

Features

- ◆ Standard 19-inch rack-mount design, stable and firm.
- ◆ Removable, manual handling possible, easy and convenient for installation and operation. Floor standing.
- ◆ Flexible configuration, ability to upgrade and expansion the power system smoothly.
- ◆ Electrical systems, distribution equipment, battery systems are distributed separately and reasonably
- ◆ Cooling system can be customized: Ventilation system, heat exchanger or DC air conditioner.
- ◆ The equipment installation position can be freely adjusted
- ◆ Energy saving
- ◆ 2 MCB 63A interlock for AC input main source and generator branch
- ◆ There is 220V / 10A socket for equipment maintenance
- ◆ The 1-phase 3-pole socket allows equal power generator outside the cabinet

Applications

- ◆ Optical network and data room
- ◆ Network access
- ◆ Transmission equipment

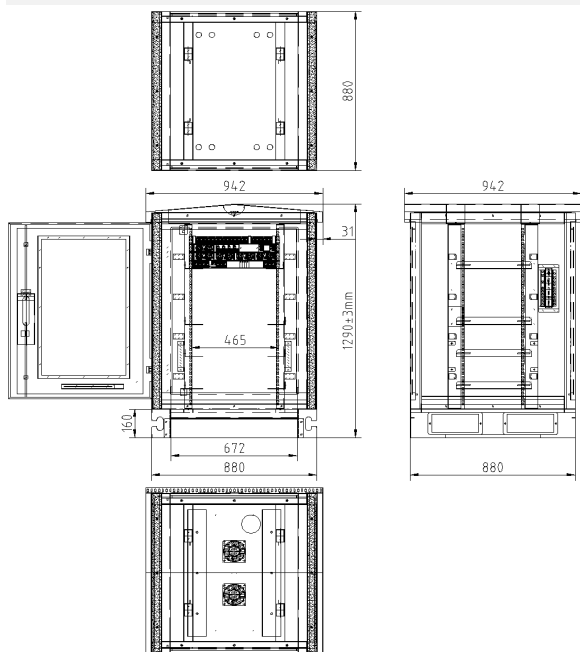


General Introduction

- A type of electric cabinets installed outdoors, which is compact, easy to install and operate and takes up little space.
- Having a strong frame structure, high bearing capacity, high insulation, especially capable of disassembling into blocks very conveniently for installation in high rise locations.
- Flexible cooling system can be used by fan or air conditioner according to the ambient climate.
- Integrated cabinet system, power supply and distribution system, temperature control system, lightning protection grounding system and backup battery system, highly integrated design, providing a complete solution.
- Factory assembled, only requires installation of mains power and optical cables to work.

Cabinet Characteristics

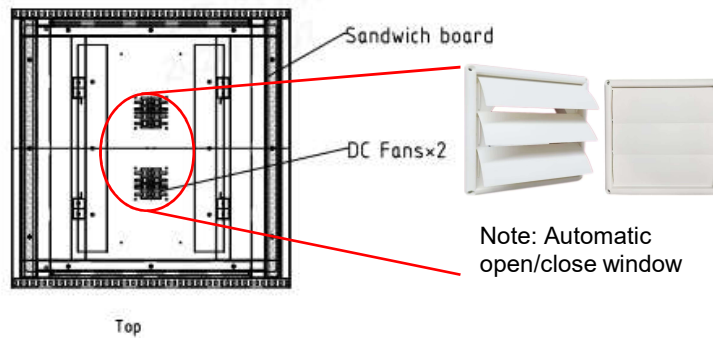
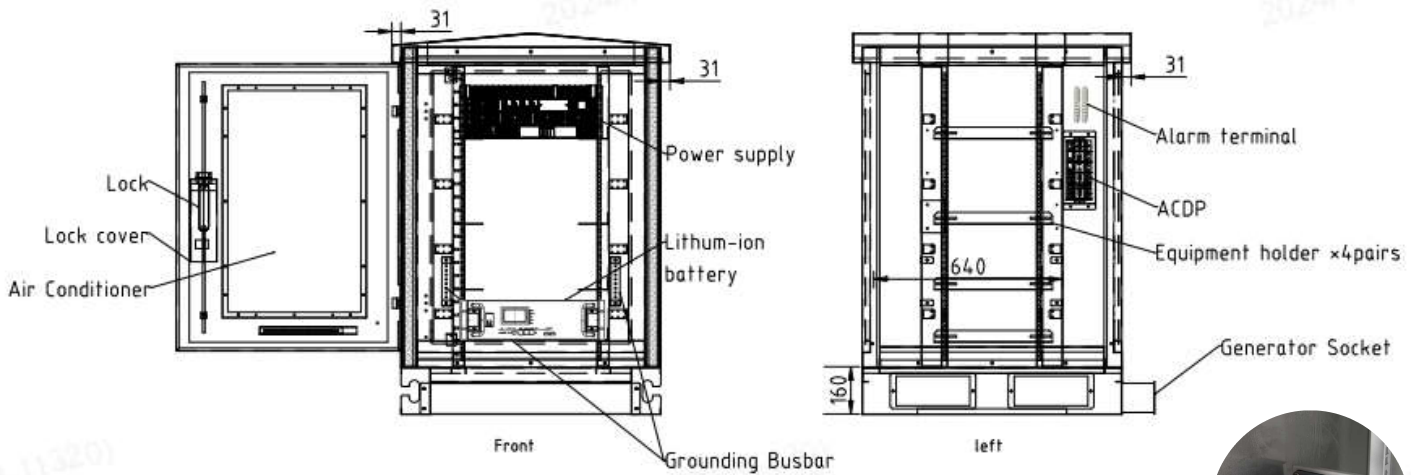
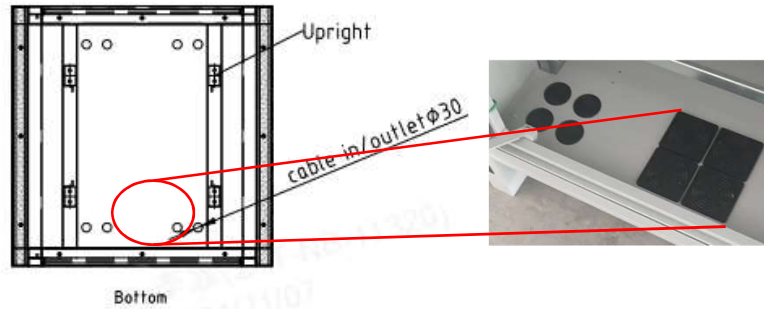
Protection Level	IP55 ,Anti-insect/ mouse, /bug penetration, Dustproof
Standard	IEC/EN 62368-1 IEC61000 IEC 60068-2-1/ IEC60068-2-2/60068-2-14/,IEC:60068-2-78
Installation	Outdoor floor mounting (Pedestal) The design is self-standing on the floor, cabinet could be fixed the to the floor with its base
Cooling Sytem	<ul style="list-style-type: none"> • DC air conditioner, cooling capacity 1500W • Air ventilation system by DC fan, fan ventilation: ≥38CFM
Alarm monitoring	Temp., humidity, door open, smoke, flooding, main source fail, battery... etc.
Com. Interface	RS485/RJ45/USB/Dry contact
Lifespan	Cabinet frame and shell ≥ 10 years.



Technical Specification

NO.	Items	Specification	
1	Cabinet Structure	Dimension(H*W*D)	1290(±5)*940(±5)*940(±5)mm
		User space	<ul style="list-style-type: none"> Total 22U(4+1U for rectifier system, 3+1U for 1 battery, 2U for cable inlet, 11U space for telecommunication equipments) Equipment mounting depth 640mm
		Main Materials	Cover layer <ul style="list-style-type: none"> Outer/Inner layer: galvanized steel plate with powder coated, thickness: outer≥1.2 mm, inner ≥1.0 mm. Insulation layer: PU, thickness ≥50±2mm, density ≥45Kg/m³, heat insulation and fireproof.
		Frame	Standard 19" equipment installation U-shaped column, case of power system 2mm thickness galvanized plate, load-bearing ≥600kg
		Roof top	The roof is sloped to prevent water accumulation.
		Cabinet base	160mm(±5)height, in/out holes
		Load tolerance	The frame is constructed by heavy-duty steel, load-bearing ≥600kg
		Grounding system	2 Separate copper bars, each bar with 8 x 35mm cable catch holes and pre-installed screws, Material: T2 copper All metal parts are grounded to the main ground of the cabinet.
		Cable in/outlet	8 holes with a size of Ø 30 mm rubber gasket running along 2 sides, in front of the cabinet
2	Cooling System	Door of cabinet	<ul style="list-style-type: none"> In front, 3-layer with 3-point lock, has a lever latch design that creates pressure when closed, Closed type with protective padlock, has a door lock cover box, and has an auxiliary keychain to standby With heat-resistant rubber gaskets
		Air conditioner	DC48V, cooling capacity 1500W.
		Backup cooling system	2pcs DC fan, fan ventilation: ≥38CFM, there is a dust filter in the air inlet.
3	Accessories	Heat exchanger	Optional
		LED light	Connect to the door switch, automatically lights up when the door is opened
		Sensors	Smoke, door opening(1pc for alarm, 1pc for LED light auto on), flooding, temperature and humidity, temperature sensor(2 position with accuracy 0.1 deg C) that can set warning thresholds
4	ACDB	Extra-roof Solution	Provide a roofing solution to limit direct sunlight, optional
		Industrial Outlet	230V, Single-Phase, 3-pole 40A *1pcs, for generator, M10 Cable
		AC Socket	220V 10A *1pcs
		AC Input	1P+N 63A*2, interlocked
		Lightning conductor	AC SPD Modes of protection: L/N-PE、L-N-PE Uc=440V AC, Iimp (10/350µs) =20kA, Up=1.5kV, Installation and repair: Hot swappable Warning connection: Dry contact, indicator flag Brand:Ningpu Type:NPS01-FA20/440/1+1/FM
		Cable	BVR 450/750V/PVC/70°C; AC/M10/2Ω-km; Grounding/M16/≤1.3Ω-km/PVC/G-Y; Signal Alarm/CU/PVC/≥0.39mm
5	Others	Disassembly	Ability to disassemble each block from the inside of the cabinet
		Working temperature	-20°C ~ 65°C
		Working humidity	10% ~ 95% (non-condensing)
		Alarm distribution frame	14-channel, To connect Larm: AC alarm, Rectifier, high temperature, door opening, air conditioner, battery/battery warnings, environmental sensors such as fire/smoke, flooding, high temperature, etc.

Cabinet Layout


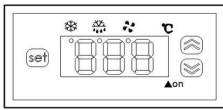



Cooling System General Introduction

Depending on the installation environment and the capacity of the device inside the cabinet, optional cooling systems of ZTT-ODU22-2 cabinets are as follows:

- DC air conditioner
- DC fan, fan ventilation: $\geq 38\text{CFM}$
- Heat exchanger (optional)

Note: The cooling system only works well when there are at least 44.5mm (1U) of air convection slots between the installation devices.

DC1500W	NO.	Items	Parameter
  <p>Displayscreen</p> <p>Powerinputport</p> <p>Alarm output and signal input port</p>	1	Working environment temperature	$-40^{\circ}\text{C}+55^{\circ}\text{C}$
	2	Noise	65dB(A)
	3	Life expectancy	>10Years
	4	Protection Level	IP55
	5	Refrigerant	R134a
	6	Input voltage range	48V
	7	Refrigerating capacity(L35/L35)	1500W
	8	Rated Refrigerating input power(L35/L35)	430W
	9	Rated Refrigerating current(L35/L35)	9.0A
	10	Maximum Refrigerating current	13.4A
	11	Heat capacity(optional)	500W
	12	Air VolumeofInner Circulation	320m ³ /h

DC Fan (For Backup)	NO.	Items	Parameter
	1	Rated operating temperature	$-20^{\circ}\text{C} \sim 45^{\circ}\text{C}$
	2	Relative humidity	5% ~ 95%
	3	Altitude	$\leq 1000\text{m}$
	4	Rated operating voltage	DC48V
	5	Fan ventilation	$\geq 38\text{CFM}$
	6	The dust-proof device of the vent should be corrosion-resistant and can be cleaned regularly and reused	

Features

- ◆ Wide input voltage: 85V ac ~ 300V ac
- ◆ Multiple battery management functions
- ◆ Hot-swappable modular design, front access wiring
- ◆ Remote operation and maintenance: configured with ethernet and RS485/RS232 interface, support Modbus_RTU/SNMP, Web and network management system
- ◆ User-friendly interface: configured with a LCD display, buttons and indicators.

General Introduction

ESPS48 series is 19" embedded switching power supply used for -48Vdc communication equipment. It consists the rectifying unit, a monitoring unit, a DC distribution unit and a BMS. All of the unit are hot swappable.

Output voltage : -48Vdc

ESPS48250_DS4U3P



Scenarios

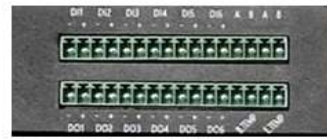
- ◆ Medium and small-size communication base stations
- ◆ Indoor and outdoor communication cabinets, computer rooms, data centers

Table of Configuration

Item	ESPS48250_DS4U3P
1	Dimension(W*H*D) 19 inch *4U*380mm(W*H*D) , The depth is behind the mounting ear.
2	AC Input 380V/3-phase and 220V/single-phase, 50Hz • Normal Circuit Breaker: 1U/4P, 63A, *1pcs
3	AC SPD AC SPD Modes of protection: L/N-PE、 L-N-PE Uc=440V AC, Iimp (10/350μs) =20kA, Up=1.5kV
4	Number of Rectifier Modules & capacity Standard config. 2pcs of RM4850 (3KW) =6KW. Applicable to ZTT RM4850 (3KW) , up to 5 pcs=15KW
5	Output Power Capacity Max. 6KW, 125A @48VDC(rated voltage)
6	DC SPD Class II, DC48V, In20kA, Imax40kA, (8/20μs) , *1pcs;Pedaro RPD48-40/1P-1U
7	Circuit Breaker Typical load (LLVD) : 1U/1P DC, 2x63A, 2x32A, 2x16A Priority load (BLVD): 1U/1P DC ,2x32A, 4x16A, Max.12pcs (CHINT:CB-63CXZ 1P C 63A;CB-63CXZ 1P C 32A;CB-63CXZ 1P C 16A) Battery Circuit Breaker: 1U/1P DC, 125A*4pcs(CHINT :CB-125CXZ 1P C 125A)
8	Contactors for LVD 200A
9	Monitoring unit ZTKD PMU-01, 1 pcs With display, keyboard, USB & RJ45 port
10	User interface module ZTKD SIU-03, 1 pcs Digital input *6, Dry contact output *6, Temp. sensor ports *2, RS485 *2
11	Operating Environment -20°C to 65°C, humidity from 5% to 90%, non-condensing

Appearance

1. USB
2. RJ45(for uplink)
3. RS485(for battery)
4. Screen
5. Button



Monitoring Module

- ◆ A microprocessor system can monitor the status of the rectifier, PV module, BMS, and it sends out audio and visual alarms.:Real-time warning by LED, horn sound ;Web function communication error warning;Allowable electrical measurement error of $\leq 2\%$;Allowable temperature measurement error of $\leq 1^{\circ}\text{C}$
- ◆ Configured with RS485 and ethernet port which support MODBUS_RTU and SNMP, the monitor enables remote detecting, remote control and remote adjusting. Power supply can connect Lithium battery for setup, monitoring such as fast charging, floating charging, balanced charging
- ◆ Has a function of periodic battery check
- ◆ User-friendly interface includes LED indicators, buttons, and a LCD display.
- ◆ Hot Swap ◆ Operation records up to 10000 ◆ Flexible use of config. files to program the system

Functions

Measurement

AC input	Voltage, current, frequency
DC output	Voltage, current
Load	Total load current, MCB status
Battery	Lithium BMS, voltage, current, capacity, remaining capacity, number of cycles, temperature, MCB status
Environment	Temperature
Time	Real time clock available

Alarm

Output voltage/current over/high/low
Load/batteryAC CB disconnct/ fuse fail
Battery voltage high/low
Current limiting point
AC input fail
Envir./battery temperature high
Rectifier fail/overload/overvoltage/fan fail/imbalance load sharing

Flexible DI/DO alarm setting

Set alarm Yes

Battery management

Battery equalizing and floating charge setting
Disconnection protection, failure
Battery charging management
Battery testing
Battery temperature compensation
Battery high temperature protection
Battery capacity detection and report
Battery backup time setting

The charging voltage can be set according to the battery specifications

Rectifier management

Rectifier power-on and power-off control
Rectifier operation status
Rectifier output power control
Rectifier Over-voltage protection
Rectifier dormancy management
Each rectifier status (In/out voltage/current, SN)
PV module management

Load management

Load low voltage disconnection (LLVD)
Battery low voltage disconnection (BLVD)

Parameter setting

Battery charging current limit, float charging, boost charging/
Battery capacity/ High DC voltage cut-off/ High/low DC/AC
voltage warning/ Temperature warning level

Input Characteristics

1	Input voltage	85 ~ 300VAC(220VAC/230VAC) Pout derate when < 176Vac
2	Frequency range	45~65Hz
3	Input power factor	≥0.99(@230Vac Input, Rated Power)
4	THD	< 5%(half~full load), @230Vac Input
5	Inrush current	≤27.75A, @230Vac Input
6	Max. Input Current	≤18.5A

Output Characteristics

1	Output Voltage	42~58Vdc, normal -48Vdc(can be set)
2	Output Current Max.	62.5A
3	Output Power	3000W (62.5A @ 48VDC)
4	Efficiency	≥96.5%(peak) (@230Vac) ≥ 95% at load from 30% to 80%
5	Peak to peak Noise	≤200mVp-p, Oscilloscope bandwidth limited to 20MHz
6	Output Holding Time	≥8ms
7	Temperature Coefficient	≤±0.02ms
8	Voltage Adjustment	≤144mV
9	Load Adjustment	≤144mV
10	Output Voltage Accuracy	≤ 0.5%
11	Output Current Accuracy	≤1%
12	Load sharing	yes

Protective Characteristics

1	Input undervoltage protection	80±5Vac
2	Input undervoltage recovery	100±5Vac
3	Input overvoltage protection	305±5Vac
4	Input overvoltage recovery	290±5Vac
5	Output overvoltage protection	≥58.5Vdc, Tested with 5A
6	Output short circuit protection	Have
7	Over temperature protection	≥75°C
8	CAN communication	Have
9	Parallel operation	Have, Maximum 48 power supplies can be paralleled
10	Remote control	Have (CAN control)
11	Output overcurrent protection	≥62.5A
12	Reverse polarity protection	Yes



RM4850

Features

- ◆ Wide input voltage: 85V ac ~ 300V ac
- ◆ Multiple battery management functions
- ◆ Hot-swappable modular design
- ◆ High efficiency, peak > 96.5%
- ◆ With working status indicator led
- ◆ High input power factor, low harmonic distortion
- ◆ Low ripple noise
- ◆ Overvoltage/ Overtemperature/ Output overcurrent/ Output short circuit/ Output overvoltage protection
- ◆ Compliant with RoHS requirements
- ◆ Soft Start function

Reference Standards

- ◆ EN55032 ◆ UL61000 ◆ UL60950-1
- ◆ CISPR32 ◆ ETSI EN 300 019
- ◆ IEC 61000-4-5 2014, IEC 61000-4-4 2012, IEC 61000-4-11 2003, IEC 61000-4-3 2006/ IEC 61000-4-2 2018/ IEC 61000-4-8 2009/ IEC 61000-3-2:2018/ IEC 61000-4-6: 2018

Environmental conditions

1	Working Temp.	-40~+75°C -40°C can work normally. 45°C~ 75°C Pout derate.
2	Storage Temp.	-40 ~+85°C
3	Humidity	Working≤90%; storage≤95%
4	Altitude	≤2000m > 2000m Pout derate
5	Cooling	Forced air cooling(adjustable)

Safety and EMI characteristics

Items	Standard (or test condition)	Remarks	
Electrical Strength	Input-Ground	1500Vac/30mA/ 1min	
	Input-Output/CAN	2500Vac/30mA/ 1min	No breakdown, flying arc phenomenon; leakage current less than 30mA
	Output/CAN-Ground	707Vdc/30mA/ 1min	
Insulation resistance	Input-Ground	≥5MΩ@500Vdc	
	Input-Output/CAN	≥5MΩ@500Vdc	Ambient temperature: 25±5°C Relative humidity: less than 95% (non-condensing)
	Output/CAN-Ground	≥5MΩ@500Vdc	
Safety Standards	UL60950-1, UL508, CSA C22.2 No.60950-1		
Leakage Current	7mA	230Vac	
Lightning	8/20us 5KA		
Surge Resistance	Input Line to Line, Line to Ground	4kV	No cracks or alarms were found in the power supply during or after testing
	Output Line to Line, Line to Ground	500V	
Electrostatic Discharge Immunity	Contact Discharge 6kV, Air Discharge 8kV	No cracks or alarms were found in the power supply during or after testing	
Radiated Electromagnetic Field Immunity	Frequency range 30 MHz-1 GHz according to EN 55032 class A, 10 m distance		
Conductivity Immunity	Frequency range 150 kHz-30MHz according to EN 55032 class A		

Mechanical properties

Product weight	≤2000g
Overall Dimension(L×W×H)	280.0±0.5×105.0±0.3×41.0±1.0mm
Standard	IEC 61000, EN55032, EN55035

Features

- ◆ Intrasystem balance
- ◆ UL94V-0 Flame retardant grade
- ◆ Good high temperature performance, high cycle number and long service life
- ◆ Safe li-iron phosphate technology
- ◆ High energy density and high conversion efficiency
- ◆ Environmentally friendly, without any heavy metals
- ◆ Built-in battery management system
- ◆ 19-inch standard rack and installation kit
- ◆ Built-in overcharge, over-discharge and over-temperature automatic protection
- ◆ Prismatic (rectangular box)
- ◆ Fit to install 19" Rack

Applications

- ◆ Backup power supply for communication base stations
- ◆ Emergency power supply for wired communication bureaus (stations), switching stations
- ◆ Wireless communication bureaus (stations), decentralized base stations
- ◆ Various types of private network communication base stations for power, military, etc.

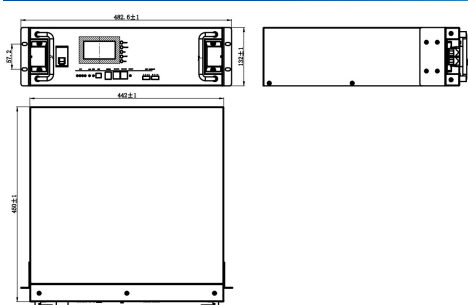
Appearance



Main Characteristic

Item	Parameter
Model	LFELI-48100
Technology	Lithium Iron Phosphate (LiFePO4) (LFP)
Nominal Capacity	100 Ah
Nominal Voltage	48V
Discharge cut-off voltage	40.5V
Charge Limit Voltage	54.7V
Maximum charge/discharge current	100A(1crt)
Weight (approx.)	40KG
Charging capacity	4800Wh
Display unit	With display screen
Maximum number of parallel connections	15
Dimensions (W*D*H) mm	442*450*132
Design life	10 years
Cycles	3500 times (0.2C 80%DOD,25°C) ≥ 1,000 cycles(0.2C80%DOD, 45 °C) ≥ 2,000 cycles (0.2C 100%DOD,25°C)
Protection Level	IP30
Enclosure Material	SPCC
Temperature/Humidity	0 to +55/ 5% ÷ 95%
Pole (+ -)	M6, protective cover
Number of Cells	15
Design life	≥ 10 years(at 20 -25 degrees Celsius)
Turn on/off battery operation manually	There is an ON/OFF switch
Certification & Standard	UL/UN38.3/EN61000-6/ISO9001,ISO 14001

Dimension



25°C Constant Current Discharge Meter (Amperes)

Time	1h	2h	3h	5h	10h
Discharge cut-off voltage 40.5V	100A	50A	33.3A	20A	10A

25°C Constant Power Discharge Meter (Watts)

Time	1h	2h	3h	5h	10h
Discharge cut-off voltage 40.5V	4800 W	2400 W	1600 W	960 W	480 W

Technical Specification

Cell specifications	Cells are printed with code information or QR codes so that cell information can be looked up. Labels must not cover information printed directly on the cell	Yes
	Cells must be identical in structure, similar in size, weight and the same manufacturer	Yes
Uniformity between cells	Deviation of maximum capacity value, minimum capacity value from the average capacity value of all cells when fully charged	± 1% of the average value
	Deviation of the maximum internal resistance value, the minimum internal resistance value with the average internal resistance value of all battery cells when fully charged	± 15% of the average value
	Open circuit voltage difference between the highest cell and the lowest cell when the battery is fully charged	≤ 0.05V
	Voltage difference between the highest and lowest cell when discharging the tank to 100% DOD in 0.2Crt discharge mode	≤ 0.3V
Load/discharge parameters	Self-discharge coefficient (%/month) at 25 degrees Celsius	≤ 3%/month
	Round trip efficiency/Energy Charge Efficiency in Wh at 0.2C charge/discharge current	≥ 92%
	Capacity (in discharge mode with constant current 0.2C, duration 5 hours, deep discharge 100% DOD at 25 degrees C	≥ 100Ah
	Capacity (in discharge mode with constant current 0.5C, deep discharge 100% DOD at 25 degrees C	≥ 97Ah
	Capacity (in discharge mode with constant current 0.8C, deep discharge 100% DOD at 25 degrees C	≥ 95Ah
	The internal resistance is at a temperature of 25 ÷ 45°C when the battery is fully charged	≤ 20mΩ
Pairing Capabilities	Temperature increase of the cell when charging and discharging the battery for 5 continuous cycles at 0.5C in an environment of 50°C	≤ 20°C
	Connect to 1 battery and get instant data of all batteries connected in parallel	yes
BMS	BMS management system built into the battery	Yes
	Push button to reset battery	Yes
	Automatically balances cell voltage during charging	Yes
	Set the feed current limit	Yes
	Automatically limits the charging current when it exceeds the allowable threshold	Yes
	Measurement error and voltage monitoring of each cell and the whole tank	≤ 1%
	Measurement error and current monitoring of the entire battery	≤ 2% at 0.5C charge/discharge current
	Measurement and monitoring error of cell temperature, BMS and ambient temperature	≤ 3 °C (4 test points in the cell area and 1 point on the BMS)
	Measurement error and monitoring of level of charge (SOC)	≤ 5% at 0.2C charge and discharge current
	Measure the state of health of the accu (SOH - State of Health)	Error ≤5%

Technical Specification

	Measurement and monitoring error of cell temperature, BMS and ambient temperature	≤ 3 degrees Celsius (4 temperature measurement points in the cell area and 1 temperature measurement point on the BMS)
BMS	Protection function	Over voltage when charging, low voltage when discharging
		Overcharge current
		High and low temperature: temperature on cell and BMS
		Short circuit, reverse polarity when battery is turned on
	Display and warning function	Display SOC, battery warning by LED or LCD screen
		Battery warning function via Dry Contact (NC-Normal Close type):
		- Cell/battery voltage is low
		- Overcharge current
		- High cell temperature
		- Short circuit, reverse polarity
Battery monitoring software features (connect to computer via dedicated cable)	- Accu is off	
	Displays the voltage of the battery, each cell, temperature, SOC, SOH, current, number of discharge cycles	
	Displays battery status, warnings, protections, errors	
	Displays manufacturer's setting parameters when connecting to BMS software	
Data storage capabilities	Store a minimum of 200 events	
Ability to dump archived data	Yes	
Communication port for monitoring and control	RJ45/RS232/RS485 (RS485 connects to the power supply to display : Actual capacity, voltage and current, SOC , SOH of each cell; cell temperature, number of discharge cycles).	
Communication protocol	Modbus RTU/RS485	
Linkage of cells	Laser welding	
Other	Temperature measuring sensor (cell temperature sensor, ambient temperature sensor in the tank, temperature sensor at the heat-dissipating chipset), cell voltage sensor	Yes, securely attached
	Internal power and signal wiring system	Must be firmly and neatly fixed with straps or fixing tabs, with a code on each wire
	User manual	In English
	The negative (blue) and positive (black) power cables are pre-pinned for each tank	Size: 25mm ² Length: ≥ 70cm
	LAN cable with connector for connection between battery modules	Length: ≥70cm/bottle