

PCS AC-COUPLED SYSTEM

Installation Guidance

Standard Operating Procedures & Best Practices

ATESS ENERCOLLEGE

Technical Support Document



ATESS EnerCollege 🔍



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1 Introduction

To ensure the proper and safe installation of the ATESS PCS500-630 Bidirectional battery inverter, please follow the steps provided in this guide.

2 Tools Required

The following tools are recommended for the installation process:



Torque wrench



Screwdriver



Wire stripper



Hydraulic crimper



Heat dryer



Multimeter



Insulating gloves



Forklift

3 Nameplate Overview

Check that the model and electrical parameters on the nameplate match your installation scenario.

ATESS Bidirectional Battery Inverter		ATESS Bidirectional Battery Inverter		ATESS Bidirectional Battery Inverter		ATESS Bidirectional Battery Inverter	
Model	PCS100	Model	PCS250	Model	PCS500	Model	PCS630
Battery voltage range	500V d.c.-820V d.c.	Battery voltage range	500V d.c.-820V d.c.	Battery voltage range	600V d.c.-900V d.c.	Battery voltage range	600V d.c.-900V d.c.
Battery Max. charge/discharge power	110kW	Battery Max. charge/discharge power	275kW	Battery Max. charge/discharge power	550kW	Battery Max. charge/discharge power	693kW
Battery Max. charge/discharge current	220A d.c.	Battery Max. charge/discharge current	550A d.c.	Battery Max. charge/discharge current	917A d.c.	Battery Max. charge/discharge current	1155A d.c.
AC rated voltage	400V a.c. (3/PE)	AC rated voltage	400V a.c. (3/PE)	AC rated voltage	400V a.c. (3/PE)	AC rated voltage	400V a.c. (3/PE)
AC rated frequency	50/60Hz	AC rated frequency	50/60Hz	AC rated frequency	50/60Hz	AC rated frequency	50/60Hz
AC rated current	144A a.c.	AC rated current	361A a.c.	AC rated current	722A a.c.	AC rated current	909A a.c.
AC rated power	100kW	AC rated power	250kW	AC rated power	500kW	AC rated power	630kW
AC rated apparent power	100kVA	AC rated apparent power	250kVA	AC rated apparent power	500kVA	AC rated apparent power	630kVA
PF range	0.8lagging--0.8leading	PF range	0.8lagging--0.8leading	PF range	0.8lagging--0.8leading	PF range	0.8lagging--0.8leading
Protective class	Class I	Protective class	Class I	Protective class	Class I	Protective class	Class I
Overvoltage category	Bat.II AC:III	Overvoltage category	Bat.II AC:III	Overvoltage category	Bat.II AC:III	Overvoltage category	Bat.II AC:III
Ingress protection	IP20	Ingress protection	IP20	Ingress protection	IP20	Ingress protection	IP20
Communication port	RS485/CAN	Communication port	RS485/CAN	Communication port	RS485/CAN	Communication port	RS485/CAN
Inverter topology	Isolated	Inverter topology	Isolated	Inverter topology	Isolated	Inverter topology	Isolated
Operating Temp.range	-25°C to +55°C	Operating Temp.range	-25°C to +55°C	Operating Temp.range	-25°C to +55°C	Operating Temp.range	-25°C to +55°C
DATE OF MADE		DATE OF MADE		DATE OF MADE		DATE OF MADE	
S/N:	940.ZT0013301	S/N:	940.ZT0012501	S/N:	940.ZT0003602	S/N:	940.ZT0011801

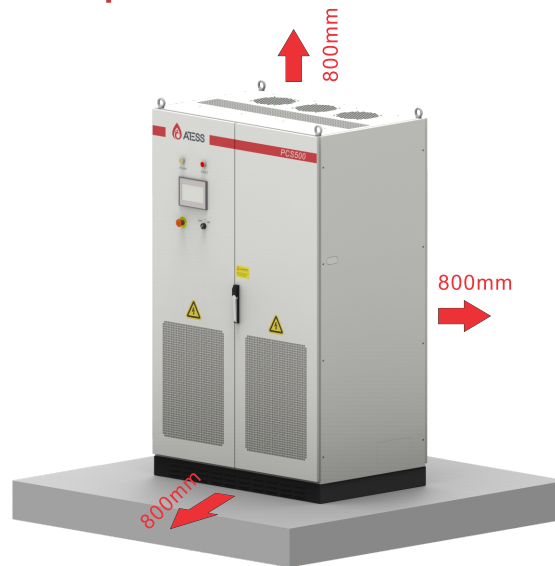
4 Cable Requirements

Cable	Requirements for bus diameter			
Model	PCS100	PCS250	PCS500	PCS630
Battery	70mm ²	95mm ² *2	95mm ² *3	95mm ² *4
AC output	70mm ²	70mm ² *2	95mm ² *3	95mm ² *4
N line	70mm ²	70mm ² *2	95mm ² *3	95mm ² *4
Ground line	The diameter of the ground cable should not be less than half of the cross-sectional area of the AC output cable			
Communication line	Shielding wire: $\geq 0.75\text{mm}^2$			

1. The cable diameter must not be smaller than the specified minimum.
2. It is recommended to distinguish port polarity using different cable colors:
 - DC side: Red is positive; Black is negative
 - AC side: Yellow is U phase, green is V phase, red is W Phase
3. The communication cable is recommended to use the twisted shielded pair cable.
4. Power Cable Requirements for Parallel Systems:

The length deviation of both DC and AC power cables from the combiner point to each PCS unit shall not exceed 1 meter.

5 Space & Environment Requirements



Space requirements:

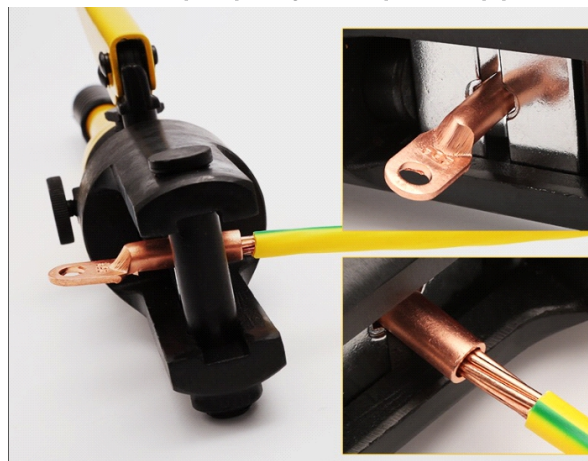
Please reserve 800mm space on the top, front door, and rear door of the inverter as shown in the figure to facilitate inverter heat dissipation and future maintenance.

Environment requirements:

Please install the inverter indoors or in a clean place as specified in the user manual to prevent damage caused by direct sunlight or rain.

6 Cable Terminal Guidelines

All cables must be terminated with properly crimped copper lugs or terminals.

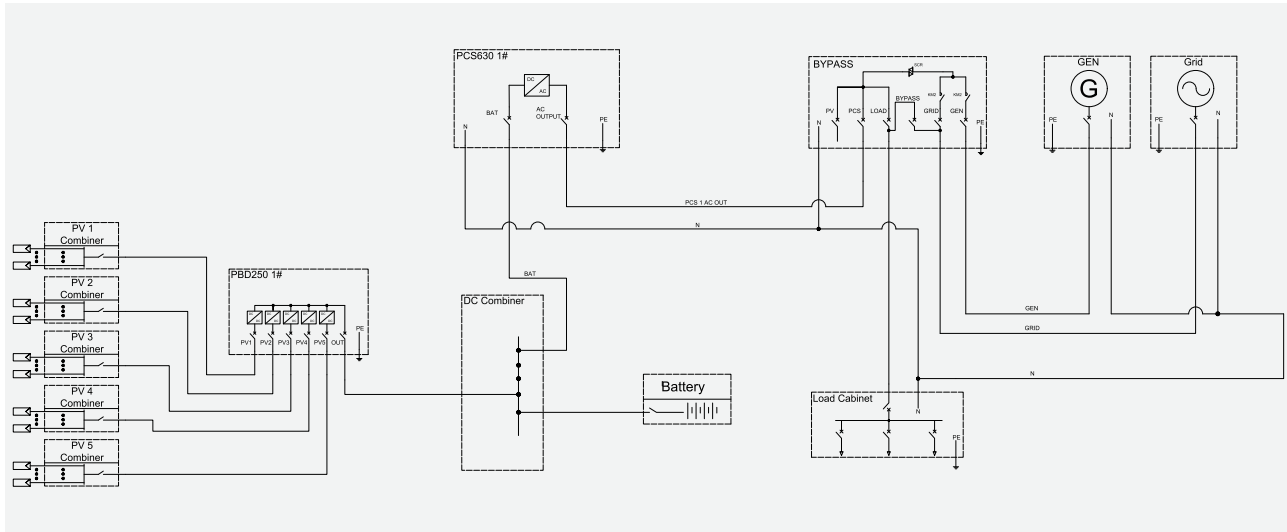


1. Strip off the insulation skin at the end of the cable.
2. Crimp the wiring copper lug.
 - a. Put the stripped copper core into the crimping hole of the copper lug.
 - b. Use the terminal pressing machine to press the copper lug tightly. The number of crimping shall be more than two.
3. Install the shrink fit sleeve.
 - a. Select the heat shrinkable sleeve which is more consistent with the cable size, length is about 5cm.
 - b. Slide the heat shrink sleeve over the copper lug to completely cover the crimped area.
 - c. Use a heat blower to tighten the heat shrink sleeve.

7 Connection Diagram & Description

Refer to the diagram below for proper connection of AC/DC and communication wiring.

Single PCS500/PCS630 system



DC side: need distinguish the positive and the negative polarity

1. If there is no PBD, connect the battery to the battery input of the PCS.
2. If there is a PBD, connect the DC bus to the battery breaker of the PCS after merging.

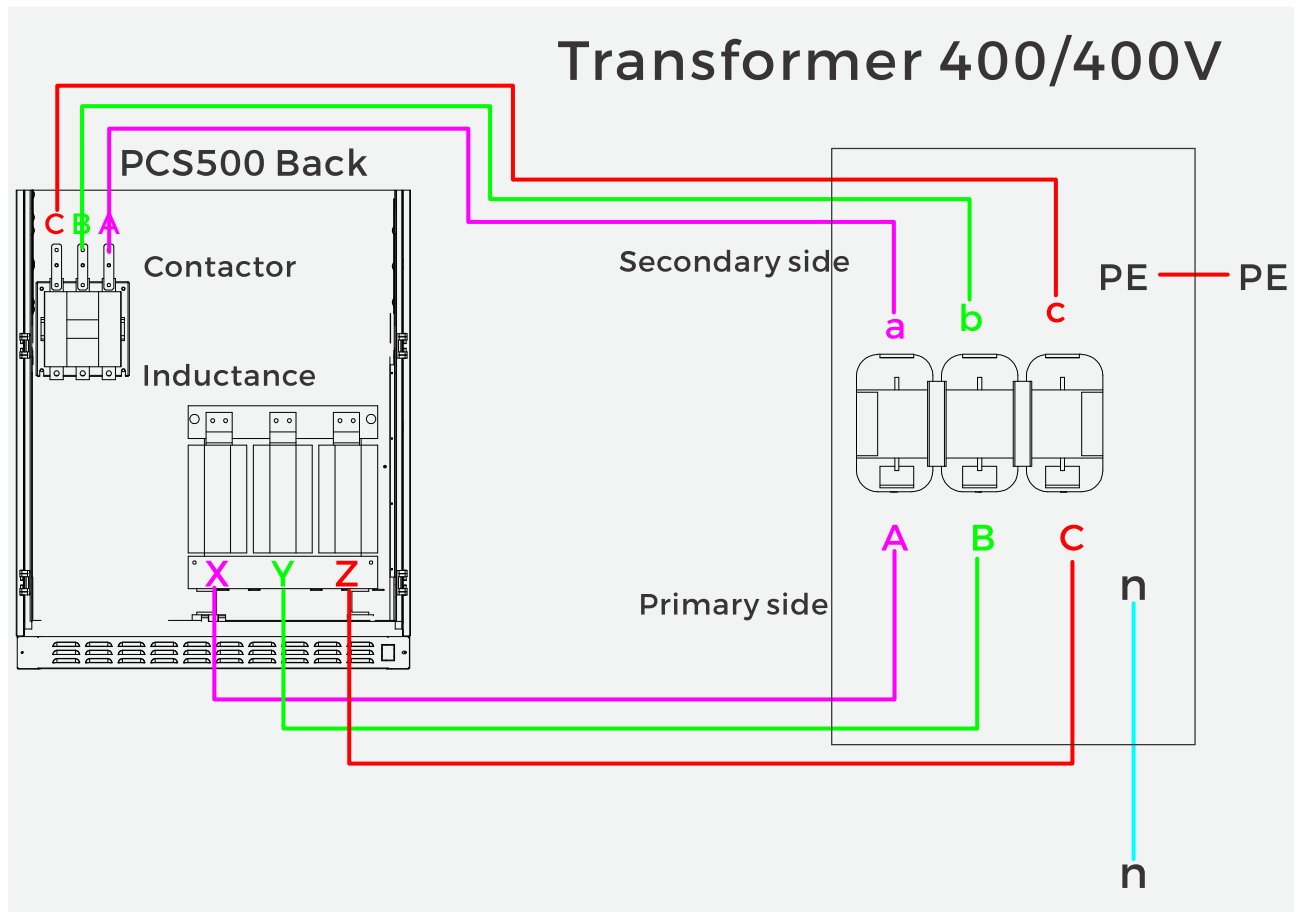
AC side: need distinguish the phase sequence

1. Connect the grid to the grid breaker of BYPASS.
2. Connect the generator to the generator breaker of BYPASS.
3. Connect the load to the load breaker of BYPASS.
4. Connect the PCS breaker of BYPASS to the AC OUTPUT of PCS.
5. If there is a PV inverter, Please connect the PV inverter to the PV/INV breaker of BYPASS.

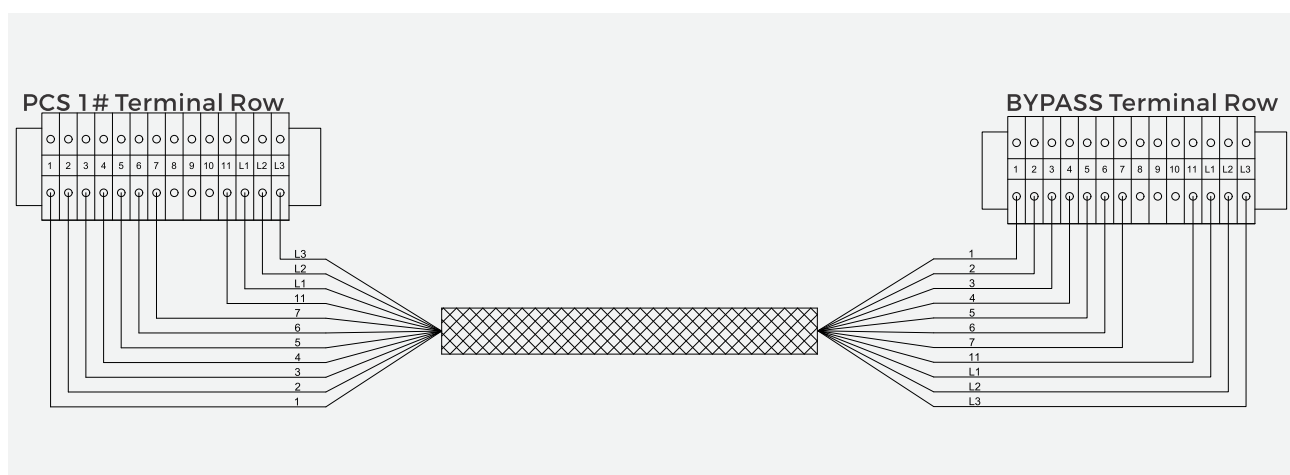
7 Connection Diagram & Description

Single PCS500/PCS630 system

The wiring between PCS and isolation transformer is shown below



Terminal block connection diagram of PCS and BYPASS Connect according to line markings.



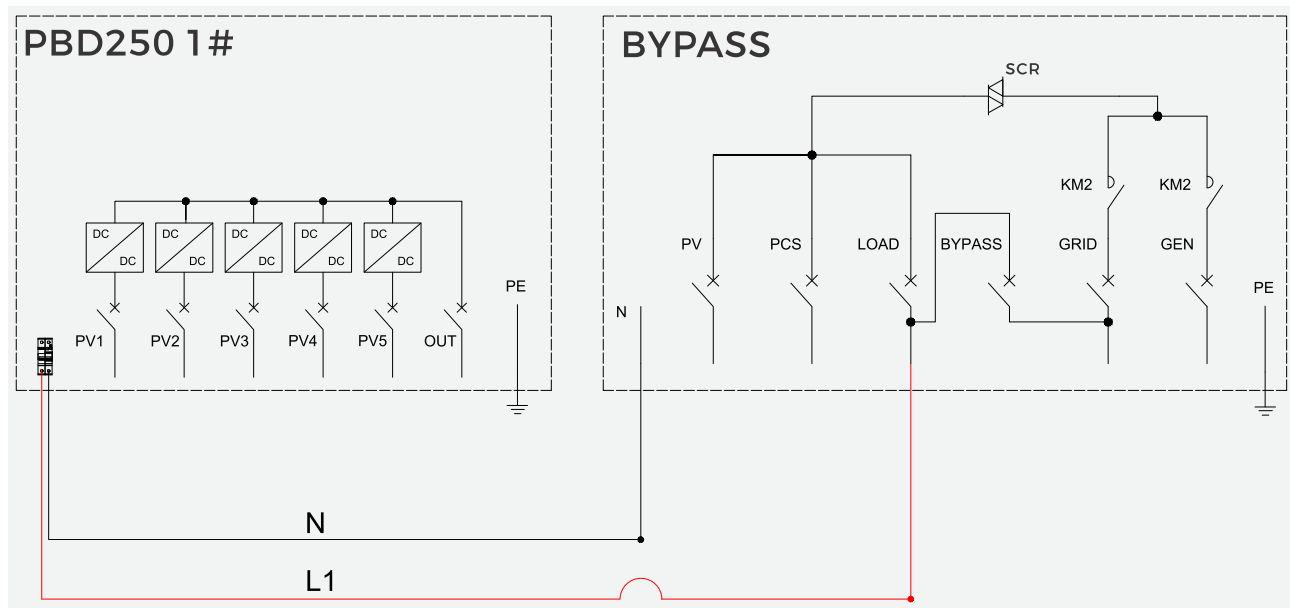
7 Connection Diagram & Description

Single PCS500/PCS630 system

PBD AC fan power supply wiring. If the system does not have BYPASS, you can choose to take 220V AC from the isolation transformer.

Note: 1. The positions of the PBD AC micro-breaks are different between the old and new versions.

2. The nameplate has the machine part number, and the parameters are different. New machine part number: E200.ZT0004201 .Old machine part number: E200.ZT0004200

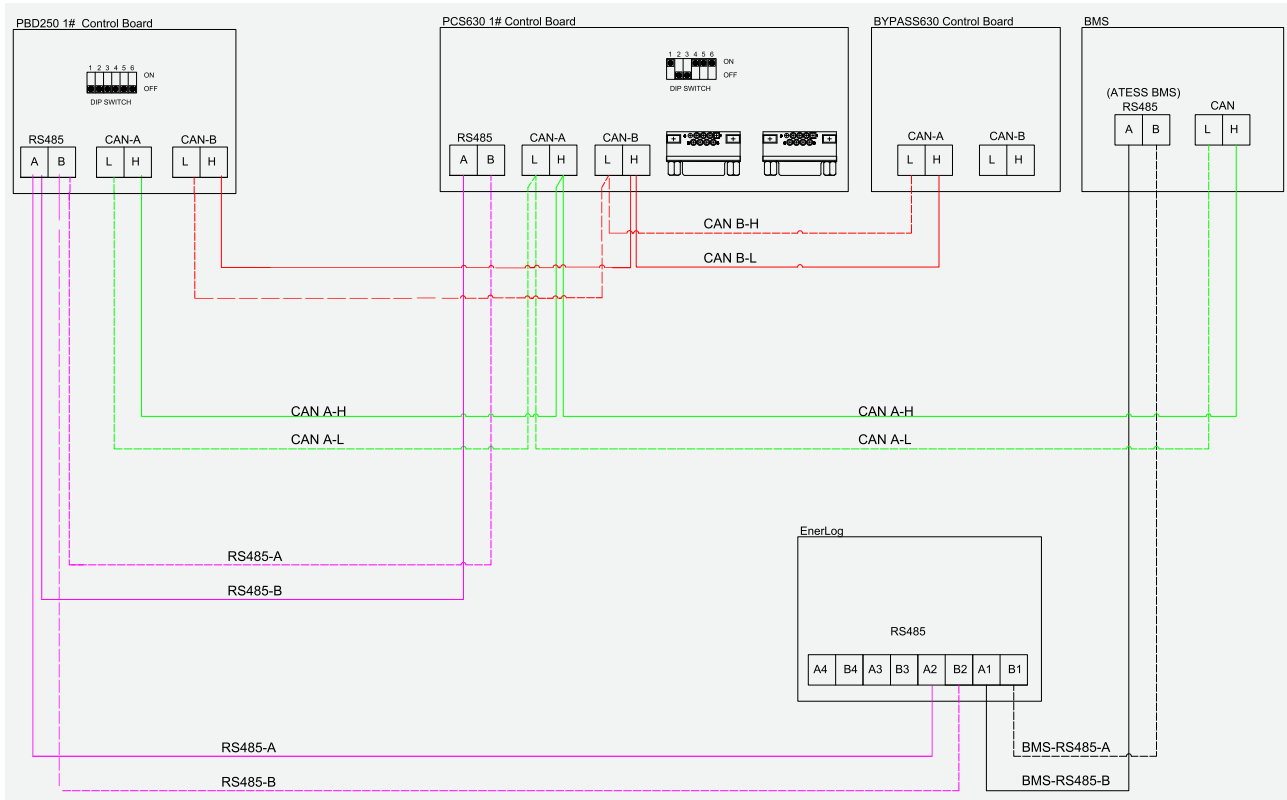


7 Connection Diagram & Description

Communication wiring between PCS and PBD, BYPASS, battery, EnerLog.

The standard communication cable length is 5 meters, so the installation distance between PCS and PBD, and PCS to bypass should not exceed to 3 meters.

For any need to extend or customize the communication cable, please contact ATESS after-sales engineer: support@atesspower.com.

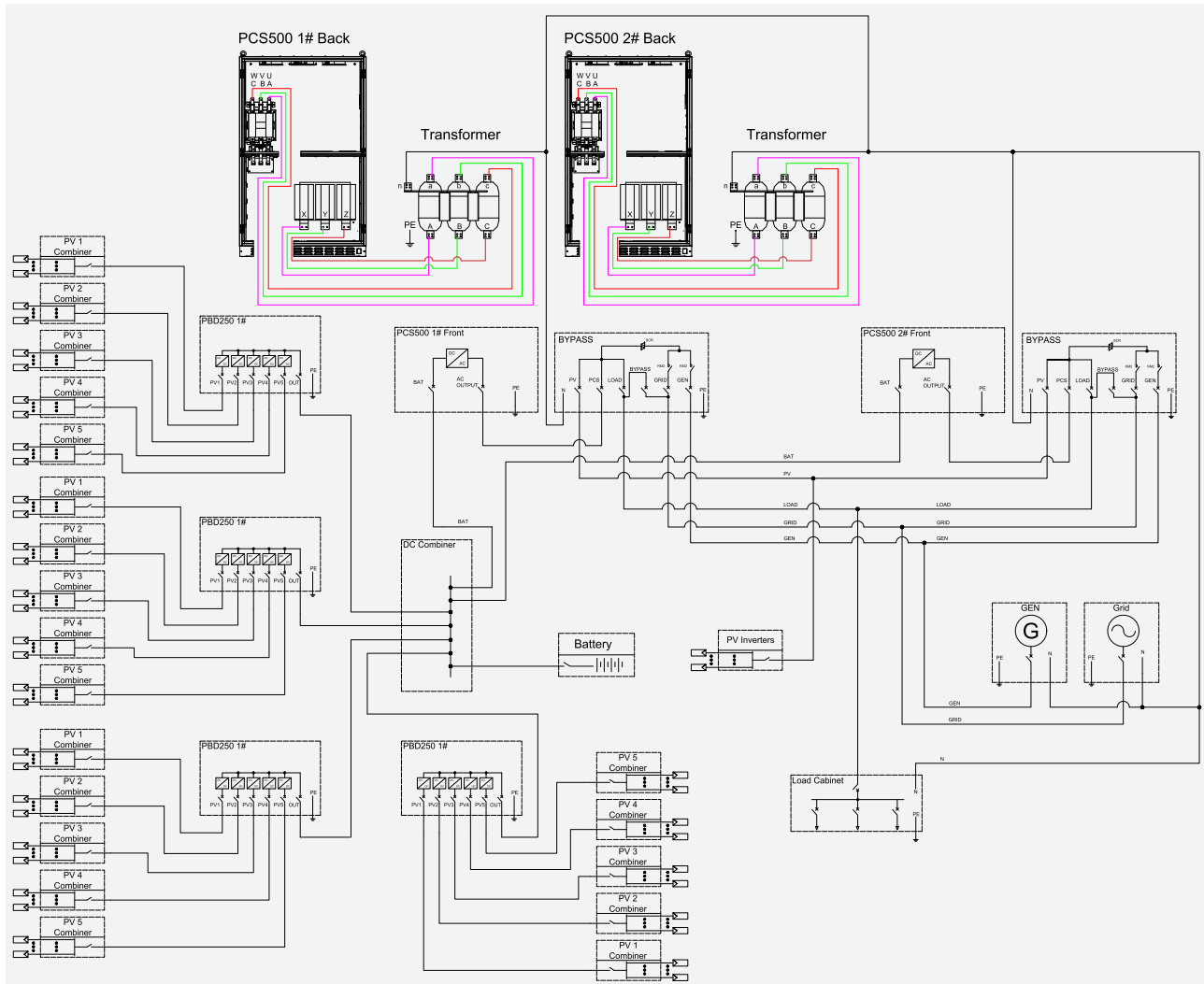


1. BMS-CAN communication: need distinguish the "H" and "L" port.
2. RS485 communication: need distinguish the "H" and "L" port. Connect the EnerLog to the "RS485" of PBD.
3. CAN B communication: CanB connects PCS CanB connects BYPASS CanA.

7 Connection Diagram & Description

Parallel 2*PCS+2*BYPASS+4*PBD system:

The diagram below shows the power cable connections for the parallel system, following the same wiring principles as a single PCS500/PCS630 system.

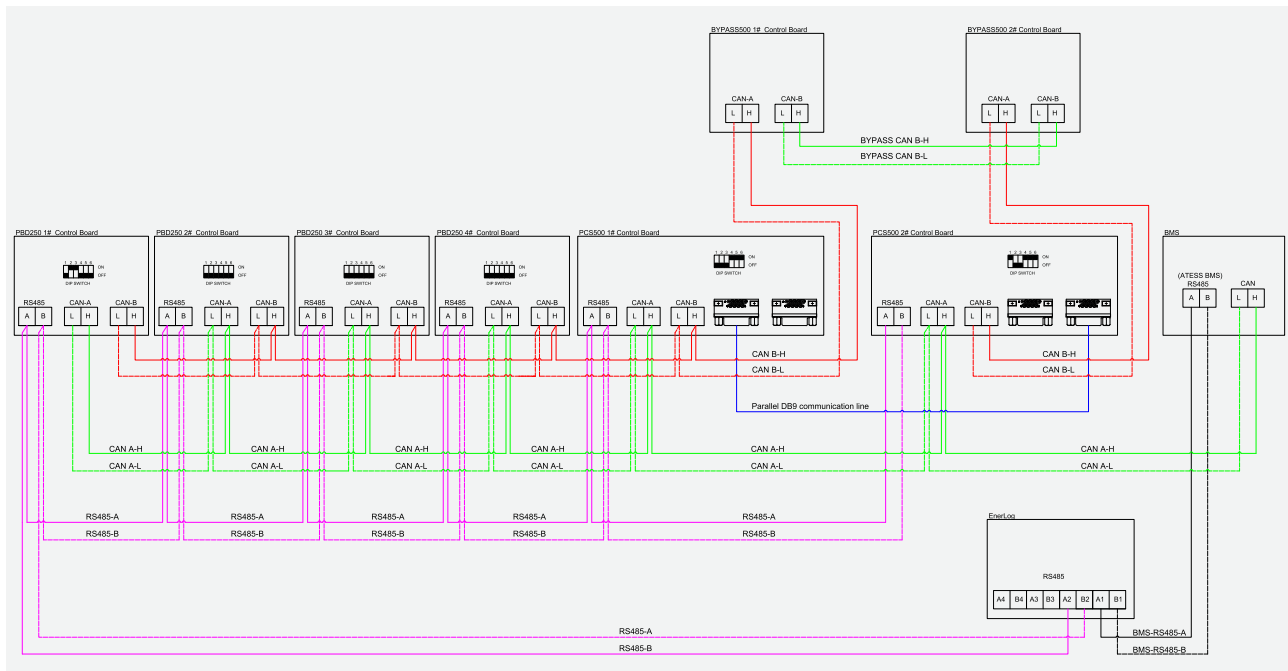


Note: Power cable connection

If there are multiple PBDs on site, the power cables must be connected in parallel through a DC combiner cabinet before being paralleled with PCS and batteries. It is not recommended to connect the power cables of PBDs to PCS in a "daisy-chain" manner.

7 Connection Diagram & Description

Parallel 2*PCS+2*BYPASS+4*PBD system:



BMS-CAN communication:

1. Connect the BMS to the CanA of PCS.
2. Then connect the PBD CanA and the two PCS CanA one by one.

RS485 communication:

1. Connect the EnerLog to the RS485 of PCS1
2. Then connect the 485 of PV combiner, the 485 of PBD and the 485 of two PCS one by one.
3. If the battery is ATESS battery, please connect the battery's 485 to another 485 port of EnerLog.

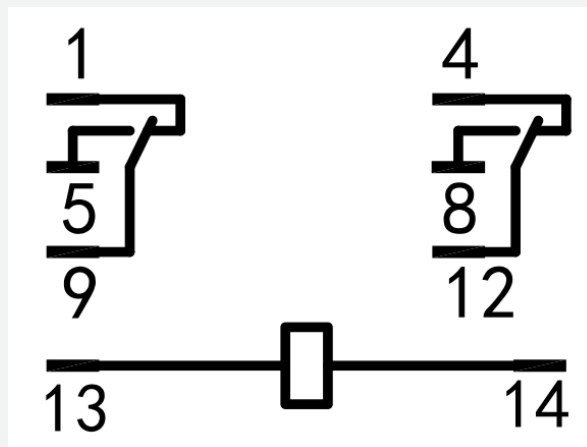
CANB communication:

1. Connect CanB of BYPASS1 and BYPASS2.
2. Connect CanB of PBD one by one, then connect to CanB of PCS1, and then connect to CanA of BYPASS1.
3. Connect CanB of PCS2 to CanA of BYPASS2.

Parallel communication:

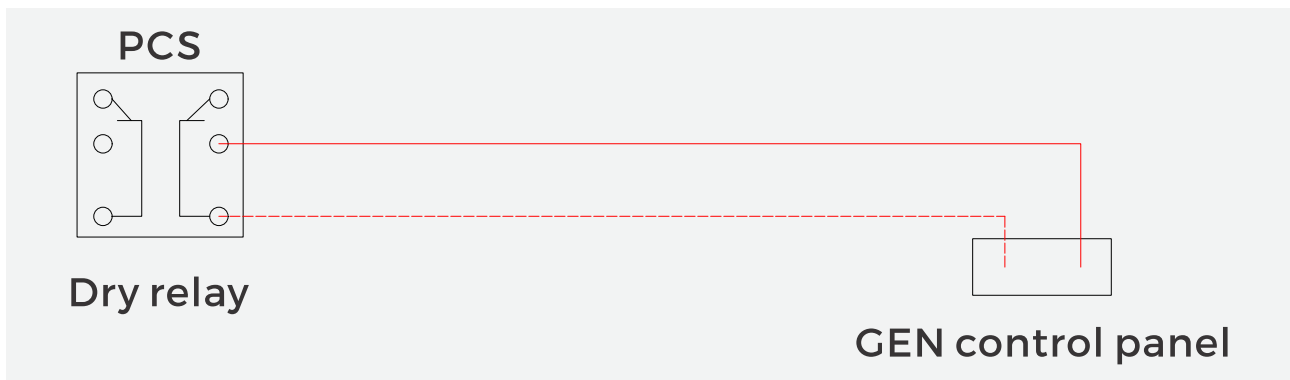
Connect the CN18 or CN19 of PCS1 to CN18 or CN19 of PCS2 by the DB9 parallel cable prepared already

8 Diesel Generator Dry Contact Wiring



1. "13" and "14" are the power supply of dry contact contactor, no need for wiring.
2. connect the GEN single cables to the "1" and "9" or "4" and "12" If you want to start the Gen when the state of the dry contact is changed from normally closed to normally open.
3. connect the GEN single cables to the "5" and "9" or "8" and "12" If you want to start the Gen when the state of the dry contact is changed from normally open to normally closed.
4. If current passes through the dry contact, ensure the AC voltage does not exceed 240V, DC voltage does not exceed 28V, and current does not exceed 5A.

Dry Diagram - PCS Single System



Dry Contact Diagram - PCS Parallel System

