




VER 1.0

Technical Manual

DS-OLS10-FSC



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1. Features



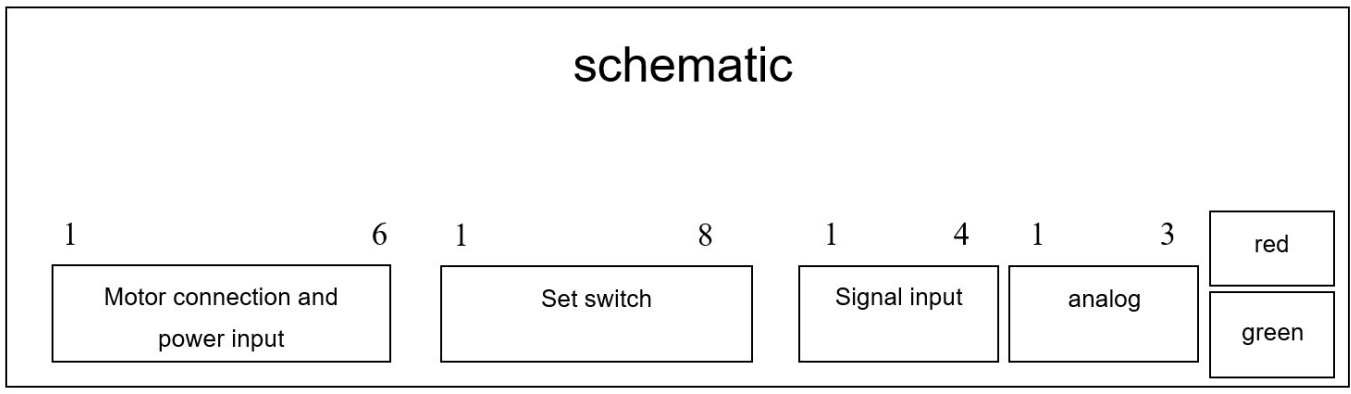
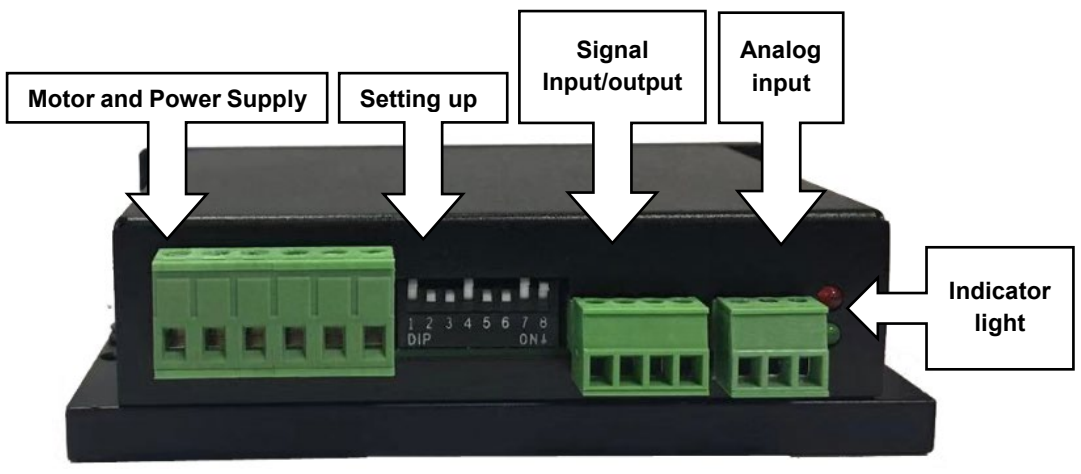
- Input power: DC 24V-48V
- Maximum output current (peak) : 4.5A
- Control mode: constant speed, analog quantity
- Optoelectronic isolation input function, 5-24VDC compatible input
- Motor short circuit protection function
- Compact design, low noise, low vibration

2. Technical Parameters



Drive model		DS-OLS10-FSC
Applied motor		Adapted to two-phase hybrid stepping motor, DS-OLS10-FSC Maximum fit 4.5A
Power supply		24 - 48V DC
Output current		DS-OLS10-FSC : 1.0A-4.5A/ phase (Peak value)
Drive method		Full-bridge bi-polar PWM driver
Input signal	IN1 (start) signal	Optocoupler input voltage H = 3.5-26V, L = 0-0.8V Conducting current 6-15mA
	In2(direction) signal	
	IN3 (speed switch) signal	
Analog adjustment		Connected with 10K potentiometer or 0~10V analog adjustment
Dimension		118 × 78 × 34mm
Weight		About 300 g
Operation Environment	Precaution	Avoid dust, oil mist and corrosive gases
	Humidity	< 85 % RH, No condensation
	Temperature	0°C - +40°C
	Cooling	Installed in a ventilated environment

3. Schematic and Interface Definition



1. Motor connection and power input (arranged from left to right as shown in the diagram)

Pin1 --V+, Pin2 --V-, Pin3 --A+, Pin4 --A-, Pin 5 --B+, Pin 6 --B -

2. Signal input (arranged from left to right as shown in the diagram)

Pulse control mode:

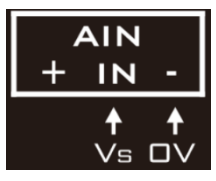
Pin1--COM, Pin2--IN1(start), Pin3-- IN2 (direction), Pin4-- IN3 (speed switch)

3. Analog input (arranged from left to right according to the diagram)

Pin 1--AIN+, Pin 2--IN, Pin 3--AIN-

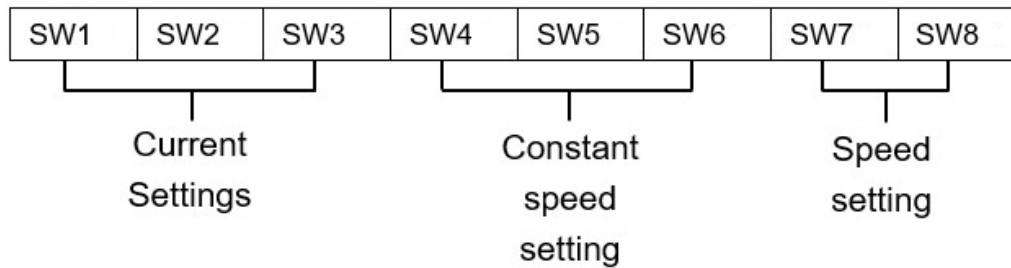
A. Connect 10K potentiometer

B. connect 0~10V analog amount





4. Setting Switch



Current settings

DIP switch			Phase Current
SW1	SW2	SW3	
ON	ON	ON	1.0A
OFF	ON	ON	1.5A
ON	OFF	ON	2.0A
OFF	OFF	ON	2.5A
ON	ON	OFF	3.0A
OFF	ON	OFF	3.5A
ON	OFF	OFF	4.0A
OFF	OFF	OFF	4.5A

Constant speed setting

DIP switch			SPD Revolutions per minute
SW4	SW5	SW6	
ON	ON	ON	15
ON	ON	OFF	30
ON	OFF	ON	45
ON	OFF	OFF	60
OFF	ON	ON	75
OFF	ON	OFF	90
OFF	OFF	ON	105
OFF	OFF	OFF	120

Analog quantity maximum speed setting

SW7	SW8	Analog maximum speed
ON	ON	300 rpm
ON	OFF	600 rpm
OFF	ON	900 rpm
OFF	OFF	1500rpm

Model specification

Analog speed regulation mode: according to the potentiometer input speed regulation, IO control the start, stop, running direction and switching speed (switching: the speed fixed by the general dialing of the optocoupler guide, and the speed controlled by the analogue of the optocoupler cutoff)

Indicator function

This product has two red and green LED indicator to show the status:

Indicator status	State	Instructions
Green Light flashing	Drive is working properly	
1Green+4Red	Overvoltage power input	The supply voltage is greater than 48VDC
1Green+5Red	Driver overcurrent	Short circuit of motor winding
1Green+6red	Motor winding open circuit	Motor wiring is not connected properly or wrongly
2Green+3Red	Internal voltage error	Power supply is too low
2Green+4Red	Power input undervoltage	Supply voltage less than 24VDC
2Green+5Red	Other fault	Other fault



5. Power Supply

Voltage

When the chopper driver works, it constantly changes the size and direction of the voltage at the end of the motor winding and detects the current to obtain the accurate phase current. If both high efficiency and low noise are to be ensured, the power supply voltage of the driver shall be at least 5 times the rated phase voltage of the motor (i.e., the rated phase current of the motor \times phase resistance).

- If you need the motor for better high-speed performance, you need to increase the drive supply voltage.
- If a regulated power supply is used, the supply voltage shall not exceed 48V.
- If unregulated power supply is used, the required voltage shall not exceed 34V. Because the rated current of the unregulated power supply is full load current; When the load is very light, for example when the motor is not running, the actual voltage can be up to 1.4 times the rated voltage of the supply. For smooth and quiet motor operation, choose low voltage.

Current

The maximum supply current shall be the sum of the two phases. Typically, the current you need depends on the type of motor, voltage, speed, and load conditions. The actual power supply current value is much lower than this maximum current value, because the driver uses a switching amplifier to convert the high voltage low current into low voltage high current, the more the power supply voltage exceeds the motor voltage, the less power supply current is needed. When the motor works with a 48V power supply, the output current of the power supply is half of the output current of the 24V power supply.

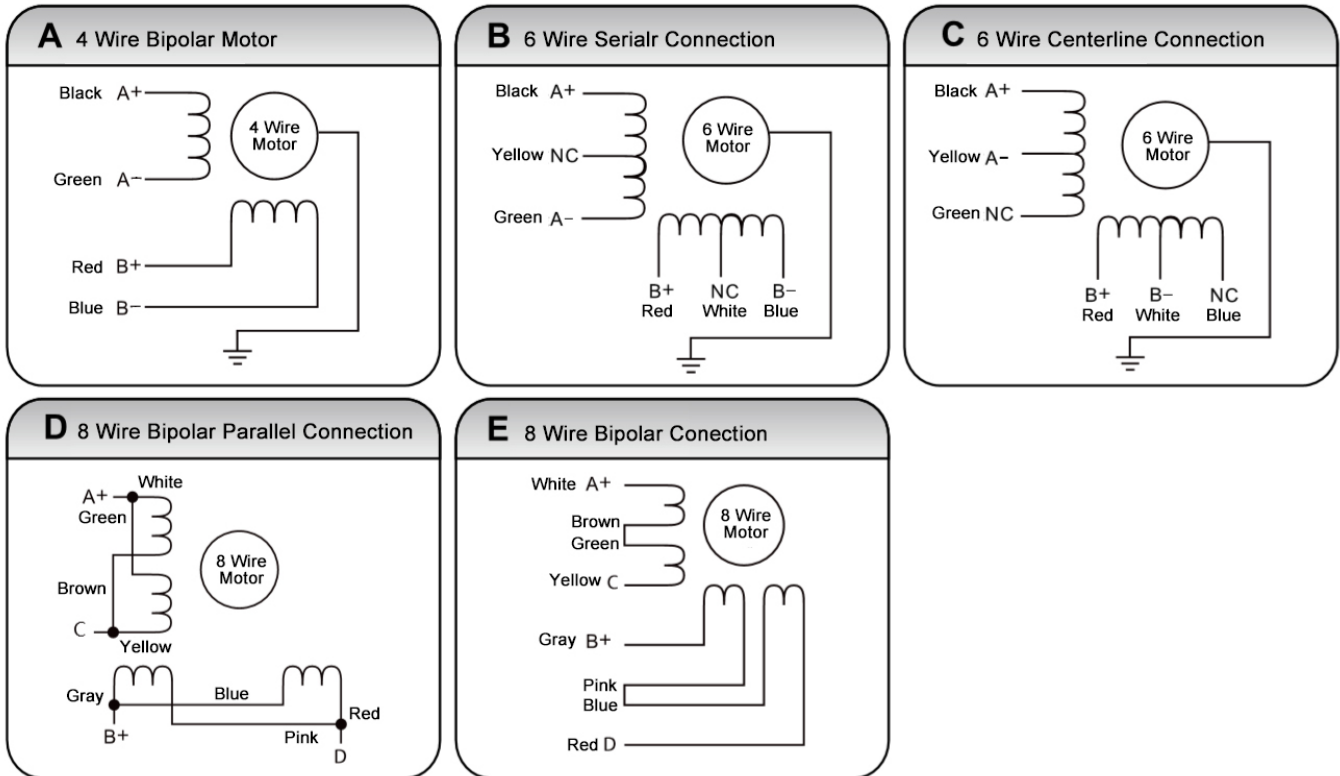
6. Motor Connection



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Warning

Before connecting the motor to the driver, make sure the power is turned off. Verify that unused motor leads are not short-circuited with other objects. Do not disconnect the motor while the drive is energized. Do not connect the motor lead to the ground or to the power supply.



- 1) The four-wire motor can only be connected in one way.
- 2) The six-wire motor can be connected in two ways: full group and half group. In full assembly mode, the motor has more torque at low speeds, but cannot run as fast as in half assembly. For full group operation, the motor needs to operate at less than 30% of the current in half group mode to avoid overheating.
- 3) The eight-wire motor can be connected in two ways: series and parallel. Series mode has higher torque at low speeds and lower torque at high speeds. When running in series, the motor needs to run at 50% of the current in parallel mode to avoid overheating

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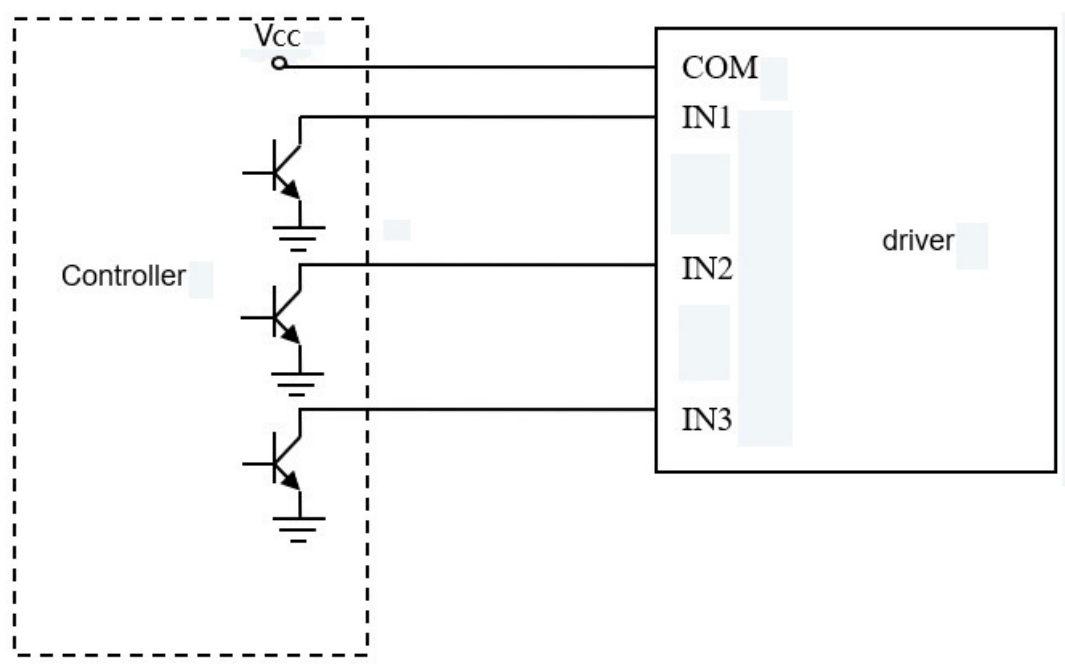
Notes

- 1) The corresponding color of different motor leads is different, and the motor information description shall prevail when using.
- 2) The windings of different phases of the motor cannot be connected to the terminals of the same phase of the driver (A+ and A- are one phase, and B+ and B- are the other phase). If the motor steering is different from the expected steering, only the positions of A+ and A- can be exchanged.
- 3) This driver can only drive two-phase hybrid stepper motor, cannot drive three-phase and five-phase stepper motor.

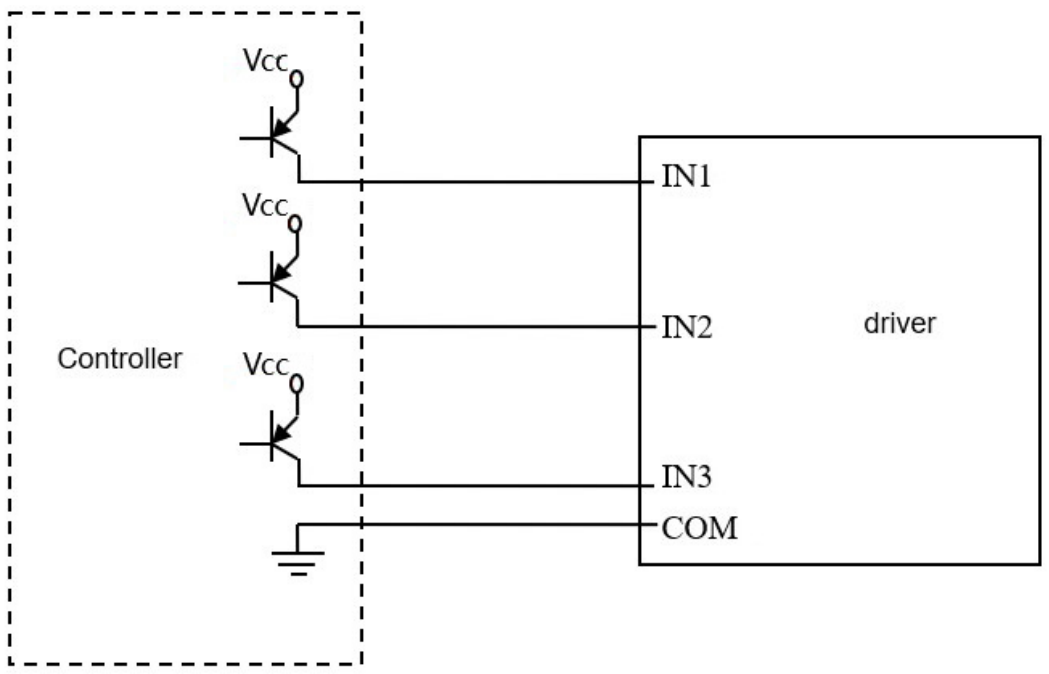
7. Typical Connection Signal



Common anode connection



Common cathode connection

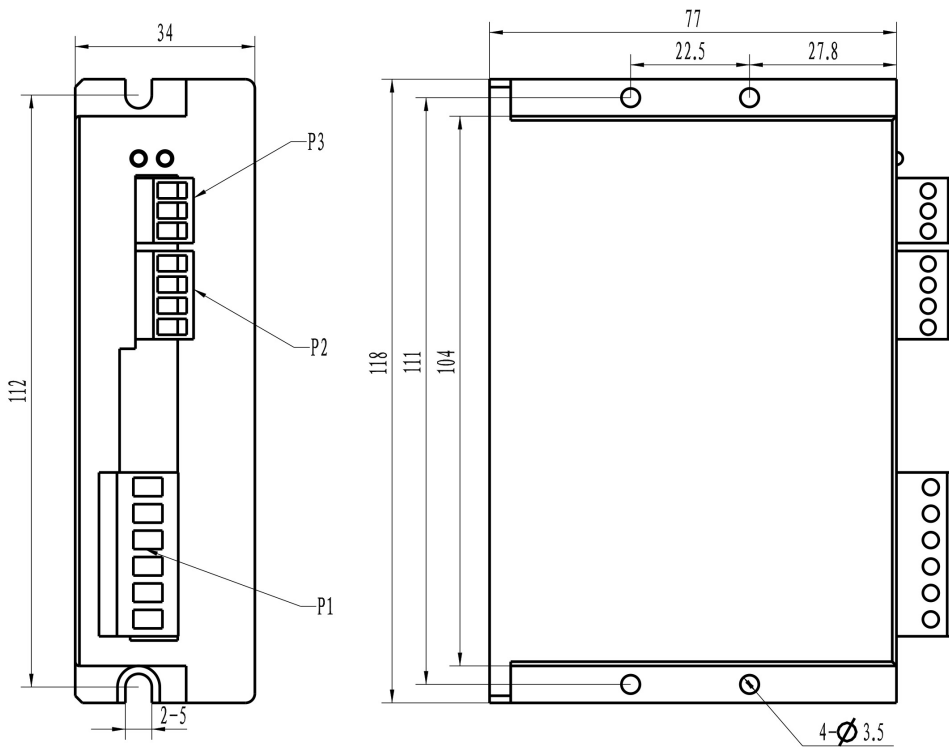


8. Wiring Requirements



- 1) In order to prevent the interference of the driver, it is recommended to use the shielded cable for the control signal, and the shielding layer is short connected with the ground wire. Except for special requirements, the shielded wire of the control signal cable is single-ended grounded: the upper computer end of the shielded wire is grounded, and the driver end of the shielded wire is suspended. It is only allowed to be grounded at the same point in the same machine. If it is not the real grounding wire, the interference may be serious. At this time, the shielding layer is not connected.
- 2) Pulse and direction signal lines and motor lines are not allowed to be bundled together side by side. It is better to be separated at least 10cm apart, otherwise motor noise will easily interfere with pulse direction signals and cause motor positioning errors and system instability.
- 3) If a power supply is used for multiple drives, parallel connection should be adopted at the power supply. Chain connection from one to another is not allowed.
- 4) It is strictly prohibited to plug and unplug the strong electric (motor and power) terminals of the driver. When the electric motor stops, there is still a large current flowing through the coil. The plug and unplug the strong electric (motor and power) terminals will cause a huge instantaneous induced electromotive force to burn out the driver.
- 5) It is strictly prohibited to add tin to the wire head and connect to the terminal, otherwise the terminal may be damaged by overheating due to the increase of contact resistance.
- 6) The wiring head should not be exposed outside the terminal to prevent accidental short circuit from damaging the drive.

9. Installation Dimensions (mm)



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DS-OLS10-FSC
Input Voltage: 24~48VDC
Output Current: 4.5A

CURRENT			Powered By SDP
SW1	SW2	SW3	PEAK(A)
ON	ON	ON	1.0A
ON	ON	OFF	1.5A
ON	OFF	ON	2.0A
ON	OFF	OFF	2.5A
OFF	ON	ON	3.0A
OFF	ON	OFF	3.5A
OFF	OFF	ON	4.0A
OFF	OFF	OFF	4.5A

SW4	SW5	SW6	SPD(RPM)
ON	ON	ON	15
ON	ON	OFF	30
ON	OFF	ON	45
ON	OFF	OFF	60
OFF	ON	ON	75
OFF	ON	OFF	90
OFF	OFF	ON	105
OFF	OFF	OFF	120

SEL/IN3=TURN ON

MODE	SW4-SW6	SPD	SPD(RPM)
ON	ON	ON	15
ON	ON	OFF	30
ON	OFF	ON	45
ON	OFF	OFF	60
OFF	ON	ON	75
OFF	ON	OFF	90
OFF	OFF	ON	105
OFF	OFF	OFF	120

SEL/IN3=TURN OFF

MODE	SW7	SW8	MAX SPEED
ON	ON	ON	300RPM
ON	OFF	ON	600RPM
OFF	ON	ON	900RPM
OFF	OFF	ON	1200RPM

AIN + IN - AIN + IN -
↑ V_B 0V V_B: 0~10V ↓ 10KΩ

ERR(RD) - RUN(BR) -
AIN - AIN +
SEL/IN3 DIR/IN2 RUN/IN1 COM
SW8 SW7 SW6 SW5 SW4 SW3 SW2 SW1
B - B + A - A + V - V +

Drive installation

Install with narrow sides, using M4 screws through holes on both sides. The power components of the driver will heat up. If the driver works continuously under the condition of high input voltage and large power, the effective heat dissipation area should be expanded or forced cooling.

Do not use it in places where the air is not circulating or where the ambient temperature exceeds 40°C.

Do not install the drive in damp or metal shavings.



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