■ Main Features:

➢ Full closed loop
➢ High efficiency
➢ High torque
➢ High speed
➢ Low heat
➢ Smooth and accurate
➢ High speed response
➢ Six - digit nixie tube display, can set parameter easily
➢ and monitor motor running state .

■ Brief introduction

2HBS hybrid stepper servo drive system integrated servo control technology into the digital step driver. It adopts typical tricyclic control method which include current loop,speed loop and position loop.This product has the advantage of both step and servo system, is a highly cost-effective motion control products.
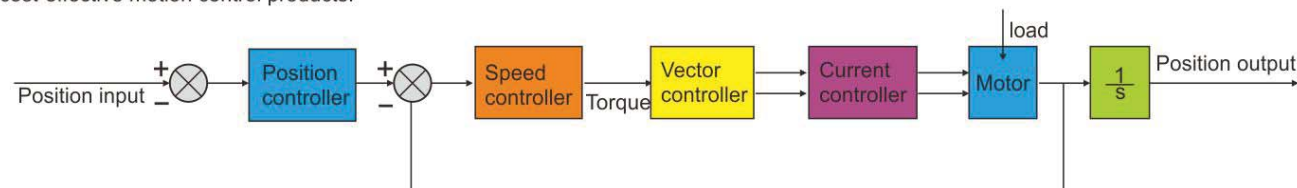

■ Full closed loop
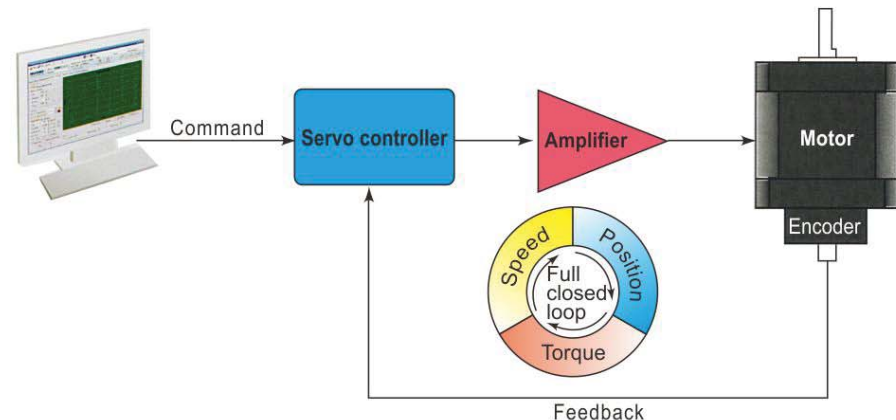
1.Accurate position and speed control can achieve the most strict request of the application.
2.High robustness's servo control adapt to wide range change of inertial load and friction load.
3.The motor with 1000CPR encoder,support vector closed loop control,Compare with traditional step motor,it solved the problem of lose step.

■ Low heat/high efficiency

1.Adjust the current according to actual load,the heat is much lower compare with traditional step motor.
2.The current is almost 0,and without heat under stop condition.
3.It save energy and can achieve nearly 100% torque output.Working smoothly and accurately.

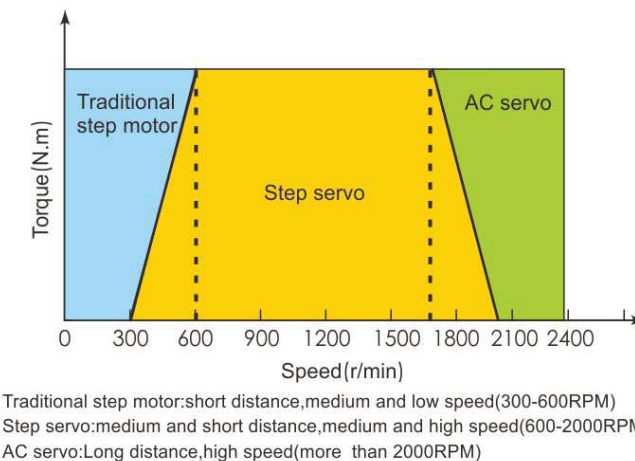The motor temperature in the same working condition
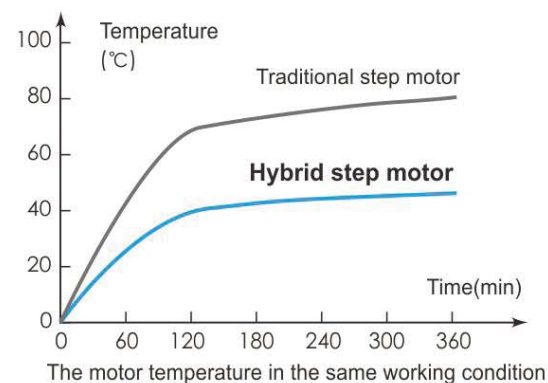
■ Smooth and accurate

Based on the feedback encoder's space vector current control algorithm and vector smoothing filterin technique. It can resist the "low-frequency resonance" caused by the traditional step motor. The motor can still run smoothly under low speed. This is a perfect solution to slove the problem of noise and vibration for the traditional stepper motor.

■ High speed response

1.Hybrid step servo system have some advantages of the traditional open-loop stepper system, position response input and output command signal are almost real-time synchronization, so very suitable for condition of short distance quickly start / stop and zero-speed stop stably.

2.In condition of point-to-point fast positioning, advanced servo control technology provides a large torque output. It makes the system has a very high dynamic response, it is far over the limit of step system.
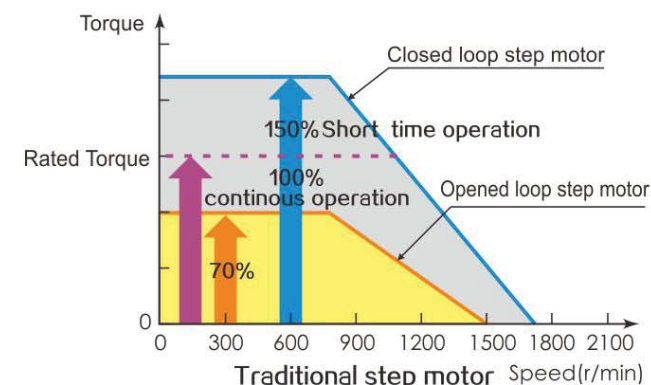

Traditional step motor:short distance,medium and low speed(300-600RPM)
Step servo:medium and short distance,medium and high speed(600-2000RPM)
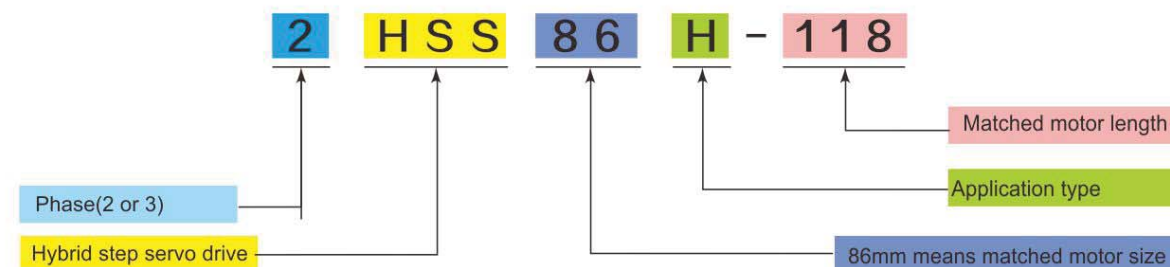AC servo:Long distance,high speed(more than 2000RPM)

■ High torque /high speed

1.Hybrid servo drive system adopts the optimized current control mode, the torque of the motor can be 100% full use. There is no need to consider torque redundancy when design the machine.

2.A large torque output can simplified the complexity of the deceleration equipment in certain cases.

3.The high-speed performance of the hybrid step servo drive systems improve 30% and the effective torqued improve 70% compare with opened loop step motor. This makes the motor can maintain high-torque operation under high-speed.

■ Name rules of Hybrid step servo drive system

| 2 | HSS | 86 | H | – | 118 |

- Matched motor length
- Application type
- 86mm means matched motor size
- Phase(2 or 3)
- Hybrid step servo drive

■ Data sheet for hybrid step servo drive

Model	current（A）	Voltage（V）	Motor	Weight（KG）	Dimension（mm）	Control signal
2HSS57	0-6A	DC(24-48V)	57,86	0.27	118*75.5*34	differential
2HSS86H	0-7A	AC(24-70V) DC(30-100V)	57,86	0.6	150*97.5*53	differential
2HSS858H	0-6A	AC(50-90)	57,86	0.27	140*70*56	differential
3HSS2208H-86	0-8A	AC(180-250V)	86	0.57	140*70*56	differential
3HSS2208H-110	0-8A	AC(180-250V)	110	1.5	140*70*56	differential

◆**Note:**The default setting for the driver's control is Step/Directtion Mode. Please inform the manufacturer, if you need CW/CCW mode.

■ Key Features:

➤ Without losing step, High accuracy in position
➤ 100% rated output torque
➤ Variable current control technology, High current efficiency
➤ Little vibration, Smooth and reliable moving at low speed
➤ Accelerate and decelerate control inside, Great improvement in smoothness of starting or stopping the motor
➤ User-defined micro steps
➤ Compatible with 1000 and 2500 lines encoder
➤ No adjustment in general application
➤ Lack of phase, over current, over voltage and over position protection
➤ Green light means running while red light means protection or off line

■ Introduction

2HSS57 two-phase hybrid stepper servo drive system integrated servo control technology into the digital step driver. It adopts typical tricyclic control method which include current loop,speed loop and position loop.This product has the advantage of both step and servo system, and it's a highly cost-effective motion control products.

■ Electrical Specifications

Parameters	Min	Typical	Max	Unit
Supply voltage	24V	36V	60V	VDC
Output Current (Peak)	-	-	6.0	Amps
Logic Input Current	-	10	-	mA
Pulse input frequency	-	-	200	KHz
Low Level Time	2.5	-	-	μsec

■ Environment

Cooling	Natural Cooling or Forced Convection	
Environment	Space	Avoid dust, oil frost and corrosive gases
	Ambient Temperature	-20°C～+80°C
	Humidity	<80%RH
	Vibration	5.9m/s² Max
Storage Temp.	-20°C～+80°C	
Weight	Approx. 300 gram	

■ DIP Switch setting

Microstep Resolution Setting

Step / Rev.	SW3	SW4	SW5	SW6
Default	ON	ON	ON	ON
800	OFF	ON	ON	ON
1600	ON	OFF	ON	ON
3200	OFF	OFF	ON	ON
6400	ON	ON	OFF	ON
12800	OFF	ON	OFF	ON
25600	ON	OFF	OFF	ON
51200	OFF	OFF	OFF	ON
1000	ON	ON	ON	OFF
2000	OFF	ON	ON	OFF
4000	ON	OFF	ON	OFF
5000	OFF	OFF	ON	OFF
8000	ON	ON	OFF	OFF
10000	OFF	ON	OFF	OFF
20000	ON	OFF	OFF	OFF
40000	OFF	OFF	OFF	OFF

Input edge settings

* SW1 : Dialing Switch checking Input edge settings .
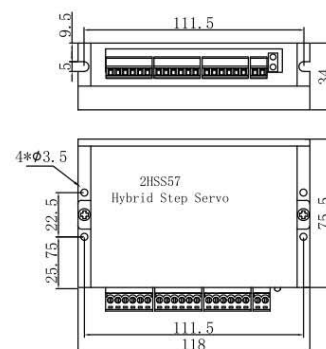* OFF=Rising edge effective ,
ON= falling edge effective

Logical direction setting

* SW2：When dialing switch SW2 switches ON or OFF , it can change the present running direction of motor
* OFF=CCW , ON=CW

■ Dimensions

Dimensions (Unit : mm)

111.5
118
4*Ø3.5
2HSS57
Hybrid Step Servo

■ Ports Introduction

1.ALM signal output ports

Port	Symbol	Name	Remark
1	ALM+	Alarm output +	
2	ALM-	Alarm output -	

2.Control signal input port

Port	Symbol	Name	Remark
1	PLS+	Pulse signal +	Compatible with 5V or 24V
2	PLS-	Pulse signal -	
3	DIR+	Direction signal+	Compatible with 5V or 24V
4	DIR-	Direction signal-	
5	ENA+	Enable signal +	Compatible with 5V or 24V
6	ENA-	Enable signal -	

3.Power Interface Ports

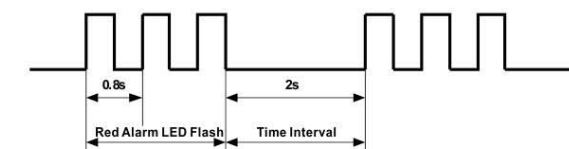| 1	Motor Phase Wire Input Ports	A+	Phase A+(Red)	Motor Phase A
2		A-	Phase A- (Blue)	
3		B+	Phase B+(Green)	Motor Phase B
4		B-	Phase B-(Black)	
5	Power Input Ports	VCC	Input Power +	24-50V DC
6		GND	Input Power-	

■ Sequence Chart of Control Signals

In order to avoid some fault operations and deviations, PUL, DIR and ENA should abide by some rules, shown as following diagram:

PUL   t3 t4 t5>5μs   High level > 3.5V

DIR   t2>6μs   High level > 3.5V   Low level > 3.5V

ENA   t1>5μs   Low level > 3.5V
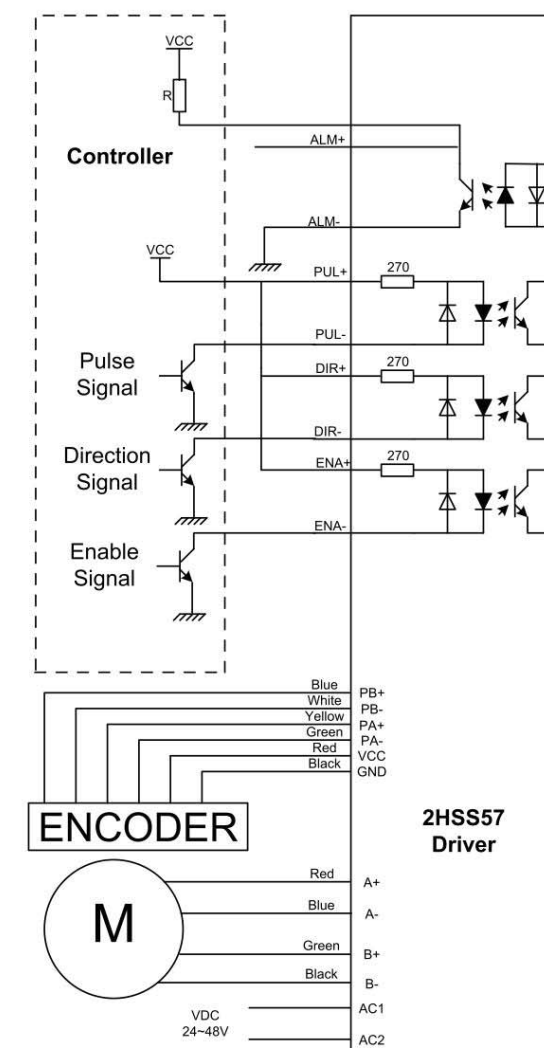
PUL/DIR
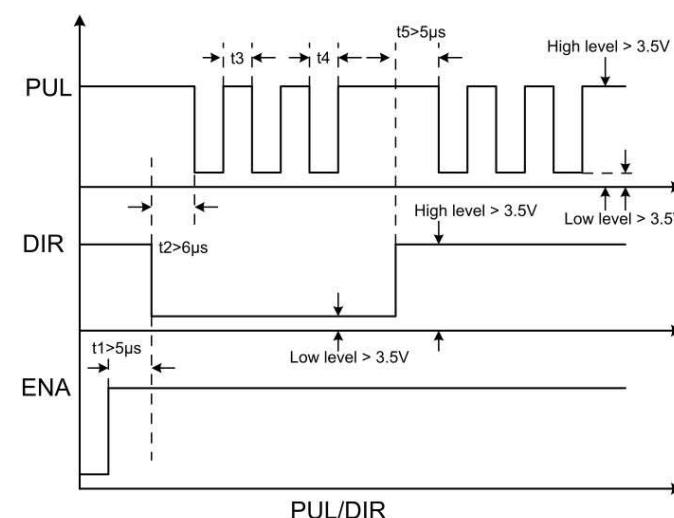
Remark:
a. t1: ENA must be ahead of DIR by at least 5μs. Usually, ENA+ and ENA- are NC (not connected).
b. t2: DIR must be ahead of PUL active edge by 6μs to ensure correct direction;
c. t3: Pulse width not less than 2.5μs;
d. t4: Low level width not less than 2.5μs.

■ Faults alarm and LED flicker frequency

0.8s   2s
Red Alarm LED Flash   Time Interval

Flicker Frequency	Description to the Faults
1	Error occurs when the motor coil current exceeds the drive's current limit.
2	Voltage reference error in the drive
3	Parameters upload error in the drive
4	Error occurs when the input voltage exceeds the drive's voltage limit.
5	Error occurs when the actual position following error exceeds the limit which is set by the position error limit.

■ Wiring

VCC
R
Controller
ALM+
VCC
ALM-
PUL+   270
Pulse Signal
PUL-
DIR+   270
Direction Signal
DIR-
ENA+   270
Enable Signal
ENA-

Blue   PB+
White   PB-
Yellow   PA+
Green   PA-
Red   VCC
Black   GND

ENCODER
M

Red   A+
Blue   A-
Green   B+
Black   B-
VDC 24~48V   AC1
AC2

2HSS57 Driver

Remark:* VCC is compatible with 5V or 24V;
R1(3~5K) must be connected to control signal terminal.

Key Features:

➢ Without losing step, High accuracy in position
➢ 100% rated output torque
➢ Variable current control technology, High current efficiency
➢ Little vibration, Smooth and reliable moving at low speed
➢ Accelerate and decelerate control inside, Great improvement in smoothness of starting or stopping the motor
➢ User-defined micro steps
➢ Compatible with 1000 and 2500 lines encoder
➢ No adjustment in general application
➢ Lack of phase, over current, over voltage and over position protection
➢ Green light means running while red light means protection or off line

Introduction

2HSS86H two-phase hybrid stepper servo drive system integrated servo control technology into the digital step driver.
It adopts typical tricyclic control method which include current loop,speed loop and position loop.This product has the advantage of both step and servo system, and it's a highly cost-effective motion control products.

Electrical Specifications

Parameters	Min	Typical	Max	Unit
Supply voltage	24V	60V	75V	VAC
Output Current (Peak)	-	-	8.0	Amps
Logic Input Current	-	10	-	mA
Pulse input frequency	-	-	200	KHz
Low Level Time	2.5	-	-	μsec

Environment

Cooling	Natural Cooling or Forced Convection	
Environment	Space	Avoid dust, oil frost and corrosive gases
	Ambient Temperature	-20°C—+80°C
	Humidity	<80%RH
	Vibration	5.9m/s² Max
Storage Temp.	-20°C—+80°C	
Weight	Approx. 580 gram	

DIP Switch setting

Microstep Resolution Setting

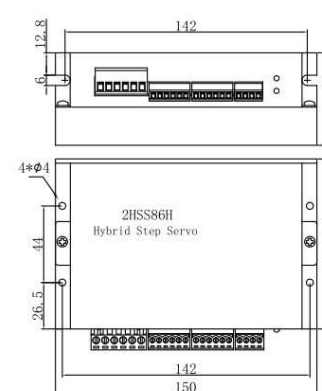| Step / Rev.	SW3	SW4	SW5	SW6
Default	ON	ON	ON	ON
800	OFF	ON	ON	ON
1600	ON	OFF	ON	ON
3200	OFF	OFF	ON	ON
6400	ON	ON	OFF	ON
12800	OFF	ON	OFF	ON
25600	ON	OFF	OFF	ON
51200	OFF	OFF	OFF	ON
1000	ON	ON	ON	OFF
2000	OFF	ON	ON	OFF
4000	ON	OFF	ON	OFF
5000	OFF	OFF	ON	OFF
8000	ON	ON	OFF	OFF
10000	OFF	ON	OFF	OFF
20000	ON	OFF	OFF	OFF
40000	OFF	OFF	OFF	OFF

Input edge settings

* SW1 : Dialing Switch checking Input edge settings .
* OFF=Rising edge effective ,
ON= falling edge effective

Logical direction setting

* SW2：When dialing switch SW2 switches ON or OFF , it can change the present running direction of motor
* OFF=CCW , ON=CW

Dimensions

Dimensions (Unit : mm)

142
12.8
6
53
4*Φ4
2HSS86H
Hybrid Step Servo
44
97.5
26.5
142
150

Ports Introduction

1.Control signal input port

Port	Symbol	Name	Remark
1	DIR-	Pulse signal +	Compatible with 5V or 24V
2	DIR+	Pulse signal -	
3	PUL-	Direction signal+	Compatible with 5V or 24V
4	PUL+	Direction signal-	
5	ENA-	Enable signal +	Compatible with 5V or 24V
6	ENA+	Enable signal -	

2.Power Interface Ports

1	Motor Phase Wire Input Ports	A+	Phase A+(Red)	Motor Phase A
2		A-	Phase A- (Blue)	
3		B+	Phase B+(Green)	Motor Phase B
4		B-	Phase B-(Black)	
5	Power Input Ports	VCC	Input Power +	AC24V-75V DC30-110V
6		GND	Input Power-	

Faults alarm and LED flicker frequency

0.8s
2s
Red Alarm LED Flash
Time Interval

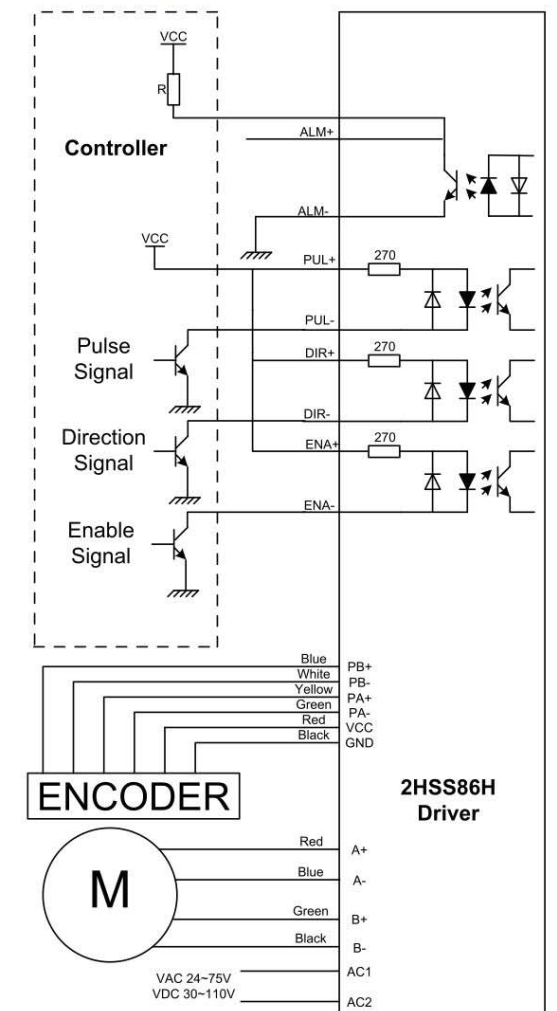| Flicker Frequency	Description to the Faults
1	Error occurs when the motor coil current exceeds the drive's current limit.
2	Voltage reference error in the drive
3	Parameters upload error in the drive
4	Error occurs when the input voltage exceeds the drive's voltage limit.
5	Error occurs when the actual position following error exceeds the limit which is set by the position error limit.

Sequence Chart of Control Signals

In order to avoid some fault operations and deviations, PUL, DIR and ENA should abide by some rules, shown as following diagram:

t5>5μs
t3 t4 High level > 3.5V
PUL
High level > 3.5V Low level > 3.5V
DIR
t2>6μs
t1>5μs Low level > 3.5V
ENA
PUL/DIR

Remark:
a. t1: ENA must be ahead of DIR by at least 5μs. Usually, ENA+ and ENA- are NC (not connected).
b. t2: DIR must be ahead of PUL active edge by 6μs to ensure correct direction;
c. t3: Pulse width not less than 2.5μs;
d. t4: Low level width not less than 2.5μs.

3.ALM and PEND signal output ports

Port	Symbol	Name	Remark
1	PEND+	In position signal output +	
2	PEND-	In position signal output -	
3	ALM+	Alarm output +	
4	ALM-	Alarm output -	

4.Encoder Feedback Signal Input Ports

Port	Symbol	Name	Wiring color
1	PB+	Encoder phase B +	Blue
2	PB-	Encoder phase B -	White
3	PA+	Encoder phase A +	Yellow
4	PA-	Encoder phase A -	Green
5	VCC	Input power	Red
6	GND	Input power ground	Black

Wiring

VCC
R1
Controller
ALM+
ALM-
VCC
PUL+ 270
PUL-
Pulse Signal
DIR+ 270
DIR-
Direction Signal
ENA+ 270
ENA-
Enable Signal

Blue PB+
White PB-
Yellow PA+
Green PA-
Red VCC
Black GND

ENCODER
2HSS86H Driver
M
Red A+
Blue A-
Green B+
Black B-
VAC 24~75V AC1
VDC 30~110V AC2

Remark:* VCC is compatible with 5V or 24V;
R1(3~5K) must be connected to control signal terminal.