Megatank | ENERTEC NO LIMITS.

User & Installation Manual

Model No: GL48100

GL48100 User & Installation Manual

General instructions

This manual contains important instructions for our GL48100 battery storage system. This manual includes all the information related to GL48100's specifications, interface, and user guide. Please read this manual carefully before installing your equipment and retain it for future reference.

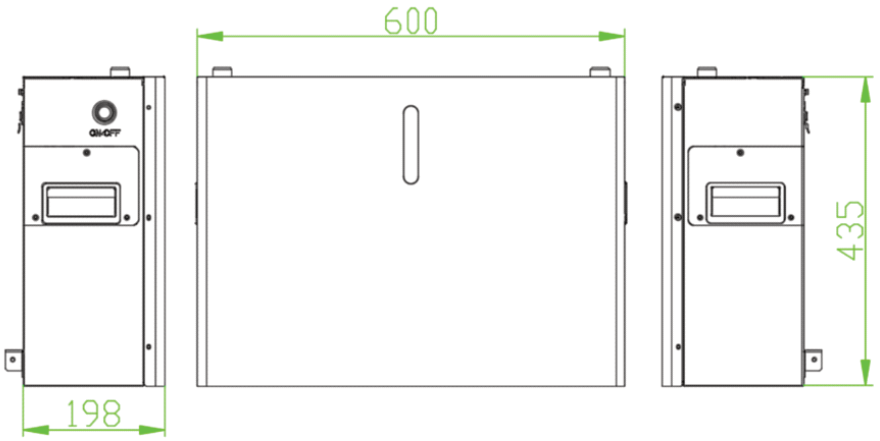
Compatible inverter

Model	GL48100	**Mounting**	Floor-mounting / wall-mounting
Compatible with	Off-grid and on-grid inverter ≤ 5kW (Single GL48100) If you are using a grid-tied inverter or your inverter operates in grid-tied mode, please ensure that the communication between your inverter and GL48100 is properly connected and functioning correctly.		

Driving load performance

Battery nominal voltage	Inverter efficiency	Load start-up instantaneous power	Start-up time	Note
51.2V	80%	5.3kW≤P<8.2kW	<10 seconds	Instantaneous power is an ideal value only for reference. It will be affected by your inverter's efficiency.
		8.2kW≤P<12.2kW	< 3 seconds	

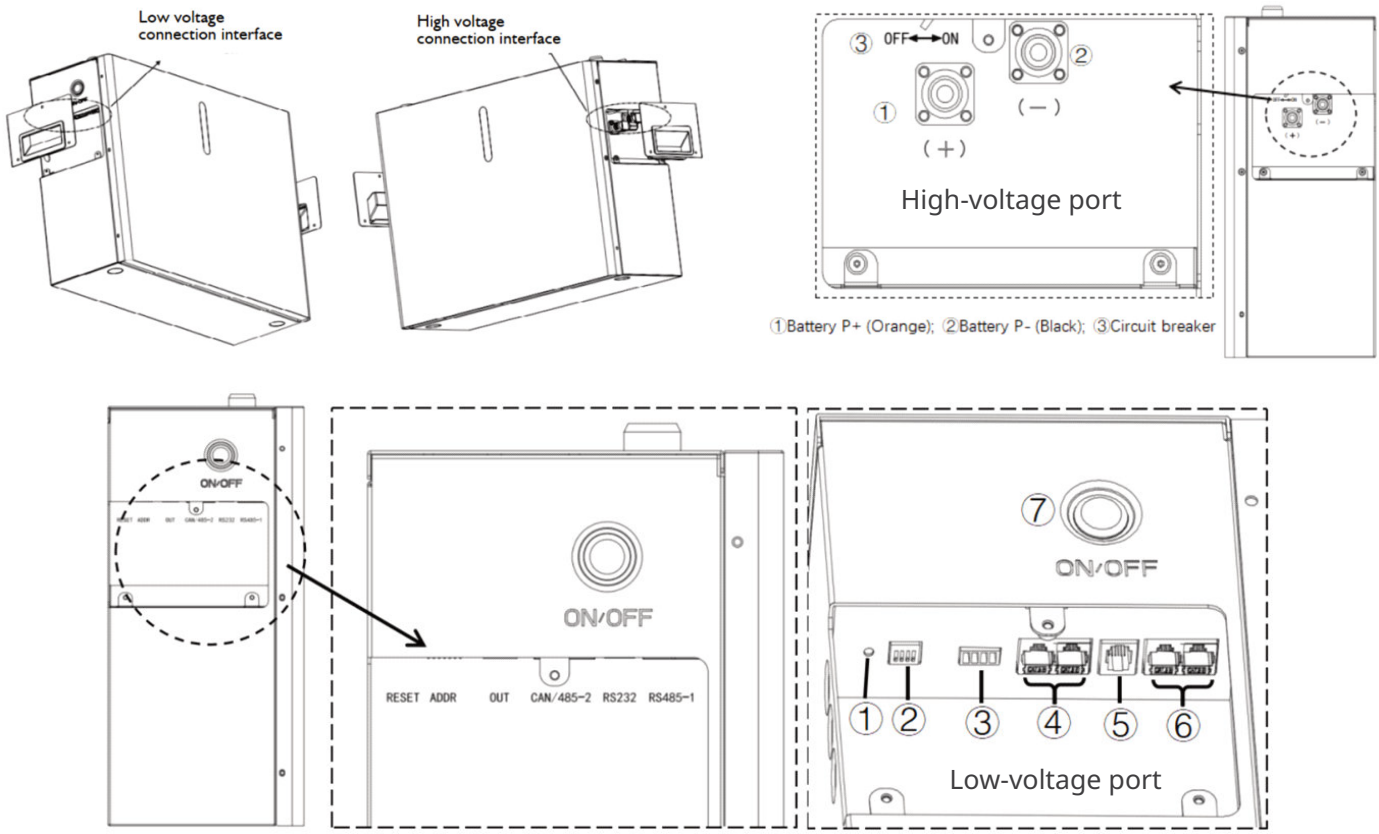
Dimension



Unit:mm

Ports

Ports are concealed within the left and right handle covers of GL48100. Low voltage ports are on the left side, while high-voltage ports are on the right.Please open the handle covers to connect the power & communication cables.



❶	**RESET**	Reset button	Reserved for after-sales service purposes only.
❷	**ADDR**	Address switch	To set the battery address in parallel operation. The master battery is the one that communicates with the inverter. Its address is 01.
❸	**OUT**	Dry contact	
❹	**CAN/485-2**	Two RJ45 ports. Both CAN port & RS 485 can be used to communicate with an inverter. RS485-2 port can be used to monitor all parallelled 's working status on BMS Monitoring software.	
❺	**RS232**	Reserved.	
❻	**RS485-1**	There are two RJ45 ports for communication between GL48100 systems in parallel operation (daisy-chain). The RS485-1 port can be used to monitor the working status of all GL48100 systems through the BMS upper computer when the master GL48100 is not connected to the inverter.	
❼	**ON /OFF Button**	Press the ON/OFF button to power your GL48100 on or off.	

Ports

We recommend using CAN communication between GL48100 and your inverter.

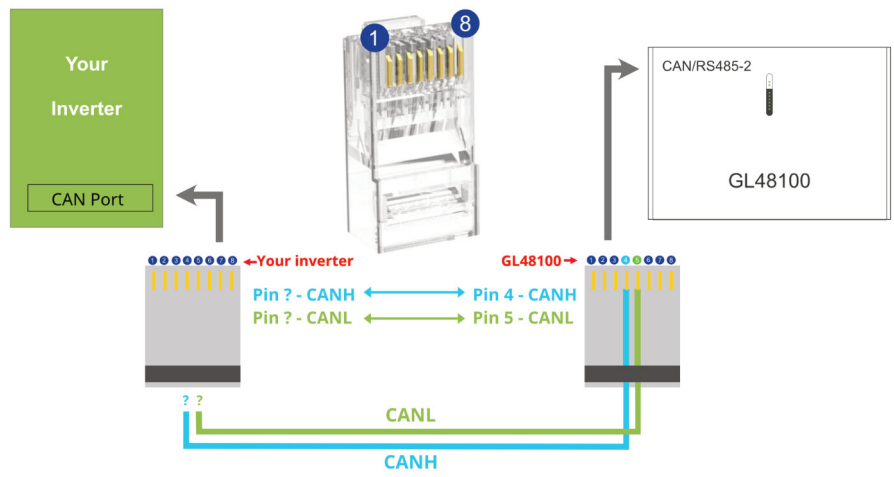
Some inverters on the market have both RS485 and CAN ports. If your installer uses the CAN port for communication with the GL48100, please disconnect the RS485 network cables to avoid potential communication loss between the GL48100 and your inverter.

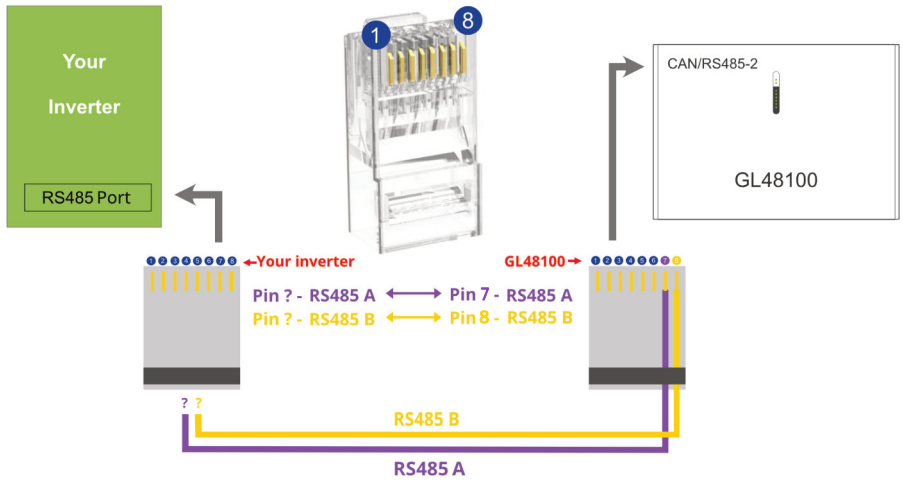
Two RJ45 ports RS485-1	For multiple GL48100s daisy-chain communication	Pin 1 & Pin 8	RS485-B
		Pin 2 & Pin 7	RS485-A
		Pin 3 & Pin 6	GND
		Pin 4 & Pin 5	NC

Two RJ45 ports CAN &RS485-2	For inverter communication and service purposes	Pin 4	CAN-H (to inverter CAN-H)
		Pin 5	CAN-L (to inverter CAN-L)
		Pin 3 & Pin 6	GND
		Pin 1 & Pin 8	RS485-B (to inverter RS485-B or BMS software communication)
		Pin 2 & Pin 7	RS485-A (to inverter RS485-A BMS software communication)

GL48100 communication pins with a inverter

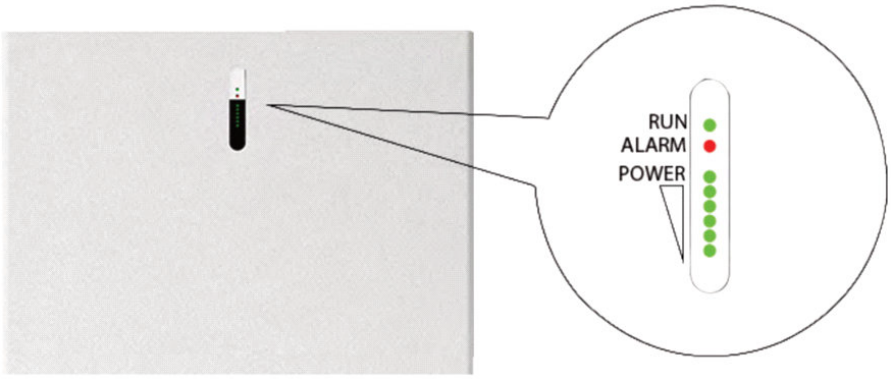
- Please consult your inverter manual for the inverter-battery communication pin definition first.
- Always remove unnecessary wires from the RJ45 connector, as some inverter communication pins carry voltage and pose a potential risk of damaging your BMS.





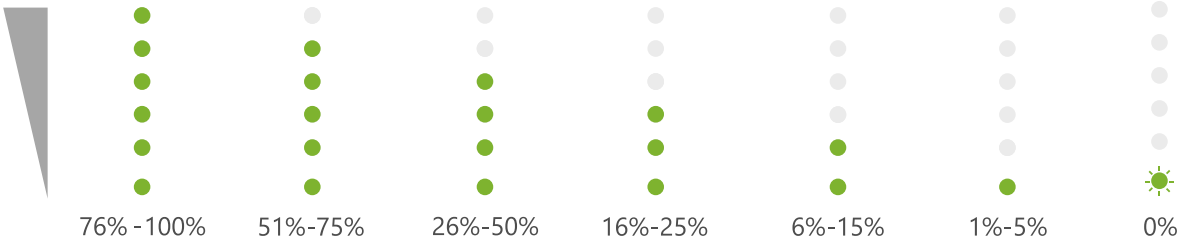
The indicators

When your GL48100 is on, the RUN indicator blinks green every second. If an alarm occurs, the ALARM indicator blinks red every second your GL48100 can still be charged if the alarm indicator blinking red, but discharging may be limited under certain conditions (low battery percentage). If GL48100 is under protection, the ALARM indicator turns solid red, limiting charging and discharging functions.



The POWER indicator - Charging

The POWER indicator - Discharging



Discharging	75%-100%	
	51%-75%	
	26% - 50%	
	6% -15%	Low battery. Please charging the batteries as soon as you can. Do not power any loads.
	1% - 5%	The GL48100 will stop discharging to protect itself. If you see this indicator, please charge the battery immediately.
	0% (Blinking green)	The GL48100 may enter sleep mode. To wake it up, please use a low-current battery charger.

The charging alarm & protection indicator

When	Alarm & Protection	Conditions	Indicator	Note
Charging	Over-voltage protection	Battery voltage ≥ 56.8V Cell voltage ≥ 3.65V	Off	Higher charging voltage negatively affects battery life. Please adjust your inverter's parameters accordingly.
	Over- current alarm	≥ 105A	Blinking red	You can still charge/discharge your GL48100.
	Over-current protection	≥ 115A	Solid red	GL48100 stop charging. Please reduce your charging current. You can discharge to power your loads.
	Over-temperature alarm (Battery)	≥ 50°C	Blinking red	You can still charge your GL48100. Please reduce your charging current.
	Over-temperature protection (Battery)	≥ 55°C	Solid red	GL48100 stop charging.But you can still discharge GL48100 to power your loads. Please disconnect some of your heavy loads < 2.5kW to reduce the heating produced by the battery.
	Under-temperatue alarm(Battery)	≤ 5°C	Blinking red	You can still charge your GL48100. Please reduce your charging current to 20A.The GL48100 will be able to charge when the enviroment temperature > 10°C.
	Under-temperatue protection(Battery)	≤ 0°C	Solid red	GL48100 stop charging.You can discharge to power your loads. The GL48100 will be able to charge when the enviroment temperature > 5°C.

If improper inverter settings or long load shedding periods lead to an abnormally flat battery percentage in the GL48100, your inverter may not charge it effectively. This could result in two scenarios:

- A solid green power indicator, or
- A blinking green power indicator with a solid red alarm indicator.

In these situations, please reach out to your installer or request technical support services.

The Alarm & Protection indicator (Discharging)

When	Alarm & Protection	Conditions	Indicator	Note
Dis-charging	Low-voltage alarm	Battery voltage ≤ 46.4V Cell voltage ≤ 2.8V	Blinking red	Please charge your battery immediately.
	Low battery procentage alarm(Low SOC)	≤ 10%		
	Low-voltage protection	Battery voltage ≤ 44.8V Cell voltage ≤ 2.7V	Solid red	GL48100 stop discharging and enter the protection mode. You may need your installer's help to wake up the battery.
	Low Battery procentage protection(Low SOC)	≤ 5%		
	Over-current alarm	≥ 120A	Blinking red	You can still charge /discharge the battery.Please reduce your load to decrease the discharging current.
	Over-current protection	≥ 130A	Solid red	Please reduce your load to decrease the discharging current.
	Over-temperature alarm	≥ 55°C	Blinking red	Please disconnect some of your heavy loads < 2.5kW to reduce the heating produced by the battery.
	Over-temperature protection	≥ 60°C	Solid red	The GL48100 stops charging and discharging. Please verify if your inverter's output is too high for the GL48100. Also, ensure the ambient environment is sufficiently cool.
	Under-temperatue alarm	≤ -5°C	Blinking red	You can still discharging you GL48100.
	Under-temperatue protection	≤ -20°C	Solid red	GL48100 stop discharging.You can discharge to power your loads. The GL48100 will be able to discharge when the enviroment temperature > -10°C.
	BMS short-circuit protection		Solid red	The GL48100 stops charging and discharging. Please verify if your inverter's output is too high for the GL48100, and check for any short circuit issues with the inverter or your loads.
	Circuit-breaker short-circuit protection		Solid red	Avoid turning on GL48100 until the short-circuit issue is resolved.

The inverter settings

For a safe, stable, and reliable home energy storage system, please follow the table below to configure your inverter's output power and GL48100 quantity. The maximum quantity for GL48100 should not exceed 15 units.

Inverter Output Power(kW)	≤5kW	5-6kW	6-8kW	8-10kW
GL48100 Quantity	≥ 1	≥ 2		

The recommended inverter parameters

When communication between your inverter and GL48100 is lost, most inverters can continue to charge & discharge GL48100 , but they will not be able to obtain the GL48100's charging& discharging cut-off parameters via communication. In this case, the reliable operation of GL48100 depends on the parameters your installer configured on your inverter.

Please NEVER use the built-in default values of your inverter. If your inverter 's charge and discharge parameters only have the "Battery Brand - Voltage Platform" option, please prioritize selecting Pylon-51.2V.

Therefore, regardless of whether the communication between the inverter and GL48100 is normal, it is necessary to config the related charging and discharging parameters in your inverter. The requirements are as follows:

Settings	**Inverter Parameters**	**Note**
Battery type	Li	Lithium battery, if there is an LFP option, please choose LFP($LiFePO_4$ Battery)
Communication method	CAN	We recommend always use CAN if it is available
Charging voltage	55.2V	The maximum charging voltage is the threshold at which charging will stop once it is reached.
Float charging voltage	54.7V	Some inverters have a float charging voltage option. When the charging voltage reaches 55.2V, these inverters will reduce the charging current.
Discharging cut-off voltage	49.5V	Some inverters use this parameter as a cut-off voltage to manage the battery. If the GL48100 voltage reaches 49.5V, the inverter will stop powering the loads. This voltage matched battery percentage is around 10% ± 5%@50A(only for reference).
Discharging recover voltage	51V	Inverters that manage battery discharge by cut-off discharge voltage will only allow the system to power your loads after detecting that the battery voltage has risen back to 51V.
Discharging cut-off SOC	20% or 30%	Some inverters use battery SOC to manage the battery . If the GL48100 voltage reaches 20% (or 30%), the inverter will stop powering the loads.
Depth of Discharge DoD	80% or 70%	Some inverters use battery DoD(100%-SOC) to manage the battery . If the GL48100 voltage reaches 80% (or70%), the inverter will stop powering the loads.
Discharging restore SOC	30%	Inverters that manage battery discharge by SOC will only allow the system to power your loads after detecting that the battery SOC has risen back to30%.
SOC hysteretic interval	15%	SOC hysteretic interval = Discharging restore SOC-Discharging cut-off SOC.

Settings	Inverter Parameters	Note
Charging current	/	When using only one GL48100, we recommend a charging current of 50A, with a maximum current of less than 70A, to prevent battery life reduction due to high current in low-temperature situations. When using multiple battery systems in parallel, please set the charging current = 50A × GL48100 quantity, but the maxium charging current should < 200A, With proper communication between the inverter and GL48100, GL48100 BMS calculates and reports its discharging current based on factors like temperature, SOC, SOH, and the number of paralleled batteries. This allows the inverter to optimize output power while prolonging the whole system's cycle life.
Discharing current	/	For some inverters, it's necessary to set the "Rated discharging current." Please set this parameter to 100A. •When using multiple GL48100s in parallel, please set the max continuous discharging current to 100A x GL48100 quantity, but keep the total discharging current below 200A. With proper communication between the inverter and GL48100, GL48100 BMS calculates and reports its discharging current based on factors like temperature, SOC, SOH, and the number of paralleled batteries. This allows the inverter to optimize output power while prolonging the whole system's cycle life.

A note about discharging cut-off voltage:

The discharging cut-off voltage comes into play when communication between the inverter and GL48100 is lost or when operating in the inverter's voltage-cut-off mode. Battery voltage can be affected by factors such as heavy load output, low temperatures, and battery aging. These natural characteristics may lead to the inverter stopping prematurely, affecting user experience.

When the load power is high or the ambient temperature is low, the battery voltage will reach the discharge cut-off voltage prematurely (equivalent to a higher discharge cut-off voltage setting), causing the inverter to stop working and resulting in less discharged energy, affecting user experience. When the load power is low or the ambient temperature is appropriate, the battery voltage will slowly reach the discharge cut-off voltage (equivalent to a lower discharge cut-off voltage setting), leading to an increased depth of discharge, and even over-discharging the battery, which is detrimental to the battery's cycle life.

Therefore, it is challenging to appropriately manage the battery discharge state using the discharge cut-off voltage. As a result, we recommend users set their inverters to battery SOC to manage GL48100 .

A note about 49.5V settings(When the communication between the inverter and GL48100 is lost)

As mentioned earlier, the discharge cut-off voltage of 49.5V is just a reference value. Please adjust it according to actual load requirements. For a discharging current of around 50A (2.5kW output), use 49.5V. If the current is less than 50A, set the voltage to >49.5V.

If the discharging cut-off voltage setting on your inverter is too low, the inverter may not stop as intended, causing the battery to protect itself and enter sleep mode. Please try to reboot your entire system manually.Otherwise, please ask your installer for further assistance.

A note about "discharging cut-off SOC."

When the GL48100 has good communication with the inverter, this mode functions effectively. In the future, for instance, after 3-5 years, we recommend setting the discharging cut-off SOC higher, such as by 20% to 30%, to prolong the GL48100's lifespan.

When using multiple GL48100 units in parallel, please ensure proper communication between the inverter and the master GL48100, as well as between the individual GL48100s. This is crucial for the normal operation of the entire system.

Inverter parameter settings and system test run

After connecting the power cables and communication cables between GL48100 and your inverter, do not connect the load to the inverter's AC output before your test run.

Please refer to the information above and configure the relevant charging and discharging parameters on the inverter first.

Start your GL48100(s) in the following way:

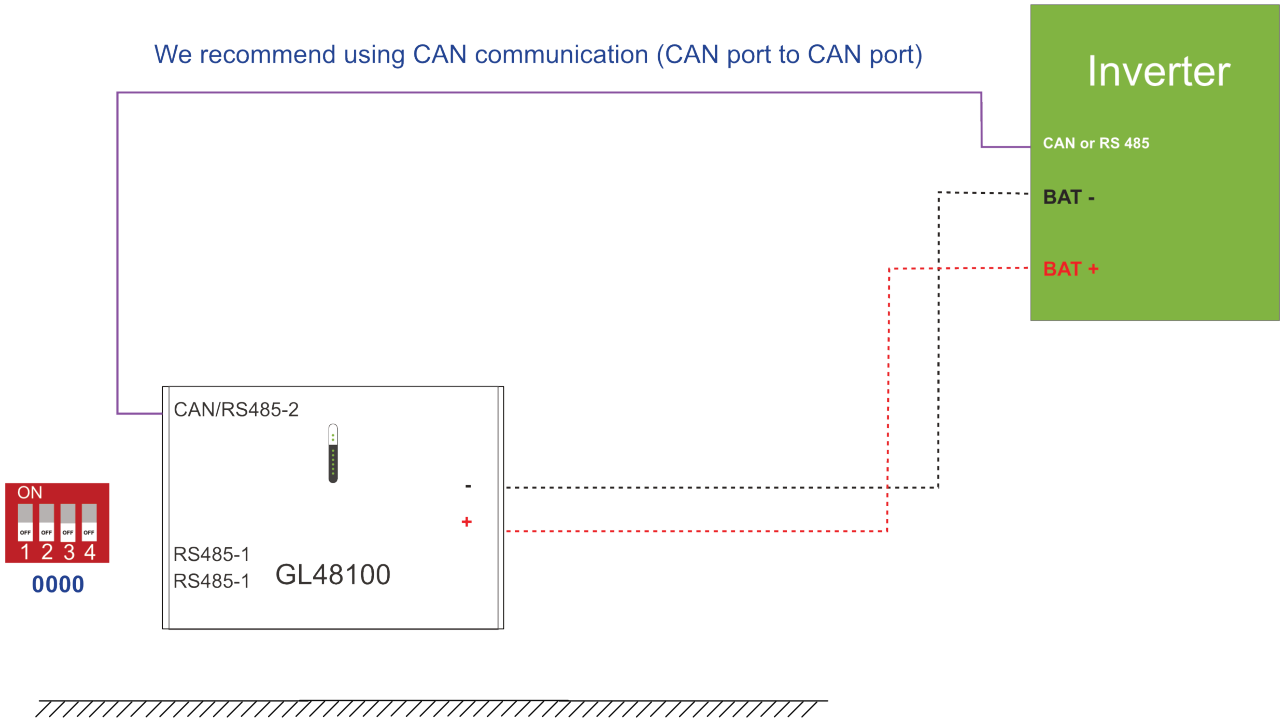
• Turn on all GL48100 circuit breakers.

- Turn on the master GL48100 power ON switch.
- Confirm that there are no abnormalities, then turn on the button switches of all slave GL48100.
- Connect your load, gradually increase the load power, and check the entire system's running status:

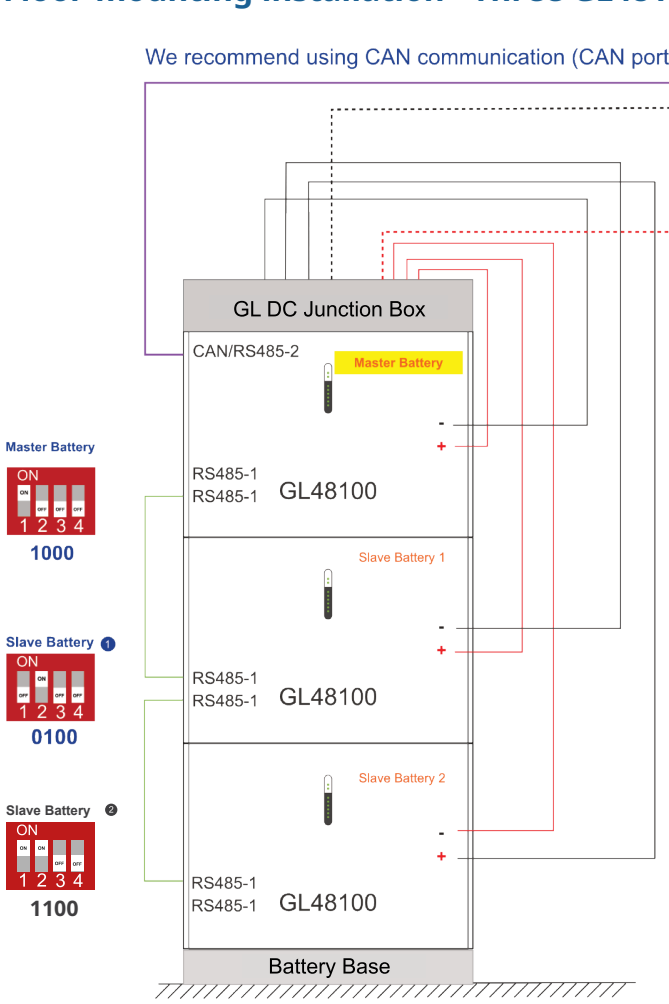
• Ensure that the battery-related data displayed on the inverter is normal (e.g., battery quantity, charging/ discharging current/voltage request value, SOC, fault status, etc.). If possible, connect the GL48100 to its BMS software by computer to monitor all GL48100 running parameters.

- Please check for any abnormal phenomena during charging and discharging processes.

Wall-mounting installation - One GL48100



Floor-mounting installation - Three GL48100



Recommended inverter -GL48100 power cable size:

The power cable size:

1. 25mm² (or 4AWG) Silicone Rubber Cabling (200°C 600V)
2. 16mm² (or 6 AWG) Silicone Rubber Cabling (200°C 600V)

Recommended flammability standard:VW-1 or UL94-V0.

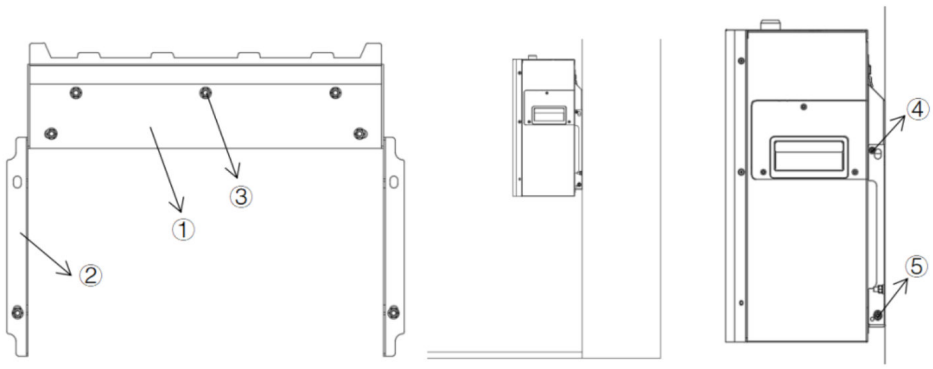
Temperature continuously usage >125°C

Note:

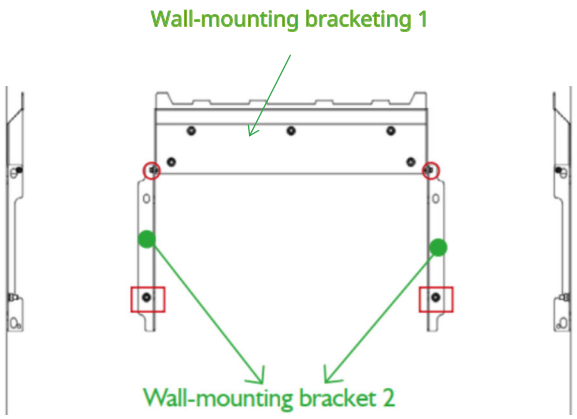
1. For 4AWG cables (smaller than 25mm²), use a 25mm² hydraulic crimping tool to ensure a tight crimp.

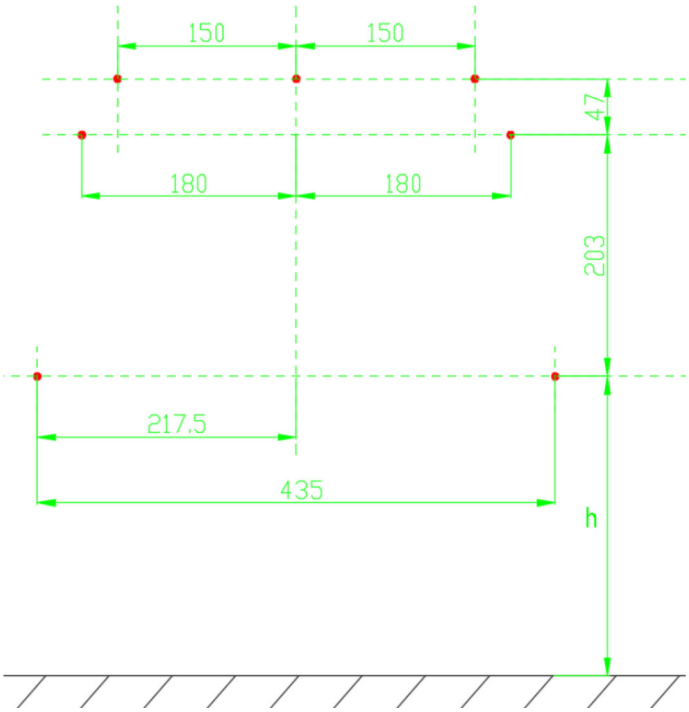
2. For 6AWG cables (smaller than 16mm²), use a 16mm² hydraulic crimping tool to ensure a tight crimp.

The wall-mounting installation



①	Wall-mounting bracket 1	④	Phillips screws with spring washer & flat washer, button head M4*10
②	Wall-mounting bracket 2	⑤	Phillips screws with spring washer and flat washer, button head M6*12
③	Sleeve anchor M6*50		





Recommended inverter -GL48100 power cable size:

The power cable size:

1. 25mm² (or 4AWG)
2. 16mm² (or 6 AWG)

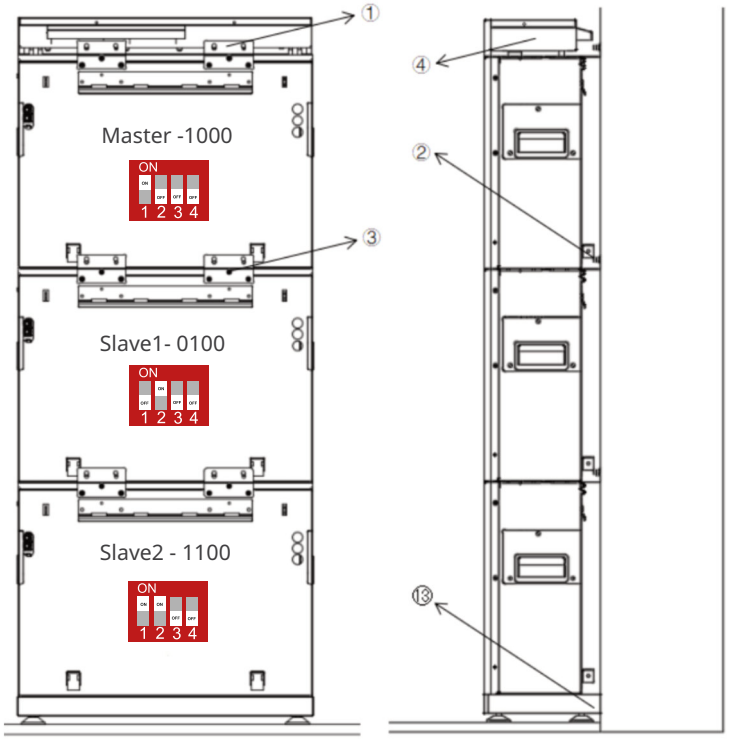
Recommended flammability standard:VW-1 or UL94-V0.

Temperature continuously usage >125°C。

Note:

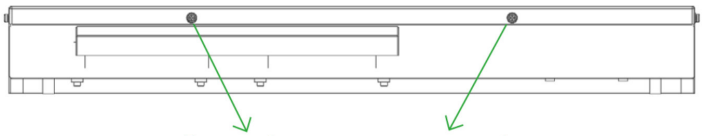
1. For 4AWG cables (smaller than 25mm²), use a 25mm² hydraulic crimping tool to ensure a tight crimp.
2. For 6AWG cables (smaller than 16mm²), use a 16mm² hydraulic crimping tool to ensure a tight crimp.

The floor-mounting installation



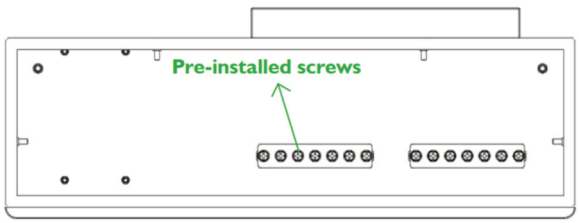
①	Wall-mounting bracket
②	Sleeve anchor M6*50
③	Phillips screws with spring washer and flat washer, button head M4*10
	GL DC junction box
⑬	Battery Base (Optional)

The DC junction box



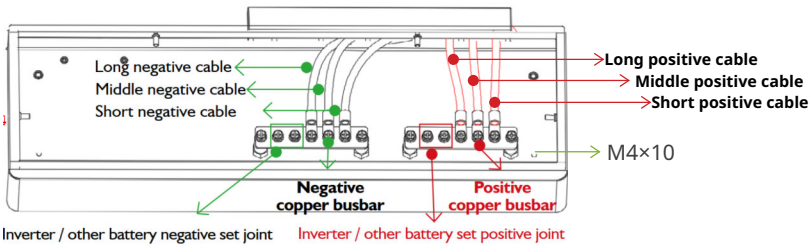
Remove two screws as spare parts

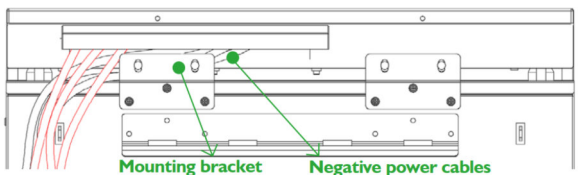
M4×16 with spring & flat washer



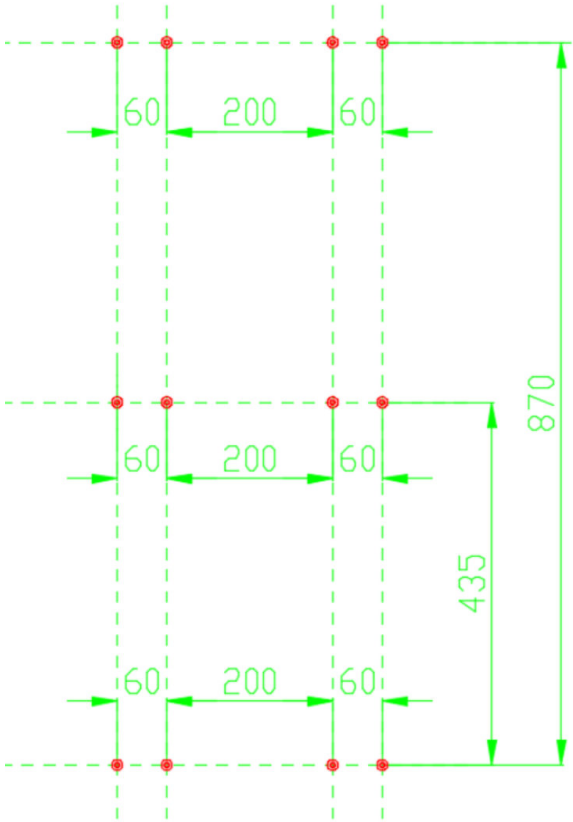
M6×12 with spring & flat washer | Tighten Torques: 5.5± 0.5Nm

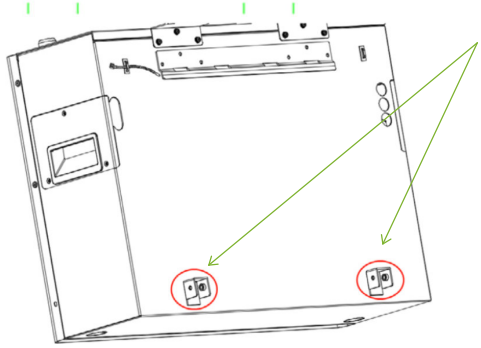
Tool: No. 10 socket wrench or philip screwdriver





The hole drilling reference





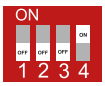
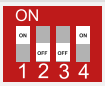
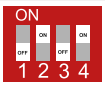
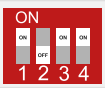
The power cables to the inverter or other GL48100 groups are not shown in the above picture. The power cable dimension between an inverter and this busbar should match the inverter's continuous current value.

Please make sure the screws are tightened with the busbar. If the screws are loose, it may cause overheating problems or safety accidents.

The bottom part are designed for groundconnection.your installer will decide whether connect GL48100 to the ground or not according to the installation needs.The ground cable is not includedin GL48100's package.

The Parallel operation address table

If you only have one GL48100, please keep the default address as 0000. This address table is only used for parallel operations.

No.	Address	1#	2#	3#	4#	Details	Note
1	1000	ON	OFF	OFF	OFF		Master
2	0100	OFF	ON	OFF	OFF		Slave 1
3	1100	ON	ON	OFF	OFF		Slave 2
4	0010	OFF	OFF	ON	OFF		Slave 3
5	1010	ON	OFF	ON	OFF		Slave 4
6	0110	OFF	ON	ON	OFF		Slave 5
7	1110	ON	ON	ON	OFF		Slave 6
8	0001	OFF	OFF	OFF	ON		Slave 7
9	1001	ON	OFF	OFF	ON		Slave 8
10	0101	OFF	ON	OFF	ON		Slave 9
11	1101	ON	ON	OFF	ON		Slave 10
12	0011	OFF	OFF	ON	ON		Slave 11
13	1011	ON	OFF	ON	ON		Slave 12
14	0111	OFF	ON	ON	ON		Slave 13
15	1111	ON	ON	ON	ON		Slave 14

Storage

During transportation, avoid violent vibrations, shocks, or pressure. Charge the battery system to 50% capacity for long-term storage. Perform a charging/discharging cycle with a 50A current monthly, using 49.5V instead of 44.8V. After the cycle, charge and discharge the battery system with a 50A current, then stop charging. Store the battery system at temperatures between 0°C and 35°C (not exceeding 40°C), with 45%-85% relative humidity, and atmospheric pressure of 70kPa - 106kPa. Keep it in a clean, dry, and ventilated area away from direct sunlight, corrosive substances, fire, and heat sources

Usage Precautions

1. Ensure the use of a high-quality matched inverter with your GL48100.
2. Verify that the appliance power output is within the required limit.
3. Carefully check positive/negative connections and communication port pin definitions before wiring.
4. Charge the battery if storing it for a longer time.
5. Adhere to the user manual, disconnect circuits before wiring, and consult a professional if necessary.
6. Refrain from disposing of scrapped batteries; contact certified recyclers for appropriate treatment.
7. In case of a bad smell or reduced capacity, cease using the battery and consult your dealer.
8. Please do not disassemble the GL48100.
9. Keep the GL48100 away from water or excessive humidity to avoid damage.
10. Store the battery system out of reach of children and pets.
11. Refrain from using damaged or frayed cables when connecting your GL48100.
12. Conduct regular inspections of your GL48100 for any signs of damage, wear, or leakage.
13. Do not modify or attempt repairs on your without professional assistance.
14. Ensure your GL48100 is properly grounded to avert electrical hazards.
15. Abide by local regulations and guidelines for your GL48100 installation and maintenance.
16. Prolonged use and storage your GL48100 in high-temperature environments above 40°C can significantly reduce its cycle life.
17. Do not connect more than 16 pcs GL48100 in parallel.

Megatank | ENERTEC NO LIMITS.

Contact Us

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