LAM Catalogue 2009

Stepper motors, drives and

Intelligent controllers

motor technology

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LAM Technologies
electronic equipment

DS10 series

Microstepping drivers 20V…240V 0.8Arms…10Arms for two phase stepper motors

- ✓ Resolution up to 25.600 step/rev
- ✓ Decimal and binary resolution
- ✓ STEP frequency over 300KHz
- ✓ Wide range of power supply
- ✓ High current density
- ✓ Resonance damping
- ✓ Automatic current reduction
- ✓ Accurate current control
- ✓ Chopper frequency over 20KHz
- ✓ High efficiency power mosfet stage
- ✓ Optocoupled and differential I/O, independently NPN or PNP usable
- ✓ Inputs working from 3Vdc up to 30Vdc with constant current
- ✓ Line driving supported
- ✓ Digital signal conditioning for each I/O
- ✓ Complete diagnostics with univocal indication for each anomaly
- ✓ Over/under voltage protection
- ✓ Cross phase short circuit protection
- ✓ Ground short circuit protection
- ✓ Positive supply short circuit protection
- ✓ Overheating protection
- ✓ Break motor phase diagnostics
- ✓ Compact size
- ✓ Easy DIN rail installation
- ✓ Connections on removable terminal block
- ✓ IP20-compliant construction
- ✓ Low cost

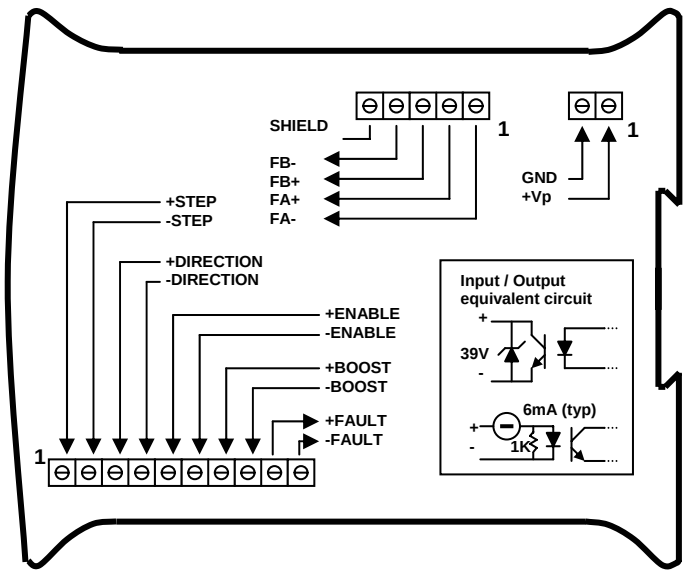
High reliability and performance, compact size and low cost have been the guidelines followed to develop the drivers of DS10xx series suitable for DIN rail mounting.
Using the last electronic components generation and the SMT technology it has been possible to produce an high power driver in a compact and smart case easy and quick to install.
The connection to the motor, with the logical signals and to the power supply is through three different colored terminal blocks, each one of them is removable, numbered and suitable for 2.5mm^2 wire size.
The many setting options available allow to use the drivers with any kind of motor and application.
The phase motor current can be tuned fine in a wide range of value as the step resolution, the current reduction, etc.
Each logic signal can be set independently from the other to PNP or NPN logic, each input can also be driven using line-driver technology.
The driver is fully protected to preserve its integrity from the most common problems.
The diagnostics is complete and univocally signals whenever one or more protections occur. Furthermore a break motor phase diagnostics is also available, very useful to determine wiring problems or motor failures.
The complete setting of the driver is immediate and simple thanks to the graphic software designed for Windows platform.

The connection to the programming DUP port of the driver is possible through the UDP30 interface (see photo), which is connected to the PC by the USB port.

LAM Technologies electronic equipment

DS10 series

Symbol	Description		Value			Unit
			Min	Typical	Max	
Vp	Power supply voltage	**DS1044**	20		50	**Vdc**
If	Phase current (**RMS**)		1		4	**Arms**
Vp	Power supply voltage	**DS1048**	20		50	**Vdc**
If	Phase current (**RMS**)		3		8	**Arms**
Vp	Power supply voltage	**DS1073**	24		90	**Vdc**
If	Phase current (**RMS**)		0.8		3	**Arms**
Vp	Power supply voltage	**DS1076**	24		90	**Vdc**
If	Phase current (**RMS**)		2		6	**Arms**
Vp	Power supply voltage	**DS1078**	24		90	**Vdc**
If	Phase current (**RMS**)		4		10	**Arms**
Vp	Power supply voltage	**DS1084**	45		160	**Vdc**
If	Phase current (**RMS**)		2		4	**Arms**
Vp	Power supply voltage	**DS1087**	45		160	**Vdc**
If	Phase current (**RMS**)		4		8.5	**Arms**
Vp	Power supply voltage	**DS1098**	45		240	**Vdc**
If	Phase current (**RMS**)		4		10	**Arms**
Res	Step resolution available		200, 400, 800, 1000, 1600, 2000, 3200, 4000, 5000, 6400, 10000, 12800, 25000, 25600			**Step / Rev.**
Vdi	Digital input voltage range		3		30	**Vdc**
Idi	Digital input supply current		4	6	8	**mA**
Vdo	Digital output voltage range		1		30	**Vdc**
Ido	Digital output current range				50	**mA**
Prt	Protections		Over/Under voltage, Short circuit, Overheating, Break phase			
Fch	Chopper frequency			20		**KHz**
Mechanical Specifications						
FDh	Height		100.4			**mm**
FDl	Depth		119.0			**mm**
FDw	Width	**DS1044, DS1073**	17.5			**mm**
		DS1048, DS1076, DS1078, DS1084, DS1087, DS1098	35.0			
FDnw	Weight	**DS1044, DS1073**	160			**g**
		DS1048, DS1076, DS1078, DS1084, DS1087, DS1098	270			



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LAM Technologies
electronic equipment

DS30 series

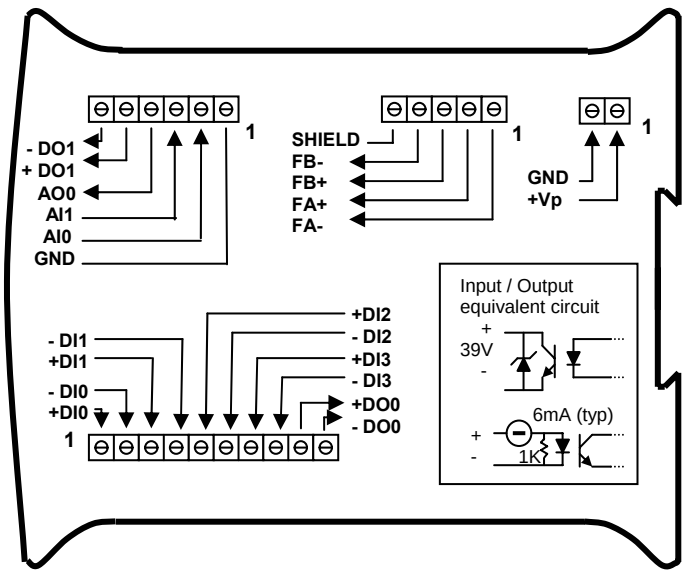
Programmable Drivers 20V…240Vdc 0,8A…10Arms for two phase stepper motors

- ✓ Simple programming at blocks
- ✓ Mathematical functions at 32bit
- ✓ Speed or position control
- ✓ 4 digital and 2 +/-10V analog inputs
- ✓ 2 digital and 1 0-10V analog ouputs
- ✓ Optocoupled and differential I/O, independently NPN or PNP usable
- ✓ Line driving supported
- ✓ Analog inputs resolution at 11bit
- ✓ Digital inputs from 3Vdc up to 30Vdc
- ✓ Independent acceleration and deceleration ramps
- ✓ Absolute and relative positioning
- ✓ Resolution at 1/128 step/rev
- ✓ Quote from -2.147.483.638 to +2.147.483.647
- ✓ Wide range of power supply
- ✓ Resonance damping
- ✓ Automatic current reduction
- ✓ High efficiency power mosfet stage
- ✓ Complete diagnostics with univocal indication for each anomaly
- ✓ Complete protections (V, I and temp.)
- ✓ Break motor phase diagnostics
- ✓ Compact size
- ✓ Easy DIN rail installation
- ✓ Connections on removable terminal block
- ✓ IP20-compliant construction
- ✓ Low cost

The DS30xx series drives have a built-in flexible motion controller able to perform accurate motor control in speed and position.
The programming is quick and simple through the development software tool. The program is built using functional blocks as variable assignment blocks, timing block, conditional jump blocks, etc. Particularly powerful is the mathematical block able to execute additions, subtractions, multiplications and divisions and which allows to realize even complex applications.
The connection with the external devices is through 4 inputs and 2 digital outputs each one optocoupled, independently PNP or NPN or line driver usable. Two +/-10V analog inputs and one 0-10Vdc analog output complete the available interface signals.
To assure the maximum flexibility, the I/O are not specialized and through the programming it is possible to use them as per application requirements. For example, it is possible to use the digital inputs to command the start and the stop of a cycle, the execution of the homing procedure, the selection of the destination quote, of the speed, etc. The digital outputs can be used to indicate the reaching of a position, the intervention of a protection, etc. The analog inputs, for example, can be used to change dynamically the speed, to execute a position adjustment, to change the timing, etc. The analog output can be used instead to command proportional actuators, to supply a speed reference to an inverter, to command an analog instrument, etc.

The drive is designed to be quickly and easily installed on DIN rail. The connection to the motor, with the control signal and the power supply is through colored and removable terminal blocks.
The connection to the DUP port of the drive is through the UDP30 interface (see photo below), which is connected to the PC by the USB port. The interface ensures the electrical insulation between the PC and the drive.

Symbol	Description		Value			Unit
			Min	Typ	Max	
Vp	Power supply voltage	**DS3044**	20		50	**Vdc**
If	Phase current (**RMS**)		1		4	**Arms**
Vp	Power supply voltage	**DS3048**	20		50	**Vdc**
If	Phase current (**RMS**)		3		8	**Arms**
Vp	Power supply voltage	**DS3073**	24		90	**Vdc**
If	Phase current (**RMS**)		0.8		3	**Arms**
Vp	Power supply voltage	**DS3076**	24		90	**Vdc**
If	Phase current (**RMS**)		2		6	**Arms**
Vp	Power supply voltage	**DS3078**	24		90	**Vdc**
If	Phase current (**RMS**)		4		10	**Arms**
Vp	Power supply voltage	**DS3084**	45		160	**Vdc**
If	Phase current (**RMS**)		2		4	**Arms**
Vp	Power supply voltage	**DS3087**	45		160	**Vdc**
If	Phase current (**RMS**)		4		8.5	**Arms**
Vp	Power supply voltage	**DS3098**	45		240	**Vdc**
If	Phase current (**RMS**)		4		10	**Arms**
Vdi	Digital input voltage range		3	24	30	**Vdc**
Idi	Digital input supply current		4	6	8	**mA**
Vdo	Digital output voltage range		1	24	30	**Vdc**
Ido	Digital output current range				50	**mA**
Vai	Analog input voltage range		-10	0	10	**Vdc**
Rai	Analog input impedance			47		**KΩ**
Vao	Analog output voltage range		0		10	**Vdc**
Iao	Analog output current range		0		10	**mA**
Prt	Protections / Diagnostics		Over/Under voltage, Short circuit, Overheating, Break phase			
Mpr	Quote range (1/128 step)		-2,147,483,638 / +2,147,483,647			**1/128p**
Psp	User program memory (functional blocks)			250		
Clp	Mathematical calculation resolution			32		**bit**
Mechanical Specifications						
FDh	Height			100.4		**mm**
FDl	Depth			119.0		**mm**
FDw	Width	**DS3044, DS3073**		17.5		**mm**
		DS3048, DS3076, DS3078, DS3084, DS3087, DS3098		35.0		
FDnw	Weight	**DS3044, DS3073**		185		**g**
		DS3048, DS3076, DS3078, DS3084, DS3087, DS3098		295		



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OS10 serie

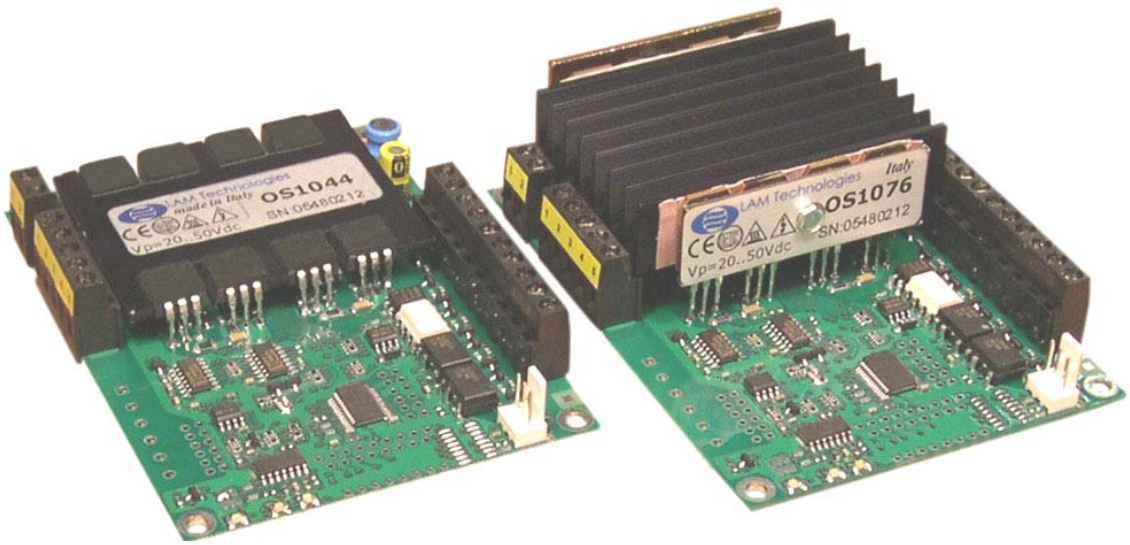
Microstepping drivers 20V…240V 0.8Arms…10Arms for two phase stepper motors

High reliability and performance, compact size and low cost are the main characteristics of the drivers of the OS10xx series.
Realized in open design they can be easily integrated inside equipments and cabinet. The driver is mountable through 4 holes, suitable for M3 screws, placed on the corners of the board.
The connection to the motor, with the logical signals and to the power supply is through three different terminal blocks, each one of them is numbered and suitable for 2.5mm^2 wire size.

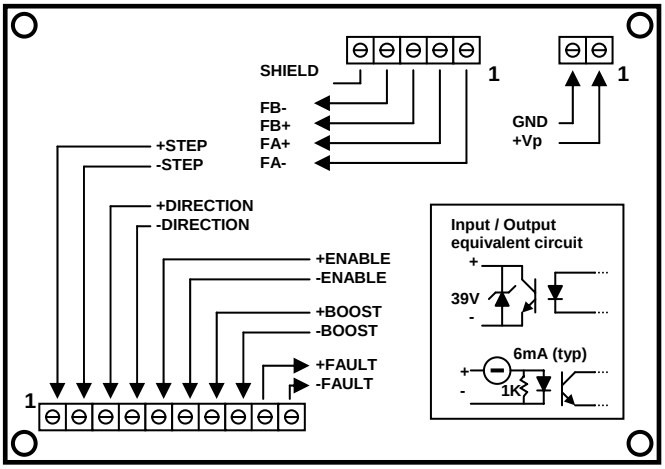
Using the last electronic components generation and the SMT technology it has been possible to obtain in a small space high power and advanced performances.
The many setting options available allow to use the drivers with any kind of motor and application.
The phase motor current can be tuned fine in a wide range of value as the step resolution, the current reduction, etc.
Each logic signal can be set independently from the other to PNP or NPN logic, each input can also be driven using line-driver technology.
The driver is fully protected to preserve its integrity from the most common problems.
The diagnostics is complete and univocally signals whenever one or more protections occur.
Furthermore a break motor phase diagnostics is also available, very useful to determine wiring problems or motor failures.
The complete setting of the driver is immediate and simple thanks to the graphic software designed for Windows platform.

- ✓ Decimal and binary resolution
- ✓ Resolution up to 25.600 step/rev
- ✓ STEP frequency over 300KHz
- ✓ Wide range of power supply
- ✓ High current density
- ✓ Resonance damping
- ✓ Automatic current reduction
- ✓ Accurate current control
- ✓ Chopper frequency over 20KHz
- ✓ High efficiency power mosfet stage
- ✓ Optocoupled and differential I/O, independently NPN or PNP usable
- ✓ Inputs working from 3Vdc up to 30Vdc with constant current
- ✓ Line driving supported
- ✓ Digital signal conditioning for each I/O
- ✓ Complete diagnostics with univocal indication for each anomaly
- ✓ Over/under voltage protection
- ✓ Cross phase short circuit protection
- ✓ Ground short circuit protection
- ✓ Positive supply short circuit protection
- ✓ Overheating protection
- ✓ Break motor phase diagnostics
- ✓ Compact size
- ✓ Connections on screw terminal block
- ✓ Low cost

The connection to the programming DUP port of the driver is possible through the UDP30 interface, which is connected to the PC by the USB port.



Symbol	Description		Value			Unit
			Min	Typical	Max	
Vp	Power supply voltage	**OS1044**	20		50	**Vdc**
If	Phase current (**RMS**)		1		4	**Arms**
Vp	Power supply voltage	**OS1048**	20		50	**Vdc**
If	Phase current (**RMS**)		3		8	**Arms**
Vp	Power supply voltage	**OS1073**	24		90	**Vdc**
If	Phase current (**RMS**)		0,8		3	**Arms**
Vp	Power supply voltage	**OS1076**	24		90	**Vdc**
If	Phase current (**RMS**)		2		6	**Arms**
Vp	Power supply voltage	**OS1078**	24		90	**Vdc**
If	Phase current (**RMS**)		4		10	**Arms**
Vp	Power supply voltage	**OS1084**	45		160	**Vdc**
If	Phase current (**RMS**)		2		4	**Arms**
Vp	Power supply voltage	**OS1087**	45		160	**Vdc**
If	Phase current (**RMS**)		4		8.5	**Arms**
Vp	Power supply voltage	**OS1098**	45		240	**Vdc**
If	Phase current (**RMS**)		4		10	**Arms**
Res	Step resolution available		200, 400, 800, 1000, 1600, 2000, 3200, 4000, 5000, 6400, 10000, 12800, 25000, 25600			**Step / Rev.**
Vdi	Digital input voltage range		3		30	**Vdc**
Idi	Digital input supply current		4	6	8	**mA**
Vdo	Digital output voltage range		1		30	**Vdc**
Ido	Digital output current range				50	**mA**
Prt	Protections		Over/Under voltage, Short circuit, Overheating, Break Phase			
Fch	Chopper frequency			20		**KHz**
Mechanical Specifications						
FDh	Height	**OS1044, OS1073**	18			**mm**
		OS1048, OS1076, OS1078, OS1084, OS1087, OS1098	29			
FDl	Depth		105			**mm**
FDw	Width		78			**mm**
FDnw	Weight	**OS1044, OS1073**	90			**g**
		OS1048, OS1076, OS1078, OS1084, OS1087, OS1098	180			



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LAM Technologies electronic equipment

Stepper motor drivers

USD series

The stepper motor drive modules of the USDxxxxx series have been designed to drive permanent magnet bipolar stepping motors.
In plastic or metal housing they are suitable for circuit board assembling. High performance, compact sizes and cost effective are their main characteristics.
The availability of twelve different models allows the application of the USD modules on many different kinds of machine. The power supply voltage range goes from 12VDC up to 85VDC and the current between 0.3A and 6A.
Each model is provided with full short circuit protection (phase to phase, phase to ground and phase to supply), with over/under voltage and over temperature protection. A fault output allows to always monitor the driver conditions.
A particular current control assures a proper driving of the motor in any condition, reducing resonances and heating. Automatic current reduction minimises heat losses when the motor is not running.
Internal pull-up resistors on each input allow the use of the modules with the addition of a few external components.

The twelve different models are split into three current sizes and four different functionalities.
The simplest series (coded USD**20**xxx) enable the stepping motor to move at full or half step through the DIRECTION, STEP and ENABLE signals.
The USD**10**xxx series use the same control signals but enhance the step motor resolution up to 1/128.
Thanks to the possibility to change step resolution at any time ("at the fly") without loss of position, i.e. with the motor still moving, it is possible to cover a wide range of speed maintaining the STEP input frequency at low value.

The drivers coded USD**60**xxx and USD**50**xxx have built-in indexer and they can be remote controlled by a simple serial link. They have a max step resolution of half and 1/128 respectively.

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LAM Technologies electronic equipment

Stepper motor drivers

USD series

Through a proprietary protocol designed to minimize communication latency it is possible to connect up to 32 different drivers using a simple two wires serial link. The commands set is wide and complete: it allows to set up the operative parameters of the driver (as for example the acceleration times, the minimum and maximum frequency, etc.); it allows to execute absolute positioning or relative to the current position and, furthermore, it allows to read in real time the functioning state of the module and the instant position of the motor.
The motor position is represented with 31bit plus sign allowing positioning between 2.147.483.647 and -2.147.483.638 at step resolution of 1/128.
Three general purposes I/O lines freely settable as input or output, complete the USD50/60xxx drive modules.

Models reference table

Model	*Functionality*	*Resolution*	*Voltage*	*Current*	*Dimension*
USD10361	STEP and DIRECTION	Up to 1/128	12Vdc..42Vdc	0.15A..1.2A	55xx29x45mm
USD10362	STEP and DIRECTION	Up to 1/128	12Vdc..42Vdc	0.3A..2.4A	55xx29x45mm
USD10606	STEP and DIRECTION	Up to 1/128	22Vdc..85Vdc	1A...7.5A	86x40x61mm
USD20361	STEP and DIRECTION	Up to ½	12Vdc..42Vdc	0.15A..1.2A	55xx29x45mm
USD20362	STEP and DIRECTION	Up to ½	12Vdc..42Vdc	0.3A..2.4A	55xx29x45mm
USD20606	STEP and DIRECTION	Up to ½	22Vdc..85Vdc	1A...7.5A	86x40x61mm
USD50361	Intelligent serial controllable	Up to 1/128	12Vdc..42Vdc	0.15A..1.2A	55xx29x45mm
USD50362	Intelligent serial controllable	Up to 1/128	12Vdc..42Vdc	0.3A..2.4A	55xx29x45mm
USD50606	Intelligent serial controllable	Up to 1/128	22Vdc..85Vdc	1A...7.5A	86x40x61mm
USD60361	Intelligent serial controllable	Up to ½	12Vdc..42Vdc	0.15A..1.2A	55xx29x45mm
USD60362	Intelligent serial controllable	Up to ½	12Vdc..42Vdc	0.3A..2.4A	55xx29x45mm
USD60606	Intelligent serial controllable	Up to ½	22Vdc..85Vdc	1A...7.5A	86x40x61mm

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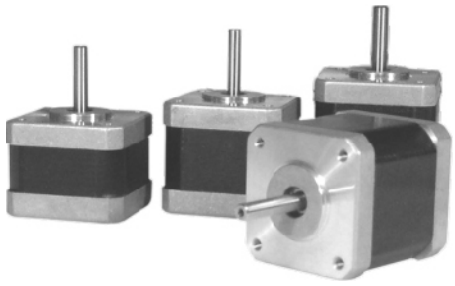
Nema 17

2 phase 1.8° step angle
hybrid stepping motor

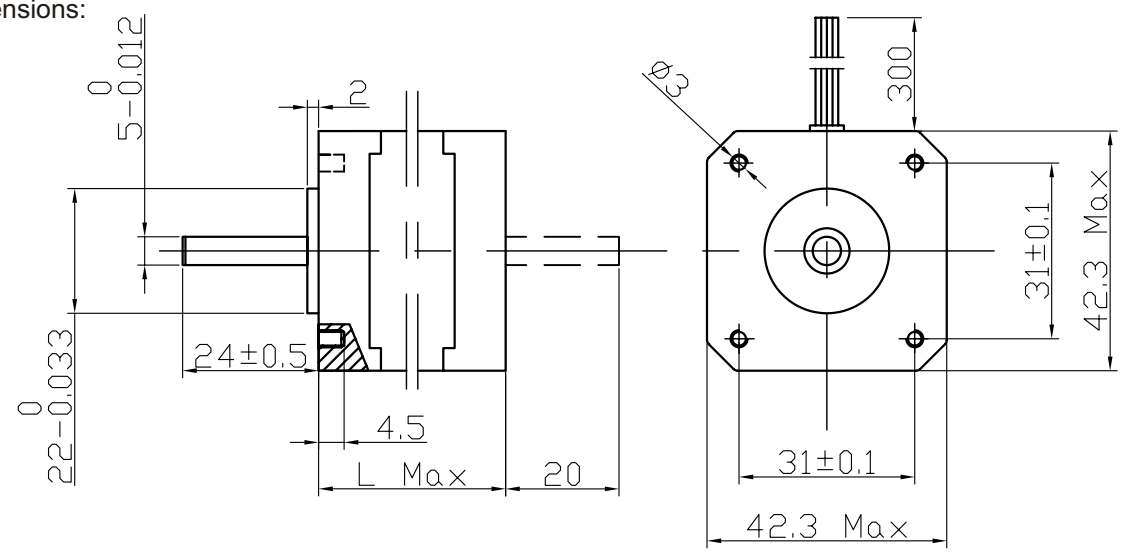


Specifications:

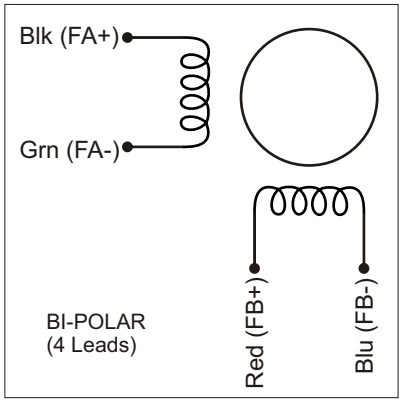
Model	Holding Torque (Nm)	Phase current (A)	Rotor Inertia (g/cm²)	Motor Lenght L max (mm)	Detent Torque (Nm)	Phase Resistence (ohm)	Phase Inductance (mH)	Lead Wire (No)	Motor Weight (Kg)	Note
M1173021	0.28	1.3	34	34	0.016	2.6	3.7	4	0.24	
M1173031	0.40	1.7	54	40	0.022	1.45	2.6	4	0.29	
M1173041	0.50	1.7	68	48	0.026	1.78	2.9	4	0.35	

Double shaft and custom windings available

Mechanical Dimensions:
Unit: mm



Wiring Diagram:



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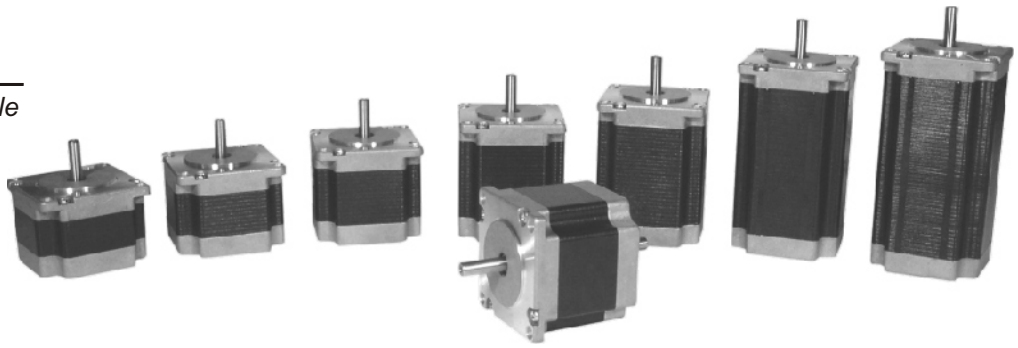
LAM Technologies
electronic equipment

M12330xx
SERIES

Nema 23

2 phase 1.8° step angle
hybrid stepping motor

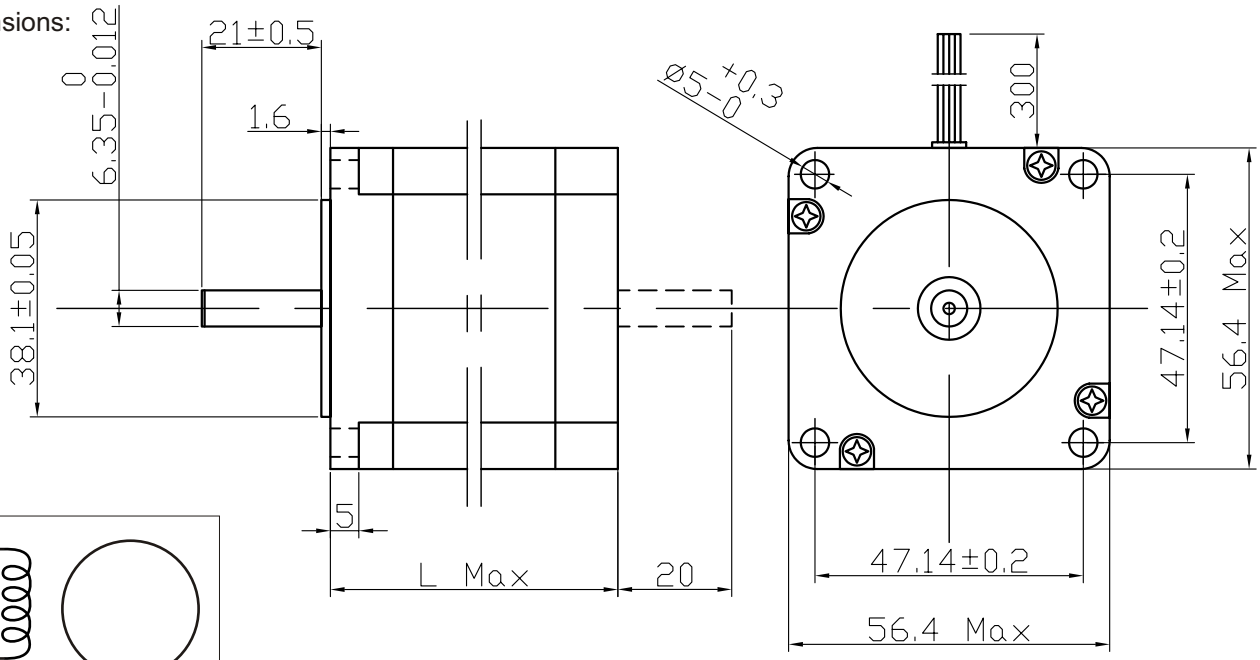


Specifications:

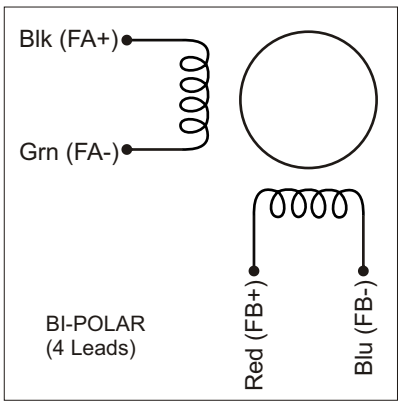
Model	Holding Torque (Nm)	Phase current (A)	Rotor Inertia (g/cm^2)	Motor Lenght L max (mm)	Detent Torque (Nm)	Phase Resistence (ohm)	Phase Inductance (mH)	Lead Wire (No)	Motor Weight (Kg)	Note
M1233011	0.55	0.62	150	41	0.025	13	24.5	4	0.47	
M1233012	0.55	2.0	150	41	0.025	1.2	2.4	4	0.47	
M1233021	0.80	0.62	190	45	0.028	12	29	4	0.52	
M1233022	0.80	2.5	190	45	0.028	1.0	2.2	4	0.52	
M1233031	1.00	0.62	190	51	0.028	13.4	33	4	0.62	
M1233032	1.10	2.5	190	51	0.028	1.15	3.3	4	0.62	
M1233041	1.10	4.2	280	56	0.035	0.4	1.2	4	0.68	
M1233051	1.40	3.0	380	64	0.05	0.8	2.4	4	0.85	
M1233061	1.80	3.0	440	76	0.06	1.0	3.54	4	1.05	8 mm shaft available
M1233062	1.80	4.2	440	76	0.06	0.55	1.8	4	1.05	
M1233070	3.00	4.2	680	100	0.1	0.8	3.0	4	1.5	
M1233071	3.00	6.0	680	100	0.1	0.4	1.5	4	1.5	
M1233081	3.40	6.0	800	112	0.12	0.44	1.9	4	1.7	

Double shaft and custom windings available

Mechanical Dimensions:
Unit: mm



Wiring Diagram:



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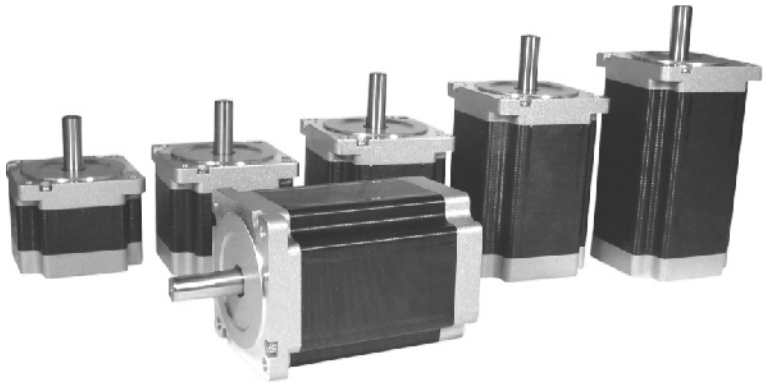
Nema 34

2 phase 1.8° step angle
hybrid stepping motor

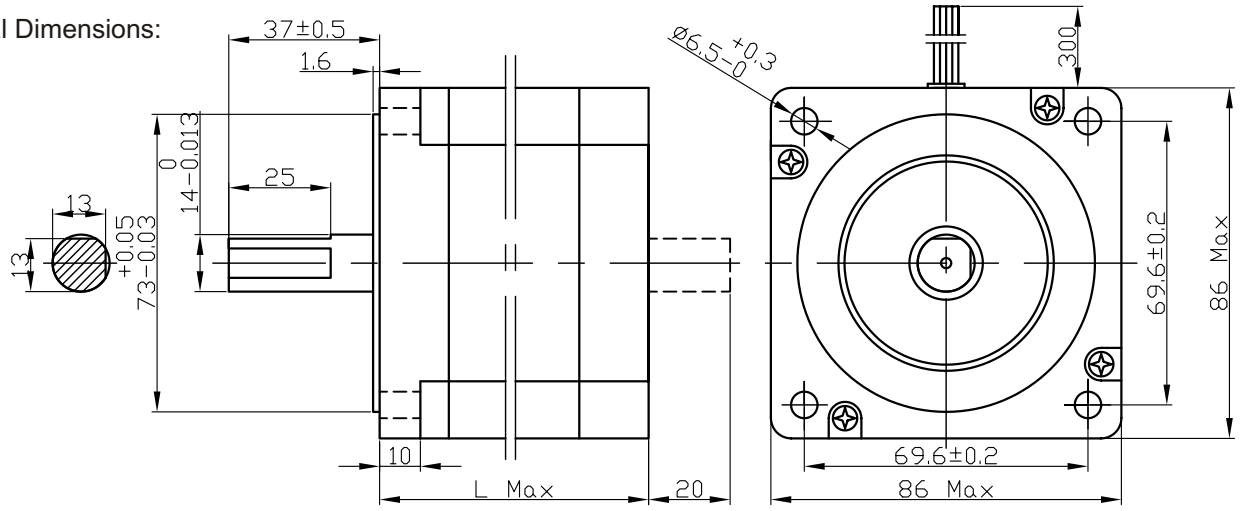


Specifications:

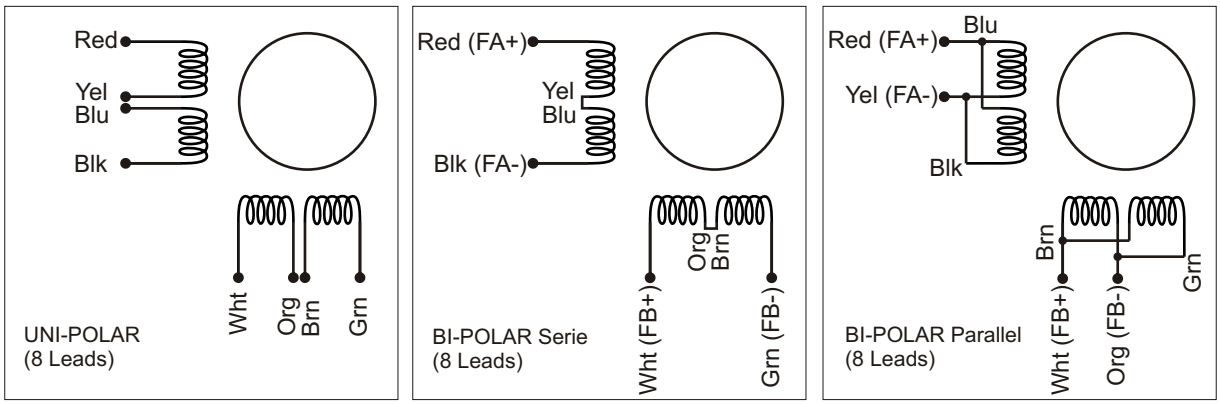
Model	Holding Torque (Nm)	Phase current (A)	Rotor Inertia (g/cm²)	Motor Lenght L max (mm)	Detent Torque (Nm)	Phase Resistence (ohm)	Phase Inductance (mH)	Lead Wire (No)	Motor Weight (Kg)	Note
M1343011	3.1	5.6	850	63	0.055	0.26	0.8	8	1.9	Bip. parallel
M1343020	4.4	5.6	1050	78	0.065	0.35	1.5	8	2.3	Bip. parallel
M1343021	4.4	7.1	1050	78	0.065	0.21	0.9	8	2.3	Bip. Parallel
M1343031	6.8	7.1	1550	98	0.095	0.26	1.2	8	3	Bip. Parallel
M1343041	8.1	7.1	1800	114	0.13	0.38	1.6	8	3.8	Bip. parallel
M1343050	9.2	7.1	2200	126	0.19	0.43	1.7	8	4.1	Bip. parallel
M1343051	9.2	10	2200	126	0.19	0.18	0.9	8	4.1	Bip. Parallel
M1343061	12.1	12	2500	150	0.25	0.17	0.9	8	5	Bip. parallel

Double shaft and custom windings available

Mechanical Dimensions:
Unit: mm



Wiring Diagram:



MOTOR TECHNOLOGY LTD
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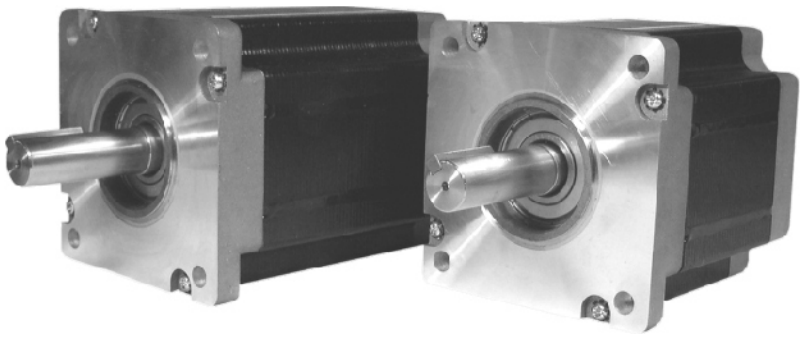
Nema 43

2 phase 1.8° step angle
hybrid stepping motor

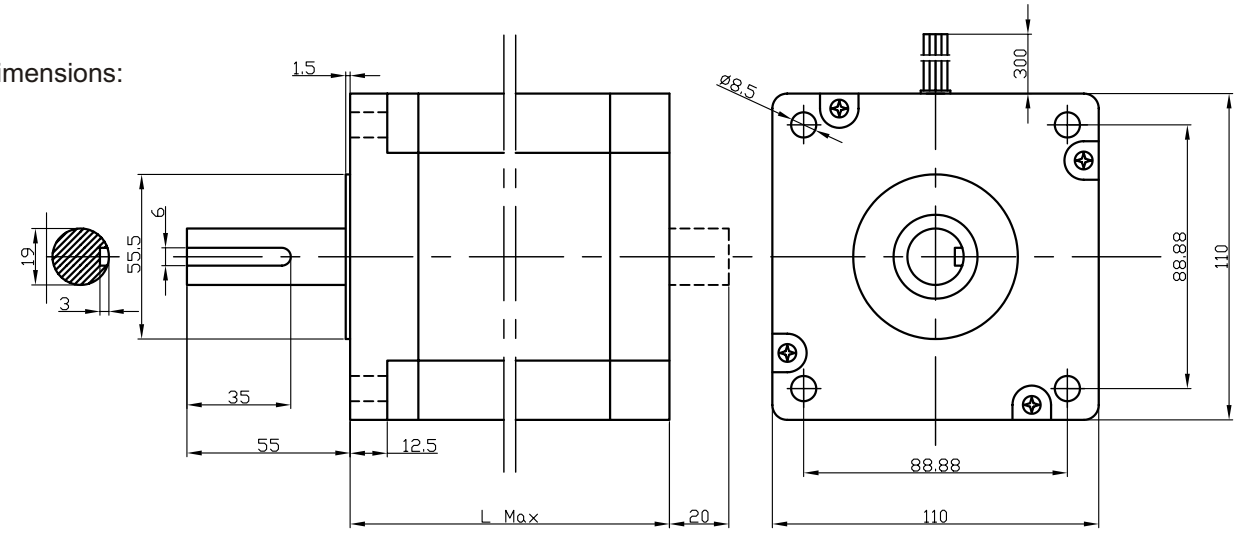


Specifications:

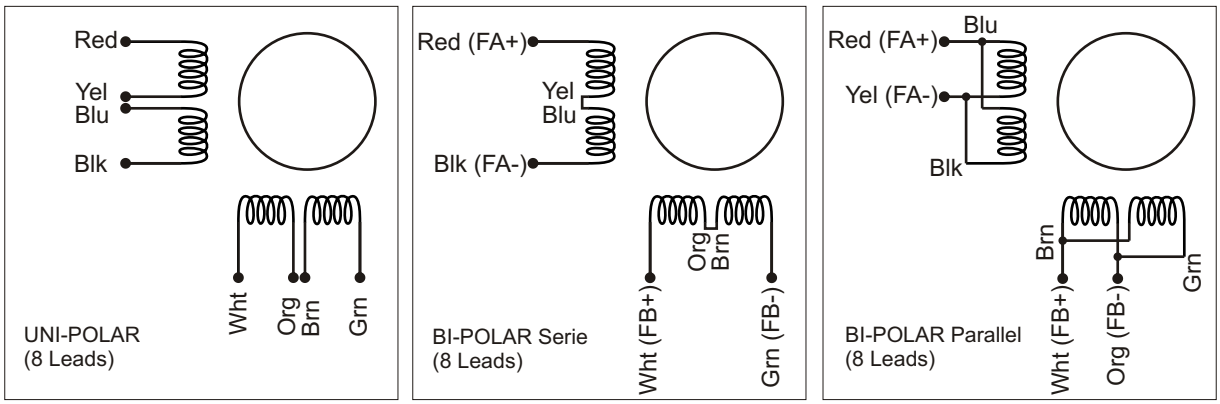
Model	Holding Torque (Nm)	Phase current (A)	Rotor Inertia (g/cm^2)	Motor Lenght L max (mm)	Detent Torque (Nm)	Phase Resistence (ohm)	Phase Inductance (mH)	Lead Wire (No)	Motor Weight (Kg)	Note
M1433011	14.4	12	5500	115	0.45	0.53	2.1	8	6.3	Bip. parallel
M1433021	21	12	11000	150	0.65	0.69	3.1	8	8.5	Bip. parallel

Double shaft and custom windings available

Mechanical Dimensions:
Unit: mm



Wiring Diagram:



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