

Before Use

Before operating this product, read the relevant safety information carefully to ensure personal safety and product safety.

DANGER 	☐ When operating, wiring, or installing the driver, be sure to confirm that the power is turned off. ☐ The circuit components on the internal circuit board of the driver are easily damaged by static electricity. Before proper anti-static measures are taken, do not touch the circuit board by hand. ☐ Do not modify the internal parts or wiring of the driver by yourself. ☐ Do not expose this product to water vapor, corrosive gas, flammable gas, or similar substances during use; otherwise electric shock or fire may occur. ☐ Install the driver and accessories away from fire sources, heating elements, and flammable materials. ☐ Before mechanical equipment starts operating, set the values according to the user parameters. If the correct matching settings are not adjusted, the mechanical equipment may lose control during operation or a fault may occur. ☐ Before the machine starts operating, confirm that the emergency stop device can be activated at any time. ☐ When power is applied, make sure the motor shaft remains stationary and will not rotate due to mechanism inertia or other factors. ☐ Do not change wiring while the power is on; otherwise electric shock or personal injury may occur.
WARNING 	☐ Do not connect the power cable to the control terminals. ☐ The rated voltage of the power system for driver installation is AC220V. ☐ First test whether the driver and motor operate normally without load, and then connect the load to avoid unnecessary danger. ☐ Do not switch the power on and off frequently. If continuous power switching is required, keep it to less than once per minute. ☐ Do not use this product for vertical lifting motion of loads. ☐ Only qualified professional personnel may install, wire, and repair the driver.

Note:

1. To explain product details fully, this manual may describe the product with the enclosure removed or safety covers disassembled using text and figures.
During operation, be sure to install the enclosure as specified, wire correctly, and operate according to the manual to ensure safety.
2. The illustrations in this manual may differ slightly from the actual product for ease of explanation, but this does not affect customer rights.

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I. Product Inspection and Description

1 1.1 Product Inspection

To prevent oversights during purchase and transportation, carefully check the items listed below:

- ☐ Whether this is the product you intended to purchase: check the product model on the driver package nameplate; refer to the model description in the next section.
- ☐ model description.
- ☐ Whether the appearance is damaged: visually check for any damage or scratches.
- ☐ Whether screws are loose: check whether any screws are not tightened or have fallen off.
- ☐ Whether accessories are missing: compare with the complete component list below.

If any of the above conditions occur, promptly contact our company or agent for proper resolution.

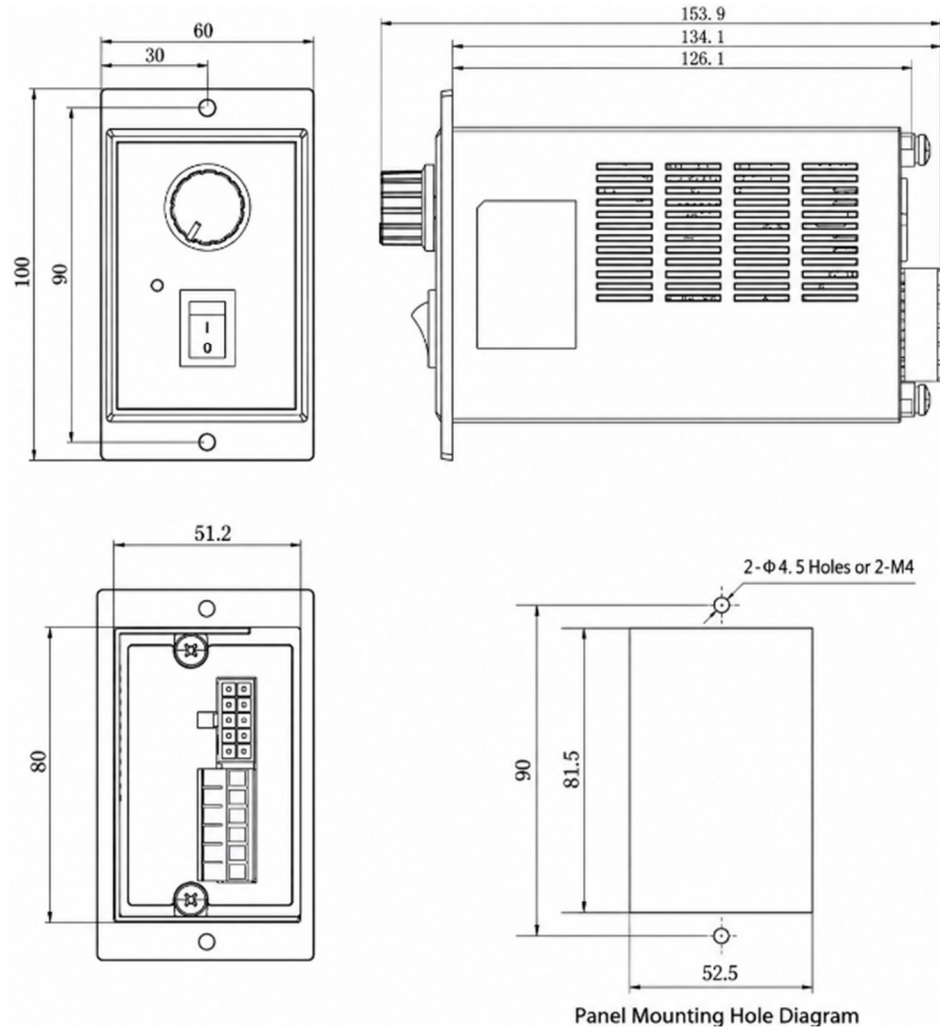
A complete operable driver set should include:

- (1) EA-DRVC13-120S2 driver - 1 unit;
- (2) 6-Pin terminal (KF2EDGK-5.08) - 1 piece;
- (3) M4*8 grounding screws (installed on the driver) - 2 pcs.

II. Product Dimensions, Installation, and Environmental Conditions

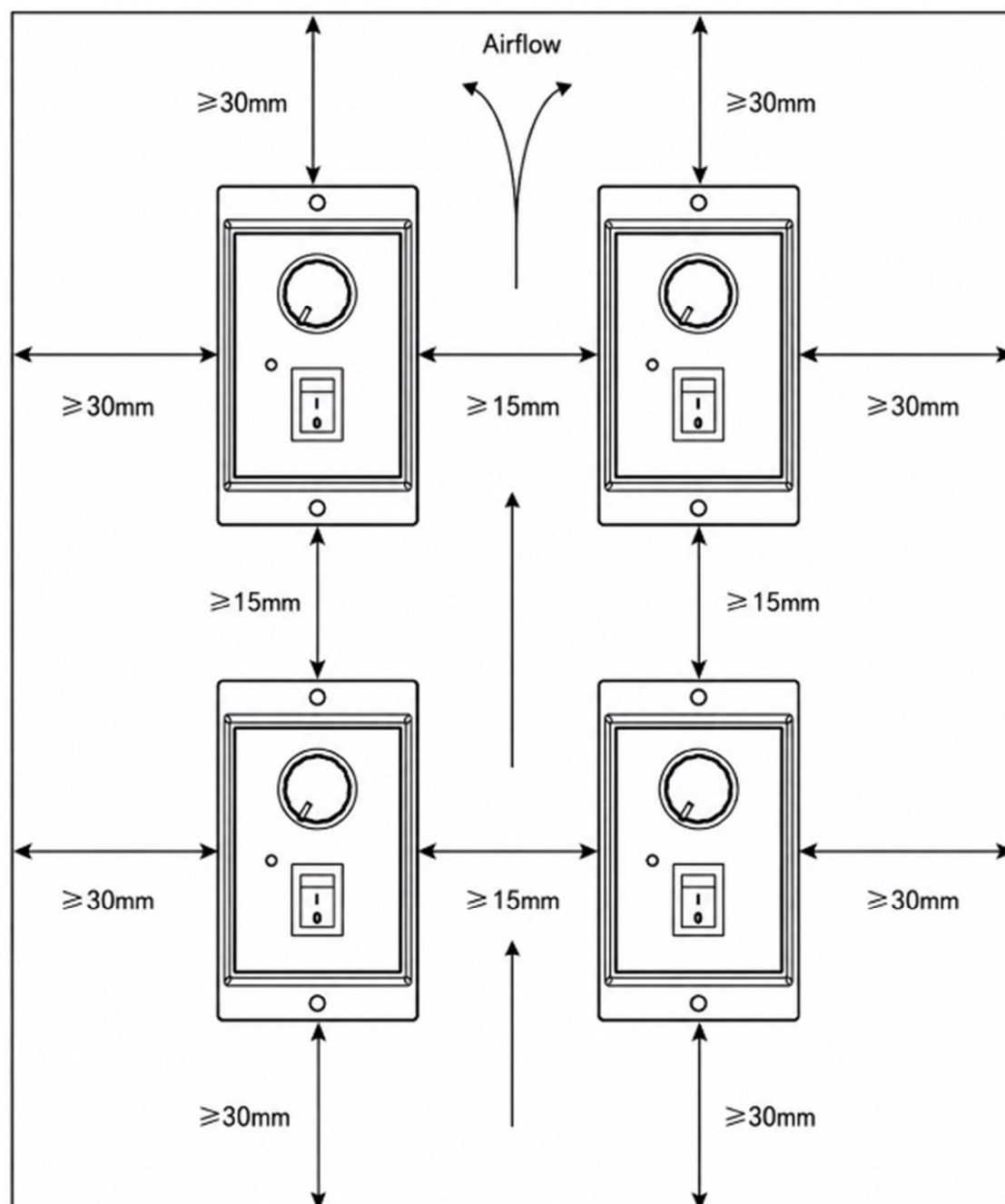
2 2.1 Product Dimensions and Installation Instructions

Unit: mm



This product is installed as an embedded type. It is recommended to mount it on a well-ventilated metal fixing surface and use the grounding screws for reliable grounding; otherwise, electric shock may occur. Refer to the panel cutout diagram and fasten with M4 combination screws.

Recommended driver installation spacing: when multiple drivers are installed side by side, keep the mounting spacing above 15 mm to ensure good heat dissipation.



* The spacing between drivers in the installation diagram is not drawn to scale with the text notes; refer to the text notes.

Precautions

Users should pay special attention to the following items:

- 1 The connection cable between the driver and motor must not be pulled tight, to prevent
 - 2 loosening or falling off;
 - 3 When fixing the driver, all fixing screws must be tightened;
 - 4 The motor shaft center must be well aligned with the equipment shaft center;
- The screws fixing the motor must be tightened.

2 2.2 Operating, Storage, and Transport Environmental Characteristics

The S driver must never be exposed to harsh environments such as dust, sunlight, corrosive or flammable gases, grease, humidity, water drops, or vibration.			
The salt content in the air must be kept below 0.01 mg/cm ² per year.			
Protection Rating		IP20: prevents ingress of solid foreign objects larger than 12 mm in diameter; no moisture	
Environmental Characteristics	Ambient Temperature	protection	- 10~40°C
		Operation	Single installation - -20 to -10 deg C or 40 to 50 deg C (derating required)
			Side-by-side installation - 10~30°C -20 to -10 deg C or 30 to 40 deg C (derating required)
		Storage	-33~-55°C
		Transport	-20~-50°C
		Non-condensing, non-freezing	
	Rated Humidity	Operation	Max.85%
		Storage / Transport	Max.90%
		Condensation prohibited	
	Atmospheric Pressure	Operation	86~106kPa
		Storage / Transport	70~106kPa
	Altitude	Operable below an altitude of 1000 m (derating is required above 1000 m; see Section 2.2.2)	
Package Drop	Storage / Transport	Do not drop from a height; risk of damage	
Vibration	Operation/Storage/Transport	Continuous vibration prohibited	
Impact	Operation/Storage/Transport	Excessive impact prohibited	

2 2.2.1 Storage Environmental

Conditions

Before installation, this product must remain in its packaging box. If it will not be used temporarily, in order for the product to comply with our warranty coverage and future maintenance requirements, pay attention to the following during storage:

- 1 It must be placed in a dust-free and dry location;
- 2 The ambient temperature and relative humidity of the storage location must be within the required range;
- 3
- 4 Avoid storage in environments containing corrosive gases or liquids;
Preferably store it properly packaged on a shelf or flat surface.

2 2.2.2 Operating Environmental Conditions

Operating	Ambient Temperature Limit
Abnormal Ambient Temperature Operation	When operating at rated current, the ambient temperature must be between -10 and 40 deg C. When the ambient temperature exceeds 40 deg C, for every 1 deg C increase,
High-Altitude Operation	reduce the rated current by 2.5%. The maximum ambient temperature is 50 deg C. When the driver is used at an altitude of 0-1000 m, apply normal operating limits. When used at an altitude of 1000-2000 m, reduce the rated current by 1% or reduce the operating ambient temperature by 0.5 deg C for every 100 m increase in altitude. If the product must be used above 2000 m altitude, contact the manufacturer.

For long-term operation, it is recommended to keep the ambient temperature below 40 deg C and place the product in a well-ventilated location to ensure product reliability.

In areas above 1000 m altitude, thin air reduces equipment insulation strength and heat dissipation performance.

Derated use is required, and use in high-altitude areas is not recommended.

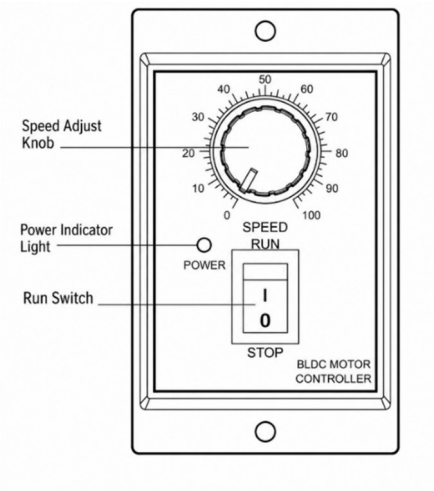
In addition, the operating conditions also include:

- 1 A place without a large amount of heat-generating equipment;
- 2 A place free of water droplets, steam, dust, and oily dust;
- 3 A place free of corrosive or flammable gases and liquids;
- 4 A place free of floating dust and metal particles;
- 5 A solid place without vibration;
- 6 A place free of electromagnetic noise interference.

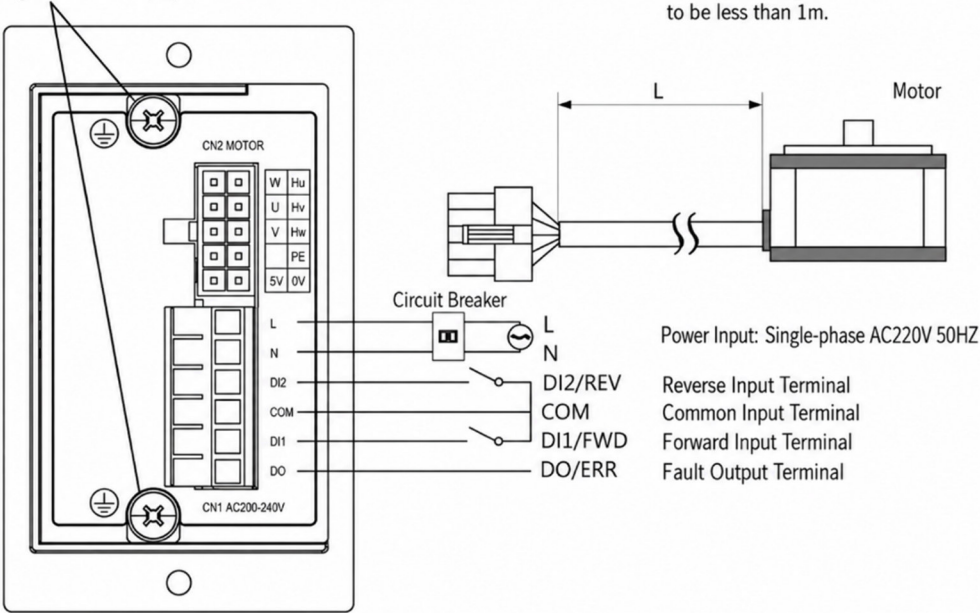
III. Wiring Method

3 3.1 Wiring Diagram

The following figure is the C13-120S2 wiring diagram:



Use the grounding screw on the drive, and ground the equipment at the rear side.



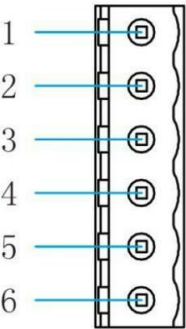
Precautions:

- 1 When wiring, first turn off the power. Wiring must be performed by professionals according to this manual and the functions required by the user to ensure safe use;
- 2 Do not connect the power cable to terminals other than the power terminals; otherwise the driver may be damaged;
- 3 Select wire gauges and perform wiring according to electrical regulations;
- 4 The grounding terminal must be properly grounded, and the screws between terminals and wires must be tightened to prevent loosening due to vibration;
- 5 Make sure the power supply capacity is more than twice the rated motor power;
- 6 It is recommended that the cable length between the motor and driver be less than 1 m.

3 3.2 Ports

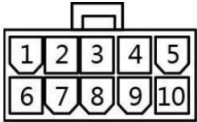
3 3.2.1 Power and I/O Terminals

Pluggable terminal block (KF2EDGK-5.08-6P), screw wiring type; use a flat-blade screwdriver with tip width $\leq 2.5\text{mm}$.

	Pin No.	Pin Name	Pin Function
	1	L	AC220V power input
	2	N	
	3	DI2/REV	Digital signal input: reverse
	4	COM	Signal common terminal
	5	DI1/FWD digital signal input: forward	
	6	DO/ERR digital signal output: fault	

3 3.2.2 Motor Interface

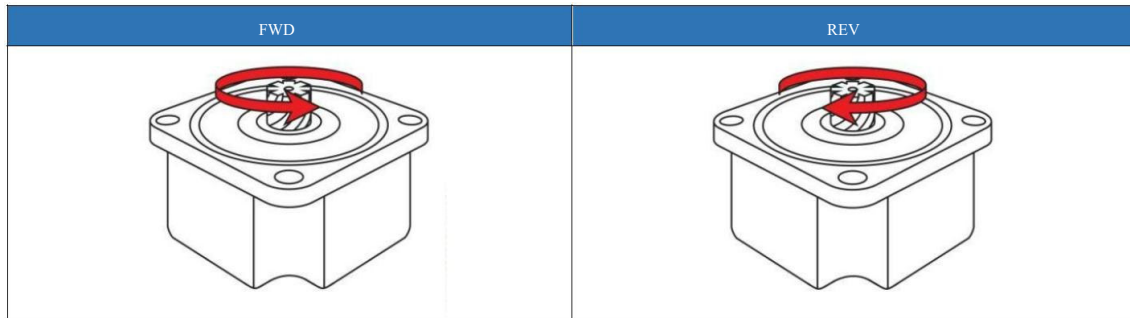
Description of corresponding signals and wire colors for high-voltage motor wiring sockets (ZD motor type):

	Socket	1 (thin red)	2	3 (thick green) 4 (thick yellow) 5 (thick blue)	
	Signal	5V	/	V	U W
	Socket	6 (thin black)	7	8 (thin blue) 9 (thin green) 10 (thin yellow)	
	Signal	0V	PE	Hw Hv Hu	

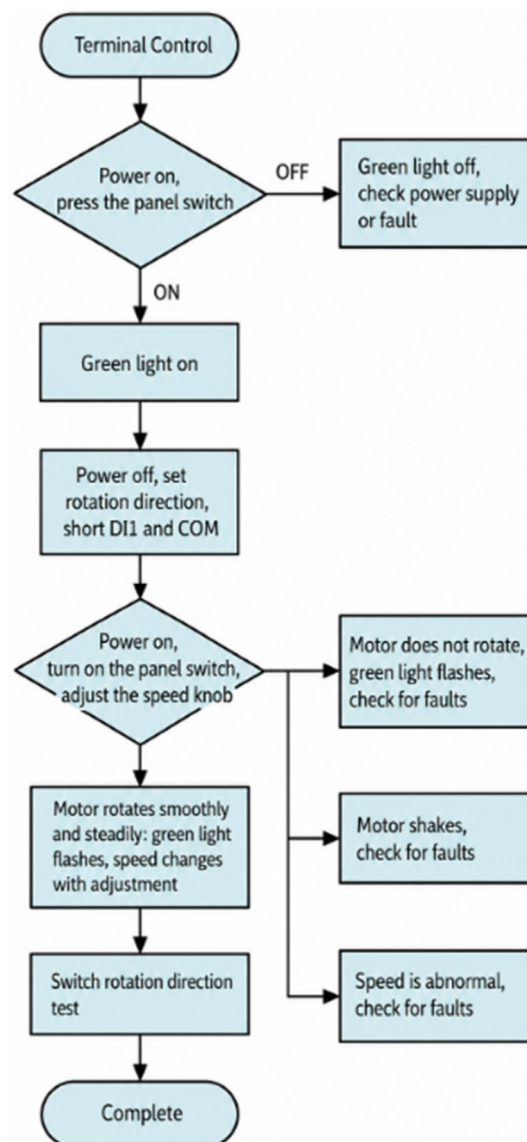
IV. Operation Instructions

Precautions:

- 1 Before operation, basic knowledge of this product is required, and operation should be performed by professionals;
- 2 For motors with different pole pairs, the default direction may differ. Be sure to perform a no-load test before use to confirm the direction:



- 3 Before formal use, perform no-load commissioning. The following figure shows the no-load commissioning flowchart.



4 4.1 Speed Reference

This product adjusts speed using the knob. Adjust the panel speed knob to set the speed. Turning the potentiometer clockwise increases the speed, and turning it counterclockwise decreases the speed.

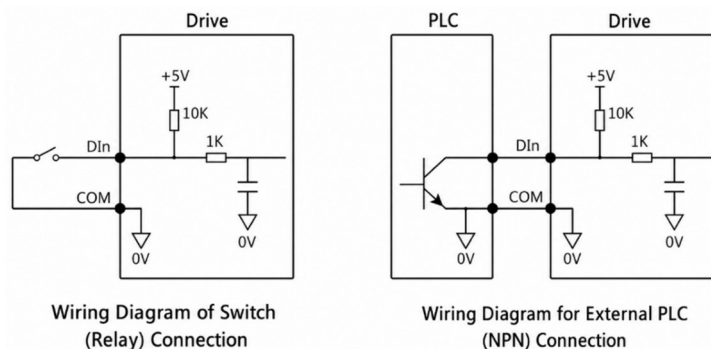
4 4.2 Port Overview

Port	Name	Function
Input	DI1/FWD	Forward
	DI2/REV	Reverse
Common	COM	Input/output common terminal
terminal	DO/ERR	Fault output (open collector output)

Output

4 4.3 Input Terminal

During terminal control, short the input terminal (DI1) to the common terminal (COM) for forward motor rotation; short the input terminal (DI2) to the common terminal (COM) for reverse motor rotation. Users may connect external switches (relays) or PLC (NPN) control for start/stop. The corresponding wiring diagram is shown below:



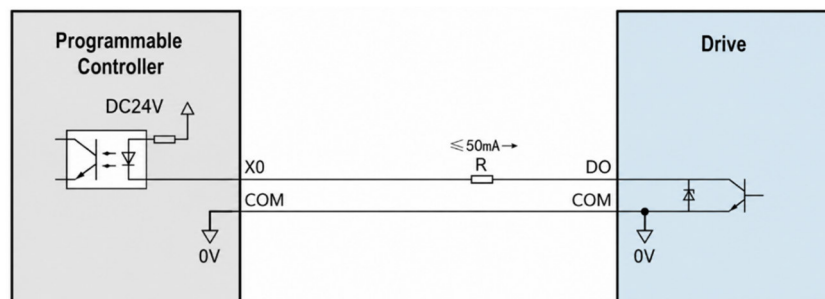
Note: 1. Do not connect DI1 and DI2 simultaneously;

2 Avoid switching rotation direction at high motor speed; it is best to switch after stopping.

4 4.4 Output Terminal

Open collector output, sink current less than 50 mA. The port function is fault output.

The output terminal can be connected to PLC control as shown below:



V. Status Display and Fault Maintenance

The table below shows the current operating status of the driver when the indicators are operating normally.

Stopped	Normal: green light steady on
	Fault: red and green lights flash alternately to indicate the fault code
Running	Normal: green light flashing

The table below shows fault indications displayed by alternating LED flashes (red/green) after the driver detects a fault and stops. Users can troubleshoot and repair according to the fault code.

One green flash represents 5

One red flash represents 1. Fault code = green flashes*5 + red flashes

Fault Code	Fault Name	Fault Indication	Fault Cause	Corrective Action
1	HW accel OC	0G 1R	1 Accel/decel too fast	1. Increase accel/decel time
2	HW decel OC	0G 2R	2 Low voltage	2. Check input voltage
3	HW const OC	0G 3R 3. Driver power small		3. Use larger driver
4	SW accel OC	0G 4R 4. Sudden load		4. Check load
5	SW decel OC	0G 5R	5 Phase short	5. Check/replace cable/motor
6	SW const OC	1G 1R	6 Strong interference	6. Check interference
7	Accel OV	1G 2R	1 Input voltage high	1. Check supply voltage
8	Decel OV	1G 3R 2. Fast FWD/REV switch		2. Increase FWD/REV switch time
9	Const OV	1G 4R	3 External drag/generating; 3. Add external brake	
1 0	Bus UV fault	1G 5R	1 Supply voltage low 2 Accel too fast, power protected; 2. Increase accel time 3 Supply voltage drop 4 Driver hardware abnormal	1. Check power input 3. Reset fault 4. Contact technical support
1 1	Motor OL	2G 1R 2. Motor power too high	1 Power voltage too low 3 Motor stall or sudden load change	1. Check power input 2. Set rated motor current 3. Reduce load/check motor & machine
1 2	Driver OL	2G 2R 2. Accel time too short	1 Power voltage too low 3 Load too large	1. Check power input 2. Increase accel time 3. Use larger controller
1 3	Hall fault	2G 3R	1 Hall wire disconnected 2 Strong interference	1. Check Hall wiring 2. Check interference
1 4	Stall	2G 4R	1 Load too large 2 Motor jammed	1. Check motor mechanics 2. Check motor cable
1 6	Driver overheat 3G 1R		1 Load too large 2 Driver hardware abnormal	1. Cool down 2. Derate use
1 9	Current detection	3G 4R 1. Driver hardware damaged		1. Replace driver
2 7	Parameter storage	5G 2R 1. Power-on write limit reached		1. Power cycle

Fault Code	Fault Name	Fault Indication	Fault Cause	Corrective Action
2 9	OC feedback	5G 4R 1. Driver hardware damaged		1. Replace driver
3 0	Output phase loss	5G 5R	1 U/V/W phase loss 2 , driver hardware damaged	1. Check U/V/W connection 2. Replace driver

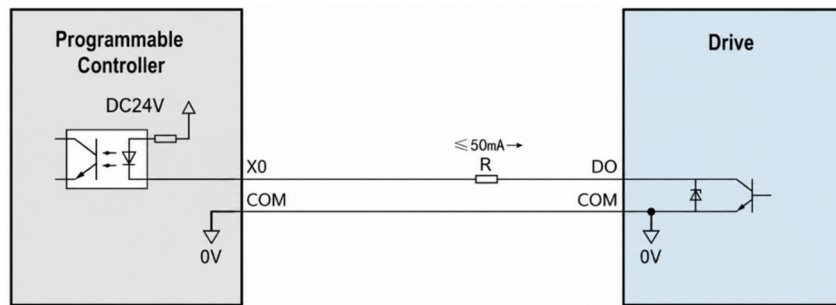
Precautions:

- 1 Confirm that the indicator lights work normally before use;
- 2 Fault maintenance should be performed with power off;
- 3 After preliminary troubleshooting, it is recommended to perform a trial run test;
4. Simple maintenance should be performed by professionals familiar with this product;
5. If the fault cannot be resolved, do not disassemble the driver enclosure for repair by yourself; contact sales or technical support.

VI. Application Cases

6.1 Input Wiring Using an Intermediate Relay

Connect the driver input terminal and PLC output terminal through an intermediate relay to adapt to different PLC models (wire the PLC according to the PLC manual).



6.2 Output Wiring Using an Intermediate Relay

Connect the driver output terminal and PLC input terminal through an intermediate relay to adapt to different PLC models (wire the PLC according to the PLC manual).

VII. Basic Inspection and Maintenance

7.1 Basic Inspection

Inspection Item	Inspection Content
General Inspection	Regularly check whether the screws at the driver mounting position, terminals and wiring, motor shaft, and mechanical connection are loose.
	Check regularly to prevent oil, water, metal powder, or other foreign matter from entering the driver.
	If the driver is installed in a place with harmful gas or heavy dust, prevent harmful gas and dust from entering.
	When changing wiring, pay attention to whether the wiring sequence is correct; otherwise danger may occur.
Pre-Operation Inspection (Power not supplied)	Before wiring, make sure power is off and the motor has stopped running.
	Insulate the connection parts of wiring terminals.
	Wiring must be correct to avoid damage or abnormal operation.
	Check whether conductive objects such as screws or metal pieces, or flammable objects, are inside the driver.
	Check whether the external control switch is set to OFF.
	To avoid electromagnetic brake failure, check whether the circuit for immediate stop and power cutoff is normal.
	If electronic instruments near the driver are affected by electromagnetic interference, use instruments to reduce EMI.
Pre-Running Inspection (Power supplied)	Confirm that the applied voltage level of the driver is correct.
	When the motor is running, check whether connection cables contact mechanical parts causing wear or are pulled during operation.
	If the motor vibrates due to the driver or the operating noise is too loud, contact the manufacturer.
	Check whether the LED indicator works normally.

7.2 Maintenance and After-Sales Service

Daily Maintenance

- ☐ Store and use under appropriate environmental conditions.
- ☐ Clean the exterior of the driver and motor periodically to avoid dust and dirt buildup.
- ☐ Do not disassemble mechanical parts during wiping and maintenance.
- ☐ Clean the gaps in the driver enclosure periodically to prevent foreign matter from entering.
- ☐ Avoid using the driver for long periods in extreme environments that may cause faults.

Service Life of Components

- ☐ Electrolytic Capacitor

The life of electrolytic capacitors is mainly affected by ambient temperature and usage conditions. According to supplier data specifications, under the limiting condition of a maximum operating temperature of 105 deg C, the service life is 7000 hours. Ideally, for every 10 deg C decrease in operating temperature, the service life doubles.

If electrolytic capacitors are stored unused for a long time, the electrolyte gradually loses activity, and rated voltage must be applied periodically

for activation to maintain electrolyte activity.

- ☐ Knob Potentiometer

According to supplier data specifications, the full rotation angle of the knob potentiometer is $300^{\circ} \pm 10^{\circ}$; rotational life: 1 0000cycles, $\Delta R/R \leq \pm 15\%$.

- ☐ MTBF

Mean time between failures: MTBF > 500000 h.

After-Sales Service

- ☐ For usage questions, contact sales or technical support. Technical support contact information is on the last page of this manual.
- ☐ This product is covered by warranty for one year from the shipment date, and free repair service is provided during the warranty period.
- ☐ If a fault occurs under normal use according to this manual, contact sales to return it for repair.

To facilitate inspection and repair, please indicate the detailed fault cause or symptoms as much as possible.

- ☐ If any of the following conditions occur, responsibility lies with the user:

- 1 Damage caused by improper use, improper repair, or modification;
- 2 Damage caused by dropping after arrival or during transportation;
- 3 Damage caused by use outside the product specifications;
- 4 Damage caused by fire, earthquake, lightning, wind disaster, chloride corrosion, or other natural disasters;
- 5 Damage caused by ingress of water, oil, metal fragments, or other foreign matter.

This excludes components with stated standard lifetimes after their respective service life has been exceeded.

