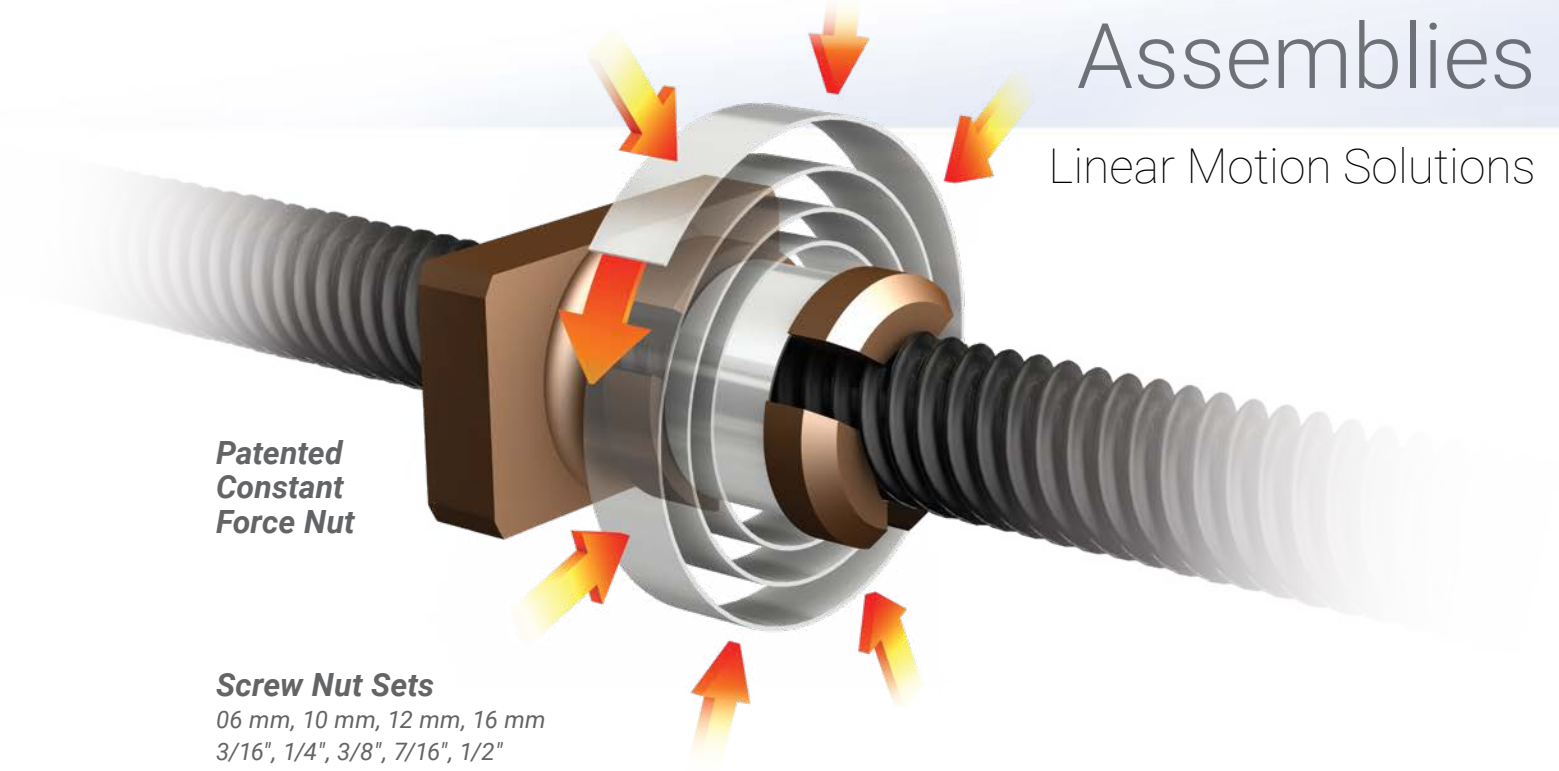
PBC Linear®

World Class LEAD SCREW Assemblies

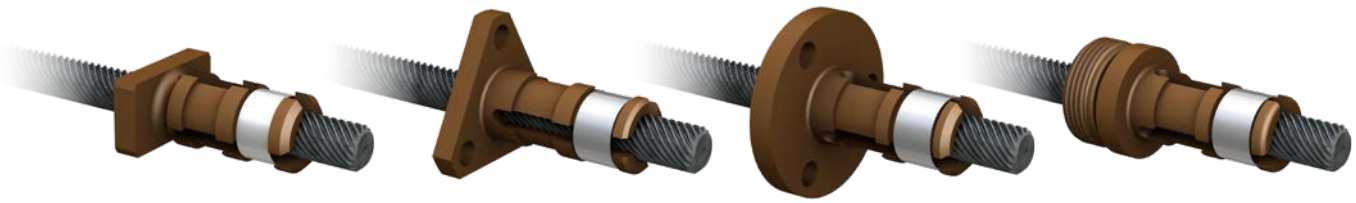
Linear Motion Solutions



Patented Constant Force Nut

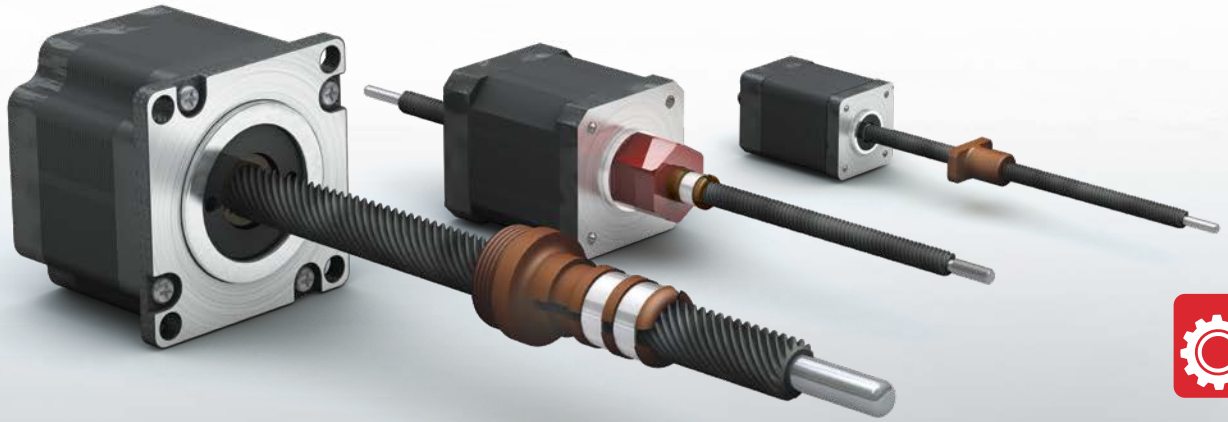
Screw Nut Sets

06 mm, 10 mm, 12 mm, 16 mm
3/16", 1/4", 3/8", 7/16", 1/2"



Integrated Motor & Screws

NEMA 08, 11, 14, 17, 23



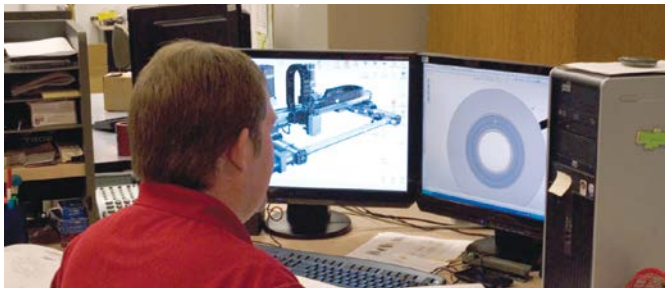
Configure Online at
pbclinear.com

1-800-962-8979

Engineering Your Linear Motion Solutions

PBC Linear®

PBC Linear maintains a commitment to bring improved linear motion solutions to market. Since 1983, its goal has been to provide innovative solutions through the development and manufacturing of linear motion components, mechanical sub-assemblies, and customized systems to meet customers' application and product needs and specifications.



The diverse staff of engineers at PBC Linear combine in-depth industry knowledge and decades of experience with a collaborative approach to meet the linear motion requirements of each application.

Global Footprint

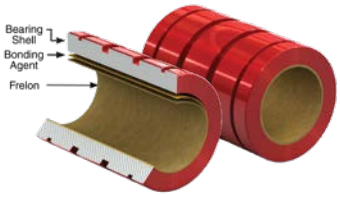
Headquartered with their main manufacturing facilities in the USA, PBC Linear also has locations in Europe, and SINO Asia, situated to support your production needs globally.

Manufacturing Agility

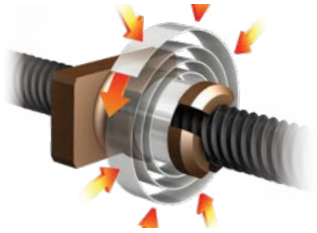
Headquartered in Roscoe, Illinois, USA, PBC Linear production is maximized to produce unmatched quality and designed specifically for the most complex and meticulous applications resulting in ready to install solutions.

This allows PBC Linear to provide quiet, smooth, and reliable linear motion in a wide array of applications, ranging from very small pick-and-place assemblies and scanners used in lab automation, to heavy-duty lift systems used in indus-trial manufacturing.

Core Competencies

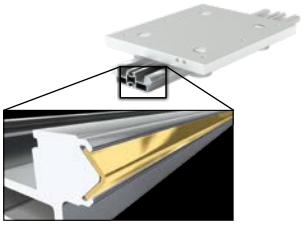


Simplicity Plain Bearings Bonding of Polymer and Fluoropolymer to Metals
Developed and refined over 26 years, linear plain bearings excel where traditional ball bearings fail.



Anti-Backlash Lead Screw Nut
Constant Force Technology is a leap forward in nut design for lead screws. The result is greater consistency in performance and life, with great resistance to backlash.

Highly accurate rail lengths with SIMO® process
The Simultaneous Integral Milling Operation (SIMO) qualifies the rail to tolerances that have 6x less bow, 2x less twist, and 2x better flatness.



Joined aluminum and steel for longer rails
Integral-V rails and Redi-Rails® are produced by mechanically embedding hardened steel race ways onto an anodized aluminum profile. Precise, durable, and lightweight.

Configure Online
at pbclinear.com
1-800-962-8979

PBC Linear Technologies	Lead Screw	Simplicity	Roller Pillow Block	Gliding Surface	Integral-V	Cam Roller	Mechatronics
Inexpensive	•	•	•	•	•	•	•
Low Maintenance	•	•	•	•			•
Compact Size	•			•			•
Low Noise	•	•					•
Multiple Configurations	•	•	•	•	•	•	•
Washdown Applications	•	•		•			•
Custom Design Support	•	•	•	•	•	•	•
Moderate to High Speed	•	•	•	•	•	•	•
Vacuum and Cleanroom Applications	•	•		•			•
Food Processing	•	•	•	•			
Ease of Installation	•				•	•	•

Screws • p 8–13

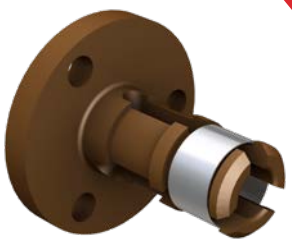
Standard Stainless Steel Threads

PTFE Coated Threads

Metric Sizes	Leads
16 mm	1, 2, 4, 5, 6, 8, 10, 12, 16, 25 mm
12 mm	1, 2, 4, 5, 6, 8, 10, 12, 16, 25 mm
10 mm	1, 2, 4, 5, 6, 8, 10, 12, 16, 25 mm
6 mm	1, 2, 4, 5, 6, 8, 10, 12 mm

Inch Sizes	Leads
1/2"	0.25", 0.10"
7/16"	1.00"
3/8"	0.20"
1/4"	0.333"
3/16"	0.05", 0.50"

Nuts• p 14–20



Round Constant Force Anti-Backlash Nut
p 17

Triangle Constant Force Anti-Backlash Nut
p 15

Rectangle Constant Force Anti-Backlash Nut
p 20

Threaded Constant Force Anti-Backlash Nut
p 19

Round Standard Nut
p 16

Rectangle Standard Nut
p 20

Threaded Standard Nut
p 18

Triangle Standard Nut
p14

Motors• p 24–55

NEMA 23 Series
47 mm
p 36

Non-Captive Version p 52

NEMA 17 Series
43 mm
p 32

Non-Captive Version p 48

NEMA 14 Series
31 mm
p 30

Non-Captive Version p 44

NEMA 11 Series
23 mm
p 28

Non-Captive Version p 42

NEMA 8 Series
16 mm
p 26

Machined Ends • Journaled Ends• p 21–22

Float Journal

Float Journal with Flat

Threaded Journal

Float Journal with Keyway

Fixed Journal

Fixed Journal with Flat

Float with Journal End

Fixed Journal with Keyway

Fixed with Journal End

Bearing Blocks • p 23

16 mm

12 mm
7/16", 1/2"

10 mm
3/8"

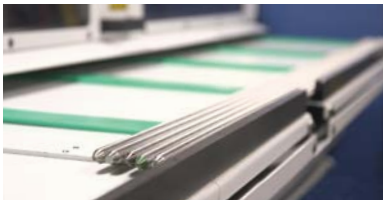
6 mm
1/4", 3/16"

Table of Contents

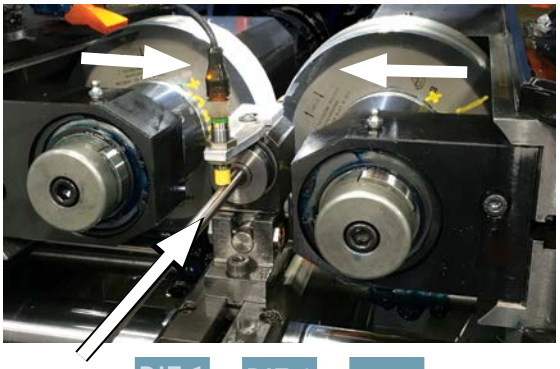
World Class Precision German Roll Threading

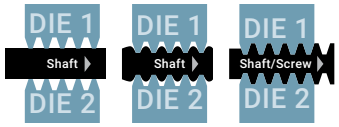
To ensure the highest level of lead accuracy, key process variables such as speed, skew, temperature, and coolant flow are precisely monitored.

CNC controlled machinery provides precision process adjustment and control.



Automated in-feed and out-feed provide consistency over the full length of the screw stock.





Quality Inspections

Microscopic inspections of the surface finish occurs at each stage of the manufacturing and coating process.

Competitor Screw Surfaces

Pitting and Fissures

Surface Roughness

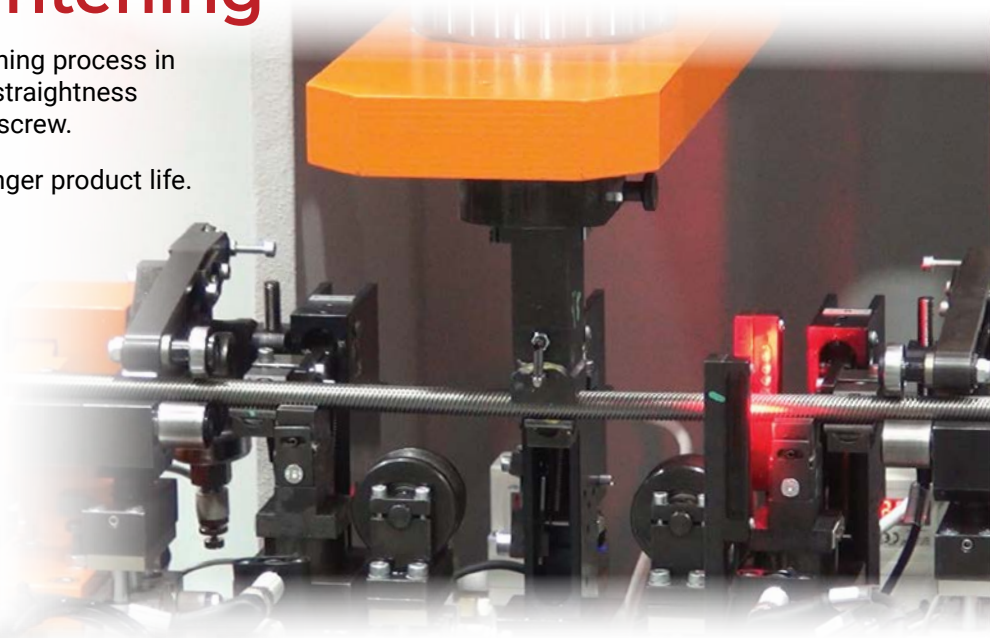
CNC Straightening

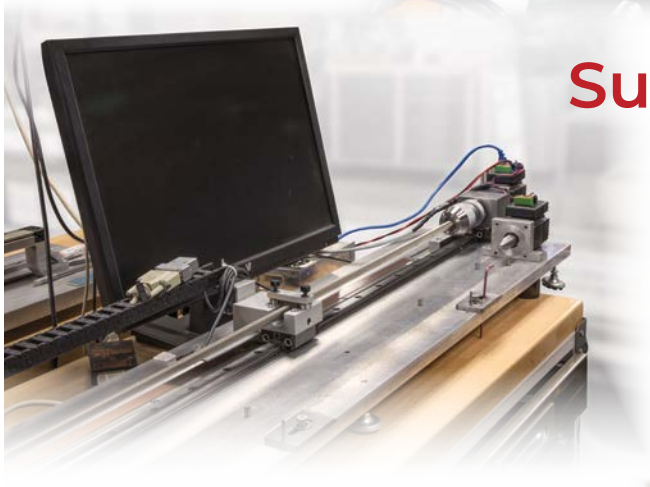
The only automated straightening process in the USA, yielding the highest straightness tolerances available in a lead screw.

Smoother finish makes for longer product life.

This process eliminates errors that are inherent to manual processes.

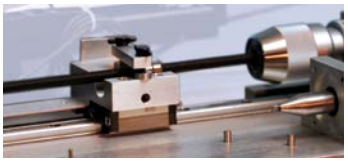
Minimizes runout which can cause vibration, noise, and premature wear.





Superior Lead Accuracy

PBC Linear inspects 100% of the screw length (Up to 20,000 points over 72" compared to the competitors data point every 6 inches over the same length).



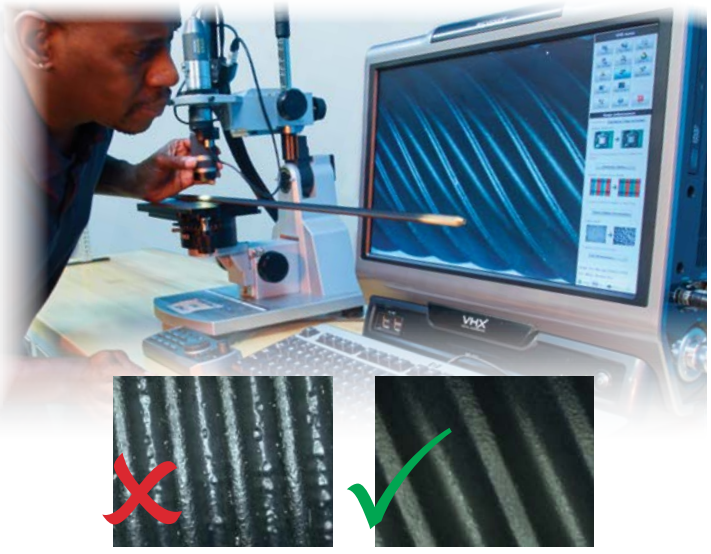
Lead accuracy of 0.003"/ft. (76 µm/300 mm), 3 times better than typical industry specifications.

Climate Controled, In-House Coating

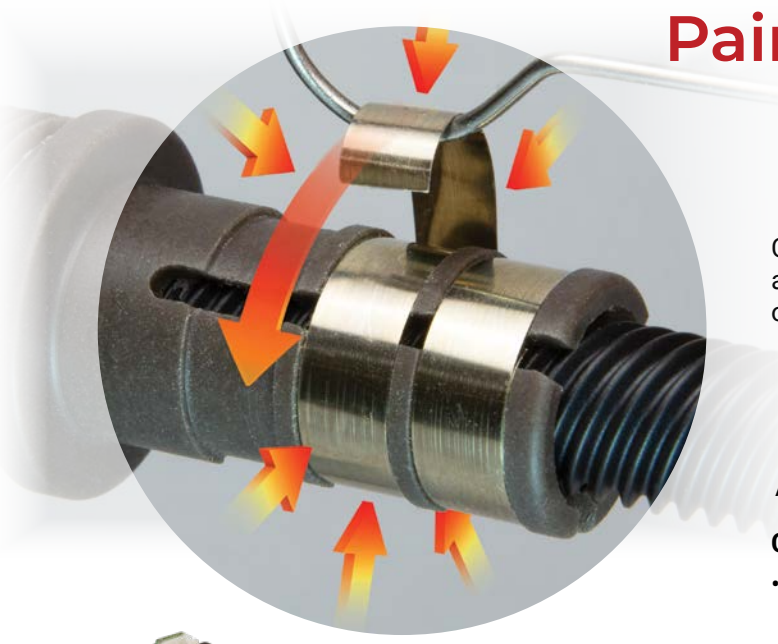
Developed in-house, this custom coating process and equipment increases the quality of finish and eliminates screw flaking.

Coating reduces coefficient of friction, increasing screw efficiency and extending life.

Each screw is inspected with a digital microscope to ensure there is no flaking or pitting in the coating surface.



Pairing a Quality Screw with an Innovative Anti-Backlash Nut



Constant Force Technology nut utilizes a spring that applies uniform radial pressure to the nut at all stages of the motion profile.

Available in various geometries for quick customization.

CFT Nut Advantages:

- Greater than 2 times superior backlash compensation
  (Confirmed by leading lab automation customer validation testing)
- Consistent preload over life
  (Key for system level tuning and consistent performance over life)
- 2–4 times better than traditional designs, as validated by customer testing
- Self lubricated (Special PTFE nut formulation developed from 30 plus years of plain bearing knowledge)

Nuts and assemblies are inspected to ensure backlash tolerances meet precise specifications .

Motors Built for Linear Motion

Lead screws are precision mounted and matched to a hollow shaft motor. The hollow shaft concentricity minimizes runout less than 0.003" (75 µm).

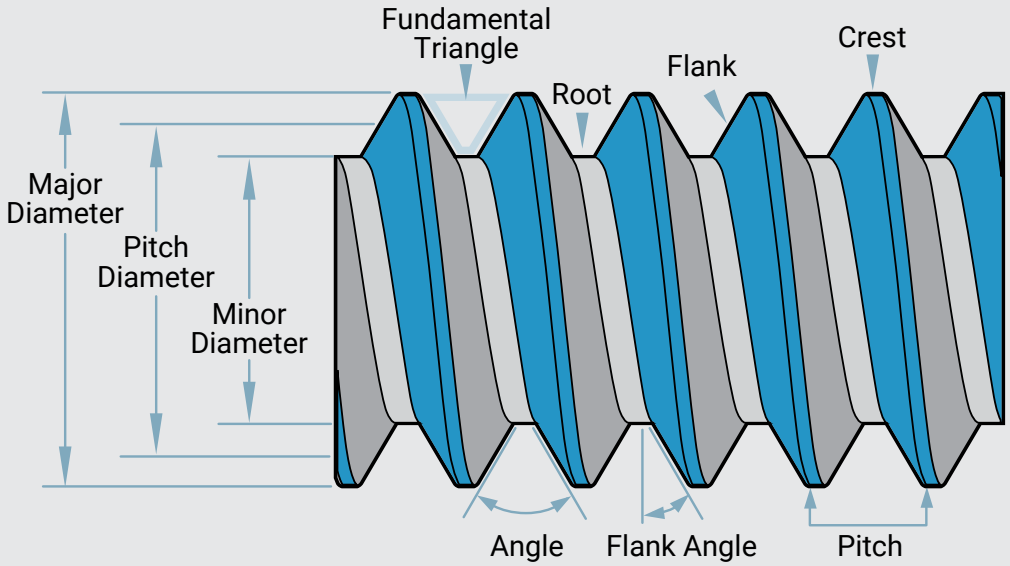
- Larger bearings increase thrust capacity and add longer life
- Preload on bearings removes axial play, reducing system backlash
- Optional smart motors

Quality Testing

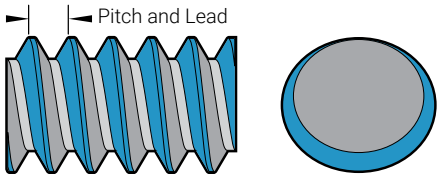
Two dedicated test labs are used to establish high performance characteristics.

One is designed for load and life where assemblies have run in excess of 2,500 miles without failure, and one is sound-proofed to analyze noise levels.

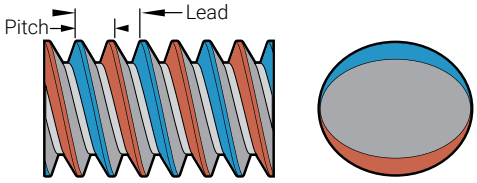
Thread Terminology



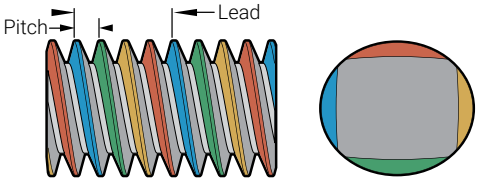
Single Start – Lead = Pitch

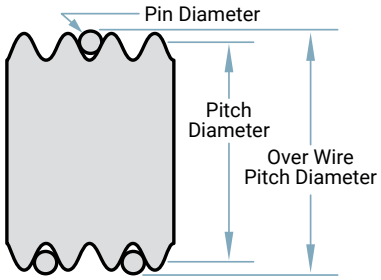


Two Start – Lead = 2 X Pitch



Four Start – Lead = 4 • Pitch





Pitch diameter is the diameter of a theoretical cylinder that passes through the threads in such a way that the distance between the thread crests and thread roots is equal. In an ideal product, these widths would each equal one-half of the thread pitch.

Lead angle is the angle made by the pitch helix, with a plane perpendicular to the axis.

Lead accuracy is the difference between the actual distance traveled verses the theoretical distance traveled based on lead.

Crests are the top of the threads.

Roots are the bottom of the threads.

Flanks are the surfaces between the crests and roots.

Pitch is the distance measured parallel to the thread axis, between corresponding points on adjacent threads.

Lead is the axial distance the nut advances in one revolution of the screw. The lead is equal to the pitch times the number of starts. Pitch • starts = lead

Flank angle is the angle between a flank and the perpendicular thread axis. Flank angles are sometimes termed “half-angle” of the thread, but this is only true when neighboring flanks have identical angles (when the threads are symmetrical).

Actual pitch diameter is determined by subtracting the pin diameter times 2 from the measurement taken across the three thread wires.

Internal thread: the minor diameter occurs at the crests while the major diameter occurs at the roots.

External thread: the minor diameter occurs at the roots while the major diameter occurs at the crests.

Lead Screws & Nuts

300 Series Stainless Steel with PTFE Coating Option

(72' length maximum avaiable on all sizes (68"–69" useable)

Leads \ Diameter	6 mm	10 mm	12 mm	16 mm
1 mm	•	•	•	•
2 mm	•	•	•	•
4 mm	•	•	•	•
5 mm	•	•	•	•
6 mm	•	•	•	•
8 mm	•	•	•	•
10 mm	•	•	•	•
12 mm	•	•	•	•
16 mm		•	•	•
25 mm		•	•	•

Leads \ Diameter	3/16"	1/4"	3/8"	7/16"	1/2"
0.05"	•				
0.10"					•
0.20"			•		
0.25"					•
0.333"		•			
0.50"	•				
1.00"				•	

Metric Leads	Coating	Leadscrew / Nut - % Efficiency Metric Screw Diameter 6 mm	10 mm	12 mm	16 mm
1 mm	Coated	39	28	24	19
	Uncoated	30	21	18	14
2 mm	Coated	60	45	40	33
	Uncoated	51	36	31	25
4 mm	Coated	71	61	56	49
	Uncoated	62	52	47	40
5 mm	Coated	76	66	62	55
	Uncoated	68	57	53	45
6 mm	Coated	77	69	65	58
	Uncoated	70	61	56	49
8 mm	Coated	81	74	71	65
	Uncoated	75	66	62	56
10 mm	Coated	84	78	75	69
	Uncoated	78	71	67	61
12 mm	Coated	84	80	77	72
	Uncoated	81	74	70	64
16 mm	Coated	–	84	81	77
	Uncoated	–	78	75	70
25 mm	Coated	–	86	85	83
	Uncoated	–	83	81	77

The listed efficiencies are theoretical values calculated by assuming the coefficients of friction.

Inch Leads	Coating	Leadscrew / Nut - % Efficiency IPS Screw Diameter 3/16"	1/4"	3/8"	7/16"	1/2"
0.05"	Coated	51	–	–	–	–
	Uncoated	41	–	–	–	–
0.10"	Coated	–	–	–	–	44
	Uncoated	–	–	–	–	35
0.20"	Coated	–	–	66	–	–
	Uncoated	–	–	57	–	–
0.250"	Coated	–	–	–	–	65
	Uncoated	–	–	–		56
0.333"	Coated	–	82	–	–	–
	Uncoated	–	76	–	–	–
0.50"	Coated	88	–	–	–	–
	Uncoated	84	–	–	–	–
1.00"	Coated	–	–	–	87	–
	Uncoated	–	–	–	82	–

Lead accuracy: 76.2 micron/300 mm or 0.003"/ft

Diameter: 6 mm–16 mm or 3/16"–1/2"

Lead: 1 mm–25 mm or 0.05"–0.25"

Dynamic Load: Up to 1.16 kN or 260 lb.

Backlash:

- **Constant Force Nuts** are designed to reduce or eliminate backlash. Generally, the higher the preload, the better the anti-backlash performance. Custom designs available
- **Standard Nut,** 0.025–0.25 mm (0.001–0.010") Longer leads have greater backlash

Part Number Configurator

Type	Thread Dir.	Diameter and Lead	Coating		Screw Length		Nut		Left End		Right End		Special
LS	R	0000	T	-	0250.00	-	RS	-	111	-	AFN	-	E

Configure It Now

Type
LS - Lead Screw

Thread Direction
R - Right
L - Left (**Note:** Contact Factory)

Coating
T - PTFE
U - Uncoated

Screw Length
Inch - 0000.00
Metric - 0000
Note: Screw type selected determines if length is inch or metric.

Special
E - Encoder Ready
N - No Option

Diameter and Lead

Code	Diameter	Lead
18050	3/16"	0.50"
18005		0.05"
25033	1/4"	0.333"
37020	3/8"	0.20"
43100	7/16"	1.00"
50010	1/2"	0.10"
50025		0.25"
0601	6 mm	1 mm
0602		2 mm
0604		4 mm
0605		5 mm
0606		6 mm
0608		8 mm
0610		10 mm
0612		12 mm
1001	10 mm	1 mm
1002		2 mm
1004		4 mm
1005		5 mm
1006		6 mm
1008		8 mm
1010		10 mm
1012		12 mm
1016		16 mm
1025		25 mm
1201	12 mm	1 mm
1202		2 mm
1204		4 mm
1205		5 mm
1206		6 mm
1208		8 mm
1210		10 mm
1212		12 mm
1216		16 mm
1225		25 mm
1601	16 mm	1 mm
1602		2 mm
1604		4 mm
1605		5 mm
1606		6 mm
1608		8 mm
1610		10 mm
1612		12 mm
1616		16 mm
1625		25 mm

Lead Screw Standard Nuts	
RS	Round
TS	Triangle
US	Threaded
VS	Rectangle

Lead Screw Anti-Backlash Nuts	
RCF	Round
TCF	Triangle
UCF	Threaded
VCF	Rectangle

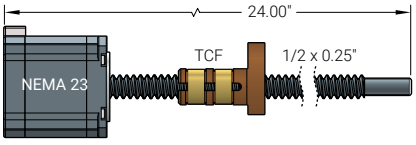
Left End Only	
080	NEMA 8 (16 mm) (Requires a 3/16", 1/4" or 6 mm screw) Note: Not available with encoder ready option.
111	NEMA 11 (23 mm) (Requires a 3/16", 1/4" or 6 mm screw)
140	NEMA 14 (31 mm) (Requires a 3/16", 1/4", 6 mm or 10 mm screw)
171	NEMA 17 (43 mm), Single Stack (Requires a 1/4", 3/8", 6 mm, 10 mm or 12 mm screw)
172	NEMA 17 (43 mm), Double Stack (Requires a 3/8", 10 mm or 12 mm screw)
231	NEMA 23 (56 mm), Single Stack (Requires a 3/8", 7/16" 1/2" 10 mm, 12 mm or 16 mm screw)
232	NEMA 23 (56 mm), Double Stack (Requires a 3/8", 7/16" 1/2" 10 mm, 12 mm or 16 mm screw)
23P	NEMA 23 (56 mm), Power Plus (Requires a 3/8", 7/16" 1/2" 10 mm, 12 mm or 16 mm screw)

Left and/or Right Ends	
AFN	Float Journal
ALN	Fixed Journal
BFN	Float Journal with Drive End
BLN	Fixed Journal with Drive End
CFN	Float Journal with Keyway*
CLN	Fixed Journal with Keyway*
AFB	Float Journal with Bearing Block
ALB	Fixed Journal with Bearing Block
BFB	Float Journal with Bearing Block
BLB	Fixed Journal with Bearing Block
CFB	Float Journal with Keyway, with Bearing Block*
CLB	Fixed Journal with Keyway, with Bearing Block*
THR	Threaded
NNN	None

* Keyways will be flat or a keyway based on screw diameter, see page 22
Flat for 6 mm, 10 mm, 3/16", 1/4", 3/8" diameters
Keyway for 12 mm, 16 mm, 7/16", 1/2" diameters

Sample Part Numbers

Left — Right



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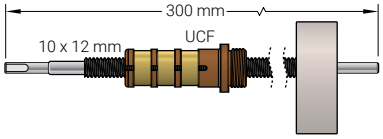

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Lead Screw Configuration Factors

Sizing a Lead Screw and Stepper Motor

The theoretical torque required to drive a load with a lead screw is:

$$Torque_{Drive} = \frac{Load \times Lead}{2\pi \times Screw\ Efficiency}$$

where lead screw efficiencies are given on page 8.

To properly use the above formula, a customer first needs to estimate the total axial load that must be driven by the lead screw system. The estimated total load should include all mass loads, acceleration loads, system friction loads, and the nut drag load. Friction loads of an actuator or a bearing and rail system must be accounted for, especially if plane bearings or bushings are used. See nut detail pages for their drag load specifictations.

Next, a customer can make a table of the estimated total loads at the important speeds of the application and use the above formula to calculate the estimated theoretical motor torque for each combination of lead screw diameter and lead of interest.

Having estimated the required motor torques and knowing the speeds of the application, a customer can check the motor torque-speed curves on pages 31–36 of the catalog to determine what stepper motor should be used. Note that it is common practice to ensure that a stepper motor can produce 1.5–2.0 times the torque required at all the speeds of an application. The multiplier of 1.5–2.0 helps compensate for variations in motor torque, friction, small misalignments, cable carrier drag, and other factors not generally accounted for in estimates of total load.

Backdriving of a Lead Screw

If the efficiency of a lead screw and nut is high enough, the lead screw can back-drive when an axial thrust force is applied to the nut. Generally, back-driving will not occur if the screw lead is less than 1/3 the diameter of an uncoated lead screw or 1/4 the diameter of a coated lead screw.

Application of lubricant to a lead screw can lower the coefficient of friction of the lead screw & nut system and cause the ability to back-drive. A screw & nut system that experiences vibration will back-drive at a lower efficiency than a similar screw & nut system that does not experience vibration.

The theoretical brake torque required to hold a load is:

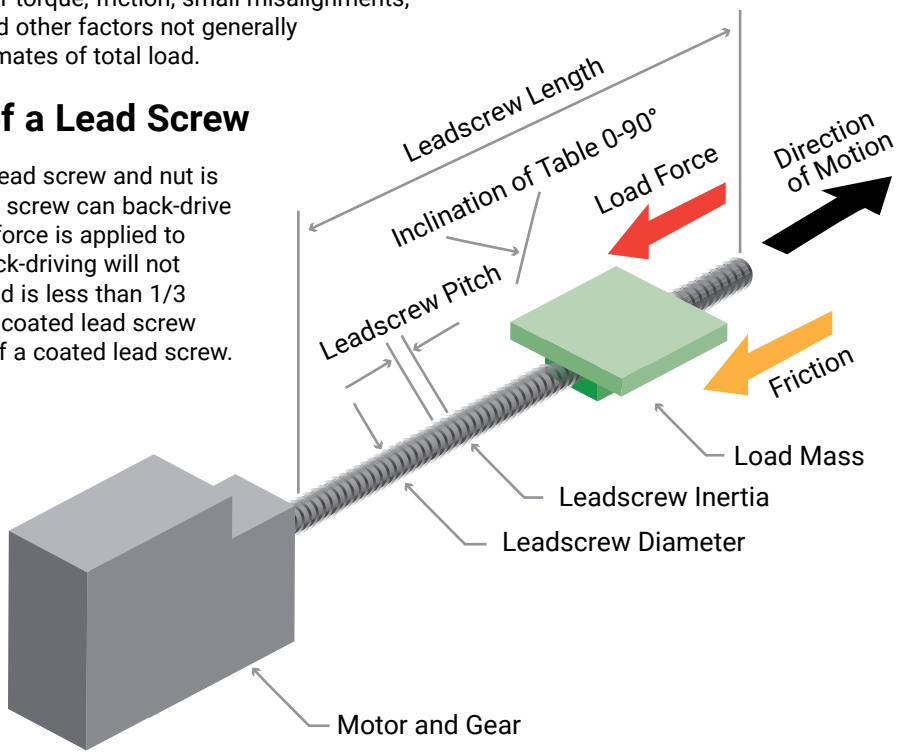
$$Torque_{Holding} = \frac{Load \times Lead \times Screw\ Efficiency}{2\pi}$$

where lead screw efficiencies are given on page 8.

Other System Factors

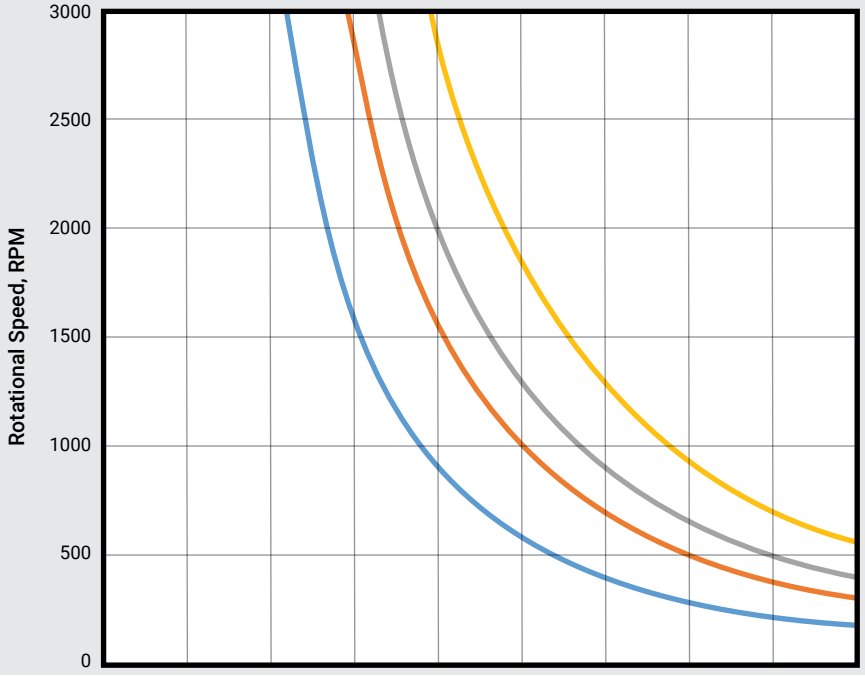
Customers should also check that the lead screw's 80% critical speed limit, the maximum compressive column loading of the lead screw, and the PV derated nut load capacity are not exceeded per the charts on the following pages.

The operating temperature range of the standard nut material is 32°–180°F (0–82°C). The thermal expansion or contraction of the nut's polymer material is significantly greater than the thermal expansion or contraction of the lead screw's stainless-steel material. Therefore, for temperature ranges of operation beyond 50°–110°F (10–43°C) please contact an Application Engineer at PBC Linear for assistance. The designed thread clearance of the nut may need to be changed for proper operation at temperatures outside the 50°–110°F (10–43°C) temperature range.



Lead Screw Speed Charts

80% Critical Speed – Metric



Fixed-Free	0	100	200	300	400	500	600	700	800	900
Simple-Simple	0	168	337	505	674	842	1010	1080	1350	1520
Fixed-Simple	0	210	420	631	841	1050	1260	1470	1680	1890
Fixed-Fixed	0	253	507	760	1010	1270	1520	1770	2030	2280

Maximum Length (mm) between Bearings

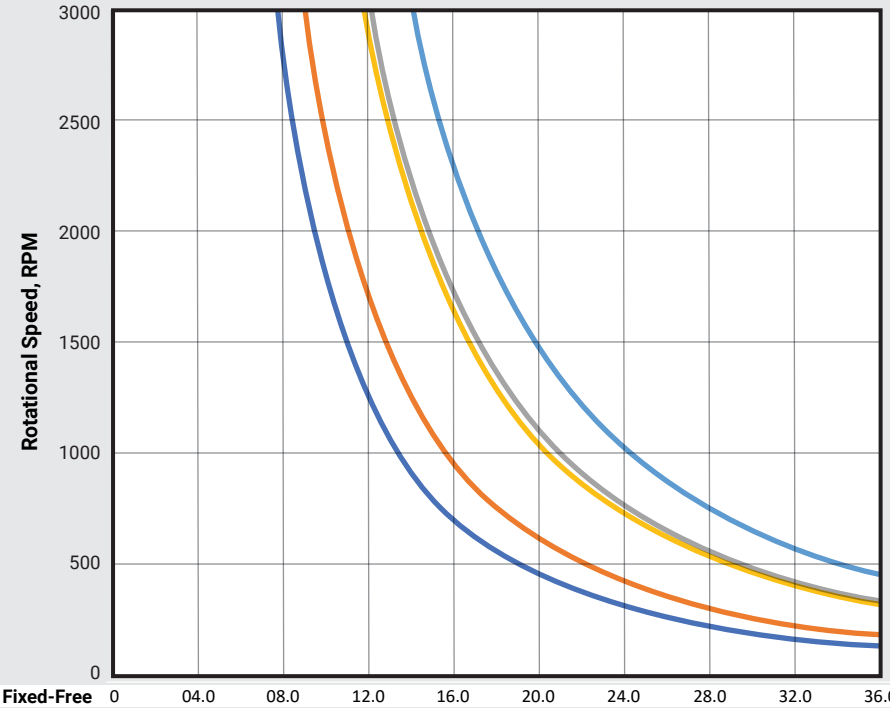
PBC Linear Recommends:

Lead screws should be sized to operate at or below 80% of the critical speed. Critical speed is the lowest rotational speed at which the screw shaft is in resonance.

Several factors help to determine critical speed including:

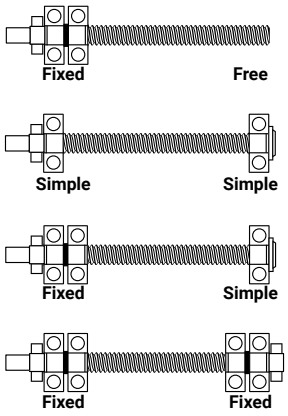
- Screw diameter
- Length between bearing supports
- Type of bearing supports used

80% Critical Speed – IPS



Fixed-Free	0	04.0	08.0	12.0	16.0	20.0	24.0	28.0	32.0	36.0
Simple-Simple	0	06.7	13.3	20.0	26.7	33.3	40.0	46.7	53.5	60.0
Fixed-Simple	0	08.1	16.2	24.2	32.3	40.4	48.5	56.6	64.7	72.7
Fixed-Fixed	0	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0

Maximum Length (inches) between Bearings



Lead Screw Load Charts

- 6 mm x (5, 12 mm)
- 6 mm x 2 mm
- 6 mm x (1,4,6,8,10 mm)
- 10 mm x (5,25 mm)
- 10 mm x (2,4,6,8,10,12,16 mm)
- 10 mm x 1 mm
- 12 mm x (5,10,25 mm)
- 12 mm x (2,4,6,8,12,16 mm)
- 12 mm x 1 mm
- 16 mm x (5,10,25 mm)
- 16 mm x (2,4,6,8,12,16 mm)
- 16 mm x 1 mm

PBC Linear Recommends:

Lead screws should be loaded in axial compression to levels below their maximum column loading.

Exceeding the maximum column loading can result in instability due to screw bending or buckling. These charts limit the screw slenderness ratios based on the type of screw support selected:

25 = Fixed - Free

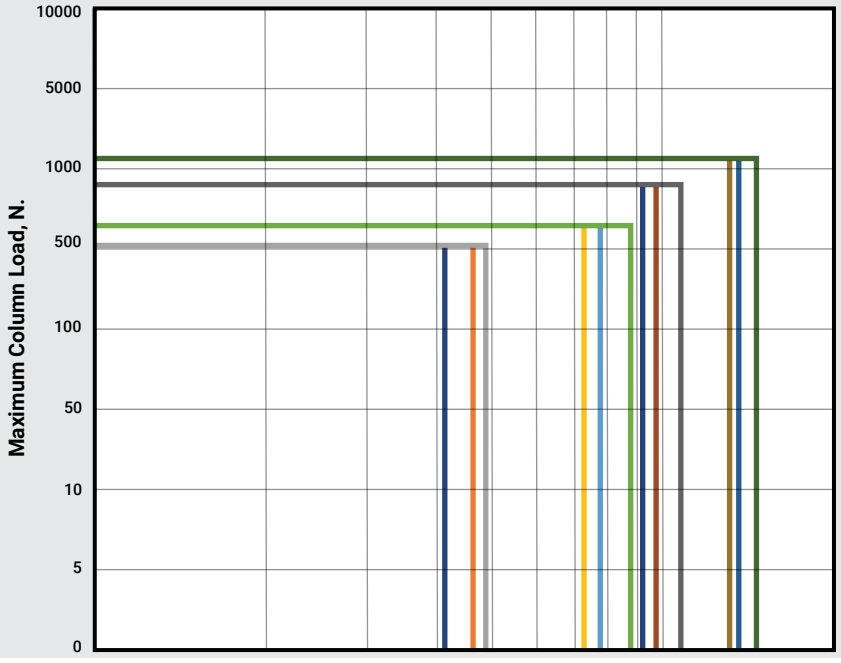
50 = Simple - Simple

70 = Fixed - Simple

100 Fixed - Fixed

Please consult PBC Linear if your application exceeds these limits

Maximum Column Loading – Metric

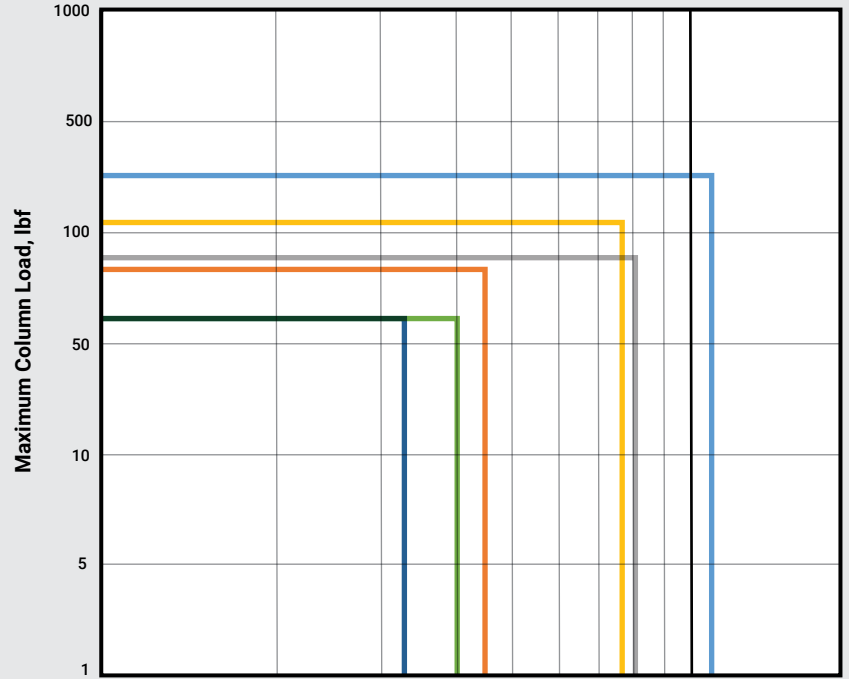


Fixed-Free	25	51	76	102	127	152	178	203	254	508
Simple-Simple	51	102	152	203	254	305	356	406	508	1016
Fixed-Simple	72	127	178	254	330	406	483	559	711	1448
Fixed-Fixed	102	203	305	406	508	610	711	813	1016	2032

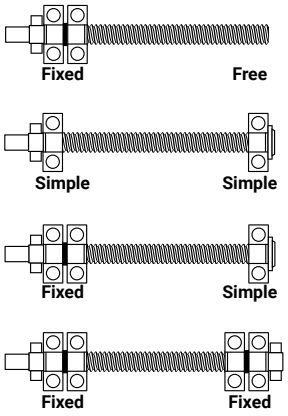
Maximum Length (mm) between Bearings

- 3/16 x 0.5 inch
- 3/16 x 0.05 inch
- 1/4 x 0.333 inch
- 3/8 x 0.200 inch
- 7/16 x 0.125 inch
- 1/2 x 0.100 inch and 0.250 inch

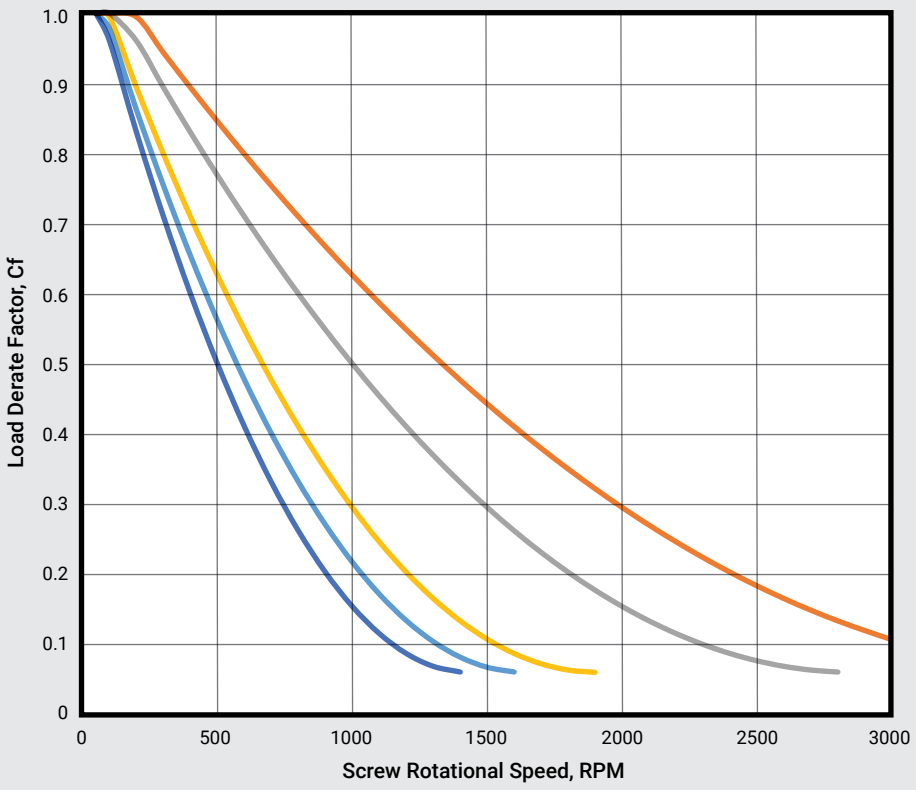
Maximum Column Loading – IPS Units



Fixed -Free	1.0	2.0	3.0	4.0	5.0	6	7	8	9.0	10	20
Simple-Simple	2.0	4.0	6.0	8.0	10.0	12	14	16	18.0	20	40
Fixed-Simple	2.8	5.7	8.5	11.3	14.1	17	20	23	25.5	28	57
Fixed-Fixed	4.0	8.0	12.0	16.0	20.0	24	28	32	36.0	40	80



Lead Screw PV Load Derate Charts



MAX Nut Load = Cf x Nut Dynamic Load Rating

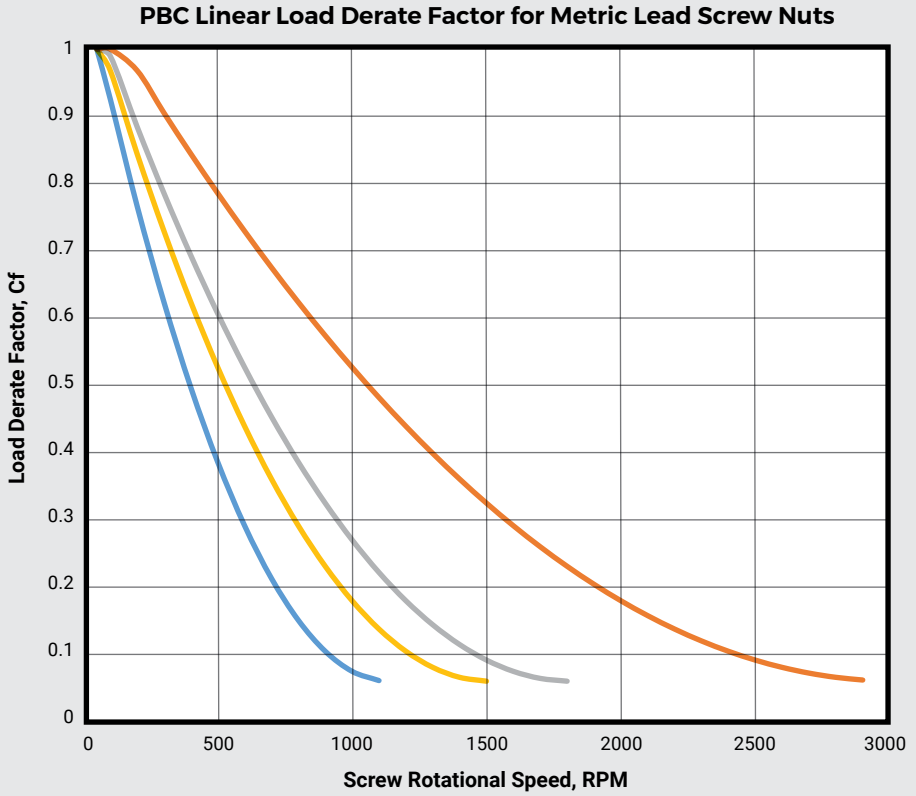
Please note that the PV limit of the nut is dependent on the duty of the application and other factors so these curves are a guideline. If your application will operate near or beyond the shown curves, please contact PBC Linear for support.

- 0.188 inch Dia Screw
- 0.250 inch Dia Screw
- 0.375 inch Dia Screw
- 0.438 inch Dia Screw
- 0.500 inch Dia Screw

PBC Linear Recommends:

When determining if a lead screw nut has adequate load capacity for an application, multiply the maximum nut load capacity by the speed dependent factor listed on this page to determine the actual load capacity of the nut at the desired operating speed.

Operating at higher loads will result in accelerated nut wear.

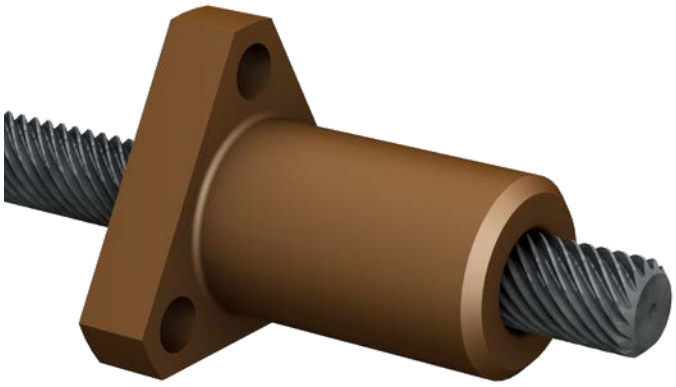


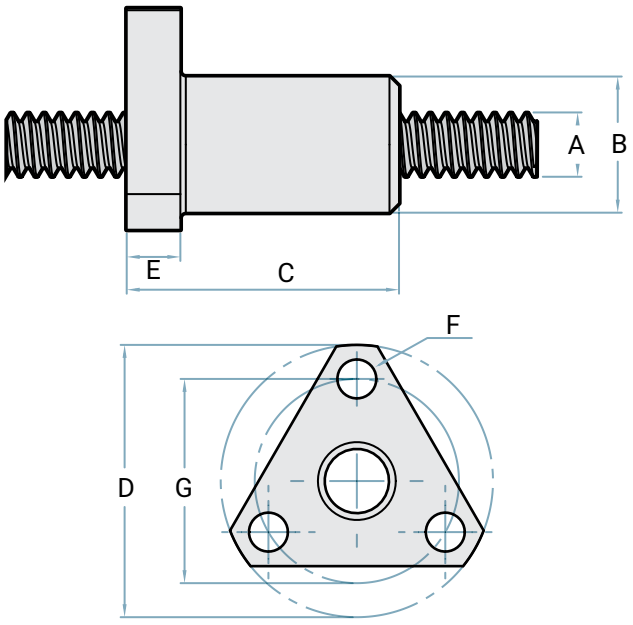
MAX Nut Load = Cf x Nut Dynamic Load Rating

Please note that the PV limit of the nut is dependent on the duty of the application and other factors so these curves are a guideline. If your application will operate near or beyond the shown curves, please contact PBC Linear for support.

- 6 mm Dia Screw
- 10 mm Dia Screw
- 12 mm Dia Screw
- 16 mm Dia Screw

Triangle Nut Standard





Metric Screws

A Screw Diameter	B Nut Dia. (mm)	C Nut Length (mm)	D Flange Dia. (mm)	E Flange Thickness (mm)	F Mounting Hole Dia.(mm)	G Bolt Circle Dia. (mm)	Drag Torque (Nm)	Dynamic Load (N)
6 mm	10.2	22.2	25.4	4.8	3.6	19.1	Free Wheeling	334 N
10 mm	15.9	25.4	38.1	4.8	5.1	28.6	Free Wheeling	445 N
12 mm	16.9	38.1	44.5	6.4	5.6	35.7	Free Wheeling	778 N
16 mm	20.3	38.1	54.0	6.4	5.6	44.5	Free Wheeling	1,160 N

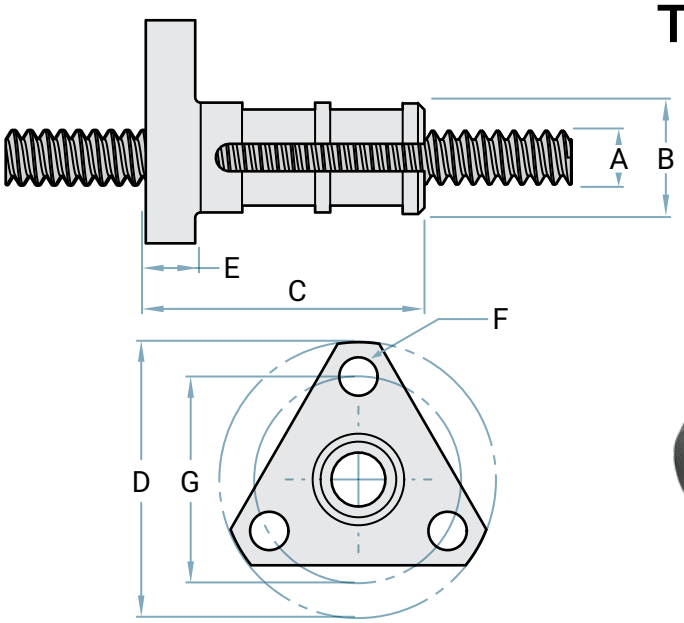
Inch Screws

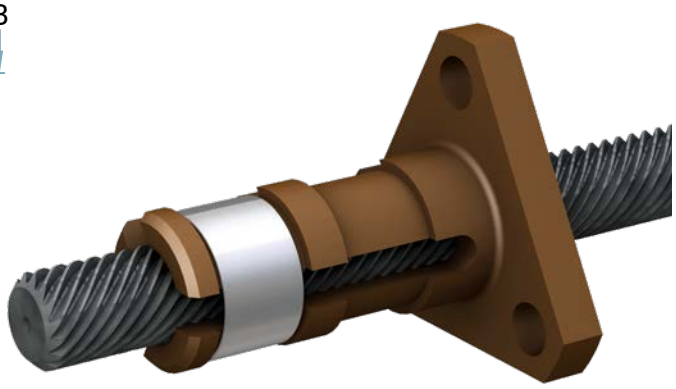
A Screw Diameter	B Nut Dia. (in)	C Nut Length (in)	D Flange Dia. (in)	E Flange Thickness (in)	F Mounting Hole Dia.(in)	G Bolt Circle Dia. (in)	Drag Torque (oz-in)	Dynamic Load (lb)
3/16"	0.35	0.63	0.81	0.13	0.12	0.600	Free Wheeling	45
1/4"	0.41	0.88	1.00	0.19	0.14	0.750	Free Wheeling	75
3/8"	0.61	1.00	1.50	0.19	0.20	1.125	Free Wheeling	85
7/16"	0.64	1.50	1.62	0.20	0.20	1.250	Free Wheeling	125
1/2"	0.69	1.50	1.75	0.22	0.22	1.406	Free Wheeling	200

Screw Diameter	Metric Leads									
6 mm	1 mm	2 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	–	–
10, 12, 16 mm	1 mm	2 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	16 mm	25 mm

Screw Dia.	Inch Leads	
3/16"	0.05"	0.50"
1/4"	0.333"	
3/8"	0.20"	
7/16"	1.00"	
1/2"	0.10"	0.25"

Triangle Constant Force Anti-Backlash Nut





Metric Screws

A Screw Diameter	B Nut Dia. (mm)	C Nut Length (mm)	D Flange Dia. (mm)	E Flange Thickness (mm)	F Mounting Hole Dia.(mm)	G Bolt Circle Dia. (mm)	Drag Torque** (Nm)	Dynamic Load (N)
6 mm	10.2	22.2	25.4	4.1	3.6	19.1	0.0134–0.0164	302 N
10 mm	15.9	38.1	38.1	4.8	5.1	28.6	0.0197–0.0240	400 N
12 mm	16.9	44.5	44.5	6.4	5.6	35.7	0.0211–0.0264	703 N
16 mm	20.3	49.5	54.0	6.4	5.6	44.5	0.0250–0.0310	1,040 N

Inch Screws

A Screw Diameter	B Nut Dia. (in)	C Nut Length (in)	D Flange Dia. (in)	E Flange Thickness (in)	F Mounting Hole Dia.(in)	G Bolt Circle Dia. (in)	Drag Torque** (oz-in)	Dynamic Load (lb)
3/16"	0.35	0.88	0.81	0.13	0.12	0.600	1.45–1.88	41
1/4"	0.41	0.88	1.00	0.19	0.14	0.750	2.37–2.90	68
3/8"	0.61	1.50	1.50	0.19	0.20	1.125	3.00–3.84	77
7/16"	0.64	1.62	1.62	0.22	0.20	1.250	3.60–4.40	112
1/2"	0.69	1.75	1.75	0.25	0.22	1.406	4.00–5.00	180

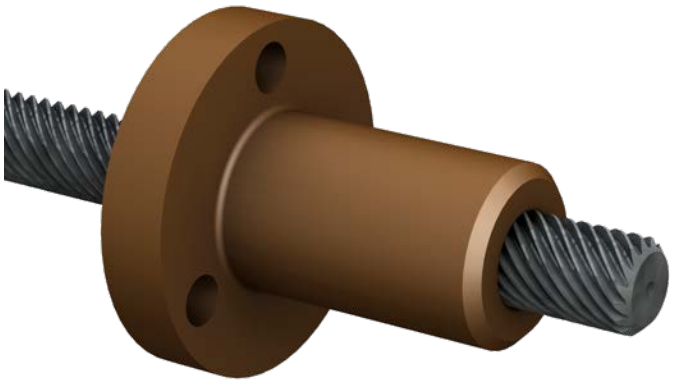
Screw Diameter	Metric Leads									
6 mm	1 mm	2 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	–	–
10, 12, 16 mm	1 mm	2 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	16 mm	25 mm

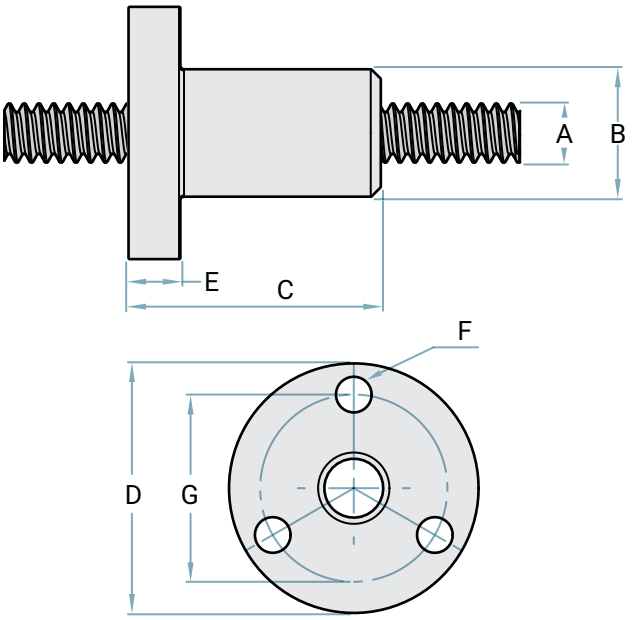
Screw Dia.	Inch Leads	
3/16"	0.05"	0.50"
1/4"	0.333"	
3/8"	0.20"	
7/16"	1.00"	
1/2"	0.10"	0.25"

***** Nut will have between 1 to 3 band slots.
Band slots may not contain bands depending on drag torque required.

****** Standard drag torque is factory set to the median number shown.
For custom drag torque please contact a PBC Linear Applications Engineer.

Round Nut Standard





Metric Screws

A Screw Dia (mm)	B Nut Dia. (mm)	C Nut Length (mm)	D Flange Dia. (mm)	E Flange Thickness (mm)	F Mounting Hole Dia.(mm)	G Bolt Circle Dia. (mm)	Drag Torque (Nm)	Dynamic Load (N)
6 mm	10.2	22.2	25.4	4.8	3.6	19.1	Free Wheeling	334 N
10 mm	15.9	25.4	38.1	4.8	5.1	28.6	Free Wheeling	445 N
12 mm	16.9	38.1	44.5	6.4	5.6	35.7	Free Wheeling	778 N
16 mm	20.3	38.1	54.0	6.4	5.6	44.5	Free Wheeling	1,160 N

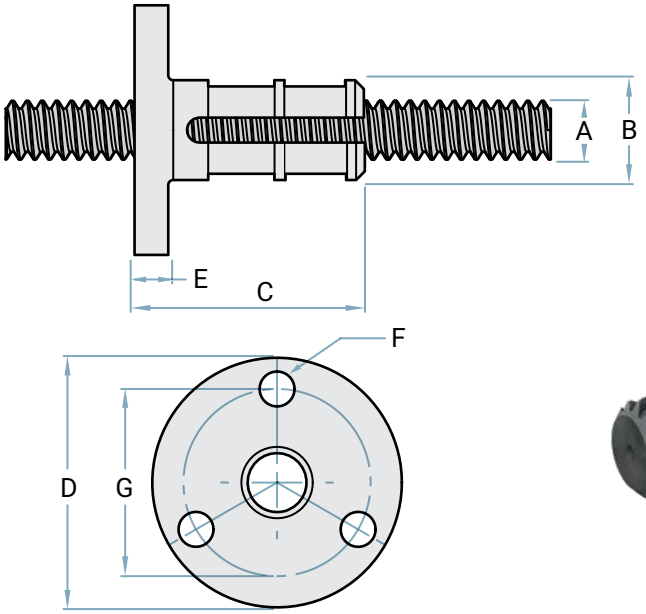
Inch Screws

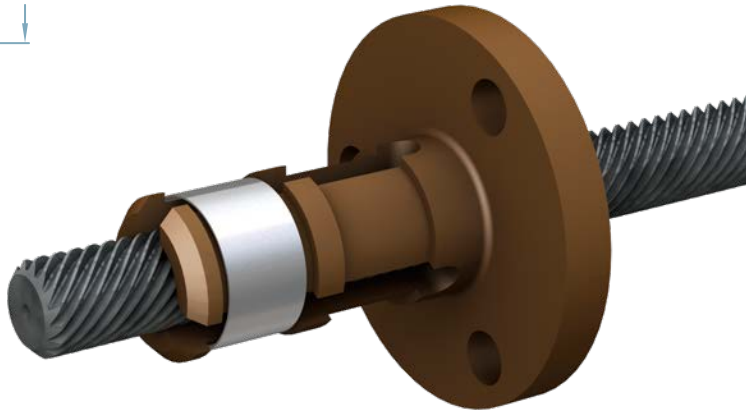
A Screw Diameter	B Nut Dia. (in)	C Nut Length (in)	D Flange Dia. (in)	E Flange Thickness (in)	F Mounting Hole Dia.(in)	G Bolt Circle Dia. (in)	Drag Torque (oz-in)	Dynamic Load (lb)
3/16"	0.35	0.63	0.81	0.13	0.12	0.600	Free Wheeling	45
1/4"	0.41	0.88	1.00	0.19	0.14	0.750	Free Wheeling	75
3/8"	0.61	1.00	1.50	0.19	0.20	1.125	Free Wheeling	85
7/16"	0.64	1.50	1.62	0.22	0.20	1.250	Free Wheeling	125
1/2"	0.69	1.50	1.75	0.25	0.22	1.406	Free Wheeling	200

Screw Diameter	Metric Leads									
6 mm	1 mm	2 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	–	–
10, 12, 16 mm	1 mm	2 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	16 mm	25 mm

Screw Dia.	Inch Leads	
3/16"	0.05"	0.50"
1/4"	0.333"	
3/8"	0.20"	
7/16"	1.00"	
1/2"	0.10"	0.25"

Round Constant Force Anti-Backlash Nut





Metric Screws

A Screw Diameter	B Nut Dia. (mm)	C Nut Length (mm)	D Flange Dia. (mm)	E Flange Thickness (mm)	F Mounting Hole Dia.(mm)	G Bolt Circle Dia. (mm)	Drag Torque** (Nm)	Dynamic Load (N)
6 mm	10.2	22.2	25.4	4.8	3.6	19.1	0.0134–0.0164	302 N
10 mm	15.9	38.1	38.1	4.8	5.1	28.6	0.0197–0.0240	400 N
12 mm	16.9	44.5	44.5	6.4	5.6	35.7	0.0211–0.0264	703 N
16 mm	20.3	49.5	54.0	6.4	5.6	44.5	0.0250–0.0310	1,040 N

Inch Screws

A Screw Diameter	B Nut Dia. (in)	C Nut Length (in)	D Flange Dia. (in)	E Flange Thickness (in)	F Mounting Hole Dia.(in)	G Bolt Circle Dia. (in)	Drag Torque** (oz-in)	Dynamic Load (lb)
3/16"	0.35	0.88	0.81	0.13	0.12	0.600	1.45–1.88	41
1/4"	0.41	0.88	1.00	0.19	0.14	0.750	2.37–2.90	68
3/8"	0.61	1.50	1.50	0.19	0.20	1.125	3.00–3.84	77
7/16"	0.64	1.62	1.62	0.22	0.20	1.250	3.60–4.40	112
1/2"	0.69	1.75	1.75	0.25	0.22	1.406	4.00–5.00	180

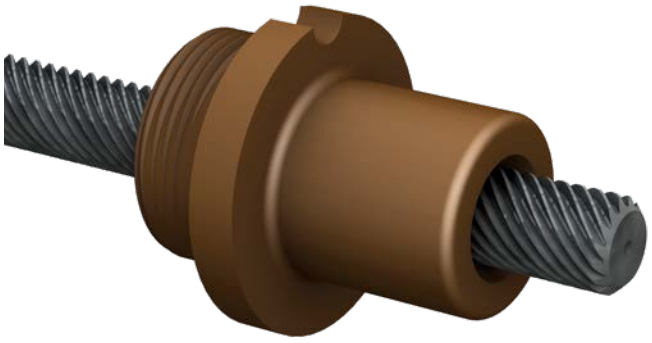
Screw Diameter	Metric Leads									
6 mm	1 mm	2 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	–	–
10, 12, 16 mm	1 mm	2 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	16 mm	25 mm

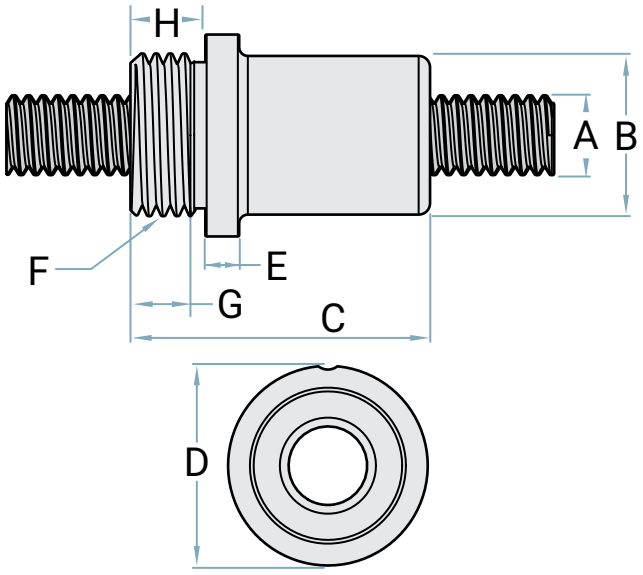
Screw Dia.	Inch Leads	
3/16"	0.05"	0.50"
1/4"	0.333"	
3/8"	0.20"	
7/16"	1.00"	
1/2"	0.10"	0.25"

***** Nut will have between 1 to 3 band slots.
Band slots may not contain bands depending on drag torque required.

****** Standard drag torque is factory set to the median number shown.
For custom drag torque please contact a PBC Linear Applications Engineer.

Threaded Nut Standard





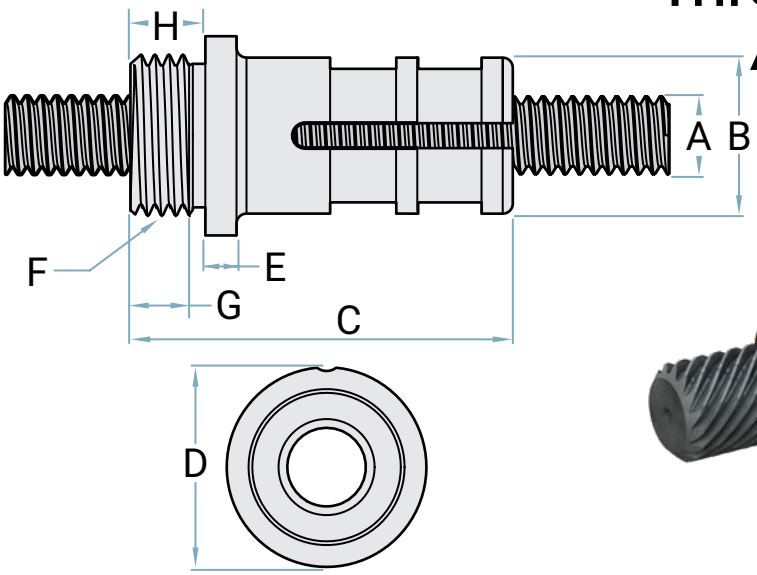
	A Screw Diameter	B Nut Dia. (mm)	C Nut Length (mm)	D Flange Dia. (mm)	E Flange Thickness (mm)	F Thread	G Thread Length (mm)	H End Length (mm)	Drag Torque (Nm)	Dynamic Load (N)
Metric Screws	**6 mm**	10.2	22.2	20.3	3.2	M14x1.5	4.8	6.3	Free Wheeling	334 N
	10 mm	15.9	25.4	25.4	3.2	M18x1.5	6.4	7.6	Free Wheeling	445 N
	12 mm	16.9	38.1	31.8	3.2	M24x2	9.5	10.8	Free Wheeling	778 N
	16 mm	20.3	38.1	31.8	3.2	M24x2	9.5	10.8	Free Wheeling	1,160 N

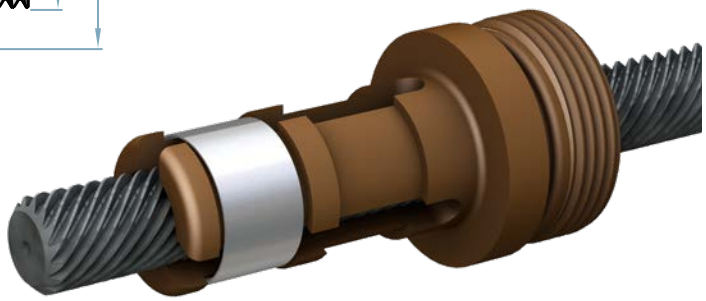
	A Screw Diameter	B Nut Dia. (in)	C Nut Length (in)	D Flange Dia. (in)	E Flange Thickness (in)	F Thread	G Thread Length (mm)	H End Length (mm)	Drag Torque (oz-in)	Dynamic Load (lb)
Inch Screws	**3/16"**	0.35	0.88	0.60	0.13	1/2"-20	0.190	0.247	Free Wheeling	45
	1/4"	0.41	0.88	0.80	0.13	9/16"-18	0.190	0.247	Free Wheeling	75
	3/8"	0.61	1.00	1.00	0.13	5/8"-18	0.250	0.300	Free Wheeling	85
	7/16"	0.64	1.50	1.25	0.13	13/16"-16	0.375	0.425	Free Wheeling	125
	1/2"	0.69	1.50	1.25	0.13	15/16"-16	0.375	0.425	Free Wheeling	200

Screw Diameter	Metric Leads									
6 mm	1 mm	2 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	–	–
10, 12, 16 mm	1 mm	2 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	16 mm	25 mm

Screw Dia.	Inch Leads	
3/16"	0.05"	0.50"
1/4"	0.333"	
3/8"	0.20"	
7/16"	1.00"	
1/2"	0.10"	0.25"

Threaded Constant Force Anti-Backlash Nut





	A Screw Diameter	B Nut Dia. (mm)	C Nut Length (mm)	D Flange Dia. (mm)	E Flange Thickness (mm)	F Thread	G Thread Length (mm)	H End Length (mm)	Drag Torque** (Nm)	Dynamic Load (N)
Metric Screws	**6 mm**	10.2	27.5	20.3	3.175	M14x1.5	4.8	6.3	0.0134–0.0164	302 N
	10 mm	15.9	44.5	25.4	3.175	M18x1.5	6.4	7.6	0.0197–0.0240	400 N
	12 mm	16.9	44.5	31.8	3.175	M24X2	9.5	10.8	0.0211–0.0264	703 N
	16 mm	20.3	49.5	31.8	3.175	M24x2	9.5	10.8	0.0250–0.0310	1,040 N

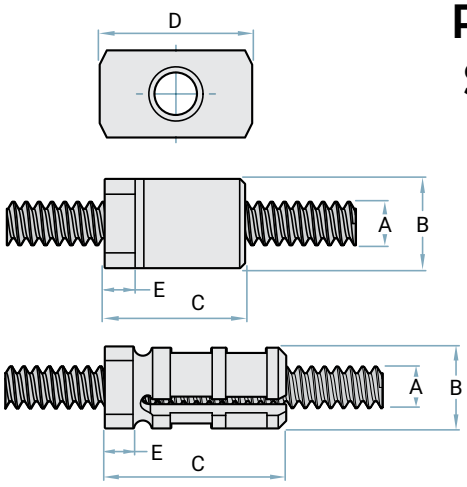
	A Screw Diameter	B Nut Dia. (in)	C Nut Length (in)	D Flange Dia. (in)	E Flange Thickness (in)	F Thread	G Thread Length (mm)	H End Length (in)	Drag Torque** (oz-in)	Dynamic Load (lb)
Inch Screws	**3/16"**	0.35	1.08	0.60	0.13	1/2"-20	0.190	0.247	1.45–1.88	41
	1/4"	0.41	1.08	0.80	0.13	9/16"-18	0.190	0.247	2.37–2.90	68
	3/8"	0.61	1.75	1.00	0.13	5/8"-18	0.250	0.300	3.00–3.84	77
	7/16"	0.64	1.75	1.25	0.13	13/16"-16	0.375	0.425	3.60–4.40	112
	1/2"	0.69	1.95	1.25	0.13	15/16"-16	0.375	0.425	4.00–5.00	180

Screw Diameter	Metric Leads									
6 mm	1 mm	2 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	–	–
10, 12, 16 mm	1 mm	2 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	16 mm	25 mm

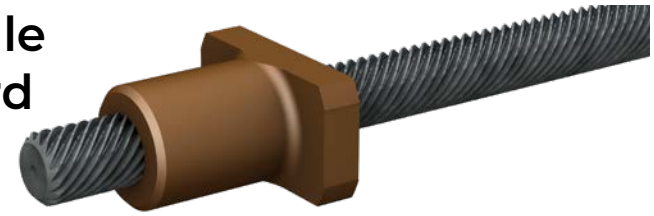
Screw Dia.	Inch Leads	
3/16"	0.05"	0.50"
1/4"	0.333"	
3/8"	0.20"	
7/16"	1.00"	
1/2"	0.10"	0.25"

***** Nut will have between 1 to 3 band slots.
Band slots may not contain bands depending on drag torque required.

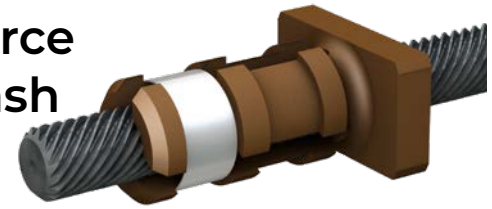
****** Standard drag torque is factory set to the median number shown.
For custom drag torque please contact a PBC Linear Applications Engineer.



Rectangle Standard



Constant Force Anti-Backlash Nut



	A Screw Diameter	B Nut Dia. (mm)		C Nut Length (mm)		D Flange Dia. (mm)	E Flange Thickness (mm)	Drag Torque** (Nm)		Dynamic Load (N)	
		Standard	Constant Force	Standard	Constant Force	Both	Both	Standard	Constant Force	Standard	Constant Force
Metric Screws	**6 mm**	10.2	10.2	22.2	22.2	17.8	3.4	Free Wheeling	0.0134–0.0164	334 N	302 N
	10 mm	15.9	15.9	25.4	38.1	22.0	5.1	Free Wheeling	0.0197–0.0240	445 N	400 N
	12 mm	19.1	19.1	38.1	41.3	30.5	5.1	Free Wheeling	0.0211–0.0264	778 N	703 N
	16 mm	20.3	20.3	38.1	49.5	38.1	5.1	Free Wheeling	0.0250–0.0310	1,160 N	1,040 N

	A Screw Diameter	B Nut Dia. (in)		C Nut Length (in)		D Flange Dia. (in)	E Flange Thickness (in)	Drag Torque** (oz-in)		Dynamic Load (lb)	
		Standard	C onstant Force	Standard	Constant Force	Both	Both	Standard	Constant Force	Standard	Constant Force
Inch Screws	**3/16"**	0.35	0.35	0.63	0.88	0.62	0.09	Free Wheeling	1.45–1.88	45	41
	1/4"	0.41	0.41	0.88	0.88	0.70	0.14	Free Wheeling	2.37–2.90	75	68
	3/8"	0.61	0.61	1.00	1.50	0.87	0.20	Free Wheeling	3.00–3.84	85	77
	7/16"	0.64	0.64	1.30	1.63	1.20	0.20	Free Wheeling	3.60–4.40	125	112
	1/2"	0.69	0.69	1.50	1.75	1.20	0.20	Free Wheeling	4.00–5.00	200	180

Screw Diameter	Metric Leads									
6 mm	1 mm	2 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	–	–
10, 12, 16 mm	1 mm	2 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	16 mm	25 mm

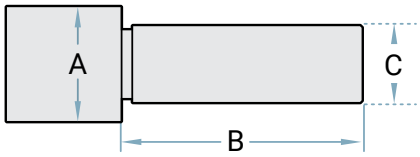
Screw Dia.	Inch Leads	
3/16"	0.05"	0.50"
1/4"	0.333"	
3/8"	0.20"	
7/16"	1.00"	
1/2"	0.10"	0.25"

***** Nut will have between 1 to 3 band slots.
Band slots may not contain bands depending on drag torque required.

****** Standard drag torque is factory set to the median number shown.
For custom drag torque please contact a PBC Linear Applications Engineer.

Machined Ends

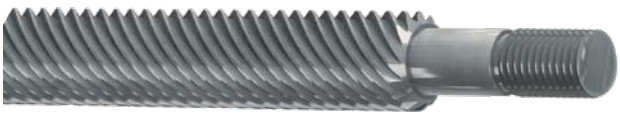
Float Journal AFN, AFB

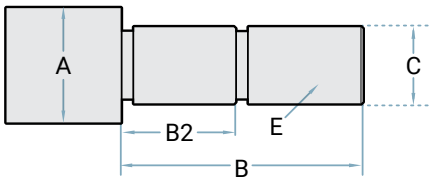


	A	B		C	
		Float	Threaded	Float	Threaded
Metric Screws	6 mm	15.24 mm	20.00 mm	4.98 mm	M5 x 0.80–6g
	10 mm	15.75 mm	20.00 mm	5.97 mm	M6 x 1.00–6g
	12 mm	20.32 mm	25.00 mm	9.98 mm	M10 x 1.50–6g
	16 mm	21.34 mm	25.00 mm	11.97 mm	M12 x 1.75–6g
Inch Screws	3/16"	0.600"	0.787"	0.157"	M4 x 0.70–6g
	1/4"	0.600"	0.787"	0.197"	M5 x 0.80–6g
	3/8"	0.600"	0.787"	0.235"	M6 x 1.00–6g
	7/16"	0.800"	0.984"	0.393"	M10 x 1.50–6g
	1/2"	0.800"	0.984"	0.393"	M10 x 1.50–6g

Threaded Journaled THR

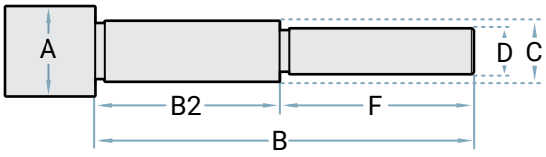
Fixed Journaled ALN, ALB





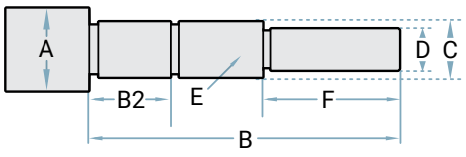
	A	B	B2	C	E
Metric Screws	6 mm	22.86 mm	10.00 mm	4.98 mm	M5 x 0.80–6g
	10 mm	22.86 mm	9.00 mm	5.97 mm	M6 x 1.00–6g
	12 mm	33.27 mm	14.22 mm	9.97 mm	M10 x 1.50–6g
	16 mm	36.88 mm	15.90 mm	11.97 mm	M12 x 1.75–6g
Inch Screws	3/16"	0.900"	0.315"	0.157"	M4 x 0.70–6g
	1/4"	0.900"	0.394"	0.196"	M5 x 0.80–6g
	3/8"	0.900"	0.354"	0.235"	M6 x 1.00–6g
	7/16"	1.310"	0.560"	0.393"	M10 x 1.50–6g
	1/2"	1.310"	0.560"	0.393"	M10 x 1.50–6g

Float Journaled Drive End BFN, BFB



	A	B	B2	C	D	F
Metric Screws	6 mm	25.40 mm	15.24 mm	4.98 mm	4.00 mm	10.16 mm
	10 mm	30.86 mm	15.24 mm	5.97 mm	4.00 mm	15.62 mm
	12 mm	36.32 mm	20.32 mm	9.97 mm	8.00 mm	16.00 mm
	16 mm	37.08 mm	20.70 mm	11.97 mm	10.00 mm	16.38 mm
Inch Screws	3/16"	1.000"	0.600"	0.157"	0.125"	0.400"
	1/4"	1.000"	0.600"	0.197"	0.125"	0.400"
	3/8"	1.215"	0.600"	0.235"	0.188"	0.615"
	7/16"	1.430"	0.800"	0.393"	0.313"	0.630"
	1/2"	1.430"	0.800"	0.393"	0.313"	0.630"

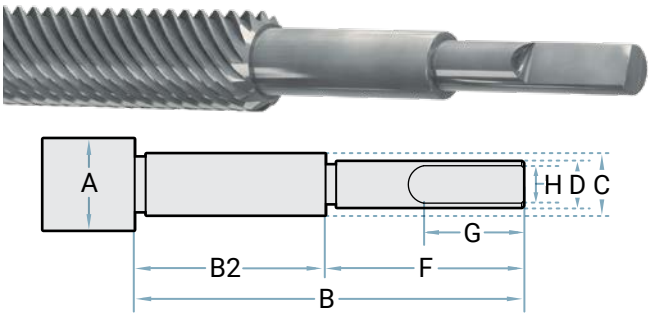
Fixed Journaled Drive End BLN, BLB



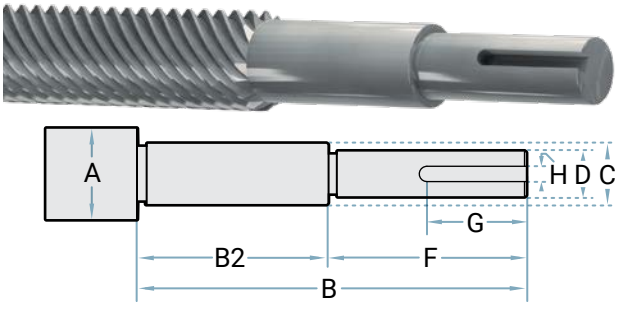
	A	B	B2	C	D	E	F
Metric Screws	6 mm	34.85 mm	10.00 mm	4.98 mm	4.00 mm	M5 x 0.80–6g	12.37 mm
	10 mm	38.10 mm	9.00 mm	5.97 mm	4.00 mm	M6 x 1.00–6g	15.24 mm
	12 mm	48.90 mm	14.22 mm	9.97 mm	8.00 mm	M10 x 1.50–6g	16.00 mm
	16 mm	50.80 mm	15.90 mm	11.97 mm	10.00 mm	M12 x 1.75–6g	16.54 mm
Inch Screws	3/16"	1.372"	0.315"	0.157"	0.125"	M4 x 0.70–6g	0.487
	1/4"	1.372"	0.394"	0.197"	0.125"	M5 x 0.80–6g	0.487"
	3/8"	1.500"	0.354"	0.235"	0.188"	M6 x 1.00–6g	0.600"
	7/16"	1.926"	0.560"	0.393"	0.313"	M10 x 1.50–6g	0.630"
	1/2"	1.926"	0.560"	0.393"	0.313"	M10 x 1.50–6g	0.630"

Machined Ends

Float Journal with Flat CFN, CFB
(for 6 mm, 10 mm, 3/16", 1/4", 3/8" screws)

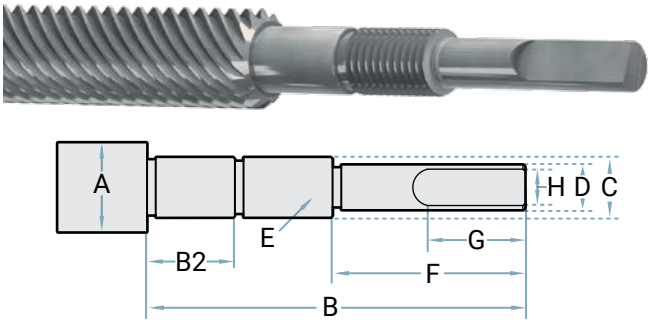


Float Journal with Keyway CFN, CFB
(for 12 mm, 16 mm, 7/16", 1/2" screws)

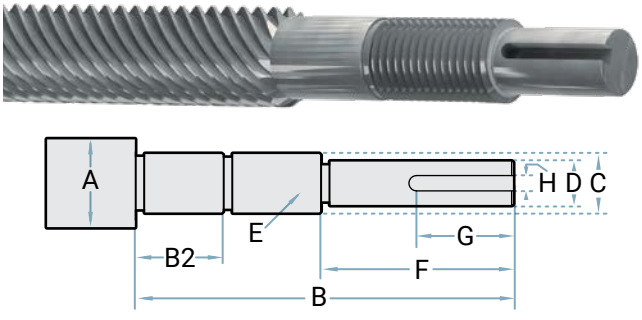


	A	B	B2	C	D	F	G	H
Metric Screws	6 mm	25.40 mm	15.24 mm	4.98 mm	4.00 mm	10.16 mm	7.26 mm	Flat
	10 mm	30.86 mm	15.24 mm	5.97 mm	4.00 mm	15.62 mm	9.53 mm	Flat
	12 mm	36.32 mm	20.32 mm	9.97 mm	8.00 mm	16.00 mm	12.70 mm	3 mm Keyway
	16 mm	37.08 mm	20.70 mm	11.97 mm	10.00 mm	16.38 mm	12.70 mm	3 mm Keyway
Inch Screws	3/16"	1.000"	0.600"	0.157"	0.125"	0.400"	0.286"	Flat
	1/4"	1.000"	0.600"	0.197"	0.125"	0.400"	0.286"	Flat
	3/8"	1.215"	0.600"	0.235"	0.188"	0.615"	0.375"	Flat
	7/16"	1.430"	0.800"	0.393"	0.313"	0.630"	0.500"	0.125" Keyway
	1/2"	1.430"	0.800"	0.393"	0.313"	0.630"	0.500"	0.125" Keyway

Fixed Journal with Flat CLN, CLB
(for 6 mm, 10 mm, 3/16", 1/4", 3/8" screws)

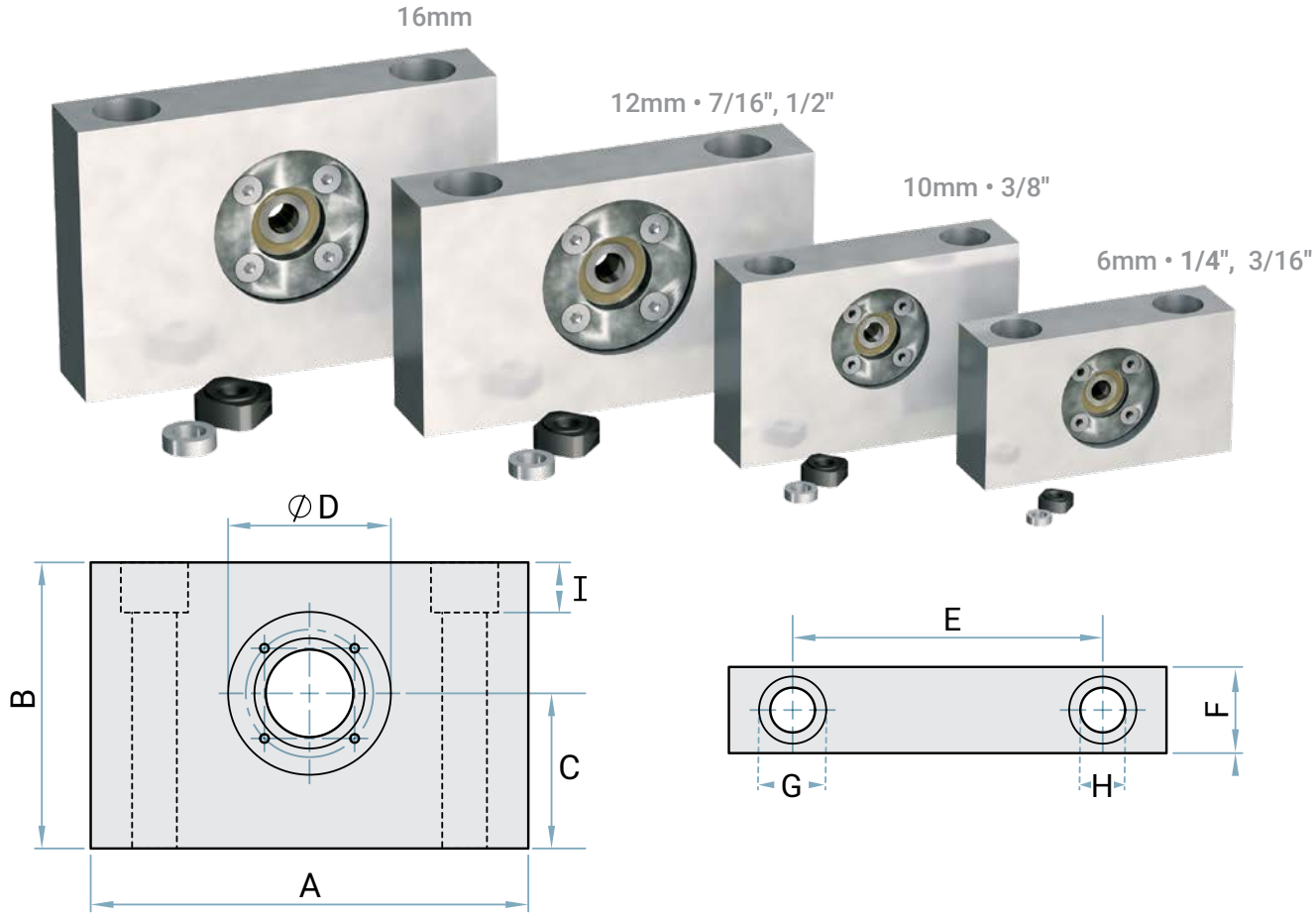


Fixed Journal with Keyway CLN, CLB
(for 12 mm, 16 mm, 7/16", 1/2" screws)



	A	B	B2	C	D	E	F	G	H
Metric Screws	6 mm	34.85 mm	10.00 mm	4.98 mm	4.00 mm	M5 x 0.80–6g	12.37mm	7.26 mm	Flat
	10 mm	38.10 mm	9.00 mm	5.97 mm	4.00 mm	M6 x 1.00–6g	15.24 mm	9.53 mm	Flat
	12 mm	48.90 mm	14.22 mm	9.97 mm	8.00 mm	M10 x 1.50–6g	16.00 mm	12.70 mm	3 mm Keyway
	16 mm	50.80 mm	15.90 mm	11.97 mm	10.00 mm	M12 x 1.75–6g	16.54 mm	12.70 mm	3 mm Keyway
Inch Screws	3/16"	1.372"	0.315"	0.157"	0.125"	M4 x 0.70–6g	0.487"	0.286"	Flat
	1/4"	1.372"	0.394"	0.197"	0.125"	M5 x 0.80–6g	0.487"	0.286"	Flat
	3/8"	1.500"	0.354"	0.235	0.188"	M6 x 1.00–6g	0.600"	0.375"	Flat
	7/16"	1.925"	0.560"	0.393"	0.313"	M10 x 1.50–6g	0.630"	0.500"	0.125" Keyway
	1/2"	1.925"	0.560"	0.393"	0.313"	M10 x 1.50–6g	0.630"	0.500"	0.125" Keyway

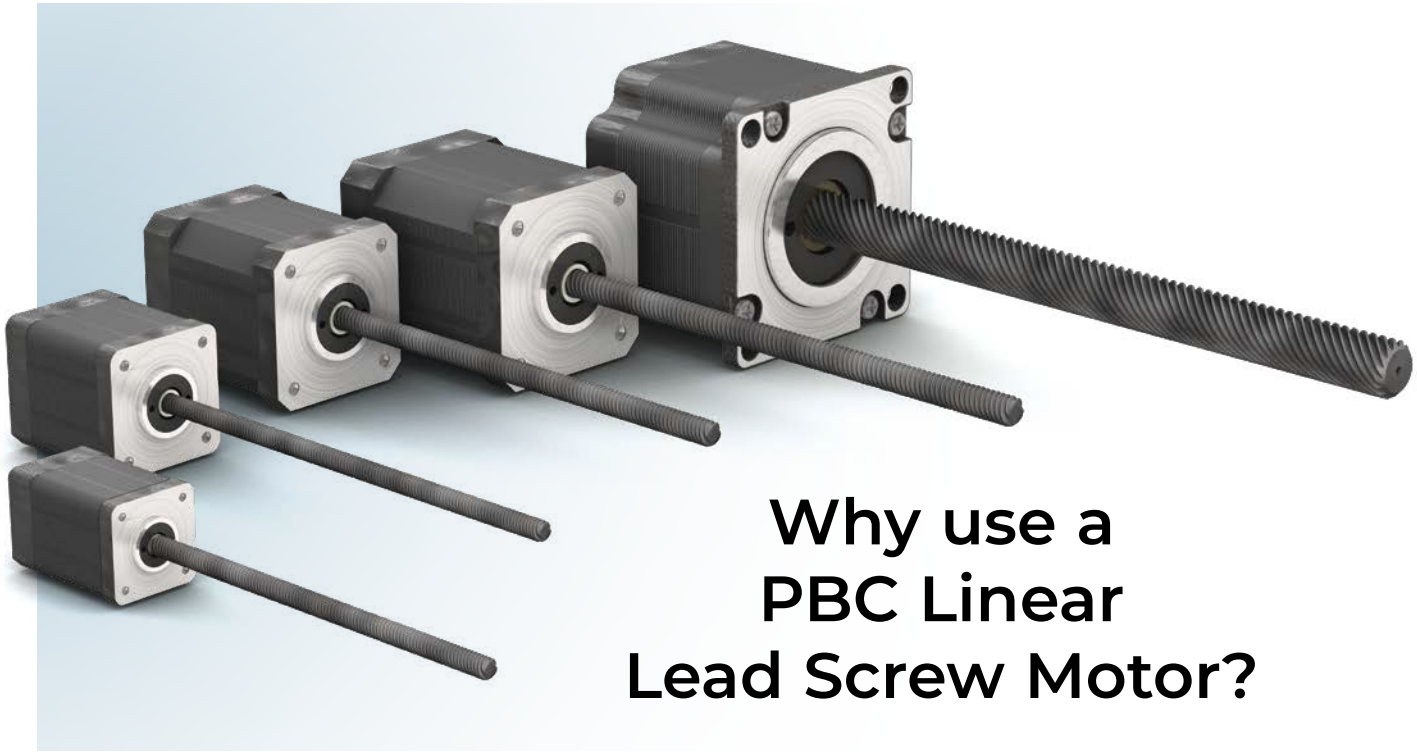
Bearing Blocks



	For Screw Dia.	Fixed P/N	A mm	B mm	C mm	D mm	E mm	F mm	G C'Bore Dia mm	H* Internal mm	I C'Bore Depth mm
Metric Screws	6 mm	LSLEB-06	76	43	22	30.25	50.0	20	14.5	8.8	8
	10 mm	LSLEB-10	85	56	33	30.25	60.0	20	14.5	8.8	8
	12 mm	LSLEB-12	120	70	40	47.25	82.5	25	19.5	13.0	12
	16 mm	LSLEB-16	127	83	45	47.25	90.0	25	19.5	13.0	12
Inch Screws	3/16"	LSLEB-05	76	43	22	30.25	50.0	20	14.5	8.8	8
	1/4"	LSLEB-06	76	43	22	30.25	50.0	20	14.5	8.8	8
	3/8"	LSLEB-10	85	56	33	30.25	60.0	20	14.5	8.8	8
	7/16"	LSLEB-12	120	70	40	47.25	82.5	25	19.5	13.0	12
	1/2"	LSLEB-12	120	70	40	47.25	82.5	25	19.5	13.0	12

***** Recommended metric screws for 16 mm and 12 mm block mounting holes is the Socket head cap screw of M12-1.75 and for 10 mm and 06 mm is the of M8-1.25
Note: Contact factory for custom size options.

Lead Screw Motors



Why use a PBC Linear Lead Screw Motor?

Cost Reduction

Fusing the motor and screw together eliminates the need for a motor mount and coupling. This also reduces setup time.

Improved Performance

Factor alignment of the motor and screw means direct out of the box precision.

Variety

Many choices of nut styles and technologies including Constant Force, to cover almost every application need.

Multiple standard machining and plating choices helps get what is needed quickly and easily.

Support & Customs

Not finding what you need or need a custom solution? PBC Linear has your engineering support covered!
Phone: 1-888-389-6266 or
pbc_applicationsengineering@pbclinear.com

PBC Linear lead screw motor products are designed based on the know-how technology of hybrid step motors, lead screw and nuts. The NEMA Series lead screw motors provide high torque, high precision, and high efficiency to fit the application needs of designers. The combination of lead screw motor styles, sizes, lead-screws and nuts, gives the freedom to use motors of different form factors to exactly fit in the application. And, it provides the best performance with any drive and power supply.

- Four frame Sizes: 11, 14, 17, 23
- Multiple motor lengths and special PowerPlus motors, provide more than 10 different motor sizes
- Integrate any lead screw from PBC Linear
- Each frame size motor has 3–11 different standard lead screws
- Each frame size motor has different selections of nuts

PBC Linear has committed to product innovation design and technical improvement, with excellent product quality,application technology, fast and flexible services,which provide customers with high level motion control solutions.

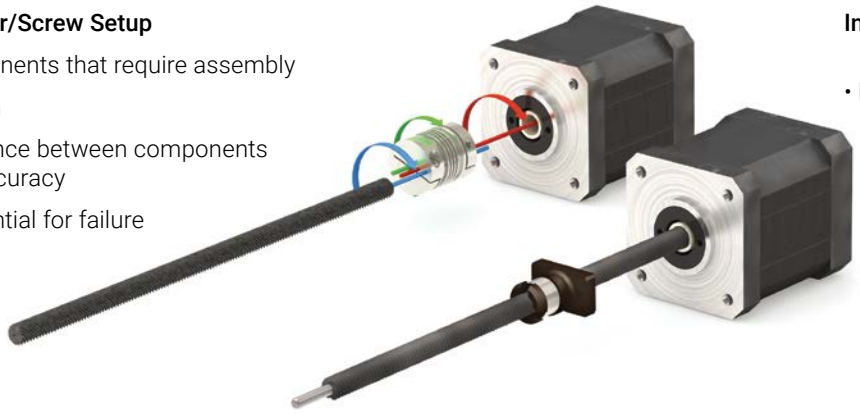
Hybrid Linear Lead Screw Actuator Selection Chart

Motor Frame	Screw Sizes								
	3/16"	6 mm	1/4"	3/8"	10 mm	7/16"	12 mm	1/2"	16 mm
NEMA 8	●	●	●						
NEMA 11	●	●	●						
NEMA 14	●	●	●	●	●				
NEMA 17, Single Stack		●	●	●	●	●	●	●	
NEMA 17, Double Stack				●	●	●	●	●	
NEMA 23, Single Stack				●	●	●	●	●	●
NEMA 23, Double Stack				●	●	●	●	●	●
NEMA 23, Power Plus				●	●	●	●	●	●

Lead Screw to Motor Connection Method Matters

Traditional Motor/Screw Setup

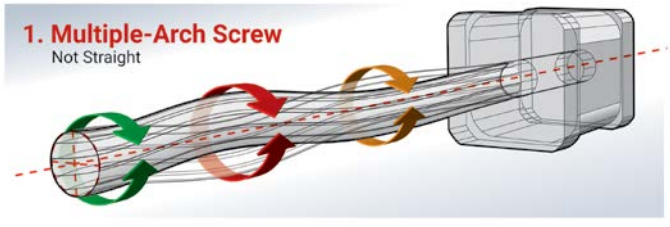
- Multiple components that require assembly
- Difficult to align
- Play and tolerance between components result in lost accuracy
- Increased potential for failure
- Higher costs

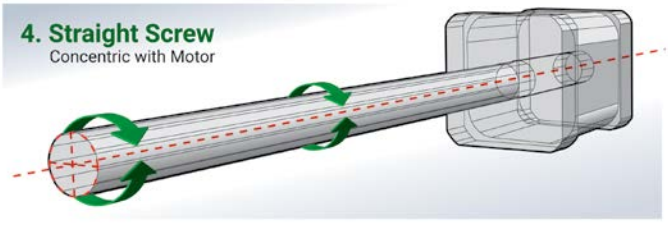


Integrated Hybrid Linear Actuator Setup

- Lead screw aligned and fixed directly with motor
  - Fewer components
  - Greater accuracy
  - More reliable
  - Higher rigidity
  - Greater value

Common Lead Screw Straightness Issues





PBC Linear utilizes an automated straightening process and holds tight TIR tolerances to eliminate common lead screw runout and straightness issues

NEMA 8 Series

Phases 2
Steps/Revolution 200
Step Accuracy ..... ±5%
IP Rating 40

Approvals ..... RoHS
Operating Temp. ..... -20°C–+50°C
Insulation Class ..... B (130°C)
Insulation Resistance ..... 100 MΩ

Step Motor - 4 Lead Bi-Polar

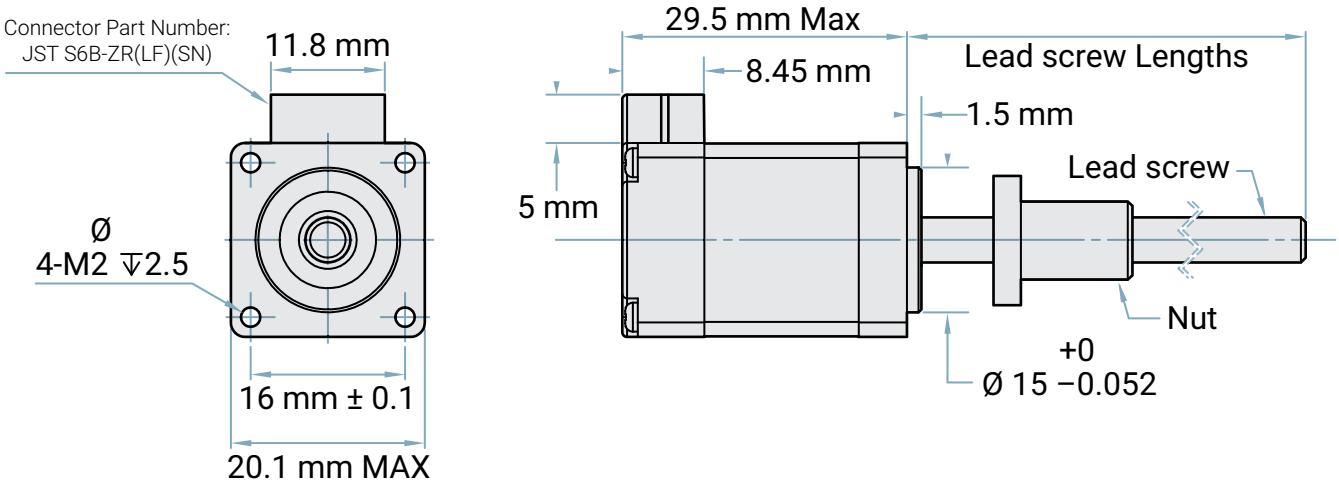
Motor Style	Motor Body Length (mm)	Electrical Connection	Rated Current (Amps)	Winding	
				Ohms	mH
				±10% at 20°C	Typical
NEMA 8	29.5	Plug In Connector	0.4	13.9	4

Lead Screw Style for NEMA 8 Series

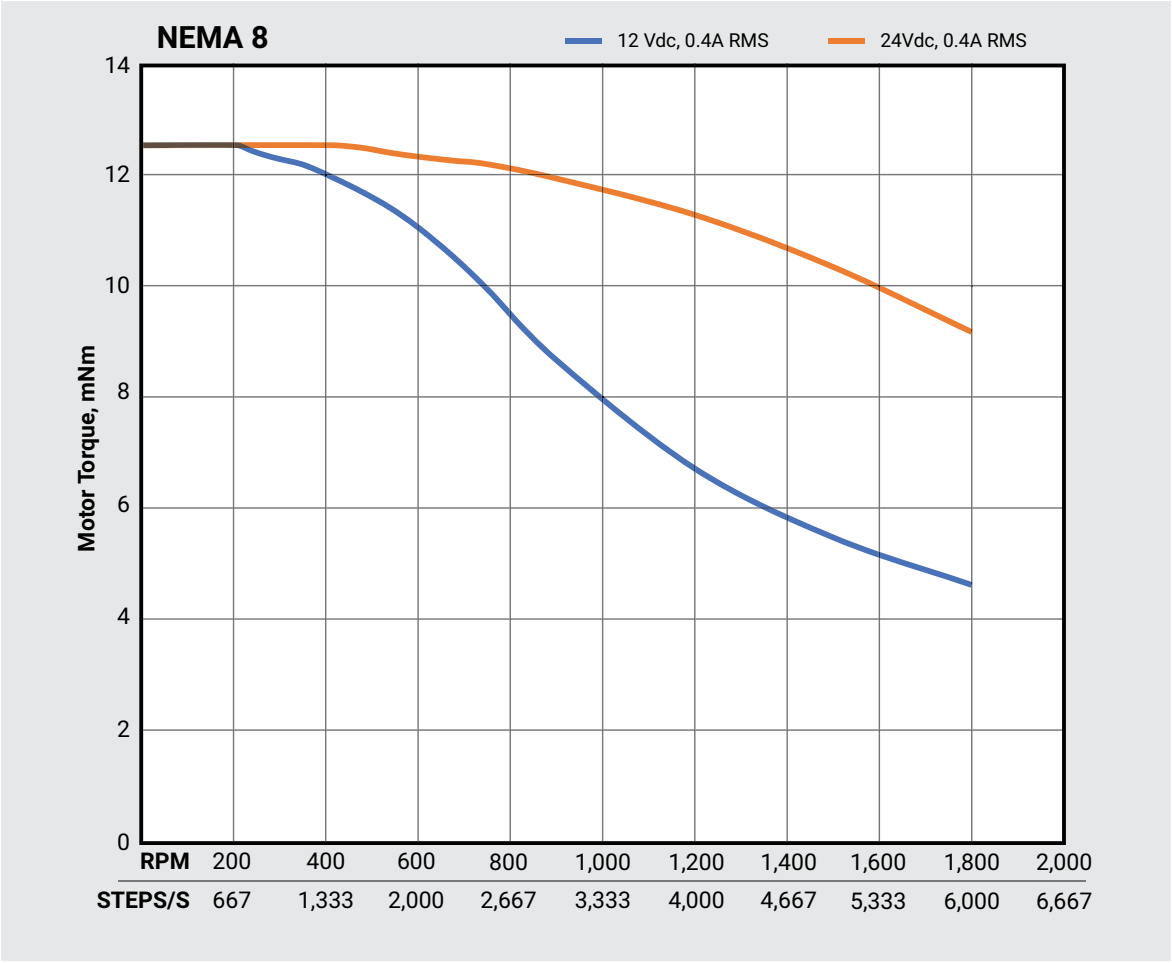
Lead Screw Style	External Diameter	Lead	Travel Per 1.8° Step
0601	6 mm	1 mm	0.005"
0602		2 mm	0.010 mm
0604		4 mm	0.020 mm
0605		5 mm	0.025 mm
0606		6 mm	0.030 mm
0608		8 mm	0.040 mm
0610		10 mm	0.050 mm
0612		12 mm	0.060 mm
18050	3/16"	0.50"	0.0004"
18005		0.05"	0.0003"
25033	1/4"	0.333"	0.002"

Note: See page 56 for wiring harness information and diagram.

NEMA 8 Series



Speed Torque Curves



NEMA 11 Series

Phases 2
Steps/Revolution 200
Step Accuracy ..... ±5%
IP Rating 40

Approvals ..... RoHS
Operating Temp. ..... -20°C–+50°C
Insulation Class ..... B (130°C)
Insulation Resistance ..... 100 MΩ

Step Motor - 4 Lead Bi-Polar

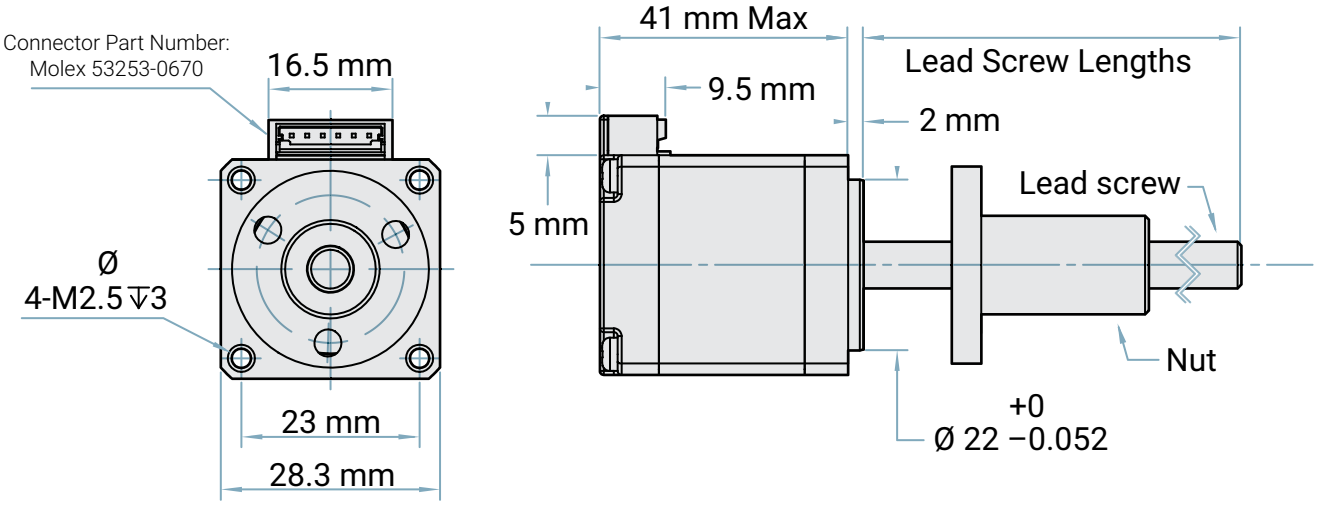
Motor Style	Motor Body Length (mm)	Electrical Connection	Rated Current (Amps)	Winding	
				Ohms	mH
				±10% at 20°C	Typical
NEMA 11	41	Plug In Connector	1	2.7	2.5

Lead Screw Style for NEMA 11 Series

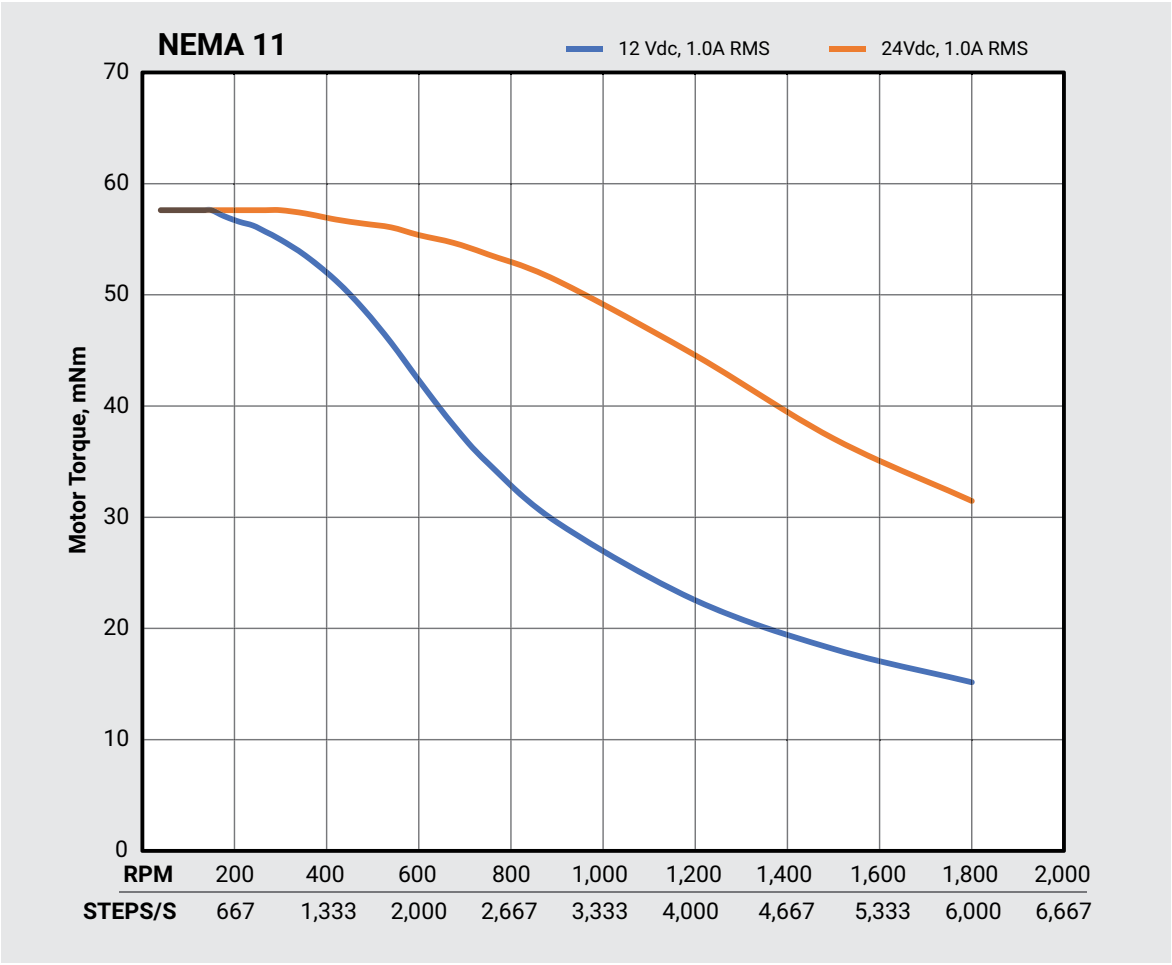
Lead Screw Style	External Diameter	Lead	Travel Per 1.8° Step
0601	6 mm	1 mm	0.005"
0602		2 mm	0.010 mm
0604		4 mm	0.020 mm
0605		5 mm	0.025 mm
0606		6 mm	0.030 mm
0608		8 mm	0.040 mm
0610		10 mm	0.050 mm
0612		12 mm	0.060 mm
25033	1/4"	0.333"	0.002"

Note: See page 56 for wiring harness information and diagram.

NEMA 11 Series



Speed Torque Curves



NEMA 14 Series

Phases 2
Steps/Revolution 200
Step Accuracy ..... ±5%
IP Rating 40

Approvals ..... RoHS
Operating Temp. ..... -20°C–+50°C
Insulation Class ..... B (130°C)
Insulation Resistance ..... 100 MΩ

Step Motor - 4 Lead Bi-Polar

Motor Style	Motor Body Length (mm)	Electrical Connection	Rated Current (Amps)	Winding	
				Ohms	mH
				±10% at 20°C	Typical
NEMA 14	36	Plug In Connector	1.5	1.61	2.5

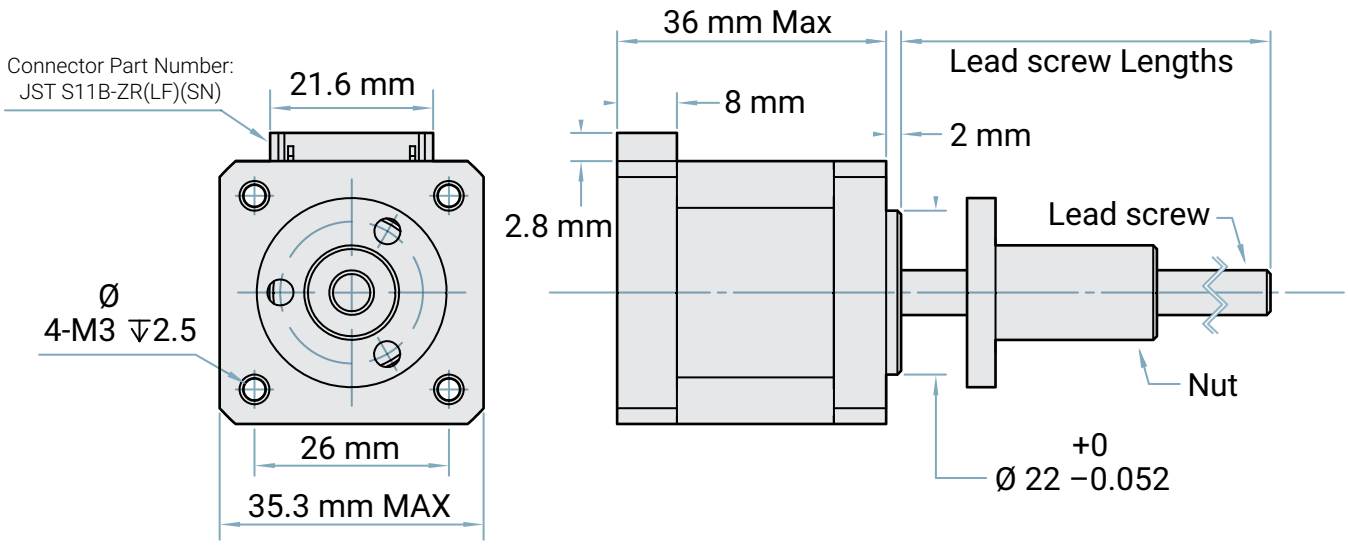
Lead Screw Style for NEMA 14 Series

Lead Screw Style	External Diameter	Lead	Travel Per 1.8° Step
0601	6 mm	1 mm	0.005 mm
0602		2 mm	0.010 mm
0604		4 mm	0.020 mm
0605		5 mm	0.025 mm
0606		6 mm	0.030 mm
0608		8 mm	0.040 mm
0610		10 mm	0.050 mm
0612		12 mm	0.060 mm
25033	1/4"	0.333"	0.002"

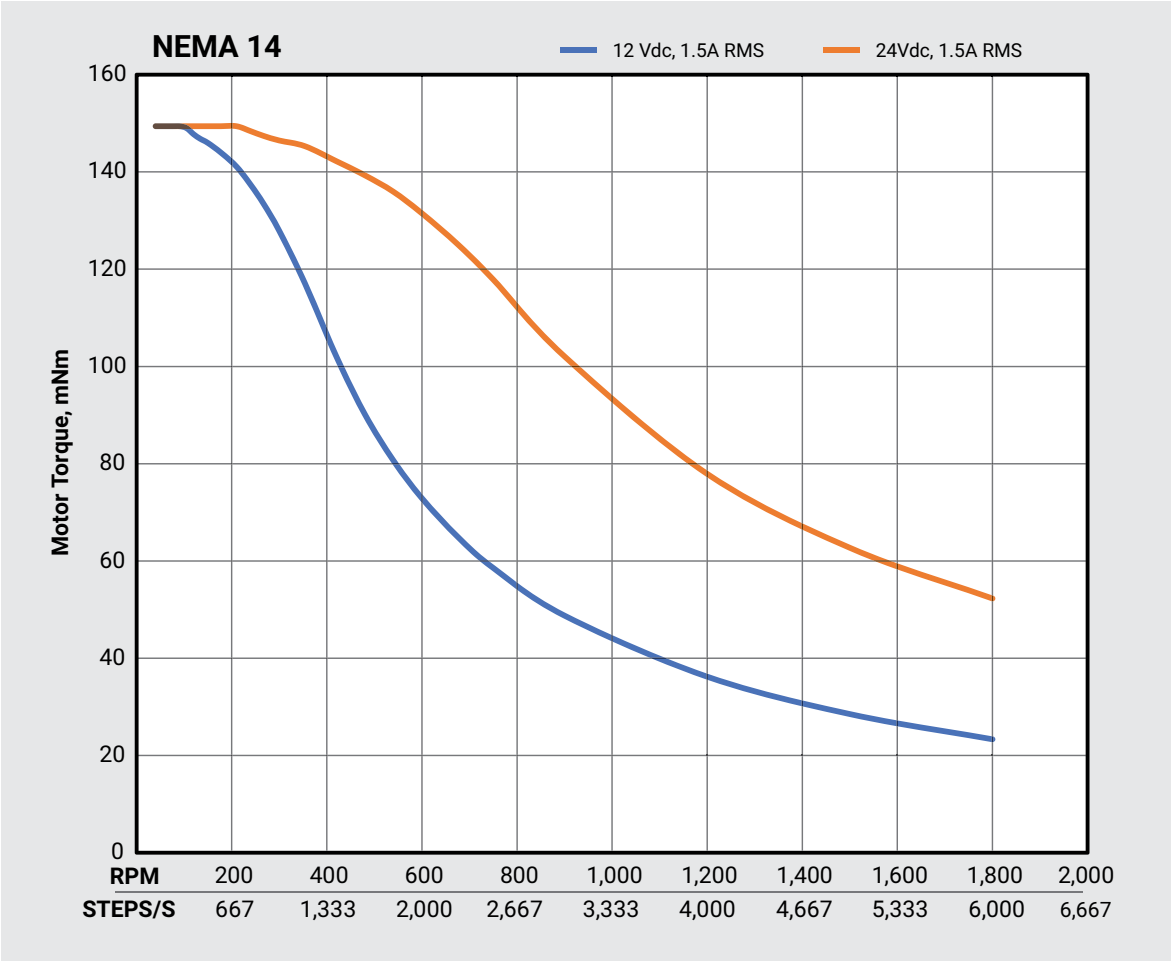
Lead Screw Style	External Diameter	Lead	Travel Per 1.8° Step
1002	10 mm	2 mm	0.010 mm
1004		4 mm	0.020 mm
1005		5 mm	0.025 mm
1006		6 mm	0.030 mm
1008		8 mm	0.040 mm
1010		10 mm	0.050 mm
1012		12 mm	0.060 mm
1016		16 mm	0.080 mm
1025		25 mm	0.125 mm

Note: See page 56 for wiring harness information and diagram.

NEMA 14 Series



Speed Torque Curves



NEMA 17 Series

Phases 2
Steps/Revolution 200
Step Accuracy ..... ±5%
IP Rating 40

Approvals ..... RoHS
Operating Temp. ..... -20°C–+50°C
Insulation Class ..... B (130°C)
Insulation Resistance ..... 100 MΩ

Step Motor - 4 Lead Bi-Polar

Motor Style	Motor Body Length (mm)	Electrical Connection	Rated Current (Amps)	Winding	
				Ohms ±10% at 20°C	mH Typical
NEMA 17 Single Stack	39.8	Plug In Connector	2	1.04	2.73
NEMA 17 Double Stack	48.3	Plug In Connector	2	1.30	2.90

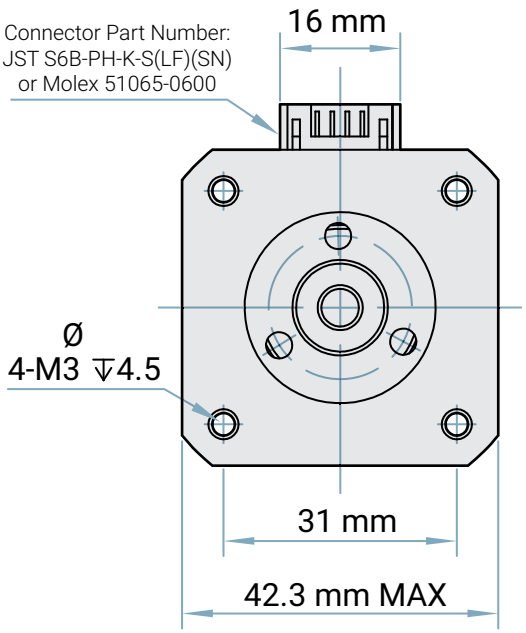
Lead Screw Style for NEMA 17 Series

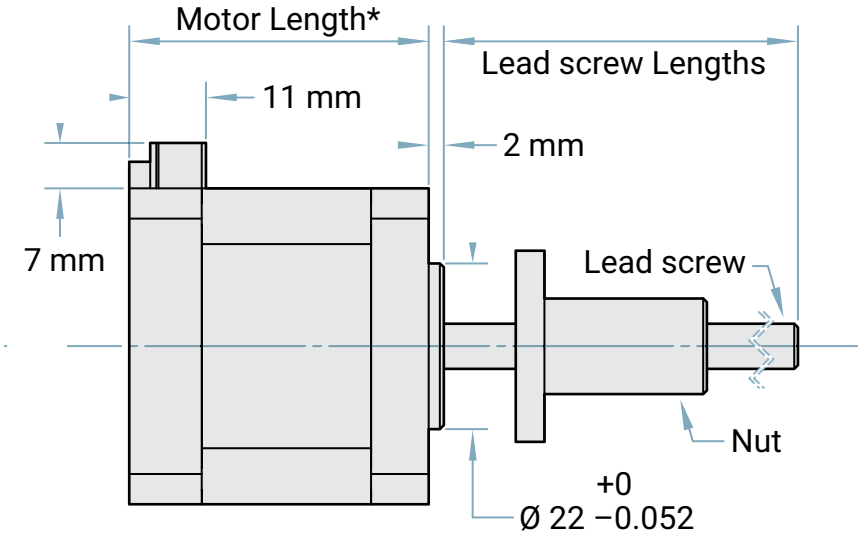
Lead Screw Style	External Diameter	Lead	Travel Per 1.8° Step
0601	6 mm	1 mm	0.005 mm
0602		2 mm	0.010 mm
0604		4 mm	0.020 mm
0605		5 mm	0.025 mm
0606		6 mm	0.030 mm
0608		8 mm	0.040 mm
0610		10 mm	0.050 mm
0612		12 mm	0.060 mm
25033	1/4"	0.333"	0.002"
37020	3/8"	0.2"	0.001"
1001	10 mm	1 mm	0.005 mm
1002		2 mm	0.010 mm
1004		4 mm	0.020 mm
1005		5 mm	0.025 mm
1006		6 mm	0.030 mm
1008		8 mm	0.040 mm

Lead Screw Style	External Diameter	Lead	Travel Per 1.8° Step
1010	10mm	10 mm	0.050 mm
1012		12 mm	0.060 mm
1016		16 mm	0.080 mm
1025		25 mm	0.125 mm
43100	7/16"	1"	0.005"
1201	12mm	1 mm	0.005 mm
1202		2 mm	0.010 mm
1204		4 mm	0.020 mm
1205		5 mm	0.025 mm
1206		6 mm	0.030 mm
1208		8 mm	0.040 mm
1210		10 mm	0.050 mm
1212		12 mm	0.060 mm
1216		16 mm	0.080 mm
1225		25 mm	0.125 mm
50025	1/2"	0.25"	0.0013"

Note: See page 56 for wiring harness information and diagram.

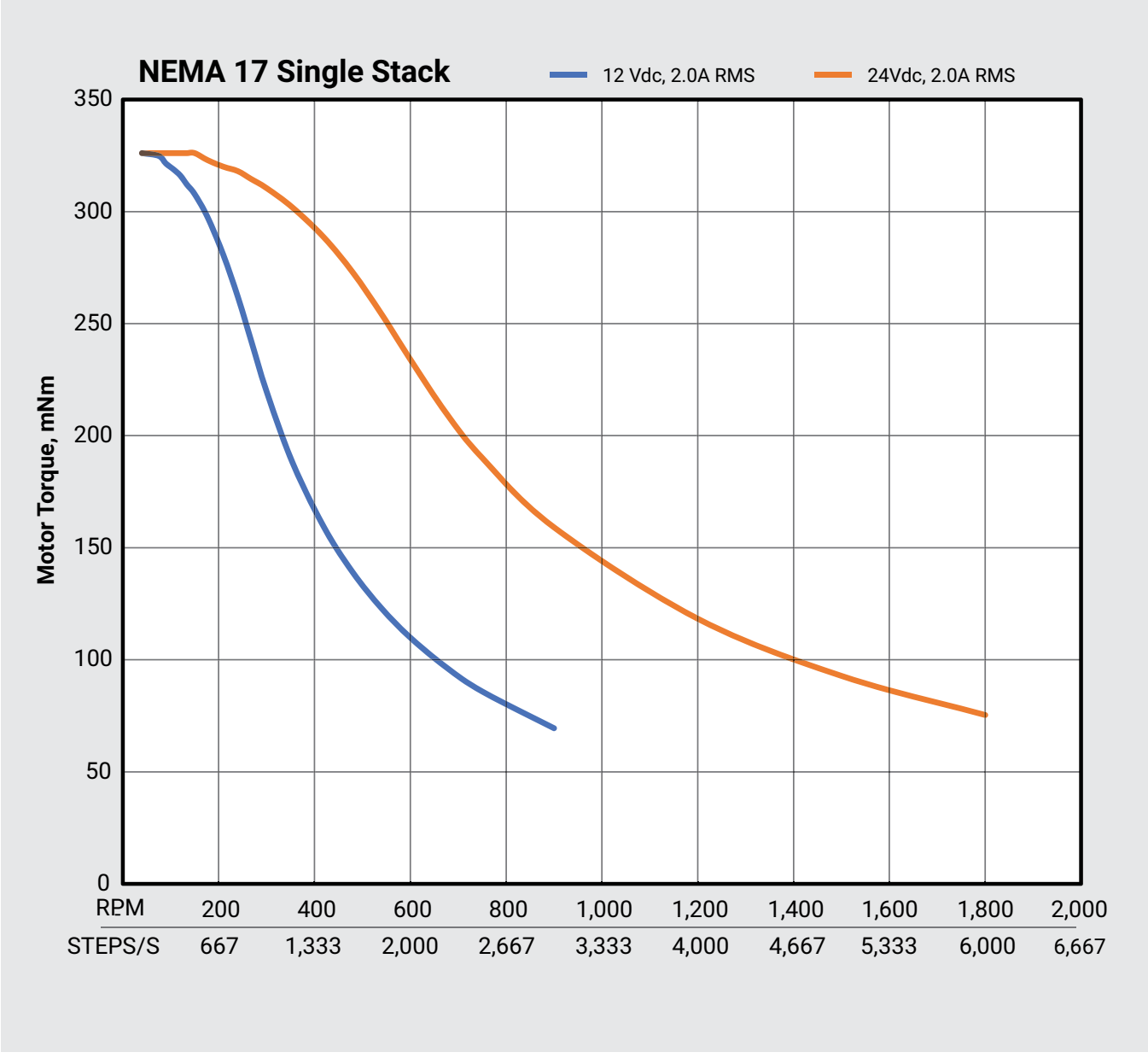
NEMA 17 Series



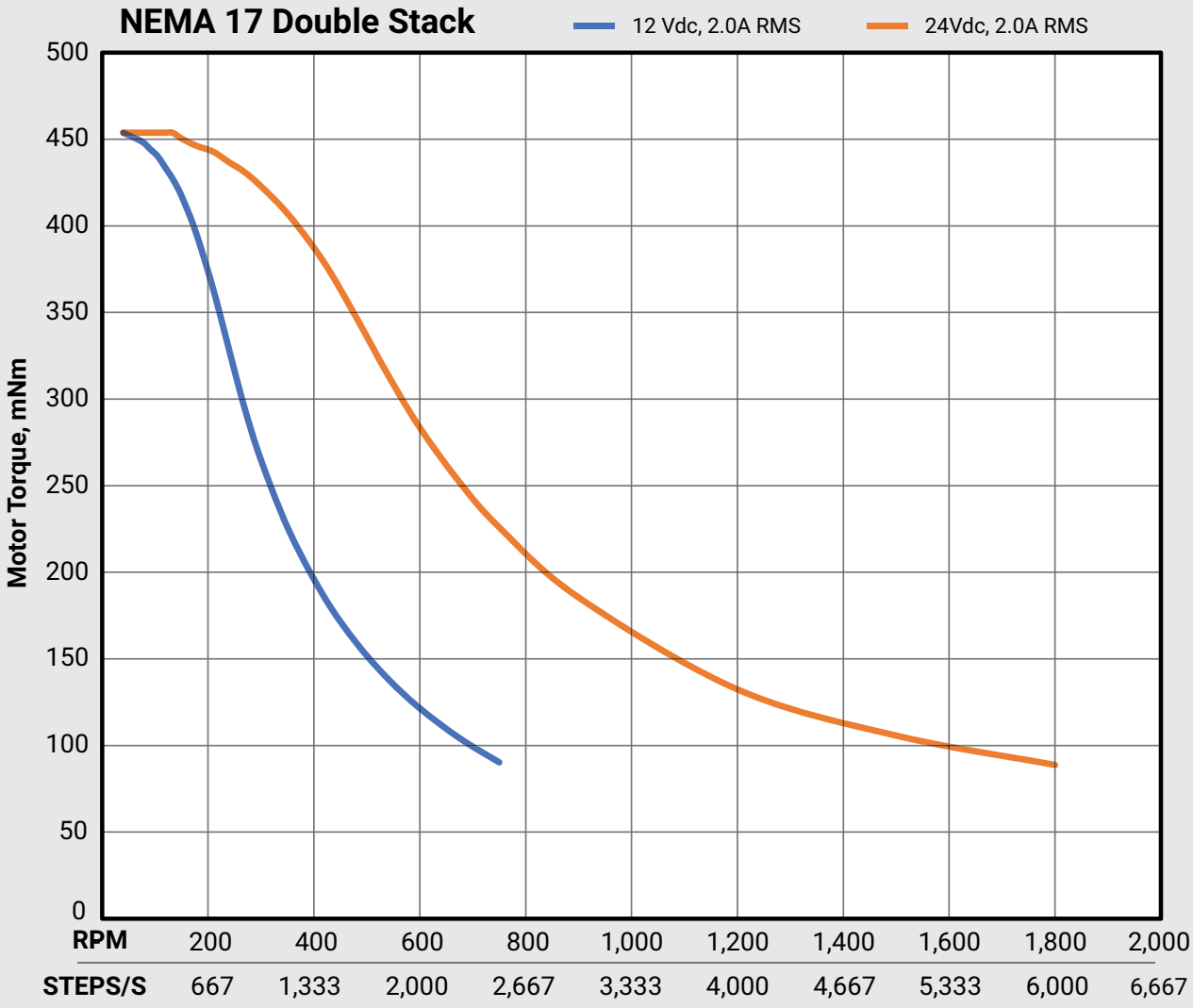


*** Motor Lengths:**
NEMA 17 Single Stack (171): 39.8 mm
NEMA 17 Double Stack (172): 48.3 mm

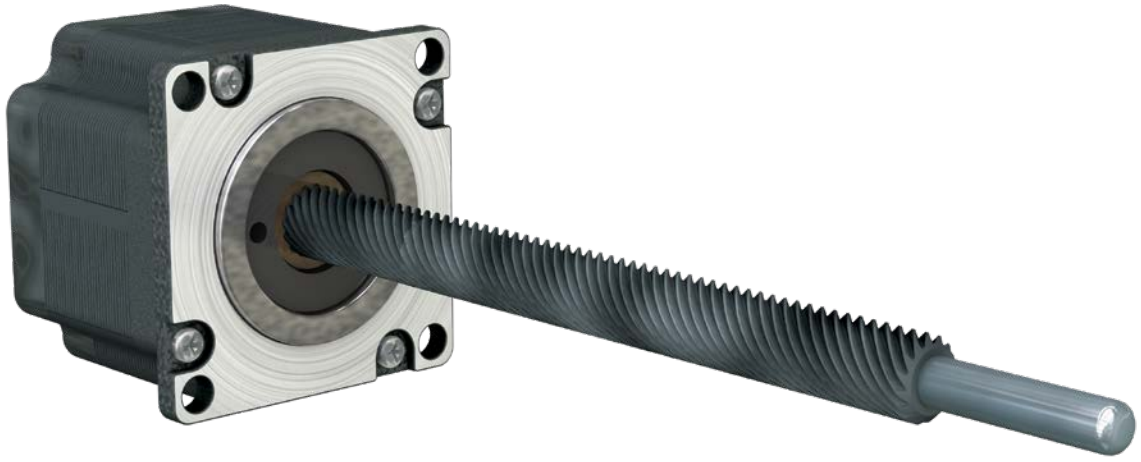
NEMA 17 Series Speed Torque Curves



NEMA 17 Series Speed Torque Curves



NEMA 23 Series



Phases 2
Steps/Revolution 200
Step Accuracy ..... ±5%
IP Rating 40

Approvals ..... RoHS
Operating Temp. ..... -20°C–+50°C
Insulation Class ..... B (130°C)
Insulation Resistance ..... 100 MΩ

Step Motor - 4 Lead Bi-Polar

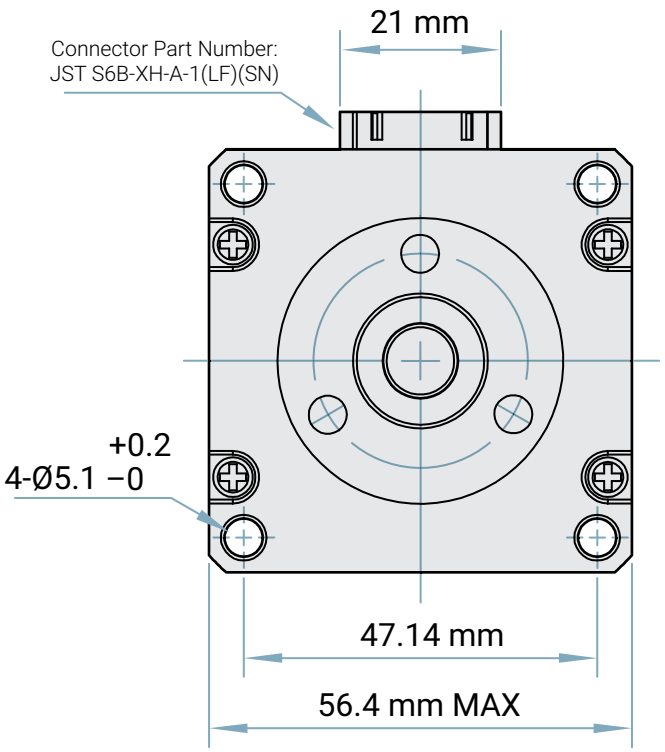
Motor Style	Motor Body Length (mm)	Electrical Connection	Rated Current (Amps)	Winding		Note
				Ohms ±10% at 20°C	mH Typical	
NEMA 23 Single Stack	57	Plug In Connector	2.2	1.6	7.2	Standard
NEMA 23 Double Stack	79	Plug In Connector	3.0	1.1	5.0	Standard
NEMA 23 Power Plus	79	Plug In Connector	3.0	1.1	3.7	PowerPlus

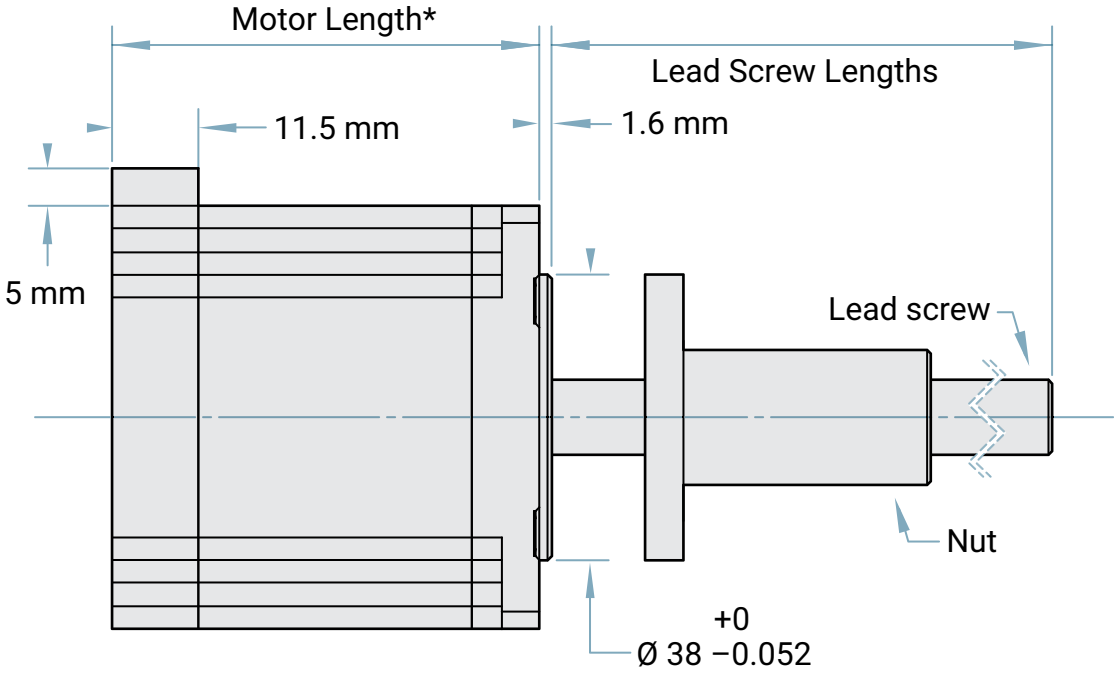
Lead Screw Style for NEMA 23 Series

Lead Screw Style	External Diameter	Lead	Travel Per 1.8° Step
37020	3/8"	0.2"	0.001"
1001	10 mm	1 mm	0.005 mm
1002		2 mm	0.010 mm
1004		4 mm	0.020 mm
1005		5 mm	0.025 mm
1006		6 mm	0.030 mm
1008		8 mm	0.040 mm
1010		10 mm	0.050 mm
1012		12 mm	0.060 mm
1016		16 mm	0.080 mm
1025		25 mm	0.125 mm
43100	7/16"	1"	0.005"
1201	12 mm	1 mm	0.005 mm
1202		2 mm	0.010 mm
1204		4 mm	0.020 mm
1205		5 mm	0.025 mm
1206	12 mm	6 mm	0.030 mm
1208		8 mm	0.040 mm
1210		10 mm	0.050 mm
1212		12 mm	0.060 mm
1216		16 mm	0.080 mm
1225		25 mm	0.125 mm
50025	1/2"	0.25"	0.0013"
1601	16 mm	1 mm	0.005 mm
1602		2 mm	0.010 mm
1604		4 mm	0.020 mm
1605		5 mm	0.025 mm
1606		6 mm	0.030 mm
1608		8 mm	0.040 mm
1610		10 mm	0.050 mm
1612		12 mm	0.060 mm
1616		16 mm	0.080 mm
1625		25 mm	0.125 mm

Note: See page 56 for wiring harness information and diagram.

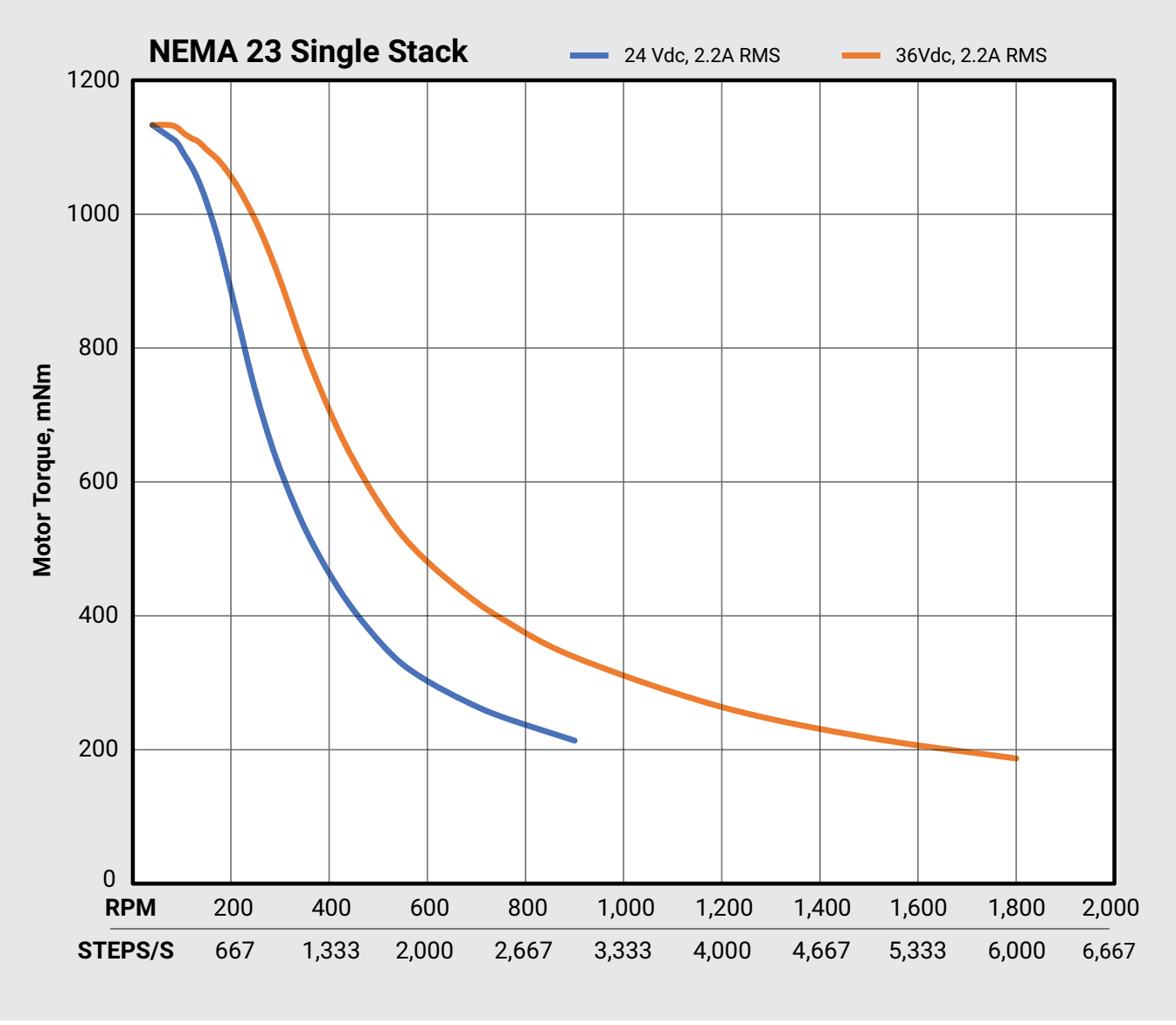
NEMA 23 Series



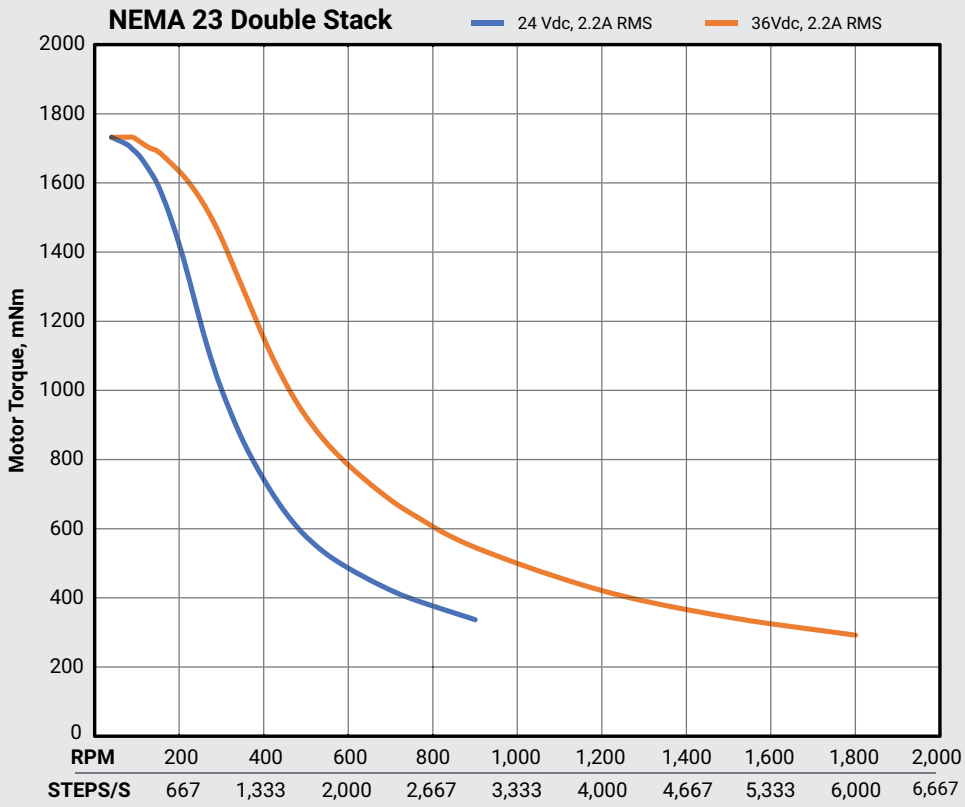


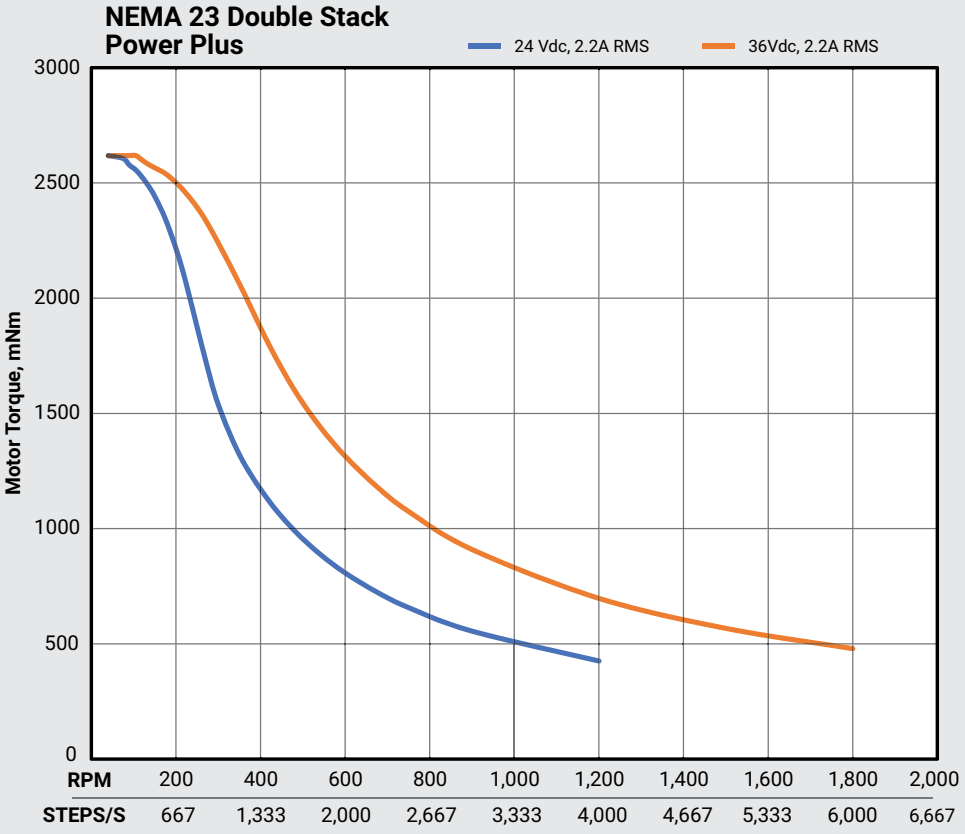
*** Motor Lengths:**
NEMA 23 Single Stack (231): 57 mm
NEMA 23 Double Stack and Power Plus (232, 23P): 79 mm

NEMA 23 Series Speed Torque Curves



NEMA 23 Series Speed Torque Curves

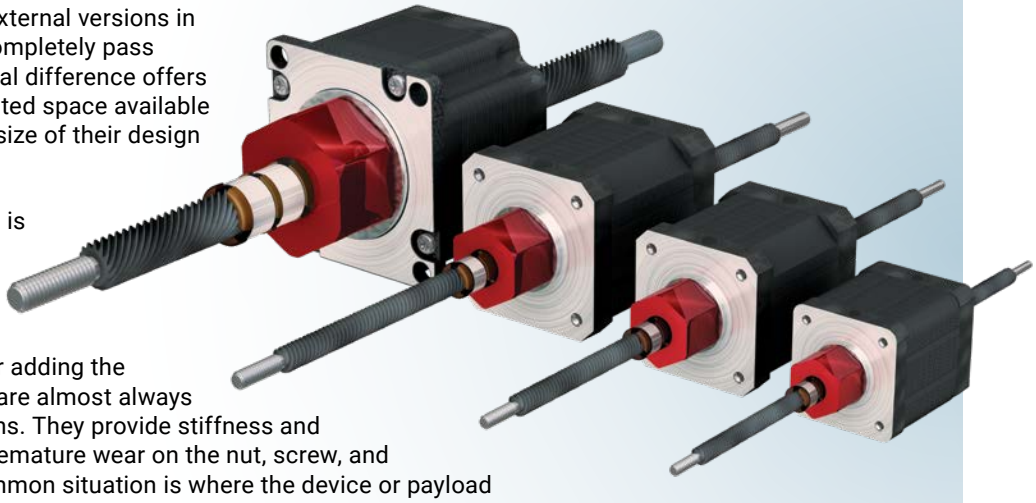




Non-Captive Lead Screw Motors

Deciding when to use a non-captive linear actuator

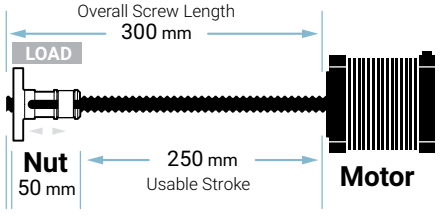
Non-captive types of lead screw driven linear actuators are different from the more common external versions in that they allow the lead screw to completely pass through the motor. This fundamental difference offers advantages for those that have limited space available or are looking to shrink the overall size of their design package.



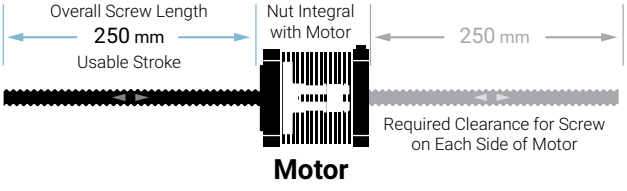
The payload or object being moved is attached to the motor, and has screw ends that are typically fixed. In most cases, this setup can allow for a shorter overall screw to be used. It is also ideal for adding the external linear guide bearings that are almost always required for non-captive applications. They provide stiffness and eliminate deflection that causes premature wear on the nut, screw, and internal motor bearings. A less common situation is where the device or payload is attached to the end of the screw. This is only used for very light loads and requires external linear guidance for stiffness. It is an arrangement that also requires clearance for the screw to extend out the opposite side of the motor.

Traditionally, this nut has been a standard nut with no mechanism to account for the play between the external threads of the screw and the internal threads of the nut. PBC Linear have the only anti-backlash nut and lead screw assembly available off-the-shelf in a non-captive configuration.

External Configuration



Non-Captive Configuration



Hybrid Linear Actuator Selection Chart

Motor Frame	Screw Sizes				
	3/16"	6 mm	1/4"	3/8"	10 mm
NEMA 11	●				
NEMA 14	●	●	●		
NEMA 17	●	●	●		
NEMA 23				●	●

This unique combination offers the best positional performance available in a non-captive hybrid actuator by utilizing our patented Constant Force Technology (CFT), which provides greater than two-times the superior backlash compensation as tested against competitors.

This advantage means that the self-lubricating nut will provide lubricant-free, consistent performance and preload over its lifetime. In addition, screws are available either uncoated or with a proprietary PTFE coating. These screws come with standard lead accuracy of 0.003 inches per foot, which is three-times better than typical screws on the market.

Non-Captive Part Number Configurator

Type	Thread Dir.	Diameter and Lead	Coating	Screw Length	Nut	Motor	Left End	Right End
LS	R	0000	T	0250.00	NCF	000	THR	THR

Type
LS - Lead Screw

Thread Direction
R - Right
L - Left (**Note:** Contact Factory)

Coating
T - PTFE
U - Uncoated

Screw Length
Inch - 0000.00
Metric - 0000
Note: Screw type selected determines if length is inch or metric.

Diameter and Lead

Motor	Code	Diameter	Lead
N11	18050	3/16"	0.50"
	18005		0.05"
N14 and N17	25033	1/4"	0.333"
	0601	6 mm	1 mm
	0602		2 mm
	0604		4 mm
	0605		5 mm
	0606		6 mm
	0608		8 mm
	0610		10 mm
	0612		12 mm
N23	37020	3/8"	0.20"
	1001	10 mm	1 mm
	1002		2 mm
	1004		4 mm
	1005		5 mm
	1006		6 mm
	1008		8 mm
	1010		10 mm
	1012		12 mm
	1016		16 mm
	1025		25 mm

Non-Captive Lead Screw Nuts

NS	Non-Captive Standard
NCF	Non-Captive Anti-Backlash

Non-Captive Motor Size

111	Nema 11 (28 mm frame size, 32 mm long) (Requires a 3/16" screw)
112	Nema 11 (283 mm frame size, 41 mm long) (Requires a 3/16" screw)
141	Nema 14 (31 mm frame size) (Requires a 3/16", 1/4", 6 mm screw)
171	Nema 17 (43 mm frame size, 34 mm long) (Requires a 3/16", 1/4", 6 mm screw)
172	Nema 17 (43 mm frame size, 40 mm long) (Requires a 3/16", 1/4", 6 mm screw)
173	Nema 17 (43 mm frame size, 48 mm long) (Requires a 3/16", 1/4", 6 mm screw)
231	Nema 23 (47 mm frame size, 45 mm long) (Requires a 10 mm screw)
232	Nema 23 (47 mm frame size, 57 mm long) (Requires a 10 mm screw)

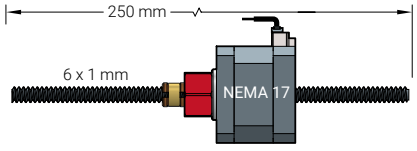
Left and/or Right Ends

NNN	None
THR	Threaded

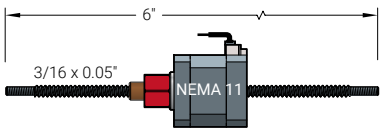
Note: See individual motor pages for threaded journal diagram.

Sample Part Numbers

Left **Right**



LSR0601T-0250-NCF171-NNN-NNN



LSR18005T-06.00-NS111-THR-THR

Configure

It Now

NEMA 11 Non-Captive Series

Phases 2
Steps/Revolution 200
Step Accuracy ..... ±5%
IP Rating 40

Approvals ..... RoHS
Operating Temp. ..... -20°C–+50°C
Insulation Class ..... B (130°C)
Insulation Resistance ..... 100 MΩ

Step Motor - 4 Lead Bi-Polar

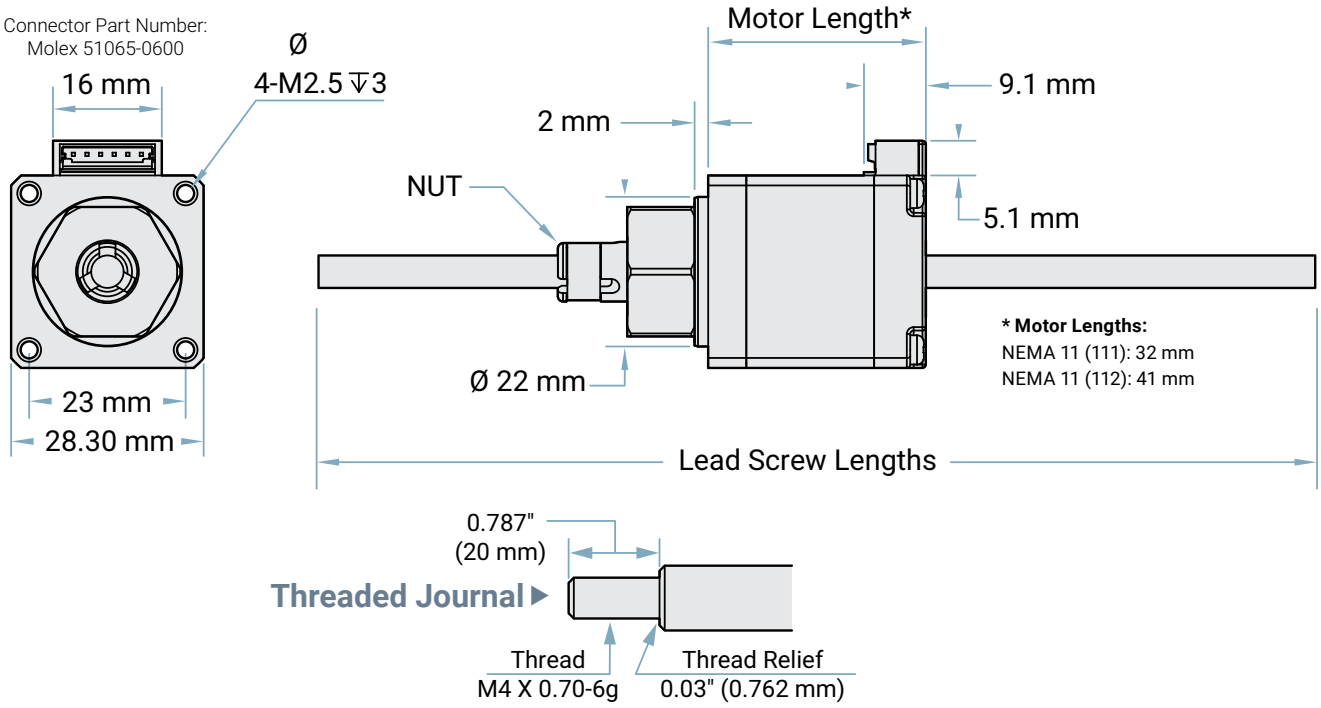
Motor Style	Part Number	Motor Body Length (mm)	Electrical Connection	Rated Current (Amps)	Winding	
					Ohms ±10% at 20°C	mH Typical
NEMA 11	111	32	Plug In Connector	0.67	6.1	5.4
NEMA 11	112	41	Plug In Connector	0.95	3.8	3.5

Lead Screw Style for NEMA 11 Series

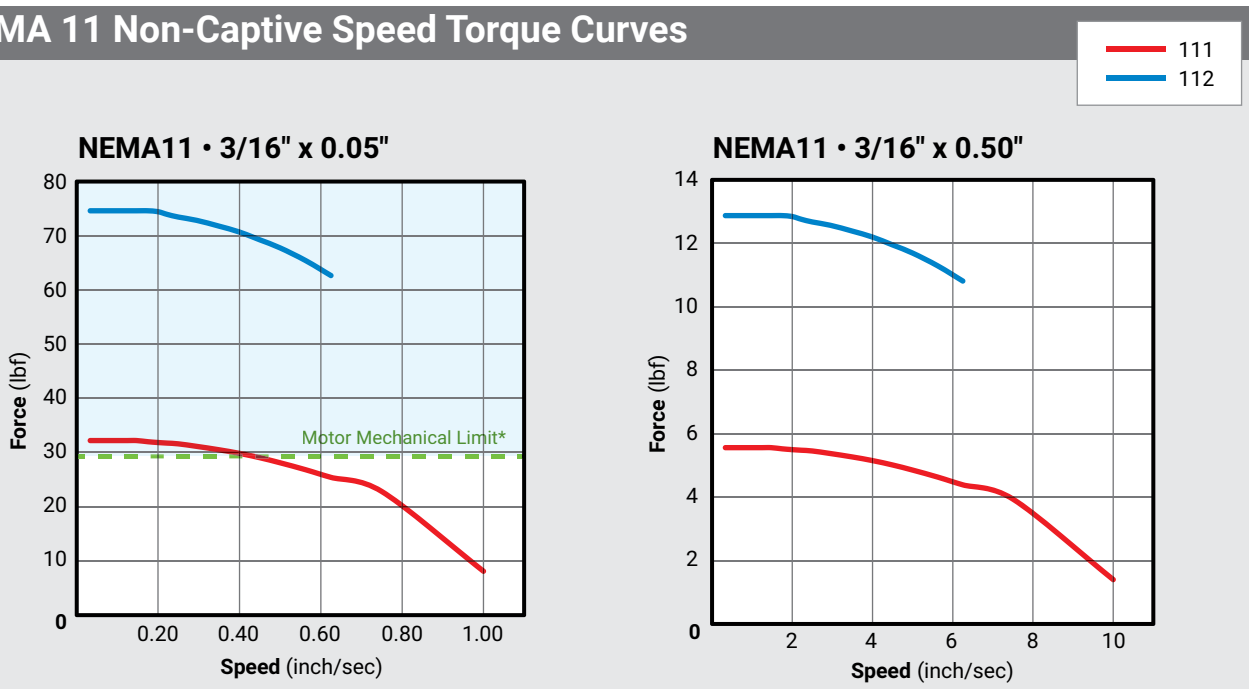
Lead Screw Style	External Diameter	Lead	Travel Per 1.8° Step
19050	3/16"	0.50"	0.00250"
19005		0.05"	0.00025"

Note: See page 56 for wiring harness information and diagram.

NEMA 11 Non-Captive Series



NEMA 11 Non-Captive Speed Torque Curves



* Motor Mechanical Limit is based on internal motor design and capacity. Do not exceed the Mechanical Limit.

Notes: (1) Force limit of the lead screw nut is determined separately using the values from the standard nut (p18) or anti-backlash nut (p19). Additionally the application speed should be taken into account using the Load Derate curves on page 13.
(2) Safety factors should be applied to the capacities in the above charts. Validation of calculated loads should be empirically tested in application conditions.

NEMA 14 Non-Captive Series

Phases 2
Steps/Revolution 200
Step Accuracy ..... ±5%
IP Rating 40
Approvals ..... RoHS
Operating Temp. ..... -20°C–+50°C
Insulation Class ..... B (130°C)
Insulation Resistance ..... 100 MΩ

Step Motor - 4 Lead Bi-Polar

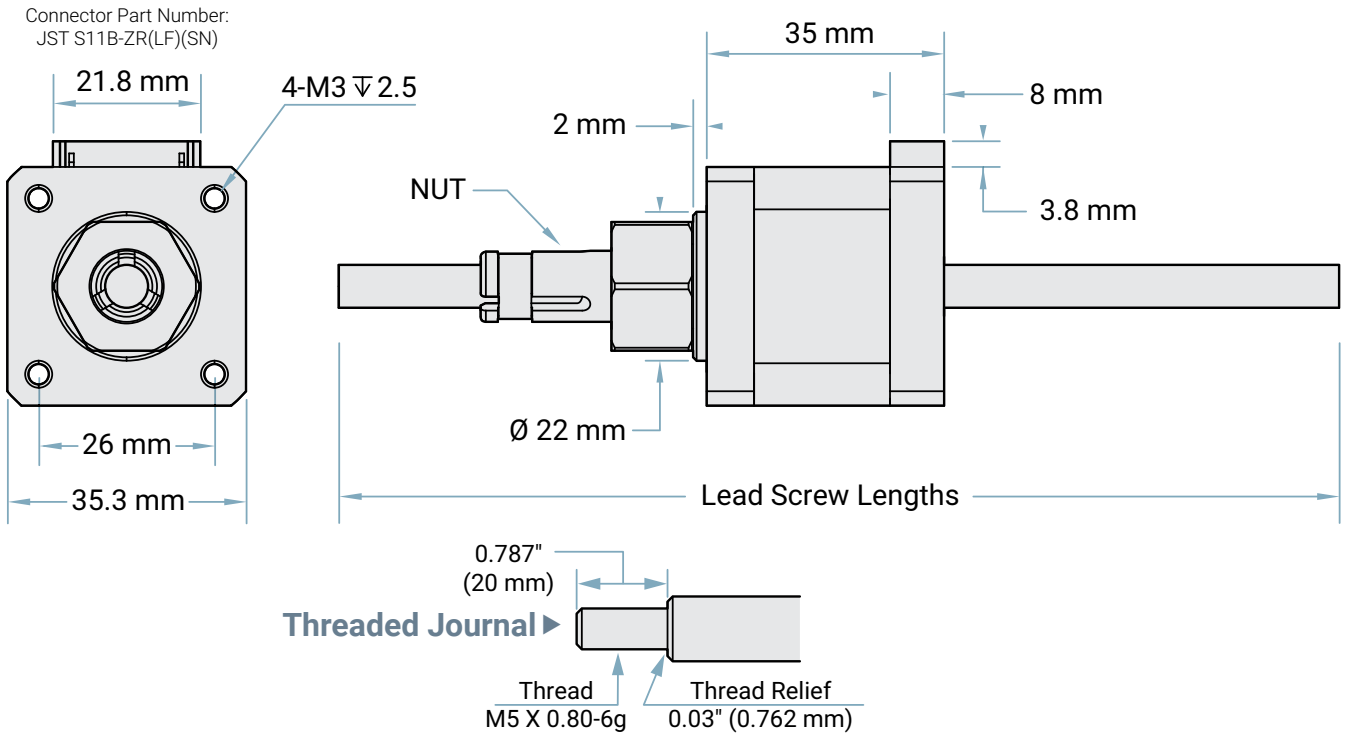
Motor Style	Part Number	Motor Body Length (mm)	Electrical Connection	Rated Current (Amps)	Winding	
					Ohms ±10% at 20°C	mH Typical
NEMA 14	141	35	Plug In Connector	1.5	1.60	2.5

Lead Screw Style for NEMA 14 Series

Lead Screw Style	External Diameter	Lead	Travel Per 1.8° Step
19050	3/16"	0.50"	0.00250"
19005		0.05"	0.00025"
0601	6 mm	1 mm	0.005 mm
0602		2 mm	0.010 mm
0604		4 mm	0.020 mm
0605		5 mm	0.025 mm
0606		6 mm	0.030 mm
0608		8 mm	0.040 mm
0610		10 mm	0.050 mm
0612		12 mm	0.060 mm
25033	1/4"	.333"	0.002"

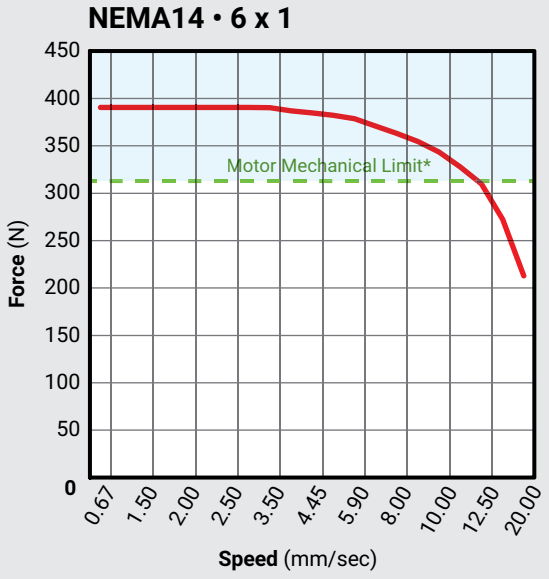
Note: See page 56 for wiring harness information and diagram.

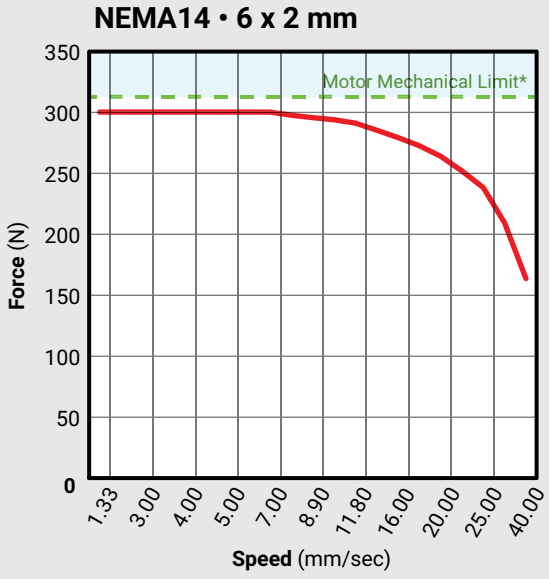
NEMA 14 Non-Captive Series



NEMA 14 Non-Captive Speed Torque Curves

141





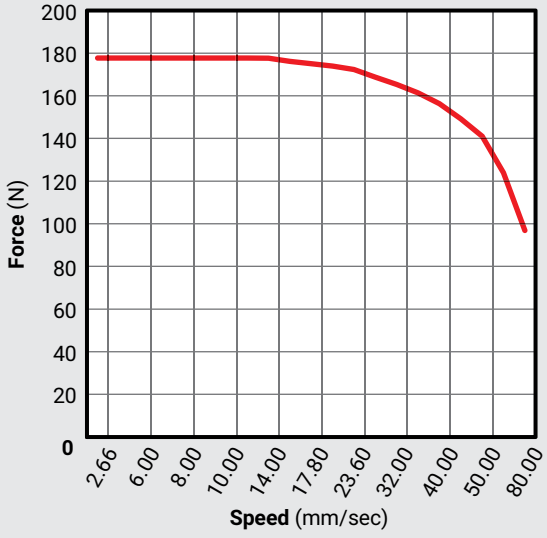
* Motor Mechanical Limit is based on internal motor design and capacity. Do not exceed the Mechanical Limit.

Notes: (1) Force limit of the lead screw nut is determined separately using the values from the standard nut (p18) or anti-backlash nut (p19). Additionally the application speed should be taken into account using the Load Derate curves on page 13.
(2) Safety factors should be applied to the capacities in the above charts. Validation of calculated loads should be empirically tested in application conditions.

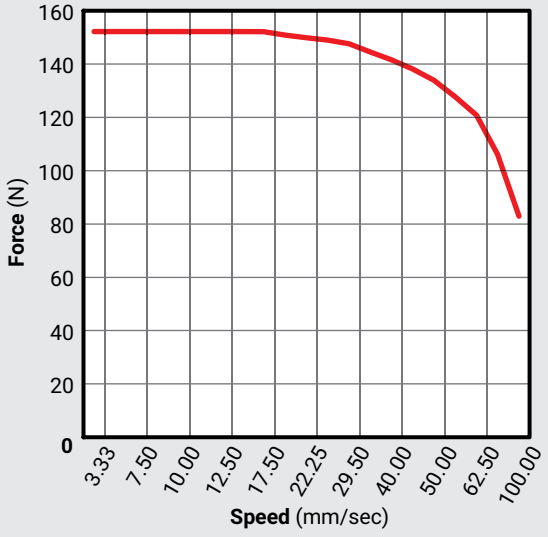
NEMA 14 Non-CaptiveSpeed Torque Curves

141

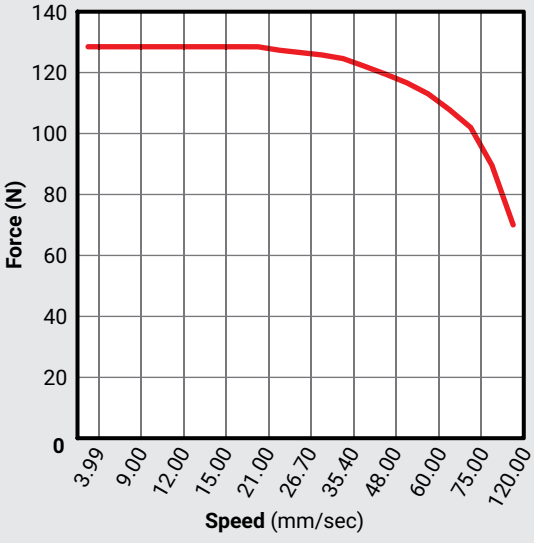
NEMA14 • 6 x 4 mm



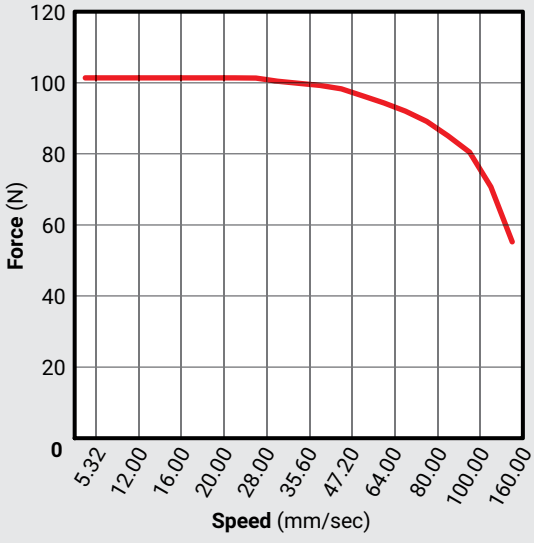
NEMA14 • 6 x 5 mm



NEMA14 • 6 x 6 mm



NEMA14 • 6 x 8 mm



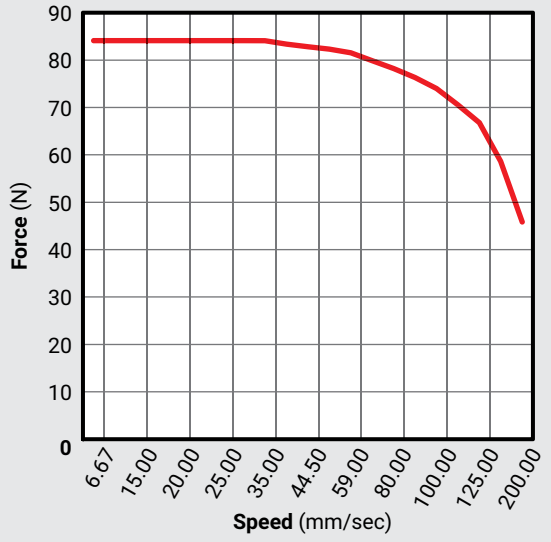
* Motor Mechanical Limit is based on internal motor design and capacity. Do not exceed the Mechanical Limit.

Notes: (1) Force limit of the lead screw nut is determined separately using the values from the standard nut (p18) or anti-backlash nut (p19). Additionally the application speed should be taken into account using the Load Derate curves on page 13.
(2) Safety factors should be applied to the capacities in the above charts. Validation of calculated loads should be empirically tested in application conditions.

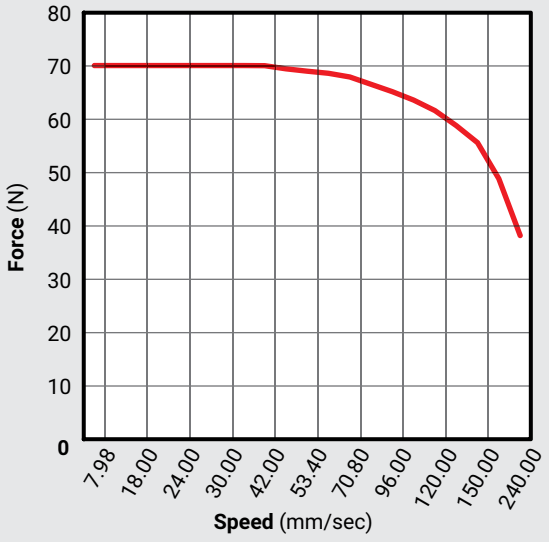
NEMA 14 Non-Captive Speed Torque Curves

141

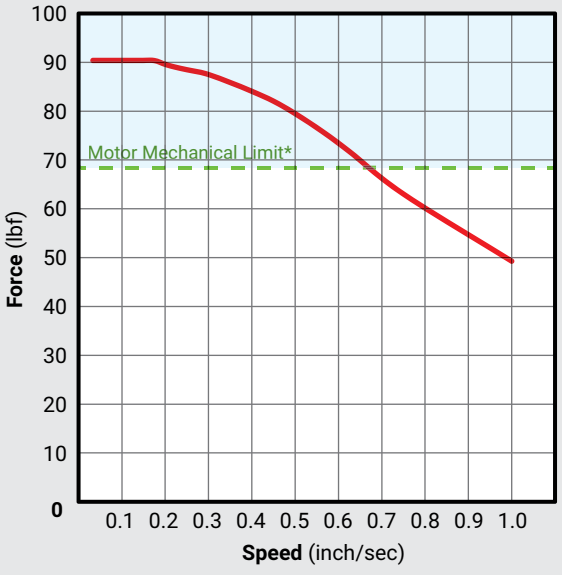
NEMA14 • 6 x 10 mm



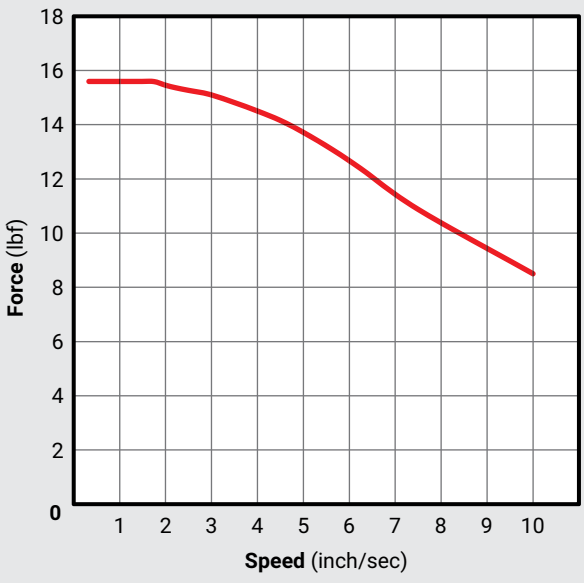
NEMA14 • 6 x 12 mm



NEMA14 • 3/16" x 0.05"



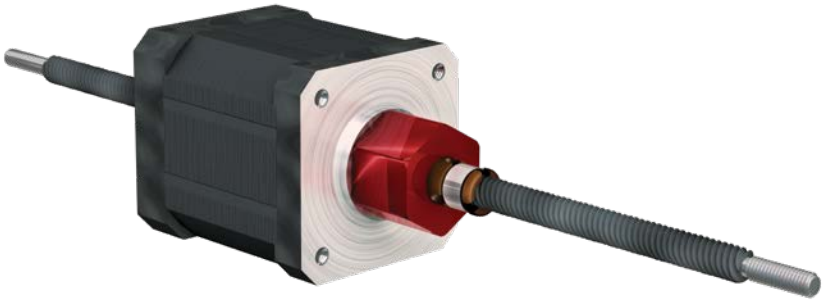
NEMA14 • 3/16" x 0.50"



* Motor Mechanical Limit is based on internal motor design and capacity. Do not exceed the Mechanical Limit.

Notes: (1) Force limit of the lead screw nut is determined separately using the values from the standard nut (p18) or anti-backlash nut (p19). Additionally the application speed should be taken into account using the Load Derate curves on page 13.
(2) Safety factors should be applied to the capacities in the above charts. Validation of calculated loads should be empirically tested in application conditions.

NEMA 17 Non-Captive Series



Phases 2
Steps/Revolution 200
Step Accuracy ..... ±5%
IP Rating 40

Approvals ..... RoHS
Operating Temp. ..... -20°C–+50°C
Insulation Class ..... B (130°C)
Insulation Resistance ..... 100 MΩ

Step Motor - 4 Lead Bi-Polar

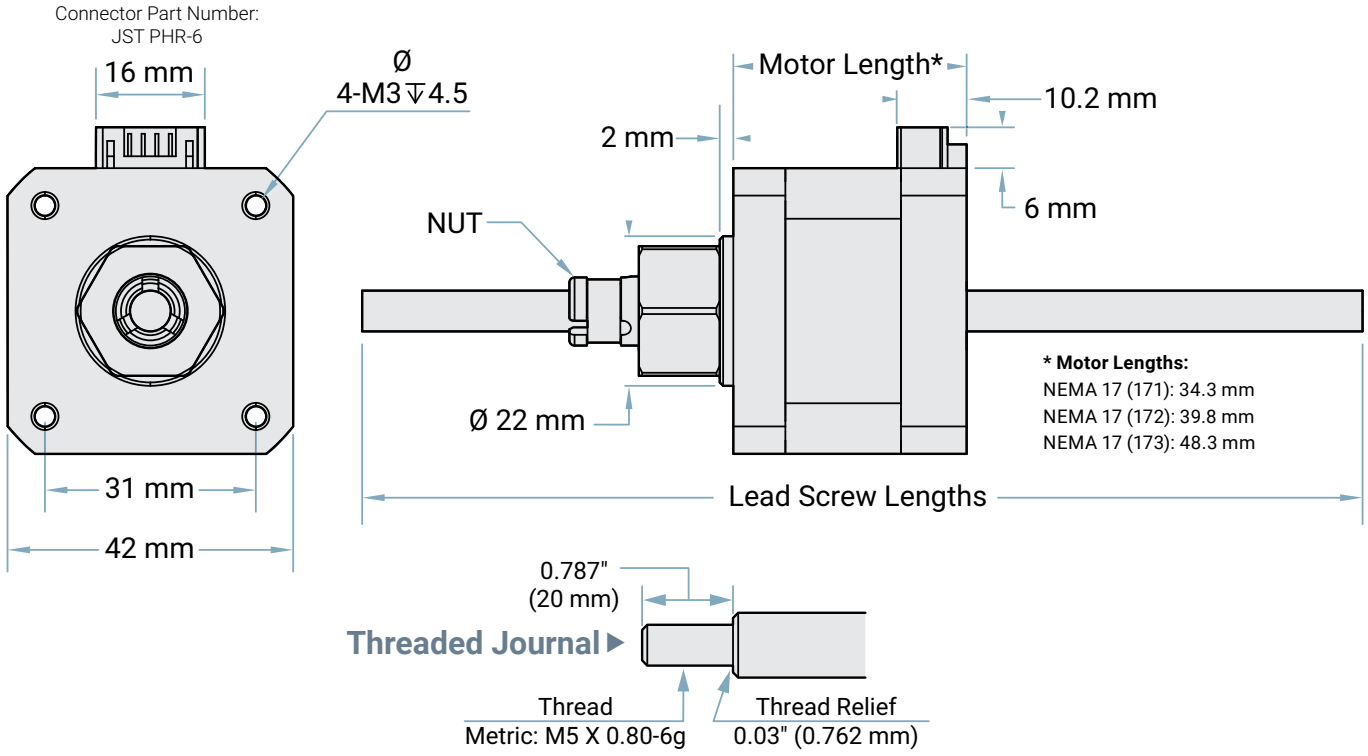
Motor Style	Part Number	Motor Body Length (mm)	Electrical Connection	Rated Current (Amps)	Winding	
					Ohms ±10% at 20°C	mH Typical
NEMA 17	171	34.3	Plug In Connector	1.0	4.30	7.7
NEMA 17	172	39.8	Plug In Connector	1.5	1.98	5.3
NEMA 17	173	48.3	Plug In Connector	2.0	1.30	3.1

Lead Screw Style for NEMA 17 Series

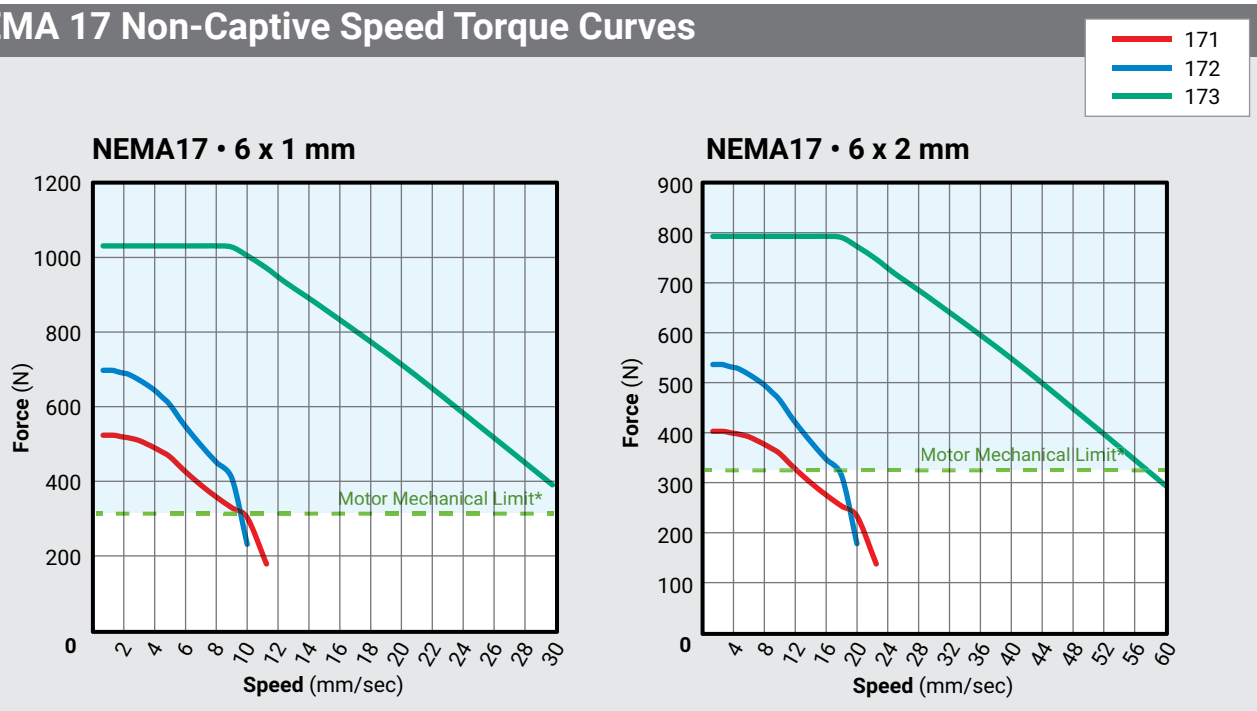
Lead Screw Style	External Diameter	Lead	Travel Per 1.8° Step
19050	3/16"	0.50"	0.00250"
19005		0.05"	0.00025"
0601	6 mm	1 mm	0.005 mm
0602		2 mm	0.010 mm
0604		4 mm	0.020 mm
0605		5 mm	0.025 mm
0606		6 mm	0.030 mm
0608		8 mm	0.040 mm
0610		10 mm	0.050 mm
0612		12 mm	0.060 mm
25033	1/4"	0.333"	0.002"

Note: See page 56 for wiring harness information and diagram.

NEMA 17 Non-Captive Series



NEMA 17 Non-Captive Speed Torque Curves



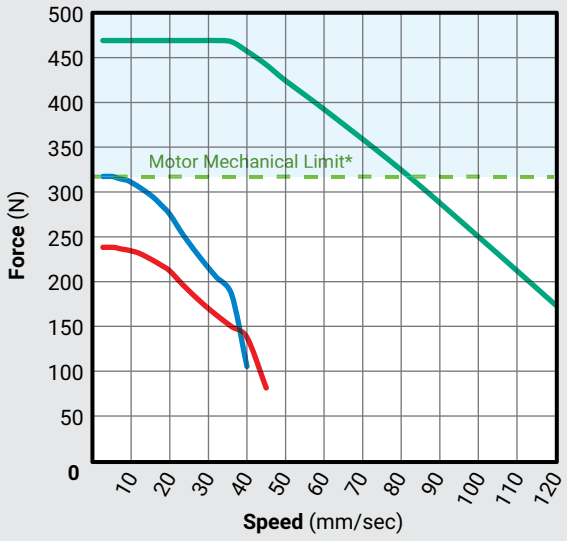
* Motor Mechanical Limit is based on internal motor design and capacity. Do not exceed the Mechanical Limit.

Notes: (1) Force limit of the lead screw nut is determined separately using the values from the standard nut (p18) or anti-backlash nut (p19). Additionally the application speed should be taken into account using the Load Derate curves on page 13.
(2) Safety factors should be applied to the capacities in the above charts. Validation of calculated loads should be empirically tested in application conditions.

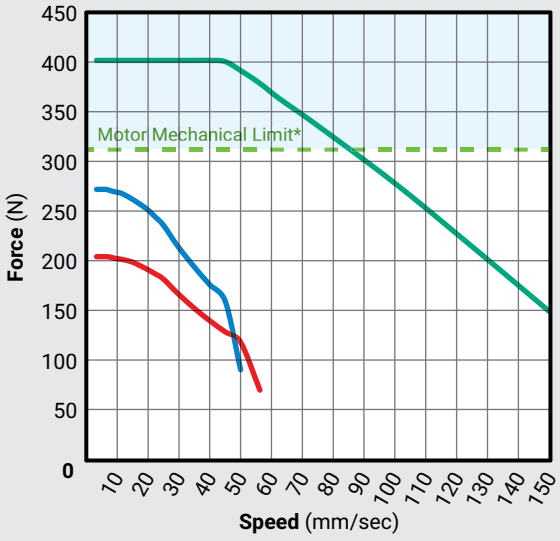
NEMA 17 Non-CaptiveSpeed Torque Curves

171
172
173

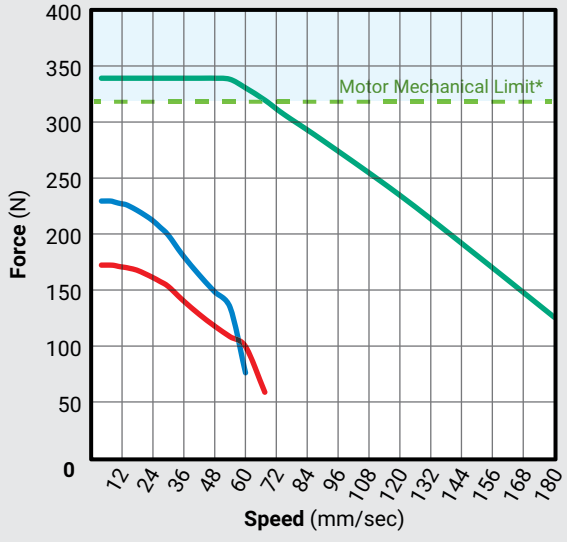
NEMA17 • 6 x 4 mm



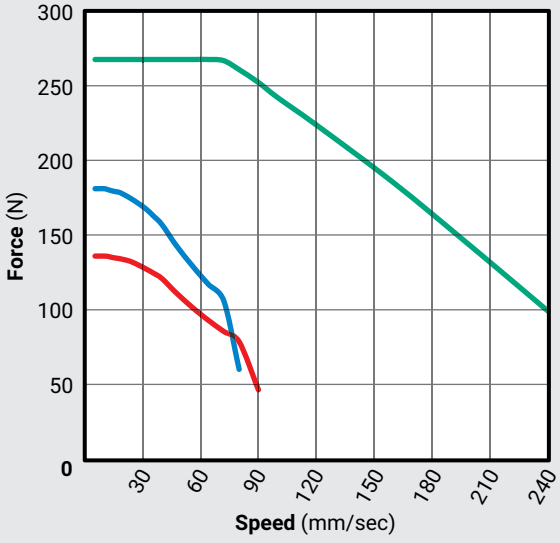
NEMA17 • 6 x 5 mm



NEMA17 • 6 x 6 mm



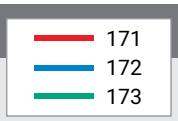
NEMA17 • 6 x 8 mm



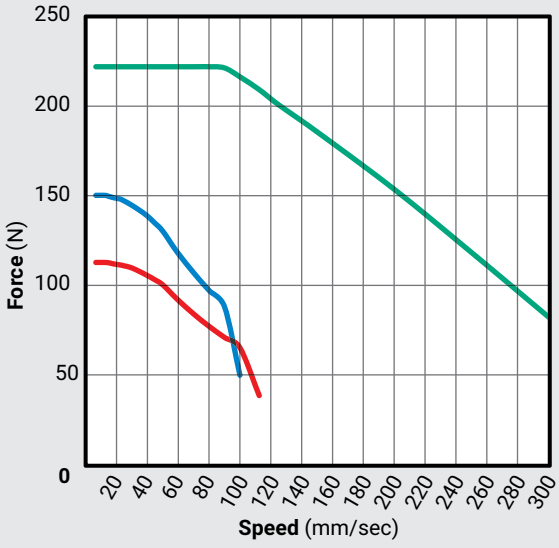
* Motor Mechanical Limit is based on internal motor design and capacity. Do not exceed the Mechanical Limit.

Notes: (1) Force limit of the lead screw nut is determined separately using the values from the standard nut (p18) or anti-backlash nut (p19). Additionally the application speed should be taken into account using the Load Derate curves on page 13.
(2) Safety factors should be applied to the capacities in the above charts. Validation of calculated loads should be empirically tested in application conditions.

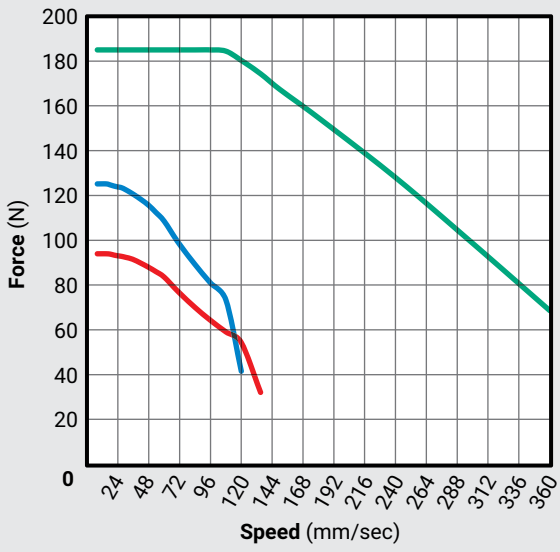
NEMA 17 Non-CaptiveSpeed Torque Curves



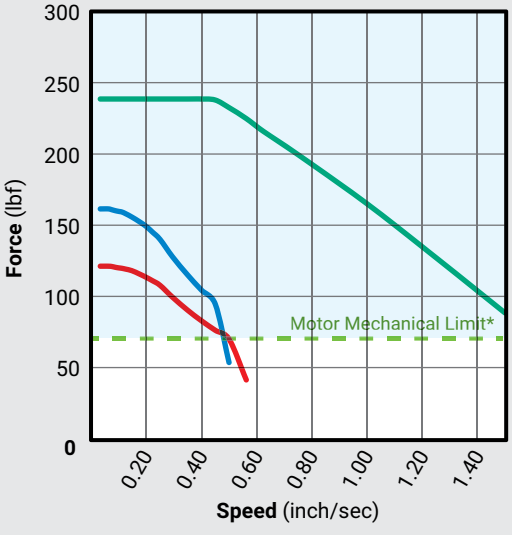
NEMA17 • 6 x 10 mm



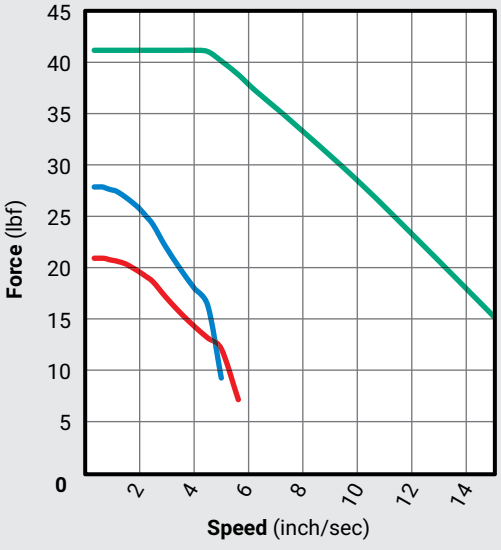
NEMA17 • 6 x 12 mm



NEMA17 • 3/16" x 0.05"



NEMA17 • 3/16" x 0.50"



* Motor Mechanical Limit is based on internal motor design and capacity. Do not exceed the Mechanical Limit.

Notes: (1) Force limit of the lead screw nut is determined separately using the values from the standard nut (p18) or anti-backlash nut (p19). Additionally the application speed should be taken into account using the Load Derate curves on page 13.
(2) Safety factors should be applied to the capacities in the above charts. Validation of calculated loads should be empirically tested in application conditions.

NEMA 23 Non-Captive Series

Phases 2
Steps/Revolution 200
Step Accuracy ..... ±5%
IP Rating 40
Approvals ..... RoHS
Operating Temp. ..... -20°C–+50°C
Insulation Class ..... B (130°C)
Insulation Resistance ..... 100 MΩ

Step Motor - 4 Lead Bi-Polar

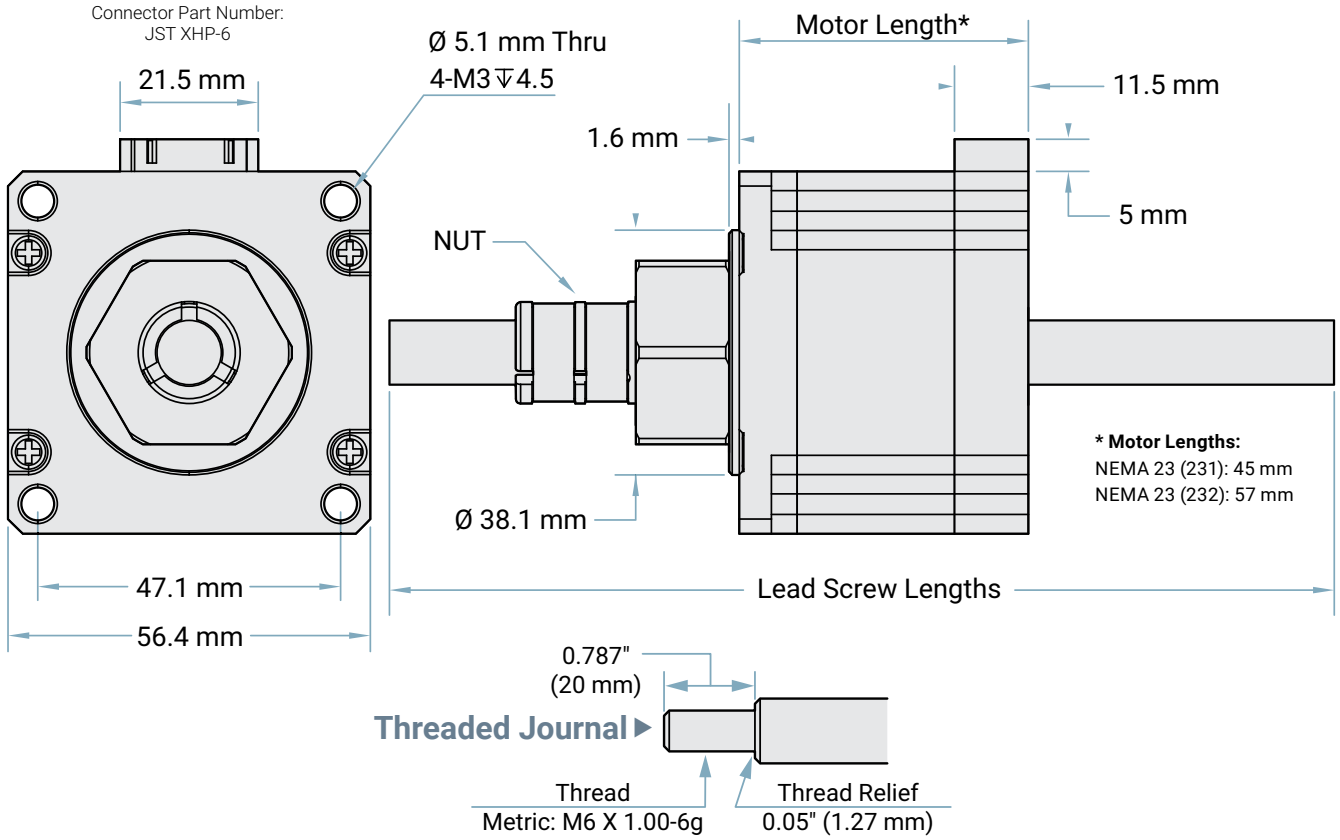
Motor Style	Part Number	Motor Body Length (mm)	Electrical Connection	Rated Current (Amps)	Winding	
					Ohms ±10% at 20°C	mH Typical
NEMA 23	231	45	Plug In Connector	2.1	1.54	4.1
NEMA 23	232	57	Plug In Connector	2.2	1.60	7.2

Lead Screw Style for NEMA 23 Series

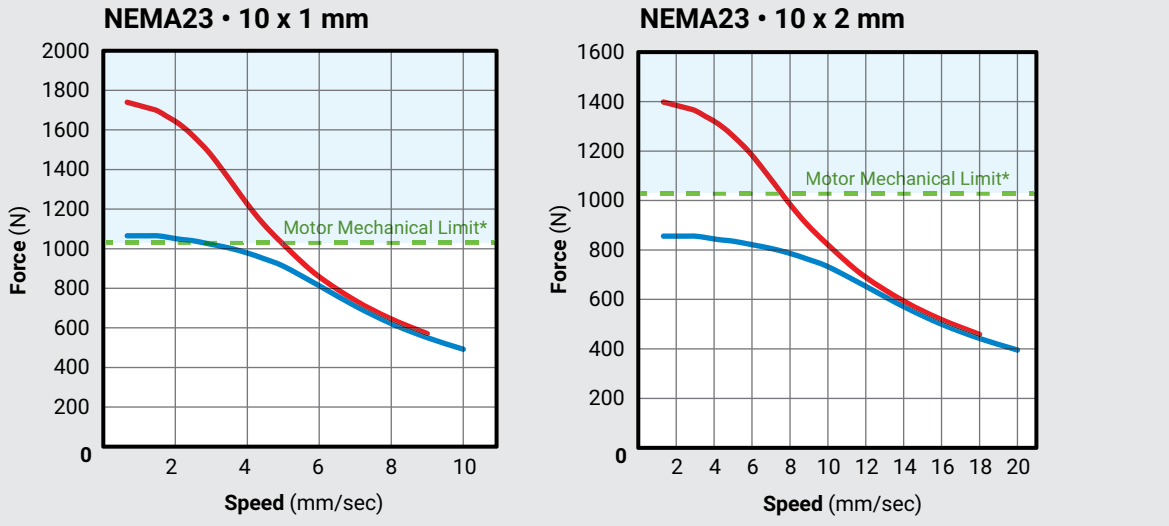
Lead Screw Style	External Diameter	Lead	Travel Per 1.8° Step
37020	3/8"	0.20"	0.001"
1001	10 mm	1 mm	0.005 mm
1002		2 mm	0.010 mm
1004		4 mm	0.020 mm
1005		5 mm	0.025 mm
1006		6 mm	0.030 mm
1008		8 mm	0.040 mm
1010		10 mm	0.050 mm
1012		12 mm	0.060 mm
1016		16 mm	0.080 mm
1025		25 mm	0.125 mm

Note: See page 56 for wiring harness information and diagram.

NEMA 23 Non-Captive Series



NEMA 23 Non-Captive Speed Torque Curves



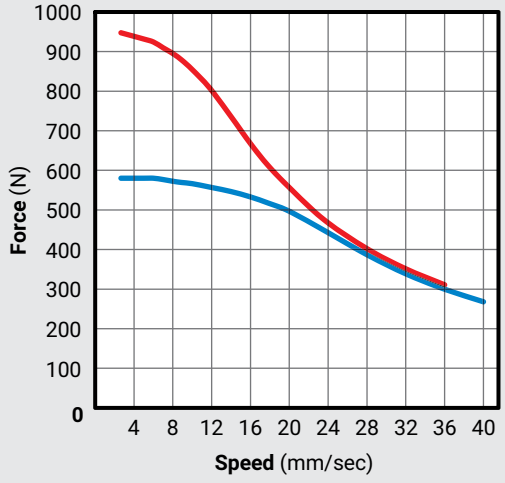
* Motor Mechanical Limit is based on internal motor design and capacity. Do not exceed the Mechanical Limit.

Notes: (1) Force limit of the lead screw nut is determined separately using the values from the standard nut (p18) or anti-backlash nut (p19). Additionally the application speed should be taken into account using the Load Derate curves on page 13.
(2) Safety factors should be applied to the capacities in the above charts. Validation of calculated loads should be empirically tested in application conditions.

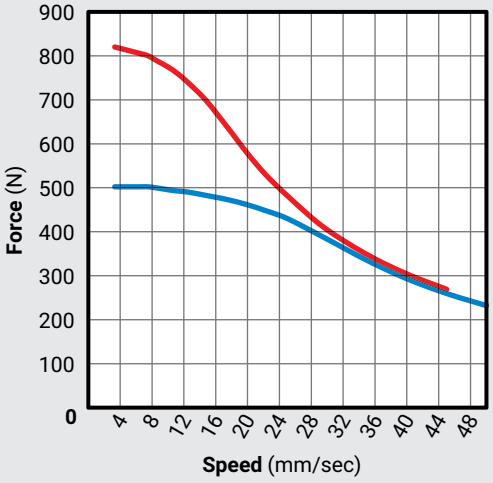
NEMA 23 Non-Captive Speed Torque Curves

231
232

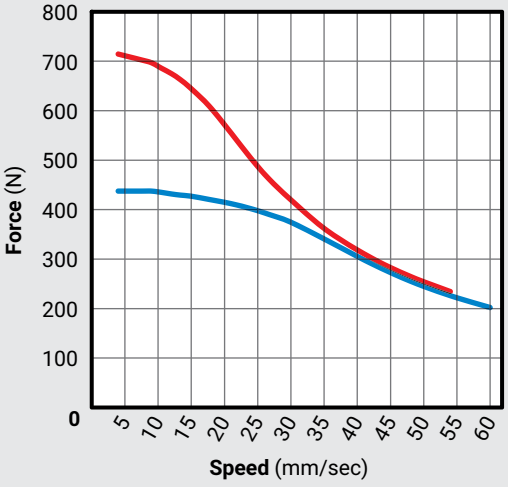
NEMA23 • 10 x 4 mm



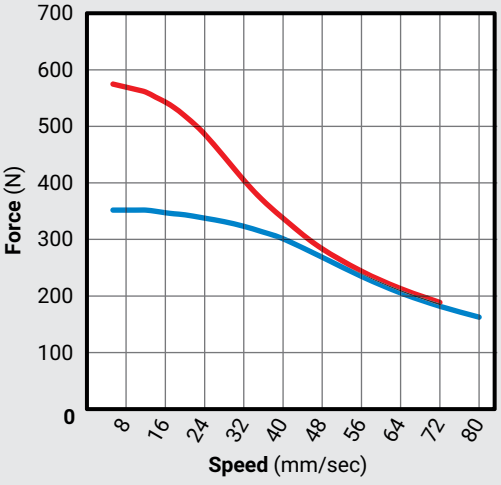
NEMA23 • 10 x 5 mm



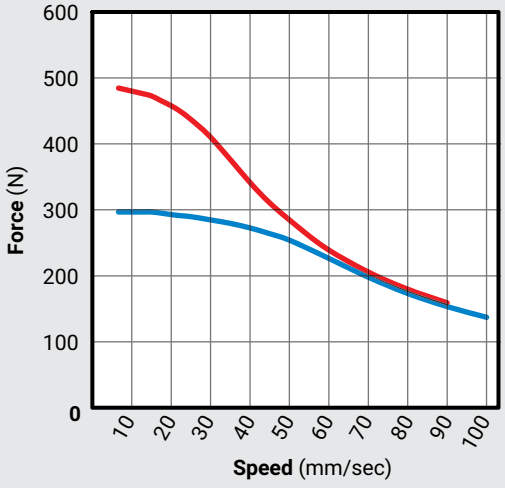
NEMA23 • 10 x 6 mm



NEMA23 • 10 x 8 mm



NEMA23 • 10 x 10 mm



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Notes: (1) Force limit of the lead screw nut is determined separately using the values from the standard nut (p18) or anti-backlash nut (p19).
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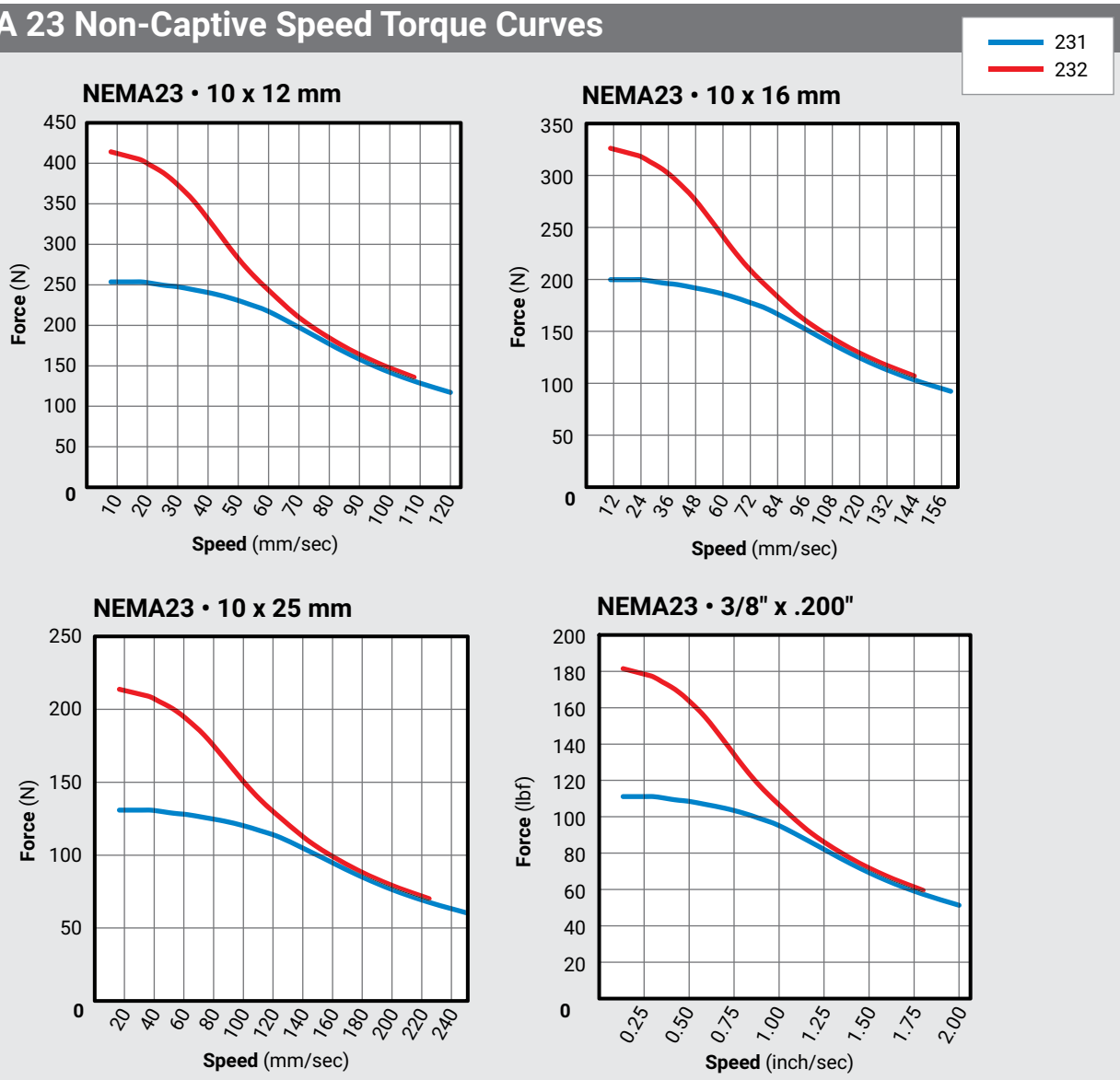
NEMA 23 Non-Captive Speed Torque Curves



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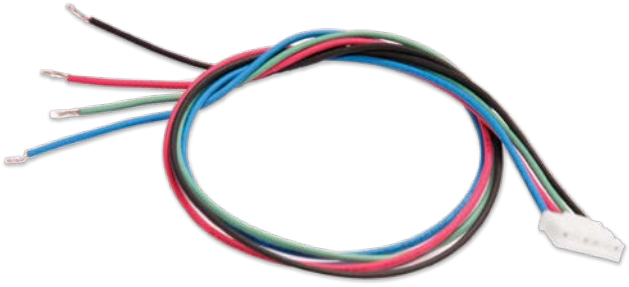
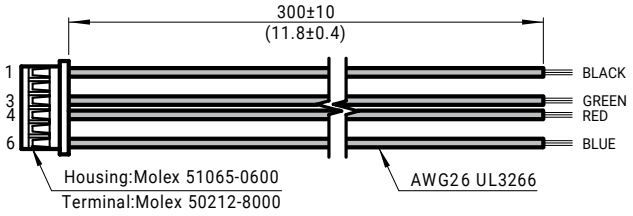
Notes: (1) Force limit of the lead screw nut is determined separately using the values from the standard nut (p18) or anti-backlash nut (p19). Additionally the application speed should be taken into account using the Load Derate curves on page 13.
(2) Safety factors should be applied to the capacities in the above charts. Validation of calculated loads should be empirically tested in application conditions.

Wiring Harnesses



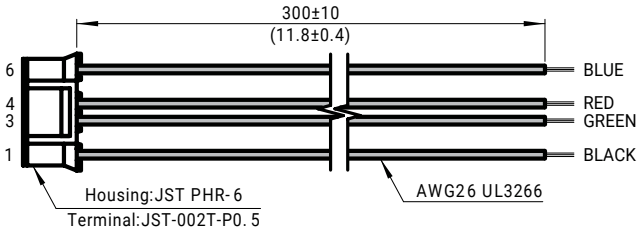
NEMA 11 Series

4 Lead Part Number 6200727



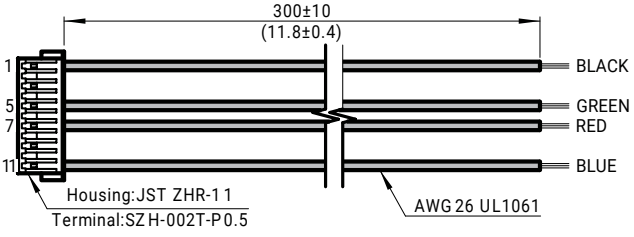
NEMA 17 Series

4 Lead Part Number 6200490



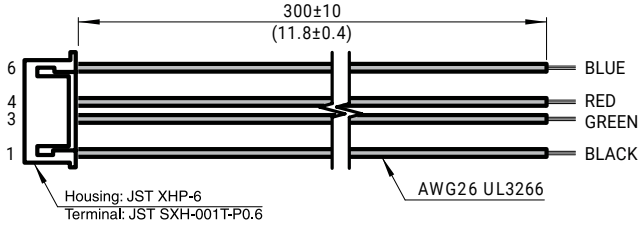
NEMA 14 Series

4 Lead Part Number 6200728



NEMA 23 Series

4 Lead Part Number 6200491



Wiring Diagram

Bipolar, Full Step

Step	Phase 1 A	Phase 1 C	Phase 2 B	Phase 2 D
1	+	–	+	–
2	–	+	+	–
3	–	+	–	+
4	+	–	–	+

CW

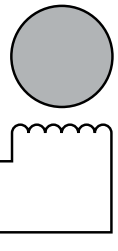
CCW

CW & CCW rotation when seen from flange side of the motor.

4 Lead (bipolar)

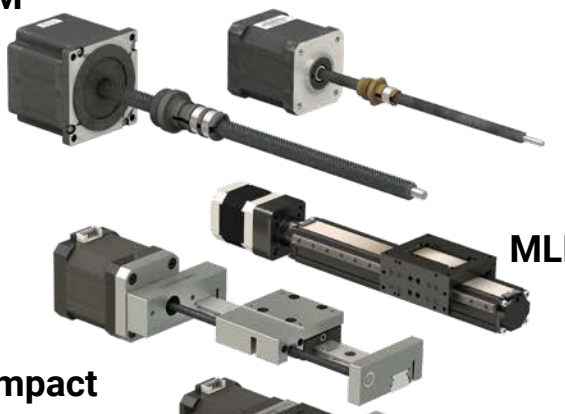
Connector Pin#

Motor Size 8, 11, 17, 23	14	
1	1	A
3	5	C
4	7	B
6	11	D



PBC Linear Line of Actuators and Key Features

LSM



MLB

Compact

SIMO

PLA

MTB

MUK

Simplicity

LSM Lead Screw Motors And Hybrid Linear Actuators

- 6, 10, 12, and 16 mm diameters; 1–25 mm leads
- Custom sizes, materials, and finishes available
- Constant Force™ screw and nut
  - Patent pending self-adjusting anti-backlash feature
  - Patent pending coil spring adjustable nut
- 300 series stainless steel screw with PTFE coating
- NEMA 17, 23, 34 flange sizes–single, double, triple stack stepper motors

ML Series

- Compact profile 28 x 32 mm for small-scale automation
- High speed precision, enhanced load capacities, and precise repeatability
- Linear guide supports, available in single or dual rails
- Long travel lengths, up to 650 mm

Compact Series

- Plain bearing or ball bearing options
- Lead screw diameter and lead options
- Constant Force Technology nuts or standard fixed nuts
- Motor options: Integrated motor or motor mount setup

SIMO® Series–Versatile, Flexible, Affordable

- All critical edges machined concurrently in one pass
- Integrated or motor mount drive mechanism
- Built to either low profile or tall base rail

MT Series

- High acceleration, speeds, and rigidity over long travel lengths
- Fully enclosed aluminum housing
- Strong yet lightweight and corrosion-resistant

PL Series

- Enclosed aluminum housing with Integral-V™ raceway
- High speed cam roller design is sealed against contamination
- Many accessories such as sensors, mounting brackets, etc.

MUK

- Incorporates two 20 mm recirculating ball profile rail guideways
- Load capabilities up to 11200 N; maximum stroke = 1500 mm
- Single or dual carriage options available

Simplicity Linear Slides

- Handles heavy loads in harsh, contaminated environments
- Low profile systems for applications with height constraints
- Rail shaft diameters from 12.7 mm (0.5 in) to 50.8 mm (2.0 in)
- Rail lengths to 2440 mm (96 in)
- Carriage speeds up to 0.457 m/s (18 in/s)
- Normal carriage loads up to 83000 N (18750 lbf)

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