



ZXDU68 B201

DC Power System

Product Description

Version: V5.0R99

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Revision History

Revision No.	Revision Date	Revision Reason
R1.2	2016-12-19	The following section and chapter are modified: ● Section 1.1, system introduction ● Section 1.3, Configuration List ● Section 2.1, system structure ● Section 2.2, ZXD3000 Rectifier ● Chapter 4, ZXD3000 Rectifier Specificationst ● appendix B, eletrical connection Diagram
R1.1	2013-04-10	The following section and chapter are modified: ● Section 1.3, Configuration List ● Chapter 4, ZXD3000 Rectifier Specificationst
R1.0	2012-11-16	First edition

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About This Manual

Purpose

this manual applies to the ZXDU68 B201(V5.0R99M01 / V5.0R99M03 / V5.0R99M04 / V5.0R99M05) DC Power System (the ZXDU68 B201 system for short). This manual describes the structure, characteristics, and specifications of the ZXDU68 B201 system.

Intended Audience

This manual is intended for:

- Planning engineers
- Maintenance engineers

What Is in This Manual

This manual contains the following chapters/appendixes:

Chapter/Appendix	Summary
1, System Overview	Introduces the ZXDU68 B201 system, describes its basic features, and provides the configuration list.
2, System Structure and Components	Describes system structure, ZXD3000 rectifier, Centralized Supervision Unit (CSU) and Signal Interface Unit(SIU).
3, System Specifications	Describes environment specifications, technical specifications, and compliance standards of the ZXDU68 B201 system.
4, ZXD3000 Rectifier Specifications	Describes technical specifications, input/output features and power decrease with high temperature.
A, Alarm List	Describes the alarm name, and the default alarm level and output relays.
B, Electrical Connection Diagram	Provides the electrical connection diagram of the ZXDU68 B201 system.

Conventions

This manual uses the following typographical conventions:

Typeface	Meaning
Italics	Variables in commands. It may also refer to other related manuals and documents.
Bold	Menus, menu options, function names, input fields, option button names, check boxes, drop-down lists, dialog box names, window names, parameters, and commands.
	Note: provides additional information about a certain topic.

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Chapter 1

System Overview

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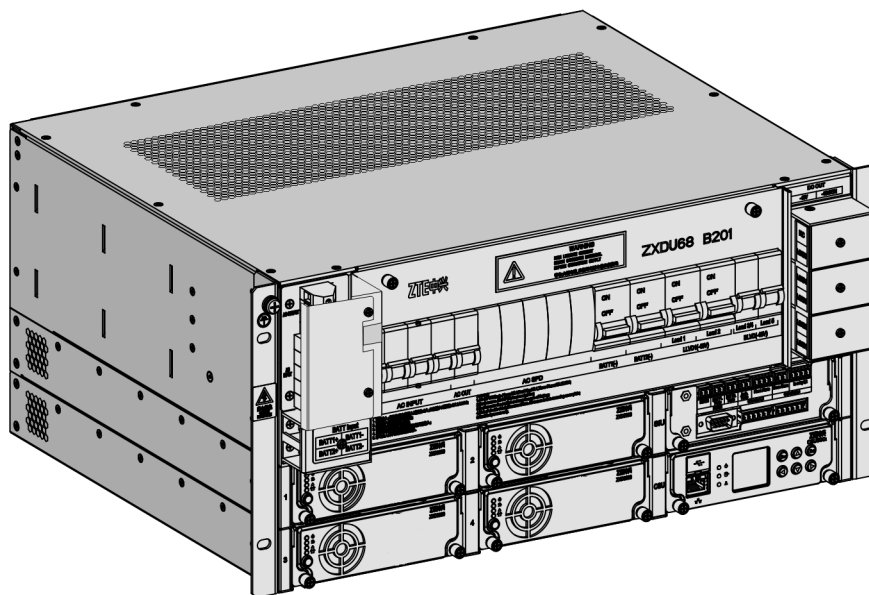
1.1 System Introduction

The ZXDU68 B201 system is an embedded DC power system. It provides -53.5 V DC power for the communications equipment.

- AC input mode
 - ZXDU68 B201 (V5.0R99M01/V5.0R99M03): Three-phase five-wire (L1/L2/L3/N/PE).
 - ZXDU68 B201 (V5.0R99M04): Single-phase three-wire (L/N/PE).
 - ZXDU68 B201 (V5.0R99M05): Three-phase four-wire (L1/L2/L3/PE).
- AC input voltage and frequency
 - Rated input voltage: 220 V to 240 V (phase voltage), 380 V to 415 V (line voltage).
 - Rated input frequency: 50 Hz/60 Hz.
- In full configuration, the system is equipped with four ZXD3000 rectifiers, which form a rated output power of 12 kW (-48 V to -57.6 V).

For the appearance of the ZXDU68 B201 systems, see [Figure 1-1](#).

Figure 1-1 Chassis Appearance



1.2 System Features

Efficient Rectifiers

With 30% - 50% output power, the rectifier efficiency is $\geq 94\%$.

With 50% - 100% output power, the rectifier efficiency is $\geq 96\%$.

Automatically Switching the Rectifiers to the Sleep Mode

The system switches one or more rectifiers to the sleep mode according to the load power. The power of a rectifier in sleep mode is not larger than 4 W.

A Wide Range of Input Voltage

A wide range of input phase voltage (85 V to 295 V) makes the system suitable for areas with unstable power sources.

Capacity Expansion

The system can be equipped with one to four ZXD3000 rectifiers according to the load power.

Accessible via Web Explorer

The system can be remotely managed through a computer installed with a web browser anywhere if Ethernet is available.

Managing Data in Batches

Users can set the parameters in batches, copy records and upgrade programs via a [USB](#) flash drive.

Professional Monitoring and Management

- The transmission speed is high via [CAN](#) bus.
- Multiple protection functions, such as Load Low Voltage Disconnect ([LLVD](#)), Load Low Temperature Disconnect ([LLTD](#)), Battery Low Voltage Disconnect ([BLVD](#)), and Battery High Temperature Disconnect ([BHTD](#)).
- Users can press the **Q** button of a rectifier to query the data of the rectifier or control it.

Flexible Monitoring Networking

The system provides input and output relays, RJ45 Ethernet interface, RS232 interface, RS485 interface, and USB interface. The system supports multiple monitoring networking modes via Telnet, Hypertext Transfer Protocol ([HTTP](#)), File Transfer Protocol ([FTP](#)), and Simple Network Management Protocol ([SNMP](#)).

1.3 Configuration List

For a description of the system configuration list, refer to [Table 1-1](#).

Table 1-1 Configuration List

Component		Configuration			
		V5.0R99M01	V5.0R99M03	V5.0R99M04	V5.0R99M05
Rectifier	Model	ZXD3000 (V5.5)			
	Quantity	Four (when fully configured)			
CSU	Model	CSU501			
	Software version	V1.13.07.00 or above			
AC distribution unit	AC input modes	Three-phase five-wire	Three-phase five-wire	Single-phase three-wire	Three-phase four-wire
	AC input terminals	Five terminals (L1/L2/L3/N/PE)	Five terminals (L1/L2/L3/N/PE)	Three terminals (L/N/PE)	Four terminals (L1/L2/L3/PE)
	AC input circuit breakers	1*50 A/4P MCB	1*50 A/4P MCB	1*80 A/2P MCB	1*63 A/3P MCB
	AC auxiliary output terminals	Four terminals (L/N/L/N)			

Component		Configuration			
		V5.0R99M01	V5.0R99M03	V5.0R99M04	V5.0R99M05
	AC auxiliary output circuit breaker	1*16 A MCB	1*16 A MCB	1*16 A/2P MCB	1*16 A/2P MCB
	AC SPD	Class C			
DC distribution unit	Battery input terminals	Four terminals (2*BATT+, 2*BATT-)	Eight terminals (4*BATT+, 4*BATT-)	Eight terminals (4*BATT+, 4*BATT-)	Eight terminals (4*BATT+, 4*BATT-)
	Battery input circuit breakers	2*100 A MCBs	4*100 A MCBs	4*100 A MCBs	4*100 A MCBs
	DC output terminals	Twelve terminals (-48 V/GND)	Eight terminals (-48 V/GND)	Eight terminals (-48 V/GND)	Eight terminals (-48 V/GND)
	DC output circuit breakers	LLVD1: 2*100 A MCBs BLVD: 1*32 A, 1*16 A MCBs	LLVD1: 2*100 A MCBs BLVD: 1*63 A, 1*16 A MCBs	LLVD1: 2*100 A MCBs BLVD: 1*63 A, 1*16 A MCBs	LLVD1: 2*100 A MCBs BLVD: 1*63 A, 1*16 A MCBs
	DC SPD	One, 15 kA SPD			
Super-vision inter-faces	Background communication	- One RJ45 Ethernet interface - One RS232 communication interface - One RS485 communication interface			
	Input/output relays	- V5.0R99M01 system: two input relays/four output relays - V5.0R99M03/V5.0R99M04/V5.0R99M05 system: two input relays/two output relays			
	Environment detection	- One flood alarm interface - One door magnet alarm interface - One environment temperature interface - V5.0R99M01 system: two battery temperature interfaces - V5.0R99M03/V5.0R99M04/V5.0R99M05 system: four battery temperature interfaces			
	USB communication	One USB interface			

- MCB: Miniature Circuit Breaker

Chapter 2

System Structure and Components

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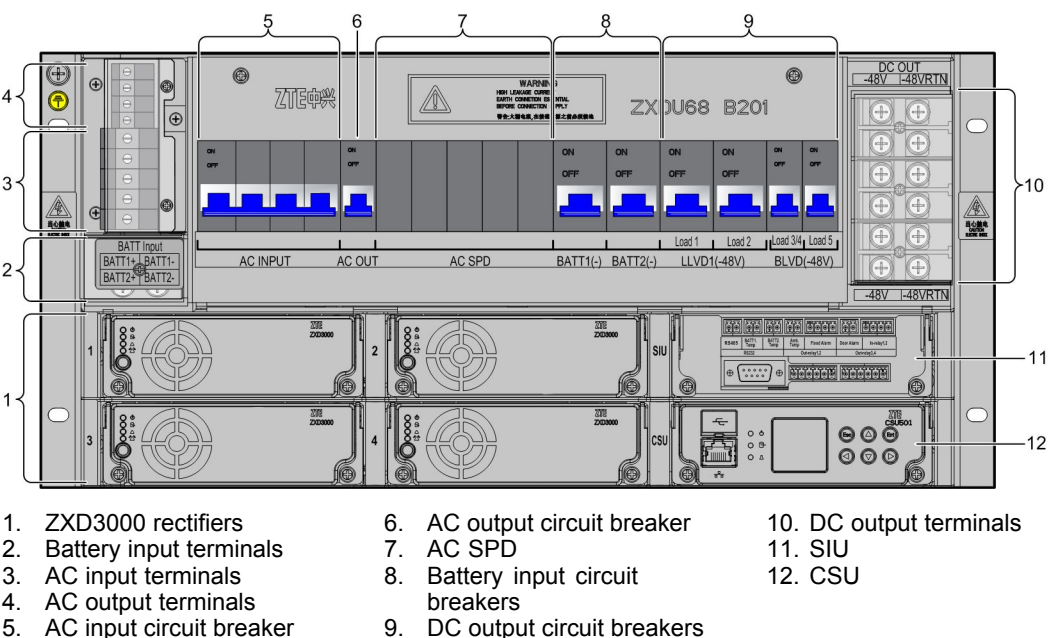
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2.1 System Structure

The ZXDU68 B201 system consists of the ZXD3000 rectifiers, Centralized Supervision Unit (CSU), Signal Interface Unit (SIU), circuit breakers, Surge Protection Devices (SPDs), and connecting terminals.

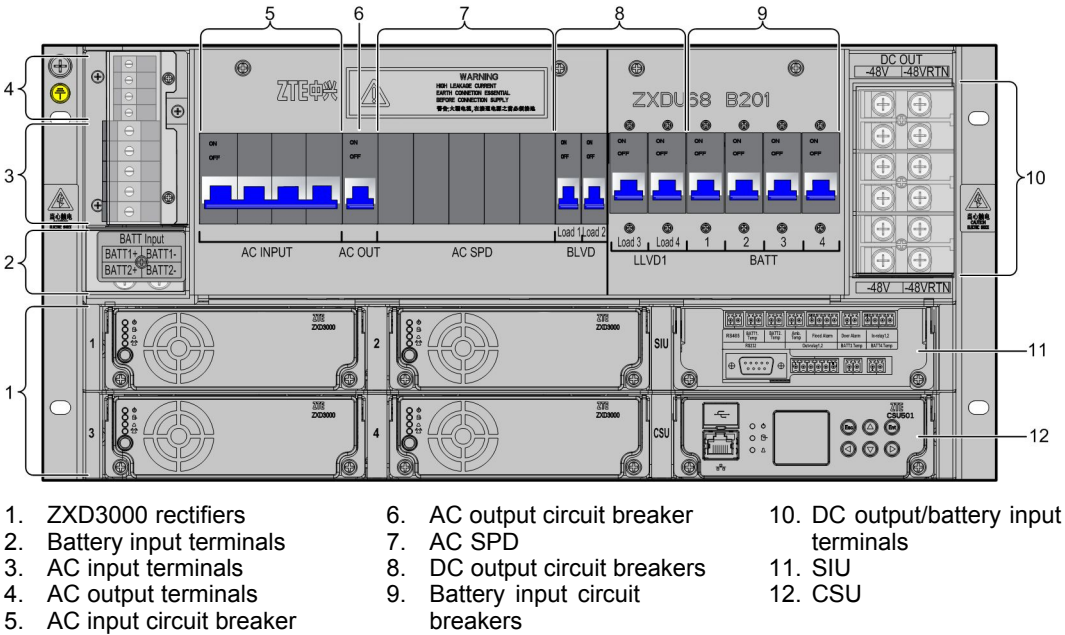
For the system structure of the ZXDU68 B201 (V5.0R99M01) system, see [Figure 2-1](#).

Figure 2-1 The ZXDU68 B201 (V5.0R99M01) System Structure



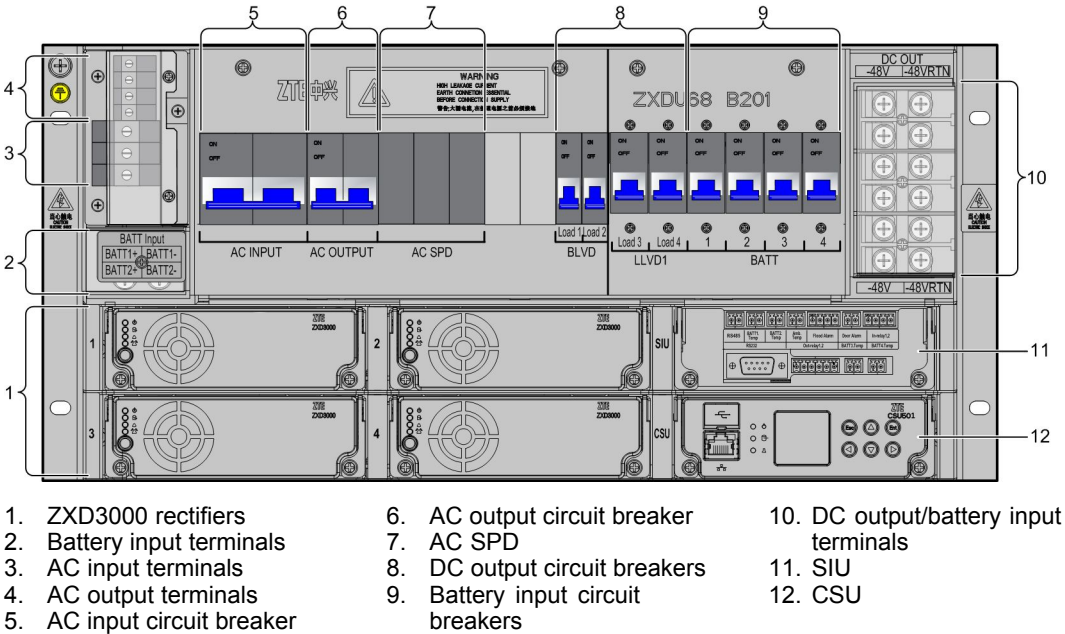
For the system structure of the ZXDU68 B201 (V5.0R99M03) system, see [Figure 2-2](#).

Figure 2-2 The ZXDU68 B201 (V5.0R99M03) System Structure



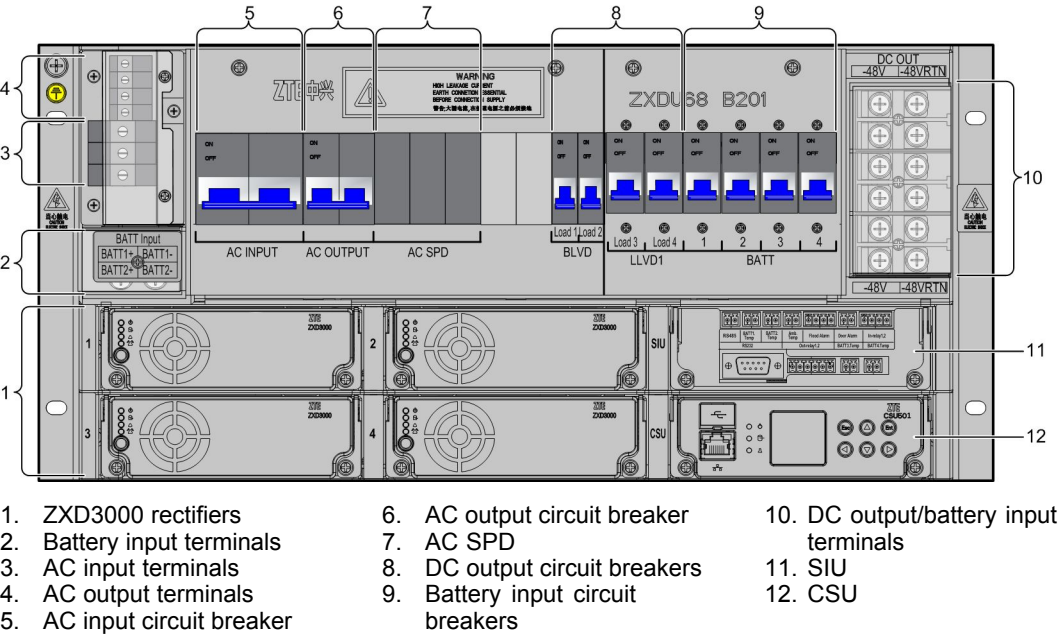
For the system structure of the ZXDU68 B201 (V5.0R99M04) system, see Figure 2-3.

Figure 2-3 The ZXDU68 B201 (V5.0R99M04) System Structure



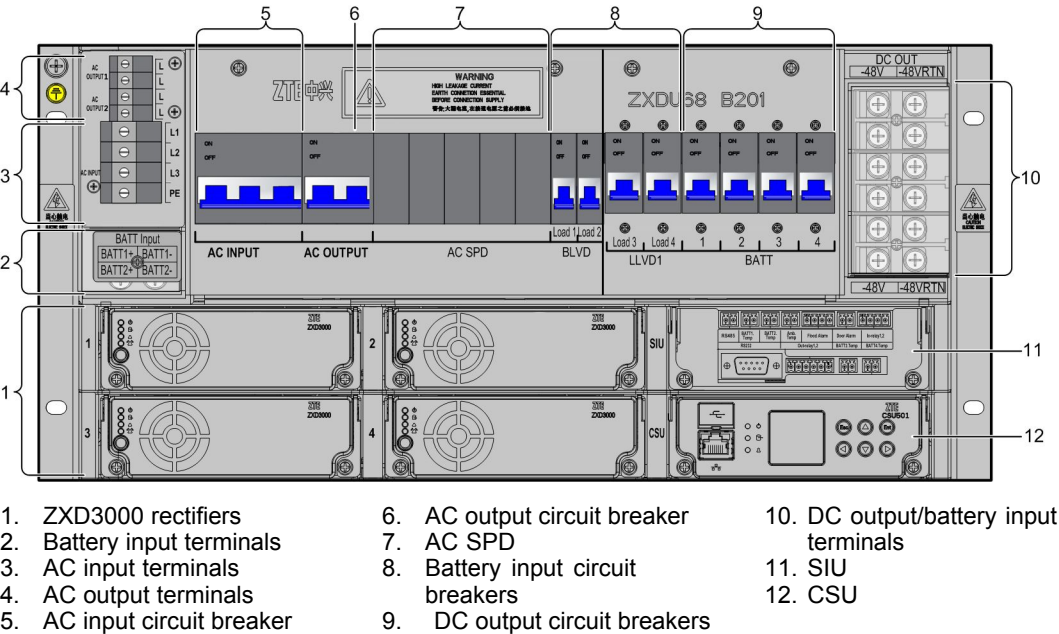
For the system structure of the ZXDU68 B201 (V5.0R99M04) system, see Figure 2-3.

Figure 2-4 The ZXDU68 B201 (V5.0R99M04) System Structure



For the system structure of the ZXDU68 B201 (V5.0R99M05) system, see [Figure 2-5](#).

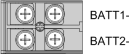
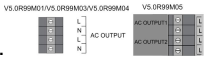
Figure 2-5 The ZXDU68 B201 (V5.0R99M05) System Structure



For a description of the structure components, refer to [Table 2-1](#).

Table 2-1 ZXDU68 B201 System Components

Component	Description
ZXD3000 rectifiers	Convert AC power to DC power.

Component	Description
Battery input terminals	Connect BATT+ and BATT- cables of the battery branches 1 and 2. 
AC input terminals	Connect AC input cables. 
AC output terminals	Connect L/N cables of AC auxiliary output. 
AC input circuit breaker	Used to control AC input to the system. - ZXDU68 B201 (V5.0R99M01/V5.0R99M03): 4-pole circuit breaker. - ZXDU68 B201 (V5.0R99M04): 2-pole circuit breaker. - ZXDU68 B201 (V5.0R99M05): 3-pole circuit breaker.
AC output circuit breaker	Used to control AC auxiliary output to the load. - ZXDU68 B201 (V5.0R99M01/V5.0R99M03): 1-pole circuit breaker. - ZXDU68 B201 (V5.0R99M04/V5.0R99M05): 2-pole circuit breaker.
AC SPD	Provides surge protection for the AC input.
Battery input circuit breakers	Used to control battery input to the system. - ZXDU68 B201 (V5.0R99M01): 2 battery input branches - ZXDU68 B201 (V5.0R99M03/V5.0R99M04/V5.0R99M05): 4 battery input branches
DC output circuit breakers	Used to control DC output to the LLVD and BLVD loads.
DC output/battery input terminals	Connect -48 V and GND cables of the DC loads or BATT+ and BATT- cables of the battery branches 3 and 4. 
SIU	Provides signal interfaces for supervision.
CSU	Supervises the system.

2.2 ZXD3000 (V5.5) Rectifier

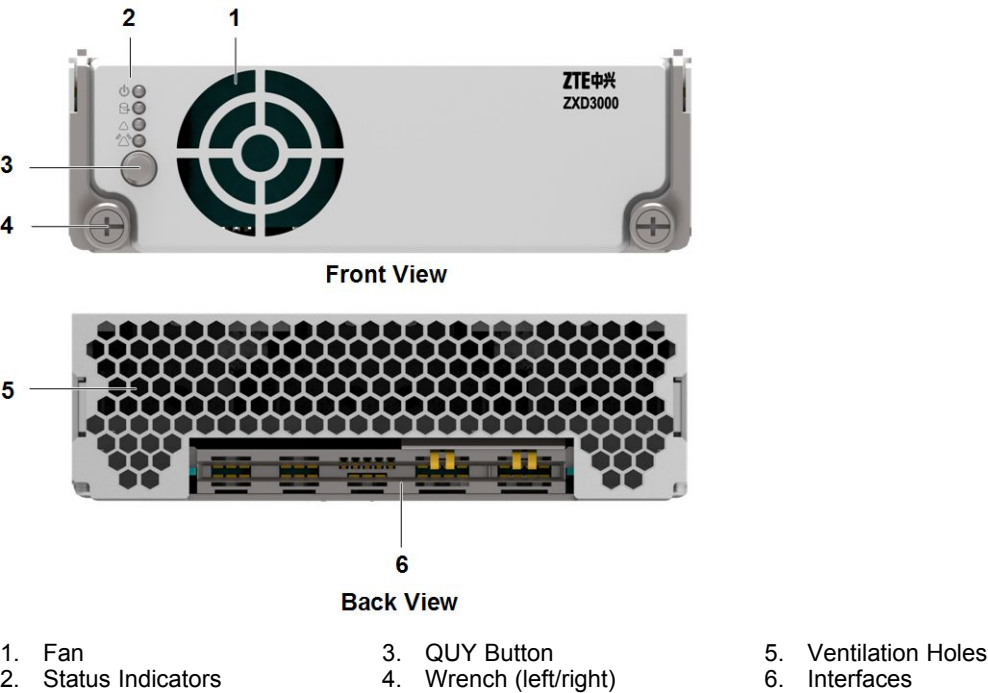
Function

The ZXD3000 (V5.5) rectifiers convert AC to DC, power DC loads and charge the batteries.

External View

For the external view of the ZXD3000 (V5.5) rectifier, see [Figure 2-6](#).

Figure 2-6 External View of the ZXD3000 (V5.5) Rectifier



For a description of the functions of each component, refer to [Table 2-2](#).

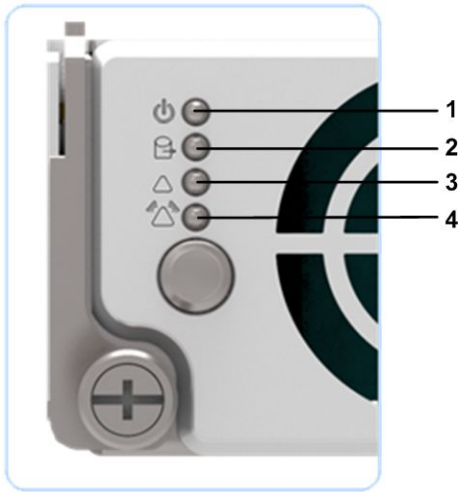
Table 2-2 Descriptions of the Functions of Each Component

No.	Component	Function Description
1	Fan	Dissipates heat in the ZXD3000 (V5.5) rectifier.
2	Indicator	Indicates the operating status of the ZXD3000 (V5.5) rectifier.
3	QUY button	After the ZXDU68 B201 rectifier is installed in the DC power supply system, you can press the QUY button. The operating information and fault information of the ZXD3000 rectifier is displayed on the monitoring unit of the DC power supply system. You can enter the parameter setting menu and modify the ID address of the ZXD3000 (V5.5) rectifier.
4	Wrench	Holds the ZXD3000 (V5.5) rectifier during installation or removal, and fixes it to slots.
5	Ventilation hole	Helps heat dissipation in the ZXD3000 (V5.5) rectifier. It cannot be covered by anything.
6	Interfaces	Electrical and signal interfaces, including the AC input interface, DC output interface and hot-pluggable charging interface.

Buttons and Indicators

There are four [LED](#) indicators on the left of the front panel of the ZXD3000 (V5.5) rectifier. [Figure 2-7](#) shows these indicators.

Figure 2-7 Status Indicators of the ZXD3000 (V5.5) Rectifier



1. Power Indicator
2. Operation Indicator
3. Alarm Indicator
4. Fault Indicator

- Press and hold the QUY (query) button of a rectifier for 5 seconds and then the CSU displays the rectifier's main information screen.
- The indicators display the operational status of the rectifier. For a description of the indicators, refer to [Table 2-3](#).

Table 2-3 Status Indicator Descriptions

Indicator and Status		Operating Status	Remarks
Power indicator (green)	Off	There is no input power supply, or the subsidiary power supply does not operate.	The power indicator indicates the power status of the ZXD3000 (V5.5) rectifier.
	On	There is AC input power supply, and the subsidiary power operates properly.	
	Flas- hing	The ZXD3000 (V5.5) rectifier is in sleep mode or query-with-one-click mode.	
Operation indicator (green)	Off	The ZXD3000 (V5.5) rectifier is in sleep mode or is shut down (due to monitoring control or unsatisfactory operational environment).	The operation indicator indicates the regulated voltage status and current-limited status of the ZXD3000 (V5.5) rectifier.
	Flas- hing	The ZXD3000 (V5.5) rectifier is in current-limited status or query-with-one-click mode.	
	On	The ZXD3000 (V5.5) rectifier is in regulated voltage status.	
Alarm indicator (yellow)	Off	There is no alarm.	The alarms are caused by external environment or other devices. You cannot determine whether the ZXD3000 (V5.5) rectifier
	Flas- hing	The communications between the ZXD3000 (V5.5) rectifier and the CAN is interrupted, or the current is not properly shared.	

Indicator and Status		Operating Status	Remarks
	On	The ZXD3000 (V5.5) rectifier is probably in one of the following status: AC input overvoltage, AC input undervoltage, rectifier overtemperature, or address collision.	is faulty only by the alarm indicator .
Fault indicator (red)	On	The ZXD3000 (V5.5) rectifier is probably in one of the following status: output overvoltage, output undercurrent, fan faults, or output fuse broken.	The fault indicator indicates whether the ZXD3000 (V5.5) rectifier is faulty.
	Off	The ZXD3000 (V5.5) rectifier operates properly.	

Interfaces

Input and output interfaces are laid at the back of the rectifier. For the interface layout of the rectifier, see [Figure 2-8](#). For a description of the pin definitions, refer to [Table 2-4](#).

The interfaces complete the electrical and signal connections between the rectifier and the ZXDU68 B201 power system.

Figure 2-8 Rectifier Interfaces

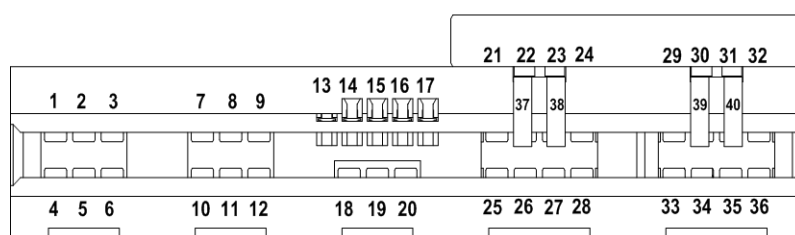


Table 2-4 Pin Definitions of Rectifier Interfaces

Interface Name	Pin No.	Signal Definition	Function
AC input interfaces	1 - 6	L	Connects the AC input phase cable.
	7 - 12	N	Connects the AC input neutral cable.
	18 - 20	PE	Connects the protection ground.
-	13	-	Reserved
Phase detection interfaces	14	AA	Locates the phase where an operating rectifier is.
	15	AB	
CAN communication detection interfaces	16	CAN-	A rectifier communicates with other devices through the interfaces. For example, a rectifier transmits data to the CSU, and the CSU issues commands to a rectifier.
	17	CAN+	

Interface Name	Pin No.	Signal Definition	Function
DC output interfaces	21 - 28	OUTPUT+	Provide DC output power.
	29 - 36	OUTPUT-	
Hot-plug pins	37, 38	Hot-plug pin (+)	Prevent sparks when a rectifier is installed into the ZXDU68 B201 system.
	39, 40	Hot-plug pin (-)	

2.3 CSU501B Unit

Functions

The centralized supervision unit CSU501B is the front-end monitoring module of the DC power system and responsible for tracing and managing the operation of the DC power system.

- **Management**
 - Implements discharge management, charge management, and test management on the battery packs.
 - Controls the automatic sleep function of the rectifiers to save energy.
 - Supports the export of historical records to a USB flash drive.
 - Supports data query, parameter setting, and system control through the [LCD](#) screen and buttons.
- **Alarms**

Raises an alarm and protects the power system if the power system becomes faulty.
- **Monitoring**
 - Collects operational data and monitors the operational status of the power system in real time.
 - Reports data to the Supervision Center ([SC](#)), and receives commands from the SC for remote monitoring of the power system.
- **Wireless communication**

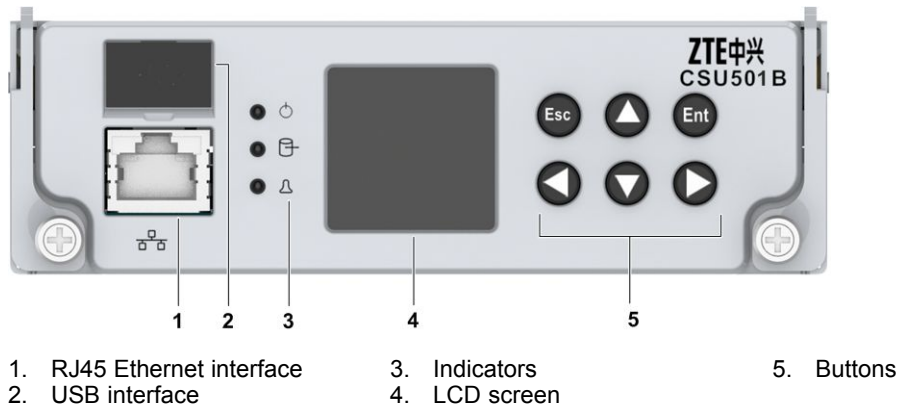
Supports wireless communication through [GPRS](#) and 3G data cards, and supports the SMS and Email notification functions.
- **Web-based access**

After the CSU is connected to the network, users can access the CSU through a browser, for example, Chrome.

External View

[Figure 2-9](#) shows the external view of the CSU501B.

Figure 2-9 CSU501B



Interfaces

- USB interface
 - Only USB flash drives are supported. SD cards, mobile hard disks, MP3, MP4, and other pluggable storage devices are not supported.
 - The file system of USB flash drives must be FAT.
- RJ45 Ethernet interface
 - The network interface is an auto-sensing 10/100-Mbps Ethernet interface.
 - The CSU supports the Telnet, HTTP, FTP, and SNMP protocols.

Indicators

The indicators indicate the operational status of the CSU and power system. For a description of the indicators, refer to Table 2-5.

Table 2-5 Indicator Descriptions

Indicator Status			CSU Status
Power Indicator	Operation Indicator	Alarm Indicator	
Lit	Flashing	Not lit	The CSU is operating properly.
Lit	Lit or not lit	-	The CSU is faulty.
Lit	Flashing	Flashing	The CSU has an alarm.

- Note: "-" means that the status of the indicator is not certain.

Buttons

The user can query information and set parameters through the operation buttons. For a description of the buttons, refer to Table 2-6.

Table 2-6 CSU Buttons

Button	Name	Function
▲	Up/arrow button	Scrolls pages up, selects the previous item, or increases numerical values.
▼	Down/arrow button	Scrolls pages down, selects the next item, or decreases numerical values.
◀	Left/arrow button	Moves the cursor leftwards or turns pages.
▶	Right/arrow button	Moves the cursor rightwards or turns pages.
Ent	Confirmation button	Confirms or saves the configuration.
Esc	Escape button	Exits or cancels the configuration.
<▲+▼>	Button combination	The user can press the ◀ and ▲ buttons together to view the shortcut menu.
<◀+▲>	Button combination	The user can press the ◀ and ▲ buttons together to view the Language Setting menu.
<▲+Ent>	Button combination	The user can press the ▲ and Ent buttons together to view the help information about the current menu.

2.4 SIU

The Signal Interface Unit (SIU) is installed inside the SIU slot. The signal interfaces are laid on the front panel of the SIU.

The interfaces include communication interfaces, battery temperature interfaces, environment detection interfaces, input and output relay interfaces. The interface layout of the SIU varies with different version.

For the SIU interface layout and definitions of the ZXDU68 B201 system, see the following figures:

- (V5.0R99M01) system: see [Figure 2-10](#) and [Figure 2-11](#).
- (V5.0R99M03/V5.0R99M04) system: see [Figure 2-12](#) and [Figure 2-13](#).

Figure 2-10 Layout of SIU Interfaces (V5.0R99M01 System)

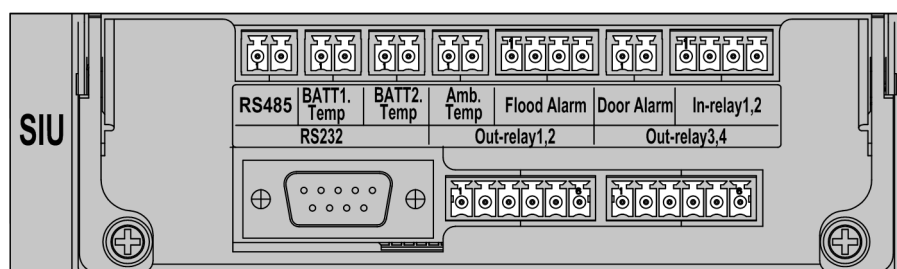


Figure 2-11 Definitions of the SIU Interfaces (V5.0R99M01 System)

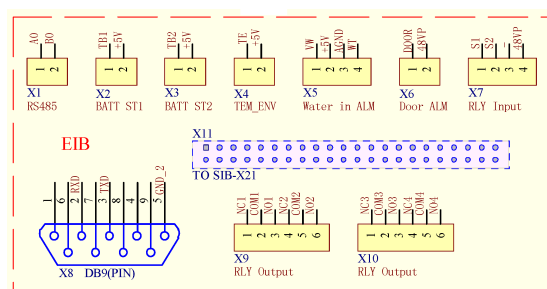


Figure 2-12 Layout of SIU Interfaces (V5.0R99M03/V5.0R99M04 System)

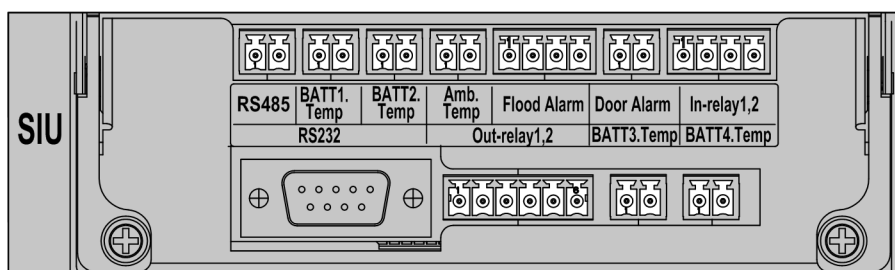
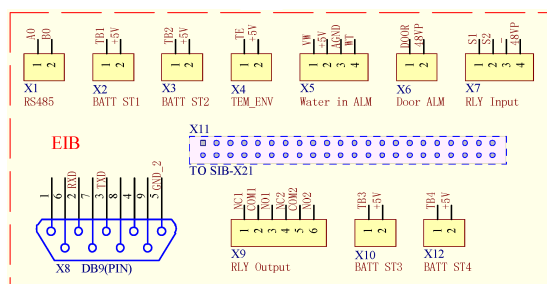


Figure 2-13 Definitions of the SIU Interfaces (V5.0R99M03/V5.0R99M04 System)



For a description of the pin definitions, refer to [Table 2-7](#).

Table 2-7 Pin Definitions of SIU Interfaces

Interface		Description
Communication Interfaces		
X1	RS485	The interface for RS485 communication
X8	RS232	The interface for RS232 communication
Environment Detection Interfaces		
X2	BATT1.Temp	Connects to temperature sensor of battery pack 1
X3	BATT2.Temp	Connects to temperature sensor of battery pack 2
X4	Amb.Temp	Connects to environment temperature sensor
X5	Flood Alarm	Connects to flood detection sensor
X6	Door Alarm	Connects to the door magnet sensor

Interface		Description
Input/Output Relay Interfaces		
X7	In-relay 1, 2	• Users can customize these input relays for alarm input. • Alarm name, level and status of each input relay can be modified in the CSU.
X9	Out-relay 1, 2	The output relays 1, 2 correspond to the software codes A1, A2 in the CSU. Users can customize these output relays for alarm output.
X10	Out-relay 3, 4 (V5.0R99M01 system)	The output relays 3, 4 correspond to the software codes A3, A4 in the CSU. Users can customize these output relays for alarm output.
	BATT3.Temp, BATT4.Temp (V5.0R99M03/V5.0R99M04 system)	Connects to temperature sensor of battery pack 3, battery pack 4.

Chapter 3

System Specifications

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3.1 Environment Specifications

For a description of the environment specifications of the ZXDU68 B201 system, refer to [Table 3-1](#).

Table 3-1 Environment Specifications

Item	Specifications
Operating temperature	-25 °C to +55 °C (+15 °C to +25 °C, recommended)
Storage temperature	-40 °C to +70 °C
Relative humidity	10% to 90% (non-condensing); 40% to 60% recommended
Altitude	0 - 2000 m: 100% output power 2000 m - 3000 m: The power derating percentage is 1% for each 100 m increase in altitude.
Other requirements	- The cabinet should be stable and erect. - No explosion hazard, no shake or jolt. - Never install the equipment where there is a risk of liquid or objects falling into the top of the equipment. - No conductive dust or corrosive gas. - No strong Electromagnetic Interference (EMI).

3.2 Technical Specifications

The ZXDU68 B201 system satisfies the following technical specifications.

- For a description of the system specifications, refer to [Table 3-2](#).
- For a description of the AC electrical specifications, refer to [Table 3-3](#).
- For a description of the DC electrical specifications, refer to [Table 3-4](#).
- For a description of the structure specifications, refer to [Table 3-5](#).

Table 3-2 System Specification

Item	Specification	
Rated output power	12 kW (when fully configured with four ZXD3000 rectifiers)	
Rectifier power limit controlled by environment temperature	-40 °C to 55 °C	Output power percentage: 100%
	55 °C to 75 °C	Linear power limit The output power decreases with the increase of the temperature and is not less than 50% when the temperature is 75 °C.
	> 75 °C	Output power: 0
Rectifier power limit controlled by AC input voltage	$\leq (85 \pm 5) \text{ V}$	Output power: 0
	$(85 \pm 5) \text{ V}$ to 110 V	Linear power limit Output power percentage: 40% to 55%
	110 V to 176 V	Linear power limit Output power percentage: 55% to 100%
	176 V to $(295 \pm 5) \text{ V}$	Output power percentage: 100%
	$> (295 \pm 5) \text{ V}$	Output power: 0
System efficiency	● $\geq 93.5\%$ (30% rated power) ● $\geq 95.5\%$ (50% rated power) ● $\geq 95.5\%$ (100% rated power)	
Monitoring networking mode	Input/output relays, RS232 interface, RS485 interface, and RJ45 Ethernet interface	
Mean Time Between Failures (MTBF)	$\geq 3.2 \times 10^5 \text{ h}$	
Equipment noise	$\leq 55 \text{ dB (A)}$	
Design service time	10 years to 15 years	
Electromagnetic Compatibility (EMC)	Satisfies the requirements of EN61000 and DIN/EN 55022, the detailed specifications are as follows:	
	Electrostatic discharge (ESD)	● Contact discharge: 8 kV ● Air discharge: 15 kV
	Radiated immunity	10 V/m 1 kHz 80% AM modulated
	Electrical fast transient/burst immunity	● AC port: 4 kV ● DC/signal port: 2 kV
	Surge immunity	AC port: 6 kV
	Conducted immunity	3 V 1 kHz 80% AM modulated

Item	Specification	
	Voltage drop	Level 2
	Conductive emission	Class A
	Radioactive emission	Class A

Table 3-3 AC Electrical Specifications

Item		Specification
AC input features	AC input mode	● ZXDU68 B201 (V5.0R99M01/V5.0R99M03): Three-phase five-wire (L1/L2/L3/N/PE) ● ZXDU68 B201 (V5.0R99M04): Single-phase three-wire (L1/N/PE) ● ZXDU68 B201 (V5.0R99M05): Single-phase four-wire (L1/L1/L2/PE)
	AC input voltage	● Rated input voltage: 220 V to 240 V (phase voltage) / 380 V to 415 V (line voltage) ● Phase voltage range: 85 V to 295 V
	AC input frequency	● Rated frequency: 50 Hz / 60 Hz ● Frequency range: 45 Hz to 66 Hz
	AC input power factor	≥ 0.998 (with rated load)
	AC surge protection	Class C, I _{max} = 40 kA (8/20 μs)
	Input Total Harmonic Distortion (THD)	THD ≤ 5% (with 30% - 100% rated power)
Protection functions	AC over-voltage protection	If the input phase voltage is higher than the over-voltage threshold, the system takes a protective action against over-voltage.
	AC under-voltage protection	If the input phase voltage is lower than the under-voltage threshold, the system takes a protective action against under-voltage.
	Input over-current protection	The AC input circuit breaker (or AC input contactor) provides the over-current protection function.

Table 3-4 DC Electrical Specifications

Item		Specification
DC output features	Rated output voltage	-53.5 V
	Output voltage range	-42 V to -58 V (adjustable in the CSU)
	DC surge protection	$I_{max} = 15 \text{ kA}$ (8/20 μs)
	DC voltage drop inside the chassis	$\leq 0.5 \text{ V}$
	Regulated voltage precision	$\leq 0.5\%$
	Weighted noise voltage	$\leq 2 \text{ mV}$
	Peak-peak noise voltage	$\leq 150 \text{ mV}$ (20 MHz bandwidth)
	Load disconnection modes	● Load Low Voltage Disconnect 1 (LLVD1) ● Battery Low Voltage Disconnect (BLVD) ● Battery High Temperature Disconnect (BHTD) ● Load Low Temperature Disconnect (LLTD)
Protection functions	DC over-voltage protection	If the DC output voltage is higher than the over-voltage threshold, the system takes a protective action against over-voltage
	DC under-voltage protection	If the DC output voltage is lower than the under-voltage threshold, the system takes a protective action against under-voltage
	Battery under-voltage protection	● If the battery voltage is lower than the LLVD1 threshold, the system disconnects the LLVD1 loads. ● If the battery voltage is lower than the BLVD threshold, the system disconnects the batteries.
	Battery high-temperature protection	If the battery voltage is higher than the BHTD threshold, the system disconnects the batteries
	Load low-temperature protection	If the battery voltage is lower than the LLTD threshold, the system disconnects the loads

Table 3-5 Structure Specifications

Item	Specifications
Protection degree	IP20
Cabling mode	Front cabling
Installation mode	Embedded in standard cabinet with 19-inch width
Maintenance mode	Cable connection and system maintenance in the front
Chassis dimensions	219.5 mm × 482.6 mm × 360 mm (H × W × D)
Chassis weight	Approximately 18.9 kg (excluding the rectifiers and batteries)
ZXD3000 rectifier weight	2 kg/set, four sets (maximum)
Chassis color (PANTONE color)	ZTE light gray (PANTONE COOL GRAY 2C)

3.3 Compliant Standards

EMC Standards

The ZXDU68 B201 system complies with the following Electromagnetic Compatibility (EMC) standards:

- EN55022
- IEC61000-3-3; IEC61000-3-2; IEC61000-4-2; IEC61000-4-3; IEC61000-4-4; IEC61000-4-6; IEC61000-4-8; and IEC61000-4-11

Safety Standards

The ZXDU68 B201 system is in compliance with the IEC/UL/EN 60950 safety standards.

Other Standards

The ZXDU68 B201 system is also in compliance with the following standards:

- The Restriction of Hazardous Substances (RoHS) directive (2002/95/EC) of the European Union.
- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference. (2) This device must accept any interference received, including interference that may cause undesired operations.

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Chapter 4

ZXD3000 Rectifier Specifications

Table of Contents

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4.1 Technical Specifications

For the technical specifications of the ZXD3000 (V5.5) rectifiers, refer to [Table 4-1](#).

Table 4-1 Technical Specifications

Item	Description	
AC input	Input mode	Single-phase three-wire (L/N/PE)
	Input voltage	- Input voltage: 85 V to 295 V - Rated input voltage: 100 V to 240 V
	Maximum input current	18 A
	Frequency	- Frequency: 45 Hz to 66 Hz - Rated frequency: 50 Hz/60 Hz
	Input power factor	≥ 0.998 (when the input and output values are rated)
DC output	Maximum output power	3,000 W (when the input voltage is 176 V to 295 V and the environment temperature is -40 °C to 55 °C)
	Rated output voltage	53.5 V
	Range of output voltage	42 V to 59.5 V Adjusted through the monitoring unit of the power system
	Output current limit	5 A to 63.5 A Set through the monitoring unit
	Efficiency	- Peak efficiency: ≥ 96% - Efficiency with the rated load: ≥ 95%
	Voltage stabilizing accuracy	≤ ±0.6%

Item	Description	
	Output weighted noise	≤ 2 mV
	Broad frequency noise voltage	≤ 50 mV (3.4 kHz to 150 kHz) ≤ 20 mV (0.15 MHz to 30 MHz)
	Discrete frequency noise voltage	≤ 5 mV (3.4 kHz to 150 kHz) ≤ 3 mV (150 kHz to 200 kHz) ≤ 2 mV (200 kHz to 500 kHz) ≤ 1 mV (0.5 MHz to 30 MHz)
	Peak-to-peak noise voltage	≤ 200 mV (bandwidth of 0 Hz to 20 MHz)
	Inter-rectifier load sharing	The number of the rectifiers that can be connected in parallel is not less than 30; when the output current of a single rectifier is 10% to 100% of the rated value, the output current imbalance of the rectifiers is not greater than 1.5 A.
Safety protection	Dielectric strength	2840 VDC voltage of the AC input terminals to the chassis for one minute: no breakdown or arc; the stable leakage current is less than 1 mA. 4242 VDC voltage of the AC input terminals to the DC output terminals for one minute: no breakdown or arc; the stable leakage current is less than 1 mA. 707 VDC voltage of the DC output terminals to the chassis for one minute: no breakdown or arc; the stable leakage current is less than 1 mA. 707 VDC voltage of other interfaces to the chassis for one minute: no breakdown or arc; the stable leakage current is less than 1 mA.
	Safety standard	Compliant with IEC60950
	Electromagnetic compatibility	Compliant with EN55022 Class B and IEC61000
Mean time between failures		$MTBF \geq 2 \times 10^5$ h
Cooling mode		- Forced cooling; - The fan speed can be adjusted according to the environment temperature and the working status of the rectifier.
Environment requirement		- Operating temperature: -40 °C to 75 °C - Storage temperature: -40 °C to 85 °C - Relative humidity: $\leq 95\%$ (non-condensing) - Air pressure: 80 kPa to 106 kPa

Item	Description
Dimensions	41.5 mm × 132 mm × 300 mm (H×W×D)
Weight	2 kg

4.2 Input Features

Undervoltage Protection

When the AC input voltage is lower than the configured undervoltage protection threshold, undervoltage protection is enabled. The ZXD3000 rectifier is shut down, there is no output current, and the alarm indicator is lit. When the voltage increases to the undervoltage restoration threshold, the ZXD3000 rectifier automatically resumes operating properly.

The undervoltage protection threshold of the ZXD3000 rectifier is $80\text{ V} \pm 5\text{ V}$, the hysteresis voltage is 5 V to 12 V, and the undervoltage restoration threshold equals the undervoltage protection threshold plus the hysteresis voltage.

Overvoltage Protection

When the AC input voltage is higher than the configured overvoltage protection threshold, overvoltage protection is enabled. The ZXD3000 rectifier is shut down, there is no output current, and the alarm indicator is lit. When the voltage decreases to the overvoltage restoration threshold, the ZXD3000 rectifier automatically resumes operating properly.

The overvoltage protection threshold of the ZXD3000 rectifier is $300\text{ V} \pm 5\text{ V}$, the hysteresis voltage is 5 V to 10 V, and the overvoltage restoration threshold equals the overvoltage protection threshold minus the hysteresis voltage.

Power Limitation Based on the Input Voltage

The ZXD3000 rectifier can limit the output power based on the input voltage.

Figure 4-1 shows power limitation based on the input voltage when the following conditions are met:

- Ambient temperature: $-25\text{ }^{\circ}\text{C}$ to $+55\text{ }^{\circ}\text{C}$.
- Output voltage: 52.5 V to 59.5 V. If the output voltage is between 42 V and 52.5 V, the maximum output current should be constant.

Figure 4-1 Power Limitation Based on the Input Voltage

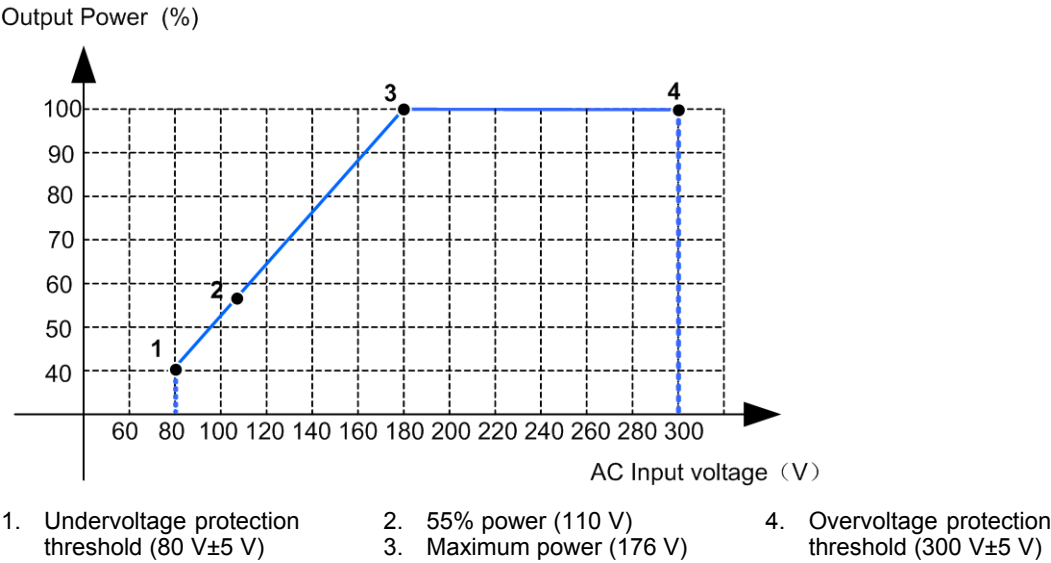


Figure 4-1 shows the relationship between the AC input voltage and the output power of the ZXD3000 rectifier. For a description of the relationship, refer to Table 4-2.

Table 4-2 Descriptions of the Relationship Between the AC Input Voltage and the Output Power of the ZXD3000 Rectifier

AC Input Voltage	Output Power (Percentage of the Maximum Power)
$\leq 80\text{ V}\pm 5\text{ V}$	0%
$(80\text{ V}\pm 5\text{ V})\text{--}110\text{ V}$	40%–55%
110 V–176 V	55%–100%
176 V– $(300\text{ V}\pm 5\text{ V})$	100%
$> 300\text{ V}\pm 5\text{ V}$	0%

4.3 Output Features

Figure 4-2 shows the output features of the ZXD3000 rectifier.

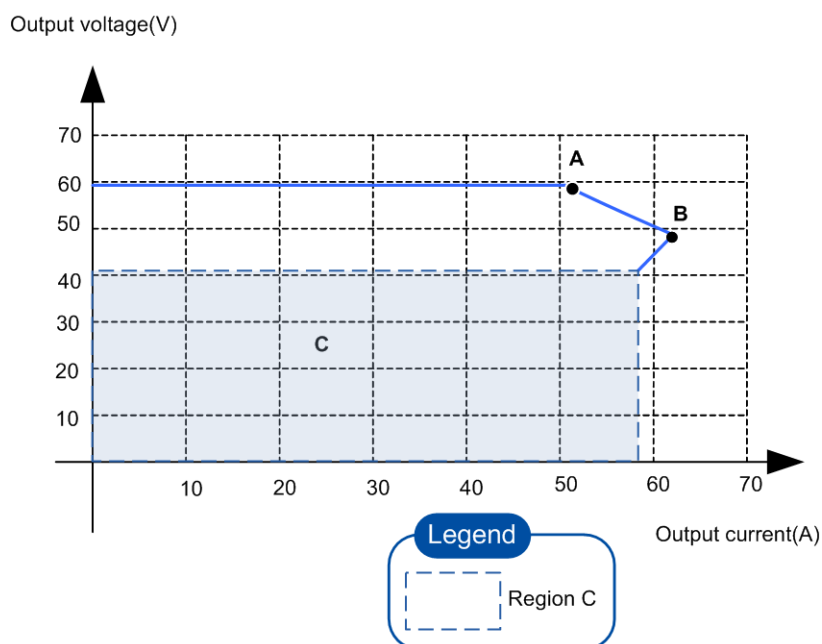
Figure 4-2 Output Features of the ZXD3000 Rectifier

Figure 4-2 shows the output features of the ZXD3000 rectifier in the following conditions:

- Point A corresponds to output voltage 58 V, and the typical output current capacity is 52.5 A.
- Point B corresponds to output voltage 48 V, and the typical output current capacity is 63.5 A.
- Area C corresponds to output voltage lower than 41 V. In this area, the ZXD3000 rectifier must operate stably and reliably, basic requirements for connecting power units in parallel must be met, and there is no mandatory requirement for the output features.
- When the output voltage is between 41 V and 48 V, the output current is constant.
- When the output voltage is lower than 36 V, the ZXD3000 rectifier restarts for protection.

If the ambient temperature is higher than 55 °C, the ZXD3000 enters the power decrease with high temperature mode. If the input voltage is lower than 176 V, the ZXD3000 enters the input power limit mode. If both the input voltage and ambient temperature are high, the maximum current limit threshold is further reduced. In that case, the maximum power and maximum output current are simultaneously affected by the input voltage, output voltage, and ambient temperature.

4.4 Power Decrease in High Temperature

When the ambient temperature exceeds the overtemperature threshold, the output power of the ZXDU68 B201 rectifier decreases with the rise in temperature.

Figure 4-3 shows the this feature of the ZXDU68 B201 rectifier. For a description of this feature, refer to Table 4-3.

Figure 4-3 Power Decrease in High Temperature

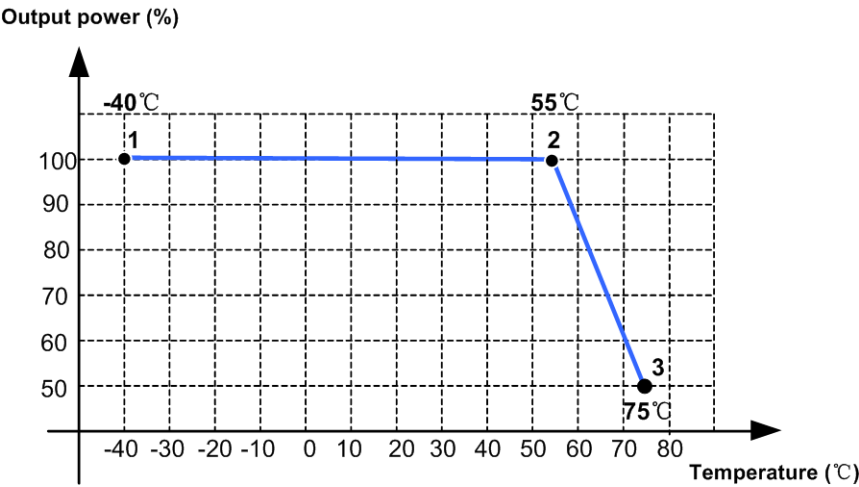


Table 4-3 Power Decrease in High Temperature

Ambient Temperature	Output Power (Percentage of the Maximum Power)
-40 °C—+55 °C	100%
+55 °C—+75 °C	The output power decreases linearly as the temperature rises. When the ambient temperature reaches 75 °C, the output power is no lower than 50% of the maximum power.
> 75°C	0% (The ZXDU68 B201 rectifier is shut down for protection due to overtemperature.)

Appendix A

Alarm List

Table A-1 lists the alarms that can be detected by the CSU501B, and describes their default alarm levels and output relays.

- A1–A6 refer to the interfaces of six output relays of the power system.
- One output relay can associate with multiple alarms, but each alarm can be related to one output relay only. When an alarm occurs, it indicates that problems occur on the corresponding output relay. If the relay is set to **No**, it indicates that no output relay is assigned to an alarm.
- If the alarm level of an alarm is set to **Mask**, its output relay attributes are invalid.

Table A-1 Alarm List

No.	Alarm Name	Alarm Level	Output Relay	Alarm Description
Battery and System Alarms				
1	Common Alarm	Mask	A1	The CSU detects that an alarm occurs.
2	In-Relay-1#	Mask	None	An alarm occurs on In-Relay-1#.
3	In-Relay-2#	Mask	None	An alarm occurs on In-Relay-2#.
4	In-Relay-3#	Mask	None	An alarm occurs on In-Relay-3#.
5	In-Relay-4#	Mask	None	An alarm occurs on In-Relay-4#.
6	In-Relay-5#	Mask	None	An alarm occurs on In-Relay-5#.
7	In-Relay-6#	Mask	None	An alarm occurs on In-Relay-6#.
8	In-Relay-7#	Mask	None	An alarm occurs on In-Relay-7#.
9	In-Relay-8#	Mask	None	An alarm occurs on In-Relay-8#.
10	In-Relay-9#	Mask	None	An alarm occurs on In-Relay-9#.
11	In-Relay-10#	Mask	None	An alarm occurs on In-Relay-10#.
12	In-Relay-11#	Mask	None	An alarm occurs on In-Relay-11#.
13	In-Relay-12#	Mask	None	An alarm occurs on In-Relay-12#.
14	Batt.Test Fail	Mask	A2	The Battery test fails.
15	LLVD1 Alarm	Critical	A2	The system performs LLVD1.
16	LLVD2 Alarm	Critical	A2	The system performs LLVD2.
17	Batt.Det.Abr.	Critical	A2	The battery detection is abnormal.
18	BLVD Alarm	Critical	A2	The system performs BLVD.

No.	Alarm Name	Alarm Level	Output Relay	Alarm Description
19	LLTD Alarm	Critical	A2	If the ambient temperature is lower than the threshold, the system performs LLVD1 and LLVD2.
20	BHTD Alarm	Critical	A2	If the battery temperature is higher than the threshold, the system performs BLVD.
21	All Alarm Blocked	Critical	A2	The system does not display real-time alarms.
22	Batt. Equal	Mask	A2	The system charges the batteries in equalization charging mode.
23	BMU Comm. Fail	Major	A2	The Battery Monitoring Unit (BMU) fails to communicate with the CSU.
24	BLTD Alarm	Critical	A6	If the battery temperature is lower than the threshold, the system enables the BLTD function and performs BLVD.
25	Battery Testing	Mask	A2	The system is performing a battery test.
26	Sys.OverLoad Alm.	Critical	A6	The load capacity exceeds the load capability of the system.
27	Multi-SMR Alm.	Major	None	Two or more than two rectifiers are faulty or fail to communicate with the CSU.
28	IOB Comm. Brk.	Major	A2	The communication between the IO board and CSU is interrupted.
29	MAC Not Set	Major	A2	The MAC address is not set.
30	FBMU CommFail	Major	None	The FeLi Battery Management Unit (FBMU) fails to communicate with the CSU.
AC Alarms				
31	AC Power Off	Major	A3	The mains power fails and there is no standby AC input.
32	AC Volt.High	Major	A3	The detected AC input voltage is higher than the threshold.
33	AC Volt.Low	Major	A3	The detected AC input voltage is lower than the threshold.
34	AC Phase Lack	Major	A3	The AC input lacks one phase or two.
35	AC Curr.High	Major	A3	The AC input current is higher than the threshold.
36	AC Volt.Imbala.	Major	A3	The difference between AC input voltages is greater than AC Volt.Imbala.

No.	Alarm Name	Alarm Level	Output Relay	Alarm Description
37	AC Out.SW Off	Major	A3	The auxiliary AC output circuit breaker is off.
38	AC In.Switch Off	Major	A3	The AC input circuit breaker is off.
39	AC SPD Abr.	Major	A3	The AC Surge Protection Device (SPD) is damaged or not installed.
40	ACEM Comm. Brk.	Major	A2	The communication between the AC energy meter and the CSU is interrupted.
41	AC Freq.High	Major	None	The AC input frequency is higher than the threshold.
42	AC Freq.Low	Major	None	The AC input frequency is lower than the threshold.
43	ATS AC1 Sig. Abr	Mask	A2	The mains supply signals of the Automatic Transfer Switch (ATS) are abnormal.
Rectifier Alarms				
44	SMR Alarm	Major	None	The rectifier is faulty.
45	SMR Fan Fault	Major	A4	The fan of the rectifier is faulty.
46	SMR In.V.H.O.	Major	A4	The AC input voltage of the rectifier is higher than the maximum input voltage.
47	SMR In.V.L.O.	Major	A4	The AC input voltage of the rectifier is lower than the minimum input voltage.
48	SMR Out.V.H.O.	Major	A4	The output voltage of the rectifier is higher than the maximum output voltage.
49	SMR Out.C.H.	Major	A4	The output current of the rectifier is higher than the maximum output current (68 A).
50	SMR Inter.T.H.	Major	A4	The temperature at the air inlet of the rectifier is higher than the maximum internal temperature.
51	SMR Input Off	Major	A4	The power input of the rectifier is interrupted.
52	SMR Comm.Fail	Major	A4	The communication between the rectifier and the CSU is interrupted because the rectifier is removed or communication exceptions occur.
53	SMR In.Freq.	Major	A4	The input frequency of the rectifier is too high or too low.
54	SMR No Match	Major	A4	Rectifier model does not match.

No.	Alarm Name	Alarm Level	Output Relay	Alarm Description
DC Alarms				
55	DC Volt.High	Major	A5	The DC output voltage is higher than the threshold.
56	DC Volt.Low	Major	A5	The DC output voltage is lower than the threshold.
57	DC SPD Abr.	Major	A5	The DC SPD is faulty or not installed.
58	Batt.Volt.Low	Major	A5	The voltage of the battery set is lower than the threshold.
59	Batt.Curr.Abr.	Minor	A5	The current of the battery set is abnormal.
60	Batt.Temp.High	Major	A5	The battery temperature is higher than the threshold.
61	Batt.Temp.Low	Major	A5	The battery temperature is lower than the threshold.
62	Batt.Loop Brk.	Critical	A5	The battery loop is disconnected.
63	Batt.Dischg.	Minor	A5	The battery set is discharging.
64	Batt.T.Invalid	Warning	A5	The system is configured with batteries, but the battery temperature detection is invalid. If the battery temperature sensor is not installed or the battery temperature is beyond the detection range, this alarm is reported.
65	LLVD1 Extend Brk.	Major	A5	The extended LLVD1 circuit breaker is off or the extended LLVD1 fuse blows.
66	LLVD1 Loop Brk.	Major	A5	The LLVD1 circuit breaker is off or the LLVD1 fuse blows.
67	LLVD2 Extend Brk.	Major	A5	The extended LLVD2 circuit breaker is off or the extended LLVD2 fuse blows.
68	BLVD Extend Brk.	Major	A5	The extended BLVD circuit breaker is off or the extended BLVD fuse blows.
69	BLVD Loop Brk.	Major	A5	The BLVD circuit breaker is off or the BLVD fuse blows.
70	Cell Reverse	Major	None	One or multiple 2 V batteries are reversely connected.
71	Block Reverse	Major	None	One or multiple 12 V batteries are reversely connected.

No.	Alarm Name	Alarm Level	Output Relay	Alarm Description
72	Cell Poor	Major	None	The voltage of one or multiple 2 V batteries is lower than the threshold.
73	Block Poor	Major	None	The voltage of one or multiple 12 V batteries is lower than the threshold.
74	DC.Loop.Brk.	Critical	None	The DC output circuit breaker is off or the DC output fuse blows.
75	Load Ext. Brk.	Major	A5	The extended DC output circuit breaker is off or the extended DC output fuse blows.
76	Cell COCA_Li	Critical	None	During charging, the current of the Feli battery set is higher than the threshold.
77	Cell DOCA_Li	Critical	None	During discharging, the current of the Feli battery set is higher than the threshold.
78	Cell DOTA_Li	Critical	None	During discharging, the temperature of one or multiple Feli batteries is higher than the threshold.
79	Cell DUTA_Li	Critical	None	During discharging, the temperature of one or multiple Feli batteries is lower than the threshold.
80	Cell OVA_Li	Critical	None	The voltage of one or multiple Feli batteries is higher than the threshold.
81	Cell UVA_Li	Critical	None	The voltage of one or multiple Feli batteries is lower than the threshold.
82	Cell Poor_Li	Critical	None	The voltage of one or multiple Feli batteries is lower than the threshold.
83	Batt.UVP_Li	Critical	A1	The under-voltage protection function of the battery set is enabled.
84	Batt.DOCP_Li	Critical	A1	During discharging, the over-current protection function of the battery set is enabled.
85	Batt.COCP_Li	Critical	A1	During charging, the over-current protection function of the battery set is enabled.
86	Cell DOTP_Li	Critical	A1	During discharging, the over-temperature protection function of one or multiple Feli batteries is enabled.
87	Cell DUTP_Li	Critical	A1	During discharging, the low-temperature protection function of one or multiple Feli batteries is enabled.

No.	Alarm Name	Alarm Level	Output Relay	Alarm Description
88	Cell OVP_Li	Critical	A1	The over-voltage protection function of one or multiple Feli batteries is enabled.
89	Cell UVP_Li	Critical	A1	The under-voltage protection function of one or multiple Feli batteries is enabled.
90	Cell TI_Li	Critical	None	The temperature sensor of one or multiple Feli batteries is invalid.
91	Batt.OVP_Li	Critical	A1	The over-voltage protection function of the battery set is enabled.
92	Cell COTA_Li	Critical	None	During charging, the temperature of one or multiple Feli batteries is higher than the threshold.
93	Cell CUTA_Li	Critical	None	During charging, the temperature of one or multiple Feli batteries is lower than the threshold.
94	Cell COTP_Li	Critical	A1	During charging, the COTP function of one or multiple Feli batteries is enabled.
95	Cell CUTP_Li	Critical	A1	During charging, the CUTP function of one or multiple Feli batteries is enabled.
96	Chg.Over T._Li	Critical	A1	The charging duration is higher than the threshold.
97	Chg.Sw.Inv_Li	Critical	None	The charging switch is invalid.
98	Dch.Sw.Inv_Li	Critical	None	The discharging switch is invalid.
99	Batt. CI_Li	Critical	None	The current sensor of the Feli battery set is invalid.
100	Batt. VI_Li	Critical	None	The voltage sensor of the Feli battery set is invalid.
101	Batt.UVA_Li	Major	None	The voltage of the Feli battery set is lower than the threshold.
102	Batt.LowSOC_Li	Critical	None	The SOC of the Feli battery is lower than the threshold.
Environment Alarms				
103	Env.Temp.High	Minor	A6	The ambient temperature is higher than the threshold.
104	Env.Temp.Low	Minor	A6	The ambient temperature is lower than the threshold.

No.	Alarm Name	Alarm Level	Output Relay	Alarm Description
105	Env.Hum.High	Minor	A6	The ambient humidity is higher than the threshold.
106	Env.Hum.Low	Minor	A6	The ambient humidity is lower than the threshold.
107	Door Alarm	Minor	A6	The door is detected open.
108	Access Ctrl.Alm.	Mask	A6	The access control sensor detects the intrusion of something.
109	Smog Alarm	Major	A6	The smog sensor detects smog.
110	Flood Alarm	Major	A6	The flood sensor detects flood.
111	Glass Brk.Alm.	Minor	A6	The glass broken sensor detects broken glasses.
112	Env.Temp.Invalid	Mask	A6	The system is not equipped with an effect ambient humidity sensor or the detection result of the ambient humidity sensor is beyond the detection range.
113	Env.Hum.Invalid	Mask	A6	The system is not equipped with an effect ambient humidity sensor or the detection result of the ambient humidity sensor is beyond the detection range.
114	Env.OTA_Li	Minor	None	The ambient temperature is higher than the threshold.
115	Env.UTA_Li	Minor	None	The ambient temperature is lower than the threshold.

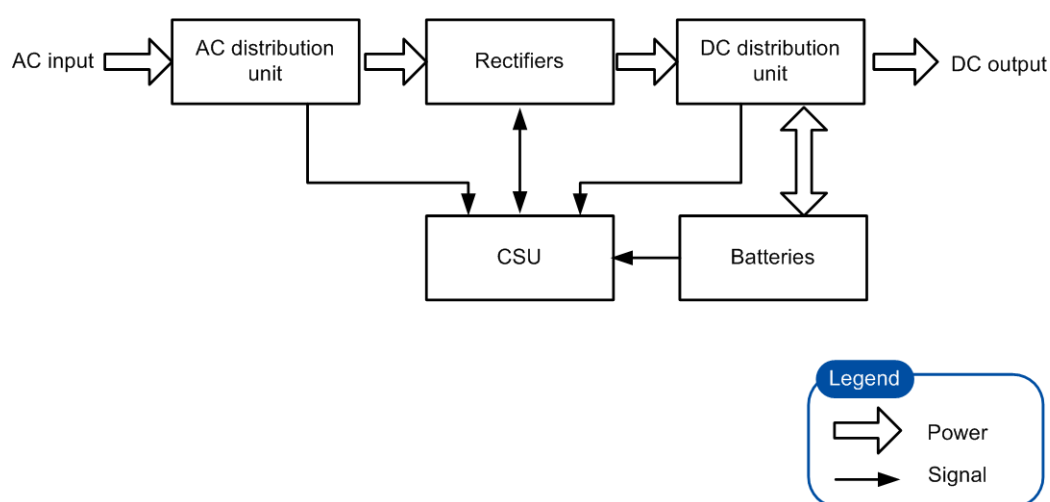
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Appendix B

Electrical Connection Diagram

For the operating principle diagram of the ZXDU68 B201 system, see [Figure B-1](#).

Figure B-1 Operating Principle Diagram of the ZXDU68 B201 System



The system components are described as follows.

- AC distribution unit: Connects AC input to the system and distributes AC power.
- Rectifiers: Convert AC to DC.
- DC distribution unit: Provides DC output to the loads and connects the batteries to the system.
- CSU: Controls and manages the system.
- Batteries: Provide standby DC power to the loads when the mains is failure.

For the detailed electrical connection diagrams of the ZXDU68 B201 system, see the following figures:

- (V5.0R99M01) system: see [Figure B-2](#).
- (V5.0R99M03) system: see [Figure B-3](#).
- (V5.0R99M04) system: see [Figure B-4](#).
- (V5.0R99M05) system: see [Figure B-5](#).

Figure B-2 Electrical Connection Diagram of the ZXDU68 B201 (V5.0R99M01) System

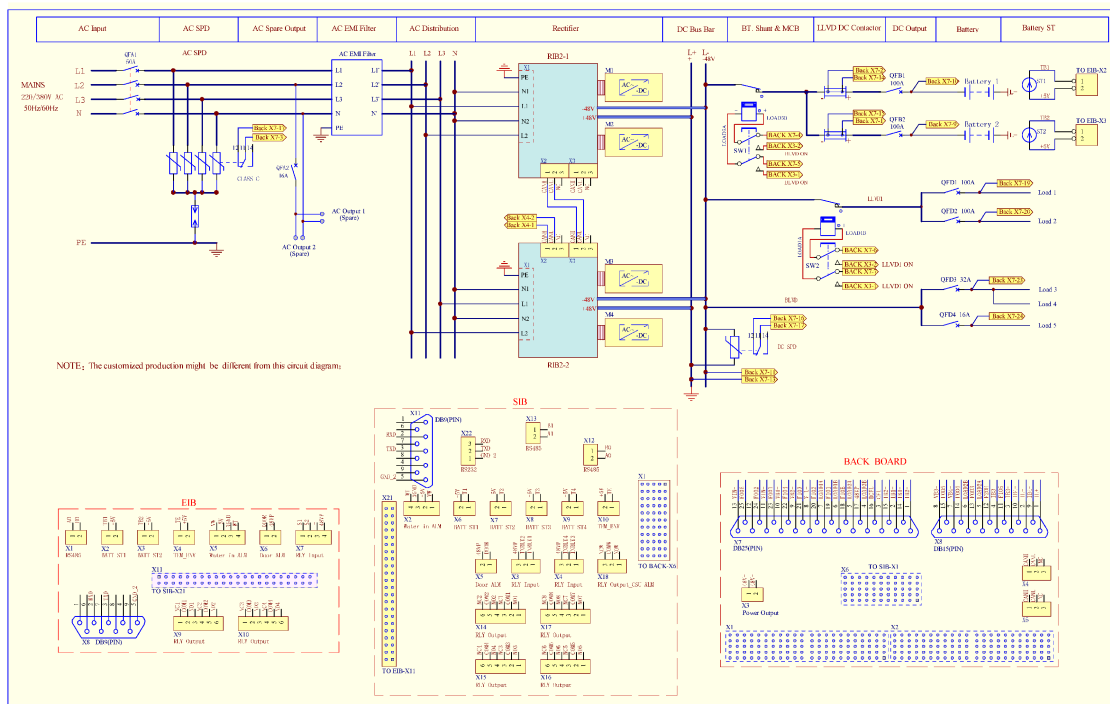


Figure B-3 Electrical Connection Diagram of the ZXDU68 B201 (V5.0R99M03) System

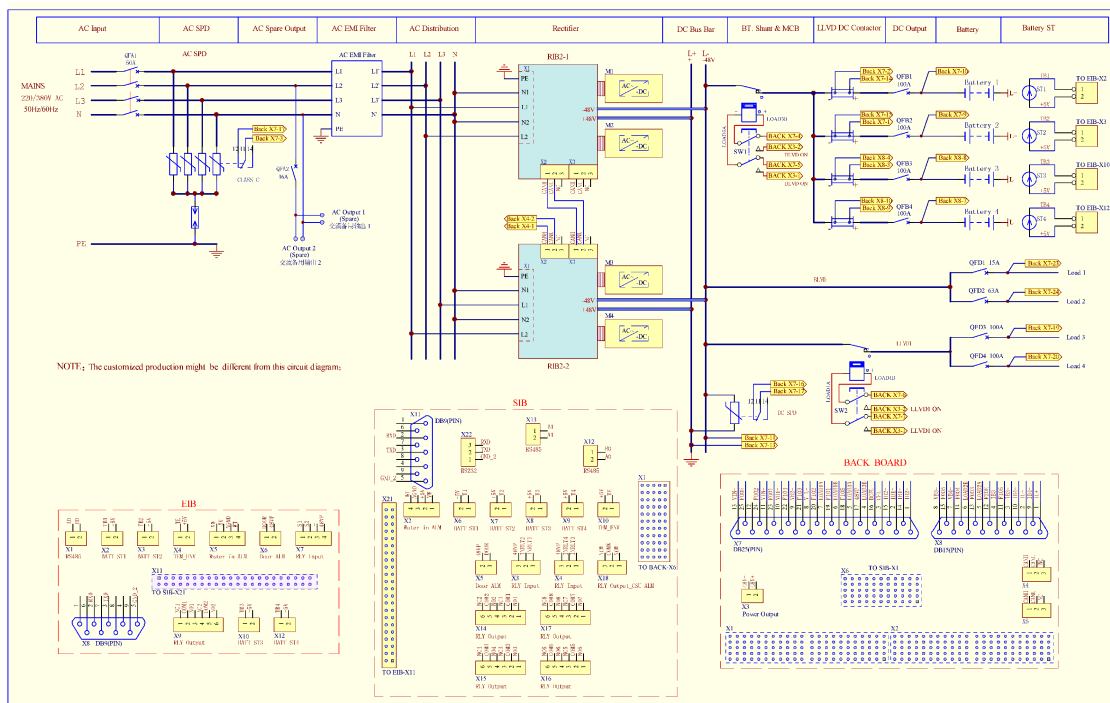


Figure B-4 Electrical Connection Diagram of the ZXDU68 B201 (V5.0R99M04) System

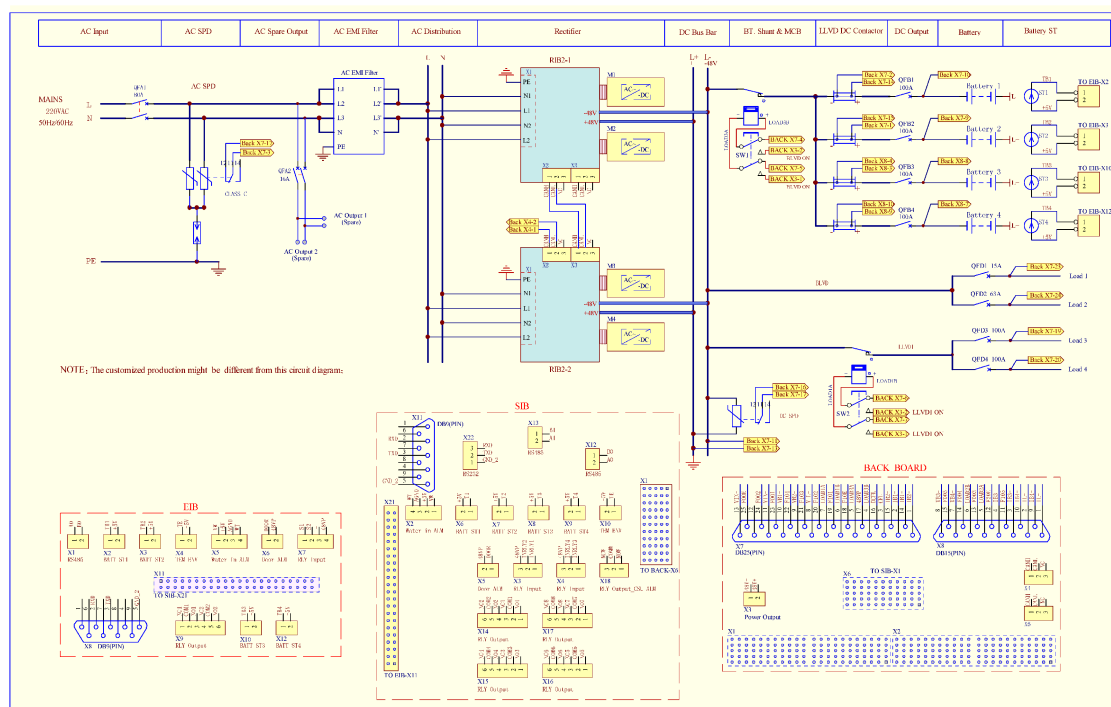
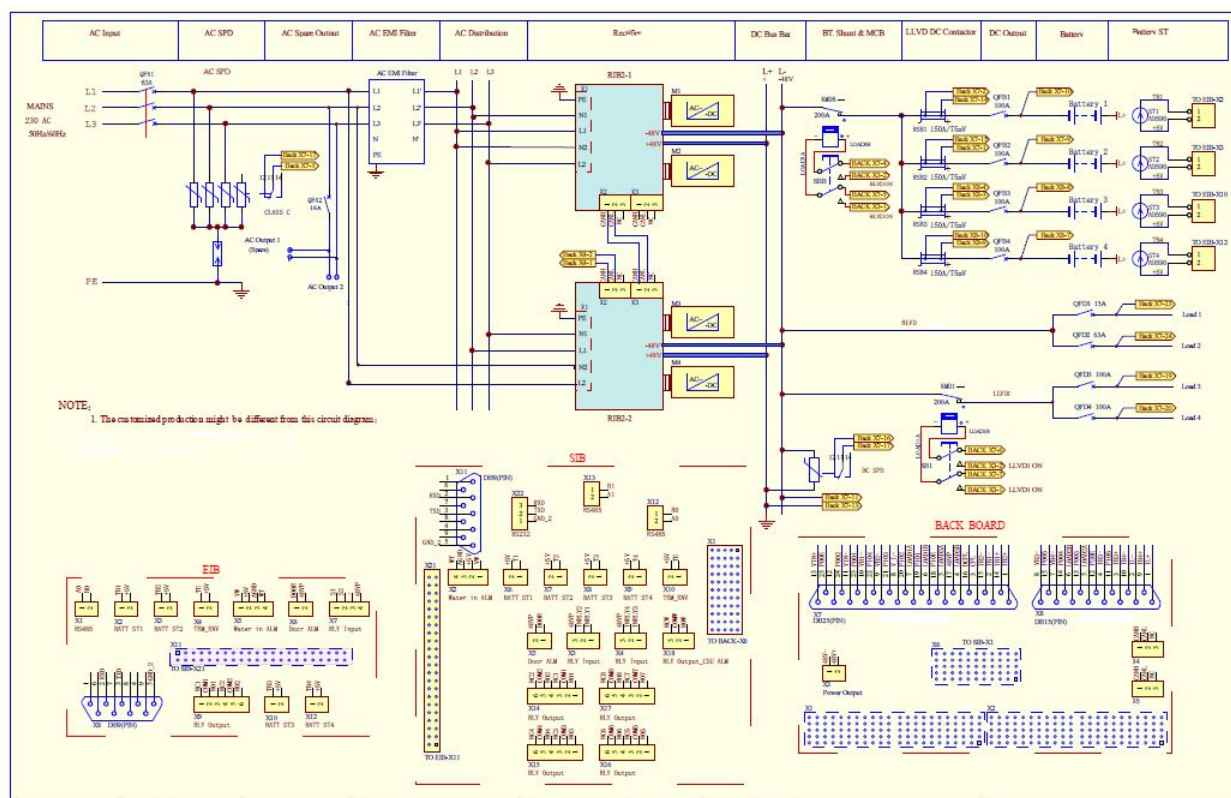


Figure B-5 Electrical Connection Diagram of the ZXDU68 B201 (V5.0R99M05) System



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Glossary

ATS

- Automatic Transfer Switch

BHTD

- Battery High Temperature Disconnect

BLTD

- Battery Low Temperature Disconnect

BLVD

- Battery Low Voltage Disconnect

BMU

- Battery Monitoring Unit

CAN

- Controller Area Network

CSU

- Centralized Supervision Unit

EMC

- Electromagnetic Compatibility

EMI

- Electromagnetic Interference

ESD

- Electrostatic Discharge

FBMU

- FeLi Battery Management Unit

FTP

- File Transfer Protocol

GPRS

- General Packet Radio Service

HTTP

- Hypertext Transfer Protocol

LCD

- Liquid Crystal Display

LED

- Light Emitting Diode

LLTD

- Load Low Temperature Disconnect

LLVD

- Load Low Voltage Disconnect

MCB

- Miniature Circuit Breaker

MTBF

- Mean Time Between Failures

RoHS

- Restriction of Hazardous Substances

SC

- Supervision Center

SD

- Secure Digital memory card

SIU

- Signal Interface Unit

SMR

- Switching Mode Rectifier

SNMP

- Simple Network Management Protocol

SPD

- Surge Protection Device

THD

- Total Harmonic Distortion

USB

- Universal Serial Bus