STEPPER SYSTEM

Be more intelligent in motion control

EtherCAT

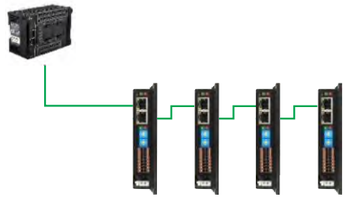
CANopen

Modbus

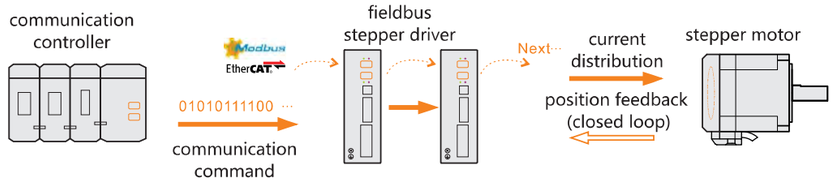
Fieldbus Stepper System

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



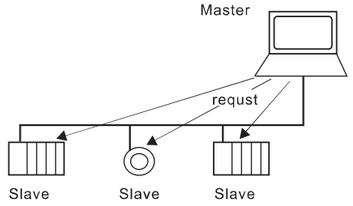
Features

Various communication modes

Includes a variety of filedbus communication methods,which are suitable for various applications.

More flexible control

The fieldbus realizes the distributed control, and for the distributed control system, the fieldbus is an indispensable part.



Stronger anti-interference ability

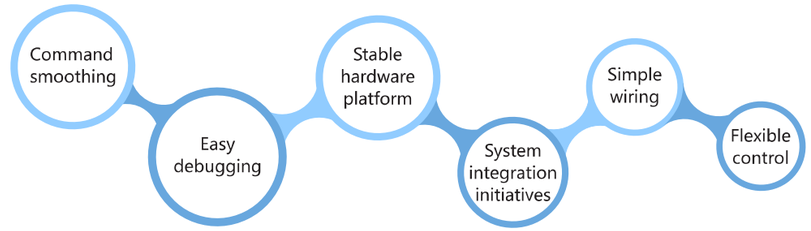
Since the fieldbus control method adopts digital serial communication method and the cable adopts shielded twisted pair, it has stronger anti-interference ability than the traditional discrete control method.

More accurate and reliable

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

EC T 60 – □

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

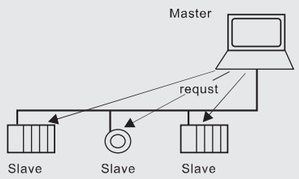
*Model naming rules are only used for model meaning analysis. For specific optional models, please refer to the details page.

Product Series

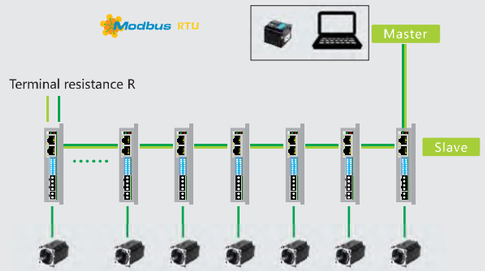
Modbus RTU NT Series	Modbus TCP EP Series	EtherCAT EC Series
		
• Matching motor frame below 86mm • Integrated motion controller function • Built-in T-shaped acceleration and deceleration command • Support torque homing • Communication control/pulse control/ switch control	• Matching motor frame below 60mm • Integrated motion controller function • Built-in T-shaped • Support torque homing • Compatible with 10M/100Mbps network interface	• Matching motor frame below 86mm • Comply with CiA402 specification • CSP/CSV/HM/PP/PV • Support torque homing • The minimum synchronization period in CSP mode is 200us

485 Communication Type Stepper Drive

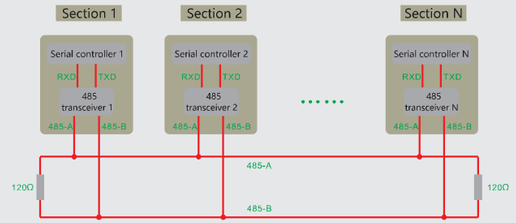
Modbus RTU Rotocol Overview

Schematic	Command format	Features
 Modbus broadcast mode block diagram	 Command format: Slave address + function code + data + CRC check Function code: 0X03 Read holding register 0X06 Write a single register 0X10 Write multiple registers	• Broadcast mode • One master multiple slaves • Host query and slave response • Slaves have no priority arbitration rights • Simple hardware • Reliable serial communication

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	
● ● ● ● ● ● ● 1 green 7 red	Motor phase loss	Check the wiring terminal and confirm the extension cable connector

NT Series Application

PLC Master Station + NT Drive Slave Station

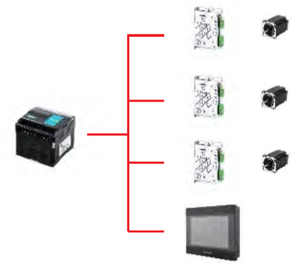
Master+Slave: PLC+NT drive

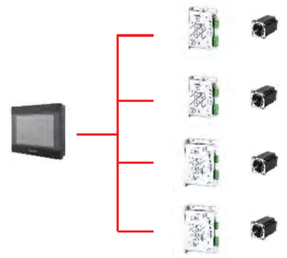
Convenient networking
PLC with 485 communication
Support up to 31 slave stations
Optional touch screen for slave station, quick interaction

Touch Screen Master + NT Drive Slave

Master+Slave: Touch screen+NT driver

Convenient networking
Streamline cost control
Commonly used macro instruction programming mode
For simple logic loop control

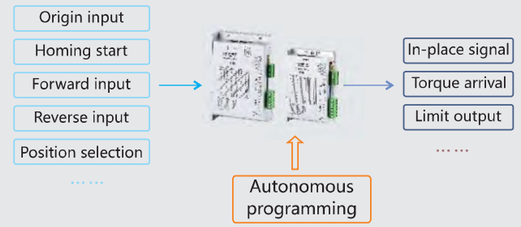




NT Series Drive Automatic Programming Mode

Drive automatic programming mode

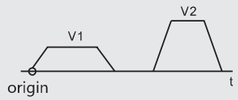
No networking required
Use the internal integrated motion control instructions
With external IO control
Fixed speed/positioning/multi-stage position/ auto-homing etc.



Function in Self-programming Mode

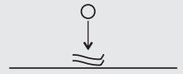
IO positioning operation

IO forward and revers
One or more target position
Support torque homing



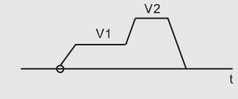
IO torque mode

IO forward and reverse
Target torque switching
Support torque homing



IO speed control operation

IO forward and reverse
One or more target position



IO torque mode

IO forward and reverse
Target torque and position switching
Support torque homing

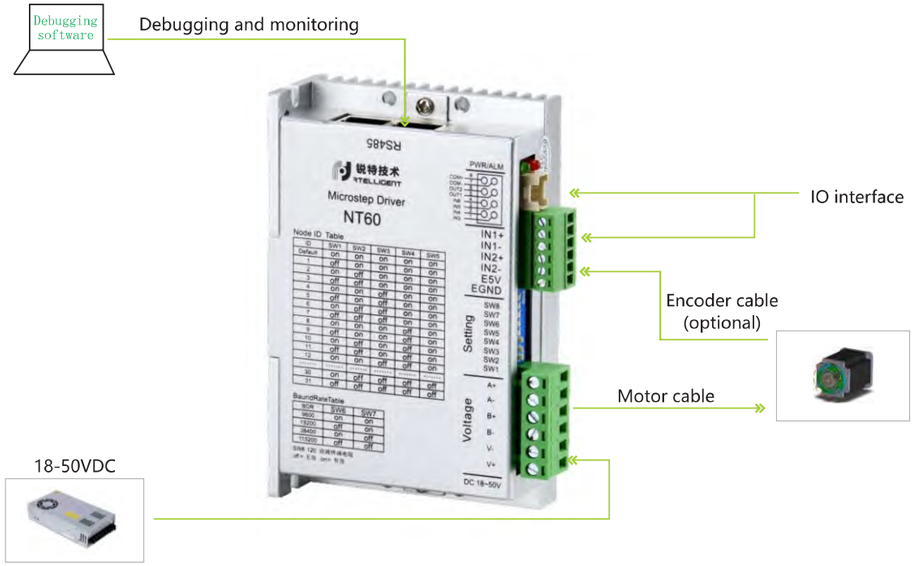
NT60

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

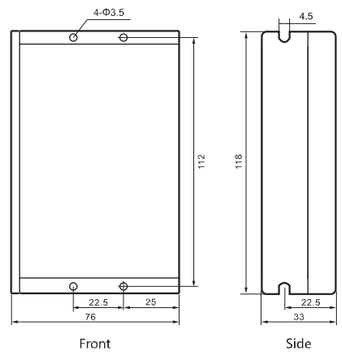
Baud rate setting		
BDR	SW6	SW7
9600	on	on
19200	off	on
38400	on	off
115200	off	off

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



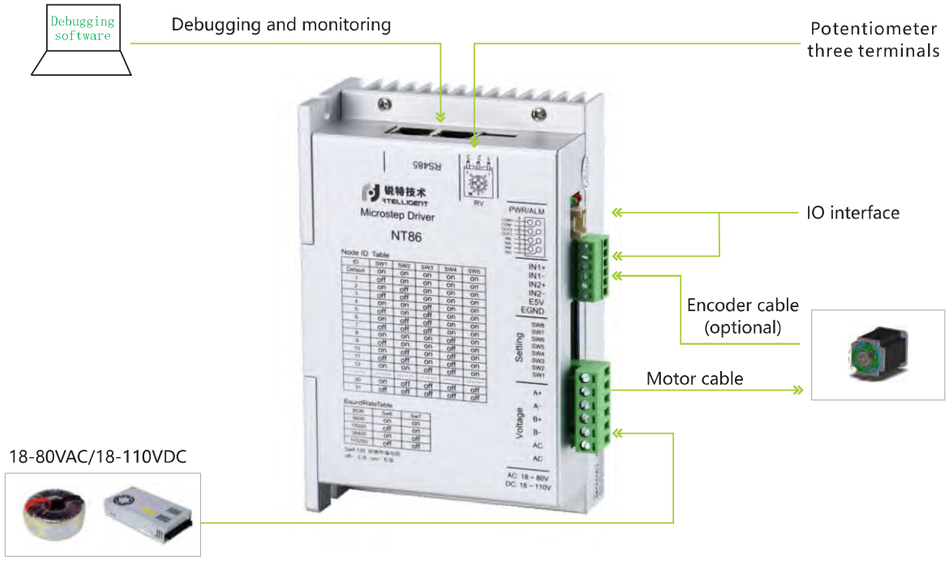
NT86

485 fieldbus stepper drive 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.

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

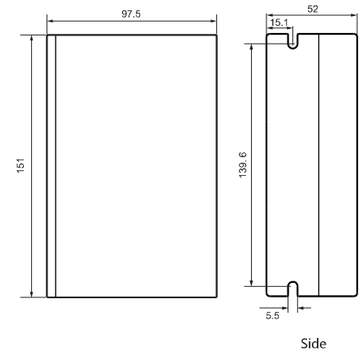
Baud rate setting		
BDR	SW6	SW7
9600	on	on
19200	off	on
38400	on	off
115200	off	off

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

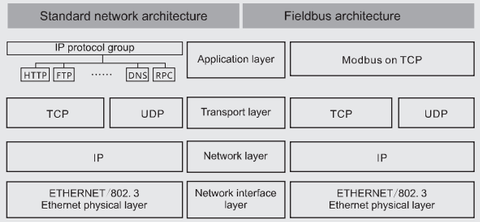
Installation Dimension



Modbus TCP Communication Type Stepper Drive

Protocol Overview

Schematic

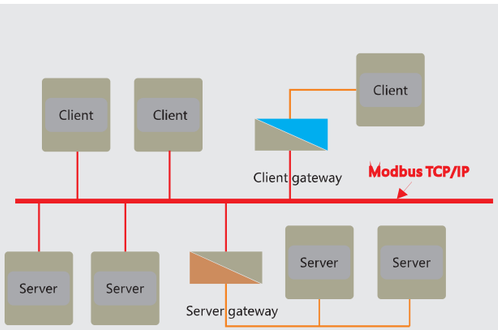


Modbus TCP is the same as the standard network bottom layer
Implement Modbus protocol only at the application layer

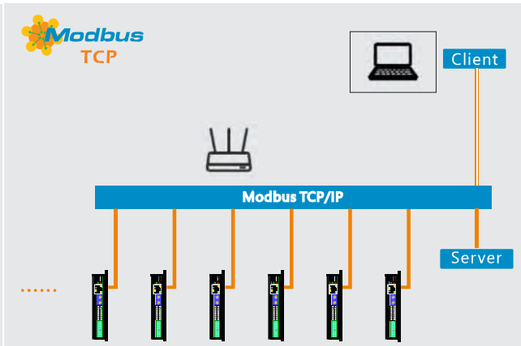
Features

- Compatible with standard Ethernet
- Cost effective of network implementation
- Easy to interconnect with various systems
- High-speed data transfer rate
- Mature supporting equipment
- Convenient for remote debugging and monitoring

TCP Network Connection Diagram



EP Series 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.

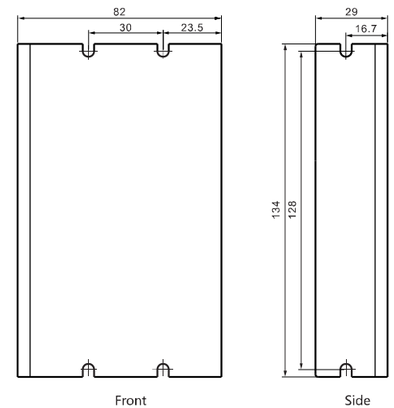
- Control mode: fixed length/fixed speed/homing/multi-speed/multi-position
- Debugging software: RTConfigurator (USB interface)
- Power voltage: 18-50VDC
- Typical applications: assembly lines, warehousing logistics equipment, multi-axis positioning platforms, etc

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 =SI*10+S2+10		
Ensure the IP address is set correctly before powering on		

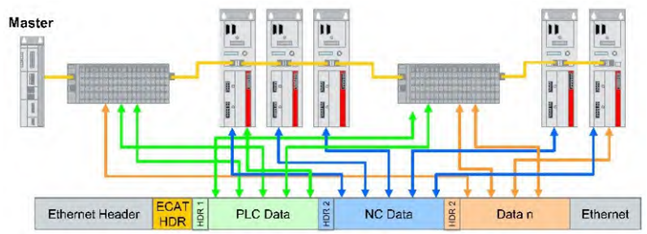
Installation Dimension



EtherCAT Protocol: Based on Industrial Ethernet Fieldbus communciation

EtherCAT Principle

ECAT principle

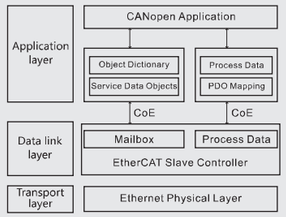


Features

- Efficient transmission mechanism and speed
- Flexible network topology
- Automatic node address configuration for easy maintenance
- Open technology
- Simple hardware, high cost performance
- Suitable for modular collaborative development

CANopen over EtherCAT Protocol Overview

CoE diagram



EtherCAT modifies the communication mechanism of Ethernet to ensure the real-time performance of the network

CiA402 control mode

Profile Position Mode (PP):
Set position, speed, acceleration and deceleration parameters, and execute relative or absolute position commands from the internal buffer of the drive.

Profile Velocity Mode (PV):
Set speed, acceleration and deceleration parameters, and execute the speed command by the internal buffer of the drive on commands from the internal buffer of the drive.

Cyclic Synchronous Position Mode (CSP)
The main controller generates a position trajectory and sends the target position (0x607A) to the drive in each PDO update cycle.

Homing Mode (HM)
Support No.17-30, No.35 homing modeThe relevant parameters need to be set according to the format.

PDO and SDO parameters

Process Data Object (PDO):

Process data object

Used to transmit real-time data

Configure the relevant parameters of the driver as PDO parameters, and realize real-time reading and writing of status and commands between the master station and the slave station in each synchronization cycle

For example, parameters such as target position in CSP mode

Service Data Object (SDO):

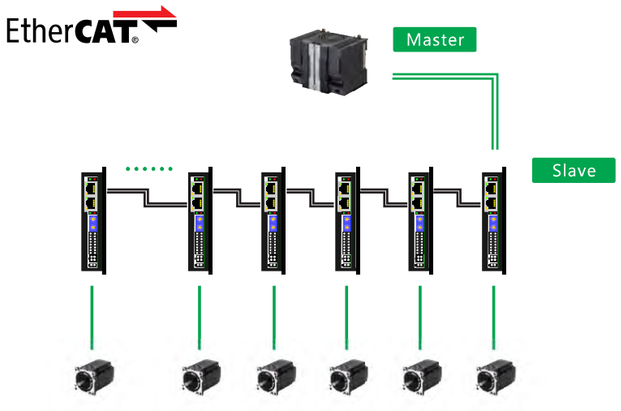
Service Data Objects

Used to configure static parameters,

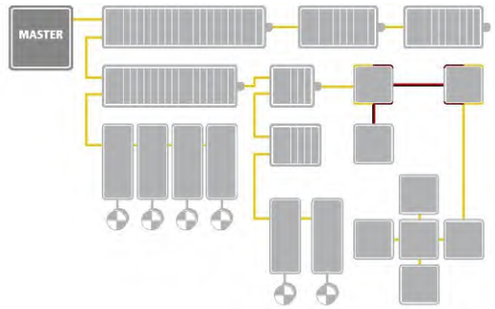
Configure the driver parameters that do not need to be changed in real time as SDO parameters, and set the relevant parameters of the slave driver on the master station.

For example, working current and other parameters.

EtherCAT Network Diagram



EtherCAT Topology



Flexible topology-support linear, tree, star

General Master Stations Supported

BECKHOFF · OMRON · KEYENCE 基恩士 · CODESYS · Zmotion 正运动技术 · INOVANCE · DELTA 台达 · XINJE · • • •

Technical Specifications

Model	Peak current A	Weight kg	Input voltage	Dimensions mm	Input and output	Matching motor
ECR42	2.5	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	3.0	0.4	18-80VDC	132×82×29	Four inputs, two outputs	closed loop below 42mm
ECT60	6.2	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
ECR60X2	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	Subindex	Content	Remark
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 400pulse/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	0x6064	——	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 IO polarity	0x2008	——	Select IO port input polarity	

Note: The object dictionary address of axis 2 of ECT60X2/ECR60X2 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

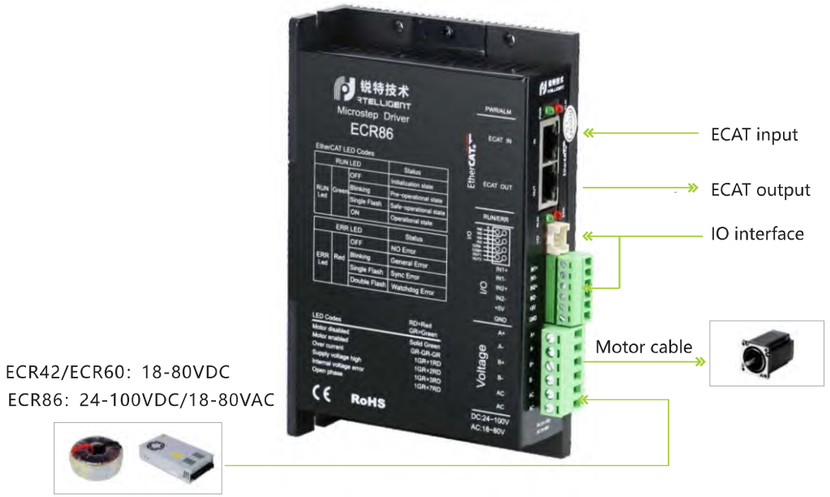
ECR Series

The EtherCAT fieldbus stepper drive ECT60X2/ECR60X2 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

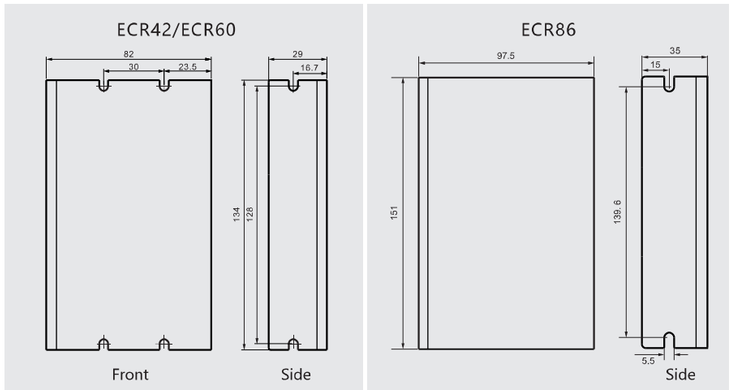
Drive Interface & Connection



Function Setting

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

Installation Dimension



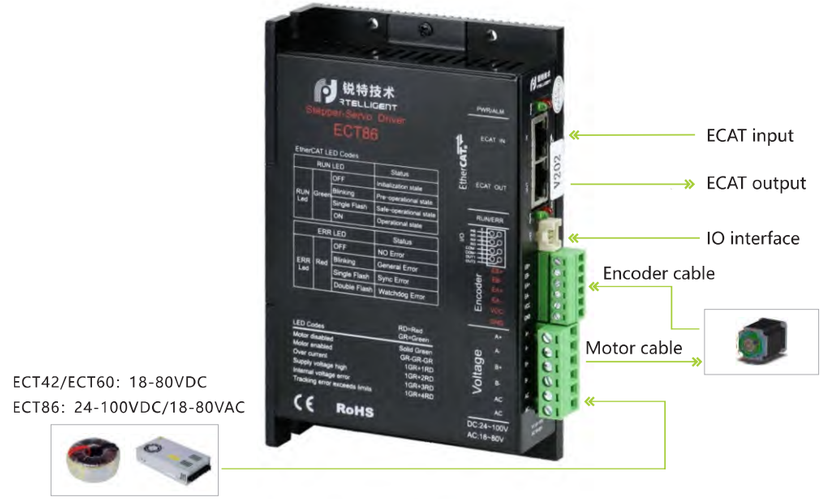
ECT Series

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

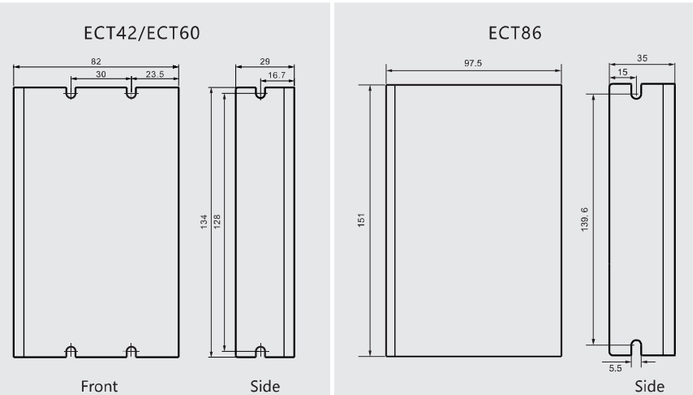
Drive Interface & Connection



Function Setting

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

Installation Dimension

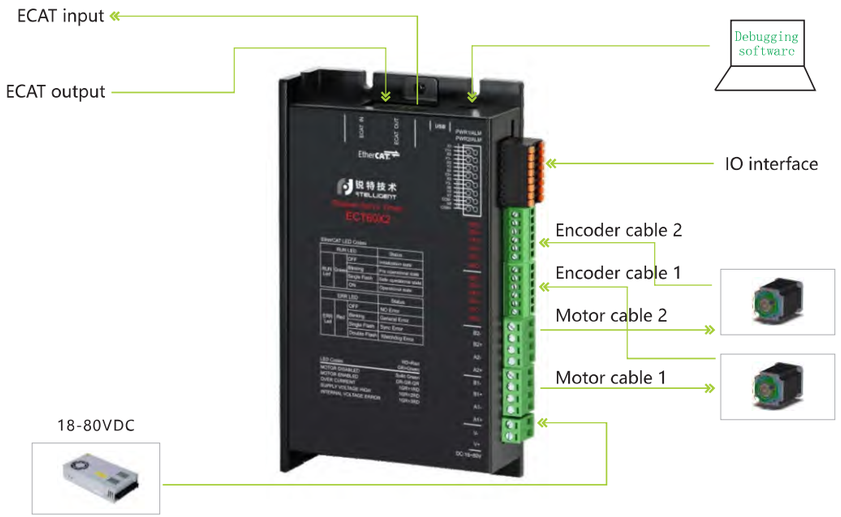


ECT60X2/ECR60X2

The EtherCAT fieldbus stepper drive ECT60X2/ECR60X2 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.
ECR60X2 matches open 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

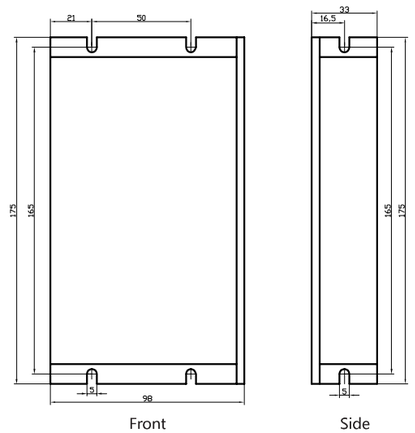
Drive Interface & Connection



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

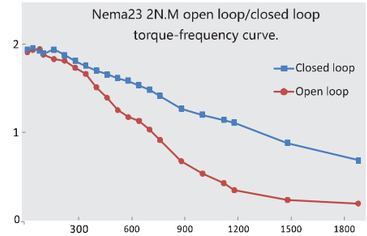


Stepper Servo System

Stepper servo 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.

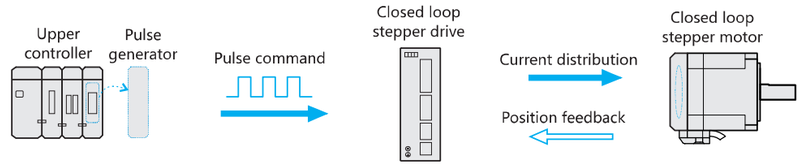
Stepper servo motor is equipped with a optical encoder on the rear shaft of the open-loop motor to form position feedback.

Stepper servo drive processes the encoder position feedback to achieve more precise current and position control.



As shown in the figure, the closed loop has a greater torque output at high speed

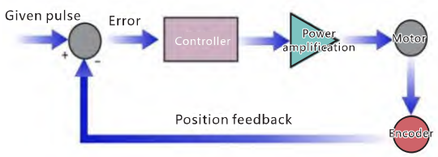
System Diagram



Features

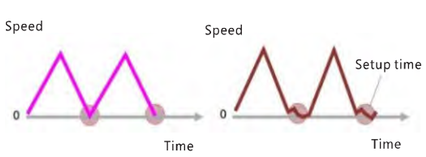
No loss of step

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.



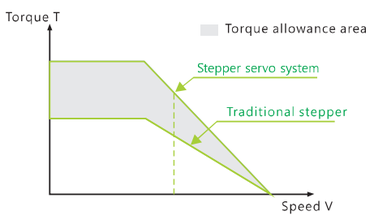
Fast response

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



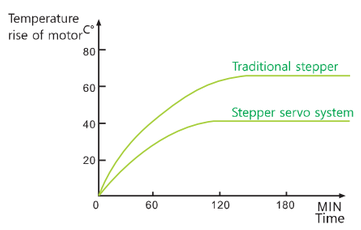
High torque

The stepper servo 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.



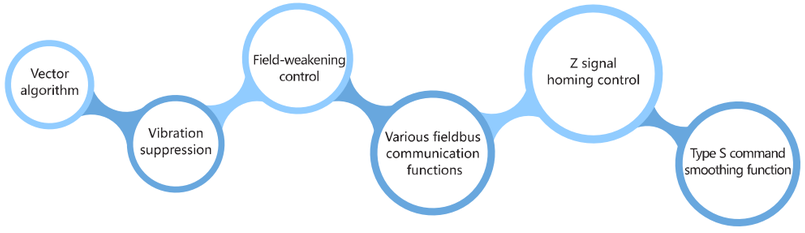
Low heating

The stepper servo 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.



Stepper Servo Drive

T series steppper servo 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 60 PLUS - □

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.

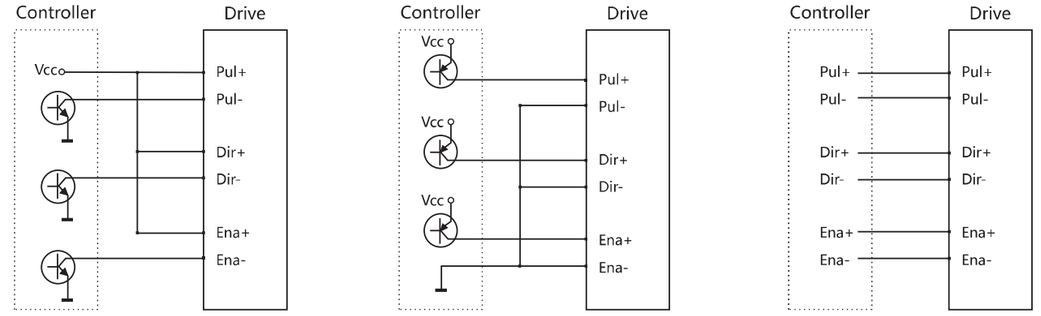
Features

General-purpose T series	Functional PLUS series	Digital display DS series
		
• Matching motor frame below 86mm • PUL&DIR or CW&CCW • Auto-tuning match motor function • Smoothing filter function optional • Debugging software to modify and monitor drive parameters and status	• Matching motor frame below 86mm • PUL&DIR or CW&CCW • Auto-tuning match motor function • Smoothing filter function optional • Debugging software to modify and monitor drive parameters and status	• Matching motor frame below 86mm • Real-time display of motor running status • Higher resolution encoders • Panel to modify and monitor drive parameters and status • Micro USB interface

Technical Specifications

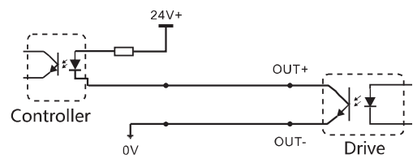
Model	Peak current A	Weight kg	Input voltage	Dimension mm	Number of micro-stepping	Pulse level	Matching motor
T42	3.0	0.2	18-68VDC	116×69×26.5	800-51200	3.3-24V	closed loop below 42mm
T60	6.0	0.2	18-68VDC	116×69×26.5	800-51200	3.3-24V	closed loop below 60mm
T60PLUS	6.0	0.3	18-48VDC	118×76×25	200-25600	3.3-24V	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



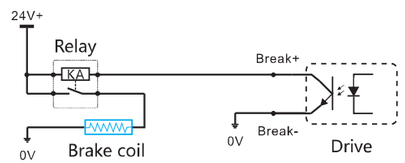
Output Signal Wiring Example

Alarm/Pend signal



OUT is ALM or Pend, pay attention to connecting current limiting resistor in series

Brake signal



Brake means brake control signal, which is set by software.
Do not connect the brake coil reversely (red +, black -)

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

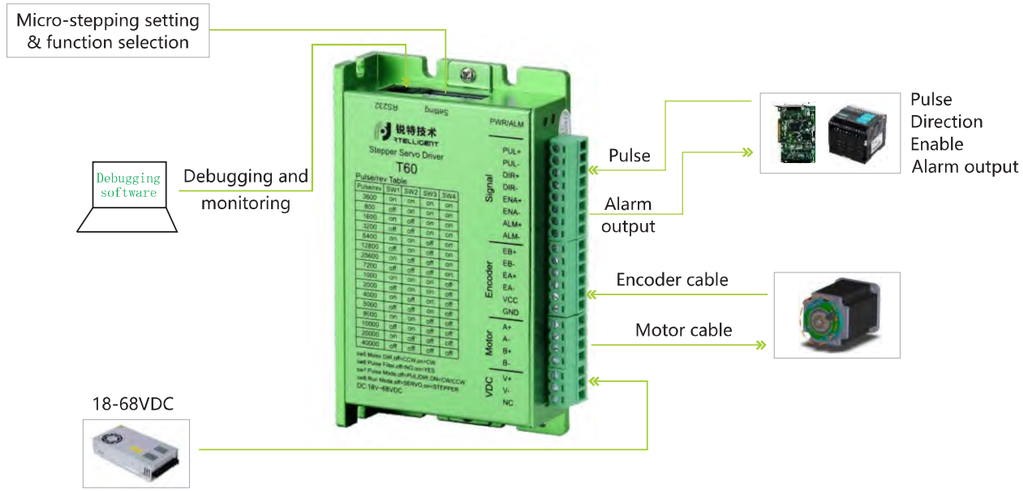
T60/T42

T60/T42 stepper servo 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 stepper servo 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

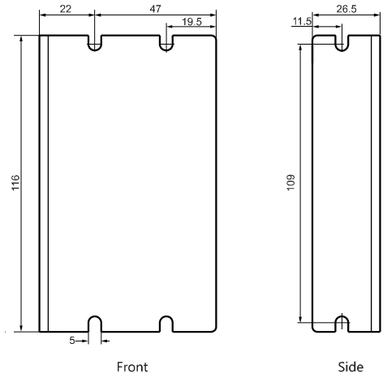
SW5	Running direction	on	Forward
		off	Backward
SW6	Command smoothing	on	S-type acceleration and deceleration take effect
		off	S-type acceleration and deceleration are invalid

SW7	Pulse mode	on	CW/CCW
		off	PUL&DIR
SW8	Open/closed loop	on	Open loop mode
		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



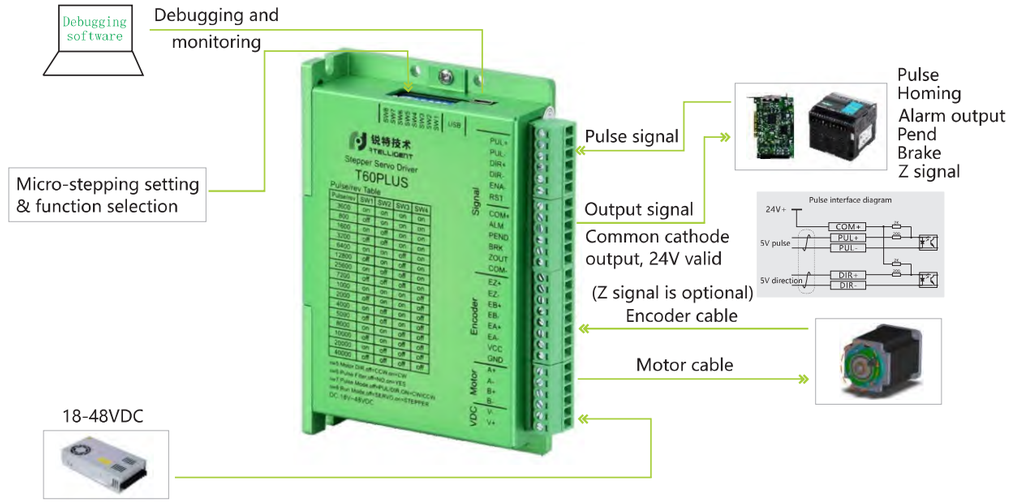
T60PLUS

T60PLUS stepper servo 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

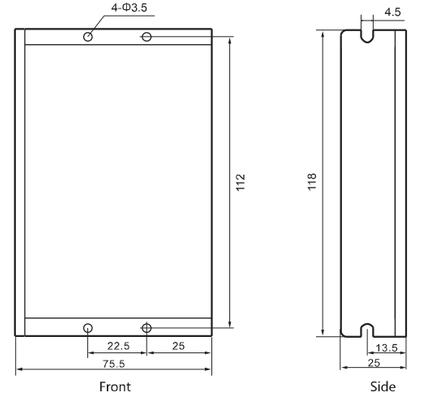
SW5	Running direction	on	Forward
		off	Backward
SW6	Command smoothing	on	S-type acceleration and deceleration take effect
		off	S-type acceleration and deceleration are invalid

SW7	Pulse mode	on	CW/CCW
		off	PUL&DIR
SW8	Open/closed loop	on	Open loop mode
		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



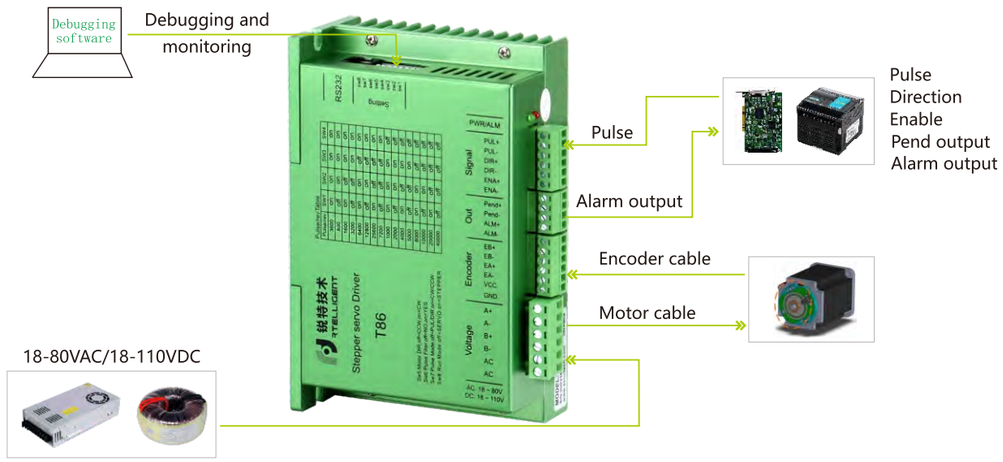
T86

T86 stepper servo 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 stepper servo 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

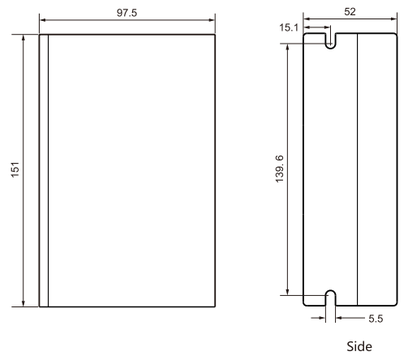
SW5	Running direction	on	Forward
		off	Backward
SW6	Command smoothing	on	S-type acceleration and deceleration take effect
		off	S-type acceleration and deceleration are invalid

SW7	Pulse mode	on	CW/CCW
		off	PUL&DIR
SW8	Open/closed loop	on	Open loop mode
		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



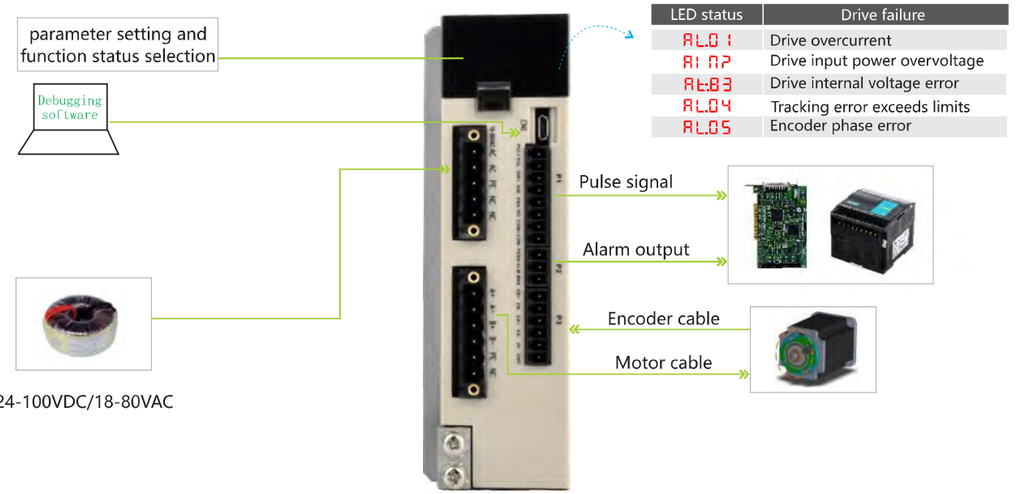
DS86

T86 stepper servo 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 stepper servo 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: 24-110VDC 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



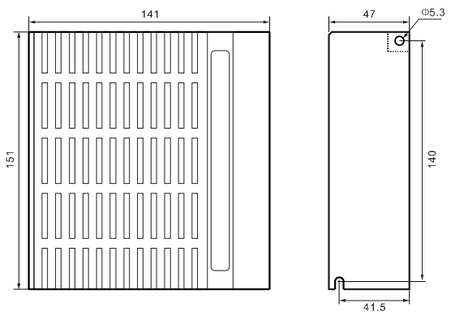
LED status	Drive failure
AL.01	Drive overcurrent
AL.02	Drive input power overvoltage
AL.03	Drive internal voltage error
AL.04	Tracking error exceeds limits
AL.05	Encoder phase error

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

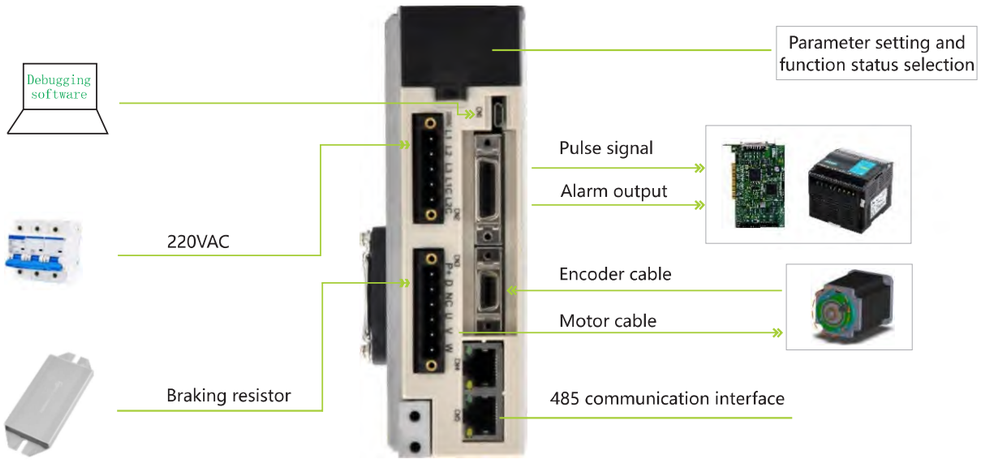
NT110

NT110 digital display 3 phase stepper servo drive, based on 32-bit digital DSP platform, built-in vector control technology and servo demodulation function, makes the stepper servo 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

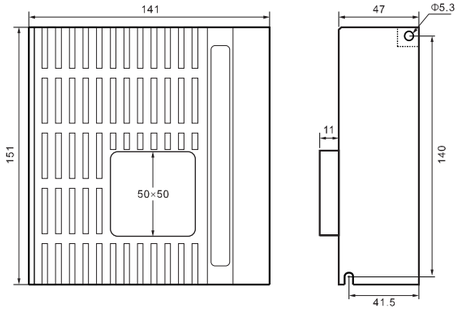


Description

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

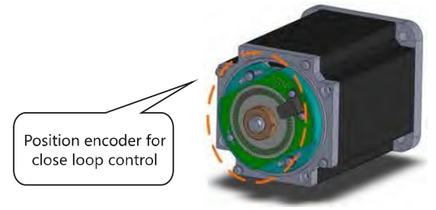
The parameters that can be set by the drive are PN000-PN499

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

Stepper Servo Motor

New AM series stepper servo 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 AMP9/Motor AMP4 plug (high voltage)
7. Supplementary code
   Z:Encoder with Z signal
8. Non-standard code
   Z2: with brake

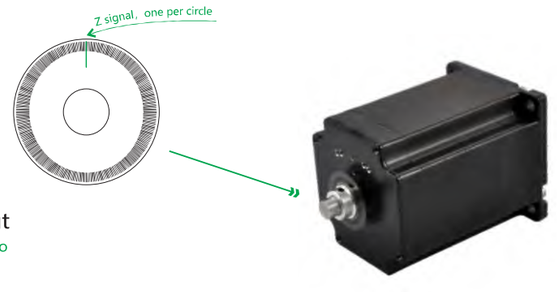
*Model naming rules are only used for model meaning analysis. For specific optional models, please refer to the details page

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 workpieceand 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.

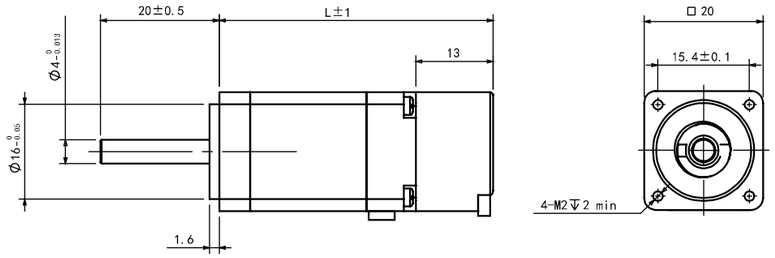


2-phase Stepper Motor 20/28mm Series Technical Specifications

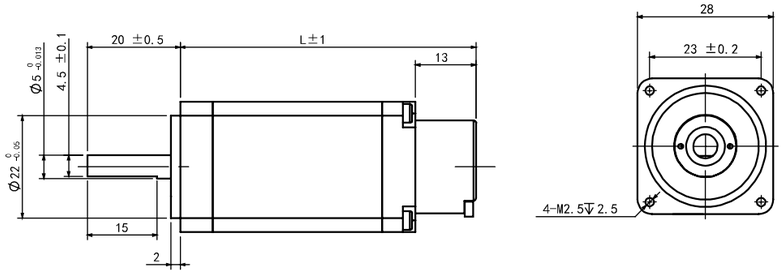
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/ Phase(Ohm)	Inductance/ Phase(mH)	Rotor inertia (g.cm²)	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
20AM003EC	1.8	0.03	0.6	5.7	2.6	3	4	20	46.0	0.09
28AM006EC	1.8	0.06	1.2	1.4	1.0	90	5	20	44.7	0.13
28AM013EC	1.8	0.13	1.2	2.2	2.3	180	5	20	63.6	0.22

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

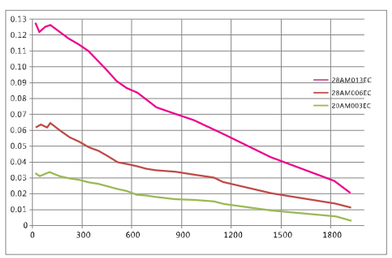
20 Series Dimension (mm)



28 Series Dimension (mm)



Torque-frequency Curve



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

Wiring Definition

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

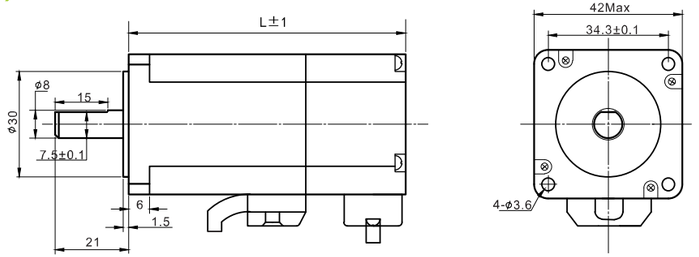
EB+	EB-	EA+	EA-	5V	GND
Yellow	Green	Black	Brown	Red	White

2-phase Stepper Motor 42mm Series Technical Specifications

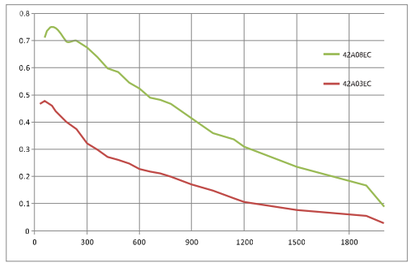
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/ Phase(Ohm)	Inductance/ Phase(mH)	Rotor inertia (g.cm²)	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
42A03EC	1.8	0.3	2.0	1.6	1.9	77	8	21	69	0.5
42A08EC	1.8	0.8	2.8	2.7	2.3	115	8	21	85	0.6
42AM06ED	1.8	0.6	2.0	1.1	1.5	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



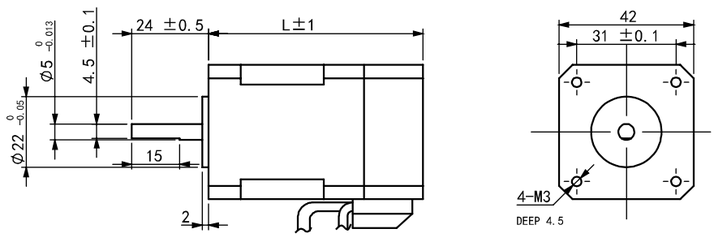
Drive: T42 Current: Rated
Voltage: 24VDC Micro-stepping: 1600

Wiring Definition

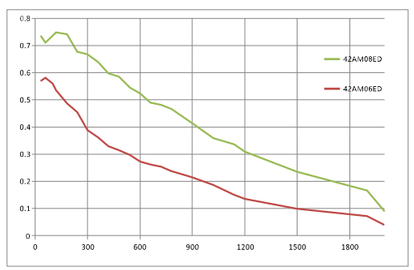
A+	A-	B+	B-
Red	Black	Yellow	Blue

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

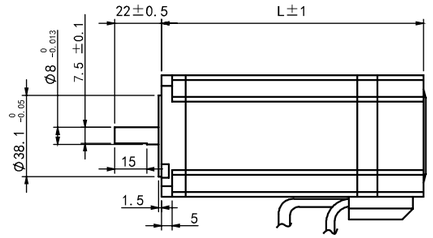
EB+	EB-	EA+	EA-	5V	GND
Green	Yellow	Brown	White	Red	Blue

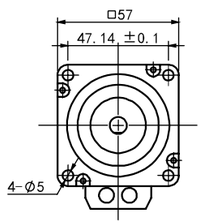
2-phase Stepper Motor 57mm Series Technical Specifications

Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/ Phase(Ohm)	Inductance/ Phase(mH)	Rotor inertia (g.cm²)	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
D57AM30ED	1.8	3.0	5.0	0.5	2.2	690	8	22	107	1.5

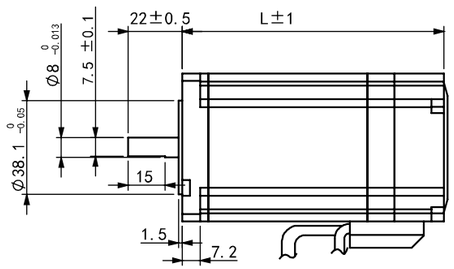
*NEMA 23 (57mm)

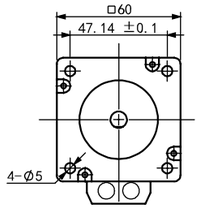
57 Series Dimension (mm)



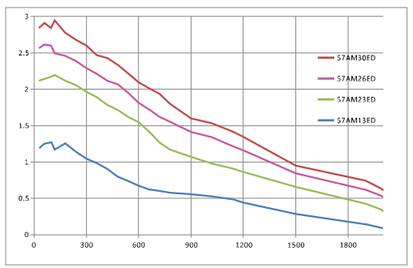


D57 Series Dimension (mm)





Torque-frequency Curve



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

Wiring Definition

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

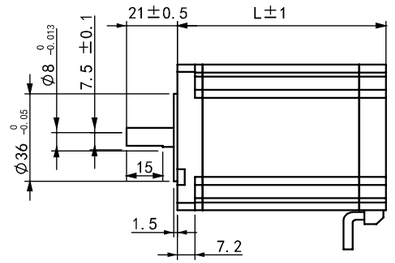
EB+	EB-	EA+	EA-	5V	GND
Green	Yellow	Brown	White	Red	Blue

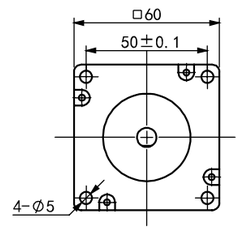
2-phase Stepper Motor 60mm Series Technical Specifications

Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/ Phase(Ohm)	Inductance/ Phase(mH)	Rotor inertia (g.cm²)	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

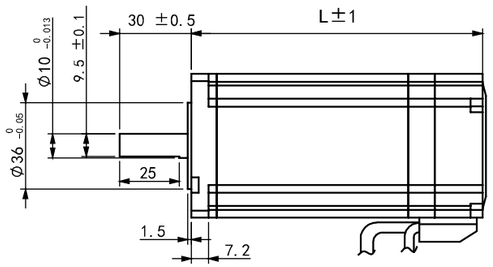
*NEMA 24 (60mm)

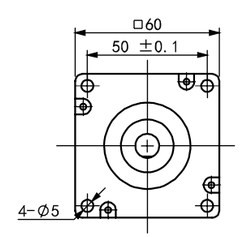
60 Series Dimension (mm)



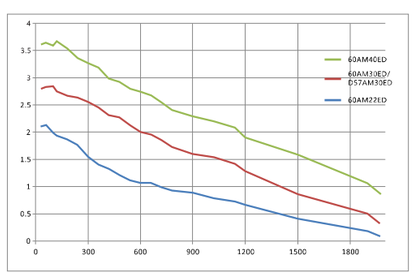


60AM40ED Dimension (mm)





Torque-frequency Curve



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

Wiring Definition

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

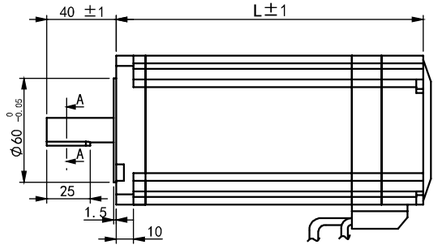
EB+	EB-	EA+	EA-	5V	GND
Green	Yellow	Brown	White	Red	Blue

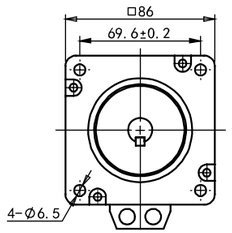
2-phase Stepper Motor 86mm Series Technical Specifications

Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/ Phase(Ohm)	Inductance/ Phase(mH)	Rotor inertia (g.cm²)	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

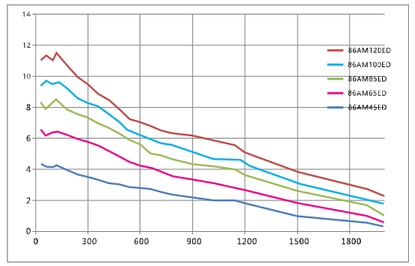
*NEMA 34 (86mm)

60 Series Dimension (mm)





Torque-frequency Curve



Drive: T86 Current: Rated
Voltage: 60VAC Micro-stepping: 1600

Wiring Definition

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

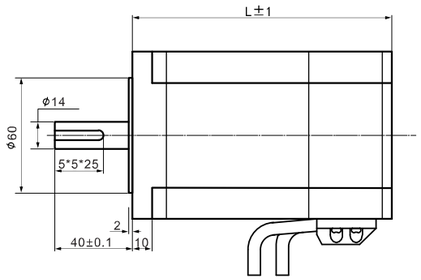
EB+	EB-	EA+	EA-	5V	GND
Green	Yellow	Brown	White	Red	Blue

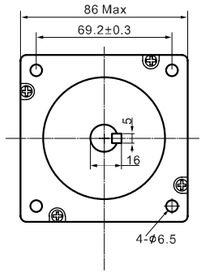
3-phase Stepper Motor 86/110mm Series Technical Specifications

Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/ Phase(Ohm)	Inductance/ Phase(mH)	Rotor inertia (g.cm²)	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

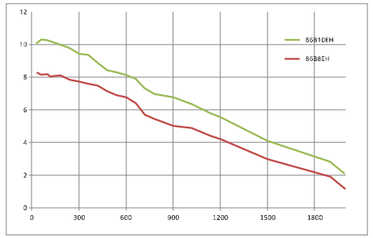
*NEMA 34 (86mm), NEMA 42 (110mm)

86 Series Dimension (mm)





Torque-frequency Curve



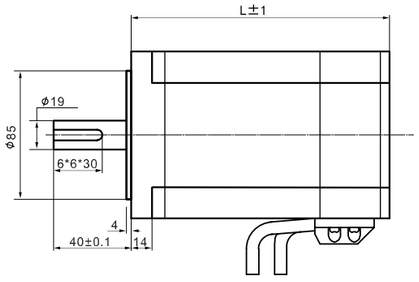
Drive: NT110 Current: Rated
Voltage: 220VAC Micro-stepping: 1600

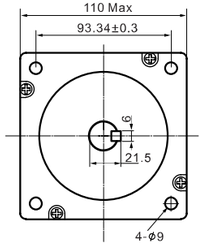
Wiring Definition

U	V	W
Black	Blue	Brown

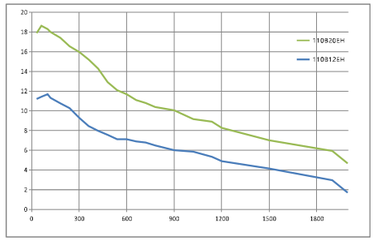
EB+	EB-	EA+	EA-	VCC	GND
Yellow	Green	Brown	Blue	Red	Black

110 Series Dimension (mm)





Torque-frequency Curve



Drive: NT110 Current: Rated
Voltage: 220VAC Micro-stepping: 1600

Wiring Definition

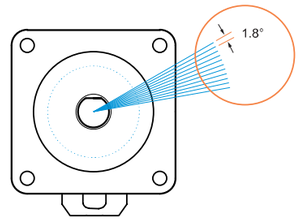
U	V	W	PE
Red	Blue	Black	Yellow

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

Stepper System

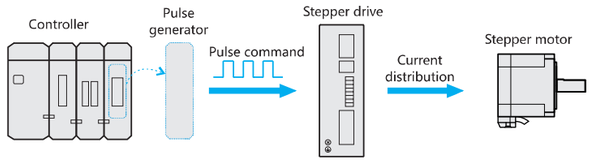
Stepper motor is a control motor whose operating speed and position can be determined. It operates step by step at a fixed angle (step angle) in rotation. Control switching pace of the step angle of stepper motor to control its operating speed and position.

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



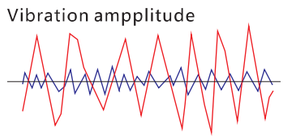
Schematic diagram of the step angle of a two-phase hybrid stepper motor.

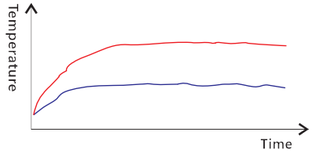
System Diagram

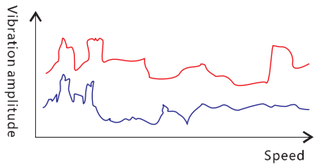


Features

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.







Traditional analog drive Rtelligent digital drive

Function Description

Input mode

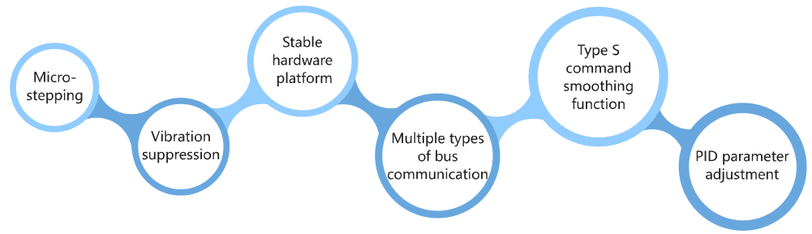
- Pulse mode
  - Pulse + direction
  - Double pulse (compatible with the pulse level of 3.3-24V)
  - Orthogonal pulse
- IO mode
  - Fixed speed of IO
  - Fixed length of IO (compatible with the switch level of 3.3-24V)
  - Speed regulation with a potentiometer

Internal processing

- Digital filtering of input pulse --enhance anti-interference ability
- Pulse command smoothing-- making motor acceleration and deceleration smoother
- Anti-jittering of IO switching input-- making the IO command more stable and reliable
- Internal micro-stepping--enable the current to be controlled better
- Low speed anti-resonance-- reduce the low speed vibration of the motor
- Current loop PID control-- reduce heating and increase the high speed torque
- Parameter self-adaptation of the matching motor--enable the motor to perform better

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

3 R 110 PLUS – □

1. 2 phase(omitted)
   3: 3 phase
   5: 5 phase
2. Serial Name
3. Match the motor flange size
4. Upgraded version
   X2: Two-in-one
   X3: Three-in-one
5. Function code
   IO: Switch
   D: One-drive-two

*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 series pulse-controlled stepper motor drive

- Matching motor base in 20mm-130mm
- Full digital Micro-stepping technology
- Pulse compatible with 5-24V
- Smooth motion & low vibration
- Auto- tuning of motor parameters
- Optimized anti-interference ability
- Better hardware design and reliablility

R-IO/R-IR Series

R-IO series switching stepper drive

- Matching motor base in 20-130mm
- 5-24V switch control
- 16 speed adjustable

R-IR series potentiometer speed-control stepper drive

- Matching motor base below 86mm
- 5-24V switch control
- Regulate speed online via potentiometer

Multi-axis Series

R-D series one-drive-two switch speed-control drive

- Matching motors base below 60mm
- 5-24V switch control
- Regulate speed online via potentiometer

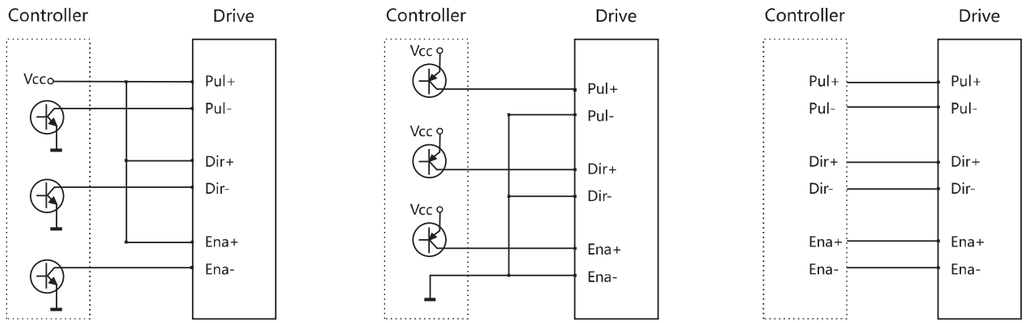
R-X2/X3 series multi-axis pulse stepper drive

- Matching motors base below 60mm
- Pulse control
- Smaller size

Technical Specifications

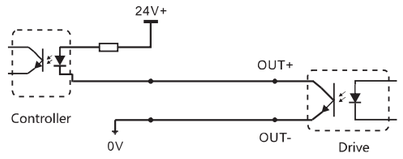
Model	Peak current A	Weight kg	Input voltage range	Dimension mm	Micro-stepping	Pulse level	Matching motor
R42	2.2	0.1	18-48VDC	92.6×56×21	200-25600	3.3-24V	Open loop below 42mm
R60	5.6	0.3	18-50VDC	118×76×33	200-25600	3.3-24V	Open loop below 60mm
R60-AL	5.6	0.2	18-50VDC	116×69×26.5	200-25600	24V/5V	Open 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



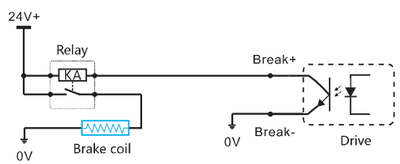
Output Signal Wiring Example

Alarm/Pend signal wiring example



OUT is ALM or Pend, pay attention to connecting current limiting resistor in series

Alarm/Pend signal wiring example



Brake is the brake control signal, which is set by software.
Do not connect the brake coil reversely (red +, black -)

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

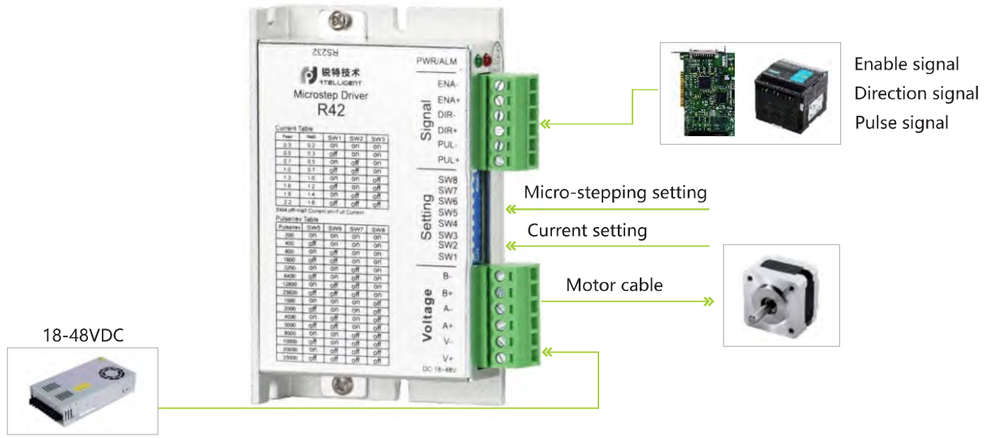
R42

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.

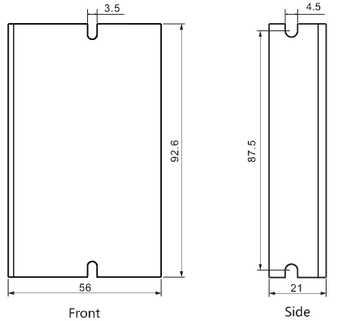
Drive Interface & Connection



Working Current Setting

Output current peak	Output cunent 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

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.

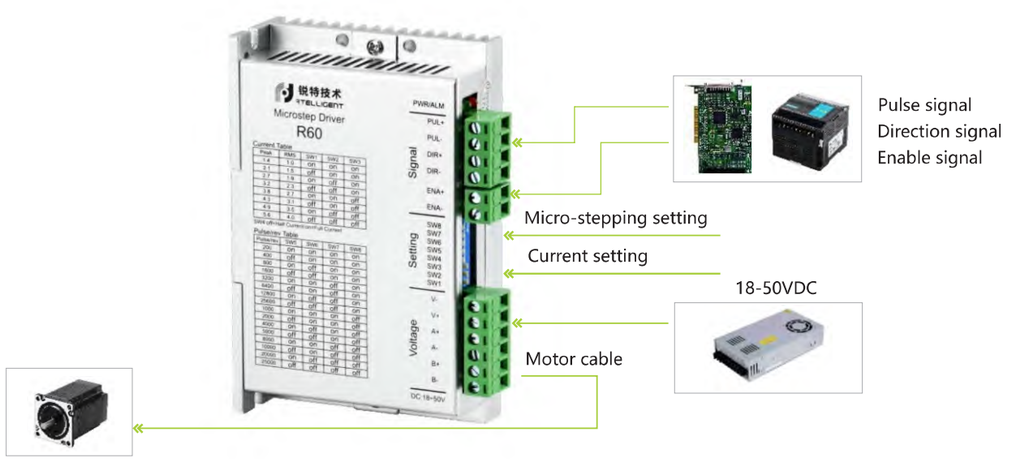
R60

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.

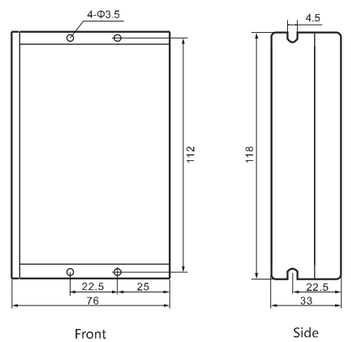
Drive Interface & Connection



Working Current Setting

Output current peak	Output cunent 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



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

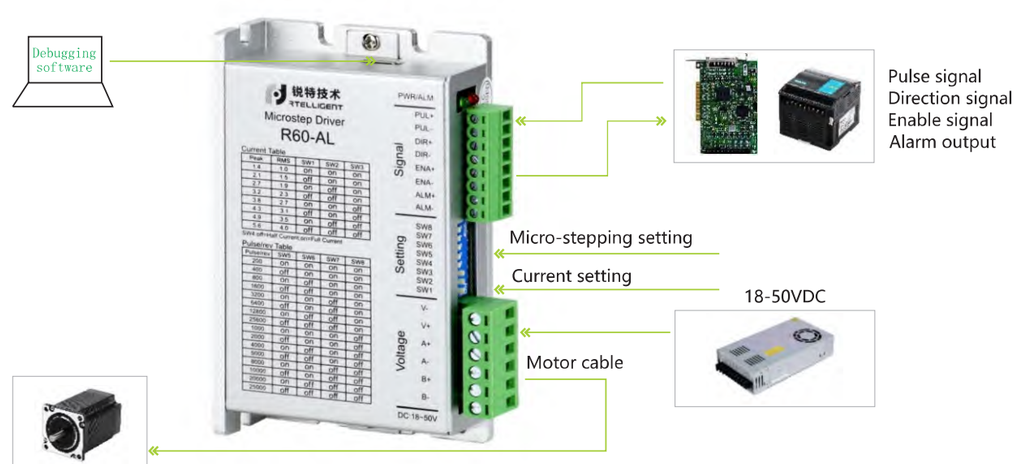
R60-AL

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.

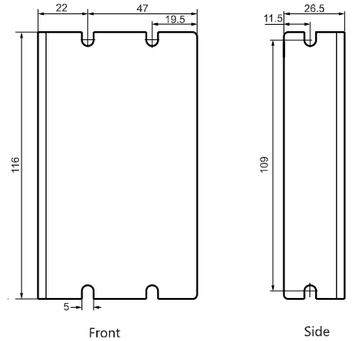
Drive Interface & Connection



Working Current Setting

Output current peak	Output cunent 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



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.

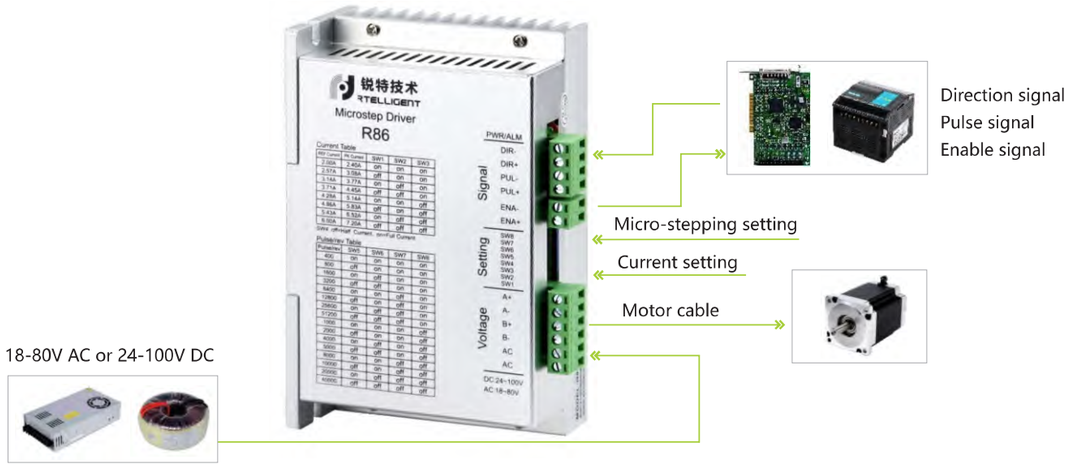
R86

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.

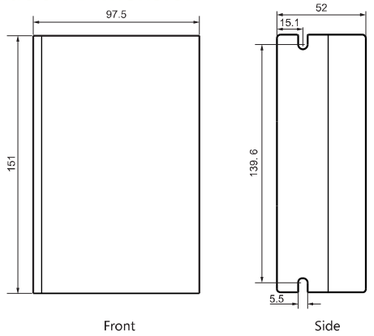
Drive Interface & Connection



Working Current Setting

Output current peak	Output cunent RMS	SW1	SW2	SW3
2.40A	2.00A	on	on	on
3.08A	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	off	on	off	on
25600	on	off	off	on
51200	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
40000	off	off	off	off

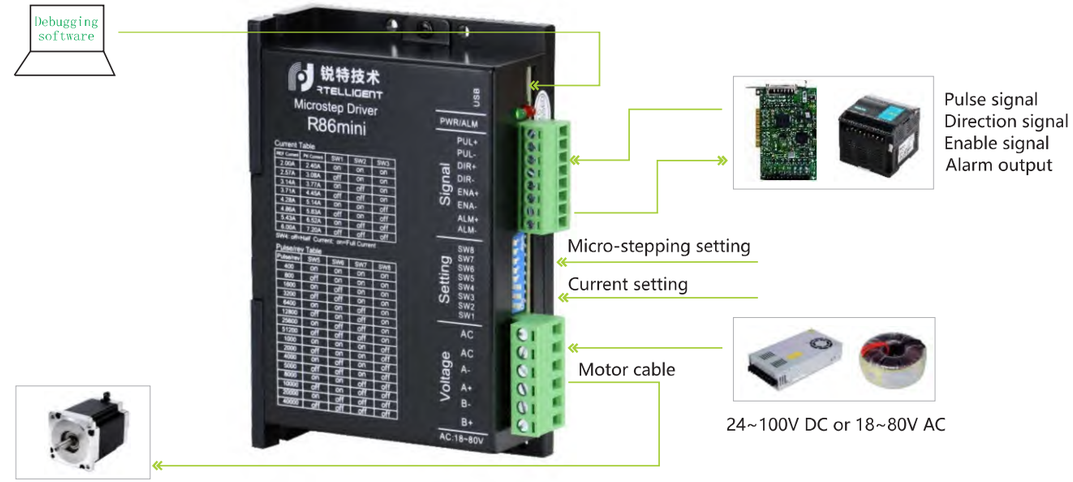
R86MINI

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.

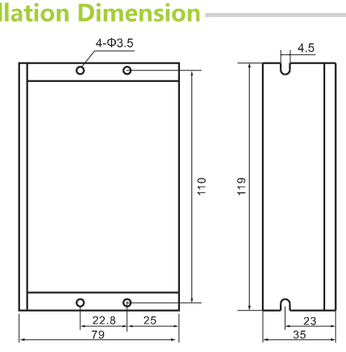
Drive Interface & Connection



Working Current Setting

Output current peak	Output cunent RMS	SW1	SW2	SW3
2.40A	2.00A	on	on	on
3.08A	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	off	on	off	on
25600	on	off	off	on
51200	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
40000	off	off	off	off

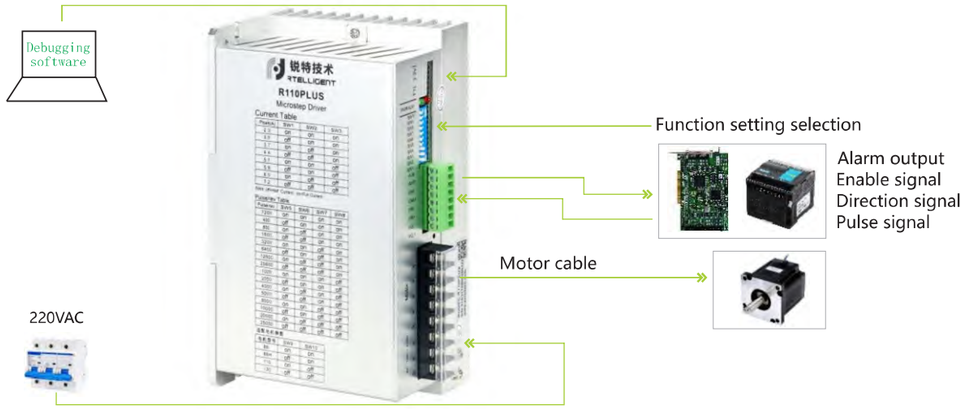
R110PLUS

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



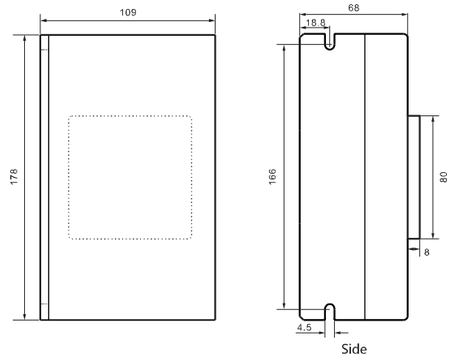
WorkingCurrent Setting

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

		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

R110PLUS V3.0

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.

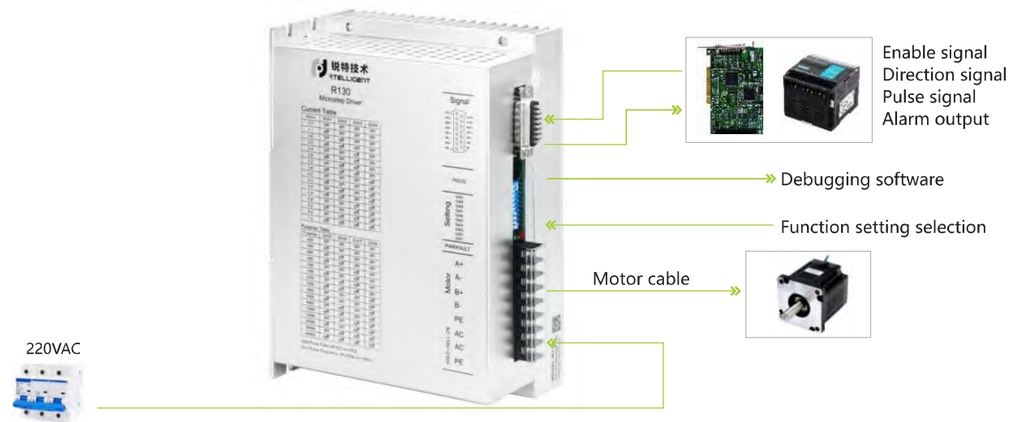
R130

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.

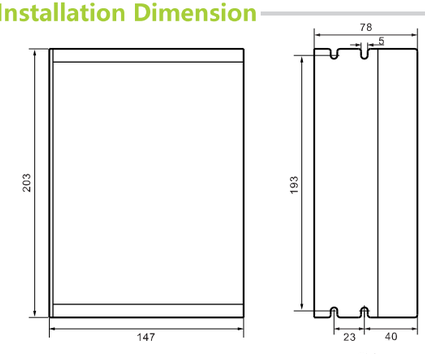
Drive Interface & Connection



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	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	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.

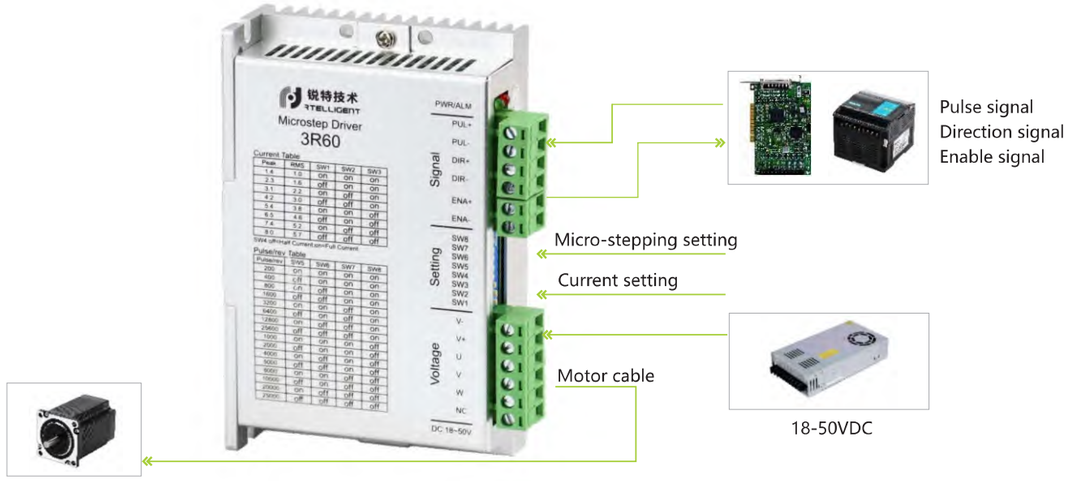
3R60

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.

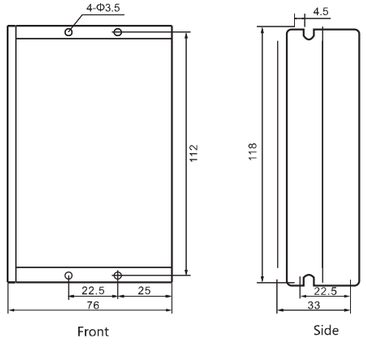
Drive Interface & Connection



Working Current Setting

Output current peak	Output cunent 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

		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

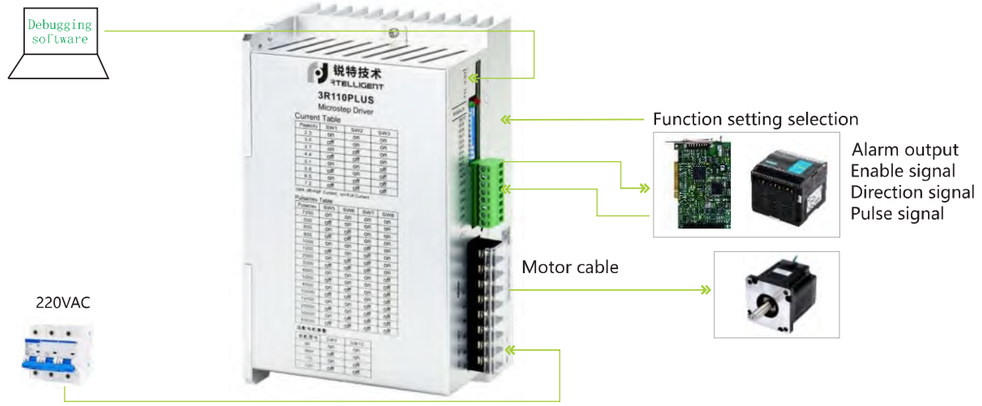
3R110PLUS

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



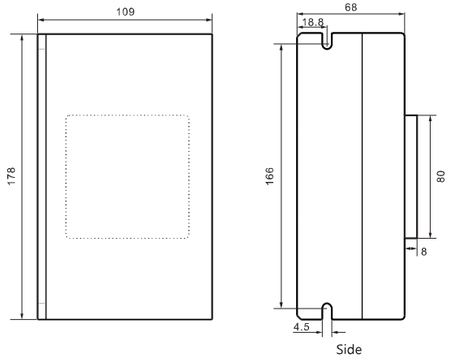
Working Current Setting

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

		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

3R110PLUS V3.0

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.

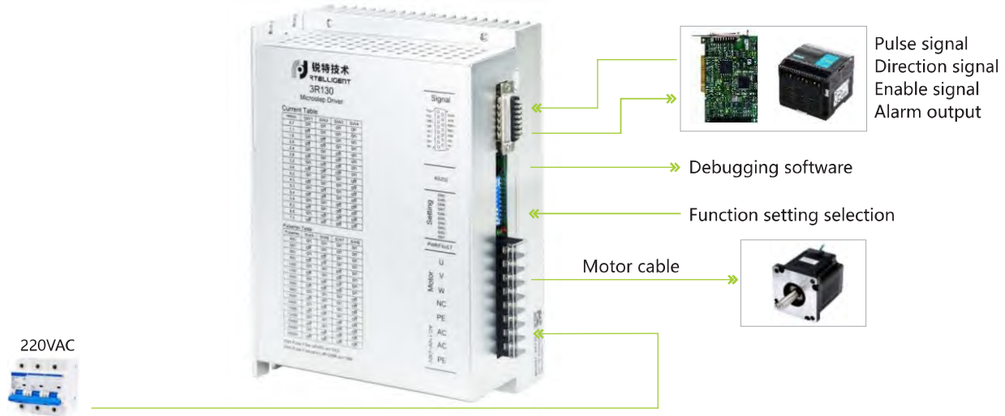
3R130

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.

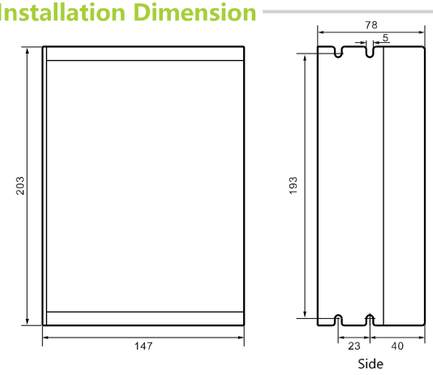
Drive Interface & Connection



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	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	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

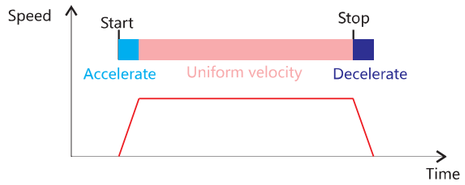
Pulse/rev	SW5	SW6	SW7	SW8
400	on	on	on	on
500	off	on	on	on
600	on	off	on	on
800	off	off	on	on
1000	on	on	off	on
1200	off	on	off	on
2000	on	off	off	on
3000	off	off	off	on
3600	on	on	on	off
5000	off	on	on	off
6400	on	off	on	off
10000	off	off	on	off
12000	on	on	off	off
20000	off	on	off	off
30000	on	off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

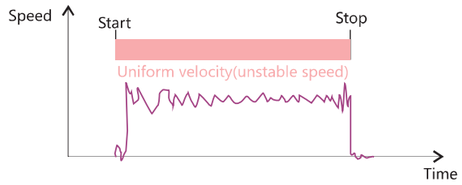
When SW5, SW6, SW7, SW8 are all on, any subdivision can be changed through the debugging software.

Switch Stepper Drive

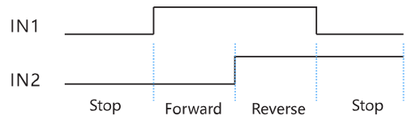
Comparision between Switch Stepper Motor and AC speed regulating motor

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

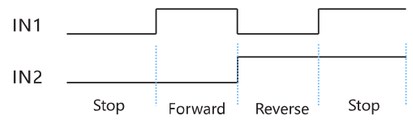


0 Mode(Mode 0 by default)

At IN1 on and IN2 off, the motor is triggered to rotate reverse.

At IN1 on and IN2 on, the motor is triggered to rotate reverse.

At IN1 off, the motor stops.



1 Mode(Mode 1 optional)

At IN1 on and IN2 off, the motor is triggered to rotate forward.

At IN1 off and IN2 on, the motor is triggered to rotate reverse.

At both IN1 and IN2 on, the motor stops.

Technical Specifications

Note: IO drive defaults Mode 0; Please contact us if the mode needs to be adjusted.

		Model	Peak current A	Weight kg	Input voltage	Dimension mm	Matching motor
Single axis control	Switch speed regulating type	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	18-80VAC	151×97×52	open loop below 86mm
		R110PLUS-IO	8.0	0.9	110-230VAC	178×97×52	open loop below 110mm
		R130-IO	8.0	1.3	110-230VAC	203×147×78	open loop below 130mm
	Potentiometer speed - regulating type	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	18-80VAC	151×97×52	open loop below 86mm

LED Indication

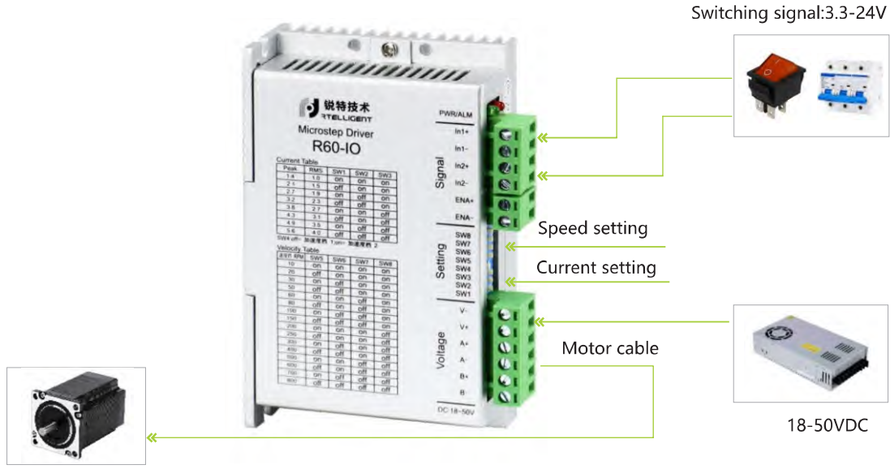
LED status	Drive status	Fault handling
Steady green light	Drive not enabled	
Flashing green light	Drive works fine	
1 green 1 red	Drive overcurrent	Check wiring、repair drive
1 green 2 red	Drive input power supply overvoltage	Check the input supply voltage
1 green 3 red	Drive internal voltage error	Drive 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 Compatiable
- Typical appications: conveying equipment, inspection converyor, PCB loader

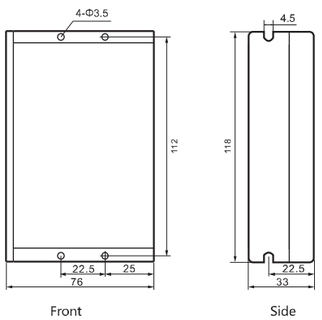
Drive Interface & Connection



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

		SW4
Acceleration 1	Low acceleration/deceleration	off
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

Multi-axis series drive support pulse or switch control, two axis motor can be independent or synchronous operation, suitable for a variety of applications

Save labor & shortening debugging time

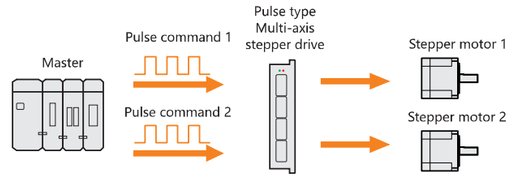
The number of drives that need to be debugged is halved, saving labor and time costs for debugging devices

Save space & facilitate customer design

Compared with traditional drives, the multi-axis series drive can save 40 to 60% of the installation space and facilitate customer layout

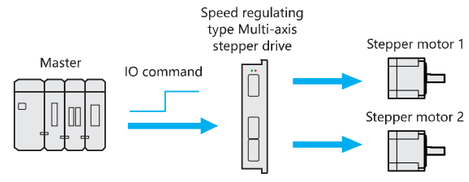
Save cost & improve equipment competitiveness

While saving space and labor, the multi-axis series can also save drive costs and improve the overall competitiveness of the equipment



Pulse Type

DIP setting of Micro-stepping & current
Two pulse signal control
The two motors work independently



Speed regulating type

DIP setting of speed & current
One switching signal control
The two motors work in sync

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

Technical Specifications

		Model	Peak current A	Weight kg	Input voltage	Dimension mm	Matching motor
Multi-axis control series	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
	Pulse	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
	Field bus	ECR60X2	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

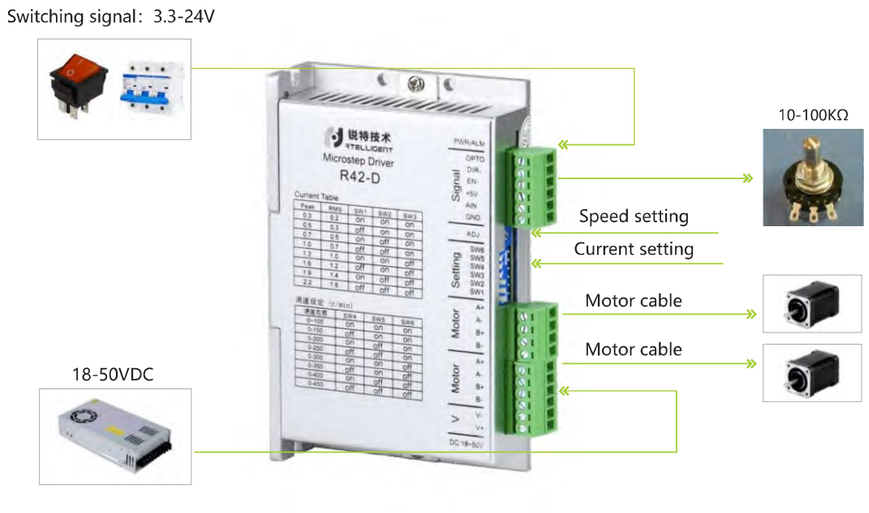
LED status	Drive status	Fault handling
● Steady green light	Drive not enabled	
●● Flashing green light	Drive works fine	
●● 1 green 1 red	Drive overcurrent	Check wiring、repair drive
●●● 1 green 2 red	Drive input power supply overvoltage	Check the input supply voltage
●●●● 1 green 3 red	Drive internal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

One-drive-two Stepper Drive R42-D

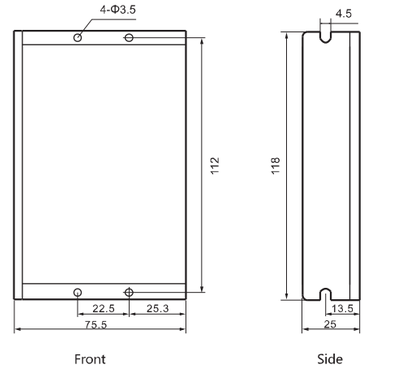
In conveying equipment, there are often two - axis synchronization application requirements.
R42-D is a customized drive for two-axis synchronization application.

- 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

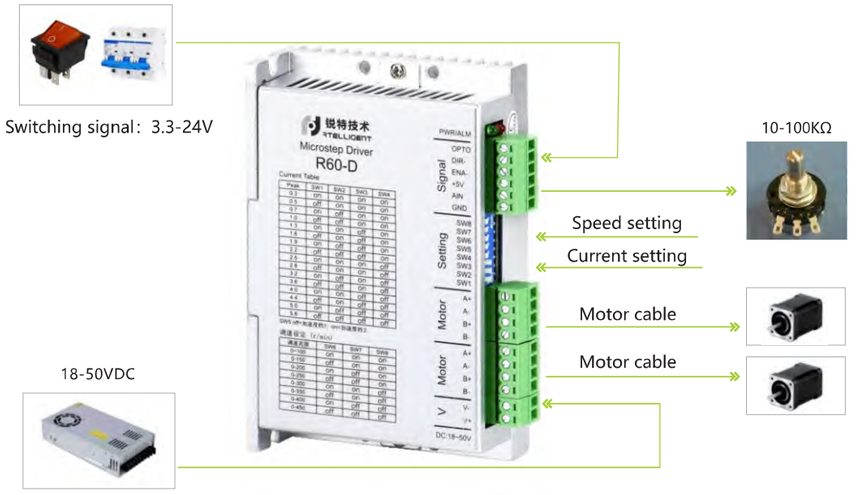
One-drive-two Stepper Drive R60-D

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

Using the TI delicated dual-core DSP chip, R60-D drives the two-axis motor independently to avoid the interference whthin 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

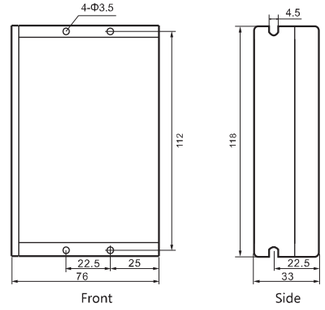
Drive Interface & Connection



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

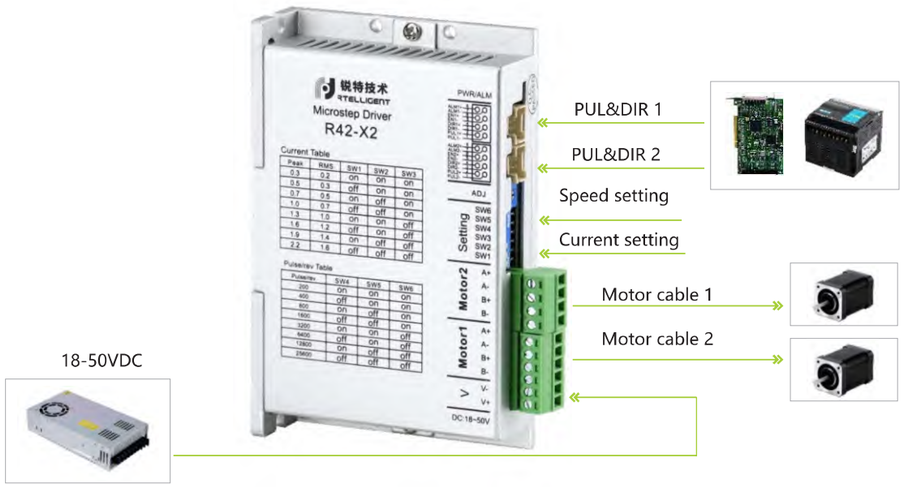
Two-in-one Drive R42X2

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 domesitic market.

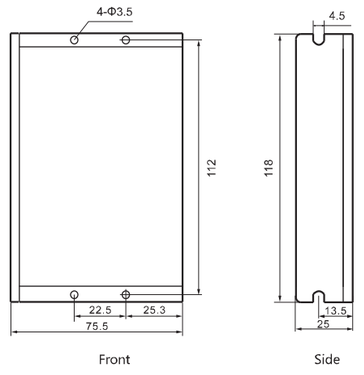
R42X2 can independently drive two 2-phase stepper motors up to 42mm frame size. The two-axis micro-stepping and current must be set to the same.

- 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	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

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

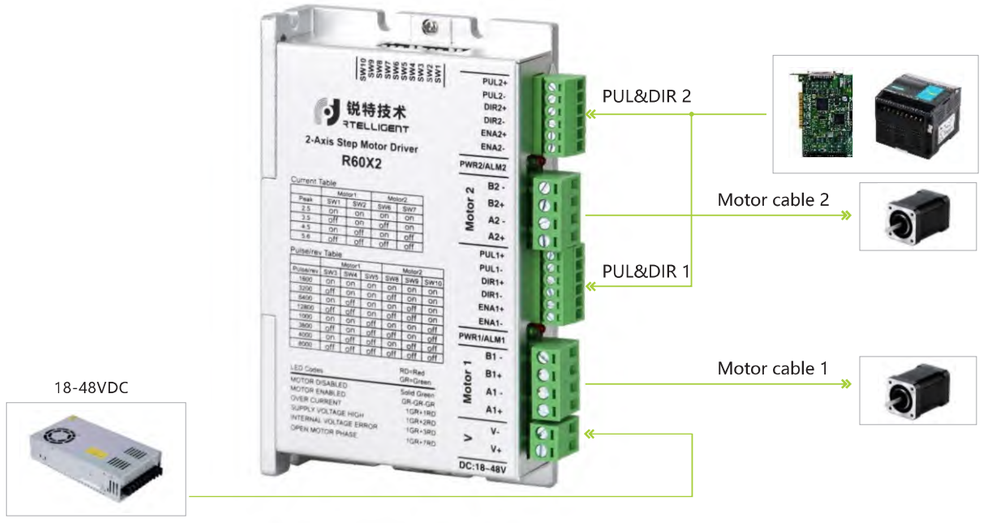
Two-in-one Drive R60X2

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.

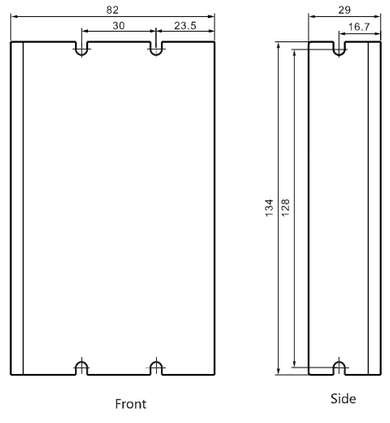
R60X2 can independently drive two 2-phase stepper motors up to 60mm frame size. The two-axis micro-stepping and current can be set separately.

- 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

	Motor 1		Motor 2	
Output current peak	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

	Motor 1(Motor 2)		
Pulse/rev	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

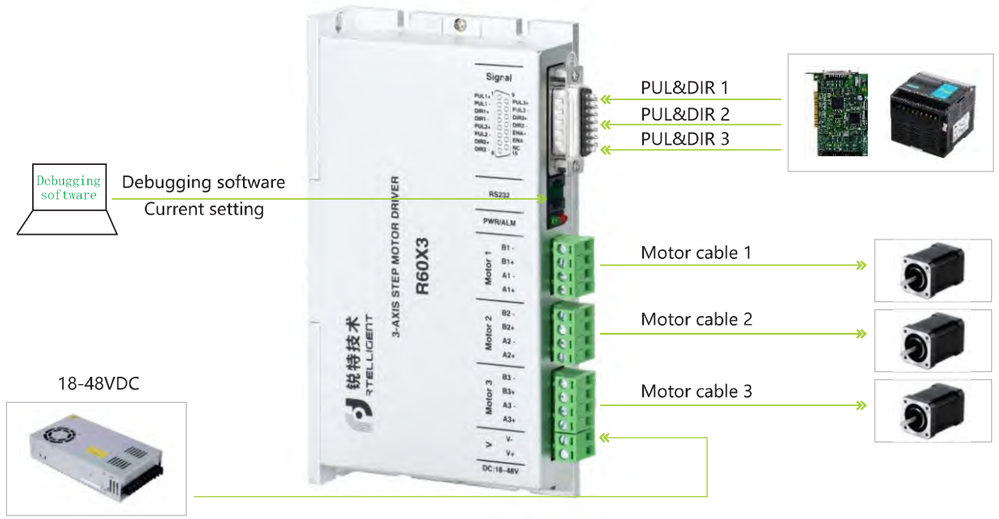
Three-in-one Drive R60X3

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 Rtelligent in dometic market.

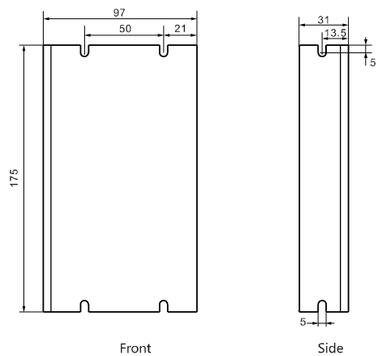
R60X3/3R60X3 can independently drive three 2-phase/3-phase stepper motors up to 60mm frame size. The three-axis micro-stepping and current are independently adjustable.

- 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

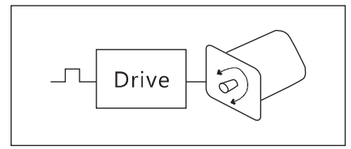


Parameter Debugging Interface

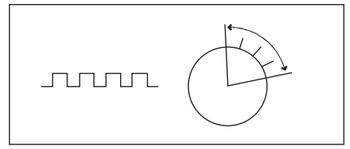
Stepper Motor

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.

Rtelligent A/AM series stepper motor is designed based on the Cz optimized magnetic circuit and adopts stator and rotator 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

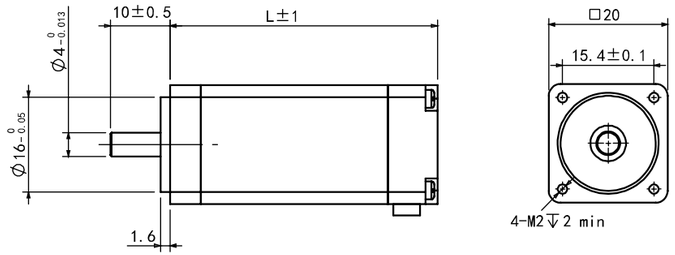
1. Stepper motor is generally used at the highest speed of 600-700rpm.
2. The low speed resonance zone of stepper motor is around 100rpm and 200rpm
   (The first resonance zone is about 100rpm, The second resonance zone is about 200rpm).
3. The 8-wire motor can be connected in series and parallel. Please 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

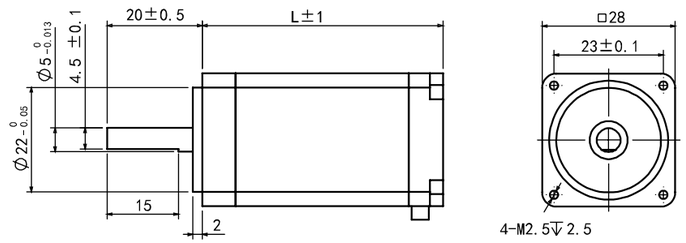
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/ Phase(Ohm)	Inductance/ Phase(mH)	Rotor inertia (g.cm²)	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
20AM003	1.8	0.03	0.6	5.7	2.6	3	4	10	33	0.07
20AM005	1.8	0.05	0.6	7.0	3.4	38	4	10	45	0.10
28AM006	1.8	0.06	1.2	1.4	1.0	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)

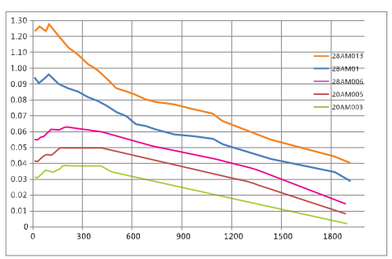
20AM Series Dimension (mm)



28AM Series Dimension (mm)

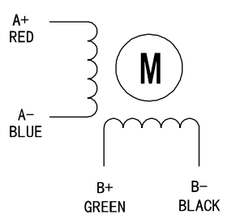


Torque-frequency Curve



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

Wiring

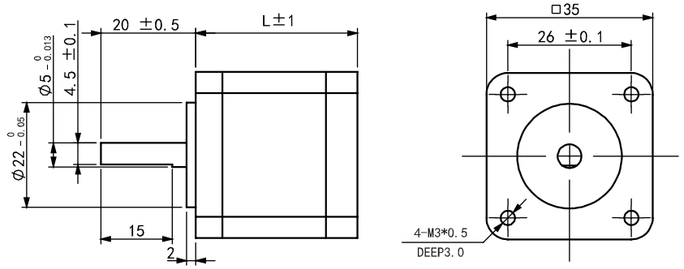


2-Phase Stepper Motor 35/39mm Series Technical Specifications

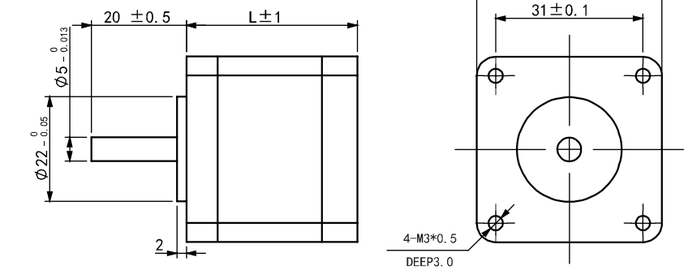
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/ Phase(Ohm)	Inductance/ Phase(mH)	Rotor inertia (g.cm²)	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
35A02	1.8	0.2	1.0	3.8	5.3	22	5	20	34	0.18
39A02	1.8	0.2	1.0	4.1	7.1	30	5	20	36	0.28

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

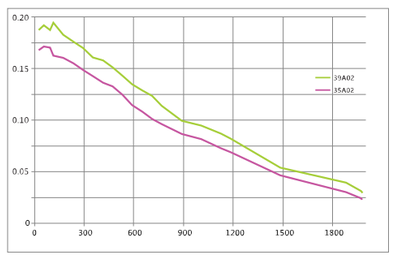
35A Series Dimension (mm)



39A Series Dimension (mm)

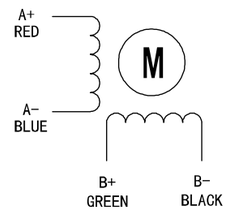


Torque-frequency Curve



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

Wiring

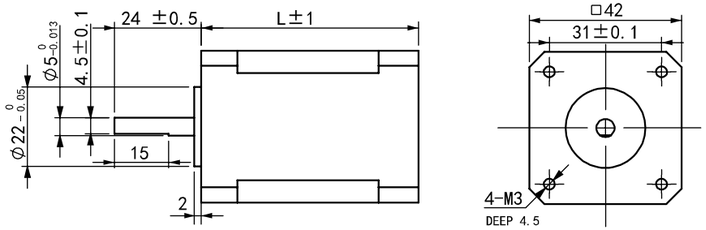


2-Phase Stepper Motor 42mm Series Technical Specifications

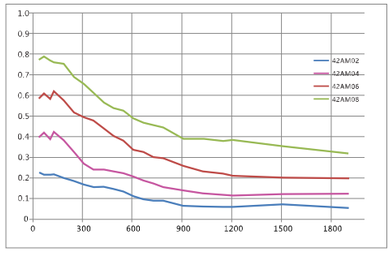
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/ Phase(Ohm)	Inductance/ Phase(mH)	Rotor inertia (g.cm²)	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
42AM02	1.8	0.2	1.5	1.3	1.9	41	5	24	34	0.23
42AM04	1.8	0.4	1.5	2.6	5.1	57	5	24	40	0.29
42AM06	1.8	0.6	2.0	1.8	3.8	82	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)

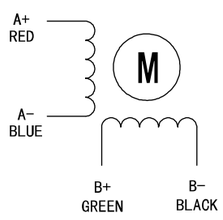


Torque-frequency Curve



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

Wiring

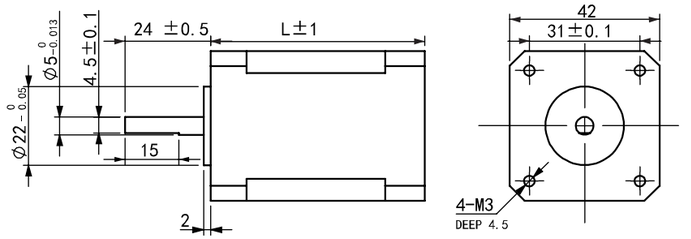


2-Phase Stepper Motor 42mm Series Technical Specifications

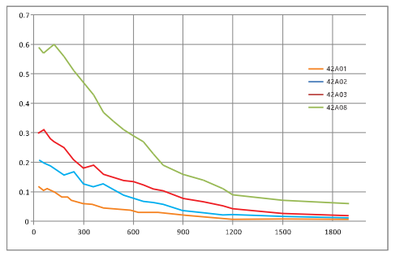
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/ Phase(Ohm)	Inductance/ Phase(mH)	Rotor inertia (g.cm²)	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
42A01	1.8	0.15	1.0	1.3	1.9	41	5	24	34	0.23
42A02	1.8	0.2	1.2	2.6	5.1	57	5	24	40	0.29
42A03	1.8	0.3	2.0	1.8	3.8	82	5	24	47	0.37
42A08	1.8	0.8	2.0	1.9	5.0	114	5	24	60	0.48

*NEMA 17 (42mm)

42A Series Dimension (mm)

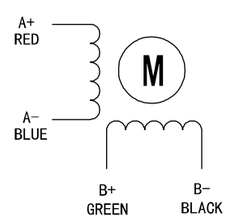


Torque-frequency Curve



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

Wiring

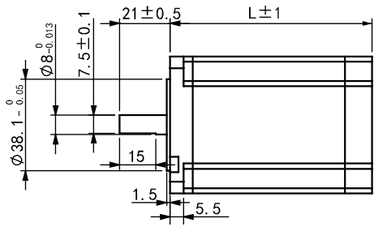


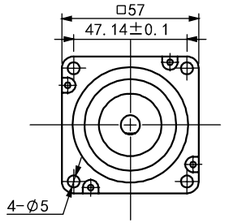
2-Phase Stepper Motor 57mm Series Technical Specifications

Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/ Phase(Ohm)	Inductance/ Phase(mH)	Rotor inertia (g.cm²)	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

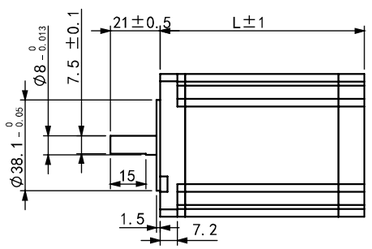
*NEMA 23 (57mm)

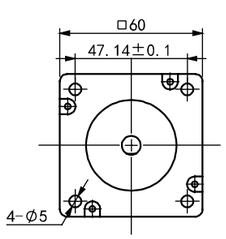
57AM Series Dimension (mm)



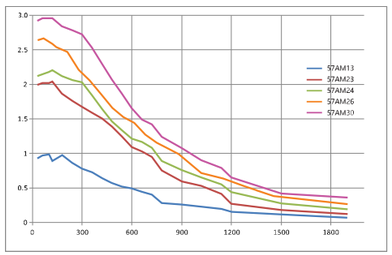


D57AM Series Dimension (mm)



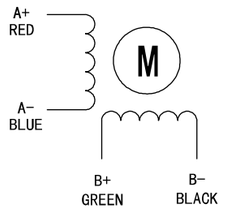


Torque-frequency Curve



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

Wiring

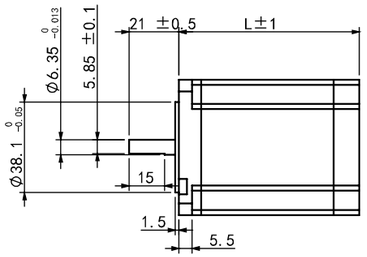


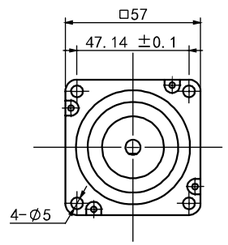
2-Phase Stepper Motor 57mm Series Technical Specifications

Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/ Phase(Ohm)	Inductance/ Phase(mH)	Rotor inertia (g.cm²)	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
57A09	1.8	0.9	2.8	0.42	1.53	260	6.35	21	55	0.67
57A1	1.8	1.3	2.8	0.64	2.65	460	6.35	21	76	1.03
57A2	1.8	2.2	4.0	0.41	2.00	460	8.00	21	80	1.11
57A3	1.8	3.0	5.0	0.82	3.73	720	8.00	21	102	1.48

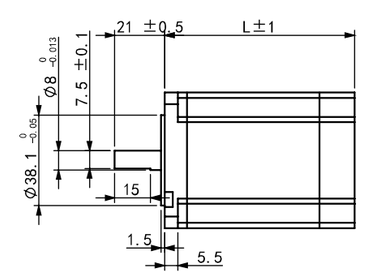
*NEMA 23 (57mm)

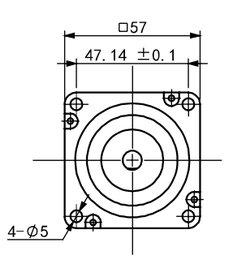
57A09/57A1 Dimension (mm)



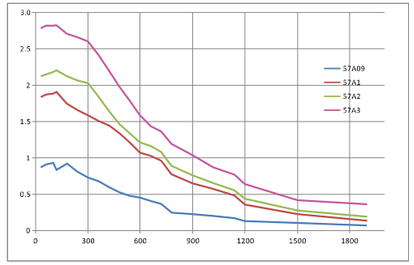


57A2/57A3 Dimension (mm)



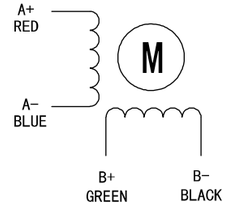


Torque-frequency Curve



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

Wiring

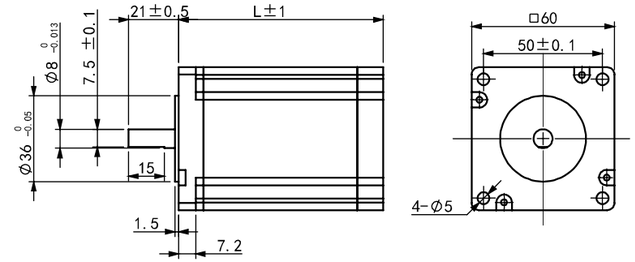


2-Phase Stepper Motor 60mm Series Technical Specifications

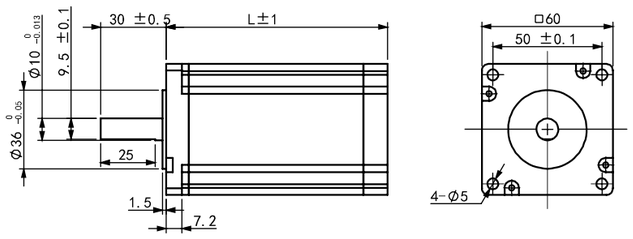
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/ Phase(Ohm)	Inductance/ Phase(mH)	Rotor inertia (g.cm²)	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
60AM21	1.8	2.1	5.0	0.35	1.3	330	8	21	58	0.87
60AM30	1.8	3.0	5.0	0.50	2.2	690	8	21	86	1.39
60AM40	1.8	4.0	5.0	0.86	3.5	880	10	30	102	2.05

*NEMA 24 (60mm)

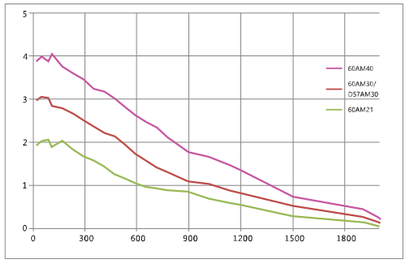
60AM21/60AM30 Dimension (mm)



60AM40 Dimension (mm)

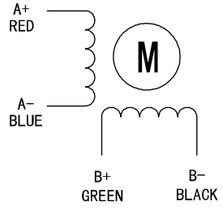


Torque-frequency Curve



Drive: R60 Current: Rated
Voltage: 48VDC Micro-stepping: 1600

Wiring

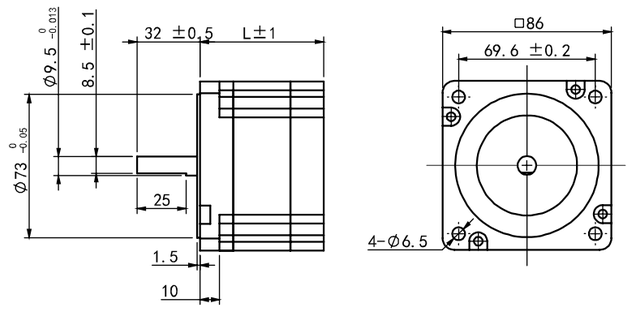


2-Phase Stepper Motor 86mm Series Technical Specifications

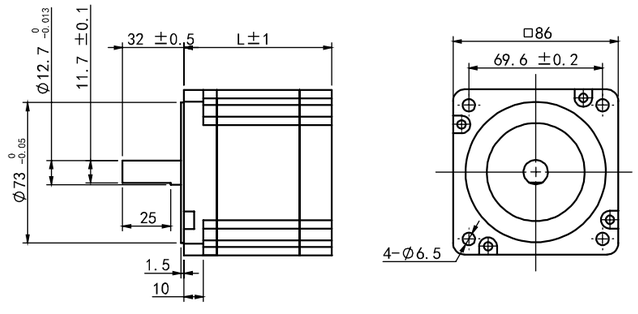
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/ Phase(Ohm)	Inductance/ Phase(mH)	Rotor inertia (g.cm²)	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
86AM35	1.8	3.5	4.0	0.81	3.87	800	9.5	32	64	1.70
86AM45	1.8	4.5	6.0	0.41	2.82	1400	12.7	32	78	2.25
86AM65	1.8	6.5	6.0	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)

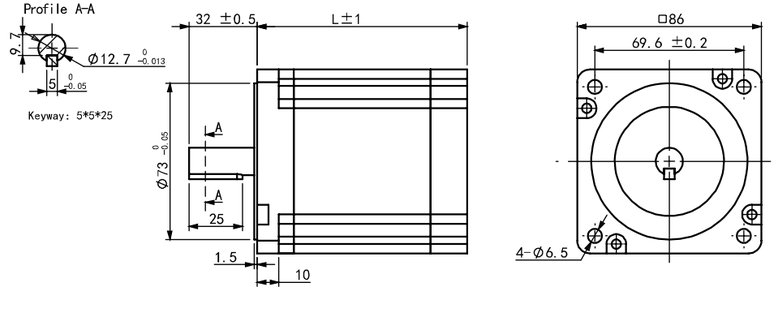
86AM35 Dimension (mm)



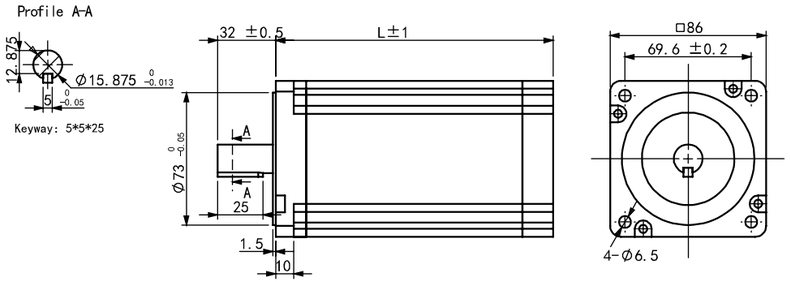
86AM45Dimension (mm)



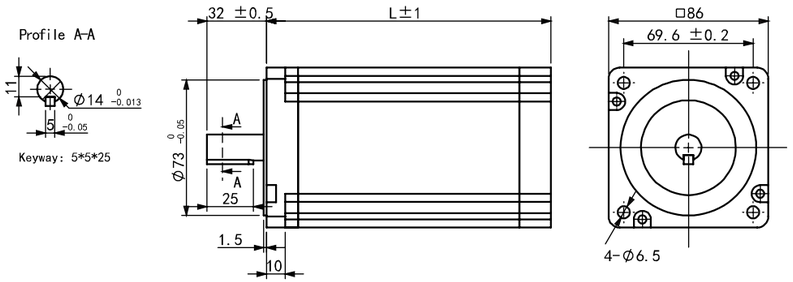
86AM65/86AM85 Dimension



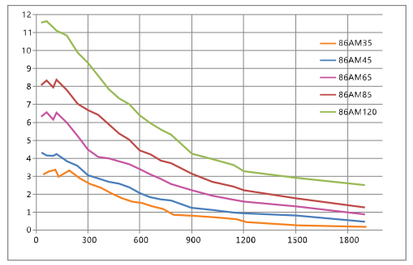
86AM120 Dimension (mm)



86AM-14 Dimension (mm)

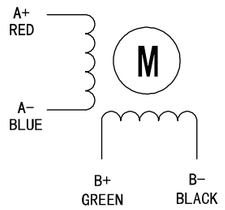


Torque-frequency Curve



Drive: R86 Current: Rated
Voltage: 60VDC Micro-stepping: 1600

Wiring

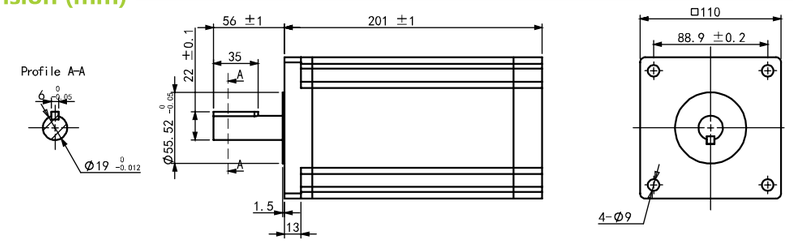


2-Phase Stepper Motor 110/130mm Series Technical Specifications

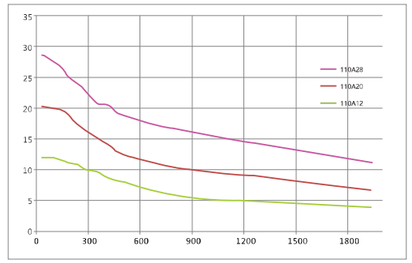
Model	Step angle (°)	Holding torque(N.m)	Rated current(A)	Resistance/ Phase(Ohm)	Inductance/ Phase(mH)	Rotor inertia (g.cm²)	Shaft diameter(mm)	Shaft length (mm)	Length (mm)	Weight (kg)
110A12	1.8	12	6.0	0.37	4.9	7200	19	56	115	6.0
110A20	1.8	20	6.0	0.80	15.0	11000	19	56	150	8.4
110A28	1.8	28	6.5	1.20	22.0	16200	19	56	201	11.7
130A27	1.8	27	6.0	0.65	13.8	35000	19	45	226	13.0
130A45	1.8	45	7.0	0.90	9.5	48400	19	45	283	19.0

*NEMA 42 (110mm), NEMA 52 (130mm)

110A series Dimension (mm)

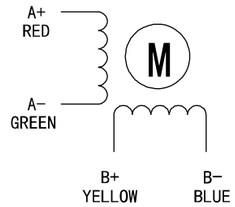


Torque-frequency Curve

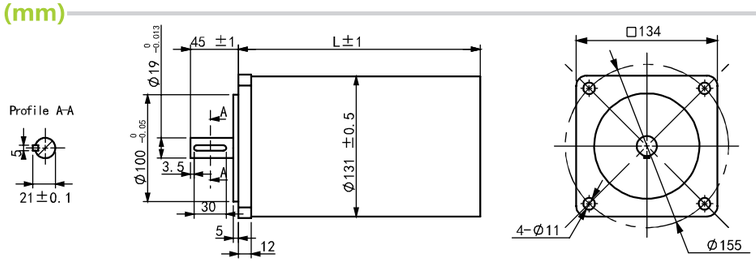


Drive: R110PLUS Current: Rated
Voltage: 220VDC Micro-stepping: 1600

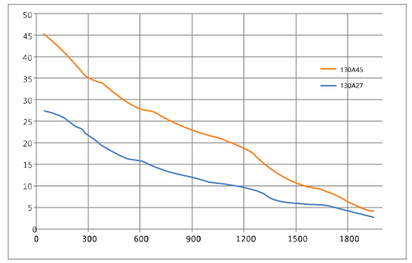
Wiring



130A Series Dimension (mm)

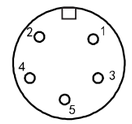


Torque-frequency Curve



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

Wiring



1	2	3	4	5
A+	A-	B+	B-	NC