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Kinco

Motion
Control
Stepper System

➔ Stepper System Catalog

- Stepper Driver
- Stepper Motor



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Stepper Motor

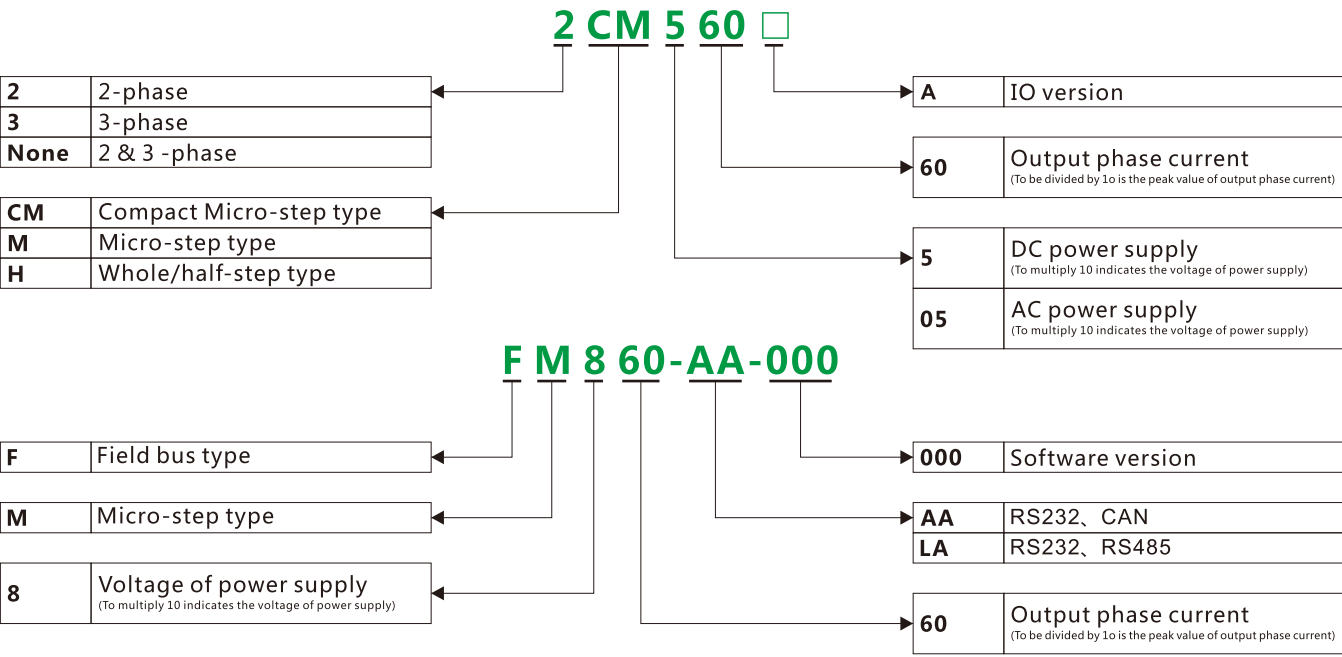
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Denomination rules/model list of stepper driver

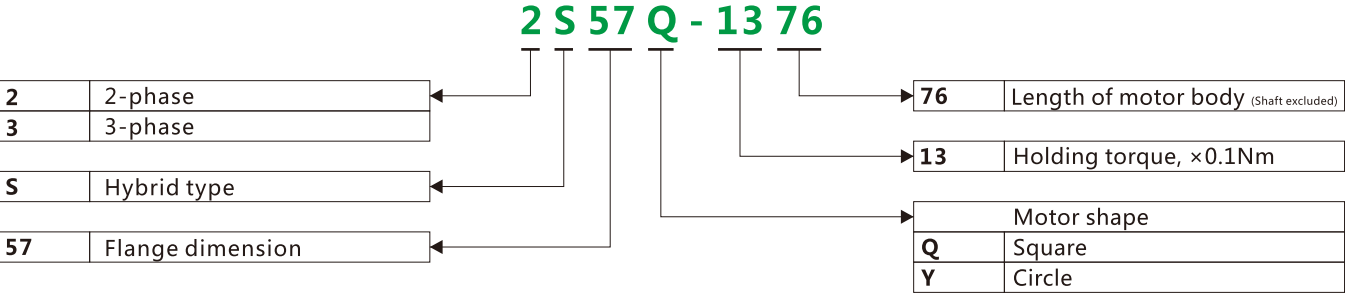
Denomination rules of stepper driver



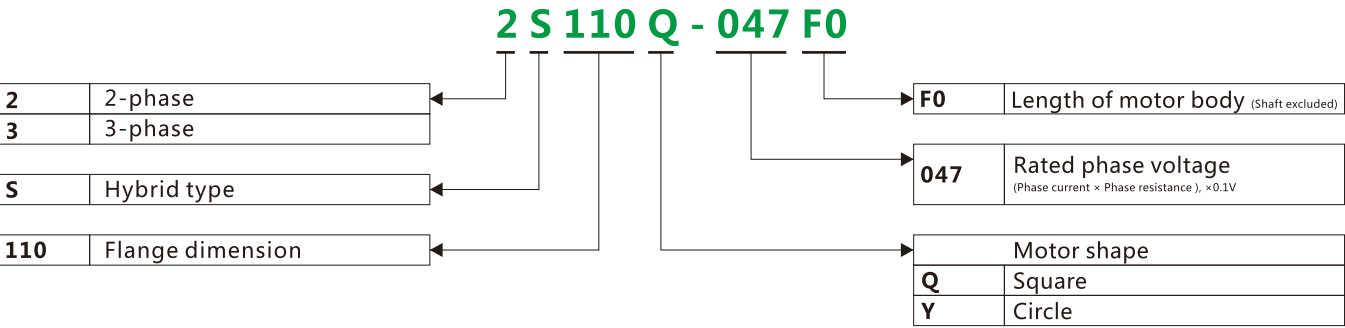
Model list of stepper driver

Series No.	Phase	Model	Peak current	Voltage	Subdivision	Weight(Kg)	Dimension(mm)
CM Series	2-phase	2CM525	0.3 ~ 2.5A	24 ~ 50VDC	200 ~ 25600	0.25	118×75.5×25.4
	2-phase	2CM545	1.0 ~ 4.5A	24 ~ 50VDC	200 ~ 25600	0.25	
	2-phase	2CM560	1.8 ~ 6A	24 ~ 50VDC	200 ~ 25600	0.25	
	2-phase	2CM860	1.8 ~ 6A	24 ~ 70VDC	200 ~ 25600	0.25	
	2-phase	2CM880	2.4 ~ 8A	24 ~ 70VDC	200 ~ 25600	0.253	118×75.5×34
	3-phase	3CM880	2.4 ~ 8A	24 ~ 70VDC	400 ~ 25600	0.253	
	2&3-phase	CM880A	0.15 ~ 8A	24 ~ 70VDC	200 ~ 65535	0.29	108×75.5×34
M Series	2-phase	2M412	0.2 ~ 1.2A	12 ~ 40VDC	400 ~ 51200	0.13	76×60×35.2
	2-phase	2H1160	2.5 ~ 6.5A	60 ~ 123VAC	200 ~ 400	1.77	200×123×86.5
	2-phase	2M1180N	4.5 ~ 8A	77 ~ 123VAC	400 ~ 25600	1.5	201×147×66
		2M2280N	4.5 ~ 8A	220VAC±15%	400 ~ 25600	1.5	
	3-phase	3M2280N	2.8 ~ 8A	220VAC±15%	400 ~ 20000	1.5	
FM Series	2&3-phase	FM860-LA-000	0.15 ~ 8A	24 ~ 70VDC	200 ~ 65535	0.36	134.5×75.5×34
		FM860-AA-000					

Denomination rules/model list of stepper motor



Phase No.	Flange	Model	Holding torque (N.m)	Phase current (A)		Phase resistance (Ω)	Phase inductance (mH)	Inertia (Kg.cm ²)	Lead No.	Shaft diameter (mm)	Shaft type	Length (mm)	Weight (Kg)	Step angle (°)
				Series	Parallel									
2-phase	42	2S42Q-0240	0.22	0.4		12.5±10%	21±20%	0.054	4	5	Without key	40	0.28	1.8
		2S42Q-0348	0.34	0.7	1.4	4.6±10%	4±20%	0.068	8	5	Without key	48	0.36	1.8
	57	2S57Q-0541	0.5	0.7	1.5	3.6±10%	4.1±20%	0.135	8	6.35	Platform	41	0.45	1.8
		2S57Q-0956	0.9	1.96	3.92	0.8±10%	1.2±20%	0.3	8	6.35	Platform	56	0.7	1.8
		2S57Q-1376	1.3	1.96	3.92	1±10%	2.1±20%	0.48	8	6.35	Platform	76	1	1.8
		2S57Q-2280	2.2	2.8	5.6	0.8±10%	1.8±20%	0.53	8	8	Platform	80	1.1	1.8
		2S57Q-25B2	2.5	2.9	6	1±10%	1.8±20%	0.8	8	8	Platform	112	1.7	1.8
	86	2S86Q-3465	3.4	6		0.3±10%	1.7±20%	1	4	13	Flat key	65	1.7	1.8
		2S86Q-4580	4.5	6		0.38±10%	3.5±20%	1.4	4	13	Flat key	80	2.3	1.8
		2S86Q-85B8	8.5	6		0.6±10%	6±20%	3.4	4	13	Flat key	118	3.7	1.8



Phase No.	Flange	Model	Holding torque (N.m)	Phase current (A)	Phase resistance (Ω)	Phase inductance (mH)	Inertia (Kg.cm ²)	Lead No.	Shaft diameter (mm)	Shaft type	Length (mm)	Weight (Kg)	Step angle (°)
2-phase	86	2S86Q-051F6	12.8	6	0.85±10%	10±20%	4	4	15.875	Flat key	156	5.3	1.8
	110	2S110Q-03999	11.7	5.5	0.7±10%	9.8±20%	5.5	4	19	Flat key	99	5	1.8
		2S110Q-047F0	21	6.5	0.72±10%	12.8±20%	10.9	4	19	Flat key	150	8.4	1.8
		2S110Q-054K1	30	8	0.67±10%	11±20%	16.2	4	19	Flat key	201	11.7	1.8
	130	2S130Y-039M0	27	6	0.65±10%	13.8±20%	33.3	4	19	Flat key	165	13	1.8
		2S130Y-063R8	40	7	0.9±10%	9.5±20%	48.4	4	19	Flat key	230	19	1.8
3-phase	57	3S57Q-04056	0.9	5.6	0.7±10%	1.7±20%	0.3	4	6.35	Without key	56	0.72	1.2
		3S57Q-04079	1.5	5.8	1.05±10%	2.4±20%	0.48	4	8	Without key	79	1	1.2
	85	3S85Q-04097	4	5.8	1.1±10%	4.6±20%	2.32	4	12	Crescent key	97	2.7	1.2
		3S85Q-040F7	7.5	4	1.78±10%	17.1±20%	0.44	4	14	Flat key	157±1	5.3	1.2

Selection table of stepper driver & motor

Control mode	Pulse control						I/O control	Pulse control					Field bus control AA: CANopen LA: RS485
Driver	2CM525	2CM545	2CM560	2CM860	2CM880	3CM880	CM880A	2M412*	2H1160*	2M1180N	2M2280N	3M2280N	FM860
Motor	2CM525	2CM545	2CM560	2CM860	2CM880	3CM880	CM880A	2M412*	2H1160*	2M1180N	2M2280N	3M2280N	FM860
2S42Q-0240	√						√	√					√
2S42Q-0348	√						√	√					√
2S57Q-0541	√						√						√
2S57Q-0956		√	√	√			√						√
2S57Q-1376		√	√	√			√						√
2S57Q-2280			√	√	√		√						√
2S57Q-25B2			√	√	√		√						√
2S86Q-3465					√		√		√	√			√
2S86Q-4580					√		√		√	√			√
2S86Q-85B8					√		√		√	√			√
2S86Q-051F6					√		√		√	√			√
2S110Q-03999									√	√	√		
2S110Q-047F0									√	√	√		
2S110Q-054K1									√	√	√		
2S130Y-039M0											√		
2S130Y-063R8											√		
3S57Q-04056						√	√						√
3S57Q-04079						√	√						√
3S85Q-04097						√	√						√
3S85Q-040F7												√	

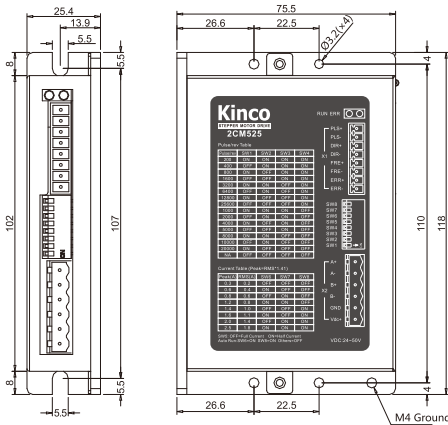
Note : √ indicates recommended motor model.
* Except 2M412 & 2H1160, other driver models could driver the third-party motors.

Stepper Driver 2CM525



- Support parameter self-adaptive function, generate optimal parameters according to motor type, ensure motor run at optimal performance;
- Phase memory function;
- Automatic half-current function, selected by DIP switches;
- Test running function, selected by DIP switches;
- Over voltage protection, over current protection functions;
- Micro-step filter function can smooth input pulse to reduce transient motion of motor, make sure motor run more smoothly;
- Opto-isolation ERR signal output with max. current of 100mA;
- Opto-isolation 5-24V pulse input, responding frequency up 400KHz;
- 15 subdivision levels and 8 current levels are selectable by DIP switches;
- Pulse type is selectable by DIP switches: PUL+DIR&CW/CCW.

Mechanical Dimensions (Unit : mm)



Function of DIP switches

Function	DIP setting	Description
PLS+DIR	SW6,SW7=ON; Others=OFF	Set DIP switches according to functions required when power off. Power on driver, RUN LED blinking in green, ERR LED is red. It means settings take effect. Then power off driver, reset subdivision and current for normal use.
CW/CCW	SW7,SW8=ON; Others=OFF	
Micro-step smooth & dynamic filter disable	SW5,SW6=ON; Others=OFF	
Micro-step smooth filter enable	SW5,SW7=ON; Others=OFF	
Micro-step dynamic filter enable	SW5,SW8=ON; Others=OFF	
Test motor parameter upon power on disable	SW6,SW7,SW8=ON; Others=OFF	Motor running @80RPM
Test motor parameter upon power on enable	SW5,SW6,SW7=ON; Others=OFF	
Test running	SW6,SW8=ON; Others=OFF	
Automatic half-current	SW5=ON	Set SW5=ON to enable automatic half-current. Phase current will reduce to half of the set value after motor stops for 1.5s

Technical Specifications

Input voltage	24 ~ 50VDC	
Overvoltage protection	85VDC	
Undervoltage protection	15VDC	
Overheat protection	80°C(Temperature of thermistor)	
Phase current(Peak)	0.3/0.6/0.8/1.2/1.4/1.6/2.0/2.5, 8 settable values in total. (Unit: A)	
Subdivision	200~25600 Pulse/rev , 15 subdivision levels in total	
Adaptable motor	42/57 series 2-phase hybird stepper motor	
Input signal	PLS (CW) 、DIR(CCW)、FREE , Input voltage : 5 ~ 24VDC , Input current : 8mA@5VDC , 12mA@24VDC	
Control mode	Pulse control : PLS+DIR , CW/CCW	
Output signal	ERR, open collector output, maximum current:100mA	
Operation indicator	Combination of RUN and ERR LED indicates different status	
Protection circuit	Over voltage, under voltage, over current, over heat	
Cooling method	Nature air cooling	
Environment	Operation environment	Avoid environment with great amount of metallic powder, oil mist, or erosive gases
	Operation humidity	<85%, RH(Non-condensing or water drops)
	Operation temperature	0°C ~ +40°C
	Storage temperature	-20°C ~ +70°C
Weight(Net)	0.25kg	
Dimensions	118×75.5×25.4 mm (Toothless heat sink)	
Ingress protection	IP20	

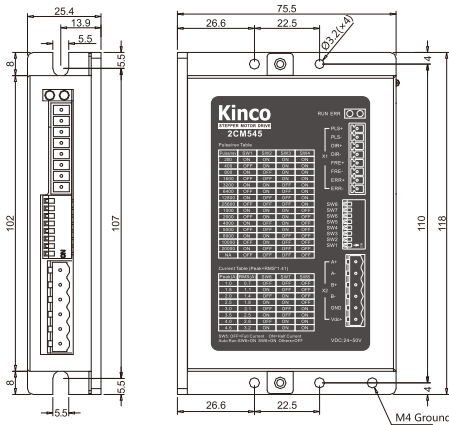
Subdivision setting (Unit:PULSE/REV)					Current setting (Unit: A)				
SW1	SW2	SW3	SW4=ON	SW4=OFF	SW6	SW7	SW8	RMS	Peak
ON	ON	ON	200	1000	ON	ON	ON	1.8	2.5
OFF	ON	ON	400	2000	OFF	ON	ON	1.4	2
ON	OFF	ON	800	4000	ON	OFF	ON	1.1	1.6
OFF	OFF	ON	1600	5000	OFF	OFF	ON	1	1.4
ON	ON	OFF	3200	8000	ON	ON	OFF	0.8	1.2
OFF	ON	OFF	6400	10000	OFF	ON	OFF	0.6	0.8
ON	OFF	OFF	12800	20000	ON	OFF	OFF	0.4	0.6
OFF	OFF	OFF	25600	NA	OFF	OFF	OFF	0.2	0.3

Stepper Driver 2CM545



- Support parameter self-adaptive function, generate optimal parameters according to motor type, ensure motor run at optimal performance;
- Phase memory function;
- Automatic half-current function, selected by DIP switches;
- Test running function, selected by DIP switches;
- Over voltage protection, over current protection functions;
- Micro-step filter function can smooth input pulse to reduce transient motion of motor, make sure motor run more smoothly;
- Opto-isolation ERR signal output with max. current of 100mA;
- Opto-isolation 5-24V pulse input, responding frequency up 400KHz;
- 15 subdivision levels and 8 current levels are selectable by DIP switches;
- Pulse type is selectable by DIP switches: PUL+DIR&CW/CCW.

Mechanical Dimensions (Unit : mm)



Function of DIP switches

Function	DIP setting	Description
PLS+DIR	SW6,SW7=ON; Others=OFF	Set DIP switches according to functions required when power off. Power on driver, RUN LED blinking in green, ERR LED is red. It means settings take effect. Then power off driver, reset subdivision and current for normal use.
CW/CCW	SW7,SW8=ON; Others=OFF	
Micro-step smooth & dynamic filter disable	SW5,SW6=ON; Others=OFF	
Micro-step smooth filter enable	SW5,SW7=ON; Others=OFF	
Micro-step dynamic filter enable	SW5,SW8=ON; Others=OFF	
Test motor parameter upon power on disable	SW6,SW7,SW8=ON; Others=OFF	Motor running @80RPM
Test motor parameter upon power on enable	SW5,SW6,SW7=ON; Others=OFF	
Test running	SW6,SW8=ON; Others=OFF	
Automatic half-current	SW5=ON	Set SW5=ON to enable automatic half-current. Phase current will reduce to half of the set value after motor stops for 1.5s

Technical Specifications

Input voltage	24 ~ 50VDC	
Overvoltage protection	85VDC	
Undervoltage protection	15VDC	
Overheat protection	85°C(Temperature of thermistor)	
Phase current(Peak)	1/1.5/2/2.5/3/3.5/4/4.5, 8 settable values in total. (Unit: A)	
Subdivision	200~25600 Pulse/rev , 15 subdivision levels in total	
Adaptable motor	57 series 2-phase hybrid stepper motor	
Input signal	PLS (CW) 、DIR(CCW)、FREE , Input voltage : 5 ~ 24VDC , Input current : 8mA@5VDC , 12mA@24VDC	
Control mode	Pulse control : PLS+DIR , CW/CCW	
Output signal	ERR, open collector output, maximum current:100mA	
Operation indicator	Combination of RUN and ERR LED indicates different status	
Protection circuit	Over voltage, under voltage, over current, over heat	
Cooling method	Nature air cooling	
Environment	Operation environment	Avoid environment with great amount of metallic powder, oil mist, or erosive gases
	Operation humidity	<85%, RH(Non-condensing or water drops)
	Operation temperature	0°C ~ +40°C
	Storage temperature	-20°C ~ +70°C
Weight(Net)	0.25kg	
Dimensions	118×75.5×25.4 mm (Toothless heat sink)	
Ingress protection	IP20	

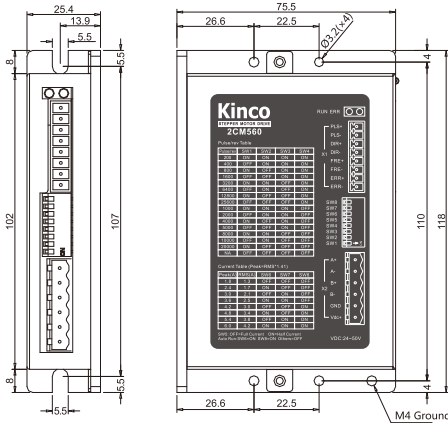
Subdivision setting (Unit:PULSE/REV)					Current setting (Unit: A)				
SW1	SW2	SW3	SW4=ON	SW4=OFF	SW6	SW7	SW8	RMS	Peak
ON	ON	ON	200	1000	ON	ON	ON	3.2	4.5
OFF	ON	ON	400	2000	OFF	ON	ON	2.8	4
ON	OFF	ON	800	4000	ON	OFF	ON	2.5	3.5
OFF	OFF	ON	1600	5000	OFF	OFF	ON	2.1	3
ON	ON	OFF	3200	8000	ON	ON	OFF	1.8	2.5
OFF	ON	OFF	6400	10000	OFF	ON	OFF	1.4	2
ON	OFF	OFF	12800	20000	ON	OFF	OFF	1.1	1.5
OFF	OFF	OFF	25600	NA	OFF	OFF	OFF	0.7	1

Stepper Driver 2CM560



- Support parameter self-adaptive function, generate optimal parameters according to motor type, ensure motor run at optimal performance;
- Phase memory function;
- Automatic half-current function, selected by DIP switches;
- Test running function, selected by DIP switches;
- Over voltage protection, over current protection functions;
- Micro-step filter function can smooth input pulse to reduce transient motion of motor, make sure motor run more smoothly;
- Opto-isolation ERR signal output with max. current of 100mA;
- Opto-isolation 5-24V pulse input, responding frequency up 400KHz;
- 15 subdivision levels and 8 current levels are selectable by DIP switches;
- Pulse type is selectable by DIP switches: PUL+DIR&CW/CCW.

Mechanical Dimensions (Unit : mm)



Function of DIP switches

Function	DIP setting	Description
PLS+DIR	SW6,SW7=ON; Others=OFF	Set DIP switches according to functions required when power off. Power on driver, RUN LED blinking in green, ERR LED is red. It means settings take effect. Then power off driver, reset subdivision and current for normal use.
CW/CCW	SW7,SW8=ON; Others=OFF	
Micro-step smooth & dynamic filter disable	SW5,SW6=ON; Others=OFF	
Micro-step smooth filter enable	SW5,SW7=ON; Others=OFF	
Micro-step dynamic filter enable	SW5,SW8=ON; Others=OFF	
Test motor parameter upon power on disable	SW6,SW7,SW8=ON; Others=OFF	Motor running @80RPM
Test motor parameter upon power on enable	SW5,SW6,SW7=ON; Others=OFF	
Test running	SW6,SW8=ON; Others=OFF	
Automatic half-current	SW5=ON	Set SW5=ON to enable automatic half-current. Phase current will reduce to half of the set value after motor stops for 1.5s

Technical Specifications

Input voltage	24 ~ 50VDC	
Overvoltage protection	85VDC	
Undervoltage protection	15VDC	
Overheat protection	80°C(Temperature of thermistor)	
Phase current(Peak)	1.8/2.4/3/3.6/4.2/4.8/5.4/6, 8 settable values in total. (Unit: A)	
Subdivision	200~25600 Pulse/rev , 15 subdivision levels in total	
Adaptable motor	57 series 2-phase hybrid stepper motor	
Input signal	PLS、 DIR、 FREE , Input voltage : 5 ~ 24VDC , Input current : 8mA@5VDC , 12mA@24VDC	
Control mode	Pulse control : PLS+DIR , CW/CCW	
Output signal	ERR, open collector output, maximum current:100mA	
Operation indicator	Combination of RUN and ERR LED indicates different status	
Protection circuit	Over voltage, under voltage, over current, over heat	
Cooling method	Nature air cooling	
Environment	Operation environment	Avoid environment with great amount of metallic powder, oil mist, or erosive gases
	Operation humidity	<85%, RH(Non-condensing or water drops)
	Operation temperature	0°C ~ +40°C
	Storage temperature	-20°C ~ +70°C
Weight(Net)	0.25kg	
Dimensions	118×75.5×25.4 mm (Toothless heat sink)	
Ingress protection	IP20	

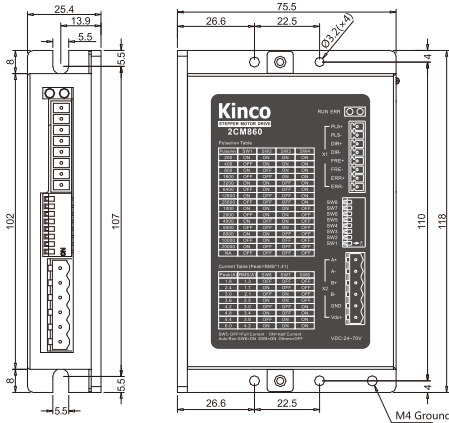
Subdivision setting (Unit:PULSE/REV)					Current setting (Unit: A)				
SW1	SW2	SW3	SW4=ON	SW4=OFF	SW6	SW7	SW8	RMS	Peak
ON	ON	ON	200	1000	ON	ON	ON	4.2	6
OFF	ON	ON	400	2000	OFF	ON	ON	3.8	5.4
ON	OFF	ON	800	4000	ON	OFF	ON	3.4	4.8
OFF	OFF	ON	1600	5000	OFF	OFF	ON	3	4.2
ON	ON	OFF	3200	8000	ON	ON	OFF	2.5	3.6
OFF	ON	OFF	6400	10000	OFF	ON	OFF	2.1	3
ON	OFF	OFF	12800	20000	ON	OFF	OFF	1.7	2.4
OFF	OFF	OFF	25600	NA	OFF	OFF	OFF	1.3	1.8

Stepper Driver 2CM860



- Support parameter self-adaptive function, generate optimal parameters according to motor type, ensure motor run at optimal performance;
- Phase memory function;
- Automatic half-current function, selected by DIP switches;
- Test running function, selected by DIP switches;
- Over voltage protection, over current protection functions;
- Micro-step filter function can smooth input pulse to reduce transient motion of motor, make sure motor run more smoothly;
- Opto-isolation ERR signal output with max. current of 100mA;
- Opto-isolation 5-24V pulse input, responding frequency up 400KHz;
- 15 subdivision levels and 8 current levels are selectable by DIP switches;
- Pulse type is selectable by DIP switches: PUL+DIR&CW/CCW.

Mechanical Dimensions (Unit : mm)



Function of DIP switches

Function	DIP setting	Description
PLS+DIR	SW6,SW7=ON; Others=OFF	Set DIP switches according to functions required when power off. Power on driver, RUN LED blinking in green, ERR LED is red. It means settings take effect. Then power off driver, reset subdivision and current for normal use.
CW/CCW	SW7,SW8=ON; Others=OFF	
Micro-step smooth & dynamic filter disable	SW5,SW6=ON; Others=OFF	
Micro-step smooth filter enable	SW5,SW7=ON; Others=OFF	
Micro-step dynamic filter enable	SW5,SW8=ON; Others=OFF	
Test motor parameter upon power on disable	SW6,SW7,SW8=ON; Others=OFF	Motor running @80RPM
Test motor parameter upon power on enable	SW5,SW6,SW7=ON; Others=OFF	
Test running	SW6,SW8=ON; Others=OFF	
Automatic half-current	SW5=ON	Set SW5=ON to enable automatic half-current. Phase current will reduce to half of the set value after motor stops for 1.5s

Technical Specifications

Input voltage	24 ~ 70VDC	
Overvoltage protection	85VDC	
Undervoltage protection	15VDC	
Overheat protection	80℃(Temperature of thermistor)	
Phase current(Peak)	1.8/2.4/3/3.6/4.2/4.8/5.4/6, 8 settable values in total. (Unit: A)	
Subdivision	200~25600 Pulse/rev , 15 subdivision levels in total	
Adaptable motor	57 series 2-phase hybrid stepper motor	
Input signal	PLS、DIR、FREE , Input voltage : 5 ~ 24VDC , Input current : 8mA@5VDC , 12mA@24VDC	
Control mode	Pulse control : PLS+DIR , CW/CCW	
Output signal	ERR, open collector output, maximum current:100mA	
Operation indicator	Combination of RUN and ERR LED indicates different status	
Protection circuit	Over voltage, under voltage, over current, over heat	
Cooling method	Nature air cooling	
Environment	Operation environment	Avoid 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)	0.25kg	
Dimensions	118×75.5×25.4 mm (Toothless heat sink)	
Ingress protection	IP20	

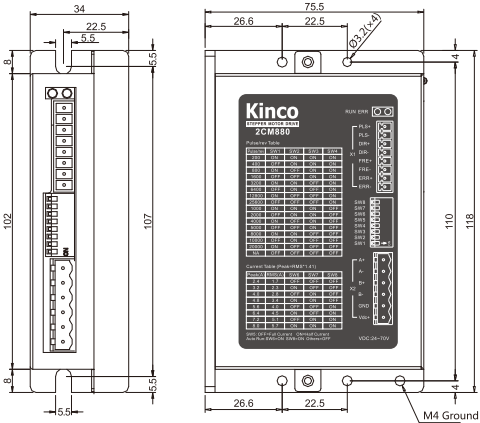
Subdivision setting (Unit:PULSE/REV)					Current setting (Unit: A)				
SW1	SW2	SW3	SW4=ON	SW4=OFF	SW6	SW7	SW8	RMS	Peak
ON	ON	ON	200	1000	ON	ON	ON	4.2	6
OFF	ON	ON	400	2000	OFF	ON	ON	3.8	5.4
ON	OFF	ON	800	4000	ON	OFF	ON	3.4	4.8
OFF	OFF	ON	1600	5000	OFF	OFF	ON	3	4.2
ON	ON	OFF	3200	8000	ON	ON	OFF	2.5	3.6
OFF	ON	OFF	6400	10000	OFF	ON	OFF	2.1	3
ON	OFF	OFF	12800	20000	ON	OFF	OFF	1.7	2.4
OFF	OFF	OFF	25600	NA	OFF	OFF	OFF	1.3	1.8

Stepper Driver 2CM880



- Support parameter self-adaptive function, generate optimal parameters according to motor type, ensure motor run at optimal performance;
- Phase memory function;
- Automatic half-current function, selected by DIP switches;
- Test running function, selected by DIP switches;
- Over voltage protection, over current protection functions;
- Micro-step filter function can smooth input pulse to reduce transient motion of motor, make sure motor run more smoothly;
- Opto-isolation ERR signal output with max. current of 100mA;
- Opto-isolation 5-24V pulse input, responding frequency up 400KHz;
- 15 subdivision levels and 8 current levels are selectable by DIP switches;
- Pulse type is selectable by DIP switches: PUL+DIR&CW/CCW.

Mechanical Dimensions (Unit : mm)



Function of DIP switches

Function	DIP setting	Description
PLS+DIR	SW6,SW7=ON; Others=OFF	Set DIP switches according to functions required when power off. Power on driver, RUN LED blinking in green, ERR LED is red. It means settings take effect. Then power off driver, reset subdivision and current for normal use.
CW/CCW	SW7,SW8=ON; Others=OFF	
Micro-step smooth & dynamic filter disable	SW5,SW6=ON; Others=OFF	
Micro-step smooth filter enable	SW5,SW7=ON; Others=OFF	
Micro-step dynamic filter enable	SW5,SW8=ON; Others=OFF	
Test motor parameter upon power on disable	SW6,SW7,SW8=ON; Others=OFF	Motor running @80RPM
Test motor parameter upon power on enable	SW5,SW6,SW7=ON; Others=OFF	
Test running	SW6,SW8=ON; Others=OFF	
Automatic half-current	SW5=ON	Set SW5=ON to enable automatic half-current. Phase current will reduce to half of the set value after motor stops for 1.5s

Technical Specifications

Input voltage	24 ~ 70VDC	
Overvoltage protection	85VDC	
Undervoltage protection	15VDC	
Overheat protection	80°C(Temperature of thermistor)	
Phase current(Peak)	2.4/3.2/4/4.8/5.6/6.4/7.2/8, 8 settable values in total. (Unit: A)	
Subdivision	200~25600 Pulse/rev , 15 subdivision levels in total	
Adaptable motor	57/86 series 2-phase hybrid stepper motor	
Input signal	PLS、 DIR、 FREE , Input voltage : 5 ~ 24VDC , Input current : 8mA@5VDC , 12mA@24VDC	
Control mode	Pulse control : PLS+DIR , CW/CCW	
Output signal	ERR, open collector output, maximum current:100mA	
Operation indicator	Combination of RUN and ERR LED indicates different status	
Protection circuit	Over voltage, under voltage, over current, over heat	
Cooling method	Nature air cooling	
Environment	Operation environment	Avoid environment with great amount of metallic powder, oil mist, or erosive gases
	Operation humidity	<85%, RH(Non-condensing or water drops)
	Operation temperature	0°C ~ +40°C
	Storage temperature	-20°C ~ +70°C
Weight(Net)	0.253kg	
Dimensions	118×75.5×34 mm (Toothed heat sink)	
Ingress protection	IP20	

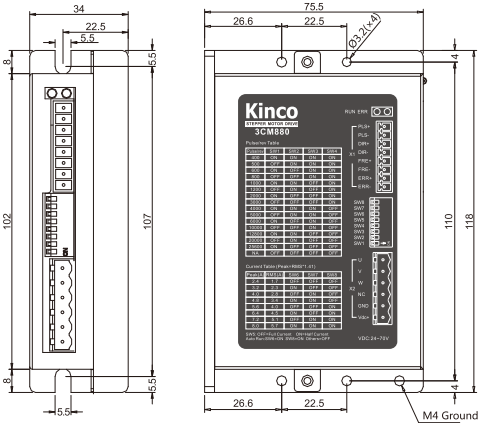
Subdivision setting (Unit:PULSE/REV)					Current setting (Unit: A)				
SW1	SW2	SW3	SW4=ON	SW4=OFF	SW6	SW7	SW8	RMS	Peak
ON	ON	ON	200	1000	ON	ON	ON	5.7	8
OFF	ON	ON	400	2000	OFF	ON	ON	5.1	7.2
ON	OFF	ON	800	4000	ON	OFF	ON	4.5	6.4
OFF	OFF	ON	1600	5000	OFF	OFF	ON	4	5.6
ON	ON	OFF	3200	8000	ON	ON	OFF	3.4	4.8
OFF	ON	OFF	6400	10000	OFF	ON	OFF	2.8	4
ON	OFF	OFF	12800	20000	ON	OFF	OFF	2.3	3.2
OFF	OFF	OFF	25600	NA	OFF	OFF	OFF	1.7	2.4

Stepper Driver 3CM880



- Support parameter self-adaptive function, generate optimal parameters according to motor type, ensure motor run at optimal performance;
- Phase memory function;
- Automatic half-current function, selected by DIP switches;
- Test running function, selected by DIP switches;
- Over voltage protection, over current protection functions;
- Micro-step filter function can smooth input pulse to reduce transient motion of motor, make sure motor run more smoothly;
- Opto-isolation ERR signal output with max. current of 100mA;
- Opto-isolation 5-24V pulse input, responding frequency up 400KHz;
- 15 subdivision levels and 8 current levels are selectable by DIP switches;
- Pulse type is selectable by DIP switches: PUL+DIR&CW/CCW.

Mechanical Dimensions (Unit : mm)



Function of DIP switches

Function	DIP setting	Description
PLS+DIR	SW6,SW7=ON; Others=OFF	Set DIP switches according to functions required when power off. Power on driver, RUN LED blinking in green, ERR LED is red. It means settings take effect. Then power off driver, reset subdivision and current for normal use.
CW/CCW	SW7,SW8=ON; Others=OFF	
Micro-step smooth & dynamic filter disable	SW5,SW6=ON; Others=OFF	
Micro-step smooth filter enable	SW5,SW7=ON; Others=OFF	
Micro-step dynamic filter enable	SW5,SW8=ON; Others=OFF	
Test motor parameter upon power on disable	SW6,SW7,SW8=ON; Others=OFF	Motor running @80RPM
Test motor parameter upon power on enable	SW5,SW6,SW7=ON; Others=OFF	
Test running	SW6,SW8=ON; Others=OFF	
Automatic half-current	SW5=ON	Set SW5=ON to enable automatic half-current. Phase current will reduce to half of the set value after motor stops for 1.5s

Technical Specifications

Input voltage	24 ~ 70VDC	
Overvoltage protection	85VDC	
Undervoltage protection	15VDC	
Overheat protection	80°C(Temperature of thermistor)	
Phase current(Peak)	2.4/3.2/4/4.8/5.6/6.4/7.2/8, 8 settable values in total. (Unit: A)	
Subdivision	400~25600 Pulse/rev , 15 subdivision levels in total	
Adaptable motor	3-phase hybrid stepper motor	
Input signal	PLS、 DIR、 FREE , Input voltage : 5 ~ 24VDC , Input current : 8mA@5VDC , 12mA@24VDC	
Control mode	Pulse control : PLS+DIR , CW/CCW	
Output signal	ERR, open collector output, maximum current:100mA	
Operation indicator	Combination of RUN and ERR LED indicates different status	
Protection circuit	Over voltage, under voltage, over current, over heat	
Cooling method	Nature air cooling	
Environment	Operation environment	Avoid environment with great amount of metallic powder, oil mist, or erosive gases
	Operation humidity	<85%, RH(Non-condensing or water drops)
	Operation temperature	0°C ~ +40°C
	Storage temperature	-20°C ~ +70°C
Weight(Net)	0.253kg	
Dimensions	118×75.5×34 mm (Toothed heat sink)	
Ingress protection	IP20	

Subdivision setting (Unit:PULSE/REV)					Current setting (Unit: A)				
SW1	SW2	SW3	SW4=ON	SW4=OFF	SW6	SW7	SW8	RMS	Peak
ON	ON	ON	400	4000	ON	ON	ON	5.7	8
OFF	ON	ON	500	5000	OFF	ON	ON	5.1	7.2
ON	OFF	ON	600	6000	ON	OFF	ON	4.5	6.4
OFF	OFF	ON	800	10000	OFF	OFF	ON	4	5.6
ON	ON	OFF	1000	12800	ON	ON	OFF	3.4	4.8
OFF	ON	OFF	1200	20000	OFF	ON	OFF	2.8	4
ON	OFF	OFF	2000	25600	ON	OFF	OFF	2.3	3.2
OFF	OFF	OFF	3000	NA	OFF	OFF	OFF	1.7	2.4

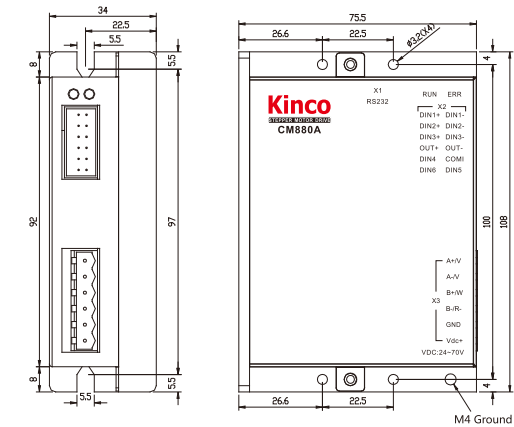
Stepper Driver CM880A

Stepper Driver 2M412



- 6 opto-isolation digital signal input channels, 3 channels support voltage range 5~24VDC;
- 1 opto-isolation digital signal output channel, max current 100mA;
- Support CW/CCW, PLS+DIR, A+B phase signal;
- Multiple IO functions, supporting homing, multi-speed, multi-position and so on;
- Support motor parameter self-adaptive, self-defined shalf lock current, self-defined micro-step filter function;
- Powerful protection function: over voltage, under voltage, over heat, over current protection;
- Support RS232 communication, parameter settings via KincoStep software.

Mechanical Dimensions (Unit : mm)



Technical Specifications

Input voltage	24 ~ 70VDC
Over voltage protection	85VDC
Under voltage protection	15VDC
Output current	0.15 ~ 8A (Peak)
Subdivision	Set by "KincoStep" software
Adaptable motor	2-phase & 3-phase hybird stepper motor
Control mode	I/O control ; Pulse control : PLS+DIR, CW/CCW, A+B phase
Cooling method	Nature air cooling
Operation environment	Avoid environment with great amount of metallic powder, oil mist, or erosive gases.
Environment humidity	<85%, RH (Non-condensing or water drops)
Environment temperature	0℃ ~ +40℃
Storage temperature	-20℃ ~ +70℃
Weight(Net)	0.29kg
Dimensions	108×75.5×34 mm (Toothed heat sink)
Ingress protection	IP20

Interface Introduction

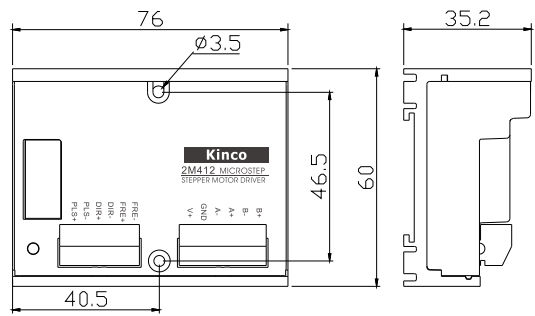
Interface			Function
X1	RS232		RS232 interface
X2 IO interface	DIN1+	DIN1 positive input	Input voltage : 5 ~ 24VDC Input current : 8mA@5VDC , 12mA@24VDC Valid input signal : >3VDC Invalid input signal : <1VDC
	DIN1-	DIN1 negative input	
	DIN2+	DIN2 positive input	
	DIN2-	DIN2 negative input	
	DIN3+	DIN3 positive input	
	DIN3-	DIN3 negative input	
	DIN4	DIN4 input	Input voltage : 12 ~ 24VDC Input current : 4mA@12VDC , 8mA@24VDC Valid input signal : >8VDC Invalid input signal : <5VDC
	DIN5	DIN5 input	
	DIN6	DIN6 input	
	COMI	COM of DIN4, DIN5, DIN6	
	OUT+	OUT positive input	Max. output current : 100mA Max. voltage drop : 0.8VDC@100mA Max. withstand voltage : 30VDC
	OUT-	OUT negative input	

Note: (1) DIN1&DIN2 adopt high-speed opto-coupler, max. input frequency is 400KHz, min. pulse width is 1us.
(2) DIN3~6 adopt low-speed opto-coupler, max. input frequency is 10KHz.
(3) OUT adopts low-speed opto-coupler, max. output frequency is 1KHz



- 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

Function of DIP switches

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.

Front view of the DIP switches:



No.	ON	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 DIP switch is forbidden setting as N/A.

Current setting

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.

Front view of the DIP switches:



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

Precaution!

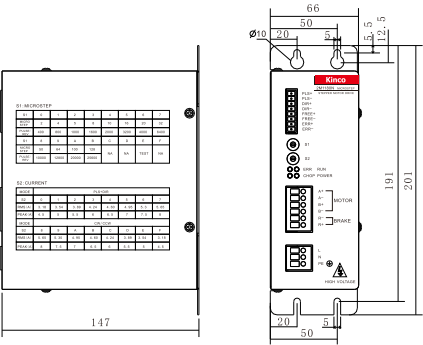
It supports control signal voltage of 5VDC. When the voltage of control signal is 24VDC, then users should add a 2kohm resistor in the connection.

Stepper Driver 2M1180N



- 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.

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	

Technical Specifications

Input voltage	77~123VAC, (50Hz)	
Over-voltage protection	187VDC	
Under-voltage protection	85VDC	
Output current	4.5 / 5 / 5.5 / 6 / 6.5 / 7 / 7.5 / 8, 8 settable values in total. (Unit: A)	
Micro step	2/ 4/ 5/ 8/ 10/ 16/ 20/ 32/ 50/ 64/ 100/ 128, total 12 subdivisions.	
Adaptable motor	57/86/110 series 2-phase bipolar hybrid stepper motors	
Input signal	PLS(CW), DIR(CCW), A/B, FREE; Current range: 6~16mA	
Control mode	Pulse control : PLS+DIR, CW/CCW, A+B	
Output signal	ERR, open collector output, maximum current:10mA	
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°C ~ +40°C
	Storage temperature	-20°C ~ +70°C
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.

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				
Pulse/rev	10000	12800	20000	25600	NA	NA	TEST	NA

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

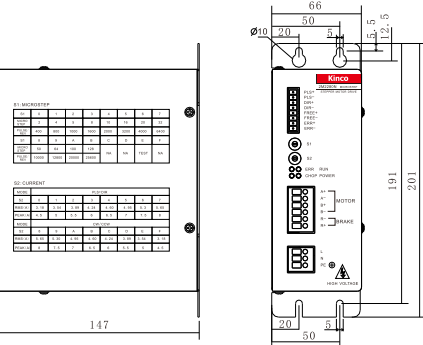
* DIP switch is forbidden to set as N/A, or the driver will be alarm automatically.

Stepper Driver 2M2280N



- 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.

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	

Technical Specifications

Input voltage	220VAC ±15%(50Hz) (187~253VAC)	
Over-voltage protection	395VDC	
Under-voltage protection	200VDC	
Output current	4.5 / 5 / 5.5 / 6A / 6.5 / 7 / 7.5 / 8, 8 settable values in total. (Unit: A)	
Micro step	2/ 4/ 5/ 8/ 10/ 16/ 20/ 32/ 50/ 64/ 100/ 128, total 12 subdivisions.	
Adaptable motor	110/ 130 series 2-phase bipolar hybrid stepper motors	
Input signal	PLS(CW), DIR(CCW), A/B, FREE; Current range: 6~16mA	
Control mode	Pulse control : PLS+DIR, CW/CCW, A+B	
Output signal	ERR, open collector output, maximum current:10mA	
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°C ~ +40°C
	Storage temperature	-20°C ~ +70°C
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.

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				
Pulse/rev	10000	12800	20000	25600	NA	NA	TEST	NA

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

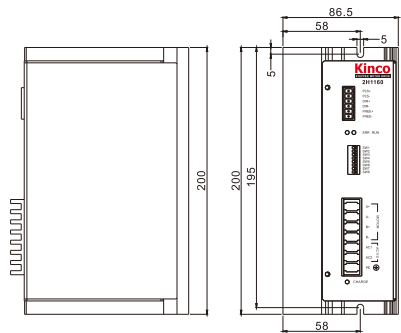
* DIP switch is forbidden to set as N/A, or the driver will be alarm automatically.

Stepper Driver 2H1160



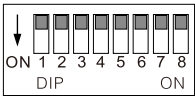
- Power supply: 60VAC~123VAC;
- Bipolar constant current drive mode is adopted, with phase current up to 6.5A. 86 &110 series bipolar hybrid stepper motors are adaptable;
- Dedicated control chip is adopted, full-step or half-step mode are selectable by DIP switches, suitable for application requiring high speed and high torque;
- Output phase current is selectable by DIP switches to match motors of different specifications;
- Automatic half-current is settable by DIP switches when motor is standstill locked, which could greatly reduce of motors;
- Support offline function to cut of current output if necessary;
- Opto couplers are used for the control signal circuit to reduce external interference.

Mechanical Dimensions (Unit : mm)



Function of DIP switches

Front view of the DIP switches:



No.	ON	OFF	Remarks
DIP1~DIP5	Set current	Set current	
DIP6	Half-current valid	Half-current invalid	
DIP7	Half-step 400 steps/round	Full-step 200 steps/round	

Precaution!



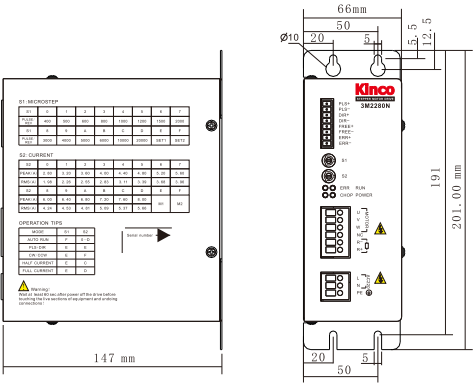
Control signal range is 5~24VDC. No need to add 2Kohm resistor when control signal is 24VDC.

Stepper Driver 3M2280N



- 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.

Mechanical Dimensions (Unit : mm)



Technical Specifications

Input voltage	220V AC±15% (50Hz)
Over-voltage protection	395VDC
Under-voltage protection	200VDC
Overheat protection	80°C(Temperature of thermistor)
Phase current	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, 14 settable values in total. (Unit: A)
Micro step	400~30000 pulse/rev, total 14 subdivisions
Adaptable motor	110 / 130 series 3-phase hybrid stepper motor
Input signal	PLS(CW) / DIR(CCW) / FREE; current range: 6 ~16mA
Control signal mode	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 Operation humidity: <85%, RH (non-condensing or water drops) Operation temperature: 0°C ~ +40°C Storage temperature: -20°C ~ +70°C
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

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
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		

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.

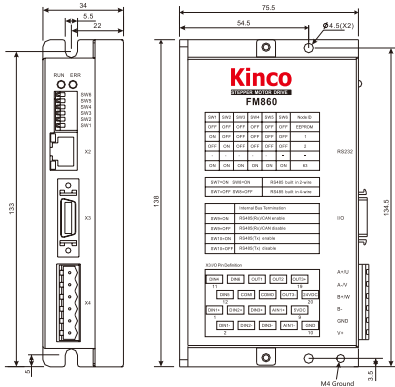
CAN Bus Stepper Driver FM860

Power supply module PFC100-65



- 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 or 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

Model	FM860-AA-000 (Supports CANopen) FM860-LA-000 (Support RS485 Modbus)
Input voltage	24 ~ 70VDC
Over-voltage protection	85V
Under-voltage protection	15V
Phase current (Peak)	0.15 ~ 8A
Subdivision	Set by "KincoStep" software
Adaptable motor	42/57/86 series 2-phase or 57/85 series 3-phase hybrid stepper motor
Control mode	CANopen or Modbus control; I/O control; Analog input Pulse control : 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°C ~ +40°C
Storage temperature	-20°C~ +70°C
Weight	0.36Kg
Dimensions	134.5x 75.5 x 34mm
Ingress protection	IP20

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

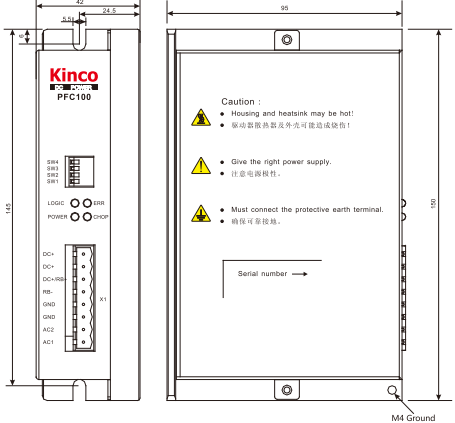
Introduction of Interface

Interface	Symbol	Function
X1 (Field Bus)	SW7~SW8	Switches for setting 2-wire or 4-wire RS485
	SW9~SW10	Switches for terminal resistor setting
ID DIP	SW1~SW6	ID rotary switch
X2	RS232	RS232 interface
X3 (IO)	DIN1+	DIN1 positive
	DIN1-	DIN1 negative
	DIN2+	DIN2 positive
	DIN2-	DIN2 negative
	DIN3+	DIN3 positive
	DIN3-	DIN3 negative
	DIN4	DIN4 input
	DIN5	DIN5 input
	DIN6	DIN6 input
	COM1	Common port of DIN4, DIN5, DIN6
	AIN1+	AIN1 differential signal positive
	AIN1-	AIN1 differential signal negative
	GND	Common port of AIN1 and logic power supply
	5VDC	5VDC Logic power output
	24VDC	24VDC Logic power input
	OUT1	OUT1 output
	OUT2	OUT2 output
	COMO	Common port of OUT1 and OUT2
	OUT3+	OUT3 positive
	OUT3-	OUT3 negative



- Built-in boost circuit ensures output 65V even when external voltage is too low;
- Built-in absorption circuit could discharge reverse electromotive force of motor;
- Over heat alarm function: when the internal temperature reach to 86°C, it will trigger over heat alarm. The boost and absorption function will be closed;
- Over voltage protection: once output voltage exceeds 68V, the boost function will be closed.

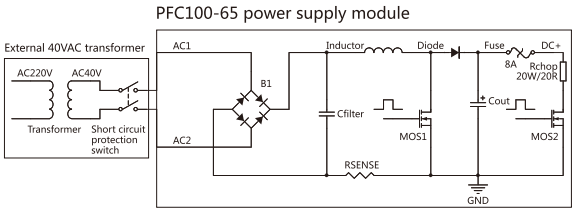
Mechanical Dimensions (Unit : mm)



Technical Specifications

Model name	PFC100-65
Matched transformer	T400-40 (Input 220VAC 50Hz, Output 40V, 10A)
Rated voltage	40VAC
PFC action voltage	35VAC
Rated output voltage	DC 65V ± 10%
Rated output power	300W
η (Vin=40Vac)	90%
Power factor	0.99
Over voltage protection	DC 68V
Internal over heat protection	>85°C (Temperature of thermistor)
Absorption voltage	75V , 81V , 84V ±3V
Allowable absorption time	Absorption time: 150ms; Duty:6%
Cooling method	Natural air cooling
Operation environment	Avoid the environment with a great amount of metallic powder, oil mist, or erosive gases.
Environment temperature	0°C ~ +40°C
Environment humidity	<85%, RH(non-condensing or water drops)
Storage temperature	-20°C~ +70°C
Weight (Net)	0.603Kg

Typical Wiring Diagram

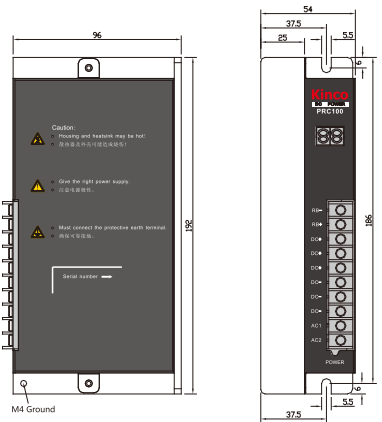


Power supply module PRC100

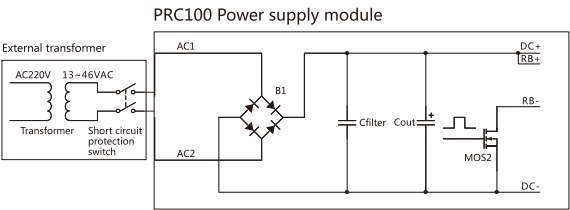


- Output voltage displayed by LEDs;
- Built-in absorption circuit, requiring external absorption resistor;
- Built-in rectifier filter circuit.

Mechanical Dimensions (Unit : mm)



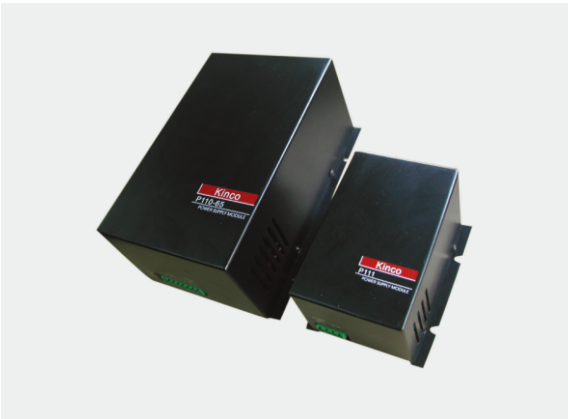
Typical Wiring Diagram



Technical Specifications

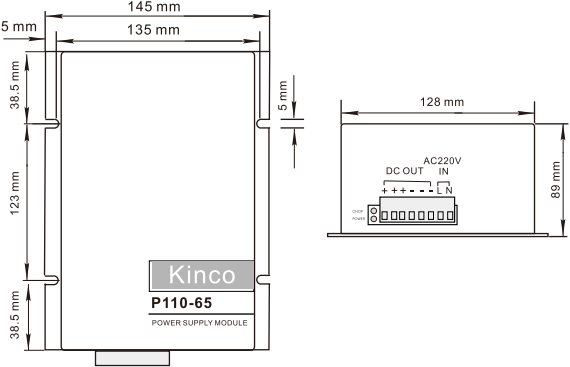
Model name	PRC100
Matched transformer	T1300-46(Input220VAC 50Hz, Output46V 28.5A)
Input voltage range	13~46VAC 50Hz
Input AC current	24A
Output DC voltage	18~65V DC
Max. output current	13A
Braking action voltage	77V
Braking close voltage	70V
Cooling method	Natural air cooling
Operation environment	Avoid the environment with a great amount of metallic powder, oil mist, or erosive gases.
Environment temperature	0°C ~ +40°C
Environment humidity	<85%, RH(non-condensing or water drops)
Storage temperature	-20°C~ +70°C
Weight(Net)	1.046Kg

Power supply module P110-65

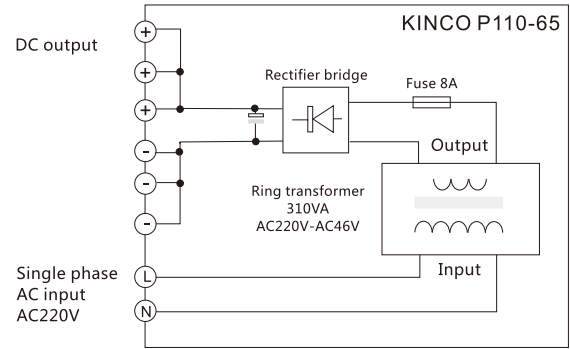


- Absorb reverse electromotive force of motor;
- Output will be cut off once output voltage exceeds 90V(Fuse burn-out);
- Operation temperature:0~45°C;
- Operation humidity:20~90%RH(Non-condensing);
- Strong and beautiful metal shell is with good protective effect and easy for installation.

Mechanical Dimensions (Unit : mm)



Typical Wiring Diagram



Description:

1. Greed indicator indicates power supply works normally. The power supply maybe faulty if the greed indicator is off;
2. The red indicator blinks or is normal on indicates the absorption circuit is absorbing regenerated energy. The red indicator is off during power supply normal work.

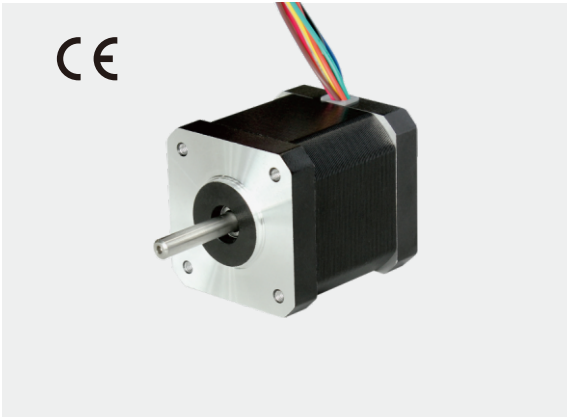
Technical Specifications

Model name	P110-65
Input voltage	AC220V/50Hz
Output voltage	DC65V
Max. output power	200W(Continuous) , Transient 310W

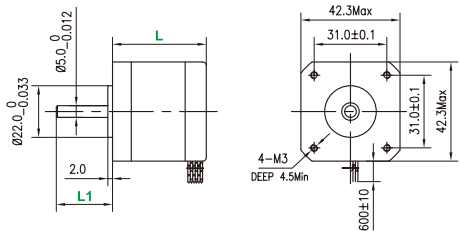
Precaution!

1. If the red indicator is normal on after power on, please cut off immediately and check the power supply;
2. The absorption circuit can not work for long time continuously, only for absorbing vibration of the power supply and reverse electromotive force of motor;
3. If the green indicator do not turn on, please check the internal fuse firstly; If the fuse is intact, please return the power supply to factory.

Two-phase stepper motor/42 series



Dimensions (Unit : mm)



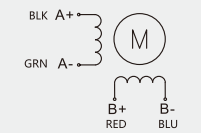
Model	L	L1
2S42Q-0348	48	24±0.5
2S42Q-0240	40	16±0.5

Specification

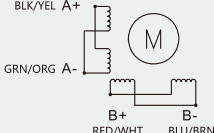
Technical Specifications		2S42Q-0348	2S42Q-0240
Step angle		1.8°	1.8°
Phase current (A)	Series	0.7	0.4
	Parallel	1.4	
Holding torque (Nm)		0.34	0.22
Damping torque (Nm)		0.026	0.022
Winding resistance (Ω)		4.6±10%	12.5±10%
Winding inductance (mH)		4.0±20%	21±20%
Motor inertia (kg.cm²)		0.068	0.054
Motor length L (mm)		48	40
Shaft diameter (mm)		5	5
Number of lead wires		8	4
Insulation class		B	
Withstand voltage level		500VAC for 1minute	
Max. axial load (N)		10N	
Max. radial load (N)		28N (20mm from the flange)	
Operating temperature		-20°C ~ +50°C	
Surface temperature rise		Max.80°C (Both phases connected with rated current)	
Insulation impedance		Minimum 100MΩ, 500V DC	
Weight (kg)		0.36	0.28

Motor cable

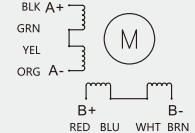
Connection of 4-wire motor



Parallel connection of 8-wire motor

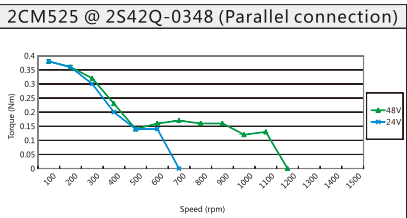
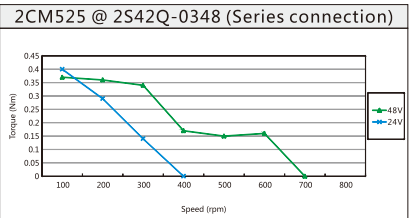
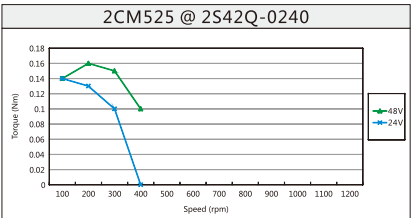


Series connection of 8-wire motor

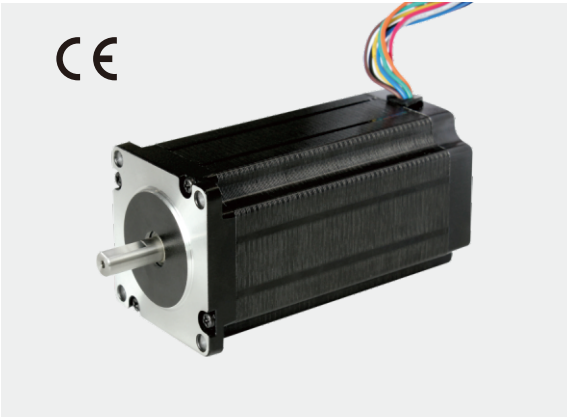


Note : AWG 26# UL1007 , Length: 600.

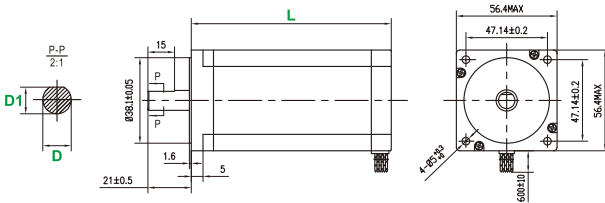
Torque-frequency curve



Two-phase stepper motor/57 series



Dimensions (Unit : mm)



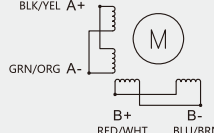
Model	L	D	D1
2S57Q-25B2	112	Ø8.0	7.5±0.1
2S57Q-2280	80	Ø8.0	7.5±0.1
2S57Q-1376	76	Ø6.35	5.8±0.1
2S57Q-0956	56	Ø6.35	5.8±0.1
2S57Q-0541	41	Ø6.35	5.8±0.1

Specification

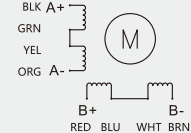
Technical Specifications		2S57Q-25B2	2S57Q-2280	2S57Q-1376	2S57Q-0956	2S57Q-0541
Step angle		1.8°	1.8°	1.8°	1.8°	1.8°
Phase current (A)	Series	2.9	2.8	1.96	1.96	0.70
	Parallel	6	5.6	3.92	3.92	1.50
Holding torque (Nm)		2.5	2.2	1.3	0.9	0.5
Damping torque (Nm)		0.12	0.07	0.068	0.04	0.022
Winding resistance (Ω)		1±10%	0.8±10%	1±10%	0.8±10%	3.6±10%
Winding inductance (mH)		1.8±20%	1.8±20%	2.1±20%	1.2±20%	4.1±20%
Motor inertia (kg.cm²)		0.8	0.53	0.48	0.3	0.135
Motor length L (mm)		112	80	76	56	41
Shaft diameter (mm)		8	8	6.35	6.35	6.35
Number of lead wires		8				
Insulation class		B				
Withstand voltage level		500VAC for 1minute				
Max. axial load (N)		15N				
Max. radial load (N)		75N (20mm from the flange)				
Operating temperature		-20°C ~ +50°C				
Surface temperature rise		Max.80°C (Both phases connected with rated current)				
Insulation impedance		Minimum 100MΩ, 500V DC				
Weight (kg)		1.7	1.1	1	0.7	0.45

Motor cable

Parallel connection of 8-wire motor



Series connection of 8-wire motor

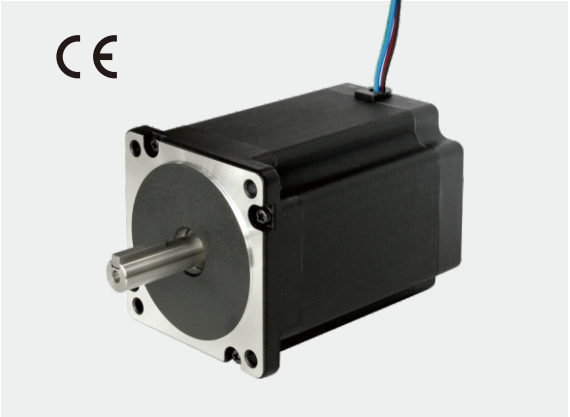
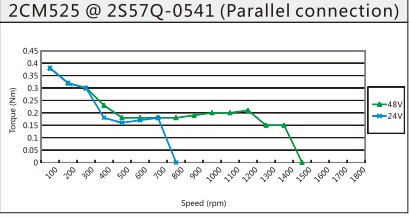
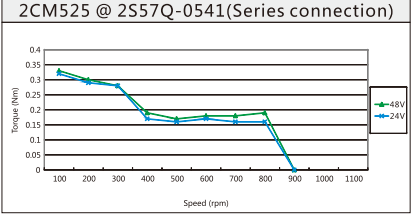
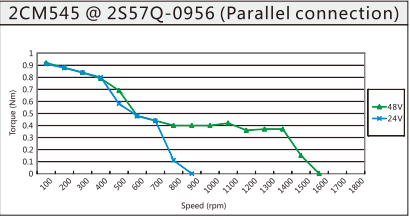
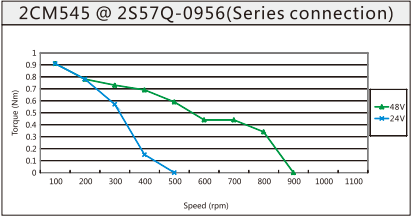
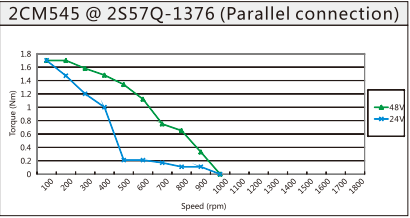
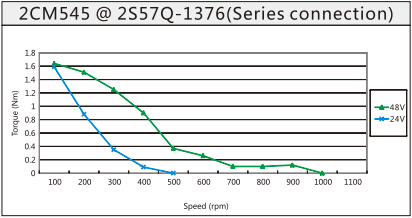
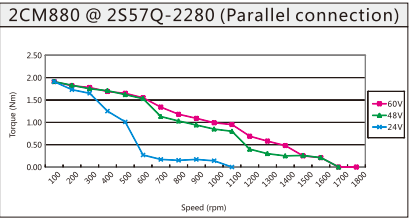
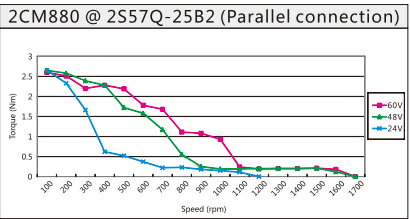
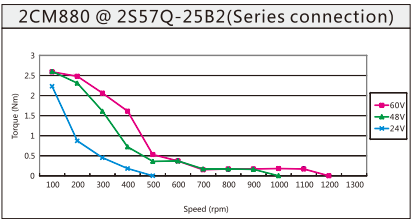


Note : AWG 22# UL1007 , Length: 600.

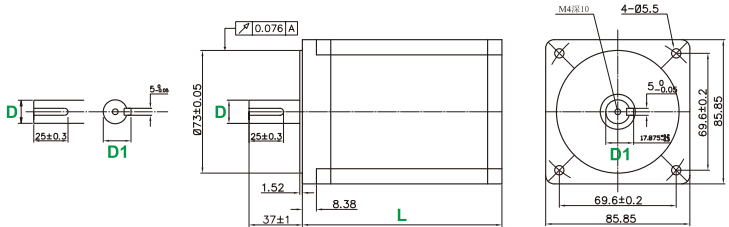
Two-phase stepper motor/57 series

Two-phase stepper motor/86 series

Torque-frequency curve



Dimensions (Unit : mm)



Model	L	D	D1
2S86Q-051F6	156	Ø15.875	17.875 ^{+0.2} _{-0.3}
2S86Q-85B8	118	Ø13	15 ^{+0.2} _{-0.3}
2S86Q-4580	80	Ø13	15 ^{+0.2} _{-0.3}
2S86Q-3465	65	Ø13	15 ^{+0.2} _{-0.3}

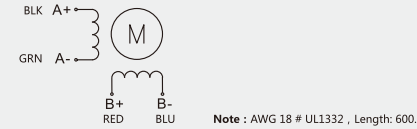
Specification

Technical Specifications	2S86Q-051F6	2S86Q-85B8	2S86Q-4580	2S86Q-3465
Step angle	1.8°	1.8°	1.8°	1.8°
Phase current (A)	6.0	6.0	6.0	6.0
Holding torque (Nm)	12.8	8.5	4.5	3.4
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.cm ²)	4	3.4	1.4	1
Motor length L (mm)	156	118	80	65
Shaft diameter (mm)	15.875	13	13	13
Number of lead wires	4			
Insulation class	B			
Withstand voltage level	1200VAC 1S 5mA			
Max. axial load (N)	60			
Max. radial load (N)	220			
Operating temperature	-20°C ~ +50°C			
Surface temperature rise	Max.80°C (Both phases connected with rated current)			
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

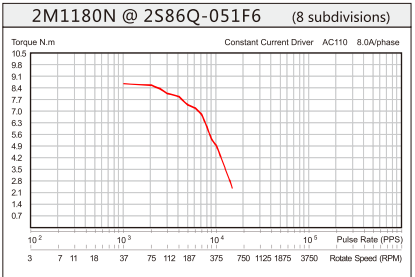
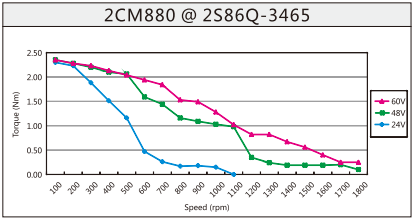
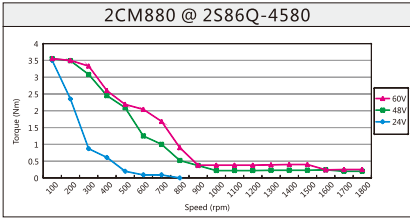
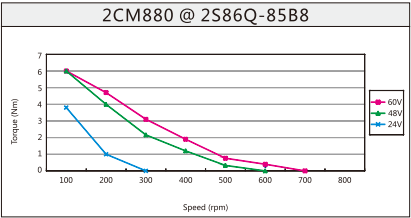
Note: The startup freq. is tested under condition of 2000 steps/round, only for reference.

Motor cable

Two-phase 4-wire motor

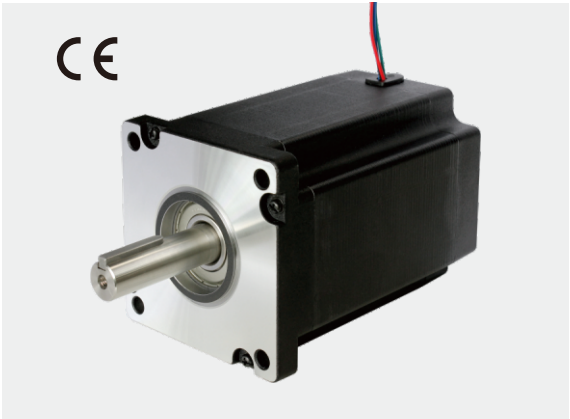


Torque-frequency curve

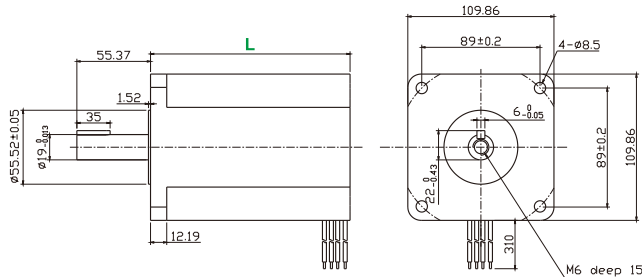


Two-phase stepper motor/110 series

Two-phase stepper motor/110 series



Dimensions (Unit : mm)



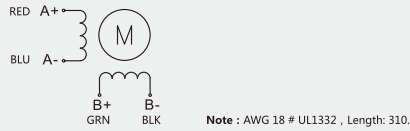
Specification

Technical Specifications	2S110Q-054K1	2S110Q-047F0	2S110Q-03999
Step angle	1.8°	1.8°	1.8°
Phase current (A)	8.0	6.5	5.5
Holding torque (Nm)	30	21	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
Shaft diameter (mm)	19	19	19
Number of lead wires	4		
Insulation class	B		
Withstand voltage level	1200VAC 1S 5mA		
Max. axial load (N)	60		
Max. radial load (N)	220		
Operating temperature	-20°C ~ +50°C		
Surface temperature rise	Max.80°C (Both phases connected with rated current)		
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

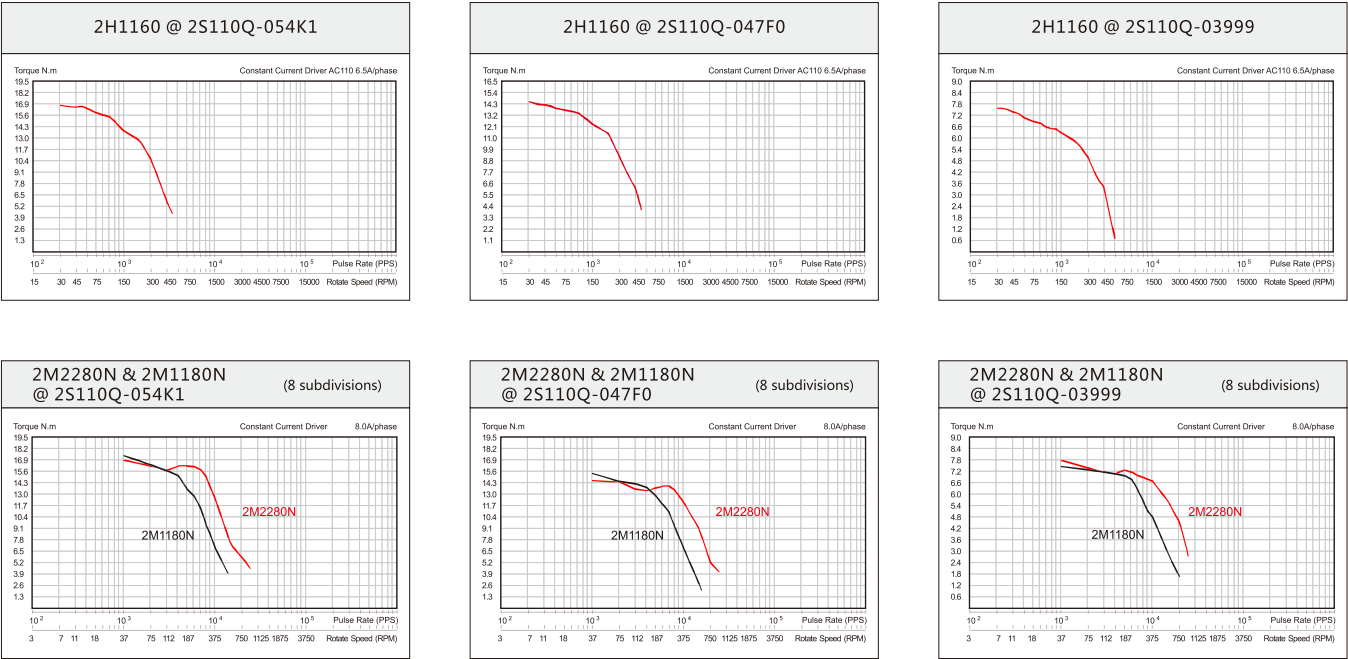
Note: The startup freq. is tested under condition of 2000 steps/round, only for reference.

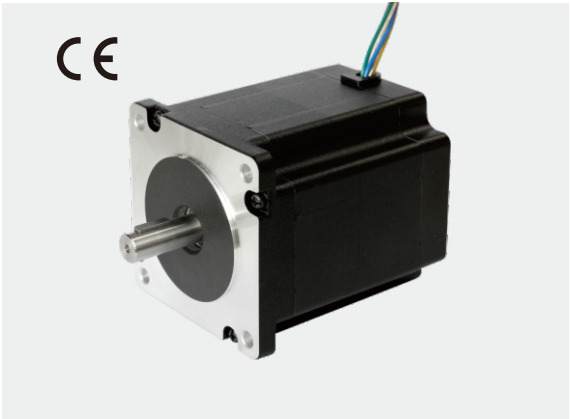
Motor cable

Two-phase 4-wire motor

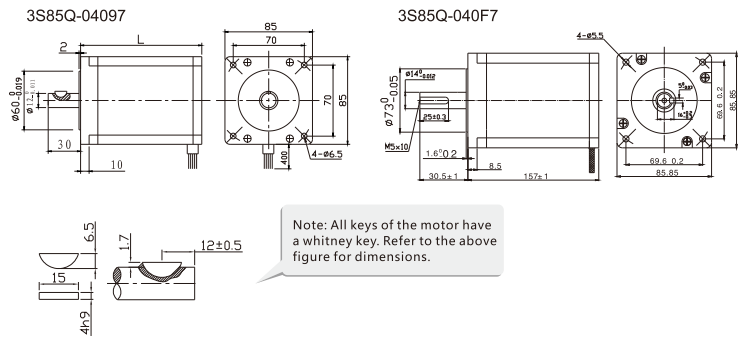


Torque-frequency curve





Dimensions (Unit : mm)

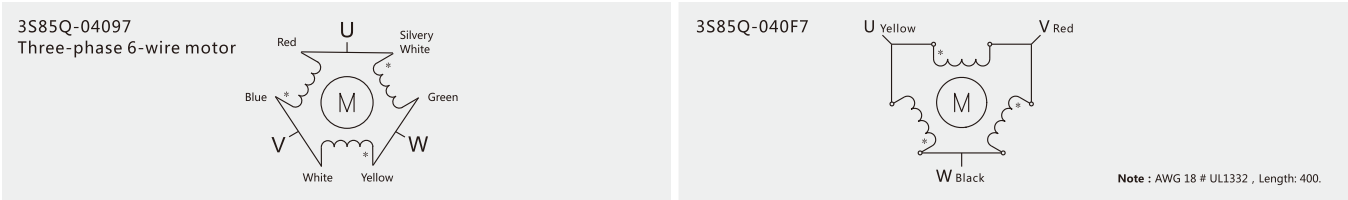


Specification

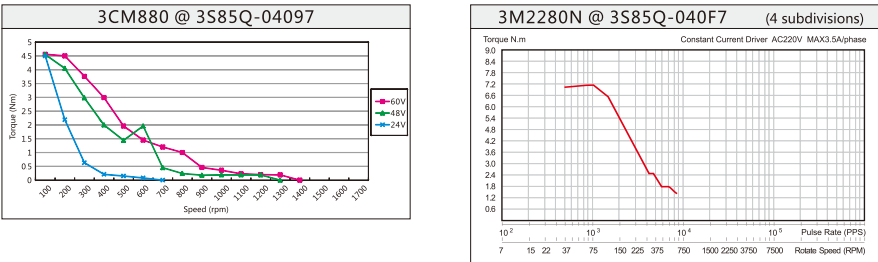
Technical Specifications	3S85Q-04097	3S85Q-040F7
Step angle	1.2°	1.2°
Phase current (A)	5.8	4
Holding torque (Nm)	4.0	7.5
Damping torque (Nm)	0.12	0.36
Winding resistance (Ω)	1.1±10%	1.78±10%
Winding inductance (mH)	4.6±20%	17.1±20%
Motor inertia (kg.cm ²)	2.32	0.44
Motor length L (mm)	97	157±1
Shaft diameter (mm)	12	14
Number of lead wires	6	3
Insulation class	B	B
Withstand voltage level	600VAC 1S 5mA	1800VAC 1S 5mA
Max. axial load (N)	60	60
Max. radial load (N)	220	220
Operating temperature	-20°C ~ +50°C	-30°C ~ +30°C
Surface temperature rise	Max.80°C (Working with rated phase current)	
Insulation impedance	Minimum 100MΩ, 500V DC	
Weight (kg)	2.7	5.3
Startup freq. with no load(Hz)*	1.4K	2.0K

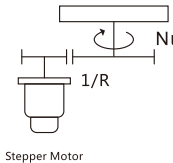
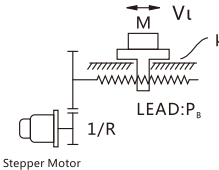
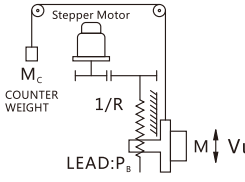
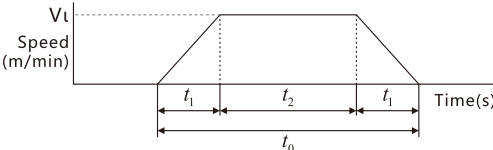
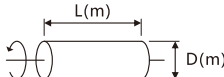
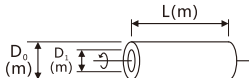
Note: The startup freq. is tested under condition of 2000 steps/round, only for reference.

Motor cable

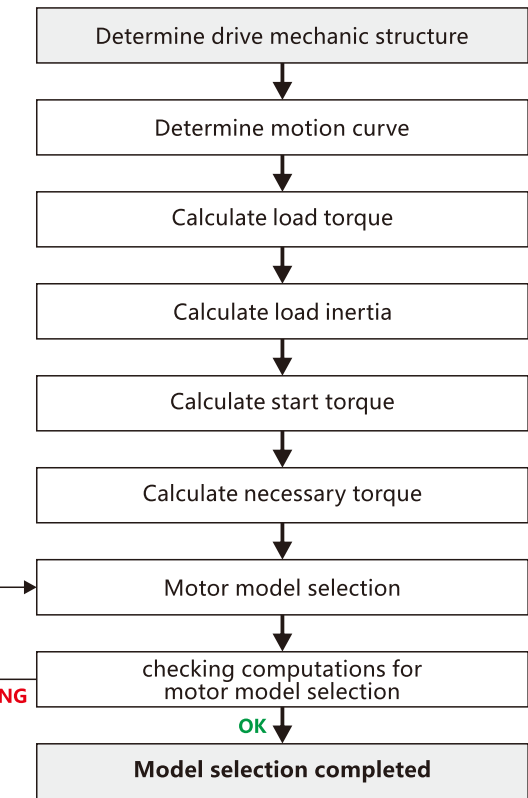


Torque-frequency curve

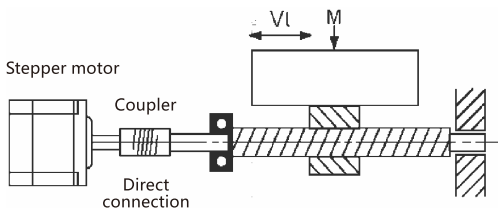


Motion Mode	Rotational Motion	Linear Motion	
		Horizontal axial direction	Vertical axial direction
Mechanical structure	 Stepper Motor	 Stepper Motor	
	N_t : JDrive speed (r/min) V_t : JLoad speed (m/min) T_t : JLoad torque (N/m) μ : JFriction coefficient P_b : JScrew lead (m)	M : JQuality of linear motion part (kg) M_c : JWeight quality (kg) $1/R$: JGear reduction ratio η : JFriction coefficient	
Speed curve			
Single travel(m)	$l = \frac{V_t}{60} (t_0 - t_1)$		
Drive speed(rpm)	N_t	$N_t = \frac{V_t}{P_b}$	$N_t = \frac{V_t}{P_b}$
Rotational speed of motor(rpm)	$N_m = N_t \cdot R$		
Load torque(N·m)	$T_L = \frac{T_t}{R \cdot \eta}$	$T_L = \frac{\mu \cdot g \cdot M \cdot P_b}{2\pi \cdot R \cdot \eta}$	$T_L = \frac{g \cdot (M - M_c) \cdot P_b}{2\pi \cdot R \cdot \eta}$
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 : $J_k = \frac{\pi}{32} \rho \cdot L \cdot (D_o^4 - D_i^4)$  density: iron $\rho = 7.9 \times 10^3 \text{ (kg/m}^3\text{)}$ Aluminum: $\rho = 2.7 \times 10^3 \text{ (kg/m}^3\text{)}$ Brass: $\rho = 8.5 \times 10^3 \text{ (kg/m}^3\text{)}$ Nylon: $\rho = 1.1 \times 10^3 \text{ (kg/m}^3\text{)}$		
	Inertia loaded to motor shaft Gear input : $J_{L2} = J_k$ Gear output : $J_{L3} = \frac{J_k}{R^2}$		
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	

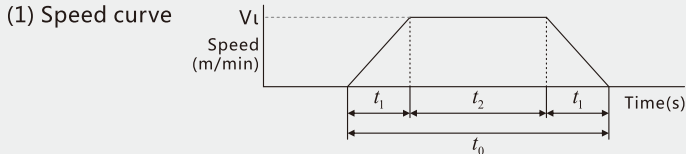
Model Selection Procedure



Example for Model Selection



Speed :	$V_L=1.5\text{m/min}$
Quality of slide part :	$M=50\text{kg}$
Screw length :	$L_B=1.4\text{m}$
Screw diameter :	$D_B=0.012\text{m}$
Screw lead :	$P_B=0.004\text{m}$
Coupler quality :	$M_C=0.2\text{kg}$
Outer diameter of coupler :	$D_C=0.04\text{m}$
Friction coefficient :	$\mu=0.3$
Movement distance :	$l=0.0275\text{m}$
Motion time :	$t_0=1.2\text{s}$
Mechanical efficiency :	$\eta=0.9$



$$\text{Acceleration time : } t_1 = t_0 - \frac{l}{V_L} = 1.2 - \frac{0.0275}{1.5/60} = 0.1(\text{s})$$

(2) Rotation speed of motor

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

(3) Load torque

$$T_L = \frac{\mu \cdot g \cdot M \cdot P_B}{2\pi \cdot R \cdot \eta} = \frac{0.3 \times 9.8 \times 50 \times 0.004}{2\pi \times 0.9} = 0.104(\text{N}\cdot\text{m})$$

(4) Load inertia

$$\text{Linear motion : } J_{LM} = M \left(\frac{P_B}{2\pi} \right)^2 = 50 \times \left(\frac{0.004}{2\pi} \right)^2 = 0.2 \times 10^{-4}(\text{kg}\cdot\text{m}^2)$$

$$\text{Ball screw : } J_B = \frac{\pi}{32} \rho \cdot L_B \cdot D_B^4 = \frac{\pi}{32} \times 7.87 \times 10^3 \times 1.4 \times (0.012)^4 = 0.224 \times 10^{-4}(\text{kg}\cdot\text{m}^2)$$

$$\text{Coupler : } J_C = \frac{1}{8} M_C \cdot D_C^2 = \frac{1}{8} \times 0.2 \times (0.04)^2 = 0.4 \times 10^{-4}(\text{kg}\cdot\text{m}^2)$$

$$\text{Load inertia : } J_L = J_{LM} + J_B + J_C = 0.824 \times 10^{-4}(\text{kg}\cdot\text{m}^2)$$

(5) Motor torque

Start torque :

$$T_s = \frac{2\pi N_M (J_M + J_L)}{60 t_1} = \frac{2\pi \times 375 \times (J_M + 0.824 \times 10^{-4})}{60 \times 0.1} = 0.032 + 392.5 J_M (\text{N}\cdot\text{m})$$

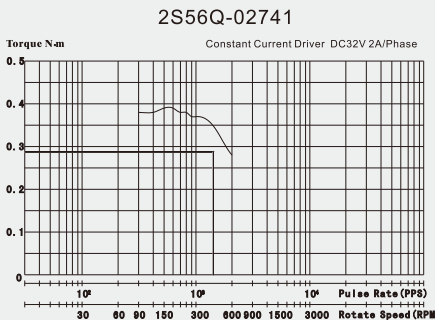
$$\text{Necessary torque : } T_M = (T_L + T_s) \times S = (T_L + T_s) \times 2 = 0.272 + 0.08 \times 10^4 J_M (\text{N}\cdot\text{m})$$

S indicates the safety coefficient, normally 2.
 J_M indicates the inertia of the motor rotator (Unit: $\text{kg}\cdot\text{m}^2$).

(6) Motor selection

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

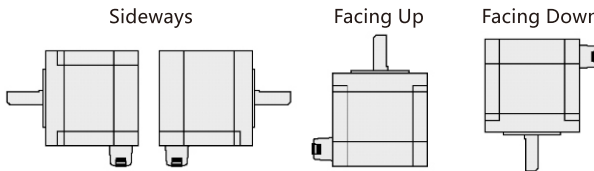
$$\text{Rotator inertia : } J_M = 0.135 \times 10^{-4} \text{ kg}\cdot\text{m}^2$$
$$T_M = 0.272 + 0.08 \times 10^4 \times 0.135 \times 10^{-4} = 0.283(\text{N}\cdot\text{m})$$



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

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 the shaft of a motor.



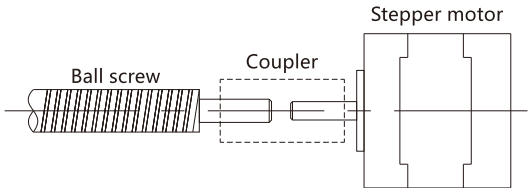
Installation

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 $-10^\circ\text{C} \sim +50^\circ\text{C}$ (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.

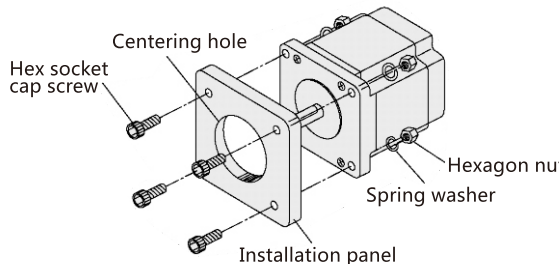
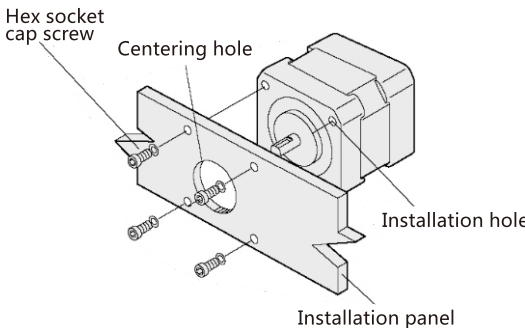


Note :

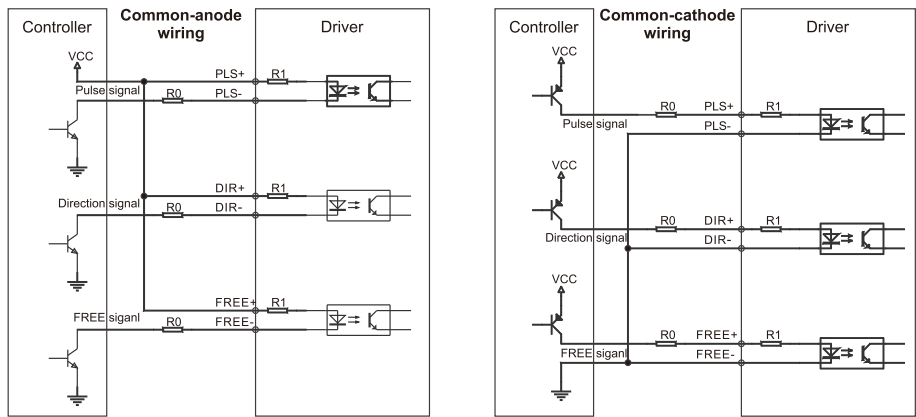
Do not disassemble the motor;
Do not apply any impact to the motor shaft;
Do not install the motor in a place where it might bear long-term vibration, so as to avoid any possible damage to the motor shaft.

Aligned Connection of Load

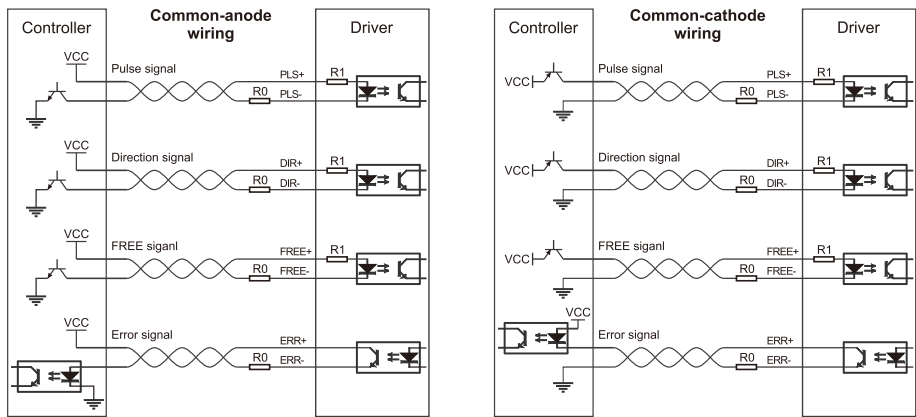
When a load is connected to the motor shaft, make sure that the load shaft aligns with the motor shaft. It is recommended that an anti-backlash flexible coupler or other appropriate devices are used to meet this requirement. Mechanical processing is forbidden for the motor shaft. Please contact your supplier if it is really necessary.



1. General Connection Mode of Control Signal

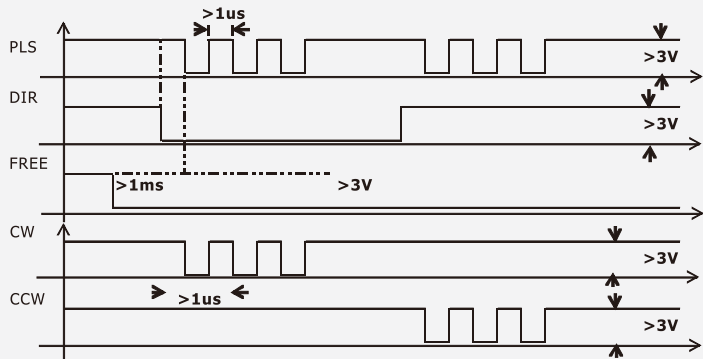


2. Twisted-pair Connection Mode of Control Signal



Note: 1. For 2CM525, 2CM545, 2CM560, 2CM860, 2CM880, 3CM880, CM880A, 2H1160, FM860, there is no need to connect 2K ohm resistor in the wiring, R0=0;
2. For 2M412, 2M1180N, 2M2280N, 3M2280N, 2K ohm resistor is required to be connected serially, R0=2K ohm.

3. Signal control sequence



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