The specification and instruction of Battery management system (BMS)

1. Use, characteristic and functional instruction

BMS has great impact on the entire vehicular safe operation, the choice of controllable strategy and operational cost.

BMS can achieve those functions as follows:

(1) The detection of monomeric battery voltage

(2) The detection of battery temperature

(3) The detection of batteries ' operating electric current

(4) The detection of insulation resistance

(5) The estimation of batteries SOC

(6) Communicate with vehicular equipment; provide necessary battery data CAN1 for the whole vehicular control.

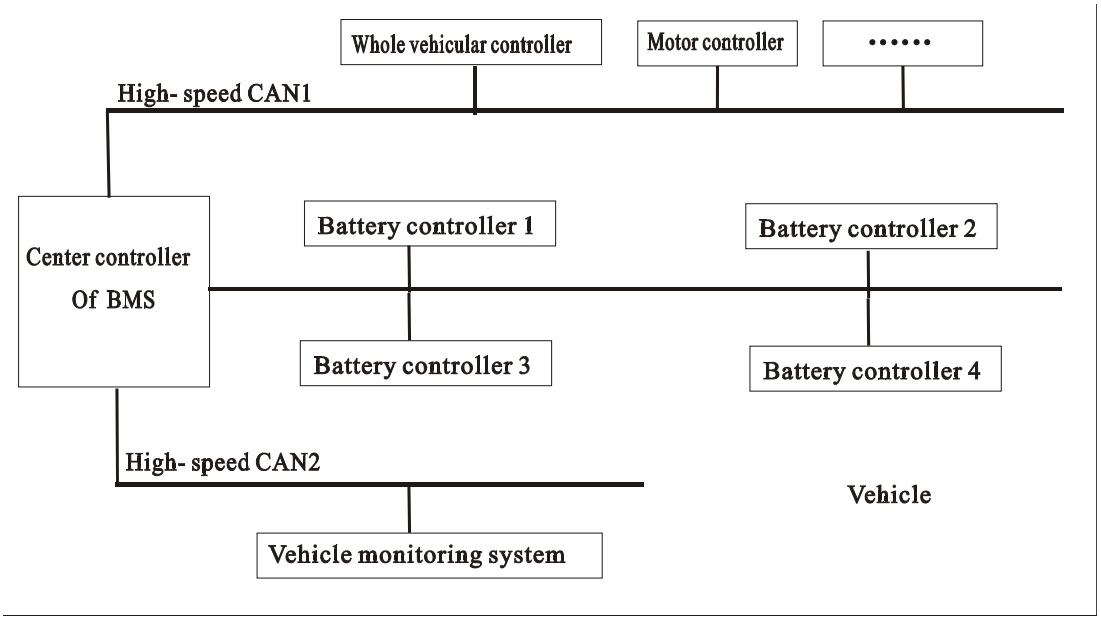
(7) Communicate with vehicular monitoring equipment; send the battery information to the panel to display CAN2.

(8) Communicate with charger, safely achieve the battery chargeRS-485.(reserved)

2. Operating mode

BMS is vehicular charge mode, charge for the whole batteries.

Under the vehicular mode, The BMS structural picture 1 is as follow. Through the CAN1 general circuitry, BMS (central controlling module) will send the Real-time and necessary battery state to the whole vehicular and motor controller, In order to adopt the more reasonable controlling strategy. Meanwhile, through the high-speed CAN2, BMS (central controlling module) will send the detailed battery information to the vehicular monitoring system.



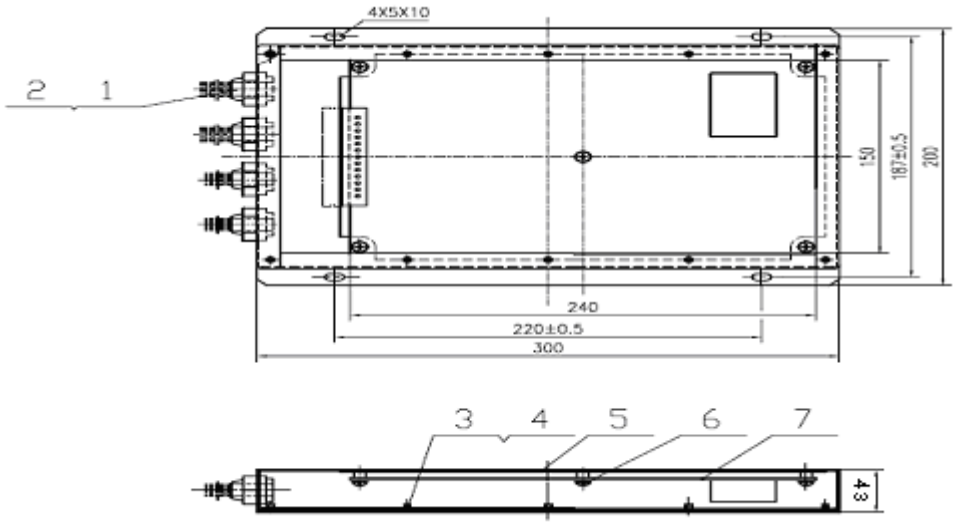
Picture 1 ：The BMS structural

3. Main technical parameter

3.1Mechanical parameter

(1) External dimensions:300*200*43 (unit: mm)

(2) The size of fixed hole:220*187 (unit: mm)



Picture 2 ：The BMS mechanical size

(3) The position of installation: beside the battery box

3.2Technical index

(1) Voltage detection error:<0.5%(2-6V)

(2) Temperature testing error: <±1℃ （-40--125℃）

(3) Current testing precision: 0.5%（-300A—300A）

(4) Creepage testing error: < 8%

(5) SOC testing error: <10%

(6) Operating temperature: -25 - 75℃

4. The operation of installation

Each BMS is made up of one central controlling module (mainframe) and four battery testing module (appurtenant).

4.1 The vehicle provides 12 voltages. Controlling module provides CAN1 and CAN2 bus interface.

4.2 The quantity of temperature sense organ

At the output terminal and in the batteries space, there will be 14 temperature sense organs.

4.3 Insulation testing: At main controlling module, the insulation of BMS will be accomplished.

Iron phosphate Lithium Batteries (64 series) parameter design and alarm setting

Sequence	Item	Enactment	Instruction
1	maximum monomeric voltage	3.7V	In the charge process, maximum monomeric voltage is allowed.
2	maximum total voltage	233.6V(calculate according to 3.65V/ cell)	In the charge process, maximum total voltage is allowed.
3	maximum charge current	50A	Maximum charge input current of charger.
4	minimum monomeric voltage	2.5V	Under the condition of continuous discharge ,minimum monomeric voltage is allowed
5	minimum total voltage	163V(calculate according to 2.55V/ cell)	Under the condition of continuous discharge, minimum total voltage is allowed.
6	maximum discharging current	80A	Under the condition of continuous discharge, maximum current is allowed.
7	peak discharging current	150A	Duration is less than 18S.

8	limitary discharge current	55A	When temperature is lower than -15℃ or is higher than 50℃, or SOC is less than 20% or monomeric battery voltage is less than 3.2V.
9	peak charge current	110A	Duration is less than 10S.
10	limitary charge current	40A	Environmental temperature is below 0℃.
11	maximum monomeric voltage alarm	3.9V	Charger will stop charging immediately once The maximum monomeric voltage alarm occurs.
12	maximum total voltage alarm	240V(calculate according to 3.75V/ cell)	Charger will stop charging immediately once The maximum total voltage alarm occurs.
13	monomeric Low-voltage alarm	2.3V	The monomeric low-voltage alarm, battery output will be closed after the state lasts for 30s.
14	total Low-voltage alarm	153.6V （ calculate according to 2.4V/ cell）	The minimum total voltage alarm , battery output will be closed after the state lasts for 30s.
15	minimum energy alarm	Monomeric voltage <3V or soc<20%	When the battery energy approaches depletion, driver will be reminded immediately back to charging station to charge.
16	high temperature alarm	>55℃	High temperature alarm indicator, battery output or charger will be closed after the state lasts for 30s.
17	insulation resistance	>118KΩ	Insulation resistance between the positive and negative electrode and battery box , there will be alarm indicator when the insulation resistance declines, prompt repair is required.

Note: The quantity of monocase: 64 batteries
The box number of battery: 4
Standard voltage: 3.2V
The battery capacity: 40Ah/55Ah
The type of battery: iron phosphate Lithium Battery
The Manufacturer: EVPST.COM