PRODUCT SPECIFICATION

Product Name: High Voltage Box

Product Model: TB-PDU0510

Version: V1.0

Compiler: Bin	Reviewer: Ethan	Ratify: Gary
2025-4-15	2025-4-15	2025-4-15

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Revision Record

Date	Revised Version	Revision Note	Reviser
2025-4-15	V1.0	Newly formulate	Bin

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1. Overview

1.1. Introduction

The TB-PDU0510 High Voltage Box is a dedicated model designed for residential stacked energy storage systems. It is intended for household DC energy storage applications and serves as the core device for power circuit management and protection of the battery cluster.

It integrates voltage and current collection, circuit control, fault protection, and status monitoring functions. By establishing a safe and reliable high-voltage connection between the battery cluster and the residential PCS, it enables intelligent management and control of the system power circuit.

The product features a rated DC voltage of 500V and a rated current of 100A. With a compact structure and compatibility with stacked installation, it meets the requirements of residential energy storage applications for compact design, high safety, and ease of deployment.

1.2. Model Description

TB-PDU0510:

Battery cluster total voltage ≤ 500 VDC, rated current ≤ 100 A

1.3. Application environment

Index item	Parameter
Use ambient temperature range	-20℃ ~ 70℃
Storage environment temperature range	-40℃ ~ 85℃
Use ambient humidity range	5 ~ 95（45℃±2℃）%RH
Storage environment humidity range	≤95（45℃±2℃）%RH
Atmospheric pressure	76 ~ 106 Kpa
Altitude	≤2000 m
Heat dissipation mode	Natural heat dissipation
IP rating	IP20

2. Function & Configuration

Function	Cell Type	☑LFP □LMO ☑LTO ☑ NMC（Mark：support）
	Cell Capacity	☐50AH ☐100AH ☐150AH ☐200AH ☑280AH ☐314AH
	Display	☐Touchscreen (7inch) ☑Touchscreen (4.3inch) Optional
	Relay	☑Equipped with 4 relays by default (main contacts: Normally Open)Includes: charge, discharge, pre-charge, and negative relays ☐Other：
		Charge Relay： ☑NC(Default) ☑NO ☐No auxiliary contact
		Discharge Relay： ☑NC(default) ☑NO ☐No auxiliary contact
		Pre-charge Relay： ☐NC ☐NO ☑No auxiliary contact（default）
		Negative Relay： ☑NC (default) ☐NO ☐No auxiliary contact
	Shunt Trip Unit	☐None ☑Default logic ☐Custom logic
		Definition：The shunt trip remains closed under normal conditions. It will open when any of the following conditions is met: 1）Emergency Stop (E-Stop), Level-3 fault 2）Fire alarm, Level-3 fault 3）When a Level-3 charge or discharge fault occurs and the corresponding current direction (charge/discharge) absolute value ≥ 10 A, the shunt trip will open after a 3-second delay. If the current drops below the threshold or the fault is cleared during the delay, the trip action will be cancelled.
	Insulation monitoring	☑Enabled ☐UPS Disabled(default for UPS)
	BMU cell Strings per Pack	12S，16S，20S，32S，48S，52S，64S（optional）
	Power supply	☐AC/DC power module ☑DC/DC power module：24V（DC/DC connected to

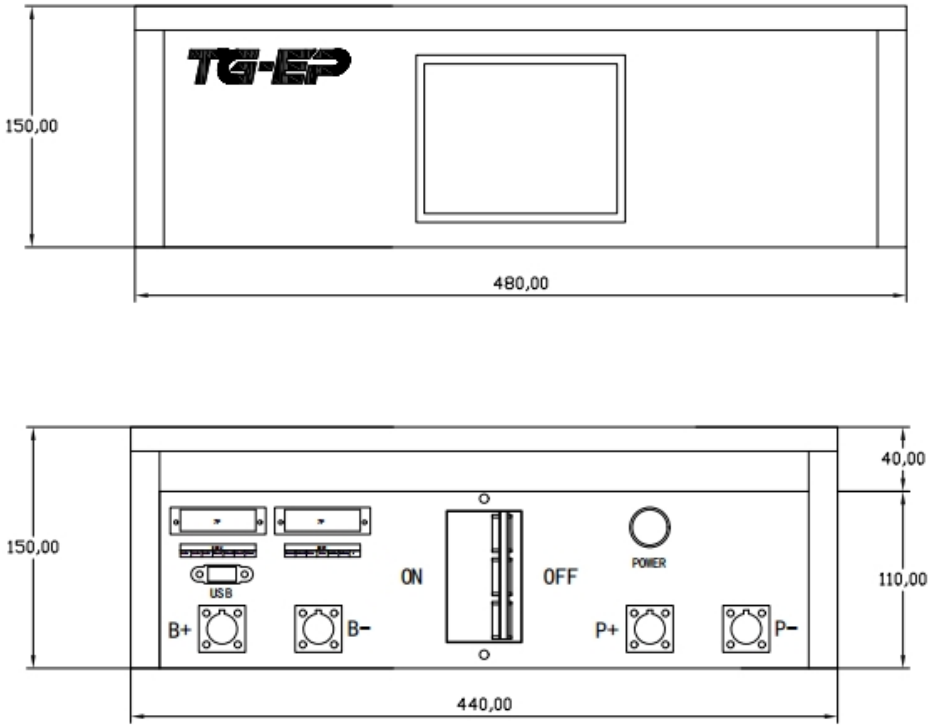
	mode	BAT+） ☐Others：____
Communication	Communication Interface	☑Independent RS485 ☑Independent CAN
	Firmware Upgrade Method	☑RS485-1 ☐CAN-2

3. Key components List

No.	Component	Qty.	Unit	Sign	Function
1	Control Board	1	PC	BCU	Brand: TG-EP Battery Cluster Master Control Board
2	Display	1	PC	Display	Brand: TG-EP
3	Circuit Breaker	1	PC	QF1	Manual switching and automatic tripping for battery cluster circuits
4	Pre - charge Contactor	1	PC	KM1	Automatic switching for pre-charge circuits
5	Main circuit Contactor	3	PC	KM2/KM3/KM4	Automatic switching for battery cluster positive/negative circuits
6	DC Fuse	2	PC	FU1/FU2	Over-current protection for main circuits/ control power
7	Pre - charge Resistor	1	PC	R1	Current limiting for pre-charge and circulation circuits
8	Switch	2	PC	S1/S2	Control power supply switching
9	DC Shunt	1	PC	R2	Current measurement
10	DC/DC	1	PC	DY1	Power supply for BCU

4. Product Structure

4.1.Structural Dimensions



4.2.Port definition

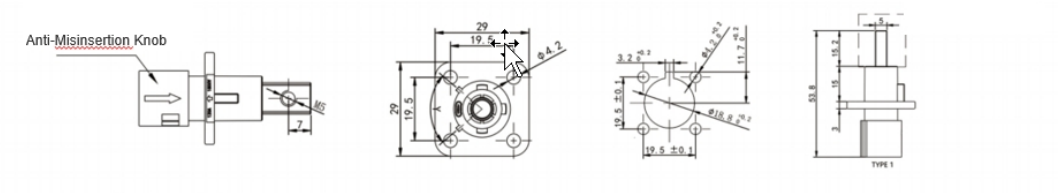
Port Definition	Description	Remarks
B+	Battery cluster positive input	input Connect to battery cluster positive terminal
B-	Battery cluster negative input	Connect to battery cluster negative terminal
P+	High-voltage box positive output	Output from HV box to PCS positive terminal
P-	High-voltage box negative output	Output from HV box to PCS negative terminal
POWER Button	Power switch	BMS power switch button, controls BMS power on/off

Note: The power connectors adopt Liandong connectors. Detailed specifications are as follows:

LD-CNZZ120-Z-CK

Company Name:	Jiangsu Liandong Electric Power Co., Ltd.
Series No.:	CNZZ Series (F indicates waterproof version)
Type:	Z represents Receptacle
Rated Current / Voltage:	120A / 1500V
Connection Method:	Customizable
Cable Specification:	16mm² or 25mm² Cable
Color:	O for Orange (RAL2008), B for Black (RAL9005)
Special Definition:	CK indicates Long Version

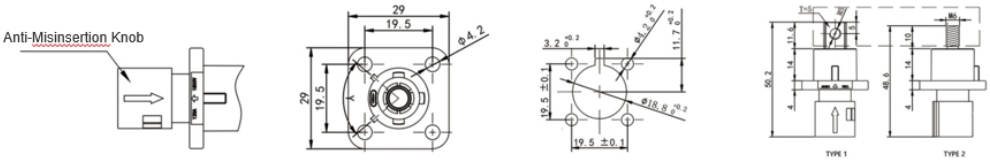




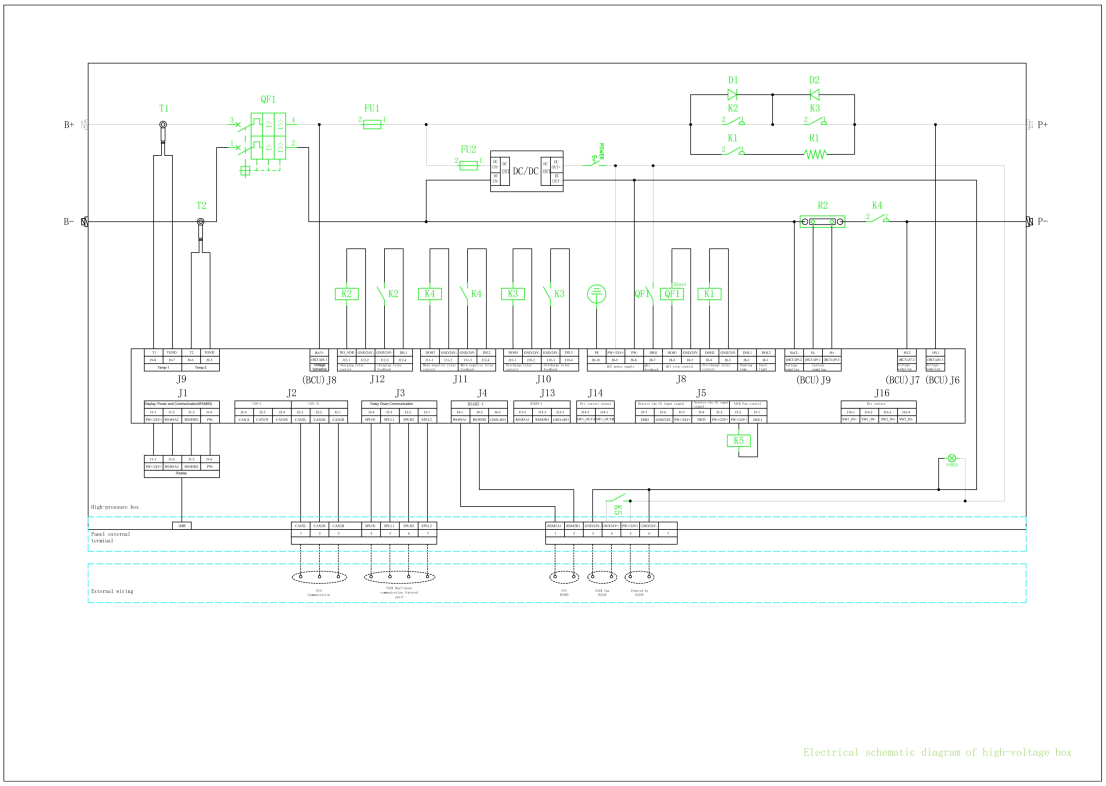
LD-CNZZ120-Z-DK

Company Name:	Jiangsu Liandong Electric Power Co., Ltd.
Series No.:	CNZZ Series (F indicates waterproof version)
Type:	Z represents Receptacle
Rated Current / Voltage:	120A / 1500V
Connection Method:	Customizable
Cable Specification:	16mm² or 25mm² Cable
Color:	O for Orange (RAL2008), B for Black (RAL9005)
Special Definition:	DK indicates Short Version





5. Schematic diagram



6. Precautions

- Prevent electrostatic discharge, moisture, and water ingress during use.
- Ensure correct polarity when connecting battery modules; reverse polarity is prohibited.Verify full insertion of terminals during harness-to-module connections.
- Avoid excessive power harness lengths and crossing with communication cables.
- Wear insulating gloves when handling HV terminals (Total Positive/Negative).
- Confirm input voltage is within specifications before powering on the HV box.
- Never touch HV terminals while the unit is energized.
- Strictly follow sequential power-on/shutdown procedures.
- Use twisted-pair shielded cables for CAN/RS485 communication.
- The Company reserves the final right to interpret this document.

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Our company reserves the right to modify the equipment parameters without prior notice.