

Before Use

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

DANGER 	■ During operation, wiring, and installation of the driver, always make sure the power is turned off! Never change the power wiring while the power is on; otherwise, electric shock or personal injury may occur. ■ The electronic components on the internal circuit board of the driver are highly susceptible to electrostatic damage. Do not touch the circuit board with your hands unless proper anti-static measures have been taken. ■ Do not modify or alter the internal components or wiring of the driver without authorization. ■ Do not expose or use this product in locations containing moisture, corrosive gas, flammable gas, or similar substances; otherwise, electric shock or fire may occur. ■ The installation location for the driver and its accessories should be kept away from fire sources, heating elements, and flammable materials. ■ Before the mechanical equipment starts operation, adjust the settings according to the user parameters. If the correct matching settings are not configured, the mechanical equipment may lose control or malfunction during operation. ■ Before the machine starts running, confirm that the emergency stop device can be activated at any time. ■ When power is applied, ensure that the motor shaft remains stationary and will not rotate due to mechanism inertia or other factors. ■ The grounding terminals of the motor and driver must be connected to the same grounding point as the power supply equipment; otherwise, electric shock or equipment damage may occur. ■ Do not directly connect the driver to a computer using a USB-to-Micro USB cable.
WARNING 	■ Do not connect AC power to the I/O terminals of the driver. ■ For the rated voltage of the driver installation power system, please refer to Section 1.3 “Electrical Specifications.” ■ Before connecting the load, first test whether the driver and motor operate normally under no-load conditions to avoid unnecessary danger. ■ Do not switch the power on and off frequently. If continuous power cycling is required, limit it to less than once per minute. ■ Do not use this product for vertical lifting or lowering of loads. ■ Only qualified professional personnel are permitted to install, wire,

	and maintain the driver..
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Note:

In this manual, some illustrations may show the housing removed or the safety cover disassembled in order to explain product details more clearly. During operation, the housing and safety cover must be properly installed, and all wiring must comply with relevant regulations. Please operate the product in accordance with this manual to ensure safety.

The illustrations and icons in this manual may differ slightly from the actual product for the purpose of explanation and demonstration, but this will not affect the customer's rights or product usage

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—. Product Information

1.1 Features

Only three motor power wires are required: This fundamentally avoids unreliable motor encoder or Hall signal wiring and signal interference problems, and can effectively improve system reliability;

No motor encoder or Hall sensor is required: A high-performance position-sensorless solution is used to implement sinusoidal FOC vector control of the motor, saving encoder or Hall wiring harnesses and terminals and effectively reducing overall system cost;

Excellent low-speed performance: Outstanding closed-loop speed control performance, with a minimum speed as low as 200 rpm.

Supports loaded start under heavy load conditions: Allows loaded starting under up to 200% of the motor rated load torque. For applications requiring higher load torque during startup, please contact us for customized solutions.

Supports ultra-long-distance motor control: For low-voltage sensorless motors, the maximum allowable distance between the motor and the three-phase power wires is 20 meters. For high-voltage sensorless motors, the maximum allowable distance between the motor and the three-phase power wires is 100 meters.

Low speed fluctuation: Under rated speed conditions, the speed fluctuation is approximately $\pm 1\%$, which can satisfy the requirements of most applications.

Supports ultra-high-speed motors: Supports motor speeds up to 3000 rpm. For higher motor speeds, please contact us for customization;

High applicability: It has a powerful automatic motor parameter identification function: This product can be adapted to various Hall-less DC brushless motors and encoderless permanent magnet synchronous motors from different manufacturers.

1.2 Electrical Specifications

C40 Series Sensorless Driver				
Voltage Level	DC24V~DC48V (±10%)	AC220V (±10%)		
Rated Power	200W(24V), 400W(48V)	200W	400W	750W
Output Current	Without additional auxiliary heat dissipation, 15 Arms can reach up to 12 Arms continuous output.	1.2Arms	2.8Arms	4.3Arms
Peak Current	42Ap	4Ap	8Ap	12.2Ap

Note: Auxiliary heat dissipation data is measured with the driver installed on an AL6063 black anodized auxiliary heat sink (300*300*10 mm).

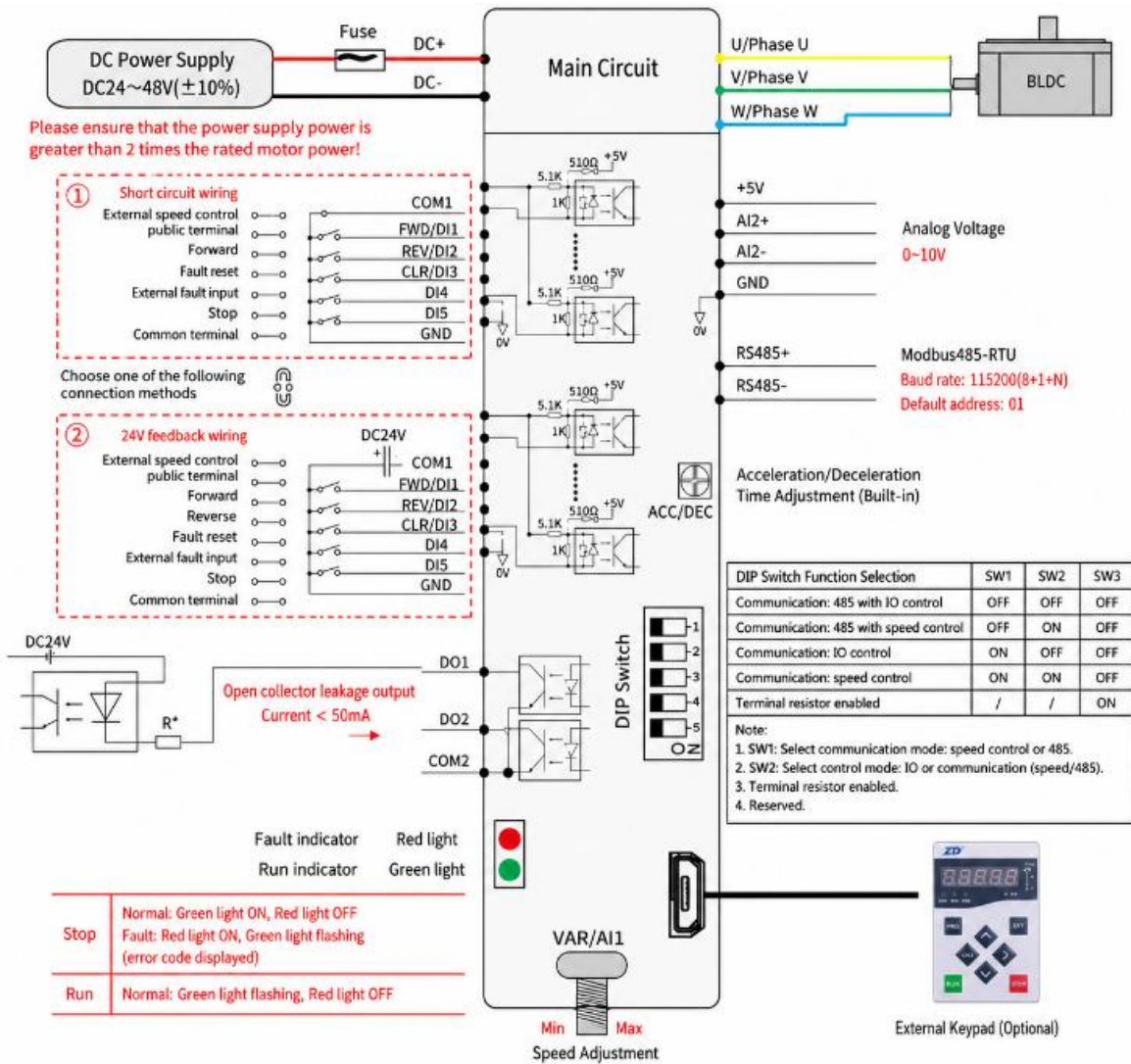
1.4 General Specifications

Function Parameters		C40 Series Sensorless Driver
Control Performance	Speed Control Accuracy	Closed-loop speed control(Control accuracy±1%)
	Overload Capacity	2times overload
	Default Maximum Speed	3000rpm
	Default Matching Pole Pairs	5 pole pairs (other pole pair settings can be configured via the keypad or RS485 communication).
	Speed Setting	AI1 knob (Default).485、 keypad. Multi-speed
IOInterface	Digital Input	4 channels (DI1~DI4), supporting both NPN and PNP digital signal connections. The terminals can be customized as required. Note: The low-voltage version has 5 channels (DI1~DI5).
	Digital Output	2 channels, Open-collector output(transistor) Switching capacity: 50mA/30V(max);
	Analog Input	External analog voltage (0~10V)
General Functions	Modbus/RS485	Default baud rate115200, can use Modbus RTU protocol
	PC Software	Can be connected to PC software via RS485 communication for parameter setting and data reading.
	Operation Panel	Optional K10 series handheld operation keypad

		available for parameter setting and data reading.
Protection Mechanism	Fault Protection Functions	Protection functions include overcurrent, overload, short circuit, overtemperature, undervoltage, overvoltage, etc.
	Undervoltage alarm protection	Low-voltage driver undervoltage pointDC16.8V; High-voltage driver undervoltage pointAC150V
	Overvoltage alarm protection	Low-voltage driver over voltage pointDC60V; High-voltage driver under voltage pointAC270V
Application Environment	Operating Temperature	When operating at rated current , the ambient temperature must be within-10~40℃ [間].When the ambient temperature exceeds40℃, for each increase of 1℃, reduce by2.5%of the rated current, maximum ambient temperature can reach50℃。
	Storage Temperature	30~65℃
	Humidity	90%RH or below, without condensation
	Cooling Method	Natural cooling (auxiliary heat dissipation is required when operating at full power).
	Protection Rating	IP20
	Installation Type	Built-in type

二、Interface Description

2.1 EA-BLDC40-400L-R



2.1.1 Input/Output Interface

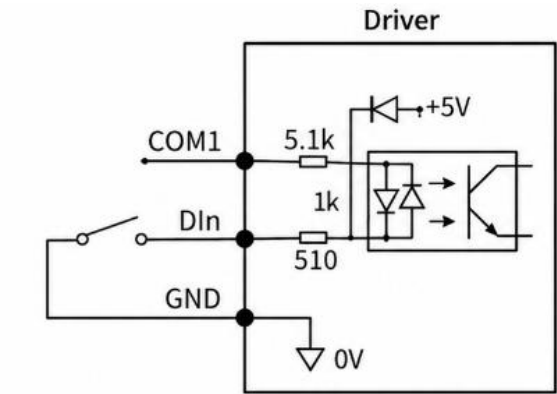
Control Interface:

Pin No.	Pin Name	Pin Function
1	CANL	Reserved
2	CANH	Reserved
3	DI5	Digital signal input
4	DI4	High level input: 12.5V~30V
5	DI3	Input current: 4~20mA
6	DI2	Low level input: 0V~3V
7	DI1	Input frequency: <1KHz
8	COM1	Digital input common terminal
9	AI2-	Analog input negative: 0V~+10V
10	RS485-	RS485_B
11	RS485+	RS485_A
12	DO1	Digital signal output 1: Maximum output current: 100mA
13	DO2	Digital signal output 2: Maximum output current: 100mA
14	COM2	Digital output common terminal
15	*	Reserved
16	+5V	Output maximum current: 300mA
17	GND	Ground
18	AI2+	Analog input positive: 0V~+10V

Power Interface:

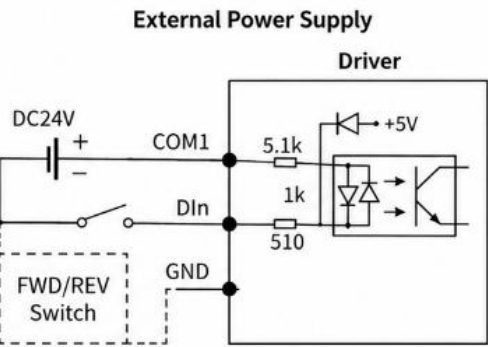
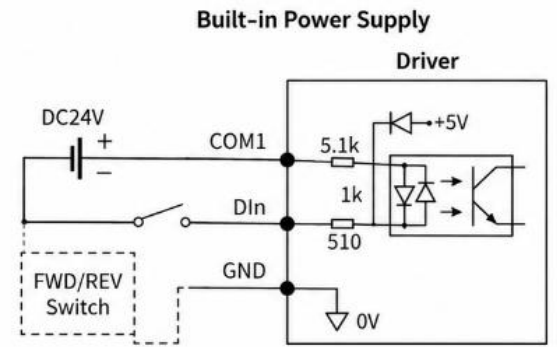
Pin No.	Pin Name	Pin Function
5	W	Motor power output
4	V	
3	U	
2	DC-	Driver power input negative
1	DC+	Driver power input positive

2.1.2 General DI Input Wiring



Notes:

1. The switch wiring method is short DIn to COM1.
2. When the motor decelerates to low speed and switches direction, it is best to stop the motor before switching.
3. Do not connect 24V signal to GND.



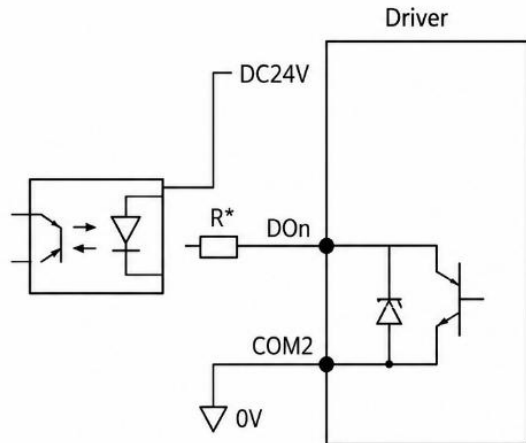
Notes:

1. Connect DC24V to COM1 to supply power to the internal circuit.
2. The high-level input voltage range is 12.5V~30V.
3. When the motor decelerates to low speed and switches direction, it is best to stop the motor before switching.

2.1.3 General DO Output Wiring

DO terminal wiring of C40-400L-R:

Built-in Power Supply

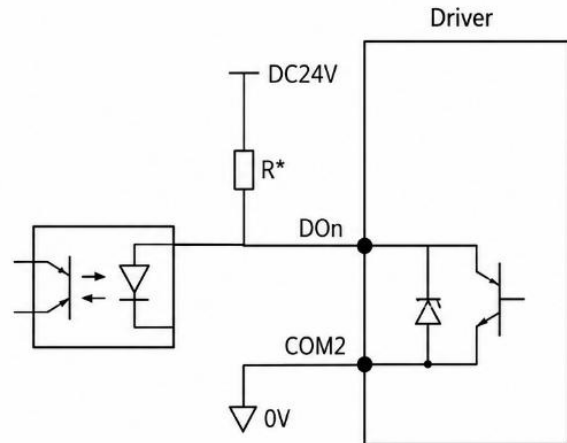


*R is the current-limiting resistor, recommended values are as follows:

DC24V: 1.2k Ω ~2k Ω (1/2W)

DC5V: 510 Ω ~1k Ω (1/2W)

External Power Supply

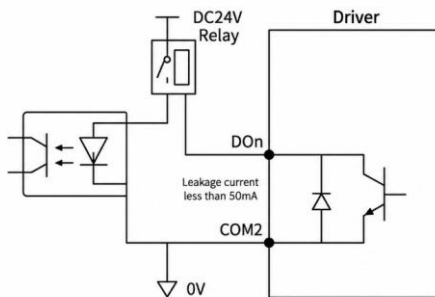


*R is the current-limiting resistor, recommended values are as follows:

DC24V: 1.2k Ω ~2k Ω (1/2W)

DC5V: 510 Ω ~1k Ω (1/2W)

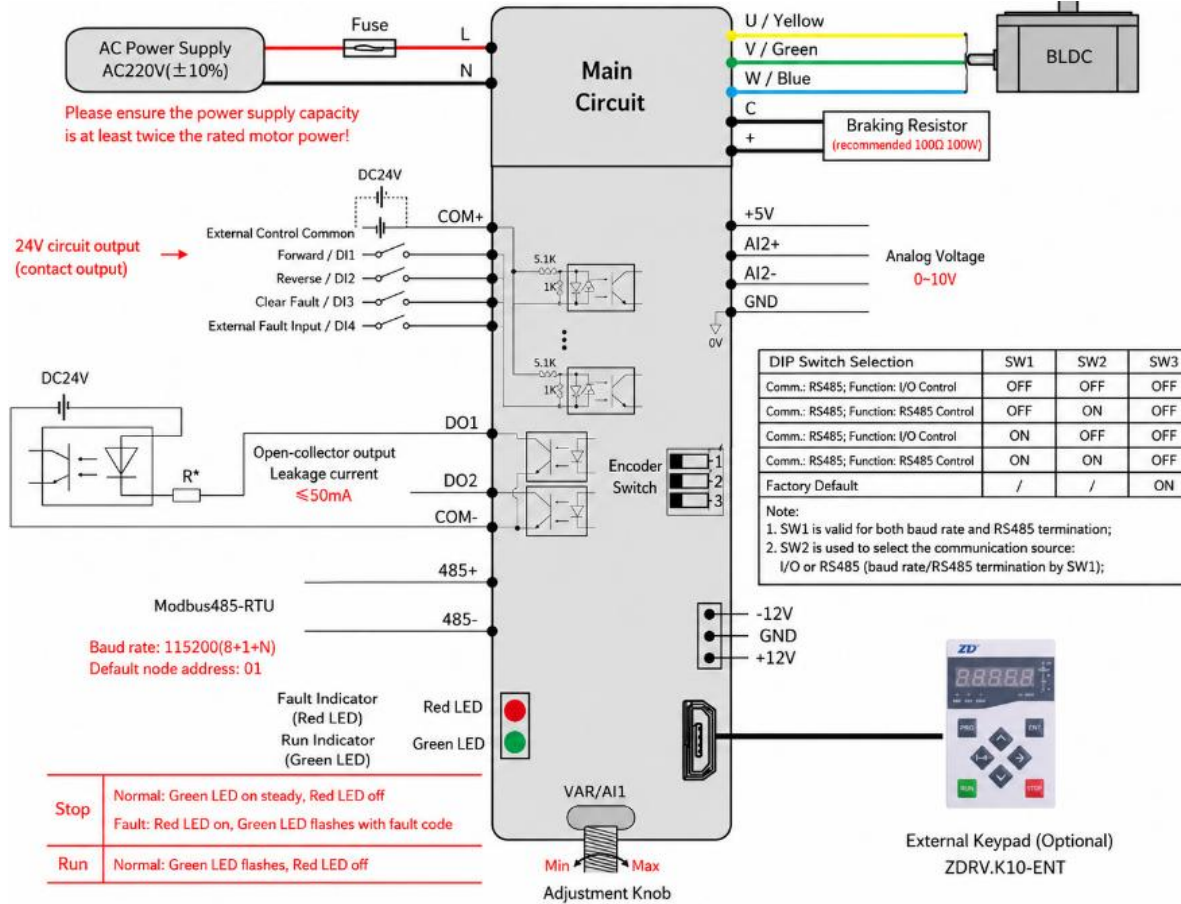
If the internal load of the PLC is large, the driver may not conduct smoothly. The following wiring method may be considered:



Notes:

1. The signal output of the driver is an open-collector output. The signal state does not indicate the signal voltage level, but rather the on/off state of the internal transistor.
2. External power supply: DC5~30V, 50mA or less.

2.2 EA-BLDC40-400/750S2-BR



2.2.1 Input/Output Interface

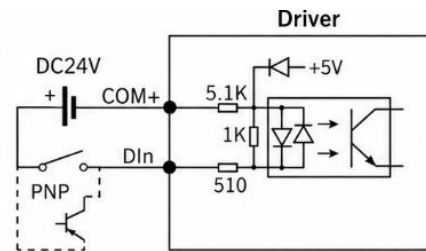
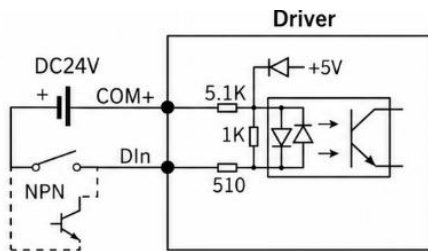
Control Interface:

Pin No.	Pin Name	Pin Function
1	AIN+	Analog input positive
2	AIN-	Analog input negative, connect to GND shorting pin 12
3	DO1	Digital signal output
4	DI1	Digital signal input
5	DI2	Digital signal input
6	485+	RS485 signal positive
7	485-	RS485 signal negative
8	DO2	Digital signal output
9	COM+	Digital signal input common
10	DI3	Digital signal input
11	+5V	+5V power output
12	GND	+5V power GND
13	COM-	Digital signal output common
14	DI4	Digital signal input
15	DI5	Digital signal input

Power Interface:

Pin No.	Pin Name	Pin Function
7	W	Motor phase W output
6	V	Motor phase V output
5	U	Motor phase U output
4	C	External braking resistor output
3	+	Power supply positive
2	N	Power input 220VAC
1	L	Power input 220VAC

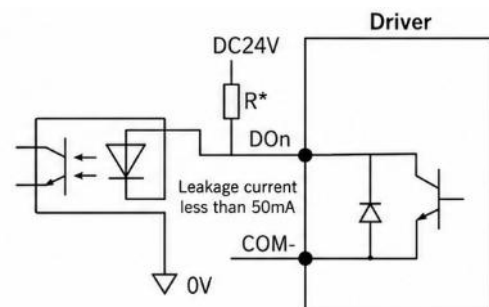
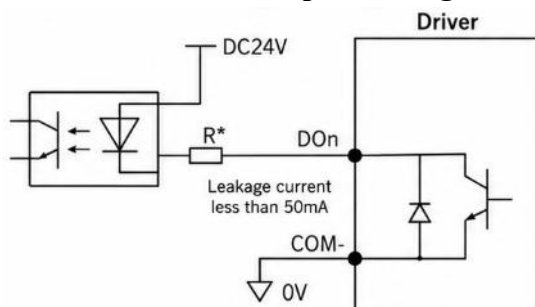
2.2.2 General DI Input Wiring



Notes:

1. DIn and COM+ form a 24V circuit output;
2. DIn high level: 18V~30V.
3. To avoid accidental operation during high-speed rotation, it is recommended to switch to OFF when stopping the motor.

2.2.3 General DO Output Wiring

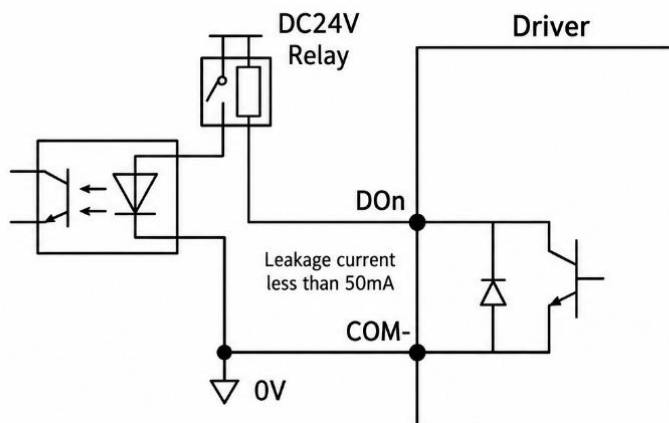


* Recommended current-limiting resistor value R:

DC24V: 2.7k Ω ~5.1k Ω (1W)

DC5V: 510 Ω ~1k Ω (0.25W)

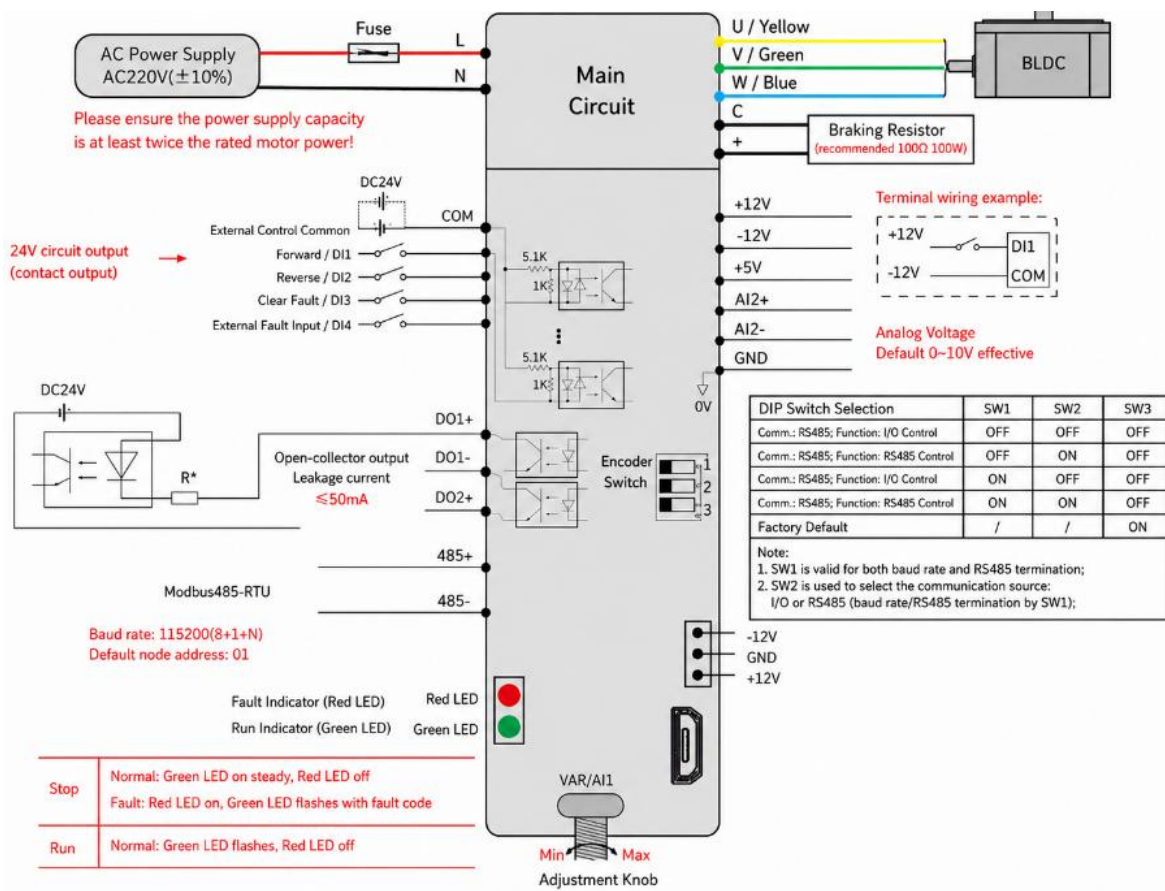
If the internal load of the PLC is large, the driver may not conduct smoothly with PNP wiring. The following wiring method may be considered:



Notes:

1. The signal output of the driver is an open-drain output. The signal state does not indicate the signal voltage level, but rather the on/off state of the internal transistor.
2. External power supply: DC5~30V, 50mA or less.

2.3 EA-BLDC40-200/400/750S2-BR-001



2.3.1 Input/Output Interface

Control Interface:

Pin No.	Pin Name	Pin Function
1	+12V	+12V Power Output Positive
2	-12V	+12V Power Output Negative
3	+5V	+5V Power Output
4	GND	Power GND
5	AIN+	Analog Input Positive
6	DO1+	Digital Signal Output Positive
7	DO1-	Digital Signal Output Negative
8	DO2+	Digital Signal Output Positive
9	DO2-	Digital Signal Output Negative
10	DI1	Digital Signal Input
11	DI2	
12	DI3	
13	DI4	
14	COM	Digital Signal Input Common

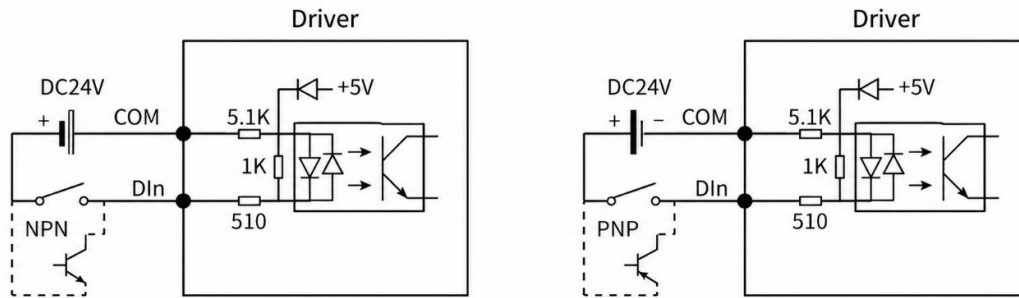
Power Interface:

Pin No.	Pin Name	Pin Function
7	W	Motor Power Output Phase W
6	V	Motor Power Output Phase V
5	U	Motor Power Output Phase U
4	C	External Braking Resistor Output
3	+	Power Supply Positive
2	N	Power Input 220VAC
1	L	Power Input 220VAC

RJ45 Interface:

Pin No.	Pin Name	Pin Function
1	NC	/
2	NC	/
3	NC	/
4	RX+	RS485+
5	RX-	RS485-
6	NC	/
7	NC	/
8	485_GND	RS485 Signal Ground

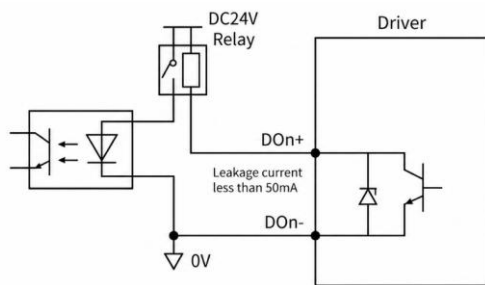
2.3.1 General DI Input Wiring



Notes:

1. DIn and COM form a 24V circuit output;
2. DIn high level: 18V~30V.
3. To avoid accidental operation during high-speed rotation, it is recommended to switch to OFF when stopping the motor.

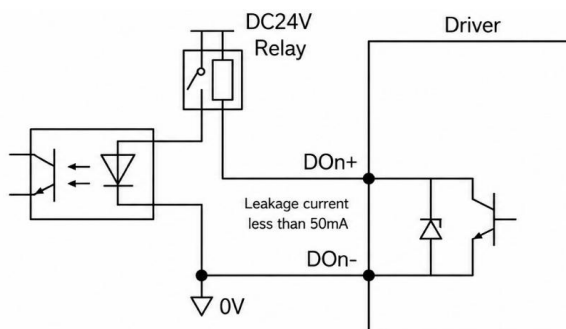
2.3.2 General DO Output Wiring



Notes:

1. The driver's signal output is an open-drain output. The signal state does not indicate the signal voltage level, but rather the on/off state of the internal transistor.
2. External power supply: DC5~30V, 50mA or less.

If the internal load of the PLC is large, the driver may not conduct smoothly with PNP wiring. The following wiring method may be considered:



Notes:

1. The driver's signal output is an open-drain output. The signal state does not indicate the signal voltage level, but rather the on/off state of the internal transistor.
2. External power supply: DC5~30V, 50mA or less.

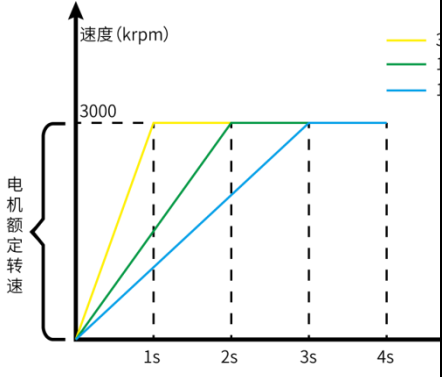
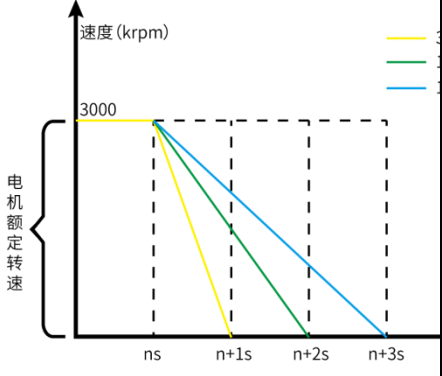
三、Function code

C40 driver parameters are grouped by function, has F00~F10a total of 11 groups, other undisplayed groups are reserved. each function group contains several function codes.

Attribute description: "R/W" read/write, "R/W*" readable/writable when stopped, "R" read-only, "N" reserved.

Control Parameters:

485 Address	Key pad Code	Name	Setting Range	Default Value	Attribute
2000H	F00.00	Version Number	0~30000 The current function code is jointly determined by the software version programmed during firmware burning and the hardware version of the driver. For example, in version number 1107, "1" represents the hardware version, and "107" represents the software version.	1107	R
2001H	F00.01	Run Command	0: Stop RS485 Communication 或 keypad Stop Enable 1: Run Enable RS485 Communication 或 keypad Run Enable When DIP switch SW2 is ON, enable is determined by 485 or the keypad, F00.01(2001H) is the run enable Note: Driver operation requires run enable and speed	0	R/W
2002H	F00.02	Motor Command Speed	-6000~6000 rpm Speed command F00.13(2129H) Speed Source = 1时, F00.02(2002H) is the speed Note: Driver operation requires run enable and speed	0	R/W

2003 H	F00. 03	Motor Acceleration Command	0~30.0 krpm/s Speed change from start to rated motor speed 	3.0	R/W
2004 H	F00. 04	Control Mode Selection	0: Speed control The rated speed is reached by the motor speed command and closed-loop speed control. 1: Torque control(Reserved)	0	R/W
2005 H	F00. 05	Motor Parameter Identification Completed	0~1	0	R
2007 H	F00. 06	Motor Deceleration Command	0~30.0 krpm/s Speed change from rated motor speed to stop 	3.0	R/W
2009 H	F00. 07	Torque Control Id Command	/	/	N
200A H	F00. 08	Enable Motor Parameter Self-learning	0~1	0	R/W

200C H	F00. 10	Fault Clear	0: No function No operation 1: Clear Clear the current driver alarm status and restore normal operating status	0	R/W
200D H	F00. 11	Sub-version Number	0~30000 Current software version date, 10079表示10月7日9点	0	R
200E H	F00. 12	Braking Mode	0: Decelerate to stop and disable No operation 1: Decelerate to stop and keep enable After stop is triggered, holding torque is applied 2: Coast stop When the stop command is triggered, the driver immediately stops frequency output and the motor stops by inertia	0	R/W
2129 H	F00. 13	Speed Source	0:knob Default 的 Speed control 方式, 顺时针转动增大, 逆时针转动减小 1:PC software or keypad F00.02(2002H)The motor speed command is valid; the speed can be changed by writing this address through the keypad or 485	0	R/W

			2:AI2 Speed由External模拟Voltage给定 3:Multi-speed Speed由Multi-speed给定		
204A H	F00. 15	Driver Power	0~30000 W Displays the current driver power	硬件 Phase 关	R
204B H	F00. 16	Acceleration/Deceleration Source	0: acceleration/deceleration comes from function codes 1: acceleration/deceleration comes from the ACC/DEC knob C40_400L-R. C40_1500L-Ronly	0	R/W

Motor Parameters:

485 Address	Keypad Code	Name	Setting Range	Default Value	Attribute
2040H	F01.00	Motor Rated Current	0.1~300.0 A Motor rated current refers to the current required by the motor under rated operating conditions. In practical applications, select an appropriate operating current according to the motor rated conditions and load requirements, and ensure sufficient safety margin for the motor. If the motor load current exceeds the rated current, it	/	R/W*

			may cause motor overheating, damage or even safety hazards.		
2041H	F01.01	Motor Maximum Current	0.1~300.0 A Motor maximum current refers to the maximum current the motor can withstand at rated voltage. Note that the maximum current only indicates the maximum load the motor can withstand, not the ideal current for long-term operation. In practical applications, select an appropriate operating current according to the motor rated conditions and load requirements.	/	R/W*
2042H	F01.02	Motor Rated Speed	0~6000 rpm determined according to the motor parameters provided by the motor manufacturer	/	R/W*
2043H	F01.03	Motor Pole Pairs	1~100 determined according to the motor parameters provided by the motor manufacturer	/	R/W*
2048H	F01.08	Motor Parameters Self-learning maximum Frequency	1~500 Maximum speed corresponding to dynamic learning during parameter self-learning	/	R/W*

Self-learningParameter:

485 Address	Keypad Code	Name	Setting Range	Default Value	Attribute
2044H	F01.04	Motor Stator Resistance	0.001~30.000 Ω Stator winding, which refers to the resistance value of the copper wire wound on the stator, measured before delivery according to the matched motor.	/	R/W*
2045H	F01.05	Motor d-axis Inductance	0.01~300.00 mH D-axis inductance, measured before delivery according to the matched motor.	/	R/W*
2046H	F01.06	Motor q-axis Inductance	0.01~300.00 mH Q-axis inductance, measured before delivery according to the matched motor.	/	R/W*
2047H	F01.07	Motor Back-EMF Coefficient	0.001~10.000 V/Hz When the motor rotor rotates, a back electromotive force (Back EMF) is induced in the windings. Back EMF = Back-EMF coefficient $\times$ motor angular speed Measured before delivery according to the matched motor.	/	R/W*

Status Parameters:

485 Address	Keypad Code	Name	Setting Range	Default Value	Attribute
2080H	F02.00	Current Fault Code	0~9999 The current fault indicates the fault status of the driver, If the driver is in alarm status, the current fault code is displayed. If it operates normally, 0 is displayed, indicating no current fault. See Faults and Maintenance for	0	R

			alarm information		
2081H	F02.01	Control Status	0~100 when not running: 1 when running: 3	1	R
2082H	F02.02	Estimation Status	0~100 when not running: 1 when running: 13	1	R
2083H	F02.03	Trajectory Status	0~100	0	R
2084H	F02.04	Actual Motor Speed	-30000~30000 rpm calculated by the driver as the current actual driver speed	0	R
2085H	F02.05	Actual Motor Frequency	-3000.0~3000.0 Hz calculated as the electrical frequency converted from the actual driver speed	0.0	R
2086H	F02.06	Motor Torque	-99.99~99.99 N·M	0.00	N
2087H	F02.07	Driver Bus Voltage	0.1~1000.0 V calculated by the driver as the current driver bus voltage	Voltage决定	R
2088H	F02.08	Motor Current Is	0~300.00 A calculated by the driver as the RMS value of the current phase current	0.00	R
2089H	F02.09	Motor Voltage Vs	0~1000.0 V	0.0	R
208AH	F02.10	Motor Current Command Id	-99.99~99.99 A The driver program sets the current motor d-axis current target value	0.00	R
208BH	F02.11	Motor Current Feedback Id	-99.99~99.99 A Actual motor d-axis current value of the driver	0.00	R
208CH	F02.12	Motor Current Iq	-99.99~99.99 A The driver program sets	0.00	R

		Command	the current Iq target value		
208DH	F02.13	Motor Iq Current Feedback	-99.99~99.99 A Actual Iq value of the driver	0.00	R
208EH	F02.14	AI2 Speed Command	0~10000 rpm Set speed converted from the analog voltage detected by the driver	0	R
208FH	F02.15	Knob Speed Command	0~10000 rpm Current set speed from the driver knob	0	R
2100H	F02.16	AI2 External Voltage	0.001~30.000 V Analog voltage input level measured by the driver	0.000	R
2090H	F02.17	Self-calibrated Motor Resistance	0.000~30.000 Ω Self-calibrated motor resistance during motor operation	0.000	R
2091H	F02.18	Self-calibrated Motor Temperature	-200.0~200.0 °C Self-calibrated motor temperature during motor operation	0.0	R
2092H	F02.19	Driver Temperature	-200.0~200.0 °C Driver Temperature	0.0	R

I/O Control:

485 Address	Keypad Code	Name	Setting Range	Default Value	Attribute
2101H	F03.00	DI1 Terminal Function	0:No function 1:Forward Run 2:Reverse Run 3:Forward Jog 4:Reverse Jog 5:Emergency Stop 6:Fault Reset 7:External Fault Input 8:Forward Limit 9:Reverse Limit 10:Multi-speed 1	1	R/W
2102H	F03.01	DI2 Terminal Function		2	R/W
2103H	F03.02	DI3 Terminal Function		6	R/W
2104H	F03.03	DI4 Terminal		7	R/W

		Function	11:Multi-speed 2 12:Multi-speed 3 13:Coast Stop 100:No function(level inverted) 101:Forward Run(level inverted) 102:Reverse Run(level inverted) 103:Forward Jog(level inverted) 104:Reverse Jog(level inverted) 105:Emergency Stop(level inverted) 106:Fault Reset(level inverted) 107:External Fault Input(level inverted) 108:Forward Limit(level inverted) 109:Reverse Limit(level inverted) 110:Multi-speed 1(level inverted) 111:Multi-speed 2(level inverted) 112:Multi-speed 3(level inverted) 113:Coast Stop(level inverted)		
2105H	F03.04	DO1 Terminal Function	0: No function 1: Running 2: Forward Running 3: Reverse Running 4: Jog Running 5: Driver Fault 6: Overload Warning 7: Underload Warning 9: Low Bus Voltage 100: Invalid(level inverted) 101: Running(level inverted) 102: Forward Running(level inverted) 103: Reverse Running(level inverted) 104: Jog Running(level inverted) 105: Driver Fault(level	1	R/W
2106H	F03.05	DO2 Terminal Function	6: Overload Warning 7: Underload Warning 9: Low Bus Voltage 100: Invalid(level inverted) 101: Running(level inverted) 102: Forward Running(level inverted) 103: Reverse Running(level inverted) 104: Jog Running(level inverted) 105: Driver Fault(level	5	R/W

			inverted) 106: Overload Warning(level inverted) 107: Underload Warning(level inverted) 109: Low Bus Voltage(level inverted)		
2117H	F03.06	DO1turn-on delay	0~10000 ms	0	R/W
2118H	F03.07	DO1turn-off delay	0~10000 ms	0	R/W
2119H	F03.08	DO2turn-on delay	0~10000 ms	0	R/W
211AH	F03.09	DO2turn-off delay	0~10000 ms	0	R/W
211BH	F03.10	Emergency Stop Deceleration	0~30.0 krpm/s Effective when the DI terminal is configured as emergency stop	30	R/W

I/O Status:

485 Address	Keypad Code	Name	Setting Range	Default Value	Attribute
2107H	F04.00	DI1 Terminal Status	0~1	0	R
2108H	F04.01	DI2 Terminal Status	Set to 1 when the DI	0	R

2109H	F04.02	DI3 Terminal Status	input is triggered; otherwise set to 0	0	R
210AH	F04.03	DI4 Terminal Status		0	R
210BH	F04.04	DO1 Terminal Status		0	R
210CH	F04.05	DO2 Terminal Status		0	R
210DH	F04.06	Digital Input Status	0000~1111	0	R
210EH	F04.07	Digital Output Status	00~11	0	R

AI Parameters:

485 Address	Keypad Code	Name	Setting Range	Default Value	Attribute
2120H	F05.00	AI2 Lower Limit Value	0~10.00 V Represents the minimum detectable voltage of the AI2 terminal.If the actual voltage input to AI2 is lower than this parameter, this parameter is used as the analog speed command voltage value of AI2	0.00	R/W
2121H	F05.01	AI2 Lower-limit Corresponding Setting	-100.0~100.0 % Represents the AI2 lower limit value(F05.00)corresponding speed command value; positive/negative signs represent forward/reverse motor speed.	0.0	R/W
2122H	F05.02	AI2 Upper Limit Value	0~10.00 V Represents the maximum detectable voltage of the AI2 terminal.If the actual voltage input to AI2 is higher than this parameter, this parameter is used as the	10.00	R/W

			analog speed command voltage value of AI2		
2123H	F05.03	AI2 Upper-limit Corresponding Setting	-100.0~100.0 % Represents the speed command value corresponding to the AI2 upper limit value (F05.02); positive and negative signs indicate forward and reverse motor rotation respectively.	100.0	R/W
2124H	F05.04	AI2 Filter Coefficient	0~100.0 % AI2 Filter Coefficient determines the response speed and smoothing level of the filter for the AI2 input voltage signal.	/	R/W

Motor Control:

485 Address	Keypad Code	Name	Setting Range	Default Value	Attribute
2140H	F06.00	d-axis Current Controller Kp	0.001~30.000 Proportional coefficient of the d-axis current PI controller, proportionally reflecting the deviation signal of id.	/	R/W
2141H	F06.01	d-axis Current Controller Ki	0.0001~3.0000 Integral coefficient of the d-axis current PI controller.	/	R/W
2142H	F06.02	q-axis Current Controller Kp	0.001~30.000 Proportional coefficient of the q-axis current PI controller, proportionally reflecting the	/	R/W

			deviation signal of iq.		
2143H	F06.03	q-axis Current Controller Ki	0.0001~3.0000 Integral coefficient of the q-axis current PI controller.	/	R/W
2144H	F06.04	Speed Controller Kp(at high speed)	0.001~30.000 Proportional coefficient of the high-speed PI speed controller.	/	R/W
2145H	F06.05	Speed Controller Ki(at high speed)	0.0001~3.0000 Integral coefficient of the high-speed PI speed controller.	/	R/W
2146H	F06.06	Speed Controller Kp(at low speed)	0.001~30.000 Proportional coefficient of the low-speed PI speed controller.	/	R/W
2147H	F06.07	Speed Controller Ki(at low speed)	0.0001~3.0000 Integral coefficient of the low-speed PI speed controller.	/	R/W
2148H	F06.08	High/Low Speed Switching Threshold	0~30000 rpm Switching speed to ensure smooth transition between the high-speed and low-speed PI values.	/	R/W
2149H	F06.09	Motor Overload Time	1.0~2000.0 s Here, motor overload time indicates the allowable maximum short-time operation duration at 2x motor load.If the motor load is less than 2x, the allowable overload short-time operation duration can be extended	60.0	R/W

			accordingly.		
214AH	F06.10	Motor Overload Current	0.01~200.00 A Driver I2T overload protection current	/	R/W
214BH	F06.11	Phase-loss Detection Threshold	1~10 Threshold of the phase-loss ratio, i.e., the ratio of the minimum phase accumulated value to the maximum phase accumulated value. A smaller value makes phase-loss alarms less likely to trigger	5	R/W
214CH	F06.12	Torque Holding Time	0.1~100 s Torque holding time after torque stop. After stopping, torque is held for a set time and then no longer held. 0: After stopping, torque is continuously held until a run signal is given again.	1	R/W
214DH	F06.13	Torque Holding Current	0.01~200 A Maximum current limit for torque holding	1	R/W
214EH	F06.14	Torque Holding Percentage	1~100 % Outputs field-weakening current as a percentage of the torque-holding maximum current limit	10	R/W
2150H	F06.15	Field-weakening Kp	0.001~30.000	0.008	R/W

			Proportional coefficient of the PI controller for field-weakening current		
2151H	F06.16	Field-weakening Ki	0.0001~3.0000 Integral coefficient of the PI controller for field-weakening current	0.0001	R/W
2152H	F06.17	Field-weakening Margin	1~49 % Difficulty of entering field weakening. A larger margin makes it harder to enter field weakening	5	R/W
2153H	F06.18	Field-weakening Limit	0~150 % Current limit for field-weakening output; expressed as a percentage of rated current	80	R/W
2154H	F06.19	Field-weakening Integration Period	5~150 Number of sampling periods per field-weakening command calculation	20	R/W
2155H	F06.20	Stop Threshold	0~30000 rpm Speed below which PWM enable is turned off	50	R/W
2156H	F06.21	EnableMotorResistance Run自校正	0: Disable No operation 1: Enable The driver automatically measures the current motor phase resistance during motor operation	0	R/W

2157H	F06.22	Motor Temperature Coefficient	1.0~1000.0 °C/%	261.5	R/W
2158H	F06.23	Temperature Corresponding Rated Resistance to Motor	-50.0~50.0 °C	25.0	R/W
2159H	F06.24	Minimum Motor Running Current	0.01~10.00 A phase-loss detection point	0.03	R/W

Multi-speed Parameters:

485 Address	Keypad Code	Name	Setting Range	Default Value	Attribute
2160H	F07.00	Multi-speed 0	-9999~9999 rpm DI input(F03.00~F03.03)When configured for multi-speed, different multi-speed settings can be triggered according to different trigger logic(F07.00~F07.07) For details, see the multi-speed example Note: Multi-speed 0 is generally not recommended to be changed. Please choose carefully, otherwise serious consequences may occur	0	R/W
2161H	F07.01	Multi-speed 1		300	R/W
2162H	F07.02	Multi-speed 2		600	R/W
2163H	F07.03	Multi-speed 3		900	R/W
2164H	F07.04	Multi-speed 4		1200	R/W
2165H	F07.05	Multi-speed 5		1500	R/W
2166H	F07.06	Multi-speed 6		1800	R/W
2167H	F07.07	Multi-speed 7		2100	R/W

Communication Parameters:

485 Address	Keypad Code	Name	Setting Range	Default Value	Attribute
2180H	F08.00	Baud Rate	0:1200 1:2400 2:4800 3:9600	7	RW*

			4:19200 5:38400 6:57600 7:115200 Set the baud rate corresponding to the driver		
2181H	F08.01	Slave address	0~128 Local slave address	1	RW*
2182H	F08.02	Restore Factory Settings	0: No function No operation 1: Restore Factory Settings Parameter reset function is activated	0	RW*
2183H	F08.03	Parity and Stop Bits	0: No parityNone,1Stop 1: Even parityEven,1Stop 2: Odd parityOdd,1Stop 3: No parityNone,2Stop 4: Even parityEven,2Stop 5: Odd parityOdd,2Stop	0	RW*
2184H	F08.04	Parameter Save	0: No function No operation 1: Save Save all parameters modified during the current power-on session	0	RW*

Fault History:

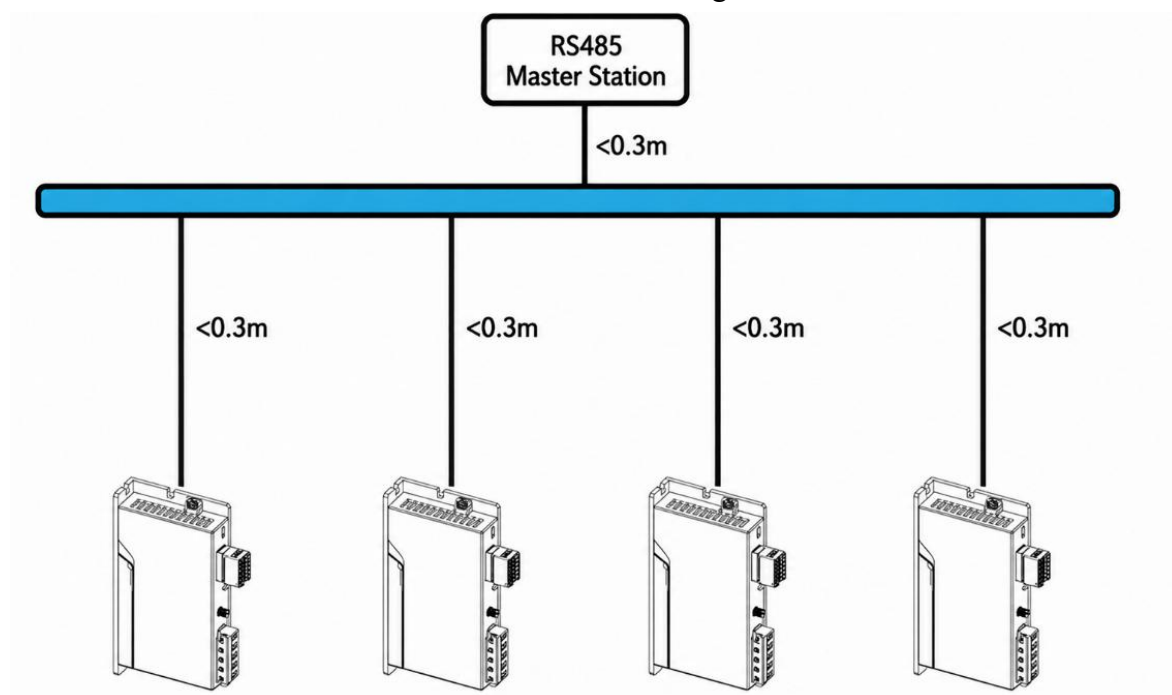
485 Address	Keypad Code	Name	Setting Range	Default Value	Attribute
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2200H	F09.00	Historical Fault 1	0~65535	/	R
2201H	F09.01	Historical Fault 2	0~65535	/	R
2202H	F09.02	Historical Fault 3	0~65535	/	R
2203H	F09.03	Historical Fault 4	0~65535	/	R

Note: For fault details, see Faults and Maintenance4、**RS485 Communication**

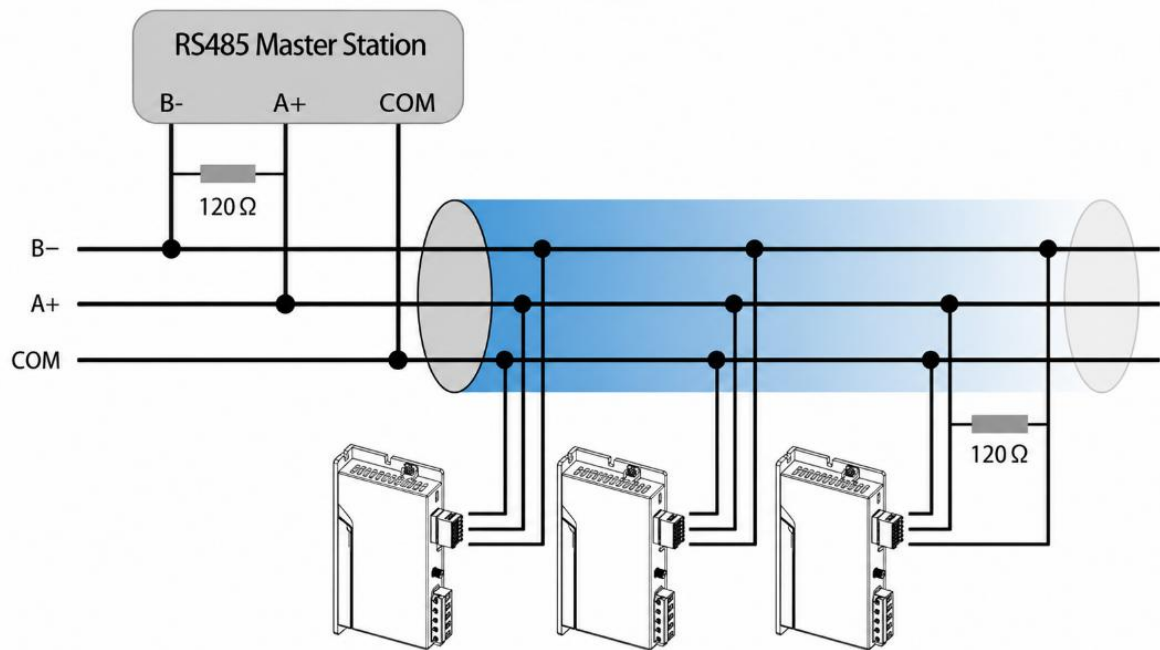
4.1 RS485 Communication Network

The connection method for the RS485 communication network is a bus topology connection, as shown in the figure below:



Each RS485 transceiver device is connected to the bus, and the length of each branch line must not exceed 10 meters. Otherwise, signal reflection may occur and cause

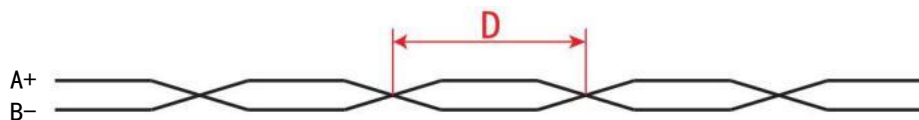
communication problems. The wiring diagram is shown below:



1. Shielded twisted-pair cable is recommended. Connect a 120 Ω terminal matching resistor at both ends of the bus to prevent signal reflection. The shield should generally be reliably grounded at a single point.
2. Use a multimeter to measure the resistance value between A+ and B- to confirm whether the field terminal resistor is correctly connected. Under normal conditions, the resistance value should be approximately 60 Ω (two 120 Ω resistors connected in parallel).
3. A maximum of 32 devices can be connected to one bus.
4. For long-distance communication between RS485 devices, the COM grounds of different RS485 circuits must be interconnected.

4.2 RS485 Communication Cable

A twisted-pair cable is recommended for the RS485 communication network. Twisted-pair cables provide good resistance to high-frequency magnetic field noise interference and can also reduce cable radiation. The figure below shows a twisted-pair cable diagram.



The twist pitch D of the twisted-pair cable should be less than 2 cm. The smaller the twist pitch, the better the anti-interference performance.

For short-distance, low-speed communication, shielded twisted-pair cables may be used to further improve interference resistance. The shield layer should be connected to PE (Protective Earth) at both ends.

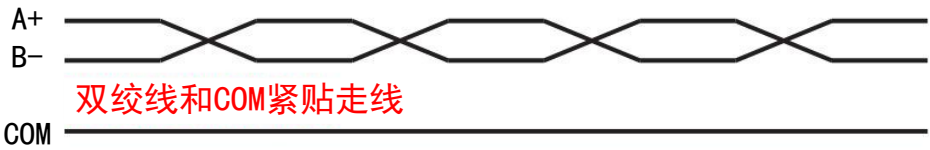
For long-distance high-speed communication, shielded cable is not recommended because the large distributed capacitance between the shield and signal wires may cause signal transmission delay.

Recommended bus cables:

Wiring Distance	Signal Cable
200m or less	0.3mm ² , twisted pair, sheathed cable
200-500 m	0.5mm ² , twisted pair, sheathed cable
500-1200 m	0.75mm ² , shielded twisted pair, sheathed cable
1200 m or above	1.0mm ² , shielded twisted pair, sheathed cable, add a repeater at 1200 m

4.2.1 Recommended RS485 Wiring Methods

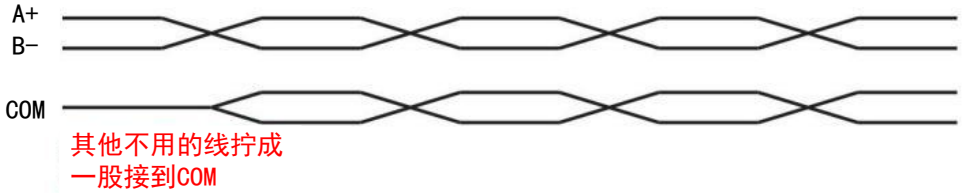
Recommended Scheme 1



Recommended Scheme 2



Recommended Scheme 3



Recommended Scheme 4



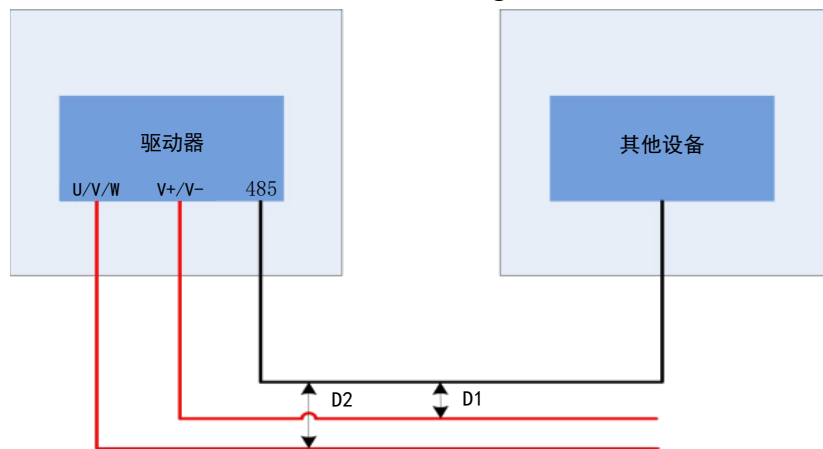
Recommended Scheme 5



4.2.2 Recommended RS485 Cable Layout

RS485 communication is susceptible to interference. If the wiring is installed near interference sources on site, communication problems may easily occur.

Recommended wiring method:



The interference cable and the RS485 cable should be routed as vertically as possible.

When routed in parallel:

The distance between the power cable and the RS485 signal cable should be $D1 > 10 \text{ cm}$.

The distance between the U/V/W power wires and the RS485 signal cable should be $D2 > 20 \text{ cm}$.

After exiting the cabinet, the power cable, U/V/W power wires, and RS485 communication cable should be routed separately.

If the interference cable and the RS485 communication cable must be routed in the same cable tray, the routing spacing should still follow the principles above.

To ensure that the C40 series driver can accurately connect to the RS485 bus network, the relevant function codes must be configured accordingly.

Address	Name	Setting Range	Default Value	Attribute
0x2181	RS485 Slave Address	1~128, 0 Broadcast address	1	RW*

0x2180	RS485 Communication Baud Rate	0:1200BPS 1:2400BPS 2:4800BPS 3:9600BPS 4:19200BPS 5:38400BPS 6:57600BPS 7:115200BPS(Default Value)	7	RW*
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Note: Regardless of whether the 0x2181 address value of the current C40 driver is the same as the ADDR address code in the data frame sent by the host, the MODBUS master can still read/write the 0x2181 address of the C40 driver to obtain the currently configured RS485 slave address of the driver. This feature is specially designed to facilitate debugging by electrical engineers.

This also means that when the master reads/writes the 0x2181 address of the C40 driver via MODBUS, only one C40 driver should be connected to the RS485 bus.

4.4 Data Frame Format

MODBUS—RTU Model				
Address code	Function code	Data	Check code	
ADDR	CMD	DATA	CRC16_L	CRC16_H
1Byte	1Byte	nBytes	1Byte	1Byte
Baud Rate: 115200 (Default) Start Bit: 1 bit Data Bits: 8 bits Parity Bit: None Stop Bit: 1 bit				
In MODBUS RTU mode, if the sending or receiving interval between any two characters exceeds 1.5 character times, the data will be considered invalid. If the interval between two characters exceeds 3.5 character transmission times, the current frame is considered complete, and a new frame can begin.				

Note:

a. Address code: 1Byte

0x00(0)----broadcast address,the slave does not respond to broadcasts; used for group control of multiple devices;

0x01(1)-0x7F(127)----Slave address;

0x80(128)-0xff(255)----reserved by the system; do not use;

b. Function code: 1Byte

0x03(3)----- Read register operation;

0x06(6)----- Write single register operation;

0x10(16)-----Write multiple registers operation;

c. Data: n Byte

Different commands use different data formats !

d. Check code: 2 Byte

CRC16check object: Address code+Function code+Data;

CRC16check algorithm: MODBUS(x16+x15+x2+1);

CRCCheck code, send the low byte first, then the high byte.

4.4.1 0x03Read register operation

1.0x03(read holding register)Data Frame Format

Master request			
Frame data	Data length	Data content	Description
Address	1Byte	0x01-0xf7	
Function code	1Byte	0x03	
Register address	2Byte	0x2000-0x30ff	High byte + low byte
Number of registers	2Byte	0x0001	High byte + low byte
Check code	2Byte	CRC16L+CRC16H	Low byte + high byte
Response after slave receives correctly			
Frame data	Data length	Data content	Description
Address	1Byte	0x01-0xf7	
Function code	1Byte	0x03	
Byte count	1Byte	0x02	Total bytes in data area
Data	2Byte	Read data content	High byte + low byte
Check code	2Byte	CRC16L+CRC16H	Low byte + high byte
Response after slave receives abnormally			
Frame data	Data length	Data content	Description
Address	1Byte	0x01-0xf7	
Function code	1Byte	0x83	Msb=1
Exception Codes	1Byte	0x00-0xff	See4.4.4Exception Codes
Check code	2Byte	CRC16L+CRC16H	Low byte + high byte

Note:

All register addresses are 2 bytes, high byte first and low byte second;

All register data are 2 bytes, high byte first and low byte second; 2.0x03(read holding register)Example

A) Read0x01slave No.的0x2001register data

Master	Address	Function code	Register address		Number of registers		Check code	
			High byte	Low byte	High byte	Low byte	低位	高位
	0x01	0x03	0x20	0x01	0x00	0X01	CRCL	CRCH
Slave	Address	Function code	Byte count	Data		Check code		
				High byte	Low byte			
	0x01	0x03	0x02	0x00	0X01	CRCL	CRCH	

B) Read 0x01 slave No. 的 0x2001 register data exception

Master	Address	Function code	Register address		Number of registers		Check code	
			High byte	Low byte	High byte	Low byte	低位	高位
	0x01	0x03	0x20	0x01	0x00	0x01	CRCL	CRCH
Slave	Address	Function code	Exception Codes				Check code	
	0x01	0x83	See 4.4 Exception Codes				CRCL	CRCH

4.4.2 0x06 Write single register operation

1.0x06 (Write Single Register) Data Frame Format

Master request			
Frame data	Data length	Data content	Description
Address	1Byte	0x01-0xf7	
Function code	1Byte	0x06	
Register address	2Byte	0x2000-0x30ff	High byte + low byte
Data	2Byte	written data content	High byte + low byte
Check code	2Byte	CRC16L+CRC16H	Low byte + high byte
Response after slave receives correctly			
Frame data	Data length	Data content	Description
Address	1Byte	0x01-0xf7	
Function code	1Byte	0x06	
Register address	2Byte	0x2000-0x30ff	High byte + low byte
DataByte count	2Byte	written data content	High byte + low byte
Check code	2Byte	CRC16L+CRC16H	Low byte + high byte

Response after slave receives abnormally			
Frame data	Data length	Data content	Description
Address	1Byte	0x01-0xf7	
Function code	1Byte	0x86	Msb=1
Exception Codes	1Byte	0x00-0xff	See 4.4.4 Exception Codes
Check code	2Byte	CRC16L+CRC16H	Low byte + high byte

Note:

- A) All register addresses are 2 bytes, with the high byte first and the low byte second.
- B) All register data are 2 bytes, with the high byte first and the low byte second.
- C) This operation can only be performed on registers of the RW or RW* type.
- D) Example of 0x06 (Write Single Register)
- E) A) Write data to register 0x2001 of slave device No. 0x01.

Master	Address	Function code	Register address		Data		Check code	
			High byte	Low byte	High byte	Low byte	低位	高位
	0x01	0x06	0x20	0x01	0x00	0x01	CRCL	CRCH
Slave	Address	Function code	Register address		Data		Check code	
			High byte	Low byte	High byte	Low byte		
	0x01	0x06	0x20	0x01	0x00	0x01	CRCL	CRCH

- F) Exception when writing data to register 0x2001 of slave device No. 0x01.

Master	Address	Function code	Register address		Data		Check code	
			High byte	Low byte	High byte	Low byte	低位	高位
	0x01	0x06	0x20	0x01	0x00	0x01	CRCL	CRCH
Slave	Address	Function code	Exception Codes				Check code	
	0x01	0x86	See 4.4.4 Exception Codes				CRCL	CRCH

4.4.3 0x10 Write multiple registers operation

10x10 (Write Multiple Registers) Data Frame Format

Master request			
Frame data	Data length	Data content	Description
Address	1Byte	0x00-0xf7	
Function code	1Byte	0x10	
Starting register address	2Byte	0x2000-0x30ff	High byte + low byte
Number of registers	2Byte	N	High byte + low byte
Total data bytes	1Byte	2*N	
Data	2*NByte		High byte + low byte
Check code	2Byte	CRC16L+CRC16H	Low byte + high byte
Response after slave receives correctly			
Frame data	Data length	Data content	Description
Address	1Byte	0x01-0xf7	
Function code	1Byte	0x10	
Starting register address	2Byte	0x2000-0x30ff	High byte + low byte
Number of registers	2Byte	N	High byte + low byte
Check code	2Byte	CRC16L+CRC16H	Low byte + high byte
Response after slave receives abnormally			
Frame data	Data length	Data content	Description
Address	1Byte	0x01-0xf7	
Function code	1Byte	0x90	Msb=1
Exception Codes	1Byte	0x00-0xff	See 4.4.4 Exception Codes
Check code	2Byte	CRC16L+CRC16H	Low byte + high byte

Note:

All register addresses are 2 bytes, with the high byte first and the low byte second.

All register data are 2 bytes, with the high byte first and the low byte second.

This operation can only be performed on registers of the RW or RW* type.

Example of 0x10 (Write Multiple Registers)

Write data to registers 0x2000 and 0x2001 of slave device No. 0x01.

Master	Address	Function code	Starting register address		Number of registers		Total data bytes	
			High byte	Low byte	High byte	Low byte		
	0x01	0x10	0x20	0x01	0x00	0x02	0x04	
	寄存器1Data		寄存器2Data		Check code			
	High byte	Low byte	High byte	Low byte				
	Data1		Data2		CRCL	CRCH		
Normal slave response	Address	Function code	Starting register address		Number of registers		Check code	
			High byte	Low byte	High byte	Low byte		
	0x01	0x10	0x20	0x01	0x00	0x02	CRCL	CRCH
Slaveexception Return	Address	Function code	Exception Codes				Check code	
	0x01	0x90	See4.4.4Exception Codes				CRCL	CRCH

4.4.4 exception码

MODBUSException Codes		
Exception Codes	Meaning	Example
0x01	Data format error	TX: 01 10 20 01 00 01 03 00 00 00 00 01 02 48 0D RX: 01 90 01 8D C0
0x02	Data value out of range or number of registers out of range(maximum10items)	TX: 01 03 20 01 00 89 DE 6C RX: 01 83 02 C0 F1
0x03	No corresponding data found at the address	TX: 01 03 88 88 00 01 2F 80 RX: 01 83 03 01 31
0x04	Incorrect function code(only03, 06, 10three function codes)	TX: 01 05 20 01 00 00 97 CA RX: 01 85 04 43 53

0x07	The data type is not a Read/Write attribute and cannot be modified.	TX: 01 06 21 07 00 01 F3 F7 RX: 01 86 07 03 A2
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4.5 Register List

Function Description	Address 定义	Data Meaning	Setting Range	Attribute
Control Parameters	2000H	Version Number	0~30000	R
	2001H	Run Command	0:Stop 1:Run	R/W
	2002H	Motor Speed Command	-6000~6000 (rpm)	R/W
	2003H	Motor Acceleration Command	0.0~30.0 (krpm/s)	R/W
	2004H	Control Mode Selection	0:Speed control 1:Torque control(Reserved)	R/W
	2005H	Motor Parameter Identification Completed	0~1	R
	2007H	Motor Deceleration Command	0.0~30.0 (krpm/s)	R/W
	2009H	Torque control时Id指令 (%)	Reserved	N
	200AH	Enable Motor Parameter Self-learning	0~1	R/W
	200CH	Fault Clear	0:No function 1:Clear	R/W
	200DH	Sub-version Number	0~30000	R/W
	200EH	Braking Mode	0:Decelerate to stop and disable 1:Decelerate to stop and keep enable	R/W
	2129H	Speed Source	0:knob 1:PC software or keypad 2:A12 3:Multi-speed	R/W

Function Description	Address 定义	Data Meaning	Setting Range	Attribute
	204AH	Driver Power	0~30000 (W)	R
	204BH	Acceleration/Deceleration Source	0: acceleration/deceleration comes from function codes 1: acceleration/deceleration comes from the ACC/DEC knob	R/W
Motor Control	2140H	d-axis Current Controller Kp	0.001~30.000	R/W
	2141H	d-axis Current Controller Ki	0.0001~3.0000	R/W
	2142H	q-axis Current Controller Kp	0.001~30.000	R/W
	2143H	q-axis Current Controller Ki	0.0001~3.0000	R/W
	2144H	Speed Controller Kp(at high speed)	0.001~30.000	R/W
	2145H	Speed Controller Ki(at high speed)	0.0001~3.0000	R/W
	2146H	Speed Controller Kp(at low speed)	0.001~30.000	R/W
	2147H	Speed Controller Ki(at low speed)	0.0001~3.0000	R/W
	2148H	High/Low Speed Switching Threshold	0~30000(rpm)	R/W
	2149H	Motor Overload Time	1.0~2000.0(s)	R/W
	214AH	Motor Overload Current	0.01~200.00(A)	R/W
	214BH	Phase-loss Detection Threshold	1~10	R/W
	214CH	Torque Holding Time	0.1~100.0(s)	R/W
	214DH	Torque Holding Current	0.01~200.00(A)	R/W
	214EH	Torque Holding Percentage	1~100%	R/W

Function Description	Address 定义	Data Meaning	Setting Range	Attribute
	2150H	Field-weakening Kp	0.001~30.000	R/W
	2151H	Field-weakening Ki	0.0001~3.0000	R/W
	2152H	Field-weakening Margin	1~49(%)	R/W
	2153H	Field-weakening Limit	0~150(%)	R/W
	2154H	Field weakeningIntegralPeriod	5~150	R/W
	2155H	停机Threshold	0~30000(rpm)	R/W
	2156H	Enable Motor Resistance Self-correction During Operation	0:Disable 1:Enable	R/W
	2157H	Motor Temperature Coefficient	1.0~1000.0 (°C/%)	R/W
	2158H	Temperature Corresponding to Rated Motor Resistance	-100.0~100.0 (°C)	R/W
	2159H	Minimum Motor Running Current	0.01~10.00 A	R/W
I/O Control	2101H	DI1 Terminal Function	0:No function 1:Forward Run 2:Reverse Run 3:Forward Jog 4:Reverse Jog 5:Emergency Stop 6:Fault Reset 7:External Fault Input 8:Forward Limit 9:Reverse Limit 10:Multi-speed 1 11:Multi-speed 2 12:Multi-speed 3 13:Coast Stop 100:No function(level inverted)	R/W
	2102H	DI2 Terminal Function		R/W
	2103H	DI3 Terminal Function		R/W
	2104H	DI4 Terminal Function		R/W

Function Description	Address 定义	Data Meaning	Setting Range	Attribute
			101:Forward Run(level inverted) 102:Reverse Run(level inverted) 103:Forward Jog(level inverted) 104:Reverse Jog(level inverted) 105:Emergency Stop(level inverted) 106:Fault Reset(level inverted) 107:External Fault Input(level inverted) 108:Forward Limit(level inverted) 109:Reverse Limit(level inverted) 110:Multi-speed 1(level inverted) 111:Multi-speed 2(level inverted) 112:Multi-speed 3(level inverted) 113:Coast Stop(level inverted)	
	2105H	DO1 Terminal Function	0: No function	R/W
	2106H	DO1 Terminal Function	1: Running 2: Forward Running 3: Reverse Running 4: Jog Running 5: Driver Fault 6: Overload Warning 7: Underload Warning 9: Low Bus Voltage 10: Invalid(level inverted) 101: Running(level inverted) 102: Forward Running(level inverted) 103: Reverse Running(level inverted) 104: Jog Running(level inverted) 105: Driver Fault(level inverted) 106: Overload Warning(level inverted) 107: Underload Warning(level inverted) 109: Low Bus Voltage(level inverted)	R/W
	2117H	DO1turn-on delay	0~10000 (ms)	R/W
	2118H	DO1turn-off delay	0~10000 (ms)	R/W
	2119H	DO2turn-on delay	0~10000 (ms)	R/W
	211aH	DO2turn-off delay	0~10000 (ms)	R/W
AI	2120H	AI2 Lower Limit Value	0.00~10.00(V)	R/W

Function Description	Address 定义	Data Meaning	Setting Range	Attribute
Parameters	2121H	AI2 Lower Limit Value 对应Set	-100.0~100.0(%)	R/W
	2122H	AI2 Upper Limit Value(V)	0.00~10.00(V)	R/W
	2123H	AI2 Upper Limit Value 对应Set	-100.0~100.0(%)	R/W
	2124H	AI2 Filter Coefficient	0.00~100.00(%)	R/W
Multi-speedSetting	2160H	Multi-speed0	-9999~9999(rpm)	R/W
	2161H	Multi-speed 1	-9999~9999(rpm)	R/W
	2162H	Multi-speed 2	-9999~9999(rpm)	R/W
	2163H	Multi-speed 3	-9999~9999(rpm)	R/W
	2164H	Multi-speed 4	-9999~9999(rpm)	R/W
	2165H	Multi-speed 5	-9999~9999(rpm)	R/W
	2166H	Multi-speed 6	-9999~9999(rpm)	R/W
	2167H	Multi-speed 7	-9999~9999(rpm)	R/W
Communication Parameters	2180H	Baud Rate	0: 1200 1: 2400 2: 4800 3: 9600 4: 19200 5: 38400 6: 57600 7: 115200	R/W*
	2181H	SlaveAddress	1~128	R/W*

Function Description	Address 定义	Data Meaning	Setting Range	Attribute
	2182H	Restore Factory Settings	0: No function 1: restore factory settings	R/W*
	2183H	Parity and Stop Bits	0: 1Stop bitNo parityNone 1: 1Stop bitEven parityEven 2: 1Stop bitOdd parityOdd 3: 2Stop bitNo parityNone 4: 2Stop bitEven parityEven 5: 2Stop bitOdd parityOdd	R/W*
	2184H	Parameter Save	0: No function 1: Save Note: All parameters are recorded after power-off restart only after saving	R/W*
Motor Parameters	2040H	Motor Rated Current	0.1~300.0(A)	R/W*
	2041H	Motor Maximum Current	0.1~300.0(A)	R/W*
	2042H	Motor Rated Speed	0~6000(rpm)	R/W*
	2043H	Motor Pole Pairs	1~100	R/W*
	2048H	Maximum Frequency During Motor Parameter Identification	1~500	R/W*
Self-learning Parameters	2044H	Motor Stator Resistance	0.001~30.000(Ω)	R/W*
	2045H	Motor d-axis Inductance	0.01~300.00(mH)	R/W*
	2046H	Motor q-axis Inductance	0.01~300.00(mH)	R/W*
	2047H	Motor Back-EMF Coefficient	0.001~10.000(V/Hz)	R/W*
Status Parameters	2080H	Current Fault	0~9999	R
	2081H	Control Status	0~100	R
	2082H	Estimation Status	0~100	R
	2083H	Trajectory Status	0~100	R
	2084H	Actual Motor Speed	-30000~30000(rpm)	R
	2085H	Actual Motor Speed	-3000.0~3000.0(Hz)	R
	2086H	Motor Torque(Reserved)	-300.00~300.00(N·M)	N

Function Description	Address 定义	Data Meaning	Setting Range	Attribute
	2087H	Driver Bus Voltage	0.0~1000.0(V)	R
	2088H	Motor Is Current	0~300.00(A)	R
	2089H	Motor Vs Voltage	0~1000.0(V)	R
	208AH	Motor Id Current Command	-99.99~99.99(A)	R
	208BH	Motor Id Current Feedback	-99.99~99.99(A)	R
	208CH	Motor Iq Current Command	-99.99~99.99(A)	R
	208DH	Motor Iq Current Feedback	-99.99~99.99(A)	R
	208EH	AI2 Speed Command	0~10000 (rpm)	R
	208FH	Knob Speed Command	0~10000 (rpm)	R
	2100H	AI2 External Voltage	0.001~30.000 (V)	R
	2090H	Self-calibrated Motor Resistance	0.000~30.000 (Ω)	R
	2091H	Self-calibrated Motor Temperature	-200.0~200.0 ($^{\circ}\text{C}$)	R
	2092H	Driver Temperature	-200.0~200.0 ($^{\circ}\text{C}$)	R
I/O Status	2107H	DI1 Terminal Status	0~1	R
	2108H	DI2 Terminal Status	0~1	R
	2109H	DI3 Terminal Status	0~1	R
	210AH	DI4 Terminal Status	0~1	R
	210BH	DO1 Terminal Status	0~1	R
	210CH	DO2 Terminal Status	0~1	R
	210DH	Digital Input Status	0000~1111	R
	210EH	Digital Output Status	00~11	R
Fault History	2200H	Historical Fault 1	0~65535	R
	2201H	Historical Fault 2	0~65535	R

Function Description	Address 定义	Data Meaning	Setting Range	Attribute
	2202H	Historical Fault 3	0~65535	R
	2203H	Historical Fault 4	0~65535	R

Register Parameter Attribute Description:

Attribute	Description
R/W	Indicates that this parameter value can be read and written in any driver state.
R/W*	Indicates that this parameter can be read and written when the driver is in the Stop state, and can be read in any state.
R	Indicates that this parameter is read-only and cannot be written.

4.6 Common Command Examples

Slave address 0x01, Baud Rate 115200, N-8-1。

Operation	DataFrame	Description
Run Command	Send Data: 01 06 20 01 00 01 12 0A Response Data: 01 06 20 01 00 01 12 0A	Address 2001H: Write 0x01
Motor Speed Command	Send Data: 01 06 20 02 0B B8 24 88 Response Data: 01 06 20 02 0B B8 24 88	Address 2002H: Write 0x0BB8 Set speed to 3000 rpm
Acceleration Command	Send Data: 01 06 20 03 00 03 32 0B Response Data: 01 06 20 03 00 03 32 0B	Address 2003H: Write 3 Set acceleration to 0.3 Krpm/s
Current Fault Code	Send Data: 01 03 20 80 00 01 8E 22 Response Data: 01 03 02 00 02 39 85	Read data from Address 2080H Returned value 0x0002 indicates undervoltage
Motor Rated Current	Send Data: 01 06 20 40 03 E8 83 60 Response Data: 01 06 20 40 03 E8 83 60	Address 2040H: Write 0x03E8 Set rated current to 10 A
Parameter Save	Send Data: 01 06 21 84 00 01 02 1F Response Data: 01 06 21 84 00 01 02 1F	Address 2184H: Write 1 Save all parameter changes written before this command.

Note:

After writing data via RS485, the parameters must be saved; otherwise, the settings will not be retained after power-off and restart.

In actual applications, communication data is represented in hexadecimal format, and

hexadecimal format cannot directly represent decimal points.

For example, 250.00 Hz cannot be directly represented in hexadecimal form, so the value is multiplied by 100 to convert it into an integer (25000). The integer 25000 is then represented in hexadecimal as 61A8(H), which corresponds to 250.00 Hz.

For writing a value of -100:

100(D) converted to hexadecimal is 64(H).

Subtract 64(H) from 10000(H) to obtain FF9C(H).

Therefore, writing FF9C via RS485 represents -100.

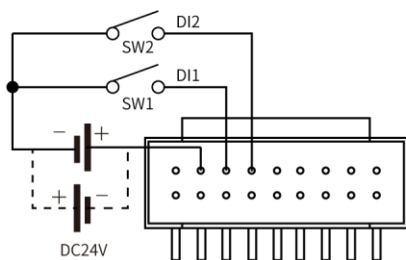
5.1 Power-on Trial Operation

1. Correctly connect the power cable and motor wires.
2. Correctly set the DIP switches. For trial operation, use the default setting with all DIP switches set to OFF.

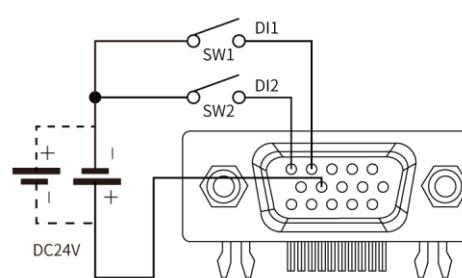
DIP Switch Settings	SW1	SW2	SW3
Communication: RS485; Function: IO Control	OFF	OFF	OFF

Note: The DIP switches SW4 and SW5 of the EA-BLDC40-400L-R are reserved for future functions. The functions of the other switches are shown above.

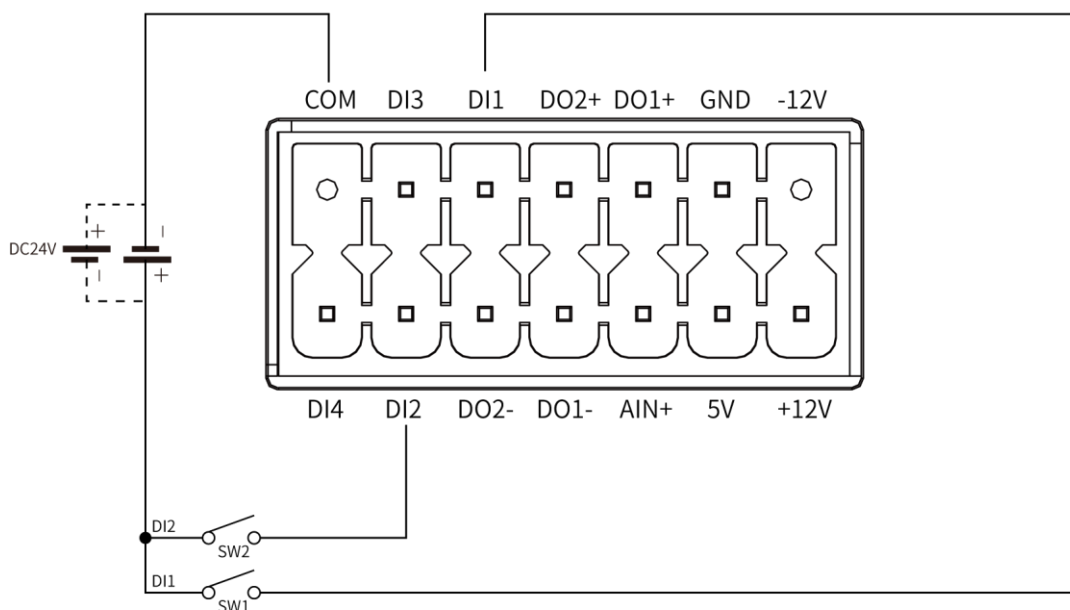
According to different driver models, the following wiring methods are used to control forward and reverse rotation:



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5. Turn the AI1 knob clockwise to set the speed, and the motor will start running.

5.2 Parameter Configuration by Keypad

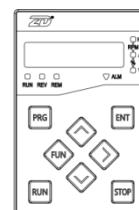
Correctly set the DIP switches. For keypad modification, set DIP switch SW1 to ON

DIP Switch Settings	SW1	SW2	SW3
Communication: Keypad; Function: IO Control	ON	OFF	OFF
Communication: Keypad; Function: Keypad Control	ON	ON	OFF

:The driver has a three-level operation menu. The three menu levels are as follows:

- 1.Function code group number (first-level menu): e.g., F00
- 2.Function code number (second-level menu): F00.00
- 3.Function code value (third-level menu): 50.00 Hz

Taking modification of the driver acceleration as an example, the operation steps are as follows:



①	Any	Driver standby, default display is speed
②	F00	Press PRG key to enter level-1 menu, press $\wedge$ or $\vee$ key to select group number
③	F00.00	Press ENT key to enter level-2 menu, press $\wedge$ or $\vee$ key to select index number
④	F00.03	Select function code F00.03
⑤	0.3	Press ENT key to enter level-3 menu, press $\wedge$ or $\vee$ key to modify the function code parameter
⑥	3.0	Modify the parameter to 3.0, i.e., acceleration = 3.0 Krpm/s
⑦	F00.04	Press ENT key to save the setting, then return to level-2 menu
⑧	F00	Press PRG key to return to level-1 menu
⑨	Any	Press PRG key again to return to the main display interface

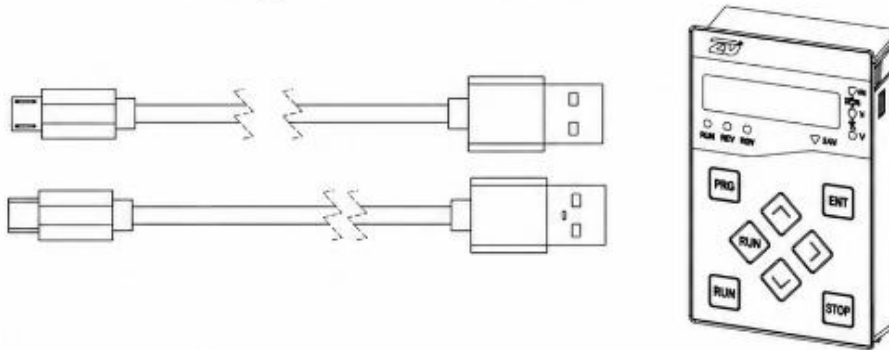
In the third-level menu status, if the parameter value is not flashing, it indicates that the function code cannot be modified. Possible reasons include:

1. The function code is a read-only parameter (“RO”), such as running frequency, fault code, etc.
2. The function code is a stop-state writable parameter (“R/W*”), which can only be modified when the driver is stopped (that is, parameters cannot be modified while the “RUN” indicator is ON).

Correctly set the DIP switches. For operation configuration by keypad, set DIP switch SW1 = ON and SW2 = ON.

DIP Switch Settings	SW1	SW2	SW3
Communication: Keypad; Function: Keypad Control	ON	ON	OFF

The keypad interface is a microUSB port. It is used with the external keypad ZDRV.K10-ENT. Connect using a microUSB data cable.

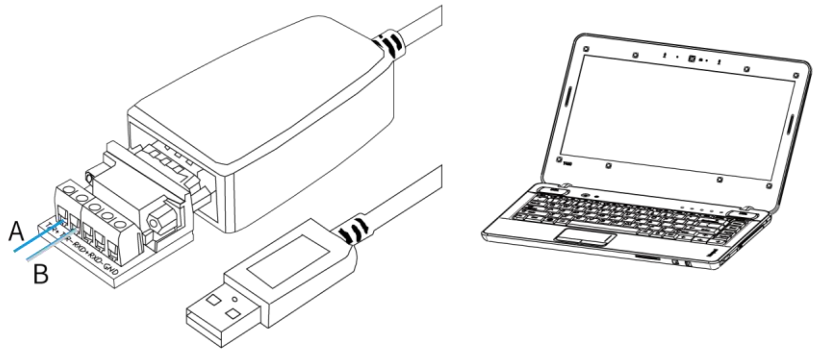
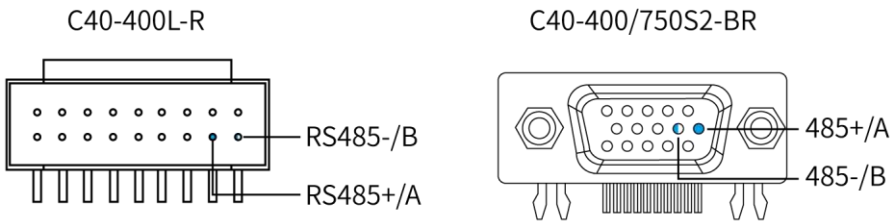


Operation configuration is as follows:

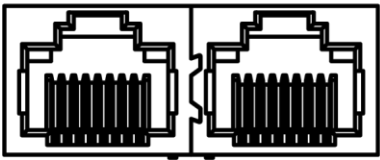
1. When the interface displays **0000**, press **PRG** to enter the level-1 menu, i.e., the group menu **F00**
2. Use the **↶** and **↷** keys to change the flashing digit to **F00**
3. Press **ENT** to enter the next menu, i.e., the level-2 menu **F0000**
4. Use the **↶** and **↷** keys to change the flashing digit to **F00.13**
5. Press **ENT** to enter the next menu, i.e., the level-3 menu. Use **↶** to change the digit position, and use **↶** and **↷** to change the flashing digit to **1**
6. Press **ENT** to save the modified value and enter the level-2 menu **F00.14**
7. Use the **↶** and **↷** keys to change the flashing digit to **F0002**
8. Press **ENT** to enter the next menu, i.e., the level-3 menu. Use **↶** to change the digit position, and use **↶** and **↷** to change the flashing digit to **-3000**
9. Press **ENT** to save the modified value and enter the level-2 menu **F0003**
10. Press **PRG** to return to the level-1 menu **F00**, then press **PRG** again to return to the initial menu interface
11. Press **RUN** to start operation, press **STOP** to stop

Note: By default, 0–3000 is forward rotation, and –3000–0 is reverse rotation.

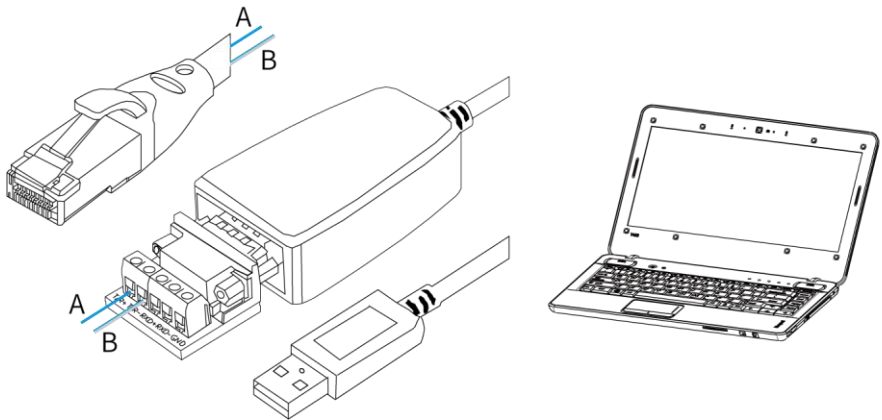
5.4 PC Software Configuration (485)



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引脚 编号	常规 线色	引脚 名称	引脚 功能
4	蓝	RX+	RS485+/A
5	蓝白	RX-	RS485-/B



Correctly set the DIP switches. For PC software configuration, set DIP switch SW1 = OFF.

DIP Switch Settings	SW1	SW2	SW3
Communication: 485; Function: IO Control	OFF	OFF	OFF
Communication: 485; Function: 485 Control	OFF	ON	OFF

5.5 External Analog Speed Control

5.5.1 PC Software Configuration(485)

Correctly set the DIP switches. For PC software configuration, set DIP switch SW1 = OFF.

DIP Switch Settings	SW1	SW2	SW3
Communication: 485; Function: IO Control	OFF	OFF	OFF
Communication: 485; Function: 485 Control	OFF	ON	OFF

5.5.2 485Command Configuration

Operation	DataFrame	Description
DI1 Set Forward Rotation	Send Data:: 01 06 21 01 00 01 13 F6 Response Data: 01 06 21 01 00 01 13 F6	Address2101HWrite0x0001 DI1FunctionFactoryDefaultForward Run
DI2 Set Reverse Rotation	Send Data:: 01 06 21 02 00 02 A3 F7 Response Data: 01 06 21 02 00 02 A3 F7	Address2102HWrite0x0002 DI2FunctionFactoryDefaultReverse Run
Speed Source	Send Data:: 01 06 21 29 00 02 D3 FF Response Data: 01 06 21 29 00 02 D3 FF	Address2129HWrite0x0002
AI2 Lower Limit Value	Send Data:: 01 06 21 20 00 00 82 3C Response Data: 01 06 21 20 00 00 82 3C	Address2120HWrite0x0000 AI2下限FactoryDefault0V
Set to 0 V	Send Data:: 01 06 21 21 00 00 D3 FC Response Data: 01 06 21 21 00 00 D3 FC	Address2121HWrite0x0000 AI2 Lower-limit Corresponding SettingFactoryDefault0%
AI2 Lower-limit Corresponding Setting	Send Data:: 01 06 21 22 03 E8 23 42 Response Data: 01 06 21 22 03 E8 23 42	Address2122HWrite0x03E8 AI2上限FactoryDefault10.00V

Set to 0%	Send Data:: 01 06 21 23 03 E8 72 82 Response Data: 01 06 21 23 03 E8 72 82	Address2123HWrite0x03E8 AI2 Upper-limit Corresponding SettingFactoryDefault100.0%
AI2 Upper Limit Value	Send Data:: 01 06 21 84 00 01 02 1F Response Data: 01 06 21 84 00 01 02 1F	Address2184HWrite0x0001

5.5.3 Keypad Configuration

Correctly set the DIP switches. For keypad modification, set DIP switch SW1 = ON.

DIP Switch Settings	SW.1	SW.2	SW.3
Communication: RS485; Function: IO Control	OFF	OFF	OFF
Communication: RS485; Function: 485 Control	OFF	ON	OFF

The configuration parameters are as follows:

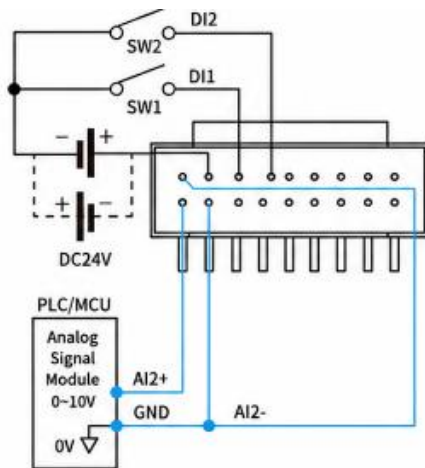
Keypad Code	Name	Setting Range	SetValue
F03.01	DI1 Terminal Function	0~119 1: Forward Run	1
F03.02	DI2 Terminal Function	0~119 2: Reverse Run	2
F00.13	Speed Source	0~3 2: AI2	0
F04.00	AI2 Lower Limit Value	0~10.00V	00.00
F04.01	AI2 Lower-limit Corresponding Setting	-200.0~200.0%	000.0
F04.02	AI2 Upper Limit Value	0~10.00V	10.00
F04.03	AI2 Upper-limit Corresponding Setting	-200.0~200.0%	100.0

Note: For configuration operations, please refer to Section 5.2.

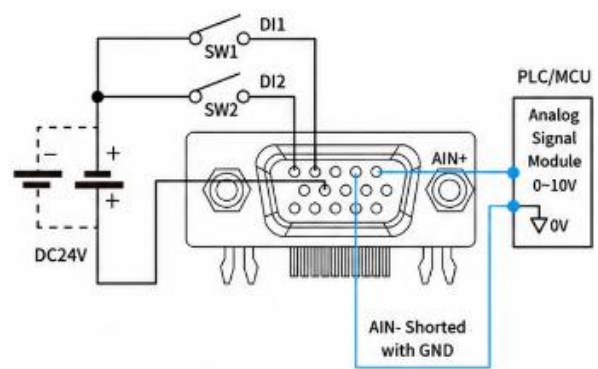
5.5.4 Wiring and Control

Correctly set the DIP switches. For analog speed control, use the default DIP switch setting with all switches set to OFF.

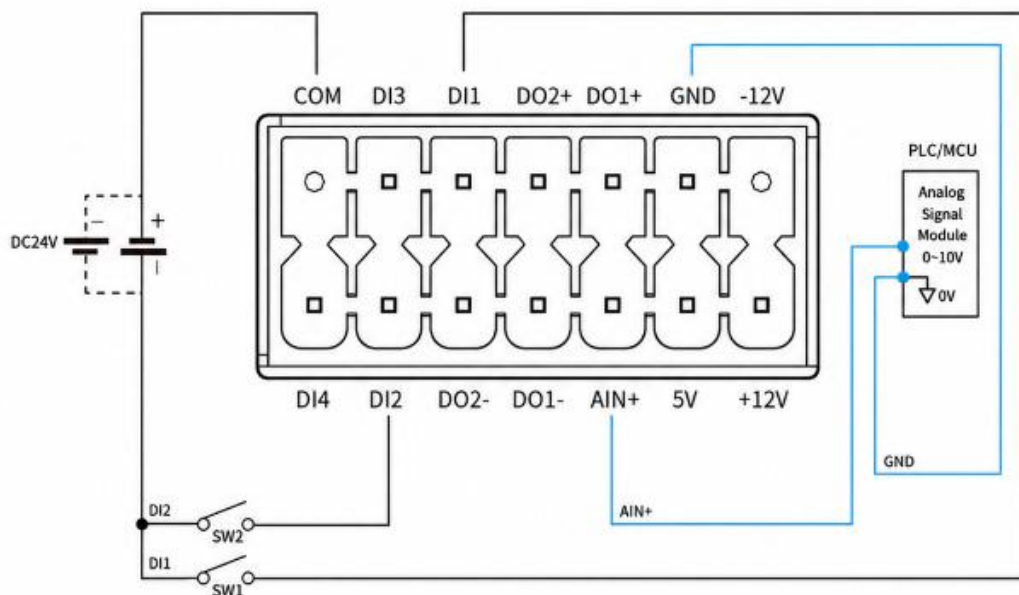
拨码开关选择	SW1	SW2	SW3
通讯:485;使能:IO控制	OFF	OFF	OFF



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Control Effects:

1. The analog module can adjust the speed by changing the input voltage.
2. When SW1 is closed, the driver operates in forward rotation.
3. When SW2 is closed, the driver operates in reverse rotation.

5.6 Multi-speed

Meaning of Multi-speed:

The motor speed command is determined by the motor speed set in the function code corresponding to the trigger mode of digital input channels 1-4 (F03.00-F03.03) (2101H-2104H).

That is:

Motor Speed Command = Multi-speed 0-7 (F07.00-F07.07) (2160H-2167H)

corresponding to the triggered IO condition.

Assume:

* F03.01 (2102H) = 10 (0AH)

* F03.02 (2103H) = 11 (0BH)

* F03.03 (2104H) = 12 (0CH)

By arranging the trigger states of DI4, DI3, and DI2 in binary order, the following table can be obtained:

DI 4	DI 3	DI 2	DI Trigger Corresponding Effect
0	0	0	Multi-speed 0(F07.00/2160H)
0	0	1	Multi-speed 1(F07.01/2161H)
0	1	0	Multi-speed 2(F07.02/2162H)
0	1	1	Multi-speed 3(F07.03/2163H)
1	0	0	Multi-speed 4(F07.04/2164H)
1	0	1	Multi-speed 5(F07.05/2165H)
1	1	0	Multi-speed 6(F07.06/2166H)
1	1	1	Multi-speed 7(F07.07/2167H)

For example, when DI3 is triggered, the corresponding multi-speed is Multi-speed 2. The function code for Multi-speed 2 is F07.02 (2162H), so the Motor Speed Command =F07.02 (2162H).

Note: Multi-speed 0 is generally not recommended to be changed (default is 0). Please select carefully; otherwise, serious consequences may occur.

****5.6.1 PC Software Configuration (485)****

Select the DIP switch correctly. For PC Software Configuration, it is processed as DIP switch SW1 = OFF.

拨码开关选择	SW1	SW2	SW3
通讯:485;使能:IO控制	OFF	OFF	OFF
通讯:485;使能:485控制	OFF	ON	OFF

5.6.2 485Command Configuration

Operation	DataFrame	Description
DI2SetMulti-speed 1	Send Data: 01 06 21 02 00 0B 63 F1 Response Data: 01 06 21 02 00 0B 63 F1	Address2102HWrite0x000B

DI3SetMulti-speed 2	Send Data: 01 06 21 03 00 0C 73 F3 Response Data: 01 06 21 03 00 0C 73 F3	Address2103HWrite0x000C
Multi-speed 0: 0rpm	Send Data: 01 06 21 60 00 00 83 E8 Response Data: 01 06 21 60 00 00 83 E8	Address2160HWrite0x0000
Multi-speed 1: -800rpm	Send Data: 01 06 21 61 FC E0 92 A0 Response Data: 01 06 21 61 FC E0 92 A0	Address2161HWrite0xFCE0
Multi-speed 2: 1000rpm	Send Data: 01 06 21 62 03 E8 22 96 Response Data: 01 06 21 62 03 E8 22 96	Address2162HWrite0x03E8
Multi-speed 3: -2000rpm	Send Data: 01 06 21 63 F8 30 30 3C Response Data: 01 06 21 63 F8 30 30 3C	Address2163HWrite0xF830
Parameter Save	Send Data: 01 06 21 84 00 01 02 1F Response Data: 01 06 21 84 00 01 02 1F	Address2184HWrite0x0001

5.6.3 Keypad Configuration

Select the DIP switch correctly. Keypad modification is processed with DIP switch SW1 = ON.

拨码开关选择	SW1	SW2	SW3
通讯:键盘;使能:IO控制	ON	OFF	OFF
通讯:键盘;使能:键盘控制	ON	ON	OFF

Configure the parameters as shown below:

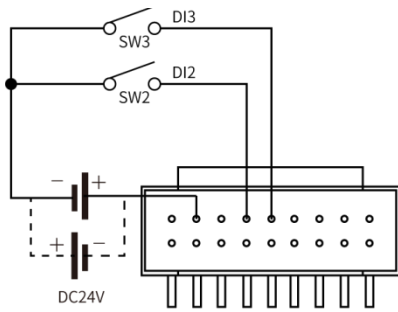
Keypad Code	Name	Setting Range	SetValue
F03.01	DI2 Terminal Function	0~119 11: Multi-speed 1	11
F03.02	DI3 Terminal Function	0~119 12: Multi-speed 2	12
F07.00	Multi-speed 0	-9999~9999rpm	0
F07.01	Multi-speed 1	-9999~9999rpm	-800
F07.02	Multi-speed 2	-9999~9999rpm	1000
F07.03	Multi-speed 3	-9999~9999rpm	-2000

Note: Please refer to Section 5.2 for the configuration operation.

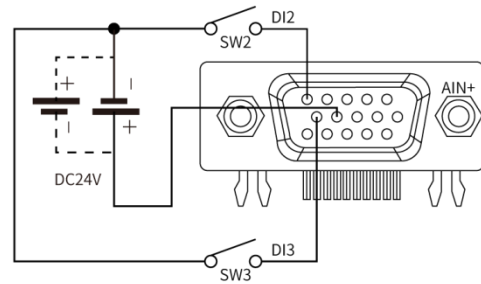
5.6.4 Wiring and Control

Select the DIP switch correctly. Multi-speed is processed with all DIP switches OFF by default.

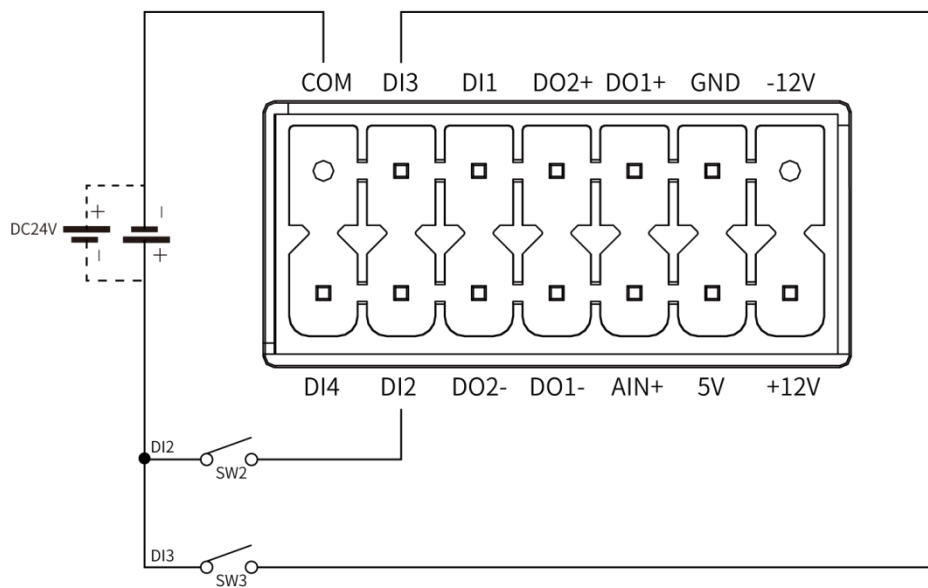
拨码开关选择	SW1	SW2	SW3
通讯:485;使能:IO控制	OFF	OFF	OFF



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C40-200/400S2-BR-001

Control Effect:

When SW1, SW2, and SW3 are all not triggered, the driver is at 0 RPM (Multi-speed 0).

When SW2 is closed, the driver runs in reverse at 800 RPM (Multi-speed 1).

When SW3 is closed, the driver runs forward at 1000 RPM (Multi-speed 2).

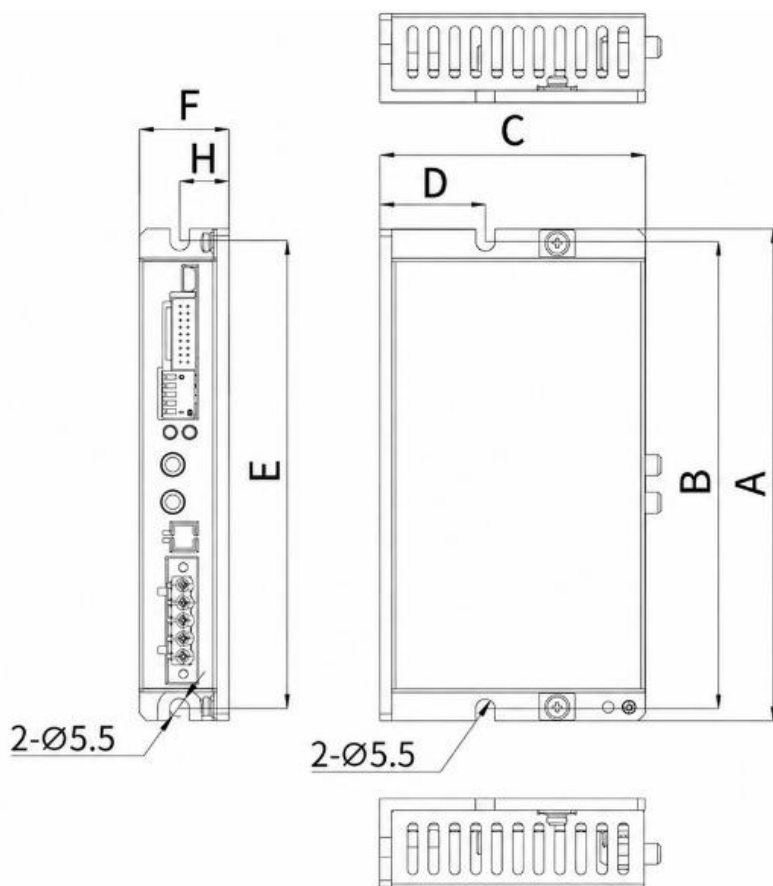
When SW2 and SW3 are closed together, the driver runs in reverse at 2000 RPM (Multi-speed 3).

Any other wiring combination will not run.

6. Product Dimensions, Environmental Conditions and Installation

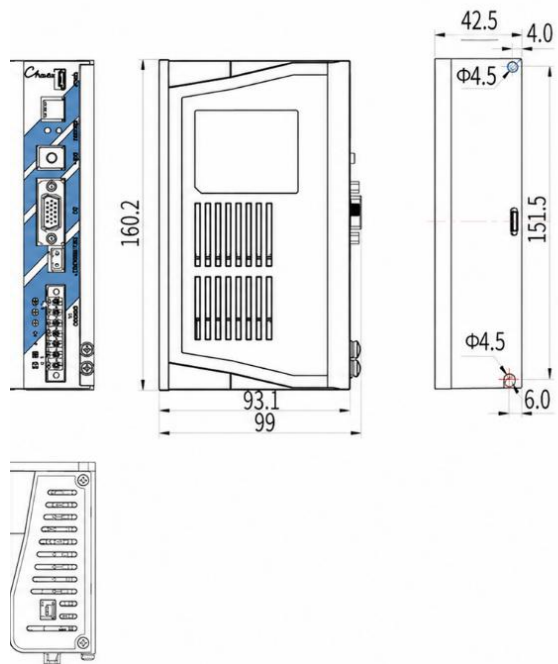
6.1 Product Dimension Drawing

6.1.1 EA-BLDC40-400L-R

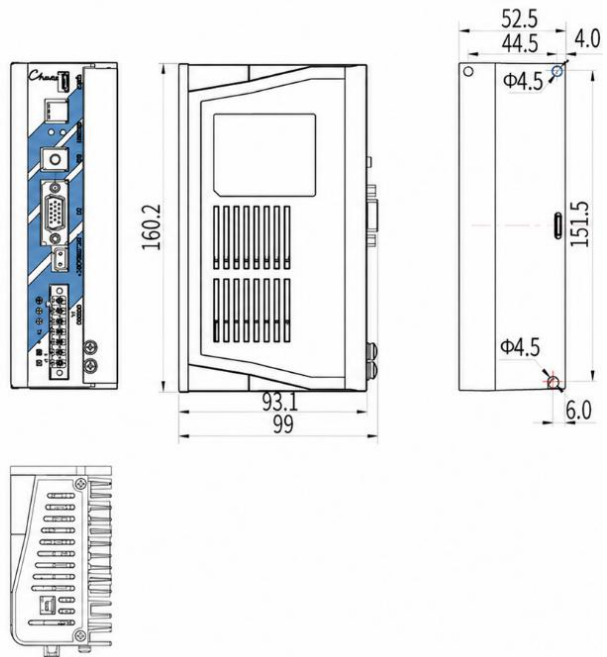


Model	Overall Dimensions (mm)				Installation Dimensions (mm)		
	A	B	C	D	E	F	H
EA-DRVC40-400L-R	141	134	75.5	30	134	25.4	13.9

6.1.2 EA-BLDC40-400/750S2-BR EA-DRVC40-400S2-BR

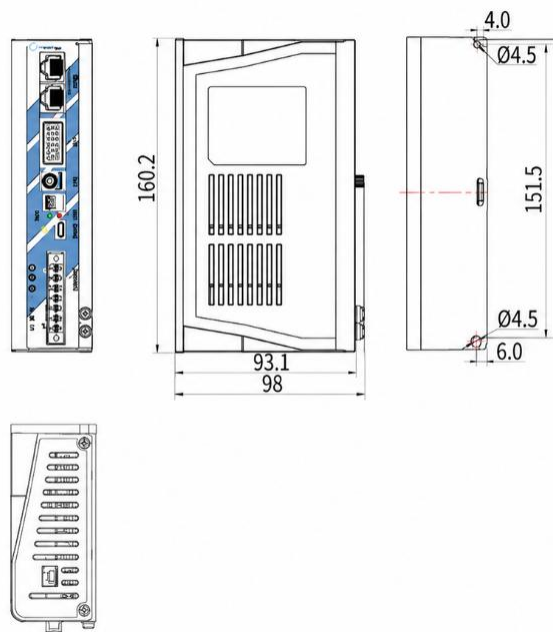


EA-DRVC40-750S2-BR

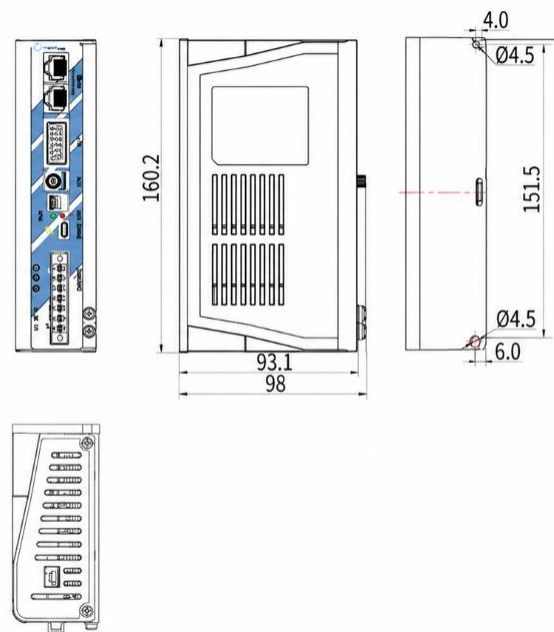


6.1.2 EA-BLDC40-200/400S2-BR-001

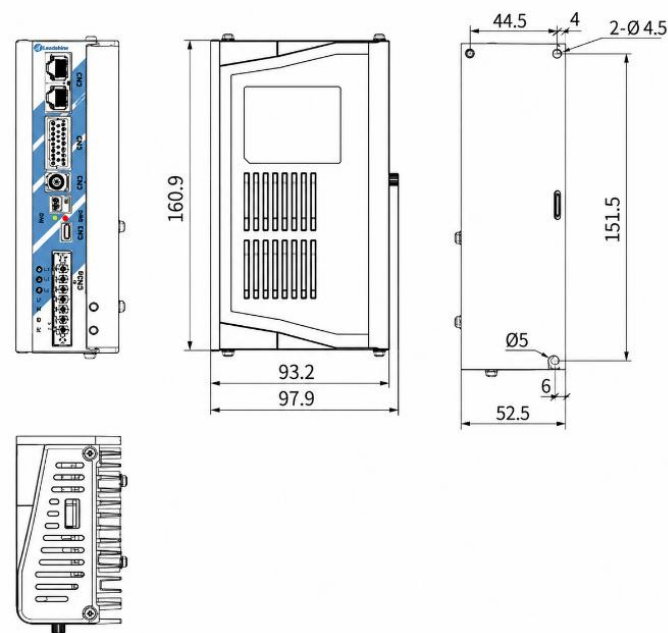
EA-DRVC40-200S2-BR-001



EA-DRVC40-400S2-BR-001



6.1.3 EA-BLDC40-750S2-BR-001
EA-DRVC40-750S2-BR-001



6.2 Operating, Storage and Transportation Environmental Characteristics

The driver must never be exposed to harsh environments such as dust, direct sunlight, corrosive or flammable gases, oil mist, humidity, water droplets, or vibration. The salt content in the air must be kept below 0.01 mg/cm².

Protection Rating		IP20:prevents entry of solid foreign objects larger than12mm的 solid foreign objects, no moisture protection		
Environment特性	Ambient Temperature	Operation	Single installation	-10~40℃ -20~-10 C 或 40~50 C(derating is required)
			Side-by-side installation	-10~30℃ -20~-10 C 或 30~40 C(derating is required)
		Storage	-33~65℃	
		Transportation	-20~50℃	
		non-condensing and non-freezing		
	Rated Humidity	Operation	Max.85%	
		Storage/Transportation	Max.90%	
		禁止凝结水		
	Atmospheric Pressure	Operation	86~106kPa	
		Storage/Transportation	70~106kPa	
	Altitude	operable below 1000 m altitude (derating is required above 1000 m, 见2.2.2章节)		

Package Drop	Storage/Transportation	Do not drop from a height; risk of damage exists
Vibration	Operation/Storage/Transportation	Do not apply continuous vibration
Shock	Operation/Storage/Transportation	Do not apply excessive shock

6.2.1 Storage Environmental Conditions

Before installation, this product must be kept in its packing box, If the unit will not be used temporarily, pay attention to the following storage requirements to keep it within the warranty scope and facilitate future maintenance:

- 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、 Avoid storage in environments containing corrosive gases or liquids;
- 4、 It is recommended to properly package and store the product on a shelf or flat surface.。

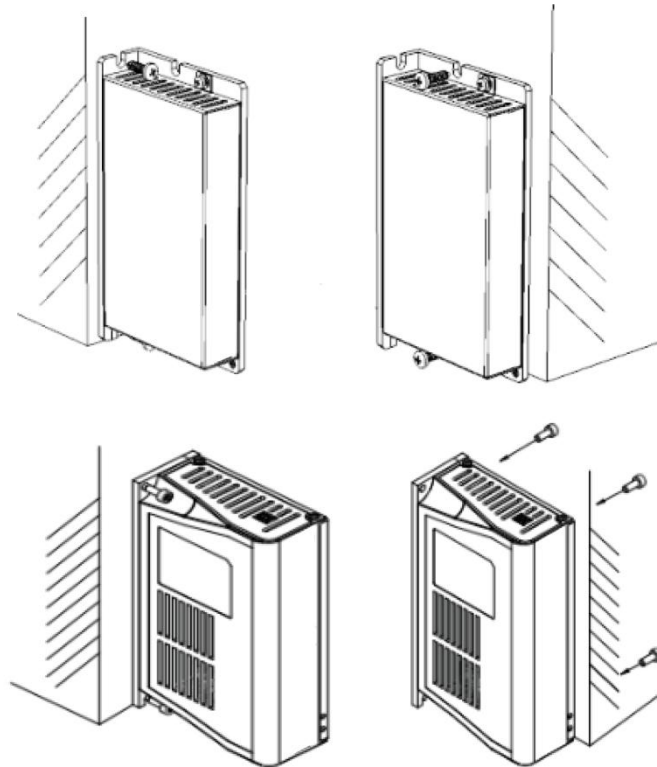
6.2.2 Operating Environmental Conditions

Operating Conditions	Ambient Temperature Limits
Abnormal Ambient Temperature Operation	When operating at rated current, the ambient temperature must be within -10°C to 40°C. When the ambient temperature exceeds 40°C, reduce the rated current by 2.5% for every 1°C increase. The maximum ambient temperature can reach 50°C.
High-altitude Operation	When the driver is used at an altitude of 0–1000 m, apply the general 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°C for every 100 m increase.

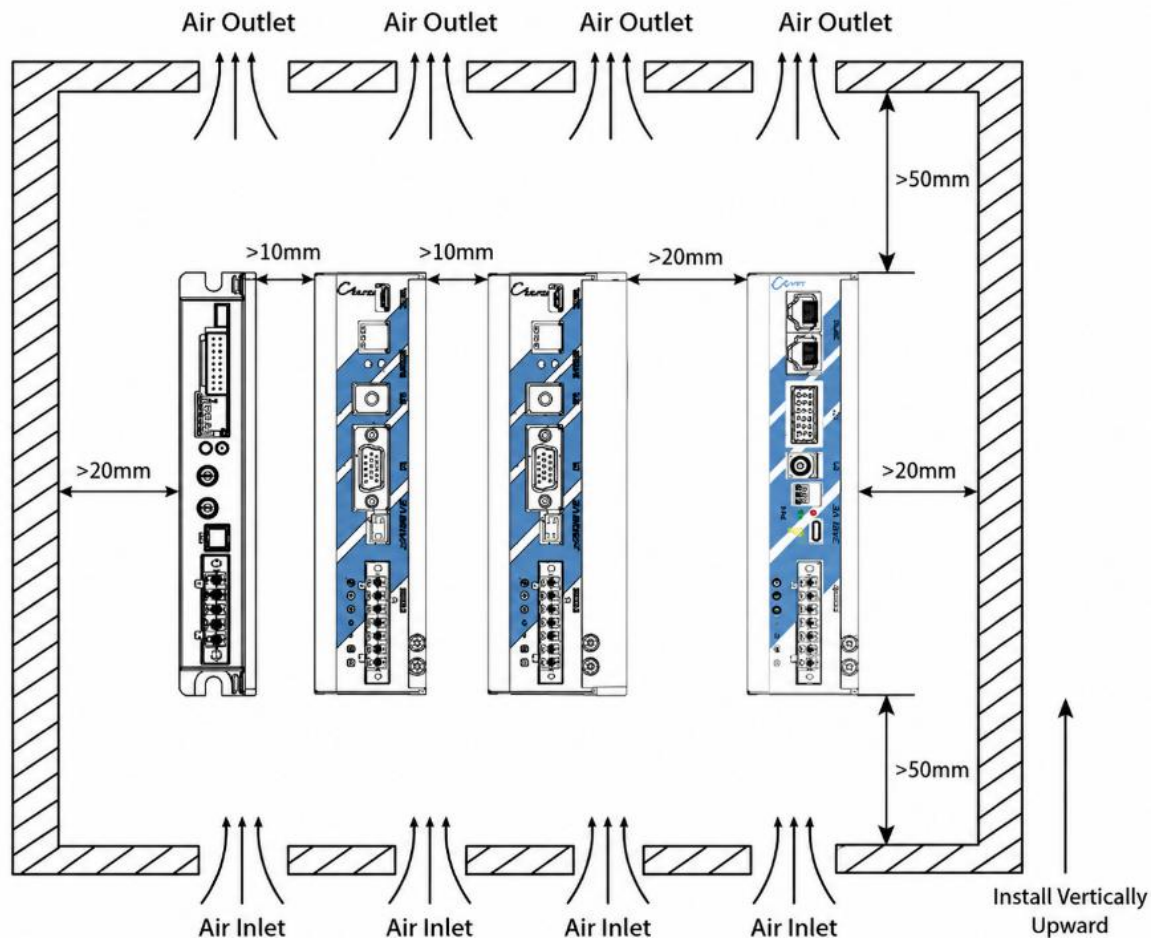
1. For long-term operation, an ambient temperature below 40°C and a well-ventilated location are recommended to ensure reliable product performance.
At altitudes above 1000 m, thinner air reduces equipment insulation strength and heat dissipation capability; therefore, derating is required, and use in high-altitude areas is not recommended.
2. In addition, the operating conditions should also include:
3. A location without large heat-generating equipment;
4. A location free from water droplets, steam, dust, and oily dust;
5. A location free from corrosive or flammable gases and liquids;
6. A location without floating dust or metal particles;
7. A firm and vibration-free location;
8. A location without electromagnetic noise interference.

6.3 Installation Precautions

9. The product installation method is wall-mounted installation.
For low-voltage drivers, it is recommended to use M4 screws with washers for mounting.
For high-voltage drivers, it is recommended to use M5 screws with washers for mounting.
10. It is recommended to install the driver on a metal mounting surface with good heat dissipation and proper grounding; otherwise, a fire hazard may occur.
11. Recommended installation spacing for drivers:
When multiple drivers are installed side by side, maintain an installation spacing of 50 mm or more to ensure proper heat dissipation.
12. The installation diagram is shown in the figure below. The actual installation orientation may be determined according to customer requirements.



The installation spacing diagram is shown in the figure below. The actual installation orientation may be determined according to customer requirements.



* The installation diagram spacing between drivers and the dimensions in the notes are not shown in equal proportion. Please refer to the written notes as the standard.

****Notes:****

1. The wiring between the driver and motor must not be pulled tightly to prevent loosening or disconnection.
2. When fixing the driver, all mounting screws must be securely tightened.
3. Low-voltage drivers use two M4 screw mounting holes for installation.
4. High-voltage drivers use two M5 screw mounting holes for installation.
5. Tightening torque: 1.2–1.5 N·m.
6. The motor shaft center must be properly aligned with the equipment shaft center.
7. The screws fixing the motor must be securely tightened.

7. Faults and Maintenance

The table below shows the fault indications displayed by the LED after the driver detects a fault stop condition. Users can troubleshoot and repair the issue according to the fault code.

 One flash of the green LED represents 5.

 One flash of the red LED represents 1.

Fault No.	Fault Display	Fault Name	Flash Count	Cause of Fault	Solution
0x0001	ERR.OV	Overvoltage Fault	1 Green, 2 Red	1. Input voltage too high 2. Electronic brake force too strong 3. Deceleration too fast	1. Check the power supply voltage 2. Modify the electronic brake parameters 3. Reduce the deceleration rate and add a braking resistor
0x0002	ERR.UV	Undervoltage Fault	1 Green, 5 Red	1. Input power voltage too low 2. Acceleration too fast, triggering external power protection 3. Instantaneous power failure 4. Driver hardware abnormality	1. Check the power input 2. Reduce the acceleration rate 3. Reset the fault 4. Seek technical support
0x0008	ERR.OH	Driver Overtemperature Fault	3 Green, 1 Red	1. Ambient temperature too high 2. Thermistor damaged 3. Inverter module damaged	1. Lower the ambient temperature 2. Replace the complete unit 3. Replace the driver
0x0010	ER.OCH	Hardware Overcurrent Fault	0 Green, 3 Red	1. Acceleration/deceleration too fast 2. Voltage too low 3. Driver power rating too small 4. Sudden load increase 5. Ground short circuit or phase-to-phase short circuit 6. Strong external interference source present 7. Parameters do not match the motor	1. Reduce acceleration/deceleration rate and lower the maximum current 2. Check the input power voltage 3. Use a higher power-rated driver 4. Check whether the load is short-circuited or stalled 5. Check/replace the cable or motor 6. Check for strong interference sources 7. Verify that the parameters match the motor
0x0040	ER.OCS	Software Overcurrent Fault	1 Green, 1 Red	1. Acceleration/deceleration too fast 2. Voltage too low 3. Driver power rating too small 4. Sudden load increase 5. Ground short	1. Reduce acceleration/deceleration rate and lower the maximum current 2. Check the input power voltage 3. Use a higher power-rated driver 4. Check

Fault No.	Fault Display	Fault Name	Flash Count	Cause of Fault	Solution
0x0001	ERR.OV	Overvoltage Fault	1 Green, 2 Red	1. Input voltage too high 2. Electronic brake force too strong 3. Deceleration too fast	1. Check the power supply voltage 2. Modify the electronic brake parameters 3. Reduce the deceleration rate and add a braking resistor
				circuit or phase-to-phase short circuit 6. Strong external interference source present 7. Parameters do not match the motor	whether the load is short-circuited or stalled 5. Check/replace the cable or motor 6. Check for strong interference sources 7. Verify that the parameters match the motor
Fault No.	Fault Display	Fault Name	Flash Count	Cause of Fault	Solution
0x0080	ER.OL2	Driver Overload Fault	2 Green, 2 Red	1. Acceleration time too short 2. Power supply voltage too low 3. Load too heavy 4. Motor and parameters do not match	1. Reduce the acceleration rate 2. Check the power supply voltage 3. Use a higher power-rated driver 4. Verify that the parameters match the motor
0x0100	ER.HLP	Motor Phase Loss Fault	2 Green, 4 Red	1. Motor wire disconnected or poor contact 2. Phase-loss detection threshold not appropriate	1. Check the wiring and reconnect properly 2. Select an appropriate threshold
0x2000	ER.OL1	Motor Overload Fault	2 Green, 1 Red	1. Power supply voltage too low 2. Motor rated current setting not appropriate 3. Motor stalled or sudden excessive load change 4. Id current command applied 5. Motor and parameters do not match	1. Check the power supply voltage 2. Increase the motor rated current setting 3. Reduce the load and inspect the motor and mechanical system 4. Set the Id current command to 0 5. Verify that the parameters match the motor

Notes:

1. Except for faults that require parameter modification through the keypad, all other fault maintenance must be performed with the power turned off.
2. Before use, please confirm that the indicator lights or keypad are functioning properly.
3. Do not move, wire, or perform maintenance work while the indicator lights are on.
4. After preliminary fault troubleshooting, a trial run test is recommended.
5. Basic maintenance should be carried out by professional personnel familiar with the operation of this product.
6. If the fault cannot be resolved, do not disassemble the driver housing for repair without authorization. Please contact sales or technical support.

8. Basic Inspection and Maintenance**8.1 Basic Inspection**

Inspection Item	Inspection Content
General Inspection	Regularly check whether the screws at the driver installation position, terminals and wiring, motor shaft center, and mechanical connection points are loose.
	Perform regular inspections to prevent oil, water, metal powder, or other foreign materials from entering the driver.
	If the driver is installed in a location with harmful gases or excessive dust, prevent harmful gases and dust from entering the driver.
	When changing wiring, check whether the wiring sequence is correct; otherwise, danger may occur.
Inspection Before Operation (Power Off)	Before wiring, ensure that the power is disconnected and the motor has stopped running.
	Apply insulation treatment to the wiring terminal connection points.
	Ensure the wiring is correct to avoid damage or abnormal operation.
	Check whether conductive objects such as screws or metal fragments, or flammable objects, are present inside the driver.
	Ensure all external control switches are set to the OFF state.
	To avoid electromagnetic brake failure, check whether the emergency stop and power cut-off circuit are functioning properly.
	If electronic instruments used near the driver are affected by electromagnetic interference, apply measures to reduce electromagnetic interference.
	Confirm that the applied input voltage to the driver is correct.
Inspection Before Running (Power On)	When the motor is running, check whether the connection cables are rubbing against machine parts or being pulled.
	If the motor vibrates due to the driver or the operating noise is excessive, please contact the manufacturer.
	Confirm that all parameter settings are correct. Depending on the mechanical characteristics, unexpected actions may occur. Do not excessively adjust parameter

	limits.
	When resetting parameters, ensure the driver is in the STOP state; otherwise, faults may occur.
	Check whether the LED indicators display any abnormal conditions.
	Check whether the keypad display and command settings show any abnormal conditions.

8.2 Maintenance and After-sales Service

Routine Maintenance

- Please store and use the product under appropriate environmental conditions.
 - Clean the exterior of the driver and motor regularly to prevent dust and dirt accumulation.
 - Do not disassemble the mechanical parts during cleaning and maintenance.
 - Clean the gaps of the keypad housing regularly to prevent foreign matter from entering.
 - Avoid using the keypad for long periods in extreme environmental conditions to prevent keypad failure.
 - It is recommended to power off the driver once every month to allow the internal capacitors to fully charge and discharge.
-

Component Service Life

Electrolytic Capacitors

The service life of electrolytic capacitors is mainly affected by ambient temperature and operating conditions. According to the supplier's specifications, under the maximum operating temperature limit of 105°C, the service life is approximately 3000 hours. Under ideal conditions, for every 10°C decrease in operating temperature, the service life doubles.

If electrolytic capacitors are stored unused for a long period, the electrolyte inside will gradually lose activity. Rated voltage should be periodically applied to maintain electrolyte activity.

Knob Potentiometer

According to the supplier's specifications:

- Full rotation angle: $250^\circ \pm 10^\circ$
- Rotational life: 100 cycles
- Resistance variation: $\Delta R/R \leq \pm(2\Omega + 3\%)$

Buttons

According to the supplier's specifications, the operating life is 100,000 cycles.

MTBF

Mean Time Between Failures (MTBF): > 200,000 hours.

After-sales Service

- For usage questions, please contact sales or technical support. Contact information for technical support can be found on the last page of this manual.

- The warranty period for this product is valid for one year from the shipment date. Free repair service is provided during the warranty period.
- If a fault occurs under normal usage according to this instruction manual, please contact sales and return the product for repair. To facilitate troubleshooting, please provide a detailed description of the fault cause or phenomenon whenever possible.

The following situations are considered the responsibility of the user:

1. Damage caused by improper use, inappropriate repair, or unauthorized modification;
2. Damage caused by dropping or transportation after delivery;
3. Damage caused by use outside the specified product operating range;
4. Damage caused by fire, earthquake, lightning, wind disaster, chloride corrosion, or other natural disasters;
5. Damage caused by the intrusion of water, oil, metal fragments, or other foreign matter.

For components with specified standard service life, failures occurring after the service life has been exceeded are excluded from warranty coverage.