



32kWh 51.2V

628Ah LIFEP04 BATTERY

TECHNICAL MANUAL

VERSION 2 - 2026



THIS UNIT IS VERY HEAVY

This unit tips the scales at a whopping 233KG, please ensure you have adequate lifting equipment in place.

32kWh



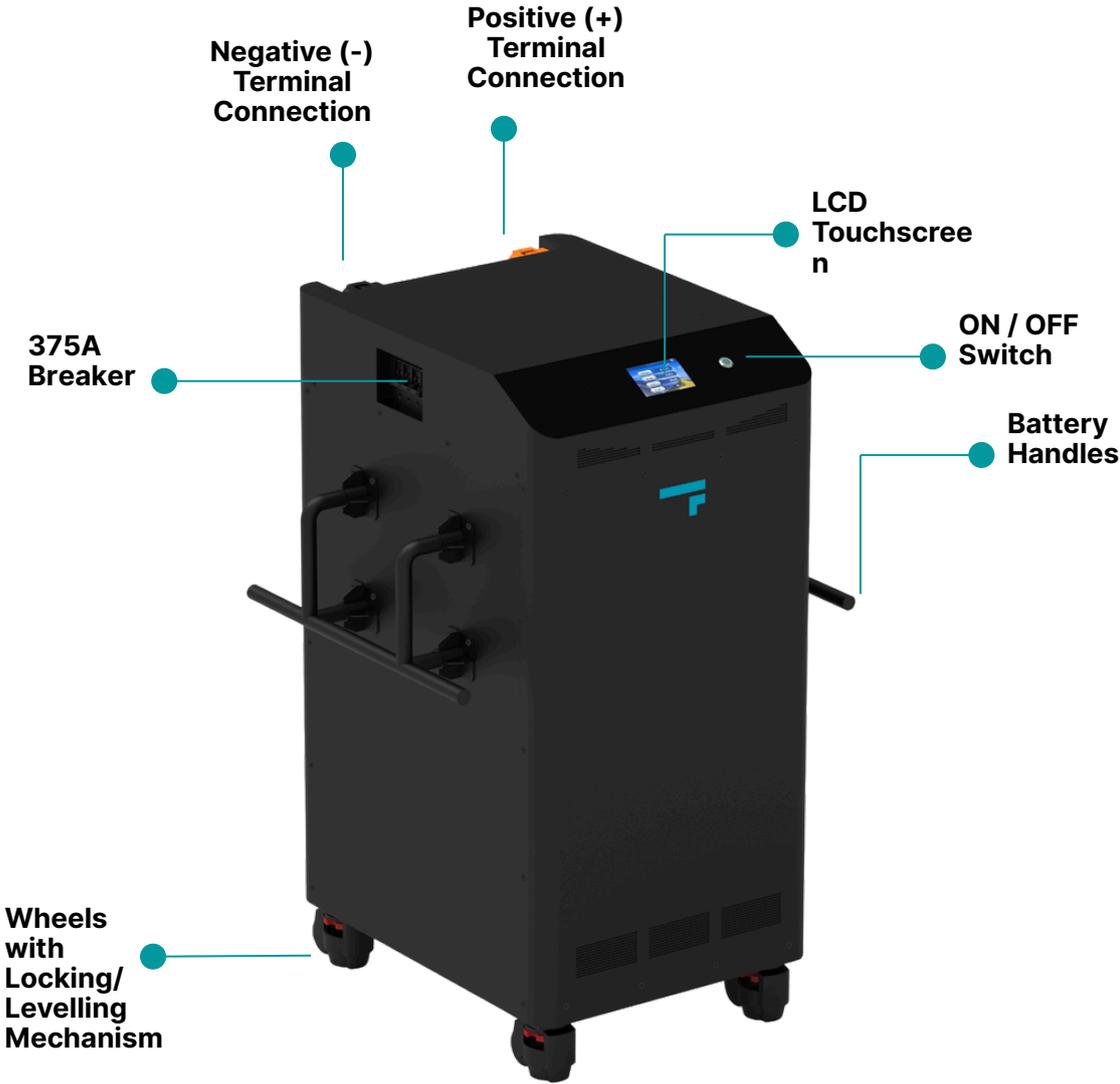
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32 kWh



YOUR BATTERY



32kWh



SAFETY



This unit is heavy

This unit tips the scales at a whopping 233KG, please ensure you have adequate lifting / manoeuvring equipment in place. Before setting it up, make sure children and furry friends are not nearby.

- Wear proper safety gear such as gloves and eye protection
- Do not reverse polarity
- Do not connect with any batteries in series
- Ensure the system is properly grounded
- Always use insulated tools
- Do not work on battery with it turned on or with the grid turned on
- Do not connect battery to solar wiring directly
- Make sure all fasteners are properly torqued
- Ensure your chargers/inverters are appropriately programmed
- Use only on 48v nominal systems, do not connect with other batteries
- Ensure the installation follows applicable local, national and all legal electric stipulations
- Installation should be done by a qualified and knowledgeable person
- Make sure proper cable sizes and overcurrent protection are utilised
- Ensure the system is installed in a location suitable for electronics
- Keep the battery within safe operational temperatures
- Do not put the battery in a hazardous, hot or flammable environment
- Install your equipment in a location where children and pets are not present
- Do not paint, or spray paint the battery
- If there are any electrical smells or excessive heat, use your breaker switch and contact your local fire station
- Only clean the battery with a dry cloth - do not use any liquids, spray cleaners, aerosols or any type of solvents.



FUNCTIONALITY

Battery Voltage Calculation:

Voltage Sampling: The battery's voltage is measured with a deviation of $\pm 20\text{mV}$ over a 32-sample battery test.

Temperature Sensors:

The system has 4 temperature sensors monitoring the battery temperature.

- 1 sensor for ambient (surrounding) temperature.
- 1 sensor for the temperature of the MOS (Metal-Oxide-Semiconductor) components.
- Temperature Deviation: The deviation in temperature readings is $\pm 2^\circ\text{C}$.

Battery Capacity and Cycle Count:

Capacity Calibration: To determine the actual battery capacity, a full charge/discharge cycle is completed.

Remaining Capacity Estimation: The system estimates the remaining capacity with a deviation of $\pm 5\%$.

Communication Interface:

Monitoring and Control: Use a PC to monitor the battery pack, control operations, and adjust settings remotely.

Historical Data Recording and Management:

Data Recording: When abnormalities arise, the status and alarm information are recorded and saved.

Fault Data: The system can store up to 500 historical fault records.

Battery Management System (BMS) Parameter Settings:

The BMS allows the configuration of various parameters, including:

- Battery overvoltage/undervoltage
- Total battery voltage overvoltage/undervoltage
- Charge/discharge overcurrent
- Battery high/low temperature thresholds
- Battery capacity
- Operational mode
- Charge/discharge limit currents.

These settings can be adjusted within the battery monitoring system.



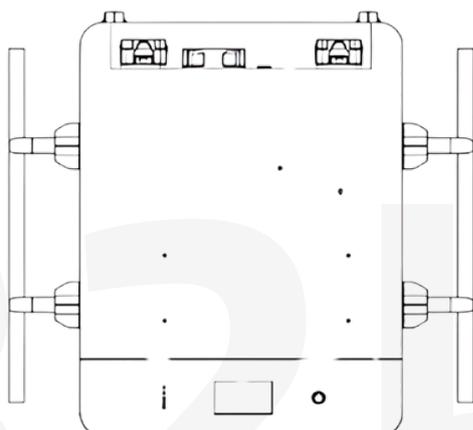
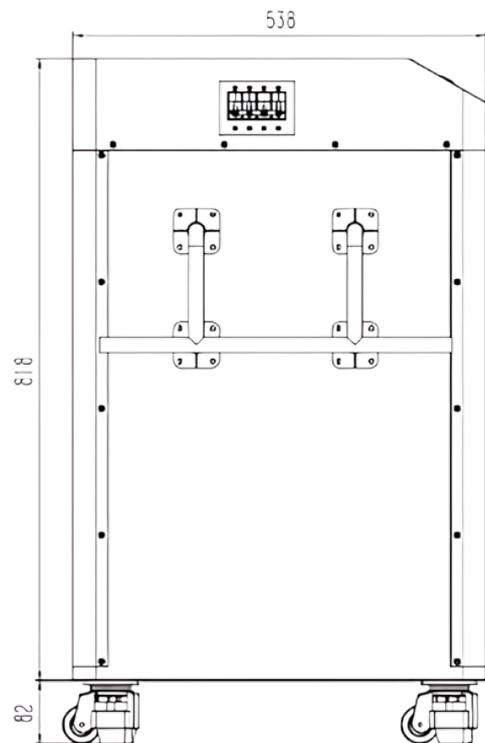
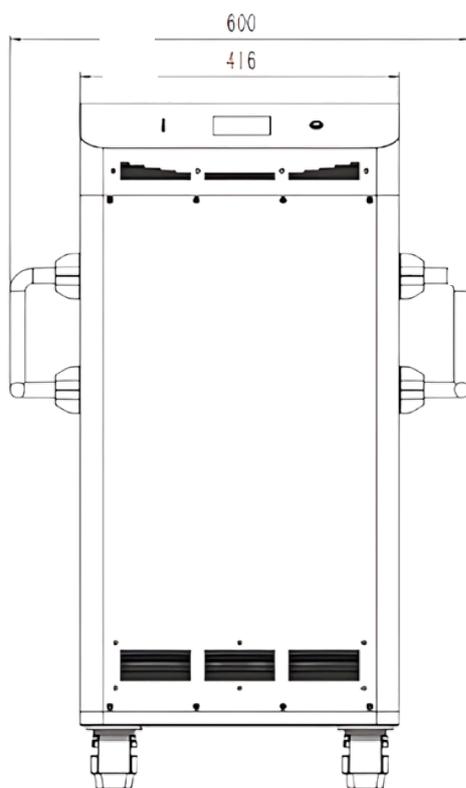
FUNCTIONALITY

Multiple Protection Functions:

The battery has several protective features to prevent damage, including:

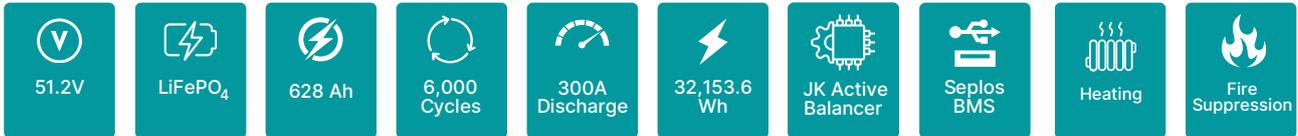
- Hardware protection
- Battery protection
- High/low temperature protection
- Output short-circuit protection

DIMENSIONS





SPECIFICATIONS



Specifications	
Rated Voltage (V)	51.2V
Maximum Charge (V)	57.6V
BMS	SEPLoS 300A
Nominal Capacity (Ah)	628Ah
Minimum Capacity (Ah)	628Ah
Maximum Charge Current (A)	300A
Total Wh	32,153.6
Maximum Discharge	300A
Discharge Cut-off Voltage	43.2V
Discharge Temperature	-20°C to 40°C
Charging Temperature	-10°C to 40°C
Storage Temperature	1 Month: -10°C ~ 35°C 3 Months: 25 ± 2 °C
Relative Humidity	65% ~ 20%
Cell Configuration	2P16S
Cycle Life	8,000 @ 91% DOD
Communication Ports	CAN, RS485
Design Life	15 years
Weight	230kg
Active Balancer	2A
Preloaded Inverter Protocols	Compatible with multiple LV inverters, including Sunsynk, Solis, Victron and more.





FIRE SUPPRESSION

Overview

This device is a compact, heat-activated aerosol fire suppression unit designed for small enclosed spaces such as electrical cabinets. When the surrounding temperature reaches its trigger point, the internal agent rapidly converts into an extinguishing aerosol that disrupts combustion and suppresses the fire.

How it works

Once the temperature-sensitive element activates, the suppression compound breaks down and releases fine aerosol particles. These particles absorb flame radicals and interrupt the combustion process, quickly stopping the spread of fire.

When the device activates, the suppression compound breaks down and produces a fine aerosol made up of potassium-based particles, including potassium carbonate (K_2CO_3), potassium hydroxide (KOH), and potassium bicarbonate ($KHCO_3$). These particles disrupt the combustion process by absorbing flame radicals. This halts the chemical chain reaction and quickly extinguishes the fire.

Technical Specifications

- Activation temperature: $170^{\circ}C \pm 10^{\circ}C$
- Operating temperature range: $-20^{\circ}C$ to $+70^{\circ}C$
- Relative humidity tolerance: $\leq 95\%$
- Discharge duration: ≤ 3 seconds
- Dimensions: $117 \times 68 \times 8$ mm (including bracket)
- Agent mass: $11 \text{ g} \pm 1 \text{ g}$

Operation

The unit is fully automatic. If a fire occurs and temperatures rise to the activation point, the device will release its aerosol agent and suppress the fire. No manual action is required.

Safety Information

- Do not dismantle or modify the unit.
- Keep it away from heat sources before installation.
- Do not expose the device to impact or strong vibration.
- Keep out of reach of children.
- If accidental discharge occurs, ventilate the area.
- For fires involving re-ignition risks, follow up with additional suppression measures.
- Replace the device if the casing is damaged.
- Do not cover or obstruct the activation surface.



BATTERY PROTECTIONS

FUNCTION NAME	FUNCTION SETTINGS	PROJECT LIST	SETTING VALUE	SETTING RANGE
Single cell voltage alarm	Open	Single high voltage alarm	3500mV	Single high voltage recovery ~Single overvoltage protection
		Single high voltage recovery	3400mV	3370mV~ Single high voltage
	Open	Single cell low voltage alarm	2900mV	Single cell undervoltage protection~ Single cell low voltage recovery
		Single low pressure recovery	3100mV	Single cell low voltage alarm ~3100mV
Single overvoltage protection	Open	Single overvoltage protection	3650mV	Single high voltage alarm ~3850mV
		Single overvoltage recovery	3400mV	3370mV~ Single high voltage recovery ~Single overvoltage voltage
		Overvoltage recovery conditions	1.The single cell voltage drops to the overvoltage recovery point. 2.The remaining capacity is lower than 96% of the intermittent charging capacity. Two conditions must be met to restart. The battery discharge current is detected to be $\geq 1A$	



BATTERY PROTECTIONS

Single cell undervoltage protection	Open	Undervoltage protection voltage	2700mV	2500mV~ Single cell undervoltage recovery
		Undervoltage recovery voltage	3100mV	Single cell undervoltage protection~ Single cell low voltage alarm
		Single unit undervoltage shutdown	After undervoltage protection, shut down and maintain communication for 1 minute	
		Undervoltage recovery conditions	Charging current detected ($\geq 1A$)	

Battery total pressure alarm	Open	Total pressure high pressure alarm	56.0V	Total pressure high pressure recovery ~ Total pressure overpressure protection
		Total pressure high pressure recovery	54.0V	51.0V~ Total high voltage
	Open	Total pressure low pressure alarm	46.4V	Total voltage undervoltage protection~ total voltage low voltage recovery
		Total pressure low pressure recovery	48.0V	Total voltage low voltage alarm ~49.0V



BATTERY PROTECTIONS

Total pressure overvoltage protection	Open	Total pressure overvoltage protection	2700mV	2500mV~ Single cell undervoltage recovery	
		Total press overpressure recovery	3100mV	Single cell undervoltage protection~ Single cell low voltage alarm	
		Overvoltage recovery conditions	1.The single cell voltage drops to the overvoltage recovery point. 2.The remaining capacity is lower than 96% of the intermittent charging capacity. Two conditions must be met to restore.		
			The battery discharge current is detected to be $\geq 1A$		

Total pressure undervoltage protection	Open	Total voltage undervoltage protection	43.2V	40.0V~ Total voltage undervoltage recovery	
		Total voltage undervoltage recovery	48.0V	Total voltage undervoltage protection~ total voltage low voltage alarm	
		Total voltage undervoltage shutdown	After undervoltage protection, shut down and maintain communication for 1 minute		
		Undervoltage recovery conditions	Charging current detected ($\geq 1A$)		



BATTERY PROTECTIONS

Battery temperature prohibits charging	Open	Charging high temperature warning	50°C	Charging high temperature recovery~charging over temperature protection
		Charging high temperature recovery	47°C	40°C~Charging high temperature warning
		Charging over~temperature protection	60°C	Charging over~temperature recovery ~65°C
		Charging over temperature recovery	55°C	Charging high temperature recovery~charging over-temperature protection
		Charging low temperature warning	-10°C	Charging under-temperature protection~charging low temperature recovery
		Charging low temperature recovery	3°C	Charging low temperature warning -10°C
		Charging under-temperature protection	-15°C	-15°C~Charge under-temperature recovery
		Charging under-temperature recovery	0°C	Charging under-temperature protection~charging low temperature recovery



BATTERY PROTECTIONS

Battery core temperature is prohibited	Open	Discharge high temperature alarm	55°C	Discharge high temperature recovery ~ discharge over-temperature protection
		Discharge high temperature recovery	50°C	45°C~Discharge high temperature alarm
		Discharge over temperature protection	60°C	Discharge over-temperature recovery ~ 65°C
		Discharge over temperature recovery	55°C	Discharge high temperature recovery ~ discharge over-temperature protection
		Discharge low temperature alarm	-10°C	Discharge under-temperature protection ~ discharge low-temperature recovery
		Discharge low temperature recovery	3°C	Discharge low temperature alarm ~ 10°C
		Discharge under-temperature protection	-15°C	-15°C~Discharge under-temperature recovery
		Discharge under-temperature recovery	0°C	Discharge under-temperature protection ~ discharge low-temperature recovery



BATTERY PROTECTIONS

Ambient temperature protection	Open	Ambient high temperature alarm	50°C	Ambient high temperature recovery ~ Ambient over-temperature protection
		Environmental high temperature recovery	47°C	45°C~Ambient high temperature alarm
		Ambient over temperature protection	60°C	Ambient over temperature recovery~65°C
		Ambient over temperature recovery	55°C	Environmental high temperature recovery~ Ambient over temperature protection
		Low ambient temperature alarm	0°C	Environmental under-temperature protection - Low temperature recovery
		low temperature recovery	3°C	Ambient low temperature alarm -10°C
		Ambient under-temperature protection	-10°C	-15°C~ Ambient undertemperature recovery
		Ambient under temperature true recovery	0°C	Ambient under-temperature protection~Ambient low-temperature recovery



BATTERY PROTECTIONS

Power temperature protection	Open	Power high temperature alarm	95°C	Power high temperature recovery ~ power over temperature protection
		Power high temperature recovery	85°C	45°C~Power high temperature alarm
		Power over temperature protection	110°C	Power high temperature alarm ~ 110°C
		Power over temperature recovery	85°C	Power high temperature recovery ~ power over temperature protection

Charging current limit	Closure	Active current limiting	95°C	Power high temperature recovery ~ power over temperature protection
		Passive current limiting		45°C~Power high temperature alarm
		Charging current limit delay	5 minutes	After the current limit is turned on, recheck whether the current limit is turned on after 5 minutes





BATTERY PROTECTIONS

Charging over current alarm	Open	Charging overcurrent alarm	305A	Charge overcurrent recovery ~ Charge overcurrent protection
		Charge overcurrent recovery	303A	0A~ Charging overcurrent alarm
Charging over current alarm	Open	Charging overcurrent alarm	305A	Charge overcurrent recovery ~ Charge overcurrent protection
		Charge overcurrent recovery	303A	0A~ Charging overcurrent alarm
		Overcurrent recovery conditions	Discharge is restored immediately, or automatically after 60 seconds	
Effective charging current	Charging current		1000mA	
	Charge exit current		700mA	

Discharge overcurrent alarm	Open	Discharge overcurrent alarm	-305A	Discharge overcurrent protection ~ discharge overcurrent recovery
		To overcurrent recovery	-303A	Discharge overcurrent alarm ~0A



BATTERY PROTECTIONS

Discharge overcurrent protection	Open	Discharge overcurrent protection	-310A	Transient overcurrent protection ~0A
		Discharge overcurrent delay	10S	Can be set
		Overcurrent recovery conditions	Charging resumes immediately or automatically after 60 seconds	

Transient overcurrent protection	Open	Transient overcurrent protection	-500A	Discharge overcurrent protection value to 500A
		Transient overcurrent delay	300 mS	Can be set
		Transient overcurrent recovery	Charging resumes immediately or automatically after 60 seconds	
	Closure	Transient overcurrent lockout	Continuous secondary overcurrent, exceeding the over current lock times	
		Overcurrent lock times	5 times	
		Momentary lock release	Connect the charger	



BATTERY PROTECTIONS

Output short circuit protection	Open (Currently does not support the shutdown setting)	Short circuit protection current and delay	Write program (not configurable)		
		Short circuit protection recovery	Charging resumes immediately or automatically after 60 seconds		
	Open	Short circuit protection lock	Continuous output short circuit, exceeding the overcurrent lock times		
		Short circuit lock times	5 times		
		Short circuit lock release	Connect charger		
Effective discharge current	Discharge entry current		-1000mA		
	Discharge exit current		-700mA		
Cell balancing function	Open	Standby balance	No charge and discharge state, start balancing		
	Open	Standby balance time	10 hours	Can be set	
	Turn on voltage condition	Charge equalization	Enable balancing in charging and floating charging states		
		Balanced start voltage	3350mV		Can be set
		Balanced opening pressure difference	30mV		
Equalization end pressure difference	20mV				



BATTERY PROTECTIONS

Cell balancing function	Open	Balanced temperature limit	Balanced shutdown temperature range according to (ambient alarm temperature determination)	
		Balanced high temperature prohibition	50°C	Can be set
		Balanced low temperature prohibition	0°C	
Battery failure alarm	Open	Cell failure voltage difference	500mV	Can be set
		Cell recovery voltage difference	300mV	
Battery capacity setting	Battery rated capacity		6328Ah	5Ah to 628Ah
	Remaining battery capacity		Estimated based on cell voltage	Can be set
	Cycle cumulative capacity		20%	Number of cycles (adjustable)
	Open	Remaining capacity warning	10%	
	Closure	Remaining capacity protection	2%	Turn off output





BATTERY PROTECTIONS

Cell balancing function	Open	Balanced temperature limit	Balanced shutdown temperature range according to (ambient alarm temperature determination)	
		Balanced high temperature prohibition	50°C	Can be set
		Balanced low temperature prohibition	0°C	
Battery failure alarm	Open	Cell failure voltage difference	500mV	Can be set
		Cell recovery voltage difference	300mV	
Battery capacity setting	Battery rated capacity		628Ah	5Ah to 628Ah
	Remaining battery capacity		Estimated based on cell voltage	Can be set
	Cycle cumulative capacity		20%	Number of cycles (adjustable)
	Open	Remaining capacity warning	10%	
	Closure	Remaining capacity protection	2%	Turn off output



BATTERY PROTECTIONS

Battery capacity setting	Battery rated capacity		6328Ah	5Ah to 628Ah
	Remaining battery capacity		Estimated based on cell voltage	Can be set
	Cycle cumulative capacity		20%	Number of cycles (adjustable)
	Open	Remaining capacity warning	10%	
	Closure	Remaining capacity protection	2%	Turn off output
Reset button	Power on/activation		The BMS is in sleep mode. Press the reset button for 1 second, the BMS is activated, and the LED indicators light up in sequence, and then it enters normal working mode.	
	Shutdown/Hibernation		When the BMS is in standby or working state (except charging), press the reset button for 3S, the BMS will be put into sleep mode, and the LED indicators will light up in sequence, and then enter the sleep mode;	
Pre-charge function	2000ms	0~5000ms can be set	BMS starts pre-charging function instantly	
BMS power management	Open	Maximum standby time	48h (Charger is not present and there is no effective discharge current)	



BATTERY PROTECTIONS

Low temperature heating of battery cells	Closure	Low temperature heating of battery cells	0°C	Can be set
		Cell heating recovery	10°C	
		Heating start logic	When the charger is online and the battery cell temperature reaches the start-up condition, heating is turned on. No heating is performed in standby and discharge states.	
External switch	Closure	When the BMS is in standby mode, the external switch can be operated to turn the BMS off and on		
LCD screen	Open	Simplified monitoring software to view data such as battery cells, temperature, current, etc.		
Manual charging activation	Open	1 point	After undervoltage protection, the BMS shuts down. Press the button manually to activate and clear the undervoltage protection to force output.	Can be set
Compensation independence	Connected fault impedance	10mΩ	Default is between 8 and 9	Battery connection line impedance compensation
	Compensation point 1	0mΩ	9	Can be set
	Compensation point 2	0mΩ	13	

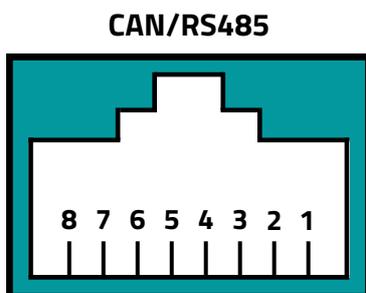


COMMUNICATIONS

CAN/RS485 Inverter Communications

The BMS communication interface is designed to align with the communication protocols of various inverters. However, some inverters have custom communication port definitions that may not match the standard BMS port configuration. As a result, a custom network cable may be required for proper connection.

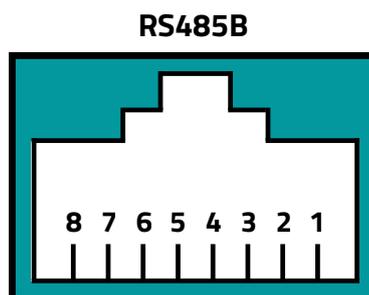
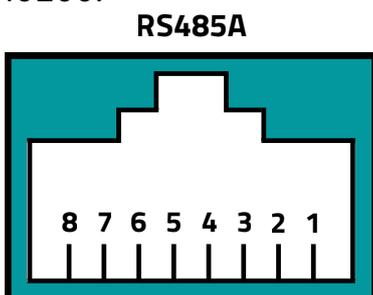
If a standard network cable is used with an incompatible inverter, it may cause the BMS to behave unexpectedly, such as automatically powering on or failing to shut down properly. In most cases, however, communication can still be established using a regular network cable, provided the port definitions are compatible.



CAN-RS485	
PIN	DEFINITION DESCRIPTION
1, 8	RS485-B
2, 7	RS485-A
4	CAN-H
5	CAN-L
3, 6	GND

RS485A / RS485B Internal Communications

Select the appropriate port for internal BMS communication and set the baud rate to 19200.



RS485A	
PIN	DEFINITION DESCRIPTION
1, 8	RS485-B
2, 7	RS485-A
3	MASTER FLAG ENABLED
4	AUTOCODE ADDRESS 2
5	GND
6	GND

RS485B	
PIN	DEFINITION DESCRIPTION
1, 8	RS485-B
2, 7	RS485-A
3	GND
4	AUTOCODE ADDRESS 1
5	GND
6	SALVE FLAG ENABLED



COMMUNICATIONS

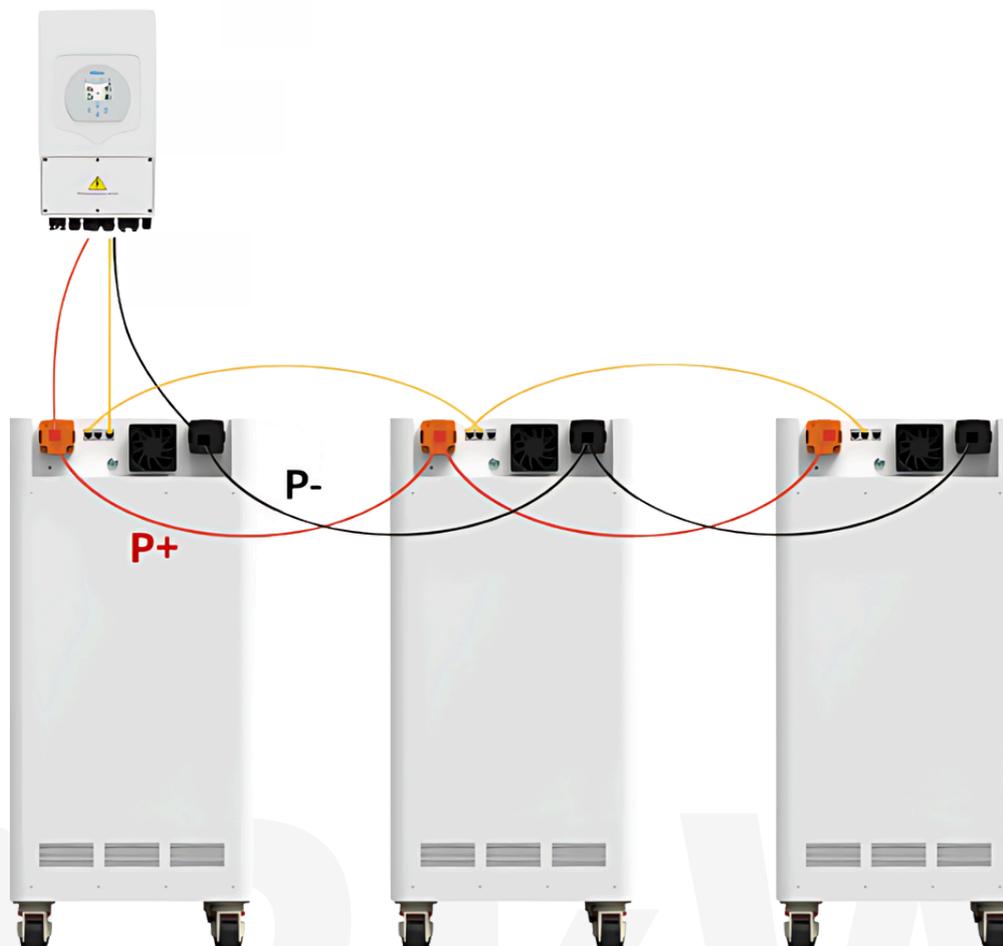
Parallel Communications

The BMS supports automatic address allocation, so there is no need to manually set DIP switches.

When connecting multiple BMS units in parallel, you can use a standard network cable. The wiring should follow this sequence:

- Connect the RS485B port of the first BMS (the host) to the RS485A port of the second BMS.
- Then connect the RS485B of the second BMS to the RS485A of the third BMS, and so on.
- The first BMS acts as the host, and all subsequent BMS units are slaves.
- The host's CAN/RS485 port is connected to the inverter for communication.

Refer to the following diagram for a visual example of the connection layout.





OPERATIONAL MODES

Charging Mode

When the BMS detects that a charger is connected and the external charging voltage is at least 0.5V higher than the internal battery voltage, it activates the charging MOSFET to begin charging. Once the charging current reaches the defined threshold for effective charging, the system fully enters charging mode. In this mode, both the charging and discharging MOSFETs are turned on to allow proper current flow.

Discharging Mode

The BMS enters discharging mode when it detects a connected load and the discharge current exceeds the minimum effective discharge threshold.

Standby Mode

If neither charging nor discharging conditions are met, the BMS enters standby mode.

Shutdown Mode

The BMS will enter shutdown mode under any of the following conditions:

- 48 hours have passed in standby mode
- Battery undervoltage protection is triggered
- Manual shutdown via key/button
- External switch triggers shutdown

Wake-up Conditions from Shutdown Mode:

- Charger is connected (charging activation)
- External voltage of 48V is applied
- Button is pressed to power on.

LED Light Indicators

1 running light, 1 warning light, 4 capacity indicator lights.



SOC



ALARM



RUN





OPERATIONAL MODES

		Charge				Discharge			
		L4 ●	L3 ●	L2 ●	L1 ●	L4 ●	L3 ●	L2 ●	L1 ●
Capacity indicator light									
	0 ~ 25%	Off	Off	Off	Flash	Off	Off	Off	Off
	25 ~ 50%	Off	Off	Flash	Always on	Off	Off	Off	Off
	50 ~ 75%	Off	Flash	Always on	Always on	Off	Always on	Always on	Always on
	≥ 75%	Flash	Always on						
Running indicator light		Charging				Flash			

LED - Flashing Indicators

Flashing Mode	Bright	OFF
Flash 1	0.25s	3.75s
Flash 2	0.5s	0.5s
Flash 3	0.5s	1.5s





OPERATIONAL MODES

LED - Flashing Indicators

System Status	Running status	RUN	ALM	SOC				
		●	●	●	●	●	●	
Standby	Hibernation	OFF	OFF					POWER OFF
Standby	Normal	Flash	OFF	OFF	OFF	OFF	OFF	Standby mode
Charge	Normal	Always On	OFF	According to the power indicator				Maximum LED flash 2
	Overcurrent alarm	Always On	Flash 2	According to the power indicator				Maximum LED flash 2
	Overvoltage protection	Flash 1	OFF	OFF	OFF	OFF	OFF	
	Temperature and overcurrent protection	Flash 1	OFF	OFF	OFF	OFF	OFF	
Discharge	Normal	Flash 3	OFF	According to the POWER indicator				According to the constant light indicator
	Alerts	Flash 3	Flash 3					
	Temperature, overcurrent, short circuit	OFF	Always on	OFF	OFF	OFF	OFF	Stop discharging, when the mains is offline, it will be forced to sleep after 48 hours without any action.
	Undervoltage protection	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharge





INSTALLATION

PRODUCT PACKING LIST	QUANTITY	IMAGE
32KWh Battery	1pc	
1.5M Power Cable	2pc	
1.8M RJ45 Computer Cable	1pc	
1.5M Comms Cable	1pc	

Connectivity and Installation

Batteries should be placed on a level, non-flammable surface such as concrete, not on flammable building materials, and installed in an environment with a temperature between 10°C and 30°C for optimal performance; ensure there is sufficient space around the batteries for heat dissipation (25cm).



INSTALLATION

Delivery

The product is securely packed in a dry, dust-proof, and moisture-resistant packaging box. It is first wrapped in plastic film or EPE (Expanded Polyethylene) for cushioning and then placed inside a wooden crate for added protection during transport.

Specifications:

- Dimensions: L 65 cm × W 63 cm × H 108 cm
- Packing Quantity: 1 unit per box
- Gross Weight: 230 kg



Batteries should be powered OFF before installing

WARRANTY

The Fogstar Energy 32kWh battery comes with a 6-year warranty and 10-year customer support, covering BMS failure, cell failure, temperature sensors, charging/discharging faults, and internal corrosion. Excludes misuse, tampering, incompatible systems, or accidental damage.

Reporting an Issue

If you experience a problem with your Fogstar unit, please contact our Customer Services team first so we can help resolve it quickly and efficiently. Please send any images or screenshots, along with a description of the issue, to: customerservice@fogstar.co.uk.

FAQ'S

Does the system include fire suppression?

The battery includes an integrated, automatic aerosol fire suppression system. If internal temperatures reach the activation threshold, the unit releases a potassium-based aerosol that interrupts the combustion process and suppresses fire without manual intervention.

Do I need to configure DIP switches?

The Fogstar Energy 32kWh utilises a BMS with automatic address allocation. No DIP switch configuration is required.

Does the battery need to be powered off before connecting?

Yes. All batteries must remain in the shutdown state before connecting communication or power cables.

Can these batteries work with other inverter brands?

Yes. The BMS seamlessly integrates with a wide range of popular inverters, containing pre-loaded protocols for popular LV inverter brands including but not limited to LuxPower, Sunsynk, Solis, Victron and more.

Can I mix different battery capacities or models in the same system?

No. Only identical battery models with the same capacity and BMS configuration should be connected in parallel.

What is the warranty period?

The Fogstar Energy 32kWh battery includes a 6-year product warranty and 10-year customer support. For full warranty terms and conditions, please refer to the Fogstar website.