

## STEPPER SYSTEM

*Be more intelligent in motion control*

EtherCAT<sup>®</sup>

CANopen

Modbus



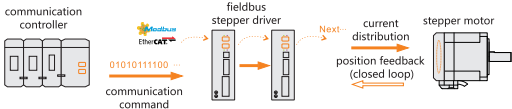
STELLIGENT

## Fieldbus Stepper System

The control method of the traditional stepper motor is that the drive receives pulses to control the operation of the motor. At present, for some applications with high requirements, the pulse type control method can no longer meet the demand, and the fieldbus type control is required.

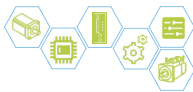
Compared with the pulse type, the fieldbus type is not only much easier in wiring, but also relatively simple to write the control program. Moreover, it can also monitor the running state of the motor and change the motor current and micro-stepping at any time, and simple control of acceleration and deceleration, analogue synchronous command, offline control, etc.

### Block Diagram



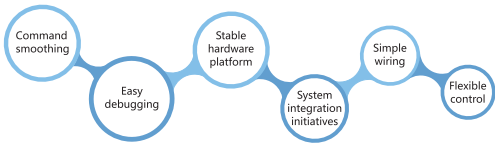
### Features

Various communication modes	More flexible control
Includes a variety of fieldbus communication methods, which are suitable for various applications.	The fieldbus realizes the distributed control, and for the distributed control system, the fieldbus is an indispensable part.
<b>Stronger anti-interference ability</b> Since the fieldbus control method adopts digital serial communication method and the cable adopts shielded twisted pair, it has stronger anti-interference ability than the traditional discrete control method.	<b>More accurate and reliable</b> Due to the intelligence and digitization of fieldbus devices, compared with traditional discrete control systems, the accuracy of measurement and control is fundamentally improved, and transmission errors are reduced. At the same time, due to the simplified structure of the system, the connection cables of the equipment are reduced, and the working reliability of the system is improved.



## Fieldbus Stepper Drive

Our fieldbus series high-performance stepper drive has better design and stability, supports 485, EtherCAT, Modbus TCP, CANopen and other fieldbus communication methods, can be connected to multi-axis networking, and is easy to use.



### Naming Rule

<u>EC</u>	<u>T</u>	<u>60</u>	-	<u>□</u>
1	2	3		4
1 Fieldbus type N: 485 communication EC: EtherCAT communication		2 Series code R: open loop T: closed loop		
3 Matching motor frame size		4 Non-standard code		

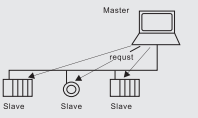

\*Model naming rules are only used for model meaning analysis. For specific optional models, please refer to the details page.

### Product Series

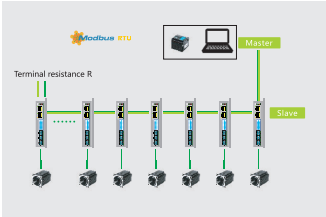
Modbus RTU NT Series	Modbus TCP EP Series	EtherCAT EC Series
<ul style="list-style-type: none"><li>Matching motor frame below 86mm</li><li>Integrated motion controller function</li><li>Built-in T-shaped acceleration and deceleration command</li><li>Support various internal homing</li><li>Communication control/pulse control/switch control</li></ul>	<ul style="list-style-type: none"><li>Matching motor frame below 60mm</li><li>Integrated motion controller function</li><li>Built-in T-shaped</li><li>Support various internal homing</li><li>Compatible with 10M/100Mbps network interface</li></ul>	<ul style="list-style-type: none"><li>Matching motor frame below 86mm</li><li>Comply with C1A402 specification</li><li>CSP/CSV/HM/PP/PV</li><li>Support various internal homing</li><li>The minimum synchronization period in CSP mode is 500us</li></ul>

■ 485 Communication Type Stepper Drive

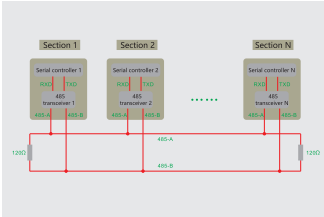
■ Modbus RTU Rotocol Overview

Schematic	Command format	Features
 <p>Modbus broadcast mode block diagram</p>	 <p>Command format: Slave address + function code + data + CRC check</p> <p>Function code: 0X03 Read holding register 0X06 Write a single register 0X10 Write multiple registers</p>	<ul style="list-style-type: none"><li>• Broadcast mode</li><li>• One master multiple slaves</li><li>• Host query and slave response</li><li>• Slaves have no priority arbitration rights</li><li>• Simple hardware</li><li>• Reliable serial communication</li></ul>

■ Networking Diagram



■ Two-wire Half-duplex Wiring Diagram



■ Technical Specifications

Model	Peak current A	Weight kg	Power voltage	Dimensions mm	Communication mode	Maximum baud rate	Matching motor
NT60	6	0.3	18-50VDC	118×76×33	485	115200	Open loop or closed loop below 60mm
NT86	8	0.6	18-80VAC	151×97×52	485	115200	Open loop or closed loop below 86mm

■ LED Indication

LED status	Drive status	Fault handling
● Steady green light	Drive not enabled	
● Flashing green light	Drive works fine	
● 1 green 1 red	Drive overcurrent	Check wiring, repair drive
● 1 green 2 red	Drive input power supply overvoltage	Check the input supply voltage
● 1 green 3 red	Drive internal voltage error	Drive failure
● 1 green 4 red	Encoder out-of-tolerance alarm	
● 1 green 5 red	Encoder phase error	
● 1 green 6 red	Parameter storage error	


■ NT Series Application

■ PLC Master Station + NT Drive Slave Station ■ Touch Screen Master + NT Drive Slave

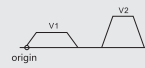
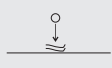
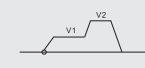

<p>Master+Slave: PLC+NT drive</p> <p>Convenient networking PLC with 485 communication Support up to 31 slave stations Optional touch screen for slave station, quick interaction</p>	<p>Master+Slave: Touch screen+NT driver</p> <p>Convenient networking Streamline cost control Commonly used macro instruction programming mode For simple logic loop control</p>
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■ NT Series Drive Automatic Programming Mode

<p>Drive automatic programming mode</p> <p>No networking required Use the internal integrated motion control instructions With external IO control Fixed speed/positioning/multi-stage position/ auto-homing etc.</p>	
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■ Function in Self-programming Mode

<p>IO positioning operation</p> <p>IO forward and revers One or more target position Support torque homing</p> 	<p>IO torque mode</p> <p>IO forward and reverse Target torque switching Support torque homing</p> 
<p>IO speed control operation</p> <p>IO forward and reverse One or more target position</p> 	<p>IO torque mode</p> <p>IO forward and reverse Target torque and position switching Support torque homing</p> 

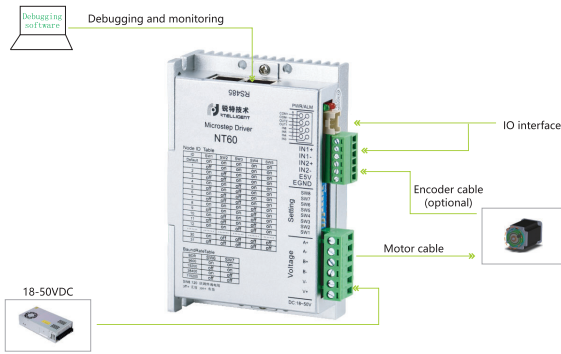
## NT60

485 fieldbus stepper drive NT60 is based on RS-485 network to run Modbus RTU protocol. The intelligent motion control function is integrated, and with external IO control, it can complete functions such as fixed position/fixed speed/multi-position/auto-homing.

NT60 matches open loop or closed loop stepper motors below 60mm.

- Control mode: fixed length/fixed speed/homing/multi-speed/multi-position
- Debugging software: RTConfigurator (multiplexed RS485 interface)
- Power voltage: 24-50V DC
- Typical applications: single axis electric cylinder, assembly line, connection table, multi-axis positioning platform, etc

### Drive Interface & Connection

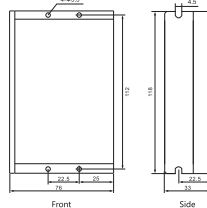


### Function Setting

ID setting		
on=0, off=1		
ID=sw1+sw2*2+sw3*4+sw4*8+sw5*16		
Ensure the ID number is set correctly before powering on		
Baud rate setting		
RDR	SW6	SW7
9600	on	on
19200	off	on
38400	on	off
115200	off	off
The baud rate of the slave station must correspond to the baud rate set by the master station		
When adjusting the dial code it is necessary to power off and restart the drive to take effect.		

Input interface		
Input 1	IN1+ IN1-	Differential input or encoder input interface
Input 2	IN2+ IN2-	
Input 3	IN3	Single-ended common anode input
Input 4	IN4	
Input 5	IN5	
Input 6	IN6	
	COM+	Common input
Output interface		
Output 1	OUT1	
Output 2	OUT2	
	COM-	Common output

### Installation Dimension



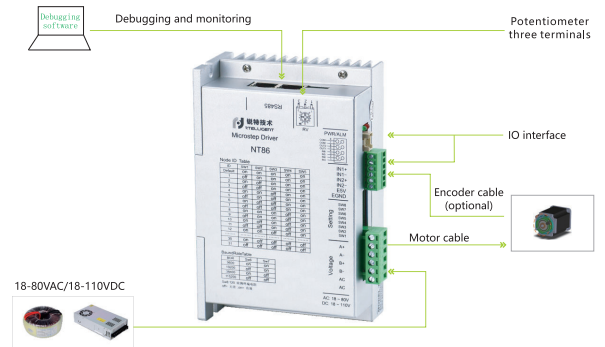
## NT86

485 fieldbus stepper drive NT86 is based on RS-485 network to run Modbus RTU protocol. The intelligent motion control function is integrated, and with external IO control, it can complete functions such as fixed position/fixed speed/multi-position/auto-homing.

NT86 matches open loop or closed loop stepper motors below 86mm.

- Control mode: fixed length/fixed speed/homing/multi-speed/multi-position/potentiometer speed regulation
- Debugging software: RTConfigurator (multiplexed RS485 interface)
- Power voltage: 18-110VDC, 18-80VAC
- Typical applications: single axis electric cylinder, assembly line, multi-axis positioning platform, etc

### Drive Interface & Connection

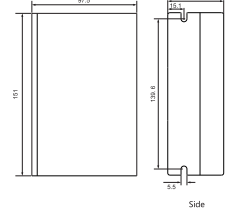


### Function Setting

ID setting		
on=0, off=1		
ID=sw1+sw2*2+sw3*4+sw4*8+sw5*16		
Ensure the ID number is set correctly before powering on		
Baud rate setting		
RDR	SW6	SW7
9600	on	on
19200	off	on
38400	on	off
115200	off	off
The baud rate of the slave station must correspond to the baud rate set by the master station		
When adjusting the dial code it is necessary to power off and restart the drive to take effect.		

Input interface		
Input 1	IN1+ IN1-	Differential input or encoder input interface
Input 2	IN2+ IN2-	
Input 3	IN3	Single-ended common anode input
Input 4	IN4	
Input 5	IN5	
Input 6	IN6	
	COM+	Common input
Output interface		
Output 1	OUT1	
Output 2	OUT2	
	COM-	Common output

### Installation Dimension



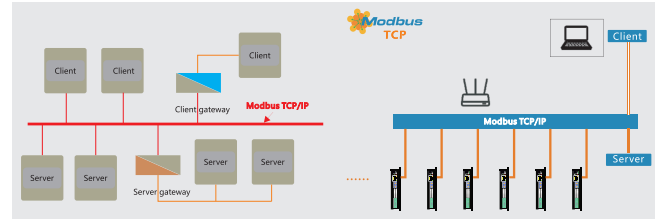


## ■ Modbus TCP Communication Type Stepper Drive

### ■ Protocol Overview

Schematic	Features
<div><div>Standard network architecture</div><div>Fieldbus architecture</div><div>Modbus TCP is the same as the standard network bottom layer. Implement Modbus protocol only at the application layer.</div></div>	<ul style="list-style-type: none"><li>Compatible with standard Ethernet</li><li>Cost effective of network implementation</li><li>Easy to interconnect with various systems</li><li>High-speed data transfer rate</li><li>Mature supporting equipment</li><li>Convenient for remote debugging and monitoring</li></ul>

### ■ TCP Network Connection Diagram



### ■ Technical Specifications

Model	Peak current A	Weight kg	Power voltage	Dimensions mm	Communication mode	Maximum baud rate	Matching motor
EPR60	6.0	0.4	18-50VDC	134 82 29	TCP/IP	10M/100M	Open loop below 60mm
EPT60	6.0	0.4	18-50VDC	134 82 29	TCP/IP	10M/100M	Closed loop below 60mm

### ■ LED Indication

LED status	Drive status	Fault handling
Steady green light	Drive not enabled	
Flashing green light	Drive works fine	
1 green 1 red	Drive overcurrent	Check wiring, repair drive
1 green 2 red	Drive input power supply overvoltage	Check the input supply voltage
1 green 3 red	Drive internal voltage error	Drive failure
1 green 4 red	Encoder out-of-tolerance alarm	
1 green 5 red	Encoder phase error	
1 green 6 red	Parameter storage error	
1 green 7 red	Motor phase loss	Check the wiring terminal and confirm the extension cable connector

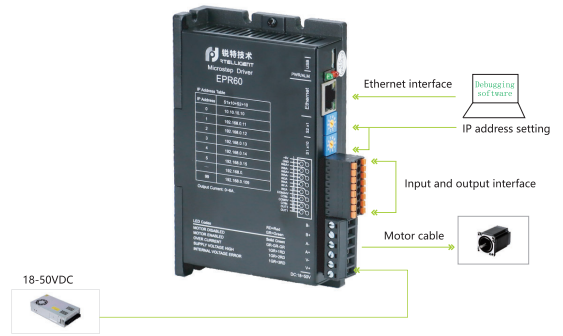
## EPR60

The Ethernet fieldbus-controlled stepper drive EPR60 runs the Modbus TCP protocol based on standard Ethernet interface and integrates a rich set of motion control functions. EPR60 adopts standard 10M/100M bps network layout, which is convenient to build the Internet of Things for automation equipment.

EPR60 is compatible with open-loop stepper motors base below 60mm.

- Control mode: fixed length/fixed speed/homing/multi-speed/multi-position
- Debugging software: RTConfigurator (USB interface)
- Power voltage: 18-50VDC
- Typical applications: assembly lines, warehousing logistics equipment, multi-axis positioning platforms, etc

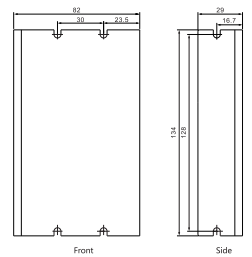
### ■ Drive Interface & Connection



### ■ Function Setting

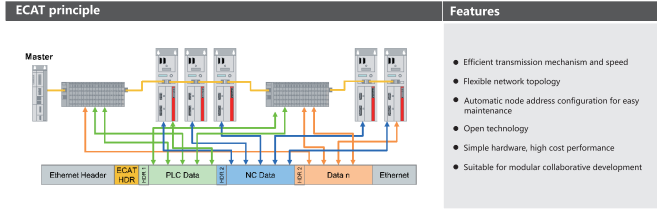
Input interface		
3	IN6+	Differential input or encoder input interface
4	IN6-	
5	IN5+	
6	IN5-	
7	IN3	Single-ended common anode input
8	IN4	
9	IN1	
10	IN2	
11	COM+	Common input
Output interface		
16	OUT1	Single-ended common cathode input
15	OUT2	
12/14	COM-	Common output
IP setting		
IP Add = S1*10 + S2*10		
Ensure the IP address is set correctly before powering on		

### ■ Installation Dimension

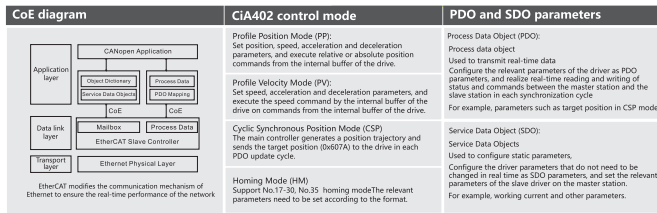


## ■ EtherCAT Protocol: Based on Industrial Ethernet Fieldbus communciation

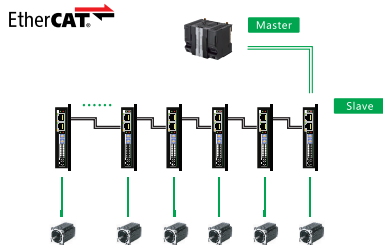
### ■ EtherCAT Principle



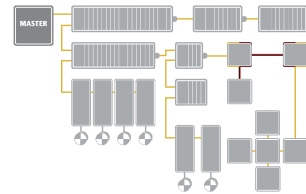
### ■ CANopen over EtherCAT Protocol Overview



### ■ EtherCAT Network Diagram



### ■ EtherCAT Topology



### ■ General Master Stations Supported



Flexible topology-support linear, tree, star

### ■ Technical Specifications

Model	Peak current A	Weight kg	Input voltage	Dimensions mm	Input and output	Matching motor
ECR42	6.0	0.4	18-80VDC	132×82×29	Six inputs, two outputs	open loop below 42mm
ECR60	6.0	0.4	18-80VDC	132×82×29	Six inputs, two outputs	open loop below 60mm
ECR86	7.2	0.6	18-80VAC	151×97×35	Six inputs, two outputs	open loop below 86mm
ECT42	6.0	0.4	18-80VDC	132×82×29	Four inputs, two outputs	closed loop below 42mm
ECT60	6.0	0.4	18-80VDC	132×82×29	Four inputs, two outputs	closed loop below 60mm
ECT86	7.2	0.6	18-80VAC	151×97×35	Four inputs, two outputs	closed loop below 86mm
ECR60X2A	6.0	0.5	18-80VDC	175 98 33	Eight inputs, four outputs	open loop below 60mm
ECT60X2	6.0	0.5	18-80VDC	175 98 33	Eight inputs, four outputs	closed loop below 60mm

### ■ LED Indication









LED status	Drive status	Fault handling
Steady green light	Drive not enabled	
Flashing green light	Drive works fine	
1 green 1 red	Drive overcurrent	Check wiring, repair drive
1 green 2 red	Drive input power supply overvoltage	Check the input supply voltage
1 green 3 red	Drive internal voltage error	Drive failure
1 green 4 red	Encoder out-of-tolerance alarm	
1 green 5 red	Encoder phase error	
1 green 6 red	Parameter storage error	
1 green 7 red	Motor phase loss	Check the wiring terminal and confirm the extension cable connector

### ■ Common Parameter

Function	Object dictionary	Sub-index	Content	Remarks
Peak current	0x2000	—	Modify the motor maximum current	The maximum motor current cannot be exceeded.
Encoder resolution	0x2020	—	Set the motor encoder resolution after 4 times the frequency	Related to motor/default 4000puls/r
Motor resolution	0x2001	—	Set the resolution of one motor revolution	Initial value 10000
Selection of pulses per revolution	0x2057	—	Select the actual motor pulse per revolution parameter value	The default 0 is the encoder resolution value
Save parameters	0x1010	1	Save all parameters(0—1)	Select 1 to set the value for 2001
The current position of the motor	0x0064	—	Display the current position value of the motor	Based on pulses per revolution
Input port status display	0x60FD	—	Display the actual status of the input port	
Input port function selection	0x2007	1/2/3/4	Input port function selection/sub-index is IN port serial number	8bit binary(convert to decimal)
Input ID polarity	0x2008	—	Select ID port input polarity	

Note: The object dictionary address of axis 2 of ECT60X2/ECR60X2A is the address of the object dictionary of axis 1, plus 0x0800.

### ■ LED Indication

LED status			Communication status
GREEN		Not bright	Initialization
		Slow flash	Pre-operational
		Single flash	Safe-operational
		Constant bright	Operational
RED		Not bright	No error
		Slow flash	General error
		Single flash	Sync error
		Double flash	Watchdog error

Slow flash: on for 200ms, off for 200ms; repeat  
Single flash: on for 200ms, off for 1s; repeat  
Double flash: on for 200ms, off for 200ms, then on for 200ms, off for 1s; repeat

ECR Series

The EtherCAT fieldbus stepper drive is based on the CoE standard framework and complies with the CiA402 standard. The data transmission rate is up to 100Mb/s, and supports various network topologies.

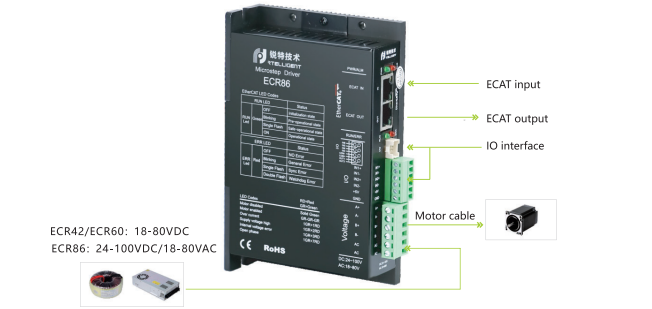
ECR42 matches open loop stepper motors below 42mm.

ECR60 matches open loop stepper motors below 60mm.

ECR86 matches open loop stepper motors below 86mm.

- Control mode: PP, PV, CSP, HM, etc
- Power supply voltage: 18-80VDC (ECR60), 24-100VDC/18-80VAC (ECR86)
- Input and output: 2-channel differential inputs/4-channel 24V common anode inputs; 2-channel optocoupler isolated outputs
- Typical applications: assembly lines, lithium battery equipment, solar equipment, 3C electronic equipment, etc

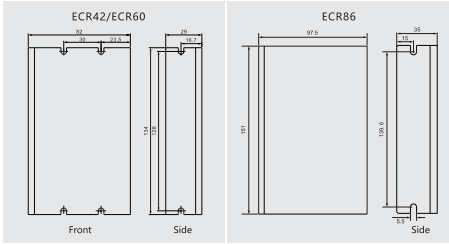
Drive Interface & Connection



Function Setting

Input interface	
Input1	IN1+ Differential input signal
Input2	IN3+ IN2+ 5V level input
Input3	IN2- IN3- Single-ended common anode input
Input4	IN4 Default function: IN3 positive limit
Input5	IN5 IN4 negative limit
Input6	IN6 IN5 origin
COM+	Common input
Internal power output interface	
+5V	Internal 5V/80mA power output
GND	
Output interface	
Output1	OUT1 Single-ended common
Output2	OUT2 cathode output
COM-	Common output

Installation Dimension



ECT Series

The EtherCAT fieldbus stepper drive is based on the CoE standard framework and complies with the CiA402 standard. The data transmission rate is up to 100Mb/s, and supports various network topologies.

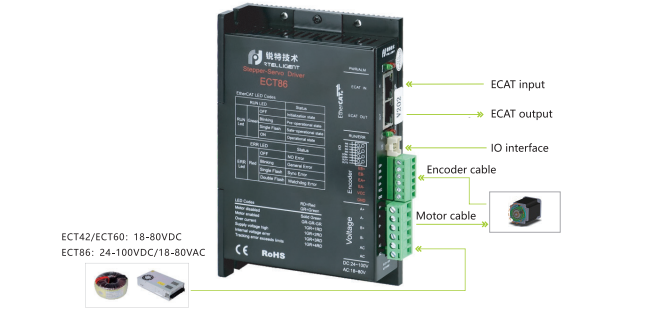
ECT42 matches closed loop stepper motors below 42mm.

ECT60 matches closed loop stepper motors below 60mm.

ECT86 matches closed loop stepper motors below 86mm.

- Control mode: PP, PV, CSP, HM, etc
- Power supply voltage: 18-80VDC (ECT60), 24-100VDC/18-80VAC (ECT86)
- Input and output: 4-channel 24V common anode input; 2-channel optocoupler isolated outputs
- Typical applications: assembly lines, lithium battery equipment, solar equipment, 3C electronic equipment, etc

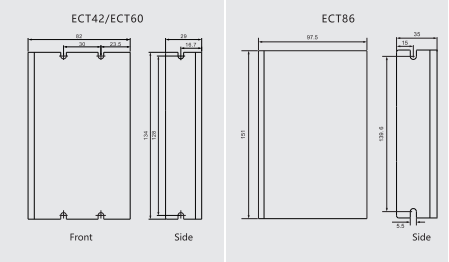
Drive Interface & Connection



Function Setting

Encoder interface	
EB+	Encoder phase A/B signal
EB-	
EA+	
EA-	
VCC	Encoder 5V power supply
GND	Provided internally by the drive
Input interface	
Input3	IN3 Single-ended common anode input
Input4	IN4 Default function: IN3 positive limit
Input5	IN5 IN4 negative limit
Input6	IN6 IN5 origin
COM+	24V common input
Output interface	
Output1	OUT1 Single-ended common
Output2	OUT2 cathode output
COM-	0V common output

Installation Dimension

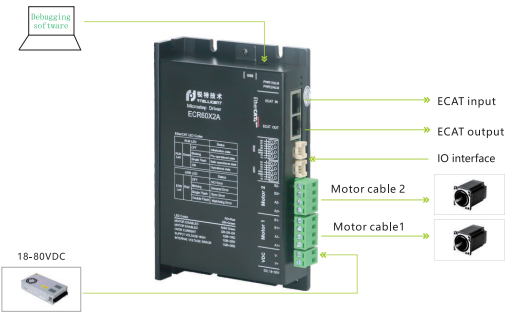


ECR60X2A

The EtherCAT fieldbus open loop stepper drive ECR60X2A is based on the CoE standard framework and complies with the CiA402 standard. The data transmission rate is up to 100Mb/s, and supports various network topologies. ECR60X2A matches open loop stepper motors below 60mm.

- Control modes: PP, PV, CSP, CSV, HM, etc
- Power supply voltage: 18-80V DC
- Input and output: 8-channel 24V common positive input; 4-channel optocoupler isolation outputs
- Typical applications: assembly lines, lithium battery equipment, solar equipment, 3C electronic equipment, etc

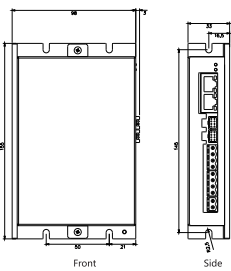
Drive Interface & Connection



Function Setting

Signal interface	ID	Default function
I/O 1	Y2	Axis 1 brake output
	Y1	Axis 1 alarm output
	COM+	Axis 1 input common : 24V
	COM-	Axis 1 output Common: 0V
	X1	Axis 1 negative limit input
	X2	Axis 1 positive limit input
	X3	Axis 1 zero input
	X4	Axis 1 emergency stop input
I/O 2	Y4	Axis 2 brake output
	Y3	Axis 2 alarm output
	COM+	Axis 2 input common : 24V
	COM-	Axis 2 output Common: 0V
	X5	Axis 2 negative limit input
	X6	Axis 2 positive limit input
	X7	Axis 2 zero input
	X8	Axis 2 emergency stop input

Installation Dimension

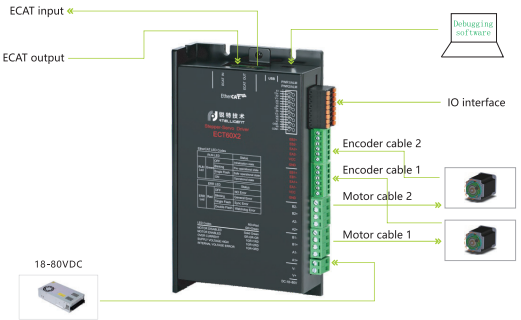


ECT60X2

The EtherCAT fieldbus stepper drive ECT60X2 is based on the CoE standard framework and complies with the CiA402 standard. The data transmission rate is up to 100Mb/s, and supports various network topologies. ECT60X2 matches closed loop stepper motors below 60mm.

- Control mode: PP, PV, CSP, HM, etc
- Power supply voltage: 18-80VDC
- Input and output: 8-channel 24V common anode input; 4-channel optocoupler isolated outputs
- Typical applications: assembly lines, lithium battery equipment, solar equipment, 3C electronic equipment, etc

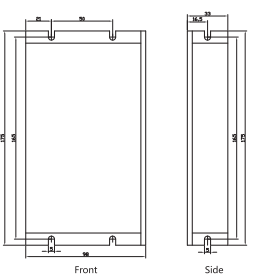
Drive Interface & Connection



Function Setting

Pin No	ID	Default function
1	X1	Axis 1 negative limit input
3	X2	Axis 1 positive limit input
5	X3	Axis 1 zero input
7	X4	Axis 1 emergency stop input
9	X5	Axis 2 negative limit input
11	X6	Axis 2 positive limit input
13	X7	Axis 2 zero input
15	X8	Axis 2 emergency stop input
2	Y1+	Axis 1 alarm output positive
4	Y1-	Axis 1 alarm output negative
6	Y2	Axis 1 brake output
8	Y3+	Axis 2 alarm output positive
10	Y3-	Axis 2 alarm output negative
12	Y4	Axis 2 brake output
14	COM-	Output common : 0V
16	COM+	Input Common : 24V

Installation Dimension

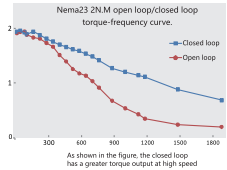


## Closed Loop Stepper System

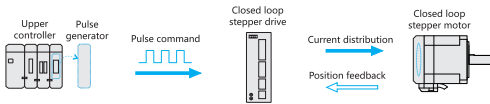
Closed loop stepper system is a control motor solution featuring high speed, high torque, high precision, low vibration, low heating and no loss of step, which is formed based on the common open loop stepper motor in combination with position feedback and servo algorithm.

Closed loop stepper motor is equipped with an optical encoder on the rear shaft of the open-loop motor to form position feedback.

Closed loop stepper drive processes the encoder position feedback to achieve more precise current and position control.



### System Diagram



### Features

**No loss of step**

The position of the motor is fed back by the optical encoder and compared with the drive command. The current is adjusted according to the position error to prevent losing step.

**Fast response**

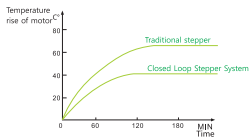
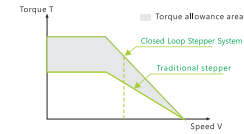
The closed loop stepper motor rotor is synchronized with the given pulse, enabling fast positioning without rigidity adjustment without too long current settling time.

**High torque**

The closed loop stepper system has better torque-frequency characteristics, and the current decay speed is slow, which can improve the output torque of the motor at high speed.

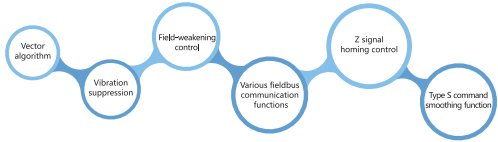
**Low heating**

The closed loop stepper system dynamically adjusts the current according to the load condition, which has a higher current utilization rate than the open loop system and reduces the heating of the motor.



## Closed Loop Stepper Drive

T series closed loop stepper drive, based on the new DSP hardware platform, using magnetic field orientation (FOC) and field- weakening control algorithm, has all-round performance beyond ordinary stepper performance.



### Naming Rule

**T**  
1

**60**  
2

**PLUS -**  
3

**□**  
4

1 Series Name  
DS series digital display

2 Matching motor base size

3 Multi-function upgrade

4 Non-standard code

\*Model naming rules are only used for model meaning analysis. For specific optional models, please refer to the details page.

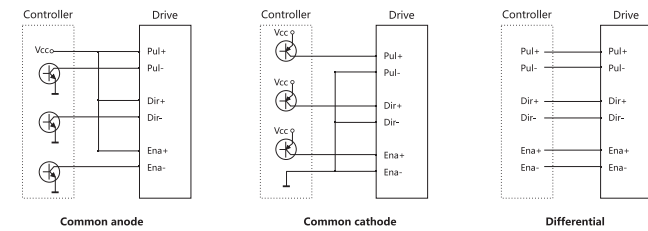
### Features

General-purpose T series	Functional PLUS series	Digital display DS series
<ul style="list-style-type: none"><li>Matching motor frame below 86mm</li><li>PUL&amp;DIR or CW&amp;CCW</li><li>Auto-tuning match motor function</li><li>Smoothing filter function optional</li><li>Debugging software to modify and monitor drive parameters and status</li></ul>	<ul style="list-style-type: none"><li>Matching motor frame below 86mm</li><li>PUL&amp;DIR or CW&amp;CCW</li><li>Auto-tuning match motor function</li><li>Smoothing filter function optional</li><li>Debugging software to modify and monitor drive parameters and status</li></ul>	<ul style="list-style-type: none"><li>Matching motor frame below 86mm</li><li>Real-time display of motor running status</li><li>Higher resolution encoders</li><li>Panel to modify and monitor drive parameters and status</li><li>Micro USB interface</li></ul>

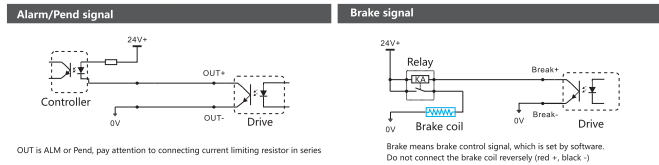
### Technical Specifications

Model	Peak current A	Weight kg	Input voltage	Dimension mm	Number of micro-stepping	Pulse level	Matching motor
T42	3.0	0.2	18-68VDC	116 69 26.5	800-51200	3.3-24V	closed loop below 42mm
T60	6.0	0.2	18-68VDC	116 69 26.5	800-51200	3.3-24V	closed loop below 60mm
T60PLUS	6.0	0.3	18-48VDC	118 76 25	200-25600	5-24V	closed loop below 60mm
T86	7.0	0.6	18-80VAC	151 97 52	400-51200	3.3-24V	closed loop below 86mm
DS86	7.2	0.8	18-80VAC	151 141 47	400-60000	3.3-24V	closed loop below 86mm
NT110	8.0	1.3	110-230VAC	151 141 58	400-60000	3.3-24V	3-phase closed loop below 110mm

### Control Signal Wiring Example



### Output Signal Wiring Example



### LED Indication

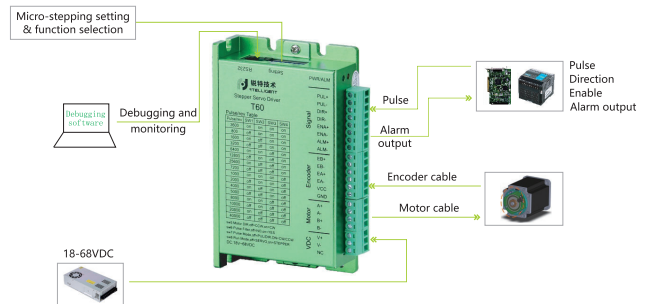
LED status	Drive status	Fault handling
Steady green light	Drive not enabled	
Flashing green light	Drive works fine	
1 green 1 red	Drive overcurrent	Check wiring, repair drive
1 green 2 red	Drive input power supply overvoltage	Check the input supply voltage
1 green 3 red	Drive internal voltage error	Drive failure
1 green 4 red	Encoder out-of-tolerance alarm	
1 green 5 red	Encoder phase error	
1 green 6 red	Parameter storage error	
1 green 7 red	Motor phase loss	Check the wiring terminal and confirm the extension cable connector

## T60/T42

T60/T42 closed loop stepper drive, based on 32-bit DSP platform, built-in vector control technology and servo demodulation function, combined with the feedback of closed-loop motor encoder, makes the closed loop stepper system has the characteristics of low noise, low heat, no loss of step and higher application speed, which can improve the performance of intelligent equipment system in all aspects. T60 matches closed-loop stepper motors below 60mm, and T42 matches closed-loop stepper motors below 42mm.

- Pulse mode: PUL&DIR/CW&CCW
- Signal level: 3.3-24V compatible; serial resistance not required for the application of PLC.
- Power voltage: 18-68VDC, and 36 or 48V recommended.
- Typical applications: Auto-screwdriving machine, servo dispenser, wire-stripping machine, labeling machine, medical detector, electronic assembly equipment etc.

### Drive Interface & Connection



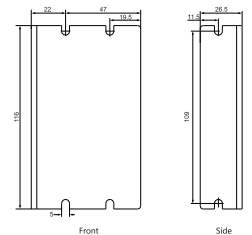
### Function Selection

SW5	Running direction	on	Forward	SW7	Pulse mode	on	CW/CCW
		off	Backward			off	PUL&DIR
SW6	Command smoothing	on	S-type acceleration and deceleration take effect	SW8	Open/closed loop	on	Open loop mode
		off	S-type acceleration and deceleration are invalid			off	Closed loop mode

### Micro-stepping Setting

Pulse/rev	SW1	SW2	SW3	SW4
3800	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
7200	off	off	off	on
1000	on	on	on	off
2000	on	off	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

### Installation Dimension



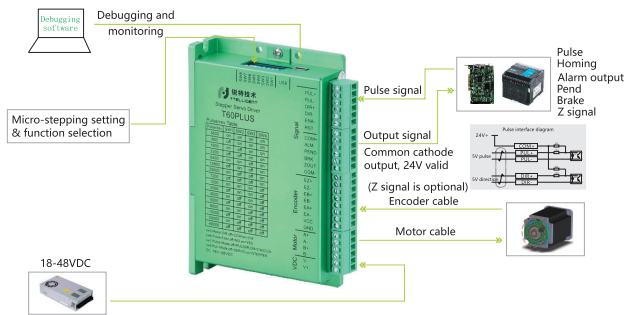
## T60PLUS

T60PLUS closed loop stepper drive, with encoder Z signal input and output functions. It integrates a miniUSB communication port for easy debugging of related parameters.

T60PLUS matches closed loop stepper motors with Z signal below 60mm.

- Pulse mode: PUL&DIR/CW&CCW
- Signal level: 5V/24V
- Power voltage: 18-48VDC, and 36 or 48V recommended.
- Typical applications: Auto-screwdriving machine, servo dispenser, wire-stripping machine, labeling machine, medical detector, electronic assembly equipment etc.

### Drive Interface & Connection



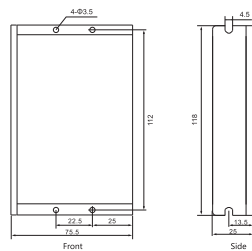
### Function Selection

SW5	Running direction	on	Forward	SW7	Pulse mode	on	CW/CCW
		off	Backward			off	PUL&DIR
SW6	Command smoothing	on	S-type acceleration and deceleration take effect	SW8	Open/closed loop	on	Open loop mode
		off	S-type acceleration and deceleration are invalid			off	Closed loop mode

### Micro-stepping Setting

Pulse/rev	SW1	SW2	SW3	SW4
3600	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
7200	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

### Installation Dimension



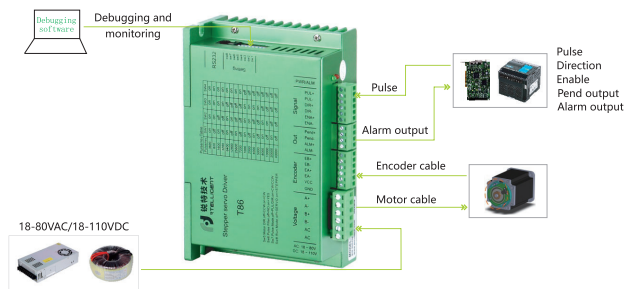
## T86

T86 closed loop stepper drive, based on 32-bit DSP platform, built-in vector control technology and servo demodulation function, combined with the feedback of closed-loop motor encoder, makes the closed loop stepper system has the characteristics of low noise, low heat, no loss of step and higher application speed, which can improve the performance of intelligent equipment system in all aspects.

T86 matches closed-loop stepper motors below 86mm.

- Pulse mode: PUL&DIR/CW&CCW
- Signal level: 3.3-24V compatible; serial resistance not required for the application of PLC.
- Power voltage: 18-110VDC or 18-80VAC, and 48VAC recommended.
- Typical applications: Auto-screwdriving machine, servo dispenser, wire-stripping machine, labeling machine, medical detector, electronic assembly equipment etc.

### Drive Interface & Connection



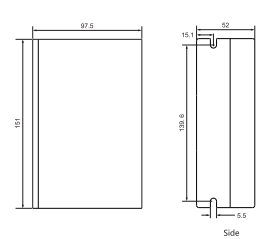
### Function Selection

SW5	Running direction	on	Forward	SW7	Pulse mode	on	CW/CCW
		off	Backward			off	PUL&DIR
SW6	Command smoothing	on	S-type acceleration and deceleration take effect	SW8	Open/closed loop	on	Open loop mode
		off	S-type acceleration and deceleration are invalid			off	Closed loop mode

### Micro-stepping Setting

Pulse/rev	SW1	SW2	SW3	SW4
3600	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
7200	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

### Installation Dimension





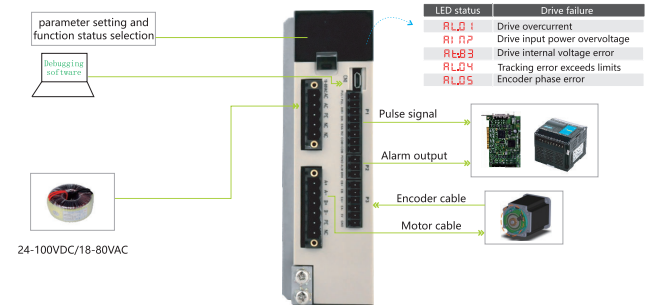
DS86

DS86 closed loop stepper drive, based on 32-bit DSP platform, built-in vector control technology and servo demodulation function, combined with the feedback of closed-loop motor encoder, makes the closed loop stepper system has the characteristics of low noise, low heat, no loss of step and higher application speed, which can improve the performance of intelligent equipment system in all aspects.

T86 matches closed-loop stepper motors below 86mm.

- Pulse mode: PUL&DIR/CW&CCW
- Signal level: 3.3-24V compatible; serial resistance not required for the application of PLC.
- Power voltage: 24-100VDC or 18-80VAC, and 75VAC recommended.
- Typical applications: Auto-screwdriving machine, servo dispenser, wire-stripping machine, labeling machine, medical detector, electronic assembly equipment etc.

Drive Interface & Connection

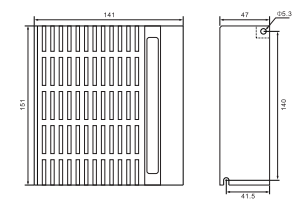


Description

Parameter setting ways:  
1. Connect with PC computer through USB interface.  
Set parameter by debugging software.  
2. Set parameter by the DS86 setting buttons.

Buttons	Description
MOD	return to the previous menu, cancelation of operation
UP	menu selection, data setting
DOWN	menu selection, data setting
SET	function confirm

Installation Dimension



Parameter Setting

The parameters that can be set by the drive are PA-00 to PA-40

No.	Name	Range	Default	Description
00	Control mode	[0,2]	1	0: Open loop operation 1: Servo mode one 2: Servo mode two
01	Micro-stepping	[200,65535]	1600	The pulse number that needed by motor running one round
02	Maximum current	[100,7000]	7000	The maximum current needs to match the corresponding motor
03	Basic current percentage	[1,100]	50	
04	Encoder resolution	[500,65535]	4000	
05	Tracking error alarm threshold	[100,65535]	4000	Set alarm threshold of tracking error
06	Reverse direction	[0,1]	0	0: Forward 1: Backward
07	Command filtering	[1,512]	128	Delay time-setting value*50us During interpolation movement, set to 1
08	Pulse mode	[0,1]	0	0: Pulse + direction 1: CW + CCW
09	Pulse effective edge	[1,512]	128	0: Rising edge 1: Falling edge
10	Enable level	[0,1]	0	0: NO 1: NC

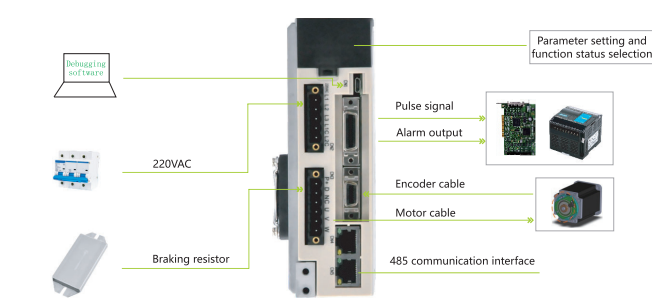
NT110

NT110 digital display 3 phase closed loop stepper drive, based on 32-bit digital DSP platform, built-in vector control technology and servo demodulation function, makes the closed loop stepper system have the characteristics of low noise and low heat.

NT110 is used to drive 3 phase 110mm and 86mm closed loop stepper motors, RS485 communication is available.

- Pulse mode: PUL&DIR/CW&CCW
- Signal level: 3.3-24V compatible; serial resistance not required for the application of PLC.
- Power voltage: 110-230VAC, and 220VAC is recommended.
- Typical applications: welding machine, wire-stripping machine, labeling machine, carving machine, electronic assembly equipment etc.

Drive Interface & Connection

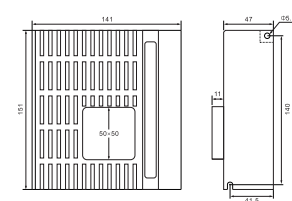


Description

Parameter setting ways:  
1. Connect with PC computer through USB interface.  
Set parameter by debugging software.  
2. Set parameter by the NT110 setting buttons.

Buttons	Description
MOD	return to the previous menu, cancelation of operation
UP	menu selection, data setting
DOWN	menu selection, data setting
SET	function confirm

Installation Dimension



Parameter Setting

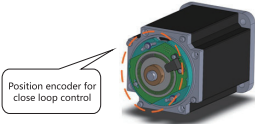
The parameters that can be set by the drive are PN000-PN499

No.	Name	Range	Default	Description
PN022	Control mode	[0,2]	1	0: Open loop operation 1: Servo mode one 2: Servo mode two
PN024	Micro-stepping	[200,65535]	4000	The pulse number that needed by motor running one round
PN045	Maximum current	[100,7000]	7000	The maximum current needs to match the corresponding motor
PN046	Basic current percentage	[1,100]	50	
PN040	Encoder resolution	[500,65535]	4000	
PN041	Tracking error alarm threshold	[100,65535]	4000	Set alarm threshold of tracking error
PN023	Reverse direction	[0,1]	0	0: Forward 1: Backward
PN028	Command filtering	[1,512]	128	Delay time-setting value*50us During interpolation movement, set to 1
PN017	Pulse source	[0,1]	1	0: Internal pulse control 1: External pulse input
PN019	Input pulse mode	[0,1,2,3]	0	0: Pulse + direction 1: Pulse + direction 2: CW + CCW 3: Orthogonal pulse
PN060	Input port setting	[0-63]	36	36: Enable control is effective at low level

Closed Loop Stepper Motor

New AM series closed loop stepper motors are based on Cz optimized magnetic circuit design and the latest compact M-shaped molds. The motor body uses high magnetic density stator and rotor materials with high energy efficiency.

- Built-in high-resolution encoder, optional Z signal.
- The lightweight design of the AM series reduces the installation space of the motor.
- Permanent magnet brake is optional, Z-axis brake is faster.



Naming Rule

57 A M 23 E D Z - □  
1 2 3 4 5 6 7 8

- 1 Base size
- 2 Step angle type code  
A: 1.8 degrees B: 1.2 degrees  
C: 0.72 degrees
- 3 Motor series code  
M: M series
- 4 Motor torque  
06:0.6Nm 30:3.0Nm  
120:12Nm
- 5 Encoder type  
E: 1000 line photoelectric encoder
- 6 Type of plug:  
C: Encoder AMP6 plug outlet  
D: Encoder DB9 plug outlet  
X: Encoder DB9/Motor AMP4 plug  
T: Encoder AMP6/Motor AMP4 plug  
H: Encoder AMP6/Motor AMP4 plug  
(high voltage)
- 7 Supplementary code  
Z: Encoder with Z signal
- 8 Non-standard code  
ZZ: with brake

\*Model naming rules are only used for model meaning analysis. For specific optional models, please refer to the details page

Motor with Brake

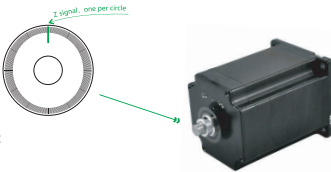


- Closed loop stepper motor with brake  
Suitable for Z-axis application environment.  
When the drive is powered off or alarms, the brake is applied to protect the workpiece and lock it to avoid free sliding
- Permanent magnet brake  
Start/stop quickly, low heating.
- 24V DC power supply  
Can use drive brake output port control.  
The outlet port can directly drive the relay to control the brake on/off.

Motor with Z Signal Encoder

- Closed loop stepper motor with Z signal  
Suitable for precision homing applications.  
Avoid the problem that the homing of the general sensor is biased due to the difference in the homing speed.

- Z signal differential output  
Z signal is 5V differential output, strong anti-interference ability
- PLUS driver with Z signal collector output  
PLUS drive adds Z signal reading and conversion output to realize Z signal output to PLC.

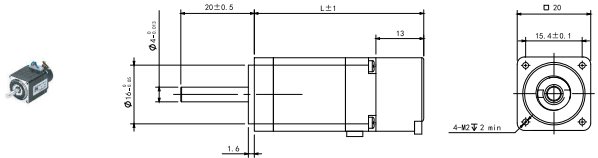


2-phase Stepper Motor 20/28mm Series Technical Specifications

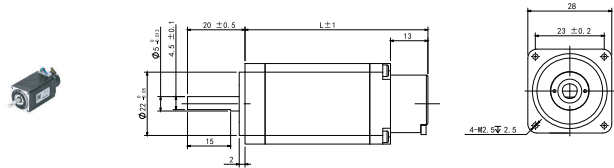
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ohm)	Inductance/Phase(mH)	Rotor inertia(g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
20AM003EC	1.8	0.03	0.6	5.7	2.6	3	4	20	46.0	0.09
28AM006EC	1.8	0.06	1.2	1.4	1.0	90	5	20	44.7	0.13
28AM013EC	1.8	0.13	1.2	2.2	2.3	180	5	20	63.6	0.22

\*NEMA 8 (20mm), NEMA 11 (28mm)

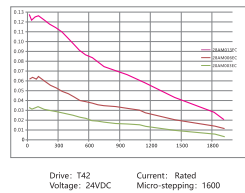
20 Series Dimension (mm)



28 Series Dimension (mm)



Torque-frequency Curve



Wiring Definition

A+	A-	B+	B-
Red	Blue	Green	Black

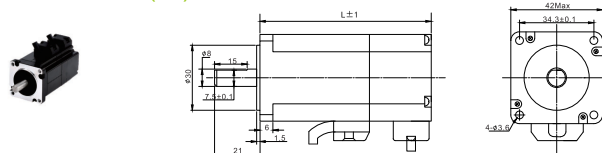
EB+	EB-	EA+	EA-	5V	GND
Yellow	Green	Black	Brown	Red	White

## ■ 2-phase Stepper Motor 42mm Series Technical Specifications

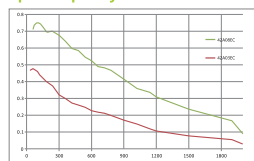
Model	Step angle (°)	Holding torque (mNm)	Rated current (A)	Resistance/Phase (Ω)	Inductance/Phase (mH)	Rotor inertia (g·cm <sup>2</sup> )	Shaft diameter (mm)	Shaft length (mm)	Length (mm)	Weight (g)
42AD35C	1.8	0.3	2.0	1.6	1.9	77	8	21	69	0.5
42AD08C	1.8	0.8	2.8	2.7	2.3	115	8	21	85	0.6
42AM06ED	1.8	0.6	2.0	1.1	1.5	82	5	24	67	0.4
42AM08ED	1.8	0.8	2.0	1.9	5.0	114	5	24	79	0.6

\*NEMA 17 (42mm)

■ 42A Series Dimension (mm)



### ■ Torque-frequency Curve



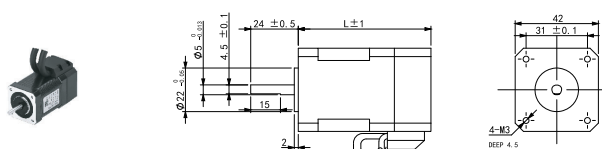
Drive: T42	Current: Rated
Voltage: 24VDC	Micro-stepping: 1600

### ■ Wiring Definition

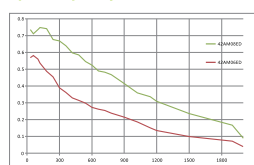
A+	A-	B+	B-
Red	Black	Yellow	Blue

EB+	EB-	EA+	EA-	5V	GND
Green	Yellow	Brown	White	Red	Blue

### ■ 42A Series Dimension (mm)



### ■ Torque-frequency Curve



Drive: T42	Current: Rated
Voltage: 24VDC	Micro-stepping: 1600

### ■ Wiring Definition

A+	A-	B+	B-
Red	Blue	Green	Black

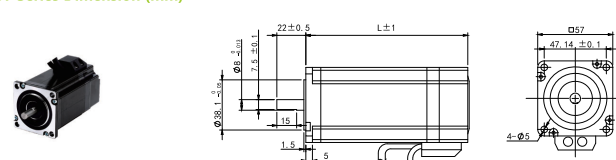
EB+	EB-	EA+	EA-	5V	GND
Green	Yellow	Brown	White	Red	Blue

## ■ 2-phase Stepper Motor 57mm Series Technical Specifications

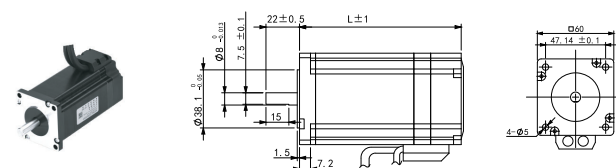
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ω)	Inductance/Phase(mH)	Rotor inertia (g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
57AM13ED	1.8	1.3	4.0	0.4	1.6	260	8	22	77	0.8
57AM23ED	1.8	2.3	5.0	0.6	2.4	460	8	22	98	1.2
57AM26ED	1.8	2.6	5.0	0.5	2.1	520	8	22	106	1.4
57AM30ED	1.8	3.0	5.0	0.8	3.7	720	8	22	124	1.5
D57AM30FD	1.8	3.0	5.0	0.5	2.2	690	8	22	107	1.5

\*NEMA 23 (57mm)

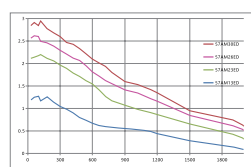
■ 57 Series Dimension (mm)



### ■ D57 Series Dimension (mm)



### ■ Torque-frequency Curve



Drive: T60	Current: Rated
Voltage: 36VDC	Micro-stepping: 1600

- **Wiring Definition**

A+	A-	B+	B-
Red	Blue	Green	Black

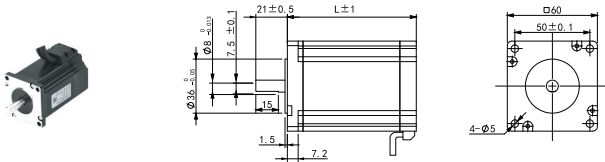
EB+	EB-	EA+	EA-	5V	GND
Green	Yellow	Brown	White	Red	Blue

2-phase Stepper Motor 60mm Series Technical Specifications

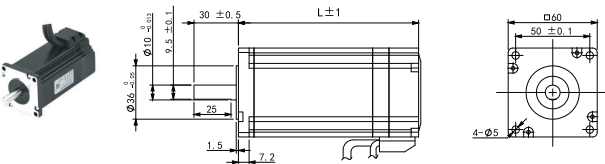
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ohm)	Inductance/Phase(mH)	Rotor inertia(g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
60AM22ED	1.8	2.2	5.0	0.4	1.3	330	8	22	79	1.1
60AM30ED	1.8	3.0	5.0	0.5	2.2	690	8	22	107	1.5
60AM40ED	1.8	4.0	5.0	0.9	3.5	880	10	30	123	2.1

\*NEMA 24 (60mm)

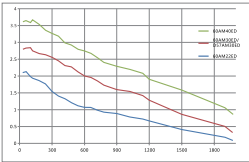
60 Series Dimension (mm)



60AM40ED Dimension (mm)



Torque-frequency Curve



Drive: T60  
Voltage: 48VDC  
Current: Rated  
Micro-stepping: 1600

Wiring Definition

A+	A-	B+	B-
Red	Blue	Green	Black

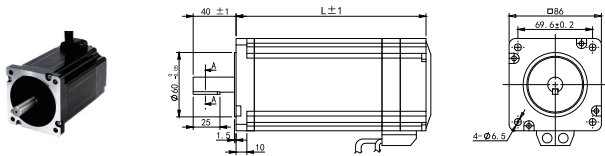
EB+	EB-	EA+	EA-	5V	GND
Green	Yellow	Brown	White	Red	Blue

2-phase Stepper Motor 86mm Series Technical Specifications

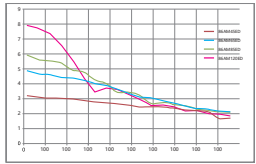
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ohm)	Inductance/Phase(mH)	Rotor inertia(g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
86AM45ED	1.8	4.5	6.0	0.4	2.8	1400	14	40	105	2.5
86AM65ED	1.8	6.5	6.0	0.5	4.2	2300	14	40	127	3.3
86AM85ED	1.8	8.5	6.0	0.5	5.5	2800	14	40	140	3.9
86AM100ED	1.8	10	6.0	0.8	5.3	3400	14	40	157	4.3
86AM120ED	1.8	12	6.0	0.7	8.3	4000	14	40	182	5.3

\*NEMA 34 (86mm)

86 Series Dimension (mm)



Torque-frequency Curve



Drive: T86 V2.0  
Voltage: 70VAC  
Current: Rated  
Micro-stepping: 1600

Wiring Definition

A+	A-	B+	B-
Red	Blue	Green	Black

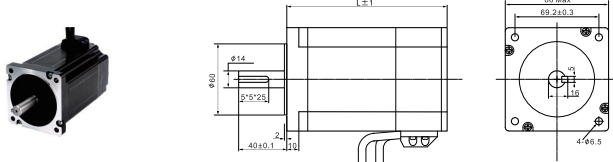
EB+	EB-	EA+	EA-	5V	GND
Green	Yellow	Brown	White	Red	Blue

3-phase Stepper Motor 86/110mm Series Technical Specifications

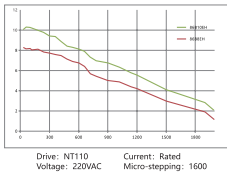
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ohm)	Inductance/Phase(mH)	Rotor inertia(g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
86B8EH	1.2	8.0	6.0	2.6	17.4	2940	14	40	150	5.0
86B10EH	1.2	10	6.0	2.7	18.9	4000	14	40	178	5.8
110B12EH	1.2	12	4.2	1.2	13.0	10800	19	40	162	9.0
110B20EH	1.2	20	5.2	1.9	18.0	17000	19	40	244	11.8

\*NEMA 34 (86mm) , NEMA 42 (110mm)

86 Series Dimension (mm)



Torque-frequency Curve

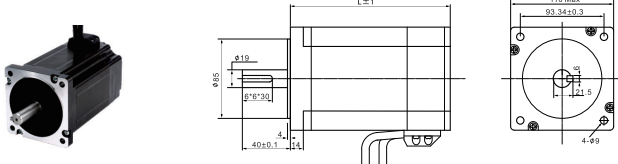


Wiring Definition

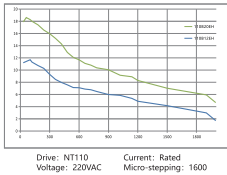
U	V	W
Black	Blue	Brown

EB+	EB-	EA+	EA-	VCC	GND
Yellow	Green	Brown	Blue	Red	Black

110 Series Dimension (mm)



Torque-frequency Curve



Wiring Definition

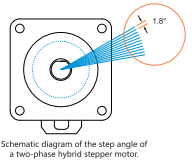
U	V	W	PE
Red	Blue	Black	Yellow

EB+	EB-	EA+	EA-	VCC	GND
Yellow	Green	Black	Blue	Red	White

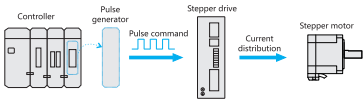
Open Loop Stepper System

Stepper motor is a control motor whose operating speed and position can be determined. It operates step by step at a fixed angle (step angle) in rotation. Control switching pace of the step angle of stepper motor to control its operating speed and position.

The stepper drive is used for switching the pace of step angle of the stepper motor according to the specified sequence.

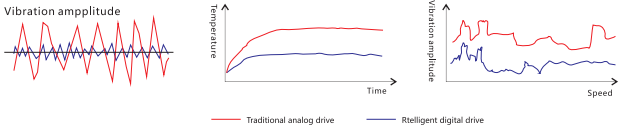


System Diagram

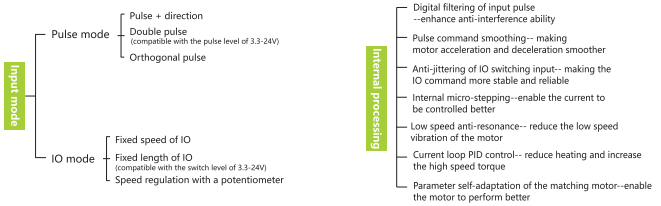


Features

Low resonance	Low temperature rise	Low noise
lowering down the vibration amplitude of motor low speed resonance area , with Low speed anti-resonance algorithm.	Under the same conditions, the digital drive features smoother current waveform, smaller current fluctuation and low temperature rise.	Built-in S-shaped command smoothing and low-speed micro-stepping technology, reduce the vibration amplitude of each speed range.

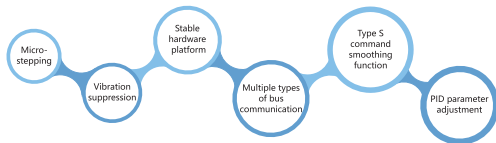


Function Description

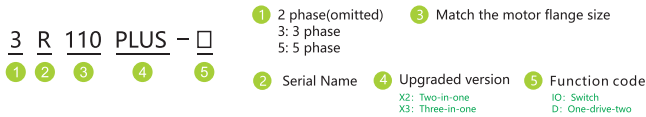


## Open Loop Stepper Drive

Based on the new 32-bit DSP platform and adopting the micro-stepping technology and PID current control algorithm design, Rtelligent R series stepper drive surpasses the performance of common analog stepper drive comprehensively.



### Naming Rule



\*Model naming rules are only used for model meaning analysis. For specific optional models, please refer to the details page.

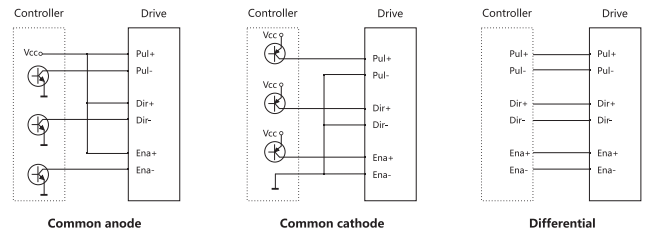
### Product Series

R Series	R-IO/R-IR Series	Multi-axis Series
<p><b>R series pulse-controlled stepper motor drive</b></p> <ul style="list-style-type: none"> <li>Matching motor base in 20mm-130mm</li> <li>Full digital Micro-stepping technology</li> <li>Pulse compatible with 5-24V</li> <li>Smooth motion &amp; low vibration</li> <li>Auto-tuning of motor parameters</li> <li>Optimized anti-interference ability</li> <li>Better hardware design and reliability</li> </ul>	<p><b>R-IO series switching stepper drive</b></p> <ul style="list-style-type: none"> <li>Matching motor base in 20-130mm</li> <li>5-24V switch control</li> <li>16 speed adjustable</li> </ul> <p><b>R-IR series potentiometer speed-control stepper drive</b></p> <ul style="list-style-type: none"> <li>Matching motor base below 86mm</li> <li>5-24V switch control</li> <li>Regulate speed online via potentiometer</li> </ul>	<p><b>R-D series one-drive-two switch speed-control drive</b></p> <ul style="list-style-type: none"> <li>Matching motors base below 60mm</li> <li>5-24V switch control</li> <li>Regulate speed online via potentiometer</li> </ul> <p><b>R-X2/X3 series multi-axis pulse stepper drive</b></p> <ul style="list-style-type: none"> <li>Matching motors base below 60mm</li> <li>Pulse control</li> <li>Smaller size</li> </ul>

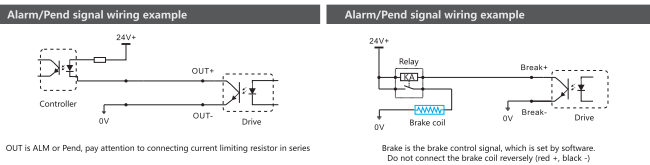
### Technical Specifications

Model	Peak current A	Weight kg	Input voltage range	Dimension mm	Micro-stepping	Pulse level	Matching motor
R42	2.2	0.1	18-48VDC	92.6 × 56 × 21	200-25600	3.3-24V	Open loop below 42mm
R60	5.6	0.3	18-50VDC	118 × 76 × 33	200-25600	3.3-24V	Open loop below 60mm
R60-AL	5.6	0.2	18-50VDC	116 × 69 × 26.5	200-25600	24V/5V	Open loop below 60mm
R86	7.2	0.6	18-80VAC	151 × 97 × 52	400-51200	3.3-24V	Open loop below 86mm
R86mini	7.2	0.3	18-80VAC	119 × 77 × 35	400-25600	3.3-24V	Open loop below 86mm
R110PLUS	8.0	0.9	110-230VAC	178 × 109 × 68	400-60000	3.3-24V	Open loop below 110mm
R130	8.0	1.3	110-230VAC	203 × 147 × 78	200-25600	3.3-24V	Open loop below 130mm
3R60	8.0	0.3	18-50VDC	118 × 76 × 33	400-51200	3.3-24V	Open loop 3 phase below 60mm
3R110PLUS	7.2	0.9	110-230VAC	178 × 109 × 68	500-60000	3.3-24V	Open loop 3 phase below 110mm
3R130	8.0	1.3	110-230VAC	203 × 147 × 78	400-60000	3.3-24V	Open loop 3 phase below 130mm

### Control Signal Wiring Example



### Output Signal Wiring Example



### LED Indication

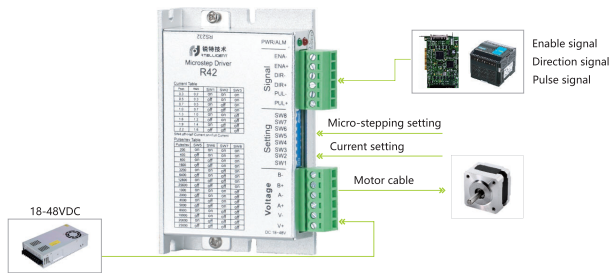
LED status	Drive status	Fault handling
Steady green light	Drive not enabled	
Flashing green light	Drive works fine	
1 green 1 red	Drive overcurrent	Check wiring, repair drive
1 green 2 red	Drive input power supply overvoltage	Check the input supply voltage
1 green 3 red	Drive internal voltage error	Drive failure
1 green 7 red	Motor phase loss	Check the wiring terminal and confirm the extension cable connector

## R42

The R42 digital 2-phase stepper drive is based on 32-bit DSP platform, with built-in micro-stepping technology & auto tuning of parameters. The drive features low noise, low vibration and low heating. It is used to drive two-phase stepper motors base below 42mm.

- Pulse mode: PUL&DIR
- Signal level: 3.3~24V compatible; series resistance not required for the application of PLC.
- Power voltage: 18-48V DC supply; 24 or 36V recommended.
- Typical applications: marking machine, soldering machine, laser, 3D printing, visual localization, automatic assembly equipment, etc.

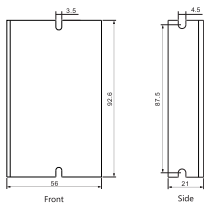
### ■ Drive Interface & Connection



### ■ Working Current Setting

Output current peak	Output current RMS	SW1	SW2	SW3
0.3A	0.2A	on	on	on
0.5A	0.3A	off	on	on
0.7A	0.5A	off	off	on
1.0A	0.7A	off	off	off
1.3A	1.0A	on	on	off
1.6A	1.2A	off	on	off
1.9A	1.4A	on	off	off
2.2A	1.6A	off	off	off

### ■ Installation Dimension



### ■ Semi-/full Current Selection

		SW4	
off	Semi-current	The idle current is half of the operating current	
on	Full Current	The idle current is equal to the operating current	

### ■ Micro-stepping Setting

Pulse/rev	SW5	SW6	SW7	SW8
200	on	on	on	on
400	off	on	on	on
800	on	off	on	on
1600	off	off	on	on
3200	on	on	off	on
6400	off	on	off	on
12800	on	off	off	on
25600	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
25000	off	off	off	off

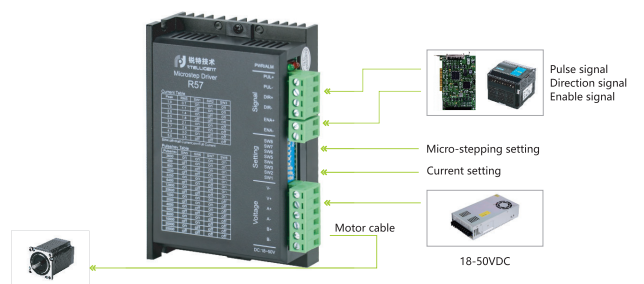
When SW5, SW6, SW7, SW8 are all on, any subdivision can be changed through the debugging software.

## R57

The R57 digital 2-phase stepper drive is based on 32-bit DSP platform, with built-in micro-stepping technology & auto tuning of parameters. The drive features low noise, low vibration, low heating and high-speed high torque output. It is used to drive two-phase stepper motors base below 57mm.

- Pulse mode: PUL&DIR
- Signal level: 3.3~24V compatible; series resistance not required for the application of PLC
- Power voltage: 18-50V DC supply; 36 or 48V recommended
- Typical applications : engraving machine , marking machine, cutting machine, plotter, laser, auto assembly equipment, etc

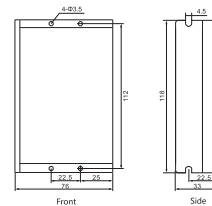
### ■ Drive Interface & Connection



### ■ Working Current Setting

Output current peak	Output current RMS	SW1	SW2	SW3
1.0A	0.7A	on	on	on
1.5A	1.1A	off	on	on
2.0A	1.4A	on	off	on
2.5A	1.8A	off	off	on
3.0A	2.1A	on	on	off
3.7A	2.6A	off	on	off
4.3A	3.0A	on	off	off
5.0A	3.5A	off	off	off

### ■ Installation Dimension



### ■ Semi-/full Current Selection

		SW4	
off	Semi-current	The idle current is half of the operating current	
on	Full Current	The idle current is equal to the operating current	

### ■ Micro-stepping Setting

Pulse/rev	SW5	SW6	SW7	SW8
3600	on	on	on	on
400	off	on	on	on
800	on	off	on	on
1600	off	off	on	on
3200	on	on	off	on
6400	off	on	off	on
12800	on	off	off	on
25600	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
25000	off	off	off	off

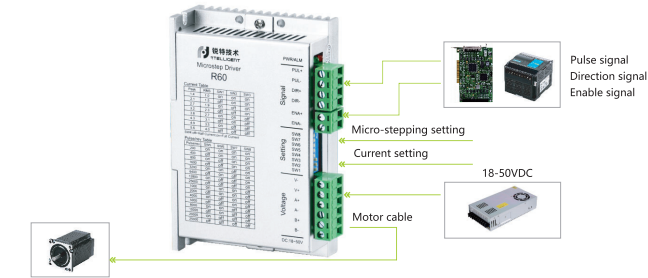


R60

The R60 digital 2-phase stepper drive is based on 32-bit DSP platform, with built-in micro-stepping technology & auto tuning of parameters. The drive features low noise, low vibration, low heating and high-speed high torque output. It is used to drive two-phase stepper motors base below 60mm.

- Pulse mode: PUL&DIR
- Signal level: 3.3~24V compatible; series resistance not necessary for the application of PLC.
- Power voltage: 18-50V DC supply; 36 or 48V recommended.
- Typical applications: Engraving machine, marking machine, cutting machine, plotter, laser, auto assembly equipment, etc.

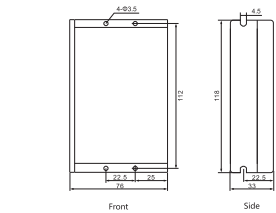
Drive Interface & Connection



Working Current Setting

Output current peak	Output current RMS	SW1	SW2	SW3
1.4A	1.0A	on	on	on
2.1A	1.9A	on	off	on
3.2A	2.3A	off	off	on
3.9A	2.7A	on	on	off
4.3A	3.1A	off	on	off
4.9A	3.5A	on	off	off
5.6A	4.0A	off	off	off

Installation Dimension



Semi-/full Current Selection

	SW4
off Semi-current	The idle current is half of the operating current
on Full Current	The idle current is equal to the operating current

Micro-stepping Setting

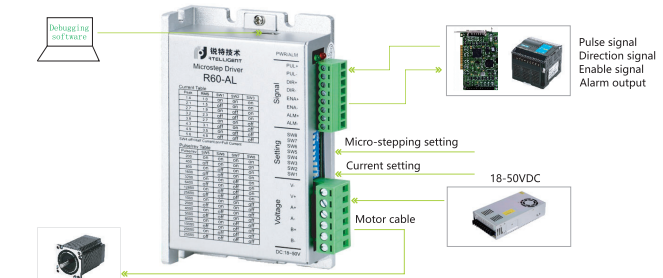
Pulse/rev	SW5	SW6	SW7	SW8
200	on	on	on	on
400	off	on	on	on
800	on	off	on	on
1600	off	off	on	on
3200	on	on	off	on
6400	off	on	off	on
12800	on	off	off	on
25600	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
25000	off	off	off	off

R60-AL

The R60-AL digital 2-phase stepper drive is based on 32-bit DSP platform, with built-in micro-stepping technology & auto tuning of parameters. The drive features low noise, low vibration, low heating and high-speed high torque output. It is used to drive two-phase stepper motors base below 60mm.

- Pulse mode: PUL&DIR
- Signal level: Default 24V, 5V model R60-AL-5V
- Power voltage: 18-50V DC supply; 36 or 48V recommended.
- Typical applications: engraving machine, marking machine, cutting machine, plotter, laser, auto assembly equipment, etc.

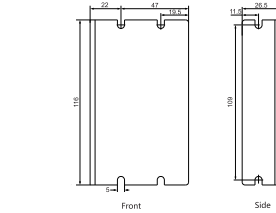
Drive Interface & Connection



Working Current Setting

Output current peak	Output current RMS	SW1	SW2	SW3
1.4A	1.0A	on	on	on
2.1A	1.9A	on	off	on
3.2A	2.3A	off	off	on
3.9A	2.7A	on	on	off
4.3A	3.1A	off	on	off
4.9A	3.5A	on	off	off
5.6A	4.0A	off	off	off

Installation Dimension



Semi-/full Current Selection

	SW4
off Semi-current	The idle current is half of the operating current
on Full Current	The idle current is equal to the operating current

Micro-stepping Setting

Pulse/rev	SW5	SW6	SW7	SW8
200	on	on	on	on
400	off	on	on	on
800	on	off	on	on
1600	off	off	on	on
3200	on	on	off	on
6400	off	on	off	on
12800	on	off	off	on
25600	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
25000	off	off	off	off

When SW5, SW6, SW7, SW8 are all on, any subdivision can be changed through the debugging software.

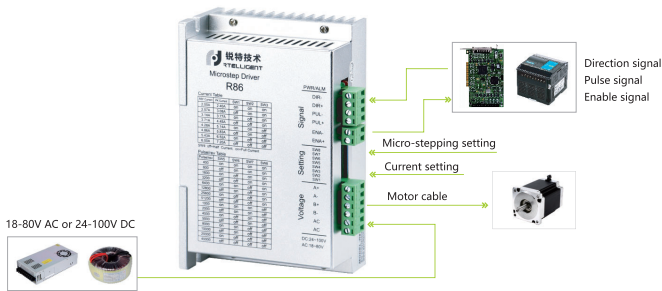
## R86

The R86 digital 2-phase stepper drive is based on 32-bit DSP platform, with built-in micro-stepping technology & auto tuning of parameters. The drive features low noise, low vibration, low heating and high-speed high torque output.

It is used to drive two-phase stepper motors base below 86mm.

- Pulse mode: PUL&DIR
- Signal level: 3.3~24V compatible; series resistance not required for the application of PLC.
- Power voltage: 24~100V DC or 18~80V AC; 60V AC recommended.
- Typical applications: engraving machine, labeling machine, cutting machine, plotter, laser, automatic assembly equipment, etc.

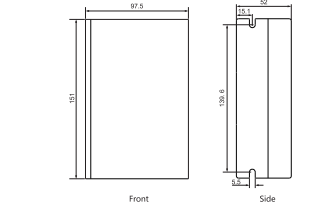
### Drive Interface & Connection



### Working Current Setting

Output current peak	Output current RMS	SW1	SW2	SW3
2.0A	2.0A	on	on	on
3.0A	2.57A	off	on	on
3.77A	3.14A	on	off	on
4.45A	3.71A	off	off	on
5.14A	4.28A	on	on	off
5.83A	4.86A	off	on	off
6.52A	5.43A	on	off	off
7.20A	6.00A	off	off	off

### Installation Dimension



### Semi-/full Current Selection

	SW4
off Semi-current	The idle current is half of the operating current
on Full Current	The idle current is equal to the operating current

### Micro-stepping Setting

Pulse/rev	SW5	SW6	SW7	SW8
400	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	on	on	off	on
25600	off	off	on	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

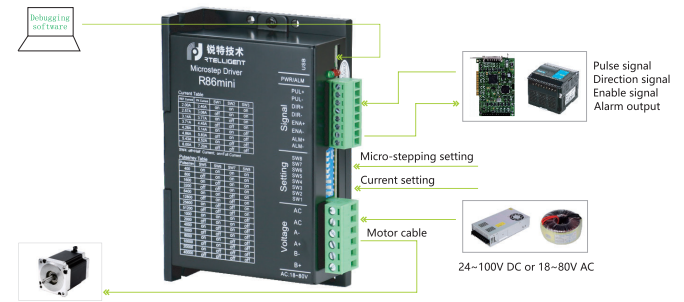
## R86MINI

Compared with R86, the R86mini digital two-phase stepper drive adds alarm output and USB debugging ports, smaller size, easier to use.

R86mini is used to drive two-phase stepper motors base below 86mm.

- Pulse mode: PUL & DIR
- Signal level: 3.3~24V compatible; series resistance not required for the application of PLC.
- Power voltage: 24~100V DC or 18~80V AC; 60V AC recommended.
- Typical applications: engraving machine, labeling machine, cutting machine, plotter, laser, automatic assembly equipment, etc.

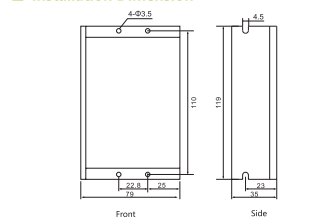
### Drive Interface & Connection



### Working Current Setting

Output current peak	Output current RMS	SW1	SW2	SW3
2.0A	2.0A	on	on	on
3.0A	2.57A	off	on	on
3.77A	3.14A	on	off	on
4.45A	3.71A	off	off	on
5.14A	4.28A	on	on	off
5.83A	4.86A	off	on	off
6.52A	5.43A	on	off	off
7.20A	6.00A	off	off	off

### Installation Dimension



### Semi-/full Current Selection

	SW4
off Semi-current	The idle current is half of the operating current
on Full Current	The idle current is equal to the operating current

### Micro-stepping Setting

Pulse/rev	SW5	SW6	SW7	SW8
400	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	on	on	off	on
25600	off	off	on	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

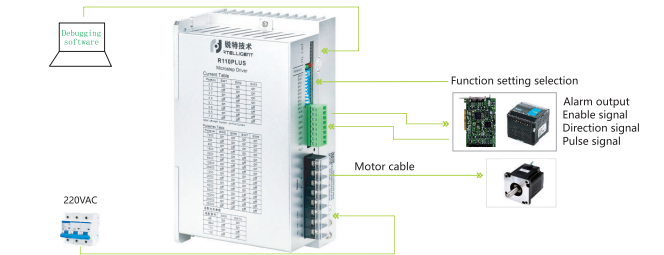
## R110PLUS

The R110PLUS digital 2-phase stepper drive is based on 32-bit DSP platform, with built-in micro-stepping technology & auto tuning of parameters, featuring of low noise, low vibration, low heating and high-speed high torque output. It can fully play the performance of two-phase high-voltage stepper motor.

R110PLUS V3.0 version added the DIP matching motor parameters function, can drive 86/110 two-phase stepper motor.

- Pulse mode: PUL & DIR
- Signal level: 3.3~24V compatible; series resistance not necessary for the application of PLC.
- Power voltage: 110~230V AC; 220V AC recommended, with superior high-speed performance.
- Typical applications: engraving machine, labeling machine, cutting machine, plotter, laser, automatic assembly equipment, etc.

### Drive Interface & Connection



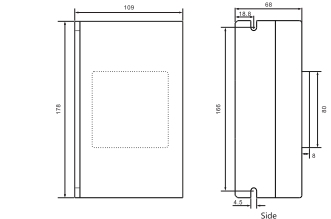
### Working Current Setting

Output current	SW1	SW2	SW3
2.3A	on	on	on
3.0A	off	on	on
3.7A	on	off	on
4.4A	on	on	off
5.1A	on	on	off
5.8A	off	on	off
6.5A	on	off	off
7.2A	off	off	off

### Semi-/full Current Selection

	SW4
off Semi-current	The idle current is half of the operating current
on Full Current	The idle current is equal to the operating current

### Installation Dimension



### Function Selection

Motor specification	SW9	SW10
86	on	on
86H	off	on
110	on	off
130	off	off

### Micro-stepping Setting

Pulse/rev	SW5	SW6	SW7	SW8
7200	on	on	on	on
400	off	on	on	on
800	on	off	on	on
1600	off	off	on	on
3200	on	on	off	on
6400	off	on	off	on
12800	on	off	off	on
25600	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
25000	off	off	off	off

When SW5, SW6, SW7, SW8 are all on, any subdivision can be changed through the debugging software.

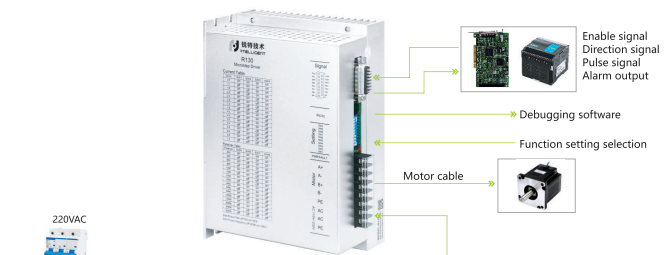
## R130

The R130 digital 2-phase stepper drive is based on 32-bit DSP platform, with built-in micro-stepping technology & auto tuning of parameters, featuring of low noise, low vibration, low heating and high-speed high torque output. It can be used in most applications of stepper motor.

R130 is used to drive two-phase stepper motors base below 130mm.

- Pulse mode: PUL & DIR
- Signal level: 3.3~24V compatible; series resistance not required for the application of PLC.
- Power voltage: 110~230V AC;
- Typical applications: engraving machine, cutting machine, screen printing equipment, CNC machine, automatic assembly equipment, etc.

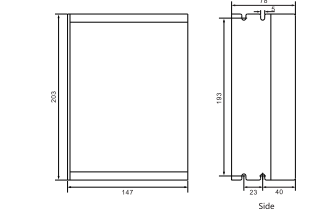
### Drive Interface & Connection



### Working Current Setting

RMS(A)	SW1	SW2	SW3	SW4
0.7	on	on	on	on
1.1	off	on	on	on
1.6	on	off	on	on
2.0	off	off	on	on
2.4	on	on	off	on
2.8	off	on	off	on
3.2	on	off	off	on
3.6	off	off	off	on
4.0	on	on	on	off
4.5	off	on	on	off
5.0	on	off	on	off
5.4	off	on	on	off
5.8	on	on	off	off
6.2	off	on	off	off
6.6	on	off	off	off
7.0	off	off	off	off

### Installation Dimension



### Function Selection

Filter selection	SW9
off No filtering	Command smooth close
on With filtering	Command smooth open

Max pulse frequency selection	SW10
off Max frequency 200kHz	on Max frequency 1MHz

### Micro-stepping Setting

Pulse/rev	SW5	SW6	SW7	SW8
400	on	on	on	on
500	off	on	on	on
600	on	off	on	on
800	off	off	on	on
1000	on	on	off	on
1200	off	on	off	on
2000	on	off	off	on
3000	off	off	off	on
3600	on	on	on	off
5000	off	on	on	off
6400	on	on	on	off
10000	off	off	on	off
12000	on	on	off	off
20000	off	on	off	off
30000	on	off	off	off
60000	off	off	off	off

When SW5, SW6, SW7, SW8 are all on, any subdivision can be changed through the debugging software.

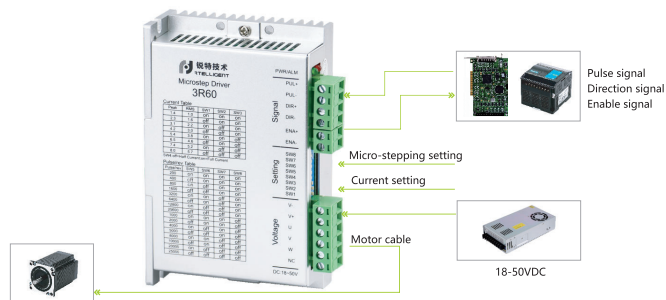
## 3R60

The 3R60 digital 3-phase stepper drive is based on patented three-phase demodulation algorithm, with built-in micro-stepping technology, featuring low speed resonance, small torque ripple. It can fully play the performance of three-phase stepper motor.

3R60 is used to drive three-phase stepper motors base below 60mm.

- Pulse mode: PUL & DIR
- Signal level: 3.3~24V compatible; Series resistance not required for the application of PLC.
- Power voltage: 18-50V DC; 36 or 48V recommended.
- Typical applications: dispenser, soldering machine, engraving machine, laser cutting machine, 3D printer, etc.

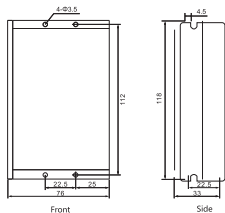
### Drive Interface & Connection



### Working Current Setting

Output current peak	Output current RMS	SW1	SW2	SW3
1.4A	1.0A	on	on	on
2.3A	1.6A	off	on	on
3.1A	2.2A	on	off	on
4.2A	3.0A	off	off	on
5.4A	3.8A	on	on	off
6.5A	4.6A	off	on	off
7.4A	5.2A	on	off	off
8.0A	5.7A	off	off	off

### Installation Dimension



### Semi-/full Current Selection

off	Semi-current	The idle current is half of the operating current.	SW4
on	Full Current	The idle current is equal to the operating current.	

### Micro-stepping Setting

Pulse/rev	SW5	SW6	SW7	SW8
200	on	on	on	on
400	off	on	on	on
800	on	off	on	on
1600	off	off	on	on
3200	on	on	off	on
6400	off	on	off	on
12800	on	off	off	on
25600	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
25000	off	off	off	off

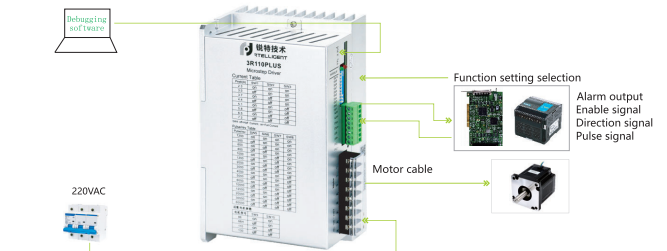
## 3R110PLUS

The 3R110PLUS digital 3-phase stepper drive is based on patented three-phase demodulation algorithm, with built-in micro-stepping technology, featuring low speed resonance, small torque ripple and high torque output. It can fully play the performance of three-phase stepper motors.

3R110PLUS V3.0 version added the DIP matching motor parameters function, can drive 86/110 two-phase stepper motor.

- Pulse mode: PUL & DIR
- Signal level: 3.3~24V compatible; series resistance not necessary for the application of PLC.
- Power voltage: 110~230V AC; 220V AC recommended, with superior high-speed performance.
- Typical applications: engraving machine, labeling machine, cutting machine, plotter, laser, automatic assembly equipment, etc.

### Drive Interface & Connection



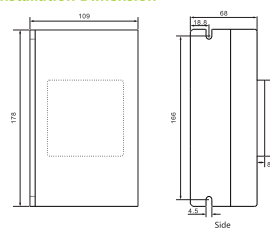
### Working Current Setting

Output current	SW1	SW2	SW3
2.3A	on	on	on
3.0A	off	on	on
3.7A	on	off	on
4.4A	off	off	on
5.1A	on	on	off
5.8A	off	on	off
6.5A	on	off	off
7.2A	off	off	off

### Semi-/full Current Selection

off	Semi-current	The idle current is half of the operating current.	SW4
on	Full Current	The idle current is equal to the operating current.	

### Installation Dimension



### Function Selection

Motor specification	SW9	SW10
86	on	on
86H	off	on
110	on	off
130	off	off

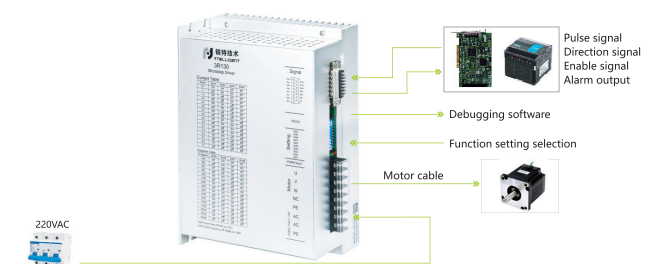
### Micro-stepping Setting

Pulse/rev	SW5	SW6	SW7	SW8
7200	on	on	on	on
500	off	on	on	on
600	on	off	on	on
800	off	off	on	on
1000	on	on	off	on
1200	off	on	off	on
2000	on	off	off	on
3000	off	off	off	on
4000	on	on	on	off
5000	off	on	on	off
6000	on	off	on	off
10000	off	off	on	off
12000	on	on	off	off
20000	off	on	off	off
30000	on	off	off	off
60000	off	off	off	off

When SW5, SW6, SW7, SW8 are all on, any subdivision can be changed through the debugging software.

## 3R130

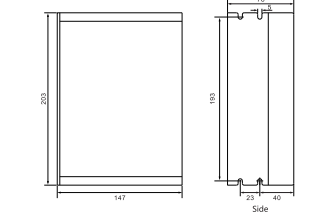
- The 3R130 digital 3-phase stepper drive is based on patented three-phase demodulation algorithm, with built-in micro-stepping technology, featuring low speed resonance, small torque ripple. It can fully play the performance of three-phase stepper motors.
- 3R130 is used to drive three-phase stepper motors base below 130mm.
- Pulse mode: PUL & DIR
  - Signal level: 3.3~24V compatible; series resistance not necessary for the application of PLC.
  - Power voltage: 110~230V AC;
  - Typical applications: engraving machine, cutting machine, screen printing equipment, CNC machine, automatic assembly equipment, etc.
- Drive Interface & Connection



### Working Current Setting

RMS(A)	SW1	SW2	SW3	SW4
0.7	on	on	on	on
1.1	off	on	on	on
1.6	on	off	on	on
2.0	off	off	on	on
2.4	on	on	off	on
2.8	off	on	off	on
3.2	on	off	off	on
3.6	on	off	off	on
4.0	on	on	on	off
4.5	off	on	on	off
5.0	on	off	on	off
5.4	off	off	on	off
5.8	on	on	off	off
6.2	off	on	off	off
6.6	on	off	off	off
7.0	off	off	off	off

### Installation Dimension



### Function Selection

Filter selection	SW9
off No filtering	Command smooth close
on With filtering	Command smooth open
Max pulse frequency selection	SW0
off Max frequency 200KHz	on Max frequency 1MHz

### Micro-stepping Setting

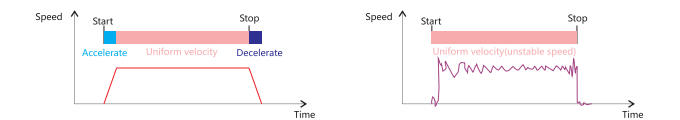
Pulse/rev	SW5	SW6	SW7	SW8
400	on	on	on	on
500	off	on	on	on
600	on	off	on	on
800	off	off	on	on
1000	on	on	off	on
1200	off	on	off	on
2000	on	off	off	on
3000	off	off	off	on
3600	on	on	on	off
5000	off	on	on	off
6400	on	off	on	off
10000	off	off	on	off
12000	on	on	off	off
20000	on	on	off	off
30000	off	on	off	off
60000	off	off	off	off

When SW5, SW6, SW7, SW8 are all on, any subdivision can be changed through the debugging software.

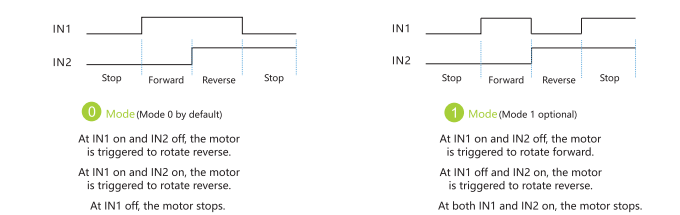
## Switch Stepper Drive

### Comparison between Switch Stepper Motor and AC speed regulating motor

IO Speed-regulating stepper motor	AC Speed regulating motor
The switch speed motor control stepper comes with S-type acceleration and deceleration, stable start and stop, low noise, and precise adjustable speed. The motor self-locks when the IO speed stepper stops.	The AC speed regulating motor has no acceleration or deceleration, the start and stop jitters are large, and the running noise is loud. The speed is adjustable but not accurate. The ordinary speed regulating motor has no self-locking force, and the stopping state is not stable.



### Control Timing Diagram



### Technical Specifications

	Model	Peak current A	Weight kg	Input voltage	Dimension mm	Matching motor
Single axis control	R42-IO	2.2	0.1	18-48VDC	92.6×56×21	open loop below 42mm
	R60-IO	5.6	0.3	18-50VDC	118×76×33	open loop below 60mm
	R86-IO	7.2	0.6	18-80VDC	151×97×52	open loop below 86mm
	R110PLUS-IO	8.0	0.9	110-230VAC	178×97×52	open loop below 110mm
Potentiometer speed-regulating type	R130-IO	8.0	1.3	110-230VAC	203×147×78	open loop below 130mm
	R42-IR	2.2	0.1	18-48VDC	92.6×56×21	open loop below 42mm
	R60-IR	5.6	0.3	18-50VDC	118×76×33	open loop below 60mm
	R86-IR	7.2	0.6	18-80VDC	151×97×52	open loop below 86mm

### LED Indication

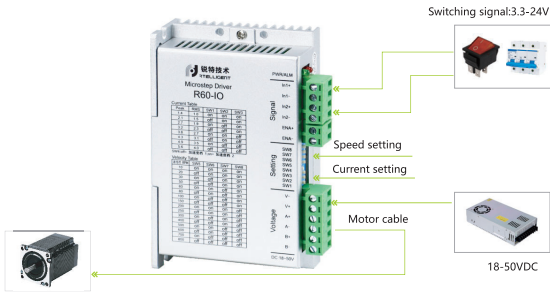
LED status	Drive status	Fault handling
Steady green light	Drive not enabled	
Flashing green light	Drive works fine	
1 green 1 red	Drive overcurrent	Check wiring, repair drive
1 green 2 red	Drive input power supply overvoltage	Check the input supply voltage
1 green 3 red	Drive internal voltage error	Drive failure

R60-IO

IO series switch stepper drive, with built-in S-type acceleration and deceleration pulse train, only need switch to trigger motor start and stop. Compared with speed regulating motor, IO series of switching stepper drive has the characteristics of stable start and stop, uniform speed, which can simplify the electrical design of engineers.

- Control mode: IN1, IN2
- Speed setting: DIP SW5-SW8
- Signal level: 3.3-24V Compatible
- Typical applications: conveying equipment, inspection conveyor, PCB loader

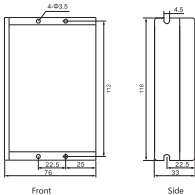
Drive Interface & Connection



Working Current Setting

Output current peak	Output current RMS	SW1	SW2	SW3
1.4A	1.0A	on	on	on
2.1A	1.5A	off	on	on
2.7A	1.9A	on	off	on
3.2A	2.3A	off	off	on
3.8A	2.7A	on	on	off
4.3A	3.1A	off	on	off
4.9A	3.5A	on	off	off
5.6A	4.0A	off	off	off

Installation Dimension



Acceleration Selection

Acceleration 1	Low acceleration/deceleration	SW4
Acceleration 2	High acceleration/deceleration	on

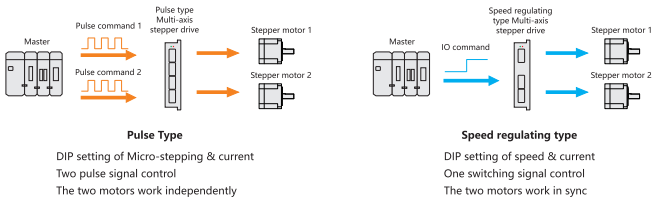
Speed Setting

Speed range(RPM)	SW5	SW6	SW7	SW8
10	on	on	on	on
20	off	on	on	on
30	on	off	on	on
50	off	off	on	on
60	on	on	off	on
80	off	on	off	on
100	on	off	off	on
150	off	off	off	on
200	on	on	on	off
250	off	on	on	off
300	on	off	on	off
400	off	off	on	off
500	on	on	off	off
600	off	on	off	off
700	on	off	off	off
800	off	off	off	off

Multi-axis Stepper Drive

Features

Multi control methods for customer choices	Save labor & shortening debugging time
Multi-axis series drive support pulse or switch control, two axis motor can be independent or synchronous operation, suitable for a variety of applications	The number of drives that need to be debugged is halved, saving labor and time costs for debugging devices
Save space & facilitate customer design	Save cost & improve equipment competitiveness
Compared with traditional drives, the multi-axis series drive can save 40 to 60% of the installation space and facilitate customer layout	While saving space and labor, the multi-axis series can also save drive costs and improve the overall competitiveness of the equipment



Note: X2 series drive receives 24V pulse signal by default, please refer to RteIntelligent for 5V pulse signal.

Technical Specifications

	Model	Peak current A	Weight kg	Input voltage	Dimension mm	Matching motor
Speed regulating	R42-D	2.2	0.2	18-50VDC	118 76 25	open loop below 42mm
	R60-D	5.6	0.3	18-50VDC	118 76 33	open loop below 60mm
Multi-axis control series	R42X2	2.2	0.2	18-50VDC	118 76 25	open loop below 42mm
	R60X2	5.6	0.4	18-48VDC	132 82 29	open loop below 60mm
	R60X3	5.6	0.5	18-48VDC	175 97 31	open loop below 60mm
	ECR60X2A	6.0	0.5	18-80VDC	175 98 33	open loop below 60mm
	ECT60X2	6.0	0.5	18-80VDC	175 98 33	closed loop below 60mm

LED Indication

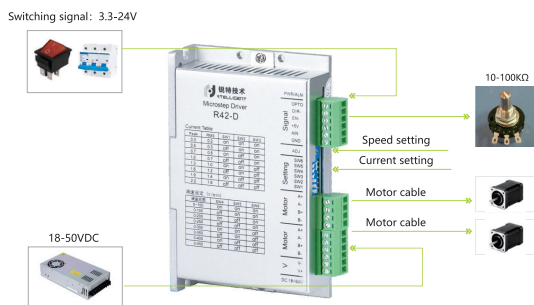
LED status	Drive status	Fault handling
Steady green light	Drive not enabled	
Flashing green light	Drive works fine	
1 green 1 red	Drive overcurrent	Check wiring, repair drive
1 green 2 red	Drive input power supply overvoltage	Check the input supply voltage
1 green 3 red	Drive internal voltage error	Drive failure

## One-drive-two Stepper Drive R42-D

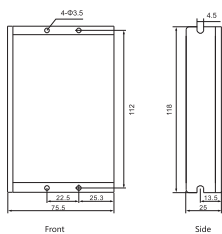
In conveying equipment, there are often two-axis synchronization application requirements. R42-D is a customized drive for two-axis synchronization application.

- Speed control mode: the ENA switching signal controls the start-stop, and the potentiometer controls speed.
- Signal level: IO signals are connected to 24V externally
- Power supply: 18-50VDC
- Typical applications: conveying equipment, inspection conveyor, PCB loader

### Drive Interface & Connection



### Installation Dimension



### Working Current Setting

Output current peak	Output current RMS	SW1	SW2	SW3
0.3A	0.2A	on	on	on
0.5A	0.3A	off	on	on
0.7A	0.5A	on	off	on
1.0A	0.7A	off	off	on
1.3A	1.0A	on	on	off
1.6A	1.2A	off	on	off
1.9A	1.4A	on	off	off
2.2A	1.6A	off	off	off

### Speed Setting

Speed range	SW4	SW5	SW6
0~100	on	on	on
0~150	off	on	on
0~200	on	off	on
0~250	off	off	on
0~300	on	on	off
0~350	off	on	off
0~400	on	off	off
0~450	off	off	off

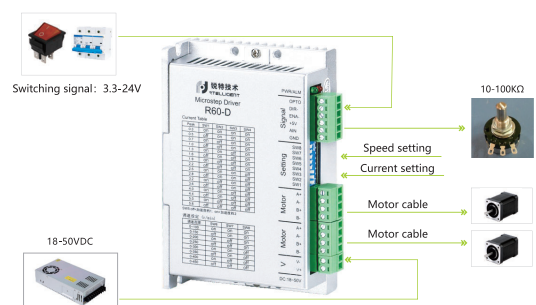
## One-drive-two Stepper Drive R60-D

Two-axis synchronization application is often required on the conveying equipment. R60-D is the two-axis synchronization specific drive customized by Rteelligent.

Using the TI delicate dual-core DSP chip, R60-D drives the two-axis motor independently to avoid the interference within the back electromotive force and achieve independent operation and synchronized movement.

- Speed control mode: the ENA switching signal controls the start-stop, and the potentiometer controls speed.
- Signal level: IO signals are connected to 24V externally
- Power supply: 18-50VDC
- Typical applications: conveying equipment, inspection conveyor, PCB loader

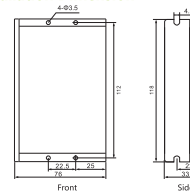
### Drive Interface & Connection



### Speed Setting

Speed range	SW6	SW7	SW8
0~100	on	on	on
0~150	off	on	on
0~200	on	off	on
0~250	off	off	on
0~300	on	on	off
0~350	off	on	off
0~400	on	off	off
0~450	off	off	off

### Installation Dimension



### Acceleration Selection

		SW5
Acceleration 1	Low acceleration/deceleration	off
Acceleration 2	High acceleration/deceleration	on

### Working Current Setting

Peak	SW1	SW2	SW3	SW4
0.3	on	on	on	on
0.5	off	on	on	on
0.7	on	off	on	on
1.0	off	off	on	on
1.3	on	on	off	on
1.6	off	on	off	on
1.9	on	off	off	on
2.2	off	off	off	on
2.5	on	on	on	off
2.8	off	on	on	off
3.2	on	off	on	off
3.6	off	off	on	off
4.0	on	on	off	off
4.4	off	on	off	off
5.0	on	off	off	off
5.6	off	off	off	off

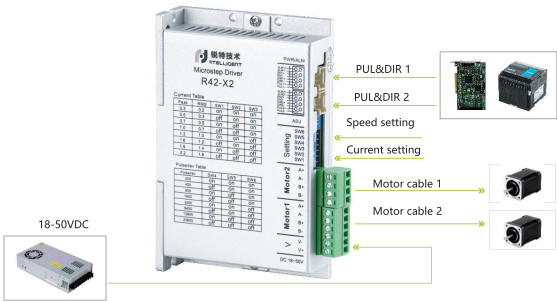


Two-in-one Drive R42X2

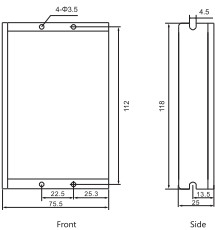
Multi-axis automation equipment is often required to reduce space and save the cost.R42X2 is the first two-axis special drive developed by Rtelligent in domestic market.  
R42X2 can independently drive two 2-phase stepper motors up to 42mm frame size. The two-axis micro-stepping and current must be set to the same.

- Speed control mode: the ENA switching signal controls the start-stop, and the potentiometer controls speed.
- Signal level: IO signals are connected to 24V externally
- Power supply: 18-50VDC
- Typical applications: conveying equipment, inspection conveyor, PCB loader

Drive Interface & Connection



Installation Dimension



Working Current Setting

Output current peak	Output current RMS	SW1	SW2	SW3
0.3A	0.2A	on	on	on
0.5A	0.3A	off	on	on
0.7A	0.5A	off	off	on
1.0A	0.7A	off	on	on
1.3A	1.0A	on	on	off
1.6A	1.2A	off	on	off
1.9A	1.4A	on	off	off
2.2A	1.6A	off	off	off

Micro-stepping Setting

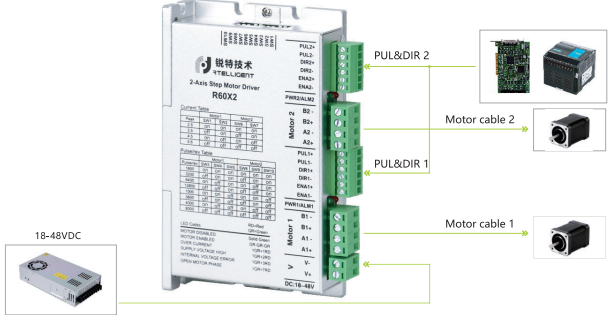
Pulse/rev	SW4	SW5	SW6
200	on	on	on
400	off	on	on
800	on	off	on
1600	off	off	on
3200	on	on	off
6400	off	on	off
12800	on	off	off
25600	off	off	off

Two-in-one Drive R60X2

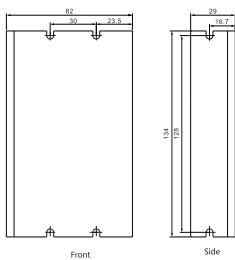
Multi-axis automation equipment is often required to reduce space and save the cost. R60X2 is the first two-axis special drive developed by Rtelligent in domestic market.  
R60X2 can independently drive two 2-phase stepper motors up to 60mm frame size. The two-axis micro-stepping and current can be set separately.

- Pulse mode: PUL&DIR
- Signal level: 24V default, R60X2-5V is required for 5V
- Typical applications: dispenser, soldering machine, multi-axis test equipment.

Drive Interface & Connection



Installation Dimension



Working Current Setting

Output current peak	Motor 1		Motor 2	
	SW1	SW2	SW3	SW4
2.5A	on	on	on	on
3.5A	off	on	off	on
4.5A	on	off	on	off
5.6A	off	off	off	off

Micro-stepping Setting

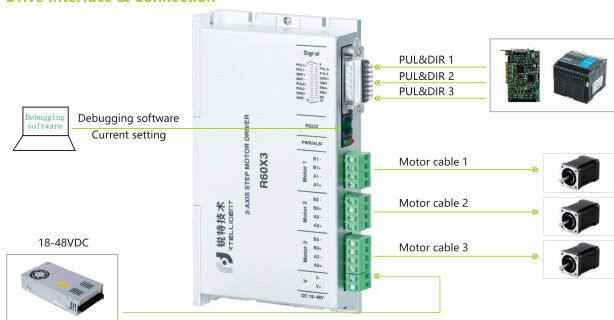
Pulse/rev	Motor 1(Motor 2)			
	SW3(8)	SW4(9)	SW5(10)	
1600	on	on	on	
3200	off	on	on	
6400	on	off	on	
12800	off	off	on	
1000	on	on	off	
3600	off	on	off	
4000	on	off	off	
8000	off	off	off	

## Three-in-one Drive R60X3

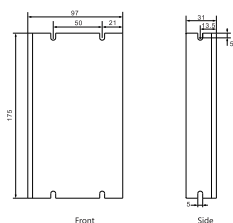
Three-axis platform equipment often has the need to reduce space and save cost. R60X3/3R60X3 is the first three-axis special drive developed by Rteligent in domestic market. R60X3/3R60X3 can independently drive three 2-phase/3-phase stepper motors up to 60mm frame size. The three-axis micro-stepping and current are independently adjustable.

- Pulse mode: PUL&DIR
- Signal level: 3.3-24V compatible; serial resistance not required for the application of PLC.
- Typical applications: dispenser, soldering
- machine, engraving machine, multi-axis test equipment.

### Drive Interface & Connection



### Installation Dimension



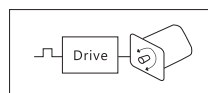
### Parameter Debugging Interface



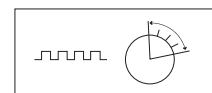
## Open Loop Stepper Motor

The stepper motor is a special motor specially designed for accurate control of position and speed. The biggest characteristic of stepper motor is "digital". For each pulse signal from the controller, the stepper motor driven by its drive runs at a fixed angle ("one step" for short), as shown in the following figure.

Rteligent A/AM series stepper motor is designed based on the Cz optimized magnetic circuit and adopts stator and rotor materials of high magnetic density, featuring a high energy efficiency.



One pulse for one step



Number of pulses equals to that of steps

### Naming Rule

- 57 A M 23 - □
- 1 Base size
  - 2 Step angle type code  
A: 1.8 degrees  
B: 1.2 degrees  
C: 0.72 degrees
  - 3 Motor series code  
M: M series
  - 4 Motor torque  
0.6: 0.6Nm  
30: 3.0Nm  
120: 12.0Nm
  - 5 Non-standard code  
D: Double shaft  
Z2: With brake

\*Model naming rules are only used for model meaning analysis. For specific optional models, please refer to the details page.

### Application Guide

- 1 Stepper motor is generally used at the highest speed of 600-700rpm.
- 2 The low speed resonance zone of stepper motor is around 100rpm and 200rpm  
(The first resonance zone is about 100rpm, The second resonance zone is about 200rpm).
- 3 The 8-wire motor can be connected in series and parallel. Please connect the cables according to the motor label.  
(Series connection is suitable for low speed and high torque applications, while parallel is suitable for high speed applications)
- 4 If motor running jitter, stop shaking, there should be the inertia matching problem, clients need to consider the acceleration and deceleration.
- 5 If stepper motor can not start, please check wiring, micro-stepping setting, system acceleration and deceleration settings.
- 6 Vertical applications require stepper motors with brakes.

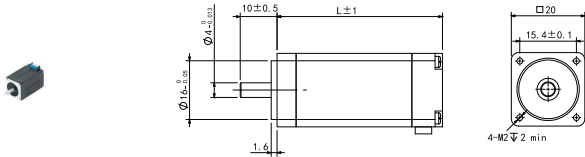


2-Phase Stepper Motor 20/28mm Series Technical Specifications

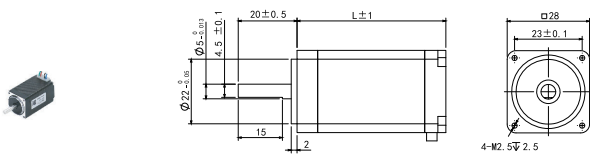
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ohm)	Inductance/Phase(mH)	Rotor inertia (g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
20AM003	1.8	0.03	0.6	5.7	2.6	3	4	10	33	0.07
20AM005	1.8	0.05	0.6	7.0	3.4	38	4	10	45	0.10
28AM006	1.8	0.06	1.2	1.4	1.0	90	5	20	32	0.11
28AM01	1.8	0.10	1.2	1.8	1.6	130	5	20	41	0.13
28AM013	1.8	0.13	1.2	2.2	2.3	180	5	20	51	0.18

\*NEMA 8 (20mm), NEMA 11 (28mm)

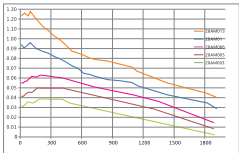
20AM Series Dimension (mm)



28AM Series Dimension (mm)

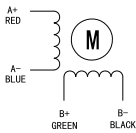


Torque-frequency Curve



Drive: R42  
Voltage: 24VDC  
Current: Rated  
Micro-stepping: 1600

Wiring

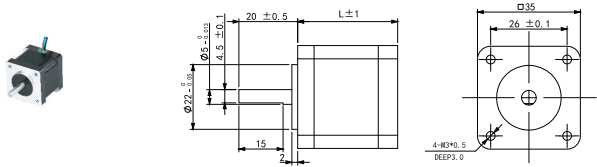


2-Phase Stepper Motor 35/39mm Series Technical Specifications

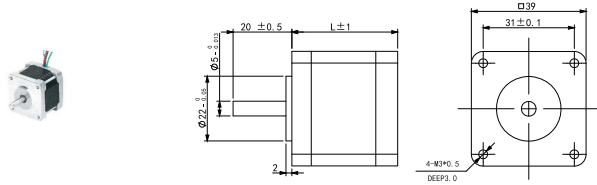
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ohm)	Inductance/Phase(mH)	Rotor inertia (g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
35A02	1.8	0.2	1.0	3.8	5.3	22	5	20	34	0.18
39A02	1.8	0.2	1.0	4.1	7.1	30	5	20	36	0.28

\*NEMA 14 (35mm), NEMA 16 (39mm)

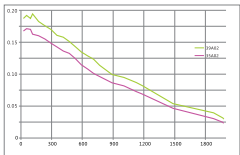
35A Series Dimension (mm)



39A Series Dimension (mm)

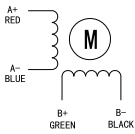


Torque-frequency Curve



Drive: R42  
Voltage: 24VDC  
Current: Rated  
Micro-stepping: 1600

Wiring

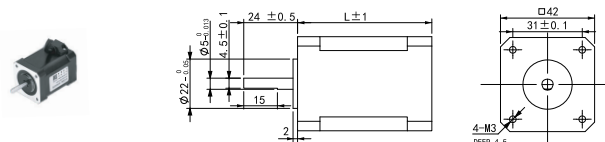


## ■ 2-Phase Stepper Motor 42mm Series Technical Specifications

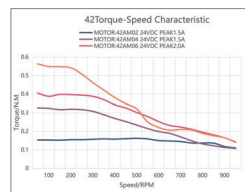
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ohm)	Inductance/Phase(mH)	Rotor inertia (g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
42AM02	1.8	0.2	1.5	1.3	1.9	41	5	24	34	0.23
42AM04	1.8	0.4	1.5	2.6	5.1	57	5	24	40	0.29
42AM06	1.8	0.6	2.0	1.8	3.8	82	5	24	47	0.37
42AM08	1.8	0.8	2.0	1.9	5.0	114	5	24	60	0.48

\*NEMA 17 (42mm)

### ■ 42AM Series Dimension (mm)

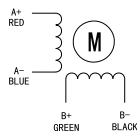


### ■ Torque-frequency Curve



Driver: R42 V2.1  
Voltage: 24VDC  
Current: Rated  
Micro-stepping: 10000

### ■ Wiring

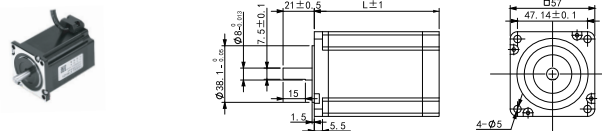


## ■ 2-Phase Stepper Motor 57mm Series Technical Specifications

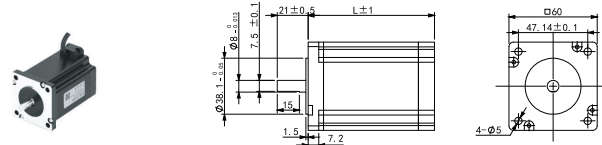
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ohm)	Inductance/Phase(mH)	Rotor inertia (g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
57AM13	1.8	1.3	3.0	0.42	1.5	260	8	21	55	0.67
57AM23	1.8	2.3	5.0	0.64	2.7	460	8	21	76	1.03
57AM24	1.8	2.4	5.6	0.41	2.0	460	8	21	80	1.11
57AM26	1.8	2.6	5.0	0.47	2.1	520	8	21	84	1.20
57AM30	1.8	3.0	5.0	0.82	3.7	720	8	21	102	1.48
D57AM30	1.8	3.0	5.0	0.50	2.2	690	8	21	86	1.39

\*NEMA 23 (57mm)

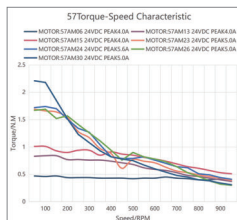
### ■ 57AM Series Dimension (mm)



### ■ D57AM Series Dimension (mm)

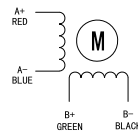


### ■ Torque-frequency Curve



Driver: R60-AL  
Voltage: 24VDC  
Current: Rated  
Micro-stepping: 10000

### ■ Wiring

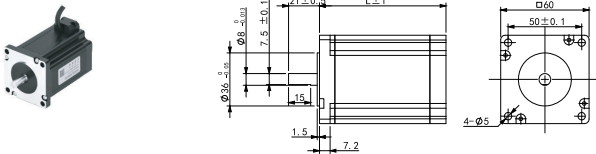


2-Phase Stepper Motor 60mm Series Technical Specifications

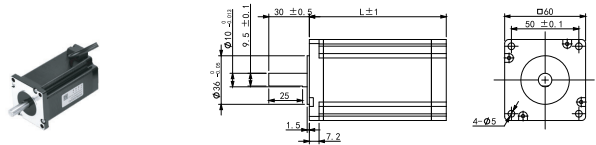
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ohm)	Inductance/Phase(mH)	Rotor inertia (g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
60AM21	1.8	2.1	5.0	0.35	1.3	330	8	21	58	0.87
60AM30	1.8	3.0	5.0	0.50	2.2	690	8	21	86	1.39
60AM40	1.8	4.0	5.0	0.86	3.5	880	10	30	102	2.05

\*NEMA 24 (60mm)

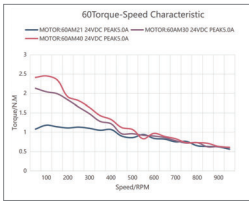
60AM21/60AM30 Dimension (mm)



60AM40 Dimension (mm)

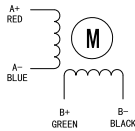


Torque-frequency Curve



Driver: R60-AL  
Voltage: 24VDC  
Current: Rated  
Micro-stepping: 10000

Wiring

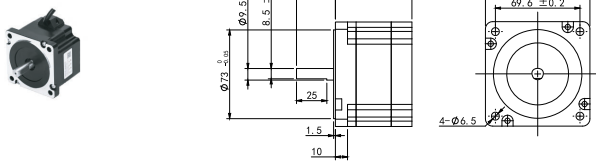


2-Phase Stepper Motor 86mm Series Technical Specifications

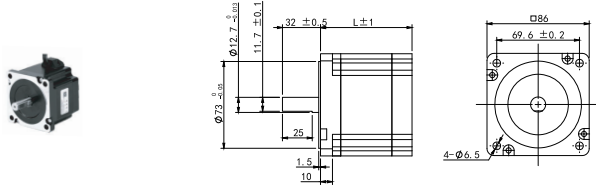
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ohm)	Inductance/Phase(mH)	Rotor inertia (g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
86AM35	1.8	3.5	4.0	0.81	3.87	800	9.5	32	64	1.70
86AM45	1.8	4.5	6.0	0.41	2.82	1400	12.7	32	78	2.25
86AM65	1.8	6.5	6.0	0.47	4.18	2300	12.7	32	98	2.95
86AM85	1.8	8.5	6.0	0.53	5.54	2800	12.7	32	112	3.67
86AM120	1.8	12	6.0	1.72	8.30	4000	15.875	32	155	5.10
86AM45-14	1.8	4.5	6.0	0.41	2.82	1400	14	32	78	2.25
86AM65-14	1.8	6.5	6.0	0.47	4.18	2300	14	32	98	2.95
86AM85-14	1.8	8.5	6.0	0.53	5.54	2800	14	32	112	3.67
86AM100	1.8	10	6.0	0.75	5.30	3400	14	32	128	4.10
86AM120-14	1.8	12	6.0	1.72	8.30	4000	14	32	155	5.10

\*NEMA 34 (86mm)

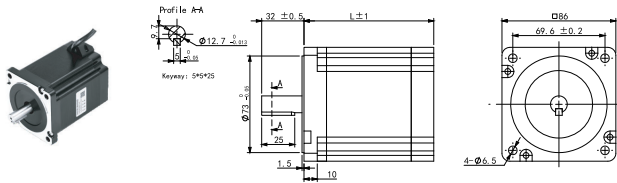
86AM35 Dimension (mm)



86AM45Dimension (mm)



86AM65/86AM85 Dimension



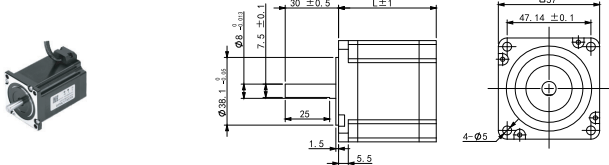


3-Phase Stepper Motor 57mm Series Technical Specifications

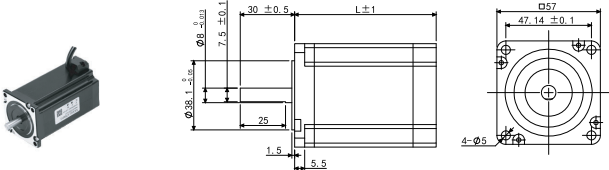
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ohm)	Inductance/Phase(mH)	Rotor inertia (g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
57BM09	1.2	0.9	3.5	0.50	1.2	260	8	30	55	0.67
57BM15	1.2	1.5	3.5	0.69	1.8	480	8	30	78	1.10

\*NEMA 23 (57mm)

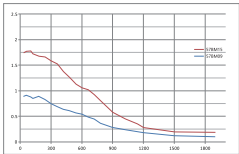
57BM09 Dimension (mm)



57BM15 Dimension (mm)

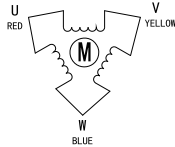


Torque-frequency Curve



Drive: 3R60  
Voltage: 36VDC  
Current: Rated  
Micro-stepping: 1600

Wiring

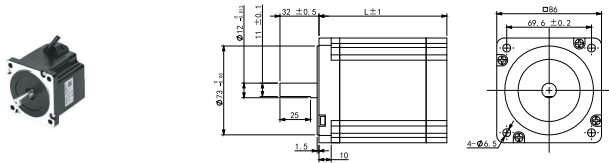


3-Phase Stepper Motor 86mm Series Technical Specifications

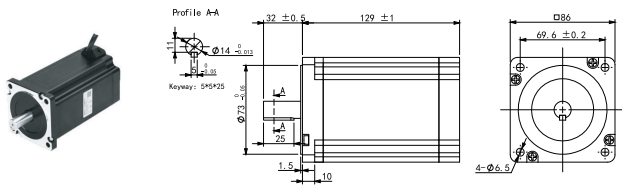
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ohm)	Inductance/Phase(mH)	Rotor inertia (g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
86BM20	1.2	2.3	3.0	2.1	7.7	1300	12	32	73	2.0
86BM40	1.2	4.3	4.5	1.1	4.5	2500	12	32	105	2.0
86BM70	1.2	7.0	3.0	4.4	20	3400	14	32	129	4.1
86BM90	1.2	9.0	3.0	5.7	29	4000	14	32	155	5.1

\*NEMA 34 (86mm)

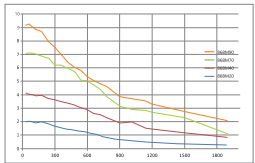
86BM20/86BM40尺寸(mm)



86BM70/86BM90尺寸(mm)

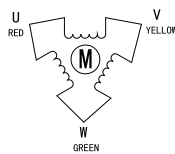


Torque-frequency Curve



Drive: 3R110PLUS V3.0  
Voltage: 220VAC  
Current: Rated  
Micro-stepping: 2000

Wiring



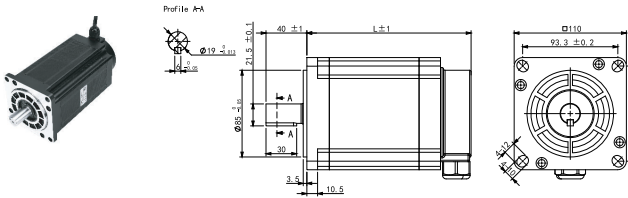


3-Phase Stepper Motor 110mm Series Technical Specifications

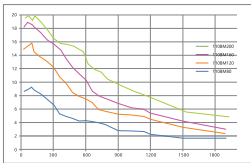
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ohm)	Inductance/Phase(mH)	Rotor inertia (g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
110BM90	1.2	8.0	4.3	1.0	11.9	8600	19	40	137	5.5
110BM120	1.2	12	6.0	1.1	12.4	11900	19	40	161	7.1
110BM160	1.2	16	6.5	1.3	19.0	14800	19	40	185	10.7
110BM200	1.2	20	7.0	1.7	22.0	19800	19	40	220	11.0

\*NEMA 42 (110mm)

110BM Series Dimension (mm)

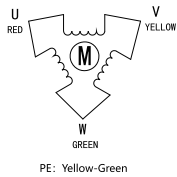


Torque-frequency Curve



Drive: 3R110RLUS  
Voltage: 220VAC  
Current: Rated  
Micro-stepping: 2000

Wiring



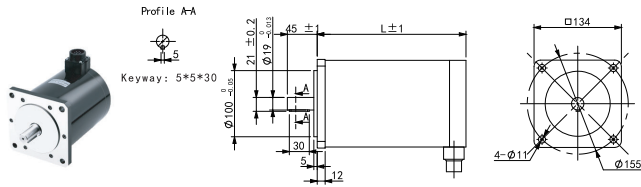
3-Phase Stepper Motor 130mm Series Technical Specifications

Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ohm)	Inductance/Phase(mH)	Rotor inertia (g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
130B23	1.2	23	5.0	0.95	9.5	26800	19(K5)	45	170	13.7
130B36	1.2	36	5.0	1.30	13.1	35000	19(K5)	45	226	18.4
130B50**	1.2	50	5.0	1.70	18.0	45500	19(K5)	45	282	22.8
130B50**	1.2	50	6.0	0.99	18.3	42500	19(K6)	44	271	16.5

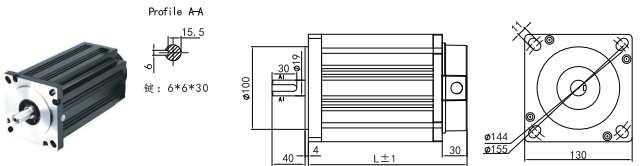
\*NEMA 52 (130mm)

\*\*We have two specifications of 130B50, Please confirm before ordering.

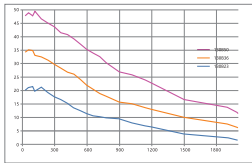
K5: 130B Series Dimension (mm)



K6: 130B50 Series Dimension (mm)

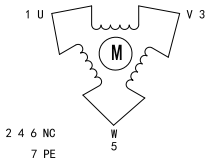


Torque-frequency Curve



Drive: 3R130  
Voltage: 220VAC  
Current: Rated  
Micro-stepping: 2000

Wiring



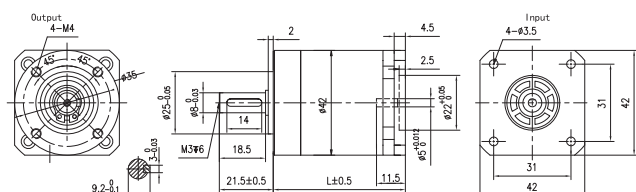
## Reducer for Stepper Motor

### ■ Transmission Stepper Reducer

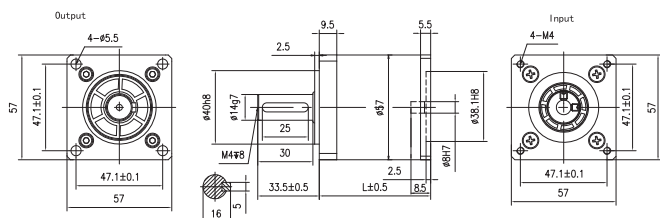
Model	Input dimension (Motor insertion end)				Output dimension (Client installation end)				Length	
	Shaft diameter	Bore diameter	Mounting hole distance	Mounting hole size	Shaft diameter	Bore diameter	Mounting hole distance	Mounting hole size	L1	L2
42PRF-	5	22	31.0	3.5	8	25	P.C.D.35	M4	43	53
57PLF-	8	38	47.1	M4	14	40	47.1	5.5	53	70
86PLF-	14	73	69.6	M6	14	73	69.6	M6	83	97

\*PRF and PLF series reducer input terminal has size limitation, some stepper motors need to be cut shaft before assembly

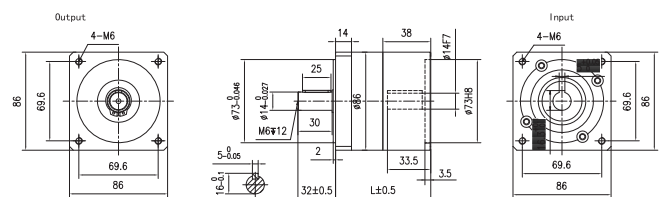
### ■ 42PRF Series Dimensions (mm)



### ■ 57PLF Series Dimensions (mm)



### ■ 86PLF Series Dimensions (mm)

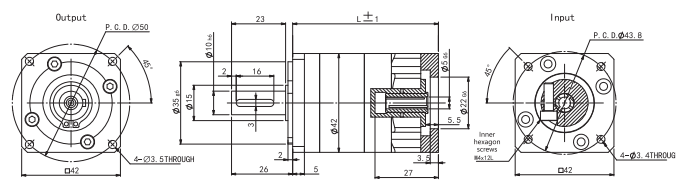


### ■ Precision Stepper Reducer

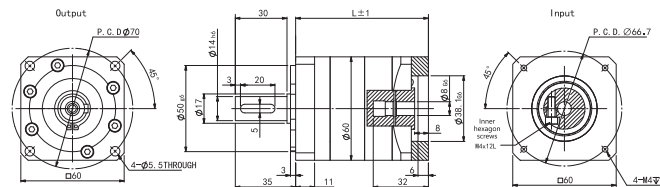
Model	Input dimension (Motor insertion end)				Output dimension (Client installation end)				Length	
	Shaft diameter	Bore diameter	Mounting hole distance	Mounting hole size	Shaft diameter	Bore diameter	Mounting hole distance	Mounting hole size	L1	L2
42PLX-	5	22	31.0	3.5	10	35	P.C.D.50	3.5	62	77
60PLX-	8	38	47.1	M4	14	50	P.C.D.70	5.5	77	95
90PLX-	14	73	69.6	M6	20	80	P.C.D.100	6.5	110	130

\*The L1 reducer can have a reduction ratio range of 3-10, the L2 reducer can have a reduction ratio range of 15-100.

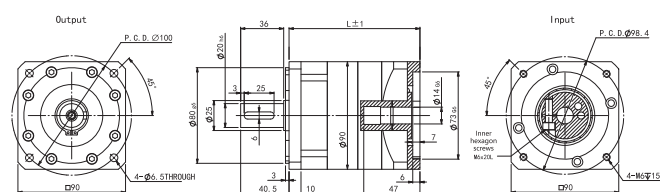
### ■ 42PLX Series Dimensions (mm)



### ■ 60PLX Series Dimensions (mm)



### ■ 90PLX Series Dimensions (mm)

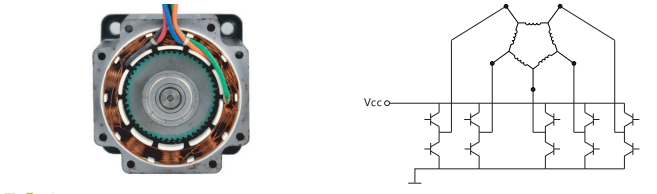


## Five-phase Stepper System

Compared with the ordinary two-phase stepper motor, the five-phase stepper motor has a smaller step angle. In the case of the same rotor structure, the five-phase structure of the stator has unique advantages for the performance of the system.

The technical difficulty of the corresponding five-phase stepper drive lies in the demodulation of the electrical angle of the five-phase winding. The five-phase stepper drive, developed by Rtelligent, is compatible with the new pentagonal connection motor and has excellent performance.

### Stepper Motor Stator Structure & Drive Control Diagram



### Features

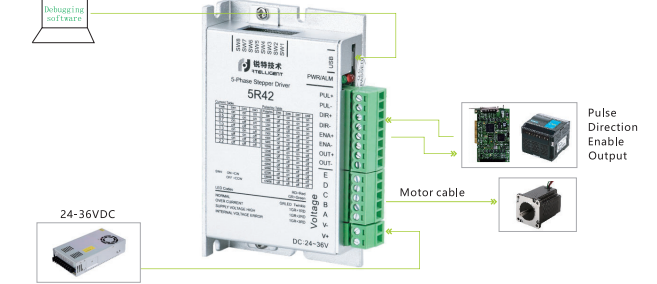
High precision	Low vibration
<p>The step angle of the five-phase stepper motor is <math>0.72^\circ</math>, which has higher step angle accuracy than the two-phase/three-phase stepper motor.</p>	<p>The stator of the five-phase stepper motor contains five pairs of windings. The decoupling algorithm of the drive makes the winding current of the five-phase stepper motor in a more reliable equilibrium state. The motor runs smoothly with little vibration.</p>
Small torque ripple	High repeat positioning accuracy
<p>Because of its unique structure and current control algorithm, the five-phase stepper system has a smaller torque ripple in the same electrical cycle of the stepper motors. Therefore, the five-phase system has unique advantages in speed stability.</p>	<p>The step angle error of stepper motor depends on the manufacturing process, generally 3%-5% of the step angle. In each interval of 50 pairs of rotor cogging, the five-phase motor corresponds to 10 stable positions, which has better repeat positioning accuracy.</p>

## 5R42

5R42 digital five-phase stepper drive is based on T1 32-bit DSP platform and integrated with the micro-stepping technology and the patented five-phase demodulation algorithm. With the features of low resonance at low speed, small torque ripple and high precision, it allows the five-phase stepper motor to deliver full performance benefits.

- Pulse mode: default PUL&DIR
- Signal level: 5V, PLC application requires string 2K resistor
- Power supply: 24-36VDC
- Typical applications: mechanical arm, wire-cut electrical discharge machine, die bonder, laser cutting machine, semiconductor equipment, etc

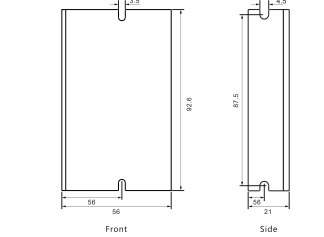
### Drive Interface & Connection



### Working Current Setting

Output current	SW1	SW2	SW3
0.3A	on	on	on
0.5A	off	on	on
0.7A	on	off	on
1.0A	off	off	on
1.3A	on	on	off
1.5A	off	on	off
1.9A	on	off	off
2.2A	off	off	off

### Installation Dimesion



### Initial Direction Setting

A	B	C	D	E
SW4	off	CW	on	CCW

### Micro-stepping Setting

Pulse/rev	SW5	SW6	SW7	SW8
500	on	on	on	on
1000	off	on	on	on
1250	on	off	on	on
2000	off	off	on	on
2500	on	on	off	on
4000	off	on	off	on
5000	on	off	off	on
10000	off	off	off	on
12500	on	on	on	off
20000	off	on	on	off
25000	on	off	on	off
40000	off	off	on	off
50000	on	on	off	off
62500	off	on	off	off
100000	on	off	off	off
125000	off	off	off	off

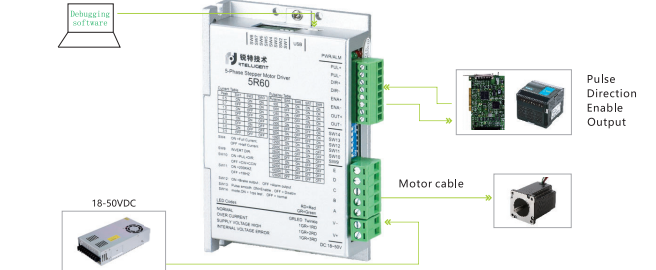
When S, K, 7, and 8 are all ON, any micro-stepping can be changed through the debugging software

5R60

5R60 digital five-phase stepper drive is based on TI 32-bit DSP platform and integrated with the micro-stepping technology and the patented five-phase demodulation algorithm. With the features of low resonance at low speed, small torque ripple and high precision, it allows the five-phase stepper motor to deliver full performance benefits.

- Pulse mode: default PUL&DIR
- Signal level: 5V. PLC application requires string 2K resistor.
- Power supply: 18-50VDC, 36 or 48V recommended.
- Typical applications: dispenser, wire-cut electrical discharge machine, engraving machine, laser cutting machine, semiconductor equipment, etc

Drive Interface & Connection



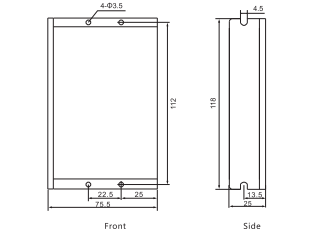
Working Current Setting

Output current	SW1	SW2	SW3
0.5A	on	on	on
0.7A	off	on	on
1.0A	on	off	on
1.5A	off	off	on
2.0A	on	on	off
2.5A	off	on	off
3.0A	on	off	off
3.5A	off	off	off

Initial Direction Setting

A	B	C	D	E
SW9	off	CW	on	CCW

Installation Dimesion



Function Setting Selection

Pulse mode	SW10
off	CW+CCW
on	PUL+DIR
Max pulse frequency	SW11
off	Max pulse 1MHz
on	Max pulse 200KHz
Output function	SW12
off	Alarm output
on	Break control output
Filter function	SW13
off	Ineffective
on	Effective
Self-check	SW14
off	Normal mode
on	self-check operation

Micro-stepping Setting

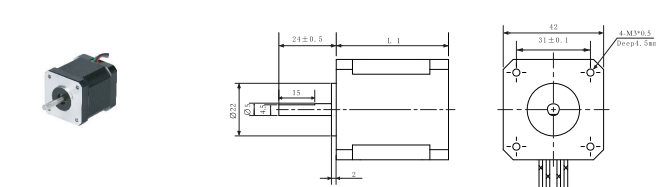
Pulse/rev	SW5	SW6	SW7	SW8
500	on	on	on	on
1000	off	on	on	on
1250	on	off	on	on
2000	off	off	on	on
2500	on	on	off	on
4000	off	on	on	on
5000	on	off	off	on
10000	off	off	off	on
12500	on	on	on	off
20000	off	on	on	off
25000	on	off	on	off
40000	off	off	on	off
50000	on	on	off	off
62500	off	on	off	off
100000	on	off	off	off
125000	off	off	off	off

When 5, 6, 7, and 8 are all ON, any micro-stepping can be changed through the debugging software

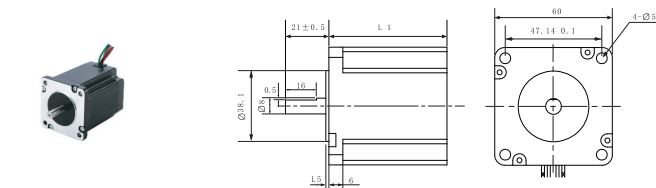
Technical Specifications

Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/Phase(Ohm)	Inductance/Phase(mH)	Rotor inertia (g.cm <sup>2</sup> )	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
42C03	0.72	0.3	0.75	1.9	1.6	68	5	24	48	0.3
60C1	0.72	1.0	1.5	0.5	1.2	380	8	21	64	0.9
60C2	0.72	1.3	1.5	3.6	9.7	550	8	21	76	1.1

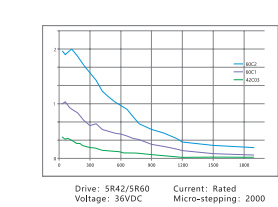
NEMA 17(42mm) Series Dimensions



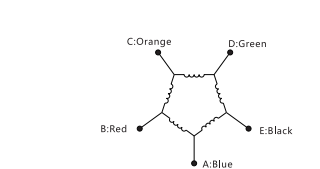
NEMA 24(60mm) Series Dimensions (mm)



Torque-frequency Curve



Wiring



## Linear Stepper Motor

External Nut ACME Screw	External Nut Ball Screw	Non-Captive ACME Screw
		
<ul style="list-style-type: none"><li>Inch T-shape screw, anti-backlash nuts are optional</li><li>Recommended speed range 300rpm</li><li>Screw transmission efficiency 20-50%</li><li>Brake and closed loop are optional</li></ul>	<ul style="list-style-type: none"><li>Rolling ball screw, C7 precision</li><li>Recommended speed range 700rpm (closed loop 1500rpm)</li><li>Screw transmission efficiency 90-98%</li><li>Brake and closed loop are optional</li></ul>	<ul style="list-style-type: none"><li>Inch T-shape screw</li><li>Recommended speed range 300rpm</li><li>Screw transmission efficiency 20-50%</li><li>Brake and closed loop are notoptional</li></ul>

### Naming Rule

57A09 E C - Z - GZ1210 - 3 - 140 - 001

1 2 3 4 5 6 7 8

- Motor model
- Shaft mode  
N: Non-Captive  
E: External Nut
- Encoder code  
C: With encoder  
None: Omitted
- Break code  
Z: With break  
None: Omitted
- Screw type & lead  
Gz1210: Ball screw,  
10mm lead, 12mm diameter  
5.08: ACME screw, 5.08mm  
lead, diameter omitted
- Rated motor current  
Unit: mm
- Screw length  
Unit: mm
- Customized Code

\*Model naming rules are only used for model meaning analysis. For specific optional models, please consult with our engineer.

### Technical Specifications

Screw type	Motor frame	Optional motor body length					Optional diameter	Optional lead						
ACME	20	30	42				3.5	1	2	4	8			
	28	34	45				4.76	0.635	1.27	2.54	5.08	10.16		
	35	34	47				6.35	1.27	2.54	6.35	12.7	25.4		
	42	34	40	48	60		6.35	1.27	2.54	6.35	12.7	25.4		
	57	45	55	65	75		9.525	1.27	2.54	5.08	10.16	25.4		
	86	76	114				15.875	2.54	3.175	6.35	12.7	25.4		
Ball	20	30	42				6	1						
	28	34	45				8	1	2					
	35	34	47				8	1	2					
							12	2	5	10				
	42	34	40	48	60		8	1	2					
							12	2	5	10				
	57	45	55	65	75		12	2	5	10				
	86	76	114				16	5	10	16				

### Concepts

**Lead:** The lead is the linear stroke of the screw when it rotates the nut for one circle.

**Thrust:** Thrust refers to the thrust generated by the motor in the shaft direction of screw. When selecting, the screw thrust should be greater than the sum of the external forces of the current load.

Thrust formula:  $T \cdot Z \cdot \eta = F \cdot B$   
T: Effective torque  
Z: Screw transmission efficiency  
F: Thrust  
B: Lead

**Screw:** The ball screw uses the cyclic movement of the ball between the nut and the screw to move the load. T-shape screw uses the oil film between the nut and the screw to generate relative sliding to move the load.

Screw type	Friction form	Friction coefficient	Transmission efficiency	Self-locking force	Motor speed
Ball screw	Rolling friction	Small	High	No	High
T-shape screw	Sliding friction	Large	Low	Has a certain selflocking force	Speed limit 300rpm

### Model Selection

- Determine the load specifications and stroke  
Dimension and weight of workpieces and loads, also the motion range of workpieces
- Determine the static stress condition of the loads according to its installationEg.  
eg: Calculate gravity and friction if installed vertically.  
Calculate friction if installed horizontally.  
Other forces should be considered as well.
- Select the proper size of linear screw motor based on speed and the screw specifications table.  
Estimate static torque based on static stress condition of the system.  
Estimate dynamic torque based on accelerated speed and inertia  
Approximately determine the condition of the motor body and screw lead.  
(Remarks: the transmission efficiency of ACME screw is 20%-60%)
- Select the matching drive

Pluse type			
Switching type			
Fieldbus type			