



Intelligent Liquid Cooling System and Liquid Cooling Gun/Line Product Specification Sheet



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I. Product Overview

Our company has developed an intelligent liquid cooling system and liquid cooling gun-and-cable solution based on industry standards; these are primarily designed for high-current charging of new energy vehicles. By employing liquid cooling technology to cool the charging gun and charging cables, we enhance their current-carrying capacity, enabling fast high-current charging. Additionally the charging cables are made more slender and lightweight thereby improving the user experience.

The system consists of three main components: a liquid-cooling gun line, a cooling source (including a smart controller), and a coolant.

The smart controller receives commands from the charging station to control the startup and shutdown of the liquid-cooling system, and it also provides feedback on the system's operating mode, fault status, and other relevant information.

During system operation, the smart controller automatically adjusts the rotational speeds of the fan and pump based on parameters such as the inlet and outlet fluid temperatures, pressure, and ambient temperature.

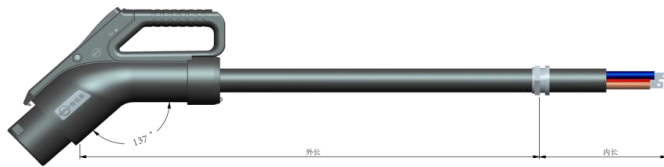
By employing an optimized control strategy while ensuring adequate heat dissipation the system significantly reduces power consumption and extends product lifespan, thereby lowering both operating and maintenance costs for the user.

II. System Architecture

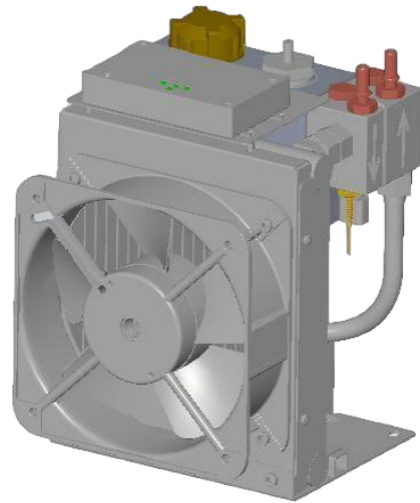
This system primarily consists of a liquid cooling gun line, a cooling source (including a controller), and a coolant.



coolant liquid



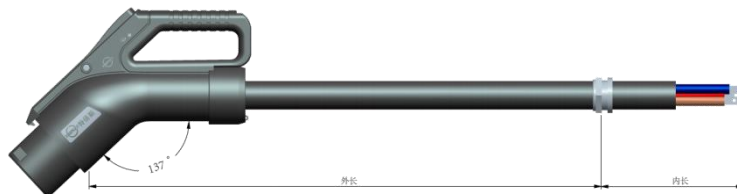
Liquid cooling gun cable *1 piece



Cold source

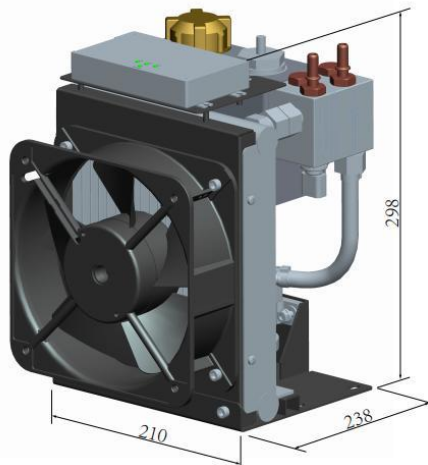
III. Technical Specifications

3.1 Liquid Cooling Gun Cable – WB-IC-DC2.0–500A



Rated voltage	1000V DC	Cable length	5m
Rated current	500A (with liquid cooling) 180A (Without liquid cooling)	Cable bending radius	5D
Voltage rating	$\geq 3000V$ AC	Terminal surface treatment	Silver plating
Insulation resistance	$\geq 100M\Omega$	Terminal material	T2 Copper
Insertion/ Removal Life span	>10,000 times	Electronic lock drive time	200-300ms
Insertion/ Extraction Force	$\leq 140N$	Electronic lock power-on time	$\leq 3s$ (Continuous power supply)
Gun Tip Protection Rating	IP55	Electronic lock type	Motor Lock
Operating ambient temperature	-30°C~50°C	Electronic Lock Protection Rating	IP67
Flame retardance rating	UL 94-V0	Electronic lock service life	$\geq 30,000$ times
Conductor thermal loss	1.404kW (@20°C)	Electronic lock operating voltage	12V DC
Cable specification (PE6)	4×25+1×6+2×(3×0.75)(P2)+2×0.75(P2)		
Cable outer diameter (PE6)	32±1 mm	Cable weight (PE6)	1.85 kg/m

3.2 Cooling Source: STP6001000 (GB)



Size(WDH)	210mm*238mm*298mm	Heat-sinking capability	2kW
Rated voltage	12V DC	Operating ambient temperature	-30°C~50°C
Rated dissipation	120W	Liquid cooling system noise	≤60 dB (25°C ambient temperature)
Manual switch	Add/Liquid Drainage	Pilot lamp	On-site fault indicator light
Control method	Voluntarily	Communication mode	RS485
Protocol	Private Protocol	Levels of protection	IP54 (excluding controller)
Weight	Approximately 8 kg	Work Flow Rate	0~3L/Min
Working pressure	0~0.3 Mpa		

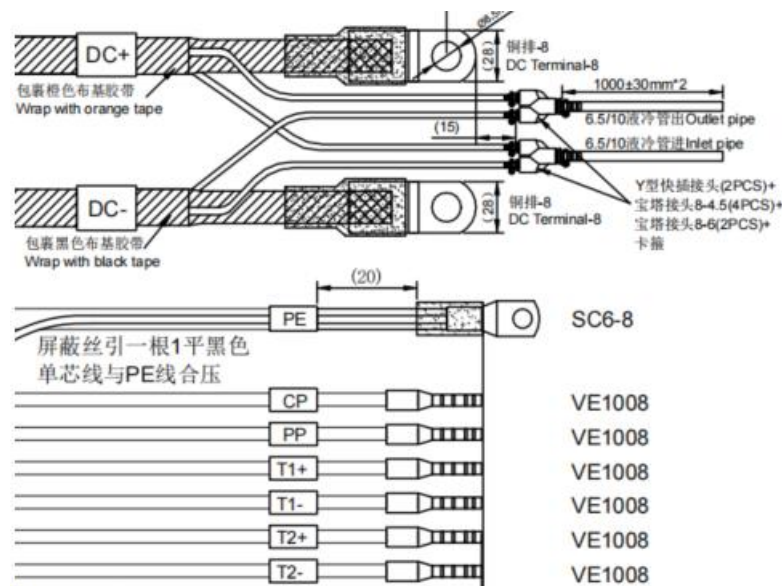
3.3 Coolant: CL-35



Ingredient	50% ethylene glycol aqueous solution	Operating temperature range	-30°C~108°C
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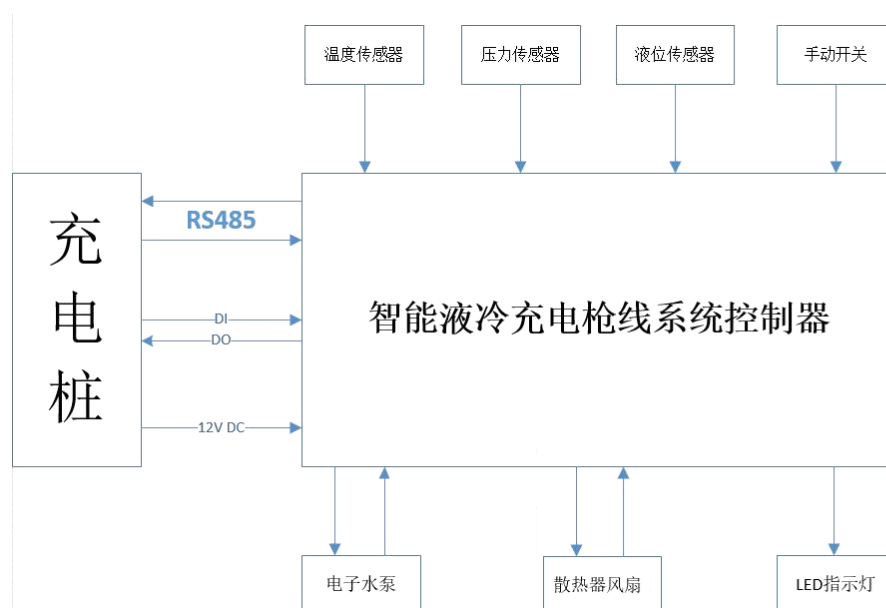
IV. Electrical Connection and Controller Functionality Overview

4.1 Electrical Connection Between the Firearm Cable and the Charging Station

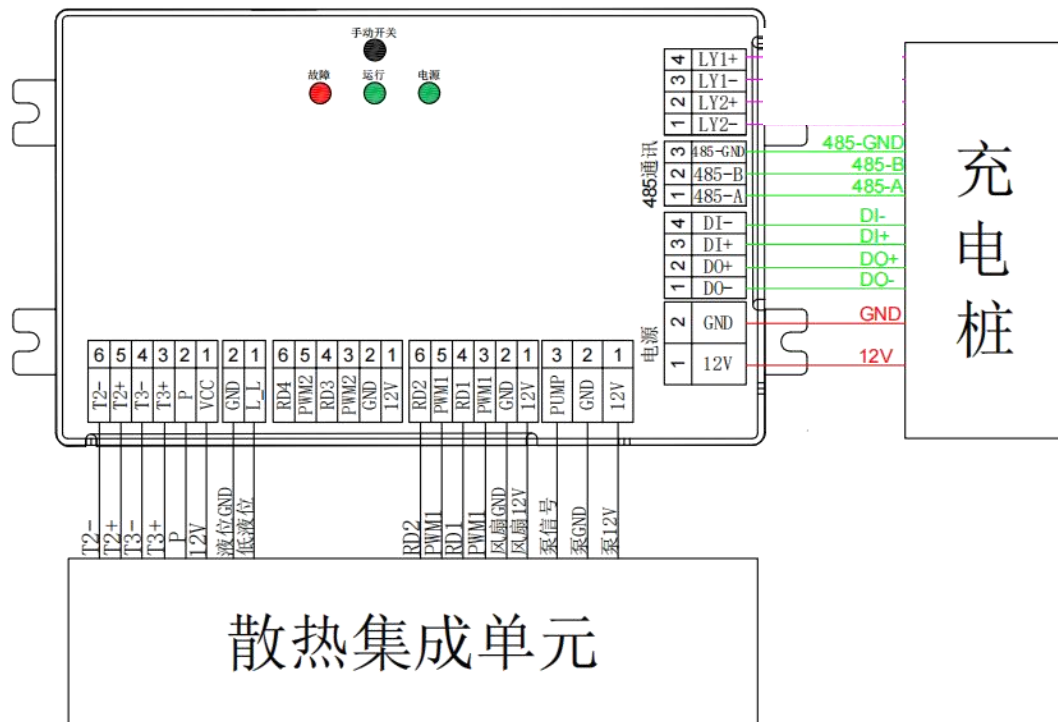


The electrical wiring between the gun cable and the charging station shall be connected such that the identification tube at the end of the liquid-cooled gun cable corresponds to each of the terminal blocks inside the charging station (subject to the order confirmation drawings).

4.2 Smart Controller Electrical Control Principle Block Diagram



4.3 Smart Controller Electrical Wiring Diagram



Note: The following is the wiring list for the liquid cooling system controller, along with wire specifications and terminal types:

Order number	Name	Conductor cross-sectional area (mm ²)	Terminal Model	Remarks
1	12V+	2.5	E2508	Controller Power Supply
2	GND	2.5	E2508	
3	485-A	0.5	E7508	485 communication interface
4	485-B	0.5	E7508	
5	485-GND	0.5	E7508	
6	DI+	0.5	E7508	Dry node DI start/stop control: Start; Stop
7	DI-	0.5	E7508	
8	DO+	0.5	E7508	PNP-type 12V Fault Feedback Output: High – Fault; Low – Normal
9	DO-	0.5	E7508	

◆ **Red line** indicates the controller's power supply interface; the charging station provides a 200W ,12V DC power supply;

◆ **Green Line** denotes the controller communication interface; select one of the two methods (RS485/

◆ Dry Contact). **Purple Line**—Liquid cooling gun line leakage monitoring signal line;

4.4 Intelligent Controller

The intelligent controller's functions include: communicating with the charging station; collecting sensor data and gathering/Reporting abnormal fault information; automatically adjusting the pump and fan speeds based on commands issued by the charging station;



- ◆ Communication with the charging station: The smart controller receives charging commands and uploads system status information.
- ◆ Collect sensor data: measure the temperatures and pressures at the radiator's inlet and outlet ports, as well as the ambient temperature.
- ◆ Collect abnormal fault information: fan failure, pump failure, liquid level fault, sensor failure.
- ◆ Control of fan and water pump: The smart controller automatically adjusts the water pump and fan speeds based on the charging status. Status indicator light:
 - ◆ Power indicator light (green): The green light remains constantly on, indicating that the system power supply is functioning normally.
 - ◆ Operating indicator light (green): The flashing green light indicates that the system is operating.
 - ◆ Fault Indicator Light (Red): Distinguishes between liquid level, fan, pump, and other faults using flashing frequency:
 - Liquid level: 1s ON, 2.5s OFF
 - Fan: 0.5s ON, 0.5s OFF
 - Pump: 0.1s ON, 0.1s OFF
 - Other faults: Constant illumination

Note: Fault indicator priority order: Pump> Fan> Liquid Level> Other Faults

For more detailed fault information, refer to the RS-485 bus documentation or the communication protocol. Manual switch: Used for filling or draining operations during system installation or maintenance.

V. Installation and User Manual

For detailed information, please refer to the "*Intelligent Liquid Cooling System and Liquid Cooling Gun/Line Product Installation and Usage Manual (Dual-Gun/Dual-Fan Series)*".



VI. Communication Protocol

Provided during equipment integration testing

VII. Important Notes

- ◆ When designing a charging station cabinet, the following factors should be taken into account:
 - (1) The air intake and exhaust vents should be positioned as far apart as possible to prevent the discharged heat from being drawn in directly;
 - (2) Maximize the area of ventilation openings to compensate for the wind resistance caused by louvers, honeycomb structures, and dust-proof cotton;
 - (3) Within the charging station cabinet, the cold air supply and exhaust ducts must be isolated by dedicated air ducts to prevent the cold air from circulating within the cabinet.
- ◆ During system operation, do not touch the fan to prevent damage to its blades.
- ◆ During system operation, do not touch the heat sink to prevent injury caused by high temperatures.
- ◆ The cooling medium for this system is a 50% ethylene glycol-water solution; do not replace it with products of any other brand. Unauthorized replacement may reduce the heat dissipation capacity, impair the performance of the system seals, cause leakage, or even obstruct the gun cable.
- ◆ The coolant should be stored indoors or in a sheltered location, away from moisture and exposure to rain.
- ◆ When adding coolant, prevent dust, water, or impurities from entering; after filling is complete, tighten the cap securely to prevent impurities from causing blockages.
- ◆ Before putting the gun cable into service, please remove the protective bag to avoid hindering heat dissipation from the surface.
- ◆ Do not open the lid while the system is in operation or when the coolant is still at high temperature.

VIII. Maintenance and Care

◆ Do not coil gun cables for storage; if the cable length exceeds 5 meters, it is recommended to use a cable management device.

◆ During cleaning or maintenance, do not plug or unplug the plug while the device is powered on.

◆ Please regularly inspect the radiator air ducts to ensure they remain clear; severe blockages can impair heat dissipation performance.

◆ The impact of dust accumulation during operation on heat dissipation performance can be considered negligible.

◆ Do not use corrosive cleaning agents to clean radiators.

If the system triggers a liquid level alarm, investigate the cause of the leak. Before adding coolant, ensure that there are no leaks.