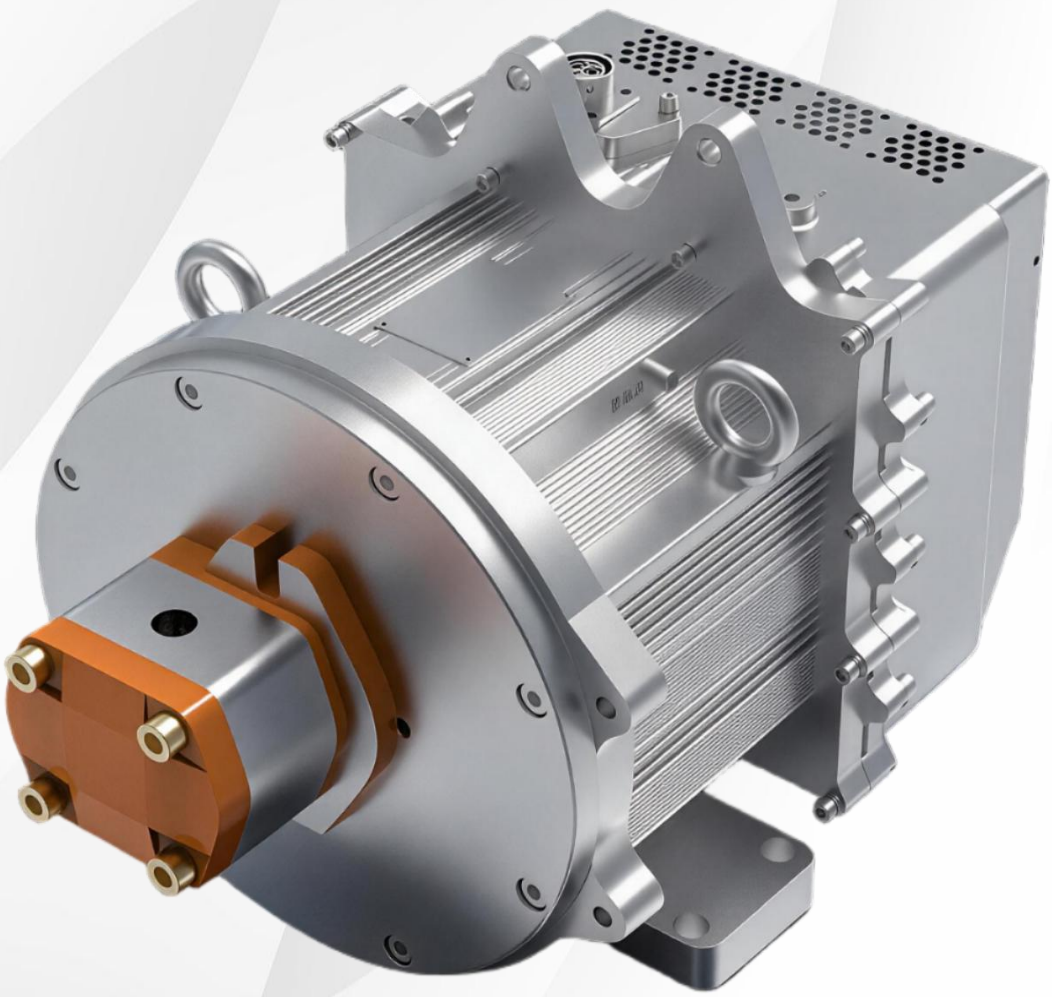
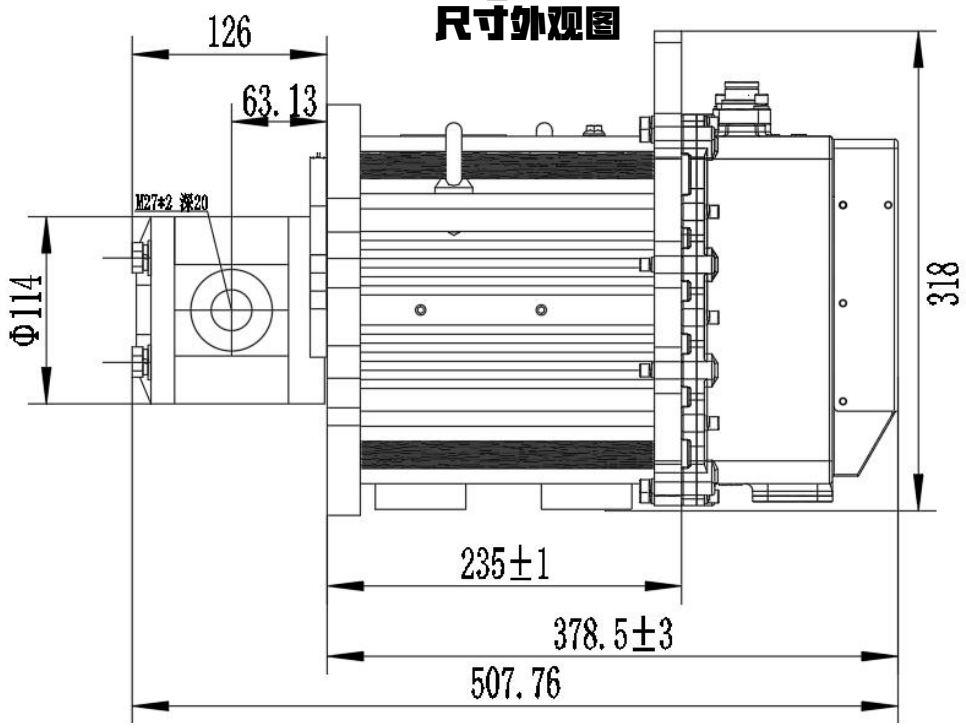
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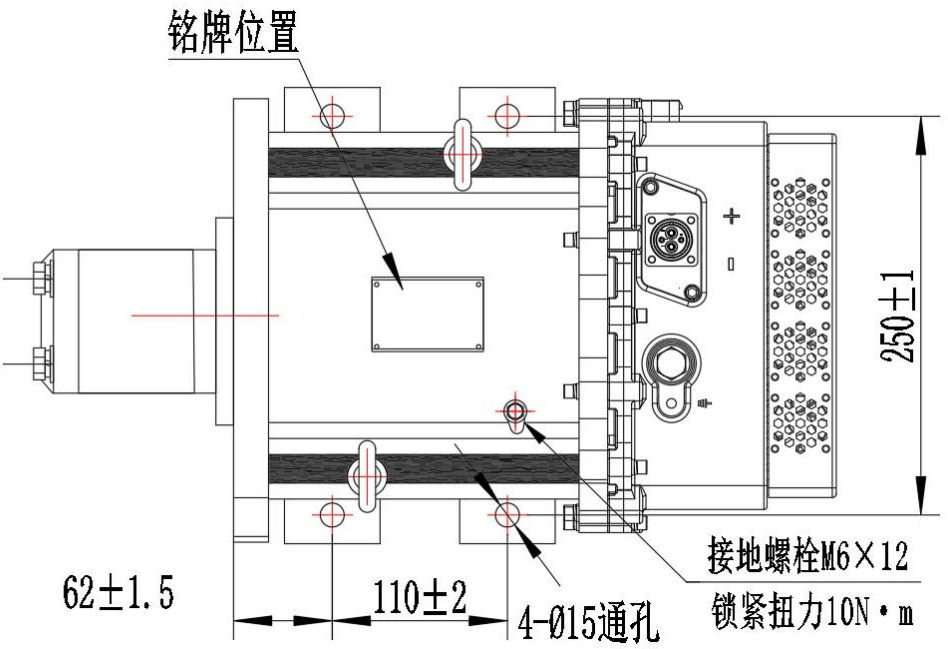


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Outline Drawing with Dimensions
尺寸外观图





This integrated unit combines motor, electronic control and oil pump. Compared with the previous-generation model, it achieves approximately 27% weight reduction and 42.91% smaller overall volume, saving vehicle body layout space with lower weight.

本产品为电机电控油泵一体机，相比旧款产品重量轻约27%，整体m^3尺寸缩小42.91%，节约车身布置空间，重量更轻!

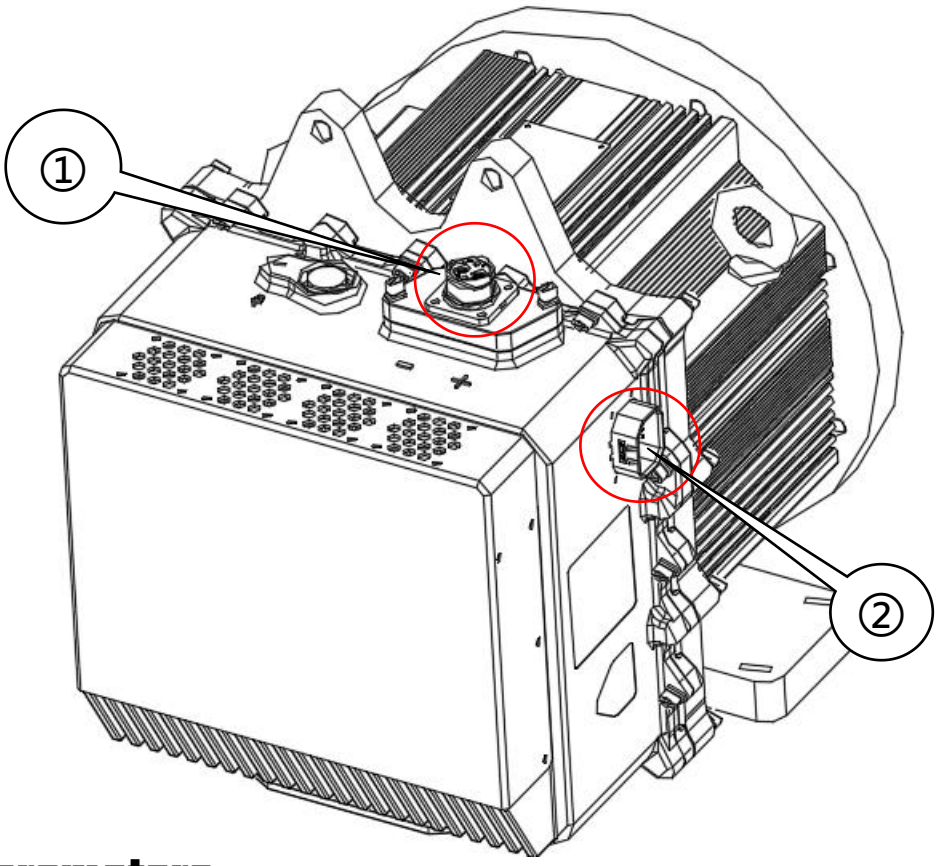
Motor Parameters
电机参数技术要求

No. 序号	Name 名称	Content 内容
①	Tolerance Control 公差控制	Linear dimension tolerances shall comply with GB/T 1804-c, and geometric tolerances shall comply with GB/T 1184-k 线性尺寸公差按 GB1804-c 级，形位公差按 GB1184-k 级
②	Cooling Method 冷却方式	The motor controller adopts air-cooling cooling method. 电机控制器为风冷
③	IP Protection Rating 防水等级	Protection rating: IP67, excluding water-electric interfaces and mechanical interfaces. 防护等级：除水电及机械接口外，IP67
④	Technical Specifications 技术条件	Complies with GB/T 18488.1-2015, Electric vehicle motors and their controllers — Part 1: Technical specifications 符合 GB/T 18488.2-2015 电动汽车用电机及其控制器 第 2 部分：试验方法

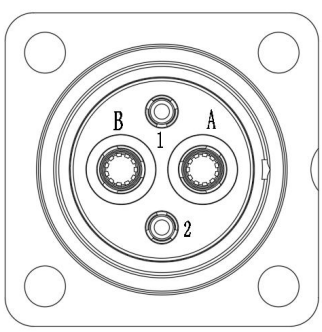
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Motor Parameters
电机参数

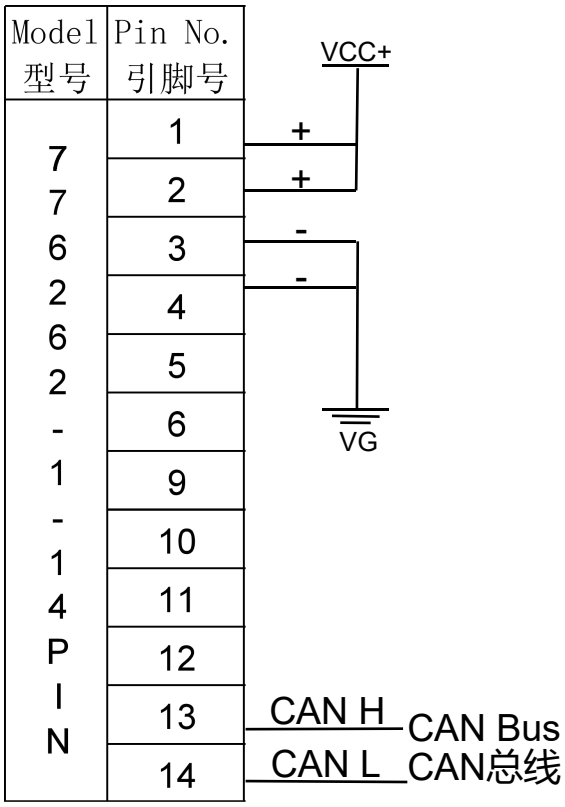
No. 序号	Name 名称	内容
⑤	Reliability Test Claus 可靠性实验条款	Complies with GB/T 18488.2-2015, Electric vehicle motors and their controllers — Part 2: Test methods. 符合 GB/T 18488.2- 2015 电动汽车用电机及其控制器 第 2 部分：试验方法
⑥	Rotation direction of shaft 轴向	Viewed from the shaft extension end, the counter-clockwise direction is defined as the positive rotation direction. 从轴伸端看逆时针方向为正方向
⑦	Rated Operating Voltage 额定工作电压	540VDC
⑧	Operating Voltage Range 工作电压范围	450~750VDC
⑨	Rated Power 额定功率	10kW
⑩	Peak Power 峰值功率	20kW
⑪	Rated Speed 额定转速	1500rpm
⑫	Peak Speed 峰值转速	3500rpm
⑬	Rated Torque 额定扭矩	63.7N.m
⑭	Peak Torque 峰值扭矩	130N.m
⑮	Duty Cycle 工作制	S1
⑯	Insulation Class 绝缘等级	H
⑰	IP Protection Rating 防护等级	IP67
⑱	Rated / Peak Current 额定/峰值电流	21A/42A
⑲	Overall Weight 整机重量	≤60kg



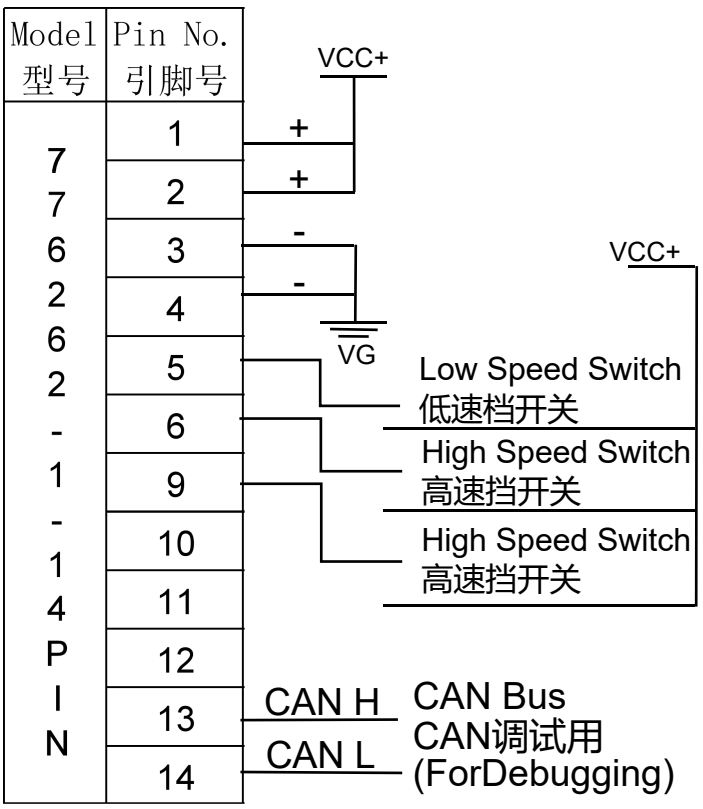
Controller Parameters
控制器参数

No. 序号	Name 名称	Part 部位	Content 内容	图例
①	Power Supply Connector and Harness 供电口插头及线束	Connector P/N 插头型号	RQB-C-5SR1-AH-A	
		Mating Connector Model 对插型号	RQB-C-5PPW1-AH-A	/
		Cable Specification 线缆规格	2×6 mm², overal-shielded/Overall Outer Diameterφ12.5±0.25 2*6平方整线屏蔽，整线外径φ12.5±0.25	/
		Polarity Definition 正负极定义	A +　B —	/

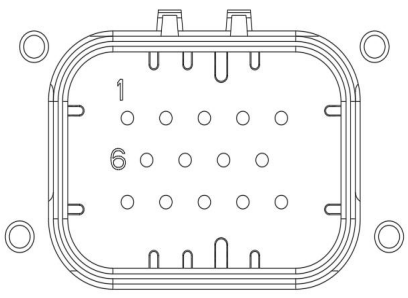
1.CAN Bus Control Wiring Principle
1.CAN总线控制接线原理

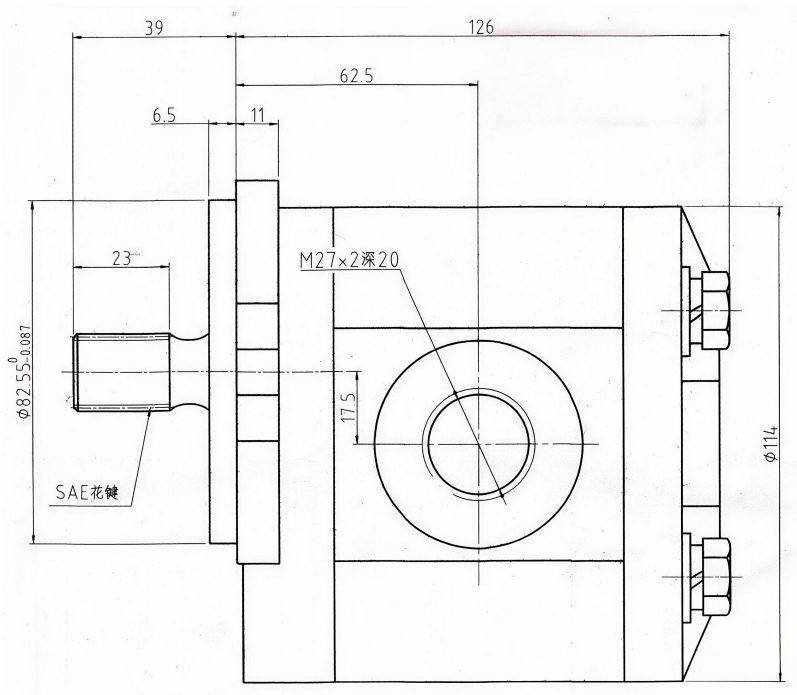


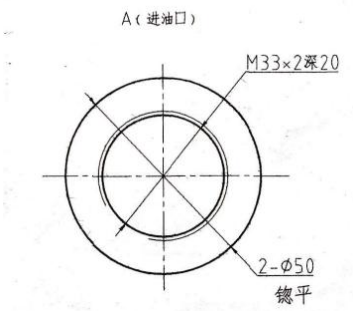
2.Digital Input Control Wiring Principle
2.开关量控制接线原理

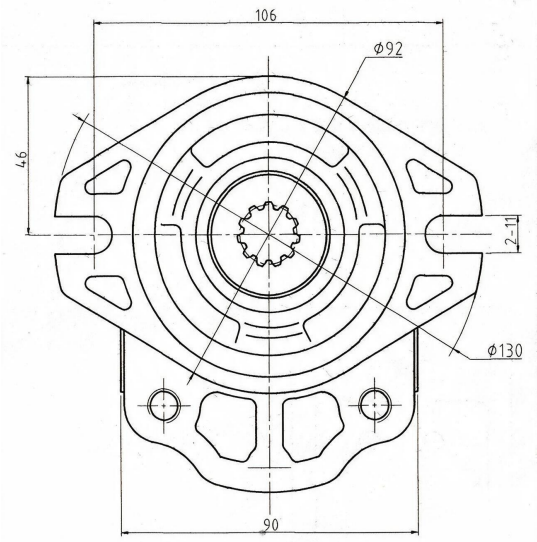


Controller Parameters
控制器参数

No. 序号	Name 名称	Part 部位	Content 内容	图例
②	Power Supply Connector and Harness 信号端插头	Connector P/N 插头型号	776262-1-14PIN	
	Pin Assignment 针脚定义	+	1	+
		+	2	+
		-	3	-
		-	4	-
		IO_DB	5	Low Speed Gear 低速档
		IO_RB	6	High Speed Gear 高速档
		NC	7	NC
		NC	8	NC
		IO_NB	9	Rotation Direction 旋向
		NC	10	NC
		NC	11	NC
		NC	12	NC
		CANH	13	CANH
		CANL	14	CANL





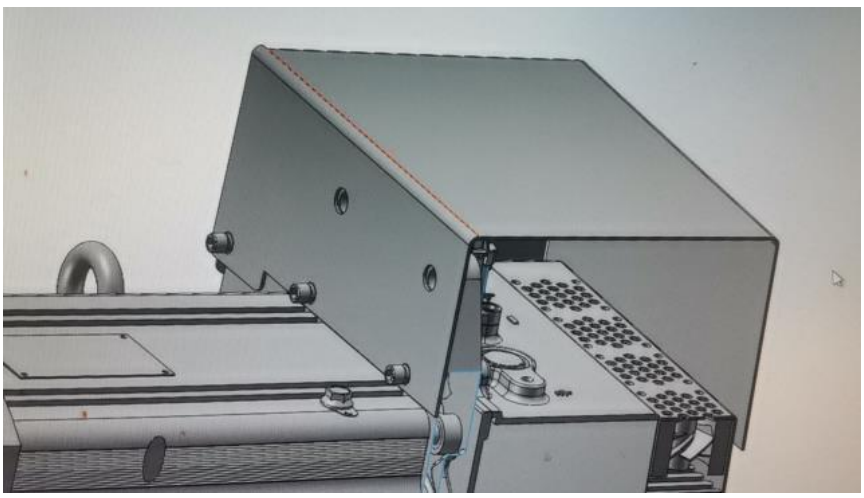


Oil pump parameters
油泵参数

No. 序号	Name 名称	Part 部位	Content 内容	备注
①	Performance 性能	Nominal Displacement 公称排量	20m L/r	
		Rated Speed 额定转速	2000 r/min	800~2800r/min
		Volumetric Efficiency 容积效率	nv≥92%	
		Rated Pressure 额定压力	20MPa	
		Maximum Pressure 最高压力	25MPa	
②	SAE花键参数	Number of Teeth 齿数	11	
		Diametral Pitch 径节	16/32D.P	
		Pressure Angle 压力角	30°	
		Major Diameter 大经	Φ18.63	
		Minor Diameter 小径	Φ15.46	
		Base Tangent Length over 2 Teeth 卡两齿公法线长度	7.17	
		Root Form 齿根型式	Flat Root 平齿根	

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Installation Specification
安装规范



1.The powertrain (excluding the fan) meets the IP67 dustproof and waterproof standard. To prevent external leakage, the controller shall be installed in a clean and dry environment as far as possible. A protective cover shall be equipped to protect the fan and high/low- voltage connectors, and a space of at least 20cm shall be reserved above the fan and high-voltage connectors.

1.防护与安装空间要求：动力总成（除风扇外）满足 IP67 的防尘与防水标准，但为避免外部泄漏，控制器应尽量安装在清洁与干燥的环境中，安装防护罩，将风扇和高低压接插件防护起来，风扇及高压接插件上方至少预留 20cm 空间。

2.During installation, the unit shall be mounted in the upright position and kept away from water- splashing areas such as near tires.

2.安装位置要求：在安装时，应该尽量保持正装且避开轮胎附近等容易溅水的位置。

3.The integrated machine housing must be grounded correctly, and the cross-sectional area of the grounding wire shall be no less than 6mm².

3.设备接地要求：一体机机壳必须正确接地，接地线的线径不小于 6 平方。

4.Before installing the powertrain, the battery circuit must be disconnected, and insulating tools must be used to prevent short circuits.

4.安装安全操作：在安装动力总成之前务必断开电池电路，带上绝缘工具，防止发生短路。

5.Before high- voltage power- on, ensure the positive and negative polarities of the high- voltage power supply are correct and no reverse connection occurs. Reverse connection of high- voltage positive and negative poles will cause damage to the motor controller.

5.高压极性要求：高压上电之前，应确保高压的正负极的极性正确，不能接反，高压正负极接反会导致电机控制器损坏。

6.The motor may fail to operate in accordance with control commands under certain conditions. Therefore, during installation and commissioning, no- load commissioning shall be conducted first, followed by load commissioning. For chassis driving motors, the vehicle shall be jacked up to keep tires off the ground during preliminary functional commissioning.

6.调试流程规范：在某些情况下可能会导致电机未按照预期的命令运行，所以在进行安装调试时，应先空载调试之后再进行带载调试；如果是底盘行走电机，前期功能调试，应将车辆架起使轮胎离开地面。

7.When installing the integrated machine, OEMs shall install shock absorption pads according to the vibration conditions of the application environment.

7.减震安装要求：主机厂安装一体机时，需要根据使用环境的振动情况，安装减震垫。

8.All high and low voltage connectors must be unplugged before welding operations; otherwise, the motor controller will be damaged.

8.焊接作业规范：进行焊接作业时，必须拔掉高低压插件，否则会导致电机控制器损坏。

CAN Signal Protocol
CAN信号协议

	signal, #byte, range [0...7]	signal, #bit, range [0...7]	signal length [bit]	signal name	signal function	value table	VCU	DCDC	BMS	Charger	physical range	binary range	scaling / resolution	offset	unit	default/initial value	Data type	comment
_____ _CAN_version_35 **This communication protocol adopts Intel format. The baud rate is 250 kbps. The default CAN node address of the motor drive is F1. If multiple motor drives are present on the same network, each CAN address must be set to a unique value.** **The configurable address range is F1, F2, F3, F4, F5, F6, F7, F8, F9, FA, FB, FC, FD, FE, FF.**																		
VCU_transmit																		
VCU to MCU_1 ID=0x802F1E3 cycle time=100ms DLC=8	0	0	2	Control_mode	工作模式	0 = reserve 1 = torque mode 2 = speed mode' 3 = reserve'	T	R			0...3	0...3	1	0		0	unsigned	一般只用速度模式
	0	2	1	Run_stop	控制指令	0 = stop 1 = run	T	R			0...1	0...1	1	0		0	unsigned	
	0	3	1	Fast_discharge	快速放电指令	0 = stop 1 = run	T	R			0...1	0...1	1	0		0	unsigned	
	3	24	16	Motor_speed	电机速度请求		T	R			-30000~30000	0...65535	1	-30000		0	unsigned	
	7	56	4	Dcac_Life	生命信号		T	R			0...15	0...255	1	0		0	unsigned	
DCAC_transmit																		
MCU_State_1 电机状态1 ID = 0xC00E3F1 cycle time=100ms DLC=8	0	0	16	Output_current	输出电流		R	T			0~50	0...65535	0.1	-500	A	0	unsigned	
	2	16	16	Input_voltage	输入电压		R	T			0~1000	0...65535	0.1	0	V	0	unsigned	
	4	32	8	McuTemp	MCU温度		R	T			-40~250	0...255	1	-40	℃	0	unsigned	
	5	40	8	MotorTemp	电机温度		R	T			-40~250	0...255	1	-40	℃	0	unsigned	
	6	48	1	Ready	准备就绪	0 = NoReady 1 = Ready	R	T			0~1	0...1	1	0		0	unsigned	
	6	49	2	Motor_Mode	电机模式	0 = reserve 1 = torque mode 2 = speed mode' 3 = reserve'	R	T			0~2	0...3	1	0		0	unsigned	
		52	1	Bus_current_value_valid	母线电流有效性		R	T			0~1	0...1	1	0		0	unsigned	为1的时候，表示Byte0-Byte5对应的量数据有效，为0的时候，对应的数据无效
		53	1	Bus_voltage_value_valid	母线电压有效性		R	T			0~1	0...1	1	0		0	unsigned	
		54	1	McuTemp_value_valid	逆变器温度有效性		R	T			0~1	0...1	1	0		0	unsigned	
		55	1	MotorTemp_value_valid	电机温度有效性		R	T			0~1	0...1	1	0		0	unsigned	
	7	56	4	Dcac_Life	生命信号		T	R			0...15	0...255	1	0		0	unsigned	
MCU_State_2 电机状态2 ID =0xC01E3F1 cycle time=100ms DLC=8	0	0	16	Motor_torque	电机扭矩		R	T			-3000~3000	0...65535	0.1	-3000	Nm	0	unsigned	
	7	56	4	Dcac_Life	生命信号		T	R			0...15	0...255	1	0		0	unsigned	

MCU_State_3 电机状态2 ID=0xC02E3F1 cycle time=100ms DLC=8	0	0	16	Motor_speed	电机速度		R	T			-30000~30000	0...65535	0.1	-30000	rpm	0	unsigned	
	2	17	7	Err_Code	Err_Code	Code Description 0 No fault 1 Over-current fault 2 Drive VCE over-current 3 Drive under-voltage fault 4 Low-voltage under-voltage fault 5 Cycle-by-cycle current limiting fault 6 Output phase loss fault 7 Drive over-temperature 8 Current sensing fault 9 Excessive speed deviation 10 Locked rotor fault 11 Inverter overload 12 Motor overload 13 EEPROM fault 14 DC bus over-voltage fault 15 Invalid VCU command 16 Fan fault	R	T			0...16	0...255	1	0		0	unsigned	
	3	24	1	OverRpmFlag	超速故障		R	T			0~1	0...1	1	0		0	unsigned	
		25	1	LowVolFlag	欠压故障		R	T			0~1	0...1	1	0		0	unsigned	
		26	1	OverVolFlag	过压故障		R	T			0~1	0...1	1	0		0	unsigned	
		27	1	overloadFlag	过载故障		R	T			0~1	0...1	1	0		0	unsigned	
		28	1	RdcFaultFlag	旋变故障		R	T			0~1	0...1	1	0		0	unsigned	
		29	1	MotCanErrFlag	CAN通讯故障		R	T			0~1	0...1	1	0		0	unsigned	
		30	1	InternalFlag	内部故障		R	T			0~1	0...1	1	0		0	unsigned	
		31	1	TorControlFlag	扭矩监控故障		R	T			0~1	0...1	1	0		0	unsigned	
	4	32	1	IGBT1Flag	IGBT1故障		R	T			0~1	0...1	1	0		0	unsigned	
		33	1	IGBT2Flag	IGBT2故障		R	T			0~1	0...1	1	0		0	unsigned	
		34	1	IGBT3Flag	IGBT3故障		R	T			0~1	0...1	1	0		0	unsigned	
		35	1	HardDriveFaultFlag1	硬件过流故障1		R	T			0~1	0...1	1	0		0	unsigned	
		36	1	HardDriveFaultFlag2	硬件过流故障2		R	T			0~1	0...1	1	0		0	unsigned	
		37	1	HallErrFlagA	A相电流传感器故障		R	T			0~1	0...1	1	0		0	unsigned	
		38	1	HallErrFlagB	B相电流传感器故障		R	T			0~1	0...1	1	0		0	unsigned	
		39	1	FastDischargeFlag	主动放电故障		R	T			0~1	0...1	1	0		0	unsigned	
	5	40	1	IgbtTempOpenFlag	IGBT温度传感器开路		R	T			0~1	0...1	1	0		0	unsigned	
		41	1	McuTempOpenFlag	控制器温度传感器开路		R	T			0~1	0...1	1	0		0	unsigned	
		42	1	MotTempOpenFlag	电机温度传感器开路		R	T			0~1	0...1	1	0		0	unsigned	
		43	1	IgbtTempShortFlag	IGBT温度传感器短路		R	T			0~1	0...1	1	0		0	unsigned	
		44	1	McuTempShortFlag	控制器温度传感器短路		R	T			0~1	0...1	1	0		0	unsigned	
		45	1	MotTempShortFlag	电机温度传感器短路		R	T			0~1	0...1	1	0		0	unsigned	
		46	1	MotRotorFlag	电机转子位置检查异常		R	T			0~1	0...1	1	0		0	unsigned	
		47	1	No	预留		R	T			0~1	0...1	1	0		0	unsigned	
	6	48	1	OverIgbtTempFlag	IGBT温度过温		R	T			0~1	0...1	1	0		0	unsigned	
		49	1	OverMcuTempFlag	控制器温度过温		R	T			0~1	0...1	1	0		0	unsigned	
	7	56	4	Dcac_Life	生命信号		T	R			0...15	0...255	1	0		0	unsigned	

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