

Deye Residential ESS and Inverter Products Installation and Wiring Guidance



Industrial-Leading Solar Residential and C&I Energy Storage Solution Expert

2025



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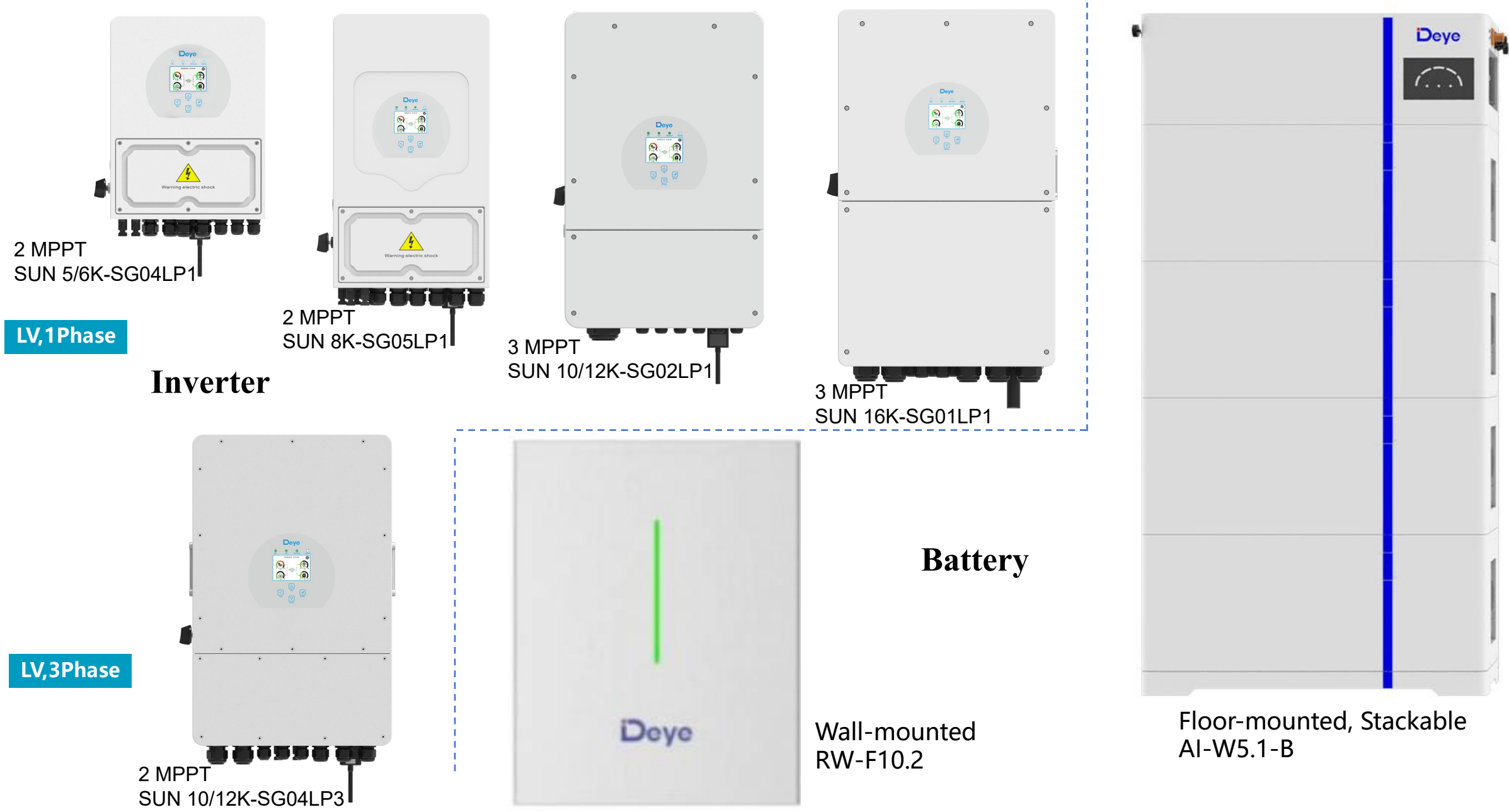
- AC Coupled Wiring
- AC/PV/battery Wiring
- Battery Module Wiring
- CT/Meter Wiring
- Generator Wiring

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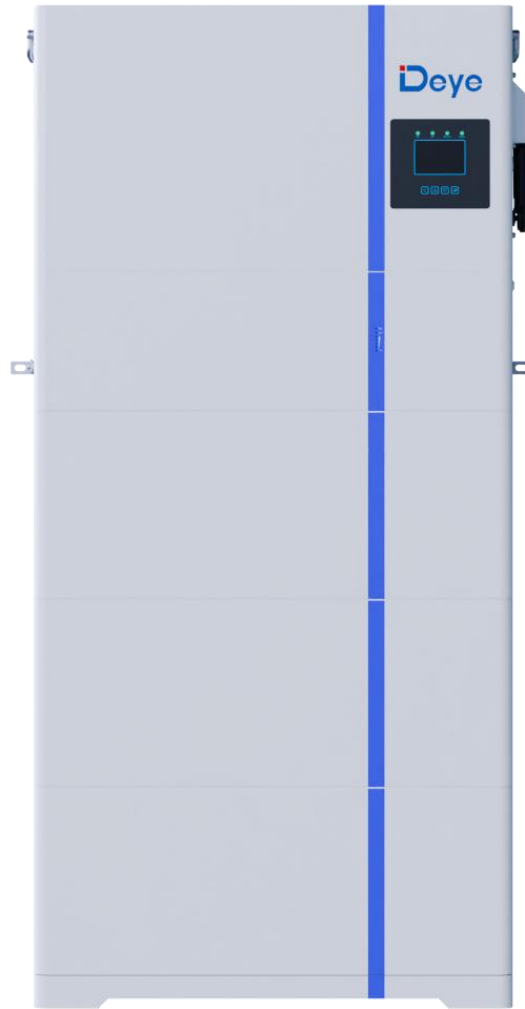


Deye Low Voltage ESS System Components

Deye Low Voltage ESS System at a Glance



Deye Low Voltage ESS System at a Glance——All in One Models



1 phase: 3.6-8kW(10kW will be available soon);
3 phase: 5-12kW

Deye Hybrid Inverter Product Appearance



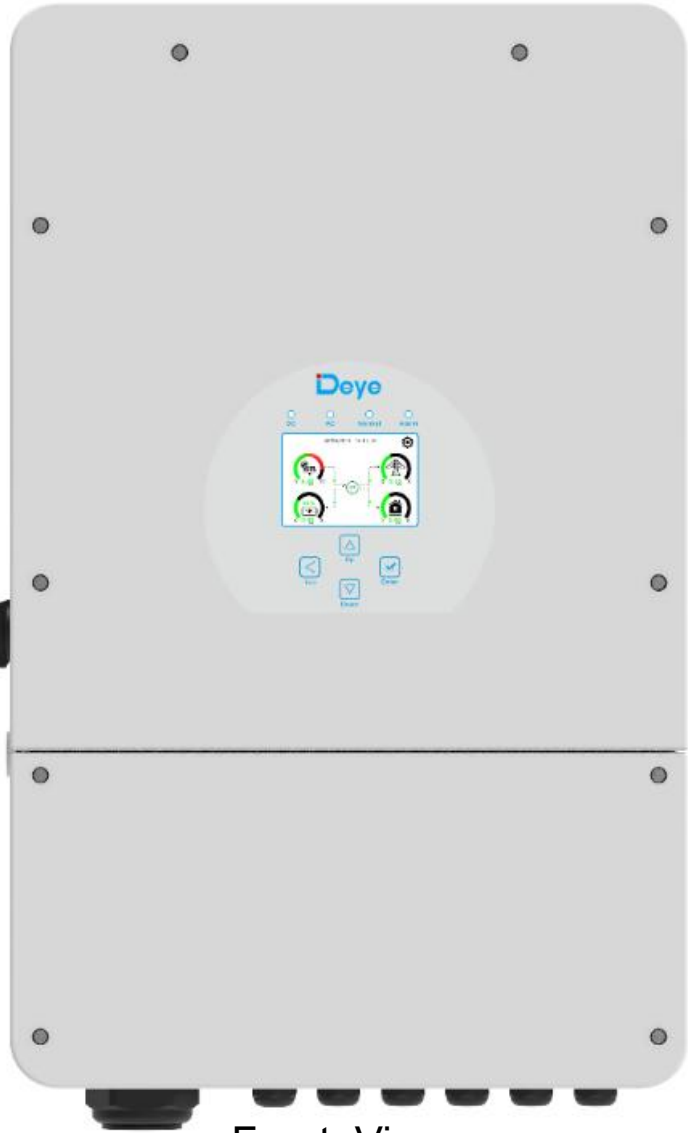
Take SUN 10/12K-SG02LP1 as an example:



Bottom View



Left View

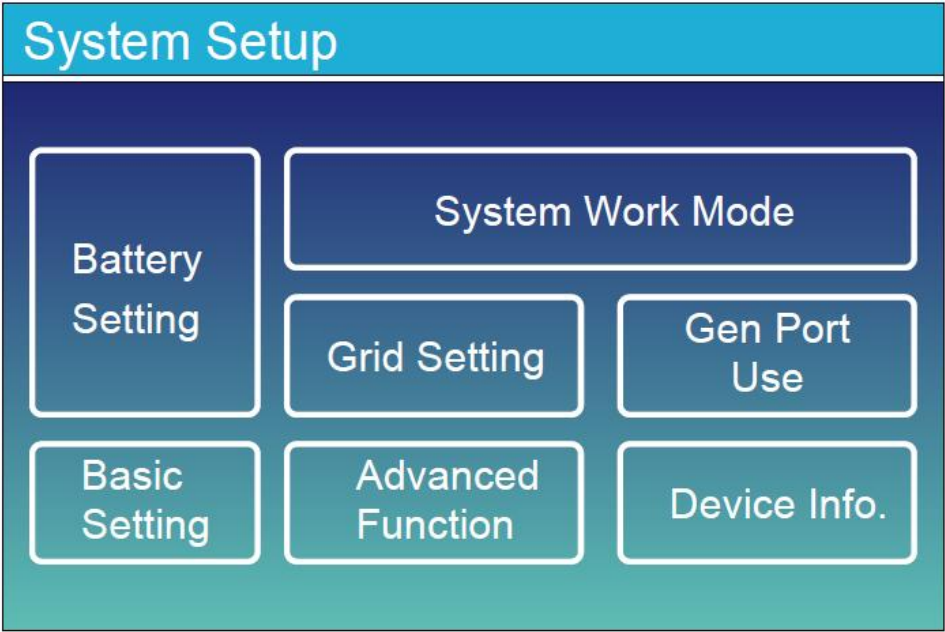


Front View

Deye Hybrid Inverter User Interface



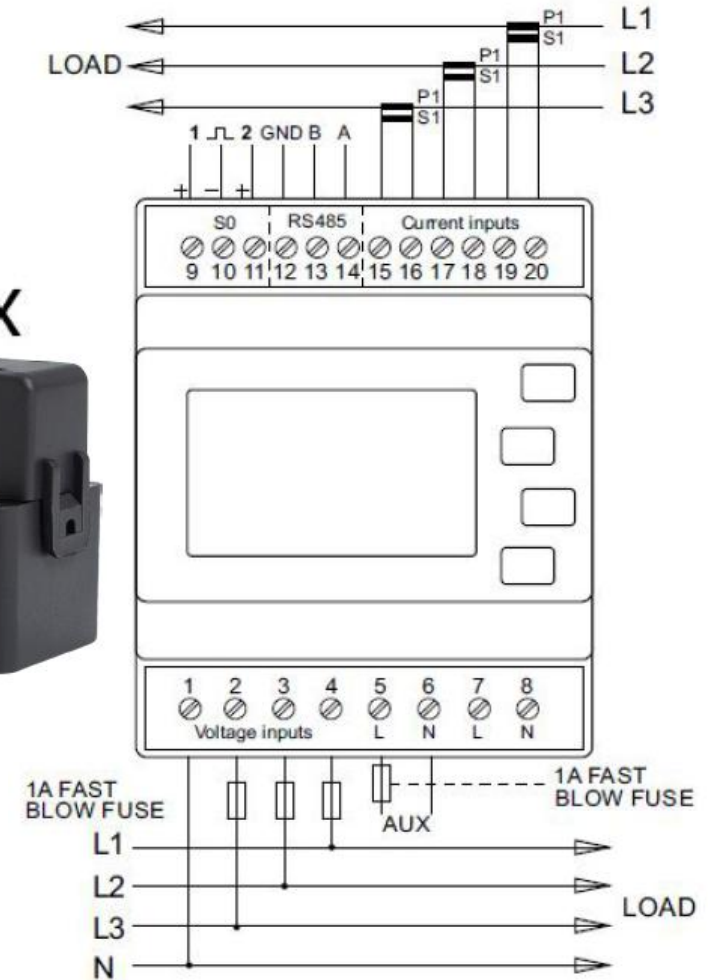
Inverter touch screen home page



system setup page

Settings and layouts may vary by model/firmware.
Use this guide for training only.
For discrepancies, refer to the latest manual or contact
Deye support.

Energy Meter for Deye Hybrid ESS System



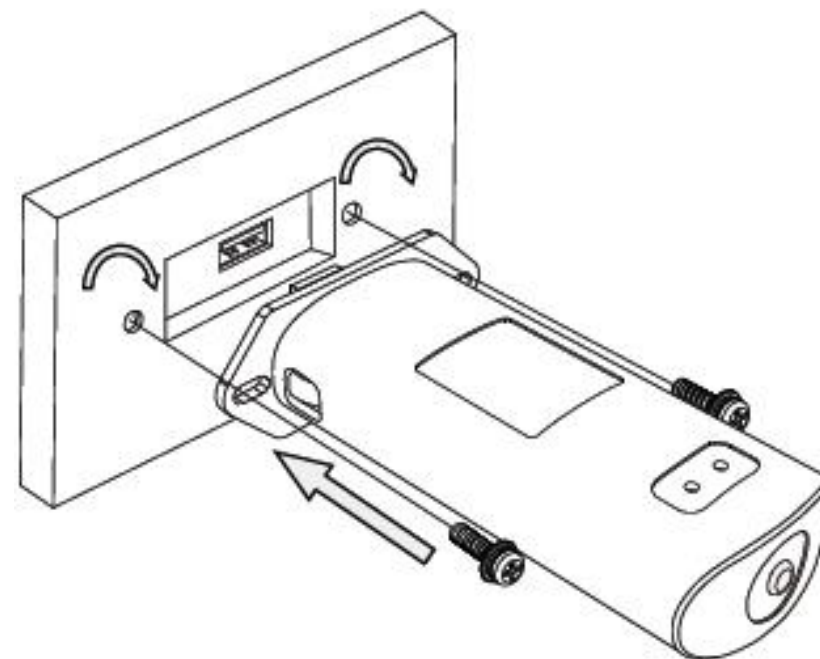
Where a CT/meter isn't required for zero export control:

- ❑ Totally offgrid system or a full house backup system

Where a meter isn't required for AC-Coupled grid-tied inverter production measurement:

- ❑ AC coupled to GEN port

WiFi Dongle for Deye Inverter



- ❑ USB connector(new version);
- ❑ WiFi 2.4GHz only;
- ❑ LAN dongle, 4G dongle available;

Assessment Questions

- 1) What's the max power of Deye single phase hybrid inverter?**
- 2) How many AC ports does a Deye Hybrid inverter have?**
- 3) What's included in a All-in-One product?**

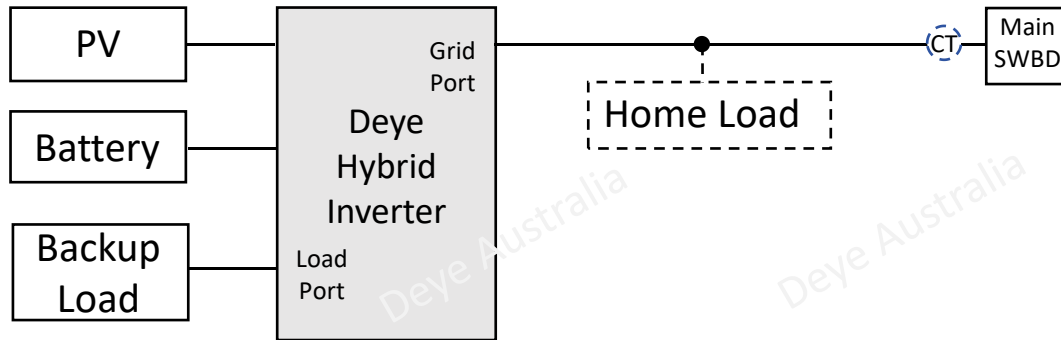
Installation & Wiring-AC Coupled Wiring

Deye in Retrofit Projects: Simple, Smart, Scalable

Solution 1 Remove legacy string/offgrid inverter

Pros : Less component, less space

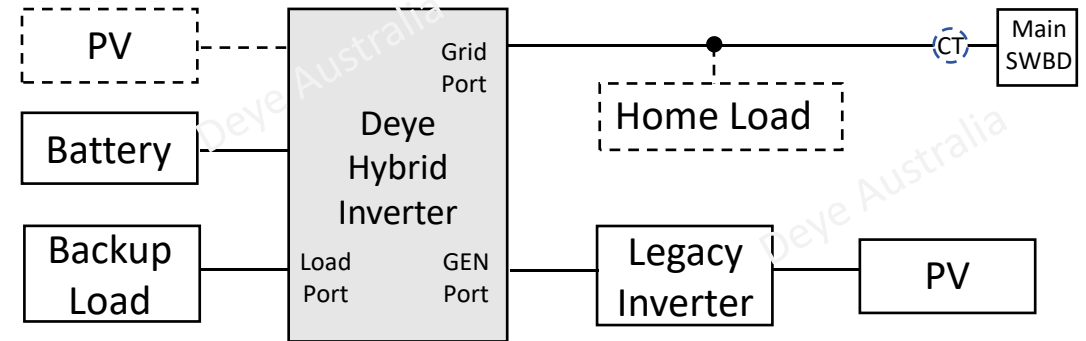
Cons: Need PV array details, less feed-in power



Solution 2 Legacy inverter AC coupled to GEN port

Pros : No extra meter, inverter works in blackout

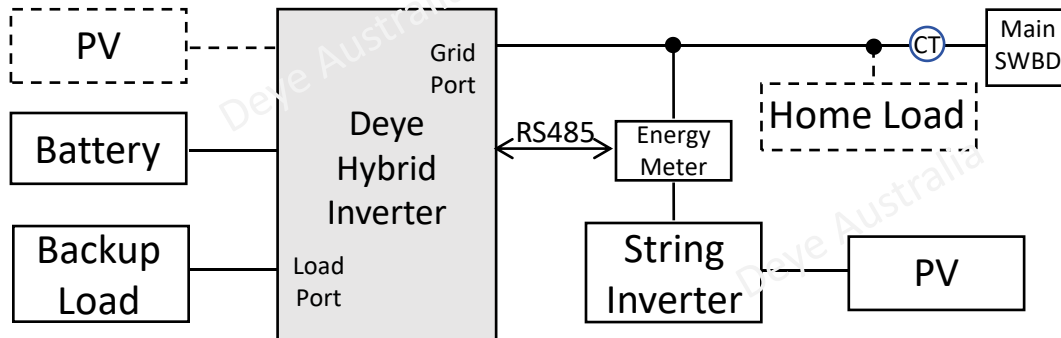
Cons: Feed-in power lower



Solution 3 String inverter AC coupled to GRID port

Pros : High feed-in power

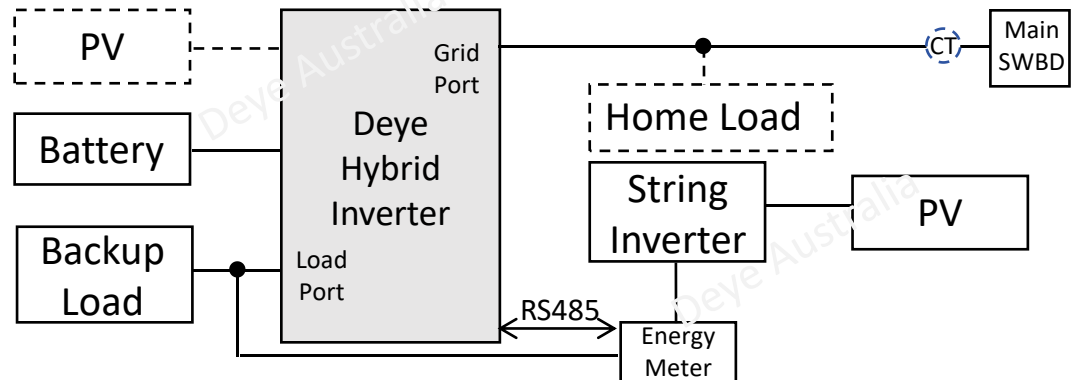
Cons: Extra meter, string inverter can't work in blackout,
Zero Export control not good



Solution 4 String inverter AC coupled to LOAD port

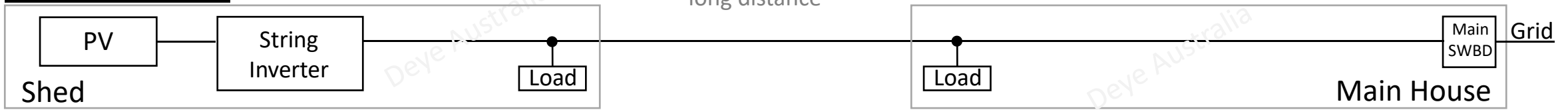
Pros : High Load, inverter works in blackout, maybe less wiring

Cons: Conditions apply for totally offgrid system

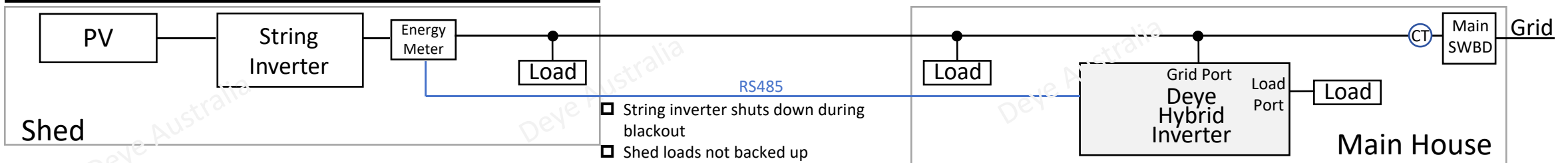


String Inverter in Shed, Deye Hybrid in Main House

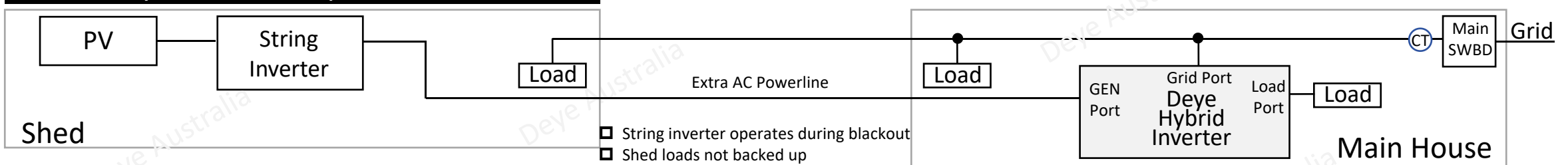
Legacy System



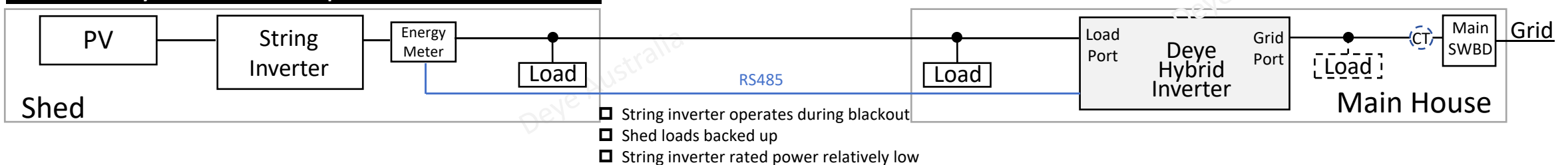
New System, AC Coupled to Grid Port



New System, AC Coupled to GEN Port



New System, AC Coupled to Load Port



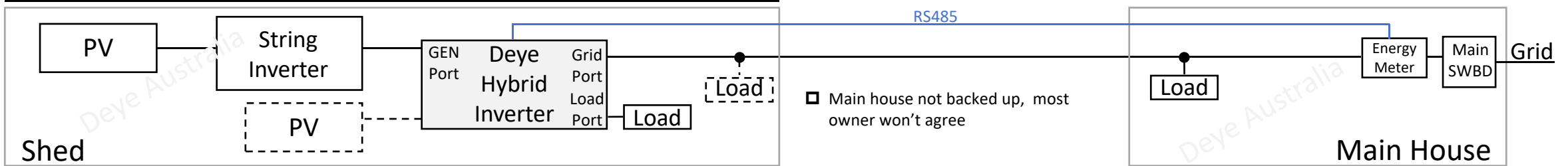
String and Deye Hybrid Inverters in Shed

long distance

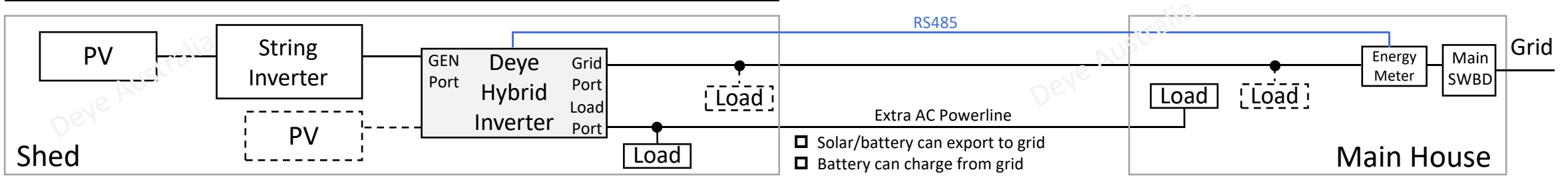
Legacy System



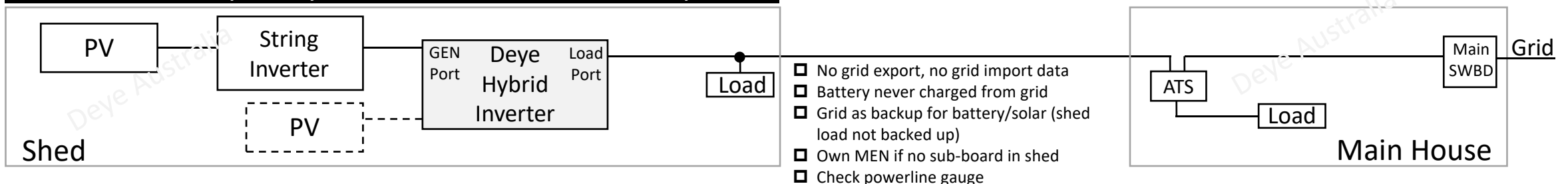
New AC/DC-Coupled System, Main House Not Backed Up



New AC/DC-Coupled System, Main House Backed Up #1

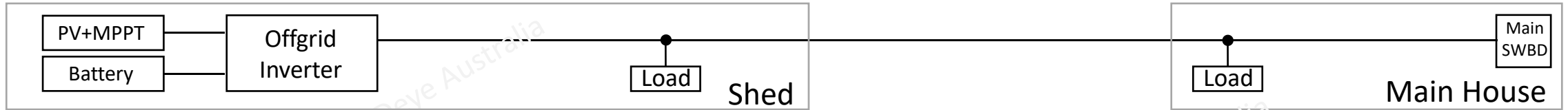


New AC/DC-Coupled System, Main House Backed Up #2

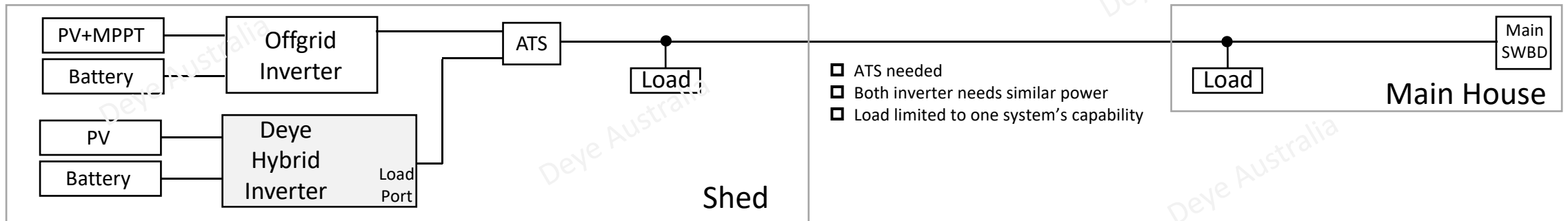


Offgrid System AC Coupled to Deye Hybrid Inverter

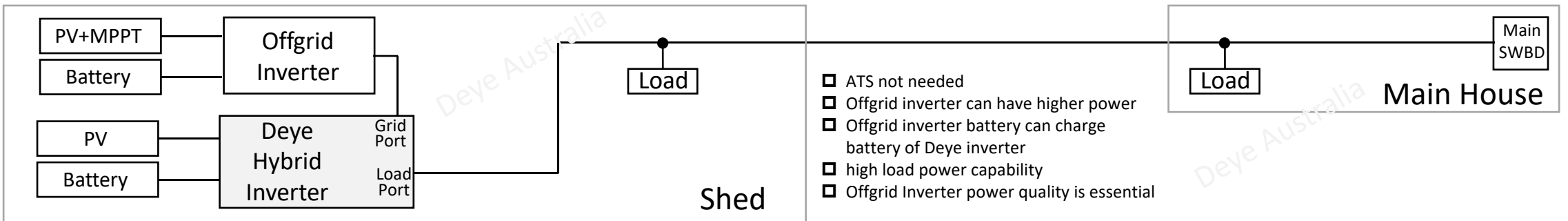
Legacy System



New System with ATS

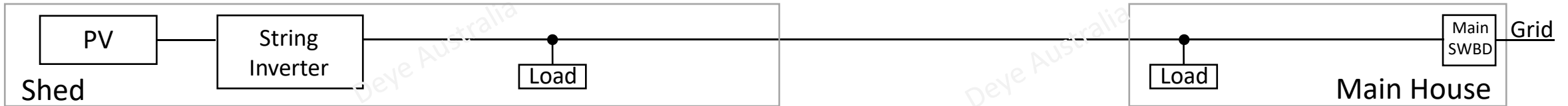


New System without ATS

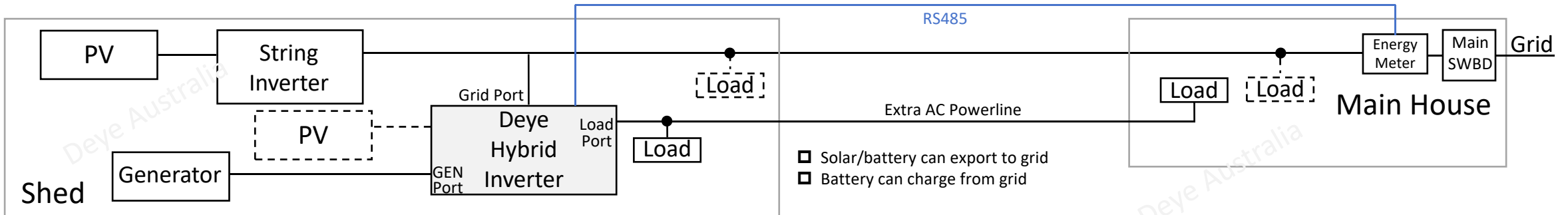


String, Hybrid Inverter and Generator in Shed

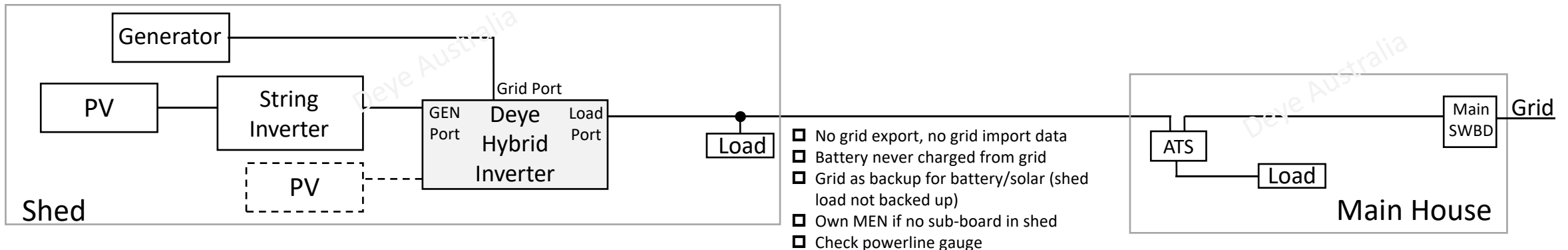
Legacy System



New AC/DC-Coupled System, Main House Backed Up #1



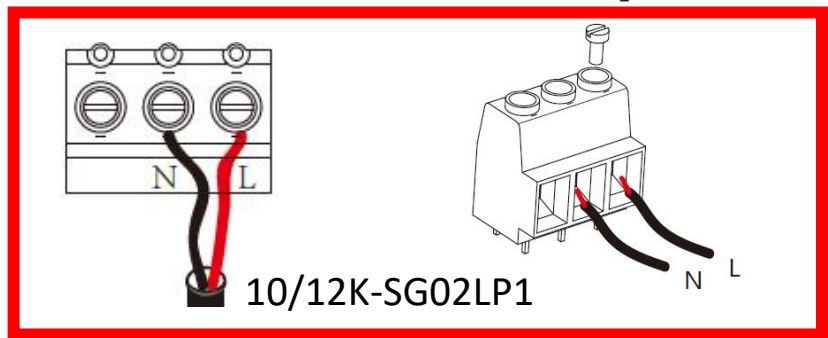
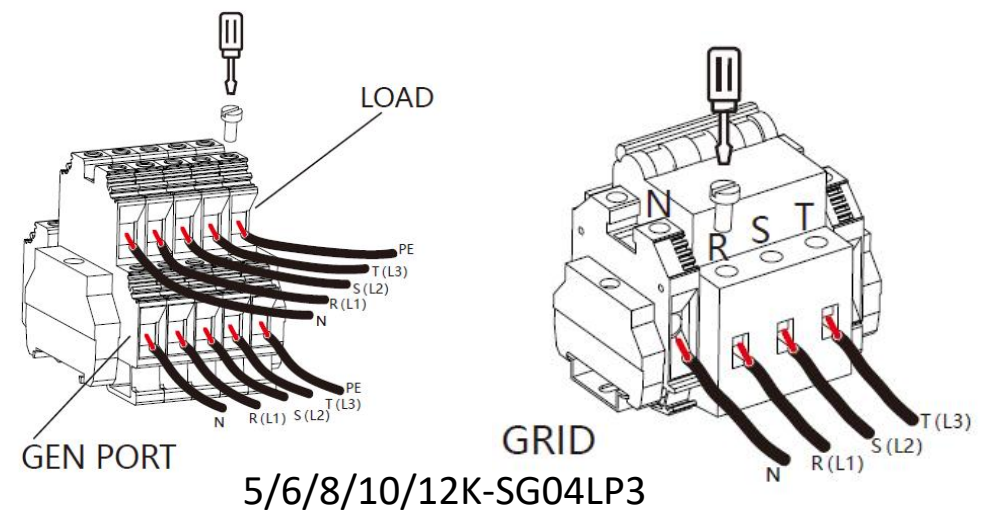
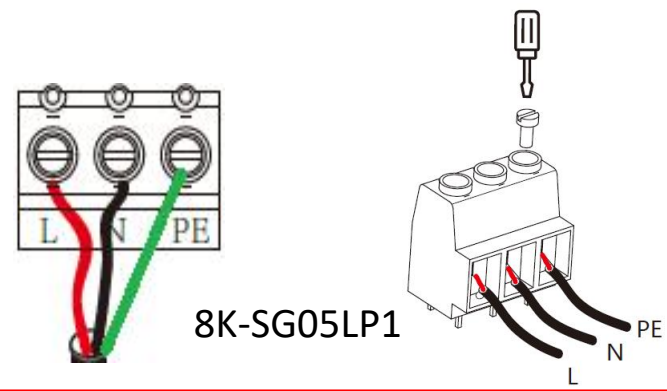
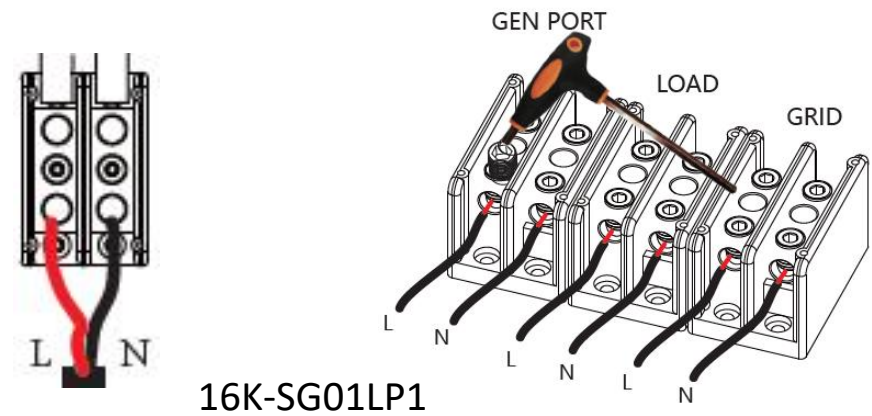
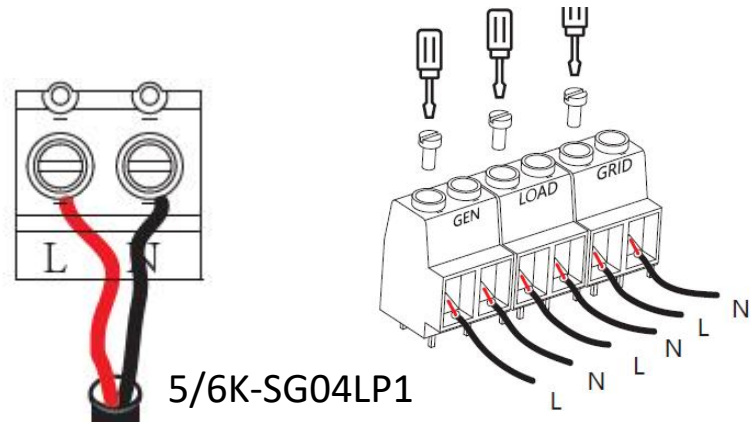
New AC/DC-Coupled System, Main House Backed Up #2



- 1) How many AC couple solutions does a Deye hybrid inverter have?**
- 2) When is AC-coupled to load port commonly used?**

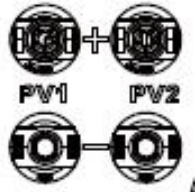
Installation & Wiring-AC/PV/Battery Wiring

Deye Low Voltage Hybrid Inverter AC Wiring



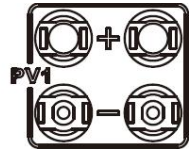
Refer to local regulation for wire size and protection

Deye Low Voltage Hybrid Inverter PV Wiring



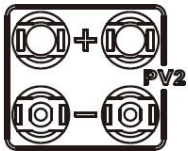
5/6K-SG04LP1,

2 MPPT, 1 string per MPPT
 $I_{sc}=19.5A$, $I_{mp}=13A$,
Max 500V



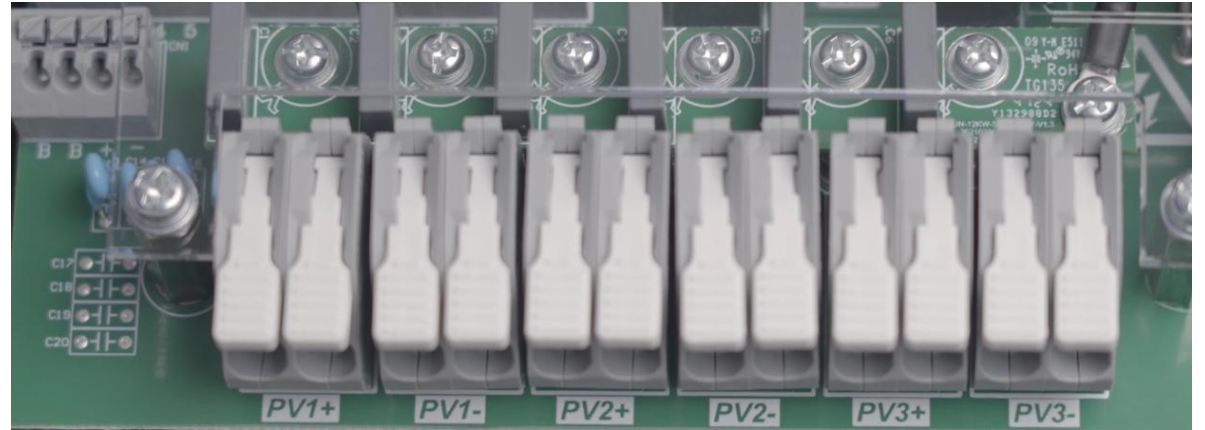
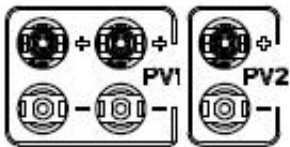
8K-SG05LP1,

2 MPPT, 2 strings per MPPT
 $I_{sc}=39A$, $I_{mp}=26A$,
Max 500V



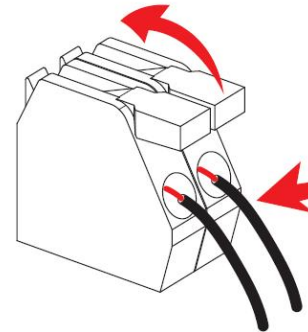
5/6/8/10/12K-SG04LP3,

2 MPPT, 3 strings in total
 $I_{sc}=39A/19.5A$, $I_{mp}=26A/13A$,
Max 800V



10/12K-SG02LP1

3 MPPT, 2 strings per MPPT
 $I_{sc}=44A$, $I_{mp}=26A$,
Max 500V



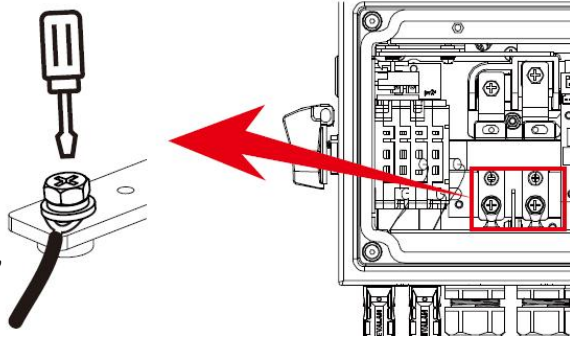
16K-SG01LP1

3 MPPT, 2 strings per MPPT
 $I_{sc}=44A$, $I_{mp}=26A$,
Max 500V

Deye Low Voltage Hybrid Inverter Battery Wiring

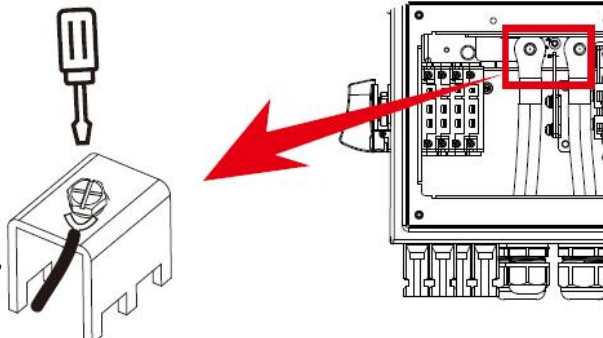
5/6K-SG04LP1

35mm² DC cable,
RS485/CAN
port for communication



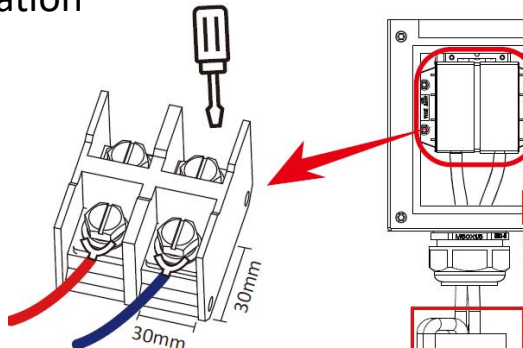
8K-SG05LP1

35mm² DC cable,
BMS 485/CAN
port for communication



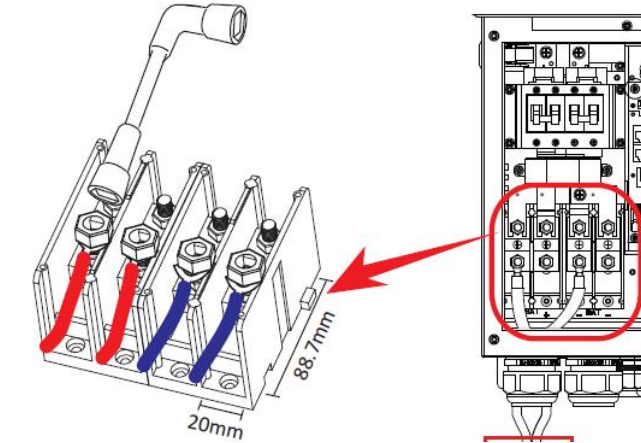
10/12K-SG02LP1

70mm² DC cable,
BMS 485/CAN
port for communication



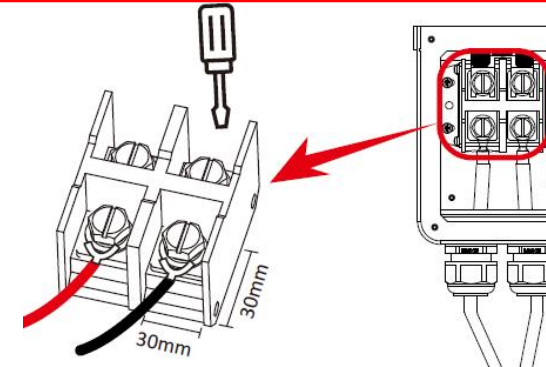
16K-SG01LP1

35mm² DC power cable*2 + Busbar/DC Combiner
Battery CANBus port for communication



10/12K-SG04LP3

70mm² DC power cable
BMS port for communication

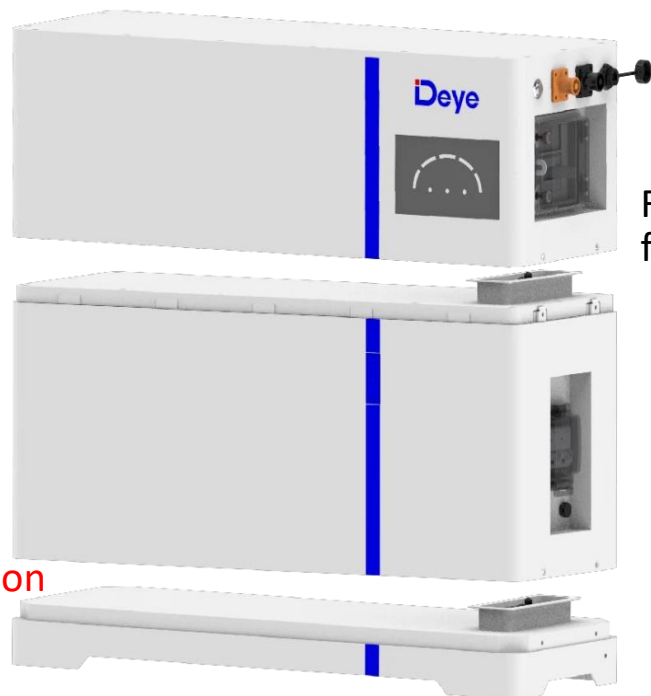


Assessment Questions

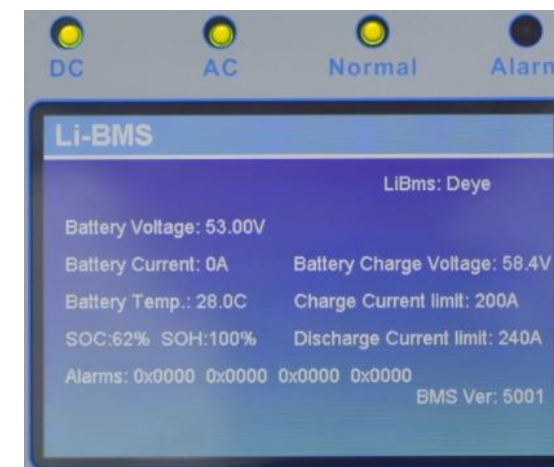
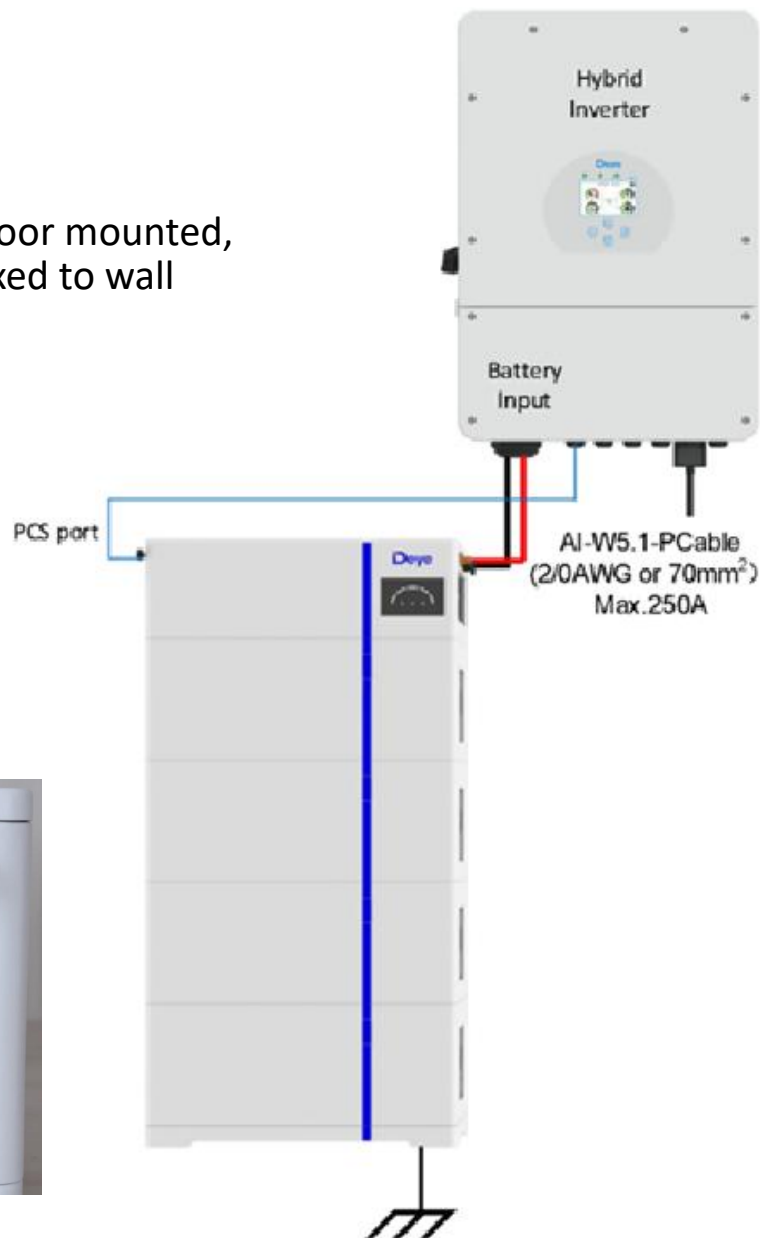
1) How many battey ports does a 16K-SG01LP1 inverter have?

Installation & Wiring-Battery Module Wiring

AI-W5.1-B Installation and Wiring



Floor mounted,
fixed to wall



Check battery and BMS
information from touchscreen to
ensure correct connection

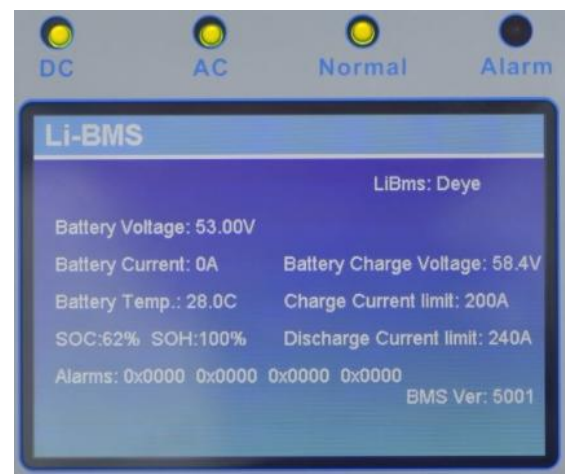
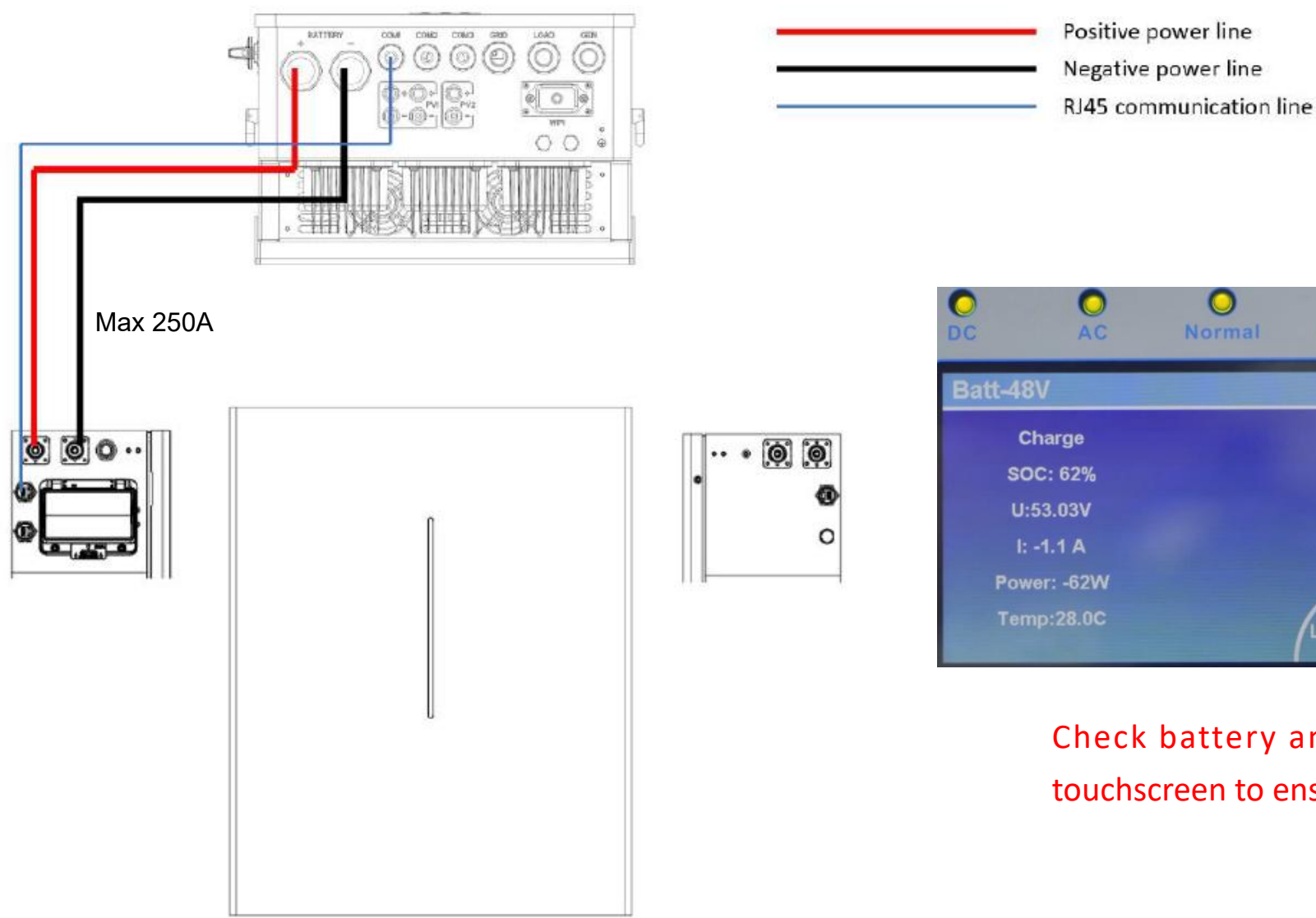


Left View



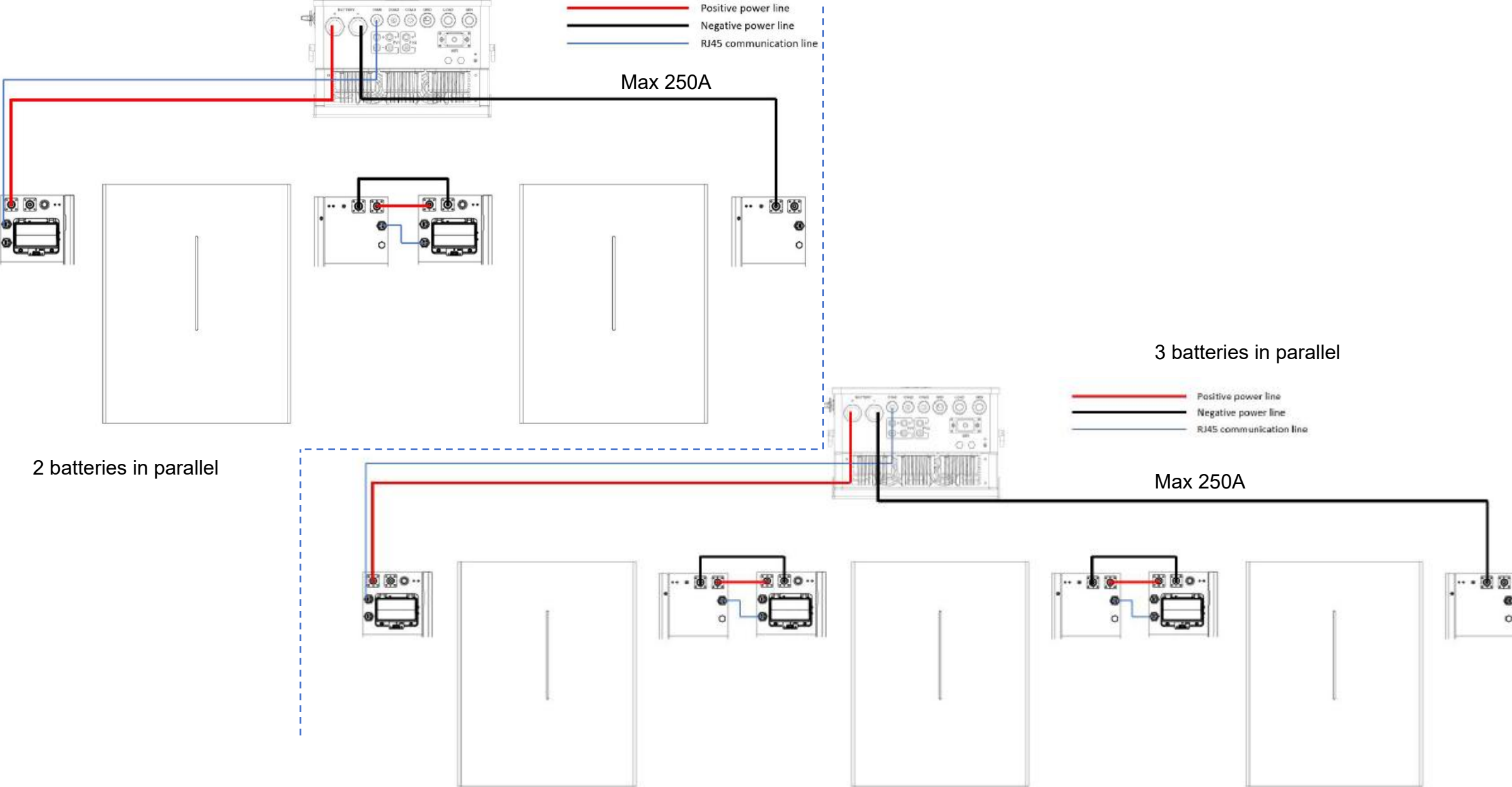
Right View

RW-F10.2 Installation and Wiring

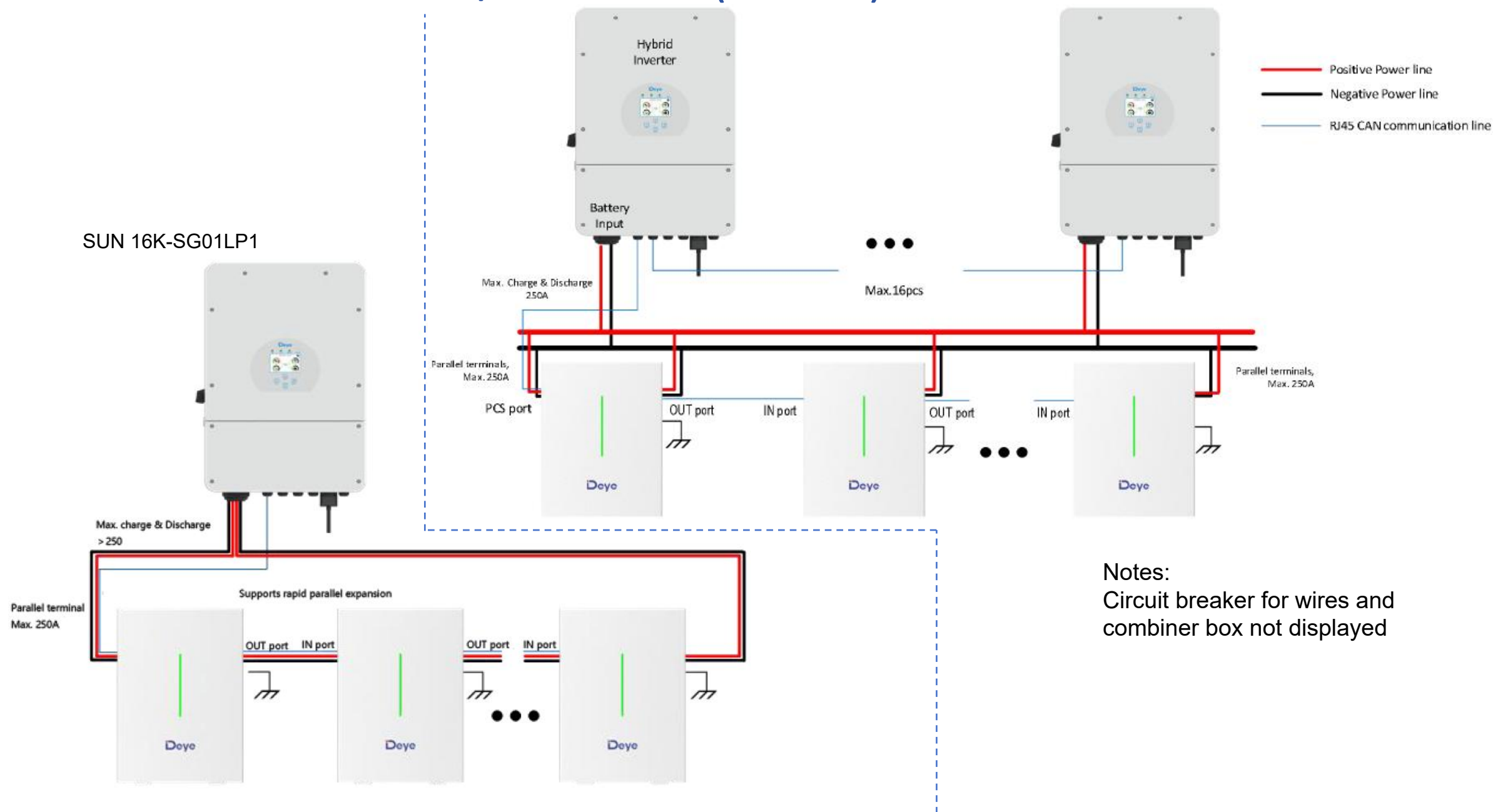


Check battery and BMS information from touchscreen to ensure correct connection

Parallel of AI-W5.1-B/RW-F10.2(≤250A)



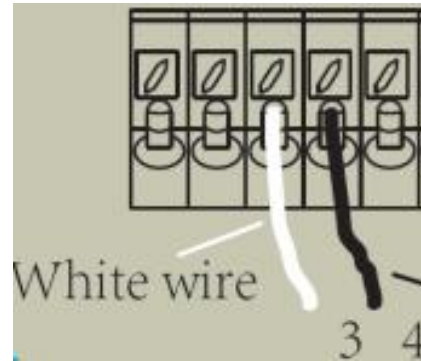
Parallel of AI-W5.1-B/RW-F10.2($\geq 250A$)



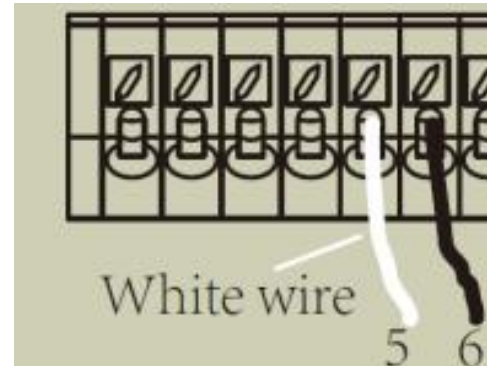
- 1) What's the max power for the cables connected to a battery?**
- 2) How to double check onsite whether the communication between inverter and battery is OK?**

Installation & Wiring-CT/Meter Wiring

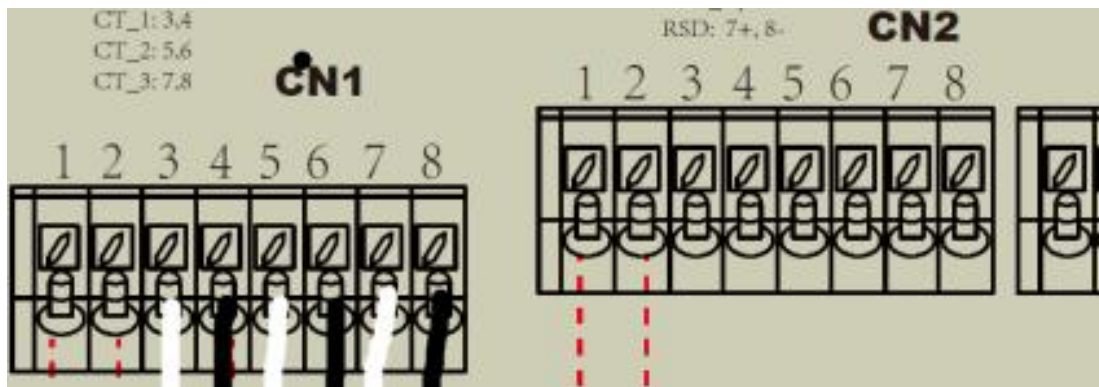
Deye Low Voltage Hybrid Inverter CT Wiring



- 5/6K-SG04LP1 & 8K-SG05LP1:
white → pin 3, black → pin 4;

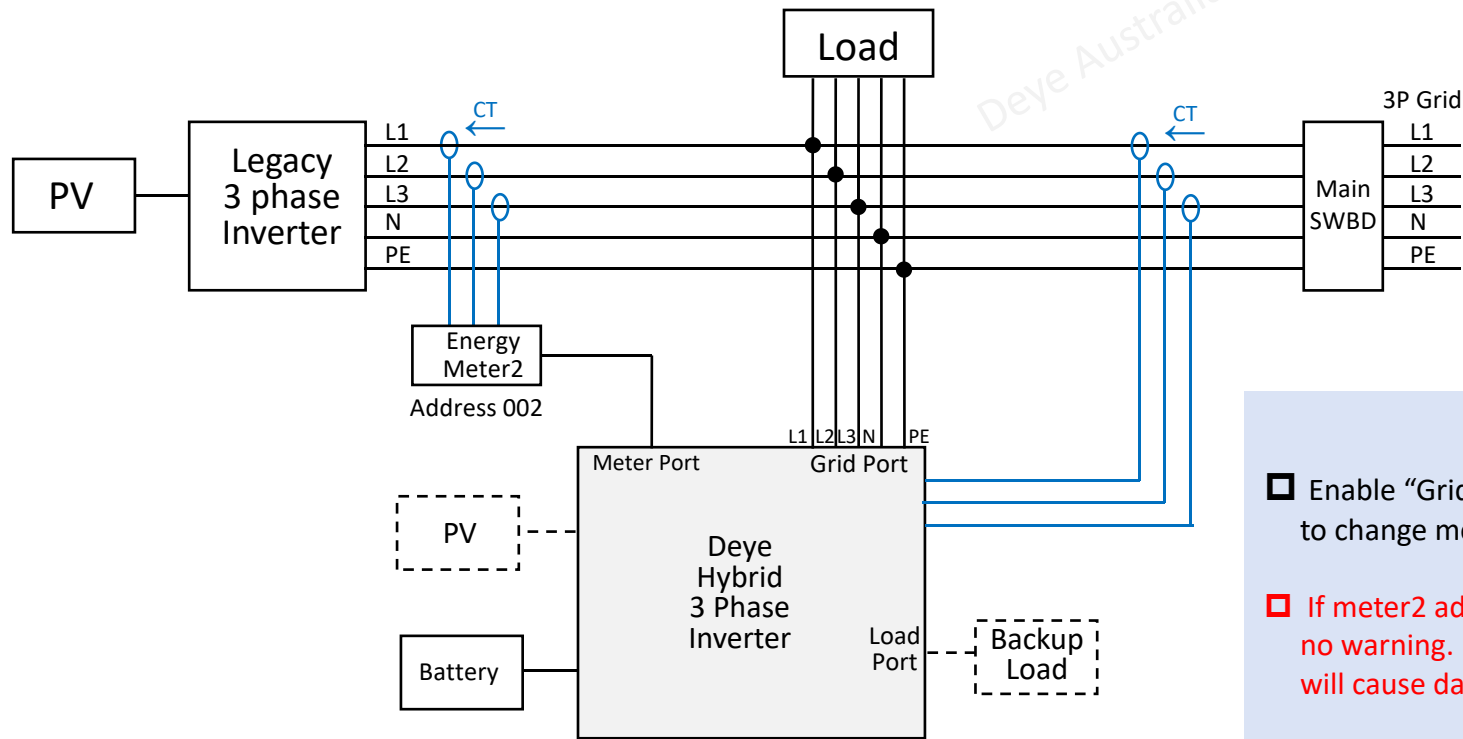


- 10/12K-SG02LP1 & 16K-SG01LP1:
white → pin 5, black → pin 6;



- 10/12K-SG04LP3:
CN1,
white → pin3/5/7, black → pin4/6/8

Deye Low Voltage Hybrid Inverter CT+Meter Wiring



Advanced Function			
☐ Parallel	Modbus SN	Baud Rate	↑ Paral. Set3 ↓ ✕ ✓
☒ Master	00	0000	
☐ Slave			
☐ EX_Meter For CT	☐ Grid Tie Meter2		
Meter Select			
No Meter 0/3			
CHNT			
Easton			

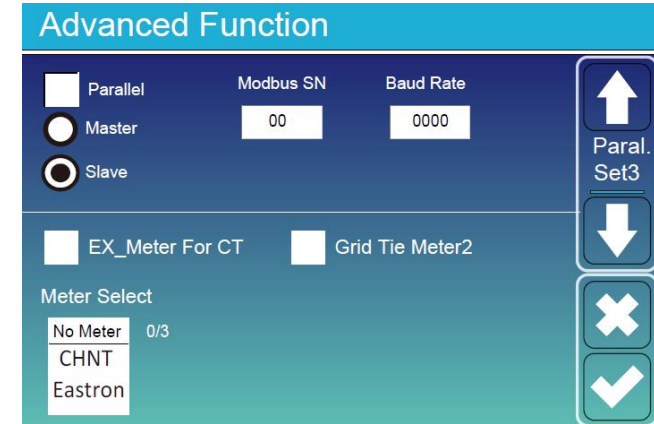
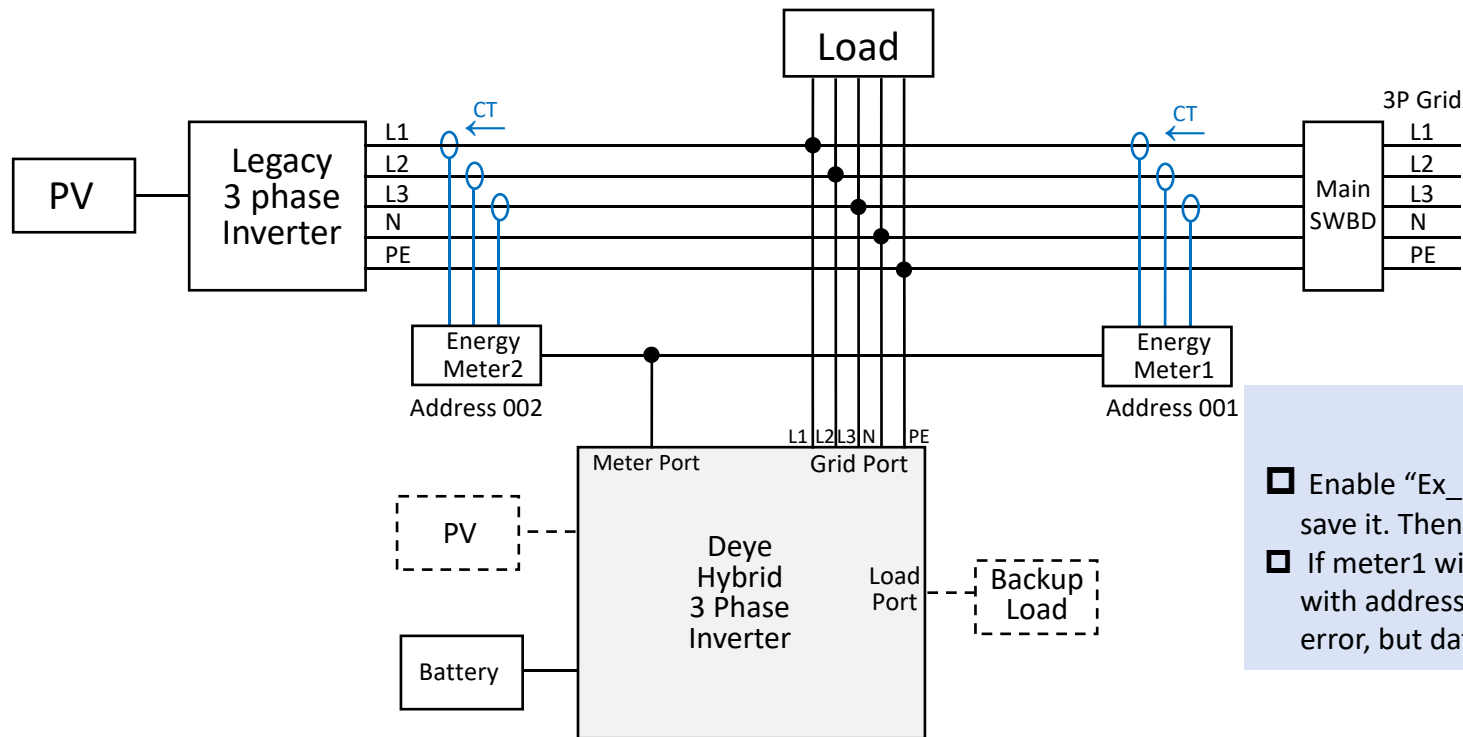
Key Points

- ❑ Enable "Grid Tie Meter2", select Easton meter, save it. Then press button to change meter2 address to 002;
- ❑ If meter2 address is 001 and "Ex_Meter For CT" is enabled, there will be no warning. Deye Inverter will use meter reading as meter1 reading which will cause data disorder.

Best Practice

Option1: Use 3p meter for meter2. Connect it and enable "Grid Tie Meter2" onsite, press button to modify its address to 002.

Deye Low Voltage Hybrid Inverter Meter CT Wiring



Key Points

- ❑ Enable “Ex_Meter For CT”, enable “Grid Tie Meter2”, select Easton meter, save it. Then press button to change meter2 address to 002;
- ❑ If meter1 with address 001 is connected to legacy inverter and meter2 with address 002 is connected closely to mains SWBD, there will be no error, but data will be in disorder.

Best Practice

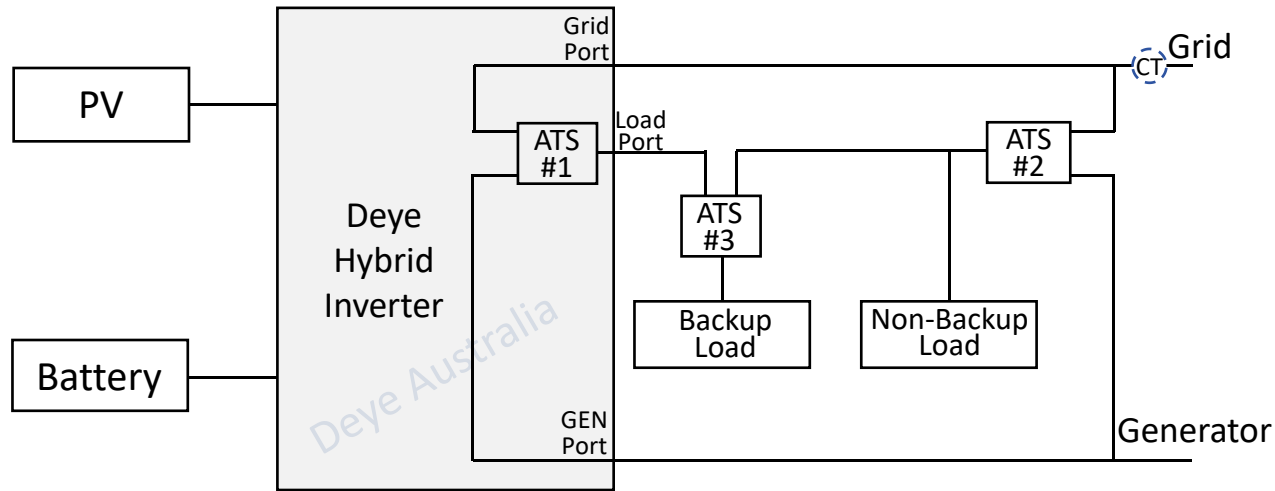
Option1: Use 3p meter for both meter1 & meter2; enable “Ex_Meter For CT” and “Grid Tie Meter2” onsite, use the button to change meter2 address to 002.

Assessment Questions

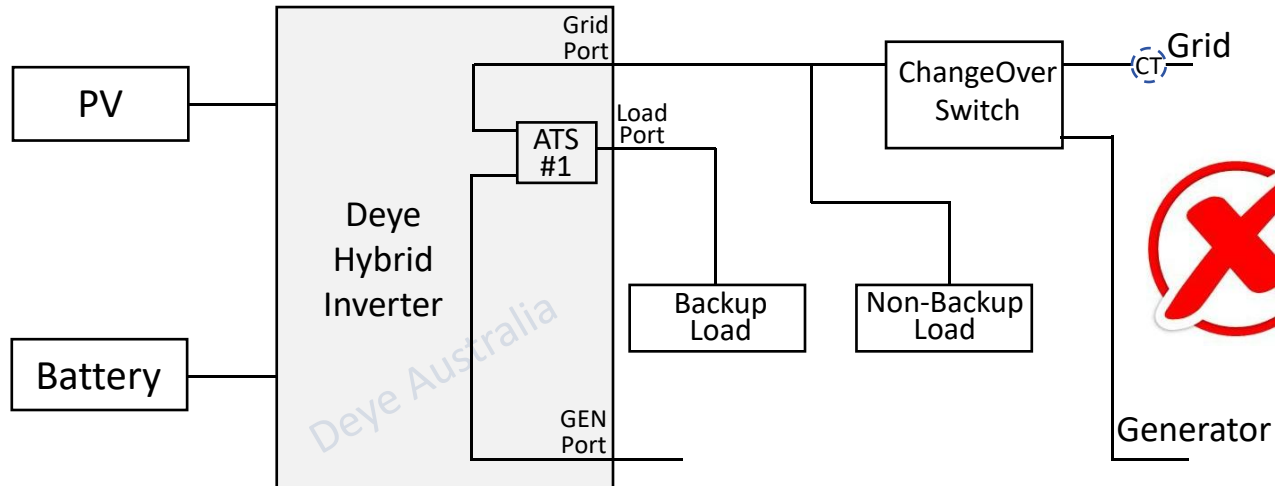
- 1) What's the address for AC coupled string inverter meter?**
- 2) What's the address for zero export control meter?**

Installation & Wiring-Generator Wiring

Generator Wiring Common Mistake

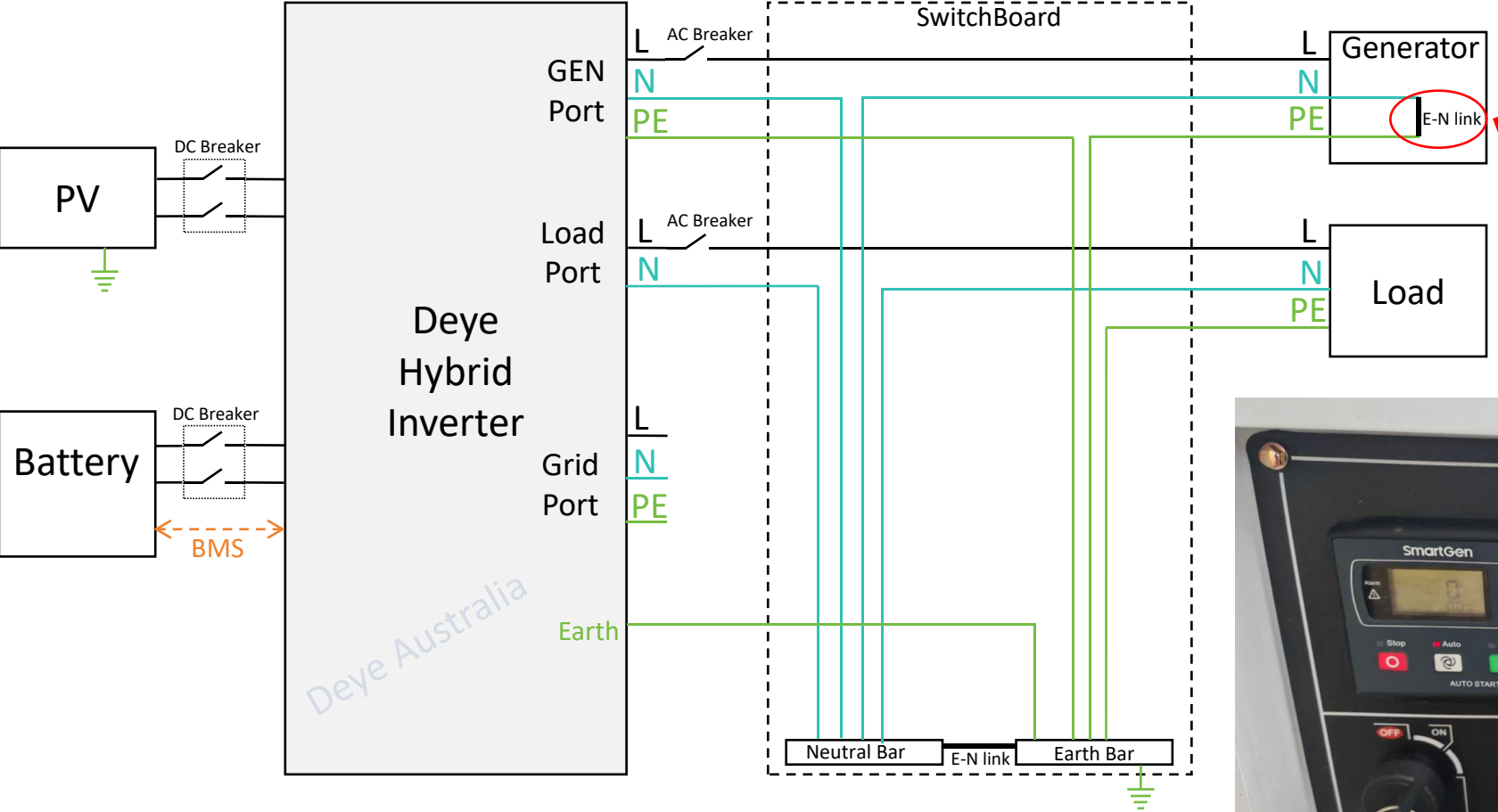


- ❑ ATS#1, inside Deye Hybrid inverter, chooses grid or generator to power the backup load.
- ❑ ATS#2, choose grid or generator to power the load.
- ❑ ATS#3, bypass the inverter if it's faulty, choose grid/generator to power the backup load.



- ❑ Need change Deye inverter setting after changeover from grid to generator

Generator Internal MEN Link



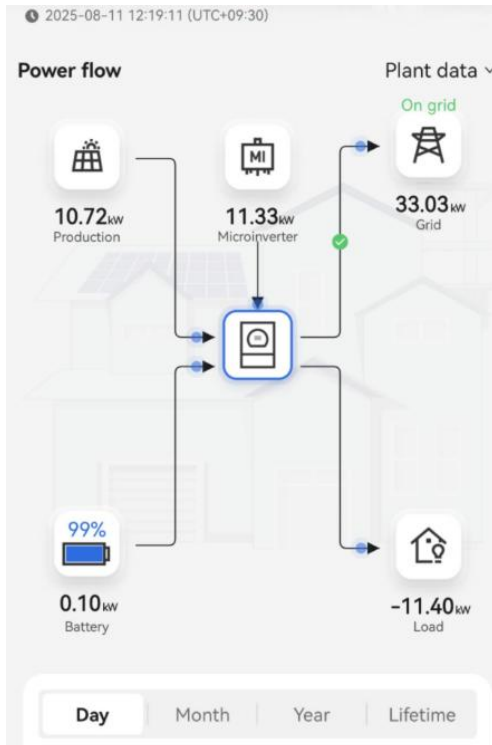
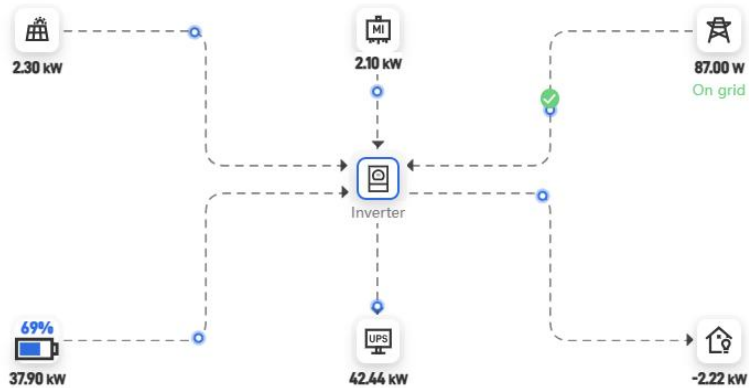
Some generators have internal MEN. If there is MEN in the switchboard already, generator's MEN must be disconnected



- 1) The internal MEN of a generator should be disconnected or not?**
- 2) Can the installer change over grid and generator to the same grid port of the inverter without changing settings?**

Troubleshooting

Test & Troubleshooting



Battery Discharging Test:

1) Choose Selling First mode to discharge at System Work Mode page 1;

Grid Charging Test:

1) Enable grid charge at Battery Setting page 2;

2) Enable grid charge at System Work Mode page 2, set start/stop SOC;

Solar Charging Test:

1) Disable Grid/Gen charge at System Work Mode page 2, set a high stop discharging SOC;

Generator Charging Test:

1) Enable GEN force at Battery Setting page 2 to test if generator works;

2) Enable Gen charge at Battery Setting page 2, set a high start SOC;

2) Enable Gen charge at System Work Mode page 2, set stop SOC;

Abnormal Data Analysis:

1) Check Work Mode setting;

2) Check CT direction or position;

3) Check Meter2;

Warning/Failure Code:

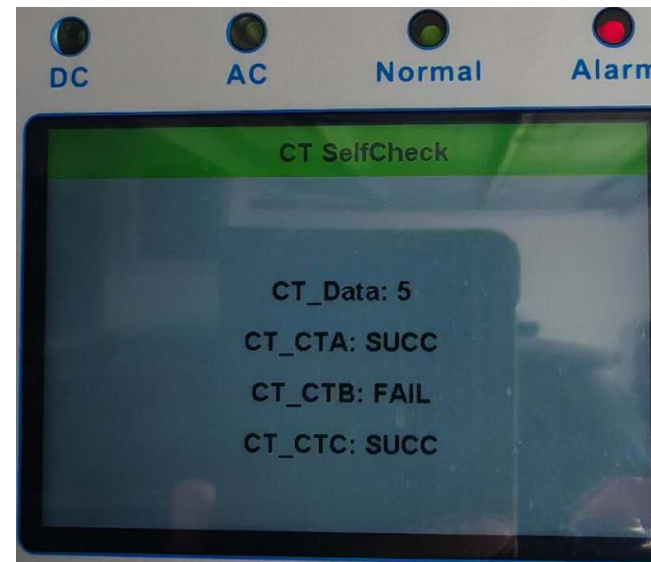
1) Check home page or Device info to get warning/failure information;

Inverter CT Commissioning Key Points

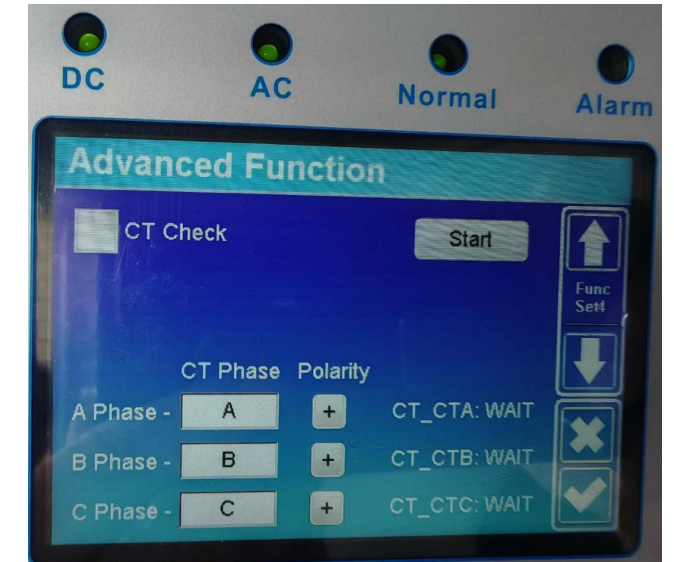
- ❑ Ensure the import/export direction is known and stable during testing
- ❑ **PF is not shown in inverter**
- ❑ Use a clamp meter to verify current and calculate expected power, then compare with the inverter's CT reading to confirm PF.
- ❑ If readings are messy, turn off battery, connect CTs one at a time to verify correct phases.
- ❑ CT Check in Advanced Function .
- ❑ New feature: adjust direction and phase remotely for 3P models



- ② L: Voltage for each Phase
CT: Power detected by the external current sensors
LD: Power detected using internal sensors on AC grid in/out breaker



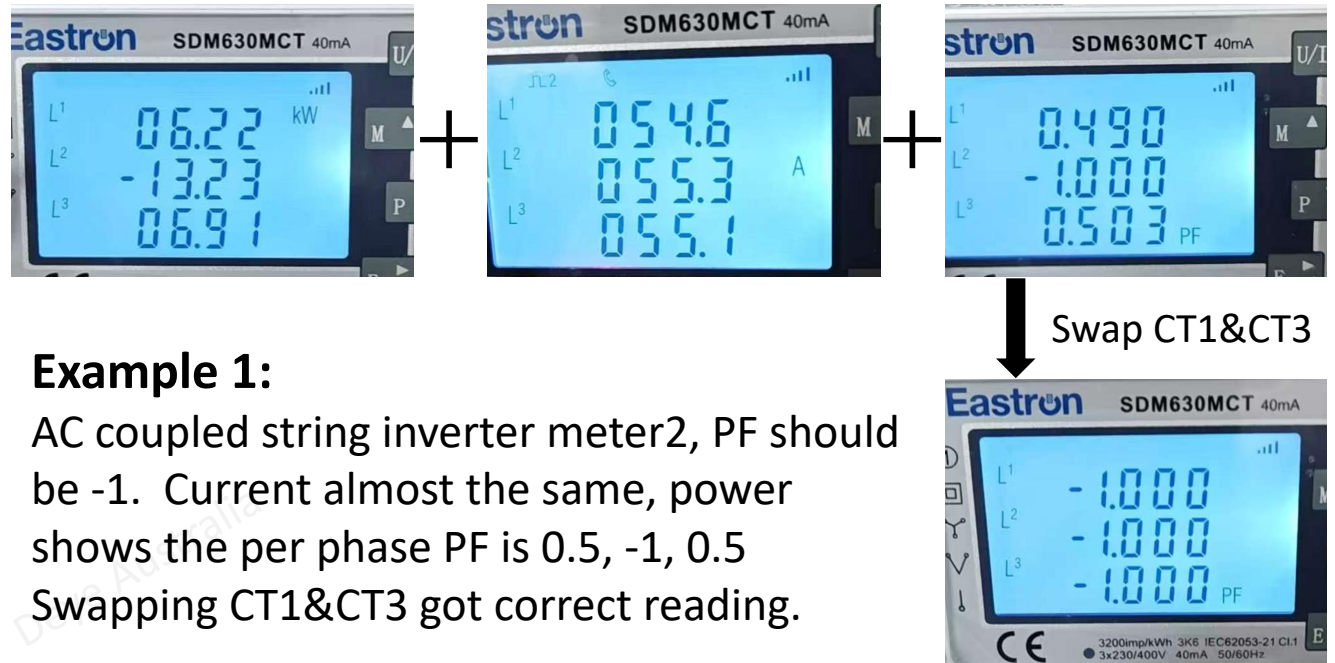
CT Check



CT Direction and phase adjustment

Meter CT Commissioning Key Points

- ❑ Ensure the import/export direction is known and stable during testing
- ❑ PF is a strong indicator of phase-order or direction errors
- ❑ Use a clamp meter to verify current and calculate expected power to verify PF.
- ❑ If readings are messy, connect CTs one at a time to verify correct phases.



Example 1:

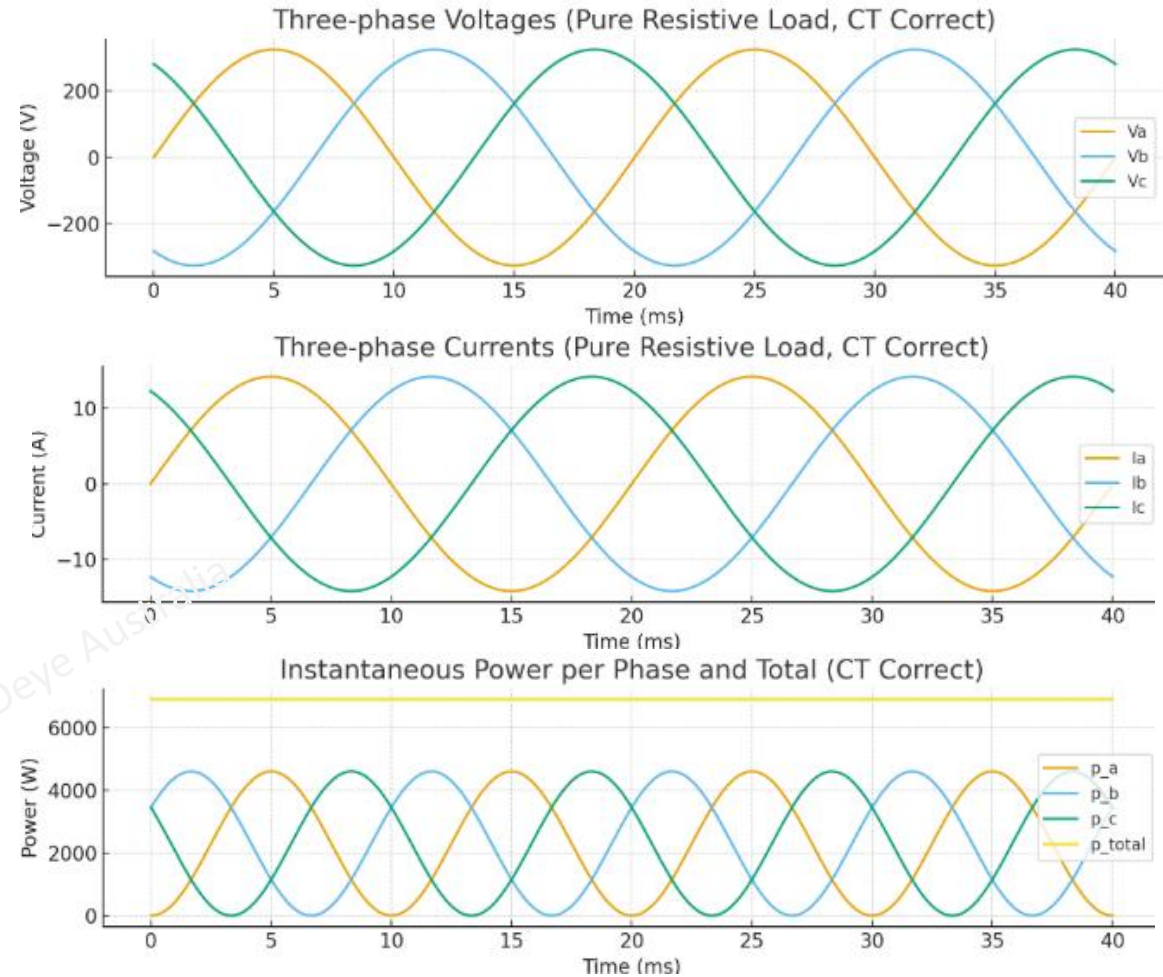
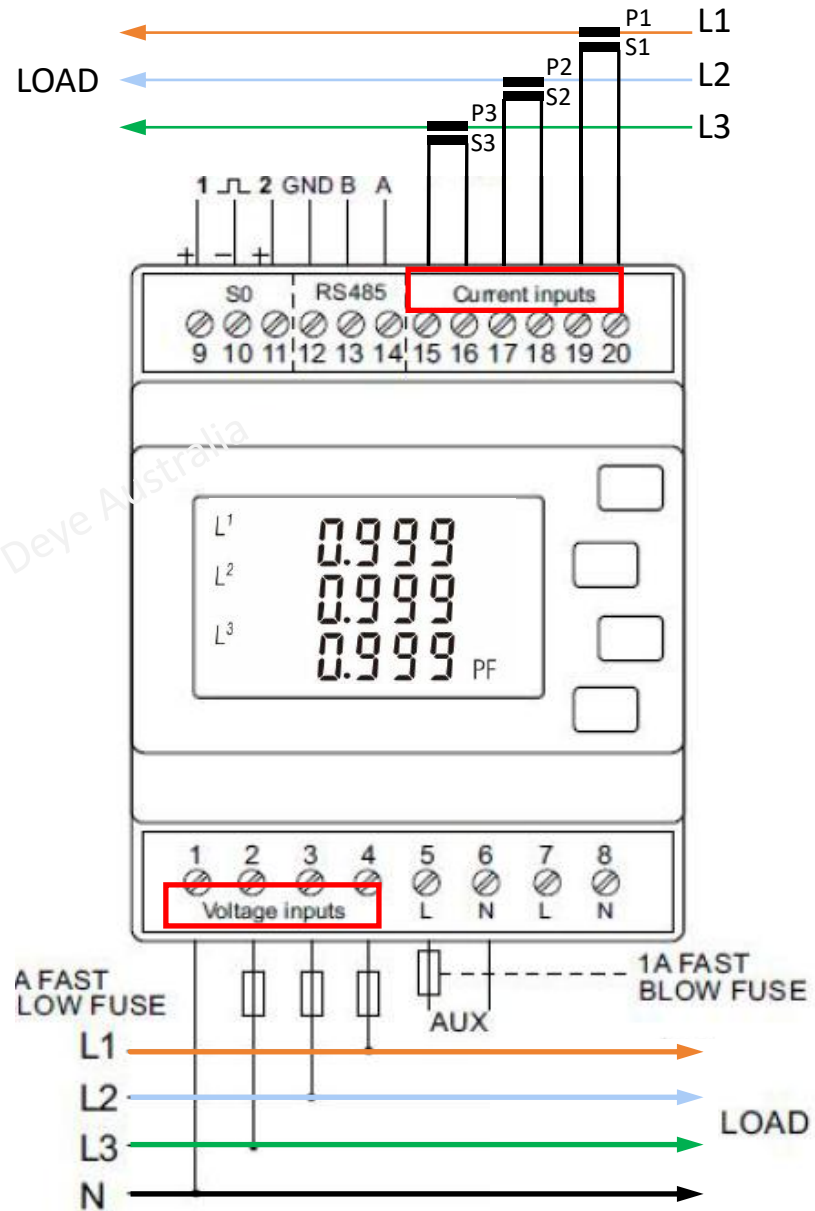
AC coupled string inverter meter2, PF should be -1. Current almost the same, power shows the per phase PF is 0.5, -1, 0.5 Swapping CT1&CT3 got correct reading.



Example 2:

Grid zero export control meter1 in a commercial site with heavy unbalanced inductive loads. PF should be around 0.8. Swapping CT1&CT2 got correct reading.

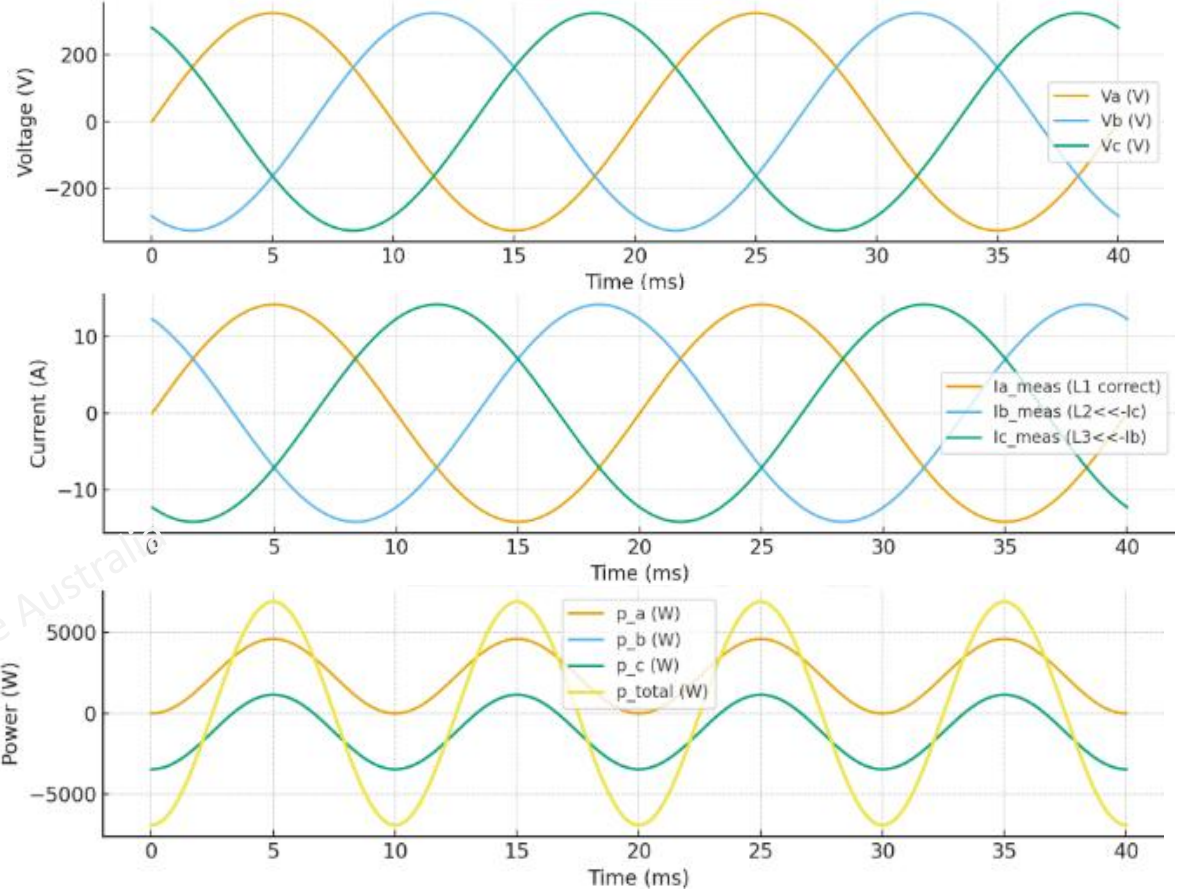
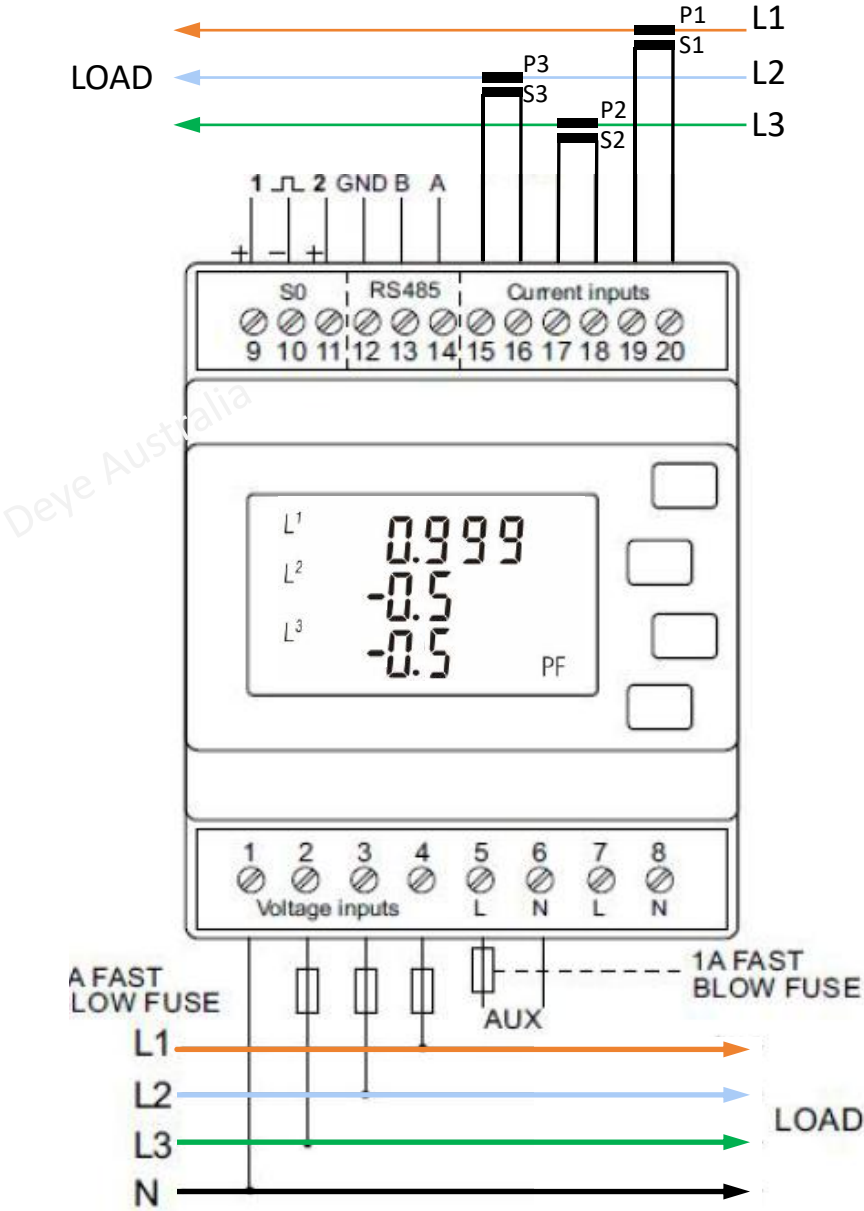
Correct CT Direction and Order for Ideal resistive import



Power Factor = $\cos\varphi$, φ = phase angle between the voltage and the current.

Purely resistive load $\rightarrow \varphi = 0^\circ \rightarrow \text{PF} = 1$

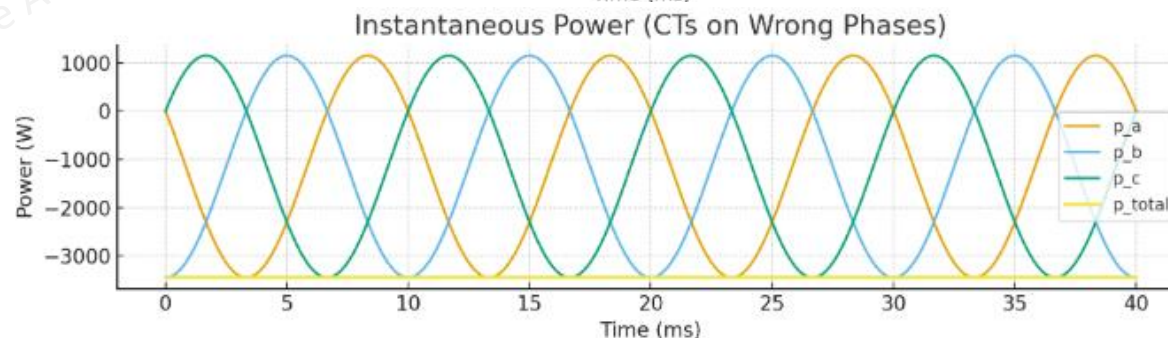
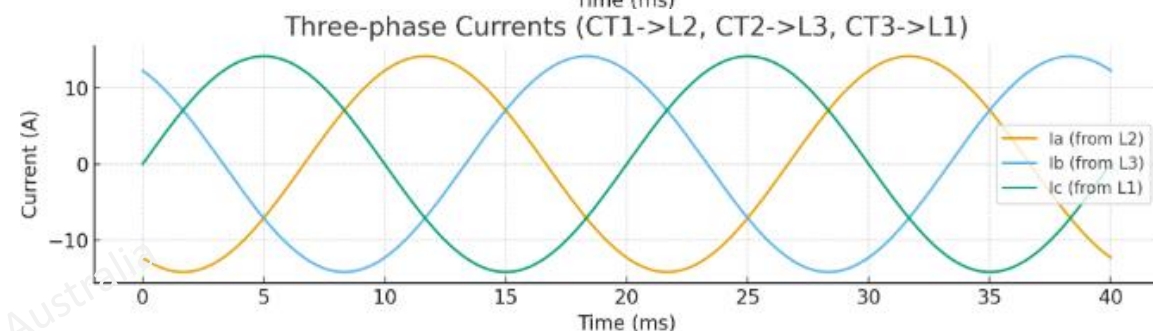
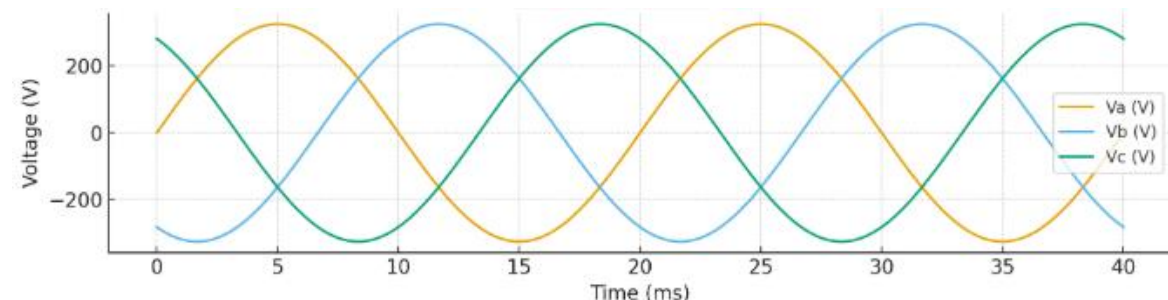
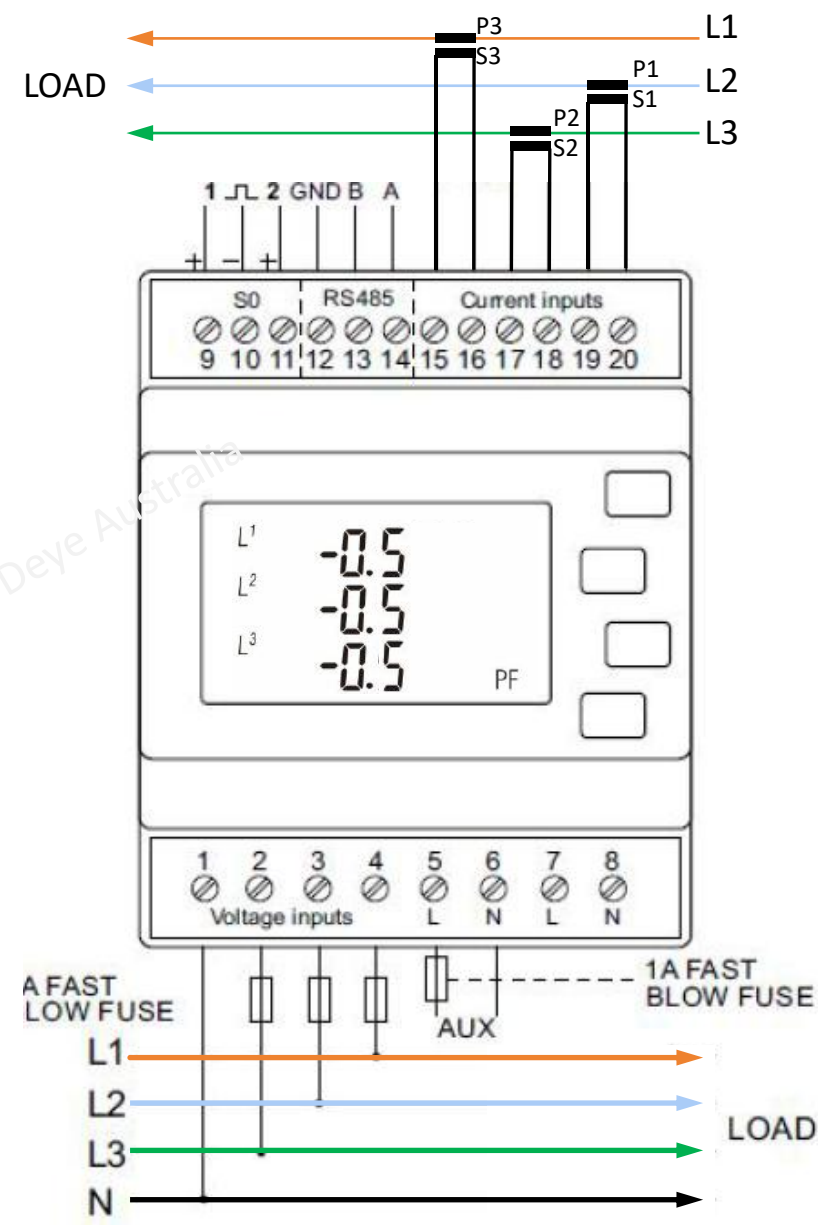
Correct CT Direction, 1 CT Order Correct, 2 CTs Order Wrong



Power Factor = $\cos\varphi$, φ = phase angle between the voltage and the current.

for correct CT phase, Purely resistive load $\rightarrow \varphi = 0^\circ \rightarrow \text{PF} = 1$
for wrong CT phases, Purely resistive load $\rightarrow \varphi = 120^\circ \rightarrow \text{PF} = -0.5$

Correct CT Direction, 3 CTs Order Wrong

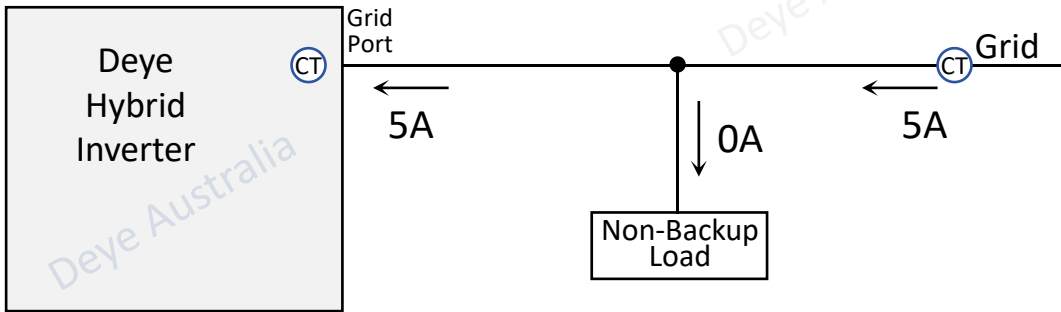


Power Factor = $\cos\varphi$, φ = phase angle between the voltage and the current.

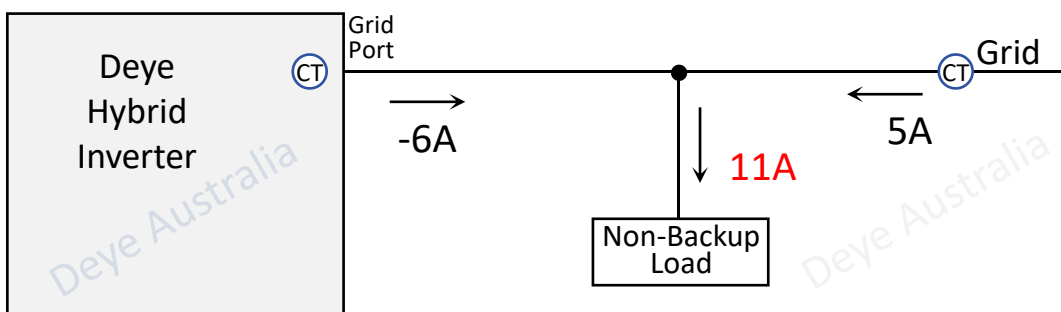
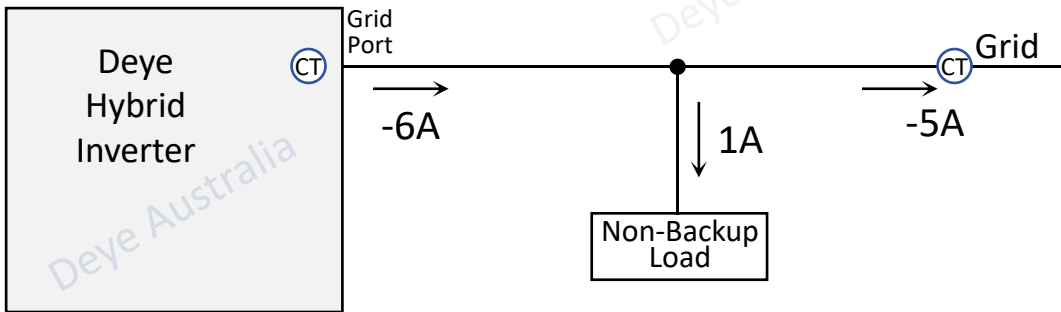
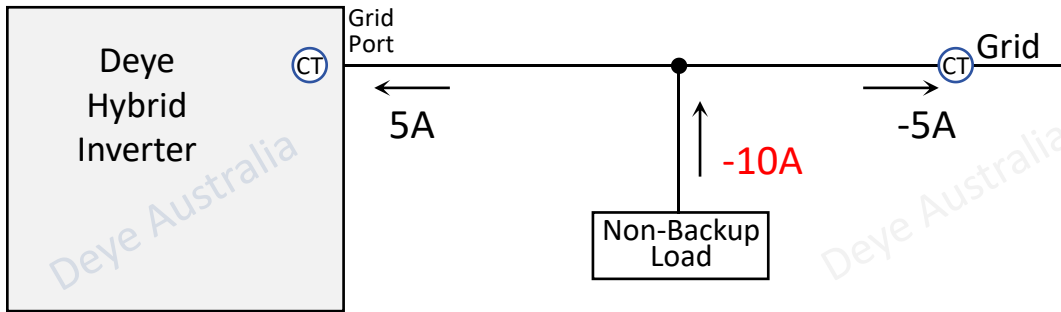
for wrong CT phases, Purely resistive load $\rightarrow \varphi = 120^\circ \rightarrow \text{PF} = -0.5$

Non-backup Load Calculation

If CT Direction not Wrong

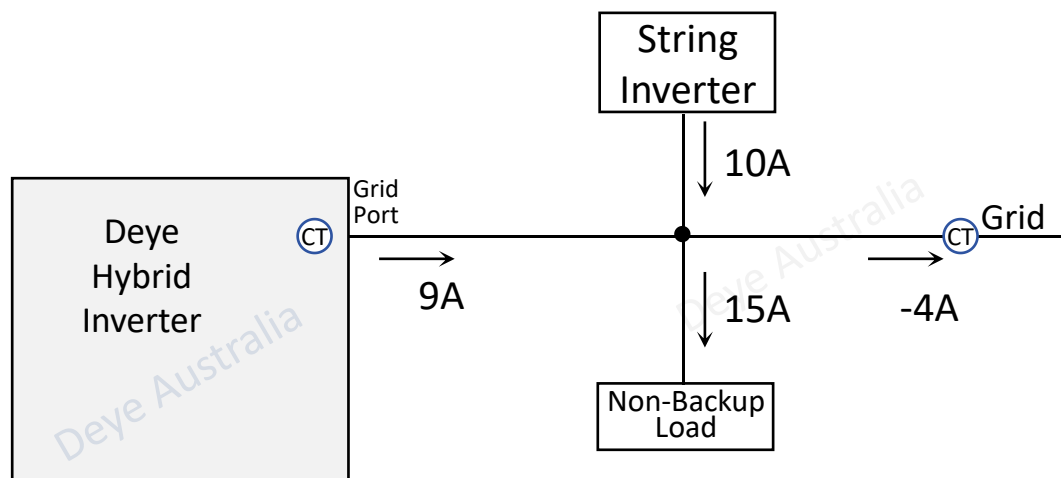
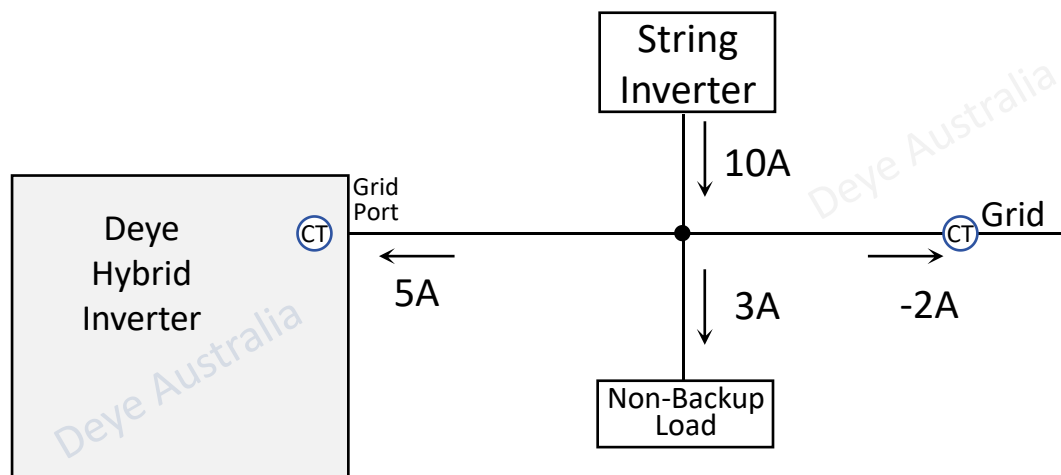


If CT Direction Wrong

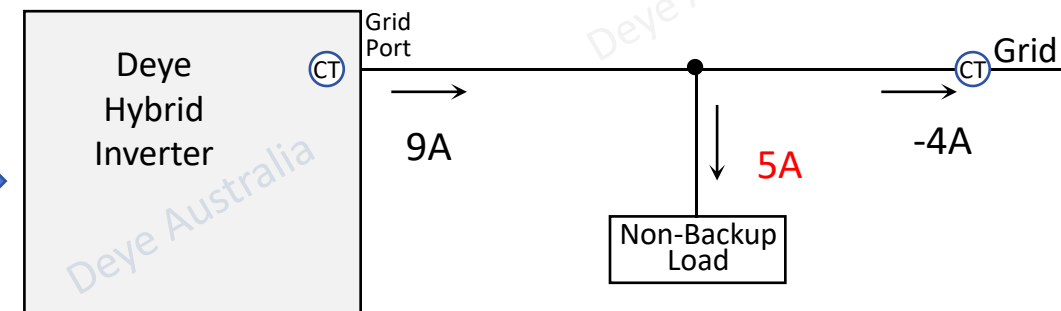
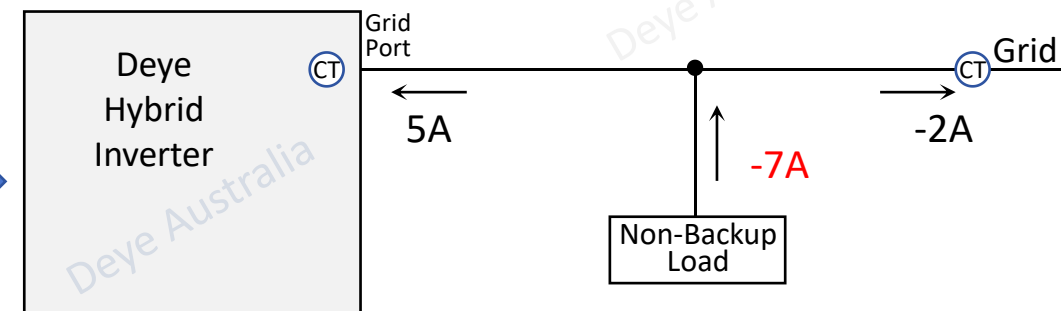


AC Coupled at Grid Port, Calculation without Meter2

Expected Reading



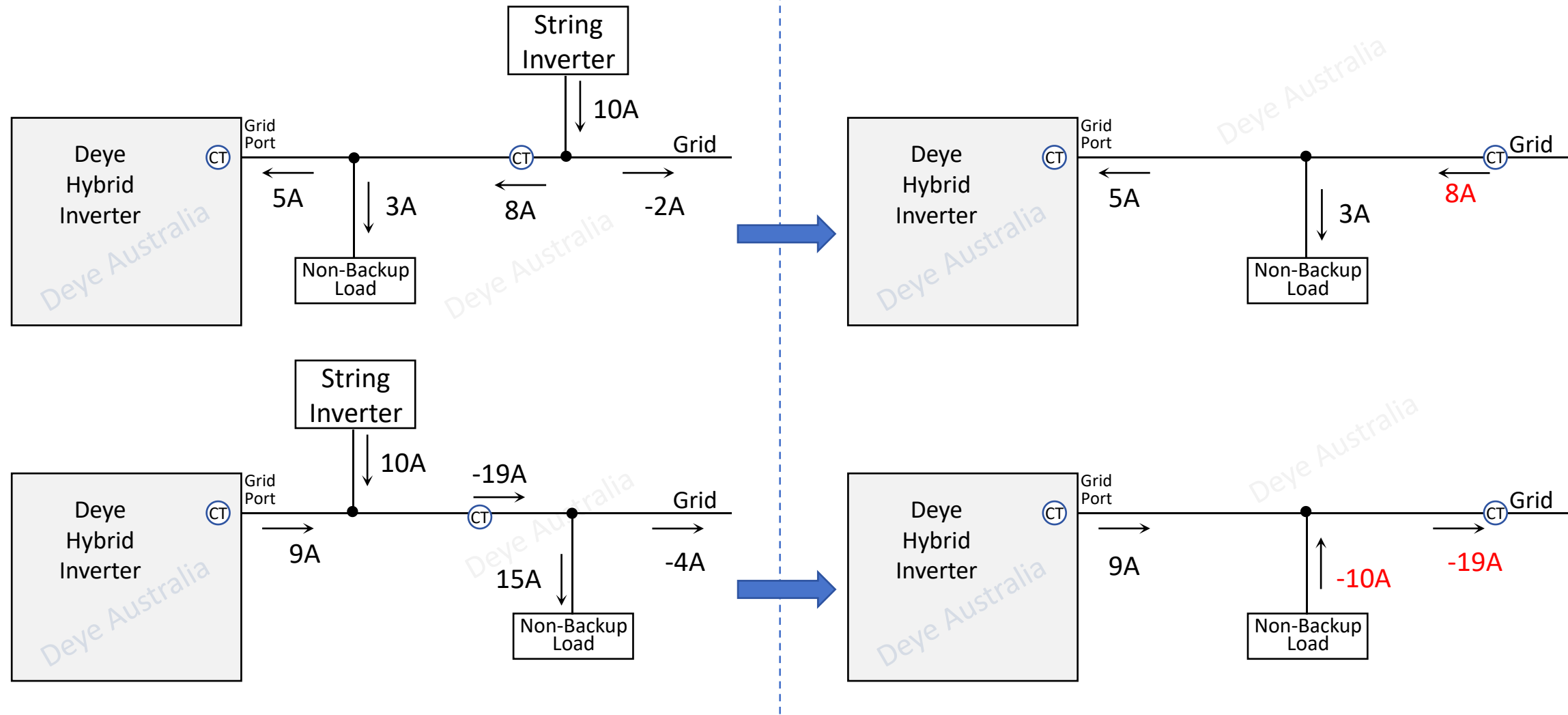
Actual Reading



CT Position for Load Calculation, without Meter2

Expected Reading

Actual Reading



- 1) How can meter PF be used to troubleshoot CT issues with meter?**
- 2) How to troubleshoot if the CTs are connected to inverter?**
- 3) Which inverter models allow CT direction and phase adjustment?**

THANKS

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