Kinco®

Stepper System

-Stepper Driver
-Stepper Motor

Kinco® Automation

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K1E07-1407

Kinco Stepper System

Corporate Profile

Kinco Automation is a leading supplier of industrial automation products and solutions from China with full line of automation products including industrial human machine interfaces (HMI), AC servo systems, stepper systems, PLC, VFD and field bus products. Kinco aims to help you achieve a leading position in your market.

Reliable partner of your success

- ☐ Gain the competitive edge
- ☐ Support your business
- ☐ Serve your needs

High standard of quality management

- ☐ 100% function and reliability test before delivery
- ☐ Quality control and tracking go through the full product life cycle
- ☐ Certificated process control and quality management capability

Proven performance

- ☐ Customers in over 40 countries and in diverse markets and sectors

Perpetual innovation

- ☐ 8% of annual turnover invested in R&D
- ☐ Experienced international R&D teams
- ☐ Patent applications continue to rise every year
- ☐ Market-driven R&D: we organize our R&D activities around the voice from the customers

Provide Chinese Automation Solutions for Global Customers

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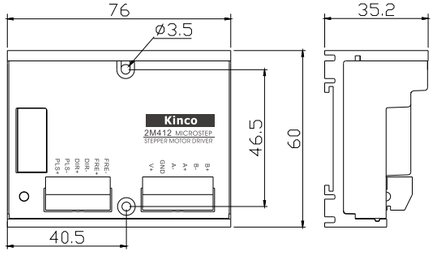
Kinco 2M412 Stepper Motor Driver (Two-phase Bipolar Micro Step)

- The maximum supply voltage can reach 40V;
- The bipolar constant current drive mode is taken, with a maximum drive current up to 1.2A per phase, which can drive any 42 series two-phase bipolar hybrid stepper motors with a current less than 1.2A;
- The drive output phase current of a motor can be regulated through the DIP switch, to match motors of different specifications;
- A DIP switch is used to set the automatic half current function of motors in statically locked status, which can greatly reduce heat dissipation of the motors;
- A dedicated control chip is used, with a maximum of 256/200 subdivisions. The subdivision function can be set by the DIP switch, to ensure the best operation stability;
- Supporting offline function so that the output current of a motor can be cut off if necessary;
- Optical coupling devices are used for the isolation of the input circuit of the control signals to reduce interference of external noises.

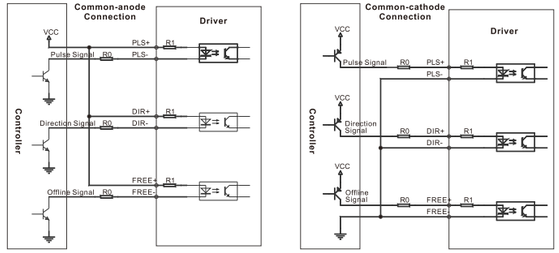
Mechanical Dimensions Unit:mm



Technical Specifications

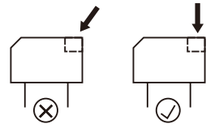
Supply voltage	12 ~ 40V DC
Output phase current	0.2 ~ 1.2A
Control signal input current	6 ~ 16mA
Cooling method	Natural air cooling
Operating environment	Avoid the environment with a great amount of metallic powder, oil mist, or erosive gases
Operating temperature	-10℃ ~ +45℃
Operating humidity	<85% (non-condensing or water drops)
Weight	0.13Kg

Typical Wring Diagram



Precautions

1. Please poke the DIP switch correctly as following figure.



2. When the voltage of the control signal is 5V, then the resistors in the connection figure are 0Ω.
When the voltage of the control signal is 24V, then the resistors in the connection figure are 2KΩ.

Functions of DIP Switch

There is a red 8-bit function setting switch at the top of the driver, which is used to set the working mode and parameters of the driver. Please carefully read the reference before use. Do remember to cut off the power before changing the settings of the DIP switch.

The front view of the DIP switch is as follows:

Serial Number	Function of ON	Function of OFF	Remarks
DIP1~DIP4	Subdivision setting	Subdivision setting	
DIP5	Half current of static current	Full current of static current	
DIP6~DIP8	Output current setting	Output current setting	

The subdivision setting table			DIP1 is ON	DIP1 is OFF
DIP2	DIP3	DIP4	subdivision	subdivision
ON	ON	ON	N/A*	2
OFF	ON	ON	4	4
ON	OFF	ON	8	5
OFF	OFF	ON	16	10
ON	ON	OFF	32	25
OFF	ON	OFF	64	50
ON	OFF	OFF	128	100
OFF	OFF	OFF	256	200

* N/A indicates invalid. The rotary switch is forbidden setting as N/A.

Current Regulation

There is a red 8-bit function setting switch at the top of the driver, which is used to set the working mode and parameters of the driver. Please carefully read the reference before use. Do remember to cut off the power before changing the settings of the DIP switch.

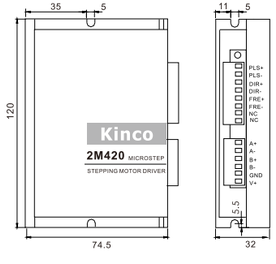
The front view of the DIP switch is as follows:

The output phase current setting table			
DIP6	DIP7	DIP8	Output Current
OFF	OFF	OFF	0.20A
OFF	OFF	ON	0.35A
OFF	ON	OFF	0.50A
OFF	ON	ON	0.65A
ON	OFF	OFF	0.80A
ON	OFF	ON	0.90A
ON	ON	OFF	1.00A
ON	ON	ON	1.20A

Kinco 2M420 Stepper Motor Driver (Two-phase Bipolar Micro Step)

- The maximum supply voltage can reach 40V, which can provide better dynamic drive performance;
- The bipolar constant current drive mode is taken, with a maximum drive current up to 2.5A per phase, which can drive any 42 and 56 series two-phase bipolar hybrid stepper motors with a current less than 2.5A;
- The drive output phase current of a motor can be regulated through the DIP switch, to match motors of different specifications;
- A DIP switch is used to set the automatic half current function of motors in statically locked status, which can greatly reduce heat dissipation of the motors;
- A dedicated control chip is used, with a maximum of 256/200 subdivisions. The subdivision function can be set by the DIP switch, to ensure the best operation stability;
- Supporting offline function so that the output current of a motor can be cut off if necessary;
- Optical coupling devices are used for the isolation of the input circuit of the control signals to reduce interference of external noises.

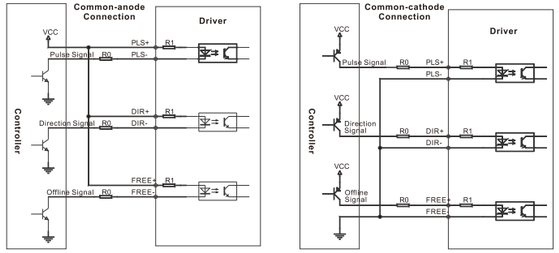
Mechanical Dimensions Unit:mm



Technical Specifications

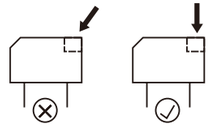
Supply voltage	24 ~ 40V DC
Output phase current	0.3 ~ 2.5A
Control signal input current	6 ~ 16mA
Cooling method	Natural air cooling
Operating environment	Avoid the environment with a great amount of metallic powder, oil mist, or erosive gases
Operating temperature	-10℃ ~ +45℃
Operating humidity	<85% (non-condensing or water drops)
Weight	0.4Kg

Typical Wring Diagram



Precautions

1. Please poke the DIP switch correctly as following figure.



2. When the voltage of the control signal is 5V, then the resistors in the connection figure are 0Ω.
When the voltage of the control signal is 24V, then the resistors in the connection figure are 2KΩ.

Functions of DIP Switch

There is a red 8-bit function setting switch at the top of the driver, which is used to set the working mode and parameters of the driver. Please carefully read the reference before use. Do remember to cut off the power before changing the settings of the DIP switch.

The front view of the DIP switch is as follows:

Serial Number	Function of ON	Function of OFF	Remarks
DIP1~DIP4	Subdivision setting	Subdivision setting	
DIP5	Half current of static current	Full current of static current	
DIP6~DIP8	Output current setting	Output current setting	

The subdivision setting table			DIP1 is ON	DIP1 is OFF
DIP2	DIP3	DIP4	subdivision	subdivision
ON	ON	ON	N/A*	2
OFF	ON	ON	4	4
ON	OFF	ON	8	5
OFF	OFF	ON	16	10
ON	ON	OFF	32	25
OFF	ON	OFF	64	50
ON	OFF	OFF	128	100
OFF	OFF	OFF	256	200

* N/A indicates invalid. The rotary switch is forbidden setting as N/A.

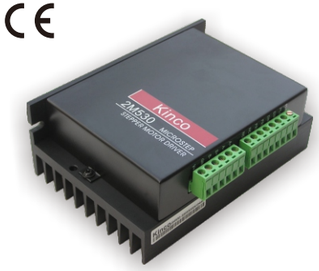
Current Regulation

There is a red 8-bit function setting switch at the top of the driver, which is used to set the working mode and parameters of the driver. Please carefully read the reference before use. Do remember to cut off the power before changing the settings of the DIP switch.

The front view of the DIP switch is as follows:

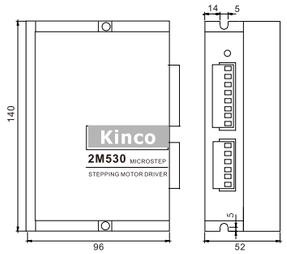
The output phase current setting table			
DIP6	DIP7	DIP8	Output Current
ON	ON	ON	0.3A
ON	ON	OFF	0.6A
ON	OFF	ON	0.8A
ON	OFF	OFF	1.2A
OFF	ON	ON	1.4A
OFF	ON	OFF	1.6A
OFF	OFF	ON	2.0A
OFF	OFF	OFF	2.5A

Kinco 2M530 Stepper Motor Driver (Two-phase Bipolar Micro Step)



- The maximum supply voltage can reach 48V;
- The bipolar constant current drive mode is taken, with a maximum drive current up to 3.5A per phase, which can drive any 56 and 86 series two-phase bipolar hybrid stepper motors with a current less than 3.5A;
- The drive output phase current of a motor can be regulated through the DIP switch, to match motors of different specifications;
- Supporting automatic half current function of motors in statically locked status, which can greatly reduce heat dissipation of the motors;
- A dedicated control chip is used, with a maximum of 256/200 subdivisions. The subdivision function can be set by the DIP switch, to ensure the best operation stability;
- Supporting offline function so that the output current of a motor can be cut off if necessary;
- Optical coupling devices are used for the isolation of the input circuit of the control signals to reduce interference of external noises.

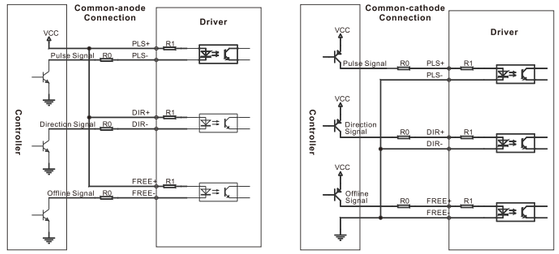
Mechanical Dimensions Unit:mm



Technical Specifications

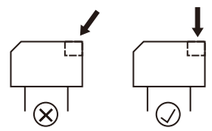
Supply voltage	24 ~ 48V DC
Output phase current	1.2 ~ 3.5A
Control signal input current	6 ~ 16mA
Cooling method	Natural air cooling
Operating environment	Avoid the environment with a great amount of metallic powder, oil mist, or erosive gases
Operating temperature	-10℃ ~ +45℃
Operating humidity	<85% (non-condensing or water drops)
Weight	0.7Kg

Typical Wring Diagram



Precautions

1. Please poke the DIP switch correctly as following figure.



2. When the voltage of the control signal is 5V, then the resistors in the connection figure are 0Ω.
When the voltage of the control signal is 24V, then the resistors in the connection figure are 2KΩ.

Functions of DIP Switch

There is a red 8-bit function setting switch at the top of the driver, which is used to set the working mode and parameters of the driver. Please carefully read the reference before use. Do remember to cut off the power before changing the settings of the DIP switch.

The front view of the DIP switch is as follows:

Serial Number	Function of ON	Function of OFF	Remarks
DIP1~DIP4	Subdivision setting	Subdivision setting	
DIP5	Half current of static current	Full current of static current	
DIP6~DIP8	Output current setting	Output current setting	

The subdivision setting table			DIP1 is ON	DIP1 is OFF
DIP2	DIP3	DIP4	subdivision	subdivision
ON	ON	ON	N/A*	2
OFF	ON	ON	4	4
ON	OFF	ON	8	5
OFF	OFF	ON	16	10
ON	ON	OFF	32	25
OFF	ON	OFF	64	50
ON	OFF	OFF	128	100
OFF	OFF	OFF	256	200

* N/A indicates invalid. The rotary switch is forbidden setting as N/A.

Current Regulation

There is a red 8-bit function setting switch at the top of the driver, which is used to set the working mode and parameters of the driver. Please carefully read the reference before use. Do remember to cut off the power before changing the settings of the DIP switch.

The front view of the DIP switch is as follows:

The output phase current setting table			
DIP6	DIP7	DIP8	Output Current
ON	ON	ON	1.2A
ON	ON	OFF	1.5A
ON	OFF	ON	1.8A
ON	OFF	OFF	2.0A
OFF	ON	ON	2.5A
OFF	ON	OFF	2.8A
OFF	OFF	ON	3.0A
OFF	OFF	OFF	3.5A

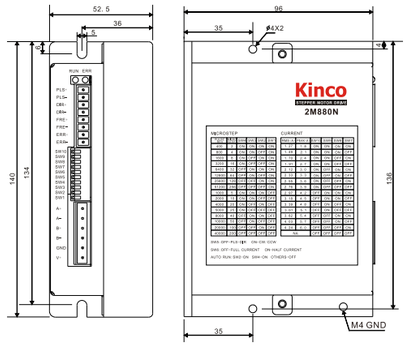
Kinco 2M880N Stepper Motor Driver (Two-phase Bipolar Micro Step)

- High performance, multiple functions, simple operation, cost-effective;
- Automatic parameter adjustable regulation, ensures motor run at optimal performance;
- Supporting driver test running function;
- Supporting phase memory function, driver will record phase position of motor during motor stop to ensure motor not shake when re-power;
- With step smooth filter, can smooth input pulse and reduce the transient motion of motor, make sure motor run more smoothly;
- Supporting automatic half current function of motors in statically locked status, which can greatly reduce heat dissipation of the motors;
- Automatic internal high-subdivision conversion technology ensures motor run at optimal subdivision state;
- Opto-isolation ERR signal output with max. current of 20mA;
- Opto-isolation signal input, with pulse response frequency up to 400KHz.

Technical Specifications

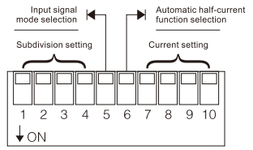
Input voltage		24 ~ 70V DC
Voltage for overvoltage protection		85V
Voltage for undervoltage protection		15V
Temperature for overheat protection		>80℃（temperature of thermistor）
Output current (peak,Unit: A)		2.4/2.8/3.2/3.6/4.0/4.4/4.8/ 5.2/5.6/6.0/6.4/6.8/7.2/ 7.6/8.0,total 15 setting values.
Micro step		2/4/5/8/10/16/20/25/32/40/50/64/100/128/200/256, total 16 subdivisions.
Adaptable motor		56 and 86 series two-phase bipolar hybird stepper motor
Input signal		PLS(CW), DIR(CCW), A/B,FREE; Current range:6~16mA
Output signal		ERR, open collector output, maximum current: 20mA
Control signal mode		PLS+DIR; CW/CCW, A+B
Automatic half current		The driver will reduce phase current of the motor by a half in 1.5 seconds
Operation indication		Combination of Run and Error LED.
Protection		Over-voltage, under-voltage, short circuit, overheat
Cooling method		Nature air cooling
Environment	Operation Environment	Avoid the environment with great amount of metallic powder, oil mist, or erosive gases.
	Operation humidity	<85%, RH (non-condensing or water drops)
	Operation temperature	0℃ ~ +40℃
	Storage temperature	-20℃ ~ +70℃
Weight (net)		0.71Kg
Dimensions		140 x 96 x 52.5 mm
Ingress protection		IP20

Mechanical Dimensions Unit:mm



Instructions for rotary switch setting

Function setting:
Input signal mode selection: SW5=OFF: Single pulse input (PLS+DIR);
SW5=ON: Double pulse input. (CW/CCW)
Automatic half-current: SW6=ON: valid. SW6=OFF: invalid.
Test running: SW4=ON, SW2=ON, others are OFF: vlaid.
Micro-step smooth filter: SW4=ON, SW1=ON, others are OFF, after re-power driver, Micro-step smooth filter will start working;
SW3=ON, SW1=ON, others are OFF, after re-power,
Micro-step smooth filter will stop working.



Subdivision setting			SW1=ON	SW1=OFF	Current setting			SW10=ON	SW10=OFF
SW2	SW3	SW4	Subdivision		SW7	SW8	SW9	Current (Peak, unit:A)	
ON	ON	ON	2	5	ON	ON	ON	2.4	5.6
OFF	ON	ON	4	10	OFF	ON	ON	2.8	6.0
ON	OFF	ON	8	20	ON	OFF	ON	3.2	6.4
OFF	OFF	ON	16	25	OFF	OFF	ON	3.6	6.8
ON	ON	OFF	32	40	ON	ON	OFF	4.0	7.2
OFF	ON	OFF	64	50	OFF	ON	OFF	4.4	7.6
ON	OFF	OFF	128	100	ON	OFF	OFF	4.8	8.0
OFF	OFF	OFF	256	200	OFF	OFF	OFF	5.2	NA

* DIP switch is forbidden to set as N/A,or the driver will be alarm automatically.

Kinco 2M1180N Stepper Motor Driver (Two-phase Bipolar Micro Step)

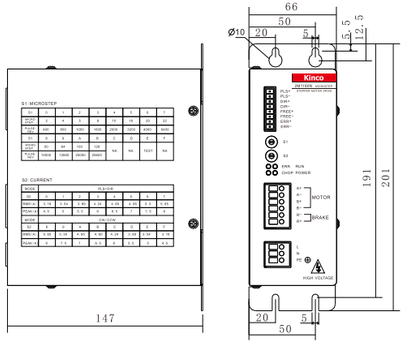
- High performance, multiple functions, simple operation, cost-effective;
- Automatic parameter adjustable regulation, ensures motor run at optimal performance;
- Supporting driver test running function;
- Supporting phase memory function, driver will record phase position of motor during motor stop to ensure motor not shake when re-power;
- With step smooth filter, can smooth input pulse and reduce the transient motion of motor, make sure motor run more smoothly;
- Supporting automatic half current function of motors in statically locked status, which can greatly reduce heat dissipation of the motors;
- Automatic internal high-subdivision conversion technology ensures motor run at optimal subdivision state;
- Opto-isolation ERR signal output with max. current of 10mA;
- Opto-isolation signal input, with pulse response frequency up to 400KHz.

Technical Specifications

Parameter		Value
Input voltage		77~123VAC, (50Hz)
Over-voltage protection		187VDC
Under-voltage protection		90VDC
Output current		4.5A, 5A, 5.5A, 6A, 6.5A, 7A, 7.5A, 8A, total 8 setting values.
Micro step		2/ 4/ 5/ 8/ 10/ 16/ 20/ 32/ 50/ 64/ 100/ 128, total 12 subdivisions.
Adaptable motor		56/86/110 series two-phase bipolar hybrid stepper motors
Input signal		PLS(CW), DIR(CCW), A/B, FREE; Current range: 6~16mA
Control signal mode		PLS+DIR, CW/CCW, A+B
Output signal		ERR, open collector output, maximum current:20mA
Automatic half current		The driver will reduce phase current of the motor by a half in 1.5 seconds
Protection		Overvoltage, undervoltage, short circuit and heat protection.
Dynamic braking circuit *		Absorb regenerated energy of motor by connecting to power resistor. Custom function.
Cooling way		Fan cooling
Environment	Operation Environment	Avoid the environment with great amount of metallic powder, oil mist, or erosive gases.
	Operation humidity	<85%, RH (non-condensing or water drops)
	Operation temperature	0℃ ~ +40℃
	Storage temperature	-20℃ ~ +70℃
Weight		1.5Kg
Dimensions		201 x 147 x 66 mm
Ingress protection		IP20

* Please confirm with factory for custom of driver with dynamic braking circuit.

Mechanical Dimensions Unit:mm



Operation Table

Mode	S1	S2	Method
Auto Run	E	0~F	Set S1=E, S2=0~F when driver is powered off, then power on the driver, the motor will run at 60RPM automatically.
PLS+DIR	0~B	0~7	Set S1=0~B, S2=0~7 when driver is powered off, then power on the driver, the motor will run in PLS+DIR mode.
CW/CCW	0~B	8~F	Set S1=0~B, S2=8~F when driver is powered off, then power on the driver, the motor will run in CW/CCW mode.
Half current	F	C	Set S1 and S2 as the "MODE settings (as the left table)" when driver is powered off. Then power on the driver, the 4 LEDs will run as: RUN LED blinks, POWER LED is green, ERR LED is red, CHOP LED is off. It means the mode setting is succeed, then restart the driver, the driver will work in setting mode.
Full current	F	D	
Step smooth filter enable	F	F	
Step smooth filter disable	F	E	

Function of Rotary Switch

S1，Micro-step： switch for subdivision and test running function

S1	0	1	2	3	4	5	6	7
Microstep	2	4	5	8	10	16	20	32
Pulse/rev	400	800	1000	1600	2000	3200	4000	6400
S1	8	9	A	B	C	D	E	F
Microstep	50	64	100	128	NA	NA	TEST	NA
Pulse/rev	10000	12800	20000	25600				

S2，Current： switch for current and PLS/DIR, CW/CCW setting

Mode	PLS+DIR							
S2	0	1	2	3	4	5	6	7
Rms(A)	3.18	3.54	3.89	4.24	4.60	4.95	5.30	5.65
Peak(A)	4.5	5	5.5	6	6.5	7	7.5	8
Mode	CW/CCW							
S2	8	9	A	B	C	D	E	F
Rms(A)	5.65	5.30	4.95	4.60	4.24	3.89	3.54	3.18
Peak(A)	8	7.5	7	6.5	6	5.5	5	4.5

* DIP switch is forbidden to set as N/A,or the driver will be alarm automatically.

Kinco 2M2280N Stepper Motor Driver (Two-phase Bipolar Micro Step)

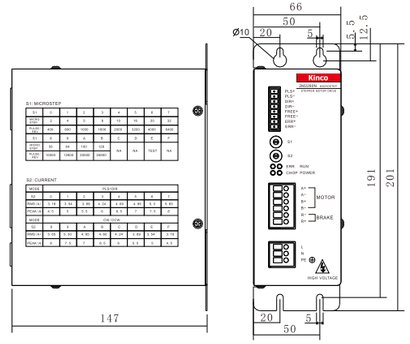
- High performance, multiple functions, simple operation, cost-effective;
- Automatic parameter adjustable regulation, ensures motor run at optimal performance;
- Supporting driver test running function;
- Supporting phase memory function, driver will record phase position of motor during motor stop to ensure motor not shake when re-power;
- With step smooth filter, can smooth input pulse and reduce the transient motion of motor, make sure motor run more smoothly;
- Supporting automatic half current function of motors in statically locked status, which can greatly reduce heat dissipation of the motors;
- Automatic internal high-subdivision conversion technology ensures motor run at optimal subdivision state;
- Opto-isolation ERR signal output with max. current of 10mA;
- Opto-isolation signal input, with pulse response frequency up to 400KHz.

Technical Specifications

Parameter		Value
Input voltage		220VAC ±15%(50Hz) (187~253VAC)
Over-voltage protection		395VDC
Under-voltage protection		200VDC
Output current		4.5A, 5A, 5.5A, 6A, 6.5A, 7A, 7.5A, 8A
Micro step		2/ 4/ 5/ 8/ 10/ 16/ 20/ 32/ 50/ 64/ 100/ 128
Adaptable motor		56/86/110 series two-phase bipolar hybrid stepper motors
Input signal		PLS(CW), DIR(CCW), A/B, FREE; Current range: 6~16mA
Control signal mode		PLS+DIR, CW/CCW, A+B
Output signal		ERR, open collector output, maximum current:20mA
Automatic half current		The driver will reduce phase current of the motor by a half in 1.5 seconds
Protection		Overvoltage, undervoltage, short circuit and heat protection.
Dynamic braking circuit *		Absorb regenerated energy of motor by connecting to power resistor. Custom function.
Cooling way		Fan cooling
Environment	Operation Environment	Avoid the environment with great amount of metallic powder, oil mist, or erosive gases.
	Operation humidity	<85%, RH (non-condensing or water drops)
	Operation temperature	0℃ ~ +40℃
	Storage temperature	-20℃ ~ +70℃
Weight		1.5Kg
Dimensions		201 x 147 x 66 mm
Ingress protection		IP20

* Please confirm with factory for custom of driver with dynamic braking circuit.

Mechanical Dimensions Unit:mm



Operation Table

Mode	S1	S2	Method
Auto Run	E	0~F	Set S1=E, S2=0~F when driver is powered off, then power on the driver, the motor will run at 60RPM automatically.
PLS+DIR	0~B	0~7	Set S1=0~B, S2=0~7 when driver is powered off, then power on the driver, the motor will run in PLS+DIR mode.
CW/CCW	0~B	8~F	Set S1=0~B, S2=8~F when driver is powered off, then power on the driver, the motor will run in CW/CCW mode.
Half current	F	C	Set S1 and S2 as the "MODE settings (as the left table)" when driver is powered off. Then power on the driver, the 4 LEDs will run as: RUN LED blinks, POWER LED is green, ERR LED is red, CHOP LED is off. It means the mode setting is succeed, then restart the driver, the driver will work in setting mode.
Full current	F	D	
Step smooth filter enable	F	F	
Step smooth filter disable	F	E	

Function of Rotary Switch

S1，Micro-step： switch for subdivision and test running function

S1	0	1	2	3	4	5	6	7
Microstep	2	4	5	8	10	16	20	32
Pulse/rev	400	800	1000	1600	2000	3200	4000	6400
S1	8	9	A	B	C	D	E	F
Microstep	50	64	100	128	NA	NA	TEST	NA
Pulse/rev	10000	12800	20000	25600				

S2，Current： switch for current and PLS/DIR, CW/CCW setting

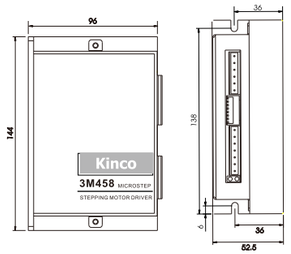
Mode	PLS+DIR							
S2	0	1	2	3	4	5	6	7
Rms(A)	3.18	3.54	3.89	4.24	4.60	4.95	5.30	5.65
Peak(A)	4.5	5	5.5	6	6.5	7	7.5	8
Mode	CW/CCW							
S2	8	9	A	B	C	D	E	F
Rms(A)	5.65	5.30	4.95	4.60	4.24	3.89	3.54	3.18
Peak(A)	8	7.5	7	6.5	6	5.5	5	4.5

* DIP switch is forbidden to set as N/A,or the driver will be alarm automatically.

Kinco 3M458 Stepper Motor Driver (Three-phase)

- The maximum supply voltage is 40VDC;
- The constant current drive mode is taken, with maximum drive current up to 5.8A per phase, which can drive any 57 and 85 series three-phase hybird stepper motors;
- A dedicated control chip is used. Maximum subdivision is up to 10000step/turn. The subdivision function can be set by the DIP switch, to ensure the best operation stability;
- The driver output phase current of a motor can be regulated through the DIP switch, to match motors of different specifications;
- Supporting automatic half current function of motors in statically locked status, which can greatly reduce heat dissipation of the motors;
- Supporting offline function so that the output current of a motor can be cut off if necessary.

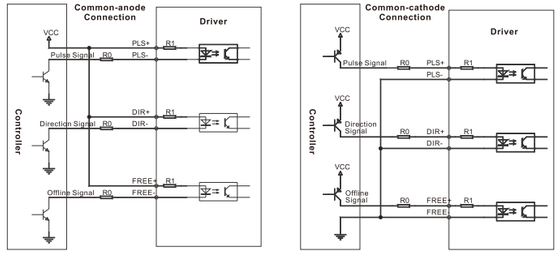
Mechanical Dimensions Unit:mm



Technical Specifications

Supply voltage	24 ~ 40V DC
Output phase current	3.0 ~ 5.8A
Control signal input current	6 ~ 16mA
Protection	Over-voltage, under-voltage, over-current, overheat
Cooling method	Natural air cooling
Operating environment	Avoid the environment with a great amount of metallic powder, oil mist, or erosive gases
Operating temperature	-10℃ ~ +45℃
Operating humidity	<85% (non-condensing or water drops)
Weight	0.7Kg

Typical Wring Diagram



Functions of DIP Switch

There is a red 8-bit DIP function setting switch in the middle of the connecting terminal at a side of the driver. It can be used to set the working mode and parameters of the driver. Please carefully read the reference before use.

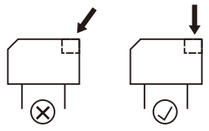
The front view of the DIP switch is as follows:

Serial Number	Function of ON	Function of OFF	Remarks
DIP1~DIP3	Subdivision setting	Subdivision setting	
DIP4	Full current of static current	Half current of static current	
DIP5~DIP8	Output current setting	Output current setting	

The subdivision setting table			
DIP1	**DIP2**	**DIP3**	**Subdivision**
ON	ON	ON	400 steps/revolution
ON	ON	OFF	500 steps/revolution
ON	OFF	ON	600 steps/revolution
ON	OFF	OFF	1000 steps/revolution
OFF	ON	ON	2000 steps/revolution
OFF	ON	OFF	4000 steps/revolution
OFF	OFF	ON	5000 steps/revolution
OFF	OFF	OFF	10000 steps/revolution

Precautions

1. Please poke the DIP switch correctly as following figure.



2. When the voltage of the control signal is 5V, then the resistors in the connection figure are 0Ω.
When the voltage of the control signal is 24V, then the resistors in the connection figure are 2KΩ.

Current Regulation

There is a red 8-bit DIP function setting switch in the middle of the connecting terminal at a side of the driver. It can be used to set the working mode and parameters of the driver. Please carefully read the reference before use.

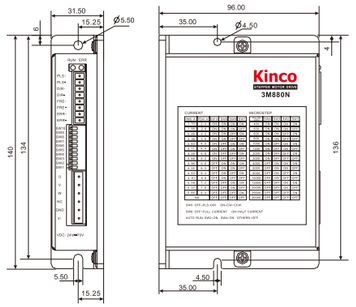
The front view of the DIP switch is as follows:

The output phase current setting table				
DIP5	**DIP6**	**DIP7**	**DIP8**	**Output Current**
OFF	OFF	OFF	OFF	3.0A
OFF	OFF	OFF	ON	4.0A
OFF	OFF	ON	ON	4.6A
OFF	ON	ON	ON	5.2A
ON	ON	ON	ON	5.8A

Kinco 3M880N Stepper Motor Driver (Three-phase)

- High performance, multiple functions, simple operation, cost-effective;
- Automatic parameter adjustable regulation, ensures motor run at optimal performance;
- Supporting driver test running function;
- Supporting phase memory function, driver will record phase position of motor during motor stop to ensure motor not shake when re-power;
- Automatic half current function;
- Step smooth filter function, can smooth input pulse and reduce the transient motion of motor, make sure motor run more smoothly;
- Automatic internal high-subdivision conversion technology ensures motor run at optimal subdivision state;
- Opto-isolation ERR signal output with max. current of 20mA;
- Opto-isolation signal input, with pulse response frequency up to 400KHz.

Mechanical Dimensions Unit:mm



Technical Specifications

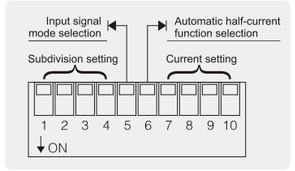
Input voltage		24~70VDC
Over-voltage protection		90V
Under-voltage protection		15V
Overheat protection		›80℃ (Temperature of thermistor)
Phase current (Peak)		2.4/2.8/3.2/3.6/4.0/4.4/4.8/5.2/5.6/6.0/6.4/ 6.8/7.2/7.6/8.0, total 15 setting values (Unit:A)
Subdivision		400~30000pulse/rev, total 16 subdivisions
Adaptable motor		57 or 85 series three-phase hybird stepper motor
Input signal		PLS(CW), DIR(CCW), A/B, FREE, Current range:6~16 mA
Control signal mode		PLS+DIR, CW/CCW, A+B
Output signal		ERR, open collector output, maximum current:20mA
Automatic half current		The driver will reduce phase current of the motor by a half in 1.5 seconds
Protection		Over-voltage, under-voltage, over-current, overheat
Cooling method		Natural air cooling
Environment	Operation environment	Avoid the environment with a great amount of metallic powder, oil mist, or erosive gases.
	Operation humidity	<85%, RH(non-condensing or water drops)
	Operation temperature	0℃~+40℃
	Storage temperature	-20℃~+70℃
Weight		0.4Kg
Dimensions		140×96×31.5mm
Ingress protection		IP20

Rotary Switch Setting

Function setting:

Input signal mode selection:
SW5=OFF: Single pulse input (PLS+DIR);
SW5=ON: Double pulse input (CW/CCW).
Automatic half-current:
SW6=ON: valid. SW6=OFF: invalid.
Test running:
SW4=ON, SW2=ON, others are OFF: invalid.

Micro-step smooth filter:
SW4=ON, SW1=ON, others are OFF, after re-power driver, Micro-step smooth filter will start working;
SW3=ON, SW1=ON, others are OFF, after re-power, Micro-step smooth filter will stop working.



Subdivision setting (Unit PULSE/REV)					Current setting (Peak, Unit:A)				
SW1	SW2	SW3	SW4=ON	SW4=OFF	SW7	SW8	SW9	SW10=ON	SW10=OFF
ON	ON	ON	400	4000	ON	ON	ON	2.4	5.6
OFF	ON	ON	500	5000	OFF	ON	ON	2.8	6
ON	OFF	ON	600	6000	ON	OFF	ON	3.2	6.4
OFF	OFF	ON	800	10000	OFF	OFF	ON	3.6	6.8
ON	ON	OFF	1000	12800	ON	ON	OFF	4	7.2
OFF	ON	OFF	1200	20000	OFF	ON	OFF	4.4	7.6
ON	OFF	OFF	2000	25600	ON	OFF	OFF	4.8	8
OFF	OFF	OFF	3000	30000	OFF	OFF	OFF	5.2	NA

Kinco 3M2280N Stepper Motor Driver (Three-phase)

- High performance, diverse functions, simple operation, cost-effective;
- Automatic parameter adjustable regulation;
- Driver test running function;
- Phase memory function;
- PLS+DIR and CW/CCW control signal available;
- Opto-isolation ERR signal output;
- The driver will reduce the phase current of the motor by a half in 1.5 seconds;
- Opto-isolation signal input, with pulse response frequency up to 400 KHz;
- 14 micro-step value, the maximum micro-step value is 20000 pulse/rev.The maximum output phase current is 8A(Peak);
- With the protection function of over-voltage, under-voltage, over-current, overheat and phase dislocation;
- With step smooth filter,can smooth the input pulse,reduce the transient motion of motor,make the motor runs more smoothly.

Technical Specifications

Input voltage	220V AC±15% (50Hz)(187~253VAC)
Over-voltage protection	395VDC
Under-voltage protection	200VDC
Phase current (peak, unit: A)	2.8, 3.2, 3.6, 4.0, 4.4, 4.8, 5.2, 5.6, 6, 6.4, 6.8, 7.2, 7.6 8.0, total 14 setting values.
Micro step (unit: pulse/rev)	400, 500, 600, 800, 1000, 1200, 1500, 2000, 3000, 4000, 5000, 6000, 10000, 20000, total 14 subdivisions.
Adaptable motor	110 and 130 series three-phase hybird stepper motor
Input signal	Three control signal ports: PLS(CW)/DIR(CCW)/FREE; current range: 6 ~16mA
Control signal input method	PLS+DIR; CW/CCW, A+B
Output signal	ERR, open collector output, max current: 10mA
Automatic half-current	The driver will reduce the phase current of the motor by a half in 1.5 seconds
Protection	Over-voltage, under-voltage, short circuit, and overheat protection
Dynamic braking circuit*	Absorb regenerated energy of motor by connecting to power resistor. Custom function.
Cooling method	Forced air cooling
Environment: Operation environment	Avoid the environment with great amount of metallic powder, oil mist, or erosive gases.
Environment: Operation humidity	<85%, RH (non-condensing or water drops)
Environment: Operation temperature	0℃ ~ +40℃
Environment: Storage temperature	-20℃ ~ +70℃
Weight (net)	1.5Kg
Dimensions	201 x 147 x 66 mm
Ingress protection	IP20

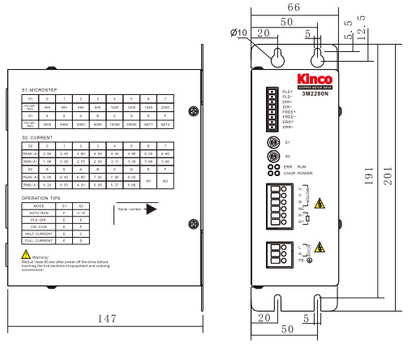
S1, Micro-step: switch for subdivision and test running function

S1	0	1	2	3	4	5	6	7
Pulse/rev	400	500	600	800	1000	1200	1500	2000
S1	8	9	A	B	C	D	E	F
Pulse/rev	3000	4000	5000	6000	10000	20000	SET1	SET2

S2, Current: switch for current and PLS/DIR, CW/CCW setting

Mode	PLS+DIR							
S2	0	1	2	3	4	5	6	7
Peak(A)	2.80	3.20	3.60	4.00	4.40	4.80	5.20	5.60
Rms(A)	1.98	2.26	2.55	2.83	3.11	3.39	3.68	3.96
Mode	CW/CCW							
S2	8	9	A	B	C	D	E	F
Peak(A)	6.00	6.40	6.80	7.20	7.60	8.00	M1	M2
Rms(A)	4.24	4.53	4.81	5.09	5.37	5.66		

Mechanical Dimensions Unit:mm



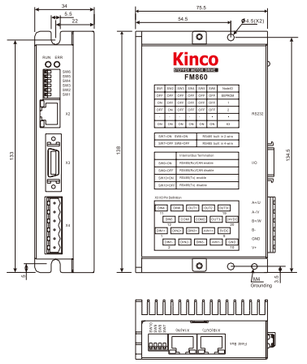
Operation Table

Mode	S1	S2	Method
Auto Run	F	0~D	Set the s1&s2 as S1=F,S2=0~D when driver is power off, then power on the driver, the motor will run automatically.
PLS+DIR	E	E	Set S1 and S2 as the "MODE settings (as the left table)" when driver is power off, then power on the driver, the 4 standards LED will run as: , this means the mode setting is success, then reboot the driver, the driver will work in setting mode.
CW/CCW	E	F	
HALF CURRENT	E	C	
FULL CURRENT	E	D	
Step smooth filter enable	F	F	Enable smoothing acceleration/ deceleration function.
Step smooth filter disable	F	E	Enable immediately response mode.

Kinco FM860 Field bus Stepper Driver (Two-phase / Three-phase)

- 6 opto-isolation digital input channels, 3 channels support voltage range 5~24VDC;
- 3 opto-isolation digital signal output channels, max current 100mA;
- 1 analog signal input channel(±10V) speed control;
- Support PLS+DIR, CW/CCW and A+B signal;
- Opto-isolation CAN and RS485 interfaces;
- Support CANopen and Modbus protocol;
- Multiple I/O functions, support homing, multi-speed;
- Support automatic parameter adjustable regulation, self-defined shalf-loack, step smooth filter;
- Over-voltage, under-voltage, overheat and over-current protection;
- Support RS232 communication, parameter settings by KincoStep software;
- CE and RoHS.

Mechanical Dimensions Unit:mm



Technical Specifications

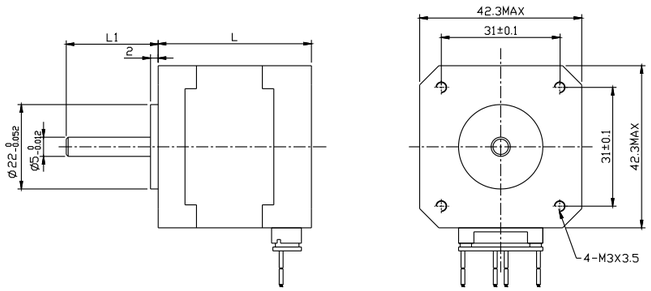
Input voltage	24 ~ 70VDC
Over-voltage protection	90V
Under-voltage protection	15V
Phase current (Peak)	0 ~ 6A
Subdivision	Set by "KincoStep" software
Adaptable motor	56/86 series two-phase or 57/85 series three-phase hybrid stepper motor
Control signal mode	PLS+DIR, CW/CCW, A+B
Cooling method	Natural air cooling
Operation environment	Avoid the environment with a great amount of metallic powder, oil mist, or erosive gases.
Operation humidity	<85%, RH(non-condensing or water drops)
Operation temperature	0℃ ~ +40℃
Storage temperature	-20℃~ +70℃
Weight	0.36Kg
Dimensions	134.5x 75.5 x 34mm
Ingress protection	IP20

Note: The communication able is suggested to purchased with the first order.
Model: Console configuration cable (conversion cable RS232-to-RJ45)

Introduction of Interface

Interface	Symbol		Function
X1 (Field Bus)	SW7~SW8	Switches for setting 2-wire or 4-wire RS485	Switches for communication interface setting
	SW9~SW10	Switches for terminal resistor setting	
		X1A(IN)X1B(OUT)	CAN bus or RS485 interface
ID DIP		SW1~SW6	ID rotary switch
X2		RS232	RS232 interface
X3 (IO)	DIN1+	DIN1 positive	High speed digital signal input interface Input voltage: 3.3~24VDC Valid input signal: >2.5VDC and >4mA Invalid input signal: <1.5VDC Maximum input frequency of optocoupler: 1MHz
	DIN1-	DIN1 negative	
	DIN2+	DIN2 positive	
	DIN2-	DIN2 negative	
	DIN3+	DIN3 positive	
	DIN3-	DIN3 negative	
	DIN4	DIN4 input	Low speed digital signal input interface Scope of input voltage: 12~24VDC Valid input signal: >8VDC and >3mA Invalid input signal: <5VDC Max. input frequency of optocoupler: 10kHz
	DIN5	DIN5 input	
	DIN6	DIN6 input	
	COMI	Common port of DIN4, DIN5, DIN6	
	AIN1+	AIN1 differential signal positive	The analog signal input interface The input impedance: 180K Max. input frequency: 4kHz Max. withstand voltage: 24VDC
	AIN1-	AIN1 differential signal negative	
	GND	Common port of AIN1 and logic power supply	
	5VDC	5VDC Logic power output	The maximum output current: 200mA
	24VDC	24VDC Logic power input	Auxiliary logic power supply when external power supply does not work
	OUT1	OUT1 output	Max. output current: 100mA Max. withstand voltage: 24VDC Max. output frequency of optocoupler: 1kHz
	OUT2	OUT2 output	
	COMO	Common port of OUT1 and OUT2	
	OUT3+	OUT3 positive	
	OUT3-	OUT3 negative	

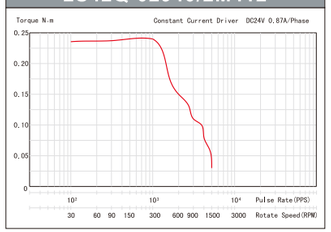
Kinco Two-phase Stepper Motor /42 Series



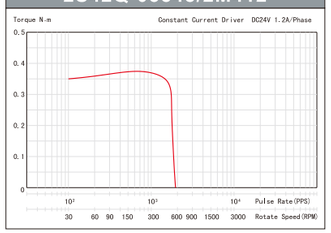
Technical Specifications	2S42Q-03848	2S42Q-02940
Step angle	1.8° ±5%	1.8° ±5%
Phase current (A)	1.2	0.87
Holding torque (Nm)	0.32	0.24
Damping torque (Nm)	0.02	0.015
Winding resistance (Ω)	3.2±10%	3.3±10%
Winding inductance (mH)	6.0±20%	5.0±20%
Motor inertia (kg.cm²)	0.08	0.06
Motor length L (mm)	48	40
Motor length L1 (mm)	24±0.5	22±0.5
Number of lead wires	4	4
Insulation class	B	
Withstand voltage level	300V AC 1S 5mA	
Max. axial load (N)	10	
Max. radial load (N)	21	
Operating temperature	-20℃ ~ 50℃	
Surface temperature rise	Max.80℃ (rated phase current after single-phases are connected)	
Insulation impedance	Minimum 100MΩ, 500V DC	
Weight (kg)	0.34	0.24
Lead wire length (mm)	400±5	500±3
Startup freq. with no load(Hz)*	11.4K	12.4K

*Note: The startup freq. is tested on condition of 2000step/turn, only for reference.

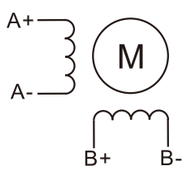
Torque-frequency Curve of 2S42Q-02940/2M412



Torque-frequency Curve of 2S42Q-03848/2M412



Motor Cable



Four lead wires of Two-phase Motor

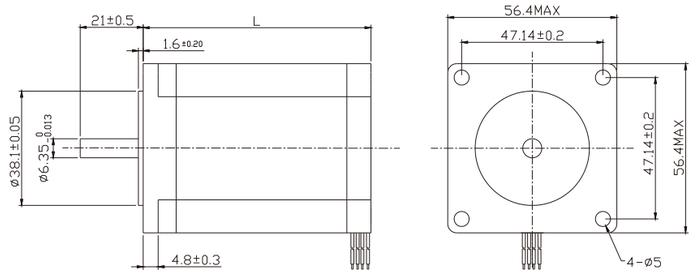
Wire Color	Motor Signal
Brown	A+
Orange	A-
Grey	B+
Green	B-

2S42Q-02940

Wire Color	Motor Signal
Red	A+
Yellow	A-
Orange	B+
Brown	B-

2S42Q-03848

Kinco Two-phase Stepper Motor /56 Series

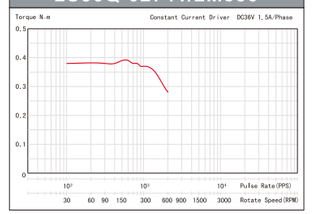


Note: Where, the shaft diameter of **2S56Q-030B5** is 8mm.

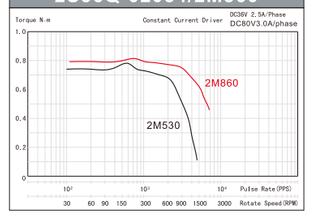
Technical Specifications	2S56Q-030B5	2S56Q-02976	2S56Q-02054	2S56Q-02741
Step angle	1.8° ±5%	1.8° ±5%	1.8° ±5%	1.8° ±5%
Phase current (A)	6.0	3.0	3.0	1.5
Holding torque (Nm)	2.5	1.5	0.9	0.5
Damping torque (Nm)	0.12	0.07	0.04	0.02
Winding resistance (Ω)	0.5±10%	0.95±15%	0.65±15%	1.8±10%
Winding inductance (mH)	1.8±20%	3.4±20%	2.5±20%	4.1±20%
Motor inertia (kg.cm²)	0.75	0.46	0.26	0.14
Motor length L (mm)	111	76	54	41
Number of lead wires	4			
Insulation class	B			
Withstand voltage level	600V AC 1S 5mA			
Max. axial load (N)	15			
Max. radial load (N)	75			
Operating temperature	-20℃ ~ 50℃			
Surface temperature rise	Max.80℃ (rated phase current after single-phases are connected)			
Insulation impedance	Minimum 100MΩ, 500V DC			
Weight (kg)	1.5	1.0	0.6	0.42
Lead wire length (mm)	300±10	300±10 *2		
Startup freq. with no load(Hz)*1	5.3K	8.8K	8.9K	9.8K

*1 Note: The startup freq. is tested on condition of 2000step/turn, only for reference.
*2 The outlet wire of 2S56Q-02741 is in plug-in form.

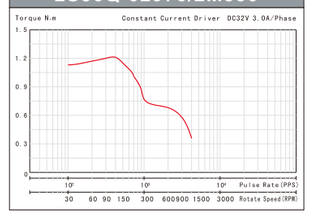
Torque-frequency Curve of 2S56Q-02741/2M530



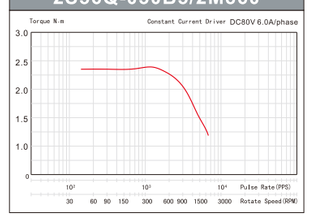
Torque-frequency Curve of 2S56Q-02054/2M530 2S56Q-02054/2M860



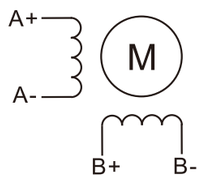
Torque-frequency Curve of 2S56Q-02976/2M530



Torque-frequency Curve of 2S56Q-030B5/2M860

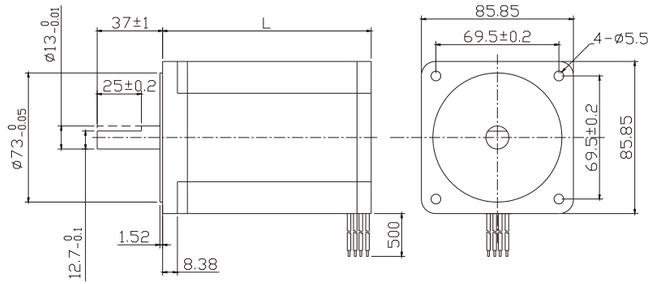


Motor Cable



Four lead wires of Two-phase Motor

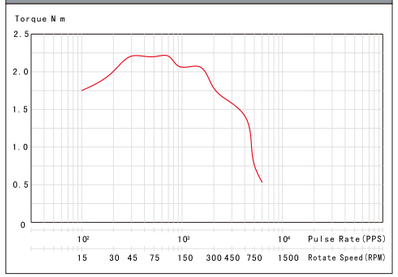
Wire Color	Motor Signal
Red	A+
Blue	A-
Green	B+
Black	B-



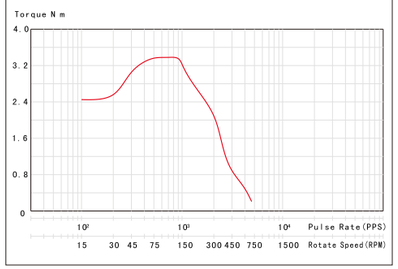
Technical Specifications	2S86Q-069B8	2S86Q-05180	2S86Q-03865
Step angle	1.8° ±5%	1.8° ±5%	1.8° ±5%
Phase current (A)	3.0	3.0	3.0
Holding torque (Nm)	8.5	4.5	3.4
Damping torque (Nm)	0.24	0.12	0.08
Winding resistance (Ω)	2.3±10%	1.7±10%	1.25±10%
Winding inductance (mH)	26±20%	16±20%	7.0±20%
Motor inertia (kg.cm²)	3.4	1.4	1.0
Motor length L (mm)	118	80	65
Number of lead wires	4		
Insulation class	B		
Withstand voltage level	1200V AC 1S 5mA		
Max. axial load (N)	60		
Max. radial load (N)	220		
Operating temperature	-20℃ ~ 50℃		
Surface temperature rise	Max.80℃ (rated phase current after single-phases are connected)		
Insulation impedance	Minimum 100MΩ, 500V DC		
Weight (kg)	3.7	2.3	1.7
Startup freq. with no load(Hz)*	4K	7K	11.1K

* Note: The startup freq. is tested on condition of 2000step/turn, only for reference.

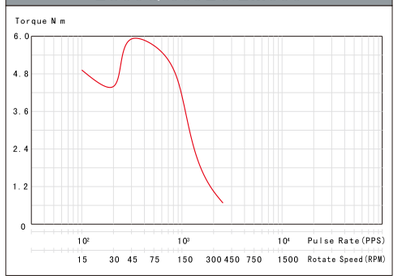
Torque-frequency Curve of
2S86Q-03865/2M530



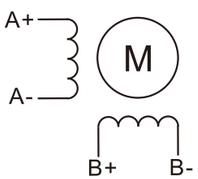
Torque-frequency Curve of
2S86Q-05180/2M530



Torque-frequency Curve of
2S86Q-069B8/2M530



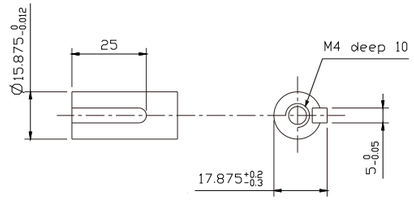
Motor Cable



Four lead wires of Two-phase Motor

Wire Color	Motor Signal
Black	A+
Green	A-
Red	B+
Blue	B-

Kinco Two-phase Stepper Motor /86 Series

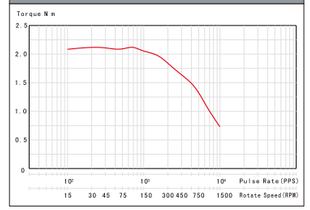


Note: Where, the shaft diameter of **2S86Q-051F6** is 15.875mm, and key is a 5x5x25mm flat key.

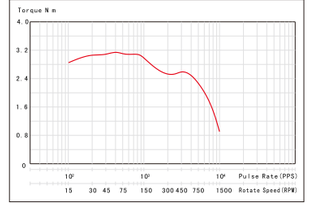
Technical Specifications	2S86Q-051F6	2S86Q-030B8	2S86Q-03080	2S86Q-01865
Step angle	1.8° ±5%	1.8° ±5%	1.8° ±5%	1.8° ±5%
Phase current (A)	6.0	6.0	6.0	6.0
Holding torque (Nm)	12.8	8.5	4.5	3.1
Damping torque (Nm)	0.36	0.24	0.12	0.08
Winding resistance (Ω)	0.85±10%	0.6±10%	0.38±10%	0.3±10%
Winding inductance (mH)	10±20%	6±20%	3.5±20%	1.7±20%
Motor inertia (kg.cm²)	4.0	3.4	1.4	1.0
Motor length L (mm)	156	118	80	65
Number of lead wires	4			
Insulation class	B			
Withstand voltage level	1200V AC 1S 5mA			
Max. axial load (N)	60			
Max. radial load (N)	220			
Operating temperature	-20℃ ~ 50℃			
Surface temperature rise	Max.80℃ (rated phase current after single-phases are connected)			
Insulation impedance	Minimum 100MΩ, 500V DC			
Weight (kg)	5.3	3.7	2.3	1.7
Startup freq. with no load(Hz)*	5.8K	10K	9.1K	10K

* Note: The startup freq. is tested on condition of 2000step/turn, only for reference.

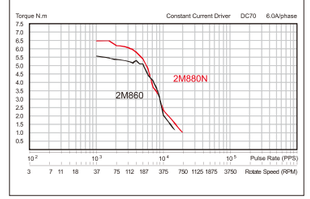
Torque-frequency Curve of
2S86Q-01865/2M860



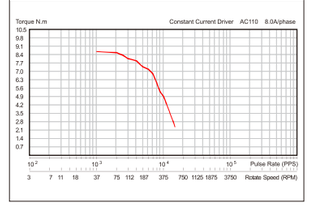
Torque-frequency Curve of
2S86Q-03080/2M860



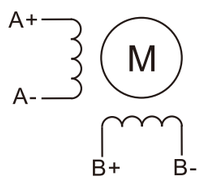
Torque-frequency Curve of (8 subdivisions)
2S86Q-030B8/2M880N&2M860N



Torque-frequency Curve of (8 subdivisions)
2S86Q-051F6/2M1180N



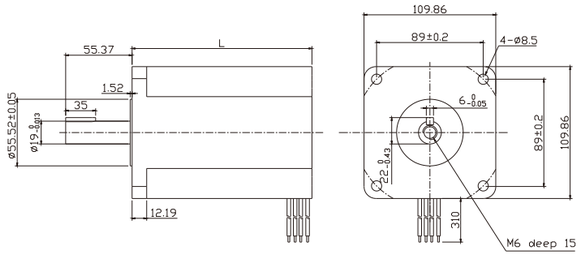
Motor Cable



Four lead wires of Two-phase Motor

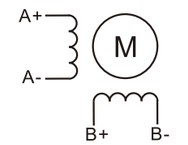
Wire Color	Motor Signal
Black	A+
Green	A-
Red	B+
Blue	B-

Kinco Two-phase Stepper Motor /110 Series



Motor Cable

Wire Color	Motor Signal
Black	A+
Green	A-
Red	B+
Blue	B-

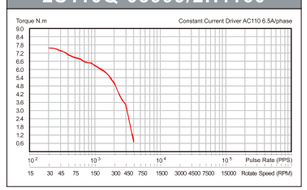


Four lead wires of Two-phase Motor

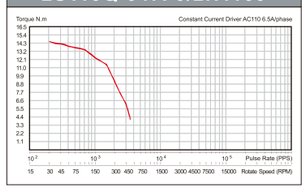
Technical Specifications	2S110Q-054K1	2S110Q-047F0	2S110Q-03999
Step angle	1.8° ±5%	1.8° ±5%	1.8° ±5%
Phase current (A)	8.0	6.5	5.5
Holding torque (Nm)	30.0	21.0	11.7
Damping torque (Nm)	0.75	0.59	0.3
Winding resistance (Ω)	0.67±10%	0.72±10%	0.7±10%
Winding inductance (mH)	11±20%	12.8±20%	9.8±20%
Motor inertia (kg.cm²)	16.2	10.9	5.5
Motor length L (mm)	201	150	99
Number of lead wires	4		
Insulation class	B		
Withstand voltage level	1200V AC 1S 5mA		
Max. axial load (N)	60		
Max. radial load (N)	220		
Operating temperature	-20℃ ~ 50℃		
Surface temperature rise	Max.80℃ (rated phase current after single-phases are connected)		
Insulation impedance	Minimum 100MΩ, 500V DC		
Weight (kg)	11.7	8.4	5.0
Startup freq. with no load(Hz)*	4.8K	4.5K	5.2K

* Note: The startup freq. is tested on condition of 2000step/turn, only for reference.

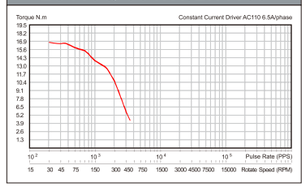
Torque-frequency Curve of
2S110Q-03999/2H1160



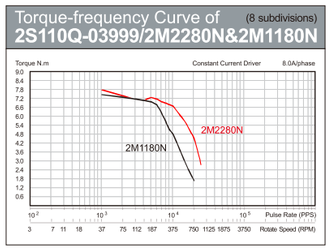
Torque-frequency Curve of
2S110Q-047F0/2H1160



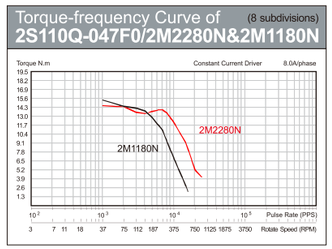
Torque-frequency Curve of
2S110Q-054K1/2H1160



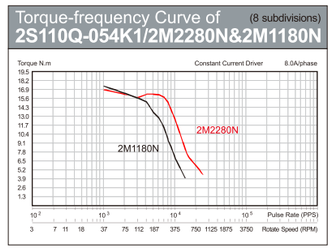
Torque-frequency Curve of (8 subdivisions)
2S110Q-03999/2M2280N&2M1180N



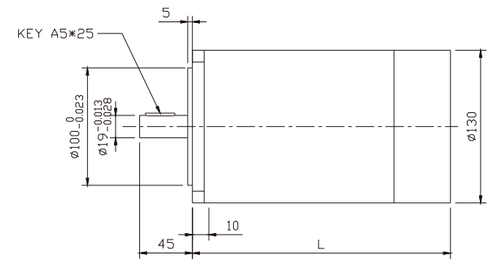
Torque-frequency Curve of (8 subdivisions)
2S110Q-047F0/2M2280N&2M1180N

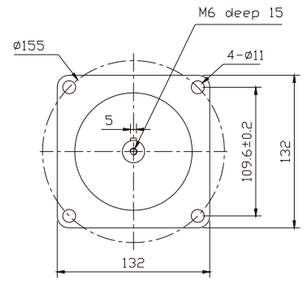


Torque-frequency Curve of (8 subdivisions)
2S110Q-054K1/2M2280N&2M1180N



Kinco Two-phase Stepper Motor /130 Series

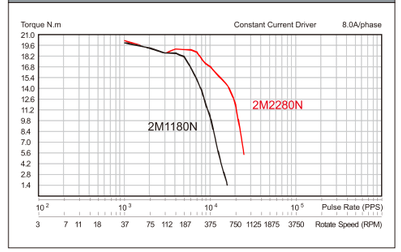




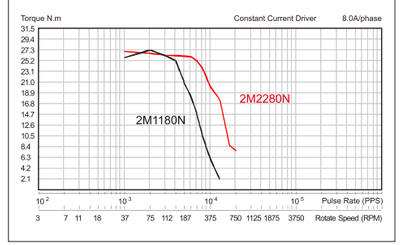
Technical Specifications	2S130Y-063R8	2S130Y-039M0
Step angle	1.8° ±5%	1.8° ±5%
Phase current (A)	7.0	6.0
Holding torque (Nm)	40.0	27.0
Damping torque (Nm)	1.5	0.8
Winding resistance (Ω)	0.9±10%	0.65±10%
Winding inductance (mH)	9.5±20%	13.8±20%
Motor inertia (kg.cm²)	48.4	33.3
Motor length L (mm)	230	165
Number of lead wires	4	
Insulation class	B	
Withstand voltage level	1800V AC 1S 5mA	
Max. axial load (N)	60	
Max. radial load (N)	220	
Operating temperature	-20℃ ~ 50℃	
Surface temperature rise	Max.80℃ (rated phase current after single-phases are connected)	
Insulation impedance	Minimum 100MΩ, 500V DC	
Weight (kg)	19.0	13.0
Startup freq. with no load(Hz)*	4.1K	4.9K

* Note: The startup freq. is tested on condition of 2000step/turn, only for reference.

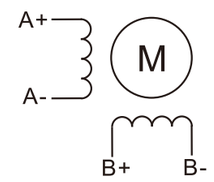
Torque-frequency Curve of (8 subdivisions)
2S130Y-039M0/2M2280N&2M1180N



Torque-frequency Curve of (8 subdivisions)
2S130Y-063R8/2M2280N&2M1180N



Motor Cable

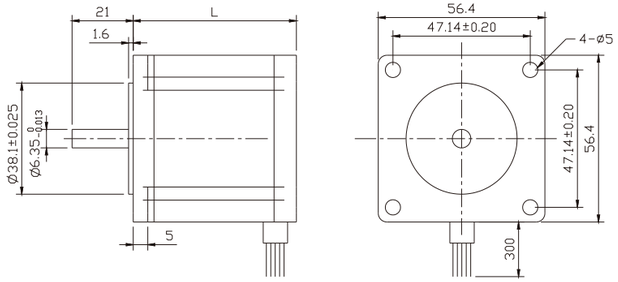


Four lead wires of Two-phase Motor

Pinout of motor connector

Pin	Motor Signal
1	A+
2	A-
3	B+
4	B-
5	GND

Kinco Three-phase Stepper Motor /57 Series

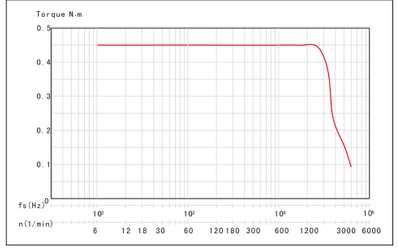


Note: Where, the shaft diameter of **3S57Q-04079** is 8mm.

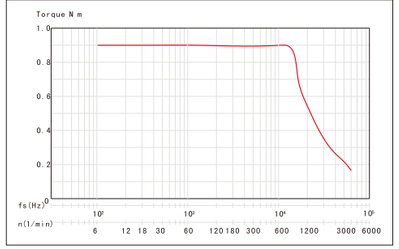
Technical Specifications	3S57Q-04079	3S57Q-04056	3S57Q-04042
Step angle	1.2° ±5%	1.2° ±5%	1.2° ±5%
Phase current (A)	5.8	5.6	5.2
Holding torque (Nm)	1.5	0.9	0.45
Damping torque (Nm)	0.07	0.04	0.02
Phase resistance (Ω)	1.05±10%	0.7±10%	1.3±10%
Phase inductance (mH)	2.4±20%	1.7±20%	1.4±20%
Motor inertia (kg.cm²)	0.48	0.3	0.11
Motor length L (mm)	79	56	42
Number of lead wires	6		
Insulation class	B		
Withstand voltage level	600V AC 1S 5mA		
Max. axial load (N)	15		
Max. radial load (N)	75		
Operating temperature	-20℃ ~ 50℃		
Surface temperature rise	Max.80℃ (Working with rated phase current)		
Insulation impedance	Minimum 100MΩ, 500V DC		
Weight (kg)	1	0.72	0.45
Startup freq. with no load(Hz)*	2.1K	2.4K	2.4K

* Note: The startup freq. is tested on condition of 2000step/turn, only for reference.

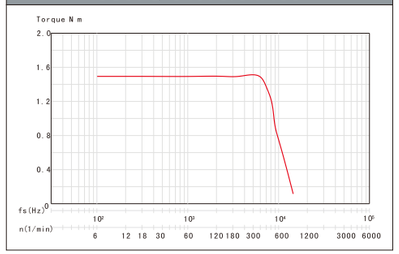
Torque-frequency Curve of 3S57Q-04042/3M458



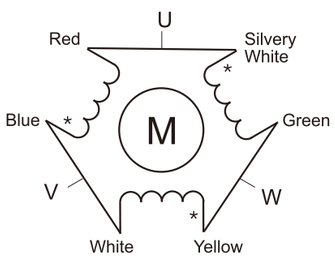
Torque-frequency Curve of 3S57Q-04056/3M458



Torque-frequency Curve of 3S57Q-04079/3M458



Motor Cable

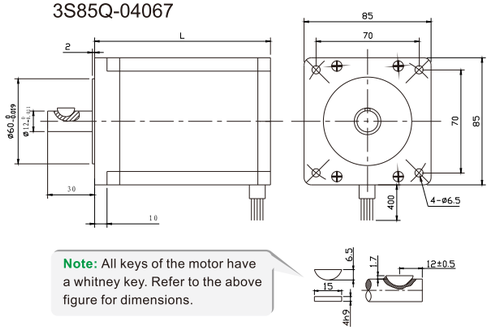


Six lead wires of three-phase motor

Wire Color	Motor Signal
Red	U
Silvery White	
Blue	V
White	
Yellow	W
Green	

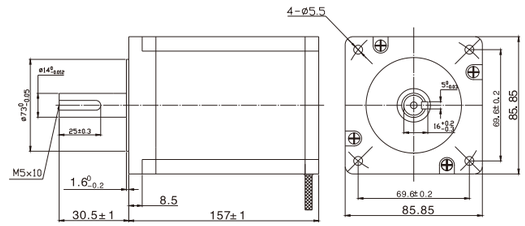
Kinco Three-phase Stepper Motor /85 Series

3S85Q-04097
3S85Q-04067



Note: All keys of the motor have a whitney key. Refer to the above figure for dimensions.

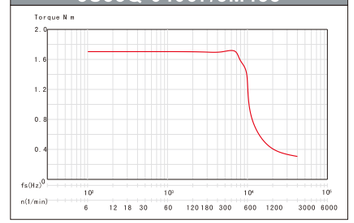
3S85Q-040F7



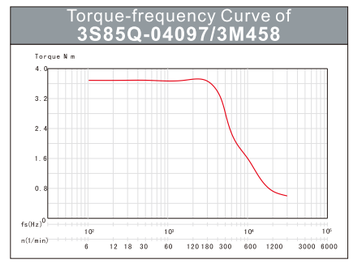
Technical Specifications	3S85Q-04097	3S85Q-04067	3S85Q-040F7
Step angle	1.2° ±5%	1.2° ±5%	1.2° ±5%
Phase current (A)	5.8	5.8	4
Holding torque (Nm)	4.0	2.0	7.5
Damping torque (Nm)	0.12	0.08	0.36
Phase resistance (Ω)	1.1±10%	0.6±10%	1.78
Phase inductance (mH)	4.6±20%	1.8±20%	17.1
Motor inertia (kg.cm²)	2.32	1.1	0.44
Motor length L (mm)	97	67	157±1
Shalf diameter (mm)	12	12	14
Number of lead wires	6		
Insulation class	B		
Withstand voltage level	600V AC 1S 5mA		
Max. axial load (N)	60		
Max. radial load (N)	220		
Operating temperature	-20℃ ~ 50℃		
Surface temperature rise	Max.80℃ (Working with rated phase current)		
Insulation impedance	Minimum 100MΩ, 500V DC		
Weight (kg)	2.7	1.65	1.65
Startup freq. with no load(Hz)*	1.4K	1.4K	2.0K

* Note: The startup freq. is tested on condition of 2000step/turn, only for reference.

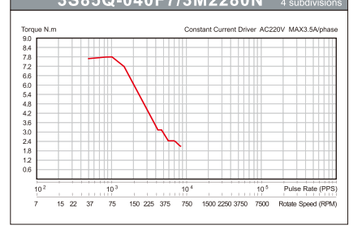
Torque-frequency Curve of 3S85Q-04067/3M458



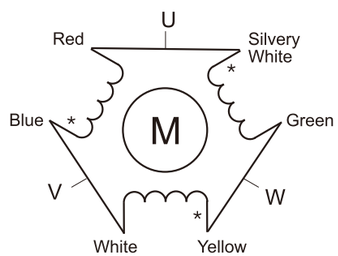
Torque-frequency Curve of 3S85Q-04097/3M458



Torque-frequency Curve of 3S85Q-040F7/3M2280N 4 subdivisions



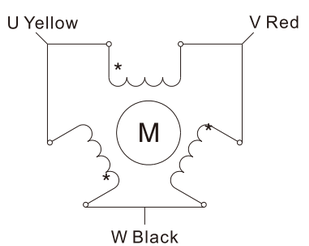
Motor Cable: 3S85Q-04097 / 3S85Q-04067



Six lead wires of three-phase motor

Wire Color	Motor Signal
Red	U
Silvery White	
Blue	V
White	
Yellow	W
Green	

Motor Cable: 3S85Q-040F7



1332 18# leading wire, wire length:400
1430 20# green-yellow grounding wire, wire length:400

Denomination Rules of Stepper Motor/Driver

Denomination Rules of Stepper Driver

2 M 4 1 2

2	Single-phase
3	Three-phase
M	Micro-step type
H	Whole/half-step type
12	Output phase current (To divide by 10 is the peak of output phase current)
4	Voltage of power supply (To multiply by 10 is the voltage of power supply)

F M 8 60-AA-000

F	Field bus type
M	Micro-step
8	Voltage of power supply (To multiply by 10 is the voltage of power supply)
000	Software version
AA	RS232、CAN
LA	RS232、RS485
60	Output phase current (To divide by 10 is the peak of output phase current)

Guide to stepper driver selection

Stepper motor needs to be driven by stepper driver, which is one of the key parts of stepper system. Stepper driver control the coil current of the stepper motor by sending pulse/direction signal, to realize accurate control of motor position and speed.

Working mode of stepper driver

Generally, there are following working modes: whole/full step, half step, subdivision(macro-step). The main difference is in control accuracy of motor coil. Usually, stepper motors vibrate at low frequency. Subdivision setting could improve stability of motor running at low speed.

Denomination Rules of Stepper Motor

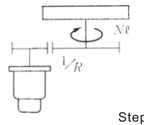
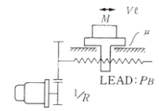
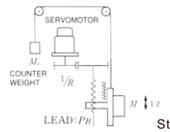
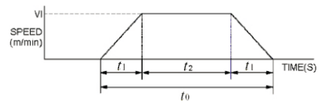
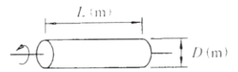
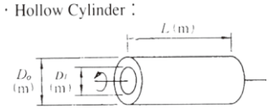
2 S 4 2 Q - 0 2 9 4 0

2	2-phase
3	3-phase
4	4-phase
S	Hybrid type
42	Flange dimension
40	Length of motor body (Exclude shaft)
029	Rated phase voltage (Phase current×phase resistance), ×0.1V
Q	Square
Y	Circle

Guide to stepper motor selection

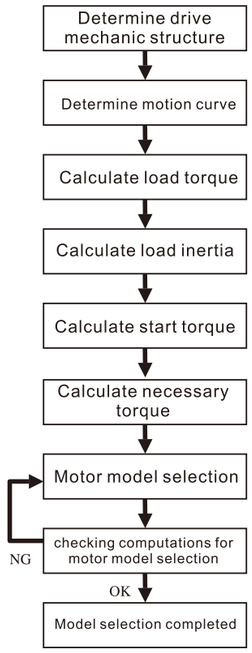
Stepper motor is specialized for positioning and accurate speed control. The main features are "digital" and " error non-accumulative". Stepper motor will turn a fixed angle for each pulse signal sent by stepper driver, so we could control angular displacement through setting number of pulses to realize accurate positioning, meanwhile control motor speed and acceleration through setting pulse frequency. The "error non-accumulative" feature of stepper motor is widely used in open-loop control.

Guide to Model Selection of Stepper Motors

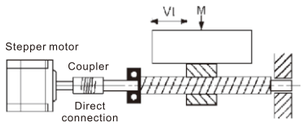
Motion Mode		Rotational Motion	Linear Motion: Horizontal axial direction	Linear Motion: Vertical axial direction
Mechanical structure		 Stepper Motor	 Stepper Motor	 Stepper Motor
		N: Drive speed (r/min) V: Load speed (m/min) T: Load torque (N/m) : Friction coefficient PB: Screw lead (m)	M: Quality of linear motion part (kg) Mc: Weight quality (kg) 1/R: Gear reduction ratio : Friction coefficient	
Speed curve				
Single travel(m)		$l=\frac{Vl}{60}(t_0-t_1)$		
Drive speed(rpm)		Nl	$Nl=\frac{Vl}{P_B}$	$Nl=\frac{Vl}{P_B}$
Rotational speed of motor(rpm)		$N_M=Nl\cdot R$		
Load torque(N.m)		$T_L=\frac{Tl}{R\cdot\eta}$	$T_L=\frac{\mu\cdot g\cdot M\cdot P_B}{2\pi\cdot R\cdot\eta}$	$T_L=\frac{g\cdot(M-M_C)\cdot P_B}{2\pi\cdot R\cdot\eta}$
Load Inertia ($kg.m^2$)		$J_L=J_{L1}+J_{L2}+J_{L3}$		
	Linear motion		$J_{L1}=M\cdot\left(\frac{P_B}{2\pi R}\right)^2$	$J_{L1}=(M+M_C)\cdot\left(\frac{P_B}{2\pi R}\right)^2$
	Rotational motion	Solid cylinder $J_K=\frac{\pi}{32}\rho\cdot L\cdot D^4$ Hollow cylinder: $J_K=\frac{\pi}{32}\rho\cdot L\cdot(D_0^4-D_1^4)$ Inertia loaded to motor shaft	· Solid Cylinder :  · Hollow Cylinder :  gear input: $J_{L2}=J_K$ Gear output: $J_{L3}=\frac{J_K}{R^2}$	density: iron $\rho=7.9\times10^3\ (kg/m^3)$ Aluminum: $\rho=2.7\times10^3\ (kg/m^3)$ Brass: $\rho=8.5\times10^3\ (kg/m^3)$ Nylon: $\rho=1.1\times10^3\ (kg/m^3)$
Start torque(N.m)		$T_S=\frac{2\pi\cdot N_M(J_M+J_L)}{60\times t_1}$	J_M indicates the inertia of the motor rotator (Unit: $kg.m^2$)	
Necessary torque(N.m)		$T_M=(T_L+T_S)\times S$	S indicates the safety coefficient, normally 2 ~ 3.	

Model Selection of Stepper Motors

Model Selection Procedure



Example for Model Selection



Speed: Vl = 1.5m/min

Quality of slide part: M= 50 kg

Screw length: L_B = 1.4m

Screw diameter: D_B = 0.012m

Screw lead: P_B = 0.004m

Coupler quality: M_C = 0.2 kg

Outer diameter of coupler Dc=0.04m

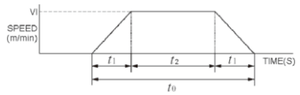
Friction coefficient: μ = 0.3

Movement distance: l = 0.00275n

Motion time: t_0=1.2s

Mechanical efficiency: η = 0.9

(1) Speed curve



Acceleration time $t_1=t_0-\frac{l}{Vl}=1.2-\frac{0.0275}{1.5\div60}=0.1(s)$

(2) rotation speed of motor

$N_M=\frac{Vl}{P_B}=\frac{1.5}{0.004}=375(rpm)$

(3) Load torque

$T_L=\frac{\mu\cdot g\cdot M\cdot P_B}{2\pi\eta}=\frac{0.3\times9.8\times50\times0.004}{2\pi\times0.9}=0.104(N\cdot m)$

(4) Load inertia

Linear motion: $J_{LM}=M\left(\frac{P_B}{2\pi}\right)^2=50\times\left(\frac{0.004}{2\pi}\right)^2=0.2\times10^{-4}\ (kg\cdot m^2)$

Ball screw: $J_B=\frac{\pi}{32}\rho\cdot L_B\cdot D_B{}^4=\frac{\pi}{32}\times7.87\times10^3\times1.4\times(0.012)^4=0.224\times10^{-4}\ (kg\cdot m^2)$

Coupler: $J_C=\frac{1}{8}M_C\cdot D_C{}^2=\frac{1}{8}\times0.2\times(0.04)^2=0.4\times10^{-4}\ (kg\cdot m^2)$

Load inertia: $J_L=J_{LM}+J_B+J_C=0.824\times10^{-4}\ (kg\cdot m^2)$

(5) Motor torque

Start torque $T_S=\frac{2\pi N_M(J_M+J_L)}{60t_1}=\frac{2\pi\times375\times(J_M+0.824\times10^{-4})}{60\times0.1}=0.032+392.5J_M\ (N\cdot m)$

Necessary torque: $T_M=(T_L+T_s)\times S=(T_L+T_s)\times2=0.272+0.08\times10^4J_M\ (N\cdot m)$

S indicates the safety coefficient, normally 2.

J_M indicates the inertia of the motor rotator (Unit: kg.m^2)

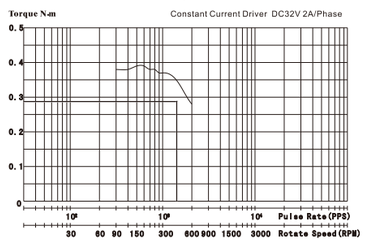
(6) Motor selection

Based on the above calculation, preliminarily this motor model is selected, i.e., 2S56Q-02741. rotator

Inertia $J_M=0.135\times10^{-4}\ kg\cdot m^2$

$T_M=0.272+0.08\times10^4\times0.135\times10^{-4}=0.283(N\cdot m)$

2S56Q-02741

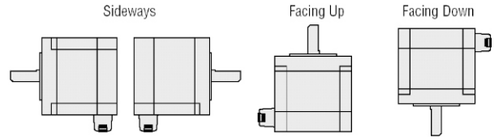


Refer to the torque-frequency curve of 2S56Q-02741.The output torque of the motor meets the requirements, so this motor is selected.

Installation Instructions for Stepper Motors

Installation Direction

There is no limitation for the installation direction of motors, but normally motors are horizontally installed. They also support vertical downward or upward installation.
Regardless of the installation direction of motors, please do not apply excessive vertical or horizontal load to the shaft of a motor.



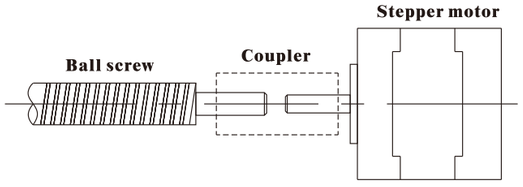
Installation

Please install the motor closely on a metallic surface with perfect heat conductivity.

Recommended Motor Installation Position

Motors shall be installed in positions meeting the following conditions:

1.Indoor;
2.The temperature inside the control cabinet shall range from -10°C ~ +50°C (non-freezing);
3.The humidity inside the control cabinet shall be less than 85% (non-condensing);
4.Free from erosive gases or dust;
5.Free from water or oil (if available, please install a sheath);
6.Perfect ventilation and heat dissipation.

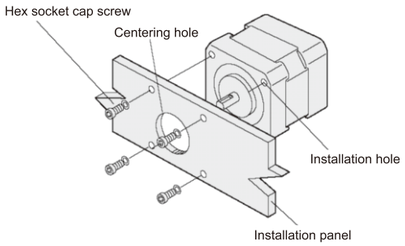


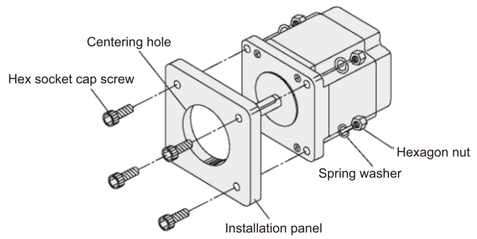
Note:
Do not disassemble the motor;
Do not apply any impact to the motor shaft;
Do not install the motor in a place where it might bear long-term vibration, so as to avoid any possible damage to the motor shaft.

Aligned Connection of Load

When a load is connected to the motor shaft, make sure that the load shaft aligns with the motor shaft. It is recommended that an anti-backlash flexible coupler or other appropriate devices are used to meet this requirement.

Mechanical processing is forbidden for the motor shaft. Please contact your supplier if it is really necessary.





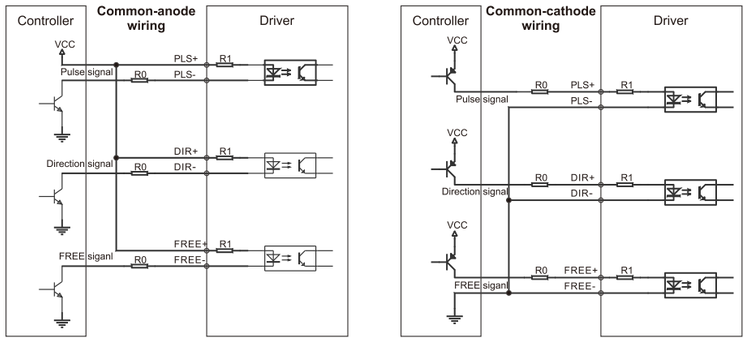
Selection Table of Stepper Driver and Stepper Motor

Motor \ Driver	2M412	2M420	2M530	2M880N	2M1180N	2M2280N	3M458	3M880N	3M2280N	FM860
2S42Q-02940	√	√								√
2S42Q-03848	√	√								√
2S56Q-02741		√	√							√
2S56Q-02054			√	√						√
2S56Q-02976			√	√						√
2S56Q-030B5				√	√					√
2S86Q-01865				√	√					√
2S86Q-03080				√	√					√
2S86Q-030B8				√	√					√
2S86Q-051F6				√	√					√
2S86Q-03865			√	√	√					√
2S86Q-05180			√	√	√					√
2S86Q-069B8			√	√	√					√
2S110Q-03999					√	√				
2S110Q-047F0					√	√				
2S110Q-054K1					√	√				
2S130Y-039M0					√	√				
2S130Y-063R8					√	√				
3S57Q-04042							√	√		√
3S57Q-04056							√	√		√
3S57Q-04079							√	√		√
3S85Q-04067							√	√		√
3S85Q-04097							√	√		√
3S85Q-040F7									√	

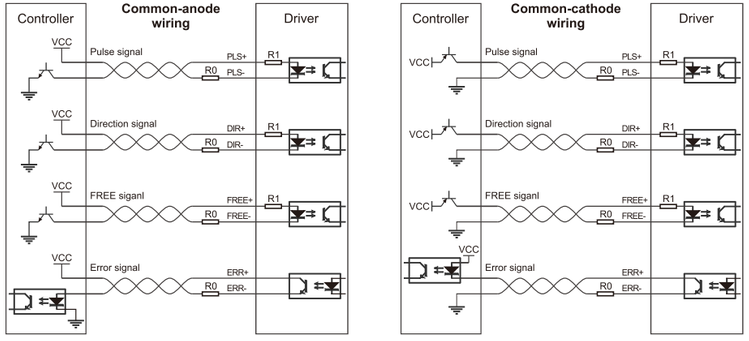
Note: Red marked driver can drive the corresponding motor, but not recommended;
3M2280N can drive the third-party motors.

Typical Wiring Diagram

1. General Connection Mode of Control Signal



2. Twisted-pair Connection Mode of Control Signal



Note: 1. For 2H1160, 3M880N, FM860, there is no need to connect 2K ohm resistor in the wiring, R0=0;
2. For 2M412, 2M420, 2M530, 2M860, 2M880N, 2M1180N, 2M2280N, 3M485, 3M2280N, 2K ohm resistor is required to be connected serially, R0=2K ohm.