

DC / DC converter product specification

Product model number: GW-P

Product name: 1.5 KW DC-DC converter

version: V1.0

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catalogue

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1. Overview

1.1 Abstract

GW-P series 1.5KW on-board DC converter is designed according to national standards to provide low-voltage DC power supply for vehicles. The output end can be attached to the 12V / 24V battery, and the DC / DC converter automatically charges the battery for management. The product not only has the advantages of high efficiency, small volume, high stability, long life, but also has the characteristics of high protection level, high reliability, complete protection function, which is the ideal power supply for electric vehicle charging. Built-in heat induction device, with overheating protection function, can be automatically restored. The fully sealed process, up to IP67 protection level, ensures to work in any complex environment without failure.

1.2 Main characteristics

1.2.1 Forced cooling of the fan

1.2.2 Built-in temperature sensor can turn off output 1 in dangerous

working conditions (internal 95℃). 2.3 protection level reaches IP67,

and can work safely under short-time immersion condition

1.2.4 Compliance with CAN 2.0 communication specification, bus display working status, fault code, etc

1.2.5 With input and output over voltage, under voltage protection, short circuit protection, hardware fault protection, over temperature protection and recovery functions

1.3 Industry terms

order number	Terms or abbreviations	explain
1	BMS	Battery Management System (Battery Management System)
2	ADS	High voltage Safety System (Auto-Disconnect System)
3	SOC	Battery state of charge (State of Charge)
4	CAN	CAN Communication Network (Controller Area Network)
5	ECU	Electronic and electronic control unit

		(Electronic Control Unit)
6	EV	Pure electric vehicle (Electric Vehicle)
7	OBC	On-board battery charger (On Board Charger)
8	DCDC	DC Converter (DC-DC Converter)
9	PDU	High-voltage power distribution (Power Distribution Unit)
10	HV	High pressure (High Voltage)
11	LV	Low pressure (Low Voltage)
12	CC	Constant current (Constant Current)
13	CV	Constant blood pressure (Constant Voltage)
13	MCU	Motor Controller (Motor Control Unit)
14	VCU	Complete Vehicle Controller (Vehicle Control Unit)
15	UDS	Diagnostic System (Unified Diagnostic Services)
16	ASIL	Vehicle Functional Safety Class (Automotive Safety Integrity Level)
17	HVIL	High-pressure interlock (High Voltage Interlock Loop)

2. Size and appearance

2.1 Dimensions and quality

Cooling method	long (mm)	wide (mm)	Height (mm)	quality (KG)
air cooling	254± 1	131± 1	95± 5	

2.2 Appearance

The surface of the parts is smooth, without layer rise, rust, cracks, spots, burr, deformation and hand accessibility. Complete connecting parts, the parts are fastened and reliable, no rust, burr, crack and other defects and damage. The connector sheath and pin are intact and free from damage, and all parts are fastened.



Product appearance

3. Technical indicators of DC / DC converter

3.1 Environmental requirements

▲ operating ambient temperature

area	minimum temperature	maximum temperature
Global	-40℃	85℃ (internal temperature)

▲ Storage of ambient temperature

area	minimum temperature	maximum temperature
Global	-55℃	100℃

▲ Humidity: relative humidity of 5%~95%, no condensation, no condensation

▲ Altitude: 5000m

▲ Working noise: the maximum noise is 70dB, meeting the GB-T24347-2009 standard

3.2 Regulatory requirements and reference standards for on-board DC / DC converters

order number	Standard number	Standard name	remarks
1	GB/T 24347-2009	Electric vehicle DC / DC converter	/
2	GB/T18488.1-2015	Electric motors and their controllers for electric vehicles- -Part 1: Technical conditions	/
3	GB/T18384.2-2015	Safety requirements for electric vehicles- -Part 2: Functional safety and fault protection	/
4	GB/T18384.3-2015	Safety requirements for electric vehicles- -Part 3: Personnel protection against electric shock	/
5	GB/T18387-2008	Limits and measurement methods of the electromagnetic field emission intensity in electric vehicles	/
6	GB/T 31498-2015	EV post-crash safety requirements	/
7	GB 9254-2008	Radio harassment limits and measurement methods for information technology equipment	/
8	GB/T18655-2010	Vehicle ship and internal combustion engine, radio harassment characteristics are used to protect the limits and measurement methods of on-board receivers	/
9	GB 29743-2013	Motor vehicle engine coolant	/
10	GB 4208	Housing protection level (IP code)	/
11	GB/T 28046-2	Environmental conditions and tests for electrical and electronic equipment of road vehicles- -Part 2: Electrical loads	/
12	GB/T 28046-3	Environmental conditions and tests for electrical and electronic equipment of road vehicles- -Part 3: Mechanical loads	/
13	GB/T 28046-4	Environmental conditions and tests for electrical and electronic equipment of road vehicles-Part 4: Climate loads	/
14	GB/T 2423.34-2012	Environmental tests- -Part 2: Test method tests Z / AD: Temperature / humidity combination cycle test	/
15	GB/T 2423.1-2008	Environmental tests of electrical and electronic products- -Part 1: Test Methods Test B: Low temperature	/
16	GB/T 2423.2-2008	Environmental tests of electrical and electronic products- -Part 2: Test Methods Test B: high temperature	/
17	GB/T 2423.3-2008	Environmental tests of electrical and electronic products- -Part 2: Test method Cab: Constant humidity and heat test	/
18	GB/T 2423.17-2008	Environmental tests of electrical and electronic products- -Part 2: Test Methods Test Ka: salt spray	/
19	GB/T 30512-2014	Automobile prohibited material requirements	/
20	QC/T 413	Basic technical conditions of automotive electrical equipment	/

4. DC / DC converter safety regulations

project	condition	standard
Ground resistance test	@25A/AC	$\leq 100\text{m}\Omega$
Input insulation test	@1000V/DC	$\geq 20\text{M}\Omega$
Input volt resistance test	@2000V/DC 1min	Leakage current of 10 ma

5. Electrical performance of DC / DC converter

5.1 Electrical characteristics

electrical character						
Model No	GW-P-144-12	GW-P-360-12	GW-P-540-12	GW-P-144-24	GW-P-360-24	GW-P-540-24
Rated input voltage	144v	360v	540v	144v	360v	540v
input voltage range V	80-200	200-500	400-750	80-200	200-500	400-750
input pre-charging path	built-in					
input precharging resistance	30R	120R	120R	30R	120R	120R
Bus capacitor	42uF	22uF	12uF	42uF	22F	12uF
output rating	1. 5KW					
Rated output voltage	14V			27V		
Output voltage range	8-16V			18-32V		
Output current range	0-107A			0-56A		
Stable pressure accuracy	± 0.2V (lead root test)			± 0.4V (lead root test)		
Output response time	≤ 200mS					
Typical efficiency	≥90%			≥93%		
defensive function						
Input overvoltage protection value	>200V	>500V	>750V	>200V	>500V	>750V
Input overvoltage recovery value	<190V	<480V	<730V	<190V	<480V	<730V
Input the undervoltage protection value	<80V	<200V	<400V	<80V	<500V	<400V
Input the undervoltage recovery value	>90V	>210V	>410V	>90V	>210V	>410V
Output the overvoltage protection	>16V			>33V		

value		
Output the overvoltage recovery value	<15V	<32V
Output the undervoltage protection value	<8V	<18V
Output the undervoltage recovery value	>9V	>19V
Output the overcurrent protection value	Stop the output when the output current is greater than the maximum current	
Output reverse connection and short-circuit protection	Output short circuit, reverse connection protection shutdown, troubleshooting can be restored by itself	
Overtemperature protection	When the output power is reduced when the radiator temperature is higher than 75℃, the circuit is disconnected when the temperature is higher than 95℃, and the output is restored when the temperature is restored below 85℃	

5.2 Environmental test

humid test	Meet the GB / T 24347-2009 6.1.2
cold test	Meet the GB / T 24347-2009 6.1.1.1twig
hot test	Meet the GB / T 24347-2009 6.1.1.2twig

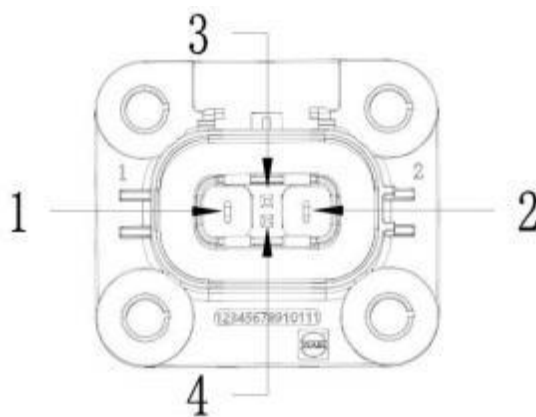
salt spray test	Meet the GB / T 2423.17
Electromagnetic perturbation	Meet chapter 4 in GB / T17619-1998
Electromagnetic harassment	See the limits specified in chapters 12 and 14 of GB18655-2002
levels of protection	IP67
vibration resistance	The 10-25 Hz amplitude of 1.2mm, 25-500Hz 30m / S2, for 8 hours in each direction
durability	Not less than the relevant provisions of GB / T 24347-2009
MTBF	150000H

6. Interface

The interface of DC / DC converter to the vehicle electrical appliances and battery includes low voltage interface and high voltage interface, low voltage interface includes CAN communication signal line and DC / DC output, high voltage interface is DC / DC input; the interface connector model can be selected by the automobile manufacturer,

Note: High voltage fuse with 1.5 x the maximum voltage / current in the DCDC input box.

6.1 High-voltage input interface and its definition

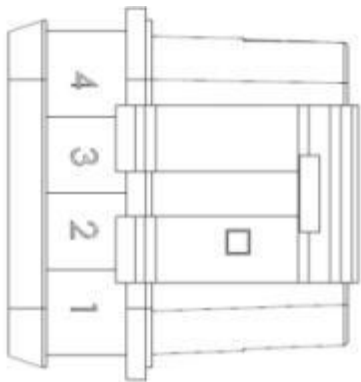


DC/DC input terminal

Product side: 3030202		Customer side: 3020202	
brand	Pin foot	definition	wire color and wire diameter
WAIN	1	positive pole	Red / 2.5
	2	negative pole	Black / 2.5

	3	/	/
	4	/	/

6.2 Signal interface and definition

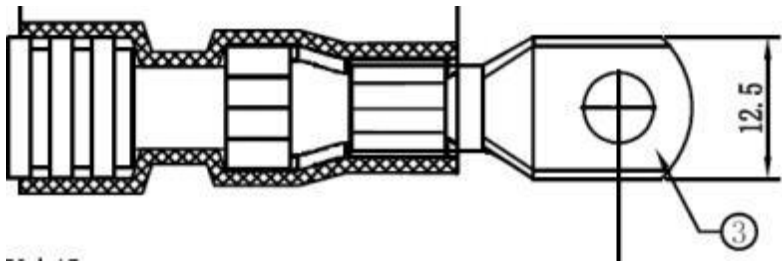


Low voltage signal terminal

Product side: DJ7041-1.5-21		Customer side: DJ7041-1.5-11	
brand	Pin foot	definition	wire color and wire diameter
jinchao	1	CAN/H	Brown / 0.5
	2	CAN/L	Grey / 0.5
	3	Hardware enable	Red / 0.5
	4	/	/

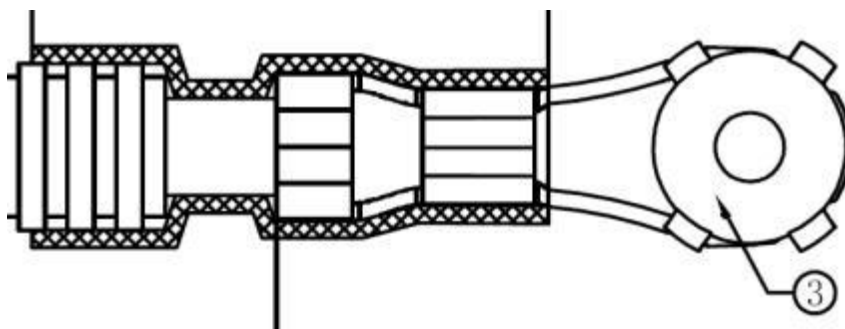
6.3 Low-voltage output cathode interface and definition

6.3.1 Low-voltage output cathode interface and definition style 1:



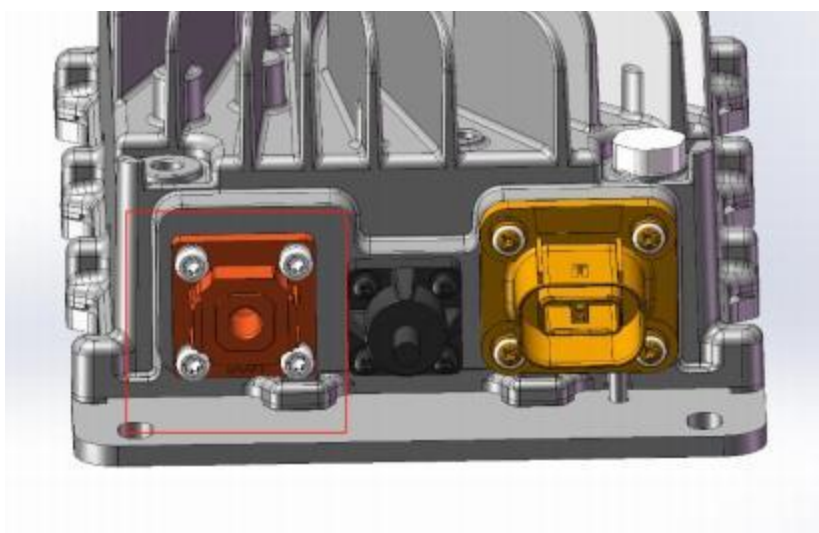
Product side: swing line-SC25-8		customer: M8 bolt	
brand	Pin foot	definition	Line color and line diameter
	output positive pole	14V/24V	Orange / 25

6.3.2 Low-voltage output cathode interface and defined styles 2:

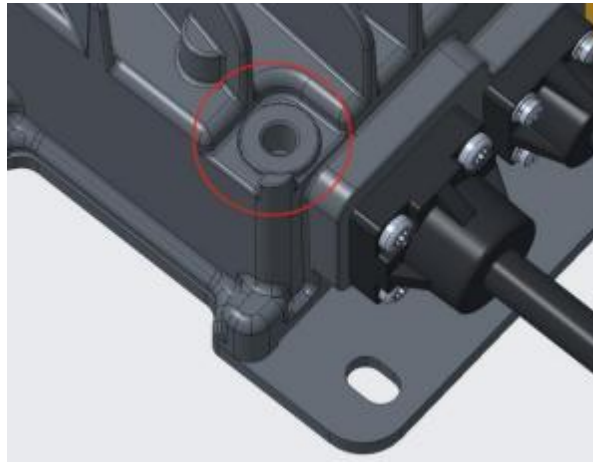


Product side: swing line-M8 nut terminal		Customer side: M8 bolt	
brand	Pin foot	definition	Line color and line diameter
	output positive pole	14V/24V	Orange / 25

6.3.3 Low voltage output Interface and Defining Style 3:



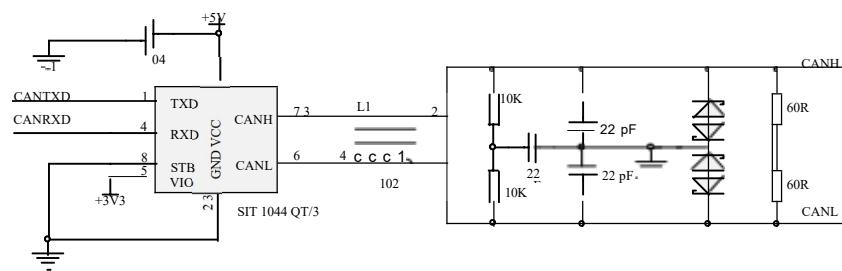
Product end: M8 thread hole		Client: M8 bolt	
brand	Pin foot	definition	Line color and line diameter
	The DC / DC output positive pole	14V/24V	Orange / 25



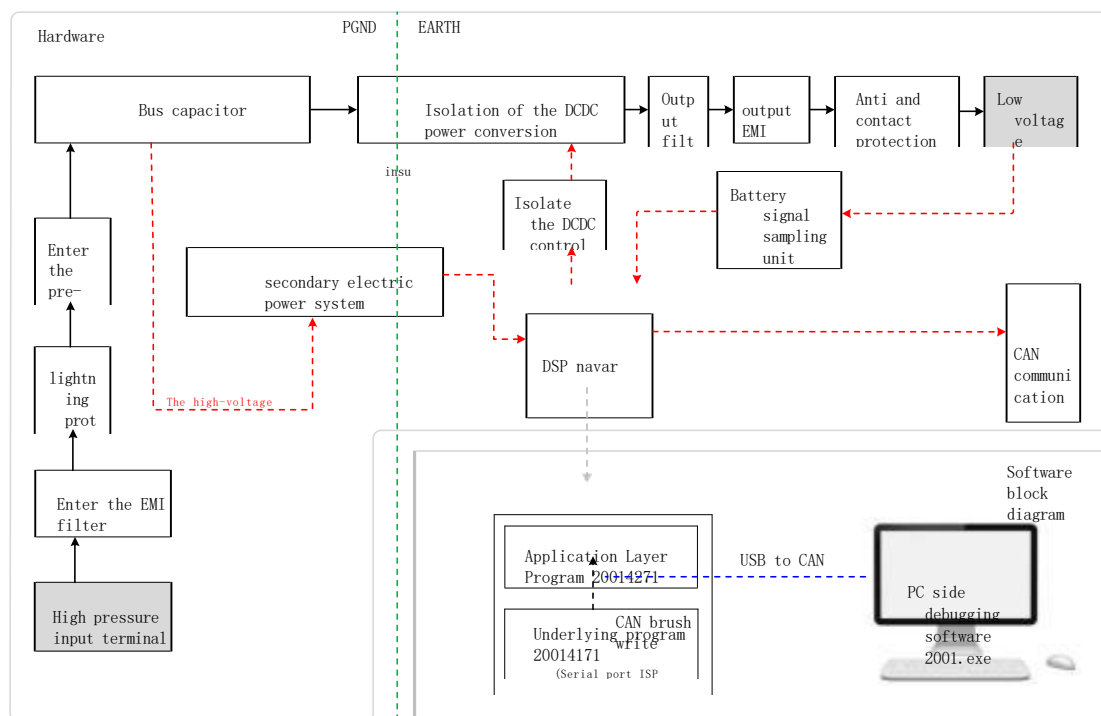
Product end: M8 thread hole		Client: M8 bolt	
brand	Pin foot	definition	Line color and line diameter
	output negative pole	14V/24V	Orange / 25

7. Principle block diagram

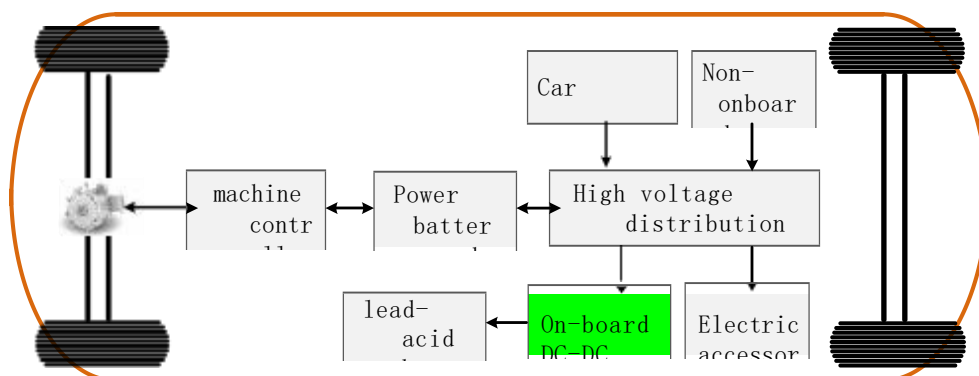
7.1 Block diagram of CAN communication principle



7.2 Hardware principle block diagram



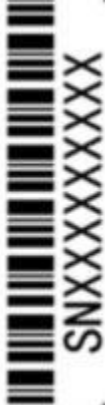
7.3 Vehicle connection block diagram



8. Nameplate, warning mark, packaging, transportation and storage

8.1 Nameplate and bar code (nameplate label is traceable)

The basic parameters of the nameplate include: model, rated voltage, rated power, production date, serial number, etc. The following formats are provided for your reference:

Product model: GW-P-XX-XX Configuration code: CANXXXX input range: XX-XXXVDC output: XXVXXXXA	
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8.2 Warning signs



High pressure warning sign

8.3 Packaging

The packing box has the product name, model, manufacturer identification, inspection certificate of the manufacturers quality department, manufacturing date, etc.

List of accessories in the packing box:

order number	name	quantity	unit	remarks
1	The DC / DC converter assembly	1	short for Taizhou	
2	test report	1	fix	

3	M8 * 16 mounting screws	1	A	Used to install the DC / DC negative wire harness
4	Φ 8 flat pad	1	A	Used to install the DC / DC negative wire harness
5	Φ 8 pad	1	A	Used to install the DC / DC negative wire harness

8.4 Transportation

Product transportation has a strong packing box, the use of the relevant national standards and should be "careful light", "moisture-proof" and other marks. Packaging boxes containing the products allow for transportation by various means of transport. Direct shower and mechanical impact of rain and snow should be avoided in transportation.



transport mark

8.5 Storage

The products shall be stored in the packing box, the warehouse environment temperature-10-40°C and relative humidity is not more than 80%, the warehouse allows no harmful gases, flammable, explosive products and corrosive chemicals, and no strong mechanical vibration, impact and strong magnetic field, the packing box shall be at least 20cm high, away from the wall, heat source, window or air inlet at least 50cm for 2 years, shall be tested again after more than 2 years.

Products shall be stored in a ventilated, dry place. At the same time, high temperature sources, fire sources and chemicals must be avoided.

Store them neatly and avoid throwing them away.

9. Safety guidelines

Warning: Remind the user that the live operation is dangerous

- * It is strictly prohibited to open and modify the device for repair or debugging without authorization

- * Do not place the parts in a rainy position

- * Before installation, please confirm that the shell is intact. If there is any damage, please replace it immediately or contact the after-sales service

Each plug and socket should be connected and fastened. If damaged or loose, please replace it immediately

- * It is strictly prohibited to plug and pull the connector when the product is electrified, otherwise personal injury may be caused

- * Do not open the product shell during the power process, otherwise personal injury may be caused

- * It is strictly prohibited to touch the high voltage live parts of the product naked. Please wear insulating gloves, insulating shoes and insulating clothing. Live maintenance and testing are strictly prohibited

- * In the process of replacing the fuse and contactor, brutal operation is strictly prohibited to avoid damaging the product and causing potential safety risks

- * When the battery is charged normally, please stay away from the fire source and flammable and explosive items

- * Do not charge damaged or nonrechargeable batteries

Note: Remind the user that the lower operation is an important operation of this product

- * Do not block the air inlet and outlet to prevent overheating

- * Please confirm that the output cable is not too long to avoid the impact of line pressure drop on charging

- * Please disconnect the power cord and the charging plug when moving the charging product

- * The battery voltage must match the nominal voltage of the converter

- * Avoid collision, compression, or pull, twist, or shake the charging cables

- * Products should be placed in a safe, dust-free and rainy environment

- * Please pack and store it for a long time

