PCS-US DC-COUPLED SYSTEM

Installation Guidance

Standard Operating Procedures & Best Practices

ATESS ENERCOLLEGE

Technical Support Document

ATESS EnerCollege

enercollege@atesspower.com

www.atesspower.com

1 Introduction

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

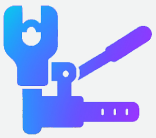
2 Tools Required

The following tools are recommended for the installation process:

Torque wrench

Screwdriver

Wire stripper



Hydraulic crimper

Heat dryer

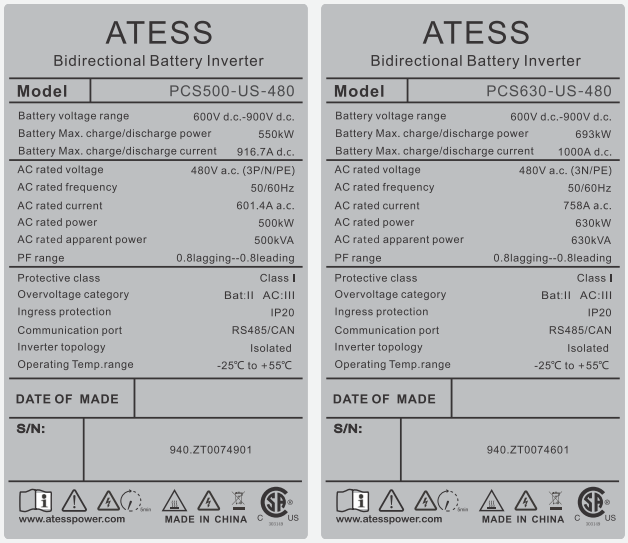
Multimeter

Insulating gloves

Forklift

3 Nameplate Overview

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



ATESS

Bidirectional Battery Inverter

Model	PCS500-US-480
Battery voltage range	600V d.c.-900V d.c.
Battery Max. charge/discharge power	550kW
Battery Max. charge/discharge current	916.7A d.c.
AC rated voltage	480V a.c. (3P/N/PE)
AC rated frequency	50/60Hz
AC rated current	601.4A a.c.
AC rated power	500kW
AC rated apparent power	500kVA
PF range	0.8lagging--0.8leading
Protective class	Class I
Overvoltage category	Bat:II AC:III
Ingress protection	IP20
Communication port	RS485/CAN
Inverter topology	Isolated
Operating Temp.range	-25℃ to +55℃
DATE OF MADE	
S/N:	940.ZT0074901

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Bidirectional Battery Inverter

Model	PCS630-US-480
Battery voltage range	600V d.c.-900V d.c.
Battery Max. charge/discharge power	693kW
Battery Max. charge/discharge current	1000A d.c.
AC rated voltage	480V a.c. (3N/PE)
AC rated frequency	50/60Hz
AC rated current	758A a.c.
AC rated power	630kW
AC rated apparent power	630kVA
PF range	0.8lagging--0.8leading
Protective class	Class I
Overvoltage category	Bat:II AC:III
Ingress protection	IP20
Communication port	RS485/CAN
Inverter topology	Isolated
Operating Temp.range	-25℃ to +55℃
DATE OF MADE	
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4 Cable Requirements

Cable	Requirements for bus diameter	
Model	PCS500-US	PCS630-US
Battery	95mm²*3	95mm²*4
AC output	70mm²*3	95mm²*3
N line	70mm²*3	95mm²*3
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: ≥0.75mm²	

1. The cable diameter must not be smaller than the specified minimum.

2. It is recommended to distinguish port polarity using different cable colors:

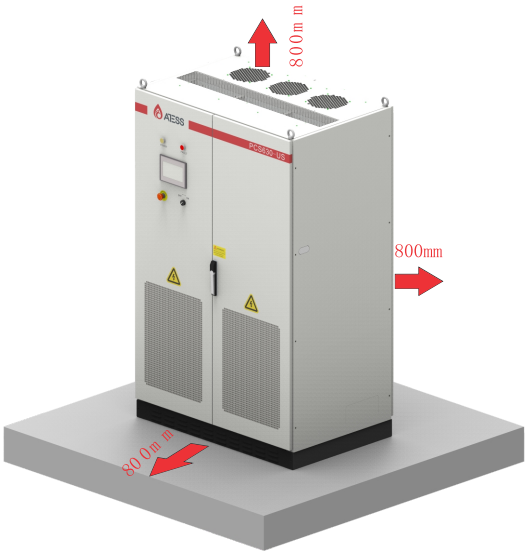
- DC side: Red is positive; Black is negative
- AC side: Yellow is U phase, green is V phase, red is W Phase

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-US unit shall not exceed 1 meter.

5 Space & Environment Requirements

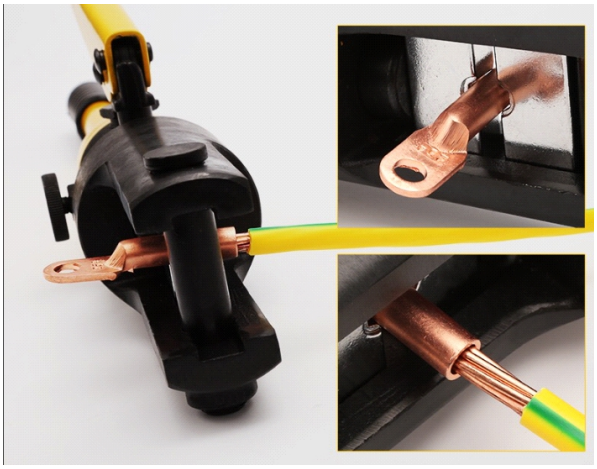


Space requirements:
Please reserve 800mm space on the top, front door, and rear door of the inverter as shown in the figure to facilitate inverter heat dissipation and future maintenance.

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.

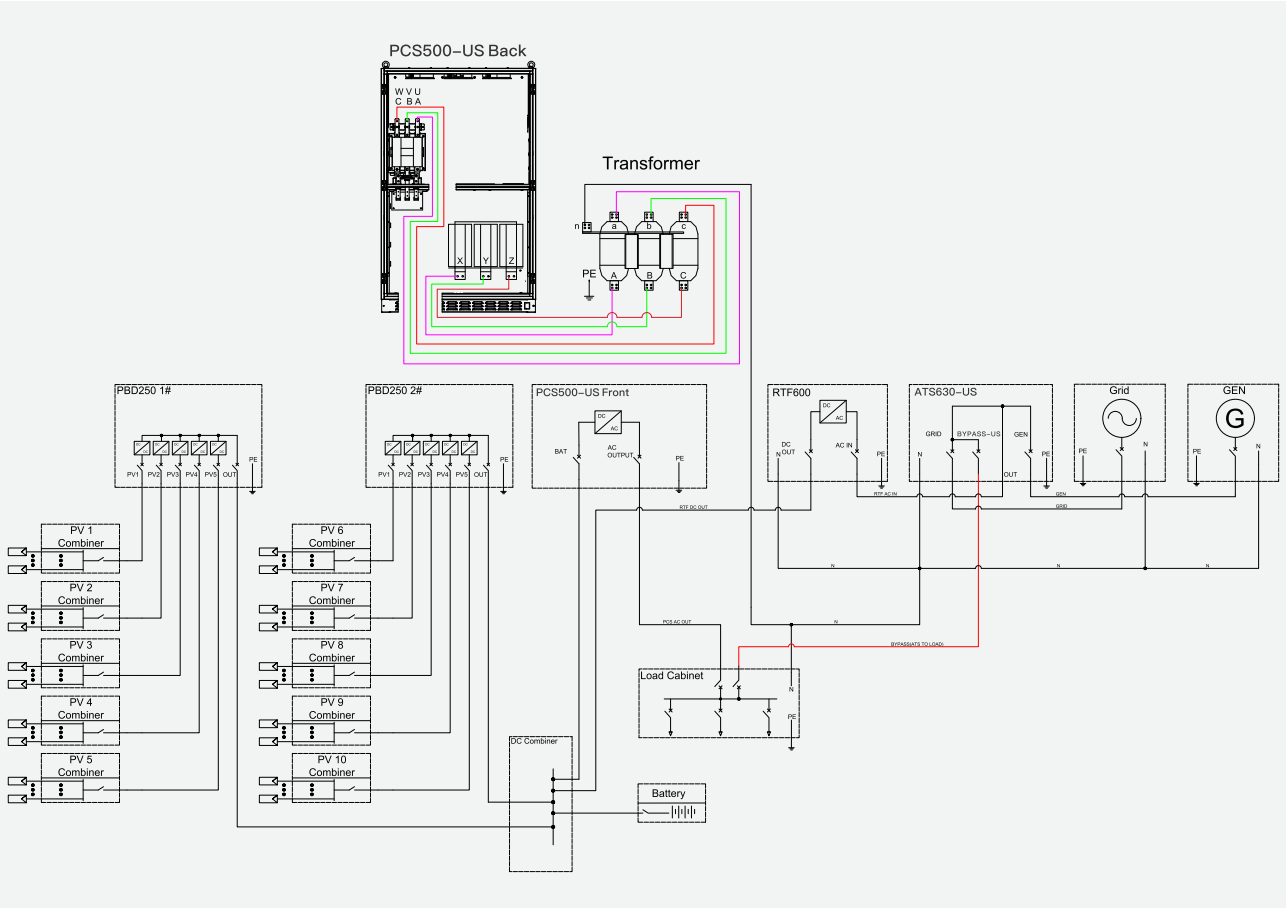
2. Crimp the wiring copper lug.
a. Put the stripped copper core into the crimping hole of the copper lug.
b. Use the terminal pressing machine to press the copper lug tightly. The number of crimping shall be more than two.

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-US/PCS630-US 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-US and batteries. It is not recommended to connect the power cables of PBDs to PCS-US in a "daisy-chain" manner.

DC side: need distinguish the positive and the negative polarity.

1. Connect the DC bus to the battery breaker of the PCS-US after merging.

2. Connect the DC bus to the DC breaker of the RTF after merging.

3. Connect the DC bus to the battery breaker of the PBD after merging.

AC side: need distinguish the phase sequence.

1. Connect the grid to the AC INPUT breaker of RTF, or connect the grid to the grid breaker of ATS-US.

2. Connect the generator to the generator breaker of ATS-US.

3. Connect the load to the Load Cabinet, and then to the AC OUTPUT of the PCS-US and the Bypass-US breaker of the ATS-US.

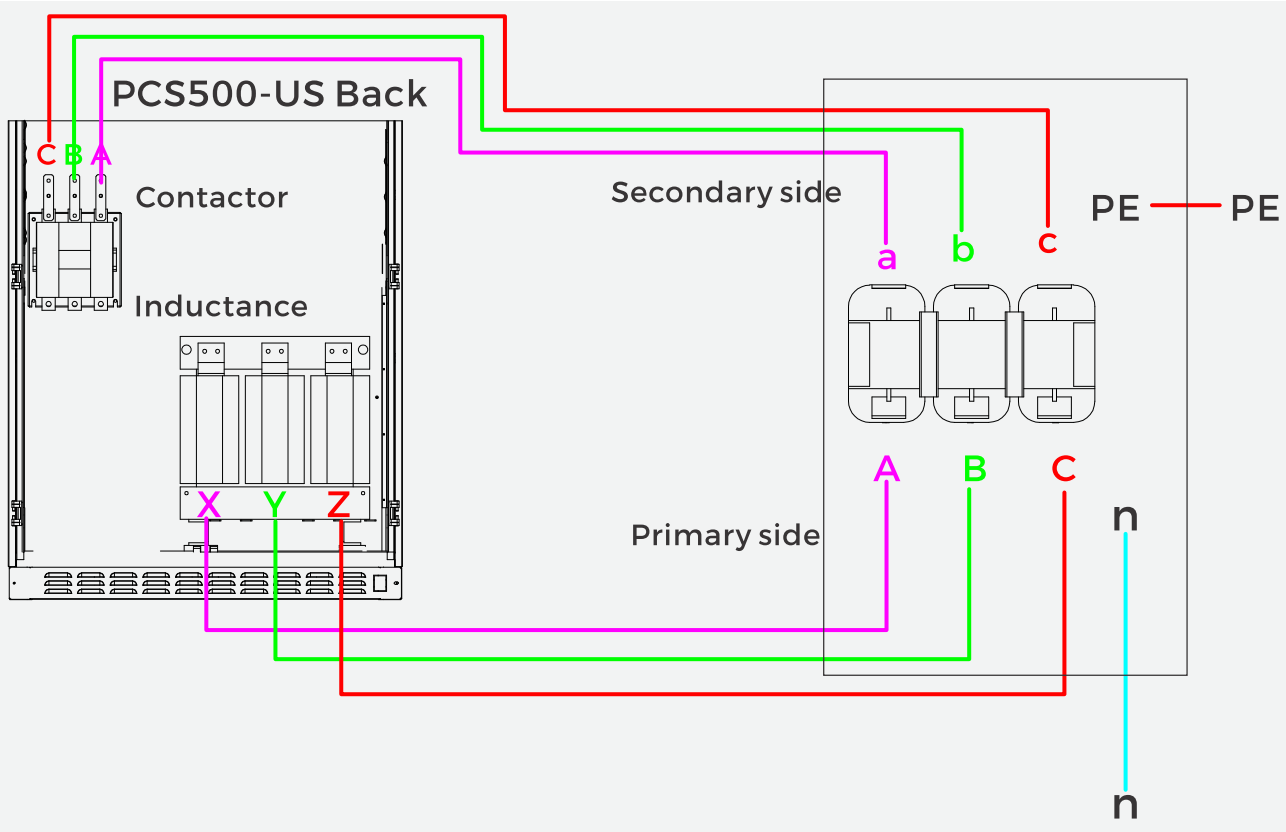
4. Connect the N line of the load, the N line of the generator, the N line of the isolation transformer, the N line of the RTF, and the N line of the ATS-US to the N line of the grid.

5. The wiring between PCS-US and isolation transformer is shown below.

7 Connection Diagram & Description

Single PCS500-US/PCS630-US system

The wiring between PCS-US and isolation transformer is shown below



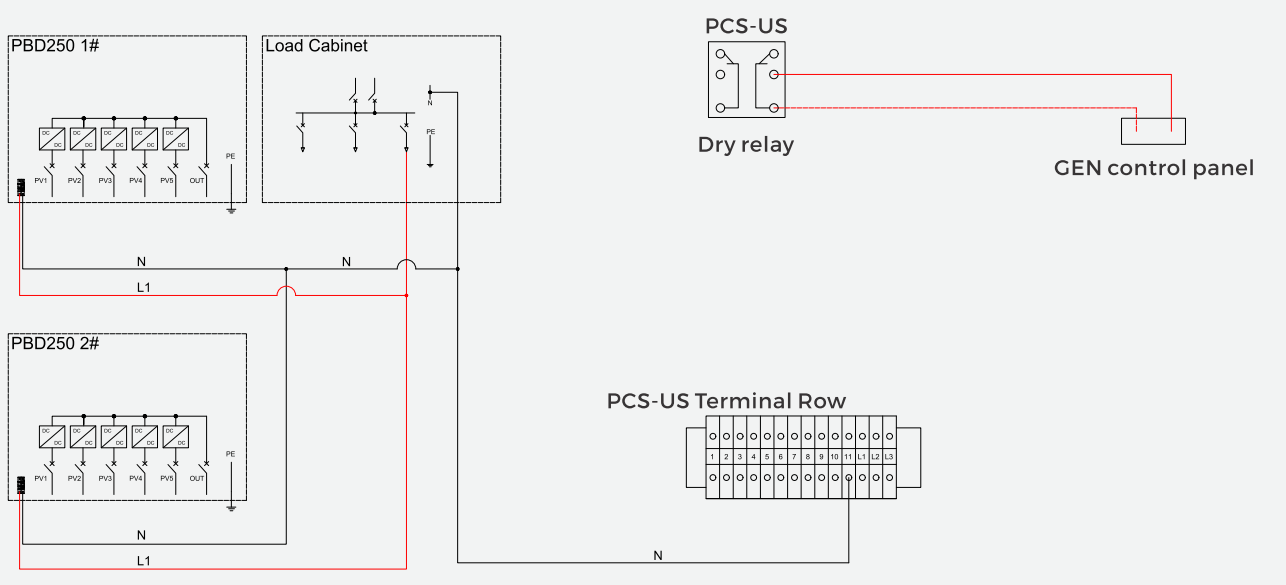
PBD AC fan power supply wiring.

Note:

1.PBD AC 220V fan power supply connected to load cabinet.

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

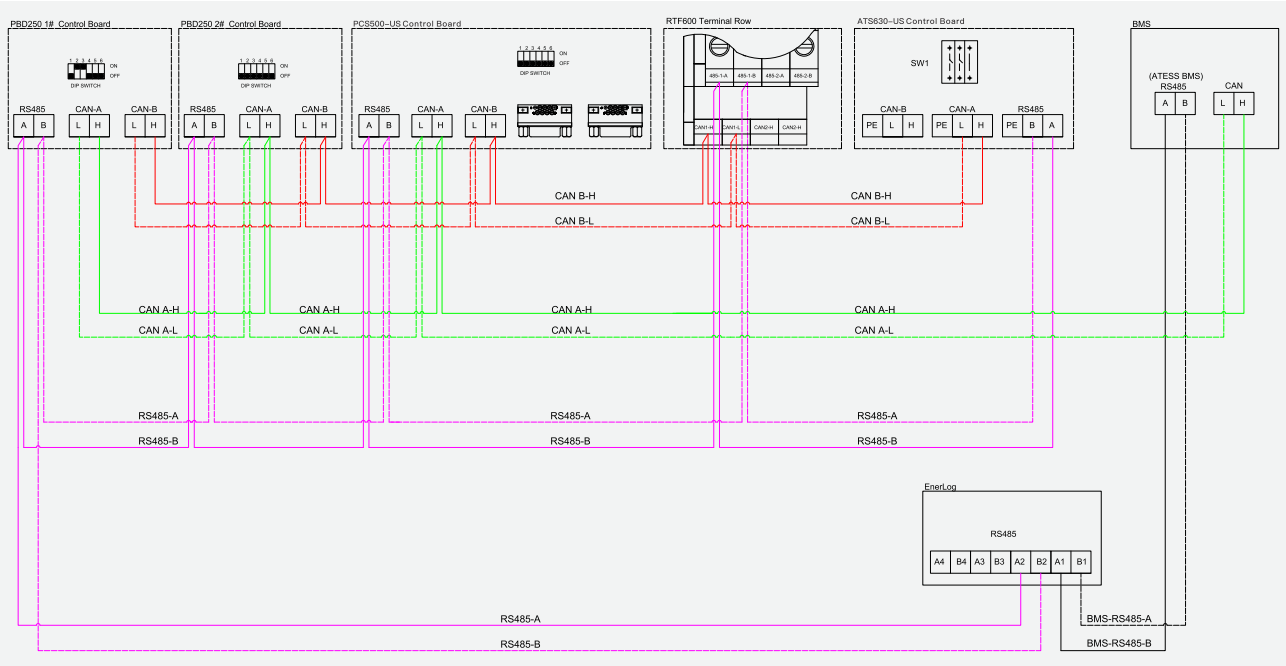
3.The nameplate has the machine part number, and the parameters are different. New machine part number:E200.ZT0004201 .Old machine part number: E200.ZT0004200



7 Connection Diagram & Description

Single PCS500-US/PCS630-US system

Communication wiring between PCS-US and PBD, RTF, battery, EnerLog, PV inverter.



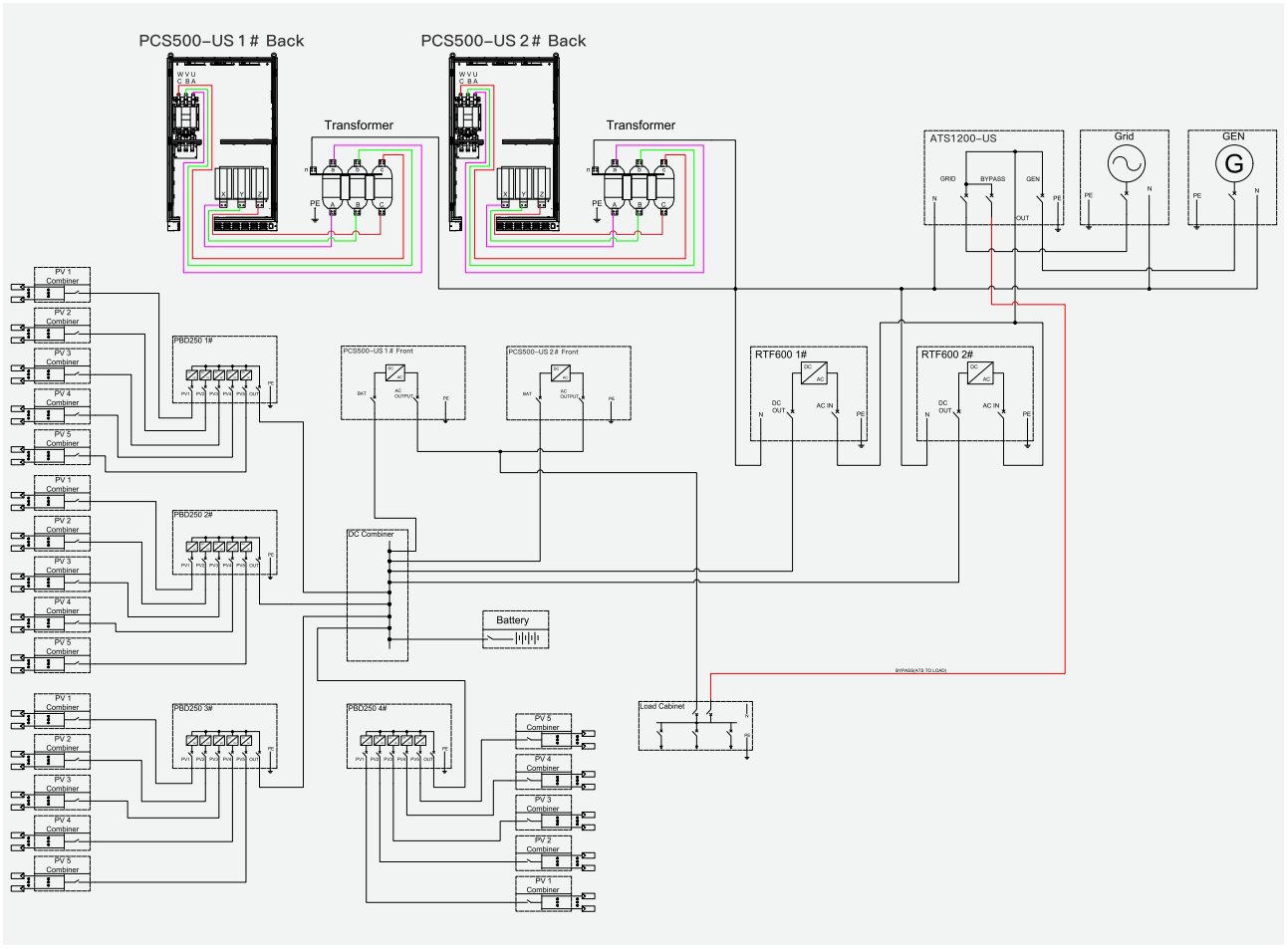
The standard communication cable length is 5 meters , so the installation distance between PCS-US should not exceed to 3 meters.

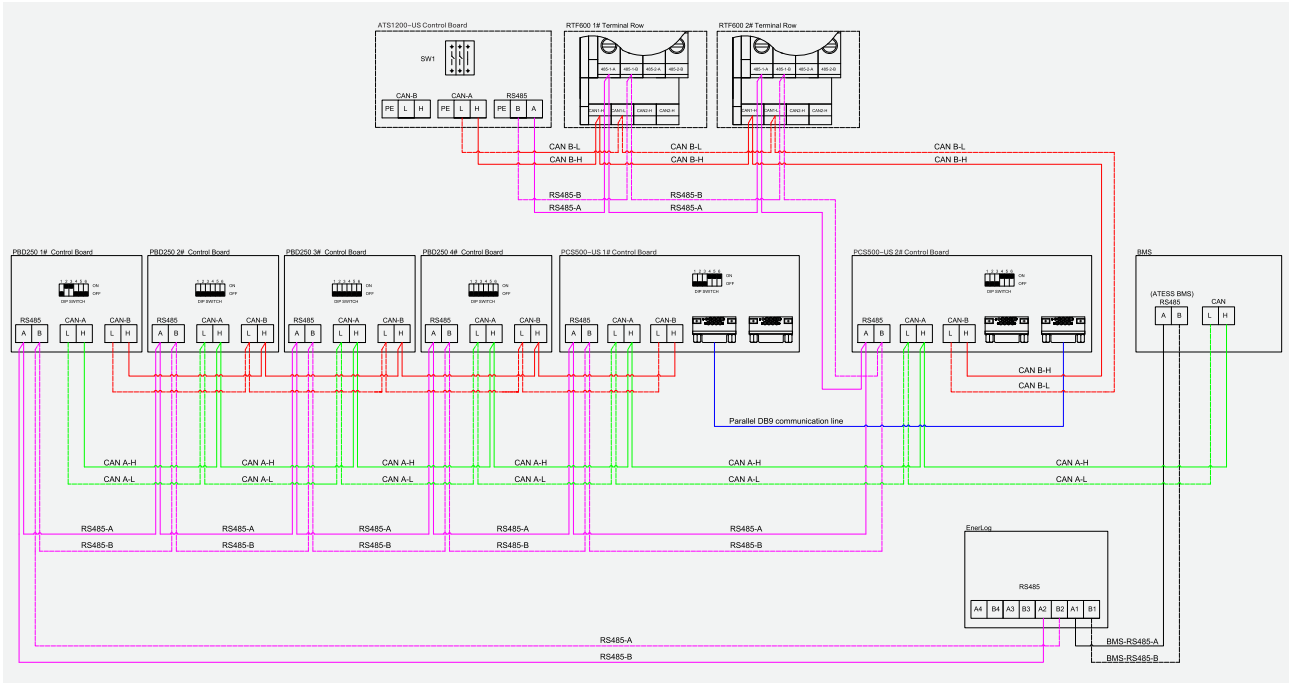
For any need to extend or customize the communication cable, please contact ATESS after-sales engineer : support@atesspower.com.

1. BMS-CAN communication: need distinguish the “H” and “L” port.
2. RS485 communication: need distinguish the “H” and “L” port,Connect the enerLoag to the “RS485” of PBD.
3. CAN B communication: PBD CANB connects PCS-US CANB connects RTF CAN1.

7 Connection Diagram & Description

Parallel 2*PCS-US+2*RTF+4*PBD system:





7 Connection Diagram & Description

Parallel 2*PCS-US+2*Bypass-US+4*PBD system:

BMS-CAN communication:

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

RS485 communication:

1. Connect the EnerLog to the RS485 of PBD1
2. Then connect the 485 of RTF, the 485 of PBD, the 485 of ATS-US and the 485 of two PCS-US one by one.
3. If the battery is ATESS battery, please connect the battery's 485 to another 485 port of EnerLog.

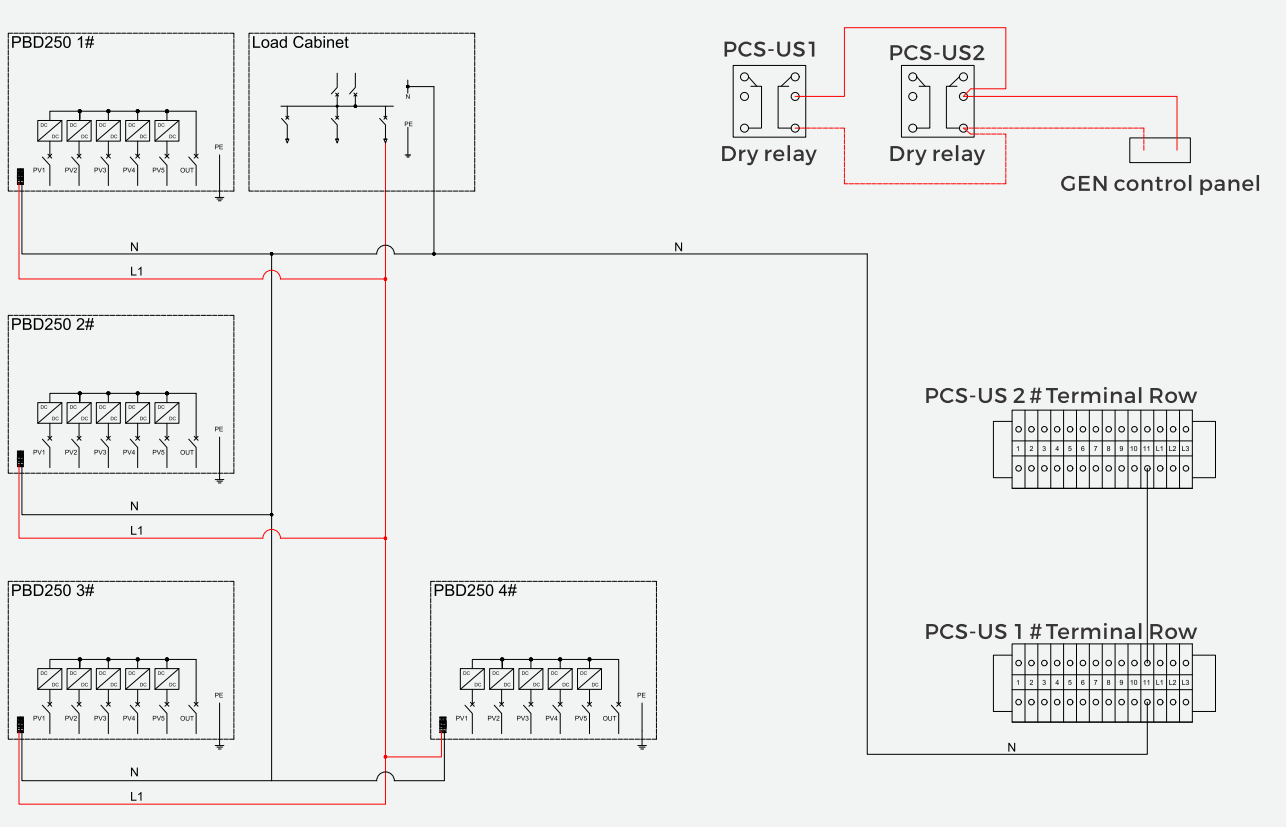
CANB communication:

1. Connect can1 of RTF1 ,RTF2 and CanB of ATS-US.
2. Connect CanB of PBD one by one, then connect to CanB of PCS-US1.
3. Connect CanB of PCS-US2 to Can1 of RTF2.

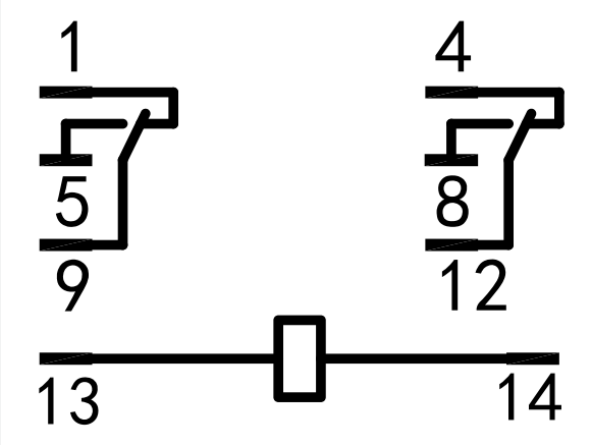
Parallel communication:

Connect the CN18 or CN19 of PCS-US1 to CN18 or CN19 of PCS-US2 by the DB9 parallel cable prepared already.

PBD AC fan power supply wiring.

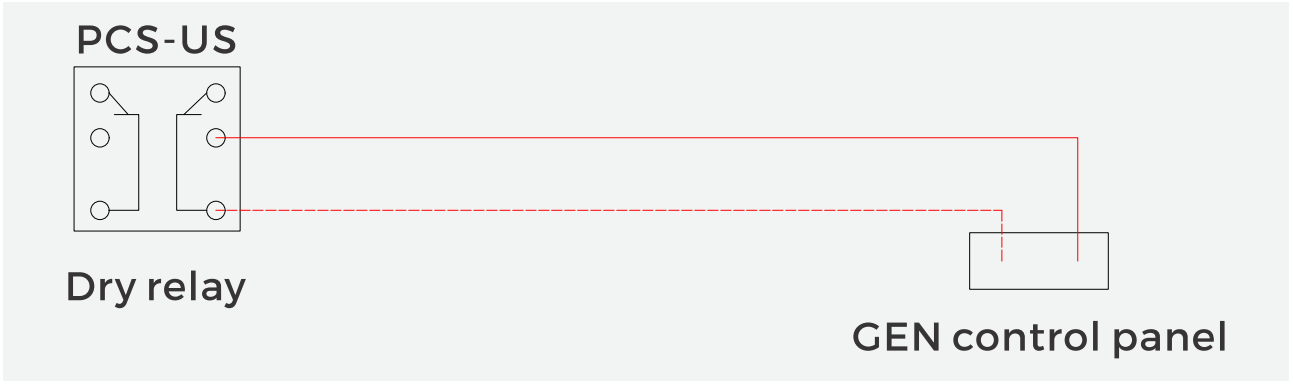


8 Diesel Generator Dry Contact Wiring



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 Contact Diagram – PCS-US Single System



Dry Contact Diagram – PCS-US Parallel System