LBMC EJ5XE

Product Introduction

• The product is a newly developed PMSM (Permanent Magnet Synchronous Motor) controller made by Wuxi Lingbo Electronic Technology Co., Ltd., which can output 2000~3000W power. It uses FOC (Field Oriented Control) algorithm in which SVPWM modulation is used to drive the power device so that it injects sinusoidal current to the three-phase motor. Meanwhile, we use a 32-bit microprocessor that integrates the latest ARM core, it exhibits excellent computational capability and task processing ability. The system can handle several close loops which include torque, flux, speed loop, and other high demands of real-time task operations at the same time. Through these control methods, the system can achieve the following performance: maximum torque control, constant power control, speed closed-loop control and braking energy feedback control. Compared with the traditional DC motor (BLDC) controller, it has significant advantages as follows:

Comfortable Driving

• Direct torque control, smooth start-up, excellent acceleration performance, especially in the middle and high speed stages, which approximates to the performance of fuel motorcycle.

Smooth & Silent

• Vector control type sine wave current output, motor output torque is smooth, and low frequency noise caused by motor torque fluctuation is fully suppressed.

Flexible Configuration

• Provide PC software (GUI), by which can configure hundreds of parameters, so will improve the flexibility of on-site application.

• Monitor the operating status in real-time.

• Make the function interfaces of different types of products compatible.

Perfect Protection Function

• Have Signal integrity detection (e.g., motor interface signal, control signal, etc.).

• With Over-current, over or under voltage, over temperature protection.

• Provide motor temperature-control interface.

Key Features

• Self-checking function after power on.

• Energy feedback braking.

• Brake, cruise, 3-modes speed selection port.

• Integral waterproof terminal port.

• PWM output port.

• Dashboard port.

• LED indication for operation and fault status.

• Ultra-thin shape design, convenient for vehicle installation.

Scope of Application

• Electric motorcycle

• Small electric vehicles

• Electric golf vehicle

• Electric Sightseeing vehicle

Main Technical Parameters and Working Conditions

Main Parameters	
Rated Input Voltage	48V/60V/72VDC
Rated Input Current	100A
Max Output Current	300A
Rated Output Power	2000W~3000W
Operating Temperature Range	-20℃~90℃
Storage Temperature Range	-10℃~40℃
Motor Control Mode	Field Oriented Control（FOC）
Standby Power Consumption	20～40mA
Max Motor Speed Limitation	Depend on Motor and Configuration
Driving Method	Torque Loop + Speed Loop Control
Controller Net Weight	（1200±30）g

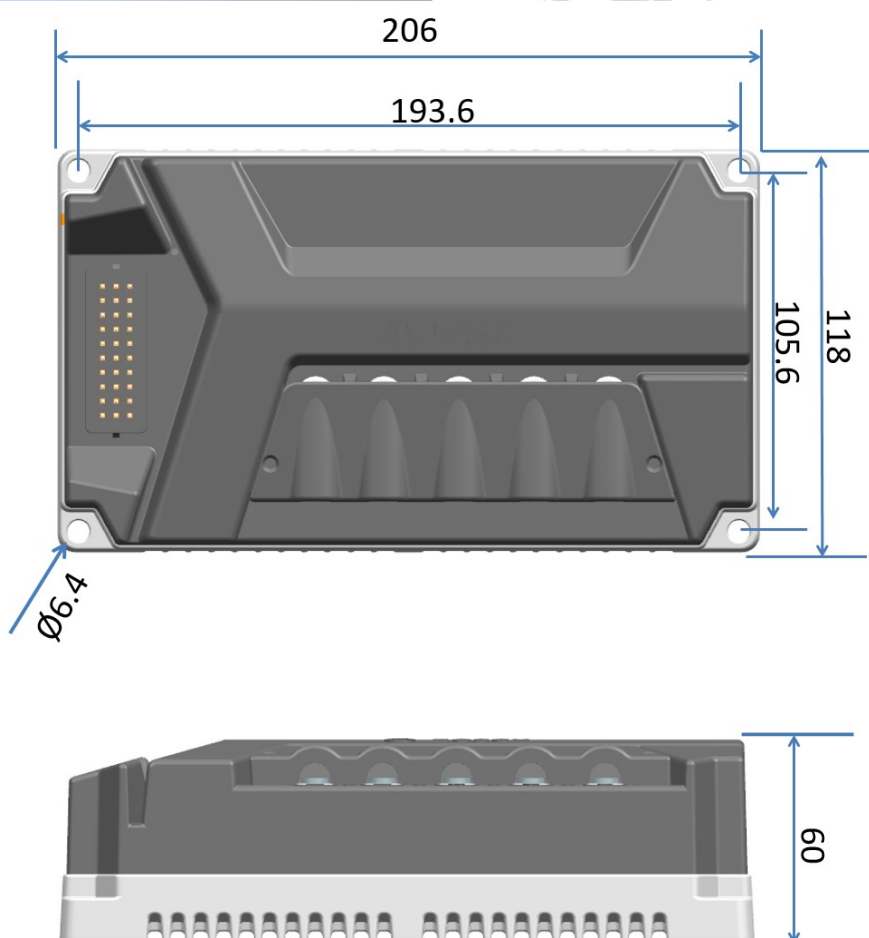| System Protection Characteristics		LED Blinking Times
Over-voltage protection	Battery voltage is higher than default value	1
Under-voltage protection	Battery voltage is lower than default value	2
Motor over-current protection	Motor phase or phase wire to ground is short-circuit	3
Blocked protection	Motor blocked time exceeds default value	4
Encoder protection	Encoder input is abnormal.	5
MOSFET protection	MOSFET self-checking is abnormal	6
Phase winding disconnection protection	One of the motor phase wire is disconnected	7
Stall protection	Motor stall	8
Brake state	Controller is in the braking state	9
Self-checking error protection	Internal self-checking is abnormal when power-on	10
Controller over-temperature protection	Controller operation temperature is higher than default value	11

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Throttle protection	Controller input is abnormal	14
GUI parameter failure	GUI parameter setting is incorrect	15
Self-learning failure	Self-learning failure	16
Crystal oscillator failure	External crystal oscillator setting is incorrect	17

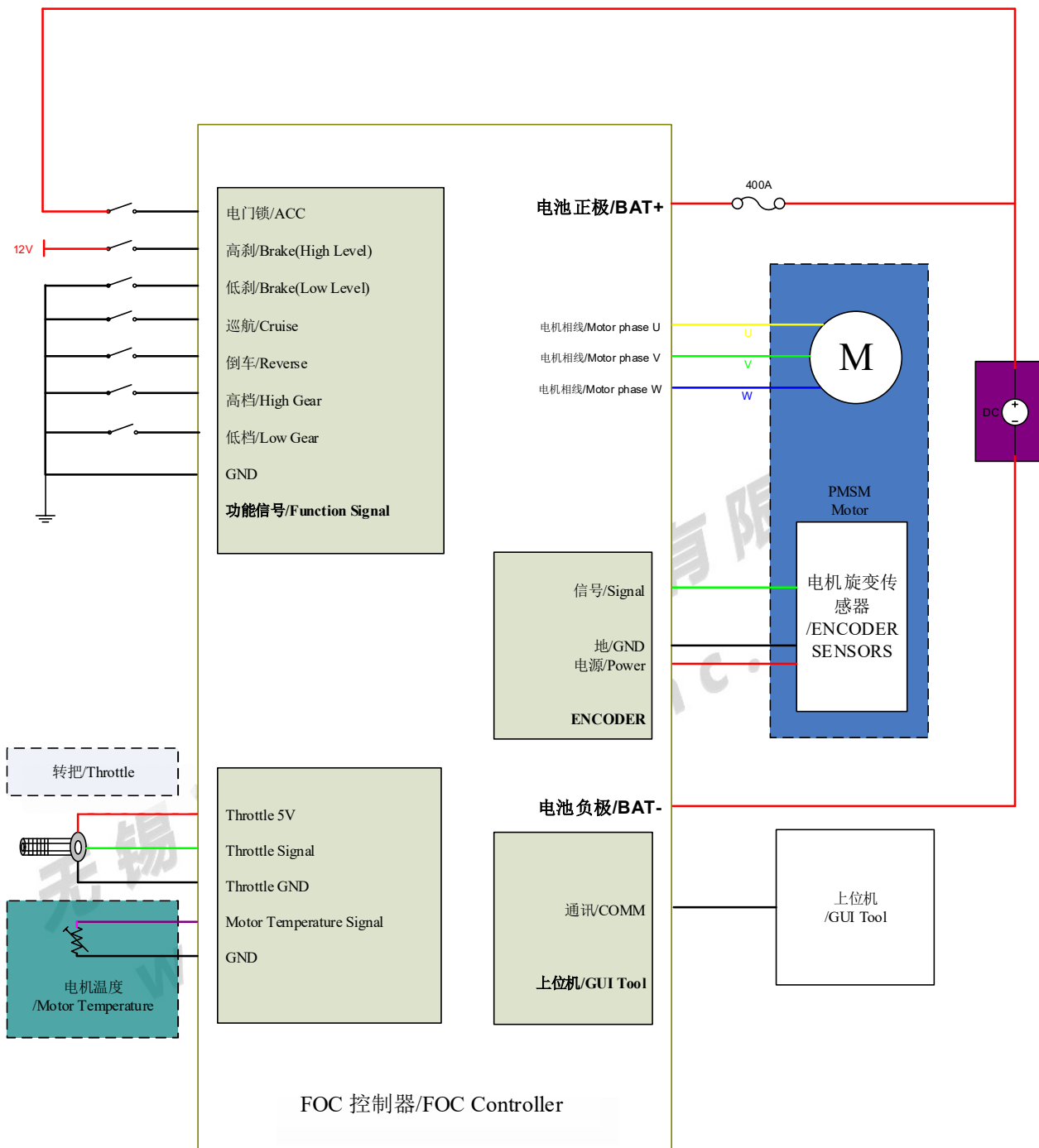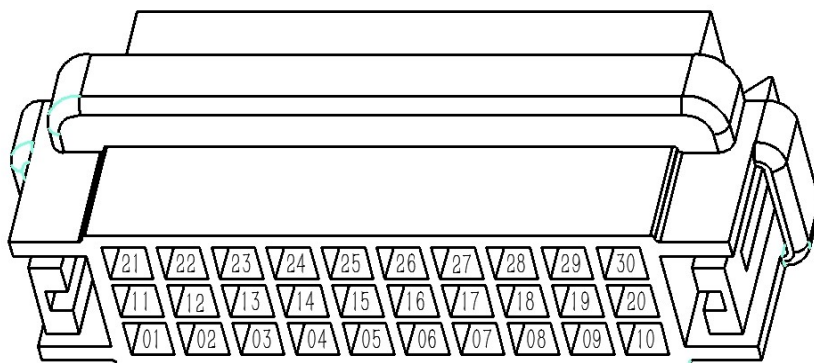| Communication Characteristics	
GUI Tools	RS485 interface: parameter configuration or working status monitoring (optional)
RS485 Communication	RS485 interface (optional)
CAN Communication	CAN interface (optional)
LED Indicator	Indicate current working or fault state

LBMC EJ5XP Dimension

Typical Electrical Wiring

电门锁/ACC

高刹/Brake(High Level)

12V

低刹/Brake(Low Level)

巡航/Cruise

倒车/Reverse

高档/High Gear

低档/Low Gear

GND

功能信号/Function Signal

电池正极/BAT+

400A

电机相线/Motor phase U — U

电机相线/Motor phase V — V

电机相线/Motor phase W — W

M

DC

PMSM Motor

信号/Signal

地/GND

电源/Power

ENCODER

电机旋变传感器/ENCODER SENSORS

转把/Throttle

Throttle 5V

Throttle Signal

Throttle GND

Motor Temperature Signal

GND

电机温度/Motor Temperature

电池负极/BAT-

通讯/COMM

上位机/GUI Tool

上位机/GUI Tool

FOC 控制器/FOC Controller

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Connector Wiring

引脚号/PIN	功能定义/Function	电压范围/Voltage range	引脚号/PIN	功能定义/Function	电压范围/Voltage range
1	CSN+	0~5V	16	地/GND	0V
2	低档/FUNC_IN3	0~5V	17	功能输入口/FUNC_IN2	0~5V
3	高档/FUNC_IN4	0~5V	18	功能输入口/FUNC_IN1	0~5V
4	Encode 5V	5V	19	电机滚动报警/Wheel Sensor Alarm	0~B+
5	CANL/5V OUT	5V	20	防盗器电门锁/Anti theft Device ACC	B+
6	地/GND	0V	21	功能输出口/FUNC_OUT	0~5V
7	地/GND	0V	22	SCLK+	0~5V
8	F8	0~5V	23	RX/485B	0~5V
9	MOSI-	0~B+	24	功能输入口/FUNC_IN5	0~5V
10	电门锁/ACC	B+	25	MISO+	0~5V
11	高刹/Brake(High Active)	0~12V	26	转把电源地/Throttle GND	0V
12	CSN-	0~5V	27	转把信号/Throttle Signal	0~5V
13	TX/485A	0~5V	28	转把电源5V/Throttle Power	5V
14	SCLK-	0~5V	29	MISO-	0~5V
15	CANH	0~5V	30	MOSI+	0~5V