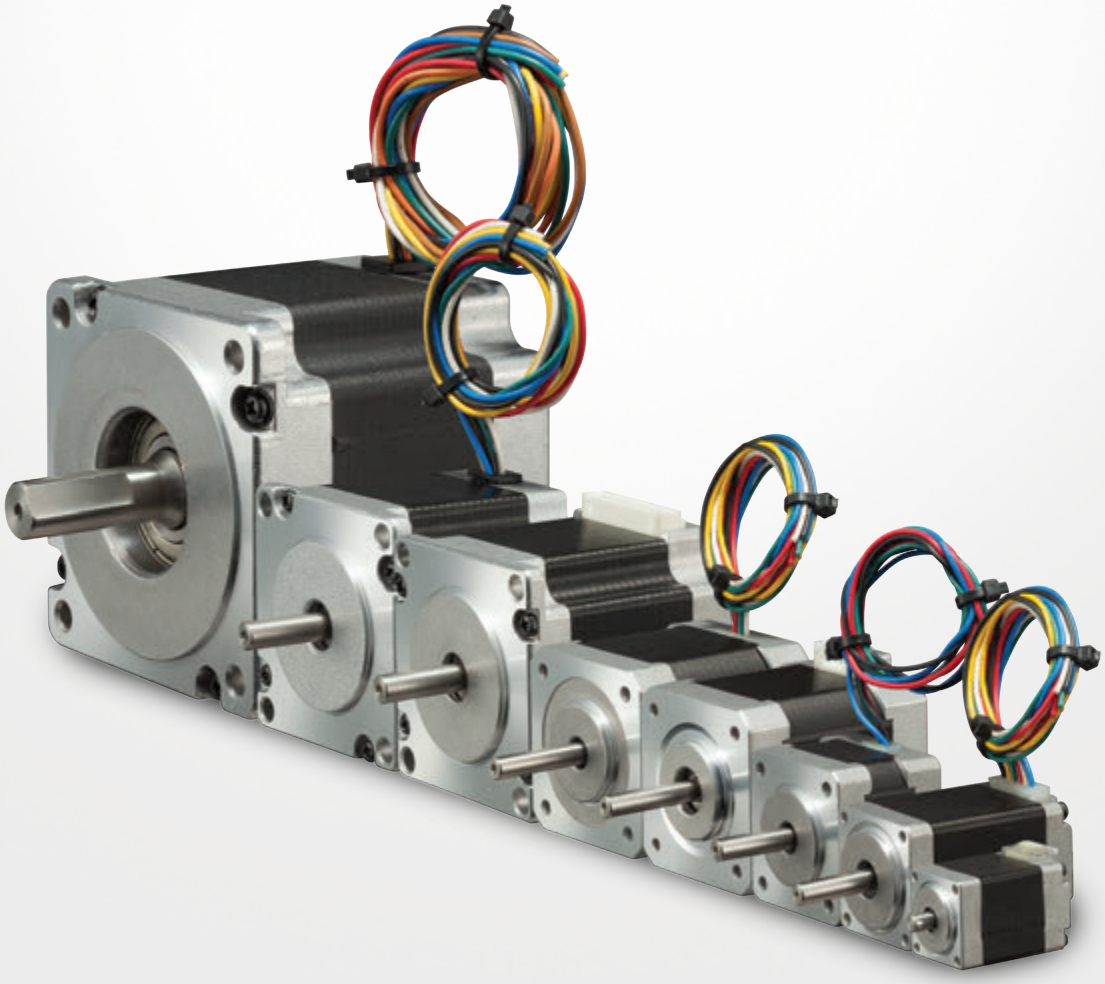
Kollmorgen PMX™ Series Stepper Motor Selection Guide



Revision B, 12/7/2015

KOLLMORGEN®

Because Motion Matters™

Kollmorgen: Your partner. In Motion.

Every solution comes from a real understanding of the challenges facing machine designers and users.

Innovators consistently rate Kollmorgen as one of their best motion systems manufacturing partners. Whether you are looking for classic servo motors; direct-drive servo motors; or stepper motors; drives & amplifiers; gearing; actuation; or CNC & multi-axis motion controllers; Kollmorgen is one of the few companies in the world whom actually design and manufacture all of these products.

Our customers are leaders in many industries, such as Aerospace & Defense; Printing; Packaging & Converting; Food & Beverage Processing; Medical Imaging, Invitro Diagnostics & Laboratory Automation, Pharmaceutical Manufacturing; Material Forming and Cutting; Oil & Gas; and Robotics. Kollmorgen is also a leader in Warehouse Automation, including complete AGV systems, software, awareness and autonomy.

Our Automation Solutions can be found on Mars and in space; Ships and submarines; O&G drilling and metrology; Surgical robots and laser eye surgery; even inside of artificial hearts. These are just a few applications that demand high performance and high quality while satisfying their specific needs.

Because motion matters, it's our focus: Motion can distinctly differentiate a machine and deliver a marketplace advantage by increasing its performance and dramatically improving OEE.

High-performance motion can make your customer's machine more reliable and energy-efficient, enhance accuracy and improve operator safety. Motion also represents endless possibilities for innovation.

We've always understood this potential, and thus have kept motion at our core and in our Vison, Mission & Values, relentlessly developing products that offer precise control of torque, velocity and position accuracy in machines that rely on complex motion.

KOLLMORGEN®

Because Motion Matters™

Removing the Barriers of Design, Sourcing, and Time

At Kollmorgen, we know that OEM engineers can achieve a lot more when obstacles aren't in the way. So, we clear obstacles in three important ways:

Integrating Standard and Custom Products

The optimal solution is often not clear-cut. Our application expertise allows us to modify standard products or develop totally custom solutions across our whole product portfolio so that designs can take flight.

Providing Motion Solutions, Not Just Components

As companies reduce their supplier base and have less engineering manpower, they need a total system supplier with a wide range of integrated solutions. Kollmorgen offers complete solutions as well as motion subsystems that combine programming software, engineering services and best-in-class motion components.

Global Footprint

With direct sales, engineering support, manufacturing facilities, and distributors spanning the Americas, Europe, Middle East, and Asia, we're close to OEMs worldwide. Our proximity helps speed delivery and lend support where and when they're needed.

Financial and Operational Stability

Kollmorgen is part of Danaher Corporation. A key driver in the growth of all Danaher divisions is the Danaher Business System, which relies on the principle of "kaizen" – or continuous improvement. Using world-class tools, cross-disciplinary teams of exceptional people evaluate processes and develop plans that result in superior performance.

Kollmorgen: Your partner. In Motion.

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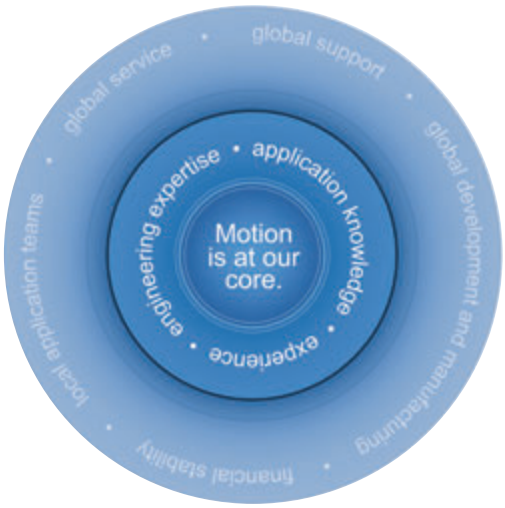


PMX™ Series Stepper Motor

Kollmorgen's stepper motors are designed with versatility, ease–of–use, and cost-effectiveness in mind. They provide high torque in a small package and come in a wide range of standard sizes, constructions, windings and options.

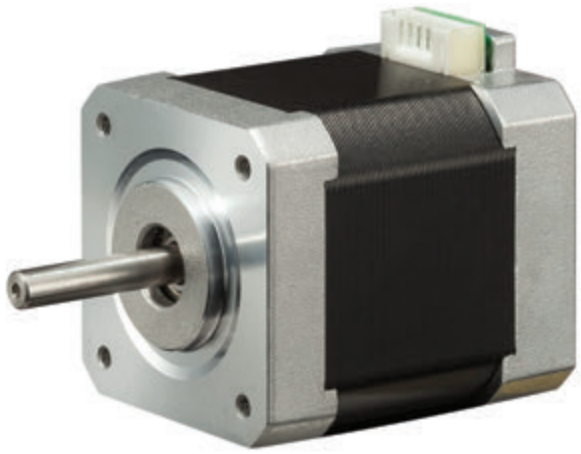
Our high-performance, brushless, maintenance-free stepper motors provide very precise, extremely cost-effective motion control. These hybrid stepper motors inherently move in small, very precise, 0.9°, or 1.8° increments (400 or 200 steps/revolution). This stepping action is simple to control and does not require complicated, expensive feedback devices.

They are available with custom leads, shafts and connectors are routinely provided to effectively solve your application needs.

Kollmorgen's PMX™ Stepper Motor series delivers breadth and design flexibility.

The PMX stepper motor series offers a wide range of sizes and options, suitable for an extensive number of applications and machine designs. High quality construction translates to reliability in the field and long service life. Localized Kollmorgen support offers improved delivery terms and immediate technical capabilities, for quicker time to market and less downtime.

- 6 frame sizes: 08, 11, 14, 17, 23, 34
- 21 frame-stack length combination
- 1.8˚ and 0.9˚ step angle options available



Features

Torque
2.5 to 1739 oz-in continuous torque in 21 frame/stack combinations. Specific torque values are often available from multiple frame sizes to optimize envelope and inertia matching requirements.

Speed
Speeds up to 3,000 RPM meet all low and medium speed requirements, typical for stepper motor applications.

Step Angle
Each frame size offers a 1.8˚ step angle, which translates to 200 steps/rev. The 17 and 23 frame sizes are also offered in a 0.9˚ configuration, or 400 steps/rev. This provides an added option for design requirements, and is also useful for replacing existing 0.9˚ stepper models to minimize control changes.

Connectivity
PMX series offers both bipolar and unipolar winding configurations in each frame size. This means improved flexibility for customer-defined controls and for replacing existing stepper solutions.

Shaft Configurations
Each frame size offers options for a smooth or flat front shaft and rear shaft extension. Need a more detailed shaft modification? Flexible manufacturing allows for Kollmorgen to easily provide special shaft modifications without sacrificing delivery.

Sealing
Base configuration offers a IP30 protection in each frame size. The 23 and 34 frames also offer additional sealing modifications to achieve IP65 protection for applications where dust or liquid is present.

Compliance
All models are CE, RoHS, and REACH compliant, allowing for swifter machine qualification.

Kollmorgen PMX and P-Series Stepper Drives Offer the Complete Solution

Each PMX frame/stack combination is offered in a winding capable of being used with a P-Series stepper dive. These advanced controls offer full, half, and microstepping models in both modular and packaged designs. they also offer a wide input voltage range including both Vdc and Vac input confirgurations. Contact your local distributor or Kollmorgen Customer Support to identify which system solution is best suited for your application.

PMX™ Series Stepper Motor

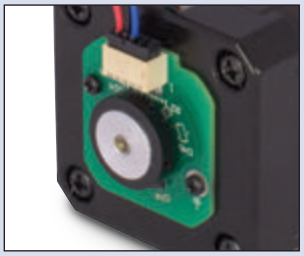
Kollmorgen's flexible manufacturing is shifting the viewpoint on custom motor capabilities.

Kollmorgen offers extensive experience in stepper motor enhancements and value-add stepper motor assemblies. Localized support gives you the technical solutions and delivery terms, leading to swifter prototype evaluation and time to market. Kollmorgen's ability to co-engineer – customize shafts, lead wires, connectors, encoders, gearboxes, etc – provides real flexibility to optimize each motor, making it easier to drop into existing applications with minimal adjustments.

Shaft Modifications

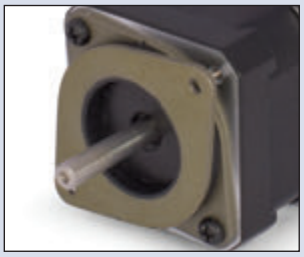
A variety of motor output shaft modifications can be supplied, allowing swifter integration into drive mechanism.

- Special shaft diameters and shaft lengths
- Special shaft details including: flats, dual flats, slots, and thru holes
- Spline shafts, helical gears, fixed acme lead screws



Electrical Modifications

Kollmorgen can swiftly evaluation special winding considerations and attempt to match current, resistance, or inductance requirements for swifter control integration.



Connectors and Cabling

Motors can be supplied with customer-specified connectors for swifter incorporation into existing cabling. Non- standard lead lengths and cable options can also be ordered.

Encoders

Kollmorgen can supply and mount customer-specified encoders. This includes different encoder types (i.e. incremental, absolute) and line counts.

Gearboxes

Kollmorgen has immediate spur and planetary gearbox solutions available. These extend the torque range of the motors and ship pre-mounted from the factory for your convenience.

Complete Sub-Assemblies

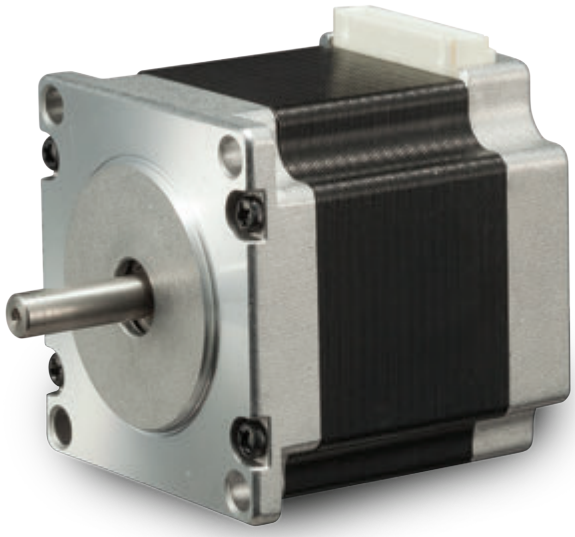
Partnering with Kollmorgen for full co-engineering design adds significant value in motion selection. Complete sub-assembly solutions mean less integration and engineering to perform. Sub-assemblies can ship directly from the factory allowing for reduced machine SKU count and swifter production readiness.

To review non-standard capabilities, contact Kollmorgen today at www.kollmorgen.com

PMX Stepper Motor Technology

Kollmorgen PMX motors utilize high torque magnetic designs that feature a large rotor diameter, small air gap, high energy rotor magnets and windings. This provides maximum torque in a small package.

- Lower Energy Usage
- Faster Machines
- Lower System Cost
- More Compact Machines

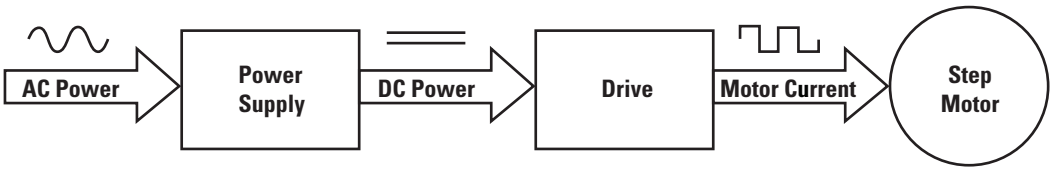


PMX Stepper Motor Operation

Kollmorgen Hybrid stepper motors have two windings (two phases) that are energized with DC current. When the current in one winding is reversed, the motor shaft moves one step, or 0.9°, or 1.8°. By reversing the current in each winding the position and speed of the motor is easily and precisely controlled, making these motors extremely useful for many different motion control applications.

For even finer resolution and smoother operation, micro-stepping drives divide each step into many increments by controlling the magnitude of the current in each winding.

The performance of hybrid stepper motors is highly dependent on the current and voltage supplied by a drive. Kollmorgen stepper motors are available with a variety of windings so they can be used with drives that have a broad range of voltage and current ratings. Performance curves are included in this catalog for many common motor drive combinations.



Holding Torque

Because motor performance at speed varies greatly with the drive, holding torque is used to rate hybrid stepper motors. Holding torque specifies the maximum torque that can be applied to a motor shaft and not cause the shaft to rotate. It is measured with the motor at standstill and energized with rated DC current. Since the motor is energized with pure DC current, holding torque is not dependent on specific drive characteristics.

Kollmorgen Stepper Motor Overview

Kollmorgen offers a comprehensive range of stepper motor products including continous torque, high torque and hybrid options to meet a wide range of application requirements. For other Kollmorgen stepper products or information not included in this catalog go to www.kollmorgen.com.

		Product Family	NEMA	Step	Stacks	Holding Torque (oz-in)
Economy, Push		PMX08	08	1.8°	2	4.0
		PMX11	11	1.8°	3	16.8
		PMX14	14	1.8°	3	26.4
		PMX17	17	0.9° 1.8°	5	107.0
		PMX23	23	0.9° 1.8°	4	378.0
		PMX34	34	1.8°	4	1739
Economy		CTP1	17	1.8°	3	80
		CTP2 CTM2	23	1.8°	3	360 / 470
		CTP3 CTM3	34	1.8°	3	1500 / 1930
Flagship Products		P2 M2	23	1.8°	3	214 / 253
		T2	23	1.8°	4	380
		N3 K3	34	1.8°	4	2180 / 2790
		N4 K4	42	1.8°	3	4370 / 5660
Conventional Round Flange		H2 E2	23	1.8°	3	158 / 225
		H3 E3	34	1.8°	3	916 / 1300
		H4 E4	42	1.8°	3	2650 / 3960
		MH172	66	1.8°	1	6139
Special Purpose		MX9	34	1.8°	3	550
		MX11	42	1.8°	2	1390

Holding Torque (oz-in): 400, 1200, 2000, 2800, 3600, 4400, 5200, 6000

Standard Stepper Motor Construction

Step motor utilizing SIGMAX® Technology

Product Family	NEMA	Features				Standard Options (○ available option)														Family Features
		UL Recognized	CE Mark	RoHS	SIGMAX® Technology	Integral Connectoin	Leadwire	4-Lead Bipolar	6-Lead Unipolar	8-Lead	Terminal Box	MS Connector	IP Sealing	Encoders	Front Shaft: Normal	Front Shaft: Flat	Front Shaft: Keyway	Rear Shaft	Low Inertia	
PMX08	08		•	•			•	•					30		○	•		•		• NEMA Sizes 8, 11, 14, 17, 23, 34 • CE, RoHS, and REACH Compliant • Unipolar or Bipolar windings • Options: shaft flats, rear shaft with encoder mounting holes, IP Sealing • Special Options readily available: spur and planetary gearboxes, encoders, special shafts
PMX11	11		•	•			•	•					30		○	•		•		
PMX14	14		•	•			•	•					30		○	•		•		
PMX17	17		•	•		•	•	•	○				30		○	•		•		
PMX23	23		•	•		•	•	•	○				30, 65[1]		○	•		•		
PMX34	34		•	•			•	•					30, 65[1]		○	•	○	•		
CTP1	17	•	•	•			•	•	•				40		•			•		• High torque standard CTP models • Enhanced CTM SIGMAX models produce up to 25% more torque in same package • Large bearings provide high thrust and radial loads
CTP2 CTM2	23	• •	• •	• •	•		• •	• •	• •				40		•	○		• •		
CTP3 CTM3	34	• •	• •	• •	•		• •	• •	• •				40				•	• •		
P2 M2	23	• •	• •		 •	• •	• •			• •			40 40	• •	• •	○ ○		• •	• •	• High torque standard hybrid stepper motor • Enhanced M and K SIGMAX models provide up to 25% more torque in same package • Low detent torque for smoother microstepping • Bipolar and unipolar winding • Large array of options
T2	23	•	•				•	•	•		•	•	40	•	•	○		•		
K3 N3	34	• •	• •		 •		• •	• •	• •	• •	• •	• •	65[1] 65[1]	• •			• •	• •		
K4 N4	42	• •	• •		 •		• •	• •	• •	• •	• •	• •	65[1] 65[1]	• •			• •	• •		
H2 E2	23	• •	• •		 •		• •	• •	• •	• •		• •	40 40	• •	• •	○ ○		• •	• •	• High efficiency, low loss hybrid designs in a conventional round frame • Enhanced E SIGMAX models provide up to 25% more torque in the same package • Torque produced over a wide speed range • Large array of options • E2, H2 offer high axial loading
H3 E3	34	• •	• •		 •		• •	• •	• •	• •		• •	65[1] 65[1]	• •	• •	○ ○		• •		
H4 E4	42	• •	• •		 •		• •	• •	• •	• •		• •	65[2] 65[2]	• •			• •	• •		
MH172	66										•		40	•			•	•		
MX9	34	•											40		•			•		• Standard hybrid stepper motor • Meets Explosion proof UL Class 1, Division 1 Group D requirements • Up to 150% rated torque reserve capacity (MX9) and 200% for {MX11}
MX11	42	•											40			•		•		

Notes: 1. Requires shaft seal and connection option other than leaded (Meets IP40 otherwise)
2. Requires shaft seal option (Meets IP40 otherwise)

Stepper Positioning Drives

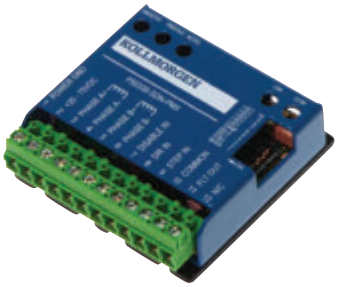
Kollmorgen's stepper drives are designed with versatility, ease-of-use, and cost-effectiveness in mind. Choose from a broad range of advanced drives and controls including full, half, and microstepping models in both modular and packaged designs.

Modular drives are open-frame units or have small enclosures, and require an external DC power source. They are generally used where the drive will become an integral part of the user's system or in multiaxis systems utilizing a common power supply.

A packaged drive is a stand-alone unit that operates directly from an AC power source and is packaged in a full enclosure.

P-Series Drive Features and Benefits

P5000



Value DC Input Stepper Drive

- Wave matching for Kollmorgen motors to provide optimal performance
- All inputs and outputs are optically isolated
- Step and direction inputs or internal velocity controlled oscillator (VCO) dip switch selectable
- DIP switch selectable micro-stepping resolution settings
- Idle current reduction, DIP switch selectable
- Compensation for mid-range instability
- RoHS & CE certified
- UL pending

P6000

Full Featured AC Input Stepper Drive

- No programming required
- Covers full power range of Kollmorgen steppers
- Switch selectable current from 0.2-5.7 Arms, 8.0 A peak
- Switch selectable for many Kollmorgen motor parings
- All inputs and outputs are optically isolated
- Single-ended and differential step and direction
- Enable input
- Switch selectable micro-stepping resolution
- Anti-resonance based on load inertia
- RoHS & CE certified

P7000

Full Featured AC or DC Input Stepper Drives with Intelligent Indexing Option (-PN)

- AC and DC input versions
- Covers full power range of Kollmorgen steppers
- Drives can be configured by either dip switches or P7000 software
- Intelligent indexing option (-PN) provides ability to link motion tasks.
- All inputs and outputs are optically isolated
- Single-ended and differential step and direction
- Enable input
- Switch selectable micro-stepping resolution
- Anti-resonance based on load inertia
- RoHS, CE and UL certified

Budget/Value → Full–Featured

STEPPER DRIVE PRODUCT OVERVIEW

Stepper Drive Model	Modes of Operation*	Input voltage (Vdc)	Input Voltage (Vac)	Output current (Adc) Continuous (Peak)
P5000	S, V	20 - 75	n/a	0.7 - 2.0 (3.5)
P6000	S	n/a	110-240 +/-10%	0.3 - 5.7 (8.0)
P70530	S, M	20 - 75	n/a	0 - 5.0 (7.1)
P70360	S, M	n/a	120/240	0 - 2.5 (3.5)

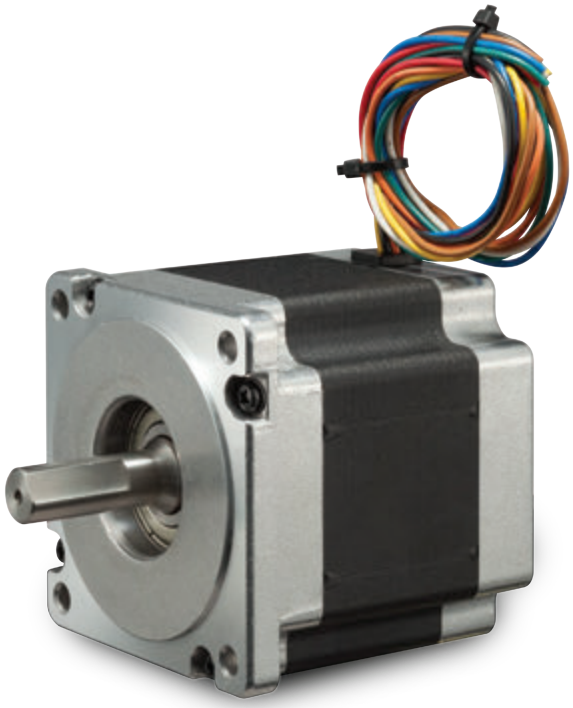
Modes of Operation: S - Step and Direction; V - Velocity Controlled Oscillator (VCO);
M - Motion Node Indexing

Complete P-Series model nomenclature can be found on pages 31-33.

PMX™ Series Stepper Motor

General Specifications

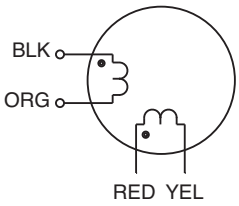
- NEMA Sizes 08, 11, 14, 17, 23, 34
- Excellent for use with leadscrews
- CE, RoHS, and REACH Compliant
- Unipolar or Bipolar windings
- Options (applicable frame sizes only): leadwire or integral connectors, smooth, flat, or keyed front shafts, rear shafts, IP65 sealing



Parameter	PMX08	PMX11	PMX14	PMX17	PMX23	PMX34
NEMA frame size	08	11	14	17	23	34
Step Angle (degrees)	1.8	1.8	1.8	0.9, 1.8	0.9, 1.8	1.8
Step Angle Accuracy	+/- 5					
Resistance Accuracy	10%					
Inductance Accuracy	20%					
Operating Temperature	-20° C to +40° C					
Temperature Rise ˚C	80					
Insulation Class	Class B, 130° C					
Insulation Resistance	100 Megohms					

PMX™ Connection Information

4-Lead Configuration



4-Lead Bipolar/Series Connection

Driver Connection	Lead Color
A	Black
$\overline{A}$	Orange
B	Red
$\overline{B}$	Yellow

Bipolar Full Step Phase Sequence

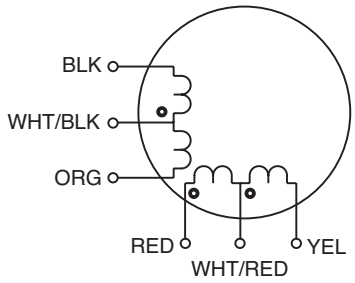
CCW ↓

STEP	A	$\overline{A}$	B	$\overline{B}$
1	+	–	–	+
2	–	+	–	+
3	–	+	+	–
4	+	–	+	–
1	+	–	–	+

↑ CW

Indicated direction when viewed from the motor drive shaft end

6-Lead Configuration



6-Lead Unipolar Connection

Driver Connection	Lead Color
A	Black (Blk)
B	Orange (Org)
C	Red
D	Yellow (Yel)
+V	Wht/Blk
+V	Wht/Red

Unipolar Full Step Phase Sequence

CCW ↓

STEP	A	B	C	D
1	GND	0	GND	0
2	0	GND	GND	0
3	0	GND	0	GND
4	GND	0	0	GND
1	GND	0	GND	0

↑ CW

Indicated direction when viewed from the motor drive shaft end

PMX™ Nomenclature

PMX 11 2 0 – G 1 0 – U N 0 – 00

1 2 3 4 5 6 7 8 9

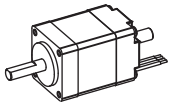
	Available Motor PMX					
1 Motor Series						
2 NEMA Frame	08	11	14	17	23	34
3 Rotor Stack Length						
1 = 1 stack	•	•	•	•	•	•
2 = 2 stacks	•	•	•	•	•	•
3 = 3 stacks		•		•	•	•
4 = 4 stacks				•	•	•
5 = 5 stacks				•		
4 Motor Winding						
Bipolar (A through D)	•	•	•	•	•	•
Unipolar (G through J)				•	•	
5 Step Angle						
1 = 1.8°	•	•	•	•	•	•
9 = 0.9°				•	•	

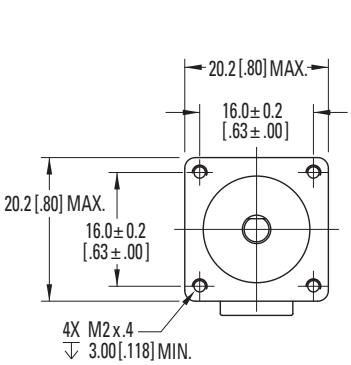
	Available Options PMX					
Motor Series						
NEMA Frame Sizes	08	11	14	17	23	34
6 Connection/Option						
B = 4 lead Bipolar	•	•	•	•	•	•
U = 6 lead Unipolar				•	•	
X = Integrated Connector				•	•	
7 Front Shaft Option						
N = Smooth front shaft	•	•	•	•	•	•
F = Flat front shaft	•	•	•	•	•	•
K = Open keyway						•

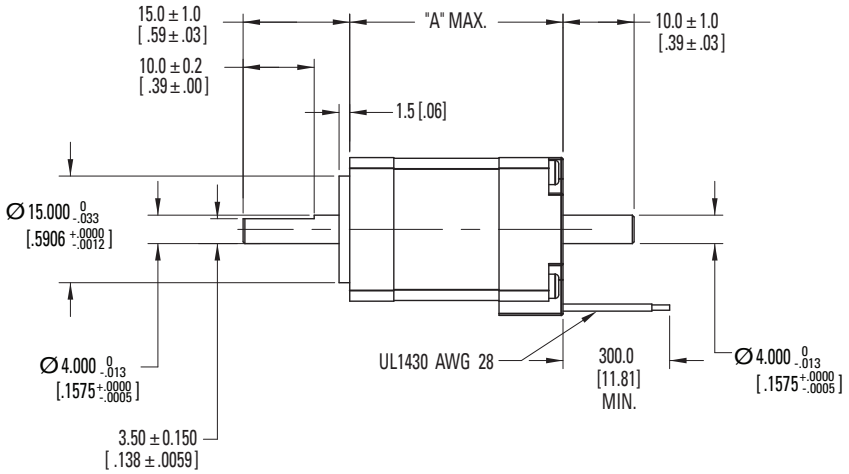
	Available Options PMX					
Motor Series						
NEMA Frame Sizes	08	11	14	17	23	34
8 Rear Shaft Option						
0 = No rear shaft	•	•	•	•	•	•
R = Rear shaft	•	•	•	•	•	•
9 Sealing Option						
00 = IP30	•	•	•	•	•	•
01 = IP65 sealing					•	•

PMX08 Series Stepper Motors

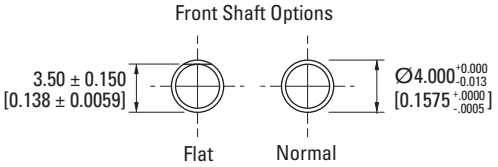
PMX08 Outline Drawings







Model	"A" MAX
PMX081	30 [1.18]
PMX082	42 [1.65]



Dimensions in mm [inches]

PMX 08 2 0 – A 1 0 – B N 0 – 00*

Motor Series | Frame Size | Stack Length | Winding | Step Angle | Connection | Front Shaft Opt. | Rear Shaft Opt. | Sealing Option

PMX08 Performance Data

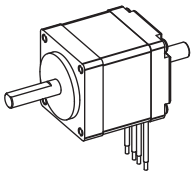
PMX08			Configuration		Holding Torque (2 phases on)	Rated Current/ Phase	Phase Resistance	Phase Inductance	Thermal Resistance	Rotor Inertia	Weight	Shaft Loading	
												Radial Force	Axial Force
Stack	Winding	Step	Bipolar	Unipolar	oz-in [Nm] +/-12%	Amps DC	Ohms +/-10%	mH Typical	Mounted °C/Watt	oz-in-s² [kg-m²]	lb [kg]	lb [N]	lb [N]
1	A	1	•		2.50 [0.018]	0.532	6.70	2.00	15.9	2.84E-05 [2.01E-07]	0.130 [0.06]	3.4 [15]	1.4 [6]
2	A	1	•		4.00 [0.028]	0.664	5.28	1.64	13.0	5.11E-05 [3.61E-07]	0.180 [0.08]	3.4 [15]	1.4 [6]

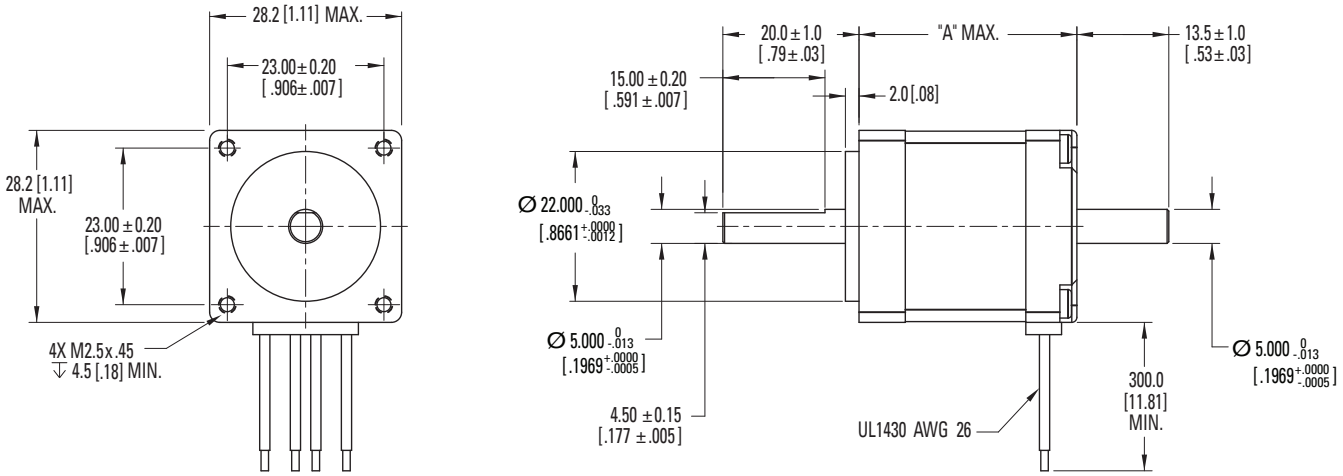
Notes

* Complete PMX series model nomenclature can be found on page 30.

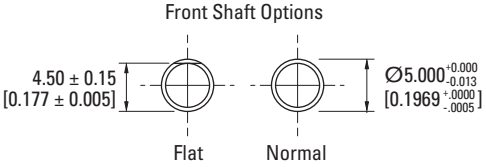
PMX11 Series Stepper Motors

PMX11 Outline Drawings





Model	"A" MAX
PMX111	32 [1.26]
PMX112	45 [1.77]
PMX113	51 [2.01]



Dimensions in mm [inches]

PMX 11 2 0 – G 1 0 – B N 0 – 00*

Motor Series | Frame Size | Stack Length | Winding | Step Angle | Connection | Front Shaft Opt. | Rear Shaft Opt. | Sealing Option

PMX11 Performance Data

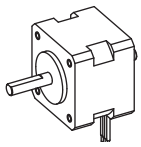
PMX11			Configuration		Holding Torque (2 phases on)	Rated Current/ Phase	Phase Resistance	Phase Inductance	Thermal Resistance	Rotor Inertia	Weight	Shaft Loading	
												Radial Force	Axial Force
Stack	Winding	Step	Bipolar	Unipolar	oz-in [Nm] +/-12%	Amps DC	Ohms +/-10%	mH Typical	Mounted °C/Watt	oz-in-s² [kg-m²]	lb [kg]	lb [N]	lb [N]
1	A	1	•		9.90 [0.070]	1.38	1.50	0.89	11.2	1.28E-05 [9.00E-07]	0.240 [0.11]	6.3 [28]	2.3 [10]
1	B	1	•		10.1 [0.071]	0.704	5.41	3.57	11.2	1.28E-05 [9.00E-07]	0.240 [0.11]	6.3 [28]	2.3 [10]
2	A	1	•		16.1 [0.114]	1.61	1.38	0.93	8.94	1.70E-04 [1.20E-06]	0.310 [0.14]	6.3 [28]	2.3 [10]
2	B	1	•		16.1 [0.114]	0.713	6.56	4.78	8.94	1.70E-04 [1.20E-06]	0.310 [0.14]	6.3 [28]	2.3 [10]
3	A	1	•		16.8 [0.119]	1.53	1.61	1.2	8.35	2.56E-04 [1.81E-06]	0.440 [0.20]	6.3 [28]	2.3 [10]
3	B	1	•		16.7 [0.118]	0.626	9.07	7.01	8.35	2.56E-04 [1.81E-06]	0.440 [0.20]	6.3 [28]	2.3 [10]

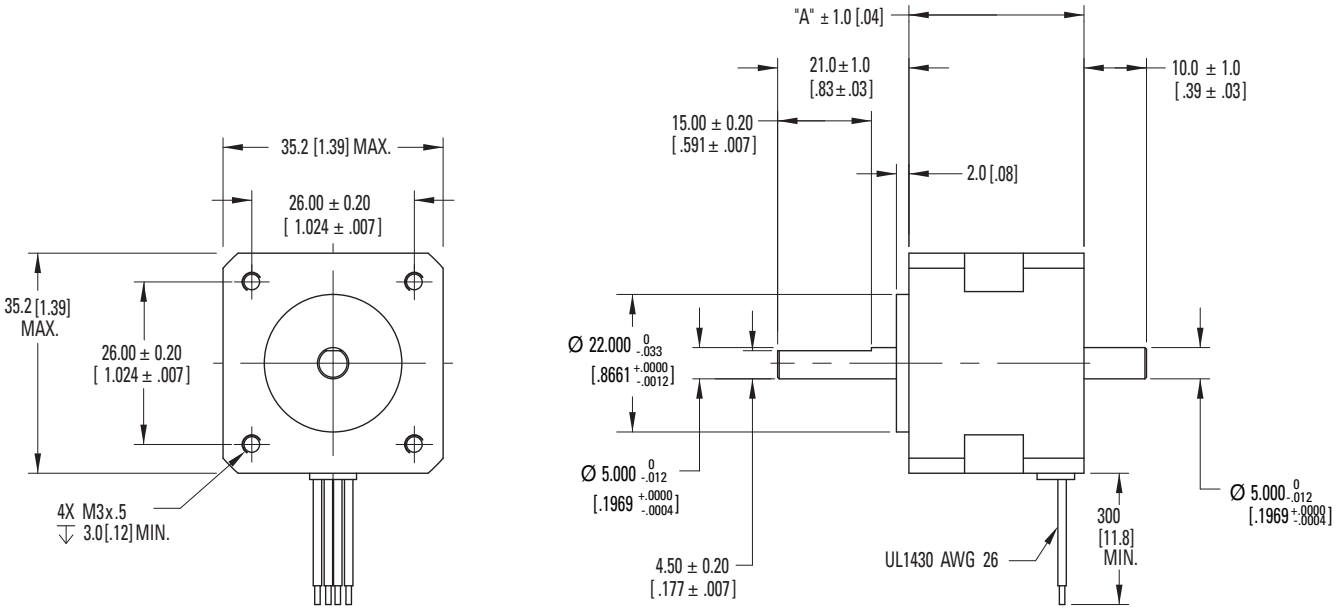
Notes

* Complete PMX series model nomenclature can be found on page 30.

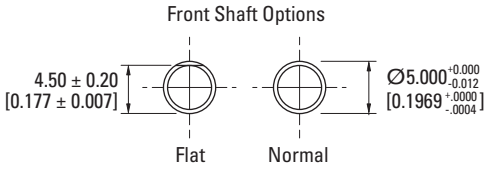
PMX14 Series Stepper Motors

PMX14 Outline Drawings





Model	"A" MAX
PMX141	26 [1.02]
PMX142	28 [1.10]
PMX143	36 [1.42]



Dimensions in mm [inches]

PMX 14 2 0 – A 1 0 – B N 0 – 00*

- PMX: Motor Series
- 14: Frame Size
- 2: Stack Length
- 0: Winding
- A: Step Angle
- 1: Connection
- 0: Front Shaft Opt.
- N: Rear Shaft Opt.
- 0: Sealing Option
- 00*: Sealing Option

PMX14 Performance Data

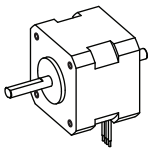
PMX14			Configuration		Holding Torque (2 phases on)	Rated Current/ Phase	Phase Resistance	Phase Inductance	Thermal Resistance	Rotor Inertia	Weight	Shaft Loading	
												Radial Force	Axial Force
Stack	Winding	Step	Bipolar	Unipolar	oz-in [Nm] +/-12%	Amps DC	Ohms +/-10%	mH Typical	Mounted °C/Watt	oz-in-s² [kg-m²]	lb [kg]	lb [N]	lb [N]
1	A	1	•		13.5 [0.095]	0.308	28.6	30.6	10.8	1.420E-04 [1.00E-06]	0.290 [0.13]	6.3 [28]	2.3 [10]
1	B	1	•		14.7 [0.104]	0.695	5.69	7.75	10.8	1.420E-04 [1.00E-06]	0.290 [0.13]	6.3 [28]	2.3 [10]
2	A	1	•		15.8 [0.112]	0.362	22.2	14.6	10.11	1.560E-04 [1.10E-06]	0.310 [0.14]	6.3 [28]	2.3 [10]
2	B	1	•		19.8 [0.140]	0.737	5.43	6.56	10.1	1.560E-04 [1.10E-06]	0.310 [0.14]	6.3 [28]	2.3 [10]
2	C	1	•		20.1 [0.142]	1.41	1.54	1.86	10.1	1.560E-04 [1.10E-06]	0.310 [0.14]	6.3 [28]	2.3 [10]
3	A	1	•		26.3 [0.186]	1.21	2.57	4.39	8.00	1.990E-04 [1.41E-06]	0.400 [0.18]	6.3 [28]	2.3 [10]
3	B	1	•		26.1 [0.184]	0.823	5.49	9.3	8.00	1.990E-04 [1.41E-06]	0.400 [0.18]	6.3 [28]	2.3 [10]
3	C	1	•		26.4 [0.186]	1.6	1.51	2.54	8.00	1.990E-04 [1.41E-06]	0.400 [0.18]	6.3 [28]	2.3 [10]

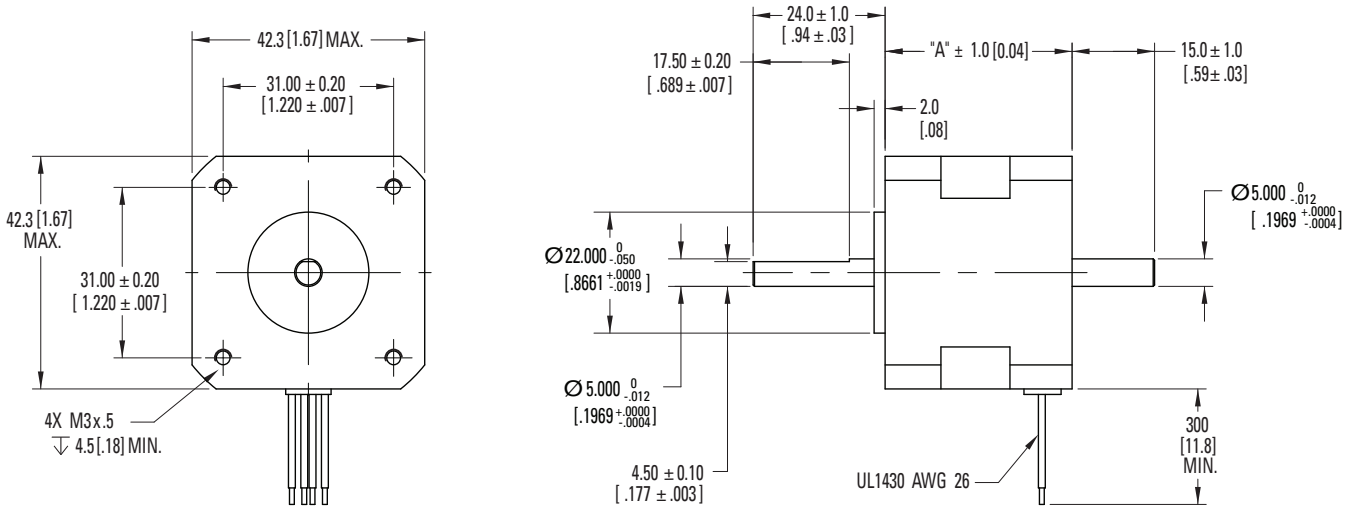
Notes

* Complete PMX series model nomenclature can be found on page 30.

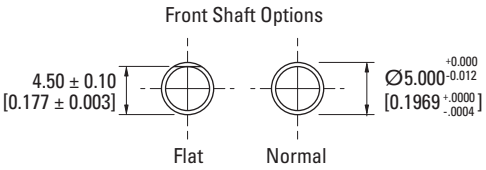
PMX17 Series Stepper Motors

PMX17 Outline Drawings





Model	"A" MAX
PMX171	26 [1.02]
PMX172	33.5 [1.32]
PMX173	39.5 [1.56]
PMX174	47.5 [1.87]
PMX175	60 [2.36]



Dimensions in mm [inches]

PMX 17 2 0 – A 1 0 – B N 0 – 00*

Motor Series | Frame Size | Stack Length | Winding | Step Angle | Connection | Front Shaft Opt. | Rear Shaft Opt. | Sealing Option

PMX17 (1.8°) Performance Data

PMX17			Configuration		Holding Torque (2 phases on)	Rated Current/ Phase	Phase Resistance	Phase Inductance	Thermal Resistance	Rotor Inertia	Weight	Shaft Loading	
												Radial Force	Axial Force
Stack	Winding	Step	Bipolar	Unipolar	oz-in [Nm] +/-12%	Amps DC	Ohms +/-10%	mH Typical	Mounted °C/Watt	oz-in-s² [kg-m²]	lb [kg]	lb [N]	lb [N]
1	A	1	•		28.4 [0.201]	0.385	24.8	31.1	7.98	2.01E-06 [2.84E-04]	0.330 [0.15]	6.30 [28]	2.3 [10]
1	B	1	•		27 [0.191]	0.692	7.74	8.35	7.98	2.01E-06 [2.84E-04]	0.330 [0.15]	6.30 [28]	2.3 [10]
2	A	1	•		39.2 [0.277]	1.48	2.00	2.56	7.00	3.51E-06 [4.970E-04]	0.480 [0.22]	6.3 [28]	2.3 [10]
2	B	1	•		38 [0.268]	1.00	4.25	5.13	7.00	3.51E-06 [4.970E-04]	0.480 [0.22]	6.3 [28]	2.3 [10]
2	H	1	•		40 [0.279]	0.306	44.78	60.73	7.00	3.51E-06 [4.970E-04]	0.48 [0.22]	6.3 [28]	2.3 [10]
2	H	1		•	27.9 [0.197]	0.433	22.4	15.2	7.00	3.51E-06 [4.970E-04]	0.480 [0.22]	6.3 [28]	2.3 [10]
2	J	1	•		40 [0.281]	0.738	7.76	10.65	7.00	3.51E-06 [4.970E-04]	0.48 [0.22]	6.3 [28]	2.3 [10]
2	J	1		•	28.1 [0.199]	1.04	3.86	2.66	7.00	3.51E-06 [4.970E-04]	0.480 [0.22]	6.3 [28]	2.3 [10]
3	A	1	•		60.2 [0.425]	1.60	1.74	3.16	6.92	5.42E-06 [7.670E-04]	0.620 [0.28]	6.3 [28]	2.3 [10]
3	B	1	•		60 [0.424]	1.52	1.92	3.48	6.92	5.42E-06 [7.670E-04]	0.620 [0.28]	6.3 [28]	2.3 [10]
3	G	1	•		58 [0.412]	0.26	62.75	109.85	6.92	5.42E-06 [7.670E-04]	0.62 [0.28]	6.3 [28]	2.3 [10]
3	G	1		•	41.3 [0.292]	0.368	31.4	27.5	6.92	5.42E-06 [7.670E-04]	0.620 [0.28]	6.3 [28]	2.3 [10]
3	H	1	•		59 [0.415]	0.553	13.92	24.74	6.92	5.42E-06 [7.670E-04]	0.62 [0.28]	6.3 [28]	2.3 [10]
3	H	1		•	41.6 [0.294]	0.782	6.94	6.19	6.92	5.42E-06 [7.670E-04]	0.620 [0.28]	6.3 [28]	2.3 [10]
3	J	1	•		61 [0.427]	0.804	6.64	12.62	6.92	5.42E-06 [7.670E-04]	0.62 [0.28]	6.3 [28]	2.3 [10]
3	J	1		•	42.8 [0.302]	1.14	3.30	3.16	6.92	5.42E-06 [7.670E-04]	0.620 [0.28]	6.3 [28]	2.3 [10]
4	A	1	•		76 [0.537]	1.71	1.82	2.98	5.77	6.82E-06 [9.660E-04]	0.770 [0.35]	6.3 [28]	2.3 [10]
4	B	1	•		76 [0.534]	2.17	1.16	1.83	5.77	6.82E-06 [9.660E-04]	0.770 [0.35]	6.3 [28]	2.3 [10]
4	G	1	•		78 [0.551]	0.298	57.16	105.47	5.77	6.82E-06 [9.660E-04]	0.77 [0.35]	6.3 [28]	2.3 [10]
4	G	1		•	55.2 [0.390]	0.421	28.6	26.4	5.77	6.82E-06 [9.660E-04]	0.770 [0.35]	6.3 [28]	2.3 [10]
4	H	1	•		71 [0.499]	0.566	15.91	22.67	5.77	6.82E-06 [9.660E-04]	0.77 [0.35]	6.3 [28]	2.3 [10]
4	H	1		•	50.0 [0.353]	0.800	7.93	5.67	5.77	6.82E-06 [9.660E-04]	0.770 [0.35]	6.3 [28]	2.3 [10]
4	J	1	•		71 [0.501]	0.852	7.08	10.08	5.77	6.82E-06 [9.660E-04]	0.77 [0.35]	6.3 [28]	2.3 [10]
4	J	1		•	50.1 [0.354]	1.20	3.52	2.52	5.77	6.82E-06 [9.660E-04]	0.770 [0.35]	6.3 [28]	2.3 [10]
5	A	1	•		102 [0.722]	1.02	5.87	12.3	4.78	1.02E-05 [1.450E-03]	1.10 [0.50]	6.3 [28]	2.3 [10]
5	B	1	•		103 [0.729]	1.76	2.02	4.26	4.78	1.02E-05 [1.450E-03]	1.10 [0.50]	6.3 [28]	2.3 [10]
5	G	1	•		107 [0.756]	0.727	11.67	27.62	4.78	1.02E-05 [1.450E-03]	1.1 [0.50]	6.3 [28]	2.3 [10]
5	G	1		•	75.7 [0.534]	1.03	5.81	6.90	4.78	1.02E-05 [1.450E-03]	1.10 [0.50]	6.3 [28]	2.3 [10]

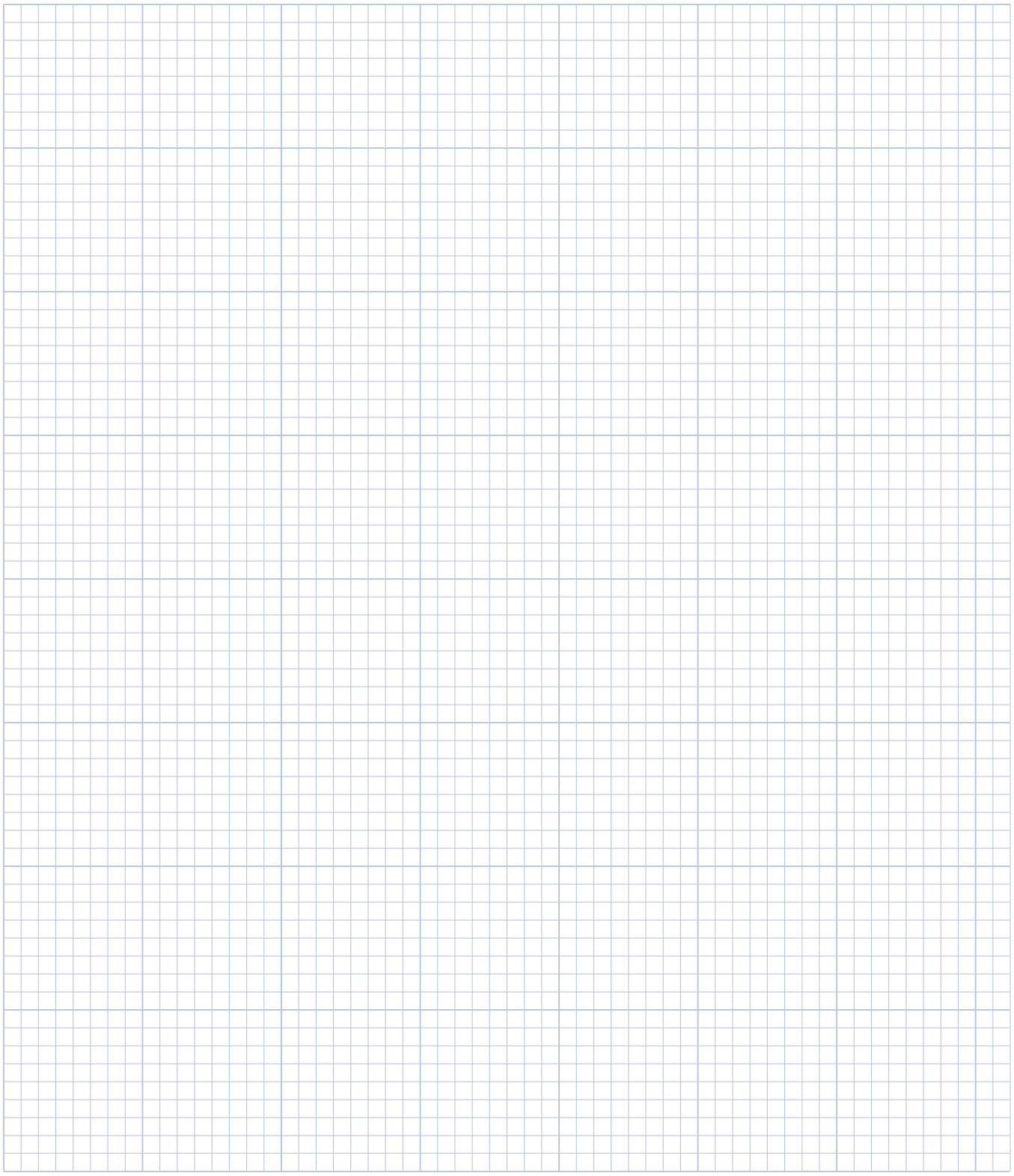
* Complete PMX series model nomenclature can be found on page 30.

PMX17 Series Stepper Motors

PMX17 (0.9°) Performance Data

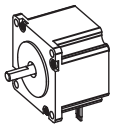
PMX17			Configuration		Holding Torque (2 phases on)	Rated Current/ Phase	Phase Resistance	Phase Inductance	Thermal Resistance	Rotor Inertia	Weight	Shaft Loading	
												Radial Force	Axial Force
Stack	Winding	Step	Bipolar	Unipolar	oz-in [Nm] +/-12%	Amps DC	Ohms +/-10%	mH Typical	Mounted °C/Watt	oz-in-s^2 [kg-m^2]	lb [kg]	lb [N]	lb [N]
2	A	9	•		38.1 [0.27]	1.41	2.20	5.69	7.0	3.51E-06 [4.970E-04]	0.480 [0.22]	6.3 [28]	2.3 [10]
2	B	9	•		36 [0.254]	1.00	4.25	9.02	7.0	3.51E-06 [4.970E-04]	0.480 [0.22]	6.3 [28]	2.3 [10]
2	H	9	•		36.4 [0.257]	0.442	21.5	48.7	7.0	3.51E-06 [4.970E-04]	0.480 [0.22]	6.3 [28]	2.3 [10]
2	H	9		•	25.7 [0.182]	0.625	10.7	12.2	7.0	3.51E-06 [4.970E-04]	0.480 [0.22]	6.3 [28]	2.3 [10]
3	A	9	•		55.9 [0.395]	1.60	1.74	4.5	6.92	5.42E-06 [7.670E-04]	0.620 [0.28]	6.3 [28]	2.3 [10]
3	B	9	•		55.8 [0.394]	1.52	1.92	4.96	6.92	5.42E-06 [7.670E-04]	0.620 [0.28]	6.3 [28]	2.3 [10]
3	H	9	•		56.8 [0.401]	0.521	15.7	44.6	6.92	5.42E-06 [7.670E-04]	0.620 [0.28]	6.3 [28]	2.3 [10]
3	H	9		•	40.2 [0.284]	0.737	7.81	11.2	6.92	5.42E-06 [7.670E-04]	0.620 [0.28]	6.3 [28]	2.3 [10]
4	A	9	•		68.6 [0.484]	1.67	1.91	5.99	5.77	6.82E-06 [9.660E-04]	0.770 [0.35]	6.3 [28]	2.3 [10]
4	B	9	•		67.5 [0.477]	2.17	1.16	3.31	5.77	6.82E-06 [9.660E-04]	0.770 [0.35]	6.3 [28]	2.3 [10]
4	G	9	•		70.2 [0.496]	0.288	61.3	178	5.77	6.82E-06 [9.660E-04]	0.770 [0.35]	6.3 [28]	2.3 [10]
4	G	9		•	49.2 [0.348]	0.414	30.6	44.4	5.77	6.82E-06 [9.660E-04]	0.770 [0.35]	6.3 [28]	2.3 [10]

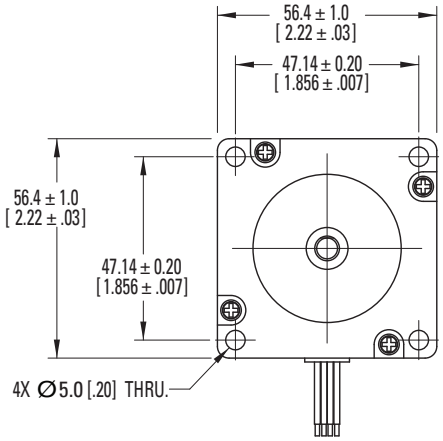
Notes

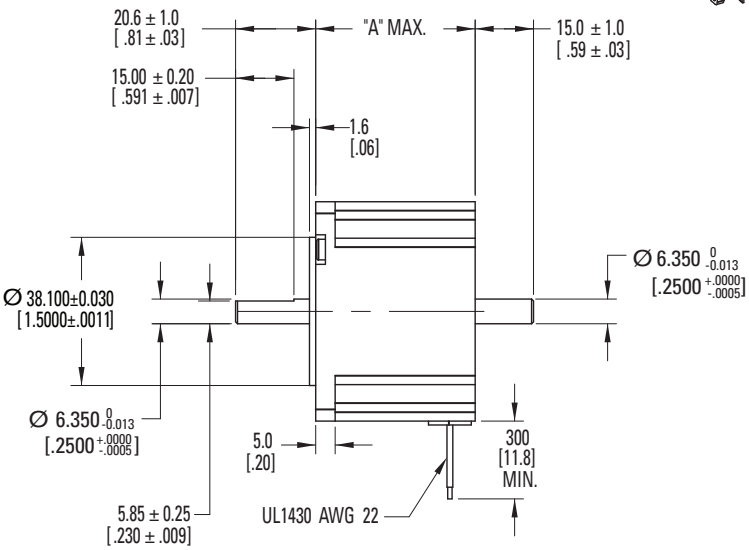


PMX23 Series Stepper Motors

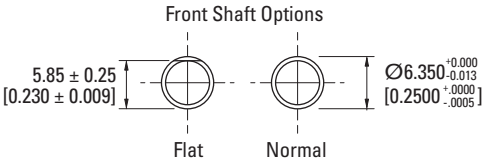
PMX23 Outline Drawings







Model	"A" MAX
PMX231	41 [1.61]
PMX232	56 [2.20]
PMX233	76 [2.99]
PMX234	85 [3.35]



Dimensions in mm [inches]

PMX 23 2 0 – A 1 0 – B N 0 – 00*
Motor Series | Frame Size | Stack Length | Winding | Step Angle | Connection | Front Shaft Opt. | Rear Shaft Opt. | Sealing Option

PMX23 (1.8°) Performance Data

PMX23			Configuration		Holding Torque (2 phases on)	Rated Current/ Phase	Phase Resistance	Phase Inductance	Thermal Resistance	Rotor Inertia	Weight	Shaft Loading	
												Radial Force	Axial Force
Stack	Winding	Step	Bipolar	Unipolar	oz-in [Nm] +/-12%	Amps DC	Ohms +/-10%	mH Typical	Mounted °C/Watt	oz-in-s² [kg-m²]	lb [kg]	lb [N]	lb [N]
1	A	1	•		100.7 [0.711]	3.50	0.68	1.33	4.69	1.700E-03 [1.20E-05]	0.990 [0.45]	16.9 [75]	3.4 [15]
1	B	1	•		99 [0.698]	0.478	34.8	59.9	4.69	1.700E-03 [1.20E-05]	0.990 [0.45]	16.9 [75]	3.4 [15]
1	C	1	•		96 [0.676]	1.27	4.94	8.93	4.69	1.700E-03 [1.20E-05]	0.990 [0.45]	16.9 [75]	3.4 [15]
1	G	1	•		100 [0.709]	0.872	10.48	21.33	4.69	1.700E-03 [1.20E-05]	0.99 [0.45]	16.9 [75]	3.4 [15]
1	G	1		•	71.0 [0.501]	1.23	5.23	5.33	4.69	1.700E-03 [1.20E-05]	0.99 [0.45]	16.9 [75]	3.4 [15]
1	H	1	•		101 [0.711]	1.75	2.62	5.33	4.69	1.700E-03 [1.20E-05]	0.99 [0.45]	16.9 [75]	3.4 [15]
1	H	1		•	71.2 [0.503]	2.47	1.31	1.33	4.69	1.700E-03 [1.20E-05]	0.99 [0.45]	16.9 [75]	3.4 [15]
1	J	1	•		102 [0.722]	2.531	1.27	2.66	4.69	1.700E-03 [1.20E-05]	0.99 [0.45]	16.9 [75]	3.4 [15]
1	J	1		•	72.3 [0.511]	3.58	0.63	0.67	4.69	1.700E-03 [1.20E-05]	0.99 [0.45]	16.9 [75]	3.4 [15]
2	A	1	•		205 [1.45]	3.45	0.83	2.63	3.11	4.260E-03 [3.01E-05]	1.54 [0.70]	16.9 [75]	3.4 [15]
2	B	1	•		197 [1.39]	0.558	30.2	88.6	3.11	4.260E-03 [3.01E-05]	1.54 [0.70]	16.9 [75]	3.4 [15]
2	C	1	•		199 [1.40]	1.24	6.2	18.7	3.11	4.260E-03 [3.01E-05]	1.54 [0.70]	16.9 [75]	3.4 [15]
2	G	1	•		200 [1.41]	0.844	13.25	40.74	3.11	4.260E-03 [3.01E-05]	1.54 [0.70]	16.9 [75]	3.4 [15]
2	G	1		•	141 [1.00]	1.19	6.62	10.2	3.11	4.260E-03 [3.01E-05]	1.54 [0.70]	16.9 [75]	3.4 [15]
2	H	1	•		208 [1.47]	1.764	3.06	10.53	3.11	4.260E-03 [3.01E-05]	1.54 [0.70]	16.9 [75]	3.4 [15]
2	H	1		•	147 [1.04]	2.49	1.52	2.63	3.11	4.260E-03 [3.01E-05]	1.54 [0.70]	16.9 [75]	3.4 [15]
2	J	1	•		204 [1.44]	2.568	1.46	4.68	3.11	4.260E-03 [3.01E-05]	1.54 [0.70]	16.9 [75]	3.4 [15]
2	J	1		•	144 [1.02]	3.63	0.72	1.17	3.11	4.260E-03 [3.01E-05]	1.54 [0.70]	16.9 [75]	3.4 [15]

Continued on the following page

* Complete PMX series model nomenclature can be found on page 30.

PMX23 Series Stepper Motors

PMX23 (1.8°) Performance Data (continued)

PMX23			Configuration		Holding Torque (2 phases on)	Rated Current/ Phase	Phase Resistance	Phase Inductance	Thermal Resistance	Rotor Inertia	Weight	Shaft Loading	
												Radial Force	Axial Force
Stack	Winding	Step	Bipolar	Unipolar	oz-in [Nm] +/-12%	Amps DC	Ohms +/-10%	mH Typical	Mounted °C/Watt	oz-in-s^2 [kg-m^2]	lb [kg]	lb [N]	lb [N]
3	A	1	•		326 [2.30]	3.23	1.14	3.75	2.70	6.280E-03 [4.82E-05]	2.2 [1.00]	16.9 [75]	3.4 [15]
3	B	1	•		337 [2.38]	3.96	0.73	2.57	2.70	6.280E-03 [4.82E-05]	2.2 [1.00]	16.9 [75]	3.4 [15]
3	C	1	•		329 [2.32]	6.55	0.29	0.87	2.70	6.280E-03 [4.82E-05]	2.2 [1.00]	16.9 [75]	3.4 [15]
3	G	1	•		320 [2.26]	0.804	16.81	53.96	2.70	6.280E-03 [4.82E-05]	2.2 [1.00]	16.9 [75]	3.4 [15]
3	G	1		•	227 [1.60]	1.14	8.39	13.5	2.70	6.280E-03 [4.82E-05]	2.20 [1.00]	16.9 [75]	3.4 [15]
3	H	1	•		326 [2.30]	1.566	4.45	15	2.70	6.280E-03 [4.82E-05]	2.2 [1.00]	16.9 [75]	3.4 [15]
3	H	1		•	231 [1.63]	2.21	2.22	3.75	2.70	6.280E-03 [4.82E-05]	2.20 [1.00]	16.9 [75]	3.4 [15]
3	J	1	•		327 [2.31]	2.401	1.92	6.44	2.70	6.280E-03 [4.82E-05]	2.2 [1.00]	16.9 [75]	3.4 [15]
3	J	1		•	232 [1.63]	3.40	0.95	1.61	2.70	6.280E-03 [4.82E-05]	2.20 [1.00]	16.9 [75]	3.4 [15]
4	A	1	•		378 [2.67]	3.83	0.81	3.23	2.52	7.380E-03 [5.21E-05]	2.64 [1.20]	16.9 [75]	3.4 [15]
4	B	1	•		348 [2.45]	0.747	20.8	67.3	2.52	7.380E-03 [5.21E-05]	2.64 [1.20]	16.9 [75]	3.4 [15]
4	C	1	•		349 [2.47]	1.16	8.66	28.3	2.52	7.380E-03 [5.21E-05]	2.64 [1.20]	16.9 [75]	3.4 [15]
4	D	1	•		354 [2.50]	0.993	11.8	40.1	2.52	7.380E-03 [5.21E-05]	2.64 [1.20]	16.9 [75]	3.4 [15]

PMX 23 2 0 – A 1 0 – B N 0 – 00*

Motor Series | Frame Size | Stack Length | Winding | Step Angle | Connection | Front Shaft Opt. | Rear Shaft Opt. | Sealing Option

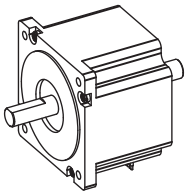
PMX23 (0.9˚) Performance Data

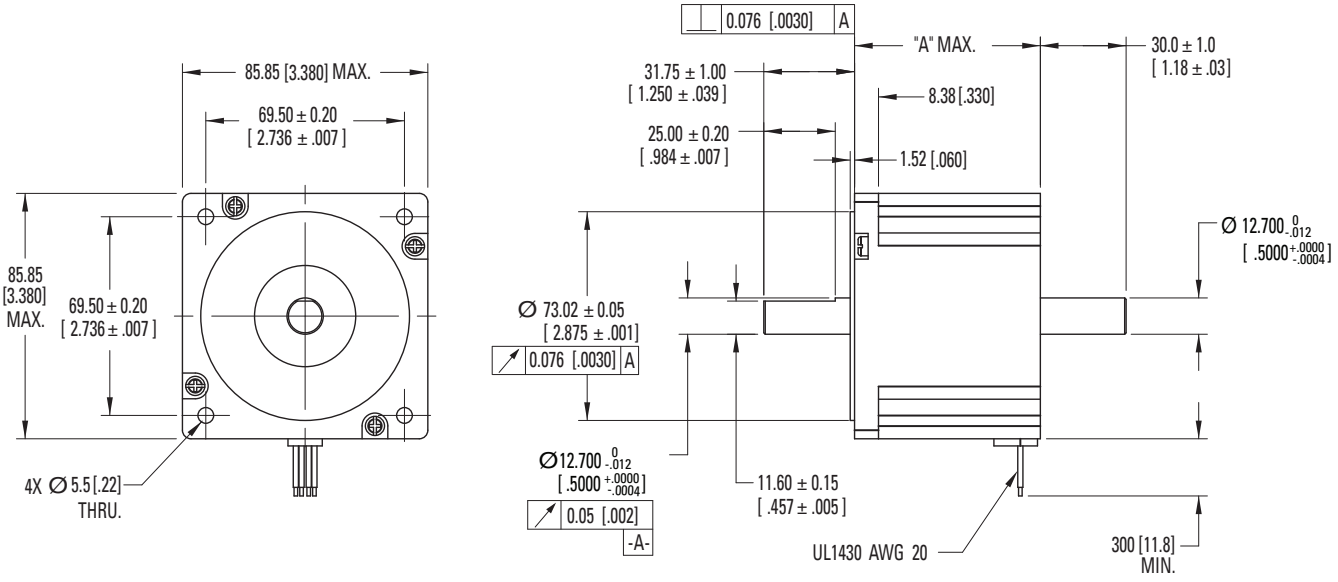
PMX23			Configuration		Holding Torque (2 phases on)	Rated Current/ Phase	Phase Resistance	Phase Inductance	Thermal Resistance	Rotor Inertia	Weight	Shaft Loading	
												Radial Force	Axial Force
Stack	Winding	Step	Bipolar	Unipolar	oz-in [Nm] +/-12%	Amps DC	Ohms +/-10%	mH Typical	Mounted °C/Watt	oz-in-s^2 [kg-m^2]	lb [kg]	lb [N]	lb [N]
1	A	9	•		97.6 [0.689]	3.37	0.740	2.66	4.69	1.700E-03 [1.20E-05]	0.990 [0.45]	16.9 [75]	3.4 [15]
1	B	9	•		92.5 [0.653]	0.473	35.5	107	4.69	1.700E-03 [1.20E-05]	0.990 [0.45]	16.9 [75]	3.4 [15]
1	C	9	•		93.7 [0.662]	1.256	5.05	15.9	4.69	1.700E-03 [1.20E-05]	0.990 [0.45]	16.9 [75]	3.4 [15]
1	G	9	•		97.4 [0.688]	0.86	10.7	38.0	4.69	1.700E-03 [1.20E-05]	0.990 [0.45]	16.9 [75]	3.4 [15]
1	G	9	•		96.3 [0.680]	0.863	10.7	38	4.69	1.700E-03 [1.20E-05]	0.990 [0.45]	16.9 [75]	3.4 [15]
1	G	9		•	68.1 [0.481]	1.22	5.22	9.5	4.69	1.700E-03 [1.20E-05]	0.990 [0.45]	16.9 [75]	3.4 [15]
2	A	9	•		204 [1.44]	3.24	0.93	5.15	3.11	4.260E-03 [3.01E-05]	1.54 [0.70]	16.9 [75]	3.4 [15]
2	B	9	•		195 [1.38]	0.564	29.6	124	3.11	4.260E-03 [3.01E-05]	1.54 [0.70]	16.9 [75]	3.4 [15]
2	C	9	•		197 [1.39]	1.249	6.07	26.3	3.11	4.260E-03 [3.01E-05]	1.540 [0.70]	16.9 [75]	3.4 [15]
2	G	9	•		205 [1.45]	0.795	14.9	87.5	3.11	4.260E-03 [3.01E-05]	1.54 [0.70]	16.9 [75]	3.4 [15]
2	G	9		•	147 [1.04]	1.16	7.47	21.9	3.11	4.260E-03 [3.01E-05]	1.54 [0.70]	16.9 [75]	3.4 [15]
3	A	9	•		313 [2.21]	3.26	1.06	6.67	2.70	6.280E-03 [4.82E-05]	2.20 [1.00]	16.9 [75]	3.4 [15]
3	B	9	•		305 [2.15]	4.141	0.670	3.75	2.70	6.280E-03 [4.82E-05]	2.20 [1.00]	16.9 [75]	3.4 [15]
3	G	9	•		305 [2.16]	0.78	17.9	107	2.70	6.280E-03 [4.82E-05]	2.20 [1.00]	16.9 [75]	3.4 [15]
3	G	9		•	216 [1.52]	1.10	8.92	26.7	2.70	6.280E-03 [4.82E-05]	2.20 [1.00]	16.9 [75]	3.4 [15]

* Complete PMX series model nomenclature can be found on page 30.

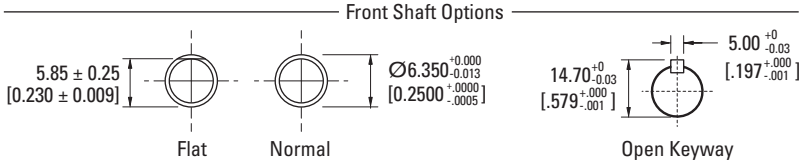
PMX34 Series Stepper Motors

PMX34 Outline Drawings





Model	"A" MAX
PMX341	65 [2.56]
PMX342	80 [3.15]
PMX343	118 [4.65]
PMX344	156 [6.14]



Dimensions in mm [inches]

PMX 34 2 0 – A 1 0 – B N 0 – 00*
Motor Series | Frame Size | Stack Length | Winding | Step Angle | Connection | Front Shaft Opt. | Rear Shaft Opt. | Sealing Option

PMX34 Performance Data

PMX34			Configuration		Holding Torque (2 phases on)	Rated Current/ Phase	Phase Resistance	Phase Inductance	Thermal Resistance	Rotor Inertia	Weight	Shaft Loading	
												Radial Force	Axial Force
Stack	Winding	Step	Bipolar	Unipolar	oz-in [Nm] +/-12%	Amps DC	Ohms +/-10%	mH Typical	Mounted °C/Watt	oz-in-s² [kg-m²]	lb [kg]	lb [N]	lb [N]
1	A	1	•		486 [3.43]	3.61	1.15	6.46	1.98	1.420E-02 [1.00E-04]	3.74 [1.70]	49.5 [220]	13.5 [60]
1	B	1	•		486 [3.43]	7.22	0.31	1.62	1.98	1.420E-02 [1.00E-04]	3.74 [1.70]	49.5 [220]	13.5 [60]
1	C	1	•		483 [3.41]	1.01	14.7	81.7	1.98	1.420E-02 [1.00E-04]	3.74 [1.70]	49.5 [220]	13.5 [60]
1	D	1	•		490 [3.46]	2.59	2.21	12.8	1.98	1.420E-02 [1.00E-04]	3.74 [1.70]	49.5 [220]	13.5 [60]
2	A	1	•		696 [4.91]	3.26	1.51	12.7	1.83	1.990E-02 [1.41E-04]	5.06 [2.30]	49.5 [220]	13.5 [60]
2	B	1	•		704 [4.97]	6.40	0.41	3.41	1.83	1.990E-02 [1.41E-04]	5.06 [2.30]	49.50 [220]	13.50 [60]
2	C	1	•		685 [4.84]	1.09	13.6	109	1.83	1.990E-02 [1.41E-04]	5.06 [2.30]	49.5 [220]	13.5 [60]
2	D	1	•		699 [4.93]	2.87	1.95	16.6	1.83	1.990E-02 [1.41E-04]	5.06 [2.30]	49.50 [220]	13.50 [60]
3	A	1	•		1239 [8.74]	3.04	2.34	22.2	1.35	3.830E-02 [2.70E-04]	8.36 [3.80]	49.5 [220]	13.5 [60]
3	B	1	•		1285 [9.07]	6.45	0.54	5.56	1.35	3.830E-02 [2.70E-04]	8.36 [8.36]	49.5 [220]	13.5 [60]
3	C	1	•		1223 [8.64]	1.23	14.3	151	1.35	3.830E-02 [2.70E-04]	8.36 [3.80]	49.5 [220]	13.5 [60]
3	D	1	•		1250 [8.83]	4.80	0.95	10.6	1.35	3.830E-02 [2.70E-04]	8.36 [8.36]	49.5 [220]	13.5 [60]
4	A	1	•		1631 [11.51]	2.94	3.05	33.1	1.21	5.680E-02 [4.01E-04]	11.7 [5.29]	49.5 [220]	13.5 [60]
4	B	1	•		1739 [12.28]	6.00	0.75	8.94	1.21	5.680E-02 [4.01E-04]	11.7 [5.29]	49.5 [220]	13.5 [60]
4	C	1	•		1659 [11.71]	1.42	12.9	148	1.12	5.680E-02 [4.01E-04]	11.7 [5.29]	49.5 [220]	13.5 [60]
4	D	1	•		1689 [11.92]	4.46	1.33	15.9	1.12	5.680E-02 [4.01E-04]	11.7 [5.29]	49.5 [220]	13.5 [60]

* Complete PMX series model nomenclature can be found on page 30.

Model Nomenclature

PMX™ Series Stepper Motor

PMX 11 2 0 – A 1 O – B N 0 – 00

Motor Series

NEMA Motor Frame Size

08, 11, 14, 17, 23, 34

Rotor Stack Length

1 = 1 stack	All PMX series motors
2 = 2 stacks	All PMX series motors
3 = 3 stacks	PMX11, -17, -23, -34
4 = 4 stacks	PMX17, -23, -34
5 = 5 stacks	PMX17

Motor Winding

A, B, C, D	Bipolar windings
G, H, J	Unipolar/Bipolar Series windings

Step Angle

1 = 1.8°	All PMX series motors
9 = 0.9°	PMX17, PMX23

Sealing Option

00 = No shaft seal	All PMX
01 = Shaft seal	PMX23, PMX34
XX = Special motor designator	All PMX

Rear Shaft Option

O = No rear shaft	All PMX series motors
R = Rear shaft	All PMX series motors

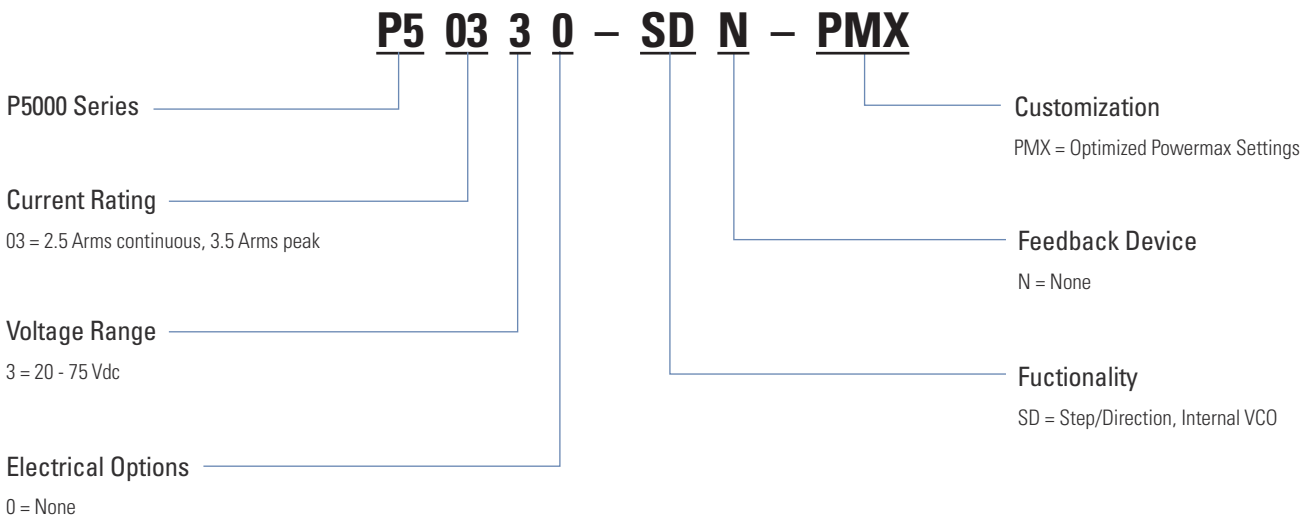
Front Shaft Option

N = Normal/Smooth front shaft	All PMX
F = Flat front shaft	All PMX
K = Open keyway	PMX34

Connection/Hookup Option

B = 4 lead Bipolar	All PMX
U = 6 lead Unipolar	PMX17, -23
X = Integrated Connector	PMX17, -23

P5000 Stepper Drive



Model Nomenclature

P6000 Stepper Drive

P6 06 6 0 – SD N – 000

- **P6000 Series**
- **Current Rating**
  06 = 5.7 Arms Continuous, 8.0 Amps peak*
- **Voltage Range**
  6 = 120/240 Vac (160/320 Vdc)
- **Electrical Options**
  0 = None
- **Fuctionality**
  SD = Step/Direction Base Drive
- **Feedback Device**
  N = No feedback, with mating connectors
  0 = No feedback, no connectors
- **Customization**
  000 = Optimized for Standard POWERPAC
  001 = Optimized for Enhanced POWERPAC
  (see tables below for detailed information on included motors)

Customization Option Available for Selected Motor

-000		-001	
P21NRXD-LNN-NS-00(P)	N33HRHE-LNK-NS-00	M21NRXD-LNN-NS-00(P)	K33HRHE-LNK-NS-00
P21NRXD-LNN-NS-00(S)	N33HRLE-LNK-NS-00	M21NRXD-LNN-NS-00(S)	K33HRLE-LNK-NS-00
P22NRXD-LNN-NS-00(S)	N41HRHF-LNK-NS-00	M22NRXD-LNN-NS-00(S)	K41HRHF-LNK-NS-00
N31HRHH-LNK-NS-00	N41HRLF-LNK-NS-00	K31HRHH-LNK-NS-00	K41HRLF-LNK-NS-00
N31HRLH-LNK-NS-00	N42HRHF-LNK-NS-00	K31HRLH-LNK-NS-00	K42HRHF-LNK-NS-00
N32HRHD-LNK-NS-00	N42HRLF-LNK-NS-00	K32HRHD-LNK-NS-00	K42HRLF-LNK-NS-00
N32HRLD-LNK-NS-00		K32HRLD-LNK-NS-00	

See the P6000 manual for rotary switch settings for these preconfigured motors.

*Note: Switch selectable 0.3 – 5.7 Arms

P7000 Stepper Drive

P7 03 6 0 – SD N _

P7000 Series

Current Rating

03 = 2.5 Arms continuous, 3.5 Arms peak (AC models only)
05 = 5 Arms continuous, 7.2 Arms peak (DC models only)

Voltage Range

3 = 20 - 75 Vdc
6 = 120/240 Vac

Electrical Options

0 = None

Customization

Omit field for standard configurations

Feedback Device

N = None

Fuctionality

PN = Motion node indexing
SD = Step/direction base drive
R4 = RS485 (P70360 only)

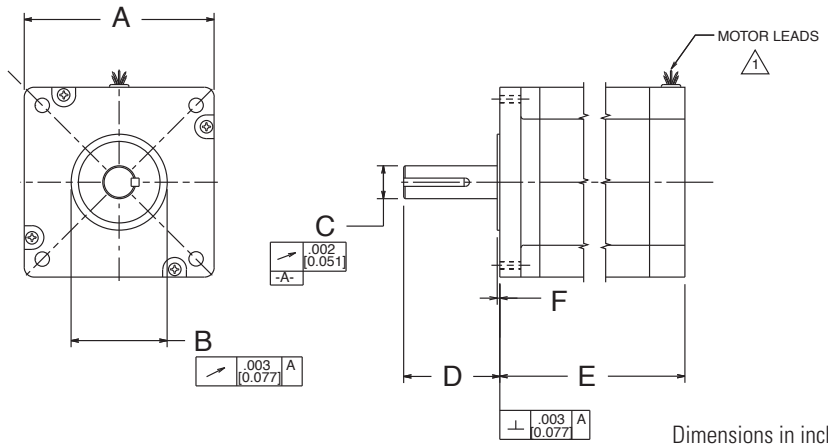
Stepper Motor Application Worksheet

Company_____ Date_____

MOTOR

circle or specify
Note: All motors are 1.8°, 2 Phase.

B - Pilot Diameter
A - Flange Width
E - Max Motor Length
F - Pilot Depth



Dimensions in inches [mm]

- **STANDARD AND SPECIAL FEATURES**

  Motor model number from catalog:

  _____

  Circle whether you want standard or special features. If special, indi cate details. Note that special features may result in increased price or leadtime.

- **FRONT SHAFT** (standard) (special)

  D shaft length_____±_____ (±.015)*

  C shaft dia._____±_____(+.0000/-.0005)*

  run out ⚠_____(.002 std. ext.)*

— **Straight Key** per electric motor standards (standard option) (special)

  Key: width_____ height_____

  length_____ other_____

— **Flat** See Fig. 1 (standard option) (special)

  Min. usable length X_____

  Dim. over flat Y_____±_____(±.005)*

  Corner radius R allowed_____(±.060)*

  Other_____

- **REAR END BELL** (standard) (special)

  mtg. hole B.C._____±_____(±.010)*

  mtg. holes_____

  hole pattern_____

  other_____

- **REAR SHAFT** (standard) (special)

  shaft length_____±_____(±.040)*

  shaft dia._____±_____(+.0000/-.0005)*

  run out⚠_____(.002)*

  other_____

— **Woodruff** Key See Fig. 2 (standard option) (special)

  ANSI std. key no._____(Example 303)

  Key location Z_____±_____(±.020)*

  Other_____

FIGURE 1

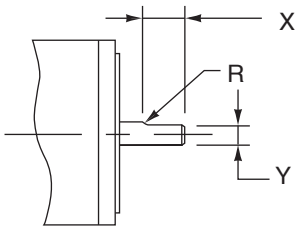
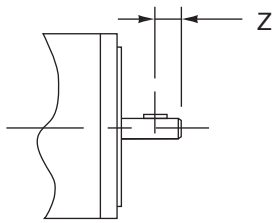


FIGURE 2



Notes:
⚠NEMA standard for shaft run out is .002" + .001" for each additional inch of extension past the standard length.
* Example of typical tolerance

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