

Low Voltage battery solution:

GW5048D-ES, **GW5048-EM**

- GM3000 meter
- Low Voltage BYD and LG

02

System design

PV Side: oversizing

GW5048D-ES, GW5048-EM, GW5000-EH, GW5KL-ET, GW10KL-ET,

are all support **33% of AC oversizing** which is 6650W PV on 5kW and 13.3kW on 10kW.

But when battery connected:

GOODWE
YOUR SOLAR ENGINE

GoodWe Energy Storage Product Statement

Dear Australian Customers,

Please refer to the below statement in regards to the maximum DC input power of two models of GoodWe energy storage products.

1. The maximum DC input power of GW5048D-ES is 8.5kW
2. The maximum DC input power of GW5048-EM is 7.5kW

Please notice:

1) GW5048D-ES firmware should be at least version 16 to support the 8.5kW maximum DC

Inbuilt DC-PV2 isolator

GOODWE SOLAR ACADEMY

GOODWE
YOUR SOLAR ENGINE

DECLARATION LETTER

We hereby declare that GoodWe inverters listed below have built-in DC disconnector in compliance with the requirements specified in AS/NZS5033:2104 Amd 1+Amd 2.

DNS Series	GW3000D-NS, GW3600D-NS, GW4200D-NS GW5000D-NS, GW6000D-NS
EH Series	GW3600-EH, GW5000-EH, GW6000-EH
MS Series	GW5000-MS, GW6000-MS, GW7000-MS, GW8500-MS, GW9000-MS, GW10K-MS
SMT Series	GW25K-MT, GW29.9K-MT, GW36K-MT

Battery side: Compatible Batteries

LV

B-Box

RESU 48V

SMILE 5 BAT

Pylontech US

Dyness B4850

HV

B-Box HV

Powercube H1(SC1000)

Battery Capacity in Technical Part

For LV battery

- such as BYD, LG – No battery capacity limit
- Conditions may requested from battery suppliers

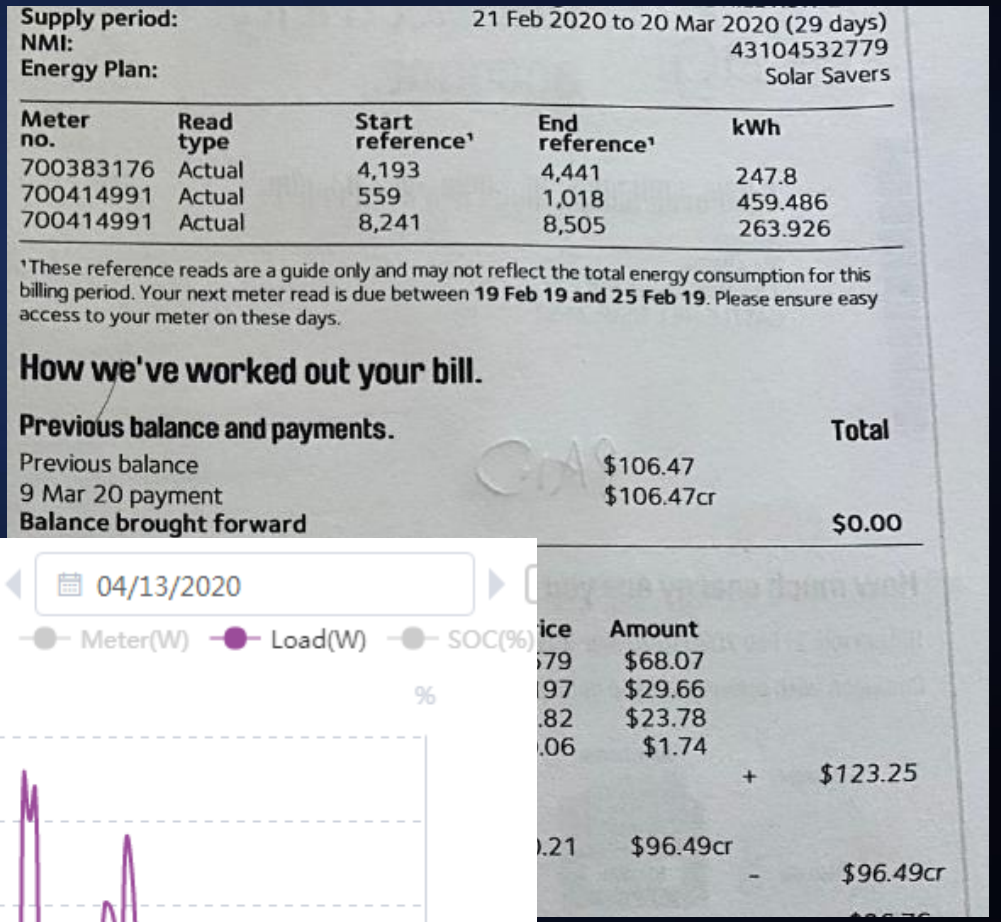
For HV BYD battery

- based on the inverter battery voltage range plus battery output voltage

Inverter		HVS 5.1	HVS 7.7	HVS 10.2	HVS 12.8	HVM 8.3	HVM 11.0	HVM 13.8	HVM 16.6	HVM 19.3	HVM 22.1
Goodwe	ET	✓	✓	✓	✓	×	✓	✓	✓	✓	✓
	EH	✓	✓	✓	×	✓	✓	✓	✓	✓	✓

Battery Size Design

- ✓ Study on customer's electricity bill
- ✓ Install home kit or hybrid without battery to monitor consumption
- ✓ Some storage experts presentation or recommended design tools. Such as Glen Morris video on Youtube or the solar plus design software.



Supply period: 21 Feb 2020 to 20 Mar 2020 (29 days)
NMI: 43104532779
Energy Plan: Solar Savers

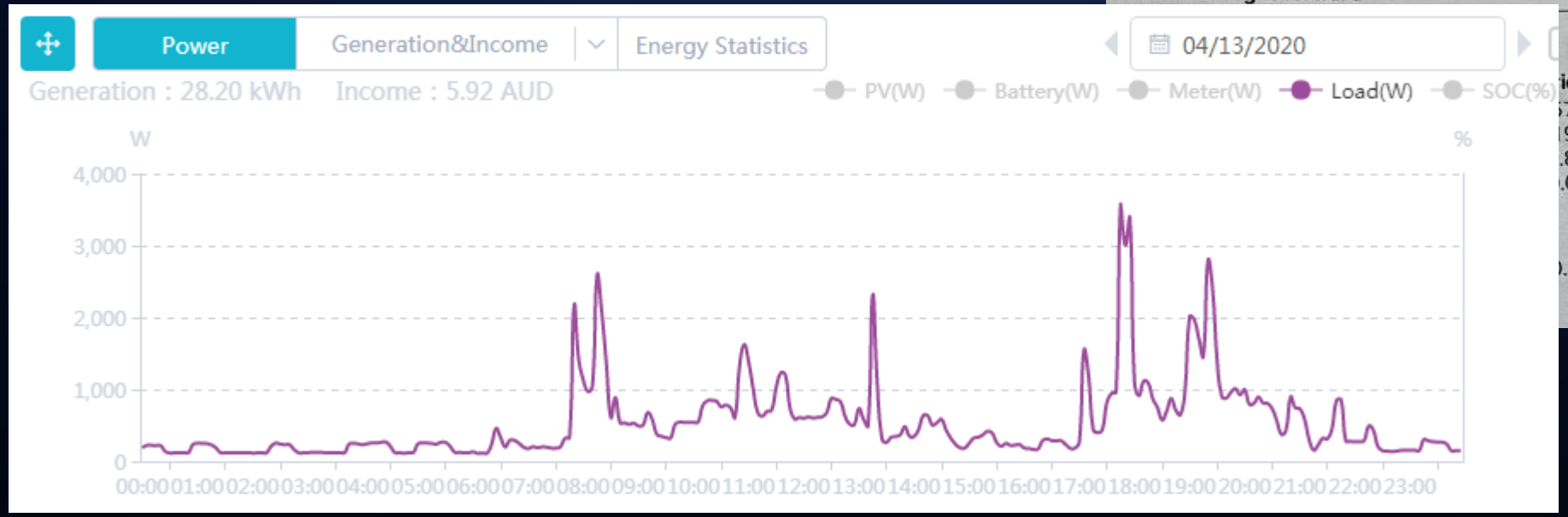
Meter no.	Read type	Start reference¹	End reference¹	kWh
700383176	Actual	4,193	4,441	247.8
700414991	Actual	559	1,018	459.486
700414991	Actual	8,241	8,505	263.926

¹These reference reads are a guide only and may not reflect the total energy consumption for this billing period. Your next meter read is due between **19 Feb 19 and 25 Feb 19**. Please ensure easy access to your meter on these days.

How we've worked out your bill.

Previous balance and payments.		**Total**
Previous balance	$106.47	
9 Mar 20 payment	$106.47cr	
Balance brought forward		**$0.00**

ice	Amount
79	$68.07
97	$29.66
.82	$23.78
.06	$1.74
	+ $123.25
.21	$96.49cr
	- $96.49cr

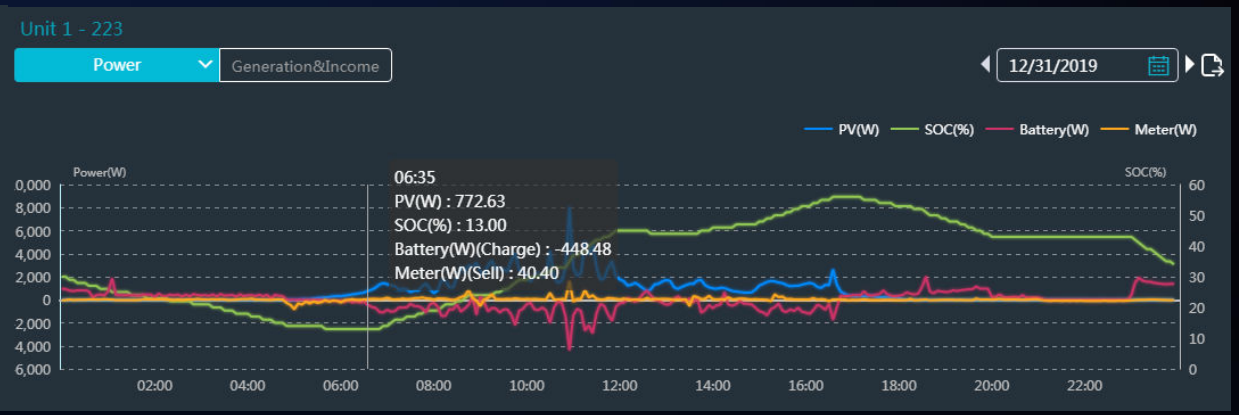


According to our statistic, the average battery size in AU now is 10kWh – 13.8kWh

Case Study

One 2.5kWh BYD battery only run for 1-2hours discharge

Good Design



AC side: Back up Size design

Declaration For Back-Up Loads

GoodWe ES inverter is able to supply a continuous 4600VA output or max 6900VA in less than 10 seconds on Back-Up side to support backup loads. And the inverter has self-protection derating at high ambient temperature.

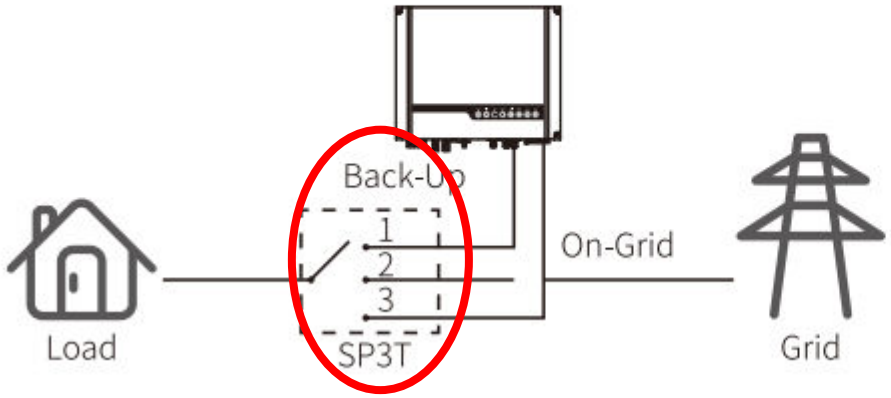
Accepted loads as below:

- Inductive Load: Max 1.5KVA for single inductive load, max 2.5KVA for total inductive load power
- Capacitive load: Total capacitive load (like computer, switch power etc.) power <3.0KVA

Note:

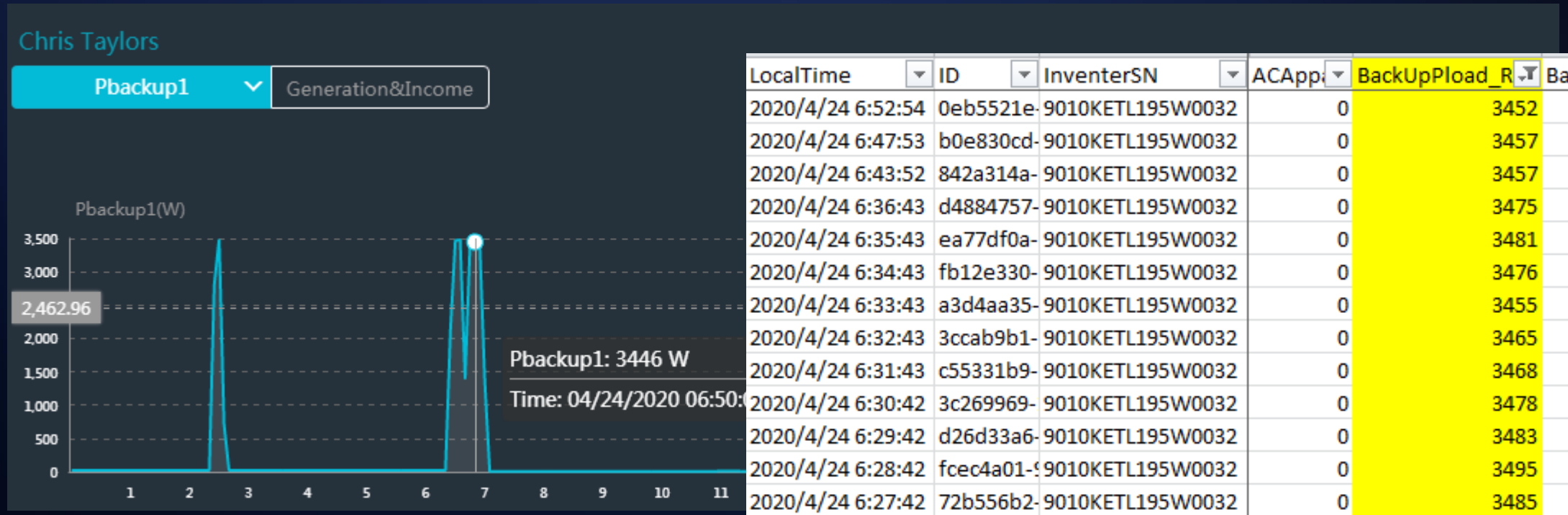
For convenient maintenance, please install a SP3T switch on back-up and on-grid side. Then it is adjustable to support load by back-up or by grid or default settings.

For a conven
switch could
On-Grid side
support load
leave it there



1. *Back-up load is supplied from back-up side.*
2. *Back-up load is isolated.*
3. *Back-up load is supplied from grid side.*

Case Study

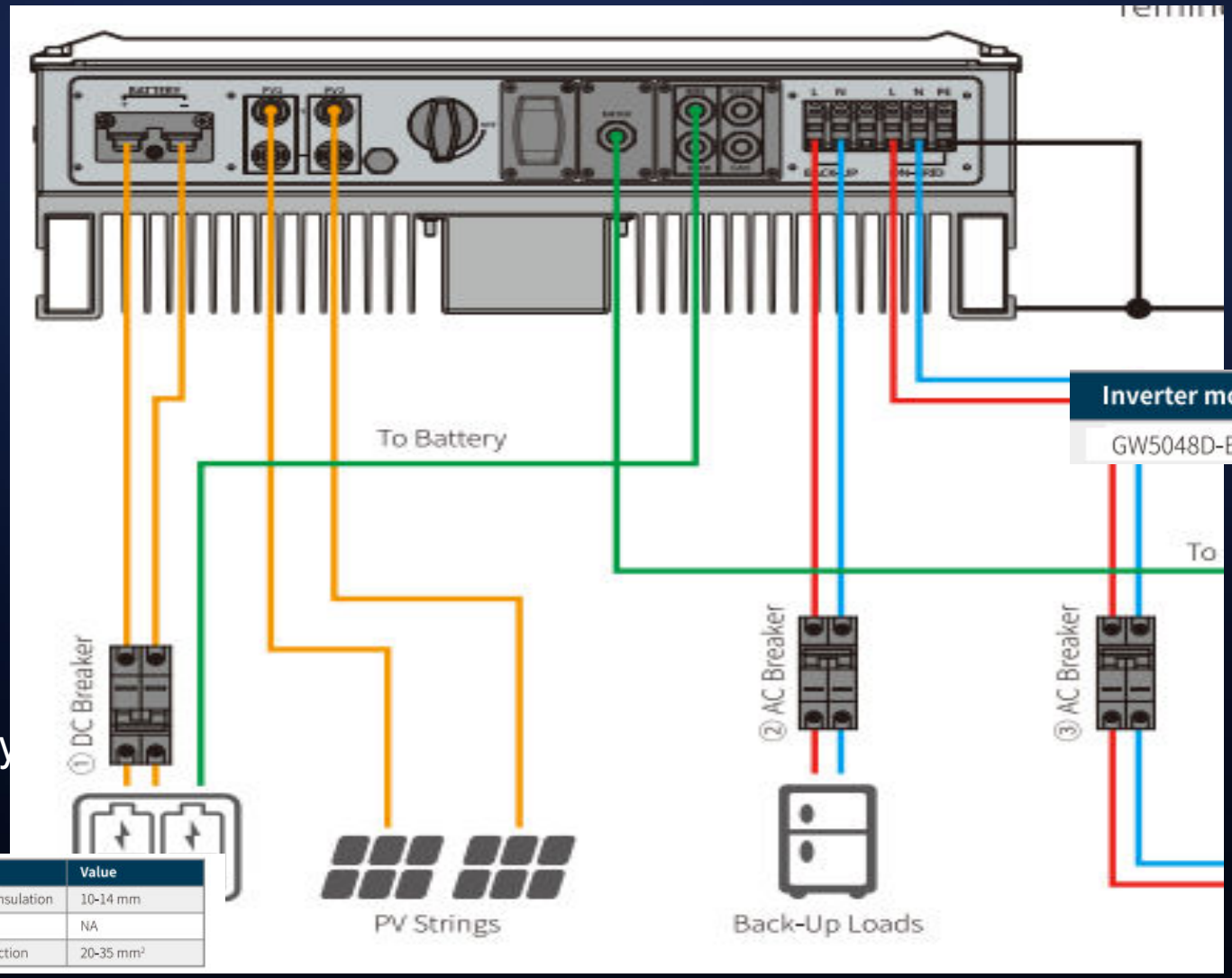


LocalTime	ID	InventerSN	ACApp	BackUpPload_R	BackUp	Back
2020/4/24 6:52:54	0eb5521e-	9010KETL195W0032	0	3452	0.8	5
2020/4/24 6:47:53	b0e830cd-	9010KETL195W0032	0	3457	0.8	5
2020/4/24 6:43:52	842a314a-	9010KETL195W0032	0	3457	0.8	4
2020/4/24 6:36:43	d4884757-	9010KETL195W0032	0	3475	0.8	4
2020/4/24 6:35:43	ea77df0a-	9010KETL195W0032	0	3481	0.8	5
2020/4/24 6:34:43	fb12e330-	9010KETL195W0032	0	3476	0.8	4
2020/4/24 6:33:43	a3d4aa35-	9010KETL195W0032	0	3455	0.8	4
2020/4/24 6:32:43	3ccab9b1-	9010KETL195W0032	0	3465	0.8	5
2020/4/24 6:31:43	c55331b9-	9010KETL195W0032	0	3468	0.8	4
2020/4/24 6:30:42	3c269969-	9010KETL195W0032	0	3478	0.8	4
2020/4/24 6:29:42	d26d33a6-	9010KETL195W0032	0	3483	0.8	4
2020/4/24 6:28:42	fcec4a01-	9010KETL195W0032	0	3495	0.7	5
2020/4/24 6:27:42	72b556b2-	9010KETL195W0032	0	3485	0.7	4
2020/4/24 2:35:12	ae5a13f3-	9010KETL195W0032	0	3488	0.2	4
2020/4/24 2:34:12	c328e719-	9010KETL195W0032	0	3489	0.2	4
2020/4/24 2:33:11	8afcd80f-	9010KETL195W0032	0	3497	0.2	4
2020/4/24 2:32:11	7f73112b-	9010KETL195W0032	0	3488	0.2	4
2020/4/24 2:31:11	7c3b31b6-	9010KETL195W0032	0	3490	0.2	5
2020/4/24 2:30:11	4e9975be-	9010KETL195W0032	0	3482	0.2	5
2020/4/24 2:29:11	3494b03f-	9010KETL195W0032	0	3506	0.2	
2020/4/24 2:28:11	1c304881-	9010KETL195W0032	0	3471	0.2	4
2020/4/24 2:27:11	4165f1ac-	9010KETL195W0032	0	3496	0.2	4

ET10kW, back up 3.3kW per phase.
Overloading happened on Phase 1.

Cabling & Breaker size

LV Inverter (GW5048D-ES, 5048-EM and GW5000S-BP)



Inverter model	AC breaker specification
GW5048D-ES	32A / 230V (e.g. DZ47-60 C32)

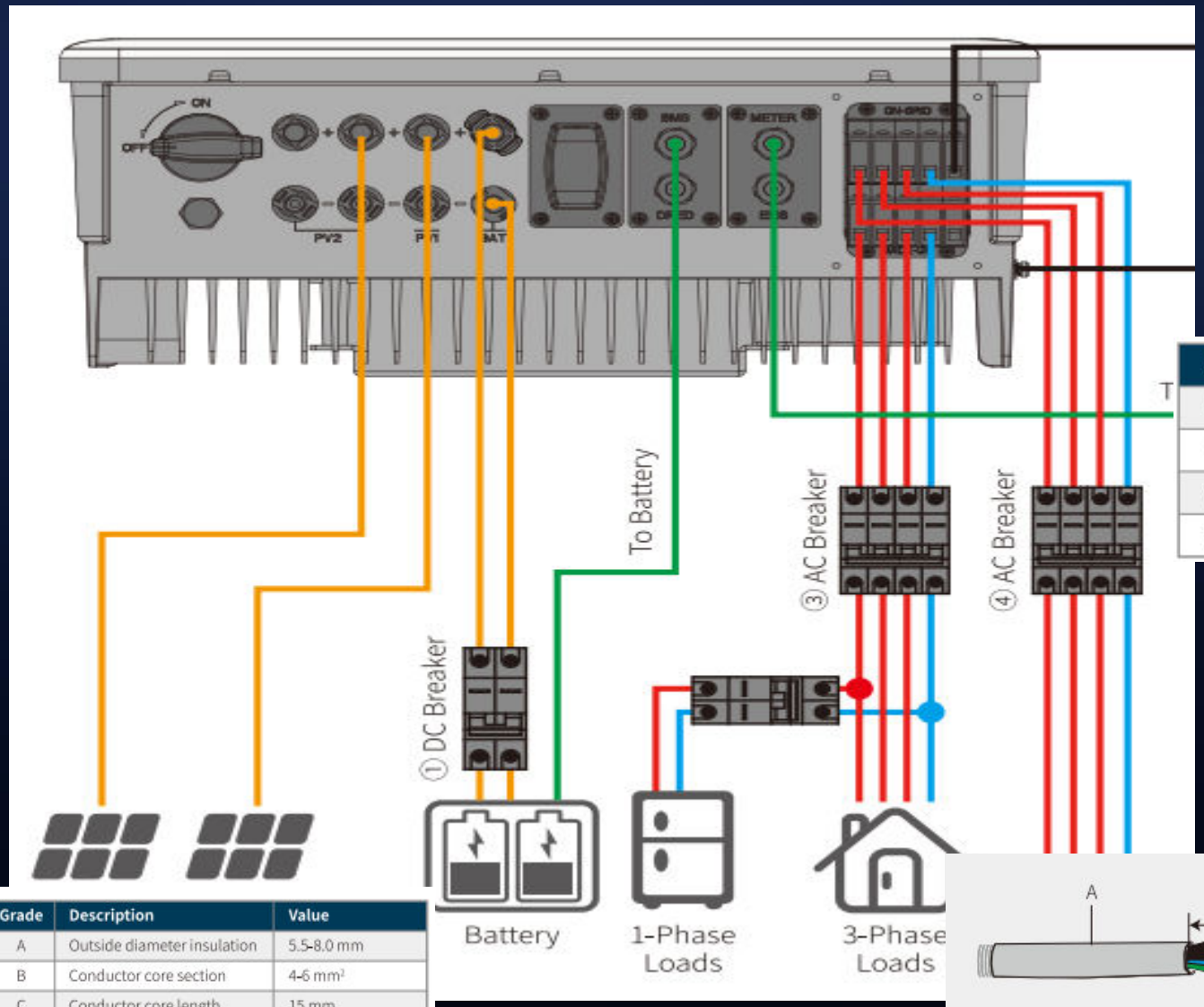
Cable and breaker selection referring to practical condition

125A External DC breaker (request referring to battery supplier)

Grade	Description	Value
A	Outside Diameter Insulation	10-14 mm
B	Isolation Section	NA
C	Conductor Core Section	20-35 mm²

Cabling & Breaker size

HV Inverter (GW5000EH and GW5000ET)



Inverter model	AC breaker specification
GW5K/GW5KL-ET	25A / 400V (e.g. DZ47-60 C25)
GW6K5/GW6KL-ET	25A / 400V (e.g. DZ47-60 C25)
GW8K/GW8KL-ET	32A / 400V (e.g. DZ47-60 C32)
GW10K/GW10KL-ET	32A / 400V (e.g. DZ47-60 C32)

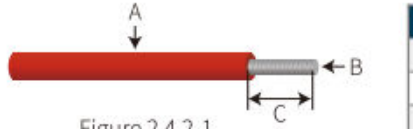


Figure 2.4.2-1

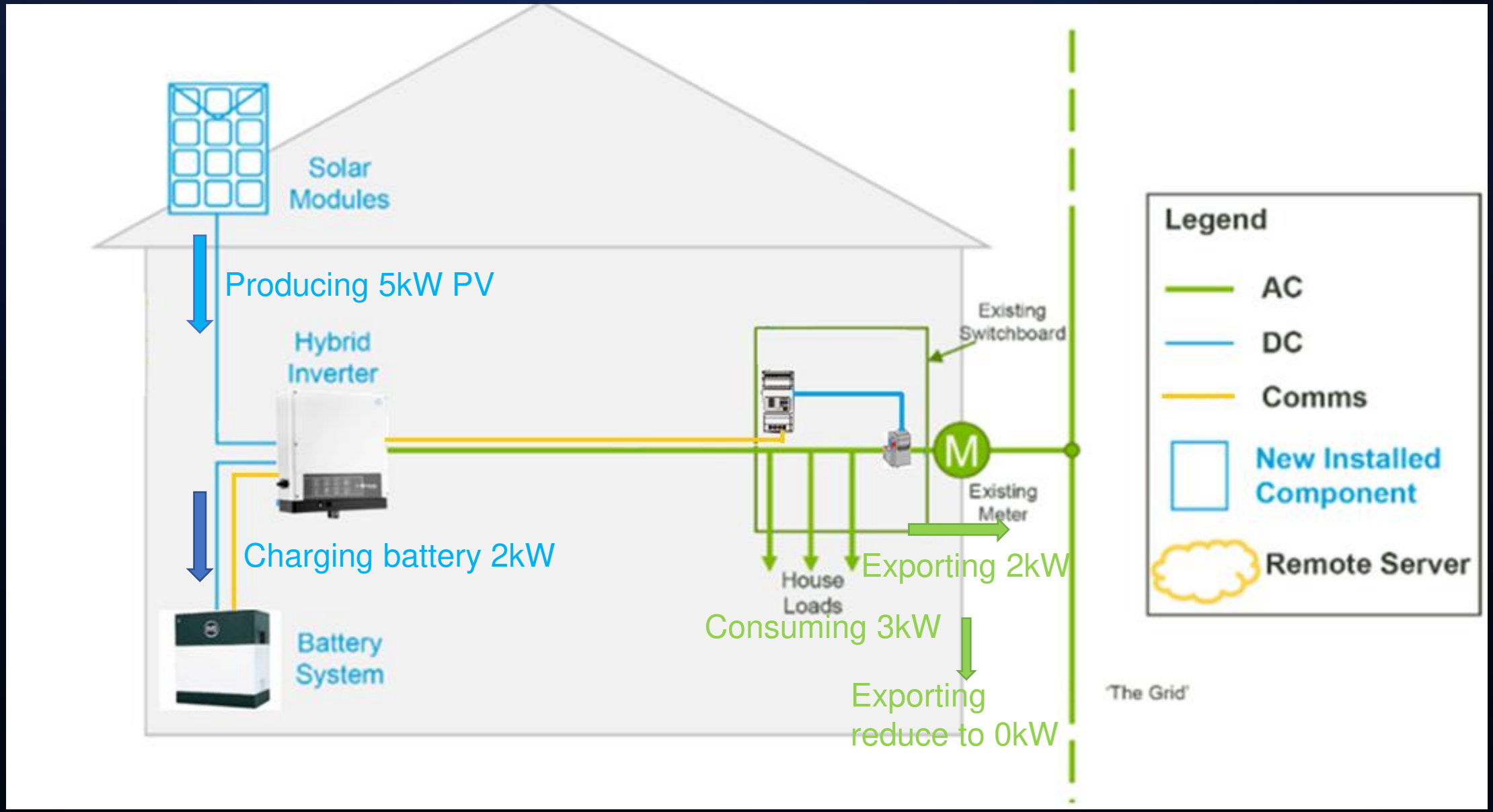
Grade	Description	Value
A	Outside diameter insulation	5.5-8.0 mm
B	Conductor core section	4-6 mm²
C	Conductor core length	15 mm

Grade	Description	Value
A	Outside diameter	13-18 mm
B	Separated wire length	20-25 mm
C	Conductor wire length	7-9 mm
D	Conductor core section	4-6 mm²

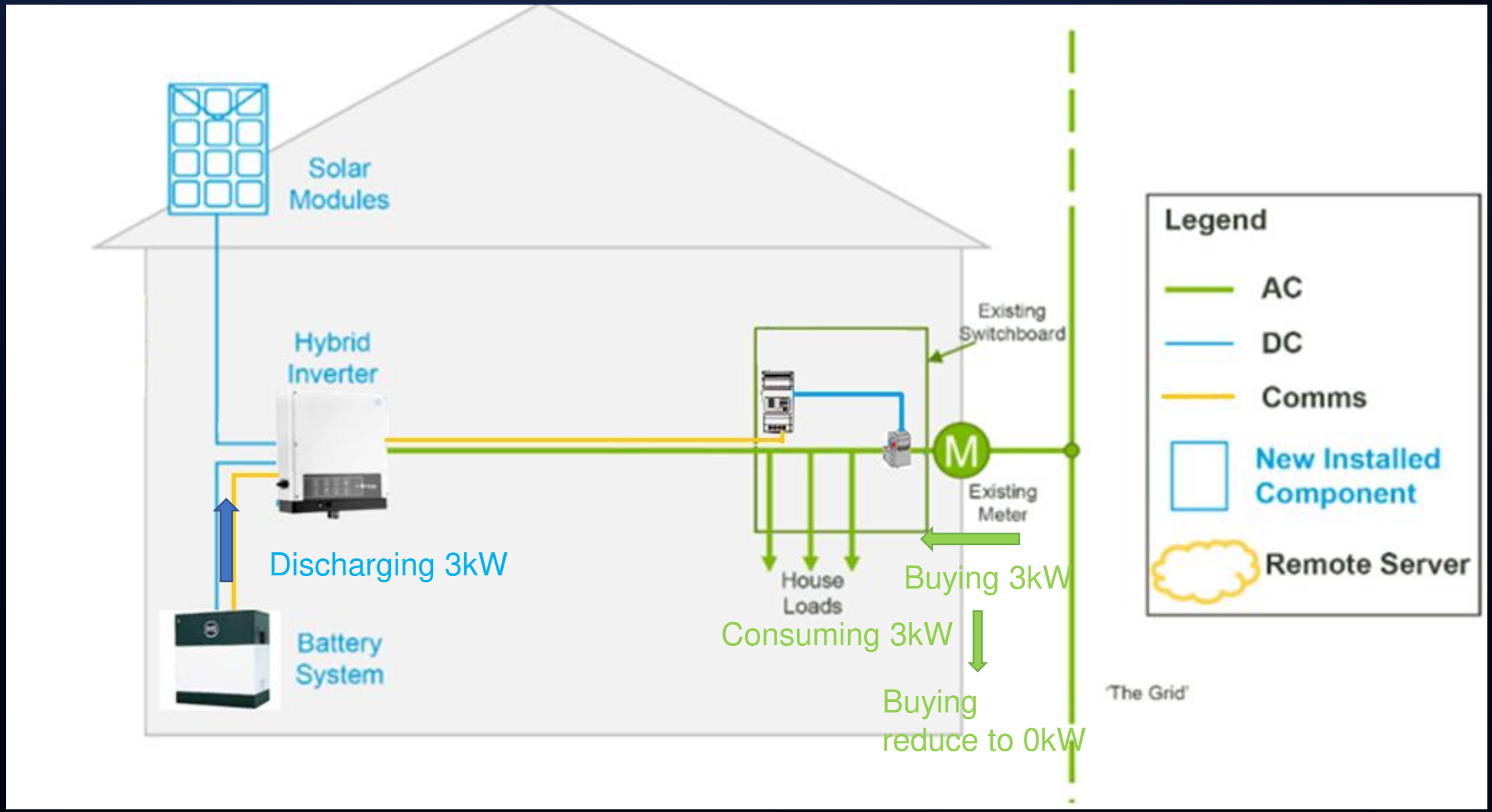
03

Physical wiring

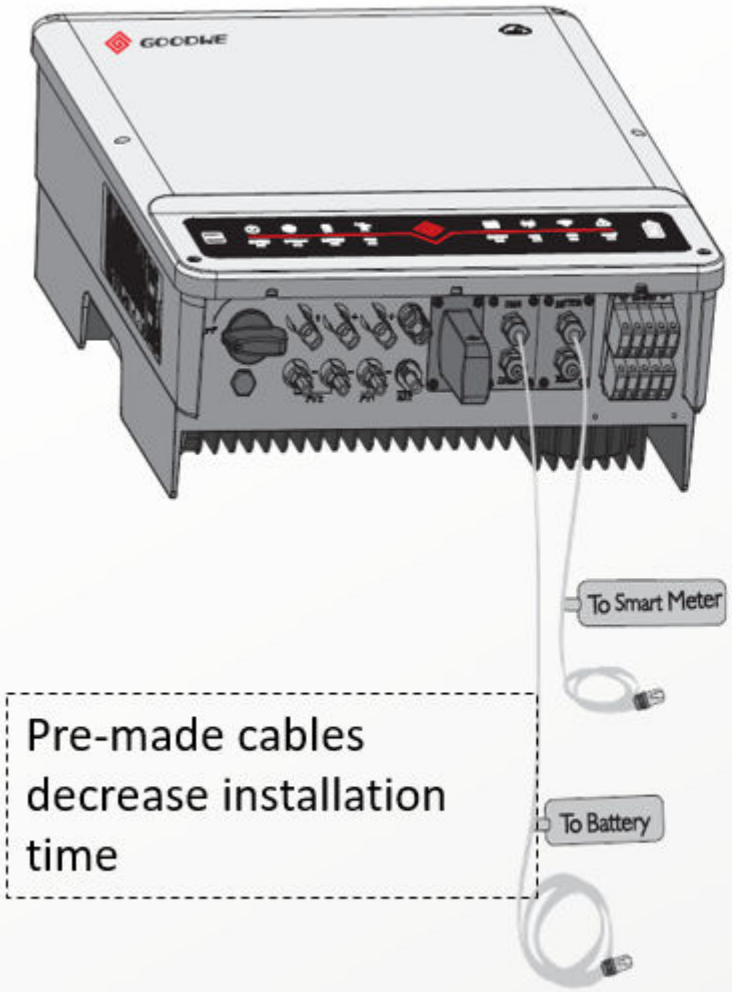
System Operation (charging in the day)



System Operation (discharging at night)

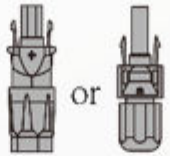


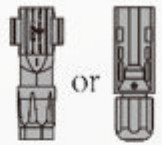
ES, EM, SBP, EH, ET architecture



Pre-made cables decrease installation time


Wall-mounted Bracket X1


Positive PV Plug X 2or3

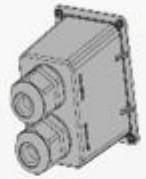

Negative PV Plug X 2or3


Positive BAT Plug X1


Negative BAT Plug X1


PE Terminal X1


Expansion Bolts X1


AC Cover X1


Pin Terminal X12


User Manual X1


Quick Installation Guide X1

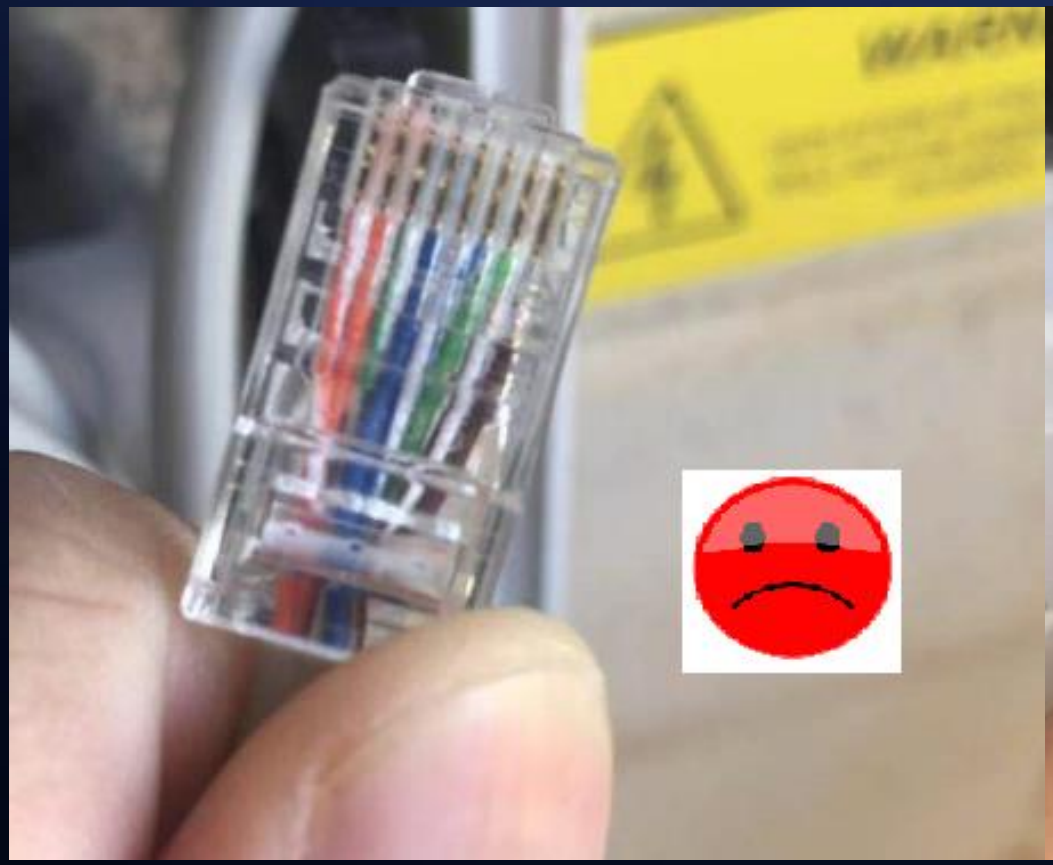
Smart Meter & CT

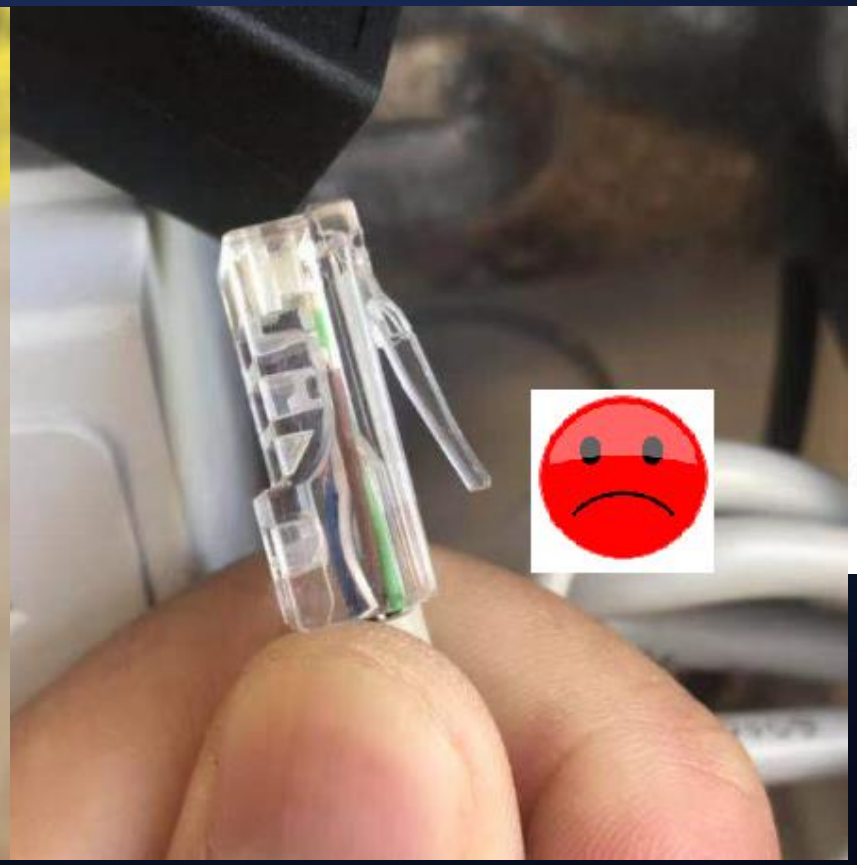
Wi-Fi Module

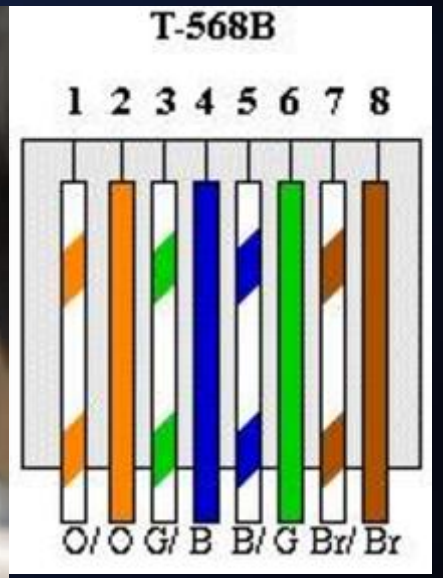
Bluetooth Module (soon)

Communication Spliters * 5 (For ET paralleling cases)

Make data cable properly

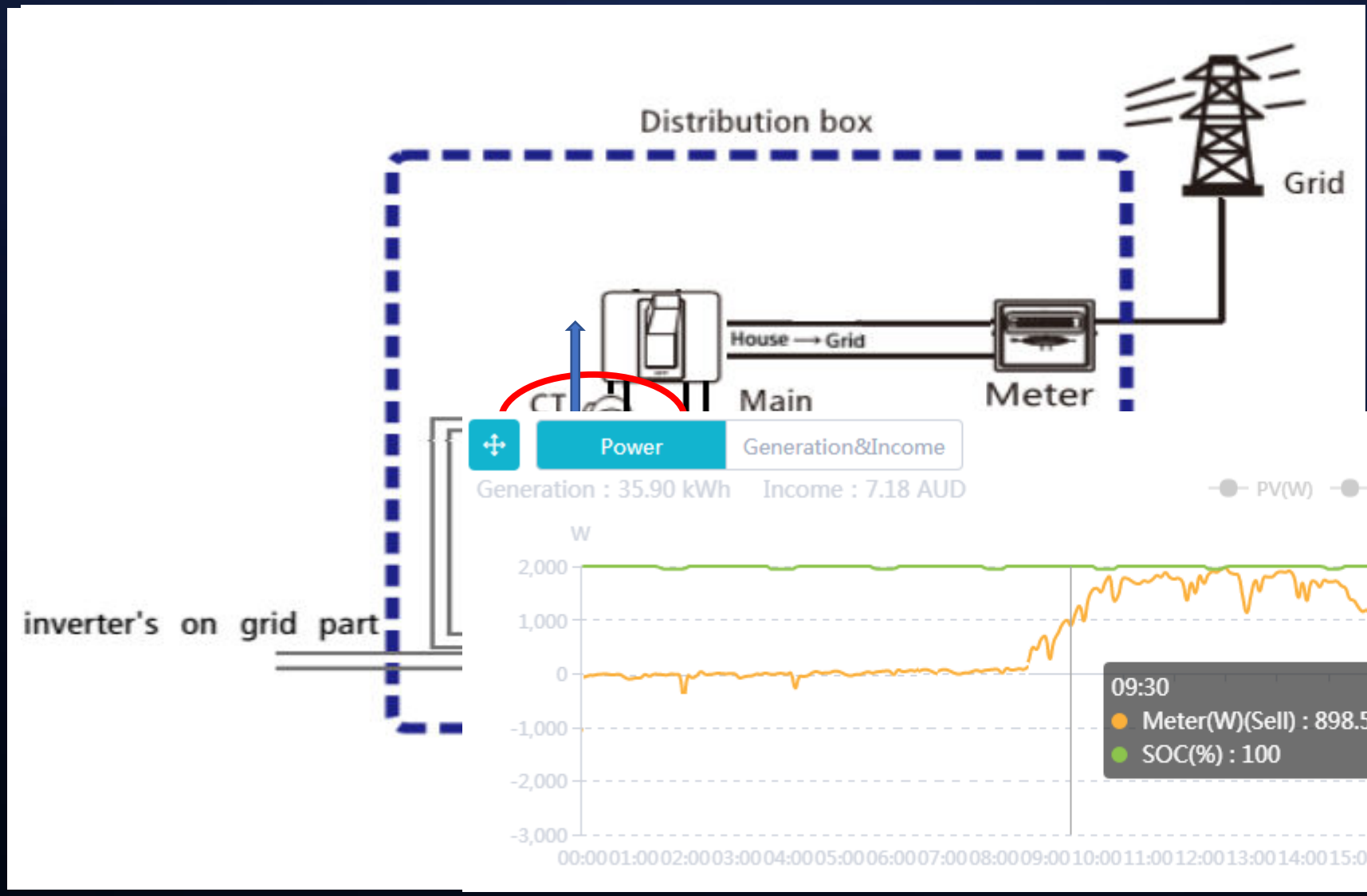






Referring to T568B for remaking the data cable if necessary

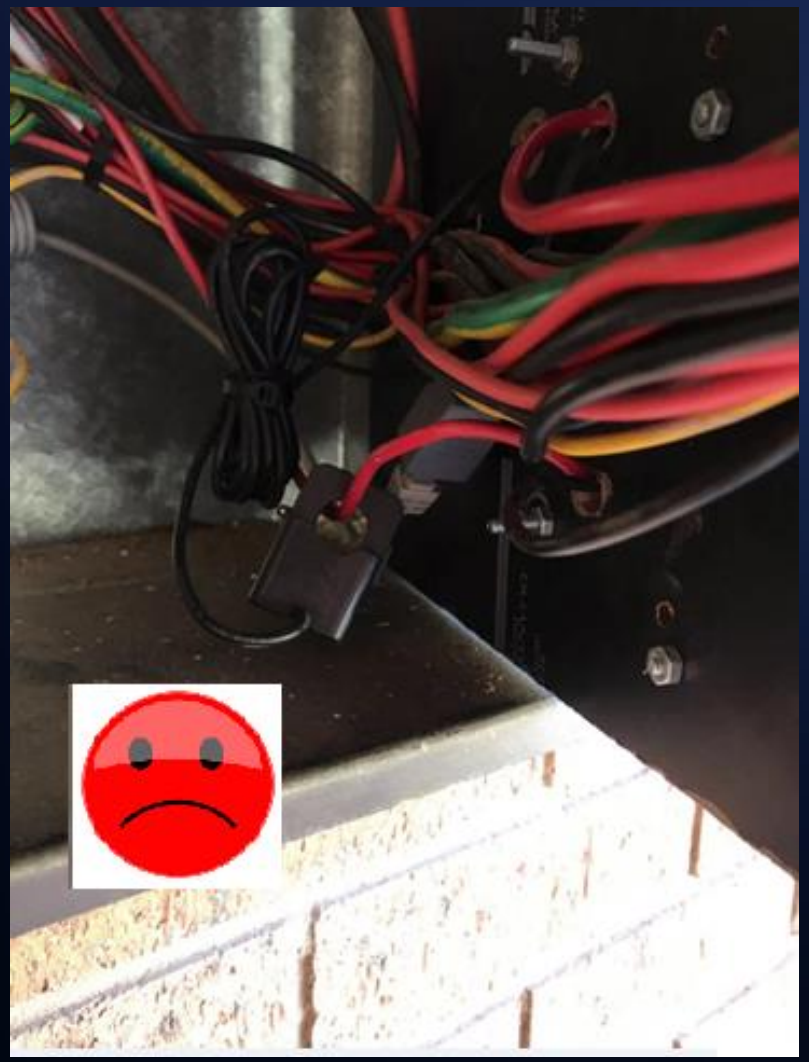
Meter&CT Installation

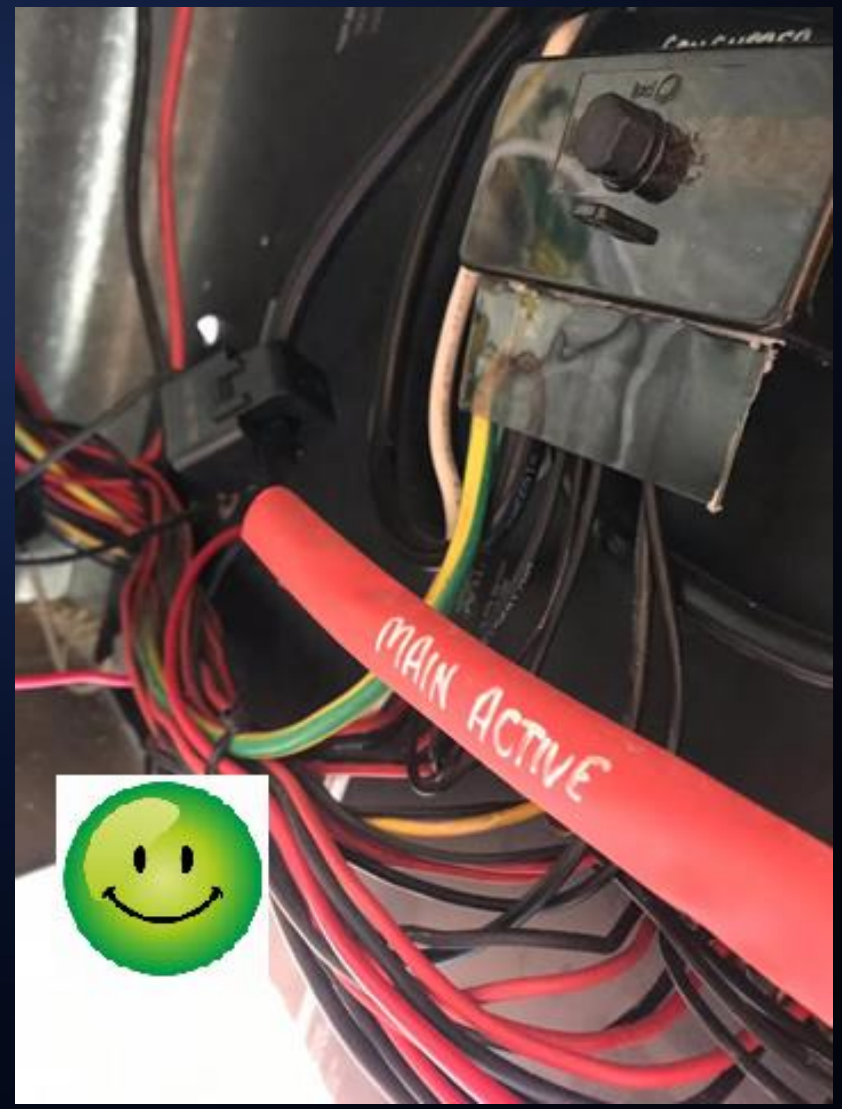


CT be put incorrectly around solar main breaker cable

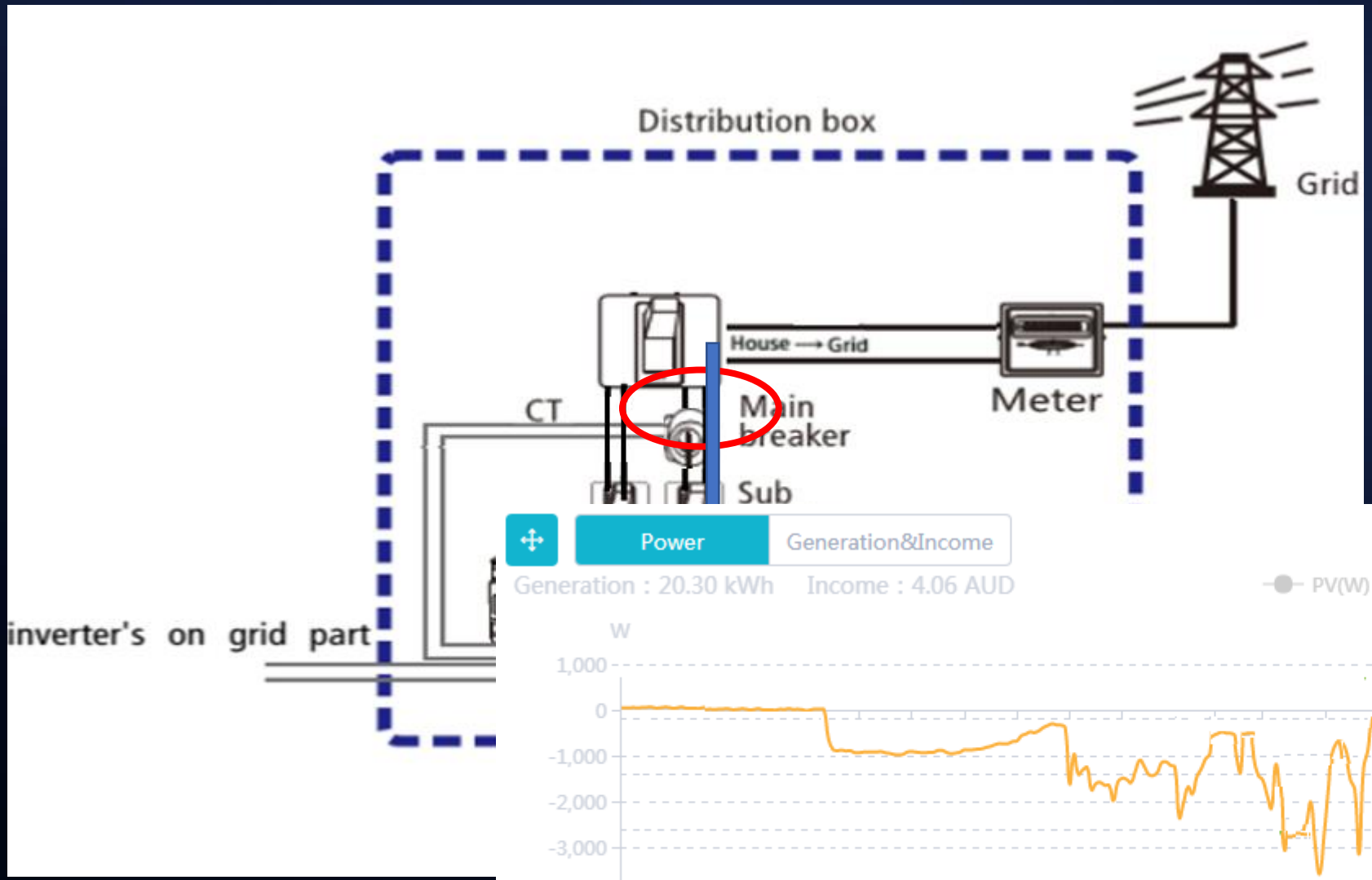
Battery only charging but no discharging

Case study



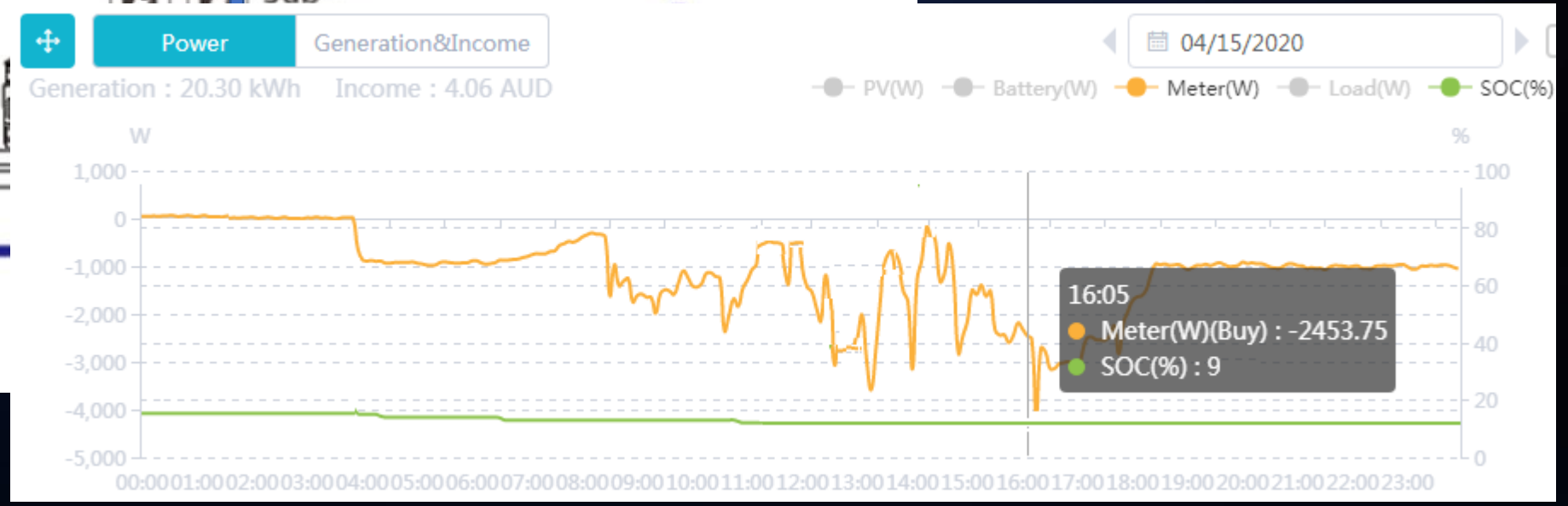


Meter&CT Installation

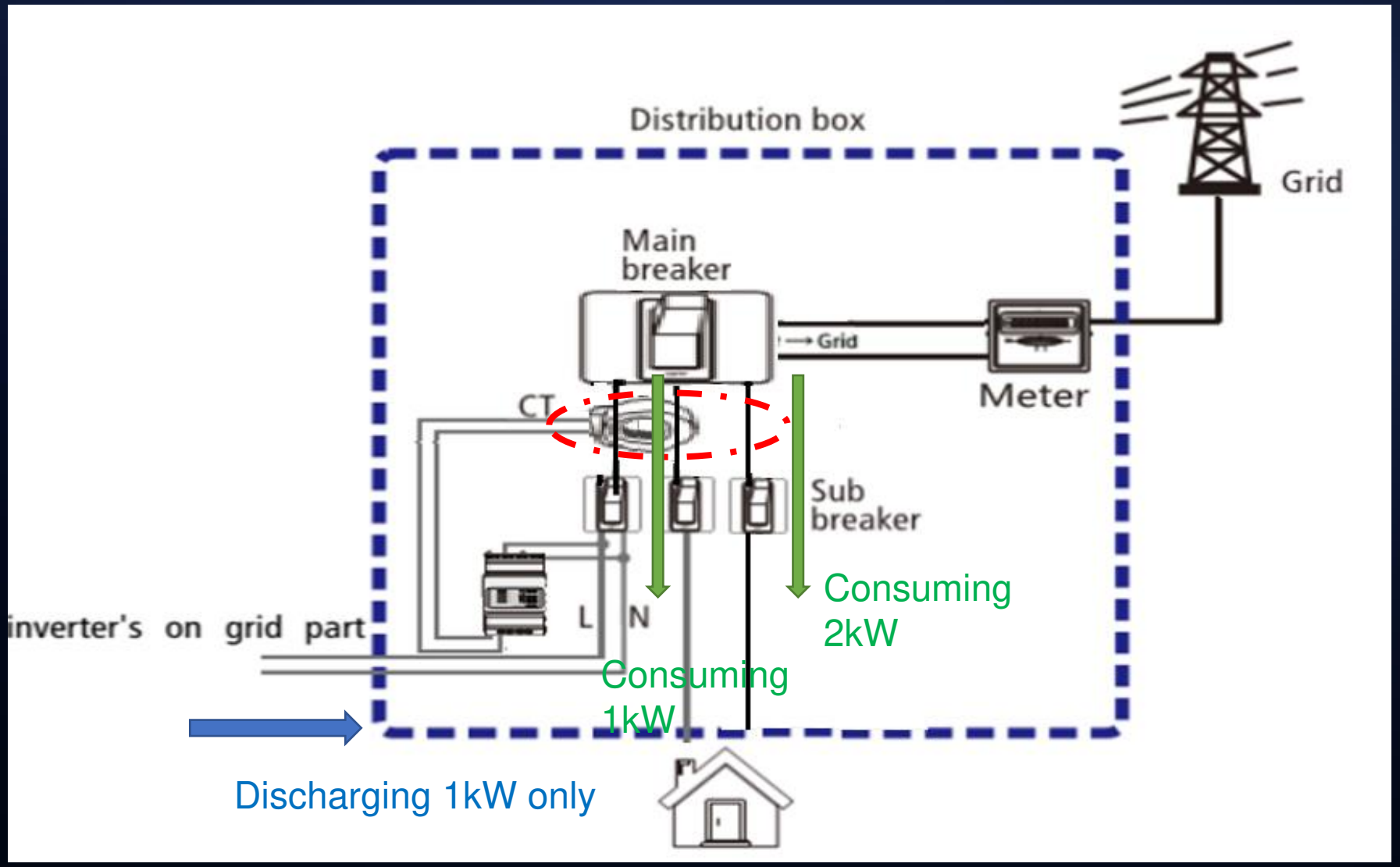


CT be put incorrectly around consumption cable

Battery only discharge but no charging

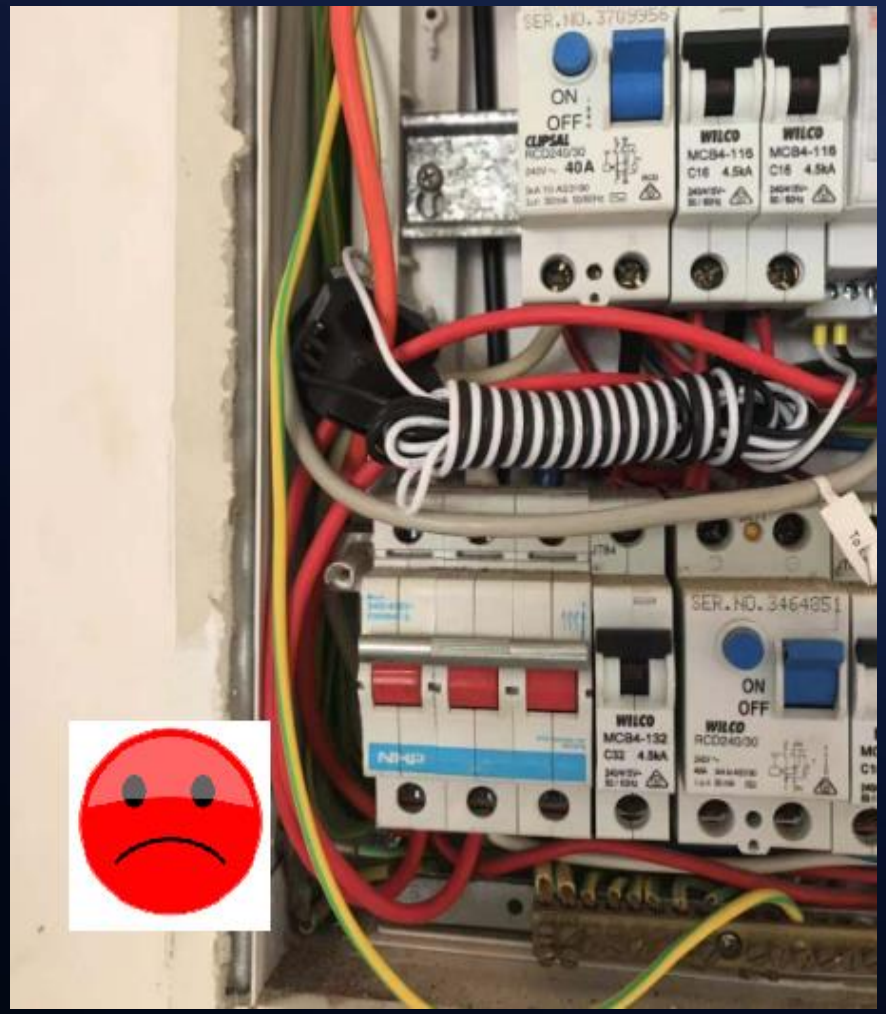


Meter&CT Installation on sign

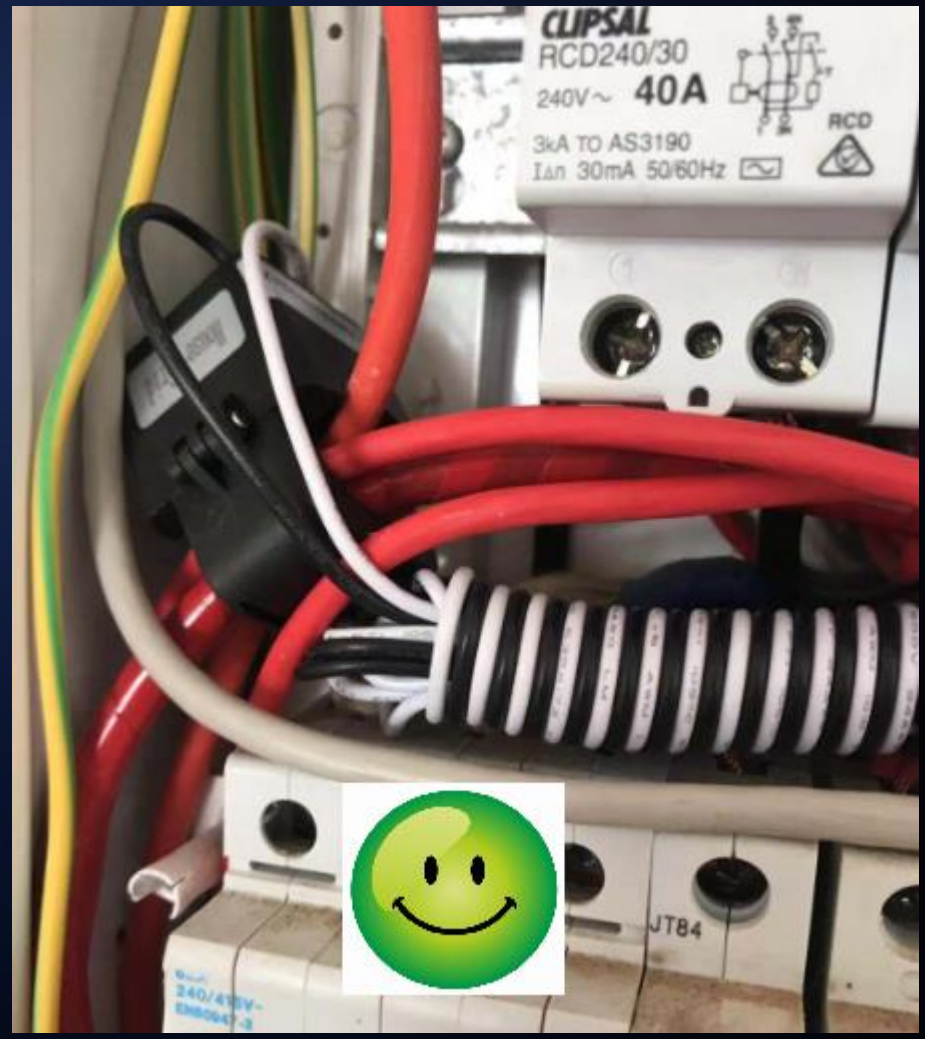


CT be put incorrectly around partially consumption cable

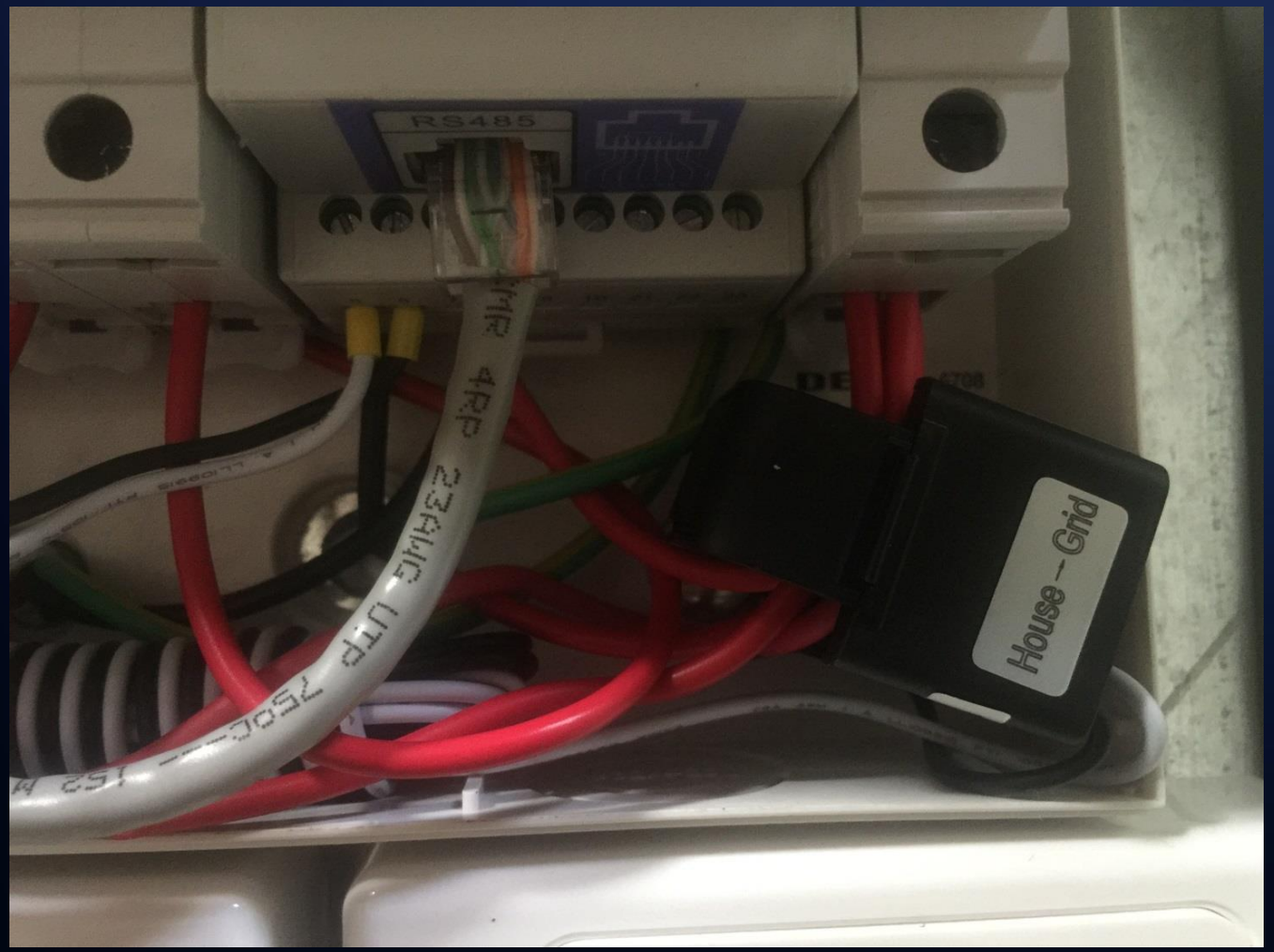
Case study


ON
OFF
CLIPSAL
RCD240/30
40A
WILCO
MCB4-116
C16
WILCO
MCB4-116
C16
SER.NO.3464351
ON
OFF
WILCO
MCB4-132
C32
WILCO
RCD240/30


DANGER
NO


CLIPSAL
RCD240/30
240V~ 40A
3kA TO AS3190
IΔn 30mA 50/60Hz
RCD
JT84

CT direction

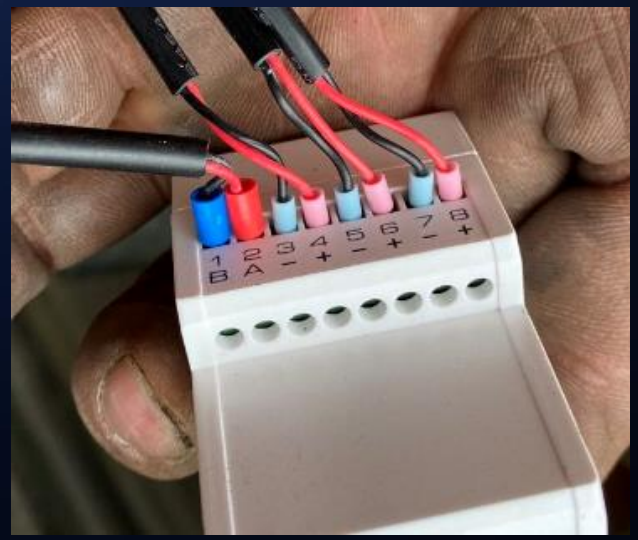


Hints:

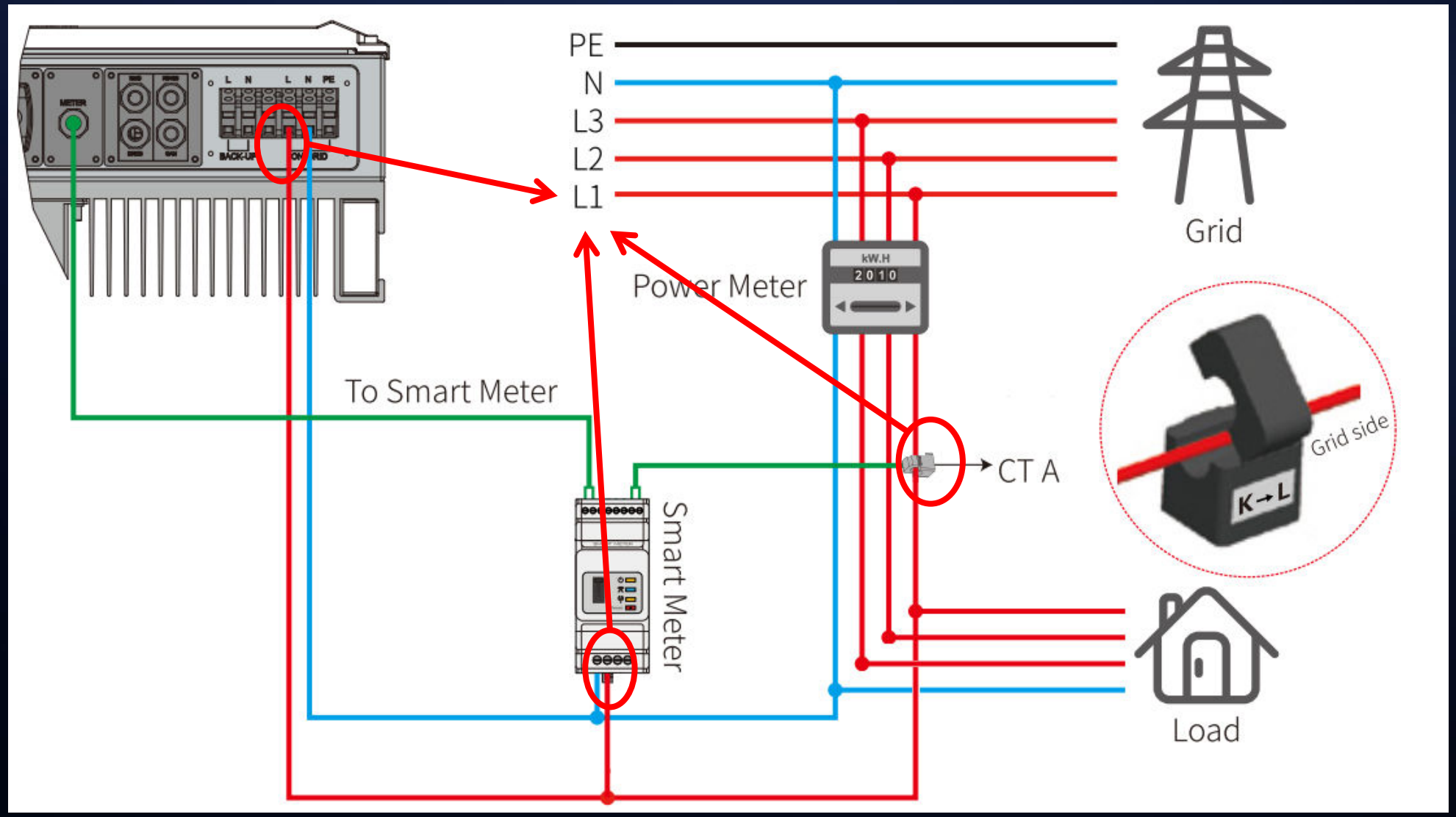
a. The energy of Solar/Battery as well as the loads must pass through the CT

b. CT clamp has its direction. The label on CT indicates the correct orientation. HOUSE indicates load side, GRID indicates line side.

c. CT has pre-connected with meter GM1000 or GM3000

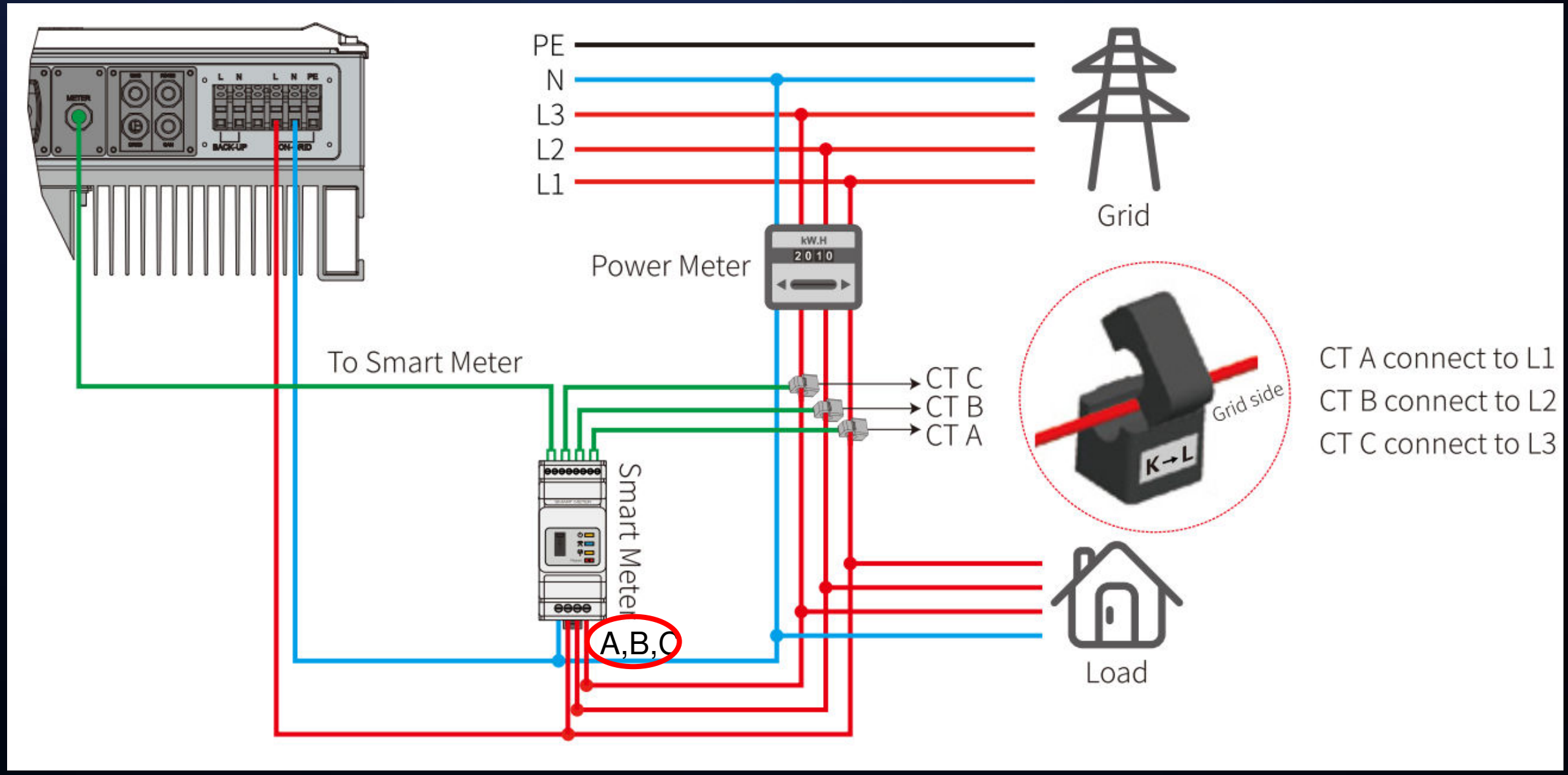


Three Phases House – GM1000

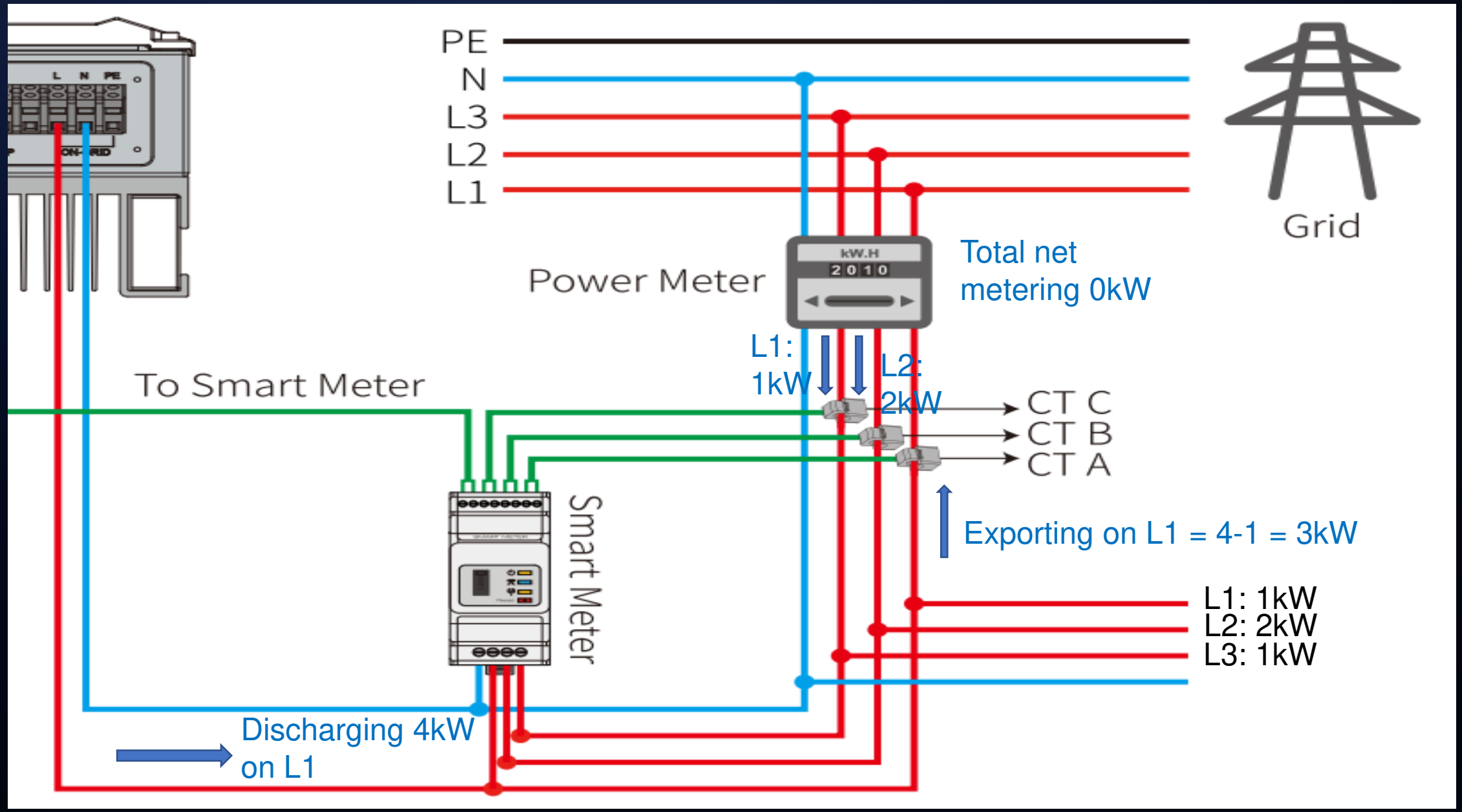


Inverter, Voltage refer on Meter and CT must be from same phase.

Three Phases House – GM3000



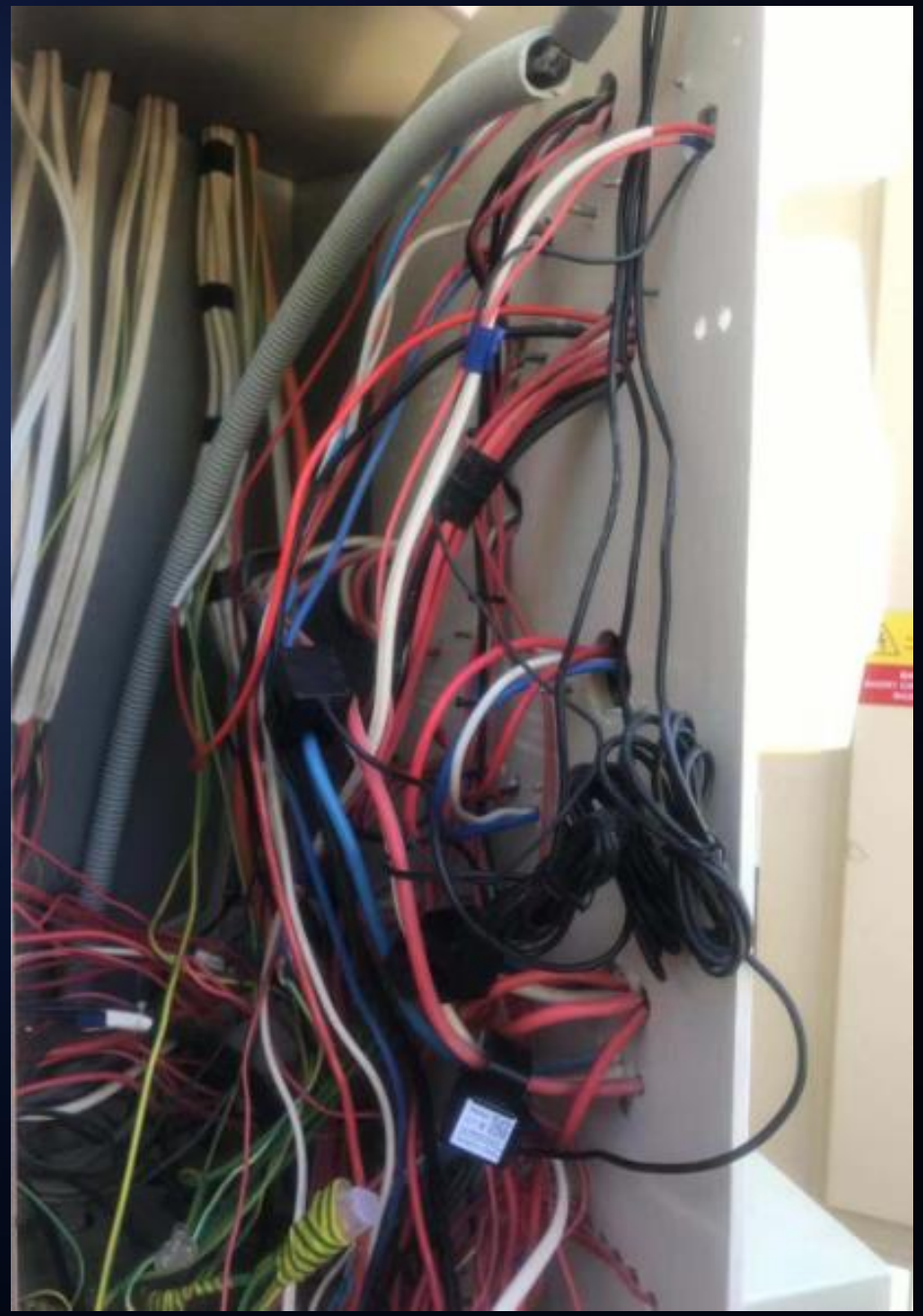
Three Phases House – GM3000 – how it works



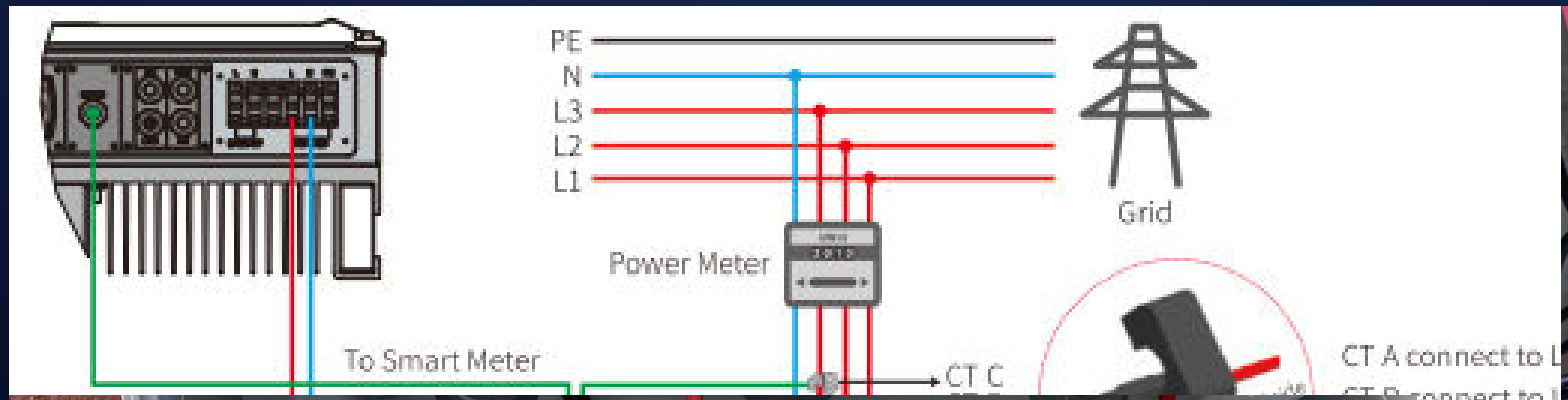
Case study

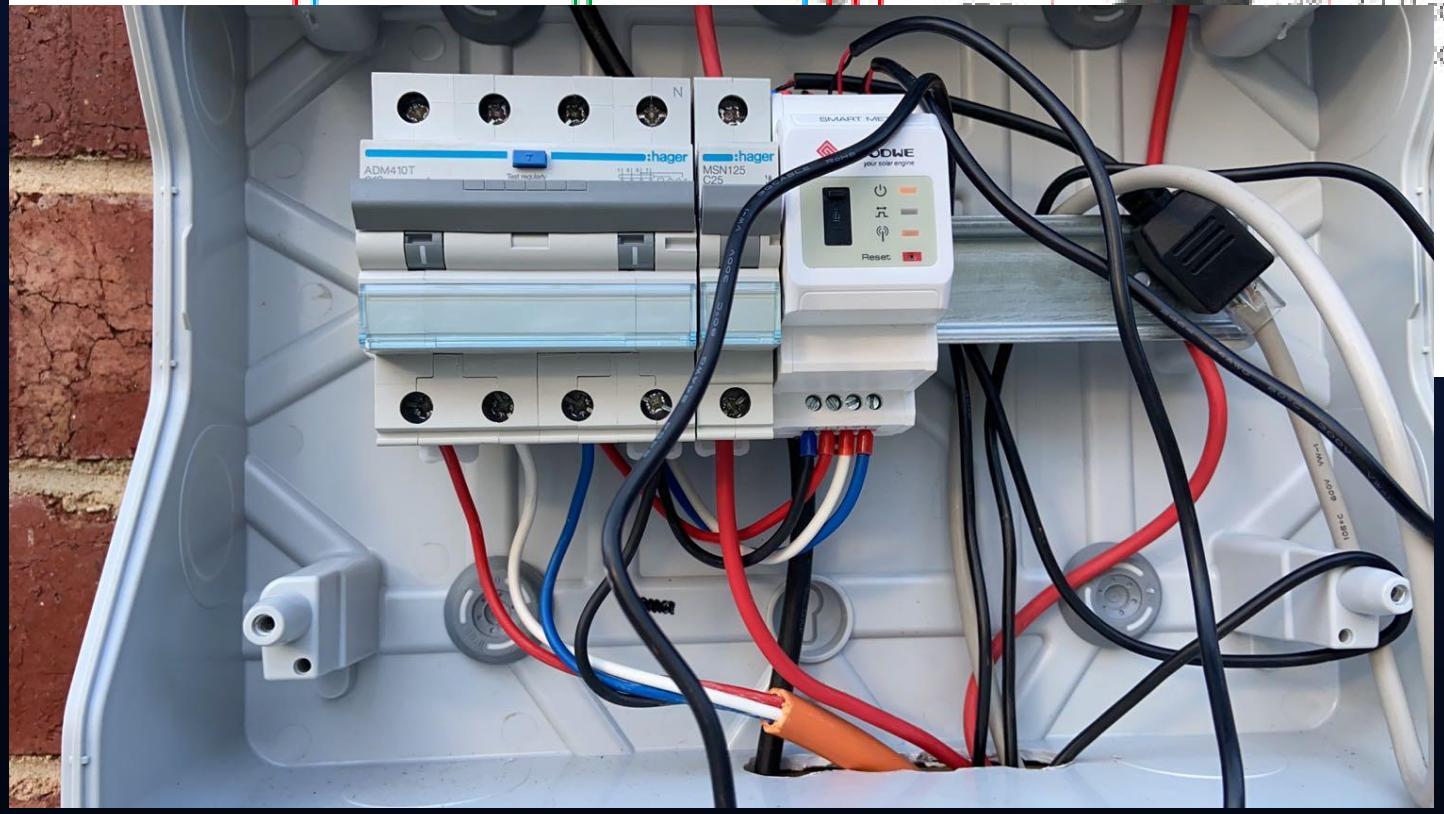

SMART METER
GOODWE
your solar engine
RESET
Reset

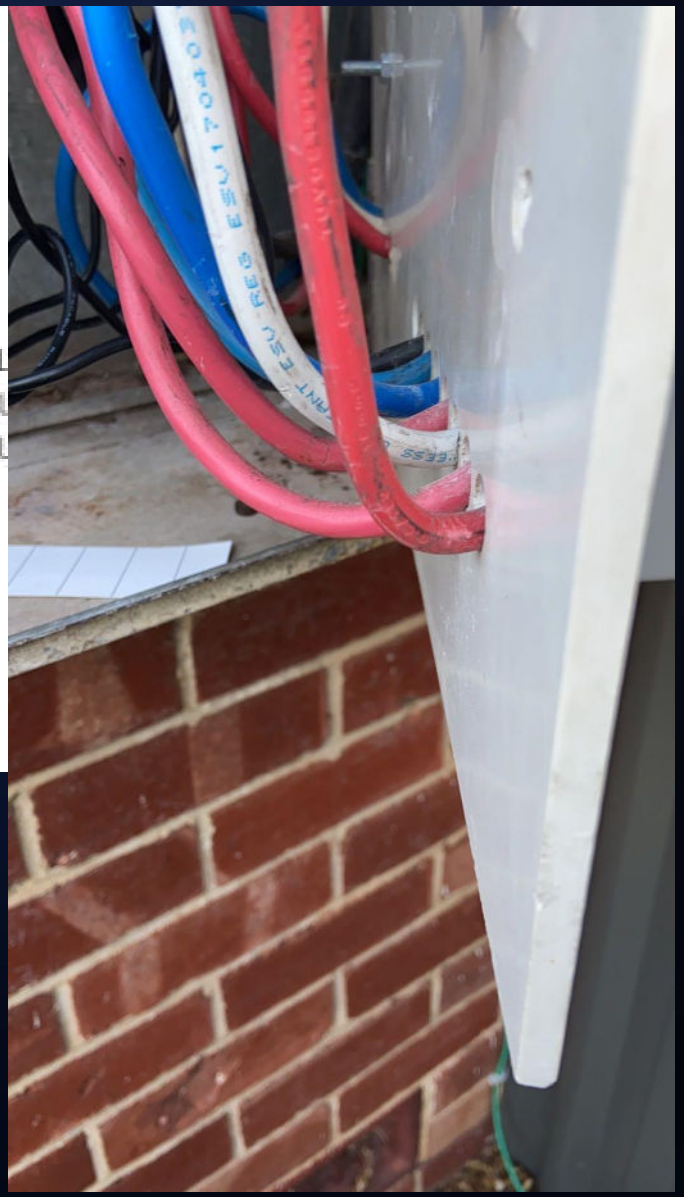

SMART METER
GOODWE
your solar engine
Reset



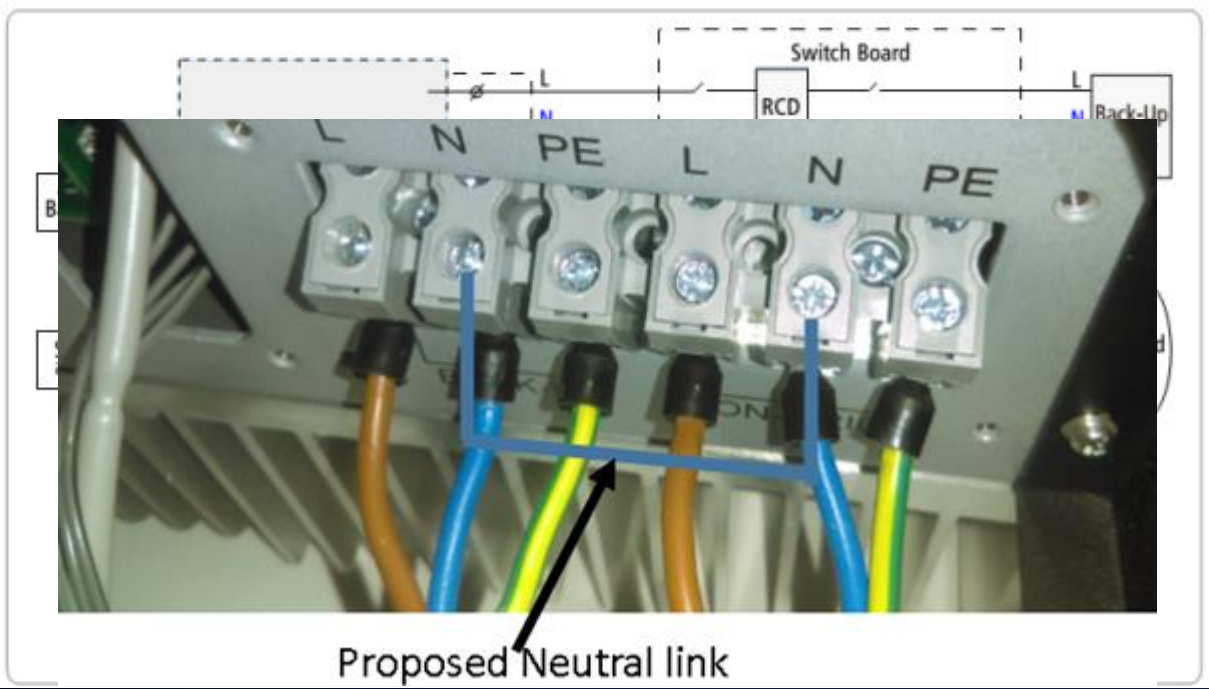
Case study II

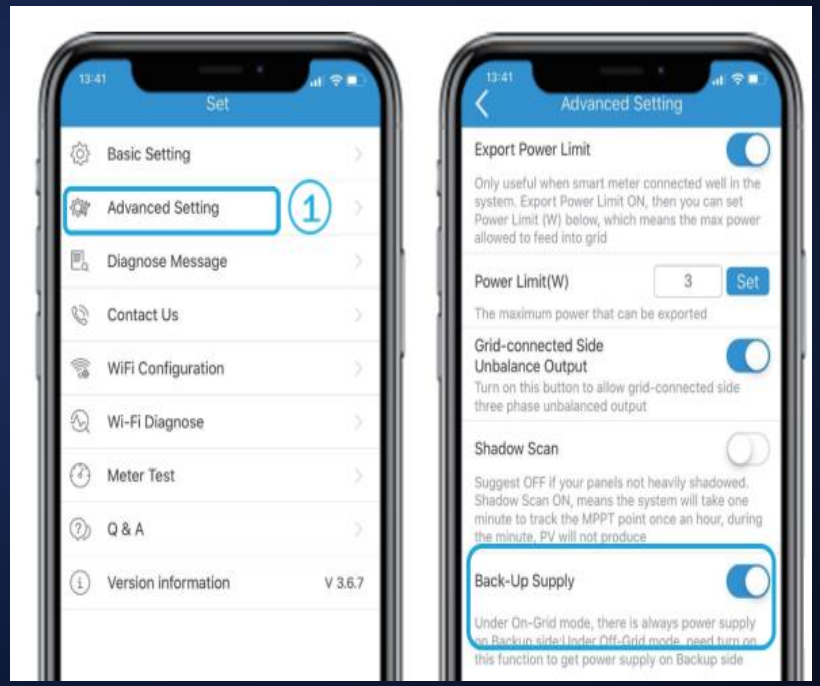


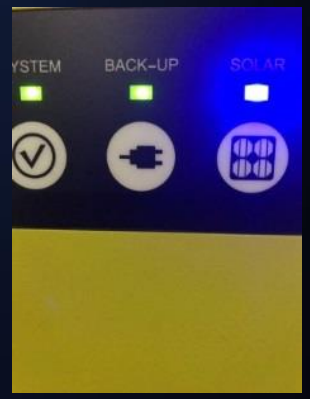




Back Up wiring







Hints:

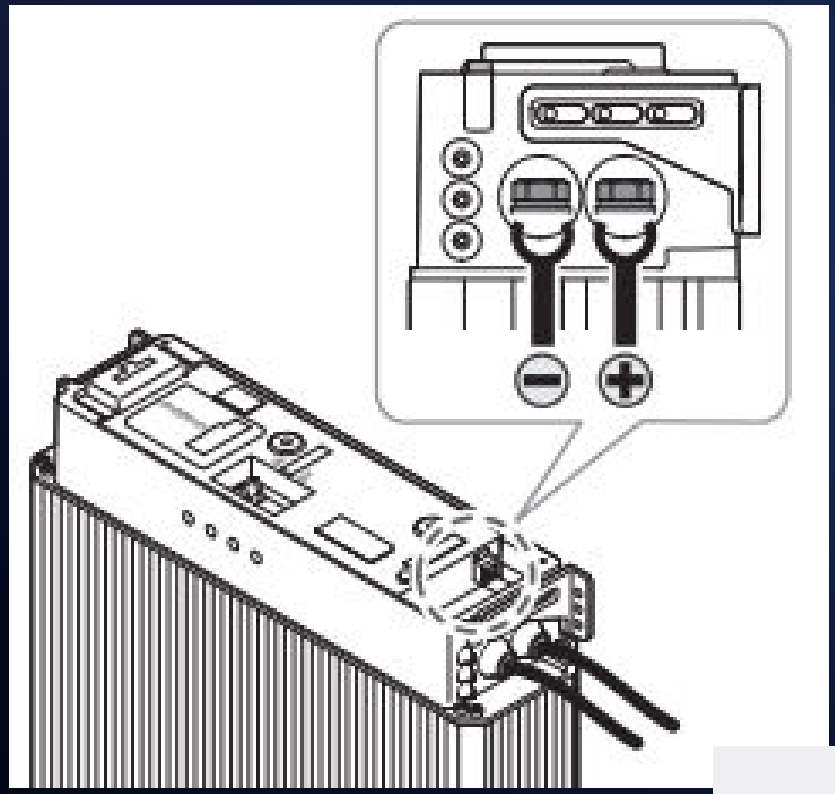
The neutral on back up part and neutral on grid tied part must be jumped together

Hints:

Go to the advanced settings and turn the Back-Up Supply ON.

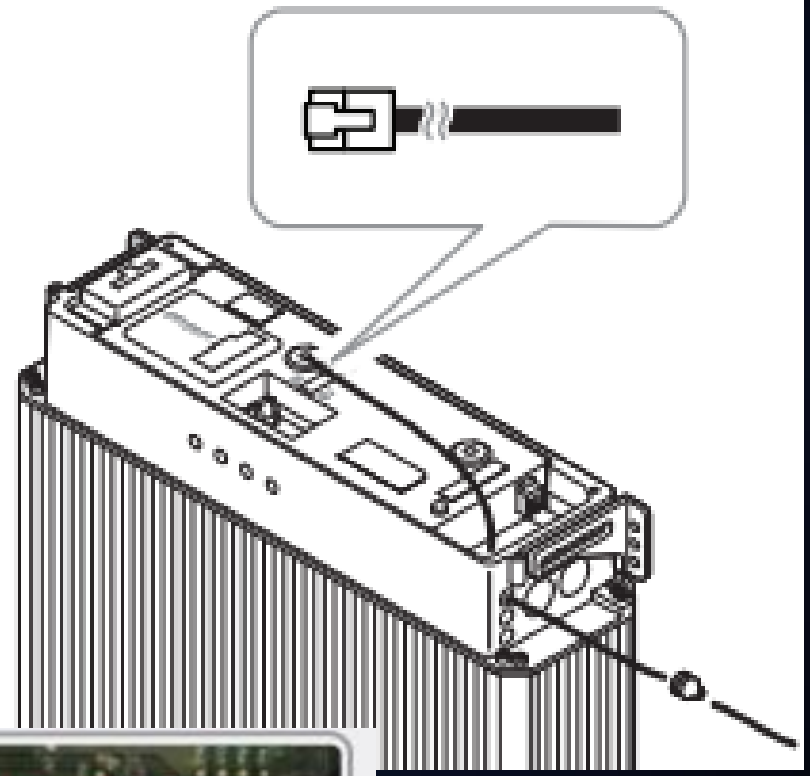
Back Up LED light on inverter will be ON to indicate the function is enable

LV LG (3.3, 6.5, 10 and 13.5kWh) wiring

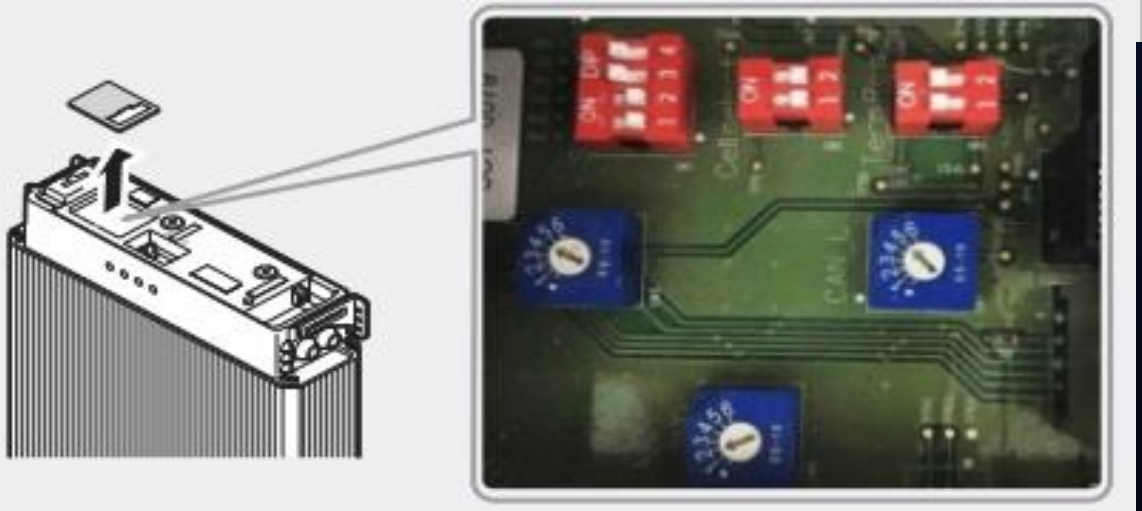


1. Always check battery power cable polarity in advance !

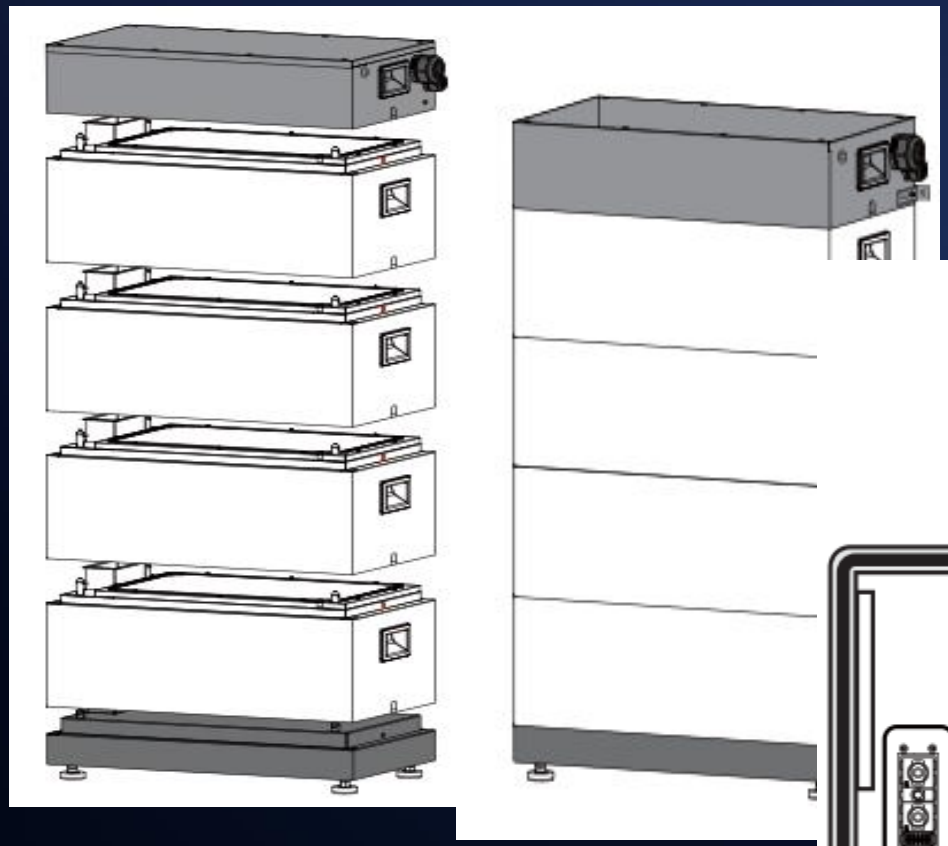
2. Link data cable from inverter to LG



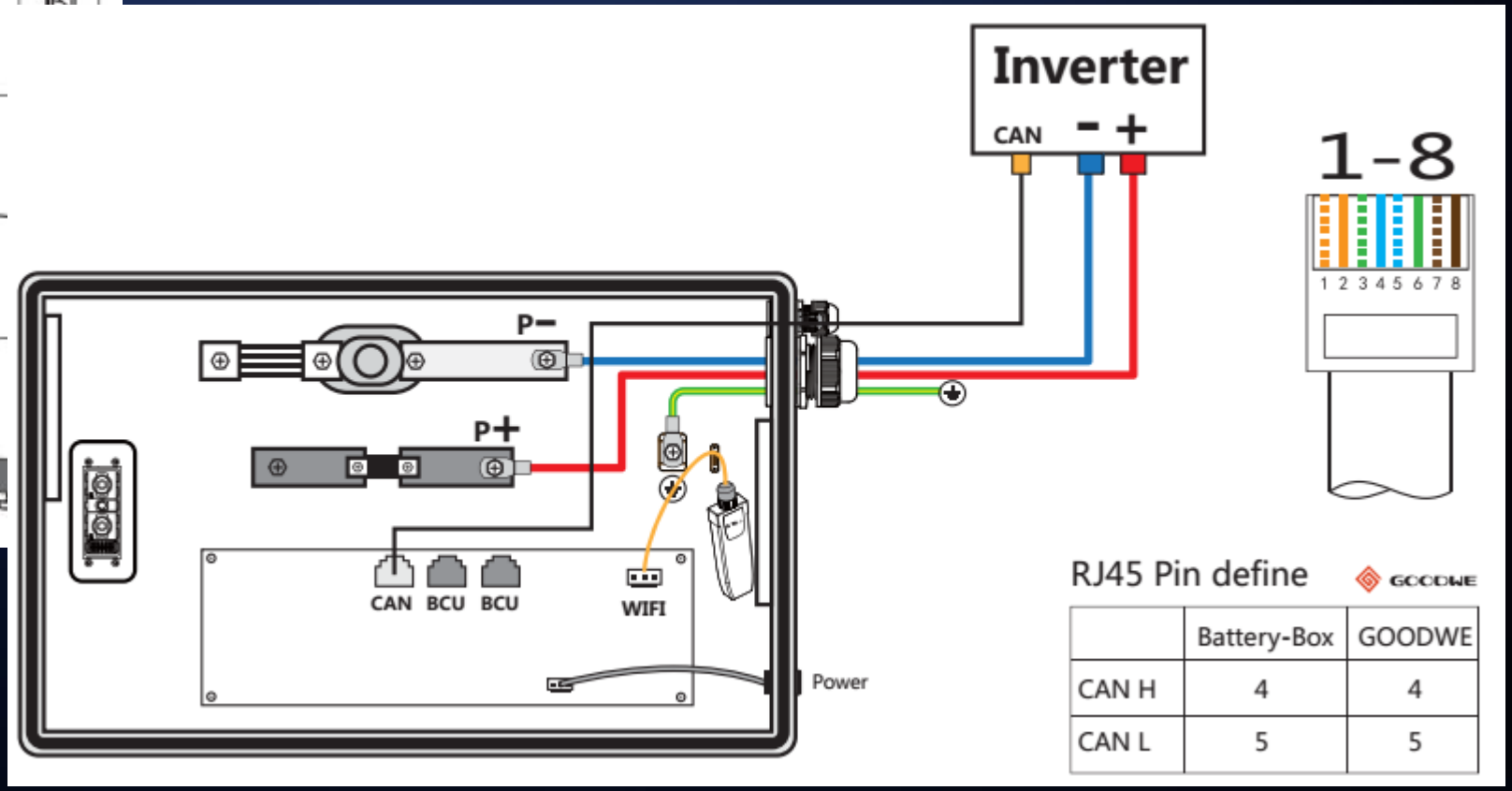
3. Set up Dip Switches correctly



BYD LV (3.5kWh per stack) wiring



Always check battery power cable polarity in advance !

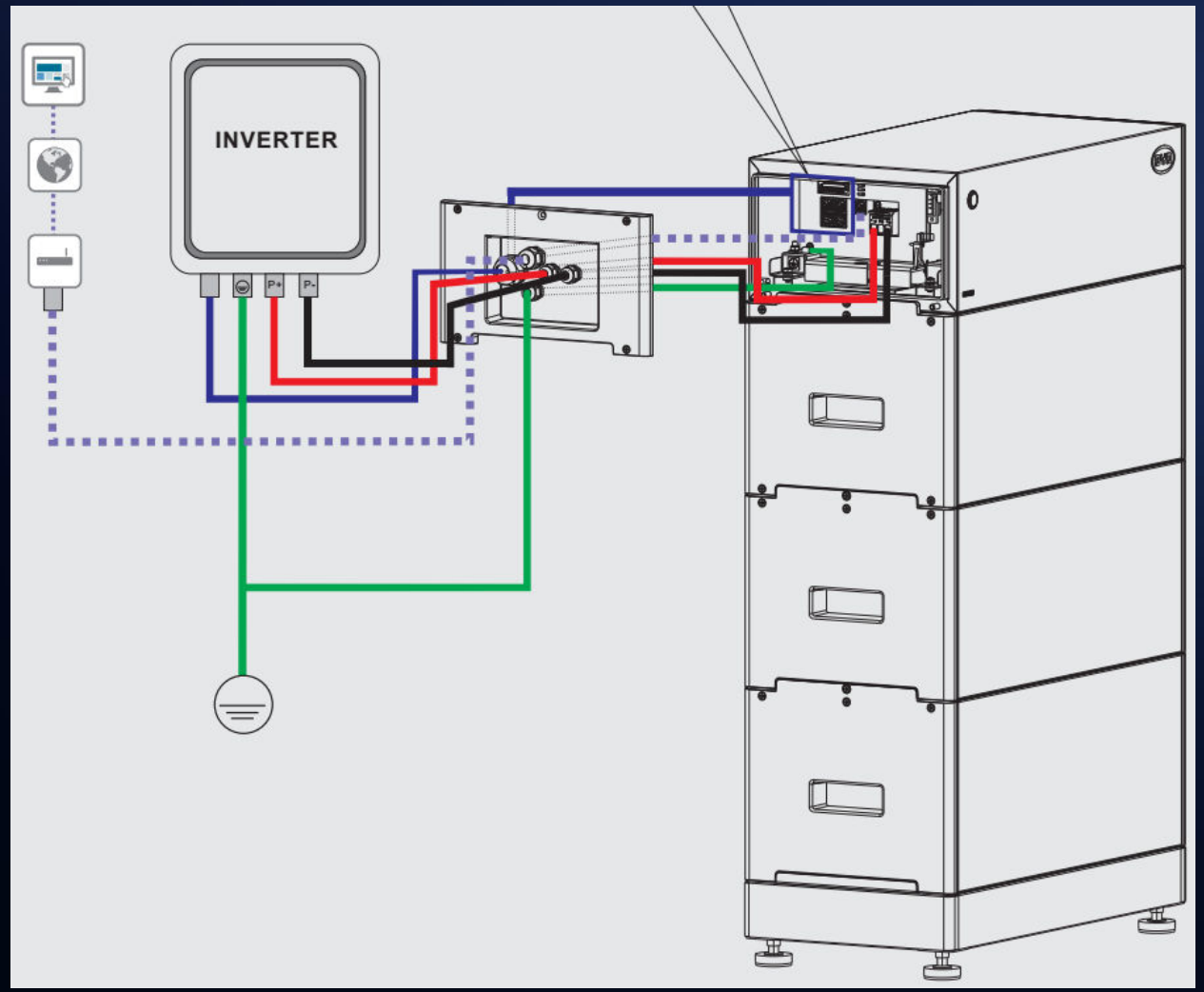


RJ45 Pin define

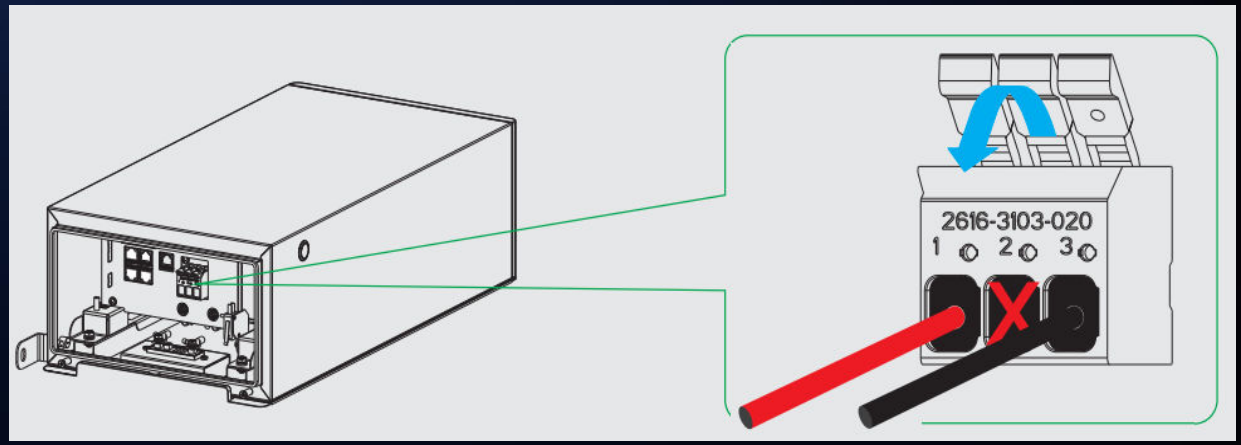
	Battery-Box	GOODWE
CAN H	4	4
CAN L	5	5

Link power cable, data cable

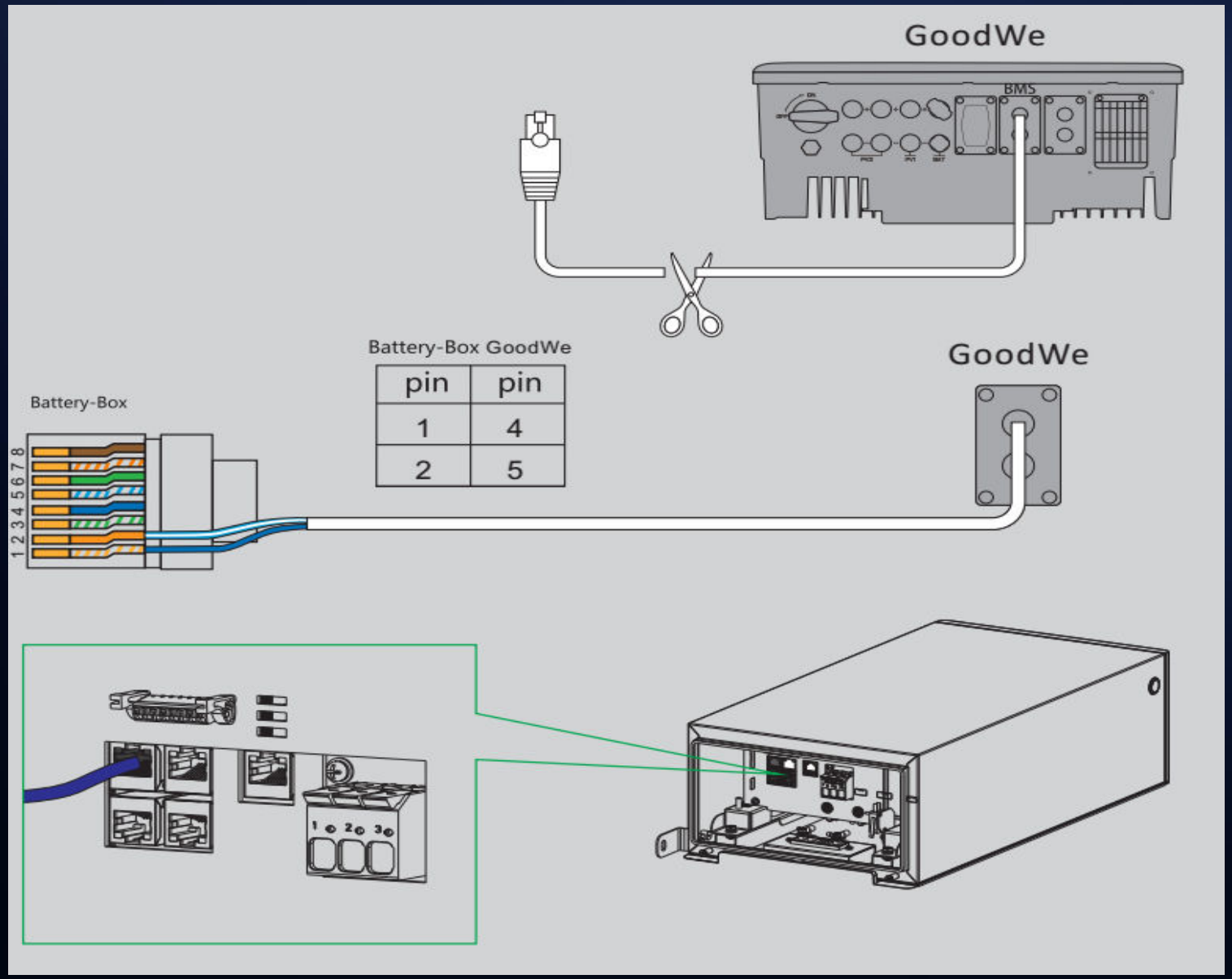
BYD HVM wiring



1. Always check battery power cable polarity in advance !



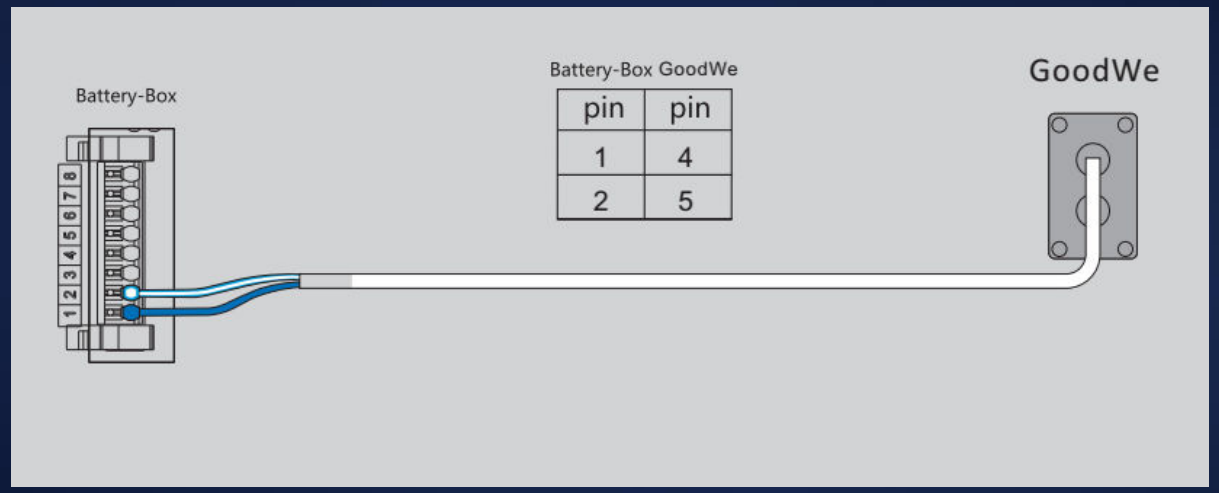
BYD HVM wiring

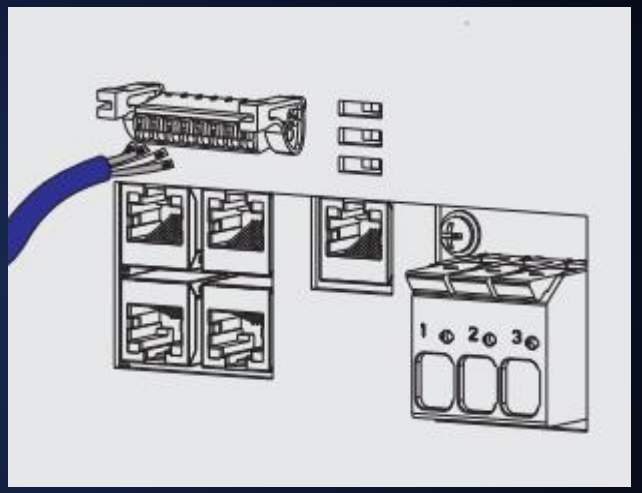


2. BMS cable **option 1**

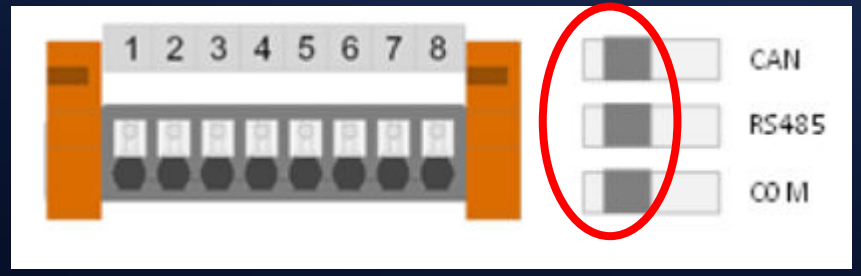
BYD HVM wiring

2. BMS cable **option 2**

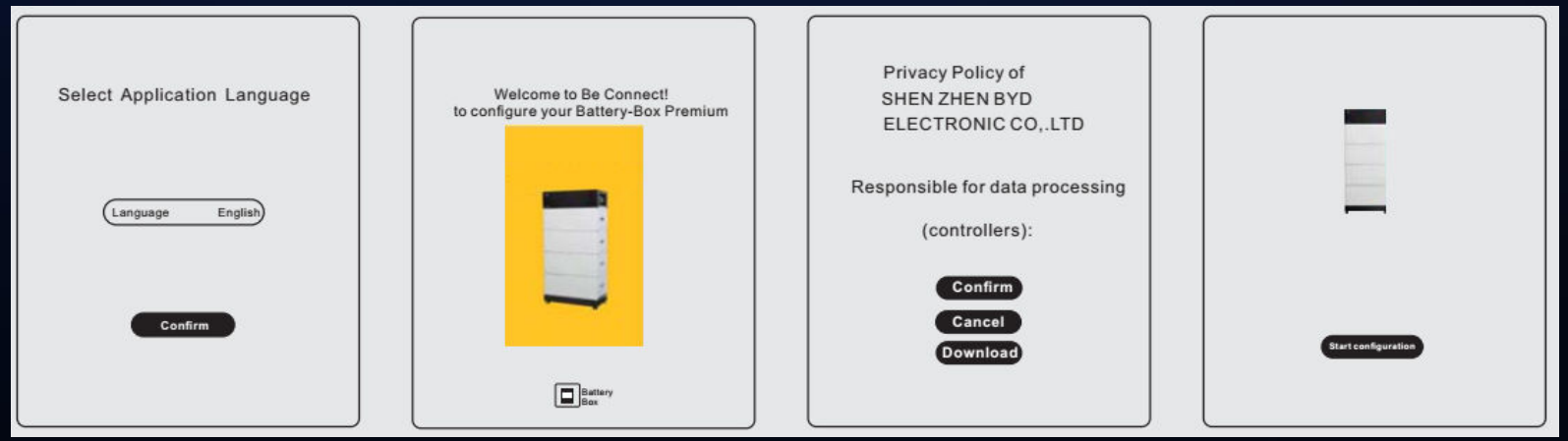




3. Put three Dip switches to left hand side



4. BYD APP for commissioning HVM battery



04

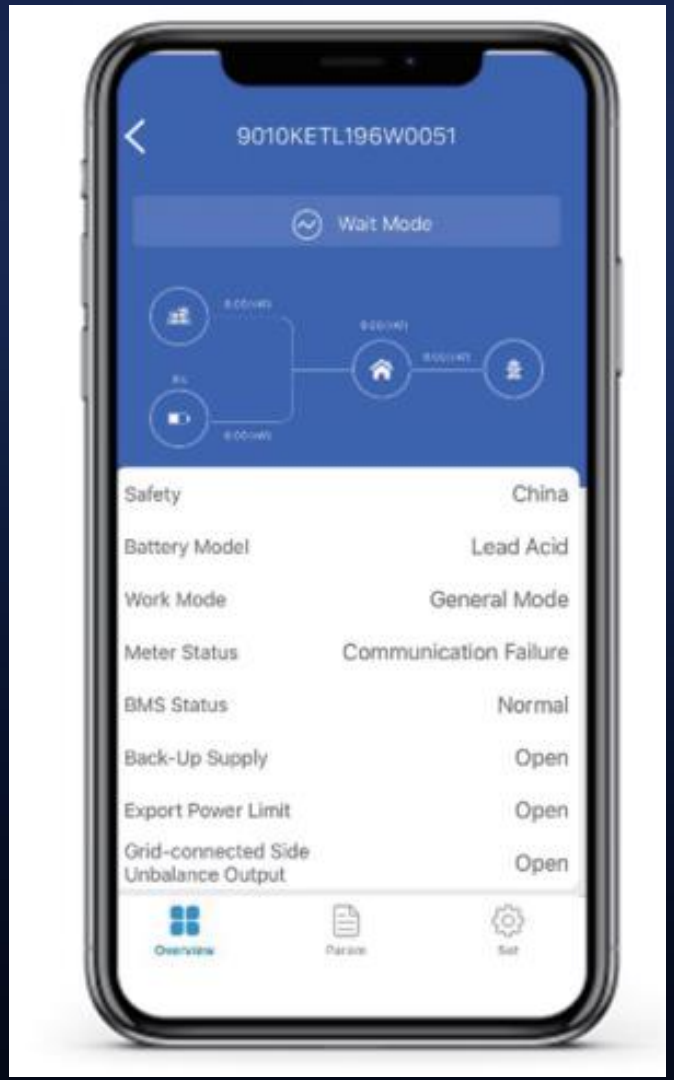
Commissioning

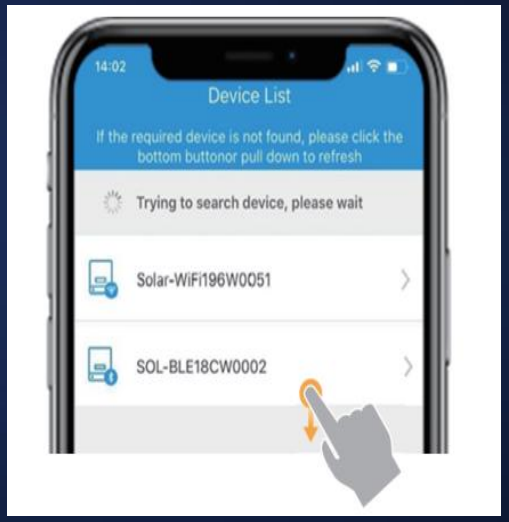
System Commission

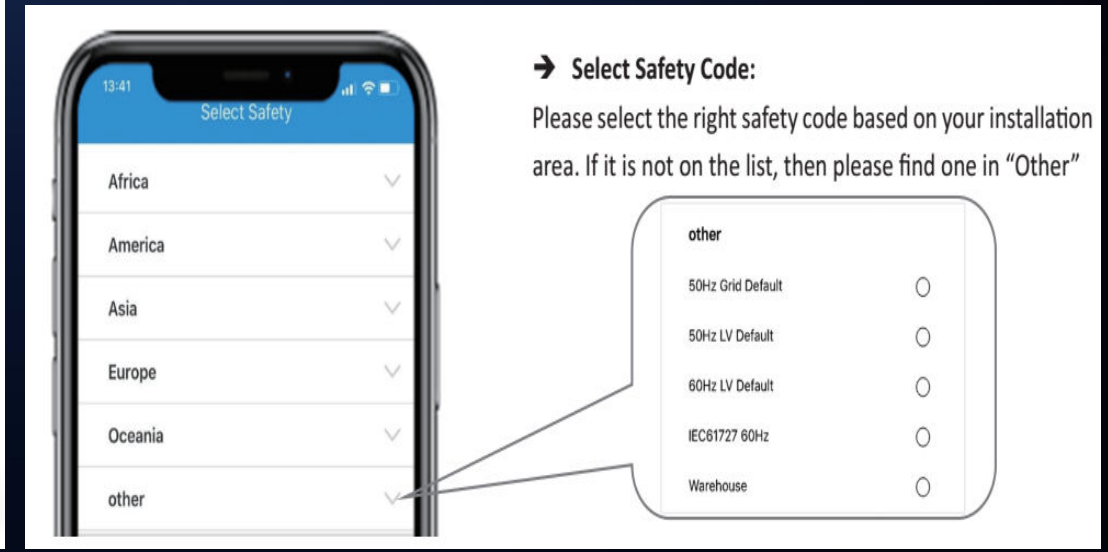
PV Master
GOODWE POWER SUPPLY TECHNOLOGY CO.,LTD.

Download the PV Master app
Connect to Solar-Wi-Fi (PW:12345678)
APP detect products automatically

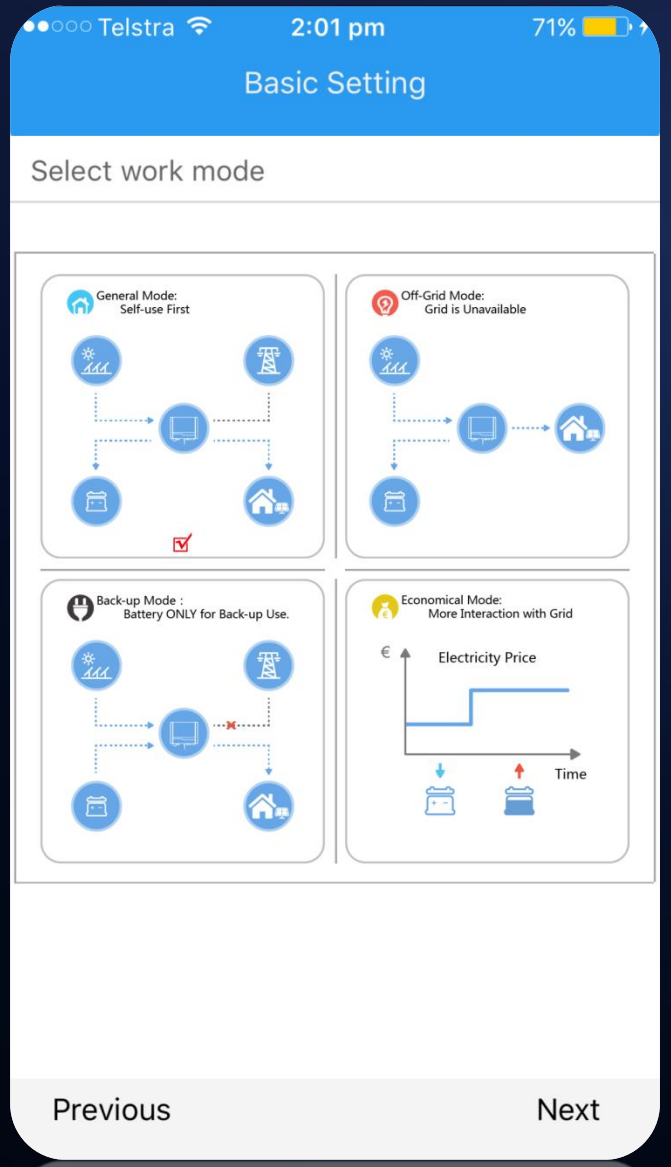
Installer password:
goodwe2010







System Commission



1. General model:

   self consumption

2. Off grid model:

   off grid use

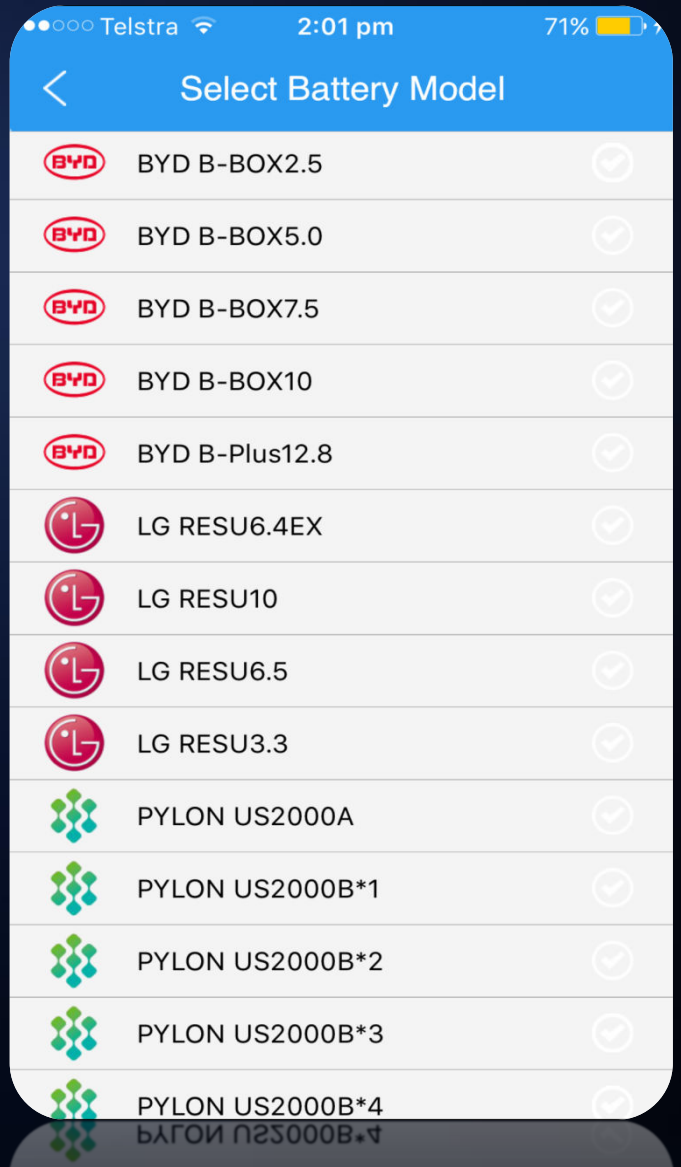
3. Back up model:

   Battery only discharge

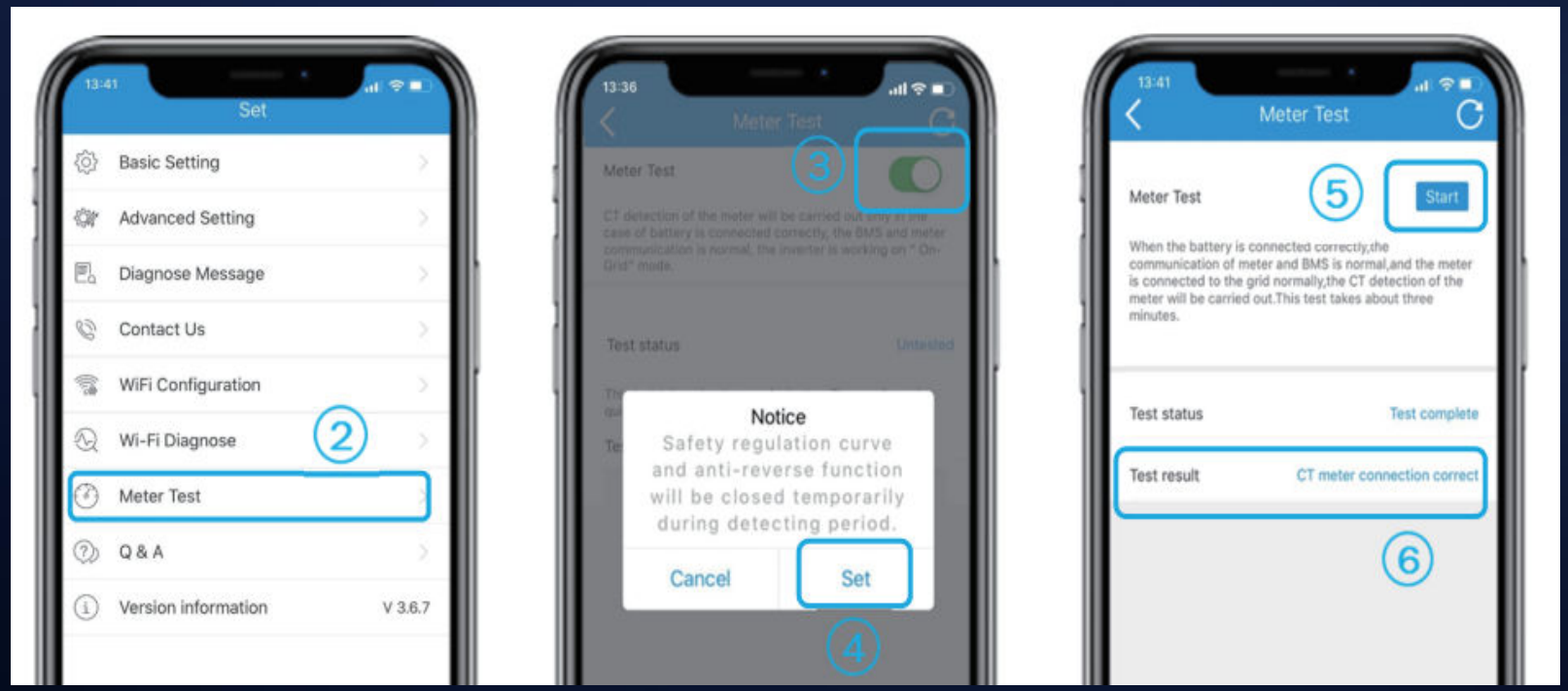
   when black out happens

4. Economic model:

   define the charge/discharge period.



System Commission – Meter test

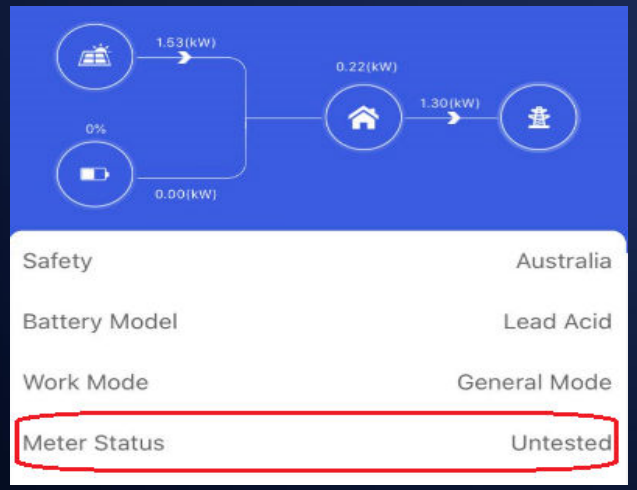


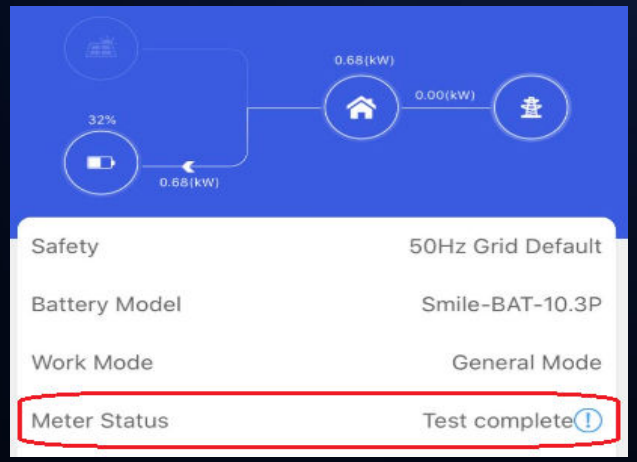
Meter Test: to check whether the CT is reversed

System Review

Meter Communication:

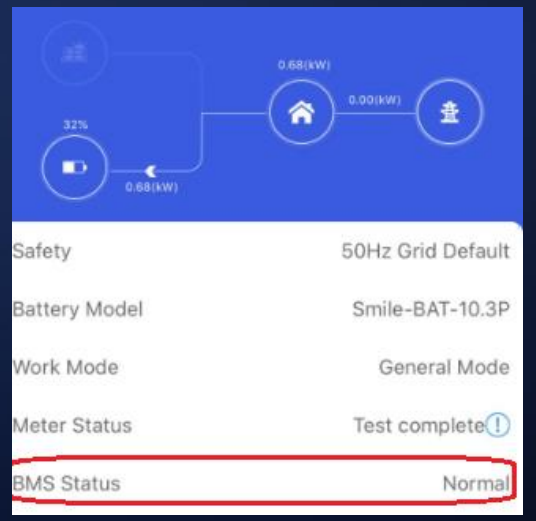
Meter part shall be show Untested or Test complete



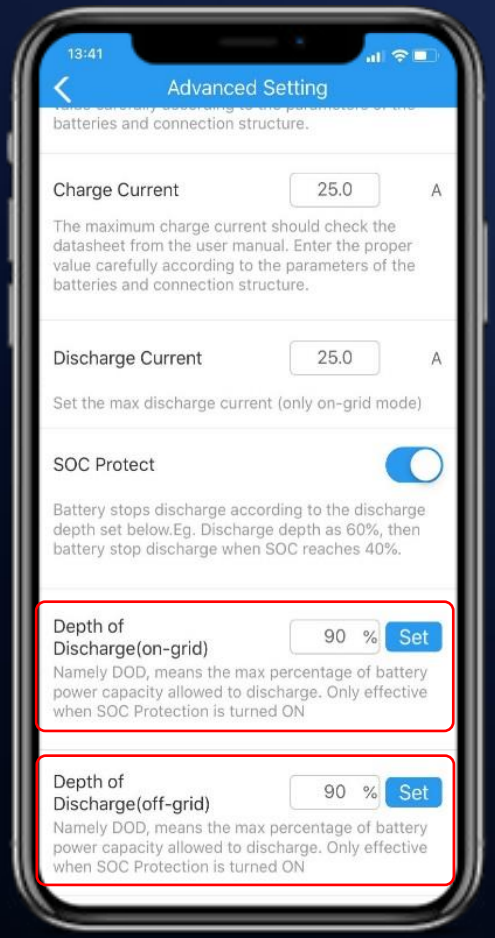


Battery BMS Communication:

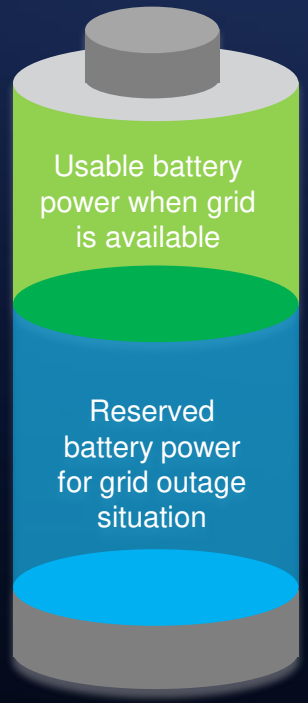
BMS status shall be always Normal



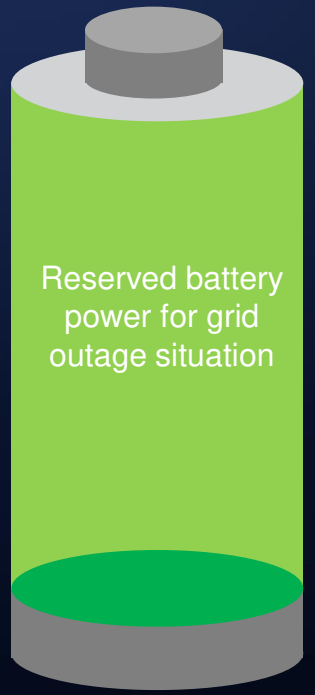
Battery Power Reservation Solution

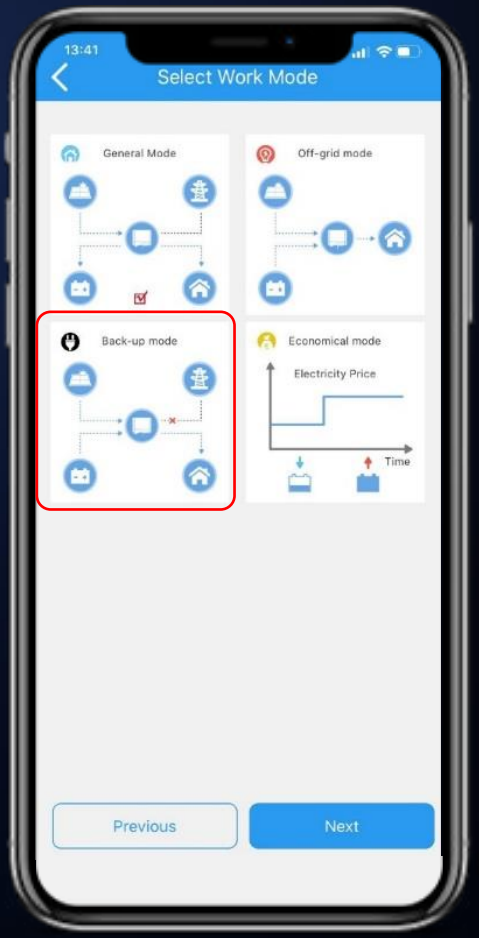


Set different DOD levels for off-grid & On-grid conditions

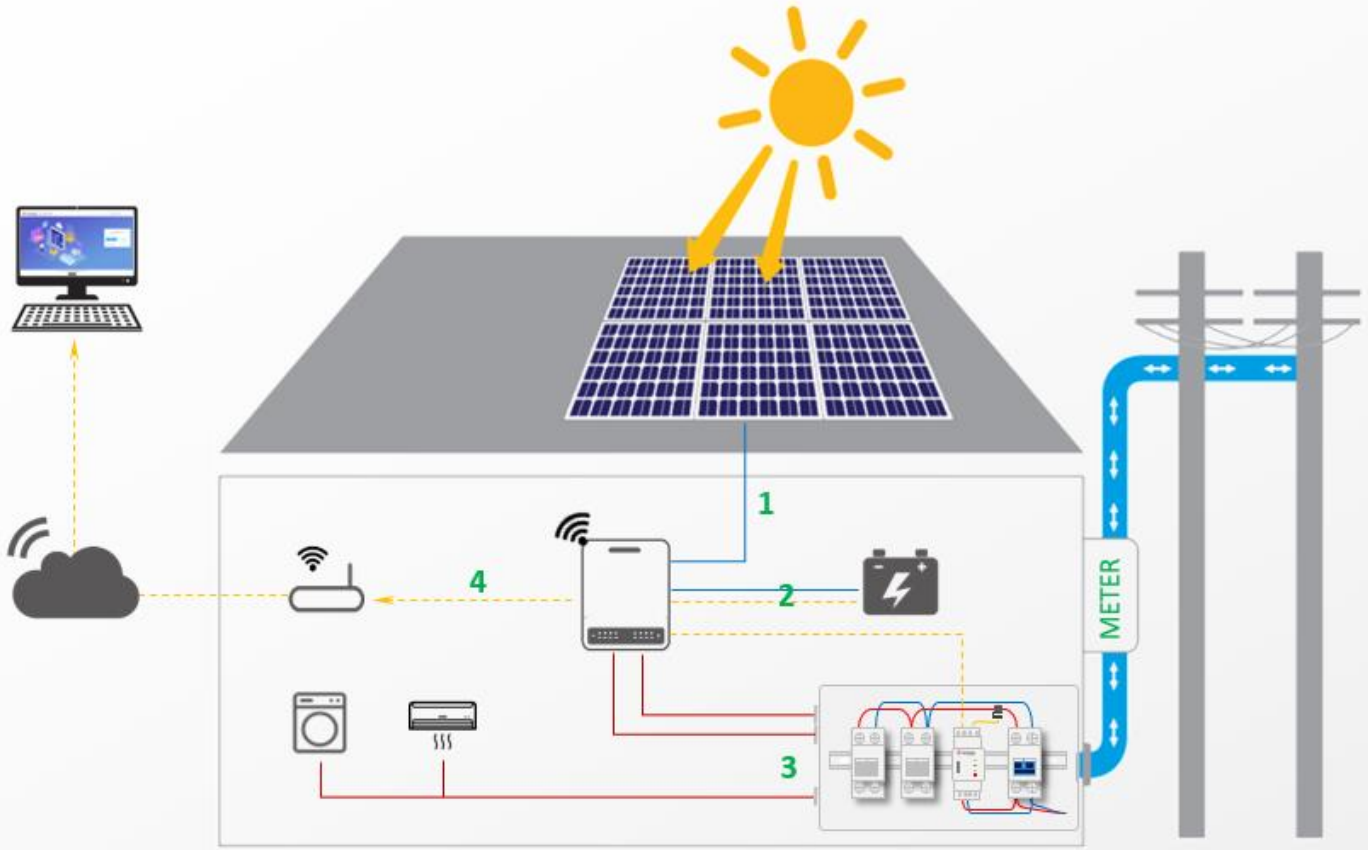


Choose “Back-Up Mode”





Quick Installation & Commissioning



Expected Building-up Time with experienced hands with proper tools

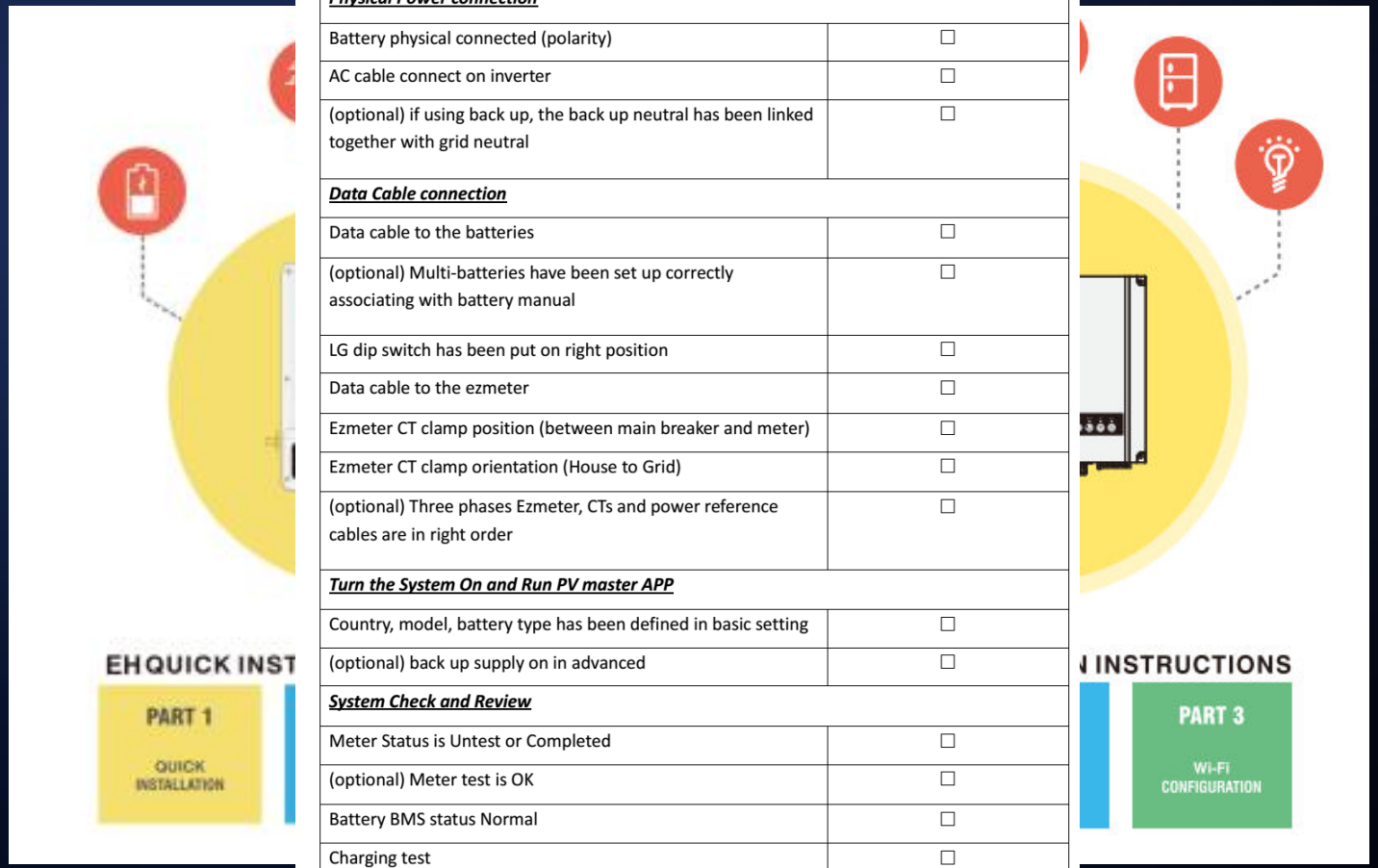
No.	Install/Commission	Time
1	PV Connection	3’~5’
2	Battery Connection (Power & Comm. cable)	6’~8’
3	AC Grid Connection (Grid & On-grid loads)	Depends (5’~15’)
	Backup Connection	4’~ 8’
	Meter + CT connection	2’~ 3’
	Meter Comm.	20”
4	Wi-Fi Configuration	1’
	APP Setting	1’~2’

Total: **22~45 Mins**

ES, EM, SBP, EH, ET architecture

Quick installation guide
LV inverter / HV inverter

Commissioning check list



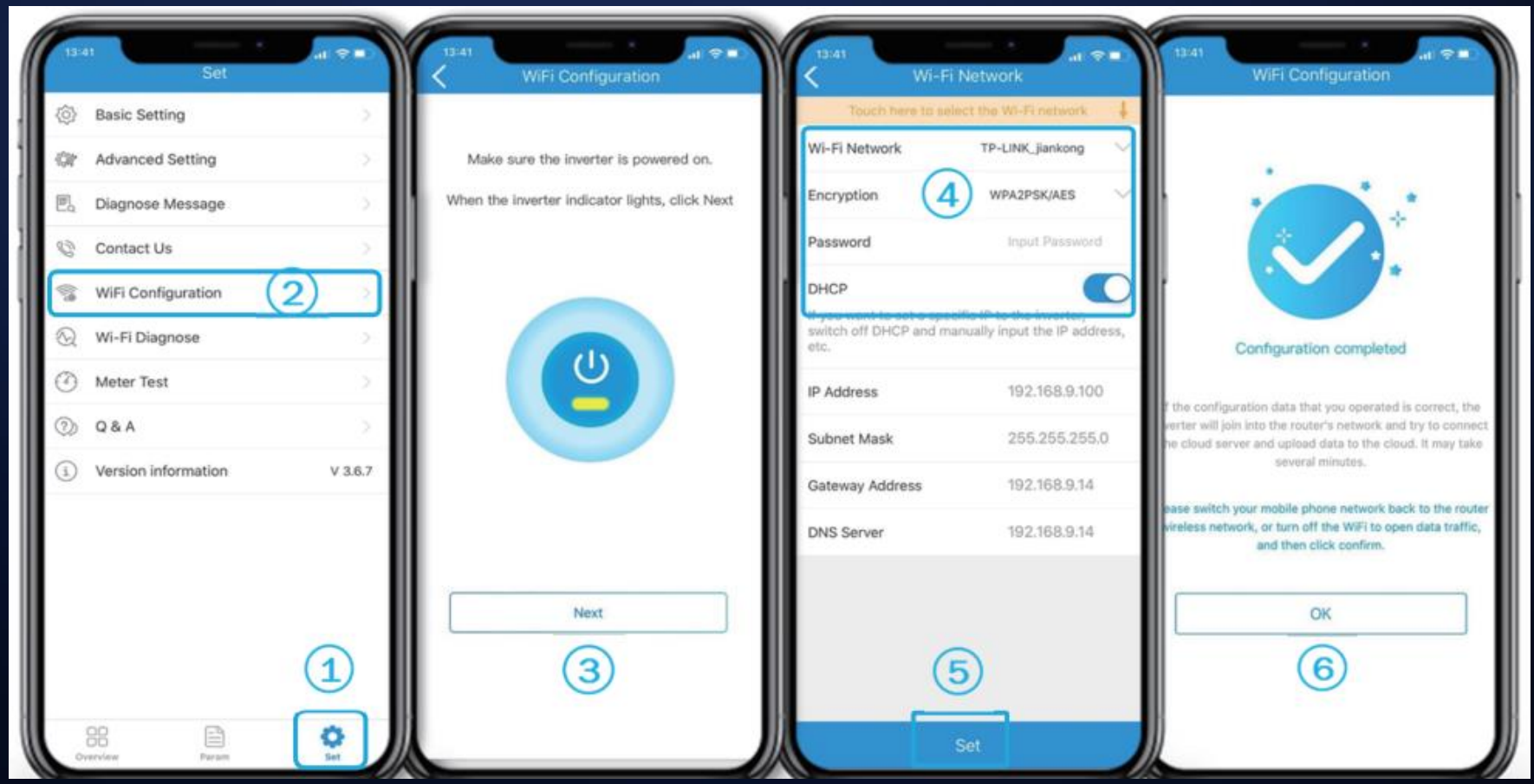
Part 5: Check List

Task	Check Ticket
Physical Power connection	
Battery physical connected (polarity)	☐
AC cable connect on inverter	☐
(optional) if using back up, the back up neutral has been linked together with grid neutral	☐
Data Cable connection	
Data cable to the batteries	☐
(optional) Multi-batteries have been set up correctly associating with battery manual	☐
LG dip switch has been put on right position	☐
Data cable to the ezmeter	☐
Ezmeter CT clamp position (between main breaker and meter)	☐
Ezmeter CT clamp orientation (House to Grid)	☐
(optional) Three phases Ezmeter, CTs and power reference cables are in right order	☐
Turn the System On and Run PV master APP	
Country, model, battery type has been defined in basic setting	☐
(optional) back up supply on in advanced	☐
System Check and Review	
Meter Status is Untest or Completed	☐
(optional) Meter test is OK	☐
Battery BMS status Normal	☐
Charging test	☐
Discharging test	☐
(optional) Back Up test	☐
WiFi set up	
The WiFi LED light is solid on	☐
Register customer account on SEMS portal	☐

04

Monitoring

WiFi Connection

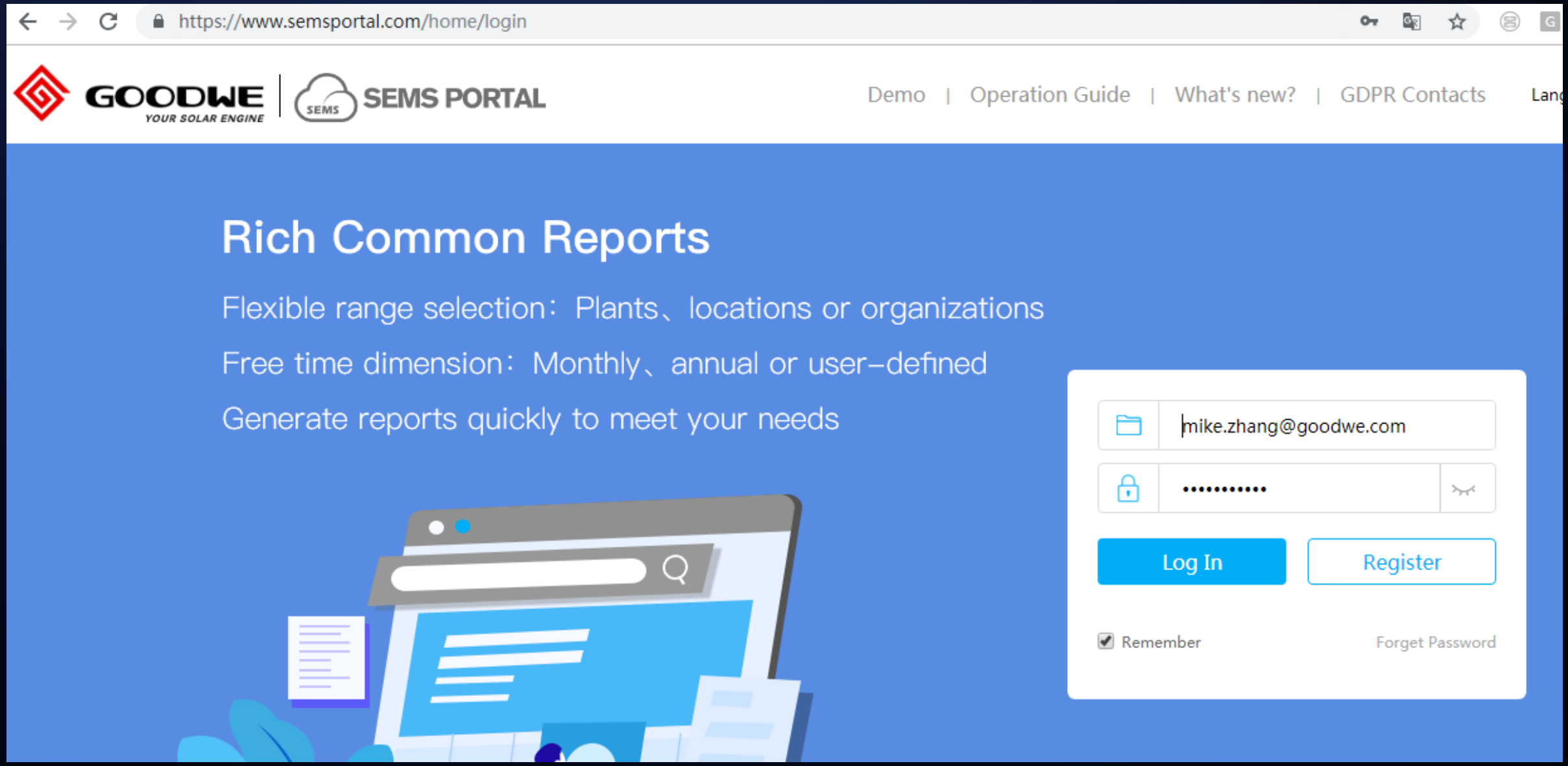


SYSTEM	BACK-UP	SOLAR	BATTERY	GRID	ENERGY	Wi-Fi	FAULT
Green	Green	Blue	Blue	Blue	Yellow	Yellow	Red

Hints:

Once the WiFi set up procedure has finished, **the WiFi LED light on inverter will be steady ON**.

Account RegisAtration



04

Popular Questions

Frequent Questions

Question:

Can we use Goodwe storage to be an off grid system / can Goodwe connect to the generator?

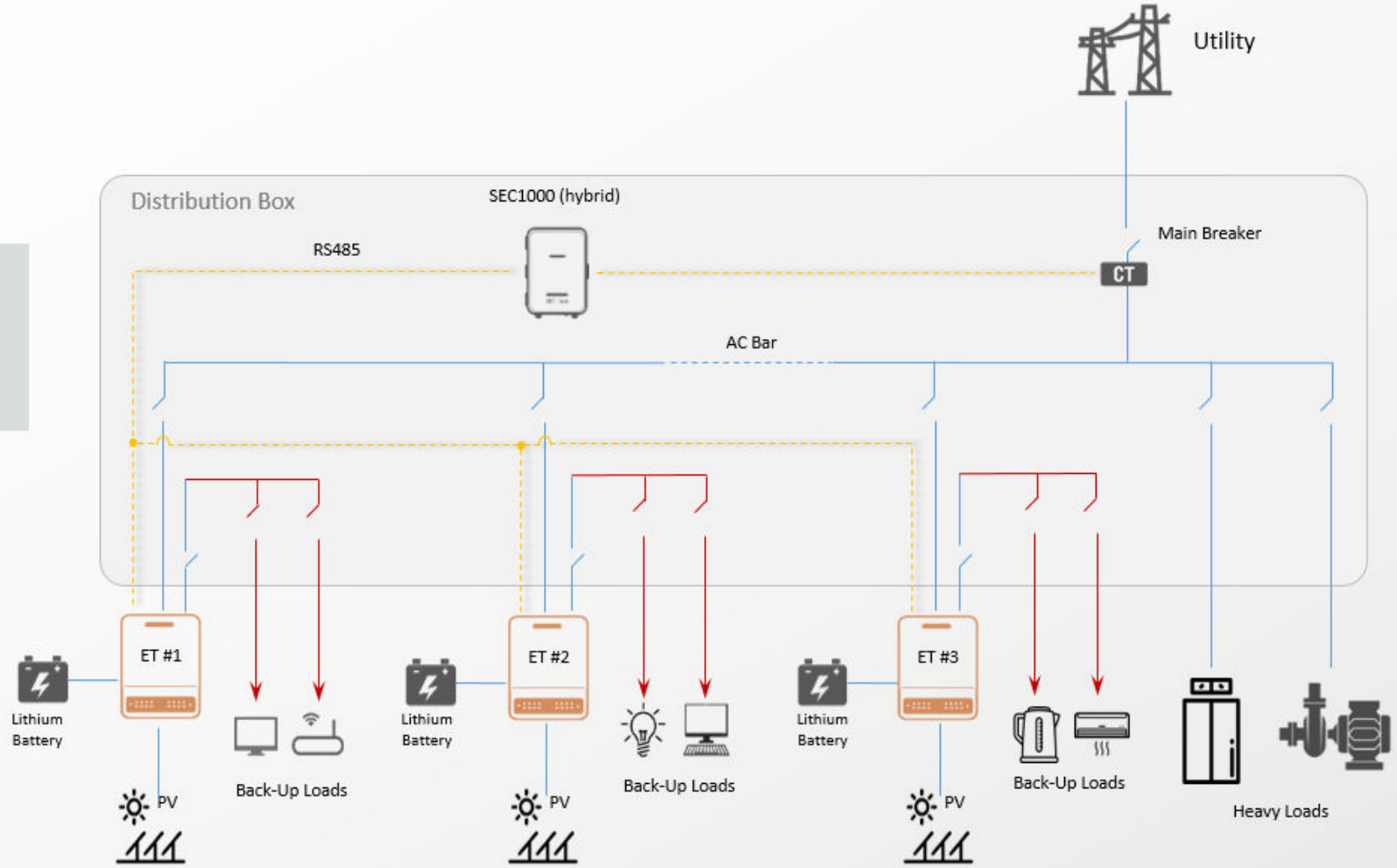
Answer:

- ✓ Simple answer: No
  Reason: generator, system design etc
- ✓ But…

Paralleling Solution – 3 phase

three-phase **ET** hybrid inverter can be paralleled up to 100kW via the SEC1000 hybrid

- **Max 100kW**
- **Unbalance Output**
- **Smart Control**




2020
THANK YOU
GOODWE, GOOD CHOICE