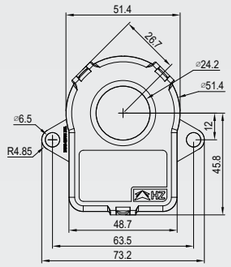
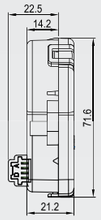
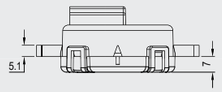
Automotive BMS current sensors

BMS SERIES

BMS300A~BMS1500A







Product model	BMS300A	BMS500A	BMS1500A
Primary rated DC current/I_{PN_DC}	±300A	±500A	±1500A
Primary overload current/I_{PM}	±350A	±530A	±1550A
Power current/I_{PWR}	30mA@Ip=0A, 80mA@IP=350A	30mA@Ip=0A, 140mA@IP=530A	100mA@Ip=0A, 1300mA@IP=500A
Secondary rated signal/I_{SN}	CAN disc installation	CAN disc installation	CAN disc installation
Accuracy/X_G	0.5%	0.5%	0.5%
Linearity/ε_L	0.1%	0.1%	0.1%
Bandwidth/BW(3dB)	100Hz	100Hz	20Hz
Response time/t_r	10ms	10ms	10ms
Zero offset voltage/I_{OT}	10mA	10mA	50mA
Supply voltage/V_C	8~16V	8~16V	8~16V
Operating temperature/T_A	-40ºC~85ºC	-40ºC~85ºC	-40ºC~85ºC
Installation method	Disc installation	Disc installation	Disc installation
Hole diameter	24.2mm	24.2mm	24.2mm
Weight	67g	67g	100g

TYPICAL APPLICATION

BMS series - Typical application

Monitoring of BMS battery charging and discharging current for new energy vehicles

One scenario for the application of BMS in new energy vehicles is monitoring the charging and discharging current of the battery. Sensors are typically installed in the BDU (battery disconnect unit) or SBOX main major or secondary circuit to measure the total battery current. The current signal will be supplied to the BMS for charging and discharging control, assessment of battery SOC (residual capacity detection), and protection against overcurrent and overcharging. When this need is broken down into current measurement functions, there are requirements for global accuracy for current sensors and zero error requirements for small currents.

In terms of the current range, the peak current of the battery can reach 1200-1500A for high-performance electric vehicles with four-wheel drive and dual motor applications. Sensor accuracy of <1% is required to improve the accuracy of SOC estimation and battery consumption rate, and many customers have even recommended 0.5%. Customers want an increase in the electric control voltage from 400V to 800V for BDU active cooling and thermal management to improve the operational efficiency of the motor and reduce copper losses and costs.

Because there is a considerable cumulative error during SOC estimation, which seriously impacts SOC accuracy, the zero-point error is a more important metric for SOC estimation of BMS batteries than gain error. Hangzhi devices achieve exceptional zero-point error and global accuracy of 0.5% of the full range and full temperature, ensuring high SOC accuracy in high and low current charging processes. Because fluxgate technology does not have to consider the issue of heating and does not have the limitation of overcurrent overload, it is theoretically infinite and avoids the aging problem caused by shunt resistor heating.

For simpler applications, our fluxgate current sensors feature direct CAN signal output and do not require further calibration at the customer's system level. This saves customers significant development expense and time and avoids the additional temperature compensation and calibration required by using a shunt. It is also naturally insulated from the high-voltage bus, ensuring system safety.