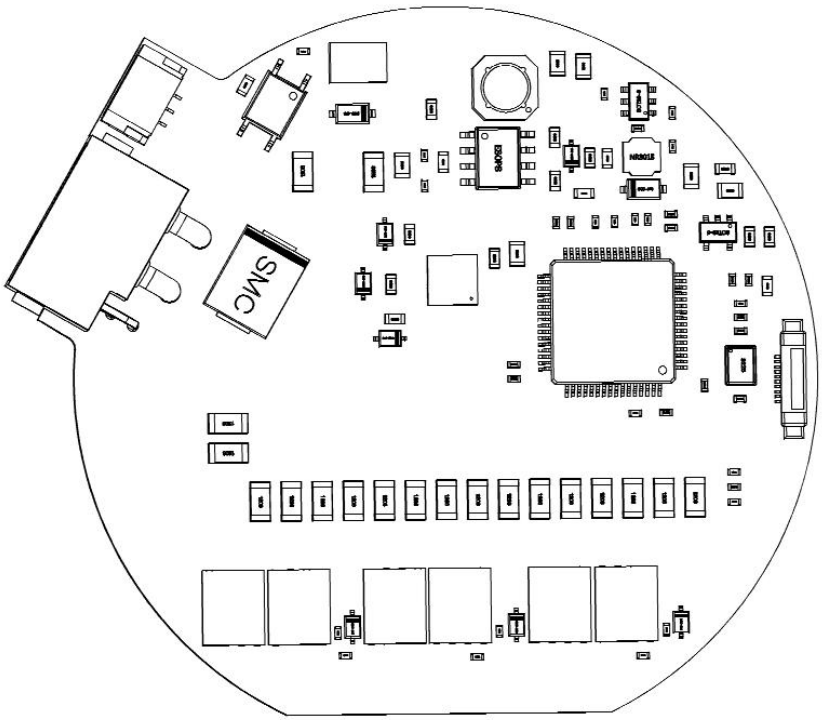
AK60-4820-1C-A2 Driver Installation Instructions

V1.0.0



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Content

Precautions 3
Product Features 3
Disclaimer 3
Version Change Record 4
1 Driver Appearance Introduction 4
2 Product Specifications 5
3 Product Dimensions and Installation Notes 6
4 Driver Interfaces and Definition 7
4.1 Driver Interface Diagram 7
4.2 Driver Interface Pin Definitions 7
4.3 Recommended Brands and Models for Driver Interface 8
5 Driver Indicator Light Definitions 8
6 Main Accessories and Specifications 9

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Precautions

1.Ensure that there are no short circuits in the circuit and that interfaces are connected correctly as required.

2.  The driver board will heat up during output; please use it carefully to avoid burns.

3.  Before use, please check if all parts are intact. If any parts are missing or aged, please stop using it and contact technical support in time.

4.  Please strictly follow the working voltage, current, temperature, and other parameters specified in this document; otherwise, it will cause permanent damage to the product!

Product Features

The AK series motor driver board adopts high-performance drive chips in the same class, uses Field Oriented Control (FOC) algorithm, and is equipped with advanced self-disturbance control technology for speed and angle control. It can be used with CubeMarsTool parameter setting software for parameter setting and firmware upgrades. In terms of hardware, the inner loop uses a 16-bit high-precision encoder, supporting up to 21 bits (custom firmware required), and the CAN communication uses a safer isolated CAN interface, along with a more reliable plug, greatly enhancing the reliability of the product's use and communication; in terms of software, the upper computer CubeMarsTool has been fully upgraded, and there is no need to switch between servo mode and force control mode, the control interface is more concise, and a large number of simplifications have been made in the operation, fully improving the customer's experience.

Disclaimer

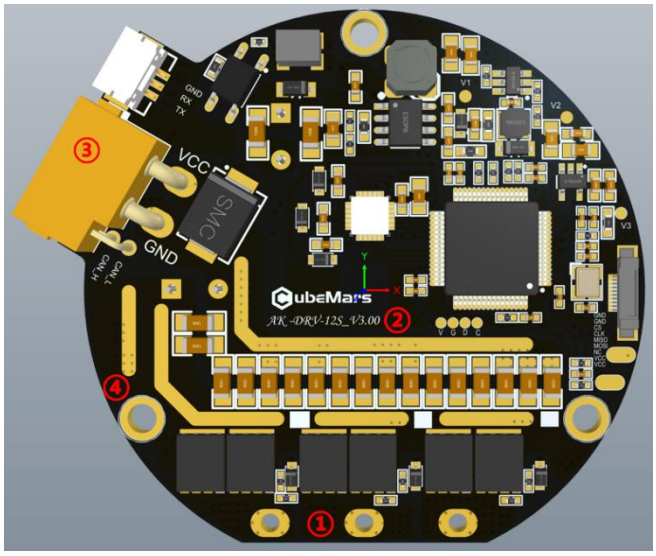
Thank you for purchasing the AK series driver board. Before using it, please read this statement carefully. Once used, it is considered as recognition and acceptance of all the contents of this statement. Please strictly follow the product manual and relevant laws, regulations, policies, and guidelines for the installation and use of the product. During the use of the product, the user promises to be responsible for their own actions and all consequences arising therefrom.

Any losses caused by improper use, installation, or modification of the product by the user, CubeMars will not assume legal responsibility.

Version Change Record

Date	Version	Content
2025.6.25	V1.0.0	1.First time edit

1 Driver Appearance Introduction

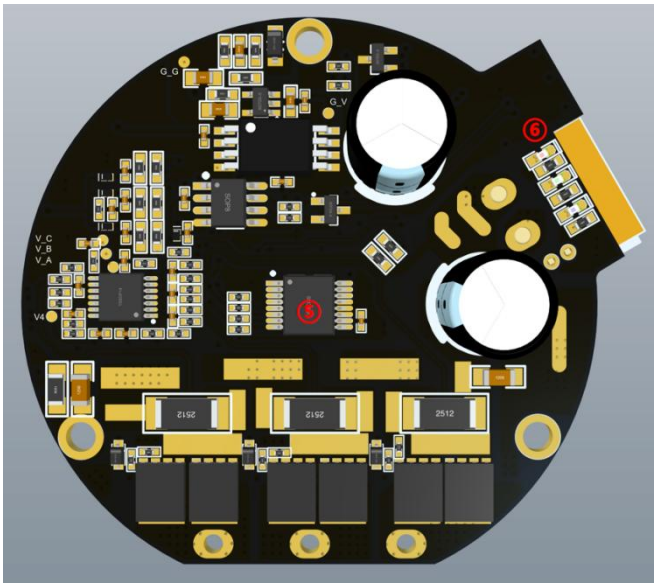


①Three-phase wires ports

②Hardware version

③Connection port

④Mounting hole



⑤Encoder chip

⑥LED indicator light

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2 Product Specifications

Specifications	
Hardware version	AK-DRV-12S-V3.00
Rated working voltage	48V
Allowable working voltage	18-52V
Rated Output Current (RMS)	20A
Maximum output current（AP）	60A
Standby power consumption	≤1W
CAN bus bit rate	1Mbps
Size	63mm×57mm
Working environment temperature	-20℃ to 65℃
Maximum allowable temperature for driver board	100℃
Encoder bits	21bit（single turn absolute）

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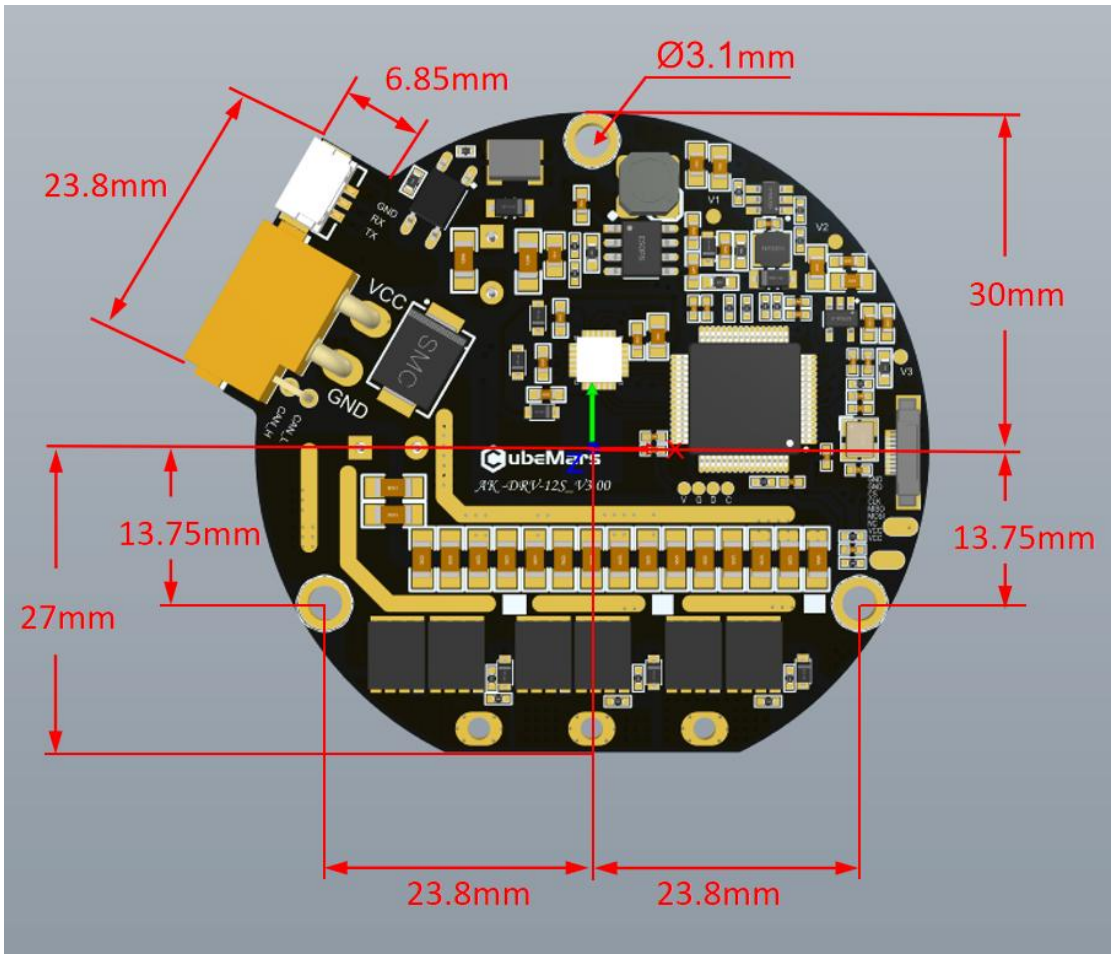
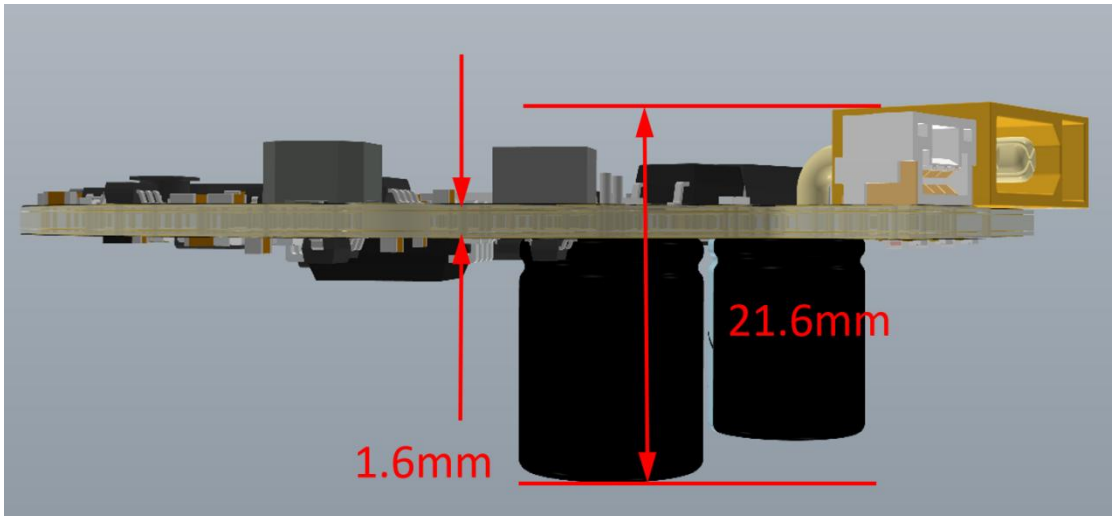
3 Product Dimensions and Installation Notes





Remark:

1、Dimensional tolerance: ±0.15 mm; mounting hole tolerance: +0.1 mm / -0 mm; PCB thickness tolerance: ±0.16 mm.

2、It is recommended to use M3 mm screws for mounting.;

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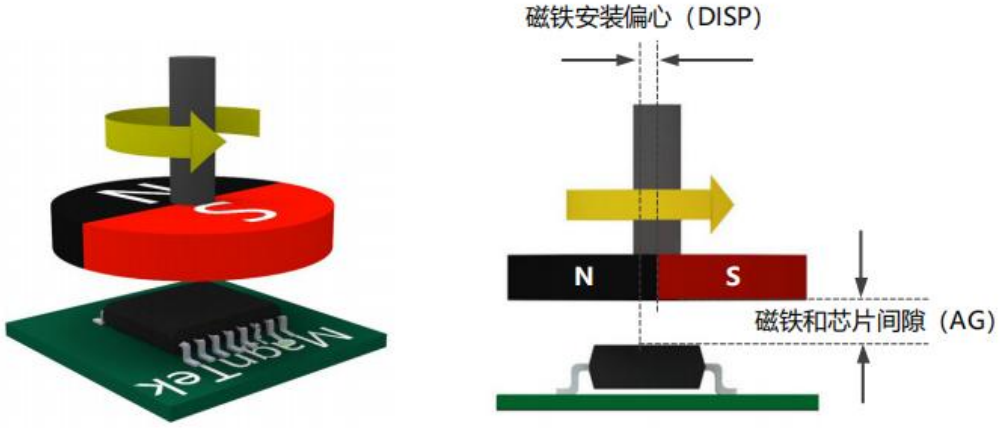
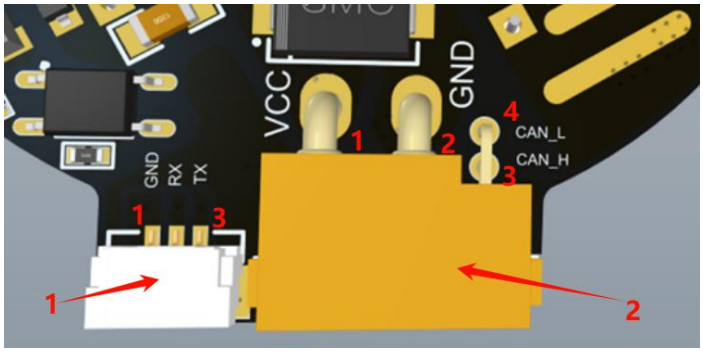
3、The suggested air gap (AG) between the encoder magnet and the chip is 1 mm, with a maximum not exceeding 3 mm.

4、The recommended maximum eccentricity (DISP: deviation between magnet center and chip center) is 0.3 mm.



4 Driver Interfaces and Definition

4.1 Driver Interface Diagram



4.2 Driver Interface Pin Definitions

No	Function	Pin	Clarification	Color
1	**Serial Communication**	1	Serial signal ground（GND）	Black
		2	Serial signal input（RX）	Yellow
		3	Serial signal output（TX）	Green

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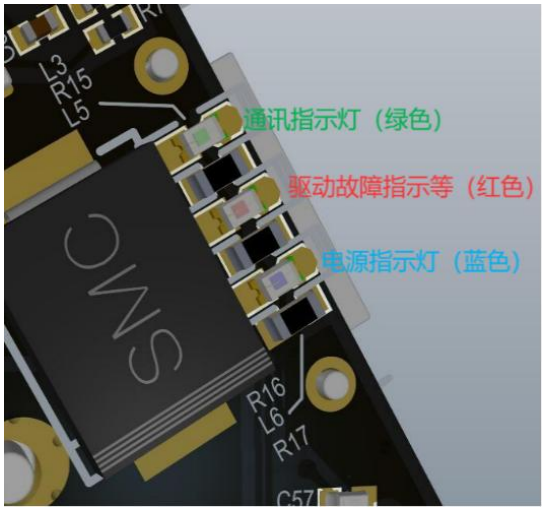
No	Function	Pin	Clarification	Color
2	**Power imput and CAN communication**	1	Positive Pole（+）	Red
		2	Negative Pole（-）	Black
		3	CAN communication high side（CAN_H）	White
		4	CAN communication low side（CAN_L）	Blue

4.3 Recommended Brands and Models for Driver Interface

No	Onboard Interface model	Brand	Terminal Interface Model	Brand
1	A1257WR-S-3P	CJT	A1257H-3P	CJT
2	XT30PW(2+2)-M	AMASS	XT30(2+2)-F	AMASS

5 Driver Indicator Light Definitions



Indicator Light Definitions		
Power Indicator Light（Blue）	Light on	The driver board is powered
	Light off	The driver board is not powered

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Operation Indicator Light(Green)	Light on	The motor is working
	Light off	The motor is not working
Drive Fault Indicator Light (Red)	Light on	Driver board fault
	Light off	Driver board function normally

⚠：After the driver board is powered, the blue light should remain on in the normal state, and the green and red lights should light up for 2 seconds before going out.

6 Main Accessories and Specifications

NO	Item	Specifications		Quantity	Remark
1	Power supply and signal cables plug	Power & CAN cable	16AWG red-black silicone wire and white-blue Teflon 30AWG (OD 0.64) – length 100 ± 10 mm – 4-core – XT30 (2+2) female connector – one end with XT30 (2+2) female connector, the other end stripped and tinned 3 ± 1 mm.	Each 1PCS	±2MM
2		Serial	Teflon 30AWG wire (OD 0.64) – length 200 ± 10 mm – 3-core – GH1.25-3PIN male connector to FC crimped IDC connector 2×4PIN.	Each 1PCS	±2MM

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