M880A

Introduction

The M880A is a high performance microstepping drive based on pure-sinusoidal current control and self-adjustment (self-adjust current control parameters according to different motors) technologies. The driven motors can run with lower noise, lower heating and smoother movement. It has better performance at higher speed than most of the drivers in the markets. It is suitable for 2-phase and 4-phase hybrid stepping motors from NEMA 23 to NEMA 42.

Applications

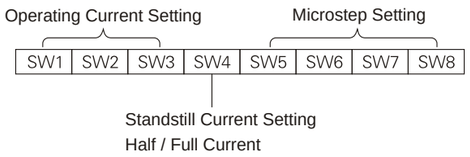
Suitable for a wide range of stepping motors from NEMA23 to 42. Widely used in various kinds of machines, such as CNC routers, labeling machines, laser machines, X-Y tables, pick-place devices, and so on. Particularly suitable for the applications require low noise, low heating and high speed performance.

Function Description

Function	Description
Microstep Setting	16 selectable microstep resolutions up to 51,200 steps/rev. It's set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep on the fly.
Current Setting	The first three bits (SW1, 2, 3) of the DIP switch are used to set the operating current, which is up to 7.8A. Select a setting closest to your motor's required current.
Automatic Standstill Current Reduction	SW4 is used for the automatic standstill current reduction function. When this function active, the current will automatically reduced to 60% of the selected operating current 0.4 second after the last pulse. Theoretically, this will reduce motor heating to 36% (due to $P=I^2*R$) of the original value.
Control Signals	PUL+ and PUL- are for pulse command signals. DIR+ and DIR- are for direction control signals. ENA+ and ENA- are for enable/ disable control signals. Series connect resistors for current-limiting when +12V or +24V used.
Motor Connector	A+, A- and B+, B- are for motor connections. Exchanging the connection of two wires for a coil to the drive will reverse default motion direction.
Power Connector	Recommend use power supplies with theoretical output of +20 ~ 68VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. Green LED on means the drive is powered up, and Red LED on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by repowering it to make it function properly after removing problem(s).

Parameter Settings

This M880A uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below.



Operating Current Setting

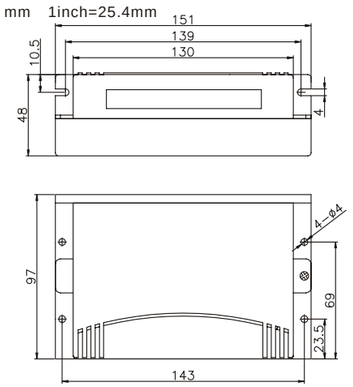
Peak Current	RMS Current	SW1	SW2	SW3
2.80A	2.00 A	on	on	on
3.50A	2.50 A	off	on	on
4.20A	3.00 A	on	off	on
4.90A	3.50 A	off	off	on
5.70A	4.07 A	on	on	off
6.40A	4.57 A	off	on	off
7.00A	5.00 A	on	off	off
7.80A	5.57 A	off	off	off

Microstep Resolution Setting

Steps/rev.	SW5	SW6	SW7	SW8
400	on	on	on	on
800	off	on	on	on
1600	on	off	on	on
3200	off	off	on	on
6400	on	on	off	on
12800	off	on	off	on
25600	on	off	off	on
51200	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
40000	off	off	off	off

Mechanical Specifications

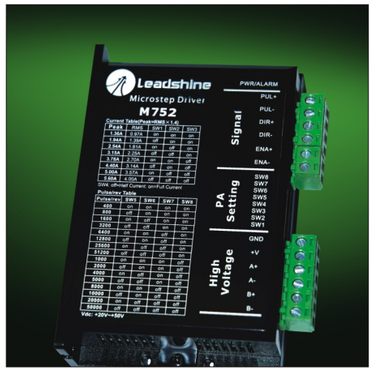
Unit: mm 1inch=25.4mm



Note: Product appearance and technical parameters are subject to change without notice.

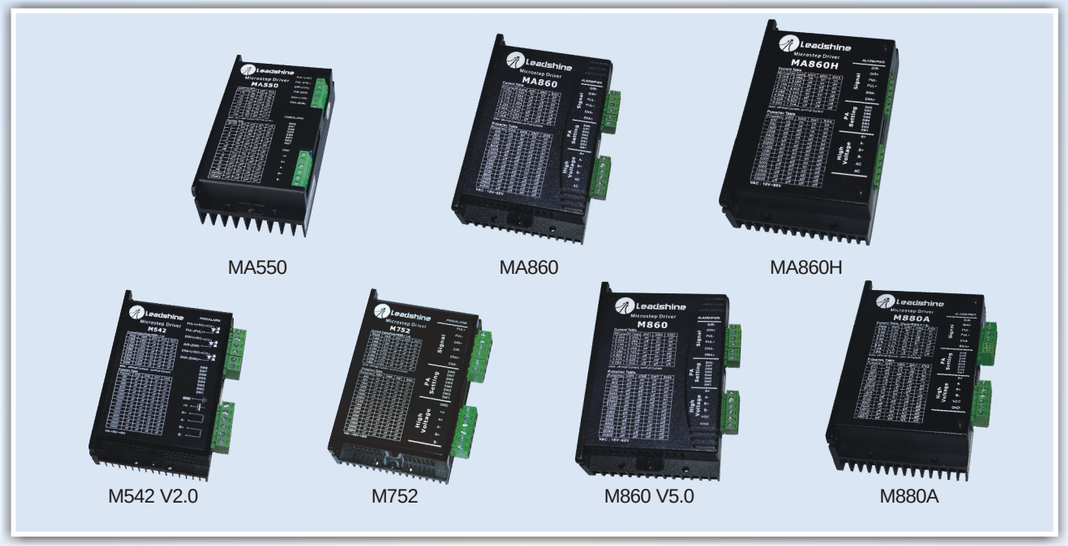
Leadshine

Leading **Technology** *Shining* **Value**



New M Series Stepping Drives

- 3rd Generation Stepping Drives
- Highly Cost-effective
- Innovative Patented Analog Technology



Highly Cost-effective
New M Series Stepping Drives

Features

- The third generation of economical high performance stepping drives
- Precise current control technology with less motor heating
- 7 models, covering 20~112VDC or 18 ~ 80VAC operating voltage ranges
- Excellent high-speed performance
- Self-adjustment technology, providing optimal performance with different motors
- Smoother movement at low-speed
- Lower noise and heating than most analog stepping drives in the market
- Replace or upgrade all old M series drives

Introduction

The new M series are the latest analog stepping drives Leadshine developed after more than 12 years R&D experiences. These drives provide better performance and offer high performance-price ratio. They are the most cost-effective stepping drives in the market.

The new M series stepping drives employ Leadshine's innovative patented control technologies. With the adoption of its pioneer "pure-sinusoidal current control technology" and the latest "self-adjustment technology", those drives can effectively reduce current ripples and mid-range vibration, enabling different motors to run at optimal performance and lower heating. They can also eliminate drawbacks of difficulty of driving various motors, high heating with smaller inductance motors, low high-speed torque with large inductance motors, poor performance under low voltage, and high motor heating under high voltage.

The new M series stepping drives use three digital filters which greatly improve anti-interference performance, and increase the precision and stability of machines.

Application and Position

The new M series includes seven models. DC input models include the M542/M752/M860 V5.0/M880A, and AC & DC input models include the MA550/MA860/MA860H. Suitable to drive 2-phase stepping motors (form NEMA17 to 42) using in industrial and office automation applications. The AC & DC input models support AC inputs, cutting using cost by a simpler power supply (without power rectifier).

The M542V2.0 is mainly used to replace the M542V1.X and ME542V1.X to improve motor noise, heating and smoothness performance.

The M752 features in small size, high-speed performance. Can be used to upgrade the ME742, M840, M839 and some other models.

The M860V5.0 is a medium voltage drive, features in high-speed and high performance and can be used to upgrade the M860, which is widely used in CNC routers where require high performance both at low speed and high speed .

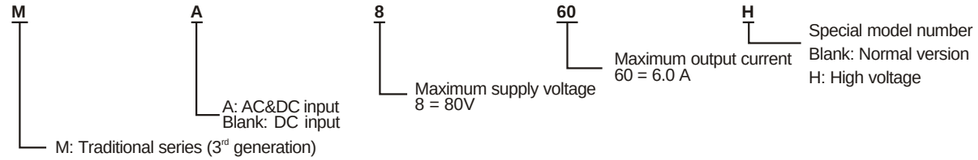
The M880A is a medium voltage drive, features in excellent high-speed performance and low heating. It can be used to upgrade the M880, ME872, MD882 , M860, and other models.

The MA550 features small size, AC & DC inputs. Widely used in packing and electronic manufacturing where require good high-speed performance, small size and lower cost.

The MA860 is a medium voltage drive, features small size, AC & DC inputs. Widely used in CNC routers where require high performance both at low speed and high speed, besides lower cost.

The M860H is an improved model of the MA860, features higher AC & DC inputs (40~80VAC/ 56~112VDC). Suitable to drive larger stepping motors (from NEMA size 34 to 42 and 6 to 15 N*m) at high-medium speed operation.

Part Number



Selection Table

Model	Models to be Replaced	Output Current (A)	Supply Voltage (V)	Size (mm) Weight (g)	Driving Motors (NEMA Size)	Control Signal	
						PUL/DIR; CW/CCW	Single-ended; Differential
M542 V2.0	M535, M542, ME542	1.0 ~ 4.2	24 ~ 50VDC	118*75.5*34 271	14, 17, 23	PUL/DIR; CW/CCW	Single-ended; Differential
M752	M840, M839, ME742	1.26 ~ 5.2	36 ~ 75VDC	118*75.5*34 280	14, 17, 23, 34	PUL/DIR; CW/CCW	Single-ended; Differential
M860 V5.0	M860	2.4 ~ 7.2	24 ~ 80VDC	151*97*48 570	17, 23, 34	PUL/DIR; CW/CCW	Single-ended; Differential
MA550	MA535B	1.0 ~ 5.0	18 ~ 30VAC	132*76*45 300	14, 17, 23	PUL/DIR; CW/CCW	Single-ended; Differential
M880A	M860, M880, ME872	2.5 ~ 7.8	36 ~ 80VDC	151*97*48 565	23, 34, 42	PUL/DIR; CW/CCW	Single-ended; Differential
MA860	M860, M880, MD882	2.4 ~ 7.2	24 ~ 60VAC	151*97*48 570	23, 34	PUL/DIR; CW/CCW	Single-ended; Differential
MA860H		2.4 ~ 7.2	36 ~ 80VAC	151*97*48 580	34, 42	PUL/DIR; CW/CCW	Single-ended; Differential

Operating Environment and Other Specifications

Cooling	Natural cooling or forced cooling	
Operating Environment	Environment	Avoid dust, oil fog and corrosive gases
	Ambient Temperature	0+50 °C
	Humidity	40-90% RH
	Vibration	5.9m/s² MAX
Storage Temperature	-20 ～125 °C	

Tips

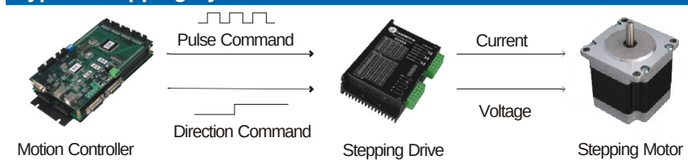
1. Working temperature for M series drives should be less than 70°C (158°F); and motor working temperature should be less than 80°C (176°F). Use automatic idle-current function to reduce drive and motor heating when a motor stops. Use forced cooling to cool the system if necessary.

2. To improve anti-interference performance of the system, use twisted pair shield cable for control signals and correctly ground the system. To prevent noise coupled on PUL/DIR signal, pulse/direction signal wires and motor wires should not be tied up together. Separate them by at least 10 centimeters (4 inches) to avoid disturbing signals generated by a stepping motor, which can easily disturb pulse and direction signals and cause motor position error, system instability and other failures.

3. Don't pull and plug motor or power wires while a stepping drive is powered ON, because there is high current flowing through motor coils (even stopped). Doing that would result in extremely high voltage surge, and could damage the drive.

4. If a power supply serves multiple drives, separately connecting the drives is recommended instead of daisy-chaining. Contact Leadshine technical support for detail by phone at 86-755-2641-8447, by fax at 86-755-2640-2718, or by email at tech@leadshine.com.

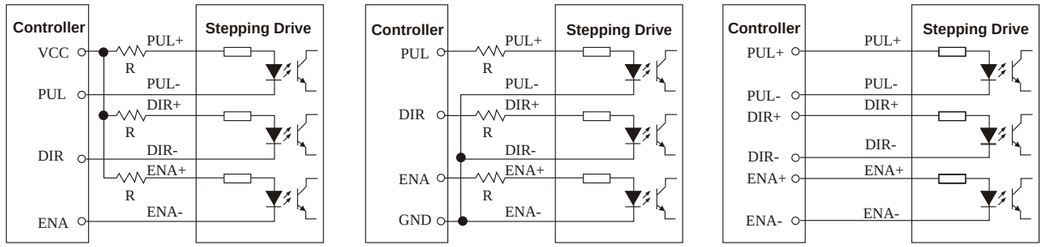
Typical Stepping System



Control Signal Interface and Its Sequence Chart

The M series drives can accept differential and single-ended inputs, including open-collector and PNP output. These drives have 3 optically isolated logic inputs which are located on connector P1 to accept line driver control signals. These inputs are isolated to minimize or eliminate electrical noises coupled onto the drive control signals. Use line driver control signals to increase noise immunity of a drive in interference environments. In the following figures, connections to open-collector and PNP signals are illustrated. In order to avoid some fault operations and deviations, PUL, DIR and ENA should abide by some rules. Connections and sequence chart of control signals are shown in the following figures.

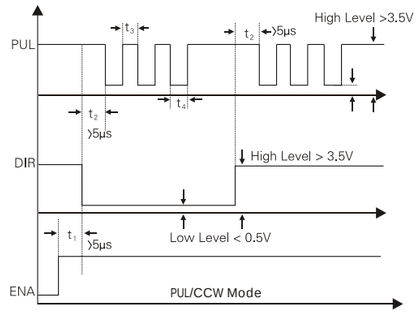
Control signal connections

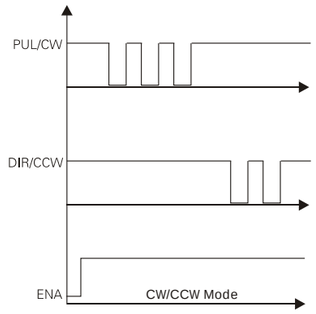


A. Connect to open-collector (common-anode) B. Connect to PNP signal (common-cathode) C. Connect to differential signal

Series connect resistors for current-limiting when +12V or +24V used. R=1K (>0.25W) if VCC=12V; R=2K (>0.25W) if VCC=24V. Make sure that the current through the opto-coupler is between 7 mA and 16 mA.

In order to avoid some fault operations and deviations, PUL, DIR and ENA should abide by some rules, shown as following diagrams:





Notes:
(a) t1: ENA must be ahead of DIR by at least 5 μs. Usually, ENA+ and ENA- are NC (not connected), drive is enabled.
(b) t2: DIR must be ahead of PUL effective edge by 5 μs to ensure correct direction;
(c) t3: High level width not less than 1.5 μs;
(d) t4: Low level width not less than 1.5 μs.

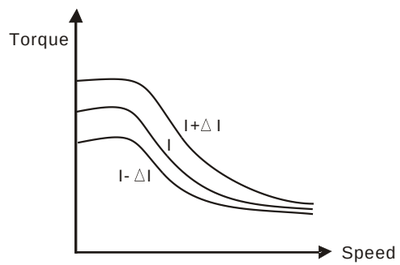
Selecting Power Supply and Output Current Setting

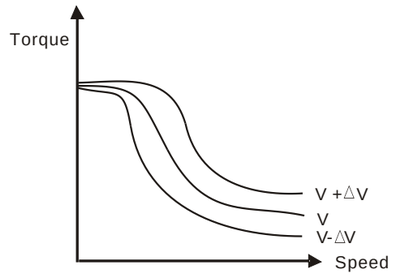
Selecting Power Supply

Although both regulated and unregulated power supplies can be used to power the drives, unregulated power supplies are preferred due to their ability to withstand current surge. Higher supply voltage can increase motor torque at higher speeds, thus helpful for avoiding losing steps. However, higher voltage may cause bigger motor vibration at lower speed, and it may also cause over-voltage protection or even drive damage. Therefore, it is suggested to choose only sufficiently high supply voltage for intended applications, and use power supplies with theoretical output voltage of at least 10% below drive's maximum input voltage, reserving room for power fluctuation and back-EMF.

Output Current Setting

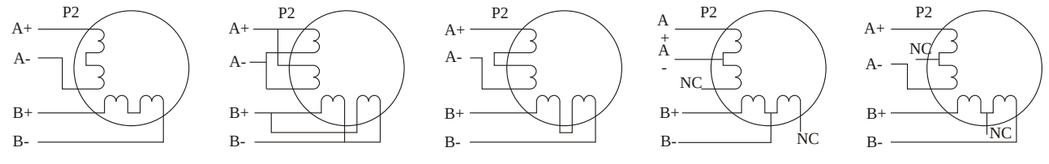
For a given motor, higher drive current will make the motor output more torque, but it also causes more heating in the motor and the drive at the same time. Therefore, output current is generally set to be such that the motor will not overheat for long time operation. Phase current rating supplied by motor manufacturer is important when setting drive current, however the setting also depends on leads and motor connections. Since parallel and serial connections of motor coils will significantly change resulting inductance and resistance, it is important to set drive output current based on motor phase current, motor leads and connection types.





Motor Connections

The M series drives can drive any 2-phase, 4-phase hybrid stepping motors, including 4-lead, 6-lead and 8-lead motors. Step angle of the motors can be 1.8 or 0.9 degree. For 6-lead and 8-lead stepping motors, different connections have different performance shown in the following figures.



4-lead

8-lead Parallel connection
Better high speed performance due to smaller inductance

8-lead Series connection
Same low-speed performance as parallel connection with smaller current

6-lead half-coil connection
Better high speed performance due to smaller inductance

6-lead Series connection
Higher torque than half-coil at low speed with the same current

Problem Symptoms and Possible Causes

Symptoms	Possible Causes
Motor is not rotating	No power
	No motion command signal
	DIP switch current or microstep resolution setting is wrong
	Fault condition exists
	The drive is disabled
	Drive failure
Motor rotates in wrong direction	Motor phases may be connected in reverse
	Direction control signal may be in reverse
	Opto-coupler for DIR inputs is broken
The drive in fault	Over voltage protection
	Over current protection
	Something wrong with motor coil
Erratic motor motion	Control signal is too weak or interfered
	Wrong motor connection
	Something wrong with motor coil
	Current setting is too small, losing steps
Motor stalls during acceleration	Current setting is too small, not enough torque
	Motor is undersized for the application
	Acceleration is set too high
	Power supply voltage too low
Excessive motor and drive heating	Inadequate heat sinking / cooling
	Automatic current reduction function not being utilized
	Current is set too high
	Too high supply voltage is used

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M542 V2.0

Introduction

The M542 V2.0 is a high performance microstepping drive based on pure-sinusoidal current control and self-adjustment (self-adjust current control parameters according to different motors) technologies. The driven motors can run with lower noise, lower heating, smoother movement and have better performance at higher speed than most of the drives in the markets. It is suitable to drive 2-phase and 4-phase hybrid stepping motors from NEMA14 to NEMA34.

Applications

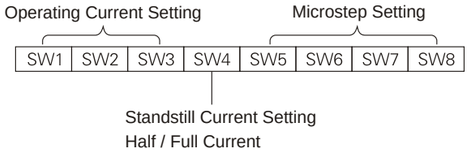
Suitable for a wide range of stepping motors from NEMA size 14 to NEMA34. Widely used in various kinds of machines, such as CNC routers, labeling machines, laser machines, X-Y tables, pick-place devices, and so on. Particularly suitable for the applications require low cost, low noise, low heating and high speed performance.

Function Description

Function	Description
Microstep Setting	15 selectable microstep resolutions up to 256,00 steps/rev. It's set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep on the fly.
Current Setting	The first three bits (SW1, 2, 3) of the DIP switch are used to set the operating current, which is up to 4.2 A. Select a current setting closest to your motor's required current.
Automatic Standstill Current Reduction	SW4 is used for the automatic standstill current reduction function. When this function active, the current will automatically reduced to 60% of the selected operating current 0.4 second after the last pulse. Theoretically, this will reduce motor heating to 36% (due to $P=I^2*R$) of the original value.
Control Signals	PUL+ and PUL- are for pulse command signals. DIR+ and DIR- are for direction control signals. ENA+ and ENA- are for enable/ disable control signals. Series connect resistors for current-limiting when +12V or +24V used.
Motor Connector	A+, A- and B+, B- are for motor connections. Exchanging the connection of two wires for a coil to the drive will reverse default motion direction.
Power Connector	Recommend use power supplies with theoretical output of +20 ~ 45VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. Green LED on means the drive is powered up, and Red LED on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by repowering it to make it function properly after removing problem(s).

Parameter Settings

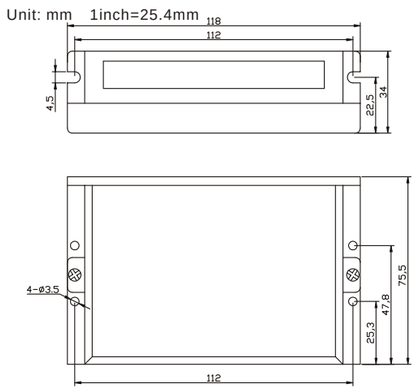
This M542 V2.0 uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below.



Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
1.00 A	0.71 A	on	on	on
1.46 A	1.04 A	off	on	on
1.91 A	1.36 A	on	off	on
2.37 A	1.69 A	off	off	on
3.84 A	2.03 A	on	on	off
3.31 A	2.36 A	off	on	off
3.76 A	2.69 A	on	off	off
4.20 A	3.00 A	off	off	off

Mechanical Specifications



Microstep Resolution Setting

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

M752

Introduction

The M752 is a high performance microstepping drive based on pure-sinusoidal current control and self-adjustment (self-adjust current control parameters according to different motors) technologies. The driven motors can run with lower noise, lower heating, smoother movement and have better performance at higher speed than most of the drives in the markets. It is suitable to drive 2-phase and 4-phase hybrid stepping motors from NEMA14 to NEMA34.

Applications

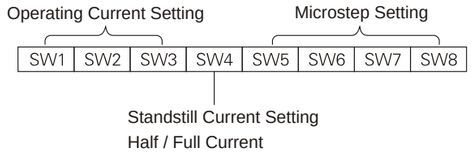
Suitable for a wide range of stepping motors from NEMA14 to NEMA34. Widely used in various kinds of machines, such as CNC routers, labeling machines, laser machines, X-Y tables, pick-place devices, and so on. Particularly suitable for the applications require low cost, low noise, low heating and high speed performance.

Function Description

Function	Description
Microstep Setting	16 selectable microstep resolutions up to 512,00 steps/rev. It's set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep on the fly.
Current Setting	The first three bits (SW1, 2, 3) of the DIP switch are used to set the operating current, which is up to 5.2A. Select a current setting closest to your motor's required current.
Automatic Standstill Current Reduction	SW4 is used for the automatic standstill current reduction function. When this function active, the current will automatically reduced to 60% of the selected operating current 0.4 second after the last pulse. Theoretically, this will reduce motor heating to 36% (due to $P=I^2*R$) of the original value.
Control Signals	PUL+ and PUL- are for pulse command signals. DIR+ and DIR- are for direction control signals. ENA+ and ENA- are for enable/ disable control signals. Series connect resistors for current-limiting when +12V or +24V used.
Motor Connector	A+, A- and B+, B- are for motor connections. Exchanging the connection of two wires for a coil to the drive will reverse default motion direction.
Power Connector	Recommend use power supplies with theoretical output of +20 ~ 68VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. Green LED on means the drive is powered up, and Red LED on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by repowering it to make it function properly after removing problem(s).

Parameter Settings

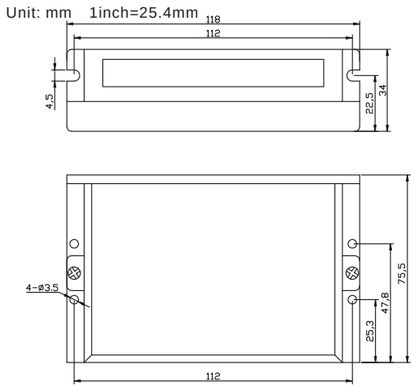
This M752 uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below.



Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
1.26 A	0.90 A	on	on	on
1.80 A	1.29 A	off	on	on
2.36 A	1.68 A	on	off	on
2.92 A	2.09 A	off	off	on
3.51 A	2.51 A	on	on	off
4.09 A	2.92 A	off	on	off
4.64 A	3.32 A	on	off	off
5.20 A	3.71 A	off	off	off

Mechanical Specifications



Microstep Resolution Setting

Steps/rev.	SW5	SW6	SW7	SW8
400	on	on	on	on
800	off	on	on	on
1600	on	off	on	on
3200	off	off	on	on
6400	on	on	off	on
12800	off	on	off	on
25600	on	off	off	on
51200	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
40000	off	off	off	off

M860 V5.0

Introduction

The M860 V5.0 is a high performance microstepping drive based on pure-sinusoidal current control and self-adjustment (self-adjust current control parameters according to different motors) technologies. The driven motors can run with lower noise, lower heating, smoother movement and have better performance at higher speed than most of the drives in the markets. It is suitable to drive 2-phase and 4-phase hybrid stepping motors from NEMA23 to NEMA42.

Applications

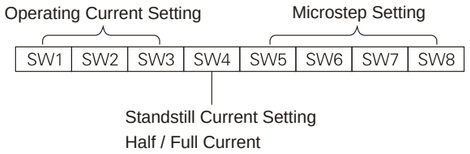
Suitable for a wide range of stepping motors from NEMA23 to NEMA42. Widely used in various kinds of machines, such as CNC routers, cutting machines, packing devices, pick-place devices, and so on. Particularly suitable for the applications require low noise and high speed performance.

Function Description

Function	Description
Microstep Setting	16 selectable microstep resolutions up to 512,00 steps/rev. It's set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep on the fly.
Current Setting	The first three bits (SW1, 2, 3) of the DIP switch are used to set the operating current, which is up to 7.2 A.. Select a setting closest to your motor's required current.
Automatic Standstill Current Reduction	SW4 is used for the automatic standstill current reduction function. When this function active, the current will automatically reduced to 60% of the selected operating current 0.4 second after the last pulse. Theoretically, this will reduce motor heating to 36% (due to $P=I^2*R$) of the original value.
Control Signals	PUL+ and PUL- are for pulse command signals. DIR+ and DIR- are for direction control signals. ENA+ and ENA- are for enable/ disable control signals. Series connect resistors for current-limiting when +12V or +24V used.
Motor Connector	A+, A- and B+, B- are for motor connections. Exchanging the connection of two wires for a coil to the drive will reverse default motion direction.
Power Connector	Recommend use power supplies with theoretical output of +20 ~ 68VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. Green LED on means the drive is powered up, and Red LED on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by repowering it to make it function properly after removing problem(s).

Parameter Settings

This M860 V5.0 uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below.

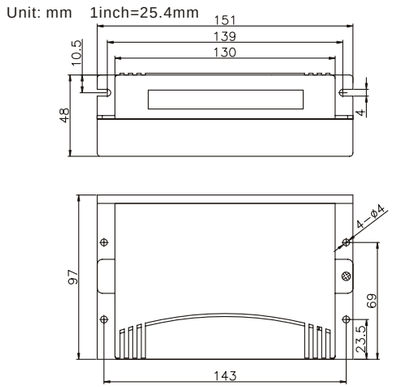


Operating Current Setting

Peak Current	M860 REF Current	SW1	SW2	SW3
2.40 A	2.00 A	on	on	on
3.08 A	2.57 A	off	on	on
3.77 A	3.14 A	on	off	on
4.45 A	3.71 A	off	off	on
5.14 A	4.28 A	on	on	off
5.83 A	4.86 A	off	on	off
6.52 A	5.43 A	on	off	off
7.20 A	6.00 A	off	off	off

Mechanical Specifications

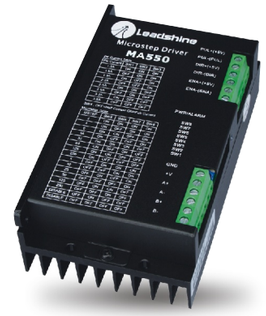
Unit: mm 1inch=25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6	SW7	SW8
400	on	on	on	on
800	off	on	on	on
1600	on	off	on	on
3200	off	off	on	on
6400	on	on	off	on
12800	off	on	off	on
25600	on	off	off	on
51200	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
40000	off	off	off	off

MA550



Introduction

The MA550 is a high performance microstepping drive based on pure-sinusoidal current control and self-adjustment (self-adjust current control parameters according to different motors) technologies. The driven motors can run with lower noise, lower heating, smoother movement and have better performance at higher speed than most of the drives in the markets. It is suitable to drive 2-phase and 4-phase hybrid stepping motors from NEMA17 to NEMA34.

Applications

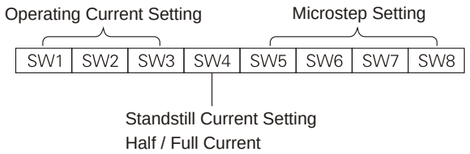
Suitable for a wide range of stepping motors from NEMA17 to NEMA34. Widely used in various kinds of machines, such as CNC routers, cutting machines, electronic manufacturing, packing, pick-place devices, and so on. Particularly suitable for the applications require low cost, low noise and high speed performance.

Function Description

Function	Description
Microstep Setting	16 selectable microstep resolutions up to 512,00 steps/rev. It's set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep on the fly.
Current Setting	The first three bits (SW1, 2, 3) of the DIP switch are used to set the operating current, which is up to 5.0 A.. Select a setting closest to your motor's required current.
Automatic Standstill Current Reduction	SW4 is used for the automatic standstill current reduction function. When this function active, the current will automatically reduced to 60% of the selected operating current 0.4 second after the last pulse. Theoretically, this will reduce motor heating to 36% (due to $P=I^2*R$) of the original value.
Control Signals	PUL+ and PUL- are for pulse command signals. DIR+ and DIR- are for direction control signals. ENA+ and ENA- are for enable/ disable control signals. Series connect resistors for current-limiting when +12V or +24V used.
Motor Connector	A+, A- and B+, B- are for motor connections. Exchanging the connection of two wires for a coil to the drive will reverse default motion direction.
Power Connector	Recommend use power supplies with theoretical output of 18 ~ 30VAC or +24 ~ 45 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. Green LED on means the drive is powered up, and Red LED on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by repowering it to make it function properly after removing problem(s).

Parameter Settings

This MA550 uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below.

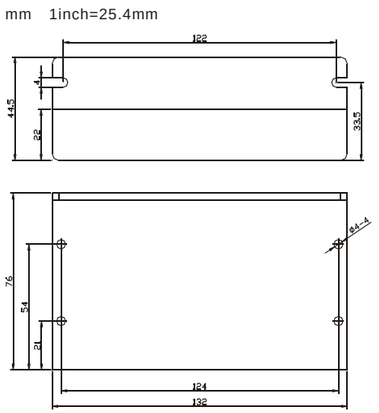


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
1.20 A	0.86 A	on	on	on
1.75 A	1.25 A	off	on	on
2.26 A	1.61 A	on	off	on
2.82 A	2.01 A	off	off	on
3.31 A	2.36 A	on	on	off
3.89 A	2.78 A	off	on	off
4.44 A	3.17 A	on	off	off
5.00 A	3.57 A	off	off	off

Mechanical Specifications

Unit: mm 1inch=25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6	SW7	SW8
400	on	on	on	on
800	off	on	on	on
1600	on	off	on	on
3200	off	off	on	on
6400	on	on	off	on
12800	off	on	off	on
25600	on	off	off	on
51200	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
40000	off	off	off	off

MA860

Introduction

The MA860 is a high performance microstepping drive based on pure-sinusoidal current control and self-adjustment (self-adjust current control parameters according to different motors) technologies. The driven motors can run with lower noise, lower heating, smoother movement and have better performance at higher speed than most of the drivers in the markets. It is suitable to drive 2-phase and 4-phase hybrid stepping motors from NEMA23 to NEMA42.

Applications

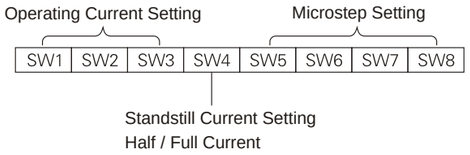
Suitable for a wide range of stepping motors from NEMA23 to NEMA42. Widely used in various kinds of machines, such as CNC routers, cutting machines, packing devices, pick-place devices, and so on. Particularly suitable for the applications require low cost, low noise, low heating and high speed performance.

Function Description

Function	Description
Microstep Setting	16 selectable microstep resolutions up to 512,00 steps/rev. It's set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep on the fly.
Current Setting	The first three bits (SW1, 2, 3) of the DIP switch are used to set the operating current, which is up to 7.2 A.. Select a setting closest to your motor's required current.
Automatic Standstill Current Reduction	SW4 is used for the automatic standstill current reduction function. When this function active, the current will automatically reduced to 60% of the selected operating current 0.4 second after the last pulse. Theoretically, this will reduce motor heating to 36% (due to $P=I^2*R$) of the original value.
Control Signals	PUL+ and PUL- are for pulse command signals. DIR+ and DIR- are for direction control signals. ENA+ and ENA- are for enable/ disable control signals. Series connect resistors for current-limiting when +12V or +24V used.
Motor Connector	A+, A- and B+, B- are for motor connections. Exchanging the connection of two wires for a coil to the drive will reverse default motion direction.
Power Connector	Recommend use power supplies with theoretical output of 18 ~ 50VAC or +20 ~ 68VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. Green LED on means the drive is powered up, and Red LED on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by repowering it to make it function properly after removing problem(s).

Parameter Settings

This MA860 uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below.

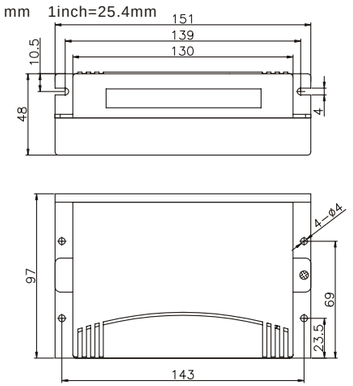


Operating Current Setting

Peak Current	M860 REF Current	SW1	SW2	SW3
2.40 A	2.00 A	on	on	on
3.08 A	2.57 A	off	on	on
3.77 A	3.14 A	on	off	on
4.45 A	3.71 A	off	off	on
5.14 A	4.28 A	on	on	off
5.83 A	4.86 A	off	on	off
6.52 A	5.43 A	on	off	off
7.20 A	6.00 A	off	off	off

Mechanical Specifications

Unit: mm 1inch=25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6	SW7	SW8
400	on	on	on	on
800	off	on	on	on
1600	on	off	on	on
3200	off	off	on	on
6400	on	on	off	on
12800	off	on	off	on
25600	on	off	off	on
51200	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
40000	off	off	off	off

MA860H

Introduction

The MA860H is a high performance microstepping drive based on pure-sinusoidal current control and self-adjustment (self-adjust current control parameters according to different motors) technologies. The driven motors can run with lower noise, lower heating, smoother movement and have better performance at higher speed than most of the drivers in the markets. It is suitable to drive 2-phase and 4-phase hybrid stepping motors from NEMA34 to NEMA42.

Applications

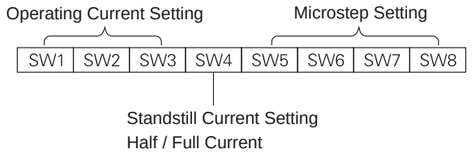
Suitable for a wide range of stepping motors from NEMA34 to NEMA42. Widely used in various kinds of machines, such as CNC routers, cutting machines, packing devices, pick-place devices, and so on. Particularly suitable for the applications require low noise, low heating and high speed performance.

Function Description

Function	Description
Microstep Setting	16 selectable microstep resolutions up to 512,00 steps/rev. It's set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep on the fly.
Current Setting	The first three bits (SW1, 2, 3) of the DIP switch are used to set the operating current, which is up to 7.2 A.. Select a setting closest to your motor's required current.
Automatic Standstill Current Reduction	SW4 is used for the automatic standstill current reduction function. When this function active, the current will automatically reduced to 60% of the selected operating current 0.4 second after the last pulse. Theoretically, this will reduce motor heating to 36% (due to $P=I^2*R$) of the original value.
Control Signals	PUL+ and PUL- are for pulse command signals. DIR+ and DIR- are for direction control signals. ENA+ and ENA- are for enable/ disable control signals. Series connect resistors for current-limiting when +12V or +24V used.
Motor Connector	A+, A- and B+, B- are for motor connections. Exchanging the connection of two wires for a coil to the drive will reverse default motion direction.
Power Connector	Recommend use power supplies with theoretical output of 24 ~ 80VAC or + 36~ 112VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. Green LED on means the drive is powered up, and Red LED on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by repowering it to make it function properly after removing problem(s).

Parameter Settings

This MA860H uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below.

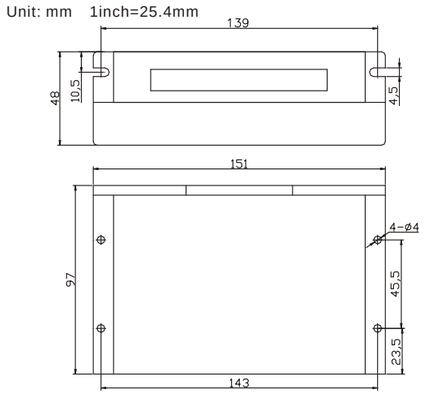


Operating Current Setting

Peak Current	M860 REF Current	SW1	SW2	SW3
2.40 A	2.00 A	on	on	on
3.08 A	2.57 A	off	on	on
3.77 A	3.14 A	on	off	on
4.45 A	3.71 A	off	off	on
5.14 A	4.28 A	on	on	off
5.83 A	4.86 A	off	on	off
6.52 A	5.43 A	on	off	off
7.20 A	6.00 A	off	off	off

Mechanical Specifications

Unit: mm 1inch=25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6	SW7	SW8
400	on	on	on	on
800	off	on	on	on
1600	on	off	on	on
3200	off	off	on	on
6400	on	on	off	on
12800	off	on	off	on
25600	on	off	off	on
51200	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
40000	off	off	off	off