ETP48200 E5A1

Embedded power supply

Product specifications

Foreword

This specification applies to ETP48200 E5A1 (hereinafter referred to as ETP48200 E5A1) outdoor wall mounted DC power supply. ETP48200 E5A1 system (ETP48200 E5A1 for short) is an outdoor wall mounted DC power supply with battery compartment, which provides power supply and backup function for -48 V communication equipment.

This book is intended for the following people:

Planning Engineers

Maintenance Engineer This book contains the following chapters.

Chapter names/Appendices	Synopsis
Chapter 1 Product introduction	Describe product positioning and product features.
Chapter 2 Component description	Describe the overall structure of the ETP48200 E5A1 system, describe the power distribution unit, rectifier, and CSU.
Chapter 3 Technical specifications	Describes the technical specifications of the ETP48200 E5A1 system, including environmental specifications, performance specifications, electrical specifications, physical specifications, and system component configuration specifications.

catalogue

1. Product introduction

1.1 Product Overview

The ETP48200 E5A1 is an embedded power supply system that supplies power to communication equipment in the -48V DC series with a maximum output current of 200A.

1.2 System Features

- The voltage range is wide 85V AC ~ 300V AC
- Support LCD interface display, key operation
- Supports hot swap of rectifier module
- The normal working range of AC input voltage is wide to 90 ~ 300V
- The rectifier module adopts active power factor compensation technology, and the power factor value is greater than 0.99
- The rectifier module adopts full-bridge soft switching technology, and the efficiency can reach more than 96%
- Intelligent monitoring and management function, temperature compensation, automatic floating charge control, automatic voltage regulation, battery management and other functions
- Rectifier module adopts non-damage hot swap technology, plug and play, easy to replace.
- Network design, provide a variety of communication interfaces (such as: LAN-optional, RS485, dry contact, etc.), flexible networking, can be limited to local and remote monitoring, unattended.
- Perfect AC, DC side lightning protection design, suitable for many thunderstorms area.
- Complete fault protection, fault alarm function.
- Full frontal operation and maintenance, can be installed against the wall, effectively save space.

1.3 Working Principle

Working principle of the power supply system:

The AC power enters the rectifier module through the AC distribution unit, and the rectifier module converts the AC into -48V direct current, which is supplied by the DC distribution unit to the multiple loads.

When the AC power supply is normal, the rectifier module provides charging current for the battery in addition to supplying power to the DC load.

When the AC power is cut off, the rectifier module stops working and the battery supplies power to the DC load.

After the AC power is restored, the rectifier module re-supplies power to the DC load, and charges the battery to replenish the consumed power.

The monitoring unit monitors the running status of each component of the power system in real time, and carries out corresponding intelligent control. If any exception occurs, it reports an alarm signal in time.

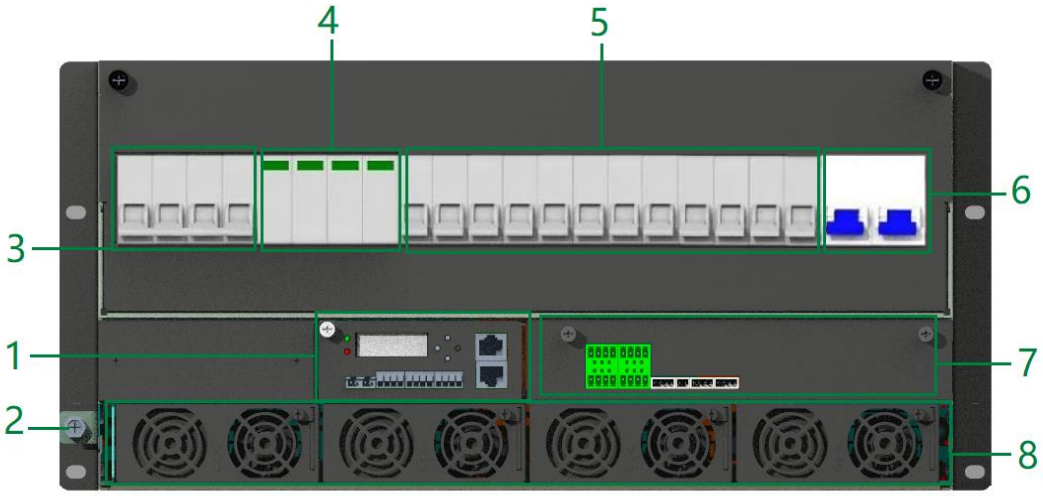
1.4 System Configuration

Items	System Configuration
Enclosures	3U power distribution space 1U monitoring installation space 1U rectifier module installation space
Power distribution unit	Ac power distribution: AC input circuit breaker Dc power distribution: major load branch (BLVD), minor load branch (LLVD), battery branch
Monitoring unit	1 monitoring unit and 1 output interface board
Rectifier module	The maximum can be configured with 4 3000W rectifiers modules, max capacity is 12KW, max current 200A
Lightning Arrester	Ac/DC lightning arrester: Nominal lightning discharge current 20kA, maximum lightning discharge current 40kA, 8/20μs

2. Component description

2.1 Appearance Diagram

The appearance of the ETP48200 E5A1 is shown in the figure.



(1)Monitoring (2) Protection ground (3) Input AC circuit breaker (4) AC surge protection (5) DC output circuit breaker (6) Battery input circuit breaker (7) Monitoring interface board (8) Rectifier

2.2 Power Distribution Unit

Specifications of the ETP48200 E5A1 AC and DC power distribution unit are shown in the following table.

Items	Power distribution Specifications
Input system	220/380V AC, 220V AC, single-phase/three-phase compatible
Ac power distribution input	Standard 1 * 63A/2P, optional 2 * 63A/2P mechanical interlock or 1 * 63A/4P 220V/10A socket for AC output
Ac lightning protection	4P, Imax=40KA
Dc power distribution	BLVD contactor 200A, circuit breaker: 2x32A, 4x16A LLVD contactor 200A, circuit breaker: 2x63A, 2x32A, 2x16A Note: Can be customized according to customer demand

Dc lightning protection	1P, Imax=40KA
Battery branch	2 way 125A/1P circuit breakers

2.3 Rectifier

The 3000W rectifier implements AC-DC conversion, converts AC to DC to output to the load, and charges the battery pack.

3000W is a rectifier with constant power output characteristics.

Rated AC input voltage: 200 V ~240V

Rated DC output voltage: 53.5V

Dc output voltage range: 42 V ~ 58 V

Maximum output power: 3000 W

Rated output current: 50 A

High efficiency and energy saving, using DSP technology, peak efficiency is greater than 96%

Environmental protection and safety, in line with ROHS requirements

Support with electric plug

Efficiency	> 96% Max > 95% (30% to 100% with load) >94.5 (25% to 100% loaded)
Maximum power	3000W (input 176VAC to 300VAC can be fully loaded output)
Input voltage	85 to 300 V AC /45~65HZ
output voltage	42 to 58V
Operating temperature	-40 ℃ to +75 ℃ (no derating below 55 ℃)
Dimensions (W x D x H)	105 mm x 281 mm x 40.8 mm
Weight	≤ 2.0 kg
Temperature control method	Forced air cooling (built-in fan), the fan automatically adjusts the speed according to the temperature
Power factor	≥ 0.99 (≥50% on load at 230VAC)
Maximum input current	≤ 19A
Voltage stabilization accuracy	< 0.2%

Dynamic response	< 1%/0.1ms
Unbalance degree of parallel flow sharing	< 3% of maximum current from 10-100% load
Counterweight noise	< 2mV
Noise voltage (peak-peak)	< 150mV
Connection protocol with monitor	CAN
MTBF	> 400,000 hours
THD	≤ 5% (at 230VAC, > 50% with load)
safety	UL60950-1 /IEC60950-1 /EN60950-1
EMC	EN55022 Class B /EN55024 /EN61000-3-2 /EN61000-3-3 /ETSI EN300 386
Protection features	Input overvoltage protection, input undervoltage protection, output overvoltage protection, high temperature protection（when temperature>75 ℃，cut off the output），long time short circuit damage, anti-reverse protection.
Indicator light	Normal working and alarm indicators

2.4 Monitoring Unit

The monitoring unit design Based on microprocessors, this system can monitor and control the entire power system and peripheral devices. the monitoring unit supports the following features:

- Support hot swap
- Support real-time detection of power system operating status

  - AC and DC information detection（input voltage/current, output voltage/current, battery voltage/current,）system/battery temperature，fault alarm, voltage measurement error less than 2%, current measurement error less than 0.2A.
  - AC and DC voltage alarm threshold setting
  - Rectifier module information detection（Input/output voltage, current, serial number and operating status），fault alarm
  - Battery information detection

Detects and alarms the ambient temperature, humidity, battery temperature, door status sensor, smoke, and water.

14-channel warning bid: Ac input power lost; load disconnected from system; fuse (CB) damage on load; Low battery voltage; High battery voltage; High battery temperature; battery disconnected from system; battery damage; rectifier damage; Rectifier overload; Rectifier overvoltage; Rectifier high temperature; Rectifier fan damage; load sharing unbalance.

- High precision sensor, temperature error is less than 1%.
-6 input dry contact signal detection
- Battery and load fuse detection
- Displays the system time

- Supports real-time alarm detection and reporting

-Alarms can be associated with eight output dry contacts and can be set to the normally open or normally closed state
- Alarm level can be set as critical/ Warning /Minor(option).
- Alert the user by indicator light, alarm sound (optional enable/disable)
- Maximum of 1000 historical alarms can be recorded

- Supports local view management and remote communication

- Local display, support various status display and real-time control
- LAN interface (optional), Web access (optional), SNMP protocol communication (optional)
-N/A Northbound RS485 interface for communication over electrical Master Protocol or Modbus
- Southbound RS485 port for managing downstream devices（temperature and humidity monitoring,battery）
-Programming all operating parameters of the system through the use of configuration files(optional）
-Multiple levels of encrypted access patterns(optional）
-Able to record 1000 visits, 1000 data visits in different time periods(optional)

- Supports flexible rectifier module management

- Can control the output voltage of the rectifier module
- Can control the output current of the rectifier module
- The opening and closing of the rectifier module can be controlled separately
- Intelligent sleep management of the rectifier module

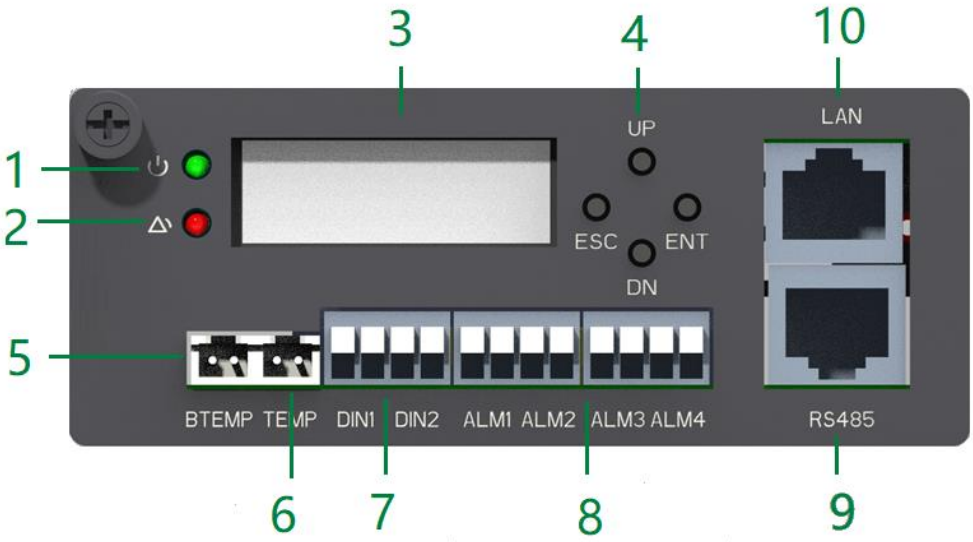
- Battery equalization and floating charge management, voltage setting

- Float charge - Boost charge - Equalize charge-
- Battery temperature compensation
- Battery high and low temperature alarms
- Battery charge current limiting management
- Battery low voltage power-off protection/power-off voltage setting
- Battery test management
- Battery remaining capacity detection
- Supports customization of other BMS reporting information
- load disconnected control

- Parameter setting function (allows setting parameters on LCD screen)

Set alarm on/off
Set the battery charging current limit
Set high/low DC voltage warning level
Set high/low DC voltage cutting off level(optional)
Set high/low AC voltage warning level
Set the temperature warning level, Set the temperature protection value(option)
Set floating charge voltage, boost charge voltage
Set the battery capacity according to the actual situation
Set the voltage of BLVD and LLVD

Monitoring Panel



(1) Running indicator light (2) Alarm indicator light (3) LCD screen (4) Buttons
(5) Battery temperature sensor port (6) Ambient temperature sensor port
(7) Dry contact input interface (8) Dry contact output interface
(9) RS485 communication interface (10)Ethernet interface

Indicator light Description

Name	Color	Status	Description
Running indicator	Green	Off	The controller has no DC input or controller fault
		Flash(0.5Hz)	The monitoring unit works normally
Alarm indicator	Red	Off	No alarm
		On	Alarm

LCD display

Information can be set or viewed in through the LCD.

Buttons

Key instructions are shown in the table below.

Keys	Name	Instructions
▲	Up Key	Press the up or down key to scroll through menus or select parameters.
▼	Down key	
S	Back key	Press the Back key to go back to the previous menu without saving the Settings.
↵	Confirm key	In the system information screen, press the Confirm key to enter the main menu. Press the Confirm key in the main menu to enter the next level submenu. Press the Confirm key when setting parameters in the submenu to save the parameters.

3. Technical specifications

3.1 Environmental Indicators

The ETP48200 E5A1 meets environmental specifications in the following table

Projects	**Indicators**
Operating temperature	-20 ℃ ~ +75 ℃ (no derating below 55 ℃).
Storage temperature	-45 ℃ ~ +75 ℃.
Operating relative humidity	≤ 95%.
Storage relative humidity	≤ 95%.
Atmospheric pressure	70 kPa to 106 kPa.
Altitude requirements	0 m to 3000 m: Full power output. 3000 m or above: The load needs to be derated by 1% for every 100m increase in altitude.
Site requirements	Horizontal installation without vibration and turbulence. Do not let liquid, conductive objects fall into the equipment. There is no water vapor, no conductive dust, no corrosive gas, no strong electromagnetic field interference, and no explosion risk around the equipment.

3.2 Performance Specifications

Performance specifications of the ETP48200 E5A1 system

Projects	index
Maximum system output power	12KW.
System peak efficiency	≥96.0%.
Machine noise	≤55 dB (A).
Networking mode	Provides RS485 serial port, dry contact, LAN (optional) and other networking functions.
Mean time to failure (MTBF)	≥3.2 x 105 hours.

Product design life	10 years.

3.3 Electrical Indicators

Electrical specifications of ETP48200 E5A1 include AC electrical specifications and DC electrical specifications.

Ac Electrical specifications

item		Indicators
Ac input characteristics	Input system	Single-phase 220VAC/230VAC, three-phase optional
	Input voltage range	85 V-300V,no derating between 175V and 300V
	Input frequency	Rated frequency: 50 Hz/60 Hz, frequency range 45~65HZ
Ac Power distribution	Ac input	Standard 1 * 63A/2P, optional: 2 * 63A/2P mechanical interlock or 1 * 63A/4P (IEC 60898 standard)
	Ac output	Optional
	Ac Lightning protection	Class C, 10/350 μs (L-N / N-PE), Iimp ≥ 20/40 kA; • In ≥ 20 kA; • Uc ≥ 1.1Uo (Uo = 230 VAC); • Up ≤ 1.5 kV; • TOV (L-N) ≥ 440 V (±1%)/120 mins, Tr ≤ 100 ns; Alarm dry contact point and status window
Protective characteristic	Ac overvoltage protection	When the input single-phase voltage is greater than the AC overvoltage protection point, the overvoltage protection action occurs.
	Ac undervoltage protection	When the input single-phase voltage is less than the AC undervoltage protection point, the undervoltage protection action occurs.

Dc electrical specifications

Items		Indicators
Dc output characteristics	Rated DC output voltage	-53.5V.
	Output voltage range	-42V-58V
	Dc maximum output current	200A.

	Dc lightning protection	Lightning protection flux: I_{max} = 40 kA (8/20 μs).
	Voltage stabilization accuracy	≤0.5%.
	Ripple	≤200 mV.
	Counterweight noise voltage	≤2 mV.
Dc power distribution	Battery input	2 channels, 2 x 125 A MCBs(IEC 60898 standard)
	Dc load output	LLVD: 2x63A, 2x32A, 2x16A (IEC 60898 standard) BLVD: 2x32A, 4x16A (IEC 60898 standard)
Protection features	Dc overvoltage protection	The overvoltage protection action occurs when the output voltage is higher than the DC overvoltage protection point.
	Dc undervoltage protection	When the output voltage is lower than the DC undervoltage protection point, the undervoltage protection action occurs.
	Battery undervoltage protection	When the battery voltage is lower than the power-off voltage protection point, the power-off protection action occurs.

3.5 Physical Specifications

The following table lists the physical specifications that the ETP48200 E5A1 meets

Items	Indicators
Overall dimensions	482.6mm x 360 mm x 220.7mm (W x D x H)
Weight	About 20 kg (without module).
Cabling method	Go up and out.
Installation mode	19 "standard rack mount