LCDA357H

3-phase closed-loop stepper driver

Product overview

LCDA357H is one of the models in Lichuan easy servo drives which can take 20-50 VDC operating voltage and output 0.5~8.0 A continuous load-based current. It is capable of driving Lichuan 3 phase NEMA23 easy servo motors (stepper motors with encoders) with the position loop closed in real time. Based on latest DSP technology and adopting Lichuan advanced control algorithm, LCDA357 easy servo drive applies servo control on easy servo motors. When adopted with an easy servo motor, it combines features of both open loop steppers & brushless servo systems, and offers many unique advances features for excellent motion control system performance.

Application field

With many unique advanced features, Lichuan LCDA357H easy servo systems are ideal for many industries to upgrade stepper performance or replace brushless servo systems in many applications.clients have successfully implemented LCDA357H driven easy servo systems in applications such as desktop CNC routers, small CNC mills, laser cutters / engravers, dental mills, electronic assembly & inspection equipment, labeling equipment, pick & place machines, X-Y tables, scientific instruments.
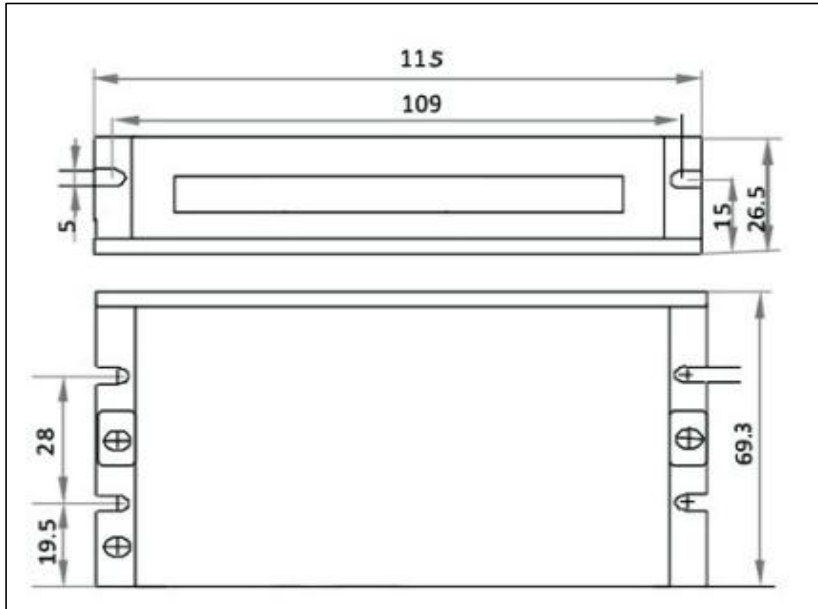
Function

➢ Voltage input range：18V~50VDC

➢ Max peak current：7A

➢ Subdivision：200~51200ppr

➢ Pulse mode：pulse+direction

➢ Pulse response frequency：0～200KHz

➢ Motor parameters can be turned automatically

➢ Overvoltage, overcurrent and tracking protecting functions

Using Environment and Parameters

➢ Save temperature：-20℃～80℃

➢ Using temperature：0℃～55℃

➢ Using humidity：90%RH（no condensation）

➢ Shake frequency：less than 0.5G（4.9m/s2）

        10Hz～60Hz（Not run continuously）

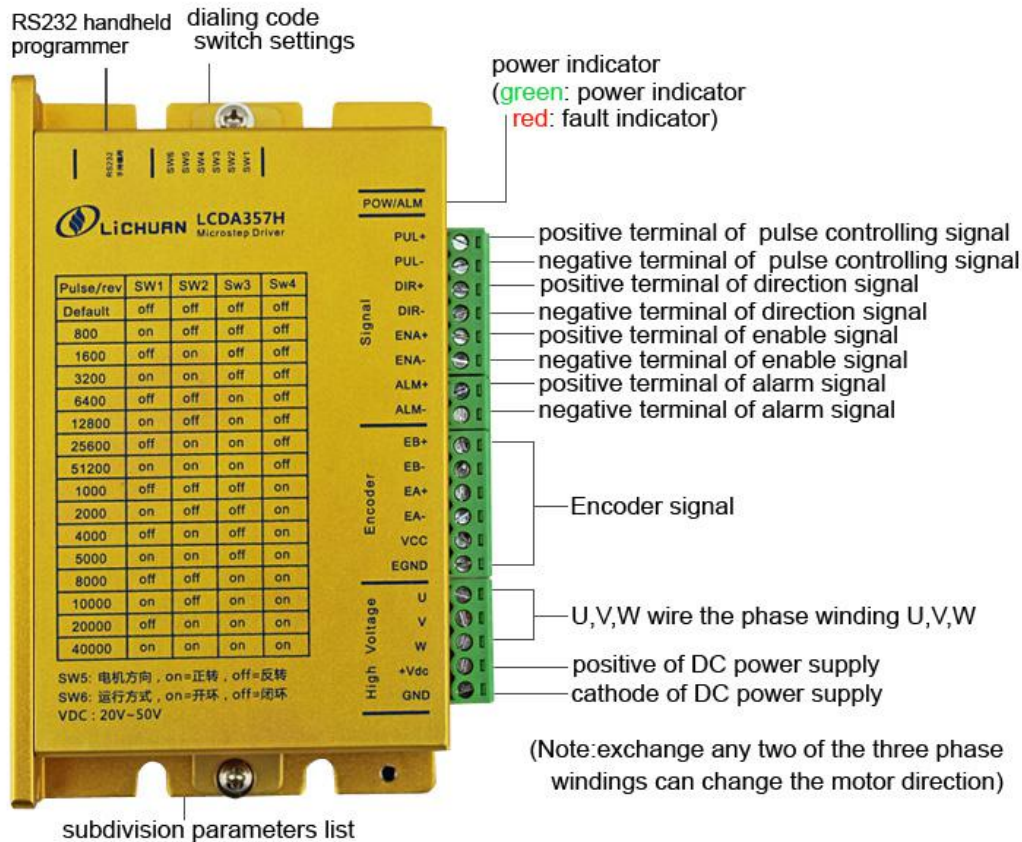# *Install Size （mm）*

Protection Indications

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

RS232 handheld programmer

dialing code switch settings

power indicator
(green: power indicator
red: fault indicator)

LCDA357H Microstep Driver

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	off	on	off	on
4000	off	off	on	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

SW5: 电机方向，on=正转，off=反转
SW6: 运行方式，on=开环，off=闭环
VDC: 20V~50V

POW/ALM

PUL+ — positive terminal of pulse controlling signal
PUL- — negative terminal of pulse controlling signal
DIR+ — positive terminal of direction signal
DIR- — negative terminal of direction signal
ENA+ — positive terminal of enable signal
ENA- — negative terminal of enable signal
ALM+ — positive terminal of alarm signal
ALM- — negative terminal of alarm signal

Signal

EB+
EB-
EA+
EA-
VCC
EGND — Encoder signal

U
V
W — U,V,W wire the phase winding U,V,W
+Vdc — positive of DC power supply
GND — cathode of DC power supply

(Note:exchange any two of the three phase windings can change the motor direction)

subdivision parameters list

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; 4-5V when PUL-HIGH, 0-0.5V when PUL-LOW. For reliable response, pulse width should be longer than 1.5µs. Series connect resistors for current-limiting when +12V or +24V used. The same as DIR and ENA signals.
PUL-	
DIR+	DIR signal: In single-pulse mode, this signal has low/high voltage levels, representing two directions of motor rotation; For reliable motion response, DIR signal should be ahead of PUL signal by 5µs at least. 4-5V when DIR-HIGH, 0-0.5V when DIR-LOW. Please note that rotation direction is also related to motor-driver wiring match. Exchanging the connection of two wires for a coil to the driver will reverse 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

ALM-	normal operation and become high when the LCDA357H goes into error. The active level of alarm signal is software configurable.

The encoder signal input terminal

LCDA357H encoder signal interface adopts 6 pin green terminals, pin are defined as follows:

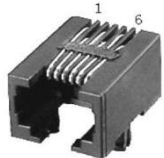| Symbol	Name
EB+	Encoder channel B+ input
EB-	Encoder channel B- input
EA+	Encoder channel A+ input
EA-	Encoder channel A- input
VCC	+5V @ 100 mA max
EGND	Signal ground

Motor and power input interface

Symbol	Name	explain
U	Motor Phase U	-
V	Motor Phase V	-
W	Motor Phase W	-
VDC	Power Supply Input	+20V~+50V
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

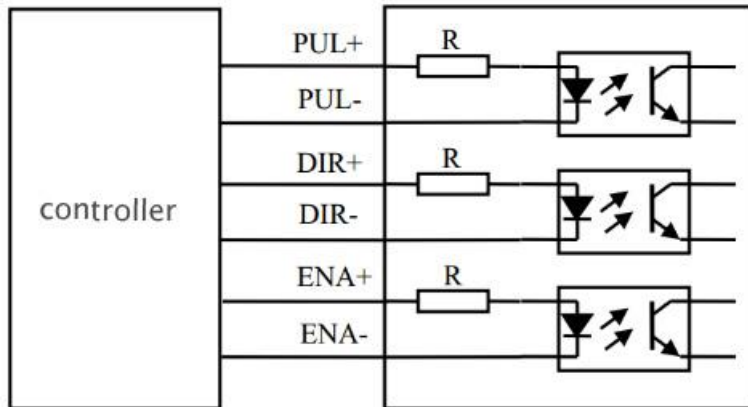SW6 ：switch open loop to closed loop operating mod

Dynamic Current

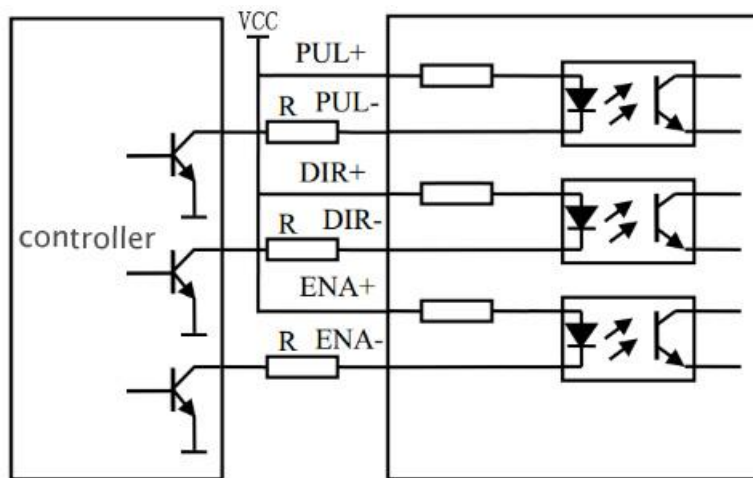| Pulse/rev	SW1	SW2	SW3	SW4
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1000	OFF	OFF	OFF	ON
2000	ON	OFF	OFF	ON
4000	OFF	ON	OFF	ON
5000	ON	ON	OFF	ON
8000	OFF	OFF	ON	ON
10000	ON	OFF	ON	ON
20000	OFF	ON	ON	ON
40000	ON	ON	ON	ON

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 so ftware. The configurable parameters include close-loop current, holding current, enc oder resolution, micro step and etc. There are also PID parameters for the current loop, and they have been tuned for Li chaun matching motors so the user does n ot need to tune them.
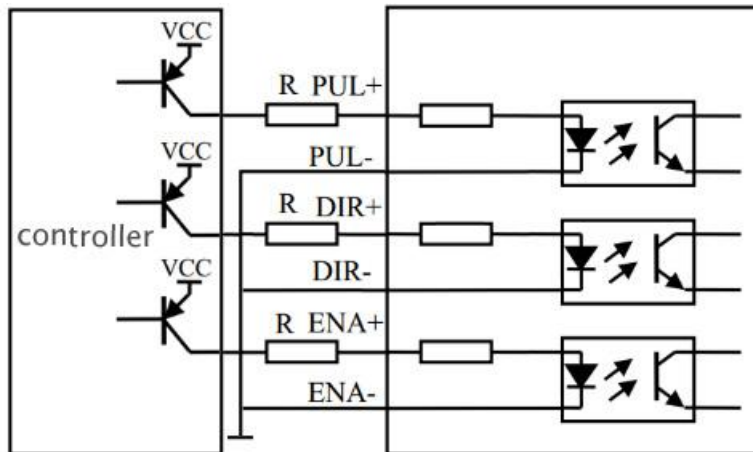
Control Port Wiring Method

➢ 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

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