

1. Overview

The ND series Hall one-line pass-through controller is a high-end high-power permanent magnet synchronous motor controller with the advantages of high quality, high efficiency, and intelligence. It is suitable for vehicle applications of various Hall motors. It is suitable for middle and high speed motorcycles with in-wheel motors, mid-mounted motors, and high-end electric tricycles. Using high-quality fully imported MOS core, full metal shielding and aluminum die heat dissipation structure, the hardware architecture and software implementation are perfectly matched and refined.



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Precise matching control function :

Using 32-bit intelligent microprocessor, matching high-precision motor angle encoder, and innovative vector control algorithm and intelligent control technology, the motor efficiency is maximized. The wide dynamic range of high efficiency enables the driving vehicle to still obtain strict cruising range requirements under comprehensive road conditions. Expand and highlight the advantages of comfort performance and weak magnetic field expansion. Anti-slipping function, maximum speed limit, electronic brake, energy feedback, current limit, host computer communication and other functions are all available. To meet various needs.

Rich software parameter configuration :

- Monitor and configure the controller through the visual computer interface, and update and upgrade online.



- The current at different speeds can be adjusted online.
- The maximum speed of forward and backward, economic speed can be set.
- The overall bus current and phase current can be set.
- The accelerator pedal threshold can be set to adjust the response sensitivity of the pedal.

Perfect protection function :

Monitor working voltage, current, temperature, motor, gear, accelerator pedal, brake, etc. Ensure the safety of vehicle driving control:

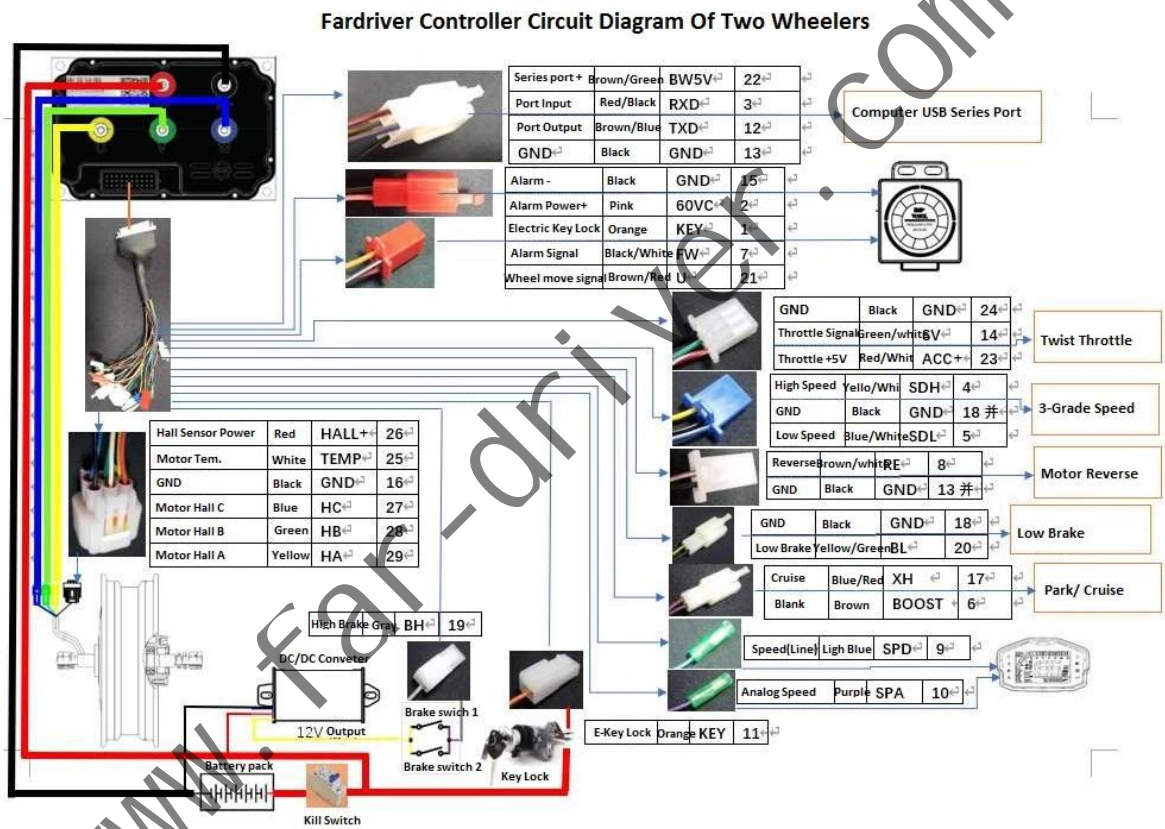
1.Indicator parameters

Model	Maximum BUS Current	Maximum Phase Current	Operating Voltage	Size	Weight	Max. Voltage
72240	80A	300A	48V~72V	189mm*121mm*63.5mm	1.7kg	88V
72330	120A	400A	48V~72V	189mm*121mm*63.5mm	1.7kg	88V
72490	180A	660A	48V~72V	189mm*121mm*63.5mm	2.0kg	88V
72800	220A	800A	48V~72V	189mm*121mm*63.5mm	2.0kg	88V
84330	110A	400A	72V -84V	189mm*121mm*63.5mm	2.0kg	100v
84490	180A	660A	72V~84V	189mm*121mm*63.5mm	2.0kg	100V
96240	90A	240A	48V~72V	189mm*121mm*63.5mm	2.0kg	110V
96330	110A	400A	48V~72V	189mm*121mm*63.5mm	2.0kg	110V
96490	170	660	60V-96V	189mm*121mm*63.5mm	2.1kg	110V
721200	600A	1200A	52V~90V	238*155*88mm	4.0kg	88V
721800	800A	1800A	52V~90V	238*155*88mm	4.0kg	88V

Items	Norm
Functional ways	Dual current loop true vector control
Speedometer display	Isolated pulse meter or CAN communication meter
Energy feedback	be provided with
Protection level	Fully sealed potting

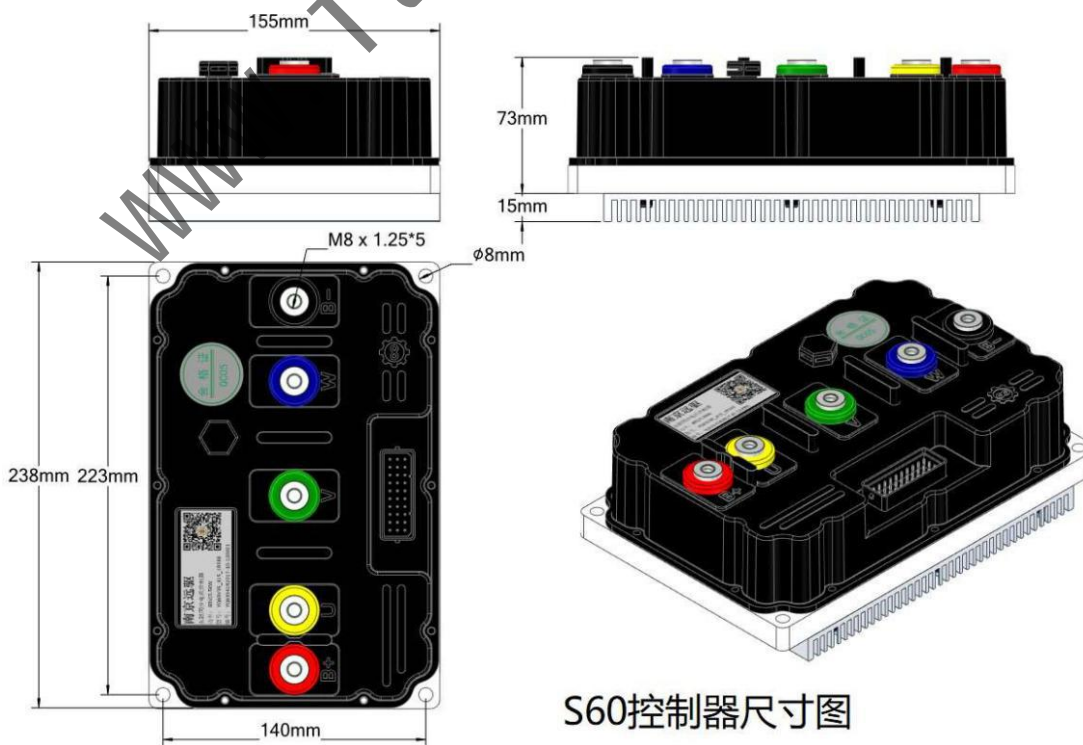
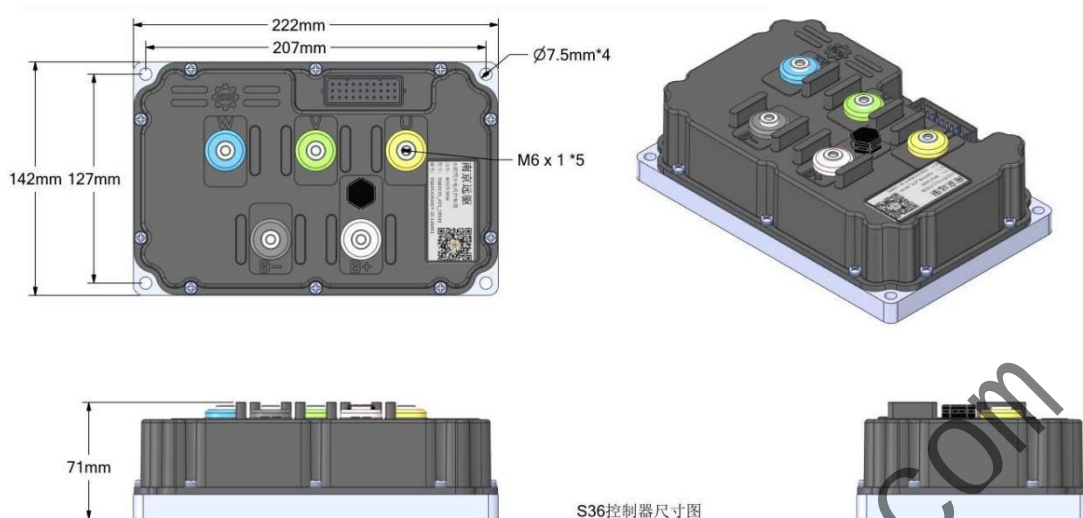
Insulation class	DC1000V Leakage current 0.05
Working temperature	-30°C ~+55°C
Storage temperature	-45°C ~+85°C
Efficiency	99%
Cooling method	Natural Cooling
Vibration standard	GB/T2423
Heat release requirements	Good ventilation or increase air cooling

3.Wiring diagram



● Dimensions

S24 controller size chart



● **Electrical characteristics :**

No.	Items		
1	Motor HALL+	14V (No load) 8V/30mA load	
2	Accelerator power supply 5V	5.1V	optional
3	Accelerator pedal signal	0.5V~4.3V 1.1V~3.9V	Setting on the computer
4	BW5V	Bluetooth 5V, To power the Bluetooth module	
5	High gear/low gear	Dangling invalid Effective GND(ground) wire	
6	Back gear	Dangling invalid GND or positive electricity connection is valid	
7	Alarm signal	Dangling invalid GND or battery connection is valid	
8	Low-voltage brake	Hanging driving and GND parking Hanging parking and GND driving	Setting on the computer
9	High-voltage brake	Hanging driving and positive electricity or 12V connection parking Hanging parking and positive electricity or 12V connection driving	Setting on the computer
10	Small key switch output	That is, the electric door lock signal supplies power to the controller	
11	RX	Computer receiving signal, controller output, TTL level	
12	TX	Computer sending signal, controller input, TTL level	
13	GND	GND	

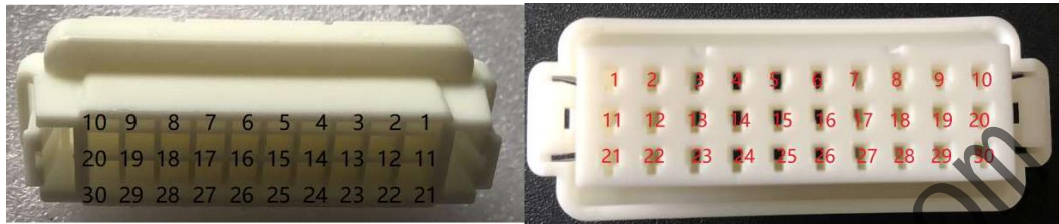
● **Outgoing interface description**

6.1 Plastic Shell Controller Hall One-line Pass Version Outlet Diagram,
It is suitable for Hall one-line communication controller.

30PIN connector recommended color definition



21	22	23	24	25	26	27	28	29	30
U		ACC+	GND	TEMP	HALL+	HC	HB	HA	
brown and red		White and red	black	white	red	blue	green	yellow	
11	12	13	14	15	16	17	18	19	20
60VKEY	TXD	GND	SV	GND	GND	XH	GND	BH	BL
orange	Brown and blue	black	White and	black	black	Blue and red	black	Grey	Yellow and

			green						green
1	2	3	4	5	6	7	8	9	10
60VKEY	60VC	RXD	SDH	SDL	BOOST	FW/FD	RE	SPD	SPA
orange	pink	Black and red	Yellow and white	Blue and white	brown	Black and white	Brown and white	Light blue	purple



Connector		Description	color	Definition	pin
Hall wire length:290mm		Motor 12V	red	HALL +	26
		Motor temperature	white	TEMP	25
		Motor wire GND	black	GND	16
		Motor wire C	blue	HC	27
		Motor wire B	green	HB	28
		Motor wire A	yellow	HA	29
Electric door lock length: 290mm		Electric Key Lock	orange	KEY	11
Cruise BOOST Length: 290mm		Cruise	Blue and red	XH	17
		BOOST	brown	BOOS T	6
Low-voltage: Length: 290mm		GND	black	GND	18
		Low-voltage brake	Yellow and green	BL	20

Analog speedometer wire Length: 290mm		Analog speedometer	purple	SPA	10
High voltage brake Length: 290mm		High voltage brake	Grey	BH	19
Throttle length: 290mm		GND	black	GND	24
		Throttle signal	Green and white	SV	14
		Throttle power	Red and white	ACC+	23
Anti-theft signal length: 290mm		Anti-theft	White and black	FW	7
		Phase wire	brown	U	21
		Electric door lock	orange	KEY	1
Anti-theft power supply Length: 290mm		Electricity +	Pink and red	60VC	2
		Electricity -		GND	15
High and low Level Speed length: 290mm	 <p style="text-align: center;">Three-core female headgear P short-circuited three-core male head (high speed by default)</p>	High speed	White and yellow	SDH	4
		GND	black	GND	18 (together)
		Low speed	Blue and white	SDL	5
Reverse Length:290mm		Back gear	Brown and white	RE	8
		GND	black	GND	13(together)

Speed Velocity pulse signal Length: 290mm		Speed pulse / one wire	Light blue	SPD	9	ND
Program port Length: 190m m		Serial power supply	brown and green	BW5V	22	
		Serial port	Black and red	RXD	3	
		Serial port	Brown and blue	TXD	12	
		GND	black	GND	13	

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● **Buzzer alarm**

The controller is equipped with a buzzer. When an alarm occurs, the buzzer will send out corresponding alarm information.

7.1 Description of the number of buzzer alarm sounds:

7.1.1 When the machine is turned on normally, the buzzer will sound once and then stop.

7.1.2 If there is a long beep, please check whether the brake and accelerator are effective at the same time.

With this function, you can check whether the brakes and accelerators are normal: step on the buzzer at the same time, and let go of any one of them will not sound.

7.1.3 If there are 2 short beeps and 1 long beep, the cycle repeats, indicating that the controller is in the self-learning state, and the self-learning should be completed according to the self-learning operation steps.

7.1.4 If there are 2 short beeps, pause for a while, and then a short beep, repeating again and again, it means that the controller program verification has failed. In this case, update the program again.

7.1.5 If there are 4 short beeps, 1 long beep, and 5 short beeps, the cycle repeats, indicating that the upgraded program does not match the controller. Please check whether the program is consistent with the model on the controller label. If it does not, find the matching program again upgrade.

7.1.6 If there are 1 to 15 beeps, judge the fault based on the number of sounds. The fault table is as follows:

	Fault description	Number of sounds	
1	Motor Hall fault	1	The signal wire between the controller and the motor is not connected properly.
2	Accelerator pedal failure	2	The accelerator does not return to zero, or the accelerator pedal is broken. Note that the fault will be displayed by default when the controller is restarted, and the fault will disappear after the self-check is passed.
3	Current protection restart	3	Abnormal protection alarm
4	phase current overcurrent	4	Abnormal protection alarm
5	Voltage failure	5	The voltage is too low or too high, which exceeds the allowable range of the controller.
6	Anti-theft alarm signal	6	reserved
7	Motor over temperature	7	Motor temperature is too low or too high beyond the scope of use
8	Controller over temperature	8	The temperature of the controller is too low or too high beyond the use range
9	phase current overflow	9	Abnormal protection alarm
10	10-phase current zero point fault	10	Controller internal alarm
11	Phase line short circuit fault	11	The phase line is short-circuited, or the motor is faulty.
12	wire current zero point fault	12	Controller internal alarm
13	MOSFET upper	13	The upper bridge of the controller is damaged

	bridge fault		
14	MOSFET lower bridge fault	14	The lower bridge of the controller is damaged
15	Peak line current protection	15	Hardware overcurrent protection alarm

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