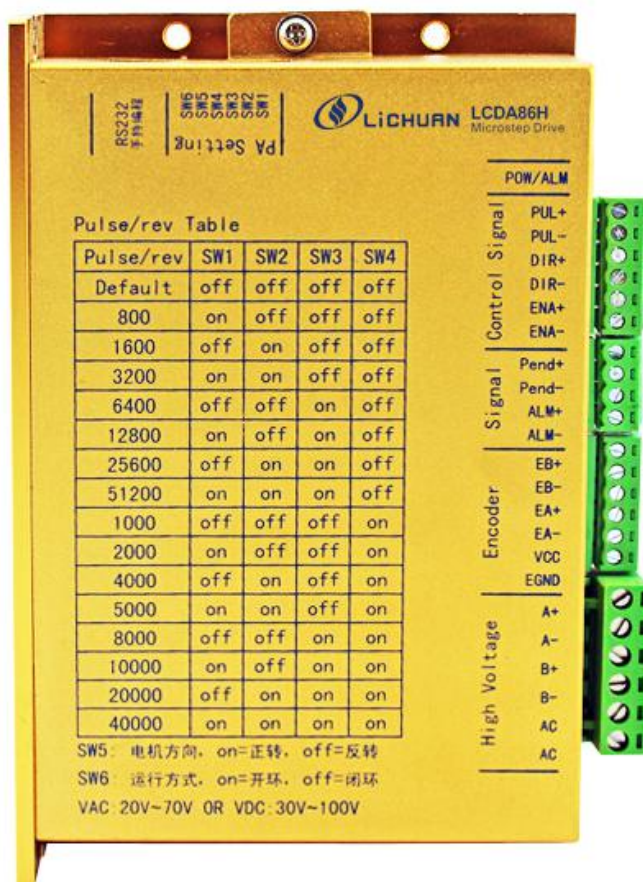




# LCDA86H

## 2-Phase Closed-loop Stepper Driver



**VAC : 20-70V / VDC : 30-100V**

## ***Product overview***

LCDA86H is a 2 phase closed loop stepper driver which can take 30-100 VDC or 20~70VAC operating voltage and 0.5 - 6 A output current published by Lichuan.

It is capable of driving NEMA 17, 23, 24 and 34 easy servo motors (stepper motors with encoders) with the position loop closed in real time.

Lichuan LCDA86H hybrid servo system combines both the advantages of open stepper and servo systems, due to the high cost performance, is the best choice for customers upgrading stepper solutions.

## ***Application field***

Lichuan LCDA86H easy servo systems are ideal for many industries to upgrade step per performance in many applications clients have successfully implemented LCDA86H driven easy servo systems in applications such as desktop CNC routers, small CNC mills, laser cutters / engravers, electronic assembly & labeling equipment, pick & place machines and so on..

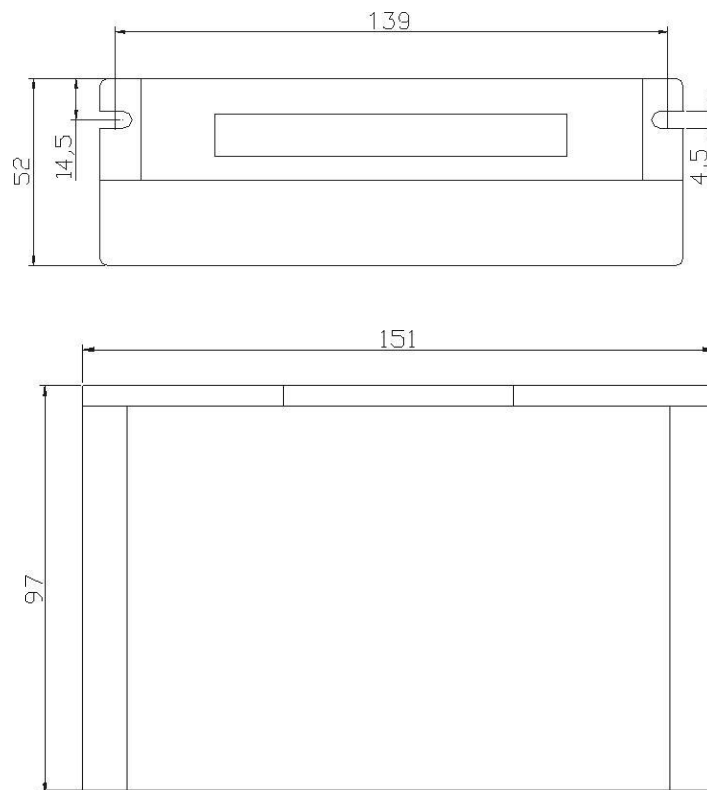
## ***Function***

- Voltage input range: 30V~100VDC or 20~70VAC
- Max peak current: 6A
- Subdivision: 200~51200ppr
- Pulse mode: pulse+direction, CW, CCW
- Pulse response frequency: 0~200KHz
- Motor parameters can be turned automatically
- Overvoltage, overcurrent and tracking protecting functions

## ***Using Environment and Parameters***

- Save temperature: -20°C~80°C
- Using temperature: 0°C~55°C
- Using humidity: 90%RH (no condensation)
- Shake frequency: less than 0.5G (4.9m/s<sup>2</sup>)  
10Hz~60Hz (Not run continuously)

## ***Install Size (mm)***

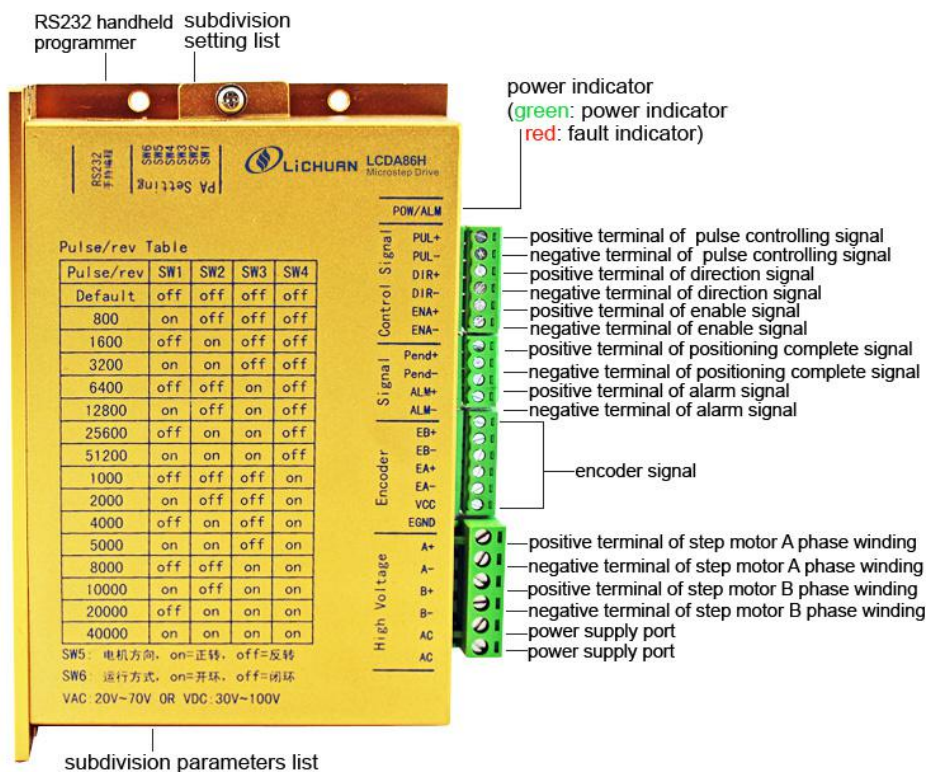


## ***Protection Indications***

The green indicator turns on when power-up. When drive protection is activated, the red LED blinks periodically to indicate the errors.

- Red light flashing one of one cycle is over current fault
- A red light flashes 2 times in the cycle is over voltage fault
- The red light flashing 7 times of one cycle is positional deviation is too large

## The interface definition



## Control Signal Connector

Pin Function	Details
PUL+	Pulse Signal: In single pulse (pulse/direction) mode, this input represents pulse signal, each rising or falling edge active (software configurable, see easy servo drive software manual for more detail); In double pulse mode (software configurable), this input represents clockwise( CW) pulse, active both at high level and low level. 4.5-24V when PUL-HIGH, 0-0.5V when PUL-LOW. For reliable response, pulse width should be longer than 2.5 $\mu$ s.
PUL-	
DIR+	Direction Signal: In single-pulse mode, this signal has low/high voltage levels, representing two directions of motor rotation. In double-pulse mode (software configurable), this signal is counter-clock (CCW) pulse, active both at high level and low level. For reliable motion response, DIR signal should be ahead of PUL signal by 5 $\mu$ s at least. 4.5-24V when DIR-HIGH, 0-0.5V when DIR-LOW. Please note that rotation direction is also related to motor-driver-encoder wiring match. Exchanging both the connection of two wires for a coil and an encoder channel to the driver the connection will reverse motion direction. Or you can toggle the SW5 to reverse the motion direction.
DIR-	
ENA+	Enable signal: This signal is used for enabling/disabling the driver. High level (NPN control signal, PNP and Differential control signals are on the contrary, namely Low level for enabling.) for enabling the driver and low level for disabling the driver.
ENA-	
ALM+	Error. This port can sink or source 20mA current at 24V. In default, the resistance between FAULT+ and FAULT- is low impedance in normal operation and become high when the ES-D508 goes into error. The active level of alarm signal is software configurable.
ALM-	

## The encoder signal input terminal

LCDA86H encoder signal interface adopts 6 pin green terminals, pin are defined as follows:

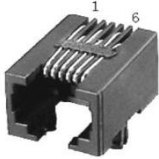
Symbol	Name
EB+	Encoder channel B+ input
EB-	Encoder channel B- input
EA+	Encoder channel A+ input
EA-	Encoder channel A- input
VCC	+5V @ 100 mA max
EGND	Signal ground

## Motor and power input interface

Symbol	Name	explain
U	Motor Phase U	-
V	Motor Phase V	-
W	Motor Phase W	-
VDC	Power Supply Input	20~70VAC,30V~100VDC
GND	Power Ground (Negative)	0V

## RS232 Communication Port

It is used to configure the peak current, microstep, active level, current loop parameters and anti-resonance parameters.

	RS232 Communication Port – RJ11			
	Pin	Name	I/O	Description
1	NC	-	Not connected	
2	+5V	O	+5V power output	
3	TXD	O	RS232 transmit	
4	GND	GND	Ground	
5	RXD	I	RS232 receive	
6	NC	-	Not connected	

## Dial Switch Setting

The current can be setting automatically of this series of drivers,

So don't need to manually set current, don't need to set by hand.

The corresponding functions of dial switches are as follows:

SW1~SW4 : Driver subdivision setting (See the drive shell segment table)

SW5 : motor direction setting

SW6 : switch open loop to closed loop operating mod

## Dynamic Current

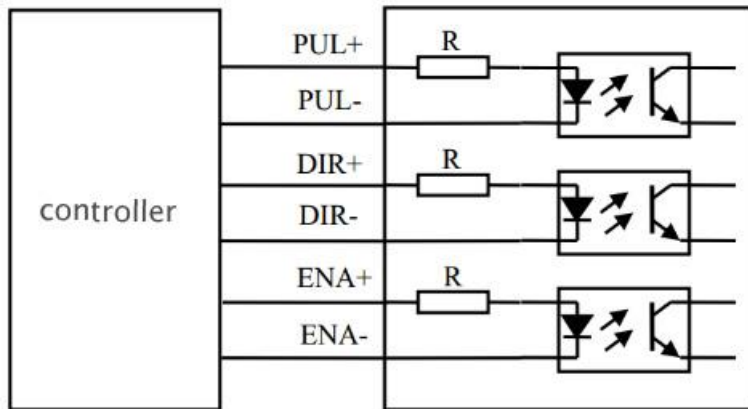
Pulse/rev	SW1	SW2	SW3	SW4
Default	OFF	OFF	OFF	OFF
800	ON	OFF	OFF	OFF
1600	OFF	ON	OFF	OFF
3200	ON	ON	OFF	OFF
6400	OFF	OFF	ON	OFF
12800	ON	OFF	ON	OFF
25600	OFF	ON	ON	OFF
51200	ON	ON	ON	OFF
1000	OFF	OFF	OFF	ON
2000	ON	OFF	OFF	ON
4000	OFF	ON	OFF	ON
5000	ON	ON	OFF	ON
8000	OFF	OFF	ON	ON
10000	ON	OFF	ON	ON
20000	OFF	ON	ON	ON
40000	ON	ON	ON	ON

## Current Control

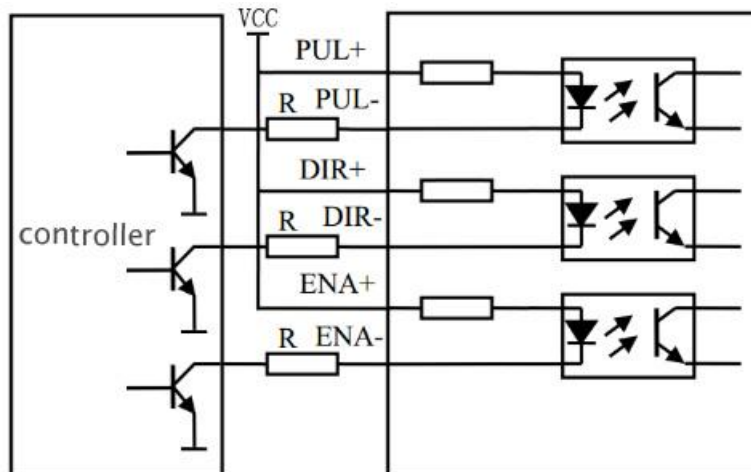
The motor current will be adjusted automatically regarding to the load or the stator-rotor relationship. However, the user can also configure the current in the tuning software. The configurable parameters include close-loop current, holding current, encoder resolution, micro step and etc. There are also PID parameters for the current loop, and they have been tuned for Lichuan matching motors so the user does not need to tune them.

## Control Port Wiring Method

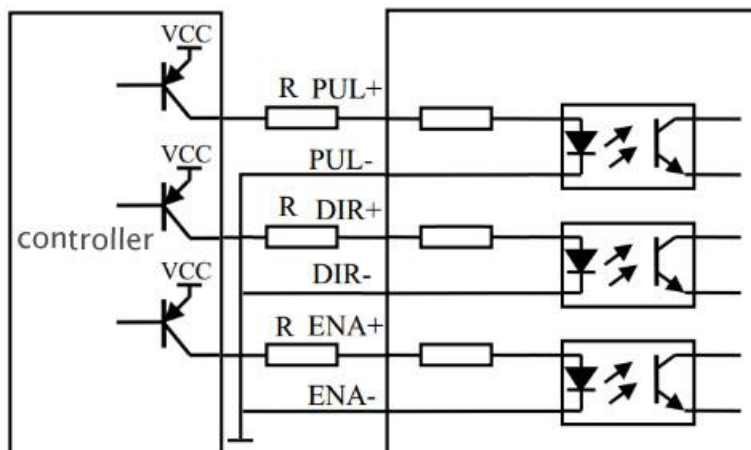
- differential signal input wiring



- common anode wiring



- common cathode wiring



Notice: when control signal voltage  $VCC = 24V$ ,  
 The current-limiting resistance  $R = 3K$  ;  
 when control signal voltage  $VCC = 5V$ ,  
 The current-limiting resistance  $R = 0K$

## ***Problem Symptoms and Possible Causes***

<b>Symptoms</b>	<b>Possible Problems</b>
<b>Motor is not rotating</b>	Microstep resolution setting is wrong DIP switch current setting is wrong Fault condition exists
<b>Motor rotates in the wrong direction</b>	Motor phases may be connected in reverse
<b>The Driver in fault</b>	DIP switch current setting is wrong Something wrong with motor coil Control signal is too weak
<b>Erratic motor motion</b>	Control signal is too weak Control signal is interfered Wrong motor connection Something wrong with motor coil Current setting is too small, losing steps
<b>Motor stalls during acceleration</b>	Motor is undersized for the application Acceleration is set too high Power supply voltage too low
<b>Excessive motor and driver heating</b>	Inadequate heat sinking / cooling Automatic current reduction function not being utilized Current is set too high