



ZXDU58 B900

DC Power System

Product Description

Version: V4.5R01M01

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About This Manual

Purpose

This manual applies to the ZXDU58 B900 (V4.5R01M01) DC Power System (the ZXDU58 B900 system for short). The ZXDU58 B900 system provides power for -48 V communications equipment.

This manual describes the structure, characteristics, and specifications of the ZXDU58 B900 system.

Intended Audience

This manual is intended for:

- Planning engineers
- Maintenance engineers

What Is in This Manual

This manual contains the following chapters/appendices:

Chapter/Appendix	Summary
1, System Overview	Introduces the ZXDU58 B900 system and describes the system features.
2, System Structure and Components	Describes the system structure, the ZXD030 S480 rectifier, the Centralized Supervision Unit (CSU), and signal interfaces on the Signal Interfaces Board (SIB).
3, System Specifications	Describes environment specifications, technical specifications, and compliance standards.
4, ZXD030 S480 Rectifier Specifications	Describes the technical specifications, internal protection functions, and output power control of the ZXD030 S480 (V1.0) rectifier.
5, Configuration List	Describes the system configuration.
6, Alarm List	Describes the alarm names, default alarm levels, and output relays.
A, Electrical Connection Diagram	Provides the electrical connection diagram of the ZXDU58 B900 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	Note: provides additional information about a certain topic.

Chapter 1

System Overview

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1.1 System Introduction

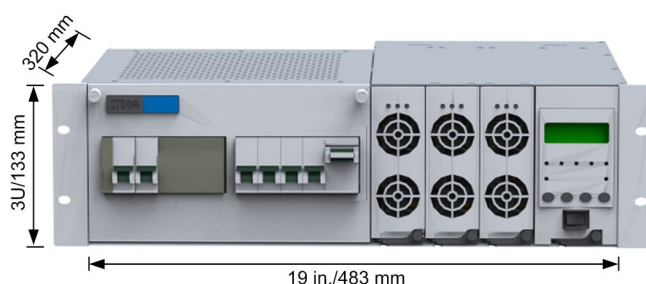
The ZXDU58 B900 system is designed to be installed in a cabinet. It is 19 inches in width and 3U in height.

- The system can provide power for -48 V communications equipment.
- AC input mode: Single-phase three-wire (L/N/PE), 220 V (phase voltage)
- DC output current

When fully configured, the system is equipped with three ZXD030 S480 rectifiers and can provide a maximum output current of 90 A.

For the appearance and dimensions of the ZXDU58 B900 system, see [Figure 1-1](#).

Figure 1-1 ZXDU58 B900 Appearance



1.2 System Features

The ZXDU58 B900 system has the following features:

- A wide range of input phase voltage (90 VAC - 264 VAC) makes the system suitable for areas with unstable voltage.
- The ZXDU58 B900 chassis contains the power distribution unit, rectifiers, and CSU.
- The ZXDU58 B900 system supports multiple networking modes, such as RS232, RS485.
- Hot-pluggable rectifiers.
- Intelligent CSU.
- High reliability with Mean Time Between Failures (MTBF) $\geq 2.2 \times 10^5$ h.

- Compact structure design. The ZXDU58 B900 chassis is 3U in height and 19 inches in width. It is designed to be installed into a cabinet.

Chapter 2

System Structure and Components

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2.1 System Structure

For the structure of the ZXDU58 B900 system, see [Figure 2-1](#).

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

Figure 2-1 Structure of the ZXDU58 B900 System

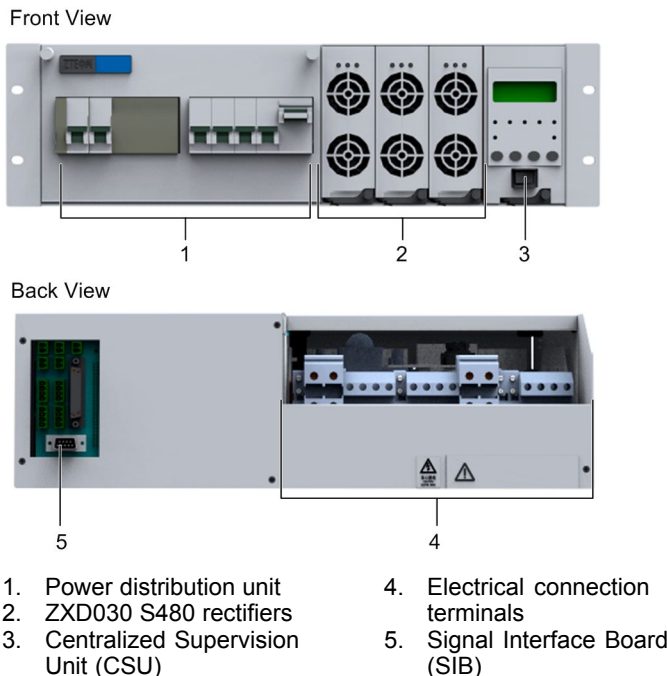


Table 2-1 System Component Description

S.N.	Component	Description
1	Power distribution unit	Provides AC power distribution and DC power distribution to the system.

S.N.	Component	Description
2	ZXD030 S480 rectifiers	Convert AC to DC. For further details, refer to 2.2 ZXD030 S480 Rectifier .
3	Centralized Supervision Unit (CSU)	Collects the system operation data and manages the system. For further details, refer to 2.3 Centralized Supervision Unit .
4	Electrical connection terminals	Connect AC input, AC output, DC input, and DC output cables.
5	Signal Interface Board (SIB)	Provides interfaces for supervision and networking. For further details, refer to 2.4 Signal Interfaces on the SIB .

The power distribution unit is shown in [Figure 2-2](#). For a description of the power distribution unit, refer to [Table 2-2](#).

Figure 2-2 Power Distribution Unit

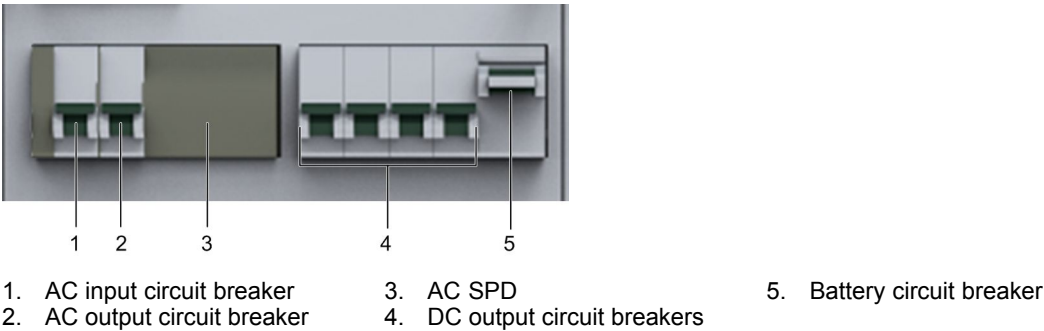
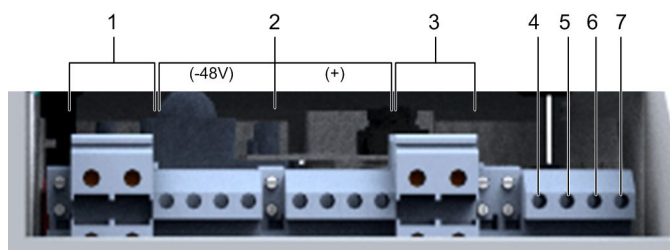


Table 2-2 Power Distribution Unit Description

S.N.	Item	Description
1	AC input circuit breaker	- To turn on/off AC input live wires. - When the AC input breaker is turned on, the rectifiers automatically turn on.
2	AC output circuit breaker	To turn on/off AC output of ZXDU58 B900.
3	AC SPD	Provides AC input surge protection.
4	DC output circuit breakers	To turn on/off DC output with overload protection.
5	Battery circuit breaker	To turn on/off battery input.

The electrical connection terminals are shown in [Figure 2-3](#). For a description of the electrical connection terminals, refer to [Table 2-3](#).

Figure 2-3 Electrical Connection Terminals

- | | | |
|---|--|--------------------------------------|
| 1. Battery input connection terminals (-48 V) | 4. AC output connection terminal (L) | 7. AC input connection terminal (PE) |
| 2. DC output connection terminals (-48 V, +) | 5. AC input connection terminal (L) | |
| 3. Battery input connection terminals (+) | 6. AC input/output connection terminal (N) | |

Table 2-3 Electrical Connection Terminals Description

S.N.	Item	Description
1	Battery input connection terminals (-48 V)	Connect battery input (-48 V) cables.
2	DC output connection terminals (-48 V, +)	Connect DC output cables.
3	Battery input connection terminals (+)	Connect battery input (+) cables.
4	AC output connection terminal (L)	Connects AC output live wire.
5	AC input connection terminal (L)	Connects AC input live wire.
6	AC input/output connection terminal (N)	Connects AC input/output neutral wire.
7	AC input connection terminal (PE)	Connects AC input PE wire.

2.2 ZXD030 S480 Rectifier

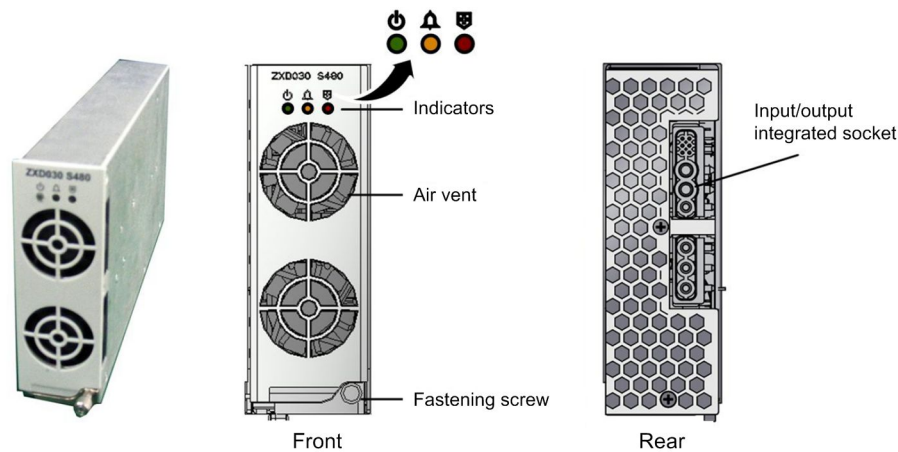
This section is applicable to ZXD030 S480 (V1.0) rectifier.

The ZXD030 S480 rectifiers convert AC to DC, power DC loads and charge the batteries.

Appearance

For the appearance of the ZXD030 S480 rectifier, see [Figure 2-4](#).

Figure 2-4 ZXDU030 S480 (V1.0) Rectifier



Indicators

The indicators display the operational status of the rectifier. For the indicators of the rectifier, see Figure 2-5. For a description of the working status of the indicators, refer to Table 2-4.

- Normally, only the power indicator is lit.
- In case that output current limit occurs, the power indicator flashes.
- In case that a system fault occurs, the alarm indicator is lit. For example, in case of under-voltage protection, the power indicator is not lit and the alarm indicator is lit.
- In case a rectifier fault occurs, the fault indicator is lit.
- When the power and alarm indicators flash at the same time, a program is being downloaded.

Figure 2-5 Rectifier Indicators

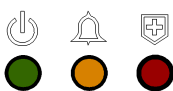


Table 2-4 Status Indication

Indicator	Normal Status	Abnormal Status	Indication
 Power (green)	Lit	Not lit	No AC input or the AC input voltage is lower than 75 V.
		Flashing	Output current limit

Indicator	Normal Status	Abnormal Status	Indication
 Alarm (yellow)	Not lit	Lit	● AC input over/under-voltage ● PFC output over/under-voltage ● Over-temperature
		Flashing	● Fast flashing: The communication between the rectifier and the CSU is interrupted. ● Slow flashing: The rectifier is in the sleep mode.
 Fault (red)	Not lit	Lit	● DC output over-voltage/current ● Output fuse blows ● Fan fault ● Other fault

2.3 Centralized Supervision Unit

The Centralized Supervision Unit (B900-**CSU**) manages the power distribution unit, rectifiers and batteries of the ZXDU58 B900 system.

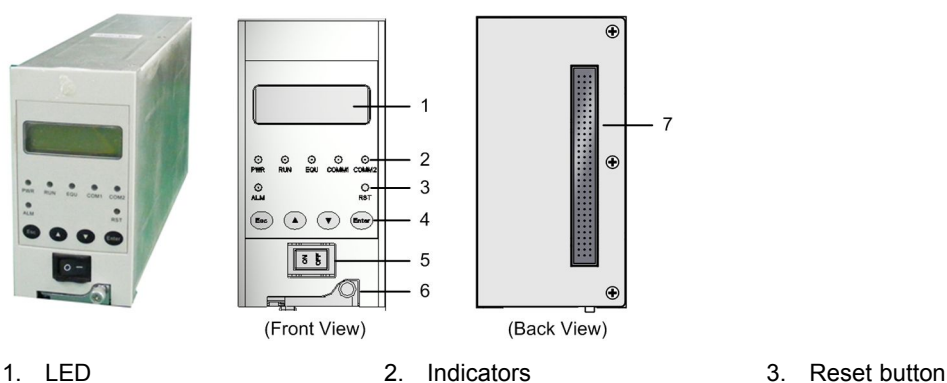
Functions

- Gives an audible and visual alarm and provides the protection function when the system is faulty.
- Collects the operational data and monitors the operations of the system.
- Performs advanced battery management with protection functions.
- Transmits data to the background Supervision Center (**SC**) and receives commands from the SC. In this way, the system can be monitored remotely.

Appearance

For the appearance of the CSU, see [Figure 2-6](#).

Figure 2-6 Centralized Supervision Unit (B900-CSU)



4. Buttons

5. Power switch
6. Handle (Fastening screw)

7. Interface

Indicators

Indicators display the working status of the CSU and the system. For the appearance of the indicators, see [Figure 2-7](#). For a description of indicators, refer to [Table 2-5](#).

Figure 2-7 CSU Indicators

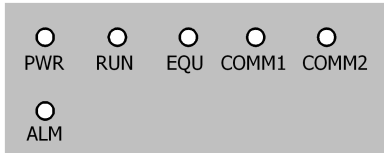


Table 2-5 CSU Indicators

Indicator	Status	Indication
PWR Power	Lit (green)	The CSU is powered on
RUN Run	Flash (green)	The CSU is operating normally
EQU Equalized charge	Lit (green)	The battery equalized charge is in the process
COMM1 Communication 1	Flash (green)	The CSU is communicating with the rectifiers
COMM2 Communication 2	Flash (green)	The CSU is communicating with the background supervision center
ALM Alarm	Flash (red)	A fault occurs to the system

Buttons and LCD

The buttons and the LCD of the CSU enable the users to query operational data of the ZXDU58 B900 system, set parameters, and control the operation of the ZXDU58 B900 system.

The button names are as follows:

- ▲/▼: up/down
- **Enter**: enter
- **Esc**: escape
- **RST**: resets the CSU

2.4 Signal Interfaces on the SIB

The Signal Interface Board (SIB) provides communication interfaces and signal interfaces.

Figure 2-8 shows the SIB. Table 2-6 describes the SIB interfaces.

Figure 2-8 SIB Interfaces

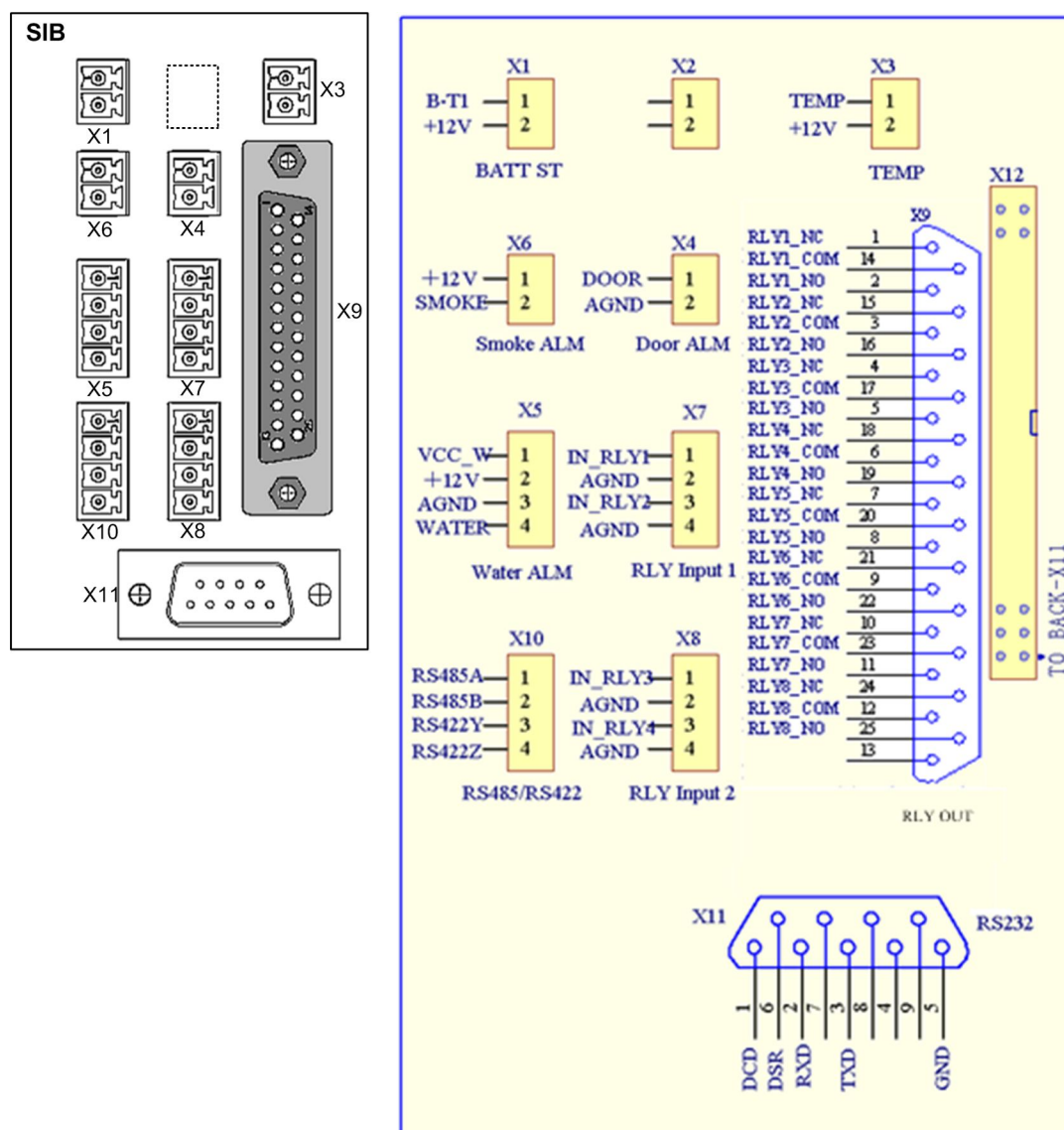


Table 2-6 SIB Interface Description

Interface		Description
Battery detection interfaces and environment detection interfaces		
X1	Battery temperature	Connects to temperature sensor of battery pack.
X3	Ambient temperature	Connects to environment temperature sensor.
X4	Door status alarm	Connects to door entrance detect sensor.
X5	Flood alarm	Connects to flood detect sensor.
X6	Smoke alarm	Connects to smoke detect sensor.
Input and output relay interfaces		

Interface		Description
X7	Input relay 1 and 2	The four input relays can be customized by the user for alarm input. The default alarm status of the input relays in the CSU are “close”.
X8	Input relay 3 and 4	
X9	Output relay 1 - Output relay 7	● The output relays 1 to 7 correspond to the software codes A1 to A7 in the CSU. ● For the default output relays for the alarms, refer to the Alarm List. ● Users can customize these output relays for alarm output.
	Output relay 8	This output relay is reserved for CSU fault.
Communication interfaces		
X10	RS485/RS422	The interface for RS485/RS422 communication.
X11	RS232	The interface for RS232 communication.

Chapter 3

System Specifications

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3.1 Environment Specifications

For the description of environment specifications of the ZXDU58 B900 system, refer to [Table 3-1](#).

Table 3-1 Environment Specifications

Item	Specification
Operational temperature	-5 °C to +45 °C, (+15 °C to +25 °C, recommended)
Storage temperature	-40 °C to +70 °C
Relative temperature	10% to 90% (non-condensing), 40% to 60% recommended
Altitude	0 to 2000 m: 100% output power 2000 m to 3000 m: The power derating percentage is 1% when the altitude increases by 100 m.
Other requirements	- Indoors - 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 ZXDU58 B900 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 Specifications

Item	Specification
Rated output current	90 A (when fully configured)
System efficiency	≥ 93%
Noise	≤ 55 dB(A)
Monitoring networking mode	RS232/RS485 serial port, and transparent transmission with the communication equipment
Mean Time Between Failures (MTBF)	≥ 2.2 × 10 ⁵ h

Table 3-3 AC Electrical Specifications

Item	Specification
AC input mode	Single-phase three-wire (L/N/PE)
AC input voltage	- Rated input voltage: 100 VAC - 240 VAC - Range: 90 VAC - 264 VAC
AC input frequency	50 Hz/60 Hz
Maximum AC input current	50 A
AC input power factor	≥ 0.99 (with full load)
AC SPD	Class C, I _{max} = 40 kA (8/20μs)
AC protection features	- AC input over-voltage protection - AC input under-voltage protection - AC input over-current protection

Table 3-4 DC Electrical Specifications

Item	Specification
DC output voltage	- Rated output voltage: -53.5 V - Range: -42 V to -58 V (adjustable in the CSU)
DC SPD	I _{max} = 15 kA (8/20μs)
Source effect	≤ 0.1%
Load effect	≤ 0.5%
Weighted noise voltage	< 1 mV
Peak-peak noise voltage	≤ 100 mV (20 MHz bandwidth)
Regulated voltage precision	≤ 0.6%
DC voltage drop inside the cabinet	< 500 mV

Item	Specification
DC protection features	● DC output over-voltage protection ● DC output under-voltage protection ● Battery under-voltage protection
Battery under-voltage protection	● LLVD1 ● LLVD2

Table 3-5 Structure Specifications

Item	Description
Chassis dimensions	133 mm × 483 mm × 320 mm (H × W × D)
Chassis weight	Approximately 11.5 kg (excluding the rectifiers and CSU)
ZXD030 S480 Rectifier weight	1.6 kg/set, three sets (when fully configured)
CSU weight	1.6 kg
Installation mode	Installation in a cabinet/rack

3.3 Compliance Standards

EMC Standards

This system is in compliance with the following Electromagnetic Compatibility (EMC) standards:

- DIN/EN 55022
- IEC61000

Safety Standards

This system is in compliance with the UL/IEC/EN 60950 standards.

Other Standards

This system is also in compliance with the following standards:

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

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Chapter 4

ZXD030 S480 Rectifier Specifications

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4.1 Technical Specifications

For the technical specifications of the ZXD030 S480 (V1.0) rectifiers, refer to [Table 4-1](#).

Table 4-1 ZXD030 S480 (V1.0) Technical Specifications

Item		Description
AC input	Input mode	Single-phase three-wire (L/N/PE)
	Input voltage	- Rated input voltage: 220 V AC - Input voltage: 85 V to 295 V
	Frequency	45 Hz ~ 65 Hz
	AC input current	≤ 10 A (RMS) (while AC input voltage is 220 V)
	Efficiency	≥ 91% (50%~100% output power percentage)
	Input power factor	≥ 0.99 (when the input and output values are rated)
	Surge current	In rated input, the starting surge current should not be more than 150% of the input current peak with the rated input. (The peak current caused by EMI capacitance is not considered.)
DC output	Output power	- Rated output power: 1605 W - Maximum output power: 1740 W
	Output voltage	- Rated output voltage: 48 V DC - Output voltage range: 42 V to 58 V (adjusted through the monitoring unit of the power system)
	Output current limit	3 A to 35 A, can be set through the monitoring unit.

Item		Description
		In case of current limit, flyback occurs when the output voltage falls below 40 V.
	Voltage stabilizing accuracy	$\leq \pm 0.6\%$
	Output weighted noise	$\leq 2 \text{ mV}$
	Broad frequency noise voltage	$\leq 30 \text{ mV}$ (3.4 kHz~150 kHz) $\leq 20 \text{ mV}$ (0.15 MHz~30 MHz)
	Discrete frequency noise voltage	$\leq 5 \text{ mV}$ (3.4 kHz~150 kHz) $\leq 3 \text{ mV}$ (150 kHz~200 kHz) $\leq 2 \text{ mV}$ (200 kHz~500 kHz) $\leq 1 \text{ mV}$ (0.5 MHz~30 MHz)
	Peak-to-peak noise voltage	$\leq 100 \text{ mV}$ (bandwidth of 20 MHz)
	Inter-rectifier load sharing	A difference between the maximum and the minimum is below 1.5 A (above 10% load).
Safety protection	Dielectric strength	- AC input terminals to the DC output terminals: 4242 V DC - AC input terminals to the chassis: 2121 V DC - DC output terminals to the chassis: 707 V DC
	Current leakage	$\leq 3.5 \text{ mA}$ (while the AC input is 220 V)
	Safety standard	In compliance with IEC60950
	Electromagnetic compatibility	In compliance with EN55022 Class B and IEC61000
Reliability		Mean time between failures (MTBF) $\geq 200,000 \text{ h}$
Cooling mode		Forced cooling, two DC fans are equipped inside the rectifier, with a wind flow amount of 14.83 CFM for each of the fans.
Environment requirement		- Operating temperature: -25°C to $+70^{\circ}\text{C}$ - Storage temperature: -40°C to $+85^{\circ}\text{C}$ - Relative humidity: 10% to 90% (non-condensing) - Air pressure: 70 kPa to 106 kPa
Dimensions		127 mm $\times$ 41 mm $\times$ 260 mm (H $\times$ W $\times$ D)
Weight		1.6 kg

4.2 Internal Protection Functions

The ZXDU58 B900 (V1.0) rectifier provides the following internal protection functions.

- AC input over/under-voltage protection

- PFC output over/under-voltage protection
- DC Output over-Voltage Protection
- DC Output over-current protection
- Over-temperature protection and fan speed control

AC Input Over/Under-Voltage Protection

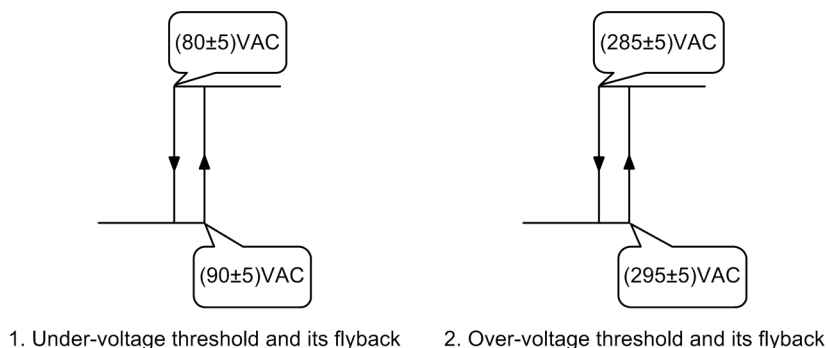
The operational status of rectifiers varies as the AC input voltage varies, refer to [Table 4-2](#). If the AC input voltage is not within the range of 85 V to 295 V, the AC input protection circuit takes effect.

Table 4-2 Relationships Between AC input voltage and Operational Status

AC Input Voltage	Operational Status	Description
< 75 V	Shutdown	The rectifiers shut down, they will start working automatically after the AC input voltage recovers.
75 V to 85 V	Low-voltage protected	The rectifiers provide no output, the Power indicator is off while the Alarm indicator is on. The rectifiers will start working automatically after the AC input voltage recovers.
85 V to 295 V	Operating normally	The rectifiers provide 48 V DC output, the Power indicator is on while the Alarm indicator is off.
> 295 V	Over-voltage protected	The rectifiers provide no output, the Power indicator is off while the Alarm indicator is on. The rectifiers will start working automatically after the AC input voltage recovers.

The different operational status are implemented by internal monitoring components (the voltage precision is ± 5 V AC), see [Figure 4-1](#).

Figure 4-1 AC Input Over/Under-Voltage Protection



PFC Output Over/Under-Voltage Protection

The PFC output over/under-voltage protection is described as follows, these protection functions are implemented through hardware. The voltage precision is ± 10 V DC and the flyback width is (15 ± 10) V DC.

- When the PFC output voltage > 440 V DC, the back DC-DC conversion circuit and the front PFC circuit stop working, and the Power indicator turns off while the Alarm indicator turns on.
- When the PFC output voltage < 340 V DC, the back DC-DC conversion circuit stops working, and the Power indicator turns off while the Alarm indicator turns on.
- The rectifiers will start working automatically after the AC input voltage recovers.

DC Output Over-Voltage Protection

The output over-voltage protection circuit prevents the DC output filter capacitor and load from damage.

Two levels of output over-voltage protection function can be implemented in the ZXD030 S480 rectifiers

- The first level is ECU (Embedded Control Unit) software over-voltage protection. The over-voltage threshold of this level is 60 V DC.

If the output voltage exceeds this over-voltage threshold, the rectifiers stop output and the Power indicator turns off while the Alarm indicator turns on. The rectifiers will start working automatically after the AC input voltage recovers, then the Power indicator turns on while the Alarm indicator turns off.

- The second level is hardware over-voltage protection. The over-voltage threshold of this level is 63 V DC.

If the output voltage exceeds this over-voltage threshold, the rectifiers stop output and the Power indicator turns off while the Alarm indicator turns on. The rectifiers can be restarted after offline troubleshooting or through operations in the monitoring unit of the DC power system.

Output Over-Current Protection

Two levels of output over-current protection functions can be implemented in the ZXD030 S480 rectifiers to prevent the rectifiers from damage caused by over-current output.

- The first level of protection function is implemented by the current limit protection circuit, the maximum current limit is 35 A.
- The second level of protection function is implemented by the over-current protection circuit, the over-current threshold is 36 A.

If the load current rises to the maximum current limit, the current limit protection circuit holds the load current to 35 A.

If the current limit protection circuit fails, the load current could exceed the maximum current limit. Then if the load current exceeds 36 A, the over-current protection circuit will take effect. The rectifiers stops output and the Power indicator turns off while the

Alarm indicator turns on. The rectifiers can not be restarted automatically, an offline troubleshooting is necessary before restarting the rectifiers.

Over-Temperature Protection and Fan Speed Control

The fan speed is controlled according to temperature. The fans may work at half speed or full speed.

In case of fans failure or the fans are already working in full speed, if the temperature continues rising, the over-temperature protection circuit will start automatically to avoid damage to the rectifiers. The over-temperature protection is described as follows.

- When the temperature exceeds the temperature protection threshold, the rectifiers stops working and the Power indicator turns off while the Alarm indicator turns on.
- When the temperature drops back to the nominal working temperature, the rectifiers resumes operation and the Power indicator turns on while the Alarm indicator turns off.

4.3 Output Power Control

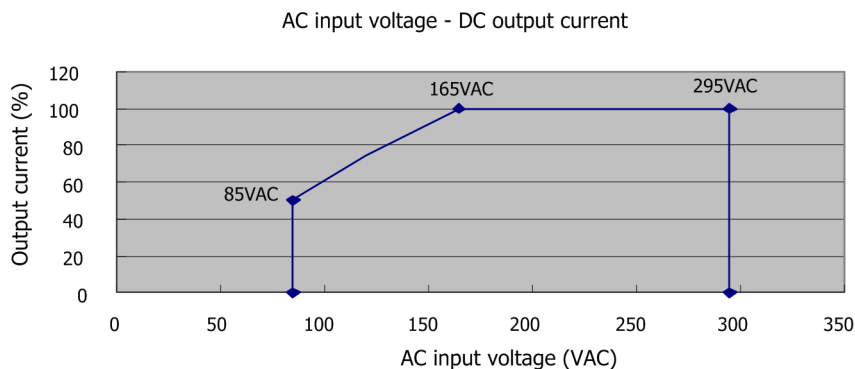
To ensure reliable operation, the output power of the ZXD030 S480 (V1.0) rectifier varies with the AC input voltage, DC output voltage, and environment temperature.

Power Control by AC Input

For the relation between the output power and the AC input voltage, see [Figure 4-2](#).

- When the AC input voltage falls in the range of 165 V ~ 295 V, the maximum output power of the rectifier is 1740 W.
- When the AC input voltage falls in the range of 85 V ~ 165 V, the maximum output power of the rectifier varies linearly with the AC input voltage.

Figure 4-2 Output Power Versus AC Input Voltage

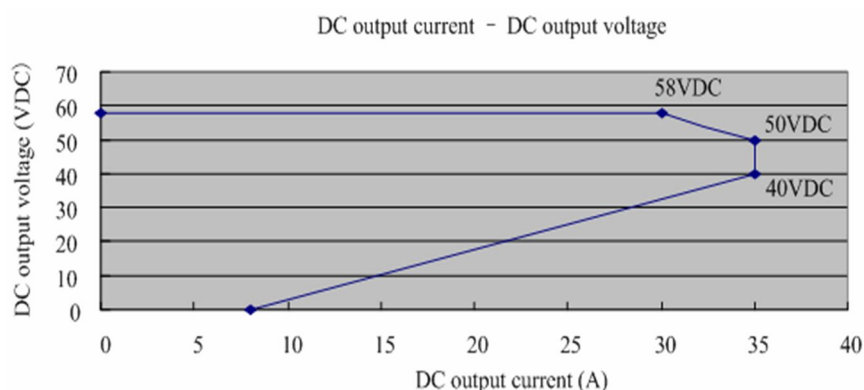


Power Control by DC Output

In the case of the AC input voltage falls in the range 165 V ~ 295 V with the maximum output power 1740 W provided, if the load keeps increasing, the output voltage will decrease. And the maximum output power decreases consequently. For a detailed curve, see [Figure 4-3](#).

- When the DC output voltage falls in the range of 50 V ~ 58 V, the output power is 1740 W. For example, when the DC output voltage is 58 V, the output current is 30 A; when the DC output voltage is 50 V, the output current is 34.8 A.
- When the DC output voltage falls in the range of 40 V ~ 50 V, the rectifier provides a constant output current 34.5 A. And the maximum output power falls linearly with the output voltage.
- When the DC output voltage falls down 40 V, the output voltage and current start flyback process.

Figure 4-3 Output Power Versus DC Output Voltage

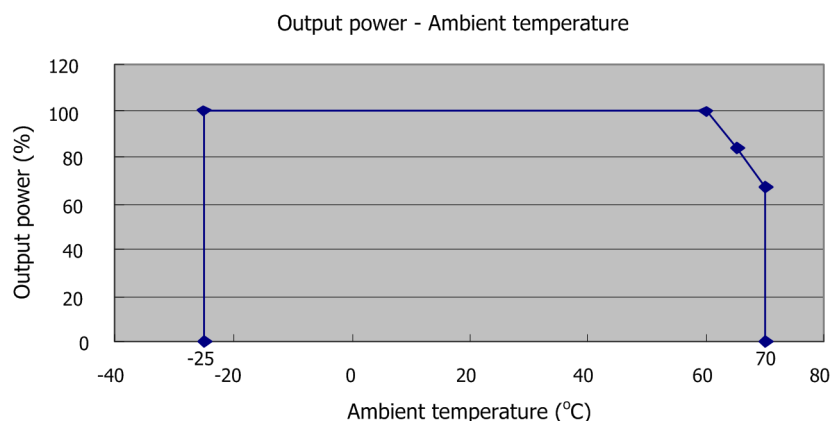


Power Control by Temperature

The output power of the ZXDU030 S480 rectifier decreases with the increase of the environment temperature when the environment temperature reaches the over-temperature threshold.

For the feature of power decrease with high temperature, see [Figure 4-4](#).

Figure 4-4 Power Decrease With High Temperature



For a description of the feature, refer to [Table 4-3](#).

Table 4-3 Power Decrease With High Temperature

Environment Temperature	Output Power (Percentage of the Maximum Power)
-25 °C to +60 °C	100%
60 °C to 70 °C	The output power decreases with the increase of the temperature and is not less than 66.67% when the temperature is 70 °C.
> 70 °C	0 (the rectifier shuts down for protection against over-temperature)

- The maximum output power of the rectifier is 1740 W.

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Chapter 5

Configuration List

Table 5-1 describes the ZXDU58 B900 system configuration.

Table 5-1 Configuration List

Item		Configuration
Chassis		One embedded chassis
Rectifier		ZXD030 S480 (V1.0) rectifiers; three sets (maximum)
Centralized Supervision Unit		B900-CSU (software version: V1.20)
AC Power Distribution	AC input	- Single-phase three-wire (L/N/PE) - One AC input, 1*50 A MCB
	AC output	1*6 A MCB
	AC SPD	One
DC Power Distribution	Battery input	1*80 A MCB 2*UIK35 terminals (battery -48 V) + 2*UIK35 terminals (battery +) (The two -48 V battery terminals are controlled by one BATT MCB.)
	DC output	- LLVD1 (2 branches): 1*63 A+1*32 A MCBs - LLVD2 (2 branches): 1*32 A+1*16 A MCBs
	Emergency light	None
	DC SPD	None
Other components		One battery temperature sensor and cable

- The customized product may be different from this table.

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Chapter 6

Alarm List

For a description of the alarms, refer to [Table 6-1](#).



Note:

- The software codes A1 to A7 correspond to the seven output relays on the Signal Interface Board (SIB).
- “No” means that no output relay is assigned to an alarm.
- Except for **Start GEN** and **Common Alarm**, the output relay for an alarm will not take effect when its alarm level is set to **Mask**.

Table 6-1 Alarms and Default Output Relays

S.N.	Alarm Name	Alarm Level and Output Relay	Alarm Description
1	Start GEN	Default level: - Default relay: 0	The generator has been started.
2	Common Alarm	Default level: - Default relay: A7	An alarm occurs.
3	AC-in Switch Off	Default level: Major Default relay: A1	The AC input switch is OFF.
4	AC Power Off	Default level: Major Default relay: A1	The mains supply is interrupted and there is no standby AC input available.
5	SPD-C Broken	Default level: Major Default relay: A3	The Class C surge arrester is faulty.
6	SPD-D Broken	Default level: Mask Default relay: A3	The Class D surge arrester is faulty.
7	AC Under-Volt	Default level: Minor Default relay: 0	The AC input voltage is lower than AC.UnderVolt .
8	AC Over-Volt	Default level: Minor Default relay: 0	The AC input voltage is higher than AC.OverVolt .
9	AC Over-Curr	Default level: Minor Default relay: 0	The AC input current is higher than AC.OverCurr .
10	SMR Over-Vout	Default level: Major Default relay: A2	The output voltage of the rectifier is higher than the threshold, and the rectifier stops output.

S.N.	Alarm Name	Alarm Level and Output Relay	Alarm Description
11	SMR Over-Iout	Default level: Major Default relay: A2	The output current of the rectifier is higher than the threshold, and the rectifier stops output.
12	SMR Fan Fault	Default level: Major Default relay: A2	The fan of the rectifier is faulty.
13	SMR PFC Fault	Default level: Major Default relay: A2	The PFC (Power Factor Correction) circuit of the rectifier is faulty.
14	SMR Over-Vin	Default level: Major Default relay: A2	The input voltage of the rectifier is higher than the threshold.
15	SMR L.Vin Off	Default level: Major Default relay: A2	The input voltage of the rectifier is lower than the threshold.
16	SMR H.T. Off	Default level: Major Default relay: A2	The temperature of the rectifier main radiator is higher than the threshold, and the rectifier stops output.
17	SMR Env.H.T.Off	Default level: Major Default relay: A2	The environment temperature of the rectifier is higher than the threshold, and the rectifier shuts down for protection.
18	SMR Env.H.T.	Default level: Minor Default relay: 0	The environment temperature of the rectifier is higher than the threshold, and the rectifier output is encountering linear load shedding.
19	SMR L.Vin	Default level: Minor Default relay: 0	The input voltage of the rectifier is lower than the threshold, and the output power of the rectifier is derated.
20	SMR Fuse Broken	Default level: Major Default relay: A2	The output fuse of the rectifier is blown.
21	SMR CommFail	Default level: Major Default relay: A2	The communication between the rectifier and the monitoring unit is interrupted.
22	DC Under-Volt	Default level: Minor Default relay: A6	The DC output voltage is lower than DC UnderVolt .
23	DC Over-Volt	Default level: Minor Default relay: 0	The DC output voltage is higher than DC OverVolt .
24	DC Loop Broken	Default level: Major Default relay: A4	The load loop is not connected.
25	Batt.Looped Brk.	Default level: Major Default relay: A4	The battery loop is not connected.
26	Bat Under-Volt	Default level: Major Default relay: A6	The battery voltage is lower than Batt.UnderVolt .

S.N.	Alarm Name	Alarm Level and Output Relay	Alarm Description
27	Bat Over-Temp	Default level: Minor Default relay: 0	The battery working temperature is higher than Batt.OverTemp .
28	TmpL Shut-down	Default level: Major Default relay: A5	The environment temperature is too low (default alarm threshold: -25°C), so all the loads are disconnected.
29	1st Shut-down	Default level: Major Default relay: A5	When the battery voltage is lower than LVD1 Volt. , the less-important loads are shut down.
30	2nd Shut-down	Default level: Major Default relay: A5	When the battery voltage is lower than LVD2 Volt. , all the loads are shut down.
31	DC SPD Broken	Default level: Major Default relay: A3	The DC surge arrester is faulty.
32	DC Breaker Alm	Default level: Mask Default relay: 0	Some breaker is faulty.
33	Batt.Test Fail	Default level: Minor Default relay: A4	The battery test is terminated despite that its duration does not reach Test Max.Hours .
34	Batt. On Load	Default level: Minor Default relay: A4	The battery is discharging.
35	Env Under-Temp	Default level: Minor Default relay: 0	The environment temperature is lower than Env.UnderTemp .
36	Env Over-Temp	Default level: Minor Default relay: 0	The environment temperature is higher than Env.OverTemp .
37	Env Under-Hum	Default level: Mask Default relay: 0	Not detected
38	Env Over-Hum	Default level: Mask Default relay: 0	Not detected
39	Smoke Alarm	Default level: Major Default relay: 0	The sensor detects the smoke.
40	Flood Alar	Default level: Major Default relay: 0	The sensor detects the entrance of water.
41	Door Magnet Alm	Default level: Minor Default relay: 0	The door with the door magnet switch is opened. Some object intrudes.
42	E.T.Invalid	Default level: Mask Default relay: 0	The environment temperature detection is invalid.
43	E.H.Invalid	Default level: Mask Default relay: 0	The environment humidity detection is invalid.

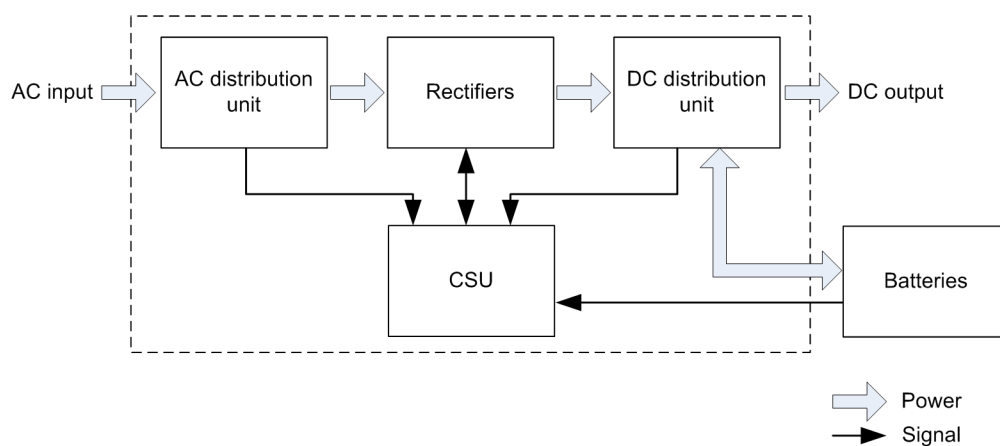
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Appendix A

Electrical Connection Diagram

For the simplified block diagram of the ZXDU58 B900 system operating principles, see [Figure A-1](#).

Figure A-1 Operating Principles of the System

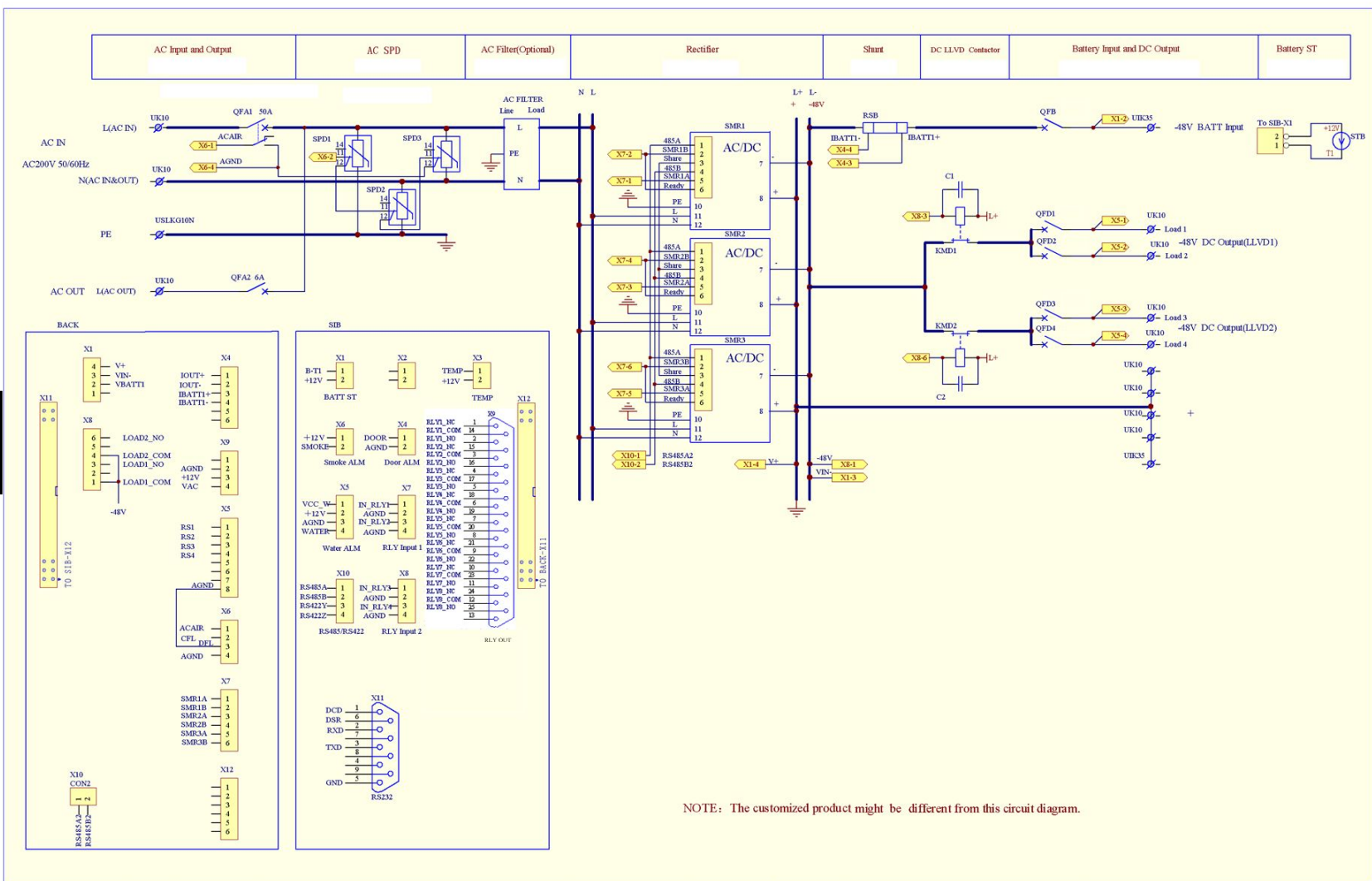


The system components are described as follows.

- AC distribution unit: The AC distribution unit connects AC input to the system and distributes AC power.
- Rectifiers: The rectifiers convert AC power to DC power.
- DC distribution unit: The DC distribution unit provides DC output to the loads and connects the batteries to the system.
- CSU: The Centralized Supervision Unit collects the system operation data and manages the system.
- Batteries: The batteries provides DC power to the loads with mains failure.

For the detailed electrical connection diagram of the ZXDU58 B900 system, see [Figure A-2](#).

Figure A-2 Electrical Connection Diagram of the ZXDU58 B900 (V4.5R01M01) System



A-2

Glossary

AC

- Alternating Current

CSU

- Centralized Supervision Unit

DC

- Direct Current

EMC

- Electromagnetic Compatibility

EMI

- Electromagnetic Interference

LLVD

- Load Low Voltage Disconnect

MCB

- Miniature Circuit Breaker

MTBF

- Mean Time Between Failures

PFC

- Power Factor Correction

RoHS

- Restriction of Hazardous Substances

SC

- Supervision Center

SIB

- Signal Interface Board

SPD

- Surge Protection Device