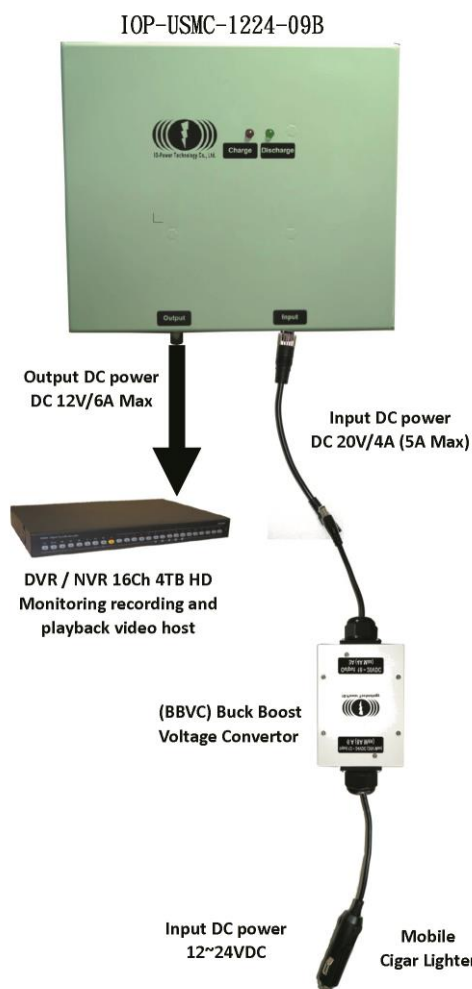




## IO-Power USMC-12V1224-OA Series

### Automobile Heavy Current & Super Long-acting Model

### Online Uninterruptible Operation + Buck Boost Voltage Convertor Power System



IOP-USMC-12V1224-OA series is specifically designed for large power equipment vehicle load system, through vehicle cigarette lighter-powered uninterruptible operation of the system, such as on-board infrared camera, car video host, DVR/NVR 48 hour record, the range of temporary large discharge current device must be over 48 hours or longer-lasting forms online without interrupting the operation of the power system.

IOP-USMC-12V1224-OA products, using industrial-grade automatic lifting of buck boost voltage converter and industrial-grade protective metal casing and mechanical design of waterproof dustproof IP66. Importing the latest technology as high and low temperature resistant C-LiFePO<sub>4</sub> lithium batteries, unique security management control of charge and discharge protection, low voltage and low power consumption ...number of proprietary technologies, achieving long-term safety of vehicle special high power loads and equipment new applications without interrupting the operation of power systems.

IO-Power USMC-12V1224-OA series, take online type does not interrupted of long-term power supply system design, special for strict requirements operation in the system of not interrupted using. Its long-term of power time can over 48 hours above, for



examples Cash transport van 48 hours surveillance system, bus lane records device, police car surveillance system, preservation patrol car, 48 hours lane records device camera system, emergency rescue system and mobile power supply system and so on, are very suitable for use.

IO-Power USMC-12V1224-OA series online type Uninterruptible Operation power system of the system components including:

1. Input DC power port: car cigarette lighter DC 12-28V DC power input, automatic lift voltage converter from 18-20V / 4A (5A Max) DC voltage and current, DC UPS power system charge and discharge operation power source.
2. Microprocessor modules: microprocessor for detecting input power management, battery management, battery management power control, output voltage management, system operations control detection and protection management, perform the dimensional transport co-ordination and control of the overall system management.
3. Charging and discharge control module: for battery voltage detection and charging management and the battery discharge management control functions, special design battery full charge and then enable directly power supply to load end features, it will reduced battery of using times and improve battery using life cycle. Auxiliary to low voltage protection and low voltage low power discharge proprietary protection mechanism, on battery of low voltage protection and the system fast recovery operation, provides best protection and efficient of operation mechanism.
4. The DC power output port: DC power supply and discharge detection through microprocessor control and protection, for loading device power requirement, corresponds to taking the appropriate current power supply, minimum 0.5A to maximum 7A DC current supply control.
5. The special enhanced protection measures: four seasons environment for high and low temperature change,



efficiency and battery life, may have a serious impact, even used on the security issue. Therefore, for USMC-12V1224-OA series of vehicle-specific products, specially designed industrial grade sealed metal shell and flame resistant high temperature resistance waterproof fittings to avoid security problems in the use of the indoor and outdoor environment.

6. Resistance high and low temperature long-term C-LiFePO<sub>4</sub> lithium batteries: the vehicle through sunshine will upgrade high temperature environment, it will operation in the system of not interrupted and more long-term using needs. The IOP-USMC-12V1224-OA series used customize of resistance high low temperature -20°C ~ +60°C long-term C-LiFePO<sub>4</sub> lithium batteries, match metal protection shell and institutions design, it can bear car within low temperature -30°C ~ +75°C of environment temperature operation. And resistance high low temperature long-term C-LiFePO<sub>4</sub> lithium batteries of high charging and discharging times and battery life, it can provides less power than the traditional systems more than twice times more electricity power capacity and 7 times more than double the service life cycle, full vehicle large-power-line machine without interrupting the operation of electric power systems of outstanding characteristics.

Special Description 1: Automobile internal by too Sun penetrating sunshine and car is confined does not ventilation environment, so will produced sunshine warming effect, in outdoor temperature up to 36°C, car within temperature by long time sunshine warming, car within will up to 60~65°C, Sunshine direct location will up to 65~70°C around, but as long as Sun sunshine no irradiation to of location, temperature will slightly below car within temperature about up 55~63°C around.

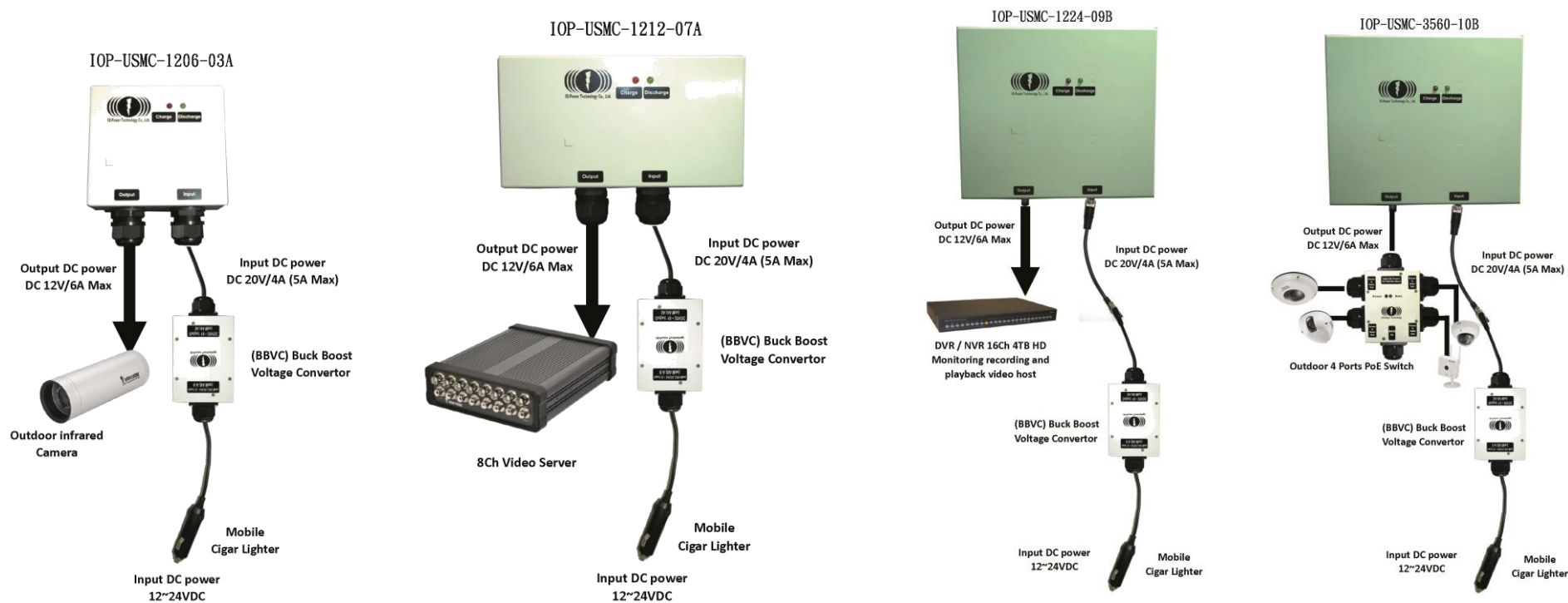
Special description 2: IO-Power USMC-12V1224-OA series online type does not interrupted operation power system, due to should car within environment of special high temperature requirements, used resistance high temperature roast paint package covered metal shell, in outdoor temperature up to 36°C, car within temperature by long time sunshine



warming, car within will up to 60~65°C, in Sunshine direct products shell surface situation, shell surface temperature about 65°C, shell within temperature about 55~58°C, C-LiFePO4 Lithium Batteries temperature about 50~55°C ;

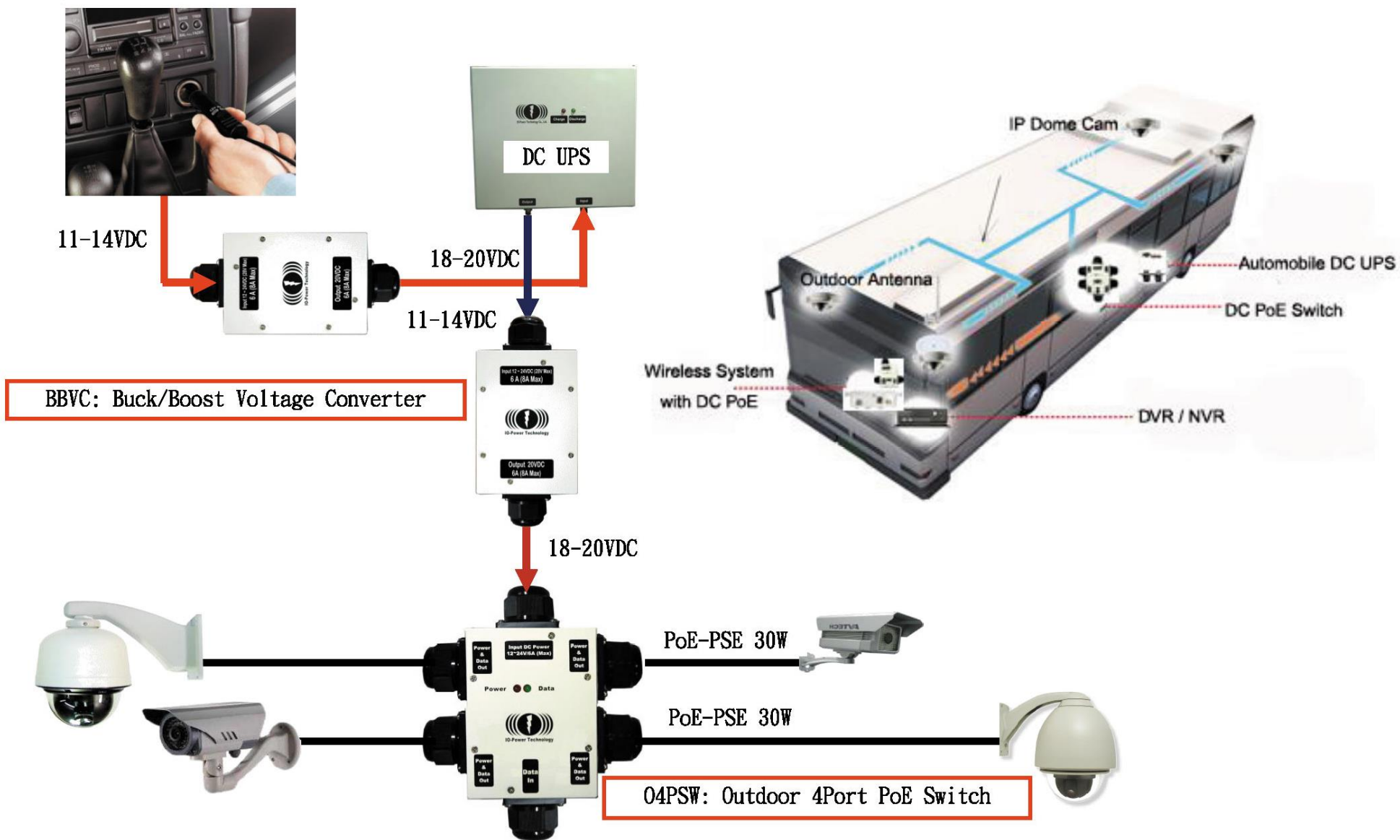
IOP-USMC-12V1224-OA products, AM 10:00~ PM 4:00 under sunshine temperature test for a long time in the morning, all features of normal operation and provide stable DC 11.5V~14.4V+3% power to the cameras inside and outside the normal operation of the car.

## ■ All kinds of battery capacity and matching system application diagram





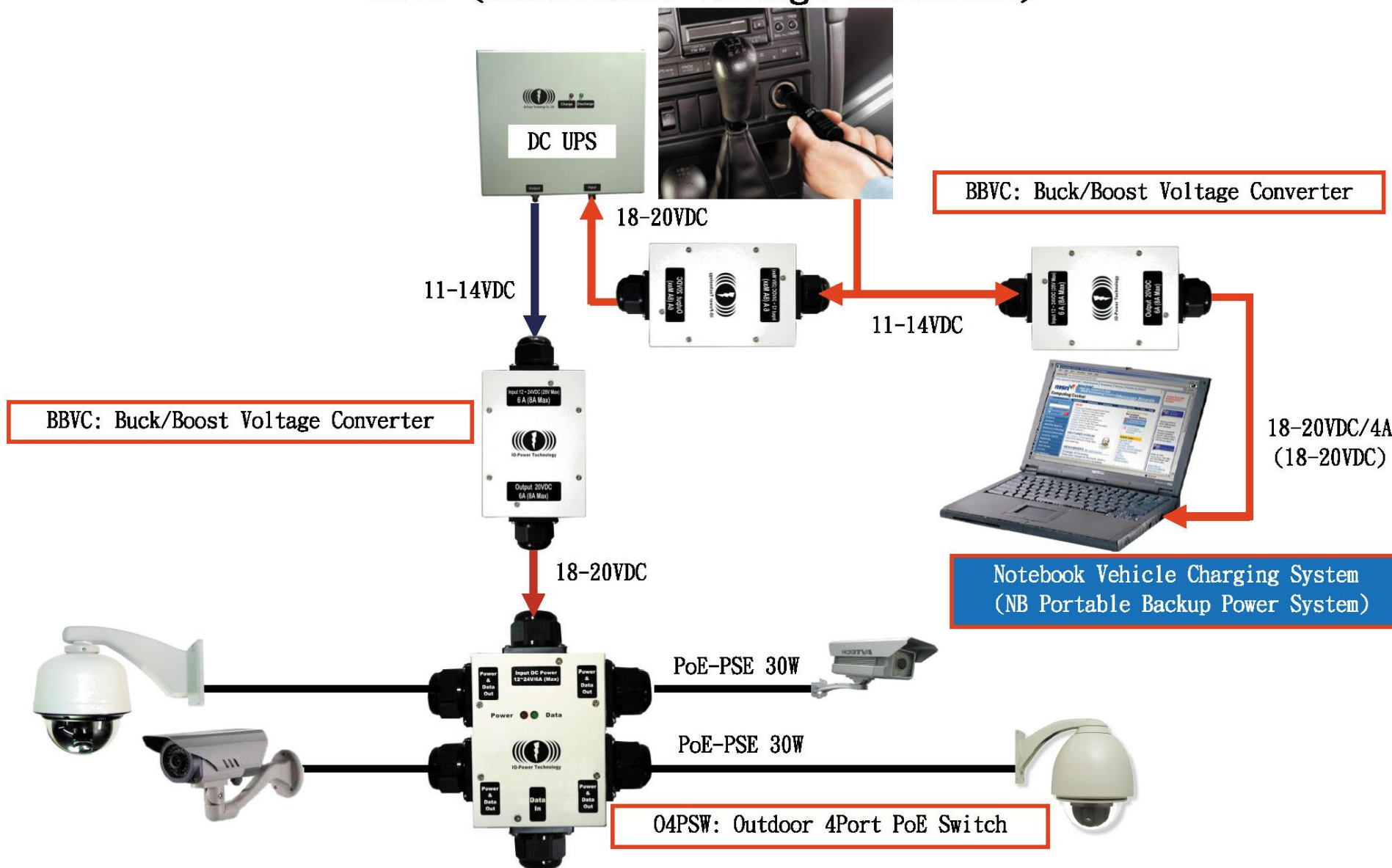
## BBVC (Buck/Boost Voltage Converter)







## BBVC (Buck/Boost Voltage Converter)





## IOP-USMC-12V1224-OA Series Specification

Model	USMC-1212-06B	USMC-1216-07B	USMC-1218-08B	USMC-1224-09B	USMC-1228-10B
<b>Automobile High Temperature Model</b> <b>M12 Connector</b> <b>Aluminum Radiating Airtight Housing</b> <b>IP 67</b>					
<b>Built In C-LiFePO4 Lithium Batteries Power Capacity</b>	148 WH (11.6Ah@12.8V)	206 WH (16.1Ah@12.8V)	235 WH (18.4Ah@12.8V)	297 WH (23.2Ah@12.8V)	355 WH (27.6Ah@12.8V)
<b>General UPS Label Size (DC Power Factor is Equal to 1)</b>	888VA (0.9KVA)	1236VA (1.2KVA)	1410VA (1.4KVA)	1782VA (1.8KVA)	2130VA (2.1KVA)
<b>Max Output Wattage (Battery Life Protection Design)</b>	85W/H	85W/H	85W/H	85W/H	85W/H



<b>UPS Discharge Power Supply Time</b>	More than 1.5hr @85W/H Discharge	More than 2hr @85W/H Discharge	More than 2.5hr @85W/H Discharge	More than 3hr @85W/H Discharge	More than 4hr @85W/H Discharge
<b>Quickly Full Charge DC UPS Battery Time</b>	About 3hr @4A Charging	About 4hr @4A Charging	About 4.5hr @4A Charging	About 6hr @4A Charging	About 7hr @4A Charging
<b>Vehicle DC Buck Boost Voltage Convertor DC UPS system Output DC voltage / current</b>	Through the car cigarette lighter or vehicle power circuit, input DC 12~28V voltage/current 6A (8A Max), the automatic Buck Boost Voltage Convertor (BBVC) output 20VDC/4A (5A Max) to charge the DC UPS power supply system Output DC voltage / current: 12VDC/6A				
<b>External load voltage</b>	DC 11.7V~14.2V +-3%				
<b>External load current**</b>	3.5A (6A around 75W/H Max)				
<b>Battery charging voltage</b>	13.8V~14.2V +-3% Max				
<b>Battery standard charging current</b>	4A				
<b>Transform Efficiency</b>	95%				
<b>Strengthen the protection measures With Special operations functions</b>	<ul style="list-style-type: none"> <li>● Power outages without disrupting the operation of the on-line operation system (monitor system not black screen)</li> <li>● MCU microprocessor starts, automatic charging and discharging systems functioning State protection</li> <li>● Automatically detect abnormal voltage the battery status and abnormal aging or faulty battery or battery charging protection</li> <li>● Shell opening record of vandal detection and RS-485 signal alarm mechanism (optional function)</li> <li>● With temperature detection records with read function mechanism</li> <li>● Mechanism of low temperature (@ -35°C) &amp; high temperature (@ +75°C) protection (Please see note 3 &amp; note 4)</li> <li>● Specially designed battery cycle life defining and recording and control mechanisms (optional function)</li> <li>● RS-485 input / output interface, can enhance remote management and control in real time (optional function)</li> <li>● System operation State record function</li> </ul>				





- Support industrial MODBUS communication protocol (allowing the PLC programmable logic control)
- Input overvoltage protection
- Input power supply over-current protection
- Input of positive and negative polarity reverse protection
- Input short-circuit protection
- Input lightning or power surge protection up to 1300W
- Battery full charge, input power supply power directly to the load, maximum output power is reached, at the same time avoiding battery overcharge protection
- Battery intelligent charging system protection and the float charge function
- Output power limit voltage protection
- Output power limit current protection
- Output of positive and negative polarity reverse protection
- Output short circuit protection
- Output lightning or power surge protection up to 1300W
- Battery voltage is less than 12.8V, MCU microprocessor automatically starts into the battery low discharge warning state
- Battery discharge below the 11.7V,MCU microprocessor automatically stop discharging into the battery low voltage protection status
- Battery voltage is lower than 11.2V, MCU microprocessor goes into sleep protection status
- Battery low voltage static ultra-low power protection
- When the input power, MCU microprocessor automatically starts recovery operation mechanism
- After discharge low voltage battery protection to restart the battery, special designed discharge voltage protection function
- Discharging under load, batteries have added support mode power supply operation
- Match the automatic Buck Boost Voltage Convertor (BBVC), with car cigarette lighter power connection charging port and protection (including fuse)



	<ul style="list-style-type: none"><li>● Match the automatic Buck Boost Voltage Convertor (BBVC), with buck boost voltage, fixed voltage, and stabilizing the voltage to upgrade effect of power supply protection.</li><li>● Match the automatic Buck Boost Voltage Convertor (BBVC), overvoltage and overcurrent and lightning / power surge protection (30V 1500W)</li><li>● Match the automatic Buck Boost Voltage Convertor (BBVC), DC 18-20VDC power supply can be used as a vehicle and charge the notebook or device for temporary</li><li>● Specially designed "Automatically Detect the Healing Recovery Function", to solve user errors using an action or temporary power Input charge / output discharge for abnormal, causing alarm fault automatic removal mechanism of State</li></ul>
<b>Support Battery Type</b>	C-LiFePO4 Lithium Batteries Lead-acid batteries or lithium batteries or other battery, can be customized to modify (optional function)
<b>Battery Safety Protection</b>	Use pressure type explosion-proof battery design
<b>Built-in battery capacity range</b>	11.6Ah @ 12.8V (148 WH) ~ 30.0Ah @ 12.8V (384 WH)
<b>Battery Charge Mode</b>	CC/CV MCU Automatic charging mode control
<b>Battery Charge Voltage</b>	14.2V +- 3%
<b>Battery Charge Float Voltage</b>	13.8V +- 3%
<b>Battery Cut-off Discharge Voltage</b>	11.7V +- 3%
<b>Battery recovery discharge voltage</b>	12.8V +- 3%
<b>Max. Charge Current</b>	4.5A



<b>Max. Discharge Current**</b>	6A (Using load-discharge C-LiFePO4 Lithium Batteries, the maximum discharge current is 6A around 75W/H)
<b>Charging and Discharging at same time, the discharge current**</b>	3.5A
<b>Charging and Discharging at same time, the discharge watts**</b>	40W/H, recommends assessing the normal functioning of the system total power consumption, lower wattage requirements is appropriate.
<b>Life cycle the battery 0.2C charge &amp; 0.5C discharge (Battery capacity remaining after using 80%, the defined service life will terminate)</b>	@ 25°C 2000 Times (@ 25°C discharging 800 times: after more than 93% capacity, @ 25°C discharging 1100 times: after more than 90% capacity) @ 45°C 1600 Times @ 50°C 1200 Times @ 60°C 550 Times @ 60°C 720 Times 70%
<b>Industrial Housing &amp; Connector</b>	Aluminum Airtight Housing IP 68 M12 Connector
<b>Connector Type</b>	Vehicle charging circuit or car cigarette lighter, enter 12~28V DC voltage / current 6A (8A Max) DC output: 12V DC Jack to DC Jack connector Input / Output I/O interface: RS-485 (optional function)
<b>Operating Temperature (Discharge Temperature)</b>	-35°C ~ +75°C (Including the chassis of the machine working temperature tolerance) -20°C ~ +60°C (Excluding institutions, the battery operating temperature tolerance) +20°C ~ +40°C Battery Capacity:100% -10°C Battery Capacity : 60% -20°C Battery Capacity : 48%
<b>Charging Temperature</b>	-35°C ~ +75°C (Including the casing machine operation)



<b>Storage Temperature</b>	-35°C ~ +75°C , Recommendations at +20°C ~ +30°C environmental temperature for storage.				
<b>Rel. Humidity</b>	10~95%RH				
<b>Storage Time</b>	Do not wake the system can store 12 months <b>(after you wake the system, each 3 months charging 1 times; Please fully charging battery in first times to use)</b>				
<b>Dimension</b>	DC UPS : 210(L) x 145(W) x 195mm(H) ; BBVC : 195mm(L)x92mm(W)x48mm(H)				
<b>Weight</b>	2.5Kg + 0.5Kg(BBVC)	3Kg + 0.5Kg(BBVC)	3.2Kg + 0.5Kg(BBVC)	3.8Kg + 0.5Kg(BBVC)	4.5Kg + 0.5Kg(BBVC)
<b>LED Indicator</b>	<p>1. AC input (Converted to DC power supplies): red light constant light, show on battery in full charge status.</p> <p>2. AC input (Converted to DC power supplies): red light flashing display, represents the battery is charging status.</p> <p>3. The battery is not charged, the load discharge 12VDC device is inserted, the discharge green constant light show; If you do not charge the job, wait until the battery discharge voltage up to 11.8V + -3%, the system will enter the state of the battery voltage protection, discharge the green light LED display will be extinguished.</p> <p>4. Simultaneous charging of the battery, insert the 12VDC device load discharge, the green light constant light show</p> <p>5. AC input (Converted to DC power supplies): quick shine a red light shows that represents an input power supply or the input port or the battery charge State, please remove the input power terminal as soon as possible.</p> <p>6. Insert the load discharge 12VDC devices: fast shiny green display on behalf of power output or output port or abnormal battery discharge condition is request to remove output power connector as soon as possible.</p> <p><b>Note 1: when the system alarm status, please remove the cause as soon as possible the reason for the exception. When after eliminating abnormal, just re-switch input power supply or plug power to supply again, the red LED flashing light signal will resume once per second in charging status. Those processing will remove most of the alarm status, allow the system to resume normal operation.</b></p> <p><b>Note 2: when a temporary abnormal use or abnormal operation occurs, causing the system to start the alarm status, specially designed automatic recovery mechanism 3 times the purpose and again after every 10 seconds to detect anomalies and try to exclude temporary malfunction alarm state.</b></p>				
<b>Housing</b>	IP66				



<b>Approvals</b>	CE & FCC
<b>Installation</b>	1.Street lamp pole mount 2.Upright pole mount 3.Wall mount installation 4.DIN Rail (Optional)
<b>Warranty</b>	Intelligent charge & discharge main board & IP66 housing & parts support two years limited warranty. Customize C-LiFePO4 lithium batteries support one year limited warranty.

Note 1: Battery Capacity is +- 5%.

Note 2: Product specifications change, without notice, consultation with agent or dealer before buying the latest specifications.

Note 3: detect the temperature reached -30°C, start the red LED have low temperature warning, reach low temperature -35 °C, a start-stop system function will enable, when temperatures returned to above -30°C, normal operation will resume.

Note 4: detect the temperature reached +70°C, start red LED have high temperature warning, reach high temperature +75°C, a start-stop system function will enable, when temperatures back below +70°C temperature, normal operation will resume.

\*\* Note 5: The discharge wattage of the DC UPS system will vary depending on whether the battery has a high or low voltage (with or without full charge) and whether it is used at the same time as charging and discharging. The following are the differences between the products Status of the proposed discharge amperage wattage (with the maximum power consumption of equipment assessment reference):

5-1. Uncharged state, only battery direct discharge, the battery is fully charged state use: The maximum discharge Amp & Wattage is 6A / 75W.

5-2. Uncharged state, only battery direct discharge, the battery is not fully used state: The maximum discharge Amp & Wattage is 3.5A / 40W.

5-3. Uncharged state, only battery direct discharge, the battery is not fully charged and the low voltage state is used. The maximum discharge Amp & Wattage is 3A / 36W.

5-4. Charging and discharging operation at the same time, the battery is fully charged state use: The maximum discharge Amp & Wattage is 6A / 75W.

5-5. Charging and discharging operation at the same time, the battery is not fully charged used state: The maximum discharge Amp & Wattage is 4A / 50W.

5-6. Charging and discharging operation at the same time, the battery is not fully charged and the low voltage state is used: The maximum discharge Amp & Wattage is 3.5A / 40W.