



VER 1.0

DS-CLF4-FRS4

Technical Manual



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1. Introduction

1.1 Product Introduction

This high-performance, intelligent stepper servo drive system offers simple control, easy implementation, and strong adaptability. It features stable and reliable quality with excellent performance. By incorporating servo control technology into the stepper system, it enables closed-loop stepper control—ensuring no step loss during operation, low heat generation, high rotational speed, and reduced vibration and noise.

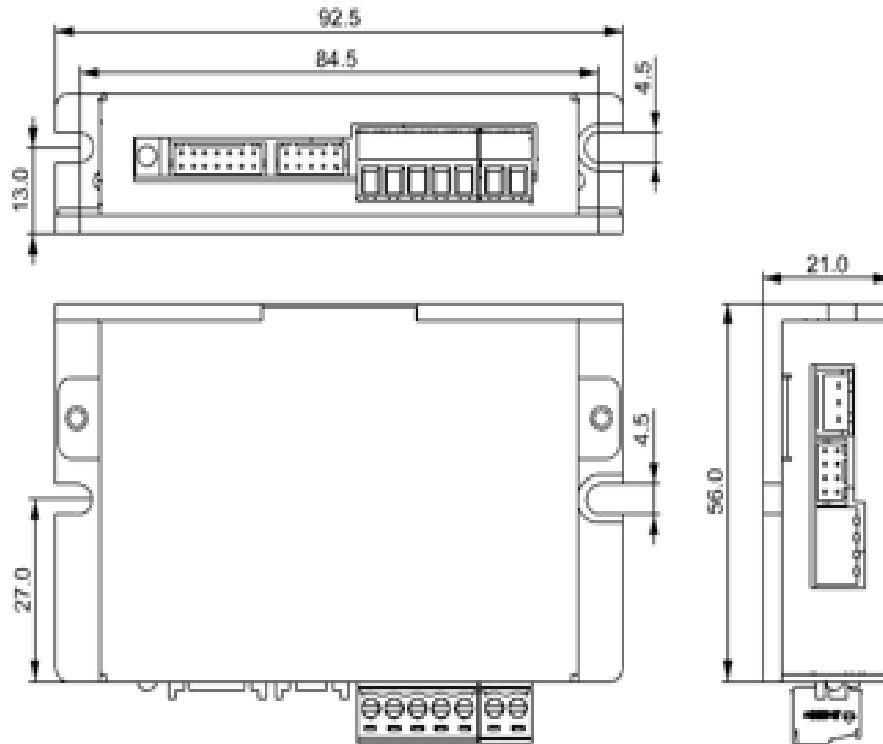
1.2 Features

- Input Power: DC 24V–36V
- Maximum Output Phase Current (Peak): 4.0A
- Supports MODBUS-RTU protocol via RS485 communication, up to 32 nodes
- Supports high-speed pulse input, motion control functions, and multiple digital I/O
- 2-channel high-speed pulse input signals: opto-isolated; configurable as pulse and direction signals
- 5-channel input signals: opto-isolated, DC 5V input
- 3-channel opto-isolated output signals; configurable port functions
- Smooth and precise current control with low motor heat generation
- Built-in protections: motor short circuit, overcurrent, overvoltage, undervoltage, and overheating

1.3 Technical Specifications

Model		DS-CLF4-FRS4
Adapted motor		2-phase open/closed-loop stepper motors 3-phase open-loop stepper motors 5-phase open/closed-loop stepper motors
Power supply		24 - 36V DC
Output current		0.3A - 4A (Phase)
Overvoltage Protection		45V DC
Undervoltage Protection		15V DC
Input/Output Intertace	2 high-speed pulse input signals	Opto-isolated, 3.5–5V input, 5–8 mA current
	5 input signals	Opto-isolated, max 30VDC, max sink current 10mA
	3 output signals	
Size		92.5 × 21 × 56 mm (excluding connectors)
Weight		175g
Use environment	Use occasion	Avoid corrosive gases
	Humidity	<85% RH, non-condensing
	Operating temperature	0° ~ 40°C
	Storage temperature	-10 ~ 70°C
	Cooling	General ventilation environment

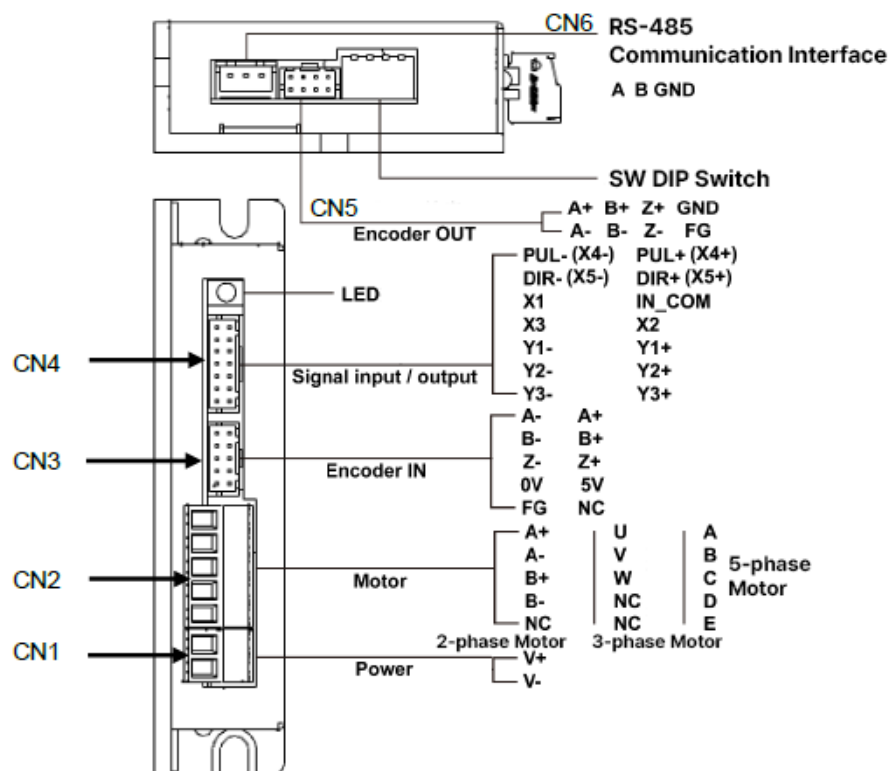
1.4 External Dimensions



Notes

1. For side mounting, use M3 or M4 screws through the holes on both sides.
2. The power device in the driver generates heat during operation.
3. If the device operates continuously under high voltage and high power conditions, effective heat dissipation surface area or forced cooling must be ensured.
4. Do not use the driver in environments with poor air circulation or where the ambient temperature exceeds 45°C.
5. Avoid installing the driver in humid locations or on metal surfaces prone to condensation.

2. Description of Interface



2.1 Power Interface Definition (CN1: Power)

Pluggable terminal block : 15EDGK-3.81-02P-1Y-00A(H) [maker: DEGSON]

Connector No.	Diagram	Pin No.	Signal name
CN1		1	Power V+
		2	Power V-

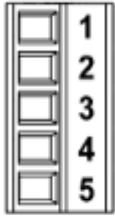


Notes

1. Please connect the power supply correctly and observe the polarity.
2. Do not plug or unplug the connector while the power is on.
3. For detailed wiring instructions, refer to section "9. Wiring Requirements"

2.2 Motor Interface Definition (CN2: Motor)

Pluggable terminal block : 15EDGK-3.81-05P-1Y-00A(H) [maker: DEGSON]

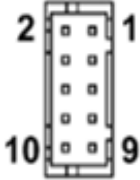
Connector No.	Diagram	Pin No.	Signal name		
			2-Phase Motor	3-Phase Motor	5-Phase Motor
CN2		1	Motor A+	Motor U	Motor A
		2	Motor A-	Motor V	Motor B
		3	Motor B+	Motor W	Motor C
		4	Motor B-	NC	Motor D
		5	NC	NC	Motor E

	Notes	1. This driver supports 2-phase, 3-phase, and 5-phase motors. The factory default setting is a 2-phase motor.
		2. Before use, make sure that parameter 0218 (motor phase number) matches the actual motor. Otherwise, the motor may be damaged.
		3. After changing the motor phase setting, power the driver off and then on again to make the new setting take effect.

2.3 Encoder Input Interface Definition (CN3: Encoder IN)

Connector housing : HX20016-10Y (Terminal: HX20016-PT) [maker: HXH]

— Compatible with PHDR-10VK (Terminal: SPHD-001T-P0.5) [maker: JST]

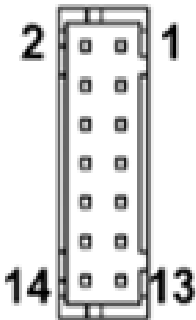
Connector No.	Diagram	Pin No.	Signal name	Pin No.	Signal name
CN3		1	A+	2	A-
		3	B+	4	B-
		5	Z+	6	Z-
		7	5V	8	0V
		9	NC	10	FG

	Notes	Please connect the power supply correctly and observe polarity.
	Notes	The encoder interface uses differential input. Power supply is 5V output, ≤200mA.

2.4 Signal Input/Output Interface Definition (CN4: I/O)

Connector housing : HX20016-14Y (Terminal: HX20016-PT) [maker: HXH]

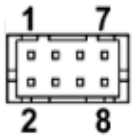
— Compatible with PHDR-14VK (Terminal: SPHD-001T-P0.5) [maker: JST]

Connector No.	Diagram	Pin No.	Signal name	Description
CN4		1	Pulse Signal PUL+ (X4+)	High-speed input, opto-isolated, 3.5–5V compatible. Max frequency: 500kHz (50% duty cycle)
		2	Pulse Signal PUL- (X4-)	
		3	Direction Signal DIR+ (X5+)	
		4	Direction Signal DIR- (X5-)	
		5	IN_COM	Opto-isolated input common terminal, NPN/PNP compatible (5V)
		6	General Input X1	General-purpose input port, opto-isolated, compatible with 3.5–5V signals. Signal function is configurable.
		7	General Input X2	
		8	General Input X3	
		9	General Output Y1+	General-purpose output port, opto-isolated, maximum output current 10mA, maximum voltage 30VDC. Signal function is configurable (e.g., alarm, brake release).
		10	General Output Y1-	
		11	General Output Y2+	
		12	General Output Y2-	
		13	General Output Y3+	
		14	General Output Y3-	

2.5 Encoder Output Interface Definition (CN5: Encoder OUT)

Connector housing : HX20016-8Y (Terminal: HX20016-PT) [maker: HXH]

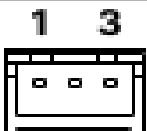
— Compatible with PHDR-08VK (Terminal: SPHD-001T-P0.5) [maker: JST]

Connector No.	Diagram	Pin No.	Signal name	Pin No.	Signal name
CN5		1	A+	2	A-
		3	B+	4	B-
		5	Z+	6	Z-
		7	GND	8	FG

2.6 RS-485 Communication Interface Definition (CN6 : RS-485)

Connector housing : HX25002-3Y (Terminal: HX25002-PT) [maker: HXH]

— Compatible with XHP-3 (Terminal: SXH-001T-P0.6) [maker: JST]

Connector No.	Diagram	Pin No.	Signal name	Description
CN6		1	A	RS-485 +
		2	B	RS-485 -
		3	GND	GND

2.7 Station Setting (Switch)

Switch Settings				Station Address (Hex)	Station Address (Decimal)	Baud Rate
SW1	SW2	SW3	SW4			
ON	ON	ON	ON	01H	1	19200
ON	ON	ON	OFF	02H	2	N/A*
ON	ON	OFF	ON	03H	3	
ON	ON	OFF	OFF	04H	4	
ON	OFF	ON	ON	05H	5	
ON	OFF	ON	OFF	06H	6	
ON	OFF	OFF	ON	07H	7	
ON	OFF	OFF	OFF	08H	8	
OFF	ON	ON	ON	09H	9	
OFF	ON	ON	OFF	0AH	10	
OFF	ON	OFF	ON	0BH	11	
OFF	ON	OFF	OFF	0CH	12	
OFF	OFF	ON	ON	0DH	13	
OFF	OFF	ON	OFF	0EH	14	
OFF	OFF	OFF	ON	0FH	15	
OFF	OFF	OFF	OFF	N/A*	N/A*	


Notes

N/A indicates that the address is assigned by the master station (parameter 298).


Notes

After changing the DIP switch settings, the driver must be powered off and restarted for the changes to take effect. 19200 bps

3. Holding Current

When there is no pulse input, the driver will automatically switch to idle current after 500 milliseconds to reduce motor heating.

When pulse input resumes, the current will return to the configured value.

4. LED Indicators

This product is equipped with a single bi-color (red/green) LED indicator to display status.

4.1 Status Display

The LED flashes a specific number of times corresponding to each status (0.5 seconds ON, 0.5 seconds OFF per cycle), then remains ON for 2 seconds before repeating the sequence.

Status Function	LED Indicator	Status Code	Description
Enable Off	Green LED flashing	1	Enable is off, motor is in free state
Stopped	Green LED flashing	2	Enable is on, motor is held but not rotating
Running	Green LED solid ON	3	Driver is in running state

4.2 Alarm Display

When an alarm occurs, the LED flashes a number of times (0.5 seconds OFF + 0.5 seconds ON per flash), then remains ON for 2 seconds before repeating the cycle.

Alarm Function	LED Status	Alarm Code	Description
Motor Overcurrent	Red LED flashes once	10	Motor phase current is too high or driver malfunction
Motor Phase Loss	Red LED flashes twice	11	Motor not connected
Undervoltage	Red LED flashes 4 times	13	Power input < 15V
Overvoltage	Red LED flashes 3 times	14	Power input > 45V
Position Deviation Excess	Red LED flashes 5 times	25	Position error exceeds set threshold
Overload	Red LED flashes 5 times	26	Load exceeds 1.5× rated for more than 2 seconds
Other Alarms	Other	Other	—

5. Power Supply

5.1 Voltage

The allowable operating voltage range for the driver is DC 24–36V, and it is recommended to use a regulated DC 24–36V power supply.

A voltage regulation capacitor can absorb current spikes on the power line and prevent false protection triggers in the driver.

When using the driver at the lower end of the voltage range, it is recommended to connect a large electrolytic capacitor in parallel at the power input to prevent undervoltage alarms caused by unstable supply voltage.

Use of the driver at supply voltages below 18V is not recommended, as operation may become unstable.

If the driver is powered by a regulated power supply and the voltage is close to 45V, it is recommended to implement voltage clamping at the power input to prevent overvoltage alarms and driver shutdown in case the input exceeds 45V.

When using a non-regulated power supply, ensure that the no-load output voltage does not exceed 32VDC.

Non-regulated power supplies are rated at full-load current. When the load is light (e.g., the motor is idle), the actual voltage can reach up to 1.4 times the rated voltage.

To ensure stable and quiet motor operation, a lower voltage is recommended.

5.2 Current

The maximum power supply current should be the sum of the currents for both motor phases.

In practice, the required current depends on factors such as motor model, supply voltage, rotational speed, and load conditions

However, the actual power supply current is usually much lower than the calculated maximum because the driver uses a switching amplifier, which converts high-voltage, low-current signals into low-voltage, high-current signals through power switching.

Since the rated voltage of the motor windings is typically low, the higher the driver's supply voltage is above the motor's rated voltage, the lower the input current required by the driver.

5.3 Regenerative Current

When the motor decelerates, it behaves like a generator, converting the load's kinetic energy into electrical energy.

Some of this energy is consumed by the driver and the motor itself.

If your application involves heavy loads running at high speeds, a significant amount of kinetic energy will be converted to electricity.

Linear power supplies typically include large capacitors that can absorb this regenerated energy without damaging the system.

However, switching power supplies may shut down under overvoltage conditions, and the excess energy is fed back to the driver.

This can lead to driver overvoltage alarms or even driver damage in severe cases.

6. High-Speed Pulse Input Signals

This driver supports 2 channels of high-speed pulse input signals, which can be configured as pulse and direction signals.

The maximum pulse frequency is 500 kHz with a 50% duty cycle.

The minimum pulse and direction signal width is 1µs.

6.1 Pulse Signal: PUL

The driver port includes a built-in opto-isolator and accepts 5VDC single-ended signals.

A transition from OFF to ON is interpreted as a valid pulse edge.

For common-anode input, a LOW level is considered valid, prompting the driver to execute one motor step according to the timing logic.

For proper operation, the duty cycle of the valid pulse signal should be less than 50%.

To ensure reliable pulse detection, the effective level duration of each pulse should not be less than 1 µs.

The signal response frequency of the micro stepping driver is 500 kHz; input frequencies exceeding this may cause incorrect responses.

6.2 Direction Signal: DIR

The direction signal input also accepts 5VDC single-ended signals. The internal opto-isolator interprets ON/OFF states as the two motor rotation directions. Changing the direction signal alters the motor's rotation direction. If the DIR terminal is left floating, it is interpreted as a high level.

Important

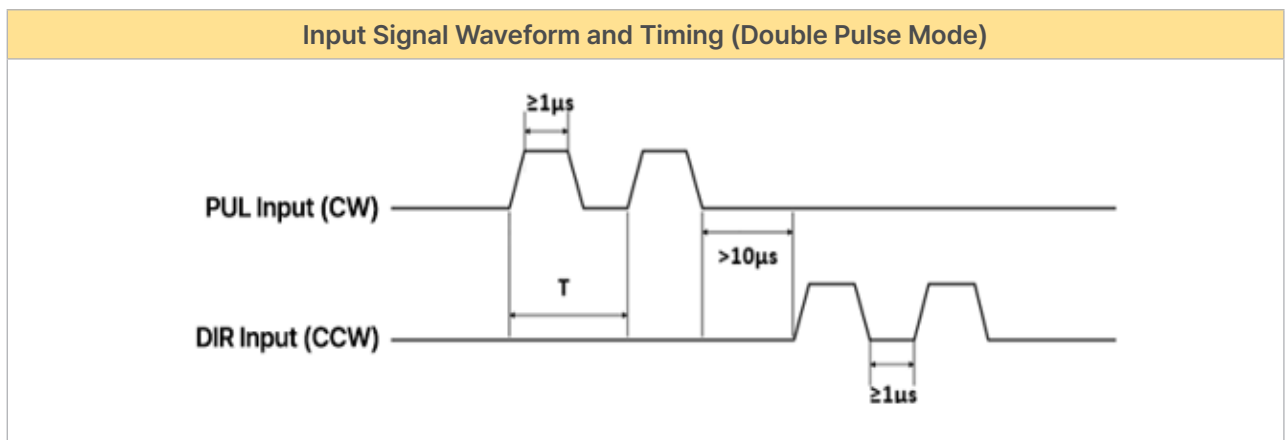
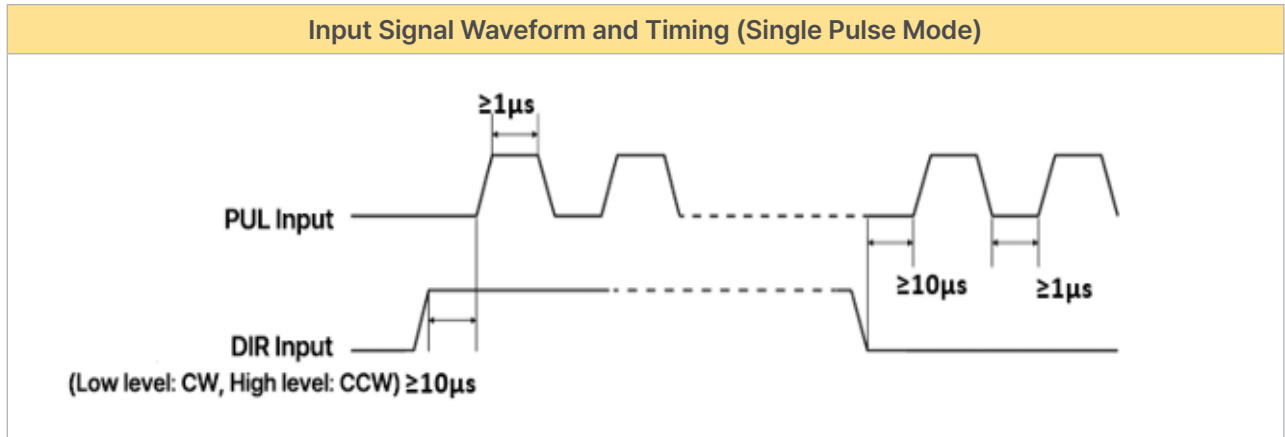
To ensure proper operation, the direction signal must be established at least 10 µs before the pulse signal to prevent missteps.

When changing direction, ensure the motor has fully decelerated and reached stop frequency before switching.

The direction signal must be changed after the last pulse of the previous direction and before the first pulse of the new direction.

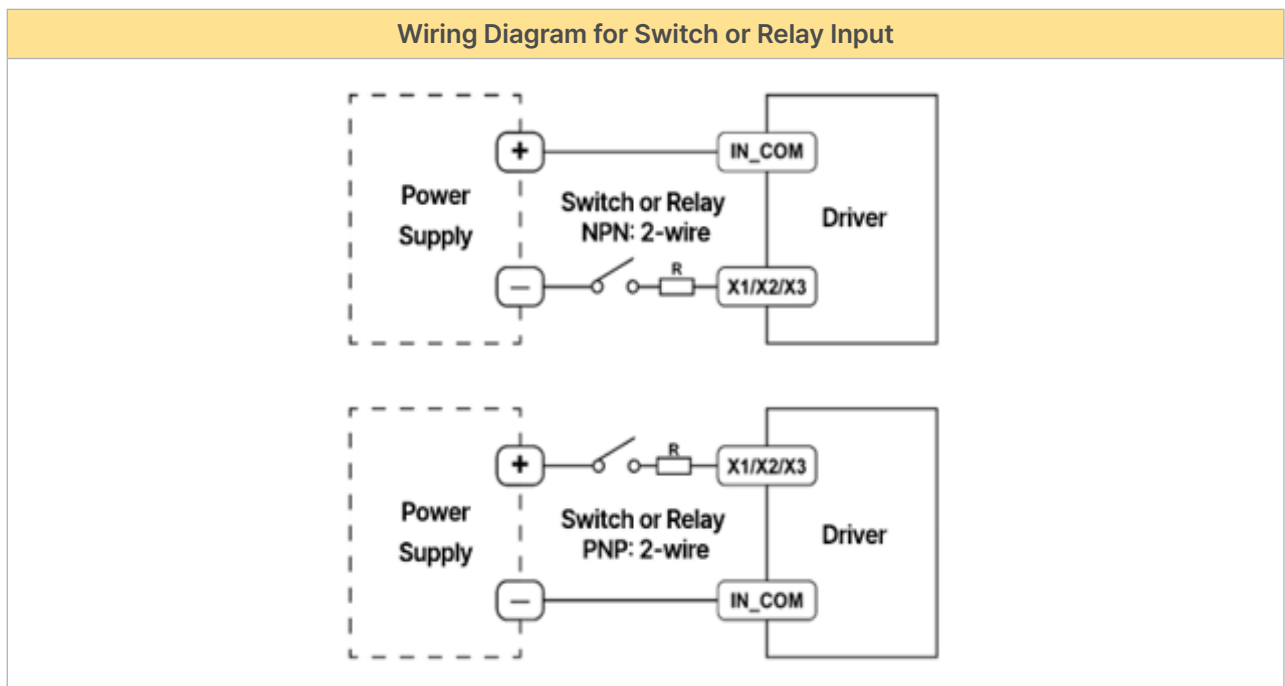
If no change in direction is needed, the DIR input can be left floating.

6.3 Pulse/Direction Input Timing Diagram

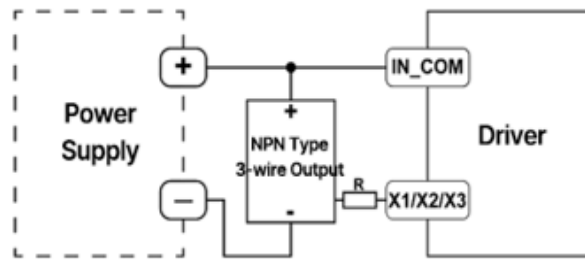


7. Typical Signal Wiring

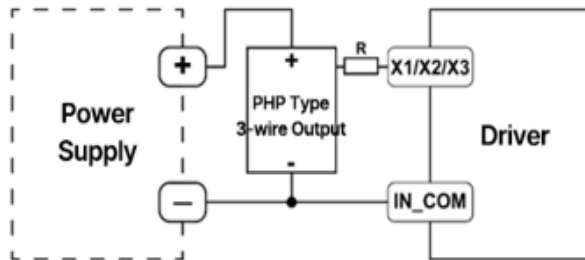
7.1 Input Circuit Diagram



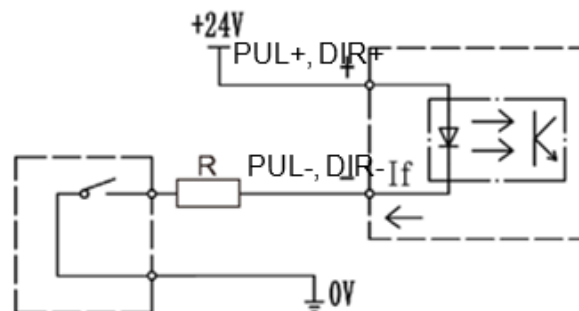
Driver NPN Input Diagram



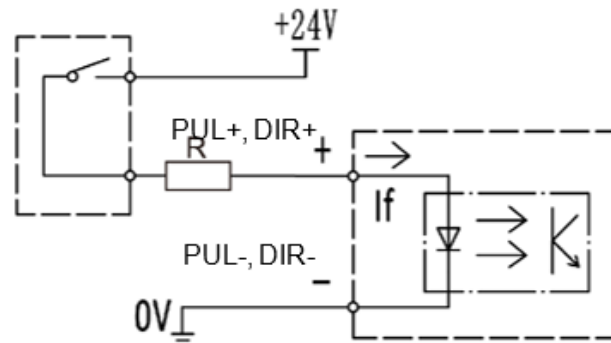
Driver PNP Input Diagram



Driver Common Anode Input Diagram



Driver Common Cathode Input Diagram



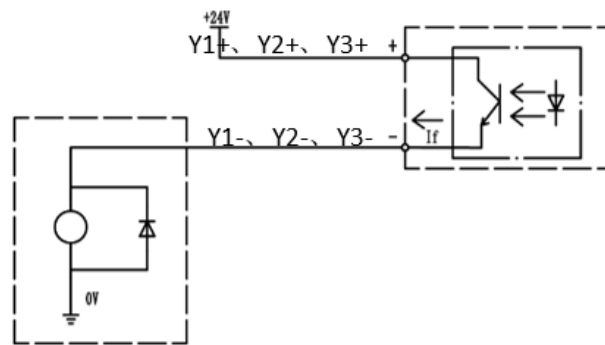
Notes VCC 3.5–5 VDC → R = 0Ω VCC 12 VDC → R = 1 kΩ VCC 24 VDC → R = 2.2 kΩ



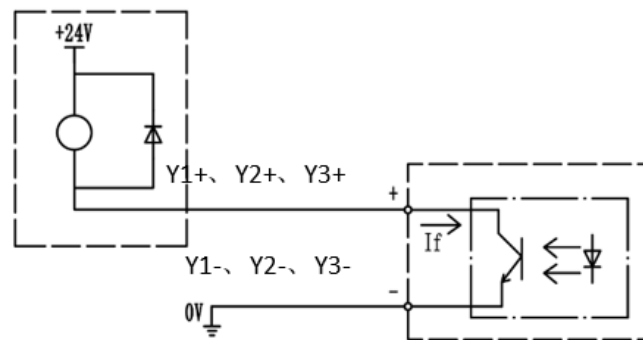
Notes Power supply 3.5–5 VDC, conduction current 5–8 mA

7.2 Output Circuit Diagram

Driver PNP Output Diagram



Driver NPN Output Diagram

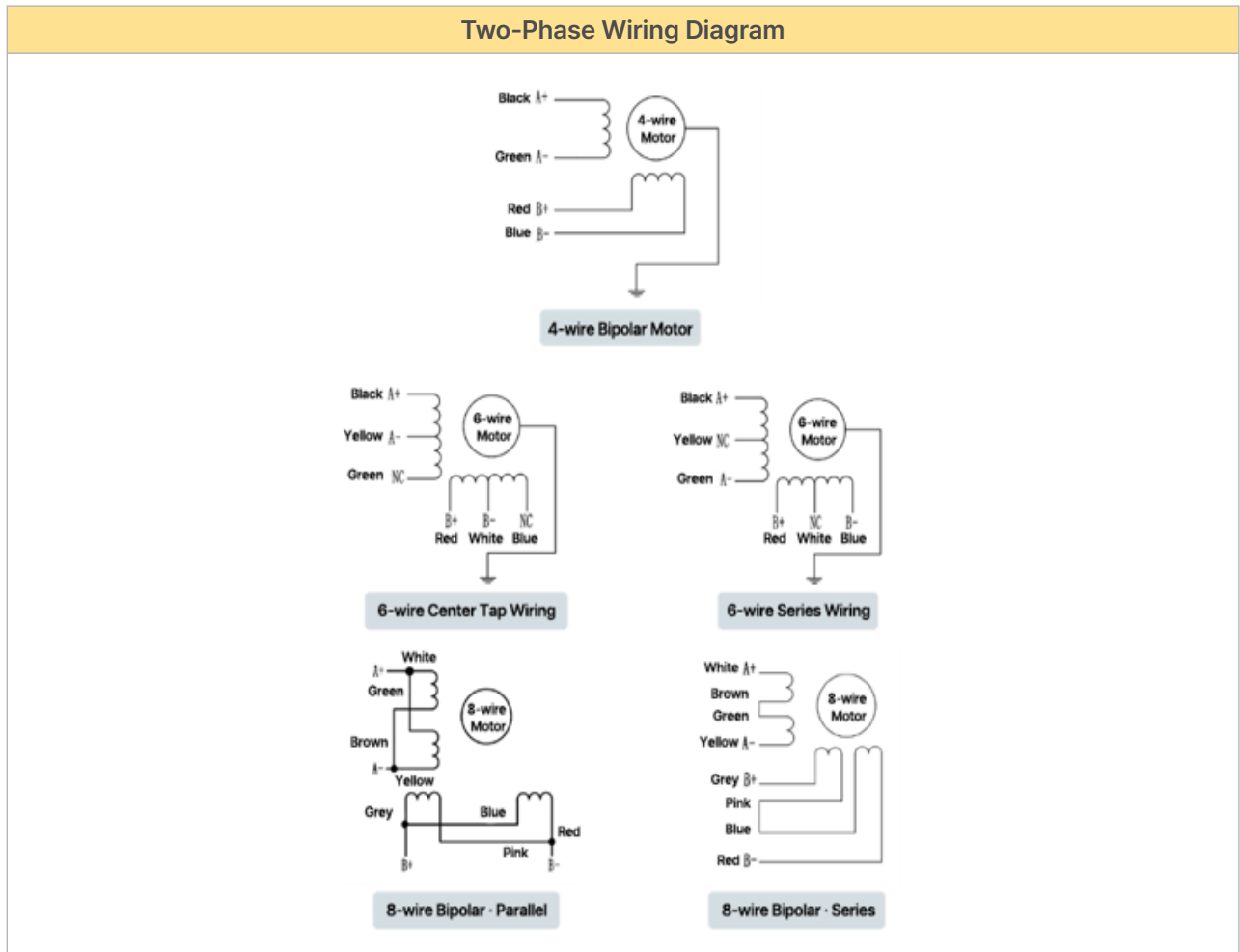


Notes

Do not connect the output terminal to DC voltage over 30V.
The output current must not exceed 10mA

8. Motor Connection

8.1 Two-Phase Motor Connection



A 4-wire motor can only be connected using one method.

A 6-wire motor can be connected in two ways: full coil or half coil. In full coil mode, the motor provides greater torque at low speeds, but it cannot run as fast as in half coil mode.

When running in full coil mode, the motor must be operated at 30% less current compared to half coil mode to prevent overheating.

An 8-wire motor can be connected in two ways: series or parallel.

Series connection provides greater torque at low speeds, but torque decreases at high speeds. When using series mode, the motor must be operated at 50% of the parallel current to prevent overheating.

Phases are relative, but windings from different phases must not be connected to the same driver phase terminals (i.e., A+ and A- form one phase, B+ and B- form the other).

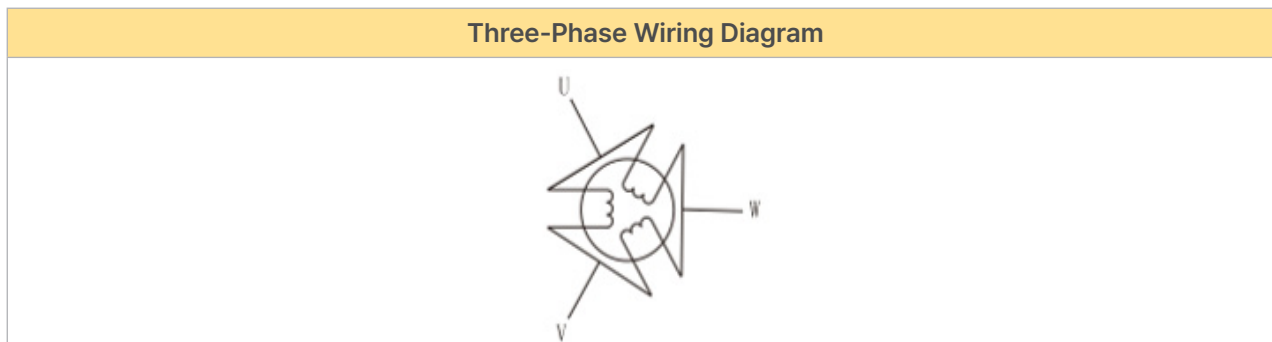
If the motor rotates in the opposite direction from what is desired, simply swap the A+ and A- connections.

To determine whether an 8-wire stepper motor is wired correctly in series or parallel mode: Manually rotate the motor shaft without connecting it to the driver.

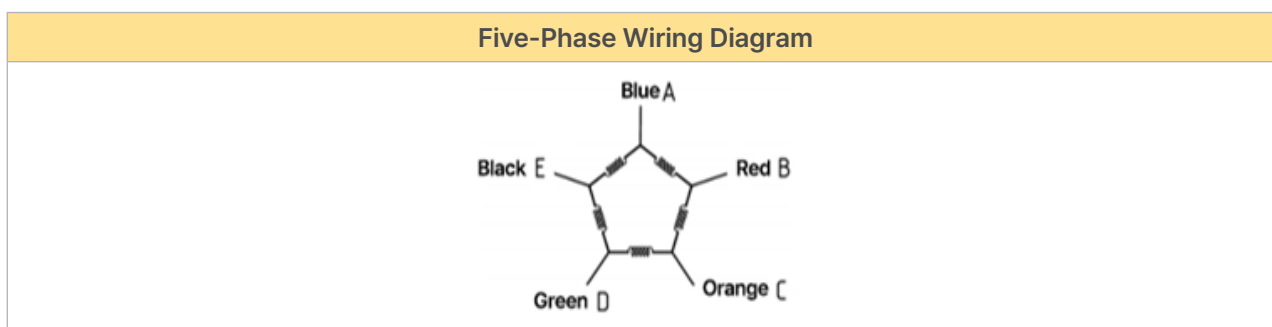
If the shaft rotates smoothly and evenly, the wiring is correct.

If there is significant resistance, uneven motion, or noise, the wiring is likely incorrect.

8.2 Three-Phase Motor Connection



8.3 Five-Phase Motor Connection



Notes

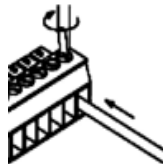
- Please connect the motor correctly; incorrect wiring may result in damage to the driver.
- This driver is compatible with five-phase hybrid stepper motors, as well as two-phase and three-phase stepper motors.
- If changing the number of motor phases during use, power must be turned off and restarted.
- All current values mentioned in this manual refer to phase current. The five-phase motor wiring described here applies only to ring connections; for other five-phase wiring methods, refer to actual motor specifications.
- The wire colors shown in the above motor connection diagrams are for general reference only.
- For exact wiring, please consult the motor's datasheet or specification manual.

9. Wiring Requirements

9.1 Wiring Method

After stripping the wire, insert it into the terminal until it touches the terminal block. Then tighten the screw clockwise to secure the wire.

Wiring Diagram



Notes

- Please connect the power supply correctly, paying attention to polarity.
- Do not plug or unplug while power is on. Before powering on, confirm that the motor and power connectors are properly installed.
- When stripping the wire, do not pre-tin the wire ends with solder, as this may prevent proper connection.
- During wiring, avoid twisting the wire strands together, and ensure that no bare strands are exposed to prevent short circuits.
- Connect the wire strands directly to the terminals. Do not solder, as vibration may cause wire breakage over time.
- Do not insert tinned (soldered) wire ends into the terminals, as increased contact resistance may cause overheating and terminal damage.
- Do not leave wire ends exposed outside the terminals, to prevent accidental short circuits and driver damage.
- Never plug or unplug the high-power (motor or power) terminals while the driver is powered on.
- When power is on, a large current continues to flow through the motor coils even when stopped.
- Unplugging under load may generate a large inductive voltage surge, potentially damaging the driver.
- Use proper tools to securely tighten the terminal screws.
- After wiring, do not apply tension or stress to the cables.
- To avoid signal interference, use shielded cables for control signals.
- The shielding layer should be connected to ground.
- Unless otherwise specified, ground the shield at only one end — typically at the controller (host) side, and leave the driver end floating.
- In a single machine, all grounds should connect at one single point.
- If the ground is not a true earth ground, interference may worsen — in such cases, do not connect the shield.
- If multiple drivers share one power supply, connect them in parallel directly from the power supply.
- Do not daisy-chain power through one driver to another.
- To verify if a stepper motor is wired correctly in series or parallel, try manually rotating the motor shaft without connecting the driver.
- If the shaft turns smoothly and evenly, the wiring is likely correct.
- If you feel strong resistance, uneven movement, or hear noise, the wiring is likely incorrect.

10. Control Parameters

	Notes	For unofficial firmware versions, some communication parameters are fixed and not configurable.
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	Notes	Except for the parameters marked in yellow, all other parameters are automatically saved to EEPROM. However, note that the EEPROM has a limited write lifespan — maximum 1,000,000 writes.
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10.1 Controller Basic Status

Addr.	Word	Attr.	Item	Description						Unit / Range
0100	1	RO	Motor Current	Real-time motor current						0.1%A
0101	1	RO	Input Voltage	Real-time input voltage						1%V
0104	2	RO	Resolution Setting	Set resolution value						ppr
0106	1	RO	Pulse Mode	1 = Pulse+Direction, 2 = CW/CCW mode						1-2
0108	1	RO	Alarm Code	Error code, see 5.2; "0" means no error						-
0109	1	RO	Operation Status	Drive running status, see 5.1						-
0110	1	RO	Hardware Version	Drive hardware version						-
0111	1	RO	Software Version	Drive software version						-
0117	2	RO	Target Position	Commanded position						pulse
0119	1	RO	Actual Speed Display	-						0.01rps
0126	1	RO	Actual Position	Real-time Operating Position						pulse
0174	1	RO	IO Multi-step Run Trigger	-						-
0176	1	RO	Multi-step Error Code	-						-
0178	1	RO	Multi-step Run No.	-						-
0135	1	RO	Input Status	Date bits	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
				Input port	X3	X2	X1	DIR (X5)	PUL (X4)	
0136	1	RO	Output Status	Date bits		Bit 2	Bit 1	Bit 0		
				Input port		Y3	Y2	Y1		

10.2 Basic settings (Category 01)

name	addr	min	max	_default	description
Direction switch	201	0	3	0	Direction settings: 0: Default 1: Reverse running direction 2: Reverse encoder direction 3: Reverse running direction and encoder direction. *After changing the parameters, the power must have to turn off and on.

Pulse edge	202	0	1	0	Pulse edge setting, pulse mode only: 0: Falling edge 1: Rising edge.
Holding current proportion	213	10	100	50	Stop current percentage setting. Open-loop mode only.
Smooth filter	224	0	700	50	The smaller the value, the smoother the operation and the higher the delay time.
Pulse filter	234	1	15	4	The filter coefficient of the input pulse. The higher the value, the lower the pulse frequency response. Pulse mode only.
Current setting	241	100	6500	1000	Current setting (mA).
Microstep setting	242	200	102400	1000	Microstep setting (ppr).
Pulse mode	244	1	2	1	Pulse mode, pulse mode only: 1: Pulse + Dir 2: Pulse + Pulse.
Holding current time	245	1	30000	200	Delay time (ms) for motor to enter stop state after stop running. Open-loop mode only.
Control mode	296	0	6	0	Control mode: 0: Pulse control 1: Integrate control 2: Not Supported 3: Not Supported 4: Not Supported 5: Torque control 6: Position-Torque control *After changing the parameters, the power must have to turn off and on.
Station number	298	1	250	1	Station NO. settings. Reconnect is needed after modification.
Baud rate	299	4800	115200	19200	Baud rate setting. Take effect after the driver restart. Settable value: 4800, 9600, 14400, 19200, 38400, 57600, 115200.

10.3 Motor settings (Category 02)

name	addr	min	max	_default	description
Current Kp	200	50	20000	800	Current loop Kp.
Current Ki	215	50	20000	800	Current loop Ki.
Motor Type	218	2	5	2	Motor Type: 2: Two-phase 3: Three-phase 5: Five-phase.
Current Kp Max	222	50	20000	800	Current loop Kp maximum.
Current boost	225	1000	2000	1000	Current boost. Open-loop mode only.
Current Ki Max	228	50	20000	800	Current loop Ki maximum.
Pole pairs of a motor	232	1	200	50	Pole pairs of a motor. *After changing the parameters, the power must have to turn off and on.
Anti resonance	277	0	500	100	Anti-resonance coefficient. Open-loop mode only.

Automatic parameter detection	295	0	1	0	Auto motor parameter detection setting: 0: Off 1: On.
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10.4 Closed-loop settings (Category 03)

name	addr	min	max	_default	description
Motor mode	217	0	2	0	Motor mode: 0: Open-loop 1: Closed-loop. <i>*After changing the parameters, the power must have to turn off and on.</i>
Encoder resolution	246	200	65535	4000	Resolution (ppr) = number of encoder lines (cpr) x4. <i>*After changing the parameters, the power must have to turn off and on.</i>
In position range	247	1	1000	10	In-position range with encoder resolution. Closed-loop mode only.
Flux weakening limit	248	0	1000	500	Flux weakening limit. Closed-loop mode only.
Flux weakening coefficient 1	249	0	1000	1	Flux weakening coefficient 1. Closed-loop mode only.
Flux weakening coefficient 2	250	0	1000	5	Flux weakening coefficient 2. Closed-loop mode only.
Speed loop Kp	251	0	30000	1000	Speed loop Kp. Closed-loop mode only.
Speed loop Ki	252	0	30000	50	Speed loop Ki. Closed-loop mode only.
Speed loop Kd	253	0	30000	0	Speed loop Kd. Closed-loop mode only.
Position loop Kp	255	0	30000	600	Position loop Kp. Closed-loop mode only.
Position loop Ki	256	0	30000	0	Position loop Ki. Closed-loop mode only.
Position loop Kd	257	0	30000	0	Position loop Kd. Closed-loop mode only.
Position error threshold	258	0	30000	1000	Position error threshold. Closed-loop mode only.
Current loop Kd filter	264	0	1000	50	Current loop Kd filter coefficient. Closed-loop mode only.
Kd filter gain	265	0	1000	50	Current loop Kd gain. Closed-loop mode only.
Current filter	266	0	1000	50	Current filter. Closed-loop mode only.

10.5 Motion settings (Category 04)

name	addr	min	max	_default	description
Start velocity	301	1	1000	100	Start velocity, invalid in pulse control mode. Unit: 0.01 rps.
Stop velocity	302	1	1000	100	Stop velocity, invalid in pulse control mode. Unit: 0.01 rps.
Acceleration	303	5	10000	50	Acceleration, invalid in pulse control mode. Unit: rps ² .
Deceleration	304	5	10000	50	Deceleration, invalid in pulse control mode. Unit: rps ² .

Homing mode	305	0	17	0	Homing mode, invalid in pulse control mode: 0: Forward to origin 1: Backward to origin 2: Forward to limit+ 3: Backward to limit- 4: Not Supported 5: Not Supported 6: Forward torque detection 7: Backward torque detection 8: Forward to Z 9: Backward to Z 10: Forward torque detection with Z 11: Backward torque detection with Z 12: Forward to origin, then forward to Z 13: Forward to origin, then backward to Z 14: Backward to origin, then forward to Z 15: Backward to origin, then backward to Z 16: Forward to Limit+, then backward to Z 17: Backward to Limit-, then forward to Z.
Velocity for position mode	306	1	5000	1000	The maximum velocity for position mode, invalid in pulse control mode. Unit: 0.01 rps.
Velocity for velocity mode	307	-5000	5000	1000	The maximum velocity for velocity mode, invalid in pulse control mode. Unit: 0.01 rps.
Velocity for JOG mode	308	1	5000	100	The maximum velocity for JOG mode, invalid in pulse control mode. Unit: 0.01 rps.
Homing approach velocity	309	1	5000	200	Approach velocity for homing, invalid in pulse control mode. Unit: 0.01 rps.
Homing creep velocity	310	1	5000	100	Creep velocity for homing, invalid in pulse control mode. Unit: 0.01 rps.
Homing offset	311	-2000000000	2000000000	0	The homing offset, invalid in pulse control mode.
Soft limit+	317	-2000000000	2000000000	2000000000	Soft limit+ setting, invalid in pulse control mode.
Soft limit-	319	-2000000000	2000000000	-2000000000	Soft limit- setting, invalid in pulse control mode.
Memory switch	324	0	32	0	Memory switch setting, invalid in pulse control mode: bit0: Disable or enable Soft limit+ bit1: Disable or enable Soft limit- bit3-4: 00: Program number is set by addr328 01: Program number is set by signal program select bitx IO 02: Program number is set by combined program select bitx IO, and triggered by program run IO. *After changing the parameters, the power must have to turn off and on.
Max acceleration	325	5	10000	1000	Maximum acceleration, invalid in pulse control mode. Unit: rps ² .

Positive region	329	-2000000000	2000000000	2000000000	The position of the positive region, invalid in pulse control mode.
Negative region	331	-2000000000	2000000000	-2000000000	The position of the negative region, invalid in pulse control mode.

10.6 Input settings (Category 05)

name	addr	min	max	_default	description
IN1 function	400	0	30	0	0: No function 1: Absolute position run, invalid in pulse control mode 2: Relative position run, invalid in pulse control mode 3: Velocity run, invalid in pulse control mode 4: JOG+, invalid in pulse control mode 5: JOG-, invalid in pulse control mode 6: Stop.Slow down and stop, invalid in pulse control mode 7: E-Stop.Quick stop 8: Set position trigger, invalid in pulse control mode;; current position is set by addr-321 9: Limit+ signal 10: Limit- signal 11: Origin signal 12: Homing run, invalid in pulse control mode 13: Alarm clear 14: Not Supported 15: Not Supported 16: Program run, invalid in pulse control mode 17: Program suspend, invalid in pulse control mode 18: Program stop, invalid in pulse control mode 19: Not Supported 20: Servo ON/OFF control. 21: Move forward for a distance, invalid in pulse control mode 22: Move backward for a distance, invalid in pulse control mode 23: Not Supported 24: Not Supported 25: Program select bit0, invalid in pulse control mode 26: Program select bit1, invalid in pulse control mode 27: Program select bit2, invalid in pulse control mode 28: Program select bit3, invalid in pulse control mode 29: Program select bit4, invalid in pulse control mode.
IN2 function	401	0	30	0	The setting content is the same as IN1 (default value: 0).
IN3 function	402	0	30	0	The setting content is the same as IN1 (default value: 0).
IN4 function selection (Pules port)	403	0	30	0	The setting content is the same as IN1 (default value: 0).
IN5 function selection (DIR port)	404	0	30	0	The setting content is the same as IN1 (default value: 0).
Input port logic	429	0	65535	0	Input port logic, range:0~65535, corresponding IN[7:1]: 0000000 ~ 1111111.

10.7 Output settings (Category 06)

name	addr	min	max	_default	description
OUT1 function	420	100	110	100	100:Controllable output,controlled by addr 428 101:Alarm out,no output when alarm occurs 102:In-position indication 103:Servo ON/OFF indication, no output when servo ON 104:Running status 105:Torque reached, invalid in pulse control mode 106:Instruction complete, invalid in pulse control mode 107:In negative region, invalid in pulse control mode 108:In center region, invalid in pulse control mode 109:In positive region, invalid in pulse control mode.
OUT2 function	421	100	110	100	The setting content is the same as OUT1 (default value: 100).
OUT3 function	422	100	110	100	The setting content is the same as OUT1 (default value: 100).
Controllable output set	428	0	255	0	The controllable output port set, range:0~15, corresponding OUT[4:1]: 0000 ~ 1111.
Output port logic	430	0	15	0	Output port logic, range:0~15, corresponding OUT[4:1]: 0000 ~ 1111.

10.8 Torque settings (Category 07)

name	addr	min	max	_default	description
Forward torque	283	5	120	50	Percentage of torque value in the forward direction.
Backward torque	284	5	120	50	Percentage of torque value in the backward direction.
Torque of homing mode	285	5	120	50	Percentage of torque value in the homing mode.
Torque detection time	286	0	10000	80	Torque detection filter time. Unit: ms.
Velocity of torque mode	287	-5000	5000	50	Max velocity of torque mode. Unit: 0.01 rps.



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