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

Leadshine

Leading Technology Shining Value

Motion Control Products 2011 - 2012

- Stepper Motors & Drives
- Hybrid Servos
- Servo Motors & Drives
- Motion Controllers
- Power Supplies

Company Overview

Founded in 1997, Leadshine Motion Technology Ltd. specializes in developing, manufacturing, and distributing high-quality cost-effective motion control products. Its products include motion controllers, stepper drives and motors, hybrid servos, DC servo products, AC servo products, and power supplies. Leadshine serves various industrial and OEM customers in Asia, Europe, North/South America, Africa and Australia.

Leadshine is one of the LARGEST manufacturers of motion control products around the world. Led by an MIT PhD graduate, Leadshine's R&D team of 80 talented engineers is capable of designing high-quality motion control products based on the latest technologies. Leadsine's manufacturing facilities are ISO-9001 certified and professionally staffed.

Leadshine is committed to provide its customers with world-class motion control products at highly competitive prices. "LEADING technology and SHINING value" is always what Leadshine intends to offer to its customers.

R&D

Leadshine is proud of its talented research & development team, which is one of the best in the motion control industry. We are capable of designing world-class products which can meet high requirements of our customers. Many innovative designs and products from Leadshine have been awarded for patents by Chinese government.

Product Quality

Leadshine has been awarded the ISO 9001 registration for quality management practices since September 2004. The certification is a testimony of Leadshine's commitment to provide its customers with high quality products and services.

Technical Support

Staffed with a highly professional and experienced technical support team, Leadshine can help its customers to increase productivity, reduce design & selection risks, and minimize the product development time. We are able to support our customers through email, telephone, field support, product studying conference, and some other approaches.

You can contact Leadshine technical support by phone at 86-755-2641-8447, by fax at 86-755-2640-2718, or by email at tech@leadshine.com.

Leadshine

Quality Products Selling 1,200,000 pcs/year!

Design & Verification

Since the formation in 1997, Leadshine has been investing heavily in research and development for the newest motion technology. Leadshine owns a large number of patents and copyrights on its hardware and software of its products. Before released to its customers, all Leadshine products have been verified and tested in Leadshine's state-of-the-art laboratory.

Assembly Line

Leadshine product quality is guaranteed by an ISO-certified manufacturing system which includes rigorous supplier selection, incoming parts QC, in-process QC, final QA, and 24-hour aging test. The certification is a testimony of Leadshine's commitment to provide its customers with high quality products and services.

Quality Assurance

All Leadshine's products have to pass QC and 24-hour aging test, making the usual return & repair rate is under 0.5%. And that is why Leadshine can offer **LONGER** warranty period (18 months) than most other motion control product manufacturers.

Support & Service

Leadshine's professional and experienced technical team can help customers to reduce design and selection risks, and minimize product development time through support of email, field support, exhibitions, product studying conference, and etc.

Innovative Products with High Reliability

Stepper Drives

Currently, Leadshine offers two main series of 2-phase microstepper drives, the digital DM series and analog M series. The high performance DM drives are based on powerful 32-bit DSP control technology. Their features include super-low stepper noise, anti-resonance, low-speed ripple smoothing, and low motor heating. The low-cost M drives employ precise analog current control and are characterized by superior high-speed torque, relatively low stepper noise, and low motor heating. Leadshine also supplies 3-phase digital and analog stepper drives.

DM Series Digital Stepper Drives (P5—P18)

M Series Analog Stepper Drives (P19—P28)

Stepper Motors

Leadshine offers 2-phase and 3-phase stepper motors from NEMA frame size 14 to 51. Made of high quality cold roll sheet copper and anti-high temperature permanent magnet, Leadshine's stepper motors are highly reliable and generate low motor heating. Because of their nice internal damping characteristics, those stepper motors can run very smoothly and have no obvious resonance area within the whole speed ranges.

NEMA14 to NEMA51 Stepper Motors (P31—P42)

Hybrid Servos

Leadshine's HBS series hybrid servos adopt hybrid motion technology prevent loss of synchronization due to transient or continued overload, extreme acceleration or deceleration, or excessive slew speed, thus can significantly improve the performance and reliability of your stepper systems. The HBS series offers an alternative for applications requiring high performance and high reliability when the servo was the only choise, while it remains cost-effective.

Hybrid Servos, 1 to 8 N*m, NEMA23 to NEMA34 (P43—P50)

World-class Products at Highly Competitive Prices

AC & DC Servos

Leadshine's brushless servos include ACS and ACH series DSP-based fully digital servo drives and ACM and BLM series brushless AC and DC servo motors. Because of their high performance and highly competitive price, they are ideal for replacing many popular AC servo drives available on the market.

Leadshine's brush servos include DCS series DSP-based fully digital servo drives and DCM series brush servo motors. The drives support command inputs of step and direction, analog input. Whether your application requires torque mode operation, accurate speed / velocity control or positioning, you may find the right drive to meet your requirements.

Highly Cost-effective Brushless Servos (P51—P66)

Innovative DC Servo Products (P67 —P79)

Power Supplies

Leadshine offers three series power supplies, including SPS series (unregulated), RPS series (regulated) switching mode power supplies and PS series linear power supplies. These power supplies are specially designed to power inductive loads generated in stepper and servo systems. Features include low cost and high reliability.

SPS, RPS and PS Series Power Supplies (P81—P86)

Motion Controllers

Leadshine's full line of motion controllers includes single and multi-axis, bus-based and stand-alone controllers. Available interface options for international markets include PCI, USB, RS232 and Ethernet for the moment. Leadshine's controllers provide high speed performance and can handle many modes of motion such as point-to-point positioning, jogging, linear and circular interpolation, continuous interpolation and helix interpolation.

PCI-Bus, PC104 and Stand-alone Motion Controllers (P89—P102)

Product Catalog 2011 - 2012

Leading Technology

Stepper Drives

Stepper Motors

Hybrid Servos

AC and DC Servos

Power Supplies

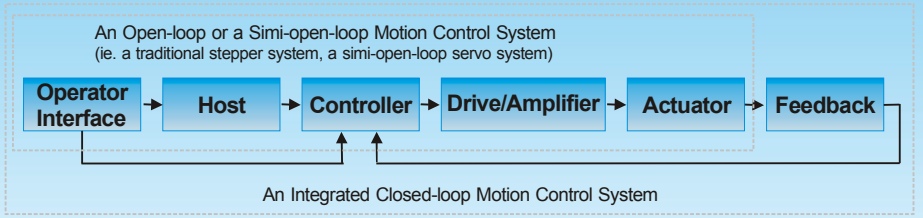
Motion Controllers

Introduction to Motion Control

Shining Value

Basic Components of Motion Control System

Many different components are used in a variety of combinations to create a modern motion control system. Usually, the system will be comprised of the following basic elements: controller, drive/amplifier, actuator. And for a more integrated motion control system will be comprised of feedback, operator interface and host, besides elements mentioned above. A simplified block diagram of a motion control system would appear as shown below.



*** Operator Interface and Host**

Operator interface and host are/is present to input control logic, modify programs, or provide real time operations, such as system shut down or schedule changes.

*** Controller**

The controller acts as brain of the system by taking the desired target positions and motion profiles and creating the trajectories for the motors to follow. It will include a means of entering a set of instructions or code into its memory which are then translated into a series of electrical pulses or analog signals and output to a drive for controlling some type of actuator.

*** Drive/Amplifier**

The drive/amplifier receives the signals from the controller and generate the current required to drive or turn the actuator.

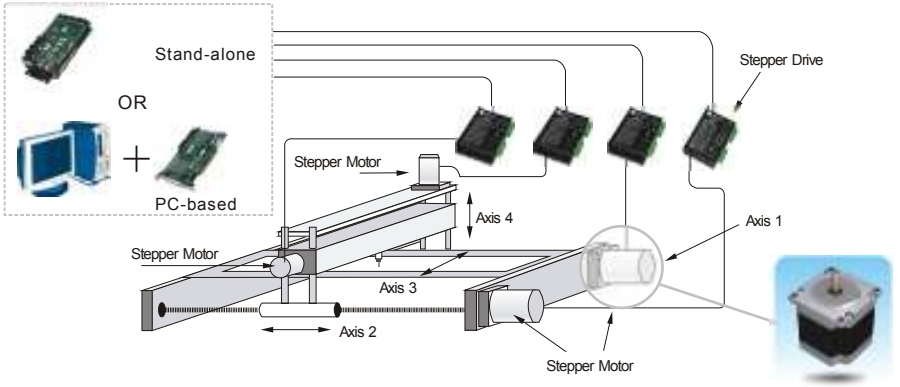
*** Actuator**

The actuator provides the actual physical motion and will be closely coupled to the design characteristics of the drive. The drive/actuator set may be any one of several different design classifications. Typically, but by no means always, they will the form of an electronic drive and an electric motor. Other common means of motion are pneumatic or hydraulic actuators.

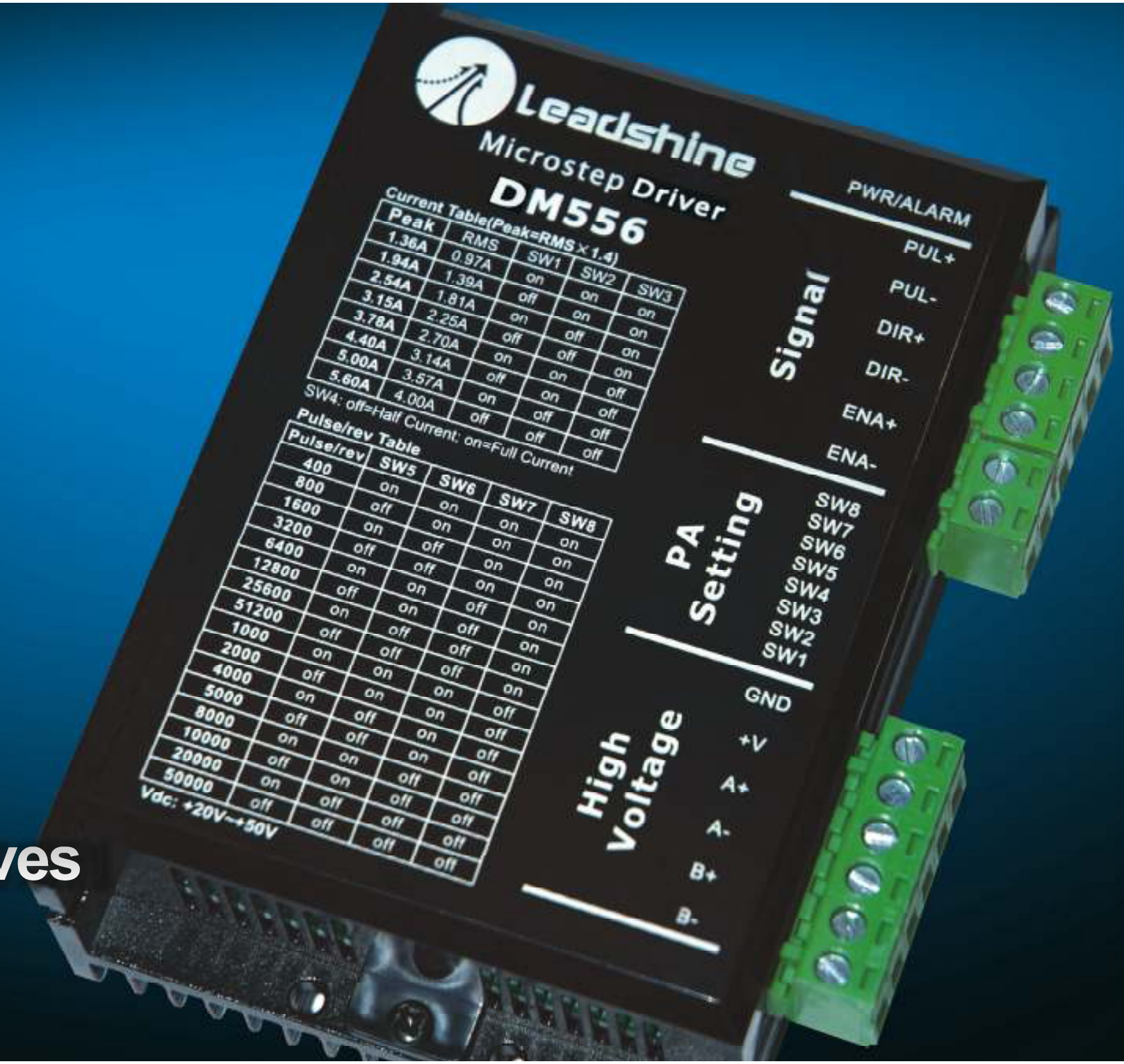
*** Feedback Device**

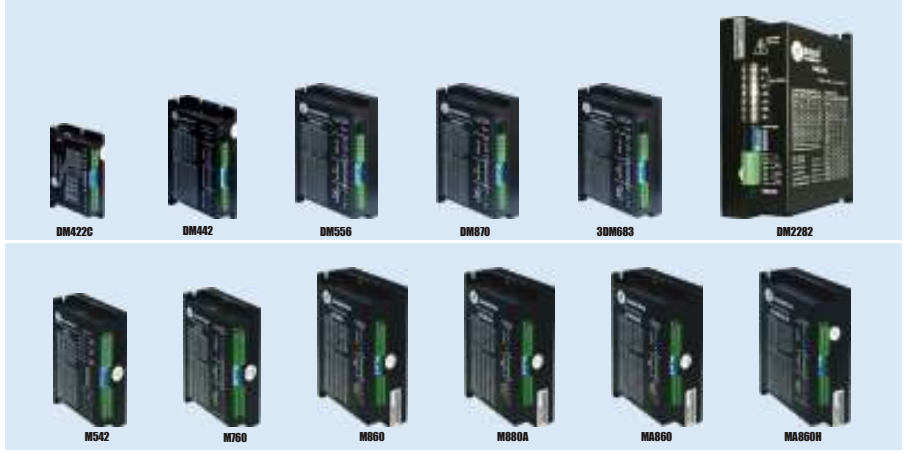
There are a wide variety of feedback devices that are commonly used in motion control systems today which provide information on linear or rotary motion, such as optical encoders, magnetic encoders and resolvers.

A Typical stepper System



Stepper Drives





Selection Guide for Stepper Drive

A stepper motor requires an electrical sequencer and it is called a stepper drive. The stepper drive is one of the key components in a stepper system. When you select a stepper drive for the special application, you can follow the following steps. Firstly, you should choose the drive type and determine the drive operating mode. Secondly, choose right supply voltage and output current according with the application and the motor. In the end, you should consider whether the acceptable control signals of the drive are right for those of your motion controller or not. Of course, the price of the chose drive should be acceptable too.

Drive Types

The output torque and power from a stepper motor are determined by the operating current, motor size, motor heat sinking, motor winding, and the type of the drive used. You can get much different performances from a given motor by choosing different type stepper drives.

There are some commonly-used drive types, such as unipolar constant voltage drive, unipolar L/nR constant voltage drive, unipolar timed bi-level drive, unipolar constant current drive, unipolar constant current drive and bipolar constant current microstepper drive.The highest output power and motor utilization for a given motor is achieved with the bipolar constant current drive. DC-losses is kept at a minimum due to maximum utilization of the copper in the winding and no power losses from leakage inductance and snubbing circuits since every winding only consists of one part.

Bipolar constant current microstepper drive is an improved version of the basic full- and half-step bipolar constant-current drive. Here, the winding currents form a sine/cosine pair. This greatly improves low frequency performances by eliminating overshot movements, ringing, and resonances. Performances at medium and high-stepper rates are close to those of full- and half-step. This drive uses the same power stage as the bipolar constant-current drive, but extra electronics for setting the sine/cosine current levels are used. Microstepper can also increase resolution and step accuracy of the stepper systems.

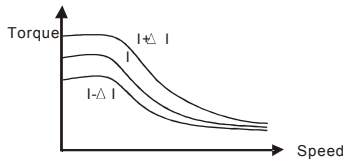
Supply Voltage and Output Current

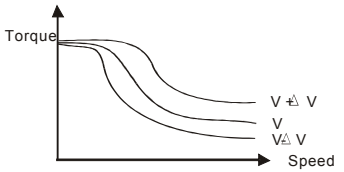
Although both regulated and unregulated power supplies can be used to power the drives, unregulated power supplies are preferred due to their ability to withstand current surge. The power supply voltage must be within the drive's allowable operating voltage range. Beyond that, the choice of voltage is dependent on the application and the motor used.

Higher supply voltage can increase motor torque at higher speeds, being helpful for avoiding losing steps. However, higher voltage may cause bigger motor vibration at lower speed, and may also cause over-voltage protection or even drive damage. Therefore, it is suggested to choose only a sufficiently high supply voltage for intended application, and use power supplies with theoretical output voltage of at least 10% below drive's maximum input voltage, leaving room for power fluctuation and back-EMF.

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. 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 a drives output current, however the setting also depends on the leads and motor connections. Since parallel and serial connections of motor coils will significantly change the resulting inductance and resistance, it is important to set drive output current based on motor's phase current and connection types.

Leadshine's stepper drives cover a broad operating voltage range, from 18 to 312VDC or 18 to 220VAC. And most of Leadshine's stepper drives have over-voltage and over-current protection functions. All of Leadshine's stepper drives use DIP switches to set motor's operating current, and all of them have automatic idle-current reduction function.





Drive Modes

The most common drive modes are full-step, half-step and microstepper.

FULL-STEP MODE: This is the basic stepper driving mode, it offers the simplest control electronics and it is recommended for high and medium frequency operation. At these frequencies, the inertia of the motor and the load smooth out the torque, resulting in less vibration and noise compared to low-speed operation.

HALF-STEP MODE: Half-step gives smoother movement at low step rates compared to full-step and can be used to lower resonances at low speeds. Half-step doubles the system resolution. Observe that for most stepper motors, the step accuracy specification only is valid for 2-phase-on positions. The accuracy is lower and the stop-position hysteresis is larger for 1-phase-on positions.

MICROstepper: The smoothest movement at low frequencies can be achieved with microstepper. If resonance-free movement at low step rates is important, the microstepper drive is the best choice. Microstepper can also be used to increase stop position accuracy beyond the normal motor limits.

Leadshine' stepper drives cover all drive modes. Both our digital stepper drives and analog stepper drives can operate in full-step, half-step and microstepper modes.

Introduction

Since releasing its first stepper drive in 1997, Leadshine has been designing stepper drives to satisfy the requirements of its customers. Today, Leadshine is one of the **LARGEST** stepper drive manufacturers in the world. Every year, over **900,000** Leadshine stepper drives are implemented in thousands of applications around the world. The applications include CNC routers, laser machines, electronic equipment, packaging equipment, textile equipment, pick-and-place device, and so on.

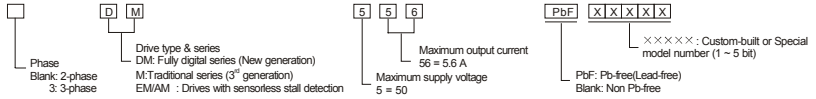
Currently, Leadshine offers two main series of 2-phase microstepper drives, the digital DM series and analog M series. The high-performance DM drives are based on powerful 32-bit DSP control technology. Their features include anti-resonance, low-speed ripple smoothing, super-low stepper noise, and low motor heating. The low-cost M drives employ precise analog current control and are characterized by superior high-speed torque, relatively low stepper noise, and low motor heating. Leadshine also supplies 3-phase digital and analog stepper drives.

Selection Table

Phase	Series	Model	Output Current (A)	Operating Voltage (V)	Microstep Resolution	Driving Motors (NEMA Size)	Weight (kg)	Size (mm)	Control Signals	
									PUL/DIR; CW/CCW	Single-ended; Differential
2	DM	DM320C	0.3 - 2.0	DC(18-30)	1-512	14, 17, 23	0.09	86*55*20	PUL/DIR;	Single-ended; Differential
		DM422C***	0.3 - 2.2	DC(18-40)	1-512	14, 17, 23	0.115	86*55*20	PUL/DIR; CW/CCW	Single-ended;
		DM442	0.5 - 4.2	DC(18-40)	1-512	14, 17, 23	0.19	116*69*26.5	PUL/DIR; CW/CCW	Single-ended; Differential
		DM556	0.5 - 5.6	DC(18-50)	1-512	14, 17, 23	0.28	118*75.5*34	PUL/DIR; CW/CCW	Single-ended; Differential
		DM870	0.5 - 7.0	DC(18-80)	1-512	17, 23, 34	0.28	118*75.5*34	PUL/DIR; CW/CCW	Single-ended; Differential
		DM1182	0.5-8.2	AC(80-150)	1-512	34, 42	1.3	202*167*63	PUL/DIR; CW/CCW	Single-ended; Differential
		DM2282	0.5-8.2	AC(80-220)	1-512	34, 42	1.3	202*167*63	PUL/DIR; CW/CCW	Single-ended; Differential
		DM805-AI**	0.5-7.0	DC(18-80)	1-512	17, 23, 34	0.28	118*75.5*34	PUL/DIR; CW/CCW	Single-ended; Differential
	M	M542	1.0-4.2	DC(20-50)	2-128, 5-125	14, 17, 23	0.28	118*75.5*34	PUL/DIR; CW/CCW	Single-ended; Differential
		M550	1.2 - 5.0	DC(20-50)	2-256, 5-200	14, 17, 23	0.28	118*75.5*34	PUL/DIR; CW/CCW	Single-ended; Differential
		M760	1.45 - 6.0	DC(20-75)	2-256, 5-200	17, 23, 34	0.57	118*75.5*34	PUL/DIR; CW/CCW	Single-ended; Differential
		M860	2.4 - 7.2	DC(24-80)	2-256, 5-200	17, 23, 34	0.57	151*97*48	PUL/DIR; CW/CCW	Single-ended; Differential
		M880A	2.8 - 7.8	DC(24-80)	2-256, 5-200	17, 23, 34	0.57	151*97*48	PUL/DIR; CW/CCW	Single-ended; Differential
		MA860	2.4 - 7.2	AC(18-58)	2-256, 5-200	17, 23, 34	0.58	151*97*48	PUL/DIR; CW/CCW	Single-ended; Differential
		MA860H	2.4 - 7.2	AC(24-80)	2-256, 5-200	34, 42	0.65	151*97*52	PUL/DIR; CW/CCW	Single-ended; Differential
3	DM	3DM683	0.5 - 8.3	DC(18-60)	200-51200s/r	17, 23, 34	0.30	118*75.5*34	PUL/DIR; CW/CCW	Single-ended; Differential

Note: Please contact Leadshine or visit our websit for information about the drives with **sensorless stall detection**.

Part Number



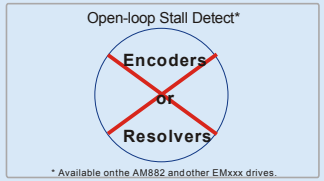
* This model has UL approved version and non-UL approved version.
** Command sources include step/direction, analog(0-5V).

DM Series Fully Digital Stepper Drives

9 Innovative Technologies

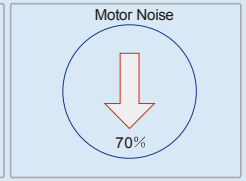
Sensorless Stall Detection

By detecting motor voltage, current, and back-emf signal, Leadshine digital drives can detect loss-of-synchronization of stepper motors without encoders. The sensorless stall detection eliminates cost of feedback devices and time of cable connection.



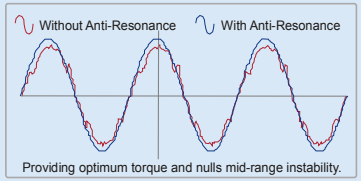
Super Low Noise

Precision current control technology and multi-stepping technology can reduce about 70% motor noise, making the DM series to be an ideal solution for the applications require



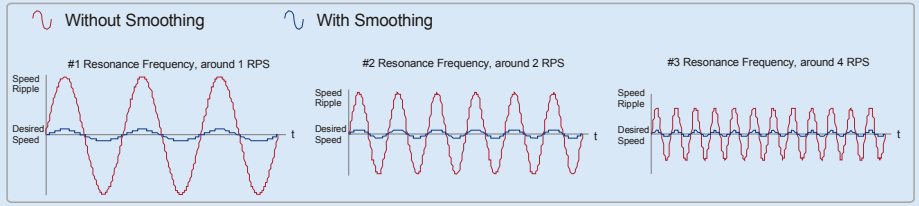
Anti-Resonance at Mid-range

Most stepper systems resonate at mid-range speed between 10 to 18 rps. DM stepper drives can calculate natural frequency of the stepper system and apply damping in control algorithm for anti-resonance, Providing optimizing torque and nulling mid-range instability.



Low-speed Ripple Smoothing

Electronic damping for 3 major resonance frequencies for stepper motors at low speed range, eliminating undesirable motor speed oscillation and delivering unique level of smoothness.

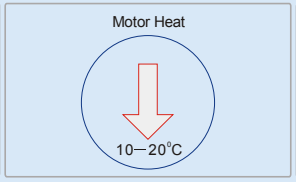


Multi-stepping Technology

Multi-stepping allows a low resolution input to produce a higher microstep output for smoother system performance. This function can improve smoothness of the stepper systems without upgrading your motion controllers.

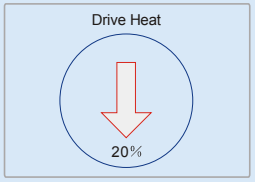
Lower Motor Heating

Due to DSP precision current control algorithm, motor heat is 10 20 ℃ lower compare to a traditional stepper drive. Longer motor lifetime can be achieved, reducing maintenance cost.



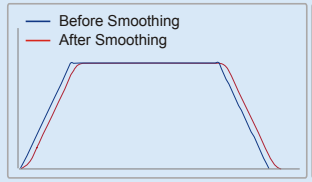
Lower Drive Heating

Drive heat is also 20% lower, offering higher drive stability and energy efficiency.



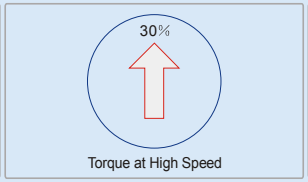
Command Signal Smoothing

Command signal smoothing can soften the effect of suddent changes in velocity and direction, thus delivering smoother performance and improving system liftime.



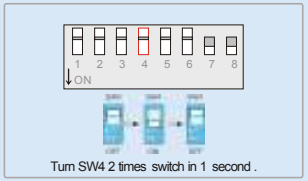
Torque Improving

Torque improvement increases torque up to 30% at high speed, therefore they can drive a normal stepper motor to 3000 RPM or even higher, and significantly increase production efficiency.



Self-test and Auto-configuration

Motor-self-test and parameter-auto-configuration technology offers optimum performance for different motors. It is easier for users to configure different axes or build different machines.



Features

- **Sensorless stall detection** eliminates cost of feedback devices and time of cable connection*
- **Super-low motor noise** offers excellent quietness
- **Anti-Resonance** optimizes torque and nulls mid-range instability technology
- **Self-test and Auto-configuration** offers optimum performance for different motors
- **Multi-stepping** allows a low resolution input to produce a higher microstep output for smoother system performance
- Command source include step/direction and analog (0 - 5 V)
- Output current, microstep resolutions, standstill current programmable
- Built-in motion controller for self-test or some simple applications
- Options to set output current and microstep relolutions via DIP switch or software
- Drives for 2-phase and 3-phase stepper motors are available
- Over-current, over-voltage, short-circuit protections

Introduction

By implementing the latest motion control technologies, Leadshine's DM series DSP-based stepper drives deliver excellent performance not available before. Unique features of super-low motor noise, extra smoothness and excellent high speed performance make DM stepper drives deliver servo-like performance at the cost of stepper drives. Leadshine DM series stepper drives are able to drive 2-phase or 3-phase stepper motors from NEMA8 to NEMA51.

Applications

Leadshine DM stepper drives are suitable for driving a wide range of stepper motors, from NEMA frame size 8 to 42. Typical applications includ CNC routers, laser cutters, laser markers, medical equipments, X-Y tables, measurement equipments, etc.

Electrical Specifications

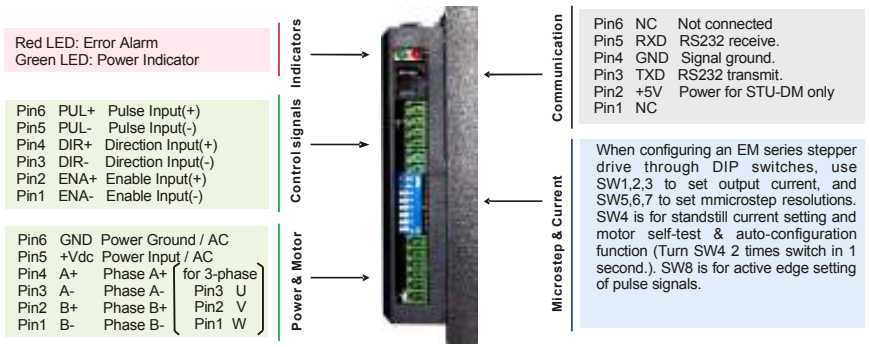
Parameters / Model	Input Voltage (VDC)			Output Current (A)		
	Min	Typical	Max	Min	Typical	Max
DM320C	+18	+24	+30	0.3	-	2.0
DM422C	+18	+24	+40	0.3	-	2.2
DM442	+18	+36	+40	0.5	-	4.2
DM556	+18	+36	+50	0.5	-	5.6
DM870	+18	+60	+80	0.5	-	7.0
DM1182	80 (VAC)	110 (VAC)	150 (VAC)	0.5	-	8.2
DM2282	80 (VAC)	120 (VAC)	220 (VAC)	0.5	-	8.2
3DM683	+18	+48	+60	0.5	-	8.2
DM805-AI	+18	+60	+80	0.5	-	7.0

Parameters / Model	Pulse Input Frequency (kHz)			Logic Signal Current (mA)			Isolation Resistance (M)		
	Min	Typical	Max	Min	Typical	Max	Min	Typical	Max
DM Series	0	-	300**	7	10	16	500	-	-

*This function is available on the AM882 and other EMxxx stepper drives. Visit Leadshine's website for the latest information about our digital stepper drives .
** Those of the DM320C and DM422C are 75 kHz, and that of the DM442 is 200 kHz .

Pin Assignment and Description

There are two connector types for a DM stepper drive. Connector type P1 (See figure below.) is for control signal connections, and connector type P2 is for power and motor connections. The RS232 communication port is for parameter configurations via computer. See brief descriptions for these connectors and interface below.

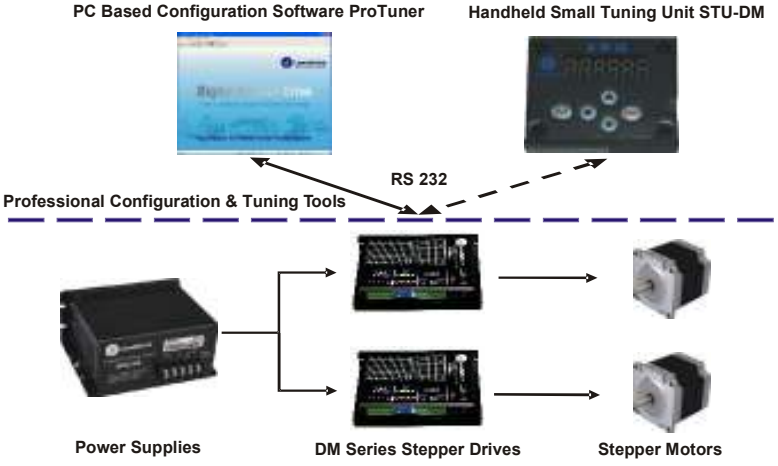


Tips:

1. Users are suggested to use motor **self-test and auto-configuration** function when powering up the system (with the motor) for the first time, or replacing a new motor.
2. To operate at current and microstep settings configured by software or STU, DIP switch must set to default mode.
3. Only software **ProTuner** can be used to configure anti-resonance parameter settings.
4. How many times the RED light blinks on in a periodic time indicates what protection has been activated. See manuals for detail.

PC Based and Handheld Configuration & Tuning Tools

For most of applications, configurations set by self-test and auto-configuration function should be good enough to meet the application requirements. However, a user can also configure the advanced features such as anti-resonance and advanced current loop tuning through software or STU-DM, a simple device specially designed for easy tuning.



ProTuner (Windows Based Setup Software)

- Upload and Download parameter settings
- PI parameter settings for current loop
- Microstep resolution and output current settings
- Operation mode configuration :PUL/DIR, CW/CCW, analog
- DIR logic level setting
- Active edge of pulse signal setting
- Electronic damping coefficient setting
- Anti-resonance parameter settings for 3 resonance area
- Parameter settings for self motion test or a simple application
- Read the latest 10 failure events and clear these events

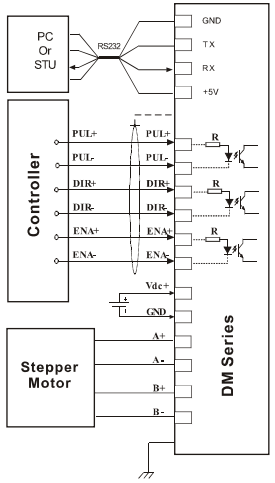
* 1 PC RS232 interface is necessary.
** Leadshine offers special cable for communication between ProTuner and the drive.

STU-DM (Handheld Configuration and Tuning Unit)

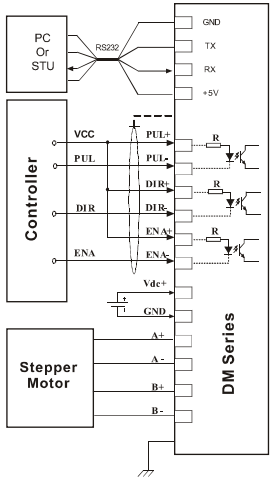
- Upload and Download parameter settings
- PI parameter settings for current loop
- Microstep resolution and output current settings
- Operation mode configuration :PUL/DIR, CW/CCW, analog
- DIR logic level setting
- Active edge of pulse signal setting
- Parameter settings for self motion test or a simple application

* Leadshine offers special cable for communication between the STU-DM and the drive.

Typical Connections



(a) Differential control signals



(b) Single-ended (NPN) control signals

DM320C

Introduction

The DM320C is a versatility fully digital stepper drive based on a DSP with advanced control algorithm. It brings a unique level of system smoothness, providing optimum torque and nulls mid-range instability. Motor auto-identification and parameter auto-configuration technology offers optimum response with different motors. The driven motors can run with much lower noise, lower heating, smoother movement than most stepper drives on the market.

Applications

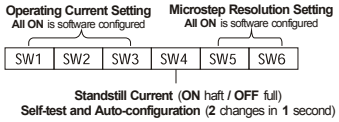
Suitable for a wide range of stepper motors, from NEMA8 to NEMA23. It can be used in various kinds of machines, such as medical machines, laser cutters, laser markers, high precision X-Y tables, labelling machines, and so on. Its unique features make the DM320C an ideal solution for applications that require low-speed smoothness.

Function Description

Function	Description
Microstep Setting	Microstep resolution is programmable. When not in software configured mode, microstep resolution is set by SW5, 6 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 2.0 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, self-test and auto-configuration functions. When the former 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.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors..
Control Signals	PUL+ and PUL- are for the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/ disable control signal. ALM+ and ALM- are for the alarm signal. Series connect resistors for current-limiting when +12V or +24V is 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	Recommended to use power supplies with output of +18 VDC to +24 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution and output current are programmable. When not in software configured mode, the drive uses a 6-bit DIP switch to set microstep resolution and motor operating current, as shown below:

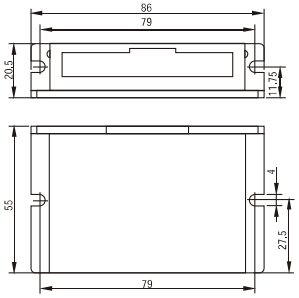


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.3-2.0 A)		on	on	on
0.5 A	0.35 A	off	on	on
0.7 A	0.50 A	on	off	on
1.0 A	0.71 A	off	off	on
1.2 A	0.86 A	on	on	off
1.5 A	1.07 A	off	on	off
1.7 A	1.21 A	on	off	off
2.0 A	1.43 A	off	off	off

Mechanical Specifications

Units: mm 1inch= 25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6
Default (software configured, 1-512)	on	on
800	off	on
3200	on	off
12800	off	off

DM422C

Introduction

The DM422C is a versatility fully digital stepper drive based on a DSP with advanced control algorithm. It brings a unique level of system smoothness, providing optimum torque and nulls mid-range instability. Motor auto-identification and parameter auto-configuration technology offers optimum response with different motors. The driven motors can run with much lower noise, lower heating, smoother movement than most stepper drives on the market.

Applications

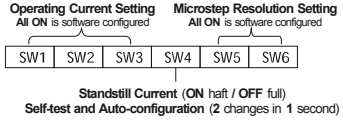
Suitable for a wide range of stepper motors, from NEMA8 to NEMA23. It can be used in various kinds of machines, such as medical machines, laser cutters, laser markers, high precision X-Y tables, labelling machines, and so on. Its unique features make the DM422C an ideal solution for applications that require low-speed smoothness.

Function Description

Function	Description
Microstep Setting	Microstep resolution is programmable. When not in software configured mode, microstep resolution is set by SW5, 6 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 2.2A. Select a current setting closest to your motor's required current.
Automatic standstill current reduction;	SW4 is used for the automatic standstill current reduction, self-test and auto-configuration function. When the former 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.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors..
Control Signals	OPTO is for the opto-coupler power supply, typically+5V. PUL is for the pulse command signal. DIR is for the direction control signal. ENA is for the enable/ disable control signal. Series connect resistors for current-limiting when +12V or +24V is 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	Recommended to use power supplies with output of +18 VDC to +36 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution and output current are programmable. When not in software configured mode, the drive uses a 6-bit DIP switch to set microstep resolution, and motor operating current, as shown below:

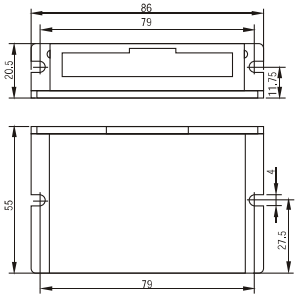


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.3-2.2 A)		on	on	on
0.5 A	0.35 A	off	on	on
0.7 A	0.5 A	on	off	on
1.0 A	0.7 A	off	off	on
1.3 A	0.9 A	on	on	off
1.6 A	1.2 A	off	on	off
1.9 A	1.4 A	on	off	off
2.2 A	1.6 A	off	off	off

Mechanical Specifications

Units: mm 1inch= 25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6
Default (software configured, 1-512)	on	on
1600	off	on
3200	on	off
6400	off	off

DM442

Introduction

The DM442 is a versatility fully digital stepper drive based on a DSP with advanced control algorithm. It brings a unique level of system smoothness, providing optimum torque, nulls mid-range instability and good high speed performance. Motor auto-identification and parameter auto-configuration technology offers optimum response with different motors. The driven motors can run with much lower noise, lower heating, smoother movement than most stepper drives on the market.

Applications

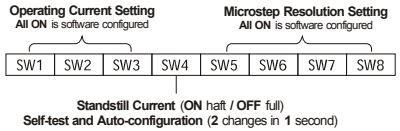
Suitable for a wide range of stepper motors, from NEMA10 to NEMA23. It can be used in various kinds of machines, such as medical machines, laser cutters, laser markers, high precision X-Y tables, labelling machines, and so on. Its unique features make the DM442 an ideal solution for applications that require low-speed smoothness and good high speed performance..

Function Description

Function	Description
Microstep Setting	Microstep resolution is programmable. When not in software configured mode, microstep resolution is set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When it's not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. 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, self-test and auto-configuration function. When the former 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.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors..
Control Signals	PUL+ and PUL- are for the pulse command signal. DIR+ and DIR- are the for direction control signal. ENA+ and ENA- are for the enable/ disable control signal. Series connect resistors for current-limiting when +12V or +24V is 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	Recommended to use power supplies with output of +18 VDC to +36 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution and output current are programmable. When not in software configured mode, the drive uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below:

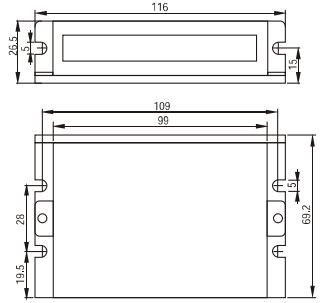


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-4.2 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
2.84 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

Units: mm 1 inch = 25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6	SW7	SW8
Default (software configured, 1-512)	on	on	on	on
400	off	on	on	on
800	on	off	on	on
1600	off	off	on	on
3200	on	on	off	on
6400	off	on	off	on
12800	on	off	off	on
25600	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
25000	off	off	off	off

DM556 c UL us

Introduction

The DM556 is a versatility fully digital stepper drive based on a DSP with advanced control algorithm. It brings a unique level of system smoothness, providing optimum torque, nulls mid-range instability and good high speed performance. Motor auto-identification and parameter auto-configuration technology offers optimum response with different motors. The driven motors can run with much lower noise, lower heating, smoother movement than most stepper drives on the market.

Applications

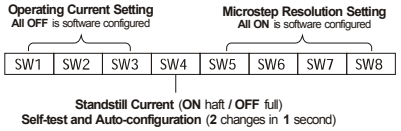
Suitable for a wide range of stepper motors, from NEMA17 to NEMA34. It can be used in various kinds of machines, such as medical machines, laser cutters, laser markers, high precision X-Y tables, labelling machines, and so on. Its unique features make the DM556 an ideal solution for applications that require low-speed smoothness and good high speed performance..

Function Description

Function	Description
Microstep Setting	Microstep resolutions is programmable. When not in software configured mode, microstep resolution is set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When it's not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 5.6 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, self-test and auto-configuration function. When the former 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.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors..
Control Signals	PUL+ and PUL- are for the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/disable control signal. Series connect resistors for current-limiting when +12V or +24V is 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	Recommended to use power supplies with output of +20 VDC to +45 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution and output current are programmable. When not in software configured mode, the drive uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below:

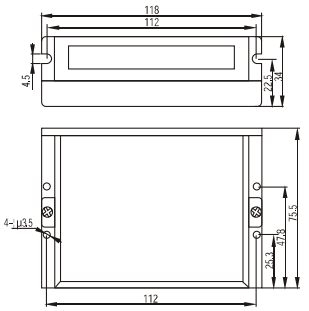


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-5.6 A)		off	off	off
2.1 A	1.5 A	on	off	off
2.7 A	1.9 A	off	on	off
3.2 A	2.3 A	on	on	off
3.8 A	2.7 A	off	off	on
4.3 A	3.1 A	on	off	on
4.9 A	3.5 A	off	on	on
5.6 A	4.0 A	on	on	on

Mechanical Specifications

Units: mm 1 inch = 25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6	SW7	SW8
Default (software configured, 1-512)	on	on	on	on
400	off	on	on	on
800	on	off	on	on
1600	off	off	on	on
3200	on	on	off	on
6400	off	on	off	on
12800	on	off	off	on
25600	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
25000	off	off	off	off

DM870

Introduction

The DM870 is a versatility fully digital stepper drive based on a DSP with advanced control algorithm. It brings a unique level of system smoothness, providing optimum torque, nulls mid-range instability and good high speed performance. Motor auto-identification and parameter auto-configuration technology offers optimum response with different motors. The driven motors can run with much lower noise, lower heating, smoother movement than most stepper drives on the market.

Applications

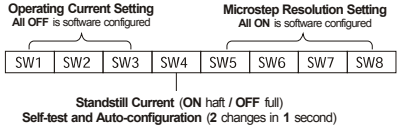
Suitable for a wide range of stepper motors, from NEMA17 to NEMA34. It can be used in various kinds of machines, such as medical machines, laser cutters, laser markers, high precision X-Y tables, labelling machines, and so on. Its unique features make the DM870 an ideal solution for applications that require low-speed smoothness and good high speed performance.

Function Description

Function	Description
Microstep Setting	Microstep resolution is programmable. When not in software configured mode, microstep resolution is set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 7.0 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, self-test and auto-configuration function. When the former 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.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors..
Control Signals	PUL+ and PUL- are for the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/ disable control signal. Series connect resistors for current-limiting when +12V or +24V is 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	Recommended to use power supplies with output of +20 VDC to +68 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution and output current are programmable. When not in software configured mode, the drive uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below:

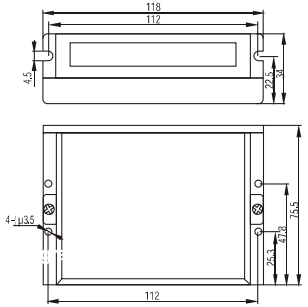


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-7.0 A)		off	off	off
2.6 A	1.8 A	on	off	off
3.4 A	2.4 A	off	on	off
4.0 A	2.8 A	on	on	off
4.8 A	3.4 A	off	off	on
5.4 A	3.8 A	on	off	on
6.1 A	4.3 A	off	on	on
7.0 A	5.0 A	on	on	on

Mechanical Specifications

Units: mm 1 inch = 25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6	SW7	SW8
Default (software configured, 1-512)	on	on	on	on
400	off	on	on	on
800	on	off	on	on
1600	off	off	on	on
3200	on	on	off	on
6400	off	on	off	on
12800	on	off	off	on
25600	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
25000	off	off	off	off

DM1182

Introduction

The DM1182 is a versatility fully digital stepper drive based on a DSP with advanced control algorithm. It brings a unique level of system smoothness, providing optimum torque, nulls mid-range instability and good high speed performance. Motor auto-identification and parameter auto-configuration technology offers optimum response with different motors. The driven motors can run with much lower noise, lower heating, smoother movement than most stepper drives on the market.

Applications

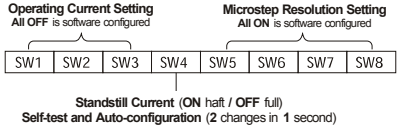
Suitable for a wide range of stepper motors, from NEMA34 to NEMA51. It can be used in various kinds of machines, such as medical machines, laser cutters, laser markers, high precision X-Y tables, labelling machines, and so on. Its unique features make the DM1182 an ideal solution for applications that require low-speed smoothness and good high speed performance.

Function Description

Function	Description
Microstep Setting	Microstep resolution is programmable. When not in software configured mode, microstep resolution is set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 8.2 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, self-test and auto-configuration function. When the former 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.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors..
Control Signals	PUL+ and PUL- are for the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/ disable control signal. Series connect resistors for current-limiting when +12V or +24V is 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	Recommended to use power supplies with output of 90 VAC to 120 VAC, leaving room for power fluctuation and back-EMF.
Indicators/ Fault Out	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free and fault out (OC) will be pulled to low. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution and output current are programmable. When not in software configured mode, the drive uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below:

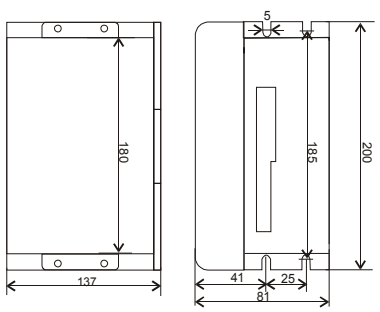


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-8.2 A)		off	off	off
2.2 A	1.6 A	on	off	off
3.2 A	2.3 A	off	on	off
4.2 A	3.2 A	on	on	off
5.2 A	3.7 A	off	off	on
6.3 A	4.4 A	on	off	on
7.2 A	5.2 A	off	on	on
8.2 A	5.9 A	on	on	on

Mechanical Specifications

Units: mm 1 inch = 25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6	SW7	SW8
Default (software configured, 1-512)	on	on	on	on
400	off	on	on	on
800	on	off	on	on
1600	off	off	on	on
3200	on	on	off	on
6400	off	on	off	on
12800	on	off	off	on
25600	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
25000	off	off	off	off

DM2282

Introduction

The DM2282 is a versatility fully digital stepper drive based on a DSP with advanced control algorithm. It brings a unique level of system smoothness, providing optimum torque, nulls mid-range instability and good high speed performance. Motor auto-identification and parameter auto-configuration technology offers optimum response with different motors. The driven motors can run with much lower noise, lower heating, smoother movement than most stepper drives on the market.

Applications

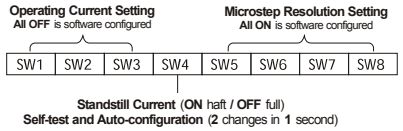
Suitable for a wide range of stepper motors, from NEMA34 to NEMA51. It can be used in various kinds of machines, such as medical machines, laser cutters, laser markers, high precision X-Y tables, labelling machines, and so on. Its unique features make the DM2282 an ideal solution for applications that require low-speed smoothness and good high speed performance.

Function Description

Function	Description
Microstep Setting	Microstep resolution is programmable. When not in software configured mode, microstep resolution is set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 8.2 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, self-test and auto-configuration function. When the former 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.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors..
Control Signals	PUL+ and PUL- are for the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/ disable control signal. Series connect resistors for current-limiting when +12V or +24V is 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	Recommended to use power supplies with output of 90 VAC to 200 VAC, leaving room for power fluctuation and back-EMF.
Indicators/ Fault Out	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free and fault out (OC) will be pulled to low. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution and output current are programmable. When not in software configured mode, the drive uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below:

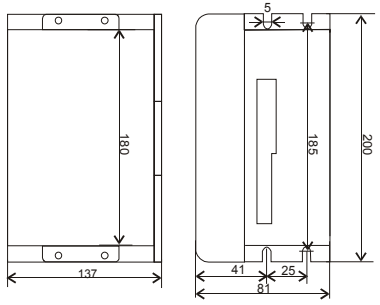


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-8.2 A)		off	off	off
2.2 A	1.6 A	on	off	off
3.2 A	2.3 A	off	on	off
4.2 A	3.2 A	on	on	off
5.2 A	3.7 A	off	off	on
6.3 A	4.4 A	on	off	on
7.2 A	5.2 A	off	on	on
8.2 A	5.9 A	on	on	on

Mechanical Specifications

Units: mm 1 inch = 25.4mm



Microstep Resolution Setting

Steps/rev.	SW5	SW6	SW7	SW8
Default (software configured, 1-512)	on	on	on	on
400	off	on	on	on
800	on	off	on	on
1600	off	off	on	on
3200	on	on	off	on
6400	off	on	off	on
12800	on	off	off	on
25600	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on	off	off	off
25000	off	off	off	off

3DM683

Introduction

The 3DM683 is a versatility fully digital 3-phase stepper drive based on a DSP with advanced control algorithm. It brings a unique level of system smoothness, providing optimum torque, nulls mid-range instability and good high speed performance. Motor auto-identification and parameter auto-configuration technology offers optimum response with different motors. The driven motors can run with much lower noise, lower heating, smoother movement than most stepper drives on the market.

Applications

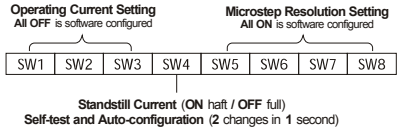
Suitable for a wide range of stepper motors, from NEMA17 to NEMA34. It can be used in various kinds of machines, such as medical machines, laser cutters, laser markers, high precision X-Y tables, labelling machines, and so on. Its unique features make the 3DM683 an ideal solution for applications that require low-speed smoothness and good high speed performance..

Function Description

Function	Description
Microstep Setting	Microstep resolution is programmable. When not in software configured mode, microstep resolution is set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 8.3 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, self-test and auto-configuration function. When the former 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.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors..
Control Signals	PUL+ and PUL- are for the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/ disable control signal. Series connect resistors for current-limiting when +12V or +24V is used.
Motor Connector	U, V, W are for motor connections. Exchanging the connection of two wires to the drive will reverse default motion direction.
Power Connector	Recommended to use power supplies with output of +20 VDC to +48 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution and output current are programmable. When not in software configured mode, the drive uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below:

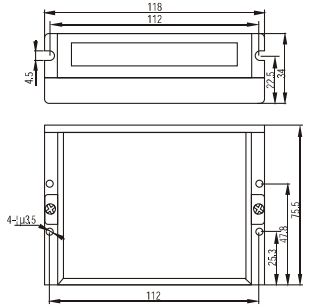


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-8.3 A)		off	off	off
3.2 A	2.3 A	on	off	off
4.0 A	2.9 A	off	on	off
4.9 A	3.5 A	on	on	off
5.7 A	4.1 A	off	off	on
6.4 A	4.6 A	on	off	on
7.3 A	5.2 A	off	on	on
8.3 A	5.9 A	on	on	on

Mechanical Specifications

Units: mm 1 inch = 25.4mm



Microstep Resolution Setting

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

DM805-AI

Introduction

The DM805-AI is a multi-function digital stepper drive and it belongs to DM series stepper drives. It has all the features that other DM drives have. The DM805-AI is distinguished from other DM series drives by it's operating modes. The DM805-AI can be operated in 4 different modes. They are 0-5V speed, low/high speed, externalPOT and pulse/direction modes.

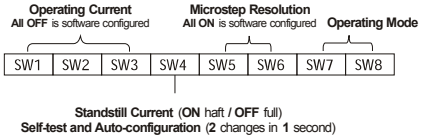
Three built-in potentiometers can be used to set the velocity, acceleration and deceleration. In 0-5V speed mode, the motor speed follows the analog 0-5V input. In Low/HIGH speed mode, the motor speed is selected by the digital input and adjusted by the high/low speed potentiometers. In pulse/direction mode, the DM805-AI acts as a traditional stepper drive. There is a 5V auxiliary output for customer use. The user can run the motor with the least configuration and connection, without buying a expensive motion controller.

Function Description

Function	Description
Microstep Setting	Microstep resolution is programmable. When not in software configured mode, microstep resolution is set by SW5, 6, 7, 8 of the DIP switch. In order to avoid losing steps, do not change the microstep resolution on the fly.
Current Setting	Output current is programmable. When not in software configured mode, operating current is set by SW1,2,3 of the DIP switch. Up to 8.2 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, self-test and auto-configuration function. When the former 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.
Self-test and auto-configuration	If the user changes the status/position of SW4 twice in 1 second, the drive will self-test the driving motor and auto-configuration control parameters, offering optimum performance with different motors.
Control Signals	The DM805-AI is a multi-function digital stepper drive. It can be operated in 0-5V speed, low/high speed, externalPOT and pulse/direction modes. There are 3 potentiometers, 4 digital inputs and 1 analog input can be configured to control the acceleration, speed, position and direction in different modes.
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	Recommended to use power supplies with output of 90 VAC to 200 VAC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s). See its manual for more information.

Parameter Settings

Microstep resolution, output current and operating mode are programmable. When not in software configured mode, the drive uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below:



Microstep Resolution Setting

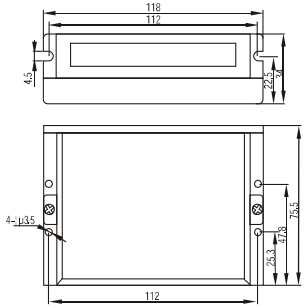
Steps/rev.	SW5	SW6
Default (software configured, 1-512)	on	on
400	off	on
1600	on	off
12800	off	off

Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
Default (software configured, 0.5-7.0 A)		off	off	off
2.6 A	1.8 A	on	off	off
3.4 A	2.4 A	off	on	off
4.0 A	2.8 A	on	on	off
4.8 A	3.4 A	off	off	on
5.4 A	3.8 A	on	off	on
6.1 A	4.3 A	off	on	on
7.0 A	5.0 A	on	on	on

Mechanical Specifications

Units: mm 1 inch = 25.4mm



Applications

Particularly suitable for the applications which need to adjust the velocity via the potentiometer or analog 0-5V command. Owing to high torque and super-low motor noise at low speed, stepper solution based on the DM805-AI can be used to replace the brushless motor and gearbox solution, which is used in various kinds of machines, such as rotary heat exchange, conveyor belts, transport vehicle, offering longer life time and lower cost than the later.

Operating Mode Setting

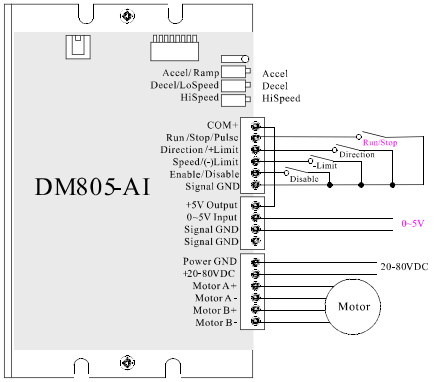
Operating Modes	SW7	SW8	Descriptions
0~5 V Speed	on	on	Speed controlled by the 0~5V, and direction controlled by the direction input.
Low/High Speed	off	on	Speed controlled by the preset low speed and high speed, and direction control by the direction input.
External POT	on	off	Both speed and direction are controlled by the 0~5V. 0~2.5 V, negative direction; 2.5~5V, positive direction.
Pulse/Direction	off	off	Speed and movement distance are controlled by the pulse, and direction controlled by the direction input.

Potentiometer Function in Different Operating Modes

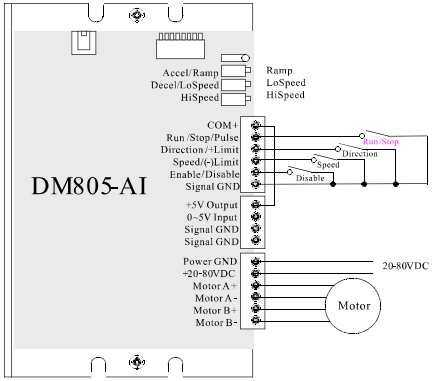
Potentiometers	0~5V Speed Mode	Low/High Speed Mode	External POT Mode	Pulse/Direction Mode
Accel / Ramp	Acceleration	Ramp	Acceleration	N/A
Decel / LoSpeed	Deceleration	Low Speed	Deceleration	N/A
HiSpeed	High Speed	High Speed	High Speed	N/A

Typical Connections

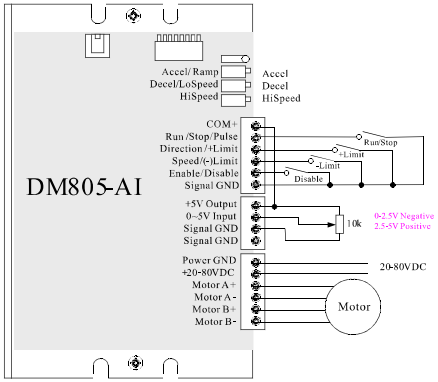
(a) 0~5 V Speed Mode



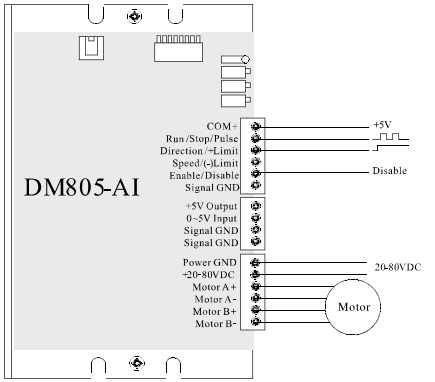
(b) Low/High Speed Mode



(c) External POT Mode



(d) Pulse/Direction Mode



Highly Cost-effective

New M Series Analog Stepper Drives

Features

- The 3rd generation of economical high performance stepper drives
- Self-adjustment technology, providing optimal performance with different motors
- Precise current control technology with less motor heating
- 7 models, covering 20 VDC to 112VDC or 18 VAC to 80VAC operating voltage ranges
- Excellent high-speed performance
- Smoother movement at low-speed
- Lower motor noise and heating than most analog stepper drives on the market

Introduction

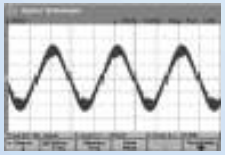
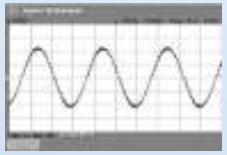
The new M series drives are the latest analog stepper drives Leadshine has developed after more than 12 years R&D experiences. These drives provide better performance and offer higher performance-price ratios. They are the most cost-effective stepper drives on the market.

The new M series stepper 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 with lower heating. They can also eliminate drawbacks of difficulty of driving various motors, such as 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 stepper drives use three digital filters which greatly improve anti-interference performance, and increase the precision and stability of machines.

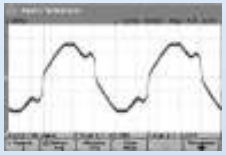
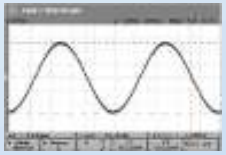
Application and Position

The new M series includes seven models. DC input models include the M550/M760/M860/M880A, and AC & DC input models include the MA550/MA860/MA860H. Suitable to drive 2-phase stepper motors (form NEMA17 to 42) using in industrial and office automation applications. The AC input models cut cost by using a simpler power supply (ie. a transformer without power rectifier).

Traditional stepper drives New M series

Much smaller current ripple means lower motor heating (10℃-20℃ lower)

Traditional stepper drives New M series

Pure-sinusoidal current control technology means smoother movement (No creep phenomenon)

Part Number

M — A — 8 — 60 — H

- M: Traditional series (3rd generation)
- A: AC&DC input; Blank: DC input
- 8: Maximum supply voltage 8 = 80V
- 60: Maximum output current 60 = 6.0 A
- H: High voltage; Blank: Normal version; Special model 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
M550	M535, M542, ME542	1.2 to 5.0	20 to 45VDC	118*75.5*34 271	14, 17, 23	PUL/DIR; CW/CCW	Single-ended; Differential
M760	M840, M839, ME742	1.45 to 6.0	20 to 70VDC	118*75.5*34 280	14, 17, 23, 34	PUL/DIR; CW/CCW	Single-ended; Differential
M860 V5.0	M860	2.4 to 7.2	24 to 80VDC	151*97*48 570	17, 23, 34	PUL/DIR; CW/CCW	Single-ended; Differential
MA550	MA535B	1.0 to 5.0	18 to 33VAC	132*76*45 300	14, 17, 23	PUL/DIR; CW/CCW	Single-ended; Differential
M880A	M860, M880, ME872	2.5 to 7.8	24 to 75VDC	151*97*48 565	23, 34, 42	PUL/DIR; CW/CCW	Single-ended; Differential
MA860	M860, M880, MD882	2.4 to 7.2	24 to 60VAC	151*97*48 570	23, 34	PUL/DIR; CW/CCW	Single-ended; Differential
MA860H		2.4 to 7.2	36 to 80VAC	151*97*52 590	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 to +50 °C
	Humidity	40-90% RH
	Vibration	5.9m/s² MAX
Storage Temperature	-20 to 125 °C	

Tips

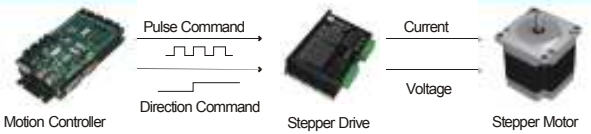
1. Working temperature for M series drives should below 70°C (158°F); and motor working temperature should below 80°C (176°F). Use automatic idle-current function to reduce drive and motor heating when a motor stops. Use forced cooling to cool the system if necessary.

2. To improve anti-interference performance of the system, use twisted pair shielded cable for control signals and correctly ground the system. To prevent noise coupling on pulse/direction signals, pulse/direction signal wires, motor wires and power wires should not be tied up together. Separate them by at least 10 centimeters (4 inches) to avoid disturbing signals generated by a stepper 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 stepper 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 (each in a star arrangements) is recommended instead of daisy-chain arrangement. 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.

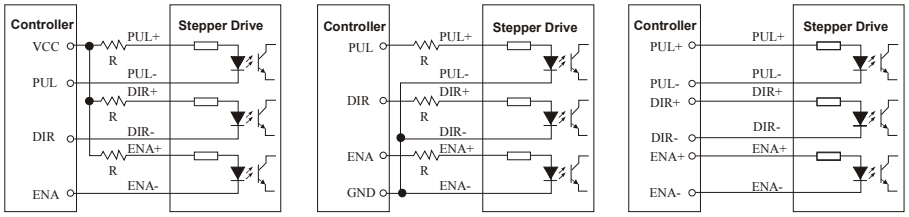
Typical stepper System



Control Signal Interface and Timing Chart

The M series drives can accept differential and single-ended inputs, including open-collector and PNP signals. The drives have 3 optically isolated logic inputs which are located on connector P1 to accept line driver control signals. The inputs are isolated to minimize or eliminate electrical noises coupling 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 the timing rules shown in the following timing diagram. Connections and timing diagram of control signals are shown in the following figures.

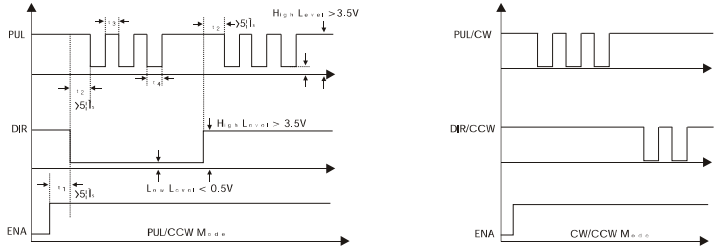
Control signal connections



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 faults in operations, PUL, DIR and ENA signals should abide by the timing rules shown in this timing diagram.



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's effective edge by 5 μs to ensure correct direction;
(c) t3: High level width not less than 1.5 μs (New M series);
(d) t4: Low level width not less than 1.5 μs (New M series).

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
Drive is 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
Motor stalls during acceleration	Current setting is too small, losing steps
	Current setting is too small, not enough torque
	Motor is undersized for the application
	Acceleration is set too high
Excessive motor and drive heating	Power supply voltage too low
	Inadequate heat sinking / cooling
	Automatic current reduction function not being utilized
	Current is set too high
	Supply voltage too high

M542

Introduction

The M542 is a high performance microstepper drive based on pure-sinusoidal current control and self-adjustment (self-adjust current control parameters according to different motors) technologies. Driven motors can run with lower noise, lower heating, smoother movement and have better performance at higher speed than most drives on the market. It is suitable for driving 2-phase and 4-phase hybrid stepper motors from NEMA14 to NEMA34.

Applications

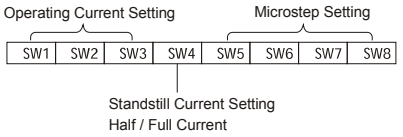
Suitable for a wide range of stepper motors from NEMA size 14 to NEMA34. Widely used in various kinds of machines, such as CNC routers, labelling machines, laser machines, X-Y tables, pick-place devices, and so on. Particularly suitable for the applications require low cost, low noise, low heating and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

Function Description

Function	Description
Microstep Setting	15 selectable microstep resolutions up to 256,00 steps/rev. 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 is 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 the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/disable control signal. Series connect resistors for current-limiting when +12V or +24V is 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	Recommended to use power supplies with theoretical output of +20 VDC to +45 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s).

Parameter Settings

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

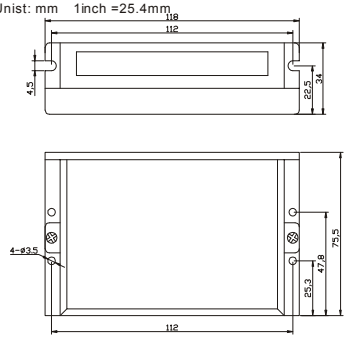


Operating Current Setting

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
2.84 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

Unist: mm 1inch =25.4mm



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

M550

Introduction

The M550 is a high performance microstepper drive based on pure-sinusoidal current control and self-adjustment (self-adjust current control parameters according to different motors) technologies. Driven motors can run with lower noise, lower heating, smoother movement and have better performance at higher speed than most drives on the market. It is suitable for driving 2-phase and 4-phase hybrid stepper motors from NEMA14 to NEMA34.

Applications

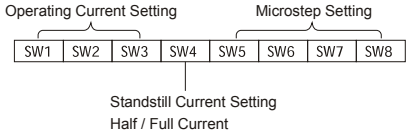
Suitable for a wide range of stepper motors from NEMA size 14 to NEMA34. Widely used in various kinds of machines, such as CNC routers, labelling machines, laser machines, X-Y tables, pick-place devices, and so on. Particularly suitable for the applications require low cost, low noise, low heating and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

Function Description

Function	Description
Microstep Setting	15 selectable microstep resolutions up to 256,00 steps/rev. 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 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 is 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 the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/ disable control signal. Series connect resistors for current-limiting when +12V or +24V is 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	Recommended to use power supplies with theoretical output of +20 VDC to +45 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s).

Parameter Settings

This M550 uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below.

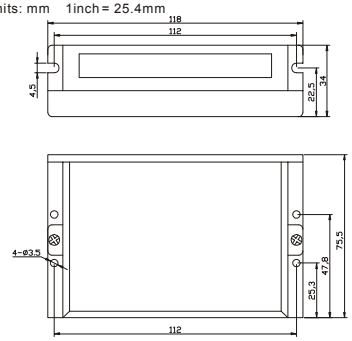


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
1.20 A	0.84 A	on	on	on
1.74 A	1.24 A	off	on	on
2.27 A	1.62 A	on	off	on
2.82 A	1.99 A	off	off	on
3.42 A	2.42 A	on	on	off
3.94 A	2.81 A	off	on	off
4.47 A	3.20 A	on	off	off
5.0 A	3.57 A	off	off	off

Mechanical Specifications

Units: mm 1inch = 25.4mm



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

M760

Introduction

The M760 is a high performance microstepper drive based on pure-sinusoidal current control and self-adjustment (self-adjust current control parameters according to different motors) technologies. Driven motors can run with lower noise, lower heating, smoother movement and have better performance at higher speed than most drives on the market. It is suitable for driving 2-phase and 4-phase hybrid stepper motors from NEMA14 to NEMA34.

Applications

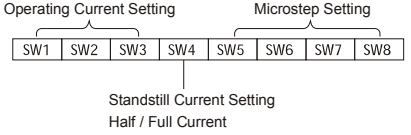
Suitable for a wide range of stepper motors from NEMA14 to NEMA34. Widely used in various kinds of machines, such as CNC routers, labelling machines, laser machines, X-Y tables, pick-place devices, and so on. Particularly suitable for the applications require low cost, low noise, low heating and high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

Function Description

Function	Description
Microstep Setting	16 selectable microstep resolutions up to 512,00 steps/rev. 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 6.0A. 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 is 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 the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/disable control signal. Series connect resistors for current-limiting when +12V or +24V is 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	Recommended to use power supplies with theoretical output of +20 VDC to +68VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s).

Parameter Settings

This M760 uses an 8-bit DIP switch to set microstep resolution, and motor operating current, as shown below.

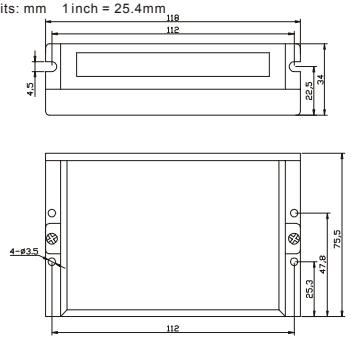


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
1.45 A	1.03 A	on	on	on
2.08 A	1.47 A	off	on	on
2.72 A	1.93 A	on	off	on
3.37 A	2.38 A	off	off	on
4.05 A	2.86 A	on	on	off
4.72 A	3.34 A	off	on	off
5.35 A	3.79 A	on	off	off
6.0 A	4.24 A	off	off	off

Mechanical Specifications

Units: 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

M860

Introduction

The M860 is a high performance microstepper drive based on pure-sinusoidal current control and self-adjustment (self-adjust current control parameters according to different motors) technologies. Driven motors can run with lower noise, lower heating, smoother movement and have better performance at higher speed than most drives on the market. It is suitable for driving 2-phase and 4-phase hybrid stepper motors from NEMA23 to NEMA42.

Applications

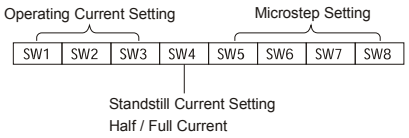
Suitable for a wide range of stepper motors from NEMA23 to NEMA42. Widely used in various kinds of machines, such as CNC routers, cutting machines, packing devices, pick-place devices, and so on. Particularly suitable for the applications require low noise and high speed performance.

Function Description

Function	Description
Microstep Setting	16 selectable microstep resolutions up to 512,00 steps/rev. 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 is 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=I²*R) of the original value.
Control Signals	PUL+ and PUL- are for the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/disable control signal. Series connect resistors for current-limiting when +12V or +24V is 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	Recommended to use power supplies with theoretical output of +24 VDC to +68 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering it to make it function properly after removing problem(s).

Parameter Settings

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

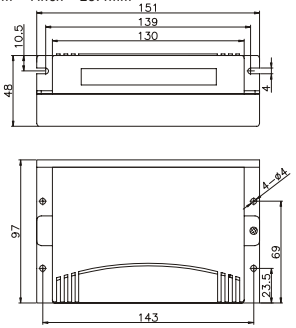


Operating Current Setting

Peak Current	RMS Current	SW1	SW2	SW3
2.40 A	1.70 A	on	on	on
3.08 A	2.18 A	off	on	on
3.77 A	2.67 A	on	off	on
4.45 A	3.15 A	off	off	on
5.14 A	3.63 A	on	on	off
5.83 A	4.12 A	off	on	off
6.52 A	4.61 A	on	off	off
7.20 A	5.09 A	off	off	off

Mechanical Specifications

Units: mm 1 inch = 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

M880A

Introduction

The M880A is a high performance microstepper drive based on pure-sinusoidal current control and self-adjustment (self-adjust current control parameters according to different motors) technologies. Driven motors can run with lower noise, lower heating, smoother movement and have better performance at higher speed than most drives on the market. It is suitable for driving 2-phase and 4-phase hybrid stepper motors from NEMA23 to NEMA42.

Applications

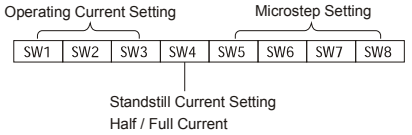
Suitable for a wide range of stepper motors from NEMA23 to NEMA42. Widely used in various kinds of machines, such as CNC routers, cutting machines, electronic manufacturing, packing, pick-place devices, and so on. Particularly suitable for the applications require low cost, low noise and high speed performance.

Function Description

Function	Description
Microstep Setting	16 selectable microstep resolutions up to 512,00 steps/rev. 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 7.8 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 i 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=I²*R) of the original value.
Control Signals	PUL+ and PUL- are for the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/ disable control signal. Series connect resistors for current-limiting when +12V or +24V is 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	Recommended to use power supplies with theoretical output of +24 VDC to +68 VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is on means the drive is in fault status. When in fault status, the motor shaft will be free. Reset the drive by re-powering 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.

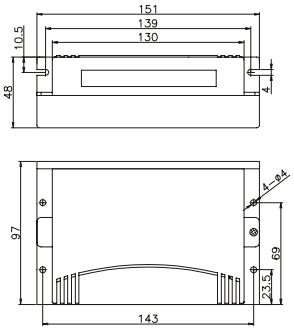


Operating Current Setting

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

Mechanical Specifications

Unist: mm 1 inch = 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 microstepper drive based on pure-sinusoidal current control and self-adjustment (self-adjust current control parameters according to different motors) technologies. Driven motors can run with lower noise, lower heating, smoother movement and have better performance at higher speed than most drives on the market. It is suitable for driving 2-phase and 4-phase hybrid stepper motors from NEMA23 to NEMA42.

Applications

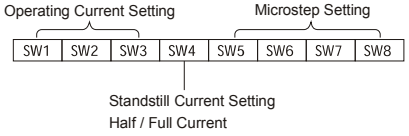
Suitable for a wide range of stepper motors from NEMA23 to NEMA42. Widely used in various kinds of machines, such as CNC routers, cutting machines, packing devices, pick-place devices, and so on. Particularly suitable for the applications require low cost, low noise, low heating and high speed performance.

Function Description

Function	Description
Microstep Setting	16 selectable microstep resolutions up to 512,00 steps/rev. 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 is 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 the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/ disable control signal. Series connect resistors for current-limiting when +12V or +24V is 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	Recommended to use power supplies with theoretical output of 18 to 50VAC or +20 to 68VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is 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.

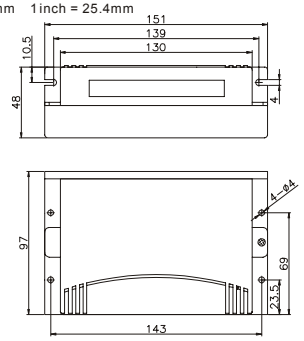


Operating Current Setting

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

Units: 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

DM SERIES
DM320C
DM422C
DM442
DM556
DM870
DM1182
DM2282
3DM683
DM805-AI
N SERIES
M542
M550
M760
M860
M880A
MA860
MA860H

MA860H

Introduction

The MA860H is a high performance microstepper drive based on pure-sinusoidal current control and self-adjustment (self-adjust current control parameters according to different motors) technologies. Driven motors can run with lower noise, lower heating, smoother movement and have better performance at higher speed than most drives on the market. It is suitable for driving 2-phase and 4-phase hybrid stepper motors from NEMA34 to NEMA42.

Applications

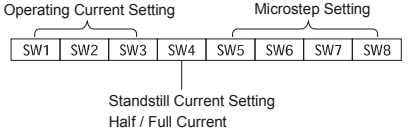
Suitable for a wide range of stepper motors from NEMA34 to NEMA42. Widely used in various kinds of machines, such as CNC routers, cutting machines, packing devices, pick-place devices, and so on. Particularly suitable for the applications require low noise, low heating and high speed performance.

Function Description

Function	Description
Microstep Setting	16 selectable microstep resolutions up to 512,00 steps/rev. 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 is 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 the pulse command signal. DIR+ and DIR- are for the direction control signal. ENA+ and ENA- are for the enable/ disable control signal. Series connect resistors for current-limiting when +12V or +24V is 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	Recommended to use power supplies with theoretical output of 24 to 80VAC or + 36 to 112VDC, leaving room for power fluctuation and back-EMF.
Indicators	There are two LED indicators on the drive for power and alarm signals. When the Green LED is on means the drive is powered up, and when the Red LED is 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.

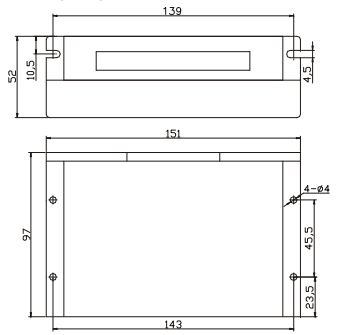


Operating Current Setting

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

Units: mm 1inch = 25.4mm



Microstep Resolution Setting

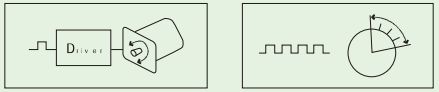
Steps/rev.	SW5	SW6	SW7	SW8
400	on	on	on	on
800	off	on	on	on
1600	on	off	on	on
3200	off	off	on	on
6400	on	on	off	on
12800	off	on	off	on
25600	on	off	off	on
51200	off	off	off	on
1000	on	on	on	off
2000	off	on	on	off
4000	on	off	on	off
5000	off	off	on	off
8000	on	on	off	off
10000	off	on	off	off
20000	on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

Stepper Motors

Stepper Motor Basic

A stepper motor is an electromechanical device which converts electrical pulses into discrete mechanical movements. The shaft or spindle of a stepper motor rotates in discrete step increments when electrical command pulses are applied to it in a proper sequence. The motor rotation has several direct relationships to these applied input pulses. The sequence of the applied pulses is directly related to the direction of motor shafts rotation. The speed of the motor shafts rotation is directly related to the frequency of the input pulses and the length of rotation is directly related to the number of input pulses applied.

A stepper motor can be a good choice whenever controlled movement is required. They can be used in applications where you need to control rotation angle, speed, position and synchronism. Because of the inherent advantages, stepper motors have found their places in many different applications, such as CNC routers, laser machines, and so on.



The length of rotation is directly related to the number of input pulses applied.

Stepper Motor Types

There are three basic stepper motor types. They are variable-reluctance, permanent-magnet and hybrid.

Variable-reluctance (VR)

This type of motor consists of a soft iron multi-toothed rotor and a wound stator. When the stator windings are energized with DC current the poles become magnetized. Rotation occurs when the rotor teeth are attracted to the energized stator poles.

Permanent Magnet (PM)

Often referred to as a "tin can" or "canstock" motor, the permanent magnet step motor is a low cost and low resolution type motor. PM motors as the name implies have permanent magnets added to the motor structure. The magnetized rotor poles provide an increased magnetic flux intensity and because of this the PM motor exhibits improved torque characteristics when compared with the VR type.

Hybrid (HB)

The hybrid stepper motor provides better performance with respect to step resolution, torque and speed. The hybrid stepper motor combines the best features of both the PM and VR type stepper motors. The rotor is multi-toothed like the VR motor and contains an axially magnetized concentric magnet around its shaft. This further increases the detent, holding and dynamic torque characteristics of the motor when compared with both the VR and PM types. Generally speaking, the hybrid motor may be the better choice along with reducing cost, for it offers better performance with respect to step resolution, torque and speed.

Normal Selection Steps

You can follow the following steps to choose a stepper motor.

1. Determining the Drive Mechanism Component

Determine the mechanism and required specifications. First, determine certain features of the design, such as mechanism, rough dimensions, distances moved, and positioning period.

2. Calculate the Required Resolution

Find the resolution the motor requires. From the required resolution, determine whether a motor only or a geared motor is to be used. The resolution and positioning accuracy of a stepper motor system is affected by several factors—the stepper angle, the selected drive mode (full-step, half-step or microstepper), and the gear rate.

3. Determine the Operating Pattern

Determine the operating pattern that fulfills the required specifications. Find the acceleration (deceleration) period and operating pulse speed in order to calculate the acceleration torque.

4. Calculate the Required Torque

Calculate the load torque and acceleration torque and find the required torque demanded by the motor.

5. Select the Motor

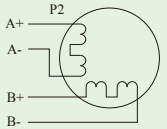
Make a provisional selection of a motor based on required torque. Determine the motor to be used from the speed-torque characteristics.

6. Check the Selected Motor

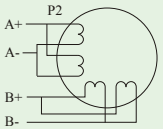
Confirm the acceleration/deceleration rate and inertia ratio.

Motor Connections

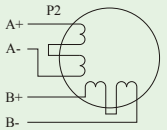
The M series drives can drive any 2-phase, 4-phase hybrid stepper motors, including 4-lead, 6-lead and 8-lead motors. Step angle of the motors can be 1.8 or 0.9 degree. For 6-lead and 8-lead stepper motors, different connections have different performance shown in the following figures.



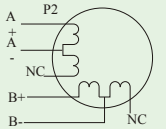
4-lead



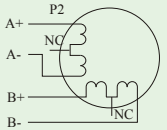
8-lead Parallel connection
Better high speed performance due to smaller inductance



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

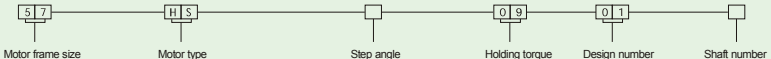
Leadshine's Stepper Motors

Leadshine offers 2-phase and 3-phase stepper motors from NEMA14 to NEMA51. Made of high quality cold roll sheet copper and anti-high temperature permanent magnet, these stepper motors are highly reliable and generate low motor heating. Because of their nice internal damping characteristics, those stepper motors can run very smoothly and have no obvious resonance area within the whole speed ranges.

Selection Table

Phase	NEMA Size	Model	Step Angle (°)	# of Leads	Connection	Current/Phase (A)	Holding Torque (Nm)	Length L (mm)	Weight (kg)	Match Drives
2	14	35HS01	1.8	4	-	0.4	0.07	26	0.15	DM320C/DM422C/DM442/M415B
	16	39HS02	1.8	4	-	0.6	0.22	34	0.2	DM320C/DM422C/DM442/M415B
	17	42HS02	1.8	4	-	0.4	0.22	40	0.24	DM320C/DM422C/DM442/M415B
		42HS03	1.8	8	Parallel	1.4	0.47	48	0.34	DM320C/DM422C/DM442/M415B
					Series	0.7	0.47			
					Unipolar	1.0	0.34			
	23	57HS04	1.8	6	Series	2.0	0.4	41	0.45	DM442/DM556/M550
					Unipolar	2.8	0.28			
		57HS09	1.8	8	Parallel	4.2	1.3	54	0.6	DM442/DM556/M550/M760
					Series	2.1	1.3			
					Unipolar	2.8	0.9			
		57HS13	1.8	8	Parallel	4.0	1.8	76	1.0	DM442/DM556/M550/M760
					Series	2.0	1.8			
					Unipolar	2.8	1.3			
		57HS22	1.8	8	Parallel	5.6	2.2	81	1.15	DM442/DM556/M550/M760
					Series	2.8	2.2			
					Unipolar	4.0	1.5			
	34	86HS35	1.8	8	Parallel	4.0	3.5	65	1.7	DM870/M760/M860/M880A
					Series	2.0	3.5			
					Unipolar	2.8	2.5			
		86HS45	1.8	8	Parallel	6.0	4.5	80	2.3	DM870/DM1182/M860/M880A
					Series	3.0	4.5			
					Unipolar	4.2	3.2			
		86HS85	1.8	8	Parallel	6.8	8.5	118	3.8	DM870/DM1182/M880A/ND2282
					Series	3.4	8.5			
					Unipolar	4.9	6.0			
	42	110HS12	1.8	4	-	5.0	12	99	5.0	DM1182/ND2282
		110HS20	1.8	4	-	6.5	20	150	8.4	DM1182/ND2282
	51	130HS27	1.8	4	-	6.0	27	227	13	DM1182/ND2282
		130HS45	1.8	4	-	7.0	45	283	19	DM1182/ND2282
3	23	573S05	1.2	6	Delta	5.2	0.45	42	0.45	3DM683/3DM883
		573S09	1.2	6	Delta	3.5	0.9	50	0.75	3DM683/3DM883
		573S15	1.2	6	Delta	5.8	1.3	76	1.1	3DM683/3DM883
	34	863S22	1.2	6	Delta	5.0	2.3	71	1.7	3DM683/3DM883
		863S42	1.2	6	Delta	5.0	4.3	103	2.9	3DM683/3DM883
		863S68H	1.2	6	Delta	2.3	6.8	135	4.0	3DM683/3DM883/3ND2283

Part Number



Motor frame size
57: 57 mm(NEMA size 23)

Motor type
HS: 2-phase hybrid stepper motor
3S: 3-phase hybrid stepper motor

Step angle
M: 0.9° (2-phase)
0.6° (3-phase)
Blank: 1.8° (2-phase)
1.2° (3-phase)

Holding torque
09 = 0.9 N*m

Design number
Blank: Standard
0X: Design number

Shaft number
Blank: Single shaft
B: Double shaft

35HSxx/39HSxx Series

General Specifications

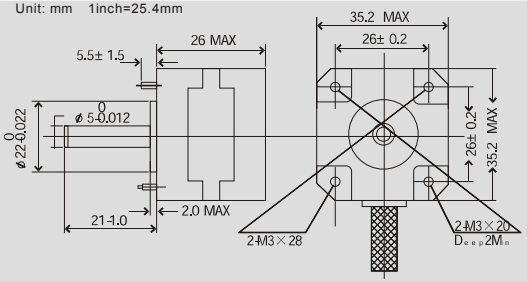
Angle Accuracy	±5%(full step, no load)
Temperature Rise	80 ℃ Max
Ambient Temperature	-10 ℃ — +50 ℃
Insulation Resistance	100MΩ min. 500VDC
Dielectric Strength	500VAC for one minute
Shaft Radial Play	0.06 Max. (450g-load)
Shaft Axial Play	0.08 Max. (450g-load)

Selection Table

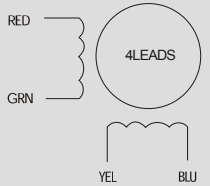
Phase	NEMA Size	Model	Step Angle (°)	# of Leads	Connection	Current/Phase (A)	Holding Torque (Nm)	Length L (mm)	Weight (kg)	Match Drives
2	14	35HS01	1.8	4	-	0.4	0.07	26	0.15	DM320C/DM422C/DM442/M415B
	16	39HS02	1.8	4	-	0.6	0.22	34	0.20	DM320C/DM422C/DM442/M415B

Mechanical Specifications

Unit: mm 1inch=25.4mm

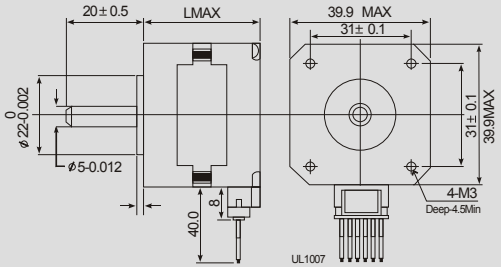


Wiring Diagram

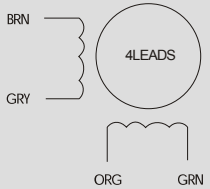


Mechanical Specifications

Unit: mm 1inch=25.4mm



Wiring Diagram



Match Drives

Model	Match Drives
35HSxx / 39HSxx	M415B/DM320C/DM422C

42HSxx Series

General Specifications

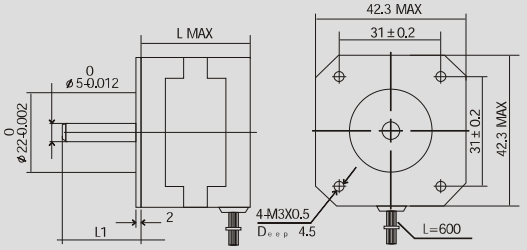
Angle Accuracy	± 5%(full step, no load)
Temperature Rise	80 ℃ Max
Ambient Temperature	-10 ℃— +50 ℃
Insulation Resistance	100MΩ min. 500VDC
Dielectric Strength	500VAC for one minute
Shaft Radial Play	0.06 Max. (450g-load)
Shaft Axial Play	0.08 Max. (450g-load)

Selection Table

Phase	NEMA Size	Model	Step Angle (°)	# of Leads	Connection	Current/Phase (A)	Holding Torque (Nm)	Length L (mm)	Weight (kg)	Match Drives
2	17	42HS02	1.8	4	-	0.4	0.22	40	0.24	DM320C/DM422C/DM442/M415B
		42HS03	1.8	8	Parallel	1.4	0.47	48	0.34	DM320C/DM422C/DM442/M415B
					Series	0.7	0.47			
					Unipolar	1.0	0.34			

Mechanical Specifications

Unit: mm 1inch=25.4mm



Wiring Diagram

Match Drives

Model	Match Drives
42HSxx	DM320/DM422C/DM432C/M415B

57HSxx Series

General Specifications

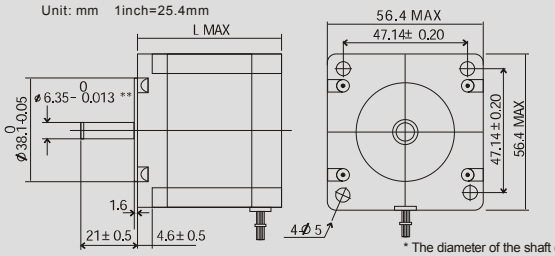
Angle Accuracy	±5%(full step, no load)
Temperature Rise	80 ℃ Max
Ambient Temperature	-10 ℃ — +50 ℃
Insulation Resistance	100MΩ min. 500VDC
Dielectric Strength	500VAC for one minute
Shaft Radial Play	0.06 Max. (450g-load)
Shaft Axial Play	0.08 Max. (450g-load)

Selection Table

Phase	NEMA Size	Model	Step Angle (°)	# of Leads	Connection	Current/Phase (A)	Holding Torque (Nm)	Length L (mm)	Weight (kg)	Match Drives
2	23	57HS04	1.8	6	Series	2.0	0.4	41	0.45	DM442/DM556/M550
					Unipolar	2.8	0.28			
		57HS09	1.8	8	Parallel	4.2	1.3	54	0.6	DM442/DM556/M550/M760
					Series	2.1	1.3			
					Unipolar	2.8	0.9			
		57HS13	1.8	8	Parallel	4.0	1.8	76	1.0	DM442/DM556/M550/M760
					Series	2.0	1.8			
					Unipolar	2.8	1.3			
		57HS22*	1.8	8	Parallel	5.6	2.2	81	1.15	DM442/DM556/M550/M760
					Series	2.8	2.2			
					Unipolar	4.0	1.5			

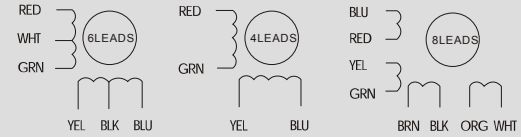
* The diameter of the shaft of the 57HS22 is 8 mm, and those of the others are 6.5 mm.

Mechanical Specifications



* The diameter of the shaft of the 57HS22 is 8 mm, and those of the others are 6.5 mm.

Wiring Diagram



Match Drives

Model	Match Drives	Model	Match Drives
57HS04	DM422C/DM432C/DM556/M752/M542/M860/MA550	57HS13	DM556/DM856/M752/M542/M860/M880A
57HS09		57HS22	

86HSxx Series

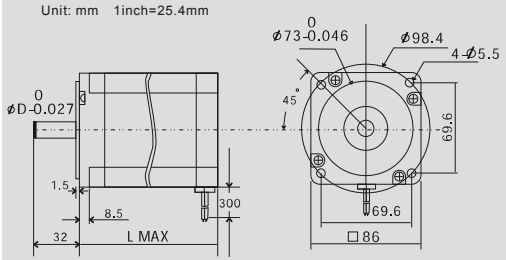
General Specifications

Angle Accuracy	±5%(full step, no load)
Temperature Rise	80 ℃ Max
Ambient Temperature	-10 ℃— +50 ℃
Insulation Resistance	100MΩ min. 500VDC
Dielectric Strength	500VAC for one minute
Shaft Radial Play	0.06 Max. (450g-load)
Shaft Axial Play	0.08 Max. (450g-load)

Selection Table

Phase	NEMA Size	Model	Step Angle (°)	# of Leads	Connection	Current/Phase (A)	Holding Torque (Nm)	Length L (mm)	Weight (kg)	Match Drives
2	34	86HS35	1.8	8	Parallel	4.0	3.5	65	1.7	DM870/M760/M860/M880A
					Series	2.0	3.5			
					Unipolar	2.8	2.5			
		86HS45	1.8	8	Parallel	6.0	4.5	80	2.3	DM870/DM1182/M860/M880A
					Series	3.0	4.5			
					Unipolar	4.2	3.2			
		86HS85	1.8	8	Parallel	6.8	8.5	118	3.8	DM870/DM1182/M880A/ND2282
					Series	3.4	8.5			
					Unipolar	4.9	6.0			

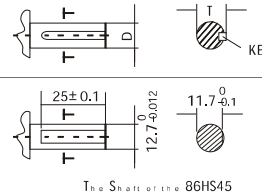
Mechanical Specifications



Wiring Diagram

Specifications of Motor Shafts

Model	T	KEY	D
86HS35	/	/	9.5
86HS45	/	/	12.7
86HS85	14.9	5*5*25	12.7



The Shaft of the 86HS45

* The shaft of the 86HS35 is round, no flat.

Match Drives

Model	Match Drives
86HS35	DM556/DM856/DM870/M752/M860/M880A/MA550/MA860/H850/MA860H
86HS45	
86HS85	M860/M880A/MA860/MA860H/ND2282

110HSxx Series

General Specifications

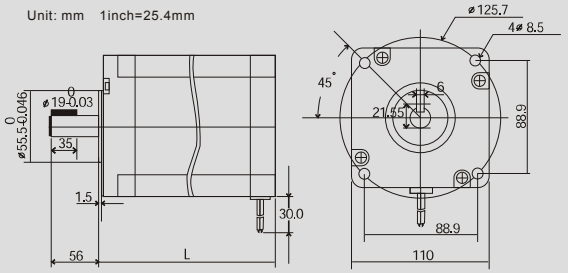
Angle Accuracy	±5%(full step, no load)
Temperature Rise	80 ℃ Max
Ambient Temperature	-10 ℃ — +50 ℃
Insulation Resistance	100MΩ min. 500VDC
Dielectric Strength	500VAC for one minute
Shaft Radial Play	0.06 Max. (450g-load)
Shaft Axial Play	0.08 Max. (450g-load)

Selection Table

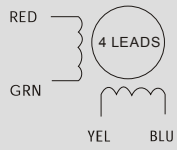
Phase	NEMA Size	Model	Step Angle (°)	# of Leads	Connection	Current/Phase (A)	Holding Torque (Nm)	Length L (mm)	Weight (kg)	Match Drives
2	42	110HS12	1.8	4	-	6.0	12	115	6.0	ND2282/DM1182
		110HS20	1.8	4	-	6.0	20	150	8.4	ND2282/DM1182
		110HS28	1.8	4	-	6.5	28	201	11.7	ND2282/DM1182

Mechanical Specifications

Unit: mm 1inch=25.4mm



Wiring Diagram



Match Drives

Model	Match Drives
110HS12	ND2282/DM1182
110HS20	
110HS28	

130HSxx Series

General Specifications

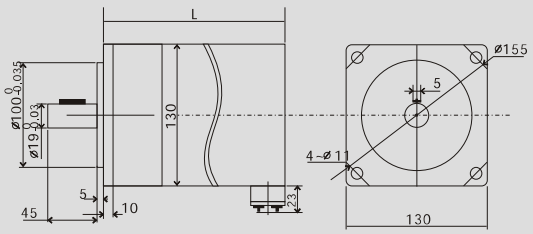
Angle Accuracy	±5%(full step, no load)
Temperature Rise	80 ℃ Max
Ambient Temperature	-10 ℃ — +50 ℃
Insulation Resistance	100MΩ min. 500VDC
Dielectric Strength	500VAC for one minute
Shaft Radial Play	0.06 Max. (450g-load)
Shaft Axial Play	0.08 Max. (450g-load)

Selection Table

Phase	NEMA Size	Model	Step Angle (°)	# of Leads	Connection	Current/Phase (A)	Holding Torque (Nm)	Length L (mm)	Weight (kg)	Match Drives
2	51	130HS27	1.8	4	-	6.0	27	227	13	ND2282/DM1182
		130HS33	1.8	4	-	6.0	33	227	13	ND2282/DM1182
		130HS40	1.8	4	-	7.0	40	283	16	ND2282/DM1182
		130HS45	1.8	4	-	7.0	45	283	19	ND2282/DM1182

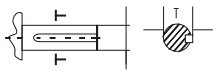
Mechanical Specifications

Unit: mm 1inch=25.4mm



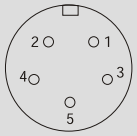
Specifications of Motor Shafts

	T	KEY	D



T£½21
KEY=5¡Á5¡Á30

Wiring Diagram



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

Match Drives

Model	Match Drives
130HSxx	ND2282/DM1182

573Sxx Series

General Specifications

Angle Accuracy	±5%(full step, no load)
Temperature Rise	80 ℃ Max
Ambient Temperature	-10 ℃ — +50 ℃
Insulation Resistance	100MΩ min. 500VDC
Dielectric Strength	500VAC for one minute
Shaft Radial Play	0.06 Max. (450g-load)
Shaft Axial Play	0.08 Max. (450g-load)

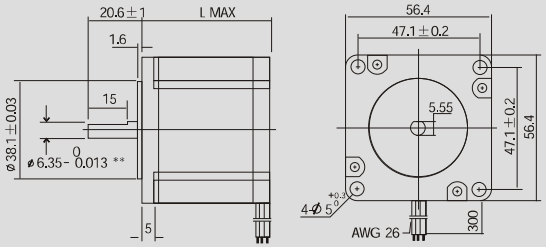
Selection Table

Phase	NEMA Size	Model	Step Angle (°)	# of Leads	Connection	Current/Phase (A)	Holding Torque (Nm)	Length L (mm)	Weight (kg)	Match Drives
3	23	573S05	1.2	6	Delta	5.2	0.45	42	0.45	3DM683/3DM883
		573S09	1.2	6	Delta	3.5	0.9	50	0.75	3DM683/3DM883
		573S15	1.2	6	Delta	5.8	1.3	76	1.1	3DM683/3DM883

* The diameter of the shaft of the 573S15 is 8 mm, and those of the others are 6.5 mm.

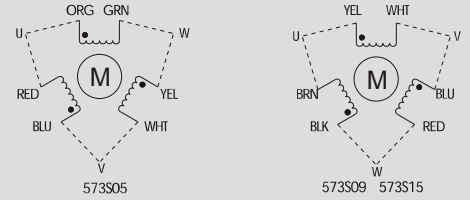
Mechanical Specifications

Unit: mm 1inch=25.4mm



** The diameter of the shaft of the 573S15 is 8 mm, and those of the others are 6.5 mm.

Wiring Diagram



Match Drives

Model	Match Drives
573S05	3DM683/3DM883
573S09	3DM683/3DM883
573S15	3DM683/3DM883

863Sxx Series

General Specifications

Angle Accuracy	±5%(full step, no load)
Temperature Rise	80 ℃ Max
Ambient Temperature	-10 ℃ —+50 ℃
Insulation Resistance	100M Ωmin. 500VDC
Dielectric Strength	500VAC for one minute
Shaft Radial Play	0.06 Max. (450g-load)
Shaft Axial Play	0.08 Max. (450g-load)

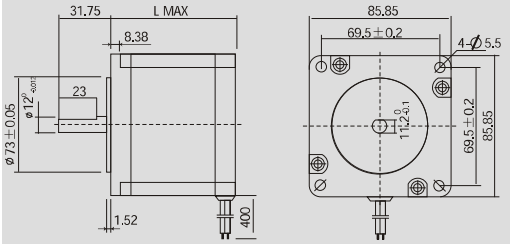
Selection Table

Phase	NEMA Size	Model	Step Angle (°)	# of Leads	Connection	Current/Phase (A)	Holding Torque (Nm)	Length L (mm)	Weight (kg)	Match Drives
3	23	863S22	1.2	6	Delta	5.0	2.3	71	1.7	3DM683/3DM883
		863S42	1.2	6	Delta	5.0	4.3	103	2.9	3DM683/3DM883
		863S68H	1.2	6	Delta	2.3	6.8	135	4.0	3DM683/3DM883

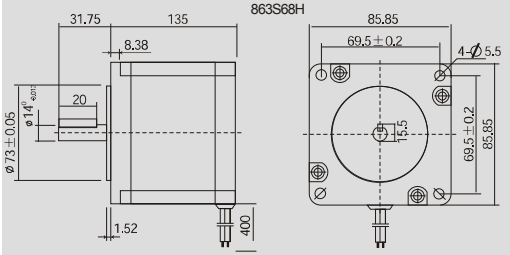
Mechanical Specifications

Unit: mm 1inch=25.4mm

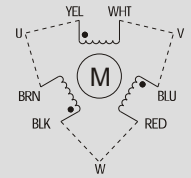
863S22, 863S42



863S68H

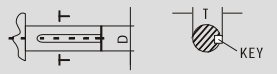


Wiring Diagram



Specifications of Motor Shafts

Model	T	KEY	D
863S68H	15.5	4*4*20	14

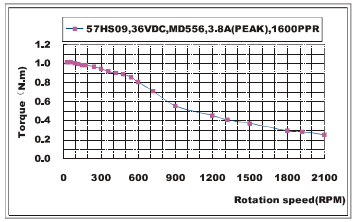


Match Drives

Model	Match Drives
863S22	3DM683/3DM883
863S42	3DM683/3DM883
863S68H	3DM683/3DM883

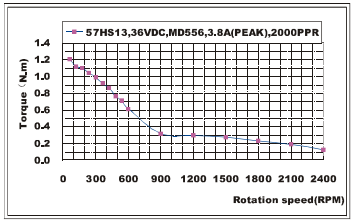
Speed-Torque Curves of 2-phase Stepper Motors

57HS09



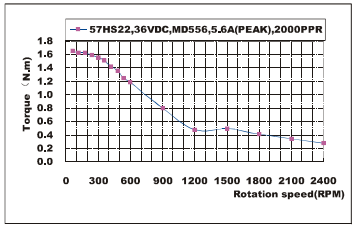
Stepper Motor: 57HS09 Output Current: 3.8 A(Peak)
Stepper Drive: MD556 Microstep: 1600 PPR
Input Voltage: 36 VDC Connection: Parallel

57HS13



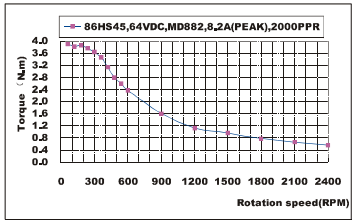
Stepper Motor: 57HS13 Output Current: 3.8 A(Peak)
Stepper Drive: MD556 Microstep: 2000 PPR
Input Voltage: 36 VDC Connection: Parallel

57HS22



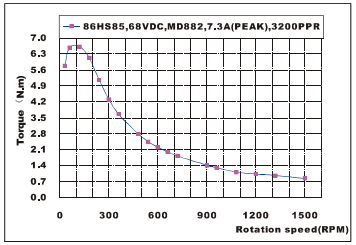
Stepper Motor: 57HS22 Output Current: 5.6 A(Peak)
Stepper Drive: MD556 Microstep: 2000 PPR
Input Voltage: 36 VDC Connection: Parallel

86HS45



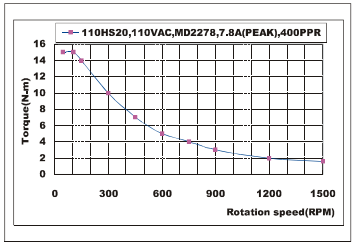
Stepper Motor: 86HS45 Output Current: 8.2 A(Peak)
Stepper Drive: MD882 Microstep: 2000 PPR
Input Voltage: 64 VDC Connection: Parallel

86HS85



Stepper Motor: 86HS85 Output Current: 7.3 A (Peak)
Stepper Drive: MD882 Microstep: 3200 PPR
Input Voltage: 68 VDC Connection: Parallel

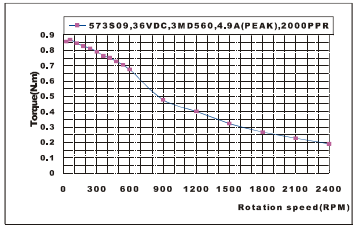
110HS20



Stepper Motor: 110HS20 Output Current: 7.8 A (Peak)
Stepper Drive: MD2278 Microstep: 400 PPR
Input Voltage: 110 VAC Connection: Parallel

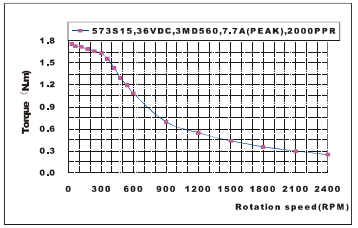
Speed-Torque Curves of 3-phase Stepper Motors

573S09



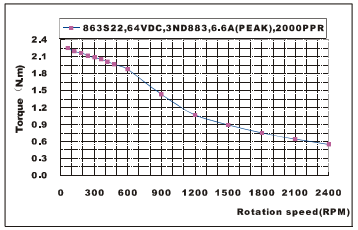
Stepper Motor: 573S09 Output Current: 4.9 A(Peak)
Stepper Drive: 3MD560 Microstep: 2000 PPR
Input Voltage: 36 VDC Connection: Delta

573S15



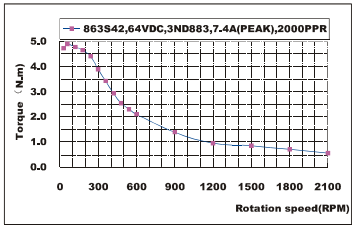
Stepper Motor: 573S15 Output Current: 7.7 A(Peak)
Stepper Drive: 3MD560 Microstep: 2000 PPR
Input Voltage: 36 VDC Connection: Delta

863S22



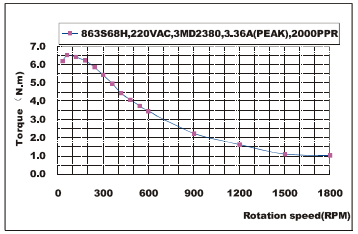
Stepper Motor: 863S22 Output Current: 6.6 A(Peak)
Stepper Drive: 3ND883 Microstep: 2000 PPR
Input Voltage: 64 VDC Connection: Delta

863S42



Stepper Motor: 863S42 Output Current: 7.4 A(Peak)
Stepper Drive: 3ND883 Microstep: 2000 PPR
Input Voltage: 64 VDC Connection: Delta

863S68H



Stepper Motor: 863S68H Output Current: 3.36 A(Peak)
Stepper Drive: 3MD2380 Microstep: 2000 PPR
Input Voltage: 220 VAC Connection: Delta