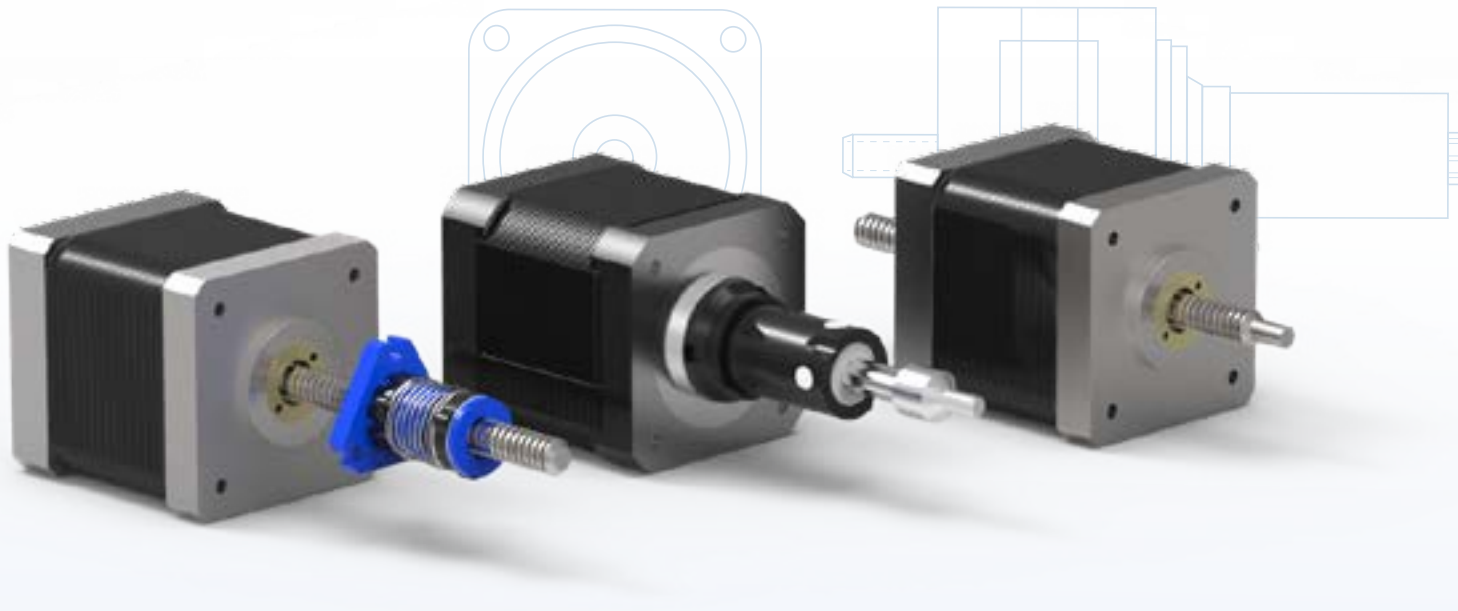

Stepper Motor Linear Actuators

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LINEAR TECHNOLOGIES

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ASSOCIATION FOR HIGH TECHNOLOGY DISTRIBUTION AHTD

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PTDA Member

Certifications

ISO 9001 : 2015 CERTIFIED

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NEMA 34 50-55

Available Lead Screws 56

Helix Linear Technologies, Inc., Beachwood, Ohio USA

Company

Helix Linear Technologies is a global manufacturer of linear actuators, lead screws and ball screws. Serving clients in the ærospace, medical, life science, security, semiconductor, and defense industries, we focus on helping our customers achieve their application and profitability goals. Our innovative product design and world-class engineering capabilities solve real-world linear motion issues, building a foundation for our client's long-term success.

Culture

Our culture is rooted in agility, responsiveness, and teamwork. Our team comprises happy, competitive professionals who are experts in manufacturing innovative electromechanical linear motion solutions. We strive to exceed our customers' expectations in all interactions and are committed to continuous improvement.

History

Helix Linear Technologies was founded in 2011 to meet the growing demand for high-precision lead screws in the electromechanical actuation industry. Our rapid growth and expanded product lines now include end-to-end linear actuator solutions, providing our clients with customized options and fully integrated solutions.

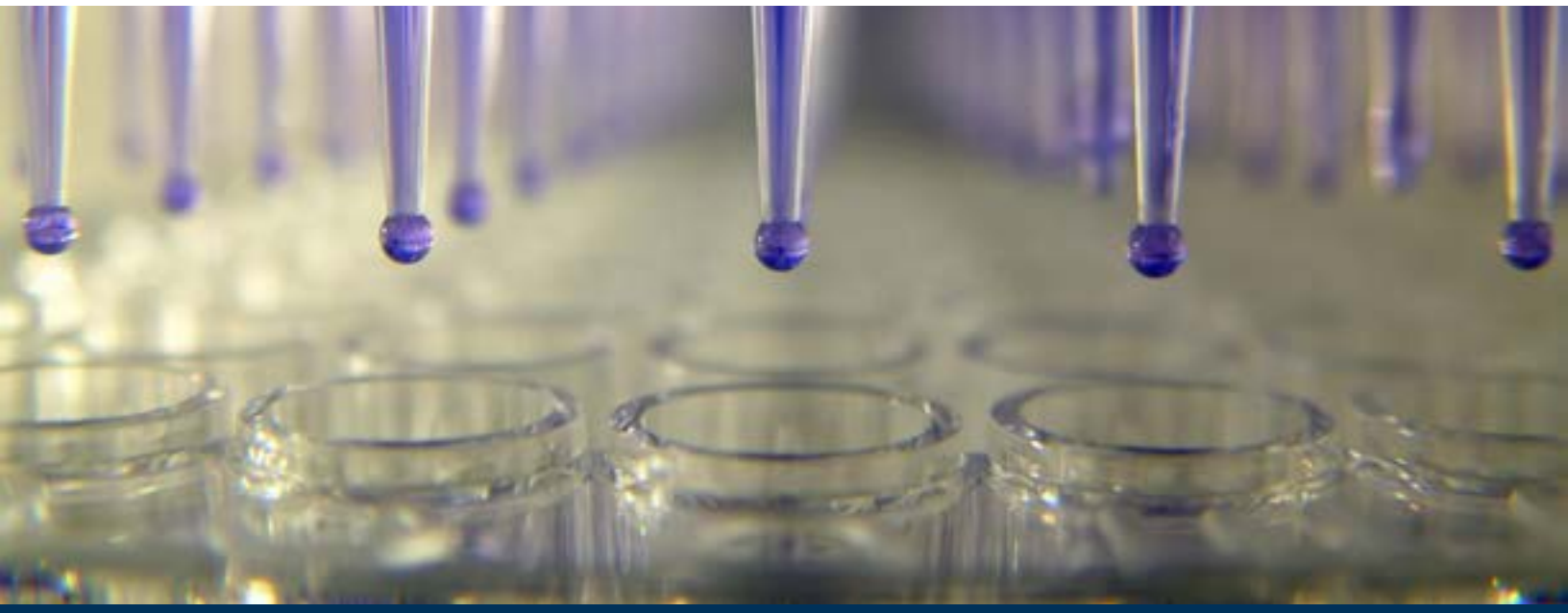
Market Segments Served

- Medical & Diagnostic
- Aerospace
- Packaging
- Automotive
- Electronics
- Transportation
- Patient Handling
- Entertainment
- Semiconductor
- Military and Defense
- Factory Automation
- Pulp & Paper
- Steel
- Chemical
- Agriculture/Food Handling
- Tire Manufacture

Captive Stepper Motor Linear Actuators
Overview

In a captive linear actuator design, the lead screw is connected to a spline shaft that passes through a spline bushing to keep it from rotating. The spline bushing prevents the lead screw from rotating but allows enough clearance for the shaft to move axially as the lead screw is driven back and forth with a corresponding clockwise and counterclockwise turn of the motor. The anti-rotation feature is inherent in the design and creates a stand-alone unit that pushes and pulls whatever device it is attached to. Because it is independent, this actuator can also provide a push force without being attached to anything. For this reason, it's an excellent choice for push-button applications where the return motion is handled by a spring pre-load or influenced by gravity.

Captive stepper motor linear actuators from Helix Linear Technologies are available in NEMA sizes 8, 11, 14, 17, and 23 with single and double stack options.



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SMA - 8 S 2.5 - C - W12125 - 1.00 - ME - ER - B

NEMA Stepper Motor Size
8 11 14 17 23

Motor Length
S = single stack
D = double stack

Voltage (see table below)

Captive Stepper Motor Actuator

Lead Screw
See Lead Screw Table on page 56

Stroke Code (in inches)
0.25 0.50 0.75 1.00 1.25 1.50 2.00

Machined End
SE = imperial machined end
ME = metric machined end

Encoder
ER = encoder-ready
E200 = 200 counts per rev
E500 = 500 counts per rev
E1000 = 1000 counts per rev
E2000 = 2000 counts per rev
00 = no encoder

Encoder Position (see table below)
A = up
B = down
00 = no encoder

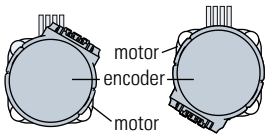
Available Motor Voltages

Motor Size	Available Voltages		
NEMA 8	2.5	5	7.5
NEMA 11	2.1	5	12
NEMA 14	2.33	5	12
NEMA 17	2.33	5	12
NEMA 23	3.25	5	12

Encoder Positions

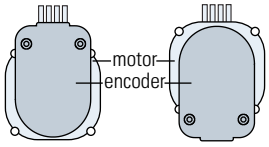
NEMA 8

Position A Position B



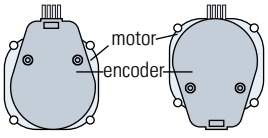
NEMA 11, 14, 17

Position A Position B



NEMA 23, 34

Position A Position B



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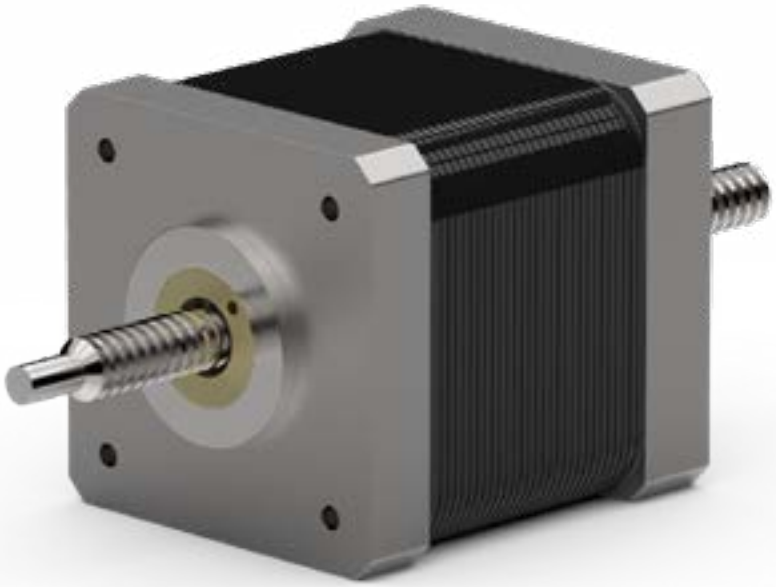
Non-Captive Stepper Motor Linear Actuators
Overview



In a non-captive actuator linear actuator, the lead screw dœs not have an anti-rotation feature. Instead, external mechanical components separate from the motor are introduced into the design to keep the lead screw from rotating. As a result, the lead screw moves back and forth axially by restricting its rotation, which then drives the device it is attached to back and forth.

A non-captive actuator is more straightforward and compact than a captive linear actuator. It is an excellent option when the machine design already includes a built-in guide mechanism or anti-rotation feature. In some specific applications, the lead screw can be provided in longer lengths, supported at each end, and held in tension.

Non-captive stepper motor linear actuators from Helix Linear Technologies are available in NEMA sizes 8, 11, 14, 17, 23, and 34 with single and double stack options.

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SMA - 8 S 2.1 - N - W12125 - 00 - 8.00 - SE - 00 - 00

NEMA Stepper Motor Size
8 11 14 17 23 34

Motor Length
S = single stack
D = double stack

Voltage (see table below)

Non-Captive Stepper Motor Actuator

Lead Screw
see Lead Screw Table on page 56

Coating
00 = no coating

Lead Screw Length
in inches

Machined End
ME = metric machined end
SE = imperial machined end
00 = no end machining

Encoder
ER = encoder-ready
E200 = 200 counts per rev
E500 = 500 counts per rev
E1000 = 1000 counts per rev
E2000 = 2000 counts per rev
00 = no encoder

Encoder Position (see table below)
A = up
B = down
00 = no encoder

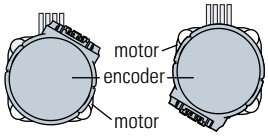
Available Motor Voltages

Motor Size	Available Voltages		
NEMA 8	2.5	5	7.5
NEMA 11	2.1	5	12
NEMA 14	2.33	5	12
NEMA 17	2.33	5	12
NEMA 23	3.25	5	12
NEMA 34	2.85	5	12

Encoder Positions

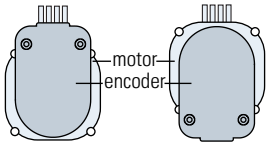
NEMA 8

Position A Position B



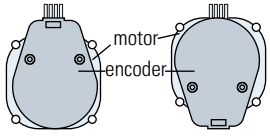
NEMA 11, 14, 17

Position A Position B



NEMA 23, 34

Position A Position B



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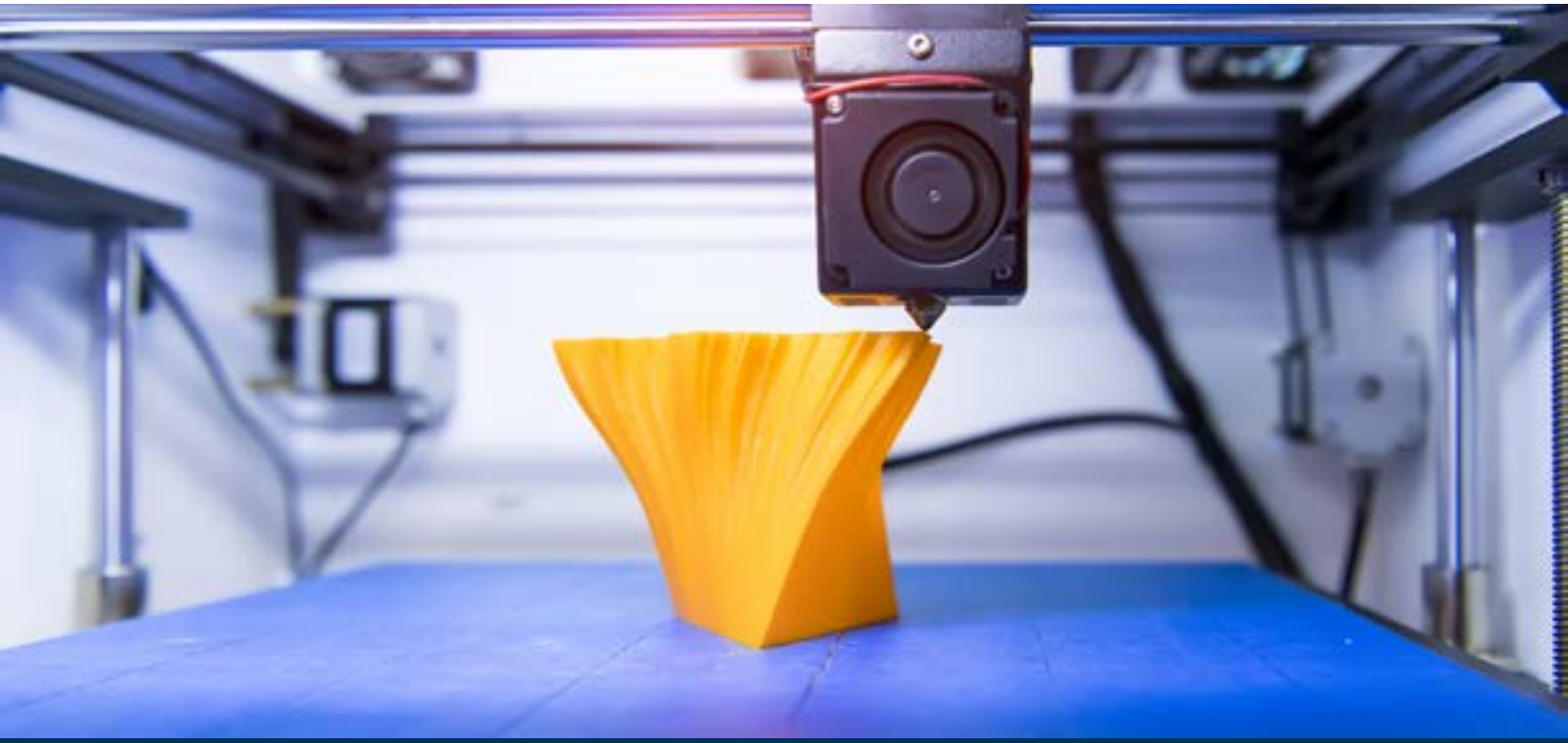
External Stepper Motor Linear Actuators
Overview

External stepper motor linear actuators feature a lead screw that is press-fit directly into the rotor of the motor. As a result, the threaded screw rotates outside of the motor body and is paired with a mating nut. This design configuration eliminates the coupling between the motor and lead screw, saving valuable design space and increasing stroke length. External stepper motor linear actuators from Helix Linear Technologies are also highly configurable with a wide range of standard lead options and numerous freewheeling and anti-backlash nuts styles. Rotation prevention of the nut is necessary to create high-resolution linear motion.



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External Stepper Motor Linear Actuators
Part Number Configuration Guide

SMA - 8 S 2.1 - E - 012125 - NFA - 8.00 - T - M1 - E200 - A

NEMA Stepper Motor Size
8 11 14 17 23 34

Motor Length
S = single stack
D = double stack

Voltage (see table below)

External Stepper Motor Actuator

Lead Screw
see Lead Screw Table on page 57

Nut Style (see table)

Lead Screw Length
in inches

Screw Coating
T = H10X™ PTFE coating
00 = no coating

Bearing Support
M1 = universal mount single bearing
F1 = flanged mount single bearing
00 = no bearing support

Encoder
ER = encoder ready
E200 = 200 counts per rev
E500 = 500 counts per rev
E1000 = 1000 counts per rev
E2000 = 2000 counts per rev
00 = no encoder

Encoder Position (see table below)
A = up
B = down
00 = no encoder

Available Motor Voltages

Motor Size	Available Voltages		
NEMA 8	2.5	5	7.5
NEMA 11	2.1	5	12
NEMA 14	2.33	5	12
NEMA 17	2.33	5	12
NEMA 23	3.25	5	12
NEMA 34	2.85	5	12

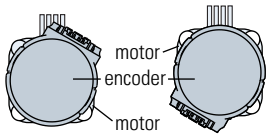
Nut Style Matrix

Style	Threaded	Flanged
Standard	NTA	NFA
Anti-Backlash Axial	ATA	AFA
Anti-Backlash Radial	RTA	RFA
Anti-Backlash Torsional	KTA	KFA

Encoder Positions

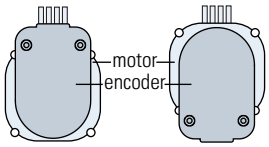
NEMA 8

Position A Position B



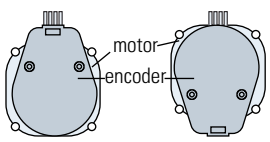
NEMA 11, 14, 17, 23

Position A Position B



NEMA 34

Position A Position B



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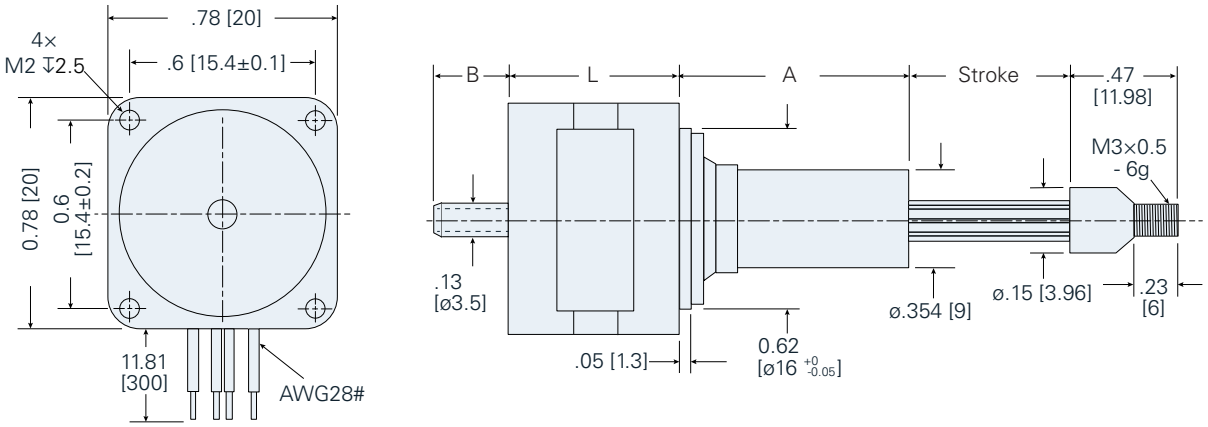
NEMA 8
Captive Stepper Motor Linear Actuator



Motor Specifications

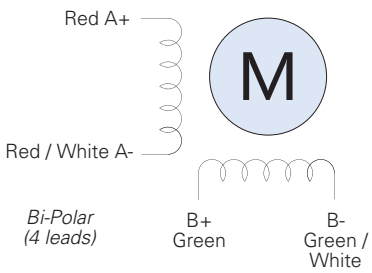
- Bipolar Wiring
- 1.8° Step Angle
- Insulation Resistance: 20 MΩ
- Temperature Rise: 167° F (75° C)

	Voltage	Current	Resistance/ Phase	Inductance/ Phase	Motor Weight		Power Input	L	
	V	A	Ω	mH	oz	g	W	in	mm
Single Stack	2.5	0.49	5.1	1.5	1.5	43	4.2	1.18	30
	5	0.24	20.4	6.7	1.5	43	4.2	1.18	30
	7.5	0.16	45.9	39	1.5	43	4.2	1.18	30
Double Stack	2.5	1.9	1.1	1.1	2.4	68	7.5	1.496	38
	5	0.75	6.7	5.8	2.4	68	7.5	1.496	38
	7.5	0.35	34.8	35.6	2.4	68	7.5	1.496	38

Stroke Codes

Stroke Code	Stroke		A		B	
	in	mm	in	mm	in	mm
0.35	.35	9.0	.44	11.1	.06	1.6
0.50	.50	12.7	.58	14.8	.21	5.3
0.75	.75	19.1	.83	21.2	.46	11.6
1.00	1.00	25.4	1.08	27.5	.72	17.9
1.25	1.25	31.8	1.33	33.9	.96	24.3
1.50	1.50	38.1	1.58	40.2	1.20	30.7

Wiring Diagram



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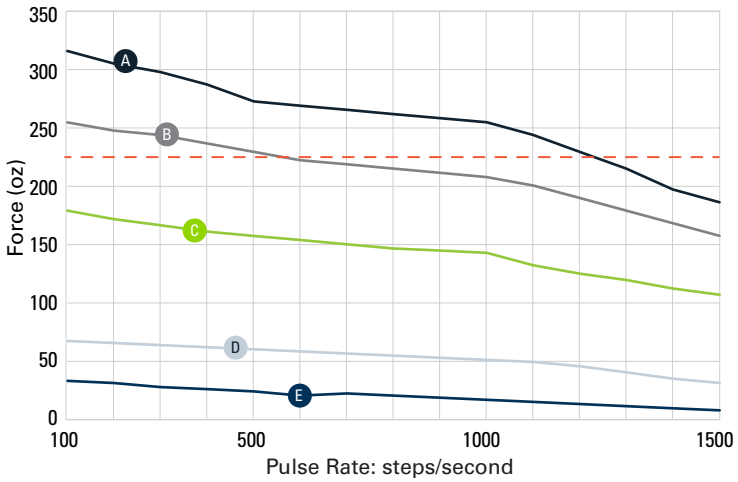
Screw Specifications

Screw Code	Diameter		Lead		Travel per Step		
	in	mm	in	mm	in	mm	
W12012	.140	3.6	.012	0.3048	.00006	.001524	A
W12024	.140	3.6	.024	0.6096	.00012	.003048	B
W12039	.140	3.6	.03937	1	.000197	.005	C
W12048	.140	3.6	.048	1.2192	.00024	.006096	
W12078	.140	3.6	.07874	2	.000394	.010	
W12096	.140	3.6	.096	2.4384	.00048	.012192	D
W12157	.140	3.6	.15748	4	.000787	.020	
W12315	.140	3.6	.31496	8	.001575	.040	E

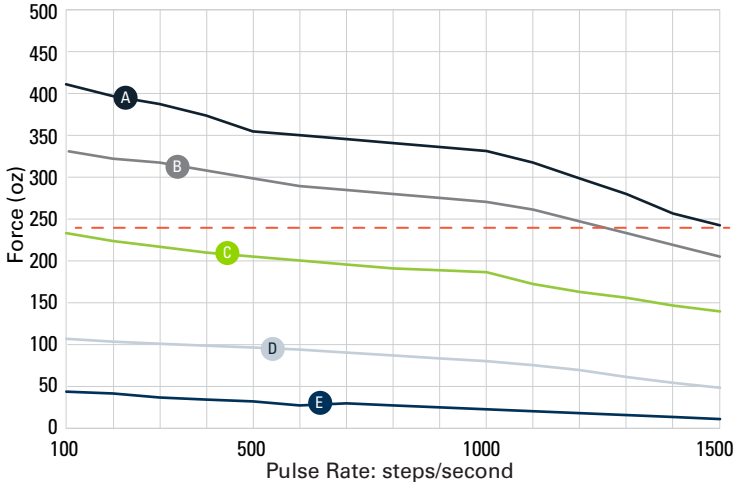
Native units: ☐ imperial ☐ metric

Force v Pulse Rate Charts

Single Stack



Double Stack



- - - - = Recommended load limit

Speed charts are based on using bi-polar motors with chopper drives at 100% duty cycle. Chopper drive curves were created using full steps on a 5 volt motor and a 40v power supply.

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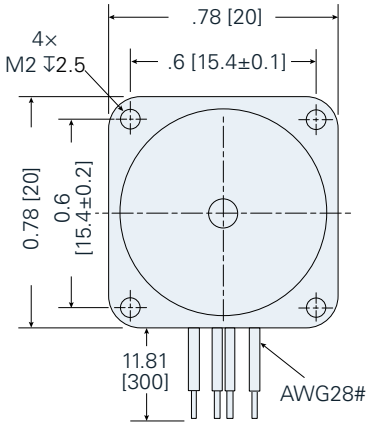
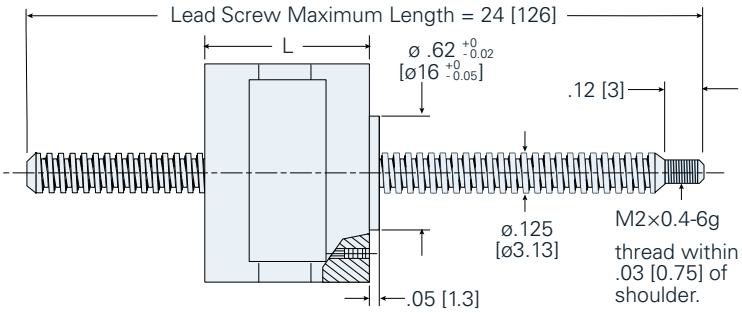
NEMA 8
Non-Captive Stepper Motor Linear Actuator



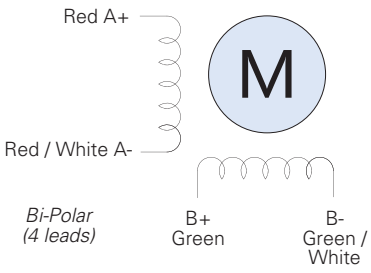


Motor Specifications

- Bipolar Wiring
- 1.8° Step Angle
- Insulation Resistance: 20 MΩ
- Temperature Rise: 167° F (75° C)

	Voltage	Current	Resistance/ Phase	Inductance/ Phase	Motor Weight		Power Input	L (max)	
	V	A	Ω	mH	oz	g	W	in	mm
Single Stack	2.5	0.49	5.1	1.5	1.5	43	4.2	1.18	30
	5	0.24	20.4	6.7	1.5	43	4.2	1.18	30
	7.5	0.16	45.9	39	1.5	43	4.2	1.18	30
Double Stack	2.5	1.9	1.1	1.1	2.4	68	7.5	1.496	38
	5	0.75	6.7	5.8	2.4	68	7.5	1.496	38
	7.5	0.35	34.8	35.6	2.4	68	7.5	1.496	38

Wiring Diagram



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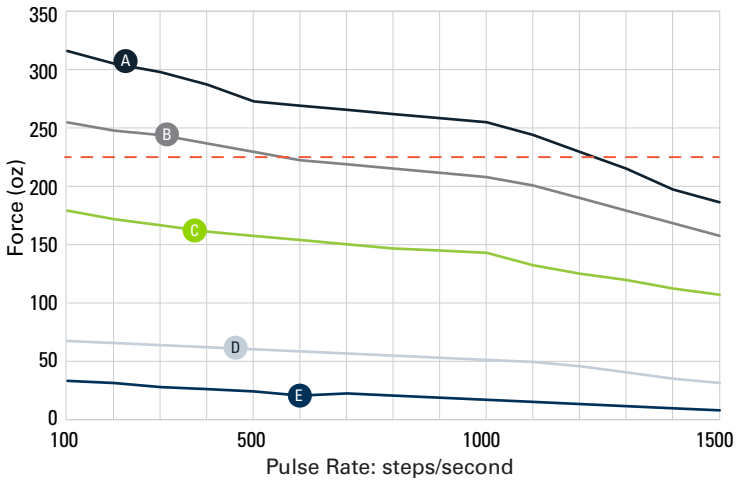
Screw Specifications

Screw Code	Diameter		Lead		Travel per Step		
	in	mm	in	mm	in	mm	
W12012	.140	3.6	.012	0.3048	.00006	.001524	A
W12024	.140	3.6	.024	0.6096	.00012	.003048	B
W12039	.140	3.6	.03937	1	.000197	.005	C
W12048	.140	3.6	.048	1.2192	.00024	.006096	
W12078	.140	3.6	.07874	2	.000394	.010	
W12096	.140	3.6	.096	2.4384	.00048	.012192	D
W12157	.140	3.6	.15748	4	.000787	.020	
W12315	.140	3.6	.31496	8	.001575	.040	E

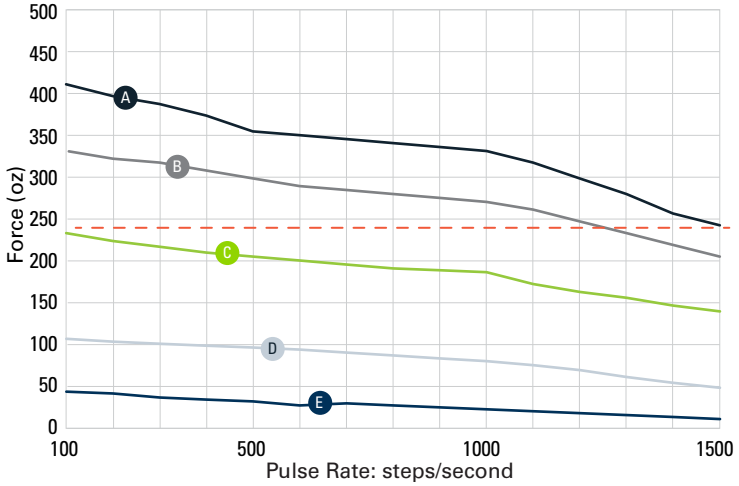
Native units: ☐ imperial ☐ metric

Force v Pulse Rate Charts

Single Stack



Double Stack



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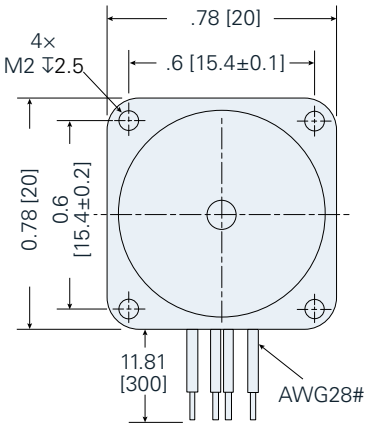

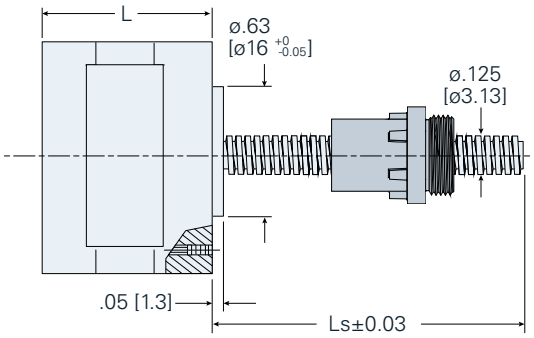

Motor Specifications

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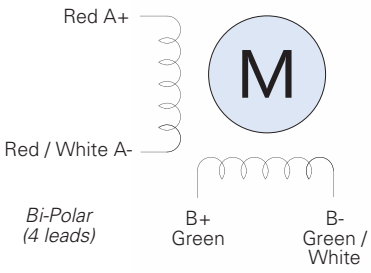
- 1.8° Step Angle
- Insulation Resistance: 20 MΩ
- Temperature Rise: 167°F (75°C)

	Voltage	Current	Resistance/ Phase	Inductance/ Phase	Motor Weight		Power Input	L	
	V	A	Ω	mH	oz	g	W	in	mm
Single Stack	2.5	0.49	5.1	1.5	1.5	43	4.2	1.18	30
	5	0.24	20.4	6.7	1.5	43	4.2	1.18	30
	7.5	0.16	45.9	39	1.5	43	4.2	1.18	30
Double Stack	2.5	1.9	1.1	1.1	2.4	68	7.5	1.496	38
	5	0.75	6.7	5.8	2.4	68	7.5	1.496	38
	7.5	0.35	34.8	35.6	2.4	68	7.5	1.496	38

Wiring Diagram



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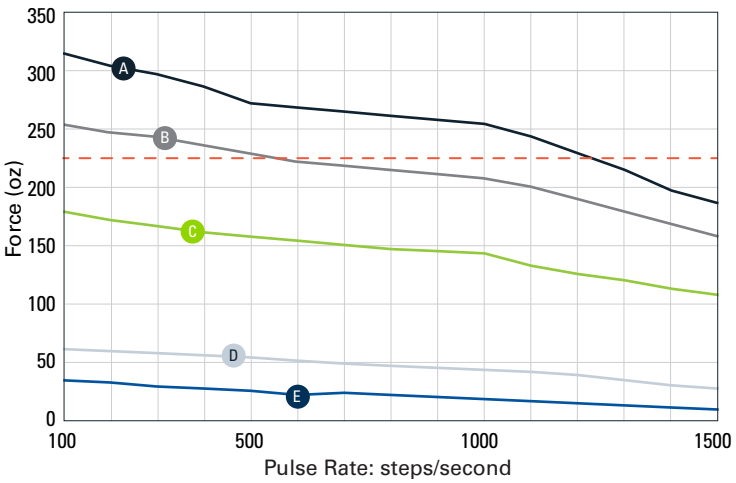
Screw Specifications

Screw Code	Diameter		Lead		Travel per Step		
	in	mm	in	mm	in	mm	
012012	.125	3.13	.012	0.3048	.00006	.001524	A
012019	.125	3.13	.01969	0.5	.000098	.0025	
012024	.125	3.13	.024	0.6096	.00012	.003048	B
012039	.125	3.13	.03937	1	.000197	.005	C
012048	.125	3.13	.048	1.2192	.00024	.006096	
012062	.125	3.13	.0625	1.5875	.000313	.007938	
012078	.125	3.13	.07874	2	.000394	.010	
012096	.125	3.13	.096	2.4384	.00048	.012192	
012125	.125	3.13	.125	3.175	.000625	.015875	D
012157	.125	3.13	.15748	4	.000787	.020	
012314	.125	3.13	.31496	8	.001575	.040	E

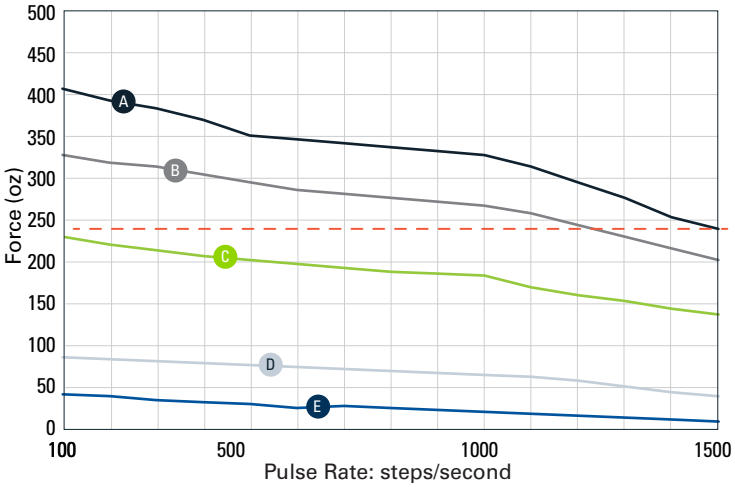
Native units: ☐ imperial ☐ metric

Force v Pulse Rate Charts

Single Stack



Double Stack



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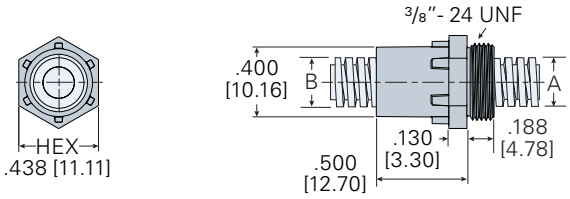
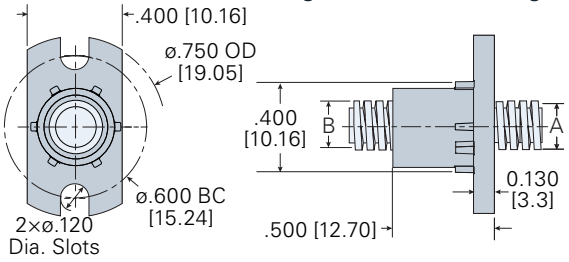
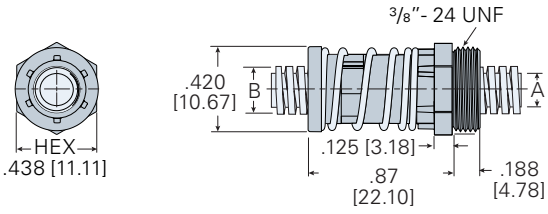
Standard Freewheeling Nut (NTA) - Threaded



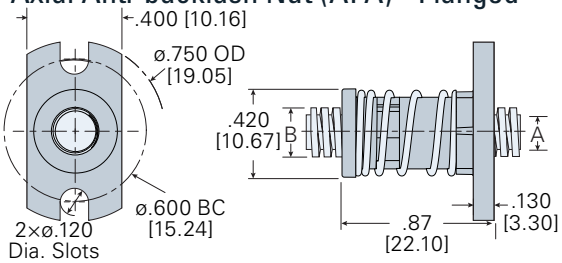
Standard Freewheeling Nut (NFA) - Flanged

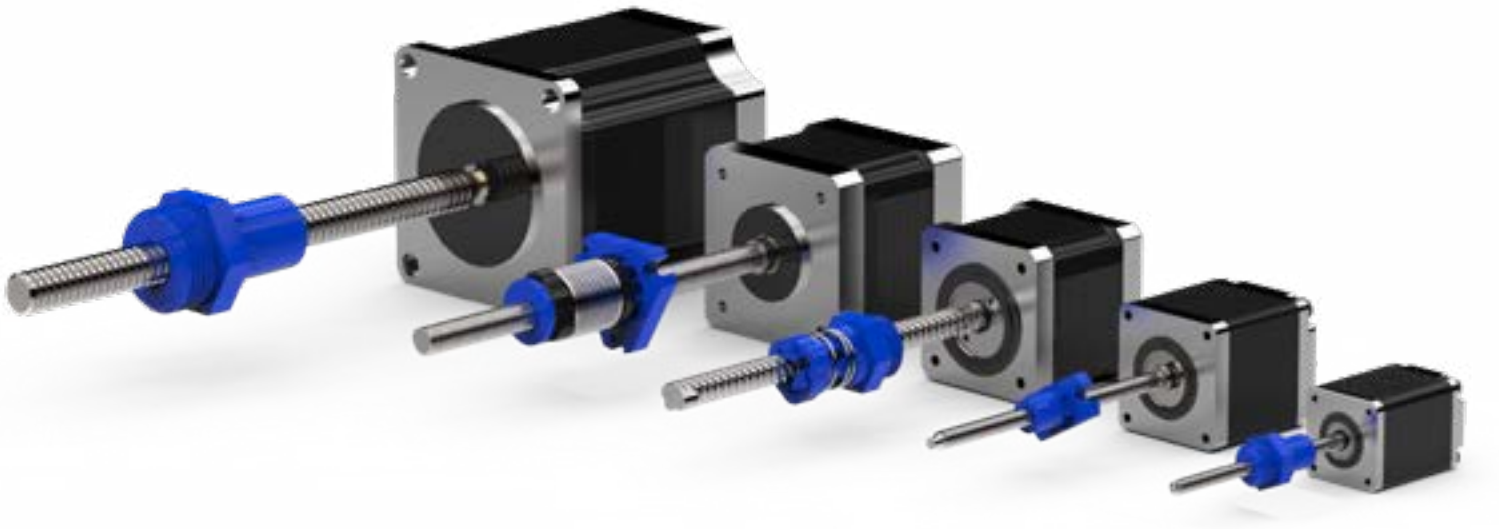


Axial Anti-backlash Nut (ATA) - Threaded



Axial Anti-backlash Nut (AFA) - Flanged





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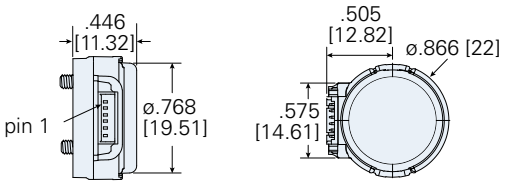
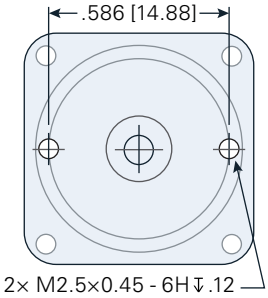
Encoder

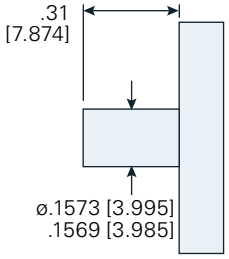


Encoder-Ready Options

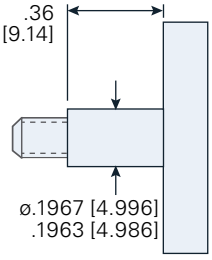
Rear View



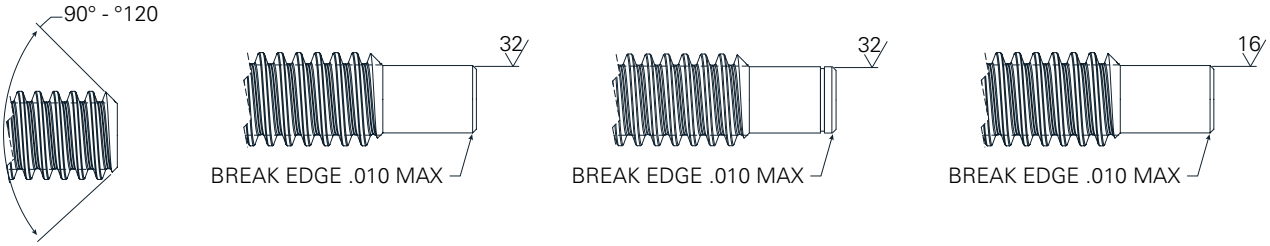
External



Non-Captive & Captive

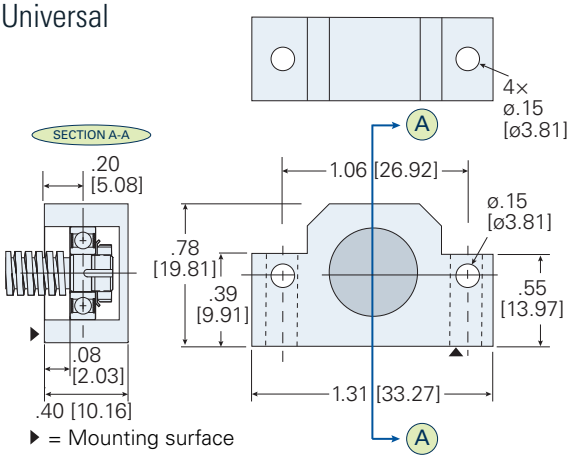


Screw End Machining

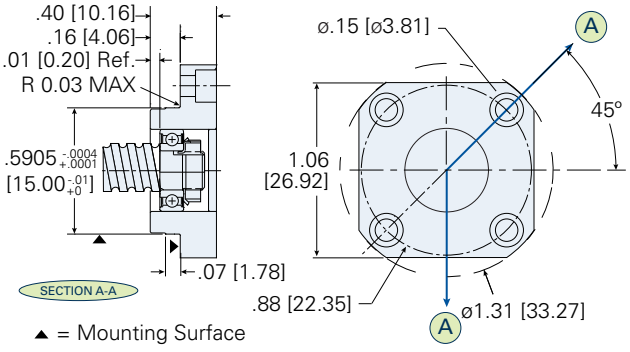


Ezze Mount™ Bearing Support

Universal



Flanged



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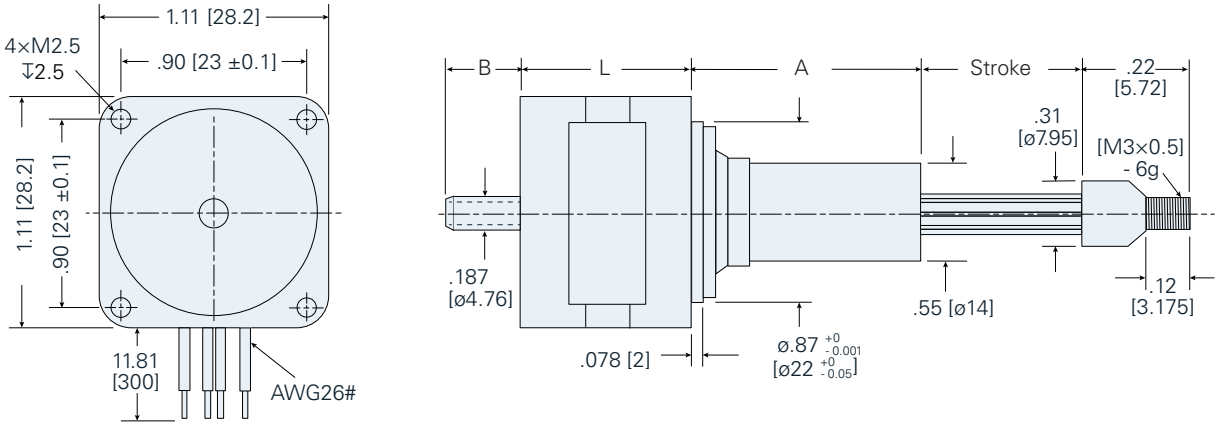


Motor Specifications

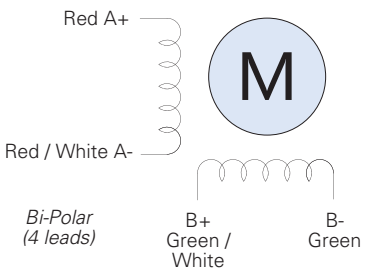
- Bipolar Wiring
- 1.8° Step Angle
- Insulation Resistance: 20 MΩ
- Temperature Rise: 167° F (75° C)

	Voltage	Current	Resistance/ Phase	Inductance/ Phase	Motor Weight		Power Input	L	
	V	A	Ω	mH	oz	g	W	in	mm
Single Stack	2.1	1.00	2.1	1.5	4.2	119	4.2	1.26	32.2
	5	0.42	11.9	6.7	4.2	119	4.2	1.26	32.2
	12	0.18	68.6	39	4.2	119	4.2	1.26	32.2
Double Stack	2.1	1.90	1.1	1.1	6.35	180	7.5	1.81	46
	5	0.75	6.7	5.8	6.35	180	7.5	1.81	46
	12	0.35	34.8	35.6	6.35	180	7.5	1.81	46

Stroke Codes

Stroke Code	Stroke		A		B	
	in	mm	in	mm	in	mm
0.50	.50	12.7	.82	20.5	.07	1.7
0.75	.75	19.1	1.05	26.8	.32	8.0
1.00	1.00	25.4	1.30	33.2	.57	14.4
1.25	1.25	31.8	1.55	39.5	.82	20.7
1.50	1.50	38.1	1.80	45.9	1.07	27.1
2.00	2.00	50.8	2.30	58.6	1.57	39.8

Wiring Diagram



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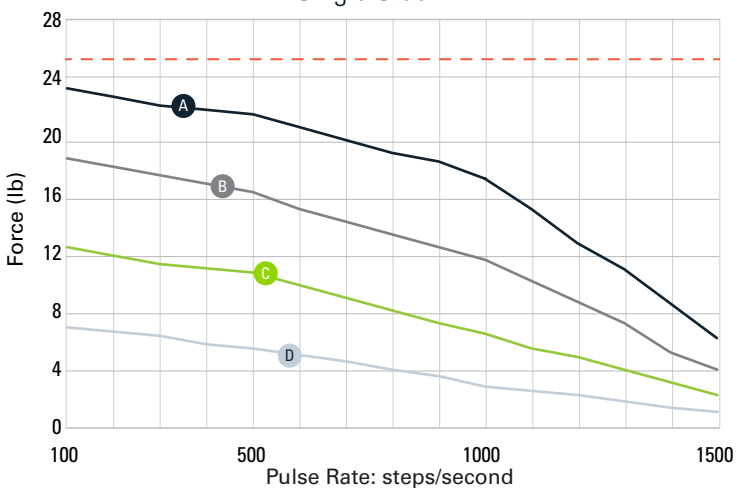
Screw Specifications

Screw Code	Diameter		Lead		Travel per Step		
	in	mm	in	mm	in	mm	
W18025	.1875	4.76	.025	0.635	.000125	0.003175	A
W18050	.1875	4.76	.050	1.27	.00025	0.00635	B
W18100	.1875	4.76	.100	2.54	.00050	0.01270	C
W18200	.1875	4.76	.200	5.08	.00100	0.02540	D
W18400	.1875	4.76	.400	10.16	.002	0.0508	

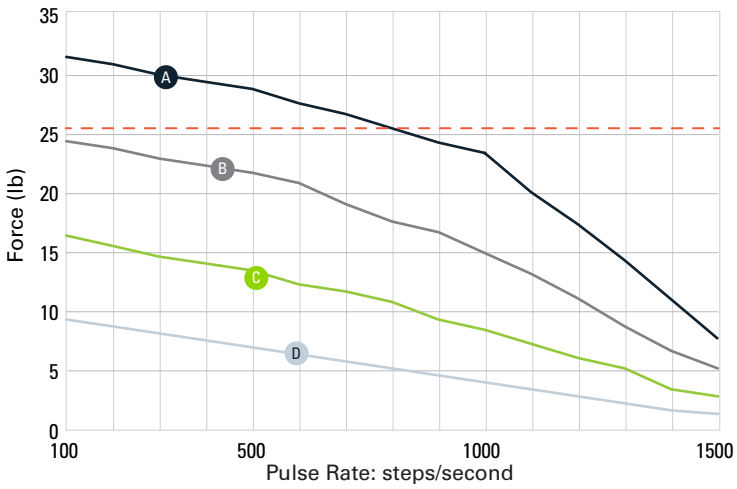
Native units: ☐ imperial ☐ metric

Force v Pulse Rate Charts

Single Stack



Double Stack



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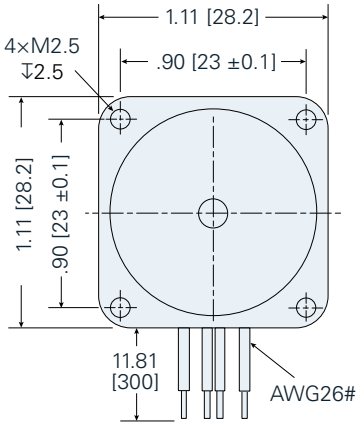
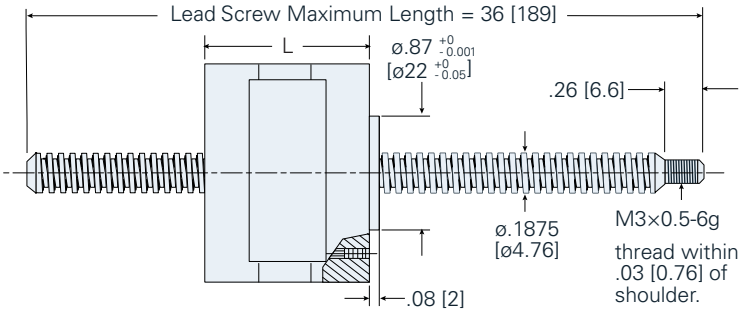
NEMA 11
Non-Captive Stepper Motor Linear Actuator





Motor Specifications

- Bipolar Wiring
- 1.8° Step Angle
- Insulation Resistance: 20 MΩ
- Temperature Rise: 167°F (75°C)

	Voltage	Current	Resistance/ Phase	Inductance/ Phase	Motor Weight		Power Input	L	
	V	A	Ω	mH	oz	g	W	in	mm
Single Stack	2.1	1.00	2.1	1.5	4.2	119	4.2	1.26	32.2
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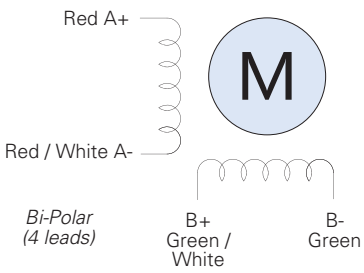
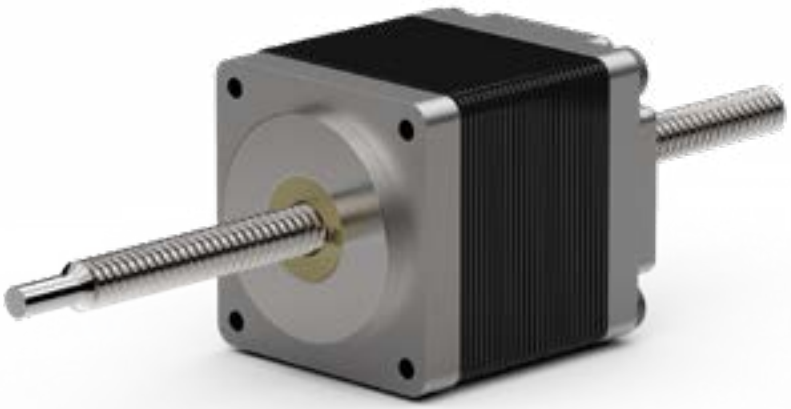
Double Stack	2.1	1.90	1.1	1.1	6.35	180	7.5	1.81	46
	5	0.75	6.7	5.8	6.35	180	7.5	1.81	46
	12	0.35	34.8	35.6	6.35	180	7.5	1.81	46

Wiring Diagram





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Screw Code	Diameter		Lead		Travel per Step		
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W18050	.1875	4.76	.050	1.27	.00025	0.00635	B
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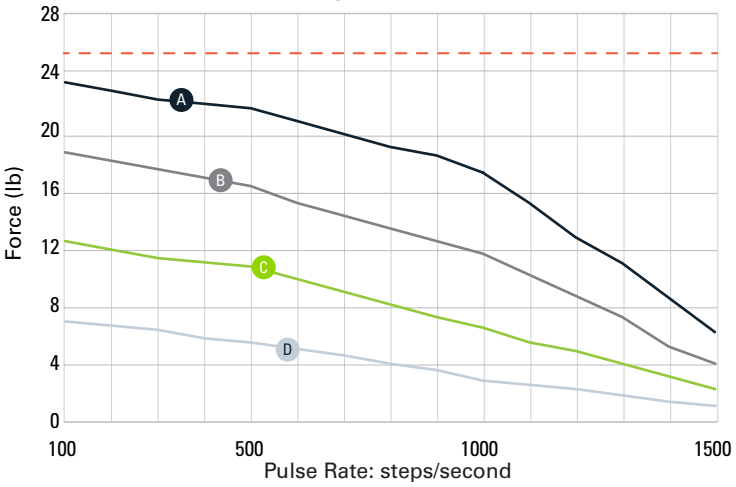
W18200	.1875	4.76	.200	5.08	.00100	0.02540	D
W18400	.1875	4.76	.400	10.16	.002	0.0508	

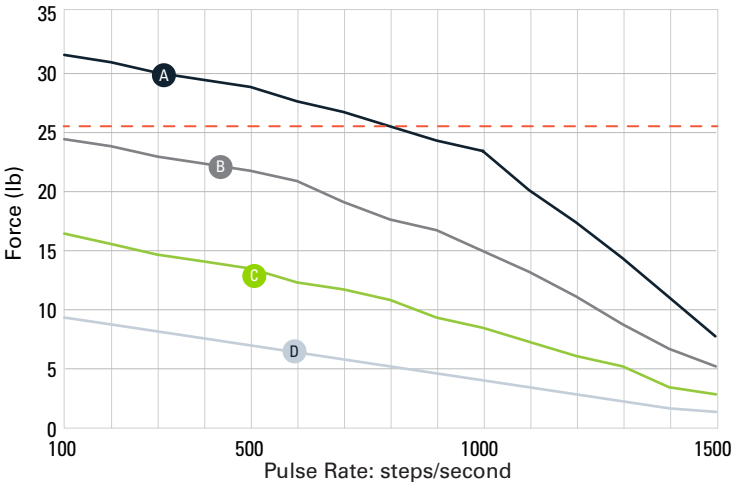
Native units: ☐ imperial ☐ metric

Force v Pulse Rate Charts

Single Stack



Double Stack



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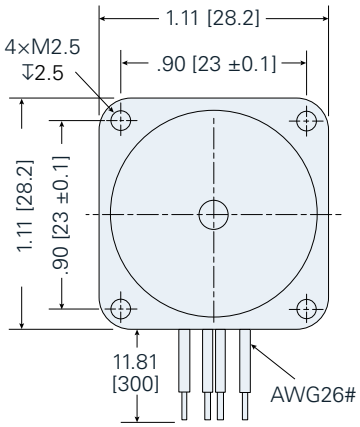
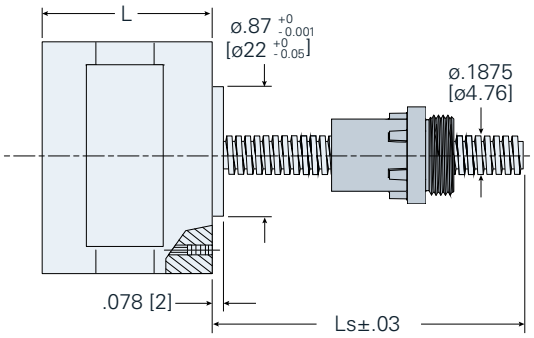
NEMA 11
External Stepper Motor Linear Actuator





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- Insulation Resistance: 20 MΩ
- Temperature Rise: 167° F (75° C)

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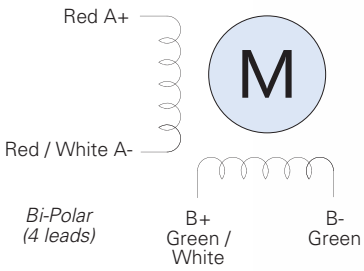
	12	0.18	68.6	39	4.2	119	4.2	1.26	32.2
Double Stack	2.1	1.90	1.1	1.1	6.35	180	7.5	1.81	46
	5	0.75	6.7	5.8	6.35	180	7.5	1.81	46
	12	0.35	34.8	35.6	6.35	180	7.5	1.81	46

Wiring Diagram



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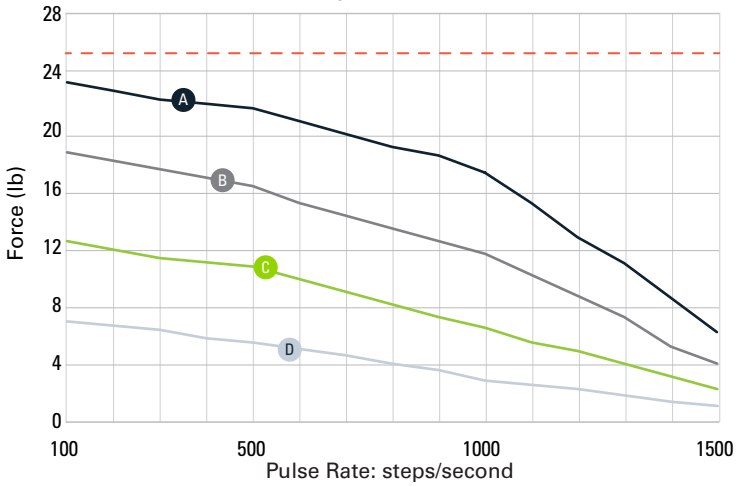
018050	.1875	4.76	.050	1.27	.00025	0.00635	B
018100	.1875	4.76	.100	2.54	.00050	0.01270	C
018200	.1875	4.76	.200	5.08	.00100	0.02540	D

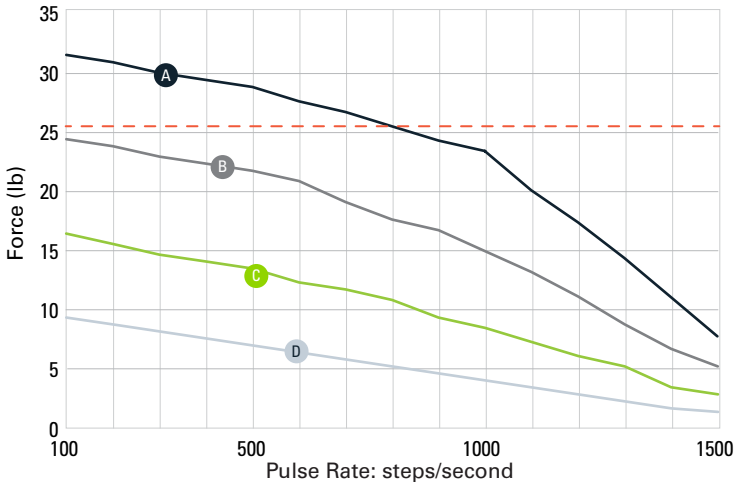
Native units: ☐ imperial ☐ metric

Force v Pulse Rate Charts

Single Stack



Double Stack



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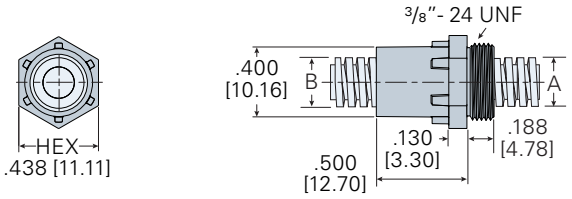
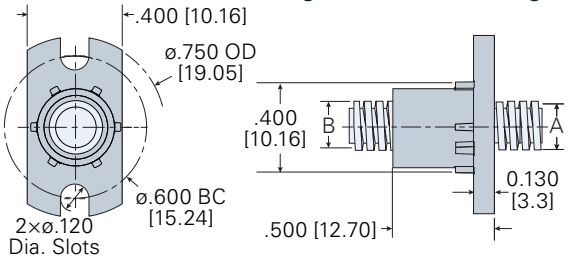
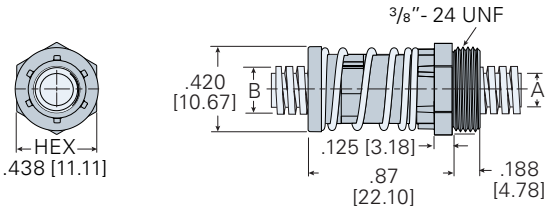


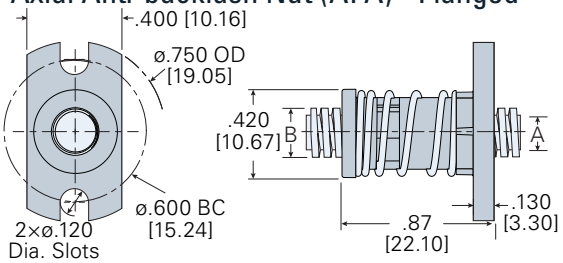
Standard Freewheeling Nut (NFA) - Flanged

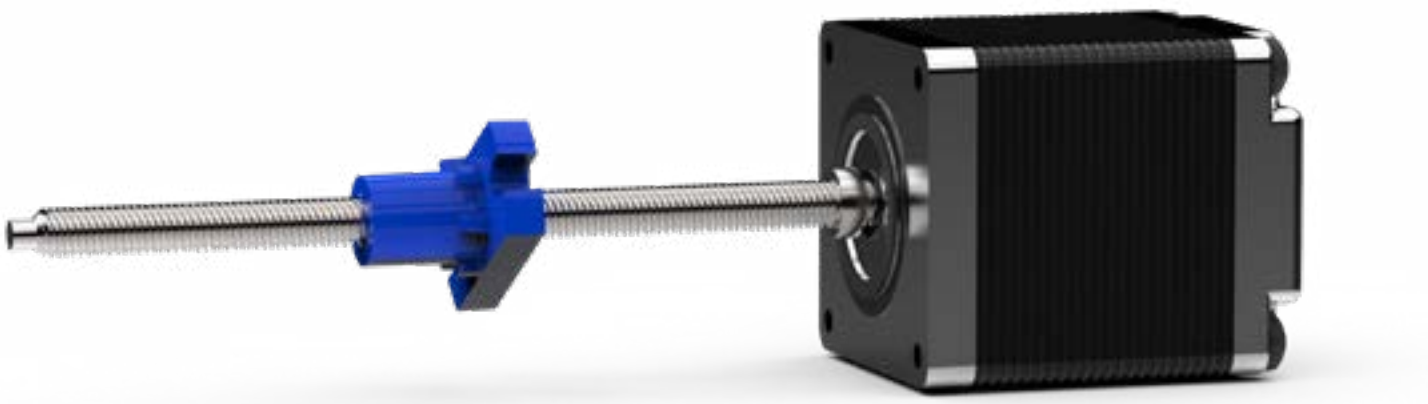


Axial Anti-backlash Nut (ATA) - Threaded



Axial Anti-backlash Nut (AFA) - Flanged





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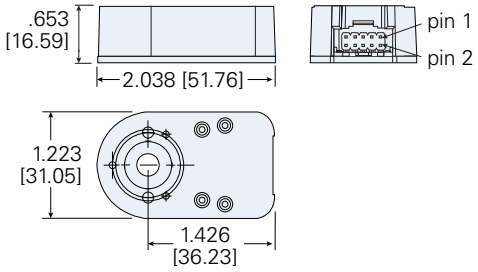
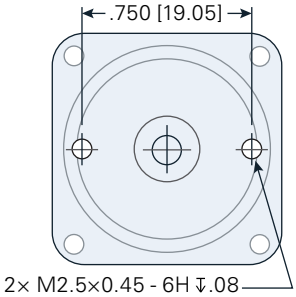
Encoder

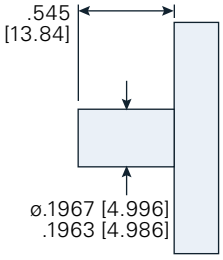


Encoder-Ready Options

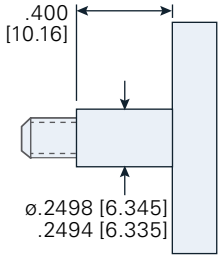
Rear View



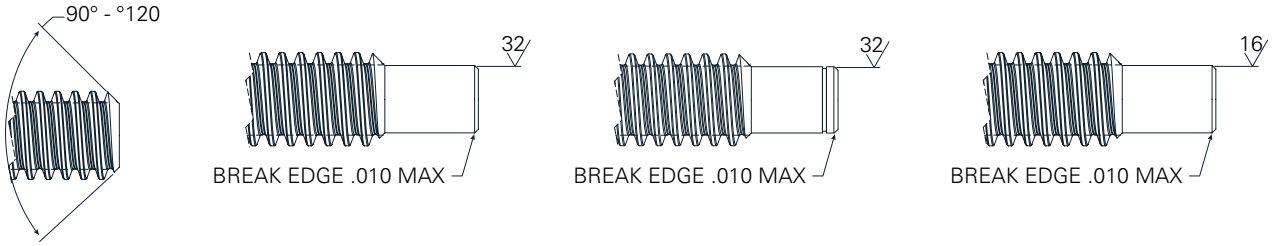
External



Non-Captive & Captive

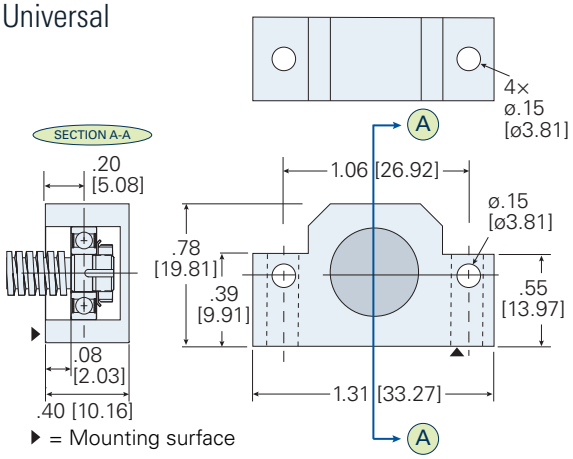


Screw End Machining

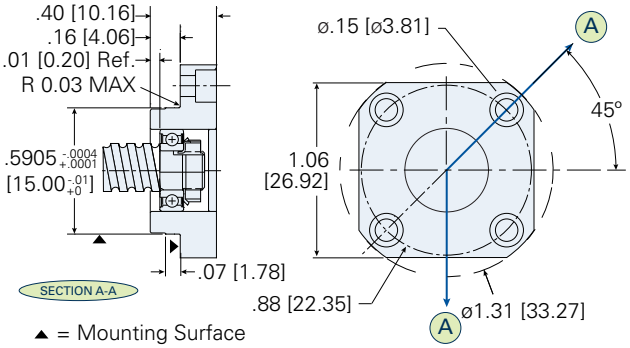


Ezze Mount™ Bearing Support

Universal



Flanged



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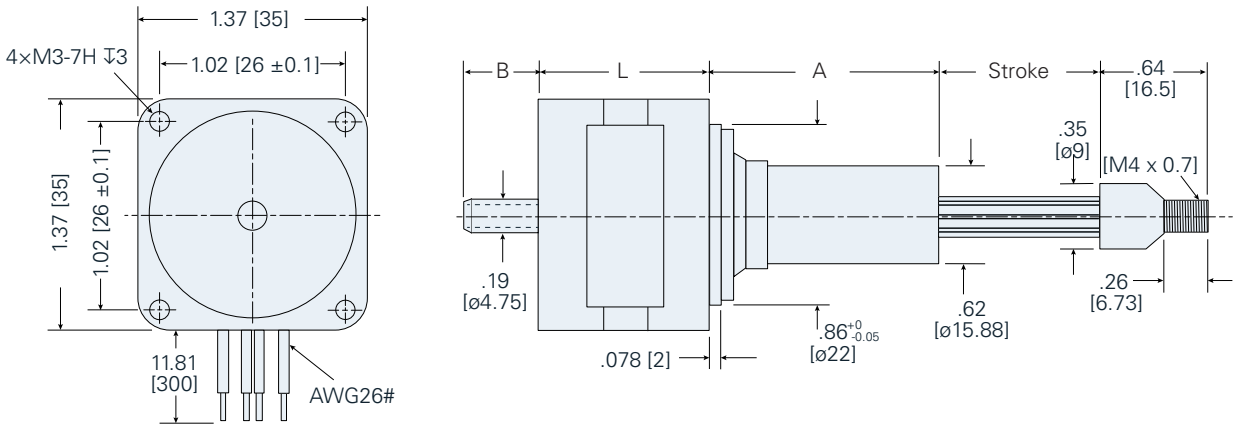
NEMA 14
Captive Stepper Motor Linear Actuator



Motor Specifications

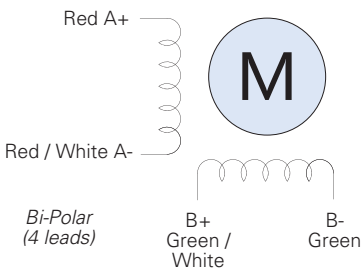
- Bipolar Wiring
- 1.8° Step Angle
- Insulation Resistance: 20 MΩ
- Temperature Rise: 167° F (75° C)

	Voltage	Current	Resistance/ Phase	Inductance/ Phase	Motor Weight		Power Input	L	
	V	A	Ω	mH	oz	g	W	in	mm
Single Stack	2.33	1.25	1.86	2.8	5.7	162	5.7	1.36	34.5
	5	0.57	8.8	13	5.7	162	5.7	1.36	34.5
	12	0.24	50.5	60	5.7	162	5.7	1.36	34.5
Double Stack	2.33	2.0	1.2	1.95	8.47	240	9.1	1.89	48
	5	0.91	5.5	7.63	8.47	240	9.1	1.89	48
	12	0.38	31.6	65.1	8.47	240	9.1	1.89	48

Stroke Codes

Stroke Code	Stroke		A		B	
	in	mm	in	mm	in	mm
0.50	.50	12.7	.82	20.8	.04	1
0.75	.75	19.1	1.07	27.2	.29	7.4
1.00	1.00	25.4	1.32	33.5	.54	13.7
1.25	1.25	31.8	1.57	39.9	.79	20.1
1.50	1.50	38.1	1.82	46.2	1.04	26.4
2.00	2.00	50.8	2.32	58.9	1.54	39.1

Wiring Diagram



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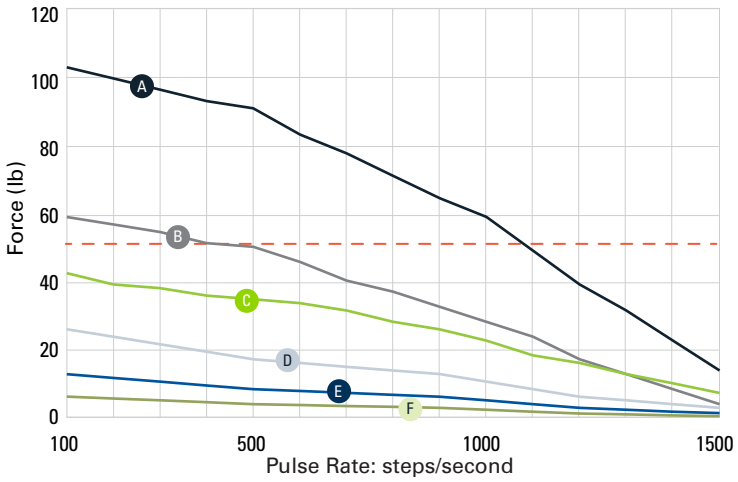
Screw Specification

Screw Code	Diameter		Lead		Travel per Step		
	in	mm	in	mm	in	mm	
W25024	.219	5.6	.024	0.6096	.00012	0.003048	A
W25031	.219	5.6	.03125	0.79375	.000156	0.003969	B
W25039	.219	5.6	.03937	1	.000197	0.005	
W25048	.219	5.6	.048	1.2192	.00024	0.006096	
W25050	.219	5.6	.050	1.27	.00025	0.00635	
W25062	.219	5.6	.0625	1.5875	.0003125	0.0079375	
W25096	.219	5.6	.096	2.438	.00048	0.012192	C
W25100	.219	5.6	.100	2.54	.0005	0.0127	
W25125	.219	5.6	.125	3.175	.000625	0.015875	D
W25192	.219	5.6	.192	4.877	.00096	0.024384	
W25250	.219	5.6	.250	6.35	.00125	0.03175	E
W25384	.219	5.6	.384	9.754	.00192	0.048768	
W25500	.219	5.6	.500	12.7	.0025	0.0635	F
W25999	.219	5.6	1.000	25.4	.005	0.127	

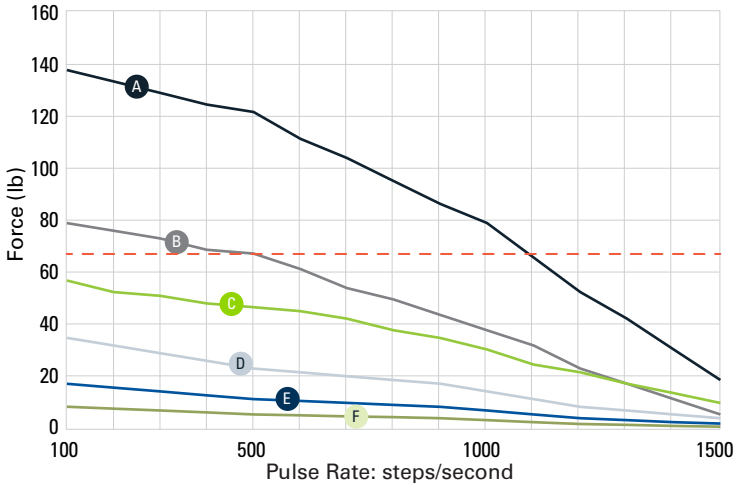
Native units: ☐ imperial ☐ metric

Force v Pulse Speed Chart

Single Stack



Double Stack



- - - - = Recommended load limit

Speed charts are based on using bi-polar motors with chopper drives at 100% duty cycle. Chopper drive curves were created using full steps on a 5 volt motor and a 40v power supply.

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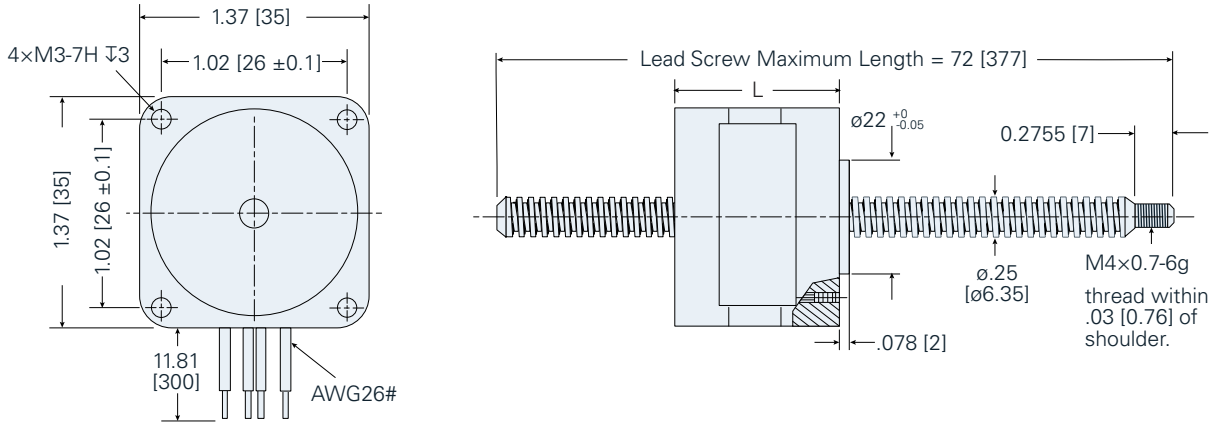
NEMA 14
Non-Captive Stepper Motor Linear Actuator



Motor Specifications

- Bipolar Wiring
- 1.8° Step Angle
- Insulation Resistance: 20 MΩ
- Temperature Rise: 167° F (75° C)

	Voltage	Current	Resistance/ Phase	Inductance/ Phase	Motor Weight		Power Input	L	
	V	A	Ω	mH	oz	g	W	in	mm
Single Stack	2.33	1.25	1.86	2.8	5.7	162	5.7	1.36	34.5
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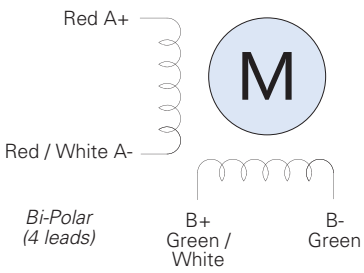
Wiring Diagram



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W25062	.219	5.6	.0625	1.5875	.0003125	0.0079375	
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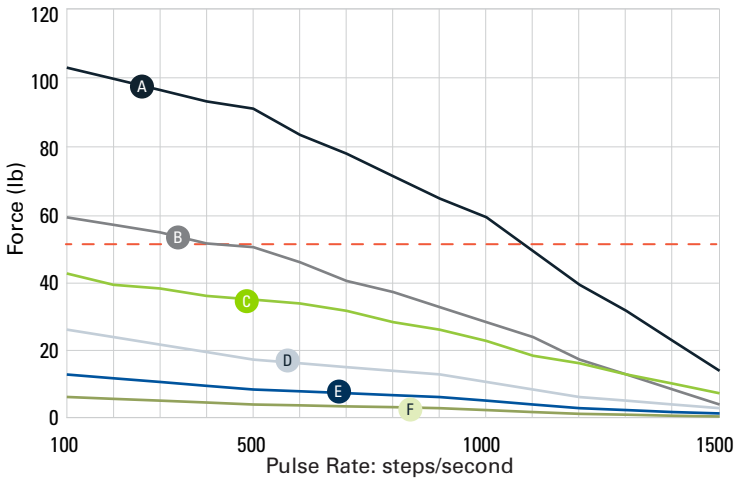
W25384	.219	5.6	.384	9.754	.00192	0.048768	
W25500	.219	5.6	.500	12.7	.0025	0.0635	F
W25999	.219	5.6	1.000	25.4	.005	0.127	

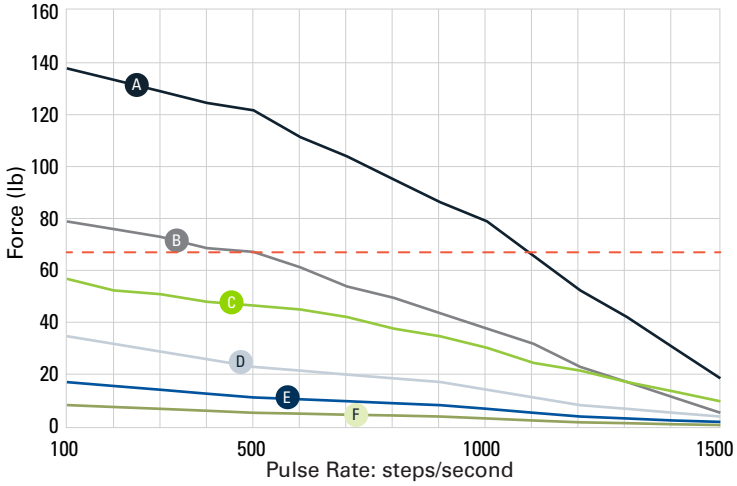
Native units: ☐ imperial ☐ metric

Force v Pulse Speed Chart

Single Stack



Double Stack



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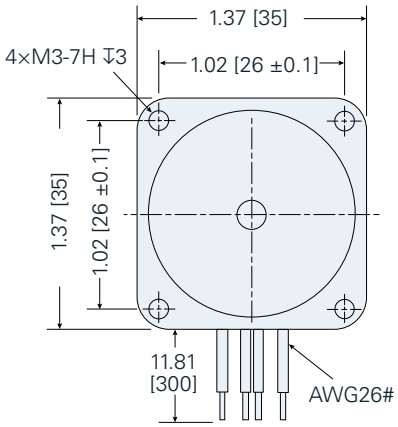
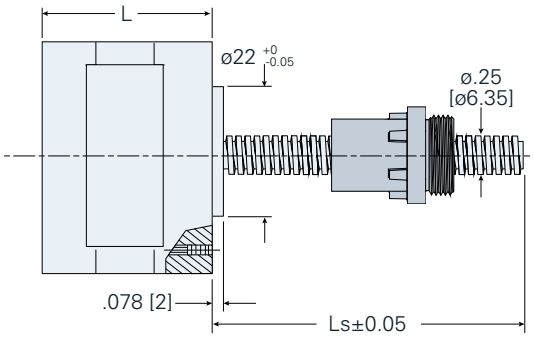
NEMA 14
External Stepper Motor Linear Actuator





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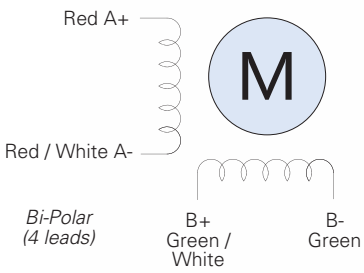
Wiring Diagram



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025048	.250	6.35	.048	1.2192	.00024	0.006096	
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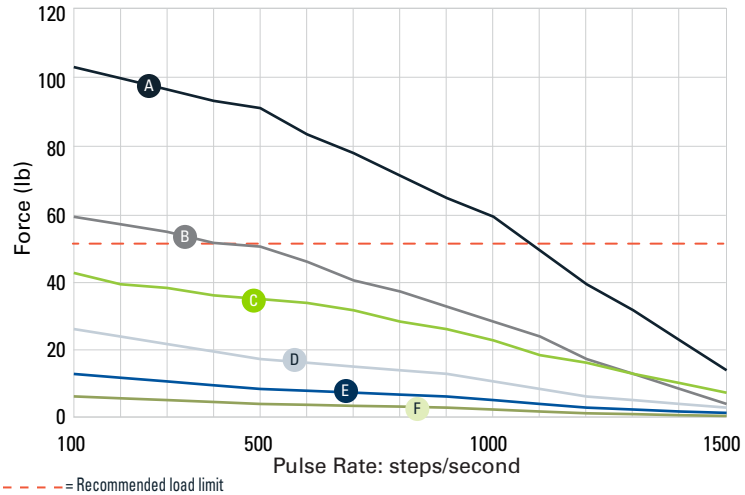
025062	.250	6.35	.0625	1.5875	.0003125	0.0079375	
025096	.250	6.35	.096	2.438	.00048	0.012192	C
025100	.250	6.35	.100	2.54	.0005	0.0127	
025125	.250	6.35	.125	3.175	.000625	0.015875	D
025192	.250	6.35	.192	4.877	.00096	0.024384	
025196	.250	6.35	.19685	5	.00098	0.025	
025250	.250	6.35	.250	6.35	.00125	0.03175	E
025384	.250	6.35	.384	9.754	.00192	0.048768	
025393	.250	6.35	.3937	10	.00197	0.050	
025500	.250	6.35	.500	12.7	.0025	0.0635	F
025750	.250	6.35	.750	19.05	.00375	0.09525	
025999	.250	6.35	1.000	25.4	.005	0.127	

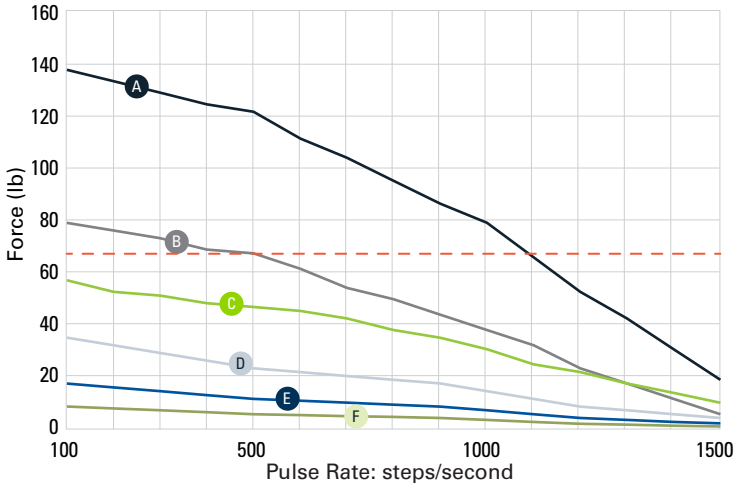
Native units: ☐ imperial ☐ metric

Force v Pulse Speed Chart

Single Stack



Double Stack



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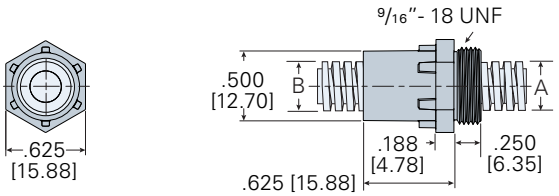
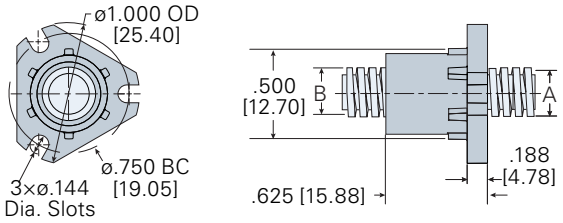
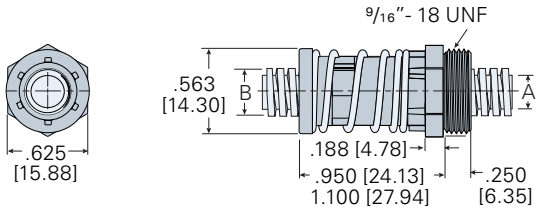
Standard Freewheeling Nut (NTA) - Threaded



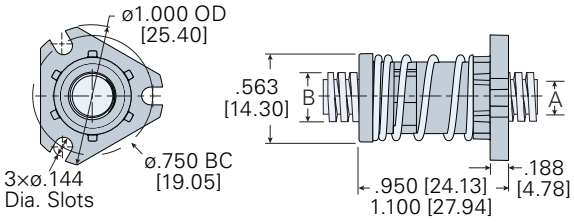
Standard Freewheeling Nut (NFA) - Flanged



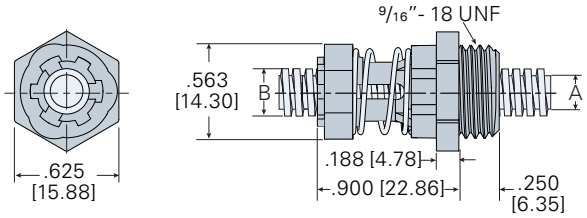
Axial Anti-backlash Nut (ATA) - Threaded



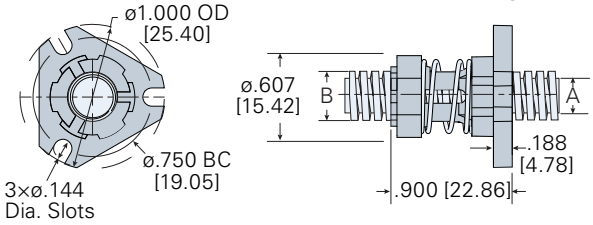
Axial Anti-backlash Nut (AFA) - Flanged



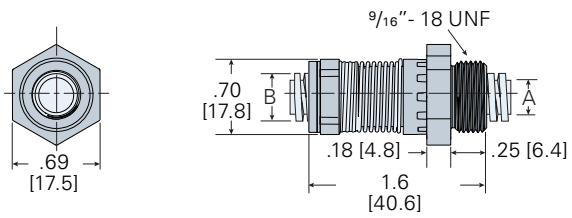
Radial Anti-backlash Nut (RTA) - Threaded



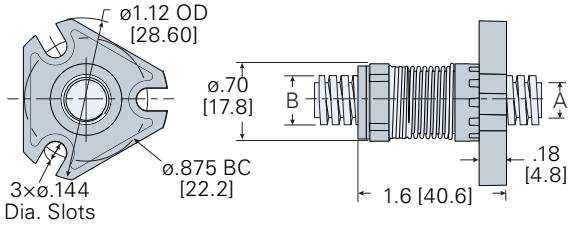
Radial Anti-backlash Nut (RFA) - Flanged



Torsional Anti-backlash Nut (KTA) - Threaded



Torsional Anti-backlash Nut (KFA) - Flanged



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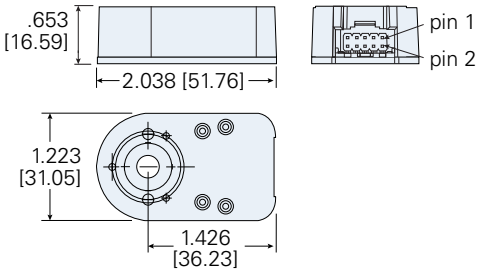
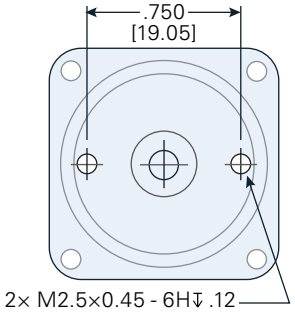
Encoder

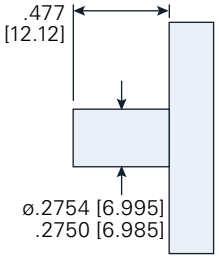


Encoder-Ready Options

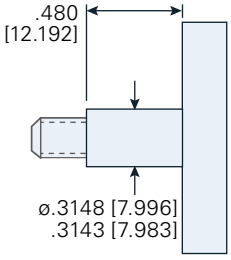
Rear View



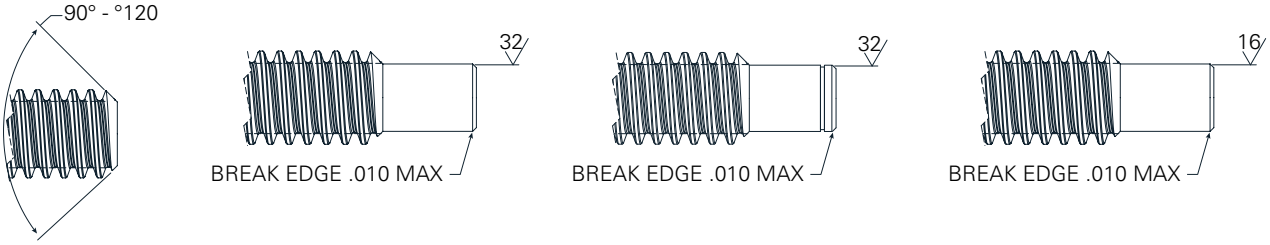
External



Non-Captive & Captive

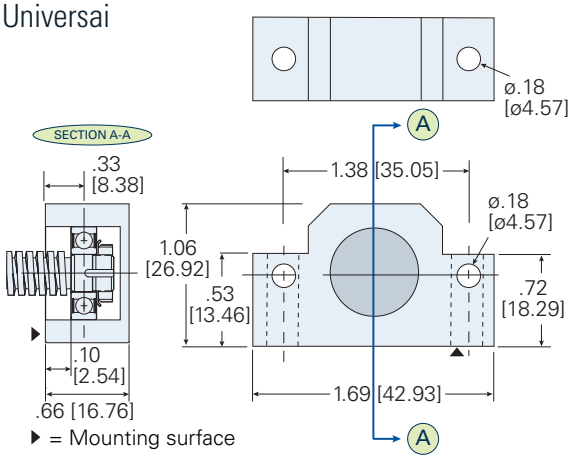


Screw End Machining



Ezze Mount™ Bearing Support

Universai



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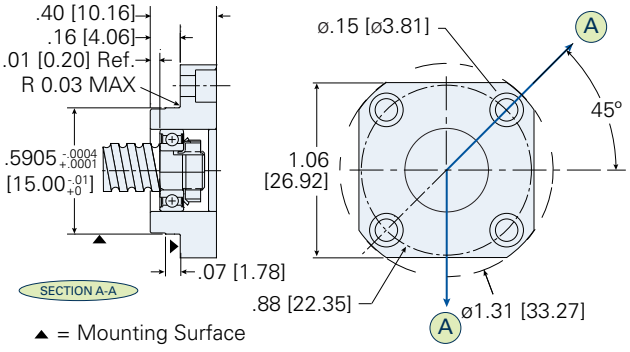

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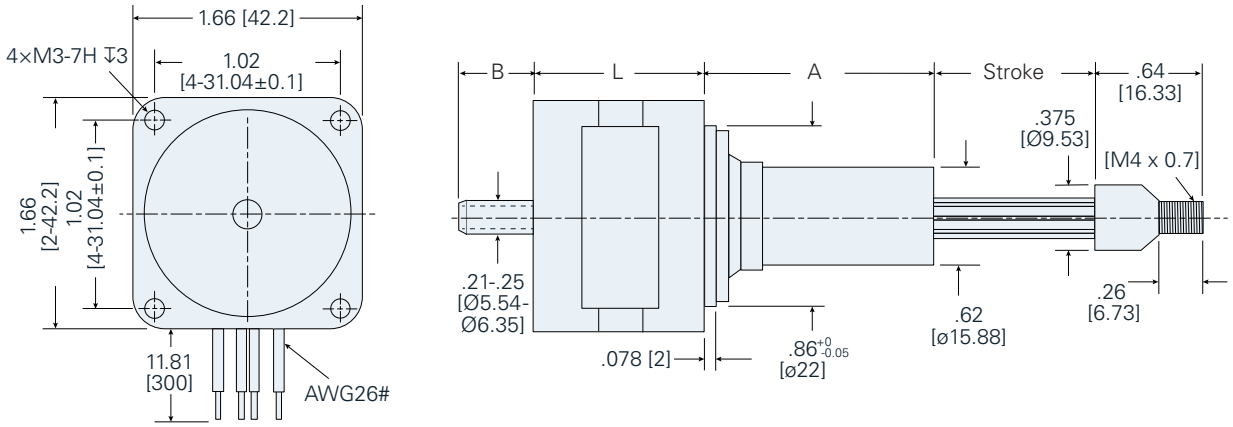
NEMA 17
Captive Stepper Motor Linear Actuator



Motor Specifications

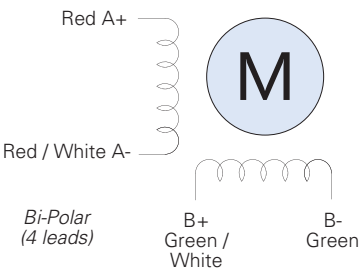
- Bipolar Wiring
- 1.8° Step Angle
- Insulation Resistance: 20 MΩ
- Temperature Rise: 167°F (75°C)

	Voltage	Current	Resistance/ Phase	Inductance/ Phase	Motor Weight		Power Input	L	
	V	A	Ω	mH	oz	g	W	in	mm
Single Stack	2.33	1.50	1.56	1.9	8.5	241	13	1.33	33.8
	5	0.70	7.2	10.6	8.5	241	13	1.33	33.8
	12	0.29	41.5	73.3	8.5	241	13	1.33	33.8
Double Stack	2.33	2.60	0.9	1.33	12.4	352	14	1.88	47.75
	5	1.30	3.8	6.6	12.4	352	14	1.88	47.75
	12	0.55	21.9	45.1	12.4	352	14	1.88	47.75

Stroke Codes

Stroke Code	Stroke		A		B	
	in	mm	in	mm	in	mm
0.50	.50	12.7	.79	19.8	.02	0.51
0.75	.75	19.1	1.03	26.2	.27	6.86
1.00	1.00	25.4	1.28	32.5	.52	13.21
1.25	1.25	31.8	1.53	38.9	.77	19.56
1.50	1.50	38.1	1.78	45.2	1.02	25.91
2.00	2.00	50.8	2.28	57.9	1.52	38.61

Wiring Diagram



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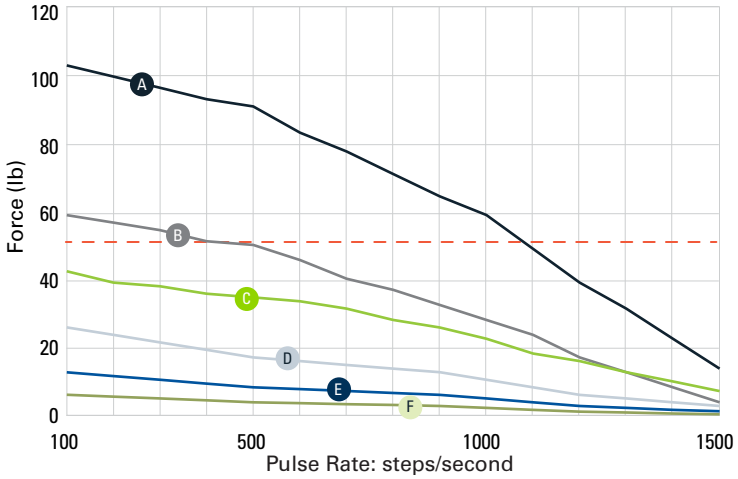
Screw Specification

Screw Code	Diameter		Lead		Travel per Step		
	in	mm	in	mm	in	mm	
W25024	.219	5.6	.024	0.6096	.00012	0.003048	A
W25031	.219	5.6	.03125	0.79375	.000156	0.003969	B
W25039	.219	5.6	.03937	1	.000197	0.005	
W25048	.219	5.6	.048	1.2192	.00024	0.006096	
W25050	.219	5.6	.050	1.27	.00025	0.00635	
W25062	.219	5.6	.0625	1.5875	.0003125	0.0079375	
W25096	.219	5.6	.096	2.438	.00048	0.012192	C
W25100	.219	5.6	.100	2.54	.0005	0.0127	
W25125	.219	5.6	.125	3.175	.000625	0.015875	D
W25192	.219	5.6	.192	4.877	.00096	0.024384	
W25250	.219	5.6	.250	6.35	.00125	0.03175	E
W25384	.219	5.6	.384	9.754	.00192	0.048768	
W25500	.219	5.6	.500	12.7	.0025	0.0635	F
W25999	.219	5.6	1.000	25.4	.005	0.127	

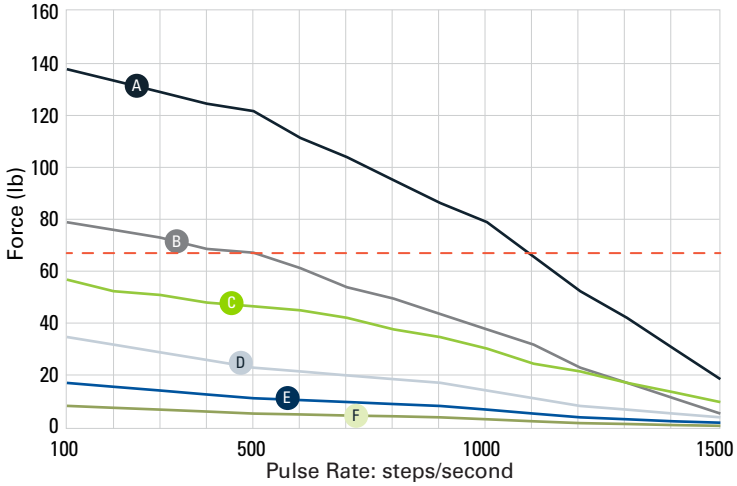
Native units: ☐ imperial ☐ metric

Force v Pulse Speed Chart

Single Stack



Double Stack



- - - - = Recommended load limit

Speed charts are based on using bi-polar motors with chopper drives at 100% duty cycle. Chopper drive curves were created using full steps on a 5 volt motor and a 40v power supply.

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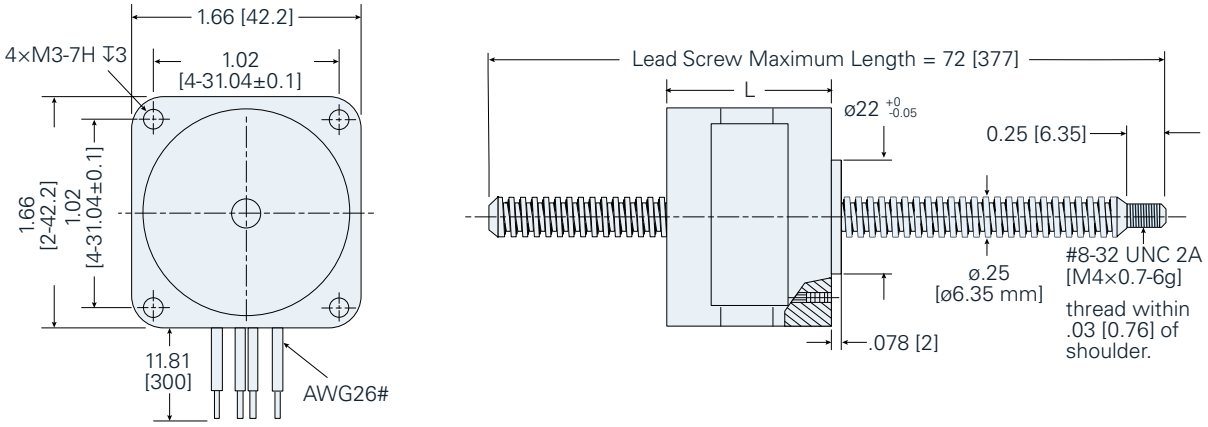

Motor Specifications

- Bipolar Wiring
- 1.8° Step Angle
- Insulation Resistance: 20 MΩ
- Temperature Rise: 167° F (75° C)

	Voltage	Current	Resistance/ Phase	Inductance/ Phase	Motor Weight		Power Input	L	
	V	A	Ω	mH	oz	g	W	in	mm
Single Stack	2.33	1.50	1.56	1.9	8.5	241	13	1.33	33.8
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	5	1.3	3.8	6.6	12.4	352	14	1.88	47.75
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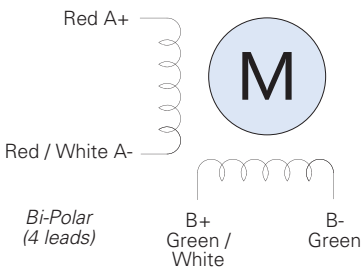
Wiring Diagram



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W25050	.219	5.6	.050	1.27	.00025	0.00635	
W25062	.219	5.6	.0625	1.5875	.0003125	0.0079375	
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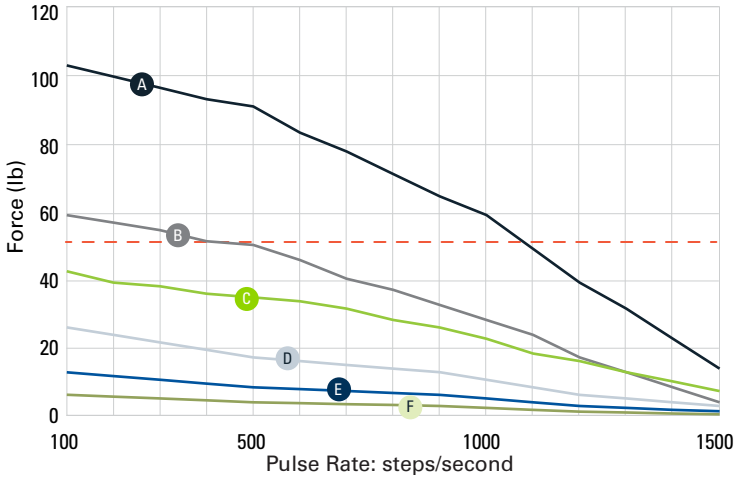
W25384	.219	5.6	.384	9.754	.00192	0.048768	
W25500	.219	5.6	.500	12.7	.0025	0.0635	F
W25999	.219	5.6	1.000	25.4	.005	0.127	

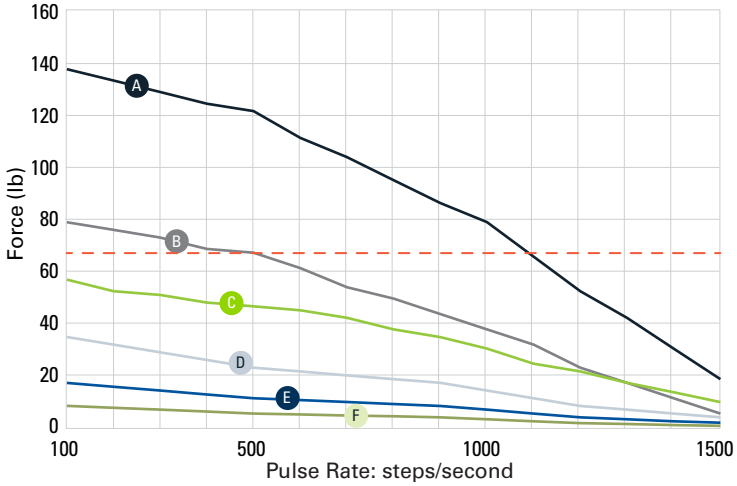
Native units: ☐ imperial ☐ metric

Force v Pulse Speed Chart

Single Stack



Double Stack



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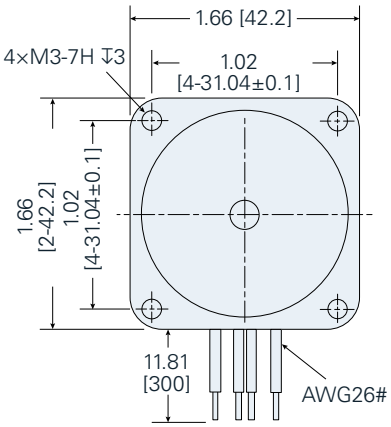
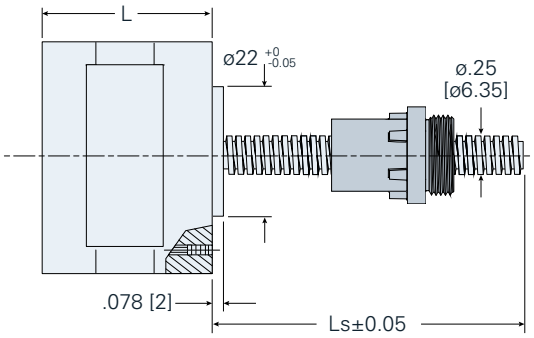
NEMA 17
External Stepper Motor Linear Actuator





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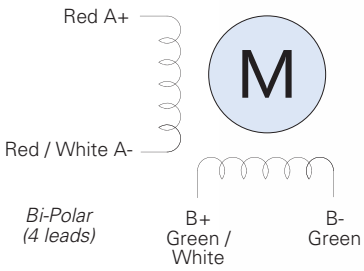
Wiring Diagram



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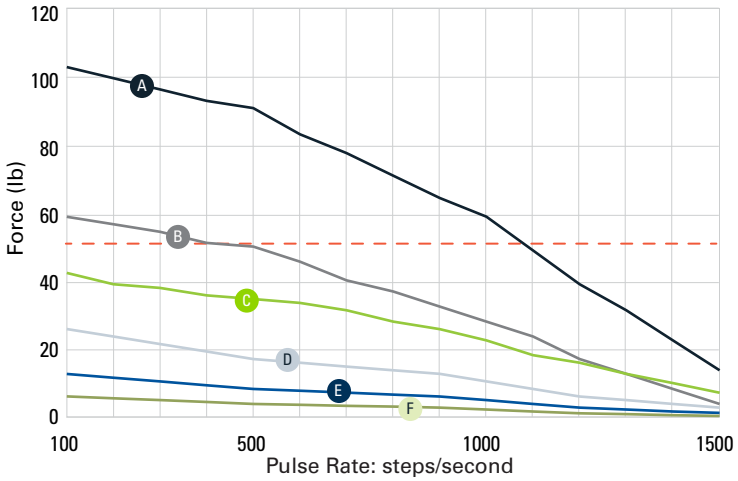
025039	.250	6.35	.03937	1	.000197	0.005	
025048	.250	6.35	.048	1.2192	.00024	0.006096	
025050	.250	6.35	.050	1.27	.00025	0.00635	
025062	.250	6.35	.0625	1.5875	.0003125	0.0079375	
025096	.250	6.35	.096	2.438	.00048	0.012192	C
025100	.250	6.35	.100	2.54	.0005	0.0127	
025125	.250	6.35	.125	3.175	.000625	0.015875	D
025192	.250	6.35	.192	4.877	.00096	0.024384	
025196	.250	6.35	.19685	5	.00098	0.025	
025250	.250	6.35	.250	6.35	.00125	0.03175	E
025384	.250	6.35	.384	9.754	.00192	0.048768	
025393	.250	6.35	.3937	10	.00197	0.050	
025500	.250	6.35	.500	12.7	.0025	0.0635	F
025750	.250	6.35	.750	19.05	.00375	0.09525	
025999	.250	6.35	1.000	25.4	.005	0.127	

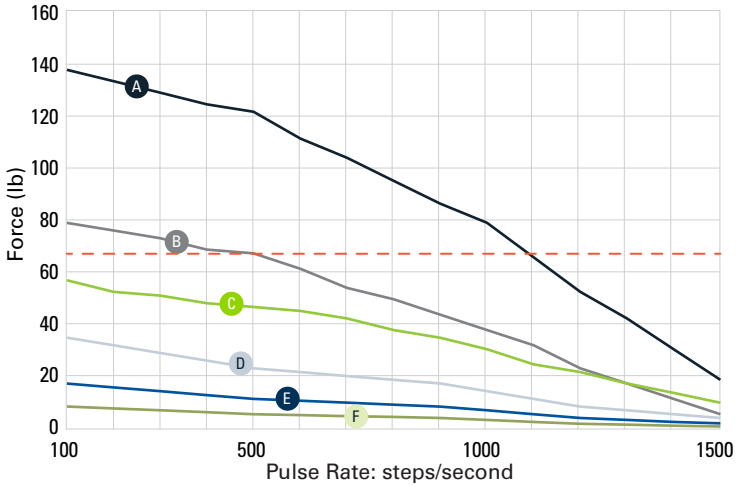
Native units: ☐ imperial ☐ metric

Force v Pulse Speed Chart

Single Stack



Double Stack



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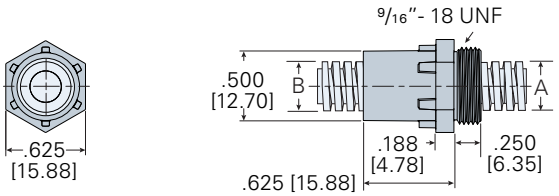
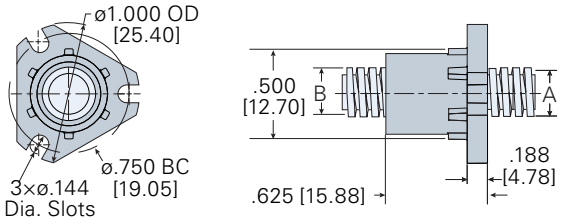
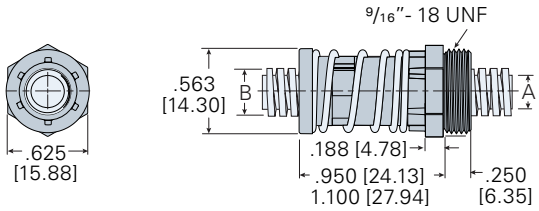
Standard Freewheeling Nut (NTA) - Threaded



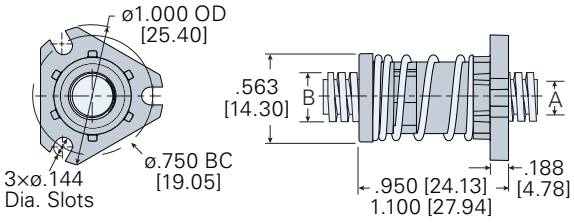
Standard Freewheeling Nut (NFA) - Flanged



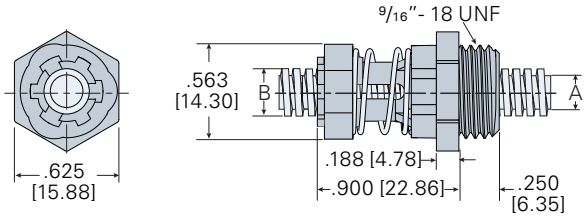
Axial Anti-backlash Nut (ATA) - Threaded



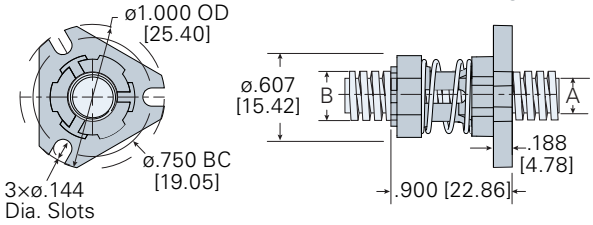
Axial Anti-backlash Nut (AFA) - Flanged



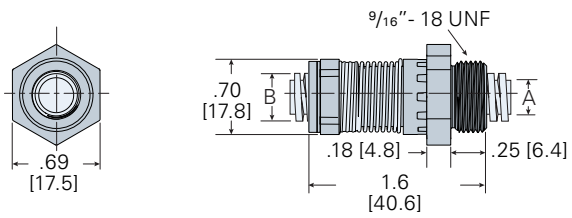
Radial Anti-backlash Nut (RTA) - Threaded



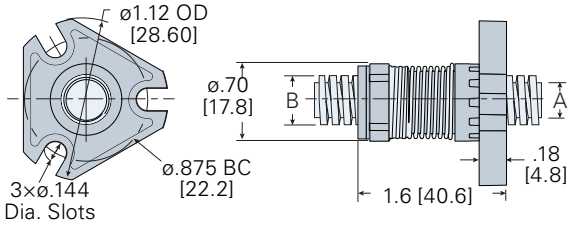
Radial Anti-backlash Nut (RFA) - Flanged



Torsional Anti-backlash Nut (KTA) - Threaded



Torsional Anti-backlash Nut (KFA) - Flanged



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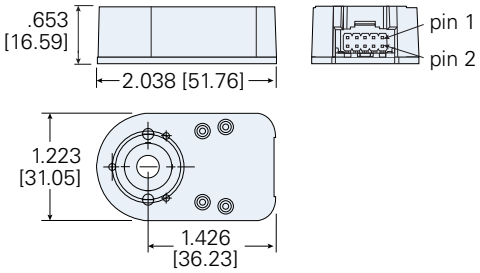
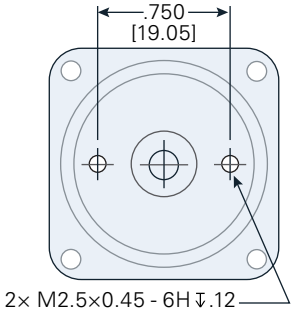
Encoder



Encoder-Ready Options

Rear View



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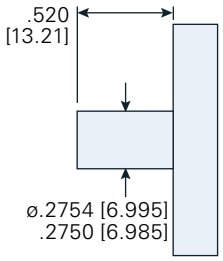

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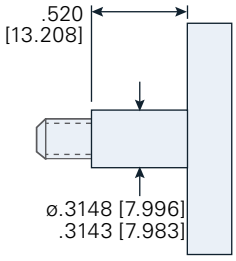
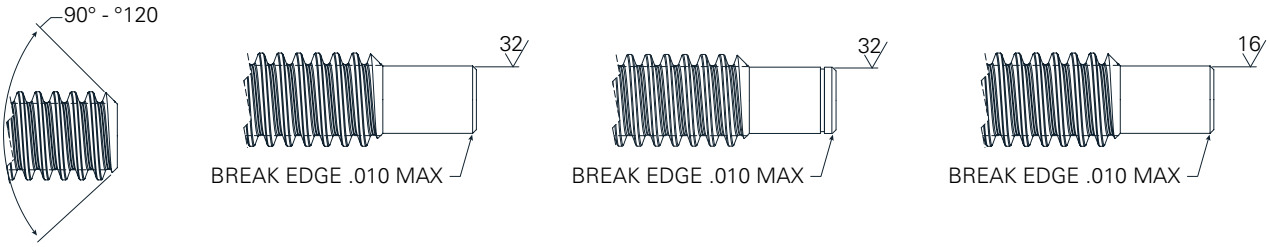
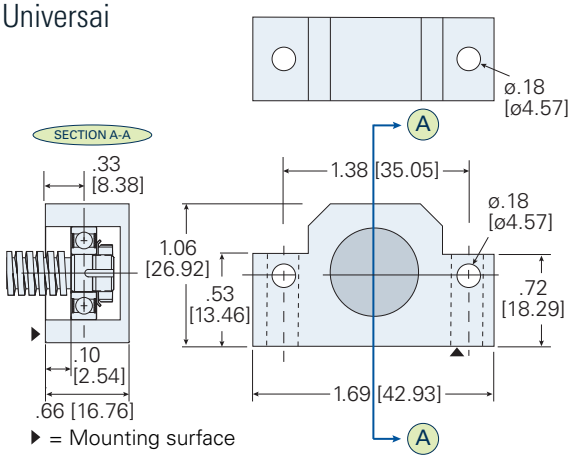


Screw End Machining



Ezze Mount™ Bearing Support

Universai



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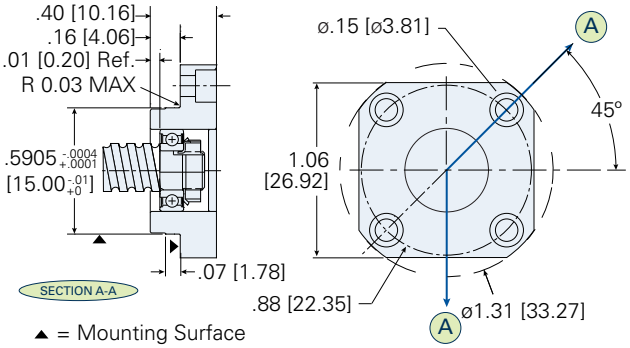

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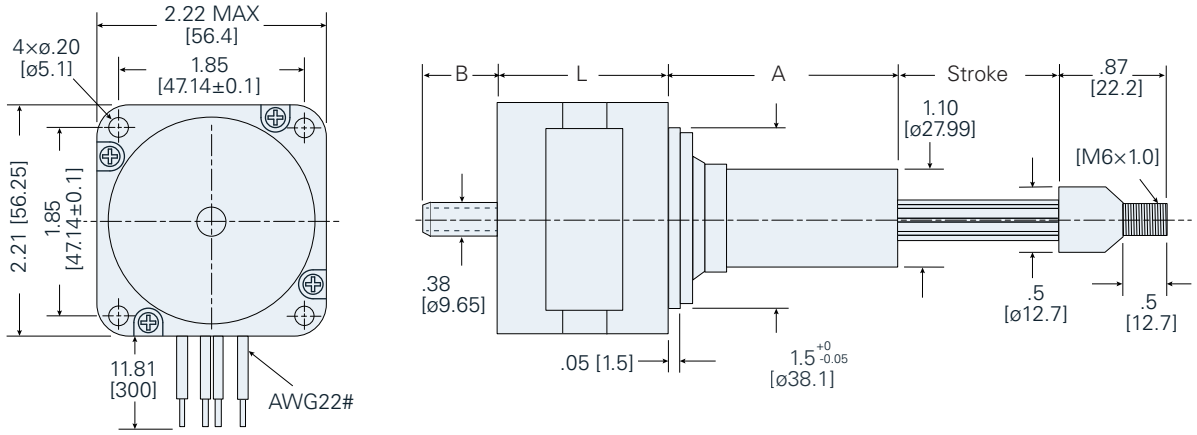
NEMA 23
Captive Stepper Motor Linear Actuator



Motor Specifications

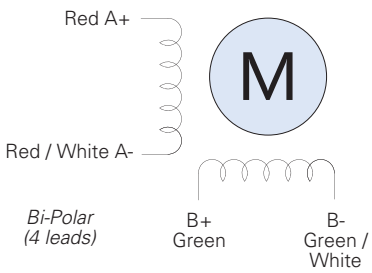
- Bipolar Wiring
- 1.8° Step Angle
- Insulation Resistance: 20 MΩ
- Temperature Rise: 167° F (75° C)

	Voltage	Current	Resistance/ Phase	Inductance/ Phase	Motor Weight		Power Input	L	
	V	A	Ω	mH	oz	g	W	in	mm
Single Stack	3.25	2	1.63	3.5	18	511	13	1.78	45.2
	5	1.3	3.85	10.5	18	511	13	1.78	45.2
	12	0.54	22.2	47	18	511	13	1.78	45.2
Double Stack	3.25	3.32	0.98	1.33	33.8	958	14	2.60	66.0
	5	2.16	2.31	6.6	33.8	958	14	2.60	66.0
	12	0.9	13.33	45.1	33.8	958	14	2.60	66.0

Stroke Codes

Stroke Code	Stroke		A		B	
	in	mm	in	mm	in	mm
0.50	.50	12.7	1.01	25.7	0.06	1.5
0.75	.75	19.1	1.26	32.0	0.31	7.9
1.00	1.00	25.4	1.51	38.4	0.56	14.2
1.25	1.25	31.8	1.76	44.7	0.81	20.6
1.50	1.50	38.1	2.01	51.1	1.06	26.9
2.00	2.00	50.8	2.51	63.8	1.56	39.6

Wiring Diagram



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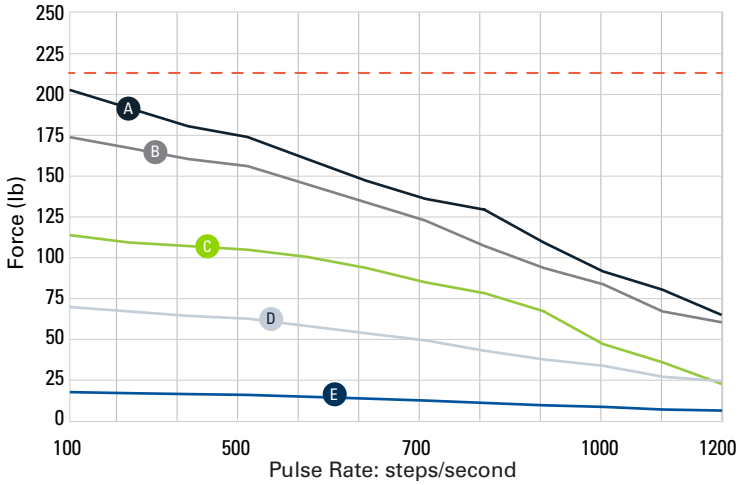
Screw Specifications

Screw Code	Diameter		Lead		Travel per Step		
	in	mm	in	mm	in	mm	
W37050	.375	9.53	.050	1.27	.00025	0.00635	
W37062	.375	9.53	.0625	1.5875	.0003125	0.0079375	
W37083	.375	9.53	.08334	2.117	.000417	0.010584	A
W37100	.375	9.53	.100	2.54	.0005	0.0127	B
W37125	.375	9.53	.125	3.175	.000625	0.015875	
W37166	.375	9.53	.16666	4.233	.000833	0.021166	C
W37200	.375	9.53	.200	5.08	.001	0.0254	
W37250	.375	9.53	.250	6.35	.00125	0.03175	D
W37400	.375	9.53	.400	10.16	.002	0.0508	
W37999	.375	9.53	1.000	25.4	.005	0.127	E

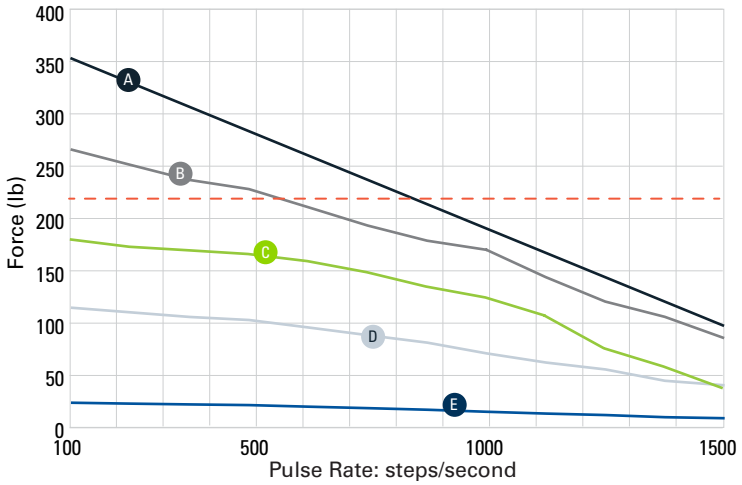
Native units: ☐ imperial ▒ metric

Force v Pulse Rate Charts

Single Stack



Double Stack



- - - - = Recommended load limit

Speed charts are based on using bi-polar motors with chopper drives at 100% duty cycle. Chopper drive curves were created using full steps on a 5 volt motor and a 40v power supply.

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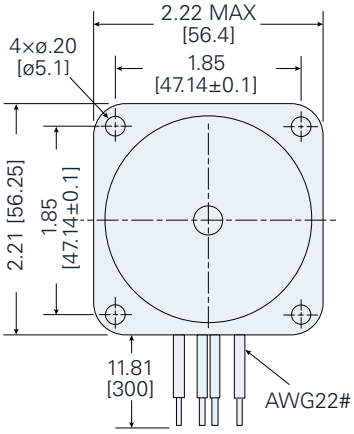

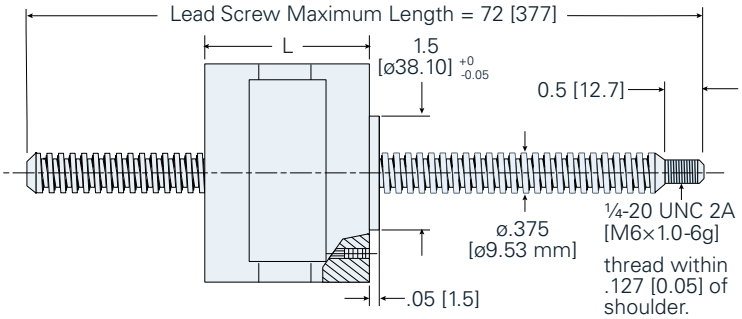

Motor Specifications

- Bipolar Wiring
- 1.8° Step Angle
- Insulation Resistance: 20 MΩ
- Temperature Rise: 167°F (75°C)

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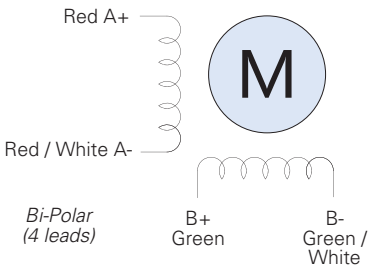
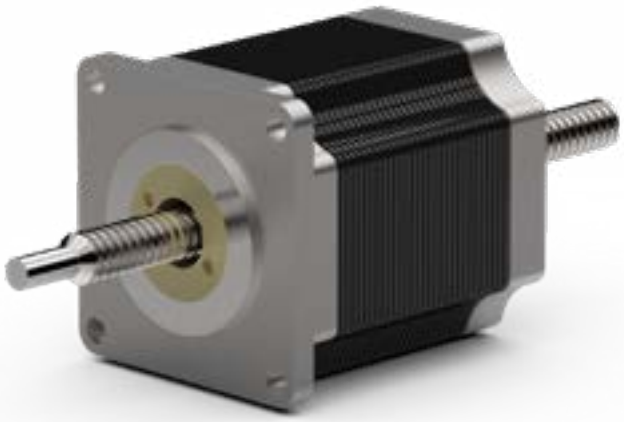
Wiring Diagram





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W37166	.375	9.53	.16666	4.233	.000833	0.021166	C
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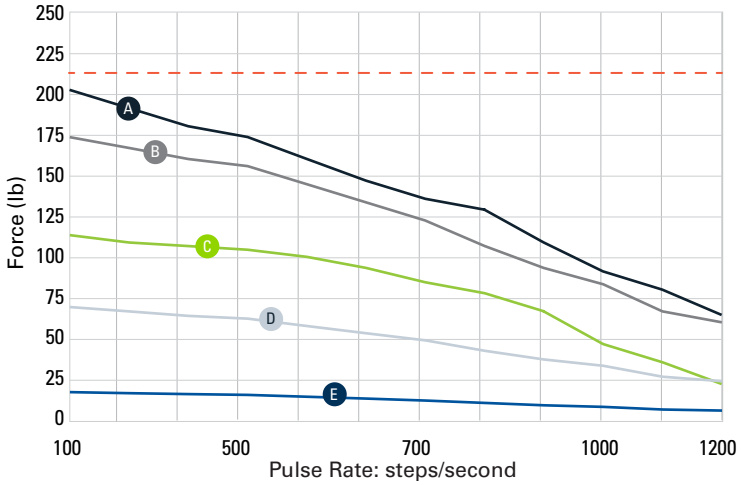
Force v Pulse Rate Charts

Single Stack



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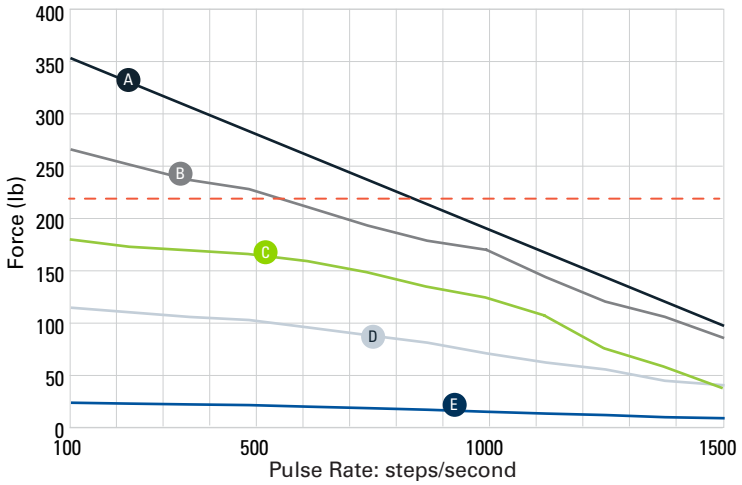

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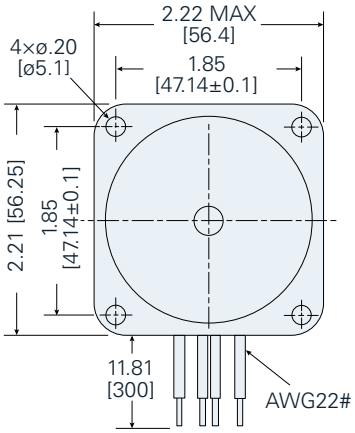

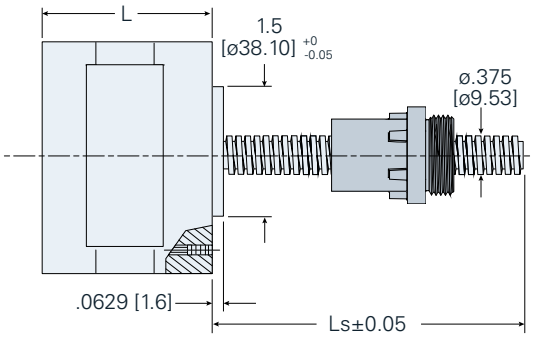

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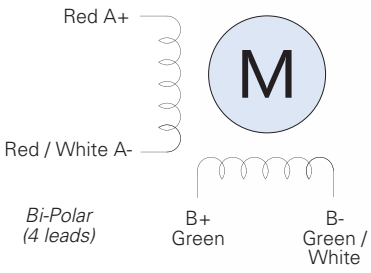
	12	0.9	13.33	45.1	33.8	958	14	2.60	66.0

Wiring Diagram



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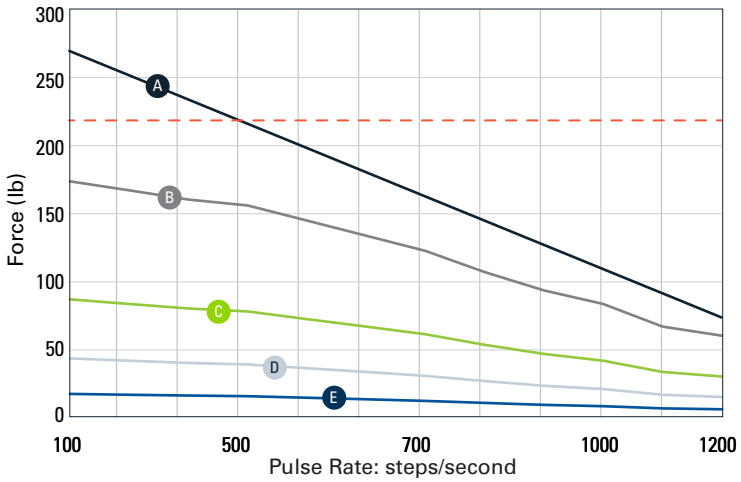
037062	.375	9.53	.0625	1.5875	.0003125	0.0079375	
037083	.375	9.53	.08334	2.117	.000417	0.010584	
037100	.375	9.53	.100	2.54	.0005	0.0127	B
037125	.375	9.53	.125	3.175	.000625	0.015875	
037166	.375	9.53	.16666	4.233	.000833	0.021166	
037196	.375	9.53	.19685	5	.00098	0.025	
037200	.375	9.53	.200	5.08	.001	0.0254	
037250	.375	9.53	.250	6.35	.00125	0.03175	C
037393	.375	9.53	.3937	10	.00197	0.050	D
037400	.375	9.53	.400	10.16	.002	0.0508	
037472	.375	9.53	.47244	12	.002362	0.060	
037590	.375	9.53	.59055	15	.002953	0.075	
037999	.375	9.53	1.000	25.4	.005	0.127	E
037M30	.375	9.53	1.1811	30	.005906	0.150	

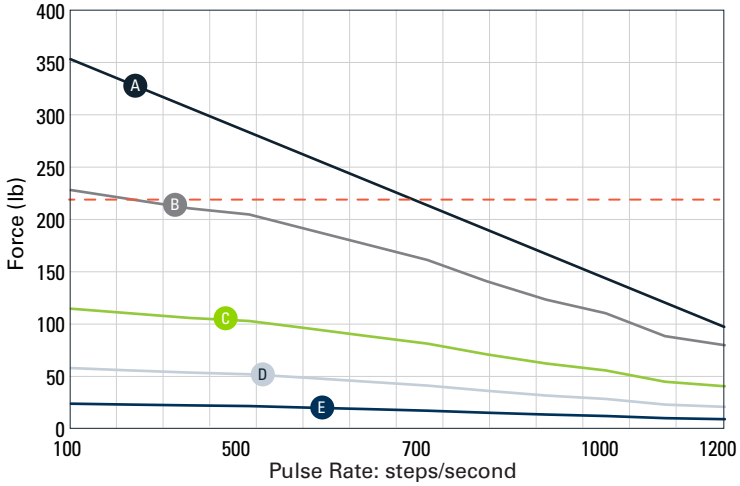
Native units: ☐ imperial ☐ metric

Force v Pulse Rate Charts

Single Stack



Double Stack



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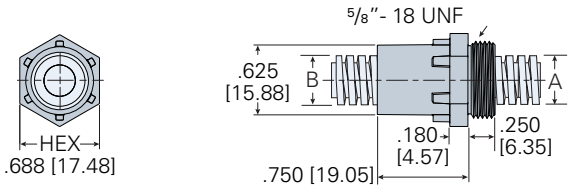
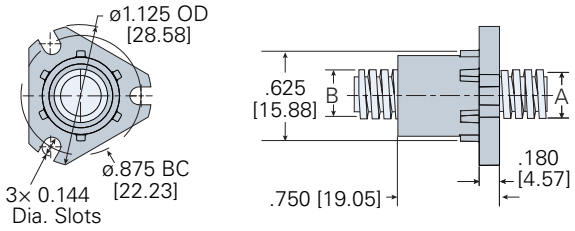
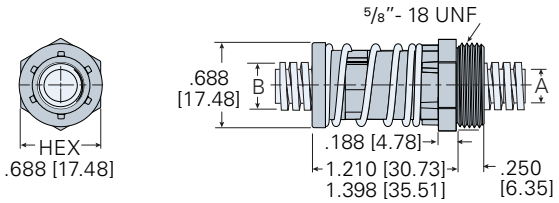
Standard Freewheeling Nut (NTA) - Threaded



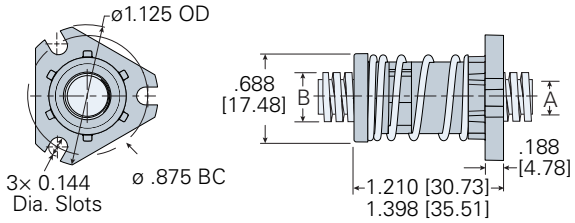
Standard Freewheeling Nut (NFA) - Flanged



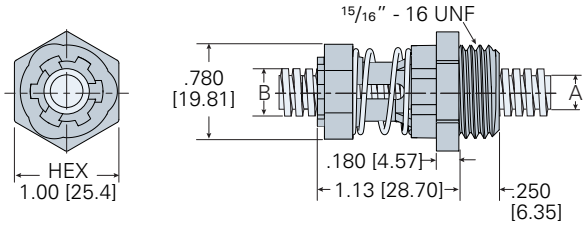
Axial Anti-backlash Nut (ATA) - Threaded



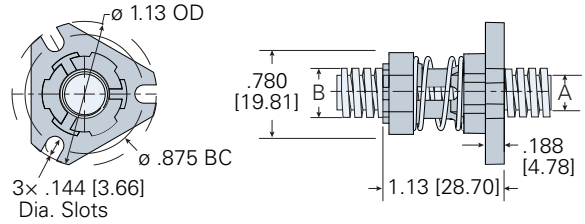
Axial Anti-backlash Nut (AFA) - Flanged



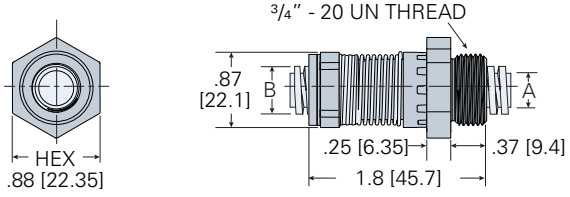
Radial Anti-backlash Nut (RTA) - Threaded



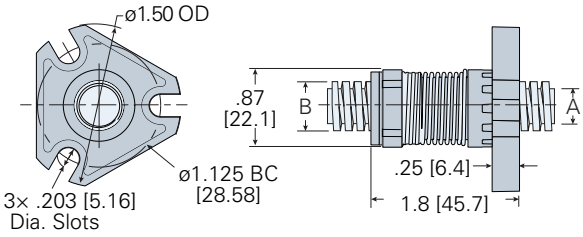
Radial Anti-backlash Nut (RFA) - Flanged



Torsional Anti-backlash Nut (KTA) - Threaded



Torsional Anti-backlash Nut (KFA) - Flanged



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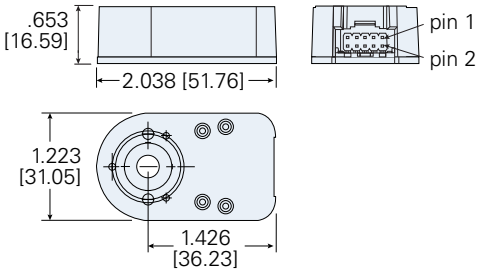
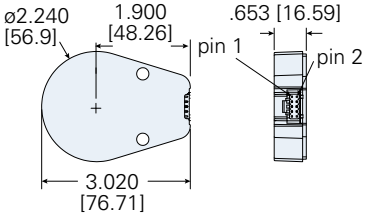
Encoder

External

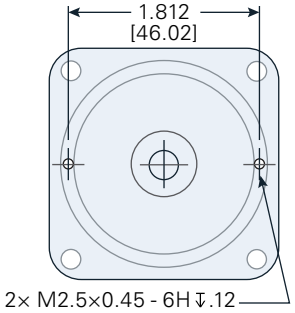


Non-Captive & Captive



Encoder-Ready Options

Rear View



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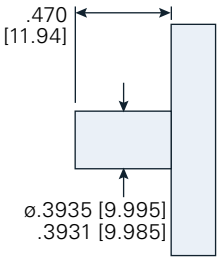

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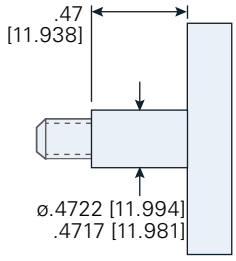

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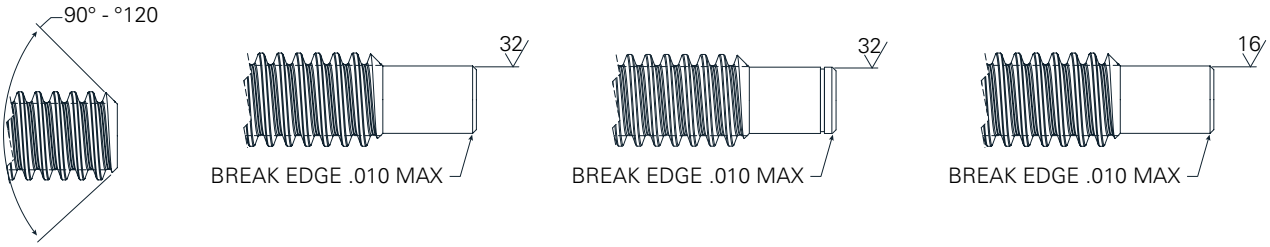

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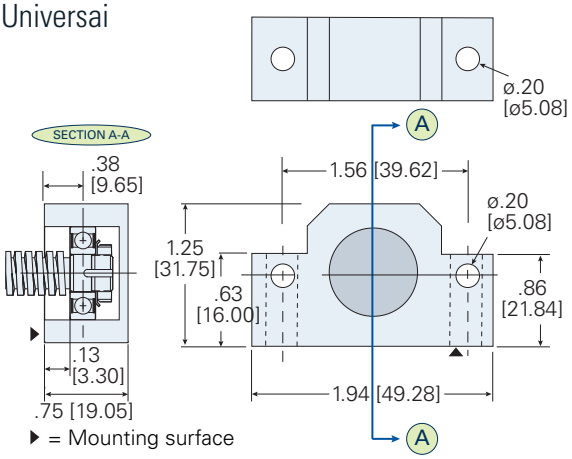
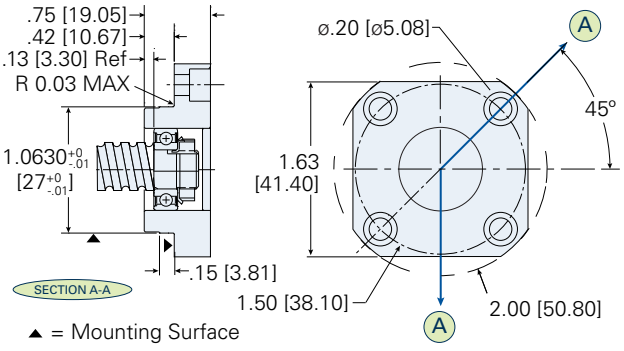


Flanged



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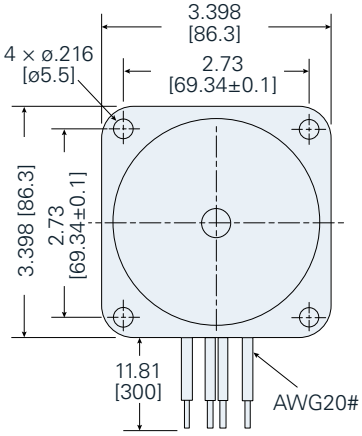
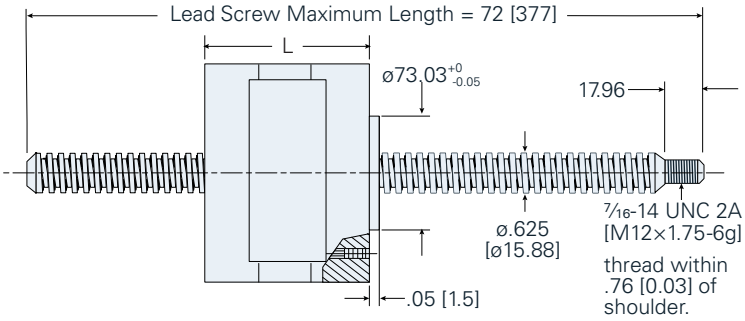
NEMA 34
Non-Captive Stepper Motor Linear Actuator



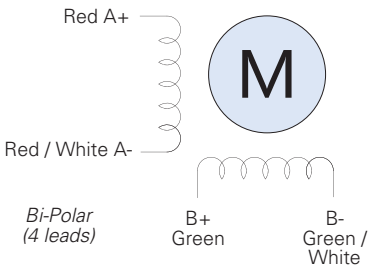


Motor Specifications

- Bipolar Wiring
- 1.8° Step Angle
- Insulation Resistance: 20 MΩ
- Temperature Rise: 167°F (75°C)

	Voltage	Current	Resistance/ Phase	Inductance/ Phase	Motor Weight		Power Input	L	
	V	A	Ω	mH	oz	g	W	in	mm
Single Stack	2.85	5.47	.52	2.86	5.07	2.3	31.2	3.0929	78.560
	5	3.12	1.6	8.8	5.07	2.3	31.2	3.0929	78.560
	12	1.3	9.23	51	5.07	2.3	31.2	3.0929	78.560

Wiring Diagram



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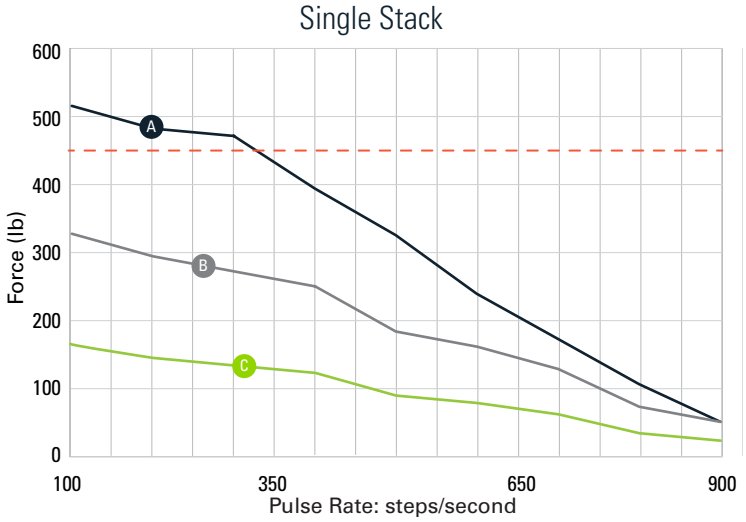
Screw Specifications

Screw Code	Diameter		Lead		Travel per Step		
	in	mm	in	mm	in	mm	
W62100	.625	15.88	.100	2.54	.0005	0.0127	A
W62250	.625	15.88	.250	6.35	.00125	0.03175	B
W62500	.625	15.88	.500	12.7	.0025	0.0635	C

Native units: ☐ imperial ☐ metric

Force v Pulse Chart



- - - - = Recommended load limit

Speed charts are based on using bi-polar motors with chopper drives at 100% duty cycle. Chopper drive curves were created using full steps on a 5 volt motor and a 40v power supply.

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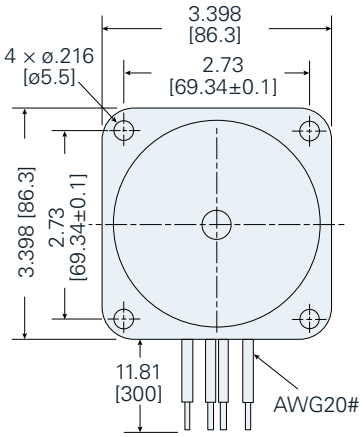
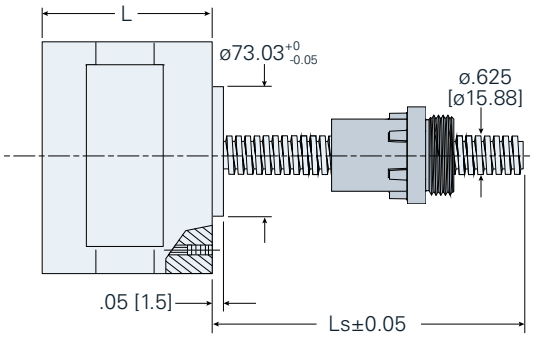
NEMA 34
External Stepper Motor Linear Actuator



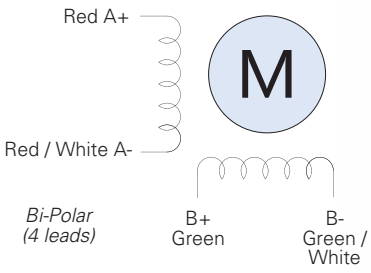


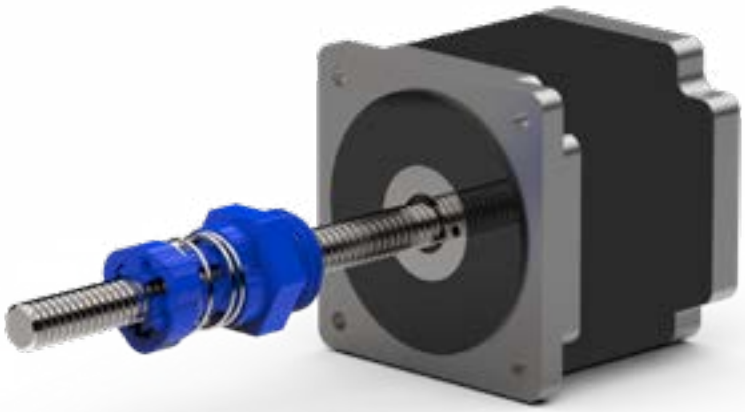
Motor Specifications

- Bipolar Wiring
- 1.8° Step Angle
- Insulation Resistance: 20 MΩ
- Temperature Rise: 167°F (75°C)

	Voltage	Current	Resistance/ Phase	Inductance/ Phase	Motor Weight		Power Input	L	
	V	A	Ω	mH	oz	g	W	in	mm
Single Stack	2.85	5.47	.52	2.86	5.07	2.3	31.2	3.0929	78.560
	5	3.12	1.6	8.8	5.07	2.3	31.2	3.0929	78.560
	12	1.3	9.23	51	5.07	2.3	31.2	3.0929	78.560

Wiring Diagram





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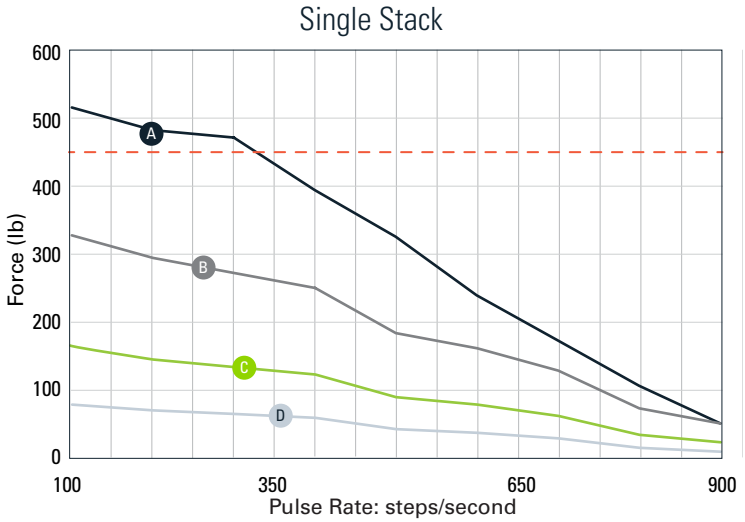
Screw Specifications

Screw Code	Diameter		Lead		Travel per Step		
	in	mm	in	mm	in	mm	
062100	.625	15.88	.100	2.54	.0005	0.0127	A
062250	.625	15.88	.250	6.35	.00125	0.03175	B
062500	.625	15.88	.500	12.7	.0025	0.0635	C
062750	.625	15.88	.750	19.05	.00375	0.09525	
062999	.625	15.88	1.000	25.4	.005	0.127	D

Native units: ☐ imperial ☐ metric

Force v Pulse Chart



- - - - = Recommended load limit

Speed charts are based on using bi-polar motors with chopper drives at 100% duty cycle. Chopper drive curves were created using full steps on a 5 volt motor and a 40v power supply.

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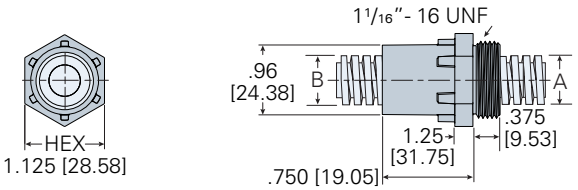
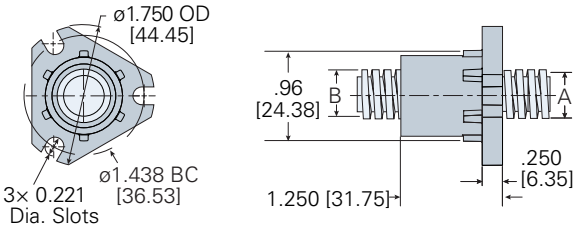
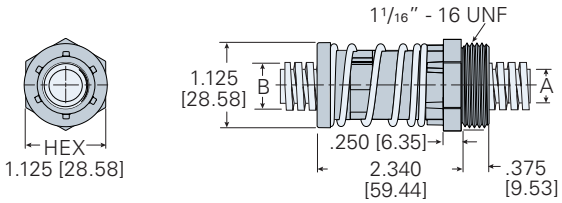
Standard Freewheeling Nut (NTA) - Threaded



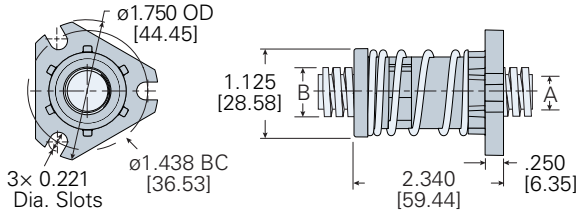
Standard Freewheeling Nut (NFA) - Flanged



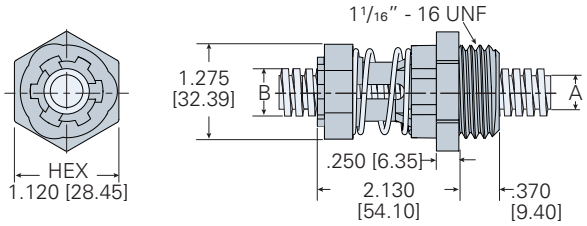
Axial Anti-backlash Nut (ATA) - Threaded



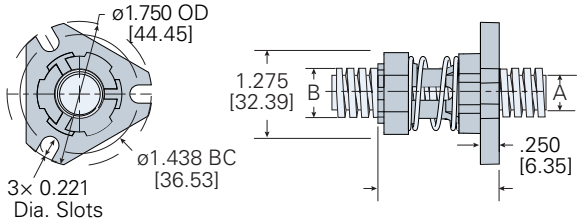
Axial Anti-backlash Nut (AFA) - Flanged



Radial Anti-backlash Nut (RTA) - Threaded



Radial Anti-backlash Nut (RFA) - Flanged



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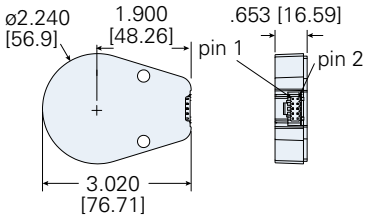
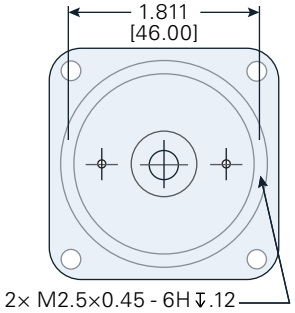
Encoder

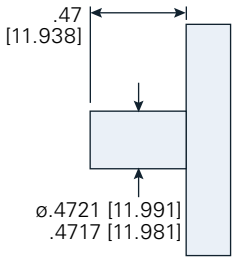


Encoder-Ready Options

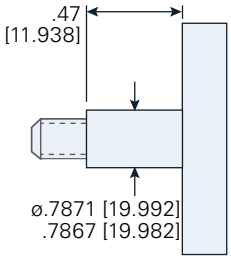
Rear View



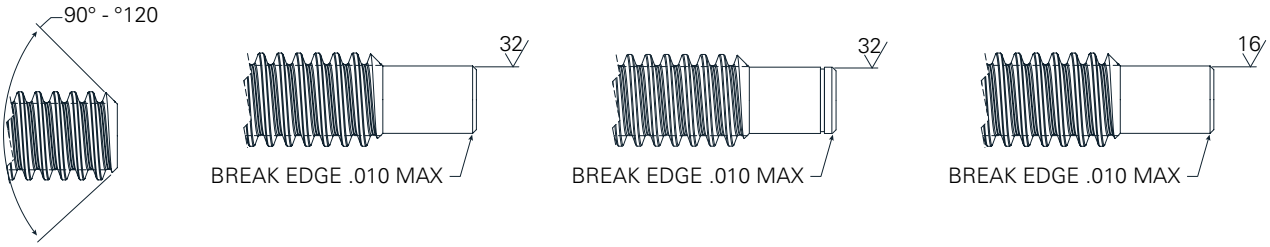
External



Non-Captive & Captive

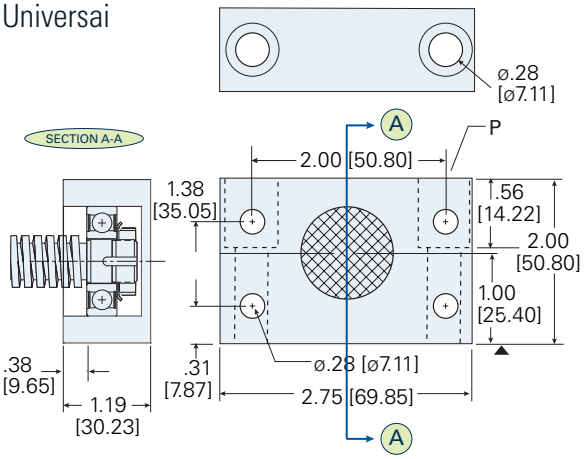


Screw End Machining



Ezze Mount™ Bearing Support

Universai



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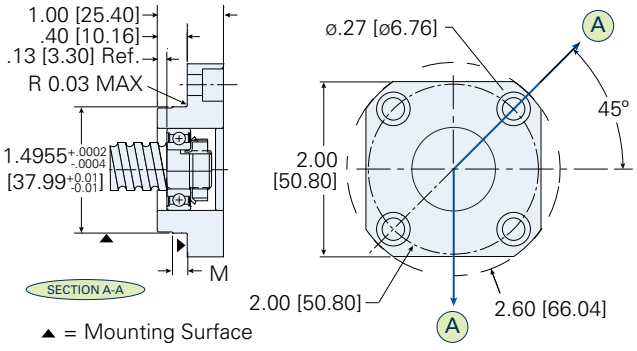

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Available Lead Screws

Captive and Non-Captive Stepper Motor Linear Actuators

Lead		Travel per Step							
in	mm	in	mm	NEMA 8	NEMA 11	NEMA 14	NEMA 17	NEMA 23	NEMA 34
.012	0.3048	.00006	.001524	W12012					
.01969	0.5	.000098	.0025	W12019					
.024	0.6096	.00012	.003048	W12024		W25024	W25024		
.025	0.635	.000125	.003175		W18025				
.03125	0.79375	.000156	.003969			W25031	W25031		
.03937	1	.000197	.005	W12039		W25039	W25039		
.048	1.2192	.00024	.006096	W12048		W25048	W25048		
.050	1.27	.00025	.00635		W18050	W25050	W25050	W37050	
.0625	1.5875	.000313	.007938			W25062	W25062	W37062	
.07874	2	.000394	.010	W12078					
.08334	2.1168	.000417	.010584					W37083	
.096	2.4384	.00048	.012192	W12096		W25096	W25096		
.100	2.54	.0005	.0127		W18100	W25100	W25100	W37100	W62100
.125	3.175	.000625	.015875			W25125	W25125	W37125	
.15748	4	.000787	.020	W12157					
.16666	4.2332	.000833	.021166					W37166	
.192	4.8768	.00096	.024384			W25192	W25192		
.200	5.08	.001	.0254		W18200			W37200	
.250	6.35	.00125	.03175			W25250	W25250	W37250	W62250
.31496	8	.001575	.040	W12314					
.384	9.7536	.00192	.048768			W25384	W25384		
.400	10.16	.002	.0508		W18400			W37400	
.500	12.7	.0025	.0635			W25500	W25500		W62500
1.000	25.4	.005	.127			W25999	W25999	W37999	

Native units: ☐ imperial ☐ metric

* only available with External Stepper Motor Linear Actuators

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Available Lead Screws
External Stepper Motor Linear Actuators

Lead		Travel per Step							
in	mm	in	mm	NEMA 8	NEMA 11	NEMA 14	NEMA 17	NEMA 23	NEMA 34
.012	0.3048	.00006	.001524	012012					
.01969	0.5	.000098	.0025	012019					
.024	0.6096	.00012	.003048	012024		025024	025024		
.025	0.635	.000125	.003175		018025				
.03125	0.79375	.000156	.003969			025031	025031		
.03937	1	.000197	.005	012039		025039	025039		
.048	1.2192	.00024	.006096	012048		025048	025048		
.050	1.27	.00025	.00635		018050	025050	025050	037050	
.0625	1.5875	.000313	.007938	012062*		025062	025062	037062	
.07874	2	.000394	.010	012078					
.08334	2.1168	.000417	.010584					037083	
.096	2.4384	.00048	.012192	012096		025096	025096		
.100	2.54	.0005	.0127		018100	025100	025100	037100	062100
.125	3.175	.000625	.015875	012125*		025125	025125	037125	
.15748	4	.000787	.020	012157					
.16666	4.2332	.000833	.021166					037166	
.192	4.8768	.00096	.024384			025192	025192		
.19685	5	.000984	.025			025196*	025196*	037196*	
.200	5.08	.001	.0254		018200			037200	
.250	6.35	.00125	.03175			025250	025250	037250	062250
.31496	8	.001575	.040	012314					
.384	9.7536	.00192	.048768			025384	025384		
.3937	10	.001969	.050			025393*	025393*	037393*	
.400	10.16	.002	.0508		018400			037400	
.47244	12	.002362	.060					037472*	
.500	12.7	.0025	.0635			025500	025500		062500
.59055	15	.002953	.075					037590*	
.750	19.05	.00375	.09525			025750*	025750*		062750*
1.000	25.4	.005	.127			025999	025999	037999	062999*
1.1811	30	.005906	.150					037M30*	

Native units: ☐ imperial ☐ metric

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