iCAN Automation

2-PHASE STEPPER MOTOR DRIVE

MC8H
User manual

Dongguan ICAN Technology Co., Ltd

2 Phase digital stepper motor driver

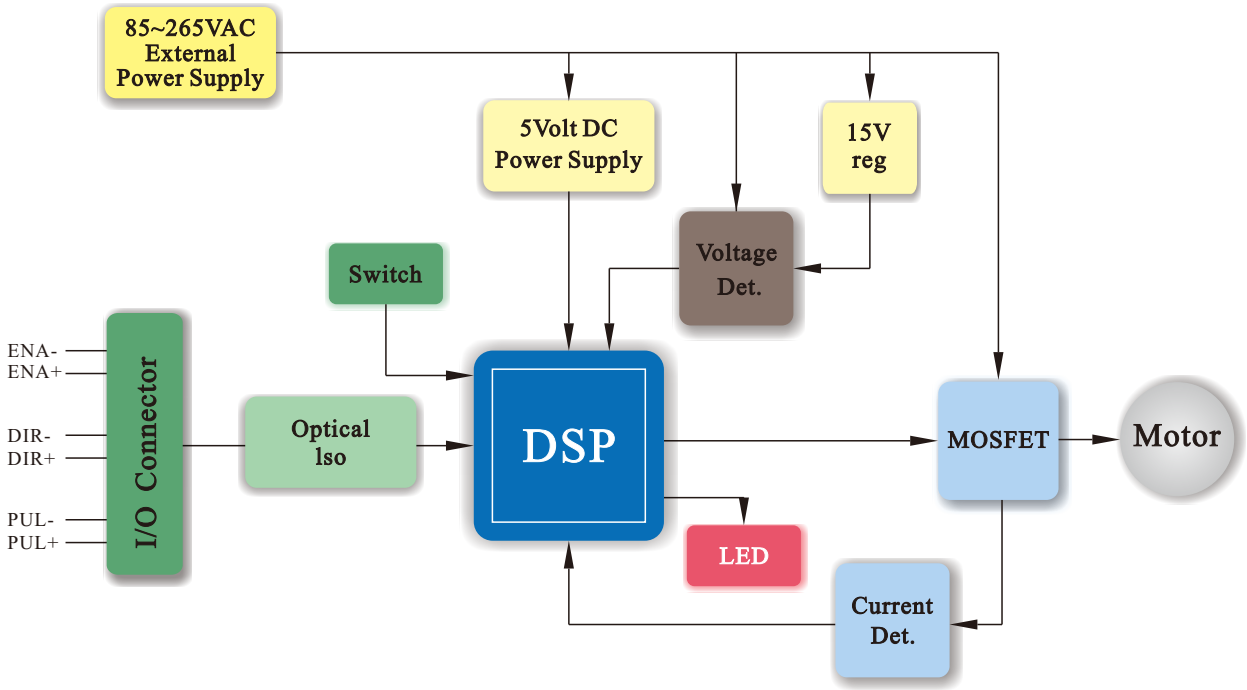
MC8H

Features

MC8H 2phase digital stepper motor driver is a cost-effective, high performance step drives. The design is based on advanced digital current control technology, and features high torque, low noise, and low vibration. The running current, microstep resolution and other parameters are switch selectable. MC8H can be matched for 2phase 110mm and 130mm stepper motors.

- New ARM 32bit processor
- Idle Current setting
- Input Voltage VAC85-265
- Torque Ripple Smoothing
- Self Test and alarm function
- Resolution is 25600
- Output current reaches 8.0A
- CW/CCW and CW/Dir modes switches
- Signal input is 5-24VDC
- Microstep Emulation

Functional diagram



Electrical performance and environment indicators

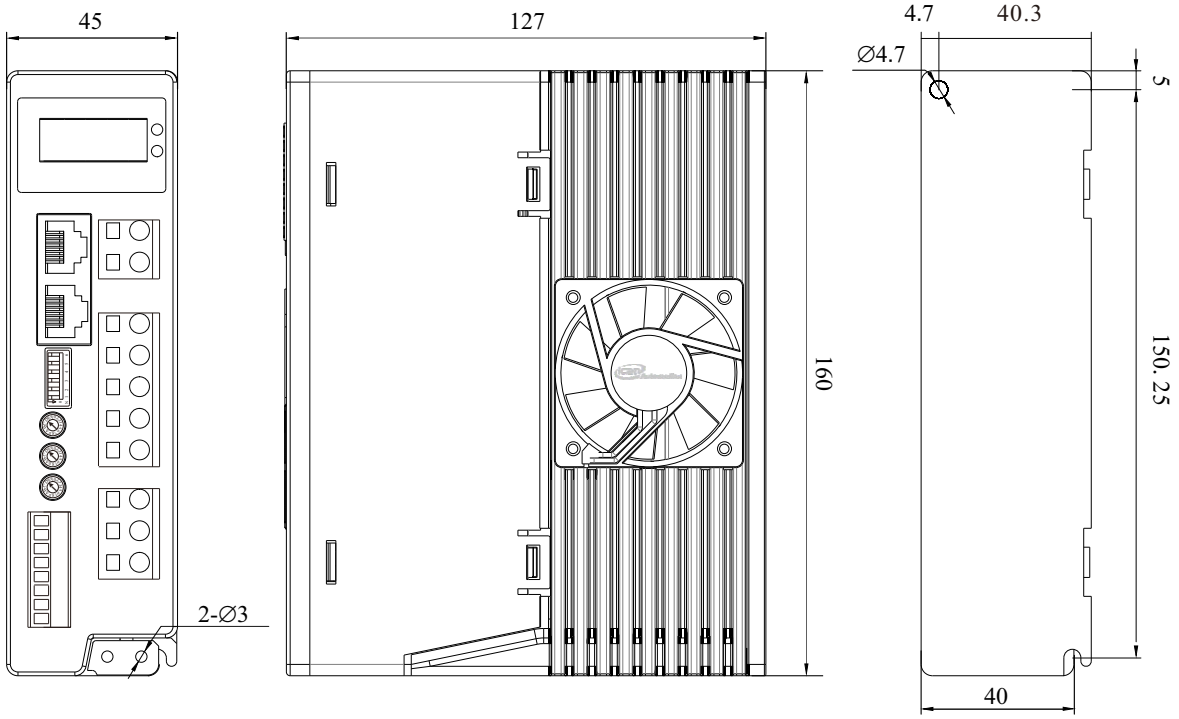
Electrical Specifications

Parameter	Min.	Typical	Max.	Unit
Power supply	85	220	265	VAC
Output Current	0.5	–	8.0	A
Step Frequency	1	–	1M	Hz
Step pulse width	250	–	5E+8	ns
Input Signal Voltage	3.6	5	24	VDC

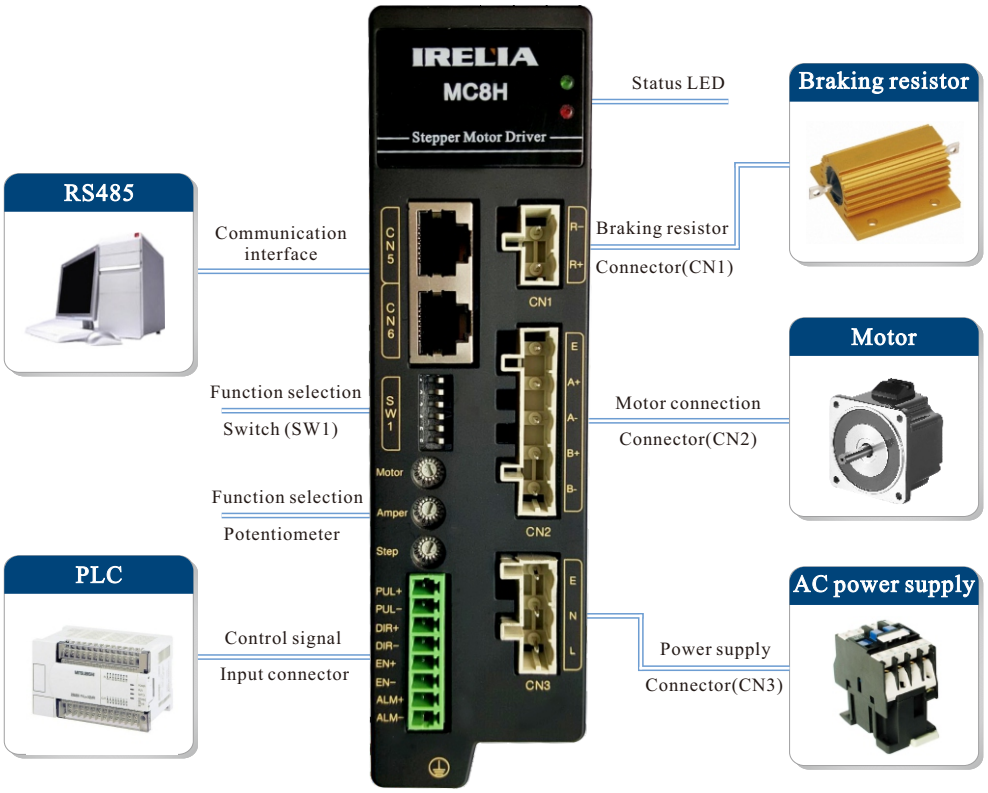
Environment Indicators

Heat Sinking Method	Natural cooling or fan-forced cooling
Atmosphere	Avoid dust, oily mist and corrosive air
Operating Temperature	0～40℃
Ambient Humidity	90% or less (non-condensing)
Storage Temperature	-10～70℃
Heat Sinking Method	5.9m/s² maximum

Dimension (Units: mm)



System Configuration



Motor connector

CN2	Function description
E	FG
A+	Motor phase A+
A-	Motor phase A-
B+	Motor phase B+
B-	Motor phase B-

Function selection switches

Name	Function description
Motor	Motor parameter setting
Amper	Current setting
Step	Resolution setting

Power supply connector

CN3	Function description
E	EG
N	AC power supply (AC220-265V)
L	

Control signal connector

Connector	Function description
PUL+	Pulse input+/CW pulse input+
PUL-	Pulse input-/CW pulse input-
DIR+	Direction signal input+/CWW pulse input+
DIR-	Direction signal input-/CWW pulse input-
ENA+	Enable signal input+
ENA-	Enable signal input-
ALM+	Alarm output signal+
ALM-	Alarm output signal-

- Braking resistor connector

CN1	Name	Function description
R-	Braking resistor-	In the heavy load occasions and the braking process, inertia generates electricity, which could destroy the drive. To protect the driver, please connect the brake resistor.
R+	Braking resistor+	

- Function setting switch SW1

Name	Function description		
P1	Massager address setting (optional). If needed, please contact sales person.		
P2			
P3			
P4	Self testing	Self testing open：ON	Self testing closed：OFF
P5	Pulse&Dir input selection	Pulse+Dir：OFF	CW/CCW：ON
P6	Current Idle	Half current：OFF	Full current：ON

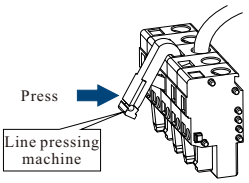
- Massager address connector (optional).

If needed, please contact sales person.

Power, motor and ground connection

CN1、CN2、CN3 connection

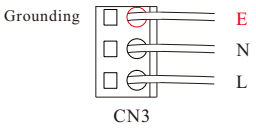
1. Put the wire into the connector using line pressing machine.
2. Loosen the line pressing machine, fix the wire.



Notice: Don't connect when power is on in case electric shock.

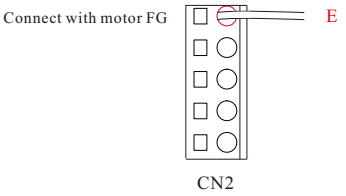
Protective earthling

Please use AWG24-16 wire to connect and connect E terminal of CN3 with ground incase electric shock.



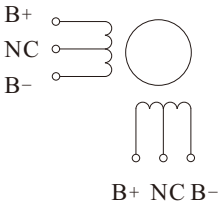
Motor connection

Please connect CN2 and Motor FG in case of electric shock.

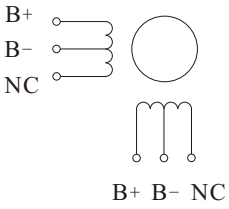


To change the direction of motor, customers only need to change the line sequence of Phase A or Phase B. Customer can select different modes of connection according to different user environment.

6 leads series motor

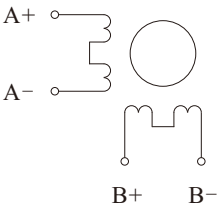


High torque output

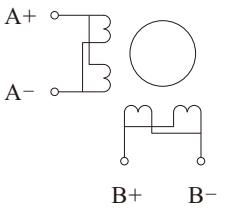


High speed output

8 leads series motor



In series (High torque output)

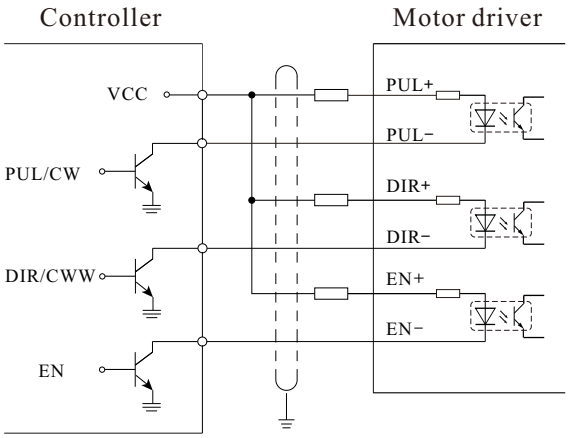


In parallel (High speed output)

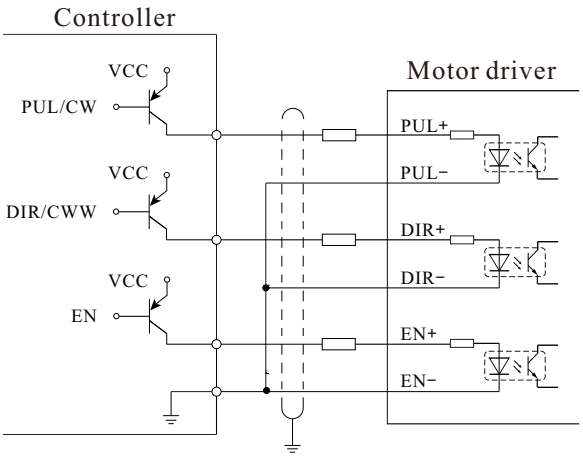
Control signal input

The control signal is OC input; the voltage ranges DC5-24V. The largest step frequency is 200KHz and rising edge is valid.

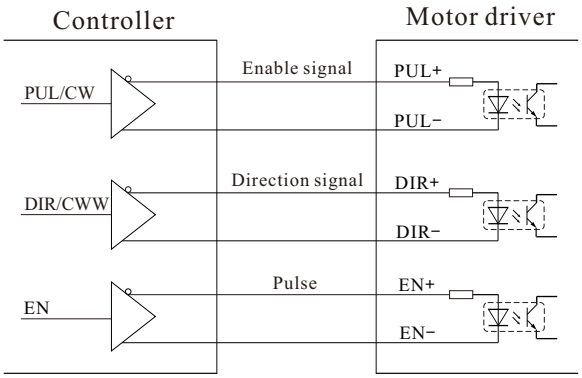
Common anode



Common cathode



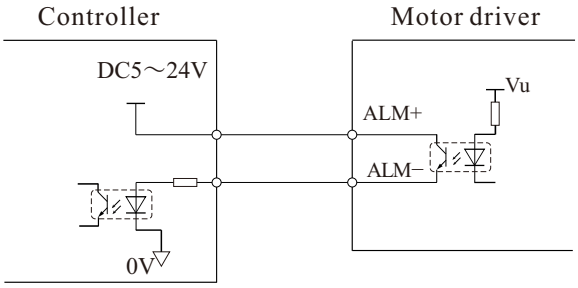
Difference



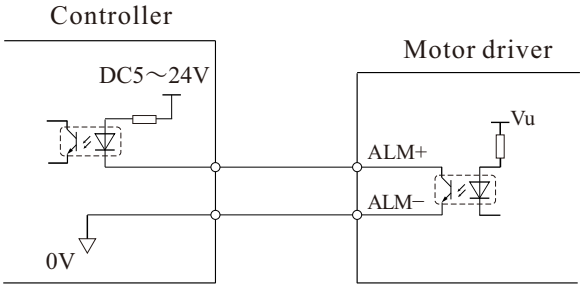
Alarm signal output

Alarm signal output is OC. The maximum saturation voltage is 30V and maximum saturation current is 100mA.

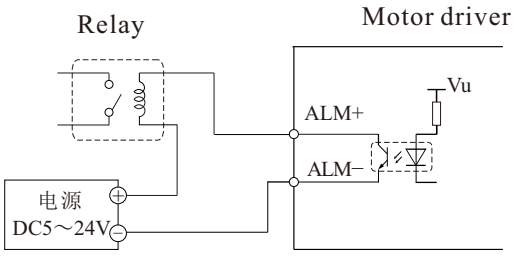
Common anode



Common cathode



Relay



Function setting

Pulse Input Mode

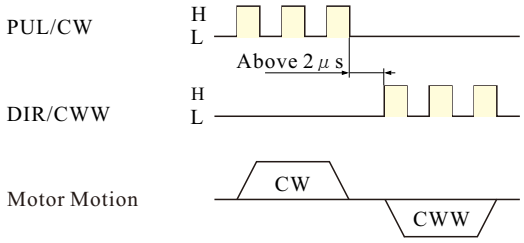
CW/CCW mode: P5=ON
PUL/DIR mode: P5=OFF (factory setting)

The setting will take effect after recycle the power

CW/CCW Pulse

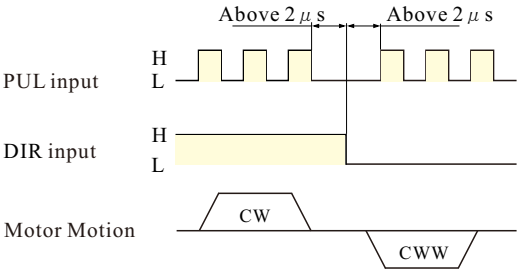
When pulse is input at PUL/CW terminal, the motor will rotate by one step in one direction.

When pulse is input at DIR/CWW terminal, the motor will rotate by one step in the other direction.



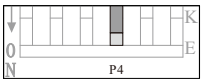
Pulse & Direction

When pulse is input at PUL terminal, and DIR terminal is high voltage, the motor will rotate by one step in one direction. When pulse is input at PUL terminal, and DIR terminal is low voltage, the motor will rotate by one step in the other direction.



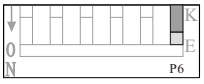
Self Test

Setting switch P4 to ON after the drive is powered up will cause the drive to perform a self test rotate the motor back and forth, two turns in each direction, setting switch P4 to OFF will disable this feature.



Idle Current

The running current of the motor driver is automatically reduced whenever the motor hasn't moved for 1 second. Setting the P6 switch to ON reduces the current to 50% of its running value. Setting this switch to OFF maintains 90% of the running current. This 90% setting is useful when a high holding torque is required. To minimize motor and drive heating it is highly recommended that the idle current reduction feature be set to 50% unless the application requires the higher setting.



EN Input

The EN input enables or disables the drive amplifier. When EN input is ON the drive amplifier.
When EN input is ON the drive amplifier is deactivated. All the mosfets will shut down, and the motor will be free.
When EN input is OFF, the drive is activated. A falling signal into the EN input will reset the error status and activate the drive amplifier again.

Anti Resonance

To optimize the system performance to gain fastest feedback, customers are allowed to select parameters to match the motor size, motor inductance.

Switch	0	1	2	3	4	5	6	7
Flange size(mm)	57	57	60	60	86	86	86	86
Switch	8	9	A	B	C	D	E	F
Flange size(mm)	110	110	110	110	130	130	130	130

The recommended motors are our motors. If performance is not good after switching according to the above tab, please contact us with motor parameters.

Running current setting

The output current of the driver is set by the Amper potentiometer and can be changed as necessary. Normally, customers set the current same with the motor rated current.

Switch	0	1	2	3	4	5	6	7
Peak running current	0. 5A	1.0A	1.5A	2.0A	2.5A	3.0A	3.5A	4.0A
Switch	8	9	A	B	C	D	E	F
Peak running current	4.5A	5.0A	5.5A	6.0A	6.5A	7.0A	7.5A	8.0A

Microstepping

The microstep resolution is set by the Step potentiometer. There are 16 settings.

Switch	0	1	2	3	4	5	6	7
Resolution(step/r)	200	400	800	1600	3200	6400	12800	25600
Switch	8	9	A	B	C	D	E	F
Resolution(step/r)	1000	2000	4000	5000	8000	10000	20000	25000

LED Error Codes

LED	Motion status/Alarm
 Flashing green	Normal
 2 green, 2red circulation flashing	Over current
 2 green, 3red circulation flashing	Open motor winding
 2 green, 4red circulation flashing	Over voltage
 2 green, 5red circulation flashing	Under voltage
 1 green, 3red circulation flashing	Internal supply voltage is insufficient
 1 green, 2red circulation flashing	Over temperature protection
 Flashing red	Motor enabled

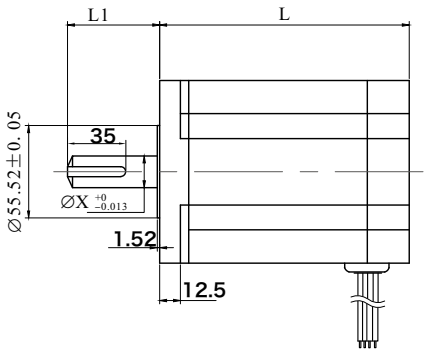
Turning on power is banned when driver hasn't been connected with motor, power positive and negative pole will ruin the driver.

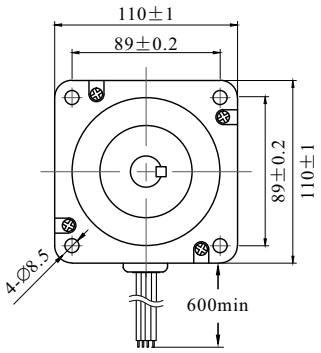
Troubleshooting

Situation	Possible cause	Suggestion
Motor disabled	Motor is in EN status	Input a falling signal into the EN input.
	Wrong wiring	Check the wiring and make sure connection is right
	Output current is low	Set the switch to set suitable current
	Microstep resolution is low	Set the resolution higher
	No pulse signal input	Make sure pulse signal input
	Input pulse signal is weak	Make sure the input signal voltage DC5-24V, 7-16Ma
	CW and CWW signal are input simultaneously	Make sure the pulse input mode
	No power supply	Make sure power supply works
Motor motion is not smooth	Motor speed is in resonance zone	Set the microstep resolution higher
	External interference exists	Make sure the interference source and interference position
The amount of movement of the motor varies with the set value	Microstep resolution is not right	Set the right resolution
	Output current is low	Set the switch to set suitable current
Motor out of step	Acceleration / deceleration time is too short	Set the Acceleration / deceleration time longer
	Rated torque is low	Select suitable motor
	Start frequency is too high	set the frequency lower when start
	Current value is low	Set the current higher
	Voltage value is low	Set the voltage higher
	External interference exists	Make sure the interference source and interference position

Recommended motor

- 2 phase hybrid nema 42 stepper motor

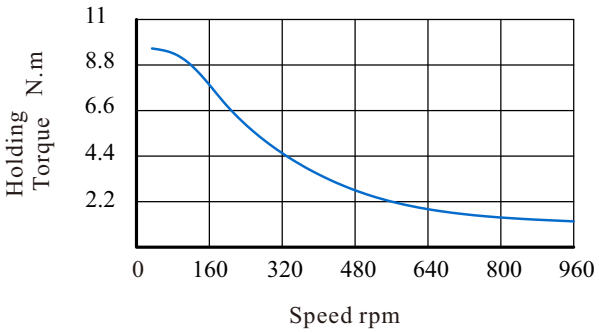




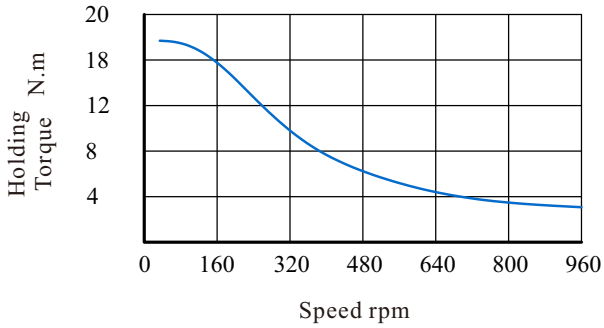
unit: mm

Model	Holding Torque(Nm)	Current/ phase(A)	Resistance (Ω)	Inductance (mH)	Diameter of axle X(mm)	Axial length L1(mm)	Motor Length L(mm)
110H2P1255A4	11.2	5.5	0.9	12	19	55.5	99
110H2P2168A4	21	6.8	0.8	11	19	55.5	150
110H2P3080A4	30	8.0	0.67	16	19	55.5	201

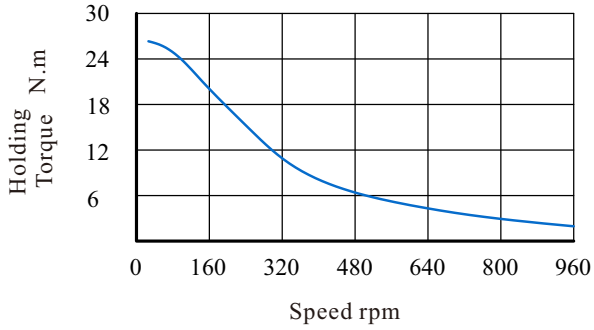
Driver:MC8H Current:5.5A AC220V
Motor:110H2P1255A4 Subdivision：3200 Step/r



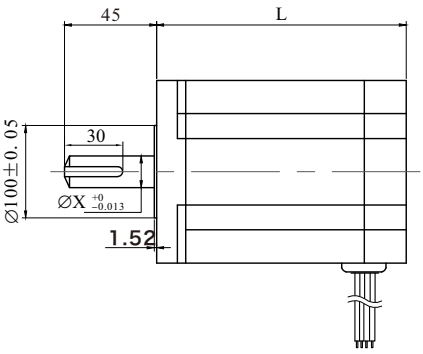
Driver:MC8H Current:6.5A AC220V
Motor:110H2P2168A4 Subdivision：3200 Step/r

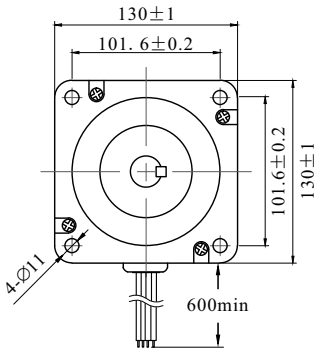


Driver:MC8H Current:8.0A AC220V
Motor:110H2P3080A4 Subdivision：3200 Step/r



- 2 phase hybrid nema 51 stepper motor



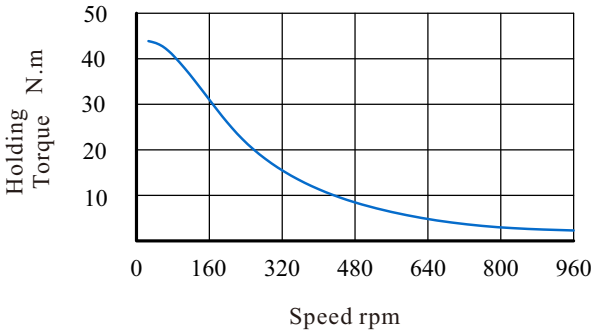


unit: mm

Model	Holding Torque(Nm)	Current/ phase(A)	Resistance (Ω)	Inductance (mH)	Diameter of axle X(mm)	Axial length L1(mm)	Motor Length L(mm)
130H2P5050A4	50	5.0	1.58	28	19	45	282

Driver:MC8H Current:5.0A AC220V

Motor:130H2P5050A4 Subdivision：3200 Step/r



After sale service

Warranty period

Dongguan ICAN Technology provides warranty for 1 year from the date of shipping.

Maintenance process

1) Get the maintenance permission

2) Ship the package to the following address: 4/F, Block B, RuiLian Zhenxing Industrial Park, Wanjiang District, Dongguan City, Guangdong Province

Tel: 86-0769-22327568

Return policy

1. After use or man-made damage condition (etc, wrong wiring), no return

2. ICAN Technology guarantees the product quality, but product incompatibility is not in the return or maintain condition.

3. Customers don't use the products under the specified electrical performance and environment indicators, no maintain condition

iCAN Automation

Dongguan ICAN Technology Co., Ltd

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