



User Manual for
Closed Loop Stepper Drive

Y Series Closed Loop Driver

Version 1.0

www.skysmotor.com.mx

Attention: Please read this manual carefully before using the drive.



1 Introductions & Features

The Y series closed-loop drivers are divided according to the driving power, which are CL57Y, CL86Y. This Closed Loop Stepper Drive offers an alternative for applications requiring higher performance and higher reliability than open loop stepper system, and it remains cost-effective. The matched stepper motors are NEMA17, 23 and 24 combined with an internal encoder which is used to close the position, velocity and current loops in real time. Its great features of quicker response and no hunting make this closed loop stepper drive ideal for applications such as bonding and vision systems in which rapid motions with a short distance are required and hunting would be a problem. And it is ideal for applications where the equipment uses a belt-drive mechanism or otherwise has low rigidity and you don't want it to vibrate when stopping. And features are showing below:

- A new generation of 32-bit DSP control technology
- Input voltage range: DC24~50V, AC20~80V/DC30~110V
- The highest impulse response frequency is 200KHz
- Low torque attenuation, up to 3000rpm
- Built-in positioning and alarm output for easy detection and control
- Intelligently regulate current, reduce vibration, noise and heat, and increase efficiency by 35%
- With single and double pulse selection function, the factory default is: pulse + direction control
- Excellent high-speed performance and rigidity, perfect combination of servo and stepping advantages

2 Specifications

2.1 Electrical Specifications

| Parameters | CL57Y | | | |
|-------------------------|-------|---------|-----|------|
| | Min | Typical | Max | Unit |
| Output Peak Current | 0 | - | 5 | A |
| Input Voltage | 24 | 36 | 50 | VDC |
| Logic Signal Current | 7 | 10 | 16 | mA |
| Pulse Input Frequency | 0 | - | 200 | kHz |
| Pulse Width | 2.5 | - | - | μS |
| Minimal direction setup | 2.5 | - | - | μS |
| Isolation Resistance | 500 | | | MΩ |

2.2 Mechanical Specifications(unit: mm [1inch=25.4mm])

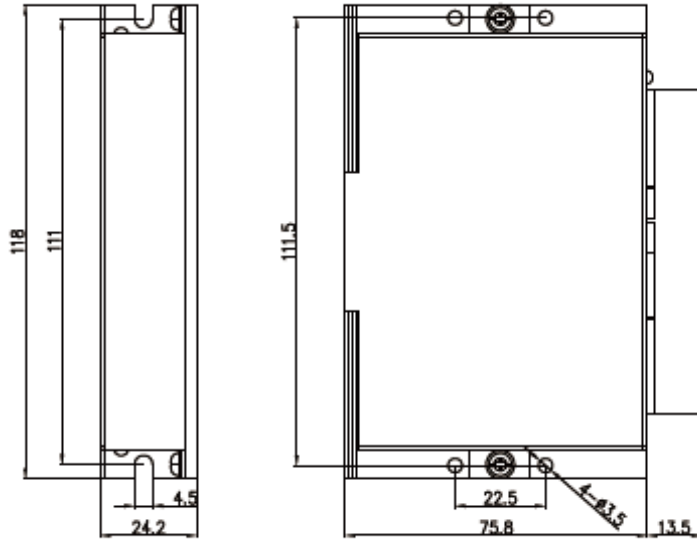


Figure 1: Mechanical specifications
Recommend use side mounting for better heat dissipation

2.3 Electrical Specifications

| Parameters | CL86Y | | | |
|-------------------------|---------|---------|----------|----------|
| | Min | Typical | Max | Unit |
| Output Peak Current | 0 | - | 6 | A |
| Input Voltage | 20 (30) | | 80 (110) | VAC(VDC) |
| Logic Signal Current | 7 | 10 | 16 | mA |
| Pulse Input Frequency | 0 | - | 200 | kHz |
| Pulse Width | 2.5 | - | - | μS |
| Minimal direction setup | 2.5 | - | - | μS |
| Isolation Resistance | 500 | | | MΩ |

2.4 Mechanical Specifications(unit: mm [1inch=25.4mm])

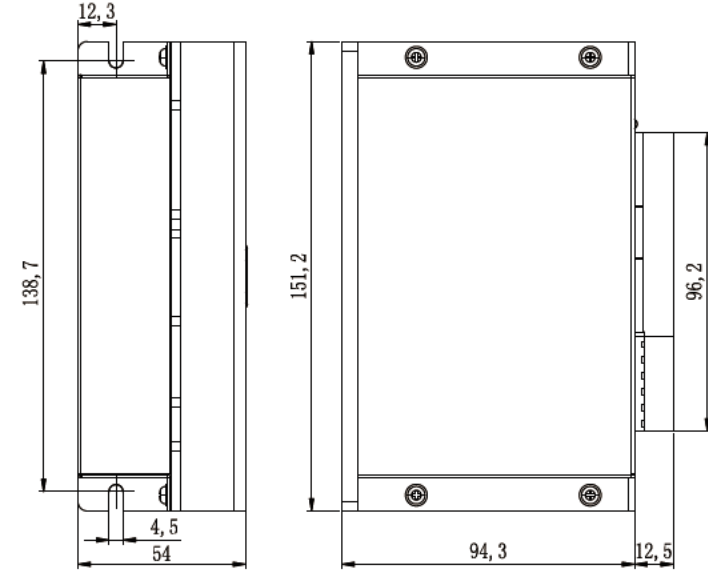


Figure 2: Mechanical specifications
Recommend use side mounting for better heat dissipation

3 Pin Assignment and Description

3.1 Connector P1 Configurations

| Pin Function | Details |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PU+ | Connected to the signal power supply, +5~+24V can be driven |
| PU- | The falling edge is valid and the pulse goes one step when the pulse goes from high to low. Requirements: Low level: 0~0.5V, high level 5~24V, pulse width greater than 2.5 microseconds. |
| DR+ | Connected to the signal power supply, +5~+24V can be driven |
| DR- | Used to change the direction of the motor. Requirements: Low level: 0~0.5V, high level 5~24V, pulse width greater than 2.5 microseconds. |
| MF+ | Connected to the signal power supply, +5~+24V can be driven |

| | |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MF- | When it is active (low level), the motor coil current is turned off, the driver stops working, and the motor is in a free state. |
| Pend+ | When the drive has finished a given pulse, the in-position signal is valid (output optocoupler is on). Pend+ is connected to the pull-up resistor to the positive terminal of the output power supply. The maximum current is 50mA. |
| Pend- | Pend- is connected to the negative terminal of the output power supply. |
| ALM+ | When overcurrent, overvoltage, undervoltage or position error alarm, the alarm signal is valid (output optocoupler is on). ALM+ is connected to the pull-up resistor to the positive terminal of the output power supply. The maximum drive current is 50mA. |
| ALM- | ALM- is connected to the negative terminal of the output power supply. |
| PWR | Power Indicator. Power on, green light is always on |
| ALM | Fault indicator. Flash once: overcurrent or phase-to-phase short circuit; Flashing twice: over voltage; Flashing three times: under voltage; Flashing five times: following position error |

3.2 Connector P2 Configurations

| Pin Function | Details |
|--------------|-----------------------------------------------------------|
| GND | Power ground. |
| +V | Power supply, CL57Y:DC24~50V; CL86Y:AC20~80V/DC30~110V |
| A+, A- | Motor phase A |
| B+, B- | Motor phase B |

3.3 Connector P3 Configurations

| Pin Name | Description |
|----------|------------------|
| EB- | Encoder B- input |
| EB+ | Encoder B+input |
| EA+ | Encoder A+ input |
| EA- | Encoder A- input |
| VCC | +5V power output |
| EGND | Signal ground |

4 Wiring

The CL57Y、CL86Y can accept differential and single-ended inputs (including open-collector and PNP output). The CL57Y、CL86Y has 4, 5 optically isolated logic inputs which are located on connector P1 to accept line drive control signals. These inputs are isolated to minimize or eliminate electrical noises coupled with the drive control signals. Recommend using line drive control signals to increase noise immunity for the drive in interference environments.

A complete closed loop stepper system should include a closed loop motor, a drive, a power supply and a controller (pulse generator). The typical connection is shown as figure 3.

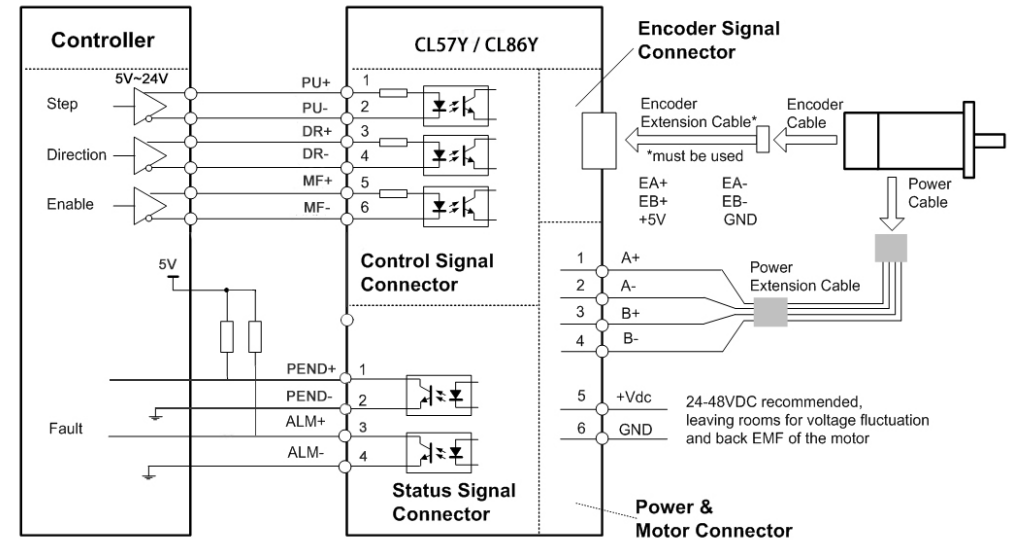


Figure 3: Typical connection

5 Motor Wiring

5.1 Connections of 4-lead Motor

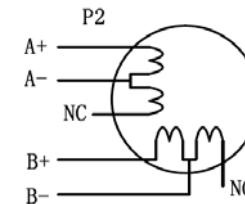


Figure 4: 4-lead Motor Connections

5.2 Connections of 6-lead Motor

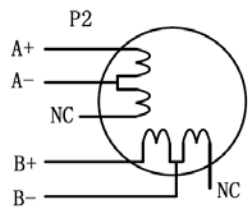


Figure5: 6-lead motor half coil (higher speed) connections

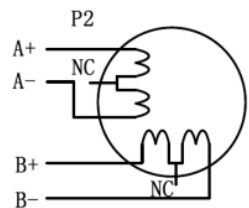


Figure 6: 6-lead motor full coil (higher torque) connections

5.3 Connections of 8-lead Motor

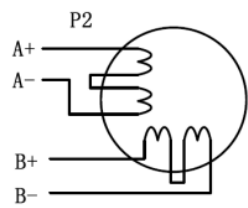


Figure 7: 8-lead motor series connections

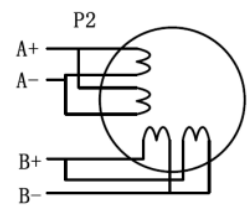


Figure 9: 8-lead motor parallel connections

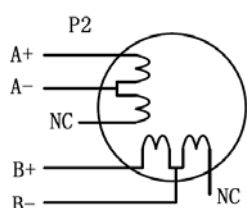


Figure10: 8-lead motor half coil

6 Frequently Asked Questions

| Symptoms | Possible Problems |
|--------------------------------------|-------------------------------------------------|
| Motor is not rotating | No power |
| | Microstep resolution setting is wrong |
| | Fault condition exists |
| | The drive is disabled |
| Motor rotates in the wrong direction | The Direction signal level is reverse |
| The drive in fault | Power supply voltage beyond drive's input range |
| | Something wrong with motor coil |
| | Wrong connection |
| Erratic motor motion | Control signal is too weak |
| | Control signal is interfered |
| | Wrong motor connection |
| | Something wrong with motor coil |
| Motor stalls during acceleration | Current setting is too small |
| | Motor is undersized for the application |
| | Acceleration is set too high |
| | Power supply voltage too low |
| Excessive motor and drive heating | Inadequate heat sinking / cooling |
| | Current is set too high |
| Motor vibration when power on | Speed loop Kp is too high |

7 Warranty

SKYSMOTOR® warrants itsproducts againstdefects in materials and workmanshipfor aperiod of 12months from shipment.During the warranty period, Skysmotor willeither,at its option, repair or replace products which proved to be defective. To obtain warranty s e r v i c e , a r e t u r n e d material authorization number (RMA) must be obtained before returning product for service.

Exclusions: The above warranty does not extend to any product damaged by reasons of improper or inadequate handlings by customer, improper or inadequate customer wirings, unauthorized modification or misuse, or operation beyond the electrical specifications of the product and/or operation beyond environmental specifications for the product.