HPS SYSTEM
Installation Guidance

Standard Operating Procedures & Best Practices

ATESS ENERCOLLEGE

Technical Support Document

❶ Introduction

To ensure the proper and safe installation of the ATESS HPS50-150 hybrid inverter, please follow the steps provided in this guide.

❷ Tools Required

The following tools are recommended for the installation process:

| Torque wrench | Screwdriver | Wire stripper | Hydraulic crimper |
| Heat dryer | Multimeter | Insulating gloves | Forklift |

❸ Nameplate Overview

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

ATESS — Hybrid Power Systems

Model	HPS50	HPS100	HPS120	HPS150
PV Max. generating power	75kW	150kW	180kW	225kW
Max. PV open-circuit voltage	1000V d.c.	1000V d.c.	1000V d.c.	1000V d.c.
PV MPPT voltage range	480-800V d.c.	480-800V d.c.	480-800V d.c.	480-800V d.c.
PV Max. input current	136A d.c.	230A d.c.	327A d.c.	409A d.c.
Isc PV	170.5A d.c.	333A d.c.	400A d.c.	500A d.c.
Battery voltage range	352-600V d.c.	352-600V d.c.	352-600V d.c.	352-600V d.c.
Battery Max. charge/discharge current	150/156A d.c.	300/313A d.c.	350/374A d.c.	450/467A d.c.
Battery Max. charge/discharge power	75kW/55kW	150kW/110kW	180kW/132kW	225kW/165kW
Battery type	Lithium iron phosphate battery	Lithium iron phosphate battery	Lithium iron phosphate battery	Lithium iron phosphate battery
Rated AC voltage	400V a.c.(3/N/PE)	400V a.c.(3/N/PE)	400V a.c.(3/N/PE)	400V a.c.(3/N/PE)
Rated AC frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Max. AC output continuous current	79A a.c.	158A a.c.	190A a.c.	238A a.c.
Rated AC output power	50kW	100kW	120kW	150kW
Max. AC output apparent power	55kVA	110kVA	132kVA	165kVA
Max. AC input power	100kVA	200kVA	240kVA	240kVA
Max. AC input continuous current	144A a.c.	288A a.c.	346A a.c.	346A a.c.
PF range	0.8lagging--0.8leading	0.8lagging--0.8leading	0.8lagging--0.8leading	0.8lagging--0.8leading
Protective class	Class I	Class I	Class I	Class I
Overvoltage category				PV:II AC:III
Ingress protection	IP20	IP20	IP20	IP20
Communication port	RS485/CAN	RS485/CAN	RS485/CAN	RS485/CAN
Inverter topology	Isolated	Isolated	Isolated	Isolated
Operating Temp.range	-25℃ to +55℃	-25℃ to +55℃	-25℃ to +55℃	-25℃ to +55℃
DATE OF MADE				
S/N:	940.ZT0000203	940.ZT0000304	940.ZT0000404	940.ZT0000504

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1. PV MPPT voltage range: 480–800V; Battery voltage range: 352–600V.

2. Recommendation: The MPPT voltage of the PV strings should be at least 50V higher than the battery's maximum operating voltage.
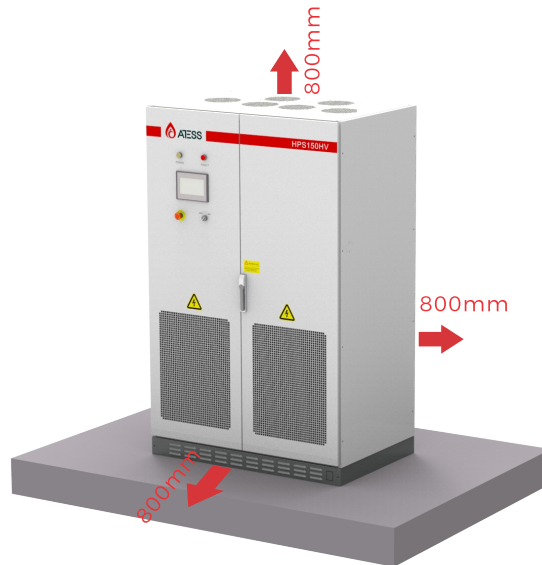
4 Cable Requirements

Cable	Cable Diameter Requirements (mm²)				Aperture	
Model	HPS50	HPS100	HPS120	HPS150	HPS50	HPS100/120/150
	Below are total line diameter					
PV	50mm²	70mm²	95mm²	120mm²	Φ8	Φ10
Battery	50mm²	120mm²	120mm²	150mm²	Φ8	Φ10
Utility	70mm²	120mm²	120mm²	150mm²	Φ8	Φ10
Load	35mm²	70mm²	70mm²	95mm²	Φ8	Φ10
N wire	70mm²	120mm²	120mm²	150mm²	Φ8	Φ10
Earth wire	More than 16 mm².Green and Yellow cable is recommended				Φ8	Φ8
Communication Wire	0.75mm², shielded communication line is recommended				/	

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 HPS unit shall not exceed 1 meter.

❺ Space & Environment Requirements

800mm
800mm
800mm

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.

❻ Cable Terminal Guidelines

**All cables must be terminated with properly crimped copper lugs or terminals.**
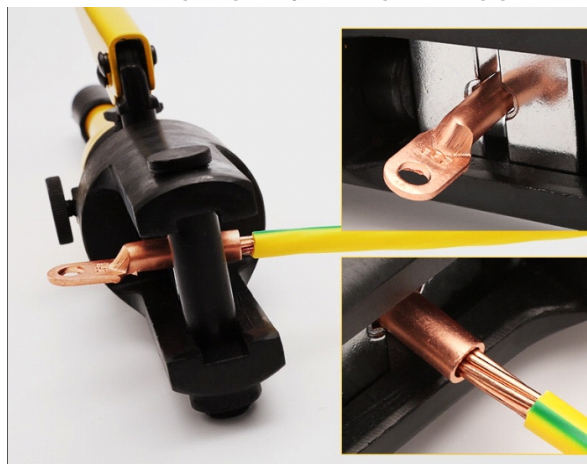
1. Strip off the insulation skin at the end of the cable.

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 HPS system:
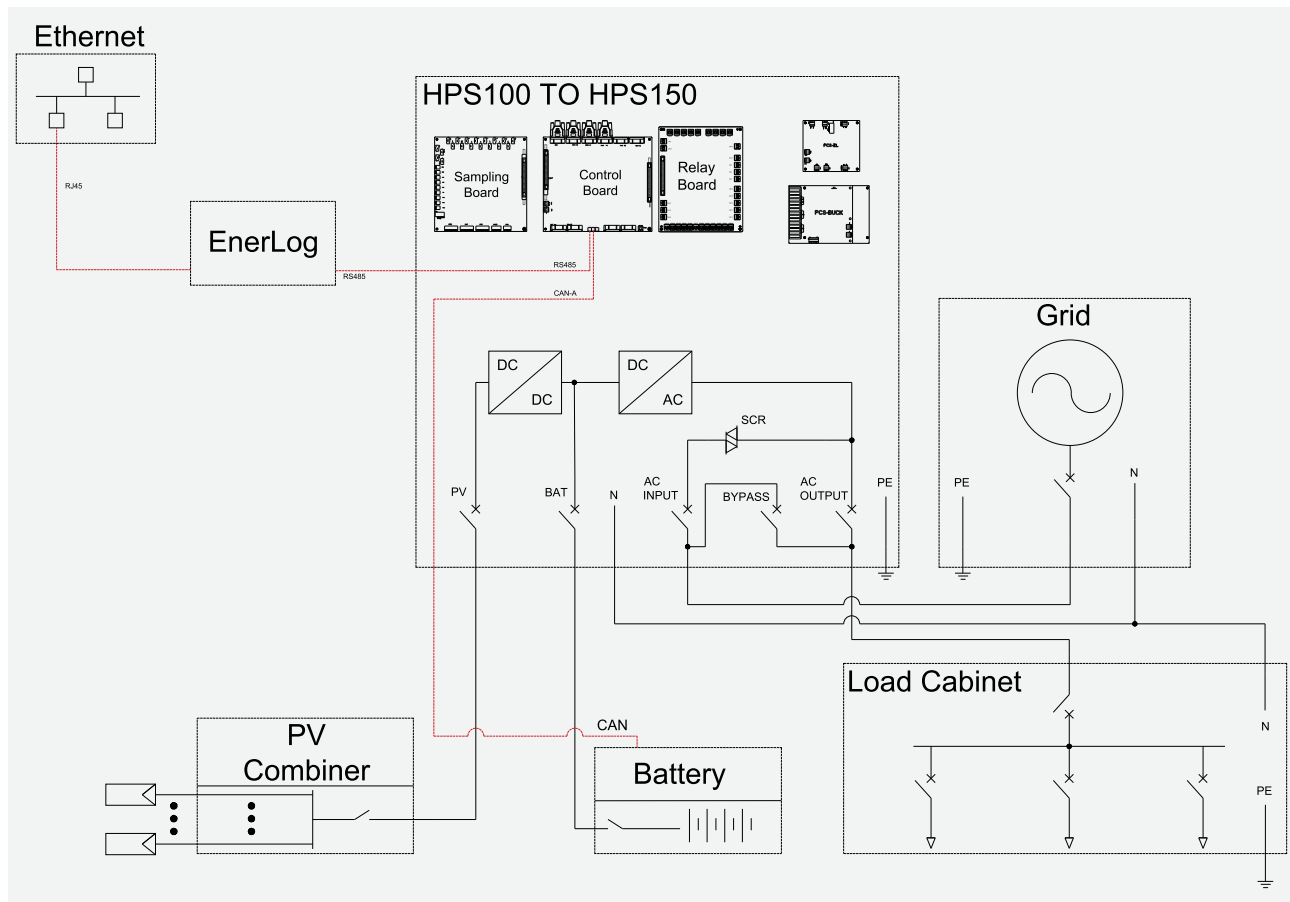
DC side: need distinguish the positive and the negative polarity
1. Connect the battery to the "Battery-input " of HPS
2. Connect the PV combiner to the "PV input " of HPS

AC side: need distinguish the phase sequence
1. Connect the Grid/Gen to the "AC input" of HPS
2. Connect the Load Cabinet to the "AC output" of HPS
3. Connect the N port of Grid/Gen and Load Cabinet to the "N copper" of HPS
4. Connect the PE port of Grid/Gen and Load Cabinet to the "PE copper" of HPS

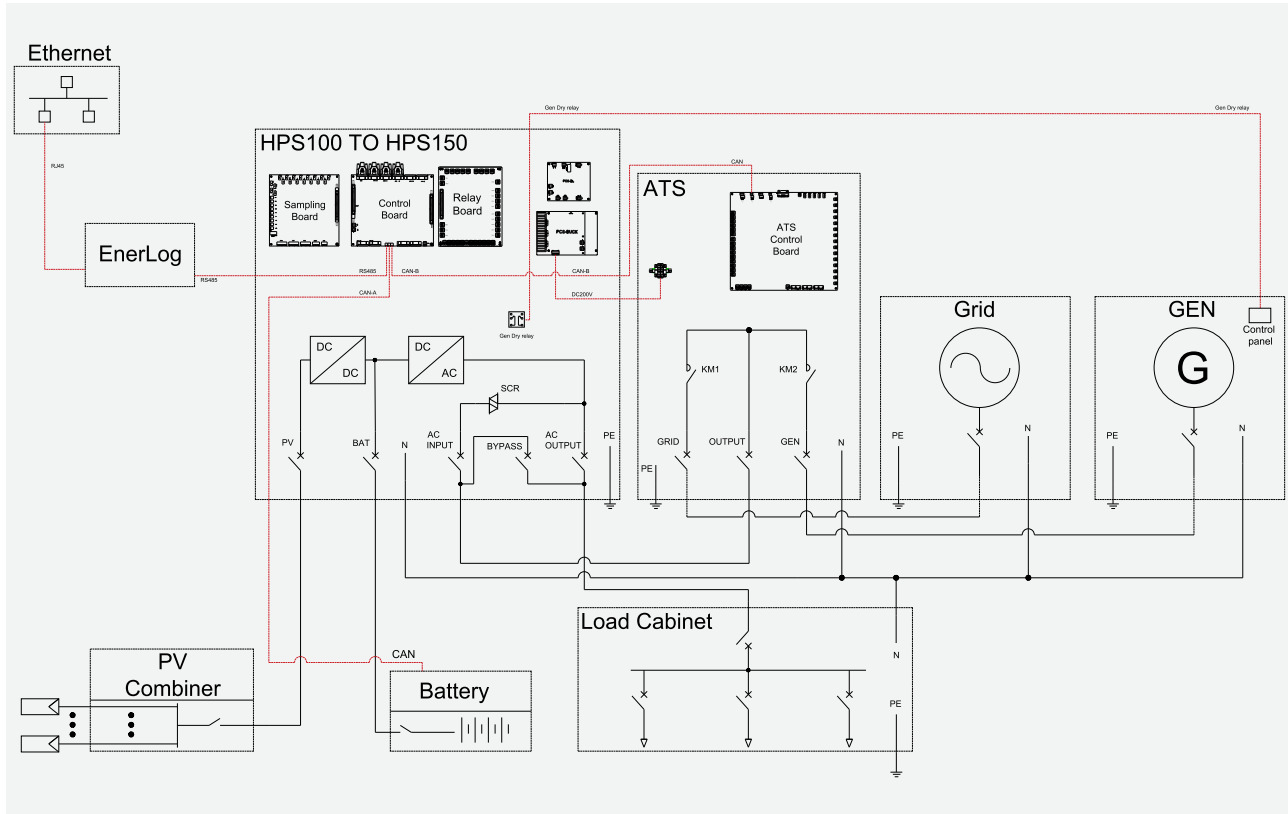**BMS-CAN communication: need distinguish the "H" and "L" port**
Connect the BMS to the "CanA" of HPS

RS485 communication: need distinguish the "H" and "L" port
Connect the EnerLog to the "RS485" of HPS

7 Connection Diagram & Description

Single HPS with ATS system:

DC side:
1. Connect the battery to the "Battery-input " of HPS
2. Connect the PV combiner to the "PV input " of HPS

AC side:
1. Connect the Grid to the "Grid" port of the ATS
2. Connect the GEN to the "Gen" port of the ATS
3. Connect the "AC input" of HPS to the "AC Output" port of the ATS
4. Connect the Load Cabinet to the "AC output" of HPS
5.Connect the N port of the grid, generator, ATS and HPS
6.Connect the PE port of the grid, generator, ATS and HPS

ATS power supply:
Connect the "CN3" of buck board to the ATS power switch

ATS-CAN communication:
Connect the "CanB" of HPS to "CanA" of ATS

BMS-CAN communication:
Connect the BMS to the "CanA" of HPS

RS485 communication:
Connect the EnerLog to the "RS485" of HPS

Note: The standard communication cable length is 5 meters. The installation distance between the HPS and ATS should not exceed 3 meters.For any needs to extend or customize the length of the communication cable, please contact ATESS after-sales engineer: support@atesspower.com.

7 Connection Diagram & Description

Parallel HPS system:
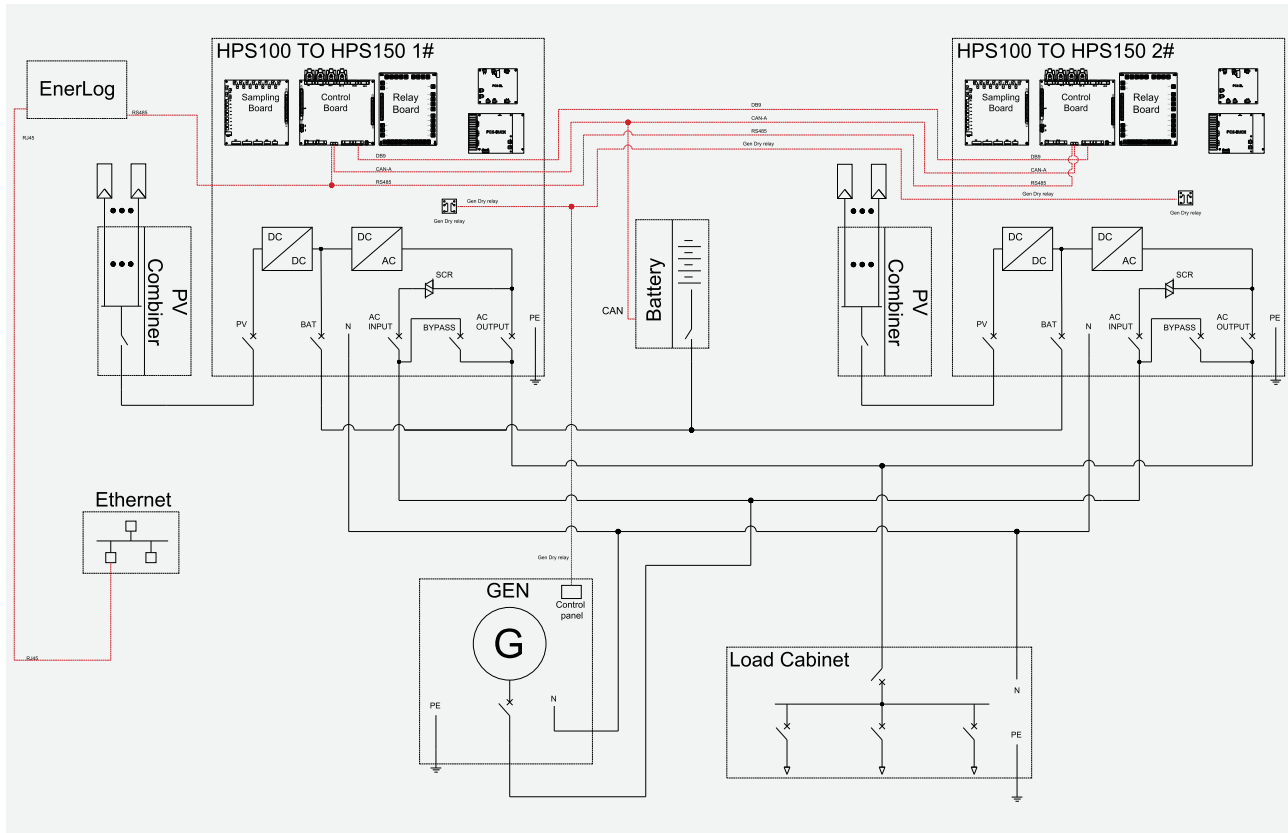
Parallel system with ATS or Without ATS:

DC side:

1. Connect the Grid/Generator to the "AC input" ports of HPS1 and HPS2 respectively. Ensure both cables are of equal length

2. Connect the PV1 combiner to the "PV input" of HPS1

3. Connect the PV2 combiner to the "PV input" of HPS2

AC side:

1. Connect the Grid/Gen to the "AC input" of HPS1 and HPS2 respectively, Note that the two cables should be the same length

2. Connect the Load Cabinet to the "AC output" of HPS1 and HPS2 respectively, Note that the two cables should be the same length

3. Connect the N port of Grid/Gen and Load Cabinet to the "N copper" of HPS1 and HPS2

4. Connect the PE port of Grid/Gen and Load Cabinet to the "PE copper" of HPS1 and HPS2

Note:

1. The length mistake of power cables from combiner to each HPS should be in 1 m

2. The standard parallel communication cable length is 5m. , the installation distance between HPS units should not exceed 3m. For any requirements to extend or customize the communication cable length, please contact ATESS after-sales engineer: support@atesspower.com.

7 Connection Diagram & Description

Parallel 2*HPS system:
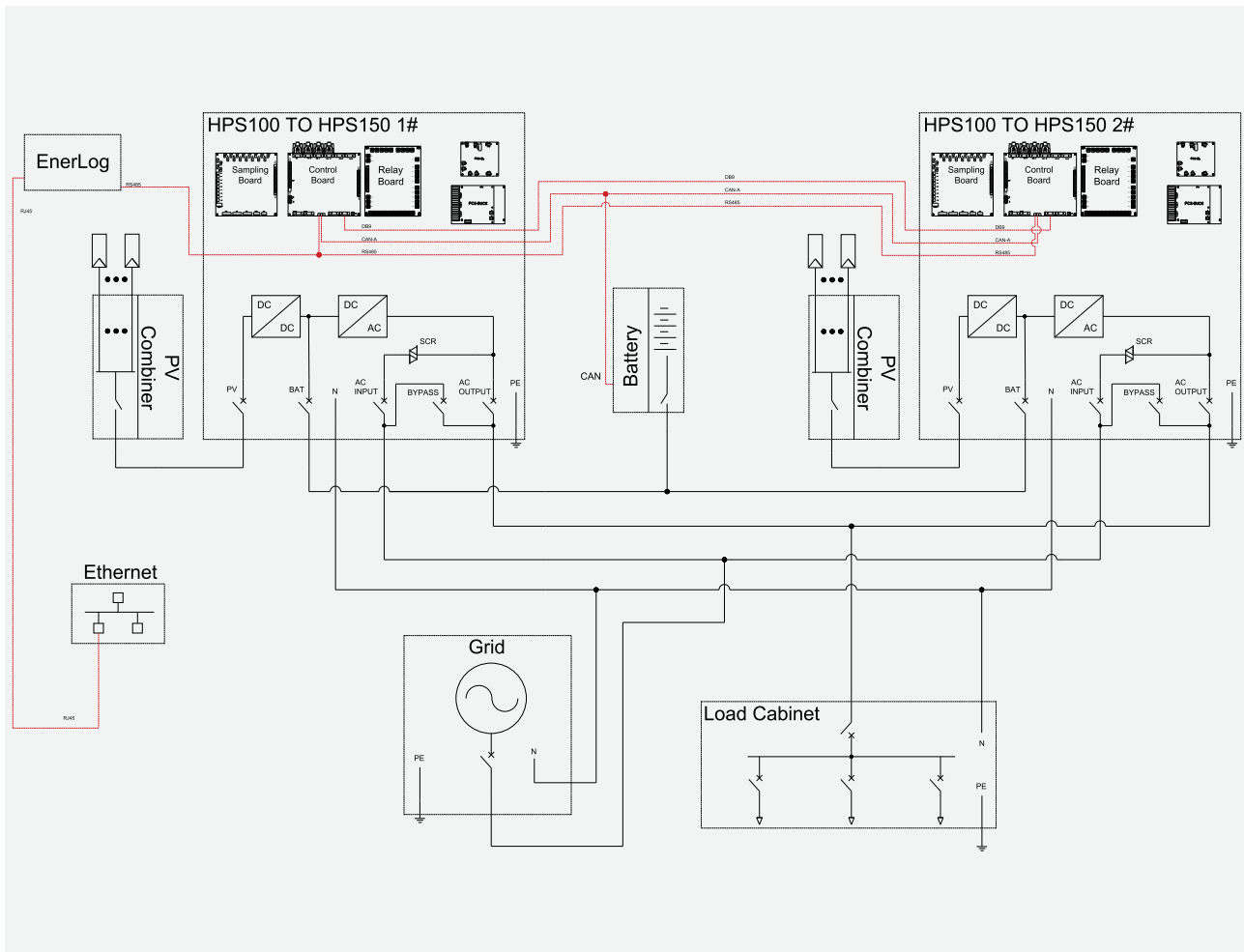
BMS-CAN communication:
1. Connect the BMS to the "CanA" of HPS1
2. Connect the "CanA" of HPS1 to the "CanA" of the HPS2
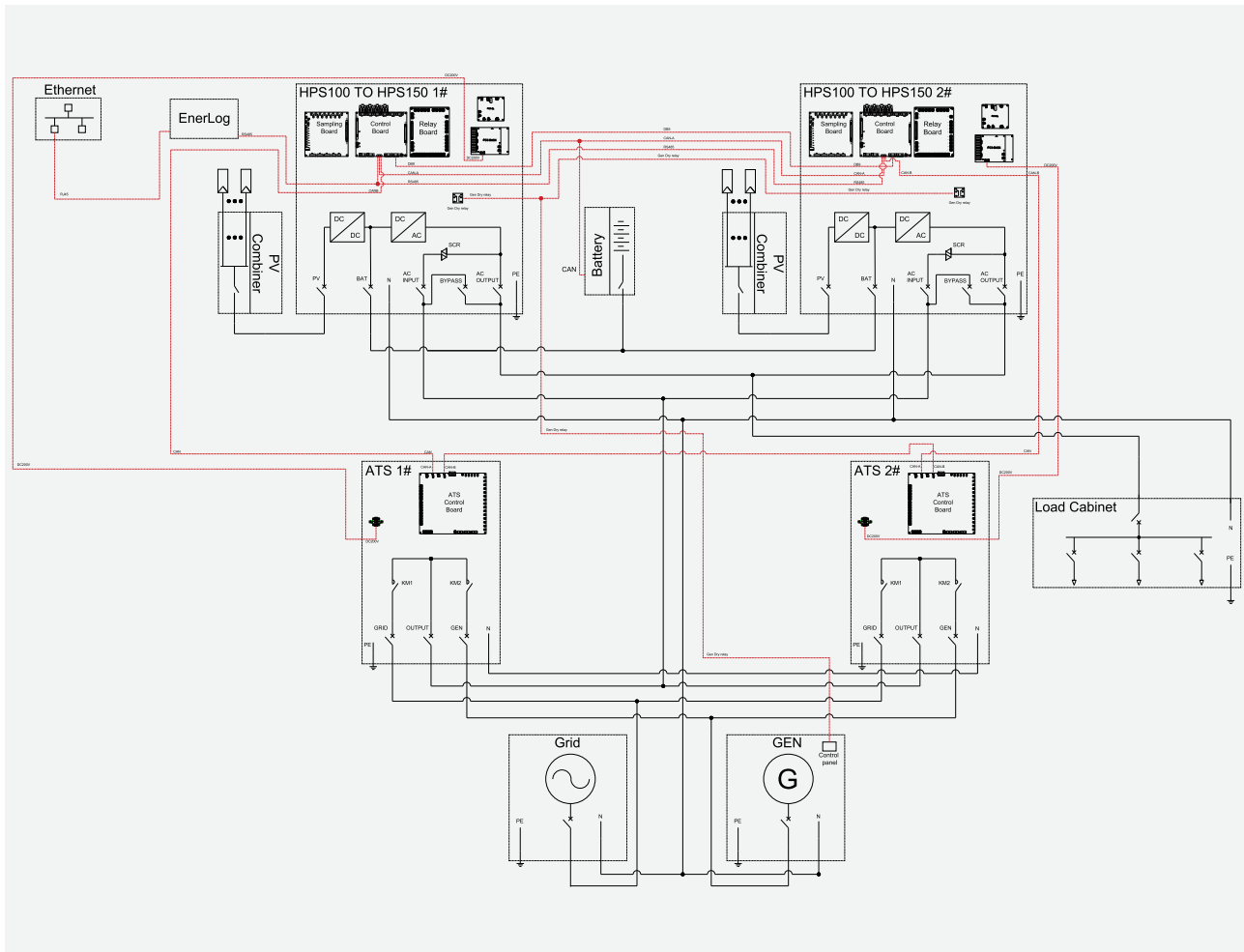
RS485 communication:
1. Connect the EnerLog to the "RS485" of HPS1
2. Connect the "RS485" of HPS1 to the "RS485" of HPS2

Parallel communication:
connect the CN18 or CN19 of HPS1 to CN18 or CN19 of HPS2 by the DB9 parallel cable prepared already

7 Connection Diagram & Description

Parallel 2*HPS with 2*ATS system:

ATS power supply:
1. Connect the "CN3" of buck board of HPS1 to the ATS1 power switch
2. Connect the "CN3" of buck board of HPS2 to the ATS2 power switch

ATS-CAN communication:
1. Connect the "Can B" of the HPS1 to the "Can A" of the ATS1
2. Connect the "Can B" of the HPS2 to the "Can A" of the ATS2
3. Connect the "Can B" of the ATS1 to the "Can B" of the ATS2

BMS-CAN communication:
1. Connect the BMS to the "CanA" of HPS1
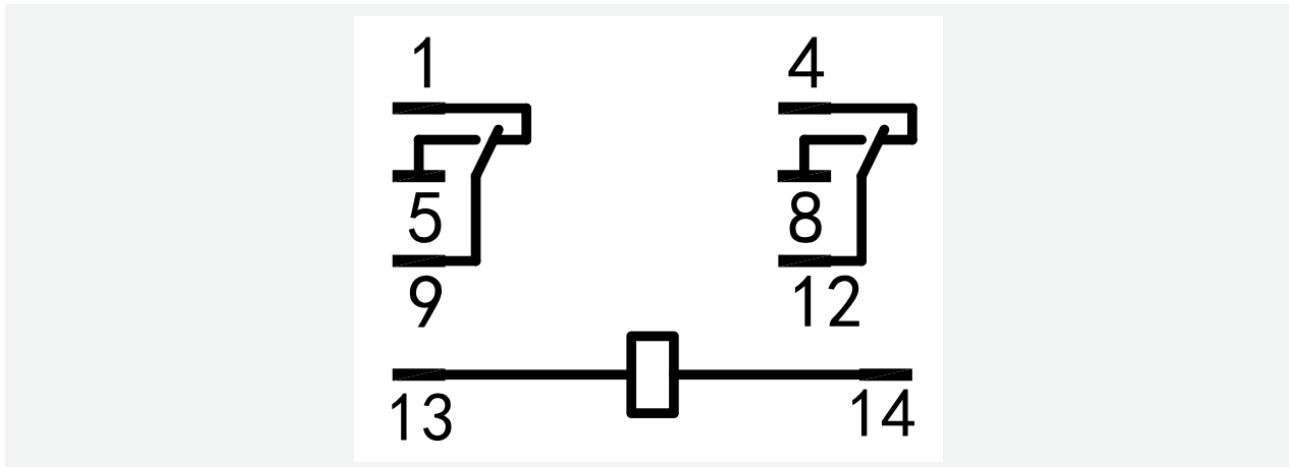2. Connect the "CanA" of HPS1 to the "CanA" of the HPS2

RS485 communication:
1. Connect the EnerLog to the "RS485" of HPS1
2. Connect the "RS485" of HPS1 to the "RS485" of HPS2

Parallel communication:
connect the CN18 or CN19 of HPS1 to CN18 or CN19 of HPS2 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.