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Stepper System

➡ Stepper System Catalog

- Stepper Driver
- Stepper Motor



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Official UK & Ireland Distributor:  
Motion Control Products Ltd  
11-15 Francis Avenue, Bournemouth,  
Dorset, UK, BH11 8NX  
Tel.: +44 (0)1202 599922  
[enquiries@motioncontrolproducts.com](mailto:enquiries@motioncontrolproducts.com)  
[www.motioncontrolproducts.com](http://www.motioncontrolproducts.com)

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Stepper Motor

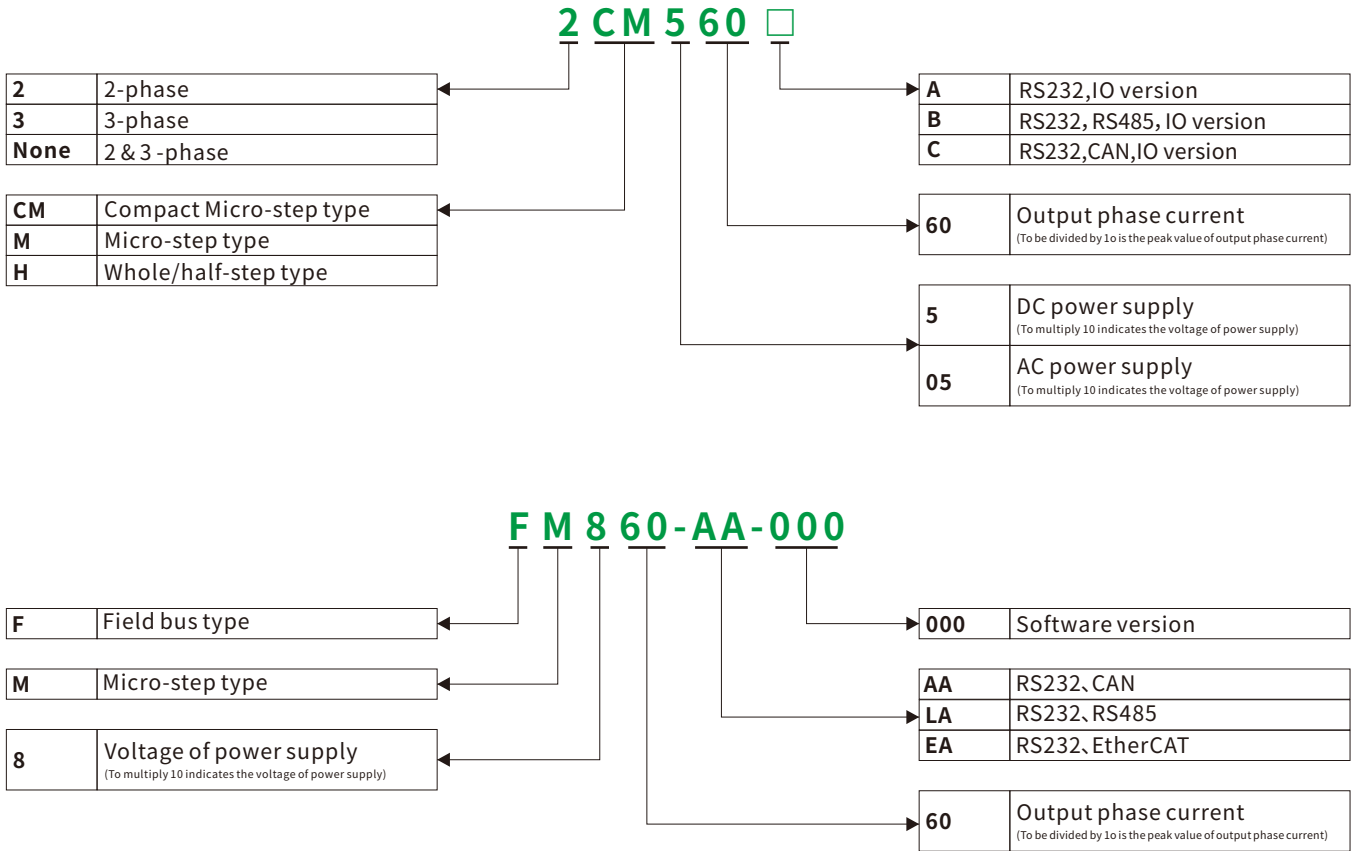
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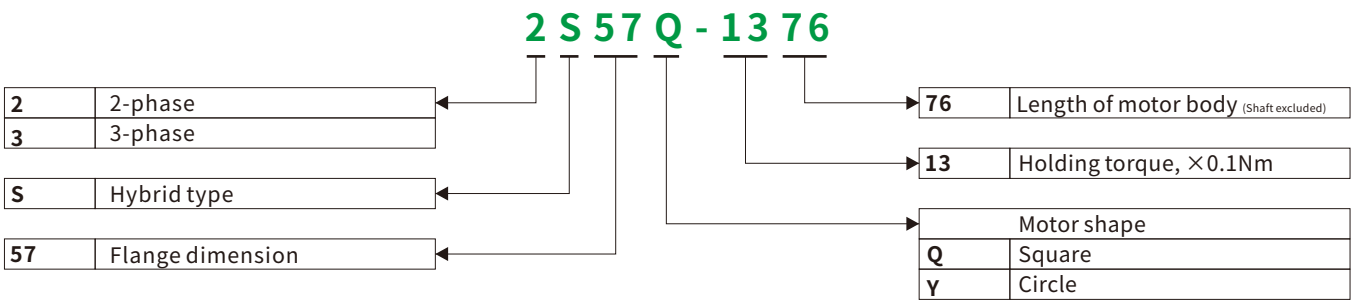
Denomination rules of stepper driver



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   |
|            | 2-phase   | 2CM0870      | 2.4~7.2A     | 18~80VAC   | 400~51200   | 0.696      | 151×97.5×57.5 |
|            | 3-phase   | 3CM880       | 2.4~8A       | 24~70VDC   | 400~25600   | 0.253      | 118×75.5×34   |
|            | 2&3-phase | CM422B       | 0.1~2.5A     | 12~40VDC   | 200~65535   | 0.11       | 93×56×21      |
|            | 2&3-phase | CM422C       | 0.1~2.5A     | 12~40VDC   | 200~65535   | 0.11       | 93×56×21      |
|            | 2&3-phase | CM880A       | 0.15~8A      | 24~70VDC   | 200~65535   | 0.29       | 108×75.5×34   |
|            | 2&3-phase | CM880B       | 0.15~8A      | 24~70VDC   | 200~65535   | 0.253      | 108×75.5×34   |
|            | 2&3-phase | CM880C       | 0.15~8A      | 24~70VDC   | 200~65535   | 0.253      | 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        |               |
| Fseries    | 2&3-phase | FM860-LA-000 | 0.15~8A      | 24~70VDC   | 200~65535   | 0.36       | 134.5×75.5×34 |
|            |           | FM860-AA-000 |              |            |             |            |               |
|            |           | FM880-EA-000 | 0.1~10A      |            |             | 0.36       |               |

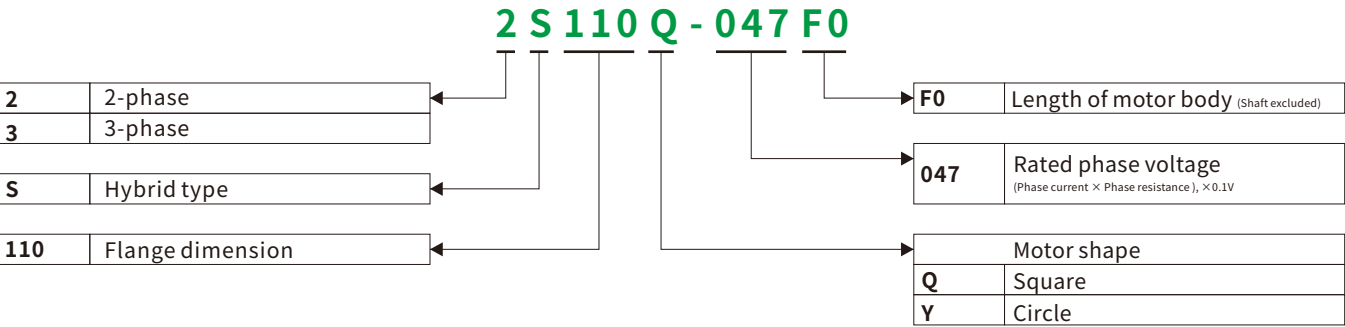
Denomination rules



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 <sup>2</sup> ) | 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            |

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 <sup>2</sup> ) | Lead No. | Shalf diameter (mm) | Shalf 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<br>AA: CANopen<br>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.

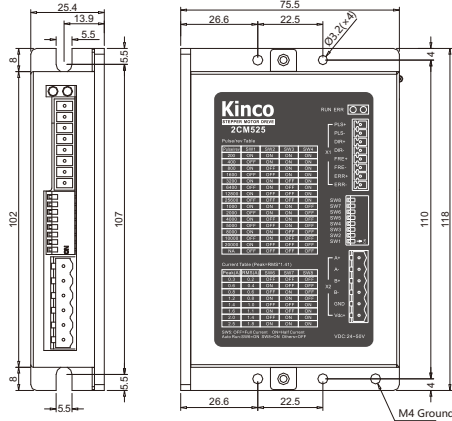
Selection table (2) of stepper driver & motor

| Control mode        | A: RS232,I/O     | B: RS232,RS485             | C: RS232,CAN                 | Bus control  | AA: CANopen | LA: RS485 | EA: EtherCAT |
|---------------------|------------------|----------------------------|------------------------------|--------------|-------------|-----------|--------------|
| Driver<br><br>Motor | CM422B<br>CM422C | CM880A<br>CM880B<br>CM880C | FM860-AA-000<br>FM860-LA-000 | FM880-EA-000 |             |           |              |
| 2S42Q-0240          | √                | √                          | √                            | √            |             |           |              |
| 2S42Q-0348          | √                | √                          | √                            | √            |             |           |              |
| 2S57Q-0541          | √                | √                          | √                            | √            |             |           |              |
| 2S57Q-0956          |                  | √                          | √                            | √            |             |           |              |
| 2S57Q-1376          |                  | √                          | √                            | √            |             |           |              |
| 2S57Q-2280          |                  | √                          | √                            | √            |             |           |              |
| 2S57Q-25B2          |                  | √                          | √                            | √            |             |           |              |
| 2S86Q-3465          |                  | √                          | √                            | √            |             |           |              |
| 2S86Q-4580          |                  | √                          | √                            | √            |             |           |              |
| 2S86Q-85B8          |                  | √                          | √                            | √            |             |           |              |
| 2S86Q-051F6         |                  | √                          | √                            | √            |             |           |              |
| 3S57Q-04056         |                  | √                          | √                            | √            |             |           |              |
| 3S57Q-04079         |                  | √                          | √                            | √            |             |           |              |
| 3S85Q-04097         |                  | √                          | √                            | √            |             |           |              |

Note:√ indicates recommended motor model.



Mechanical Dimensions (Unit:mm)



Function of DIP switches

| Function                                   | DIP setting                   | Description                                                                                                                                                                                                                      |
|--------------------------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PLS+DIR                                    | SW6,SW7=ON;<br>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;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Micro-step smooth & dynamic filter disable | SW5,SW6=ON;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Micro-step smooth filter enable            | SW5,SW7=ON;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Micro-step dynamic filter enable           | SW5,SW8=ON;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Test motor parameter upon power on disable | SW6,SW7,SW8=ON;<br>Others=OFF |                                                                                                                                                                                                                                  |
| Test motor parameter upon power on enable  | SW5,SW6,SW7=ON;<br>Others=OFF | Motor running @80RPM                                                                                                                                                                                                             |
| Test running                               | SW6,SW8=ON;<br>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                                                                                                       |

- 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.

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 hybrid stepper motor                                                                   |
| Input signal            | PLS (CW) 、DIR(CCW)、FREE,<br>Input voltage:5~24VDC,<br>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<br>Avoid environment with great amount of metallic powder, oil mist, or erosive gases |
|                         | Operation humidity<br><85%, RH(Non-condensing or water drops)                                               |
|                         | Operation temperature<br>0°C~+40°C                                                                          |
|                         | Storage temperature<br>-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  |

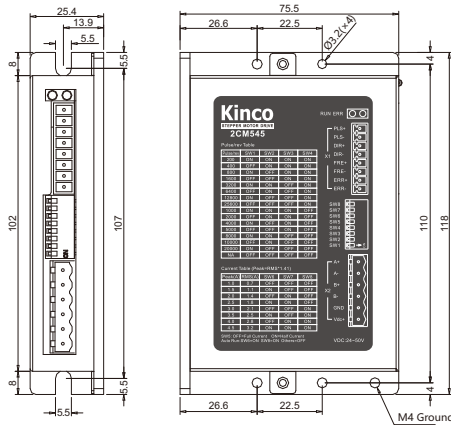
Stepper Driver 2CM545

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)



Technical Specifications

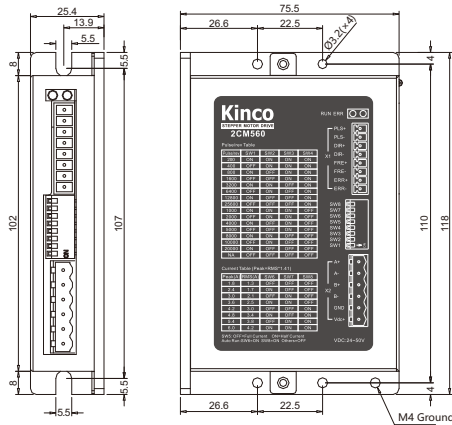
|                         |                                                                                           |                                                                                    |
|-------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 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,<br>Input voltage:5~24VDC,<br>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    |



- 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)



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,<br>Input voltage: 5~24VDC,<br>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                                                                              |                                                                                    |

Function of DIP switches

| Function                                   | DIP setting                   | Description                                                                                                                                                                                                                      |
|--------------------------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PLS+DIR                                    | SW6,SW7=ON;<br>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;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Micro-step smooth & dynamic filter disable | SW5,SW6=ON;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Micro-step smooth filter enable            | SW5,SW7=ON;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Micro-step dynamic filter enable           | SW5,SW8=ON;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Test motor parameter upon power on disable | SW6,SW7,SW8=ON;<br>Others=OFF |                                                                                                                                                                                                                                  |
| Test motor parameter upon power on enable  | SW5,SW6,SW7=ON;<br>Others=OFF | Motor running @80RPM                                                                                                                                                                                                             |
| Test running                               | SW6,SW8=ON;<br>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                                                                                                       |

| 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  |

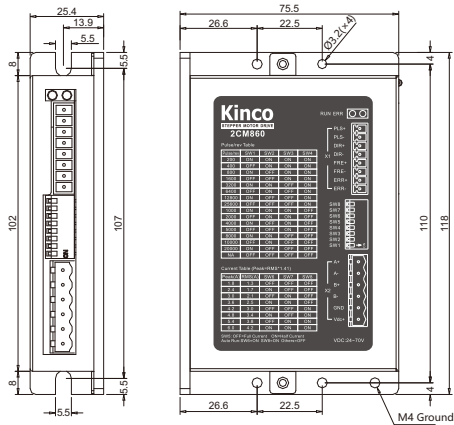
Stepper Driver 2CM860

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)



Technical Specifications

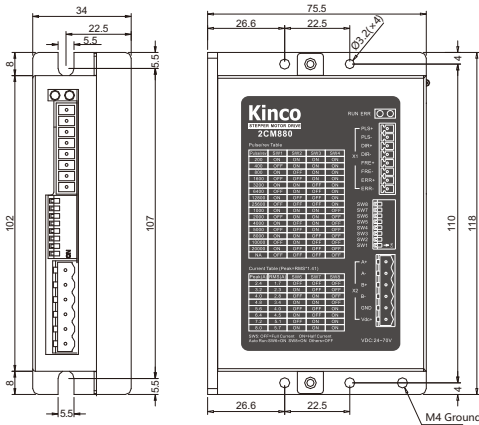
|                         |                                                                                 |                                                                                    |
|-------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Input voltage           | 24~70VDC                                                                        |                                                                                    |
| 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,<br>Input voltage:5~24VDC,<br>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  |



- 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)



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,<br>Input voltage:5~24VDC,<br>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                                                                            |                                                                                    |

Function of DIP switches

| Function                                   | DIP setting                   | Description                                                                                                                                                                                                                      |
|--------------------------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PLS+DIR                                    | SW6,SW7=ON;<br>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;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Micro-step smooth & dynamic filter disable | SW5,SW6=ON;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Micro-step smooth filter enable            | SW5,SW7=ON;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Micro-step dynamic filter enable           | SW5,SW8=ON;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Test motor parameter upon power on disable | SW6,SW7,SW8=ON;<br>Others=OFF | Motor running @80RPM                                                                                                                                                                                                             |
| Test motor parameter upon power on enable  | SW5,SW6,SW7=ON;<br>Others=OFF |                                                                                                                                                                                                                                  |
| Test running                               | SW6,SW8=ON;<br>Others=OFF     | Set SW5=ON to enable automatic half-current. Phase current will reduce to half of the set value after motor stops for 1.5s                                                                                                       |
| Automatic half-current                     | SW5=ON                        |                                                                                                                                                                                                                                  |

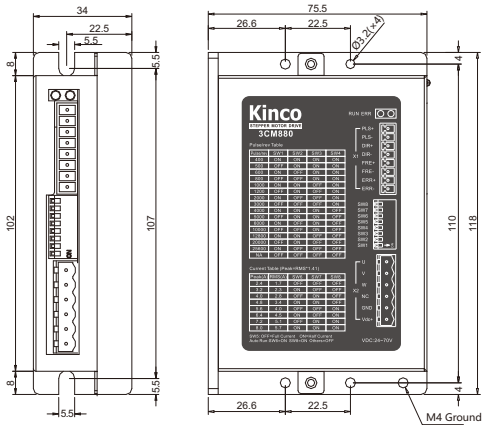
| Subdivision setting (Unit:PULSE/REV) |     |     |        |         | Current setting (Unit: A) |     |     |     |      |
|--------------------------------------|-----|-----|--------|---------|---------------------------|-----|-----|-----|------|
| SW1                                  | SW2 | SW3 | 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;<br>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;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Micro-step smooth & dynamic filter disable | SW5,SW6=ON;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Micro-step smooth filter enable            | SW5,SW7=ON;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Micro-step dynamic filter enable           | SW5,SW8=ON;<br>Others=OFF     |                                                                                                                                                                                                                                  |
| Test motor parameter upon power on disable | SW6,SW7,SW8=ON;<br>Others=OFF | Test motor parameter upon power on enable                                                                                                                                                                                        |
| Test motor parameter upon power on enable  | SW5,SW6,SW7=ON;<br>Others=OFF |                                                                                                                                                                                                                                  |
| Test running                               | SW6,SW8=ON;<br>Others=OFF     | Motor running @80RPM                                                                                                                                                                                                             |
| 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,<br>Input voltage:5~24VDC,<br>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                                                                               |

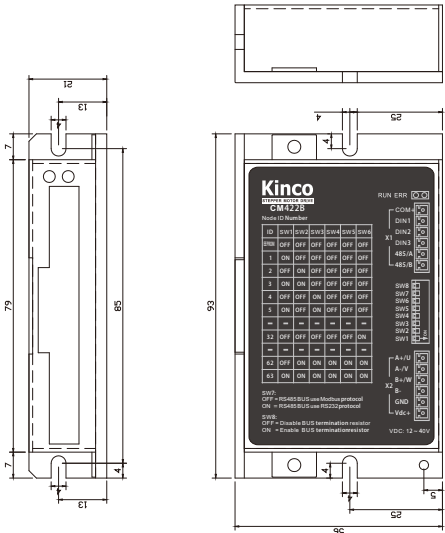
| Subdivision setting (Unit:PULSE/REV) |     |     |        |         | Current setting (Unit: A) |     |     |     |      |
|--------------------------------------|-----|-----|--------|---------|---------------------------|-----|-----|-----|------|
| SW1                                  | SW2 | SW3 | 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 CM422B



- 3 opto-isolation digital signal input channels, 3 channels support voltage range 5~24VDC;
- Support CW/CCW, PLS+DIR;
- Non-isolation RS485 interfaces, support Modbus protocol;
- Multiple I/O functions, support homing, multi-speed, multi-position,etc;
- Support automatic parameter adjustable regulation, self-defined shalf-lock, step smooth filter;
- Over-voltage, under-voltage, overheat and over-current protection;
- Suoport external UTC-SA or RS232-to-RS485 module, parameter settings by KincoStep software.

Mechanical Dimensions (Unit:mm)



Technical Specifications

|                         |                                                                                           |
|-------------------------|-------------------------------------------------------------------------------------------|
| Input voltage           | 12 ~ 40VDC                                                                                |
| Overvoltage protection  | 45VDC                                                                                     |
| Undervoltage protection | 9VDC                                                                                      |
| Phase current(Peak)     | 0.1A ~ 2.5A (Peak)                                                                        |
| Subdivision             | Set by KincoStep™ software                                                                |
| Node ID                 | Set by DIP switches SW1 ~ Sw6                                                             |
| Adaptable motor         | 42 series and under 42 series 2&3 phase hybrid stepper motor                              |
| Control mode            | I/O control; Modbus control;<br>Pulse control: PLS+DIR, CW/CCW                            |
| 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                  | 0.11kg                                                                                    |
| Dimensions              | 93X56X21mm                                                                                |
| Ingress protection      | IP20                                                                                      |

Interface Introduction

| Interface             |       |                                 | Function                                                                                                                           |
|-----------------------|-------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| X1<br>I/O             | COM+  | Common anode port of DIN        | Voltage: 5~24VDC<br>Current: 8mA@5VDC, 12mA@24VDC<br>Valid signal: For DINX, COM+ , >3VDC<br>Invalid signal: For DINX, COM+, <1VDC |
|                       | DIN1  | DIN1 negative                   |                                                                                                                                    |
|                       | DIN2  | DIN2 negative                   |                                                                                                                                    |
|                       | DIN3  | DIN3 negative                   | RS485 interface, non-isolation inside,<br>Common GND between drivers                                                               |
|                       | 485/A | Differential RS485 signal input |                                                                                                                                    |
| X2<br>Power interface | 485/B |                                 | Drive motor                                                                                                                        |
|                       | A+/U  | Motor A+/U                      |                                                                                                                                    |
|                       | A-/V  | Motor A-/U                      |                                                                                                                                    |
|                       | B+/W  | Motor B+/W                      | Power input DC12~40V                                                                                                               |
|                       | B-    | Motor B-                        |                                                                                                                                    |
|                       | GND   | Power input-                    |                                                                                                                                    |
|                       | VDC   | Power input+                    |                                                                                                                                    |

Note: (1) DIN1 and DIN2 use high-speed opto-isolation, max input frequency is 200KHz, min pulse width is 3us  
(2) DIN3 uses low-speed opto-isolation, max input frequency is 1KHz

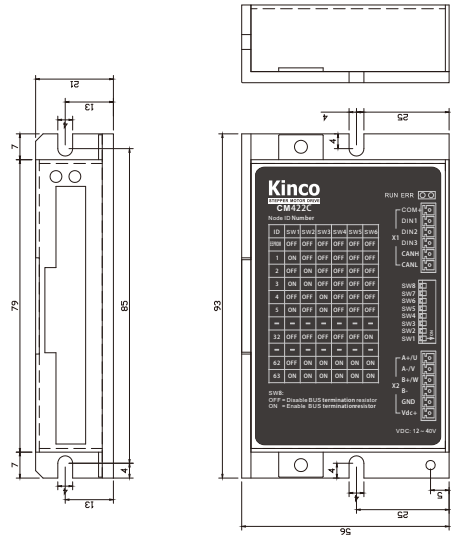
Stepper Driver CM422C

Stepper Driver CM880A



- 3 opto-isolation digital signal input channels, 3 channels support voltage range 5~24VDC;
- Support CW/CCW, PLS+DIR;
- Non-isolation CAN interfaces, support CANopen;
- Multiple I/O functions, support homing, multi-speed, multi-position,etc;
- Support automatic parameter adjustable regulation, self-defined shalf-lock, step smooth filter;
- Micro-step filter function can smooth input pulse to reduce transient motion of motor, make sure motor run more smoothly;
- Over-voltage, under-voltage, overheat and over-current protection;
- Supoort external UTC-SA or RS232-to-RS485 module, parameter settings by KincoStep software.

Mechanical Dimensions (Unit:mm)



Technical Specifications

|                         |                                                                                           |
|-------------------------|-------------------------------------------------------------------------------------------|
| Input voltage           | 12 ~ 40VDC                                                                                |
| Overvoltage protection  | 45VDC                                                                                     |
| Undervoltage protection | 9VDC                                                                                      |
| Phase current(Peak)     | 0.1A ~ 2.5A (Peak)                                                                        |
| Subdivision             | Set by KincoStep software                                                                 |
| Node ID                 | Set by DIP switches SW1 ~ SW6                                                             |
| Adaptable motor         | 42 series and under 42 series 2&3 phase hybrid stepper motor                              |
| Control mode            | I/O control; CANopen control;Pulse control: PLS+DIR, CW/CCW                               |
| 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                  | 0.11kg                                                                                    |
| Dimensions              | 93X56X21mm                                                                                |
| Ingress protection      | IP20                                                                                      |

Interface Introduction

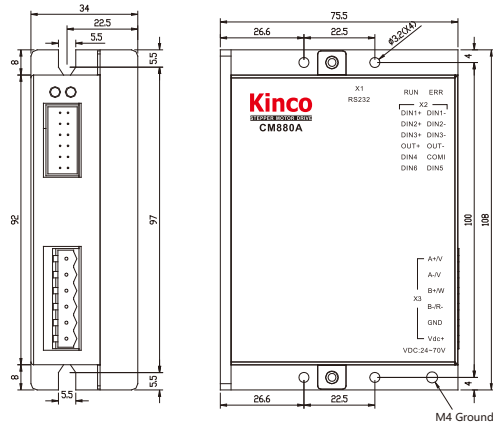
| Interface                |      |                               | Function                                                                                                                           |
|--------------------------|------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| X1<br>I/O                | COM+ | Common anode port of DIN      | Voltage: 5~24VDC<br>Current: 8mA@5VDC, 12mA@24VDC<br>Valid signal: For DINX, COM+ , >3VDC<br>Invalid signal: For DINX, COM+, <1VDC |
|                          | DIN1 | DIN1 negative                 |                                                                                                                                    |
|                          | DIN2 | DIN2 negative                 |                                                                                                                                    |
|                          | DIN3 | DIN3 negative                 |                                                                                                                                    |
|                          | CANH | Differential CAN signal input |                                                                                                                                    |
|                          | CANL | Motor A+/U                    |                                                                                                                                    |
| X2<br>Power<br>interface | A+/U | Motor A-/U                    | Drive motor                                                                                                                        |
|                          | A-/V | Motor B+/W                    |                                                                                                                                    |
|                          | B+/W | Motor B-                      |                                                                                                                                    |
|                          | B-   | Power input-                  |                                                                                                                                    |
|                          | GND  | Power input+                  | Power input DC12~40V                                                                                                               |
|                          | VDC  |                               |                                                                                                                                    |

Note:(1) DIN1 and DIN2 use high-speed opto-isolation, max input frequency is 200KHz, min pulse width is 3us  
(2) DIN3 uses low-speed opto-isolation, max input frequency is 1KHz



- 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;<br>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°C~+40°C                                                                           |
| Storage temperature      | -20°C~+70°C                                                                         |
| 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<br>IO<br>interface | DIN1+ | DIN1 positive input     | Input voltage: 5~24VDC<br>Input current: 8mA@5VDC, 12mA@24VDC<br>Valid input signal: >3VDC<br>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<br>Input current: 4mA@12VDC, 8mA@24VDC<br>Valid input signal: >8VDC<br>Invalid input signal: <5VDC |
|                       | DIN5  | DIN5 input              |                                                                                                                            |
|                       | DIN6  | DIN6 input              |                                                                                                                            |
|                       | COMI  | COM of DIN4, DIN5, DIN6 |                                                                                                                            |
|                       | OUT+  | OUT positive input      | Max. output current: 100mA<br>Max. voltage drop: 0.8VDC@100mA<br>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

Stepper Driver CM880B

Stepper Driver CM880C

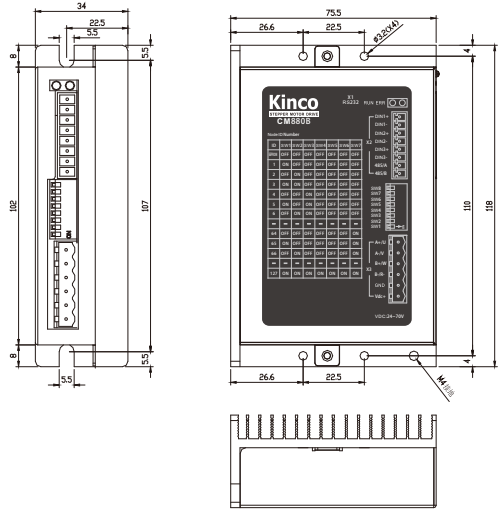


- 3 opto-isolation digital signal input channels, 3 channels support voltage range 5~24VDC;
- Support CW/CCW, PLS+DIR;
- Non-isolation RS485 interfaces, support Modbus protocol;
- Multiple I/O functions, support homing, multi-speed, multi-position,etc;
- Support automatic parameter adjustable regulation, self-defined shalf-lock, step smooth filter;
- Over-voltage, under-voltage, overheat and over-current protection;
- Supoort RS232 communication, parameter settings by KincoStep software.



- 3 opto-isolation digital signal input channels, 3 channels support voltage range 5~24VDC;
- Support CW/CCW, PLS+DIR;
- Non-isolation CAN interfaces, support CANopen protocol;
- Multiple I/O functions, support homing, multi-speed, multi-position,etc;
- Support automatic parameter adjustable regulation, self-defined shalf-lock, step smooth filter;
- Over-voltage, under-voltage, overheat and over-current protection;
- Suoport RS232 communication, parameter settings by 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&3 phase hybrid stepper motor                                                            |
| Control mode             | I/O control; Modbus control;Pulse control: PLS+DIR, CW/CCW                                |
| 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(Net)              | 0.25kg                                                                                    |
| Dimensions               | 118X75.5X34mm                                                                             |
| Ingress protection       | IP20                                                                                      |

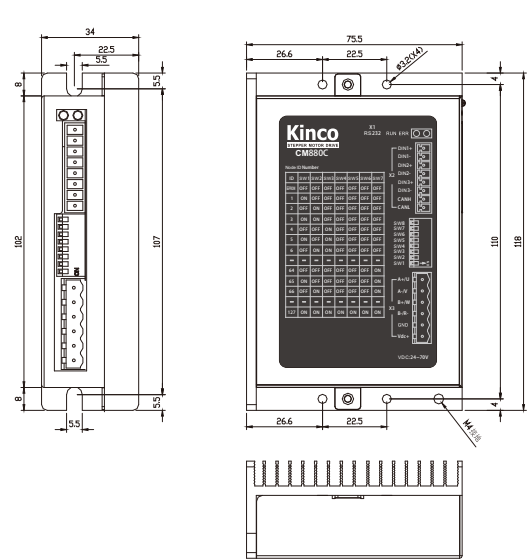
Note: Please purchase related and complete communication cable.  
Type: Console wire (RS232-to-RJ45 crystal line)

Interface Introduction

| Interface |         |                               | Function                                                                                                                           |
|-----------|---------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| X1        | RS232   |                               | RS232 port                                                                                                                         |
| I/O DIP   | SW1~SW7 |                               | ID DIP                                                                                                                             |
| X2        | DIN1+   | DIN1 positive                 | Voltage: 5~24VDC<br>Current: 8mA@5VDC, 12mA@24VDC<br>Valid signal: For DINX, COM+ , >3VDC<br>Invalid signal: For DINX, COM+, <1VDC |
|           | DIN1-   | DIN1 negative                 |                                                                                                                                    |
|           | DIN2+   | DIN2 positive                 |                                                                                                                                    |
|           | DIN2-   | DIN2 negative                 |                                                                                                                                    |
|           | DIN3+   | DIN3 positive                 |                                                                                                                                    |
|           | DIN3-   | DIN3 negative                 |                                                                                                                                    |
|           | 485/A   | Differential 485 signal input | RS485 interface, non-isolation inside, Common GND between drivers                                                                  |
|           | 485/B   |                               |                                                                                                                                    |

Note: (1) DIN1, DIN2 and DIN3 use high-speed opto-isolation, max input frequency is 50KHz, min pulse width is 10us  
(2) DIN3 uses low-speed opto-isolation, max input frequency is 1KHz

Mechanical Dimensions (Unit:mm)



Technical Specifications

|                          |                                                                                           |
|--------------------------|-------------------------------------------------------------------------------------------|
| Input voltage            | 24 ~ 70VDC                                                                                |
| Over-voltage protection  | 85VDC                                                                                     |
| Under-voltage protection | 15VDC                                                                                     |
| Phase current (Peak)     | 0.15 ~ 8A (Peak)                                                                          |
| Subdivision              | Set by KincoStep software                                                                 |
| Adaptable motor          | 2&3 phase hybrid stepper motor                                                            |
| Control mode             | I/O control; CANopen control; Pulse control: PLS+DIR, CW/CCW                              |
| 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                   | 0.25kg                                                                                    |
| Dimensions               | 118X75.5X34mm                                                                             |
| Ingress protection       | IP20                                                                                      |

Note: Please purchase related and complete communication cable.  
Type: Console wire (RS232-to-RJ45 crystal line)

Interface Introduction

| Interface |         |                               | Function                                                                                                                           |
|-----------|---------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| X1        | RS232   |                               | RS232 port                                                                                                                         |
| I/O DIP   | SW1~SW7 |                               | ID DIP                                                                                                                             |
| X2        | DIN1+   | DIN1 positive                 | Voltage: 5~24VDC<br>Current: 8mA@5VDC, 12mA@24VDC<br>Valid signal: For DINX, COM+ , >3VDC<br>Invalid signal: For DINX, COM+, <1VDC |
|           | DIN1-   | DIN1 negative                 |                                                                                                                                    |
|           | DIN2+   | DIN2 positive                 |                                                                                                                                    |
|           | DIN2-   | DIN2 negative                 |                                                                                                                                    |
|           | DIN3+   | DIN3 positive                 |                                                                                                                                    |
|           | DIN3-   | DIN3 negative                 |                                                                                                                                    |
|           | 485/A   | Differential 485 signal input | CAN interface, non-isolation inside, Common GND between drivers                                                                    |
|           | 485/B   |                               |                                                                                                                                    |

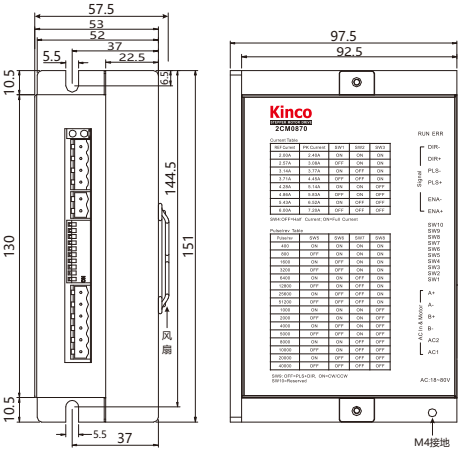
Note: (1) DIN1, DIN2 and DIN3 use high-speed opto-isolation, max input frequency is 50KHz, min pulse width is 10us  
(2) DIN3 uses low-speed opto-isolation, max input frequency is 1KHz

# Stepper Driver 2CM0870



- 1. 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 signal input, pulse responding frequency up 200KHz;
- Opto-isolation 5-24V pulse input, responding frequency up 400KHz;
- 16 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                                                                                                                                                                                                                      |
|--------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Micro-step smooth & dynamic filter disable | Sw5, SW6, SW10=ON; Others=OFF      | Set DIP switches according to functions required when power off. Power on driver, RUN LED blinking is green, ERR LED is red. It means settings take effect, Then power off driver, reset subdivision and current for normal use. |
| Micro-step smooth filter enable            | SW5, SW7, SW10=ON; Others=OFF      |                                                                                                                                                                                                                                  |
| Micro-step dynamic filter enable           | SW5, SW8, SW10=ON; Others=OFF      |                                                                                                                                                                                                                                  |
| Test motor parameter upon power on disable | SW6, SW7, SW8, SW10=ON; Others=OFF |                                                                                                                                                                                                                                  |
| Test motor parameter upon power on enable  | SW5, SW6, SW7, SW10=ON; Others=OFF |                                                                                                                                                                                                                                  |
| Test running                               | SW6, SW8, SW10=ON; Others=OFF      | Motor running @80RPM                                                                                                                                                                                                             |
| Automatic half-current                     | SW4=ON or SW4=OFF                  | SW4=ON to enable automatic half-current. Phase current will reduce to half of the set value after motor stops for 1.5s.                                                                                                          |
| Double pulse input                         | SW9=ON; Others=OFF                 | Set SW9=ON, subdivision, current, this mode can be use after power on                                                                                                                                                            |
| Single pulse input                         | SW9=OFF; Others=OFF                | 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           | 18~80VAC                                                                                                                                                                                                                                |
| Overvoltage protection  | 110VAC                                                                                                                                                                                                                                  |
| Undervoltage protection | 15VAC                                                                                                                                                                                                                                   |
| Overheat protection     | 85°C(Temperature of thermistor)                                                                                                                                                                                                         |
| Adaptable motor         | 57 and 86 series 2-phase hybrid stepper motor                                                                                                                                                                                           |
| Input signal            | PLS(CW), DIR(CCW), ENA signal;<br>Input voltage: 5VDC, input current 5mA@5VDC<br>Valid input signal: bigger than 4VDC, Invalid input signal: smaller than 1.5VDC<br>PLS, DIR signal max input frequency: 200KHz, min pulse width: 2.5us |
| Control mode            | Pulse control: PLS+DIR, CW/CCW                                                                                                                                                                                                          |
| Operator indicator      | Combination of RUN and ERR LED indicates different status<br>Over voltage, under voltage, over current,                                                                                                                                 |
| Protection              | over heat                                                                                                                                                                                                                               |
| Cooling way             | Fan cooling                                                                                                                                                                                                                             |
| 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                  | 0.696Kg                                                                                                                                                                                                                                 |
| Dimension               | 151X97.5X57.5mm                                                                                                                                                                                                                         |

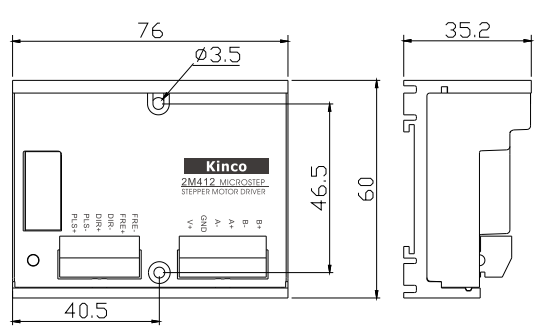
| Subdivision setting<br>(Unit: PULSE/REV) |     |     | SW8=ON    | SW8=OFF | Current setting (Unit:A) |     |     |      |      |
|------------------------------------------|-----|-----|-----------|---------|--------------------------|-----|-----|------|------|
| Sw5                                      | Sw6 | Sw7 | Pulse/rev |         | SW1                      | SW2 | SW3 | RMS  | Peak |
| ON                                       | ON  | ON  | 400       | 1000    | ON                       | ON  | ON  | 2    | 2.4  |
| OFF                                      | ON  | ON  | 800       | 2000    | OFF                      | ON  | ON  | 2.57 | 3.08 |
| ON                                       | OFF | ON  | 1600      | 4000    | ON                       | OFF | ON  | 3.14 | 3.77 |
| OFF                                      | OFF | ON  | 3200      | 5000    | OFF                      | OFF | ON  | 3.71 | 4.45 |
| ON                                       | ON  | OFF | 6400      | 8000    | ON                       | ON  | OFF | 4.28 | 5.14 |
| OFF                                      | ON  | OFF | 12800     | 10000   | OFF                      | ON  | OFF | 4.86 | 5.83 |
| ON                                       | OFF | OFF | 25600     | 20000   | ON                       | OFF | OFF | 5.43 | 6.52 |
| OFF                                      | OFF | OFF | 51200     | 40000   | OFF                      | OFF | OFF | 6    | 7.2  |

# Stepper Driver 2M412



- 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)



## 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.

## 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°C ~ +45°C                                                                            |
| Operating humidity           | <85% (non-condensing or water drops)                                                     |
| Weight                       | 0.13Kg                                                                                   |

## 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!

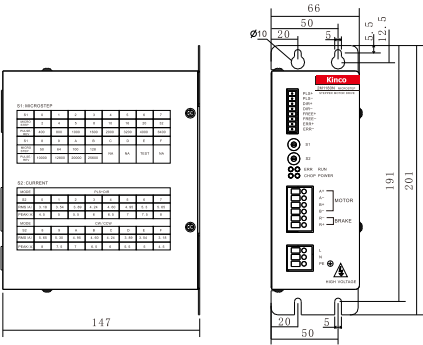
It supports control signal voltage of 5VDC. When the voltage of control signal is 24VDC, then users should add a 2kohm resistor in the connection.

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 over 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   |

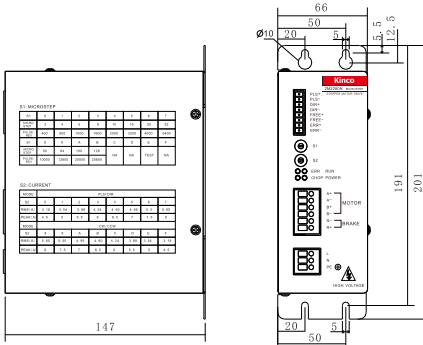
| S2, Current: switch for current and PLS/DIR, CW/CCW setting |         |      |      |      |      |      |      |      |
|-------------------------------------------------------------|---------|------|------|------|------|------|------|------|
| Mode                                                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



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   |                                                                                                                                                                                                                                                                                                                  |

- 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

|                           |                                                                                      |                                                                                         |
|---------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 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 over 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  |

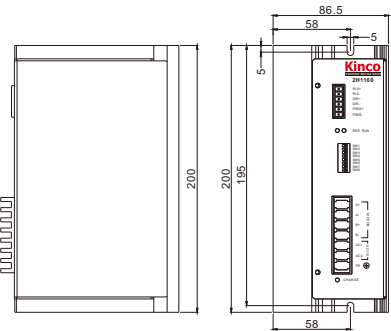
\* DIP switch is forbidden to set as N/A, or the driver will be alarm automatically.

Stepper Driver 2H1160



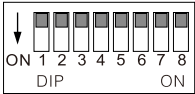
- Power supply: 60VAC~123VAC;
- Bipolar constant current drive mode is adopted, with phase current up to 6.5A. 86 & 110 series bipolar hybrid stepper motors are adaptable;
- Dedicated control chip is adopted, full-step or half-step mode are selectable by DIP switches, suitable for application requiring 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!



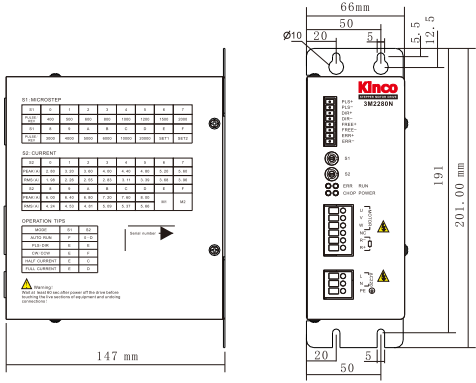
Control signal range is 5~24VDC. No need to add 2Kohm resistor when control signal is 24VDC.

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/<br>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 over heat 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 |      |      |

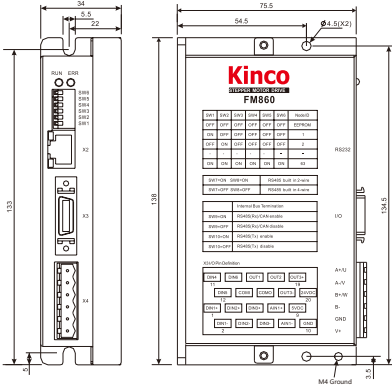
Operation Table

| 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.                                                                                                                                                                                                                      |



- 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(  $\pm 10V$ ) 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

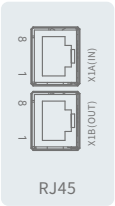
|                          |                                                                                              |
|--------------------------|----------------------------------------------------------------------------------------------|
| Model                    | FM860-AA-000 (Supports CANopen)<br>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<br>3-phase hybrid stepper motor                      |
| Control mode             | CANopen or Modbus control; I/O control; Analog input<br>Pulse control:PLS+DIR, CW/CCW, A+B   |
| Cooling method           | Natural air cooling                                                                          |
| Operation environment    | Avoid the environment with a great amount of<br>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)

Interface Introduction

| Interface  | Symbol   | Function                                    |
|------------|----------|---------------------------------------------|
| DIP switch | SW9~SW10 | Switches for terminal resistor setting      |
|            | SW7~SW8  | Switches for setting 2-wire or 4-wire RS485 |
|            | SW1~SW6  | ID rotary switch                            |

| Interface No. | Interface name               | Interface type           | Pin No. | Symbol | Signal name    | Interface No. | Interface name             | Interface                | Pin No. | Symbol | Signal name |
|---------------|------------------------------|--------------------------|---------|--------|----------------|---------------|----------------------------|--------------------------|---------|--------|-------------|
| X1A/X1B       | RS485 interface input/output | RJ45 network port female | 1       | RX+    | Data receive + | X1A/X1B       | CAN interface input/output | RJ45 network port female | 1       | CAN_H  | Signal +    |
|               |                              |                          | 2       | RX-    | Data receive - |               |                            |                          | 2       | CAN_L  | Signal -    |
|               |                              |                          | 3       | NC     |                |               |                            |                          | 3       | GNDB   | GND         |
|               |                              |                          | 4       | TX-    | Data send +    |               |                            |                          | 4       | NC     |             |
|               |                              |                          | 5       | TX+    | Data send -    |               |                            |                          | 5       | NC     |             |
|               |                              |                          | 6       | NC     |                |               |                            |                          | 6       | NC     |             |
|               |                              |                          | 7       | NC     |                |               |                            |                          | 7       | NC     |             |
|               |                              |                          | 8       | GNDB   | GND            |               |                            |                          | 8       | NC     |             |



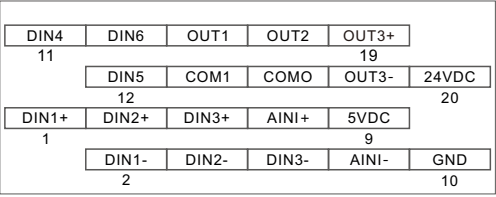
| Interface No. | Interface name  | Interface type           | Pin No. | Symbol | Signal name           | Function                                                      |
|---------------|-----------------|--------------------------|---------|--------|-----------------------|---------------------------------------------------------------|
| X2            | RS232 interface | Rj45 network port female | 1       | NC     |                       | Connect to PC, set parameters or monitor state by kincoservo+ |
|               |                 |                          | 2       | NC     |                       |                                                               |
|               |                 |                          | 3       | TX     | Driver's data send    |                                                               |
|               |                 |                          | 4       | GND    | GND                   |                                                               |
|               |                 |                          | 5       | NC     |                       |                                                               |
|               |                 |                          | 6       | RX     | Driver's data receive |                                                               |
|               |                 |                          | 7       | NC     |                       |                                                               |
|               |                 |                          | 8       | NC     |                       |                                                               |

Interface Introduction (FM560&FM880)

| Interface No. | Pin No. | Symbol | Signal name                                | Function                                                                                                                                                               |
|---------------|---------|--------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X3            | 1       | DIN1+  | DIN1 positive                              | High speed digital signal input interface<br>Input voltage: 5~24VDC<br>Input current: 8mA@5VDC, 12mA@24VDC<br>Valid input signal: >3VDC<br>Invalid input signal: <1VDC |
|               | 2       | DIN1-  | DIN1 negative                              |                                                                                                                                                                        |
|               | 3       | DIN2+  | DIN2 positive                              |                                                                                                                                                                        |
|               | 4       | DIN2-  | DIN2 negative                              |                                                                                                                                                                        |
|               | 5       | DIN3+  | DIN3 positive                              |                                                                                                                                                                        |
|               | 6       | DIN3-  | DIN3 negative                              |                                                                                                                                                                        |
|               | 11      | DIN4   | DIN4 input                                 | Low speed digital signal input interface<br>Input voltage: 12~24VDC<br>Input current: 4mA@12VDC, 8mA@24VDC<br>Valid input signal: >8VDC<br>Invalid input signal: <5VDC |
|               | 12      | DIN5   | DIN5 input                                 |                                                                                                                                                                        |
|               | 13      | DIN6   | DIN6 input                                 |                                                                                                                                                                        |
|               | 14      | COM1   | Common port of DIN4, DIN5, DIN6            |                                                                                                                                                                        |
|               | 7       | AIN1+  | AIN1 differential signal positive          | The analog signal input interface:<br>The input impedance: 180K<br>Max. input frequency: 4kHz<br>Max. Withstand voltage: 24VDC                                         |
|               | 8       | AIN1-  | AIN1 differential signal negative          |                                                                                                                                                                        |
|               | 10      | GND    | Common port of AIN1 and logic power supply |                                                                                                                                                                        |
|               | 9       | 5VDC   | 5VDC Logic power output                    | The maximum output current: 200mA                                                                                                                                      |
|               | 20      | 24VDC  | 24VDC Logic power input                    | Auxiliary logic power supply when external power supply does not work                                                                                                  |
|               | 15      | OUT1   | OUT1 output                                | Max. output current: 100mA<br>Max. Withstand voltage: 30VDC<br>Max. Voltage drop: 0.8VDC@100mA                                                                         |
|               | 17      | OUT2   | OUT2 output                                |                                                                                                                                                                        |
|               | 16      | COMO   | Common port if OUT1 and OUT2               |                                                                                                                                                                        |
|               | 19      | OUT3+  | OUT3 positive                              |                                                                                                                                                                        |
|               | 18      | OUT3-  | OUT3 negative                              |                                                                                                                                                                        |

Note: (1) DIN1, DIN2 and DIN3 use high-speed opto-isolation, max input frequency is 400KHz, min pulse width is 1.3us  
(2) DIN4~DIN6 use low-speed opto-isolation, max input frequency is 1KHz  
(3) OUT uses low-speed opto-isolation. max output frequency is 1KHz

| Interface | Name                  | Type                                      | Pin | Symbol | Signal name            | Function                                 |
|-----------|-----------------------|-------------------------------------------|-----|--------|------------------------|------------------------------------------|
| X4        | Power wiring terminal | 6 bits5mm gap Plug -in@plug -out terminal | 1   | A+/U   | Motor cable interface  | Two-phase or three-phase motor interface |
|           |                       |                                           | 2   | A-/V   |                        |                                          |
|           |                       |                                           | 3   | B+/W   |                        |                                          |
|           |                       |                                           | 4   | B-     | Power supply interface |                                          |
|           |                       |                                           | 5   | GND    |                        |                                          |
|           |                       |                                           | 6   | Vdc+   |                        |                                          |

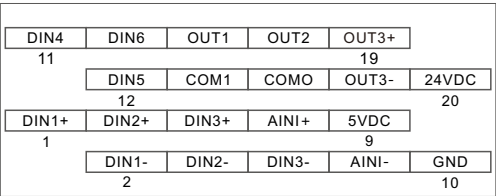


Interface Introduction (FM880)

| Interface No. | Pin No. | Symbol | Signal name                                | Function                                                                                                                                                               |
|---------------|---------|--------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X3            | 1       | DIN1+  | DIN1 positive                              | High speed digital signal input interface<br>Input voltage: 5~24VDC<br>Input current: 8mA@5VDC, 12mA@24VDC<br>Valid input signal: >3VDC<br>Invalid input signal: <1VDC |
|               | 2       | DIN1-  | DIN1 negative                              |                                                                                                                                                                        |
|               | 3       | DIN2+  | DIN2 positive                              |                                                                                                                                                                        |
|               | 4       | DIN2-  | DIN2 negative                              |                                                                                                                                                                        |
|               | 5       | DIN3+  | DIN3 positive                              |                                                                                                                                                                        |
|               | 6       | DIN3-  | DIN3 negative                              |                                                                                                                                                                        |
|               | 11      | DIN4   | DIN4 input                                 | Low speed digital signal input interface<br>Input voltage: 12~24VDC<br>Input current: 4mA@12VDC, 8mA@24VDC<br>Valid input signal: >8VDC<br>Invalid input signal: <5VDC |
|               | 12      | DIN5   | DIN5 input                                 |                                                                                                                                                                        |
|               | 13      | DIN6   | DIN6 input                                 |                                                                                                                                                                        |
|               | 14      | COM1   | Common port of DIN4, DIN5, DIN6            |                                                                                                                                                                        |
|               | 7       | AIN1+  | AIN1 differential signal positive          | The analog signal input interface:<br>The input impedance: 180K<br>Max. input frequency: 4kHz<br>Max. Withstand voltage: 24VDC                                         |
|               | 8       | AIN1-  | AIN1 differential signal negative          |                                                                                                                                                                        |
|               | 10      | GND    | Common port of AIN1 and logic power supply |                                                                                                                                                                        |
|               | 9       | 5VDC   | 5VDC Logic power output                    | The maximum output current: 200mA                                                                                                                                      |
|               | 20      | 24VDC  | 24VDC Logic power input                    | Auxiliary logic power supply when external power supply does not work                                                                                                  |
|               | 15      | OUT1   | OUT1 output                                | Max. output current: 100mA<br>Max. Withstand voltage: 30VDC<br>Max. Voltage drop: 0.8VDC@100mA                                                                         |
|               | 17      | OUT2   | OUT2 output                                |                                                                                                                                                                        |
|               | 16      | COMO   | Common port if OUT1 and OUT2               |                                                                                                                                                                        |
|               | 19      | OUT3+  | OUT3 positive                              |                                                                                                                                                                        |
|               | 18      | OUT3-  | OUT3 negative                              |                                                                                                                                                                        |

Note: (1)DIN1, DIN2 and DIN3 use high-speed opto-isolation, max input frequency is 400KHz, min pulse width is 1.3us  
(2)DIN4~DIN6 use low-speed opto-isolation, max input frequency is 1KHz  
(3)OUT uses low-speed opto-isolation. max output frequency is 1KHz

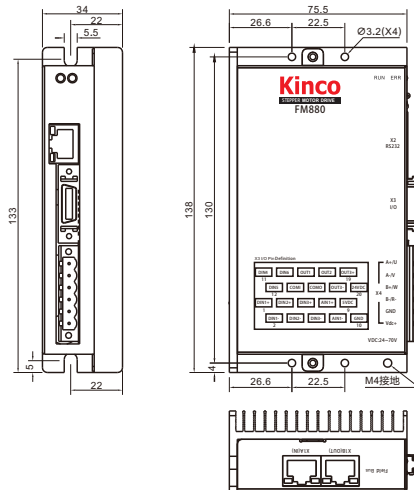
| Interface | Name                  | Type                                      | Pin | Symbol | Signal name            | Function                                 |
|-----------|-----------------------|-------------------------------------------|-----|--------|------------------------|------------------------------------------|
| X4        | Power wiring terminal | 6 bits 5mm gap Plug-in@ plug-out terminal | 1   | A+/U   | Motor cable interface  | Two-phase or three-phase motor interface |
|           |                       |                                           | 2   | A-/V   |                        |                                          |
|           |                       |                                           | 3   | B+/W   |                        |                                          |
|           |                       |                                           | 4   | B-     | Power supply interface |                                          |
|           |                       |                                           | 5   | GND    |                        |                                          |
|           |                       |                                           | 6   | Vdc+   |                        |                                          |





- 6 channels of optocoupler digital signal input, three of which support wide voltage input (5 ~ 24VDC);
- 3 light coupling digital signals lost output;
- all the analog input (plus or minus 10 v) control speed;
- support double pulse (the CW/CCW) model (P/D), pulse direction and incremental encoder (AB) mode control;
- 100Mbps Ethernet transceiver with isolation;
- support EtherCAT bus protocol control, optimize customer control circuit;
- has rich IO function configuration, support origin and multistage speed control mode;
- support motor parameters automatically to adapt to, custom lock shaft current, such as micro step filtering function;
- powerful protection function: overvoltage, undervoltage, overheating and over-current protection.
- RS232 serial communication, the use of upper machine software KincoStep parameters set;

Mechanical Dimensions (Unit:mm)



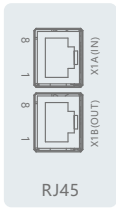
Technical Specifications

|                          |                                                                                                                                                     |                                                                |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| Model                    | FM560-EA-000                                                                                                                                        | FM880-EA-000                                                   |
| Supply voltage           | 24VDC~50VDC                                                                                                                                         | 24VDC~70VDC                                                    |
| Over-voltage protection  | Above 85VDC                                                                                                                                         | Above 85VDC                                                    |
| Under-voltage protection | Below 15VDC                                                                                                                                         | Below 15VDC                                                    |
| Input current            | 0.1~6A (Peak)                                                                                                                                       | 0.1~10A (Peak)                                                 |
| Subdivision              | Upper computer software KincoStep setting                                                                                                           |                                                                |
| Adaptive motor           | Two - phase type 42, 57 hybrid stepping motor                                                                                                       | Two - phase 86 and three - phase 57, 85 hybrid stepping motors |
| Control Method           | EtherCAT bus protocol control, IO control, analog controlPulse control: pulse + direction (PLS+DIR, positive and negative pulse (CW/CCW), A+B phase |                                                                |
| Cooling method           | Natural air cooling                                                                                                                                 |                                                                |
| Operating environment    | Avoid large amounts of metal dust, oil mist or corrosive gases                                                                                      |                                                                |
| Operating humidity       | <85%, RH (No dews or dewdrops)                                                                                                                      |                                                                |
| Operating temperature    | 0°C~+40°C                                                                                                                                           |                                                                |
| Storage temperature      | -20°C~+70°C                                                                                                                                         |                                                                |
| Weight                   | 0.363Kg                                                                                                                                             |                                                                |
| Dimensions               | 134.5x 75.5 x 34mm                                                                                                                                  |                                                                |
| Ingress protection       | IP20                                                                                                                                                |                                                                |

Remarks:  
It is recommended to purchase the matching communication cable together when purchasing for the first time. Model: Console configuration line (RS232 serial port to RJ45 crystal line)

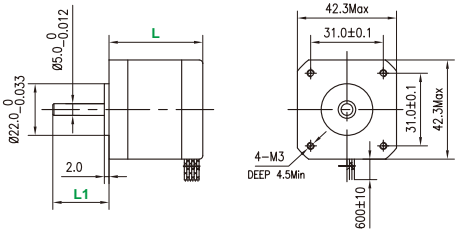
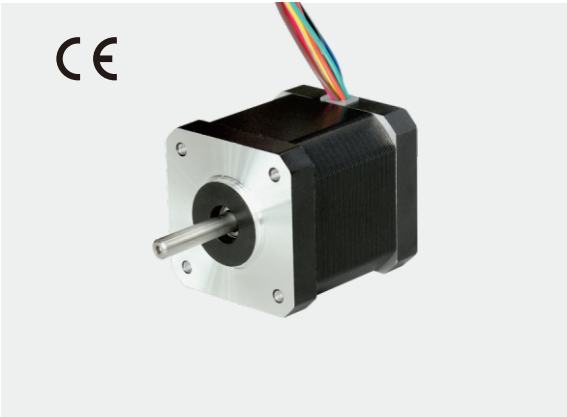
Interface Introduction

| Interface No. | Interface name                         | Interface type           | Pin No. | Symbol | Signal name                      |
|---------------|----------------------------------------|--------------------------|---------|--------|----------------------------------|
| X1A/X1B       | EtherCAT communication interface input | RJ45 network female port | 1       | TD+    | Sending the signal forward       |
|               |                                        |                          | 2       | TD-    | Negative end of sending signal   |
|               |                                        |                          | 3       | RD+    | Positive end of receiving signal |
|               |                                        |                          | 4       | NC     |                                  |
|               |                                        |                          | 5       | NC     |                                  |
|               |                                        |                          | 6       | RD-    | Negative end of receiving signal |
|               |                                        |                          | 7       | NC     |                                  |
|               |                                        |                          | 8       | NC     |                                  |



| Interface No. | Interface name  | Interface type           | Pin No. | Symbol | Signal name            | Function                                                      |
|---------------|-----------------|--------------------------|---------|--------|------------------------|---------------------------------------------------------------|
| X2            | RS232 interface | RJ45 network port female | 1       | NC     |                        | Connect to PC, set parameters or monitor state by kincoservo+ |
|               |                 |                          | 2       | NC     |                        |                                                               |
|               |                 |                          | 3       | TX     | Driver' s data send    |                                                               |
|               |                 |                          | 4       | GND    | GND                    |                                                               |
|               |                 |                          | 5       | NC     |                        |                                                               |
|               |                 |                          | 6       | RX     | Driver' s data receive |                                                               |
|               |                 |                          | 7       | NC     |                        |                                                               |
|               |                 |                          | 8       | NC     |                        |                                                               |

Dimensions (Unit : mm)

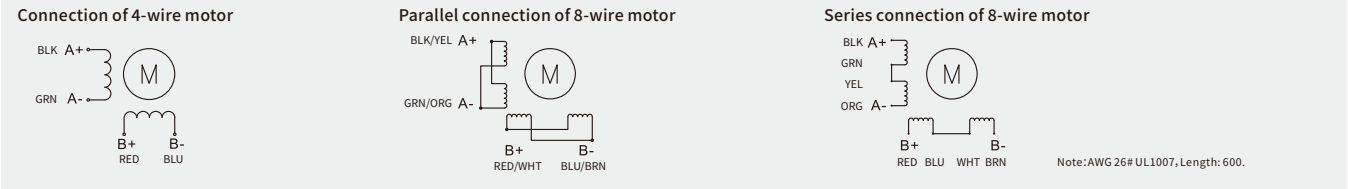


| Model      | L  | L1     |
|------------|----|--------|
| 2S42Q-0348 | 48 | 24±0.5 |
| 2S42Q-0240 | 40 | 16±0.5 |

Specification

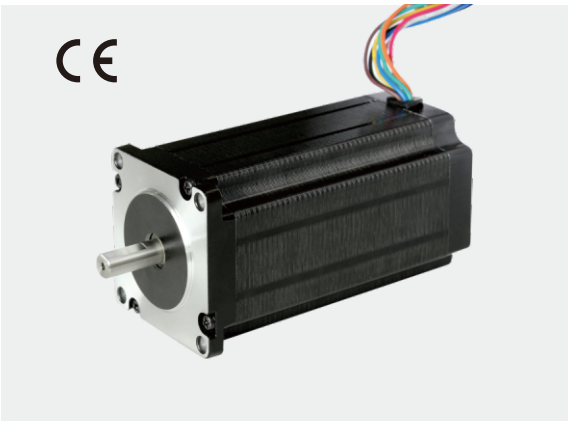
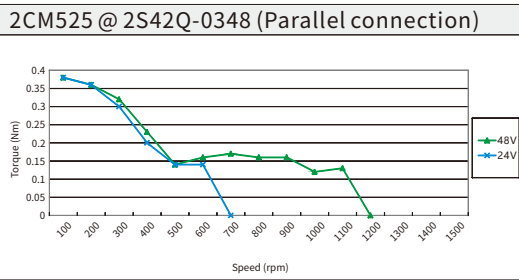
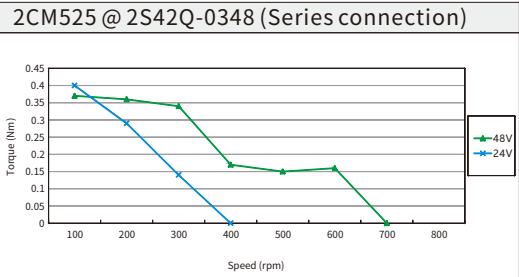
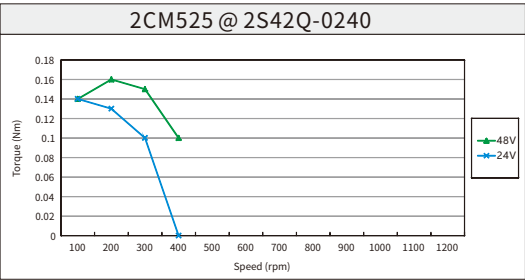
| Technical Specifications            |          | 2S42Q-0348                                          | 2S42Q-0240 |
|-------------------------------------|----------|-----------------------------------------------------|------------|
| Step angle                          | Series   | 1.8°                                                | 1.8°       |
|                                     | Parallel | 0.7                                                 | 0.4        |
| Phase current (A)                   | Series   | 0.7                                                 | 0.4        |
|                                     | Parallel | 1.4                                                 | 0.4        |
| 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.cm <sup>2</sup> ) |          | 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       |
| No-load start frequency             |          | 14K                                                 | 14K        |
| Ingress protection                  |          | IP40                                                |            |

Motor cable

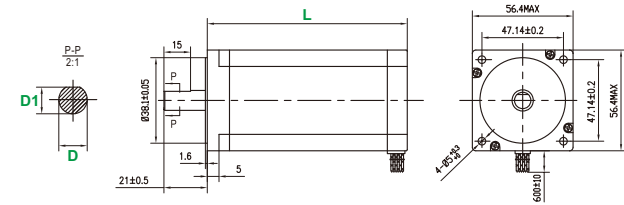


Note:AWG 26# UL1007, Length: 600.

Torque-frequency curve



Dimensions (Unit : mm)



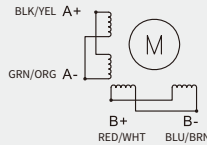
| Model      | L   | D     | D1      |
|------------|-----|-------|---------|
| 2S57Q-25B2 | 112 | Ø8.0  | 7.5±0.1 |
| 2S57Q-2280 | 80  | Ø8.0  | 7.5±0.1 |
| 2S57Q-1376 | 76  | Ø6.35 | 5.8±0.1 |
| 2S57Q-0956 | 56  | Ø6.35 | 5.8±0.1 |
| 2S57Q-0541 | 41  | Ø6.35 | 5.8±0.1 |

Specification

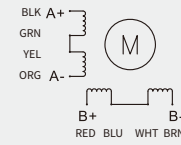
| Technical Specifications |          | 2S57Q-25B2                                          | 2S57Q-2280 | 2S57Q-1376 | 2S57Q-0956 | 2S57Q-0541 |
|--------------------------|----------|-----------------------------------------------------|------------|------------|------------|------------|
| Step angle               |          | 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       |
| No-load start frequency  |          | 12K                                                 | 12K        | 14K        | 12K        | 12K        |
| Ingress protection       |          | IP40                                                |            |            |            |            |

Motor cable

Parallel connection of 8-wire motor



Series connection of 8-wire motor

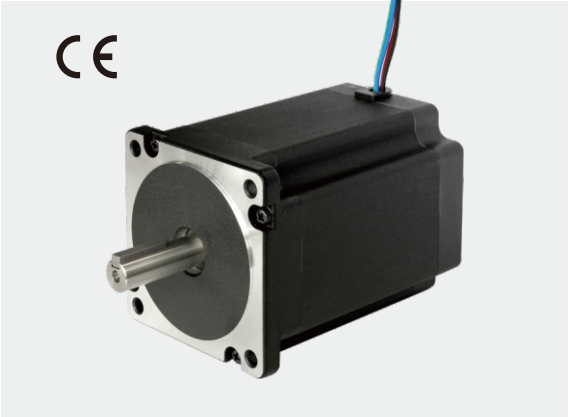
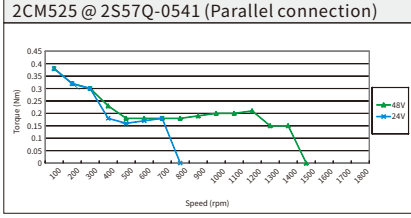
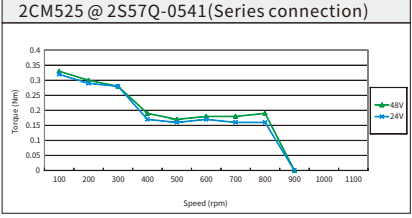
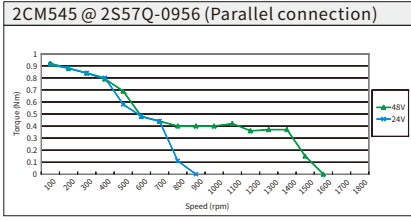
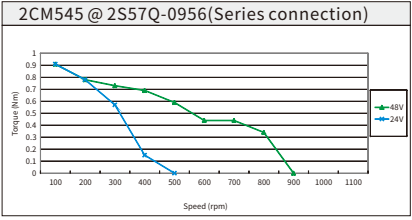
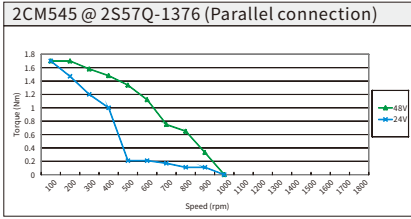
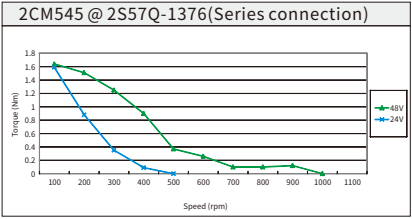
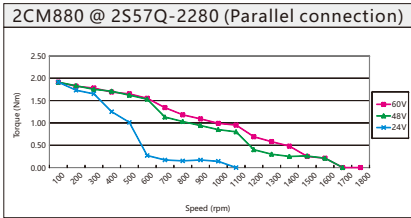
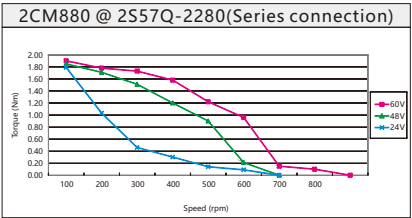
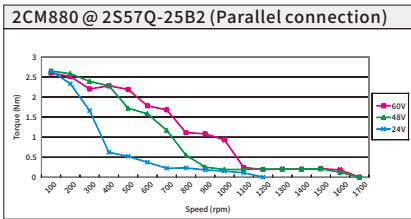
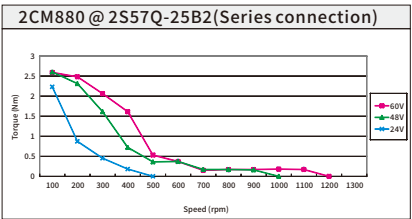


Note:AWG 22# UL1007, Length: 600.

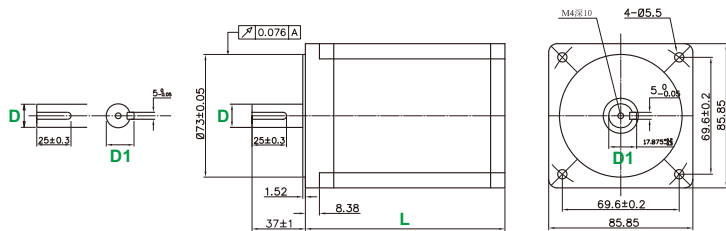
Two-phase stepper motor/57 series

Two-phase stepper motor/86 series

Torque-frequency curve



Dimensions (Unit:mm)



| Model       | L   | D       | D1                                     |
|-------------|-----|---------|----------------------------------------|
| 2S86Q-051F6 | 156 | Ø15.875 | 17.875 <sup>+0.2</sup> <sub>-0.3</sub> |
| 2S86Q-85B8  | 118 | Ø13     | 15 <sup>+0.2</sup> <sub>-0.3</sub>     |
| 2S86Q-4580  | 80  | Ø13     | 15 <sup>+0.2</sup> <sub>-0.3</sub>     |
| 2S86Q-3465  | 65  | Ø13     | 15 <sup>+0.2</sup> <sub>-0.3</sub>     |

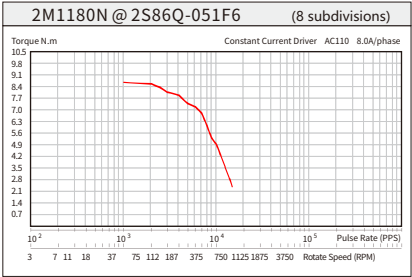
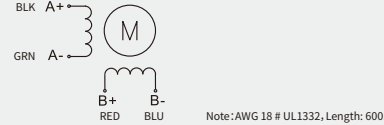
Specification

| 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 <sup>2</sup> ) | 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        |
| Ingress protection                  | IP40                                                |            |            |            |

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

Motor cable

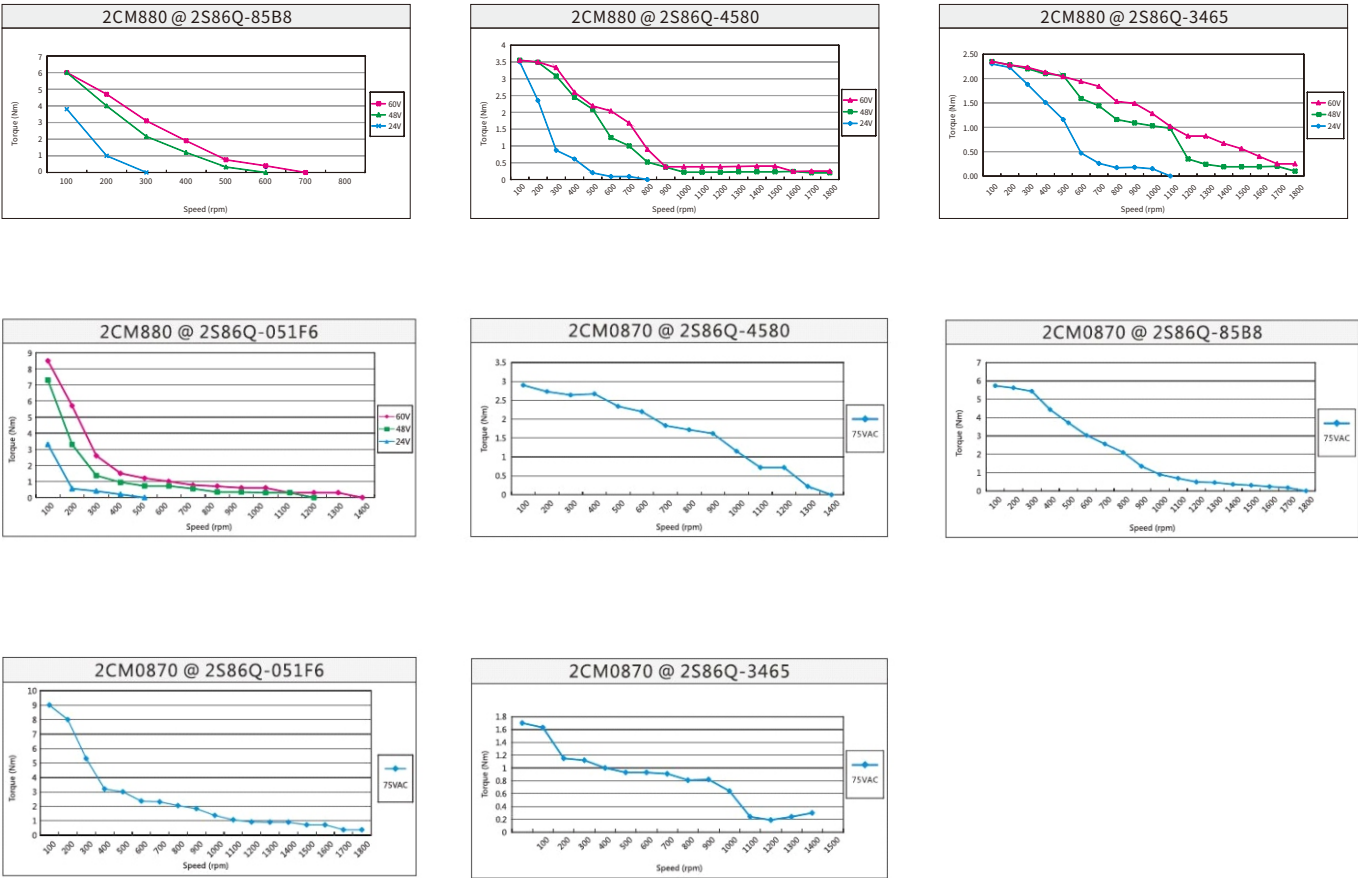
Two-phase 4-wire motor



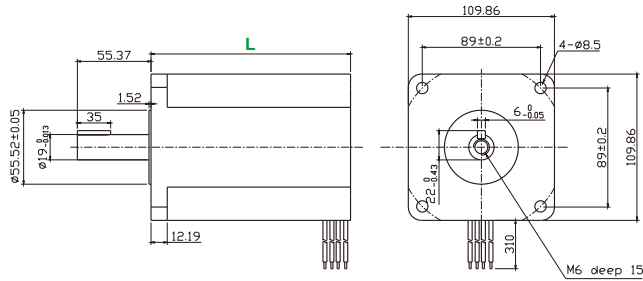
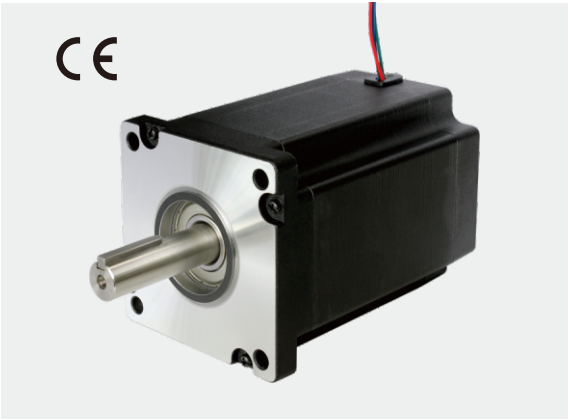
Two-phase stepper motor/86 series

Two-phase stepper motor/110 series

Torque-frequency curve



Dimensions (Unit:mm)



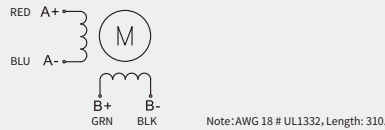
Specification

| 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.cm <sup>2</sup> ) | 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         |
| Ingress protection                  | IP40                                                |              |              |

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

Motor cable

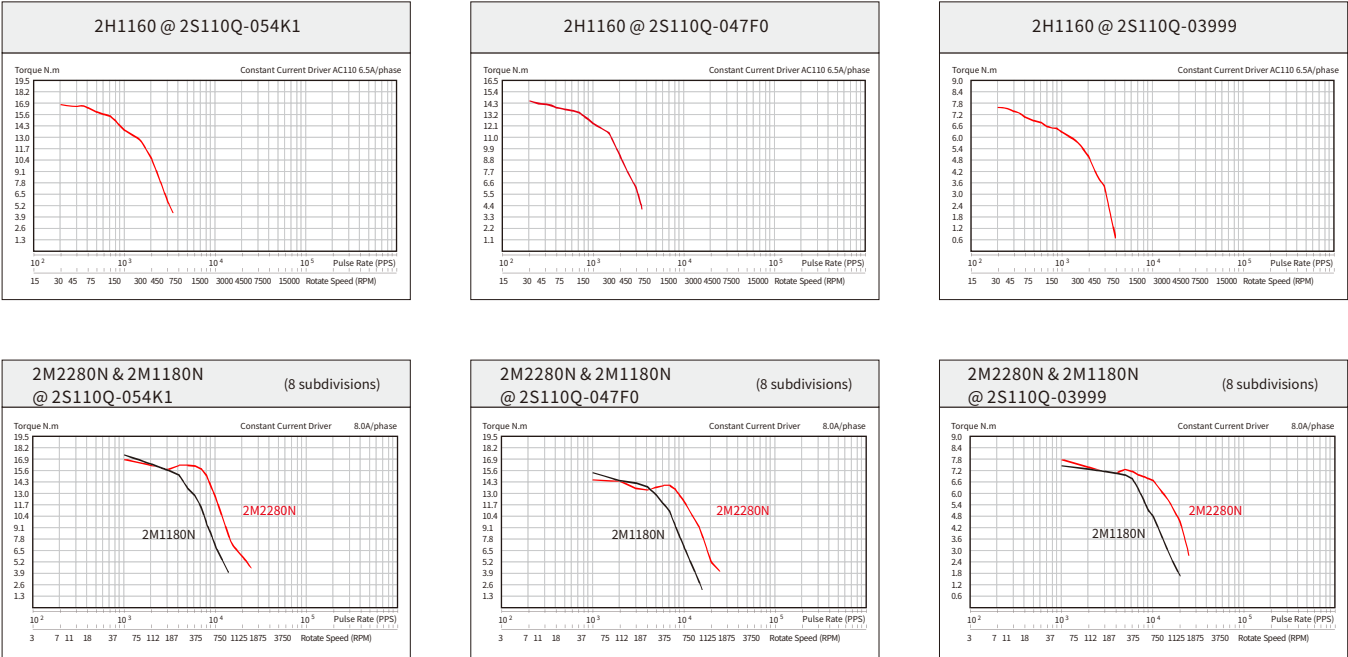
Two-phase 4-wire motor



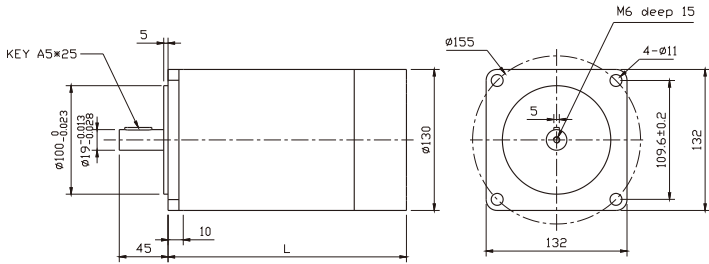
Two-phase stepper motor/110 series

Two-phase stepper motor/130 series

Torque-frequency curve



Dimensions (Unit:mm)



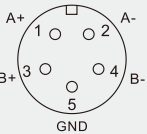
Specification

| Technical Specifications        | 2S130Y-063R8                                        | 2S130Y-039M0 |
|---------------------------------|-----------------------------------------------------|--------------|
| Step angle                      | 1.8°                                                | 1.8°         |
| Phase current (A)               | 7.0                                                 | 6.0          |
| Holding torque (Nm)             | 40.0                                                | 27.0         |
| Damping torque (Nm)             | 1.2                                                 | 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          |
| Shaft diameter (mm)             | 19                                                  | 19           |
| Number of lead wires            | 4                                                   |              |
| Insulation class                | B                                                   |              |
| Withstand voltage level         | 1800VAC 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)                     | 19.0                                                | 13.0         |
| Startup freq. with no load(Hz)* | 4.1K                                                | 4.9K         |
| Ingress protection              | IP40                                                |              |

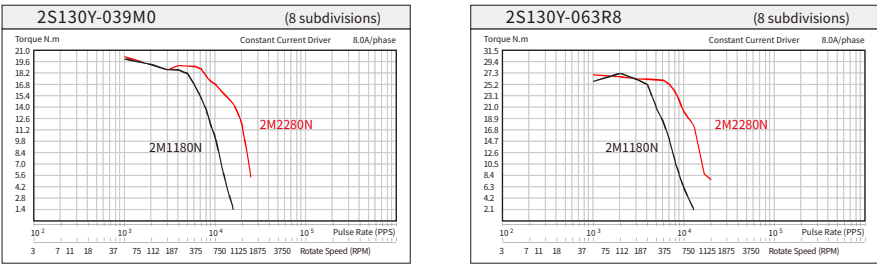
Note: The startup freq. is tested under condition of 2000 steps/round, only for reference.

Motor cable

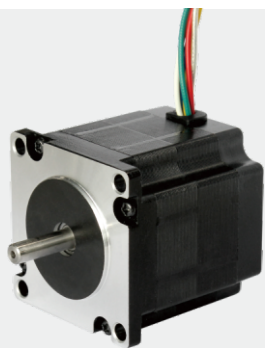
Pinput of motor connector



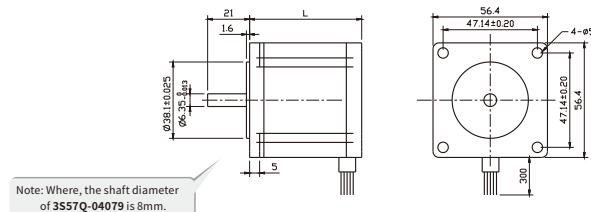
Torque-frequency curve



## Three-phase stepper motor/57 series



### Dimensions (Unit:mm)



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

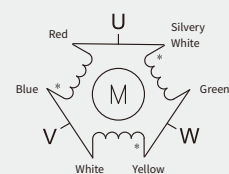
## Specification

| Technical Specifications        | 3S57Q-04079                                 | 3S57Q-04056 |
|---------------------------------|---------------------------------------------|-------------|
| Step angle                      | 1.2°                                        | 1.2°        |
| Phase current (A)               | 5.8                                         | 5.6         |
| Holding torque (Nm)             | 1.5                                         | 0.9         |
| Damping torque (Nm)             | 0.07                                        | 0.04        |
| Winding resistance (Ω)          | 1.05±10%                                    | 0.7±10%     |
| Winding inductance (mH)         | 2.4±20%                                     | 1.7±20%     |
| Motor inertia (kg.cm²)          | 0.48                                        | 0.3         |
| Motor length L (mm)             | 79                                          | 56          |
| Shaft diameter (mm)             | 8                                           | 6.35        |
| Number of lead wires            | 6                                           |             |
| Insulation class                | B                                           |             |
| Withstand voltage level         | 600VAC 1S 5mA                               |             |
| Max. axial load (N)             | 15                                          |             |
| Max. radial load (N)            | 75                                          |             |
| Operating temperature           | -20°C~+50°C                                 |             |
| Surface temperature rise        | Max.80°C (Working with rated phase current) |             |
| Insulation impedance            | Minimum 100MΩ, 500V DC                      |             |
| Weight (kg)                     | 1                                           | 0.72        |
| Startup freq. with no load(Hz)* | 2.1K                                        | 2.4K        |
| Ingress protection              | IP40                                        |             |

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

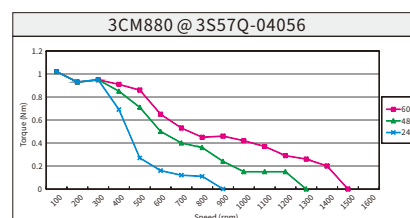
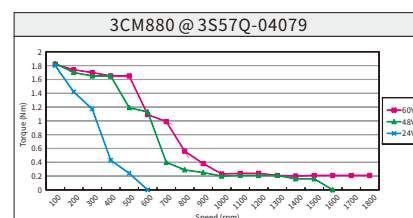
## Motor cable

Three-phase 6-wire motor

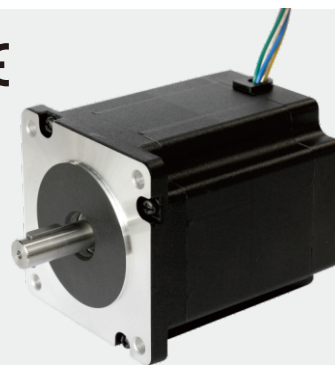


Note:AWG 18 # UL1332, Length: 400.

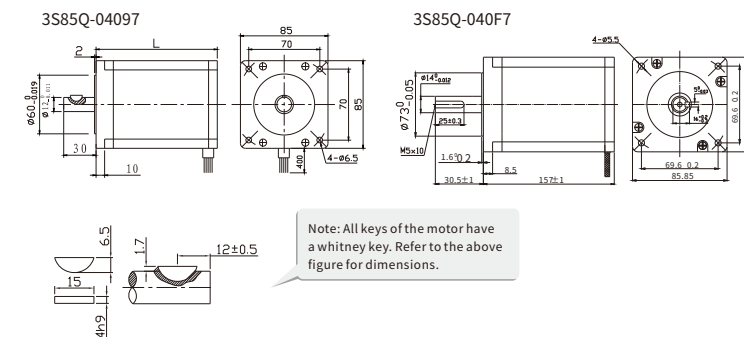
## Torque-frequency curve



## Three-phase stepper motor/85 series



### Dimensions (Unit : mm)



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

## Specification

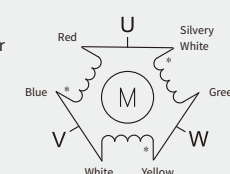
| Technical Specifications            | 3S85Q-04097                                 | 3S85Q-040F7    |
|-------------------------------------|---------------------------------------------|----------------|
| Step angle                          | 1.2°                                        | 1.2°           |
| 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 <sup>2</sup> ) | 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           |
| Ingress protection                  | IP40                                        |                |

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

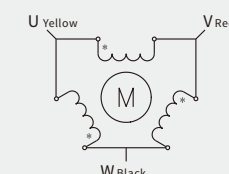
## Motor cable

3S85Q-04097

Three-phase 6-wire motor

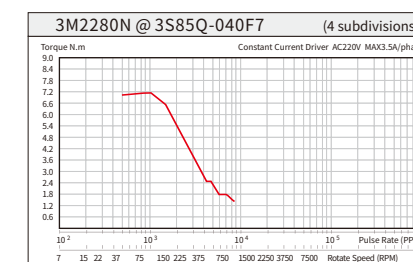
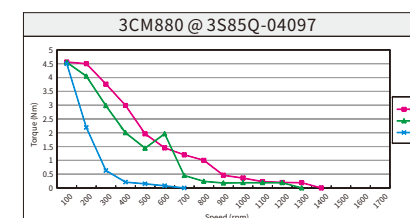


3S85Q-040F7



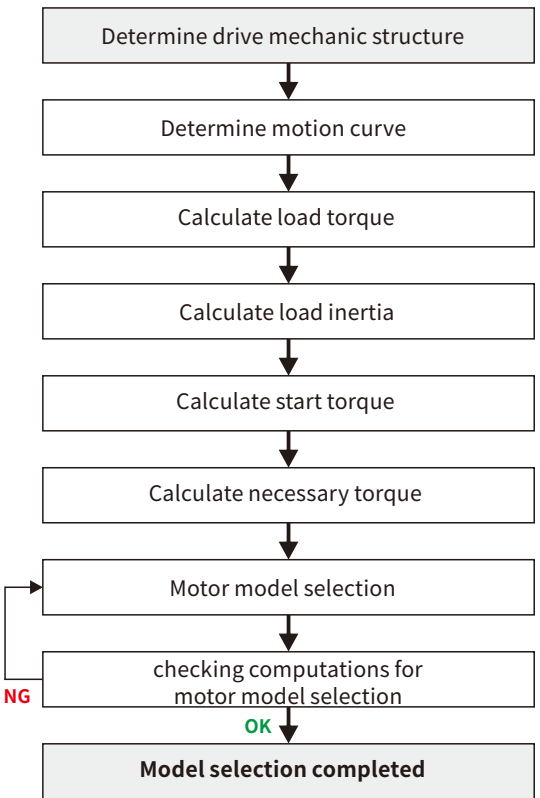
Note:AWG 18 # UL1332, Length: 400.

## Torque-frequency curve

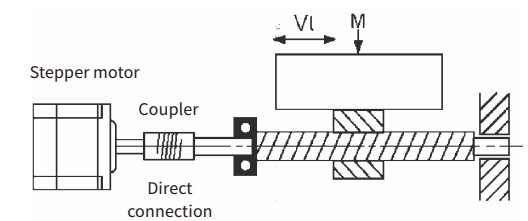


| Motion Mode                       | Rotational Motion                                                                                                                                                                                             | Linear Motion                                                                                                                                                                                                                                                                                                                                                                         |                                                                     |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
|                                   |                                                                                                                                                                                                               | Horizontal axial direction                                                                                                                                                                                                                                                                                                                                                            | Vertical axial direction                                            |
| Mechanical structure              |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                       |                                                                     |
|                                   | <p><math>N_l</math>: Drive speed (r/min)<br/><math>V_l</math>: Load speed (m/min)<br/><math>T_l</math>: Load torque (N·m)<br/><math>\mu</math>: Friction coefficient<br/><math>P_B</math>: Screw lead (m)</p> | <p><math>M</math>: Quality of linear motion part (kg)<br/><math>M_C</math>: Weight quality (kg)<br/><math>1/R</math>: Gear reduction ratio<br/><math>\eta</math>: Friction coefficient</p>                                                                                                                                                                                            |                                                                     |
| Speed curve                       |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                       |                                                                     |
| Single travel(m)                  | $l = \frac{V_l}{60} \cdot t_0$                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                       |                                                                     |
| Drive speed(rpm)                  | $N_l$                                                                                                                                                                                                         | $N_l = \frac{V_l}{P_B}$                                                                                                                                                                                                                                                                                                                                                               | $N_l = \frac{V_l}{P_B}$                                             |
| Rotational speed of motor(rpm)    | $N_M = N_l \cdot R$                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                       |                                                                     |
| Load torque(N·m)                  | $T_l = \frac{T_l}{R \cdot \eta}$                                                                                                                                                                              | $T_l = \frac{\mu \cdot g \cdot M \cdot P_B}{2\pi \cdot R \cdot \eta}$                                                                                                                                                                                                                                                                                                                 | $T_l = \frac{g \cdot (M - M_C) \cdot P_B}{2\pi \cdot R \cdot \eta}$ |
| Load Inertia (kg·m <sup>2</sup> ) | Linear motion                                                                                                                                                                                                 | $J_L = J_{L1} + J_{L2} + J_{L3}$                                                                                                                                                                                                                                                                                                                                                      |                                                                     |
|                                   | Rotational motion                                                                                                                                                                                             | $J_{L1} = M \cdot \left(\frac{P_B}{2\pi R}\right)^2$                                                                                                                                                                                                                                                                                                                                  | $J_{L1} = (M + M_C) \cdot \left(\frac{P_B}{2\pi R}\right)^2$        |
|                                   |                                                                                                                                                                                                               | <p>· Solid Cylinder: <math>J_K = \frac{\pi}{32} \cdot L \cdot D^4</math></p> <p>density: iron <math>\rho = 7.9 \times 10^3 \text{ (kg/m}^3\text{)}</math><br/>Aluminum: <math>\rho = 2.7 \times 10^3 \text{ (kg/m}^3\text{)}</math><br/>Brass: <math>\rho = 8.5 \times 10^3 \text{ (kg/m}^3\text{)}</math><br/>Nylon: <math>\rho = 1.1 \times 10^3 \text{ (kg/m}^3\text{)}</math></p> |                                                                     |
|                                   |                                                                                                                                                                                                               | <p>· Hollow Cylinder: <math>J_K = \frac{\pi}{32} \cdot L \cdot (D_o^4 - D_i^4)</math></p> <p>Inertia loaded to motor shaft</p> <p>Gear input: <math>J_{L2} = J_K</math> Gear output: <math>J_{L3} = \frac{J_K}{R^2}</math></p>                                                                                                                                                        |                                                                     |
| 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 rotor (Unit: kg·m <sup>2</sup> )                                                                                                                                                                                                                                                                                                             |                                                                     |
| Necessary torque(N·m)             | $T_M = (T_l + T_s) \times S$                                                                                                                                                                                  | $S$ indicates the safety coefficient, normally 2~3                                                                                                                                                                                                                                                                                                                                    |                                                                     |

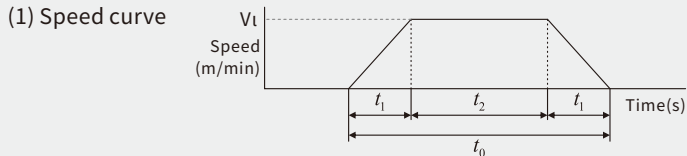
Model Selection Procedure



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:  $\eta = 0.9$



Acceleration time:  $t_1 = t_0 - \frac{l}{V_l} = 1.2 - \frac{0.0275}{1.5} = 0.98 \text{ (s)}$

(2) Rotation speed of motor

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

(3) Load torque

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

(4) Load inertia

Linear motion:  $J_{L1} = M \cdot \left(\frac{P_B}{2\pi R}\right)^2 = 50 \times \left(\frac{0.004}{2\pi}\right)^2 = 2 \times 10^{-4} \text{ (kg·m}^2\text{)}$

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

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

Load inertia:  $J_L = J_{L1} + J_B + J_C = 0.824 \times 10^{-4} \text{ (kg·m}^2\text{)}$

(5) Motor torque

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

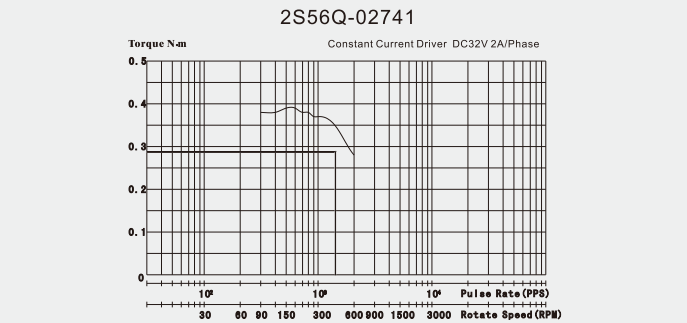
Necessary torque:  $T_M = (T_l + T_s) \times S = (0.104 + T_s) \times 2 = 0.272 + 0.08 \times 10^4 J_M \text{ (N·m)}$

$S$  indicates the safety coefficient, normally 2.  
 $J_M$  indicates the inertia of the motor rotor (Unit: kg·m<sup>2</sup>).

(6) Motor selection

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

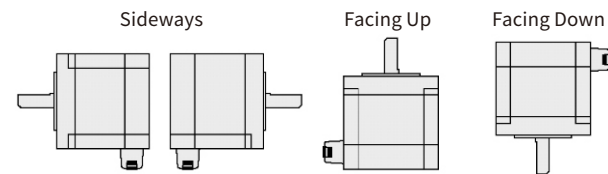
Rotator inertia:  $J_M = 0.135 \times 10^{-4} \text{ kg·m}^2$   
 $T_M = 0.272 + 0.08 \times 10^4 \times 0.135 \times 10^{-4} = 0.283 \text{ (N·m)}$



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.

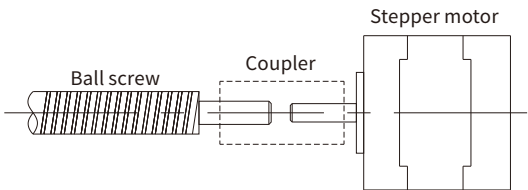
## Recommended Motor Installation Position

Motors shall be installed in positions meeting the following conditions:

1. Indoor;
2. The temperature inside the control cabinet shall range from -10°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.

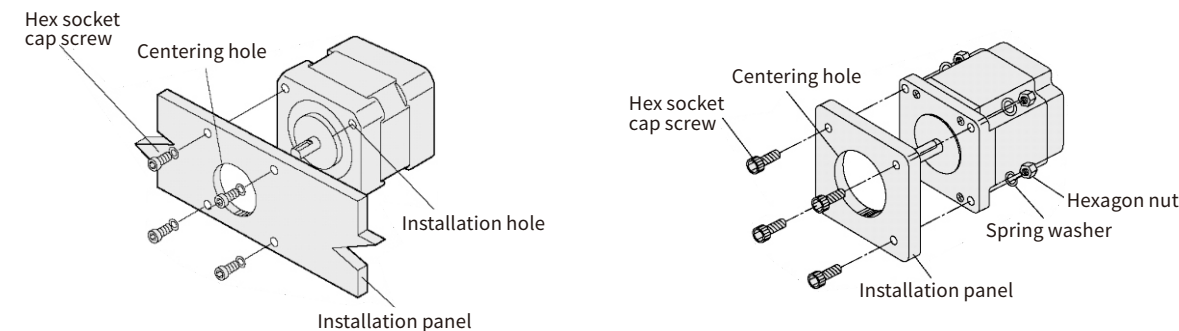
Note :

- 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.

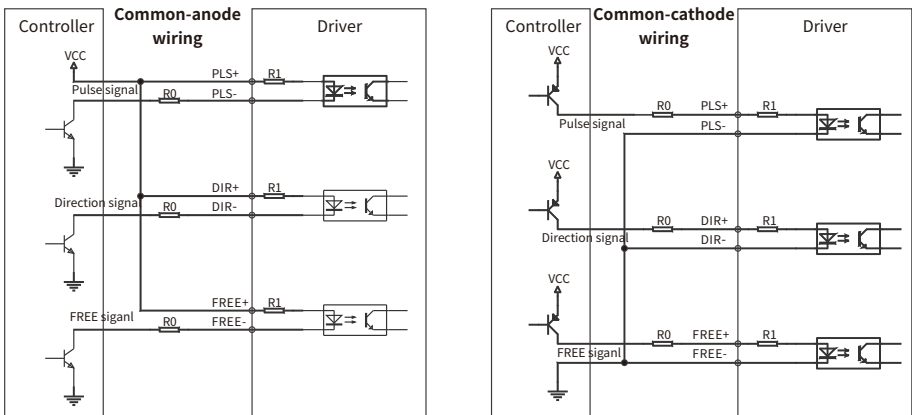


## Aligned Connection of Load

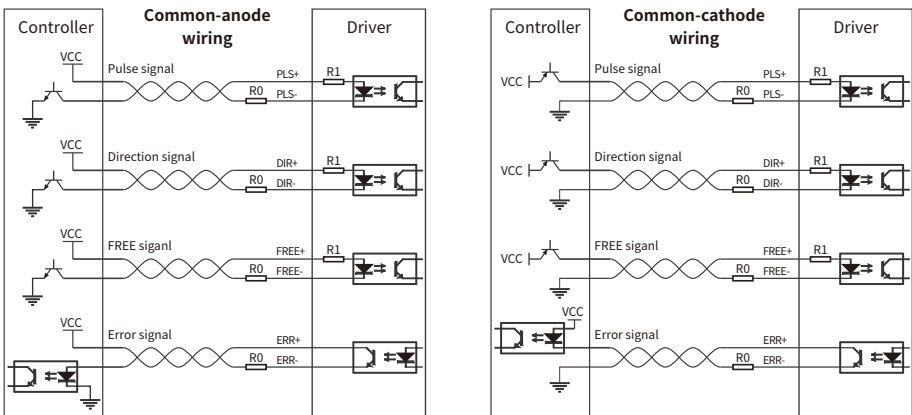
When a load is connected to the motor shaft, make sure that the load shaft aligns with the motor shaft. It is recommended that an anti-backlash flexible coupler or other appropriate devices are used to meet this requirement. Mechanical processing is forbidden for the motor shaft. Please contact your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



## 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

