

Can-Stack Actuators

The Haydon™ brand of can-stack stepper motor linear actuators provides both a broader range and, for a given size, significantly higher thrust than previously available from mini-steppers. Haydon Kerk Motion Solutions patented design accepts a larger rotor than conventional units, improving efficiency and eliminating the need for massive heat sinks. Unique features impart ruggedness and reliability that assure long life and consistent performance. Rare earth magnets are available for even higher thrust. All units are built with dual ball bearings for greater motion control, precise step accuracy and long life.

G4 19000 Series Ø 20 mm (.79-in) Can-Stack Stepper Motor Linear Actuators

Utilizing high energy rare earth (neodymium) magnets, the G4 Series linear actuators consistently deliver exceptional performance. All units are built with dual ball bearings.

The highest force of any similar size linear actuator stepper motor

Multiple versions available

- Captive
- Non-Captive
- External Linear



Specifications

Ø 20 mm (.79-in) Motor				
Part No.	Captive	1944	1954	
	Non-Captive	1934	1984	
	External Linear*	E1944	E1954	
Wiring: Bipolar				
Step angle		7.5°		15°
Winding Voltage		5 VDC	12 VDC	5 VDC
Current (RMS)/phase		350 mA	160 mA	338 mA
Resistance/phase		14.0 Ω	74.5 Ω	14.8 Ω
Inductance/phase		6.24 mH	31.2 mH	6.84 mH
Power Consumption		3.38 W		
Insulation Class		Class B		
Weight		1.24 oz (35 g)		
Insulation Resistance		20 MΩ		

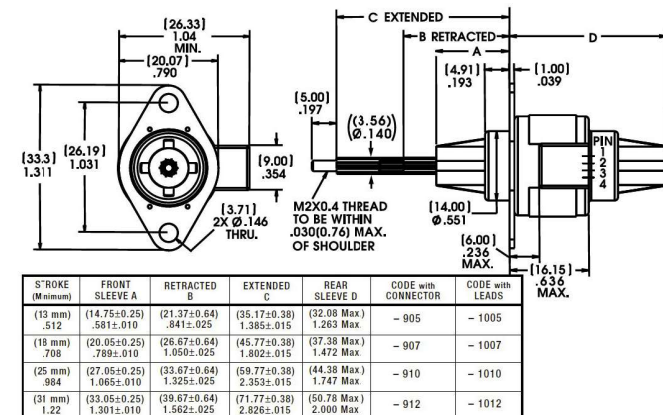
Linear Travel / Step 15° Step Angle			Order Code I.D.
step	inches	mm	
7.5° Angle	0.0005	0.013	3
	0.001	0.0254	1
	0.002	0.051	2
15° Angle	0.001	0.0254	1
	0.002	0.051	2
	0.004	0.102	4

Special drive considerations may be necessary when leaving shaft fully extended or fully retracted. Standard motors are Class B rated for maximum temperature of 130° C (266° F).

*Part numbering information on page 147.

Captive Lead Screw

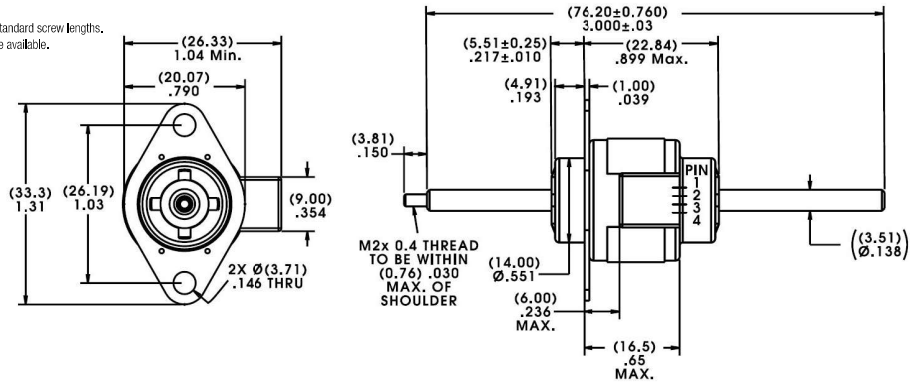
Dimensions = (mm) inches



Non-Captive Lead Screw

Dimensions = (mm) inches

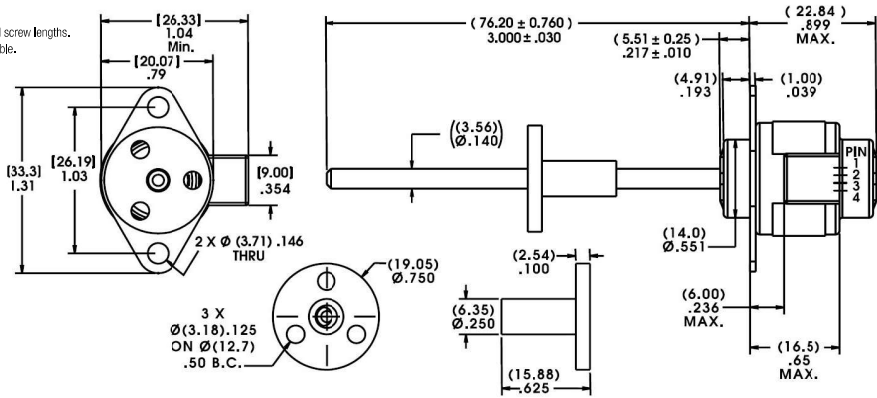
Up to 6.3-in (160 mm) standard screw lengths. Longer screw lengths are available.



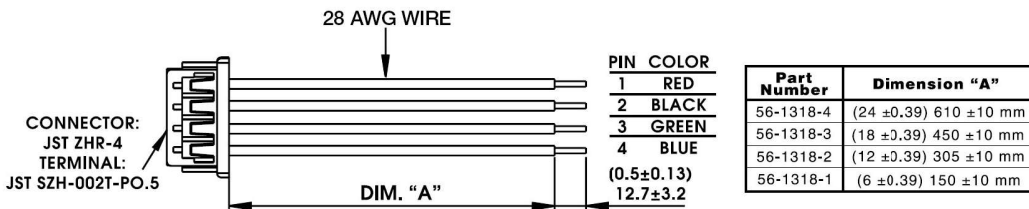
External Linear

Dimensions = (mm) inches

Up to 6.3-in (160 mm) standard screw lengths. Longer screw lengths are available.

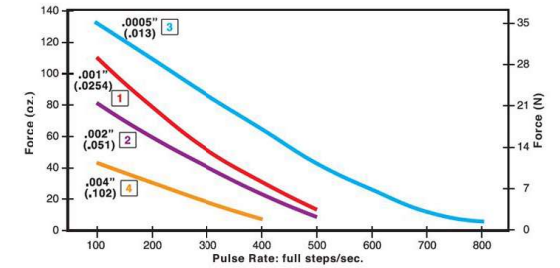


Connector



FORCE vs. PULSE RATE

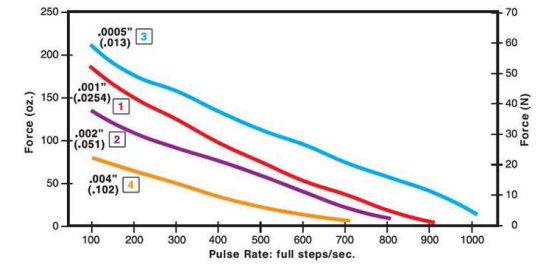
- L/R Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

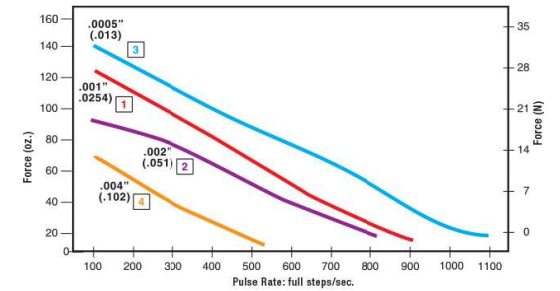
- L/R Drive
- Bipolar
- 25% Duty Cycle

Obtained by a special winding or by running a standard motor at double the rated current.



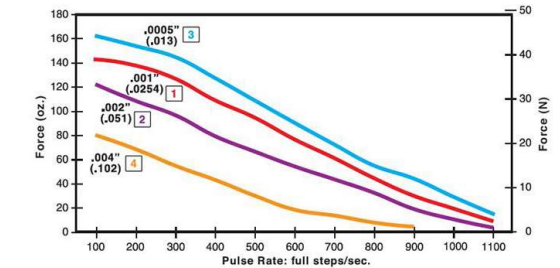
FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 25% Duty Cycle



NOTE: All chopper drive curves were created with a 5 volt motor and a 40 volt power supply. Ramping can increase the performance of a motor either by increasing the top speed or getting a heavier load accelerated up to speed faster. Also, deceleration can be used to stop the motor without overshoot.

Identifying the Can-Stack Number Codes when Ordering

E	19	5	4	2	05	1005
Prefix (include only when using the following) E = External K = External with 40° thread form P = Proximity Sensor S = Home Position Switch	Series Number Designation 19 = 19000 (Series numbers represent approximate diameters of motor body)	Style 3 = 7.5° Non-Captive 4 = 7.5° Captive or External (use "E" or "K" Prefix for External version) 5 = 15° Captive or External (use "E" or "K" Prefix for External version) 8 = 15° Non-Captive	Coils 4 = Bipolar (4 wire)	Code ID Resolution Travel/Step 1 = .001-in (.0254) 2 = .002-in (.051) 3 = .0005-in (.013) 4 = .004-in (.102)	Voltage 05 = 5 VDC 12 = 12 VDC Custom V available	Suffix Stroke Example: -1005 = captive 13mm stroke with leads -XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (-) as shown above. For assistance call our Engineering Team at 203.756.7441.

Can-Stack Stepper Motor Linear Actuators Options

TFE Coated Lead Screws for applications that require a permanent, dry lubricant

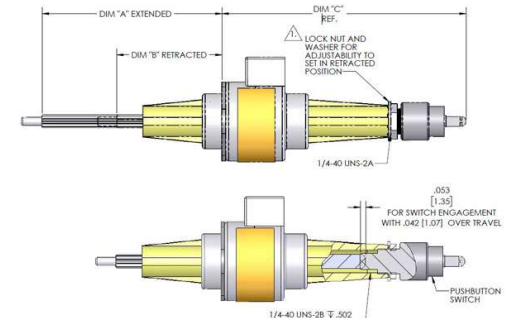
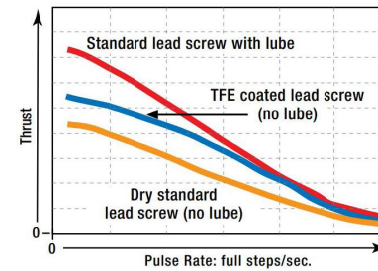
Ideal for applications where conventional oils and greases cannot be used for lead screw lubrication. Non-lubricated TFE Coated Lead Screw provides improved performance in both life and thrust as compared to a "dry" stainless steel lead screw. TFE can be applied to a wide variety of lead screw pitches. Available captive, non-captive and external linear. Typical applications: where contamination from grease or lubricants must be avoided; silicon wafer handling, clean rooms, medical equipment or laboratory instrumentation.



G4 19000 Series External Linear

Lead Screw Comparison: FORCE vs. PULSE RATE

- L/R Drive - 100% Duty Cycle



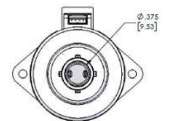
Home Position Switch monitors movements more precisely for greater control and improved quality control

Miniature electronic home position switch capable of monitoring the home positions of linear actuators. The switch mounts on the rear sleeve of captive linear motors and allows the user to identify start, stop or home positions. Depending on your preference, contacts can be normally open or normally closed. The contact closure is repeatable to within one step position, identifying linear movements as low as 0.0005-in (0.0013 cm) per step. Multiple contact switches are also available.

Activation force of 10 oz (2.78 N) required therefore may not be appropriate for smaller can-stack actuators.

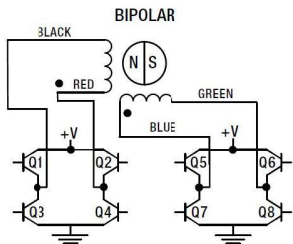
When ordering motors with the home position switch, the part number should be preceded by an "S".

NOTE: ADJUST LOCATION OF LOCK NUT TO ENSURE THE RETRACTED DIMENSION



Stroke inches (mm)	Dim "A" Extended inches (mm)	Dim "B" Retracted inches (mm)	Dim "C" Ref. inches (mm)
.512 (13)	1.385 +/- .015 (35.17 +/- 0.38)	.841 +/- .025 (21.37 +/- 0.64)	2.230 +/- .025 (56.63 +/- 0.64)
.708 (18)	1.802 +/- .015 (45.77 +/- 0.38)	1.050 +/- .025 (26.67 +/- 0.64)	2.438 +/- .025 (61.93 +/- 0.64)
.984 (25)	2.353 +/- .015 (59.77 +/- 0.38)	1.325 +/- .025 (33.67 +/- 0.64)	2.714 +/- .025 (68.93 +/- 0.64)
1.222 (31)			N/A Contact Customer Service

Can-Stacks: Wiring



Can-Stacks: Stepping Sequence

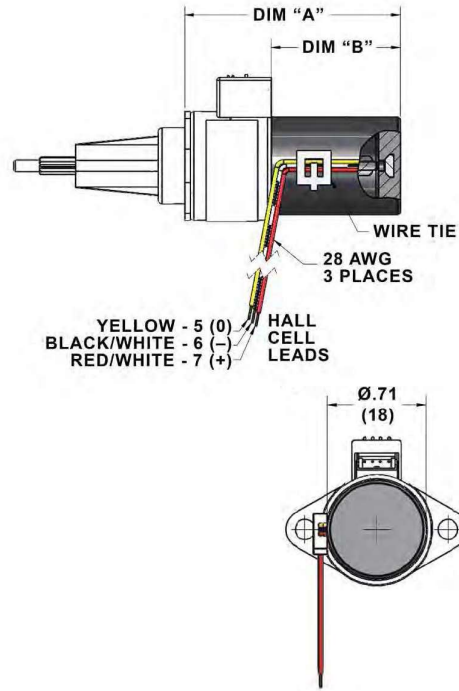
	Bipolar	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8
Step					
1	ON	OFF	ON	OFF	OFF
2	OFF	ON	ON	ON	OFF
3	OFF	ON	OFF	OFF	ON
4	ON	OFF	OFF	OFF	ON
1	ON	OFF	ON	OFF	OFF

Note: Half stepping is accomplished by inserting an off state between transitioning phases.

Can-Stack Stepper Motor Linear Actuators Options

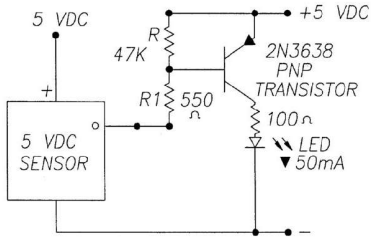
End of Stroke Proximity Sensor incorporates a hall effect device, activated by a rare earth magnet embedded in the end of the internal screw

Compact profile of the sensor allows for installation in limited space applications. Virtually unlimited cycle life. Special cabling and connectors available.



Stroke inches (mm)	Dim "A" Extended inches (mm)	Dim "B" Retracted inches (mm)
.512 (13)	1.360 (34.55)	.73 (18.55)
.708 (18 mm)	1.569 (39.85)	.94 (23.85)
.984 (25)	1.844 (46.85)	1.21 (30.85)
1.22 (31)	2,081 (52.85)	1,45 (36.85)

The sensor has virtually unlimited cycle life. Special cabling and connectors can also be provided.



NOTE: Sensor is category 2 ESD sensitive per DOD-STD-16864. Assembly operations should be performed at workstations with conductive tops and operators grounded.

G4 25000 Series
Ø 25 mm (1.0-in) Can-Stack Stepper Motor Linear Actuators

High durability and exceptional performance. All units are built with dual ball bearings.

Generates higher force than other competitors

Multiple versions available

- Captive
- Non-Captive
- External Linear



Specifications

		Ø 25 mm (1.0-in) Motor											
Part No.	Captive	2544	-	-	†	2554	-	-	†				
	Non-Captive	2534	-	-	†	2584	-	-	†				
		External Linear*				E2544	-	-	†	E2554	-	-	†
Wiring		Bipolar											
Step angle		7.5°					15°						
Winding Voltage		5 VDC		12 VDC		5 VDC		12 VDC					
Current (RMS)/phase		385 mA		160 mA		385 mA		160 mA					
Resistance/phase		13 Ω		72 Ω		13 Ω		72 Ω					
Inductance/phase		10.8 mH		60 mH		8.08 mH		48 mH					
Power Consumption		3.85 W											
Rotor Inertia		1.07 gcm ²											
Insulation Class		Class B											
Weight		1.74 oz (49 g)											
Insulation Resistance		20 MΩ											

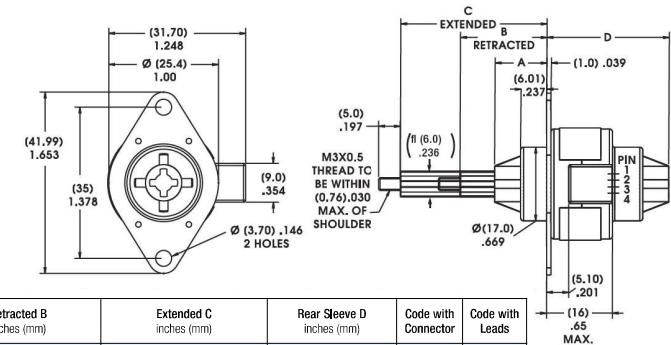
*Part numbering information on page 153.

Linear Travel / Step 15° Step Angle			Order Code I.D.
step	inches	mm	
7.5° Angle	0.0005	0.013	3
	0.001	0.0254	1
	0.002	0.051	2
15° Angle	0.001	0.0254	1
	0.002	0.051	2
	0.004	0.102	4

Special drive considerations may be necessary when leaving shaft fully extended or fully retracted. Standard motors are Class B rated for maximum temperature of 130° C (266° F).

Captive Lead Screw

Dimensions = (mm) inches

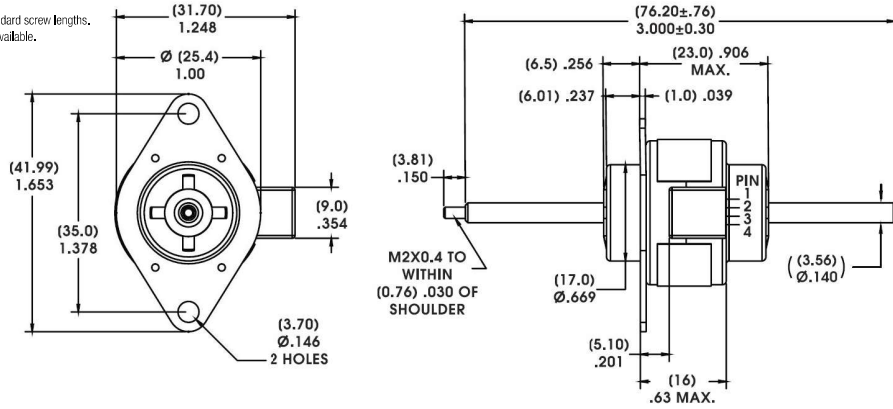


Stroke (Minimum) inches (mm)	Front Sleeve A inches (mm)	Retracted B inches (mm)	Extended C inches (mm)	Rear Sleeve D inches (mm)	Code with Connector	Code with Leads
.512 (13 mm)	.472 +/- .010 (11.99 +/- 0.25)	.787 +/- .025 (19.99 +/- 0.64)	1,329 +/- .015 (33.76 +/- 0.38)	1,128 Max, (28.65 Max.)	- 905	- 1005
.708 (18 mm)	.680 +/- .010 (17.28 +/- 0.25)	.994 +/- .025 (25.25 +/- 0.64)	1,743 +/- .015 (44.27 +/- 0.38)	1,336 Max, (33.94 Max.)	- 907	- 1007
.984 (25 mm)	.955 +/- .010 (24.26 +/- 0.25)	1,269 +/- .025 (32.23 +/- 0.64)	2,293 +/- .015 (58.24 +/- 0.38)	1,611 Max, (40.92 Max.)	- 910	- 1010
1.22 (31 mm)	1,191 +/- .010 (30.25 +/- 0.25)	1,505 +/- .025 (38.23 +/- 0.64)	2,765 +/- .015 (70.23 +/- 0.38)	1,847 Max, (46.91 Max.)	- 912	- 1012

Non-Captive Lead Screw

Dimensions = (mm) inches

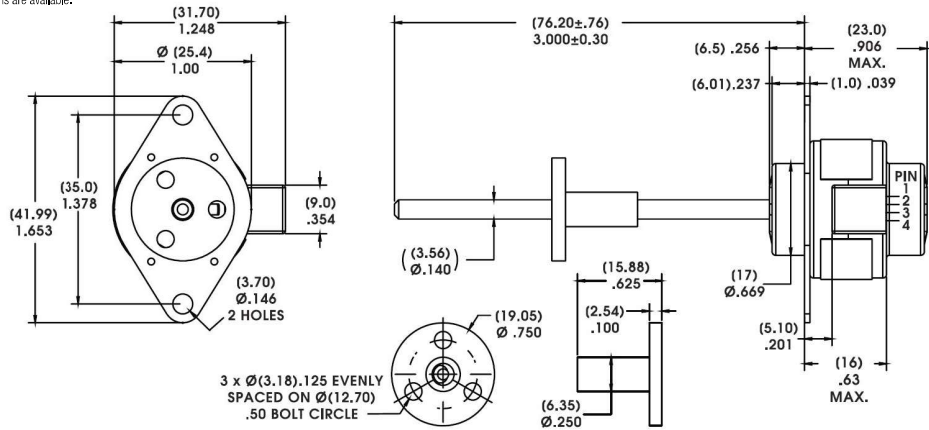
Up to 6.3-in (160 mm) standard screw lengths. Longer screw lengths are available.



External Linear

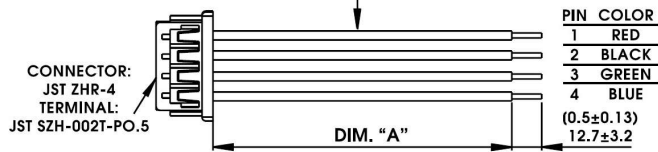
Dimensions = (mm) inches

Up to 6.3-in (160 mm) standard screw lengths. Longer screw lengths are available.



Connector

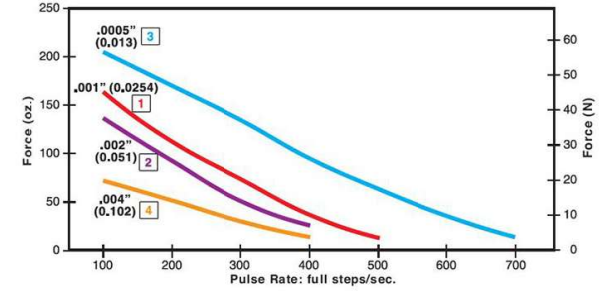
28 AWG WIRE



Part Number	Dimension "A"
56-1318-4	(24 ±0.39) 610 ±10 mm
56-1318-3	(18 ±0.39) 450 ±10 mm
56-1318-2	(12 ±0.39) 305 ±10 mm
56-1318-1	(6 ±0.39) 150 ±10 mm

FORCE vs. PULSE RATE

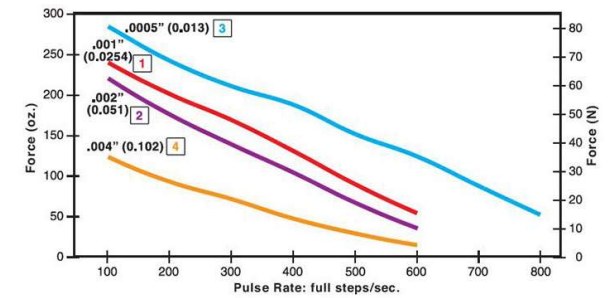
- L/R Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

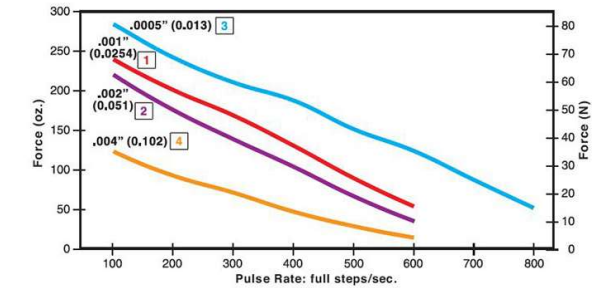
- L/R Drive
- Bipolar
- 25% Duty Cycle

Obtained by a special winding or by running a standard motor at double the rated current.



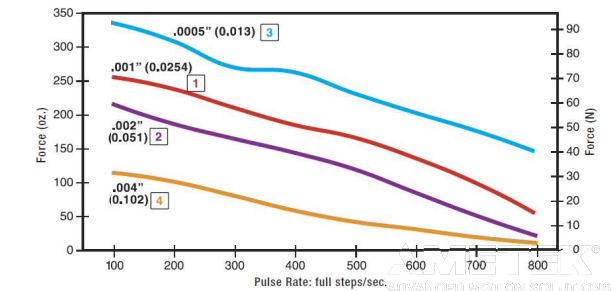
FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 25% Duty Cycle



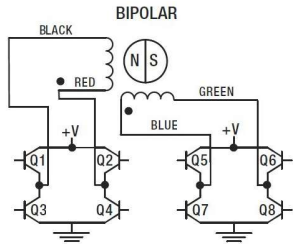
NOTE: All chopper drive curves were created with a 5 volt motor and a 40 volt power supply. Ramping can increase the performance of a motor either by increasing the top speed or getting a heavier load accelerated up to speed faster. Also, deceleration can be used to stop the motor without overheating.

Identifying the Can-Stack Number Codes when Ordering

E	25	5	4	4	12	1010
Prefix (include only when using the following) E = External with 40° thread form K = External with 40° thread form P = Proximity Sensor S = Home Position Switch	Series Number Designation 25 = 25000 (Series numbers represent approximate diameters of motor body)	Style 3 = 7.5° Non-Captive 4 = 7.5° Captive or External (use "E" or "K" Prefix for External version) 5 = 15° Captive or External (use "E" or "K" Prefix for External version) 8 = 15° Non-Captive	Coils 4 = Bipolar (4 wire)	Code ID Resolution Travel/Step 1 = .001-in (.0254) 2 = .002-in (.051) 3 = .0005-in (.013) 4 = .004-in (.102)	Voltage 05 = 5 VDC 12 = 12 VDC Custom V available	Suffix Stroke Example: -1010 = captive 25mm stroke with leads -XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (-) as shown above. For assistance call our Engineering Team at 203.756.7441.

Can-Stacks: Wiring



Can-Stacks: Stepping Sequence

Bipolar	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8
Step				
1	ON	OFF	ON	OFF
2	OFF	ON	ON	OFF
3	OFF	ON	OFF	ON
4	ON	OFF	OFF	ON
1	ON	OFF	ON	OFF

Note: Half stepping is accomplished by inserting an off state between transitioning phases.

Can-Stack Stepper Motor Linear Actuators Options

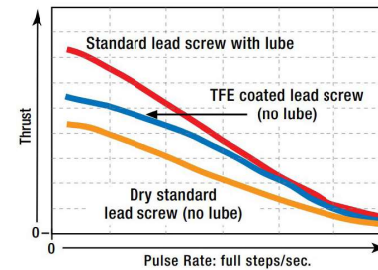
TFE Coated Lead Screws for applications that require a permanent, dry lubricant

Ideal for applications where conventional oils and greases cannot be used for lead screw lubrication.

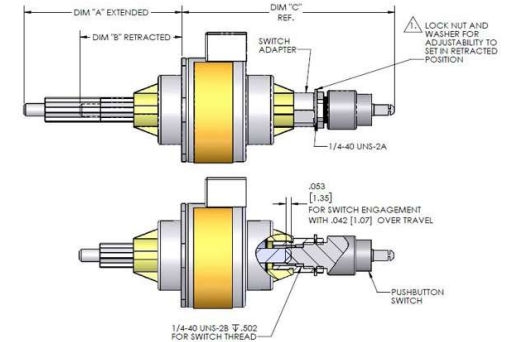
Non-lubricated TFE Coated Lead Screw provides improved performance in both life and thrust as compared to a "dry" stainless steel lead screw. TFE can be applied to a wide variety of lead screw pitches. Available captive, non-captive and external linear. Typical applications: where contamination from grease or lubricants must be avoided; silicon wafer handling, clean rooms, medical equipment or laboratory instrumentation.

Lead Screw Comparison: FORCE vs. PULSE RATE

- L/R Drive - 100% Duty Cycle



G4 25000 Series External Linear



Home Position Switch monitors movements more precisely for greater control and improved quality control

Miniature electronic home position switch capable of monitoring the home positions of linear actuators. The switch mounts on the rear sleeve of captive linear motors and allows the user to identify start, stop or home positions. Depending on your preference, contacts can be normally open or normally closed. The contact closure is repeatable to within one step position, identifying linear movements as low as 0.0005-in (0.0013 cm) per step. Multiple contact switches are also available.

Activation force of 10 oz (2.78 N) required therefore may not be appropriate for smaller can-stack actuators.

When ordering motors with the home position switch, the part number should be preceded by an "S".

Specifications	
Contact Ratings (Standard)	1.00 AMP @ 120 VAC 1.00 AMP @ 28 VDC
Operating Temperature	-30°C to +55°C (-22°F to 131°F)
Electrical Life	< 20 milliohms typ. initial at 2 - 4 V DC, 100 mA Tested to 60,000 make-and-break cycles at full load
Schematic	 Multiple contact options available.

NOTE: ADJUST LOCATION OF LOCK NUT TO ENSURE THE RETRACTED DIMENSION

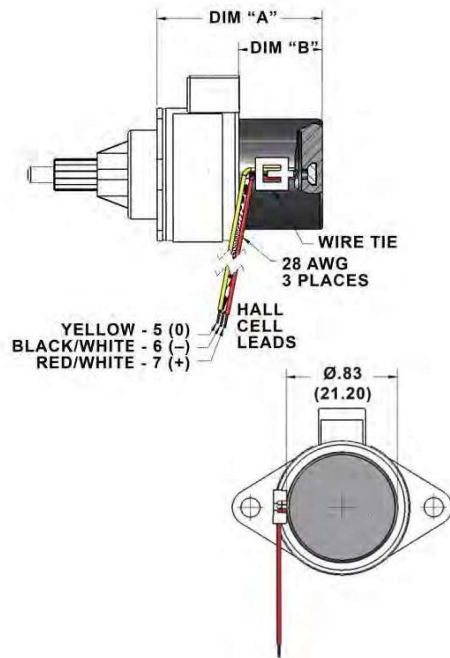
Stroke inches (mm)	Dim "A" Extended inches (mm)	Dim "B" Retracted inches (mm)	Dim "C" Ref. inches (mm)
.512 (13)	1.329 +/- .025 (33.76 +/- 0.64)	.787 +/- .025 (19.99 +/- 0.64)	2.051 +/- .025 (52.09 +/- 0.64)
.708 (18)	1.743 +/- .025 (44.27 +/- 0.64)	.994 +/- .025 (25.25 +/- 0.64)	2.258 +/- .025 (57.35 +/- 0.64)
.984 (25)	2.293 +/- .025 (58.24 +/- 0.64)	1.269 +/- .025 (32.23 +/- 0.64)	2.534 +/- .025 (64.37 +/- 0.64)
1.22 (31)	2.765 +/- .025 (70.23 +/- 0.64)	1.505 +/- .025 (38.23 +/- 0.64)	2.770 +/- .025 (70.37 +/- 0.64)

Can-Stack Stepper Motor Linear Actuators Options

End of Stroke Proximity Sensor incorporates a hall effect device, activated by a rare earth magnet embedded in the end of the internal screw

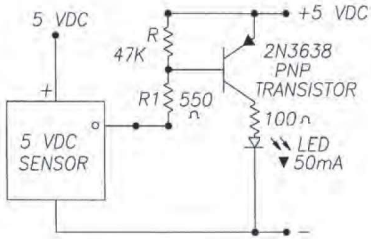
Compact profile of the sensor allows for installation in limited space applications. Virtually unlimited cycle life. Special cabling and connectors available.

Specifications	
Supply Voltage (VDC)	3.8 min. to 24 max.
Current Consumption	10 mA max.
Output Voltage (operated)	0.15 typ., 0.40 max. Sinking 20 mA max.
Output Current	20 mA max.
Output Leakage Current (released)	10µA max. @ Vout = 24 VDC; Vcc = 24 VDC
Output Switching Time	Rise 10 to 90% Fall 90 to 10%
	.05 µs typ., 1.5 µs max. @ Vcc = 12 V, RL = 1.6 KOhm .15 µs typ., 1.5 µs max. @ CL = 20 pF
Temperature	-40 to +150°C



Stroke inches (mm)	Dim "A" Extended inches (mm)	Dim "B" Retracted inches (mm)
.512 (13)	1.248 (31.71)	.632 (16.05)
.708 (18)	1.449 (36.81)	.833 (21.15)
.984 (25)	1.723 (43.76)	1.106 (28.10)
1.22 (31)	1.959 (49.76)	1.343 (34.10)

The sensor has virtually unlimited cycle life. Special cabling and connectors can also be provided.



G4 25000 Series E8T Encoder

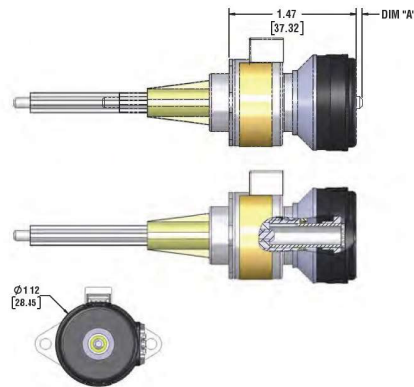
G4 25000 Series E8T Transmissive Optical Encoder is designed to provide the digital quadrature encoder feedback for high volume, compact space applications.

- Resolutions from 180 to 720
- Single-ended / Differential
- Frequency response to 100 kHz
- Low power consumption, 5 V @ 30 mA max
- High retention polarized connector

Assembly Options:

- Differential line driver with complementary outputs
- Detachable cable
- Through-hole cover

Stroke inches (mm)	Dim "A" Extended inches (mm)
.512 (13)	N/A
.708 (18)	N/A
.984 (25)	.071 (1.80)
1.22 (31)	.307 (7.80)



G4 37000 Series
Ø 36 mm (1.4-in) Can-Stack Stepper Motor Linear Actuators

Outstanding durability and high performance. The G4 Series features high energy neodymium magnets and dual ball bearings.

Exceptionally high linear force-to-size ratio, ideal for precision motion

Multiple versions available

- Captive
- Non-Captive
- External Linear



Specifications

Ø 36 mm (1.4-in) Motor				
Part No.	Captive	3744	3754	
	Non-Captive	3734	3784	
	External Linear	E3744	E3754	
Wiring Bipolar				
Step angle	7.5°		15°	
Winding Voltage	5 VDC	12 VDC	5 VDC	12 VDC
Current (RMS)/phase	561 mA	230 mA	561 mA	230 mA
Resistance/phase	8.9 Ω	52 Ω	8.9 Ω	52 Ω
Inductance/phase	11.6 mH	65 mH	8.5 mH	46 mH
Power Consumption	5.6 W			
Rotor Inertia	8.5 gcm ²			
Insulation Class	Class B			
Weight	4.2 oz (120 g)			
Insulation Resistance	20 MΩ			

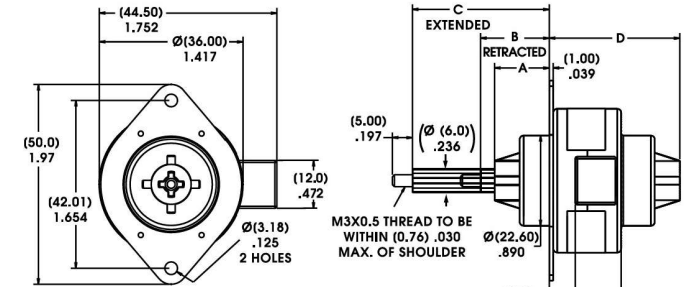
Linear Travel / Step 15° Step Angle			Order Code I.D.
step	inches	mm	
7.5° Angle	0.0005	0.013	3
	0.001	0.0254	1
	0.002	0.051	2
15° Angle	0.001	0.0254	1
	0.002	0.051	2
	0.004	0.102	4

Special drive considerations may be necessary when leaving shaft fully extended or fully retracted. Standard motors are Class B rated for maximum temperature of 130° C (266° F).

*Part numbering information on page 159.

Captive Lead Screw

Dimensions = (mm) inches



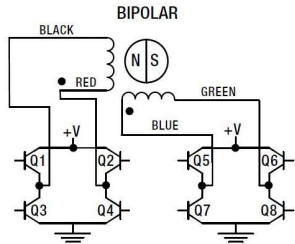
STROKE (Minimum)	FRONT SLEEVE A	RETRACTED B	EXTENDED C	REAR SLEEVE D	Suffix Code
(16.0 mm) 0.631	(13.67±0.25) .538±.010	(17.19±0.64) .677±.025	(34.24±0.38) 1.348±.015	(33.85 Max.) 1.333 Max.	- 905
(25.4 mm) 1.00	(26.37±0.25) 1.038±.010	(29.89±0.64) 1.177±.025	(56.94±0.38) 2.348±.015	(46.55 Max.) 1.833 Max.	- 910
(38.1 mm) 1.50	(39.07±0.25) 1.538±.010	(42.59±0.64) 1.677±.025	(85.04±0.38) 3.348±.015	(59.25 Max.) 2.333 Max.	- 915

Identifying the Can-Stack Number Codes when Ordering

E	37	4	4	2	05	1015
Prefix (include only when using the following) E = External with 40° thread form P = Proximity Sensor S = Home Position Switch	Series Number Designation 37 = 37000 (Series numbers represent approximate diameters of motor body)	Style 3 = 7.5° Non-Captive 4 = 7.5° Captive or External (use "E" or "K" Prefix for External version) 5 = 15° Captive or External (use "E" or "K" Prefix for External version) 8 = 15° Non-Captive	Coils 4 = Bipolar (4 wire)	Code ID Resolution Travel/Step 1 = .001-in (.0254) 2 = .002-in (.051) 3 = .0005-in (.013) 4 = .004-in (.102)	Voltage 05 = 5 VDC 12 = 12 VDC Custom V available	Suffix Stroke Example: -1015 = captive 38.1mm stroke with leads -XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (-) as shown above. For assistance call our Engineering Team at 203.756.7441.

Can-Stacks: Wiring



Can-Stacks: Stepping Sequence

Bipolar Step	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8
1	ON	OFF	ON	OFF
2	OFF	ON	ON	OFF
3	OFF	ON	OFF	ON
4	ON	OFF	OFF	ON
1	ON	OFF	ON	OFF

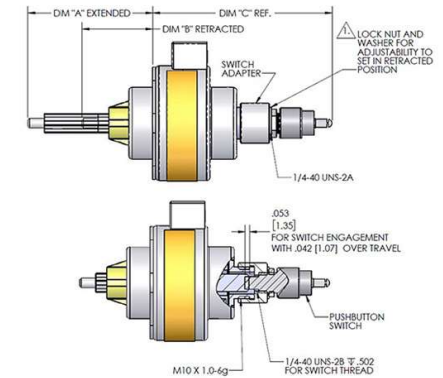
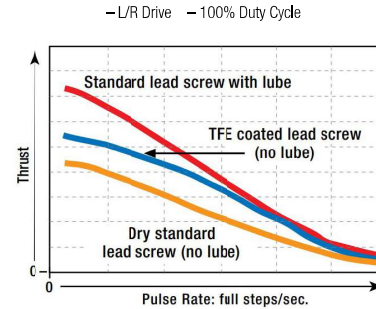
Note: Half stepping is accomplished by inserting an off state between transitioning phases.

Can-Stack Stepper Motor Linear Actuators Options

TFE Coated Lead Screws for applications that require a permanent, dry lubricant

Ideal for applications where conventional oils and greases cannot be used for lead screw lubrication. Non-lubricated TFE Coated Lead Screw provides improved performance in both life and thrust as compared to a "dry" stainless steel lead screw. TFE can be applied to a wide variety of lead screw pitches. Available captive, non-captive and external linear. Typical applications: where contamination from grease or lubricants must be avoided; silicon wafer handling, clean rooms, medical equipment or laboratory instrumentation.

Lead Screw Comparison: FORCE vs. PULSE RATE



Home Position Switch monitors movements more precisely for greater control and improved quality control

Miniature electronic home position switch capable of monitoring the home positions of linear actuators. The switch mounts on the rear sleeve of captive linear motors and allows the user to identify start, stop or home positions. Depending on your preference, contacts can be normally open or normally closed. The contact closure is repeatable to within one step position, identifying linear movements as low as 0.0005-in (0.0013 cm) per step. Multiple contact switches are also available.

Activation force of 10 oz (2.78 N) required therefore may not be appropriate for smaller can-stack actuators.

When ordering motors with the home position switch, the part number should be preceded by an "S".

Specifications	
Contact Ratings (Standard)	1.00 AMP @ 120 VAC 1.00 AMP @ 28 VDC
Operating Temperature	-30°C to +55°C (-22°F to 131°F)
Electrical Life	< 20 millionhys typ, initial at 2 - 4 V DC, 100 mA Tested to 60,000 make-and-break cycles at full load
Schematic	 Multiple contact options available.

NOTE: ADJUST LOCATION OF LOCK NUT TO ENSURE THE RETRACTED DIMENSION

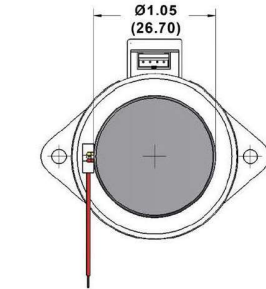
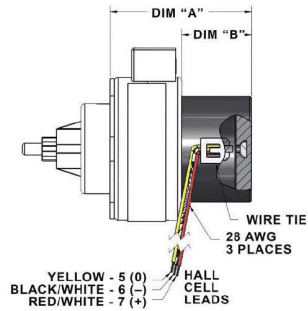
Stroke inches (mm)	Dim "A" Extended inches (mm)	Dim "B" Retracted inches (mm)	Dim "C" Ref. inches (mm)
.631 (16)	1.348 +/- .025 (34.24 +/- 0.64)	.677 +/- .025 (17.19 +/- 0.64)	2.218 +/- .025 (56.33 +/- 0.64)
1.00 (25.4)	2.348 +/- .025 (59.94 +/- 0.64)	1.177 +/- .025 (29.89 +/- 0.64)	2.718 +/- .025 (69.03 +/- 0.64)
1.50 (38.1)	3.348 +/- .025 (85.04 +/- 0.64)	1.677 +/- .025 (42.59 +/- 0.64)	3.218 +/- .025 (81.73 +/- 0.64)

Can-Stack Stepper Motor Linear Actuators Options

End of Stroke Proximity Sensor incorporates a hall effect device, activated by a rare earth magnet embedded in the end of the internal screw

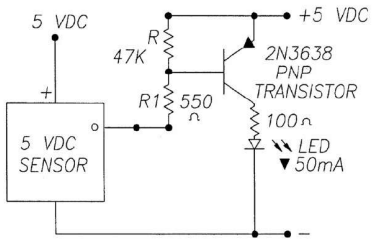
Compact profile of the sensor allows for installation in limited space applications. Virtually unlimited cycle life. Special cabling and connectors available.

Specifications		
Supply Voltage (VDC)	3.8 min. to 24 max.	
Current Consumption	10 mA max.	
Output Voltage (operated)	0.15 typ., 0.40 max. Sinking 20 mA max.	
Output Current	20 mA max.	
Output Leakage Current (released)	10µA max. @ Vout = 24 VDC; Vcc = 24 VDC	
Output Switching Time	Rise, 10 to 90%	.05 µs typ., 1.5 µs max. @ Vcc = 12 V, RL = 1.6 KOhm
	Fall, 90 to 10%	.15 µs typ., 1.5 µs max. @ CL = 20 pF
Temperature	-40 to +150°C	



Stroke inches (mm)	Dim "A" inches (mm)	Dim "B" inches (mm)
.631 (16)	1.404 (35.65)	.695 (17.65)
1.00 (25.4)	1.906 (48.41)	1.197 (30.41)
1.50 (38.1)	2.409 (61.18)	1.700 (43.18)

The sensor has virtually unlimited cycle life. Special cabling and connectors can also be provided.



G4 37000 Series E8T Encoder

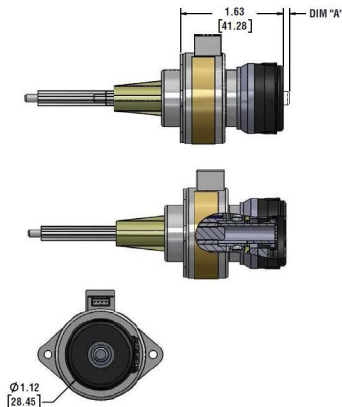
G4 37000 Series E8T Transmissive Optical Encoder is designed to provide the digital quadrature encoder feedback for high volume, compact space applications.

- Resolutions from 180 to 720
- Single-ended / Differential
- Frequency response to 100 kHz
- Low power consumption, 5 V @ 30 mA max
- High retention polarized connector

Assembly Options:

- Differential line driver with complementary outputs
- Detachable cable
- Through-hole cover

Stroke inches (mm)	Dim "A" Extended inches (mm)
.631 (16)	N/A
1.00 (25.4)	.098 (2.50)
1.50 (38.1)	.598 (15.20)



15000 Series
Ø 15 mm (.59-in) Can-Stack Stepper Motor Linear Actuators

Delivering force of up to 8 lbs (35N) without compromising long life or cost. Lightweight models can also be micro-stepped for even finer resolution. Bi-directional travel motor.

The world's smallest commercial linear stepper motor

Multiple versions available

- Captive
- External Linear
- External Linear with ZBMR Nut

Specifications

Ø 15 mm (.59-in) Motor			
Part No.	Captive	LC1574 - - - †	
	External Linear	LE1574 - - - †	
Wiring	Bipolar		
Step angle	18°		
Winding Voltage	4 VDC	5 VDC	12 VDC
Current (RMS)/phase	0.2 A	0.16 A	0.07 A
Resistance/phase	20 Ω	31 Ω	180 Ω
Inductance/phase	5.6 mH	8.7 mH	48.8 mH
Power Consumption	1.6 W		
Rotor Inertia	0.09 gcm ²		
Insulation Class	Class B (Class F available)		
Weight	LC15 0.49 oz (14 g)		
	LE15 0.39 oz (11 g)		
Insulation Resistance	20 MΩ		
Stroke	0.5-in. (12.7 mm)		



Linear Travel / Step		Order Code I.D.
inches	mm	
.00079*	.02	W
.00098*	.025	AQ
.00197*	.05	BH
.00394*	.10	DC

*Values truncated

Available Standard Connectors for Series 15000

Connector	PIN			
	1	2	3	4
JST PHR-4	Red	White	Green	Black
Molex 51021-0400	Black	Green	White	Red

Available Flying Leads

Length	Order Code I.D. Suffix (add to end on I.D.)
12 inches (304.8 mm)	-999

Special drive considerations may be necessary when leaving shaft fully extended or fully retracted. Standard motors are Class B rated for maximum temperature of 130°C (266°F).

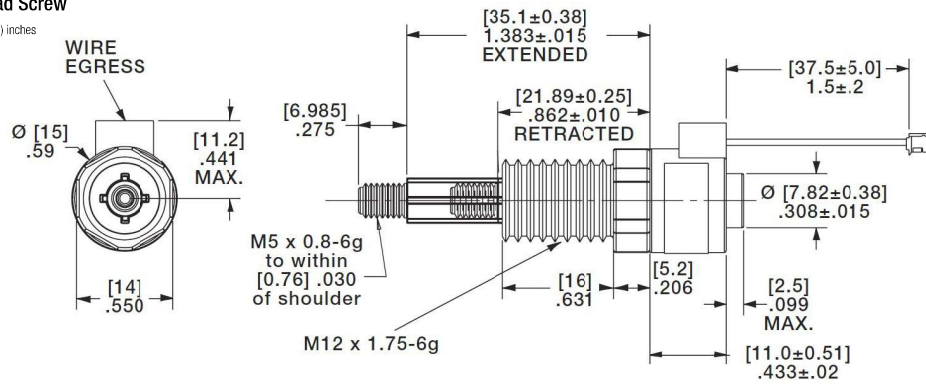
Identifying the Can-Stack Number Codes when Ordering

LC	15	7	4	W	04	999
Prefix	Series Number	Style	Coils	Code ID Resolution	Voltage	Suffix
LC = Captive LE = External Linear	15 = 15000 (Series numbers represent approximate diameters of motor body)	7 = 18° Captive	4 = Bipolar (4 wire)	Code ID Resolution Travel/Step W = .00079-in (.02) AQ = .00098-in (.025) BH = .00197-in (.05) DC = .00394-in (.10)	04 = 4 VDC 05 = 5 VDC 12 = 12 VDC Custom V available	Stroke Example: -999 = 12-in leads -XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (-) as shown above. For assistance call our Engineering Team at 203 756 7441.

Captive Lead Screw

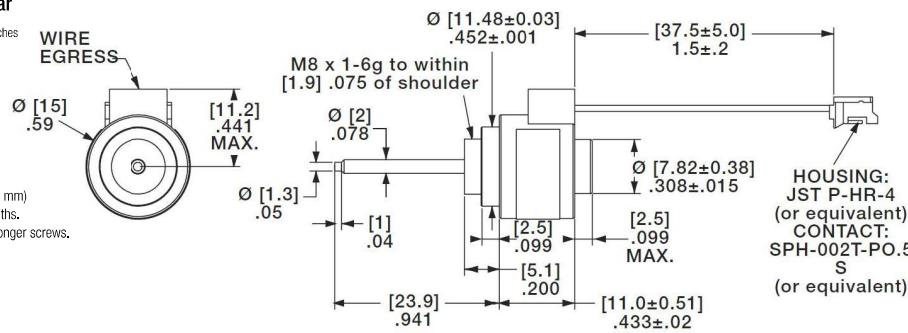
Dimensions = (mm) inches



External Linear

Dimensions = (mm) inches

Up to 2.36-in (59.9 mm) standard screw lengths. Consult factory for longer screws.



MICRO Series

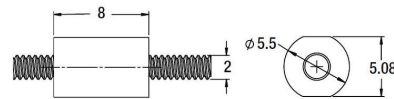
Dimensions = (mm) inches

Standard nut styles. Consult the factory for custom solutions.

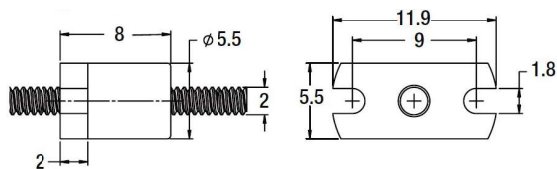
MICRO Series Nut Styles

Part No.	BFW Nut Style	Dynamic Load lbs (Kg)	Drag Torque oz-in (NM)
BFWB	Barrel Mount	10 (4.5)	Free Wheeling
BFWR	Rectangular Flange		

Barrel Nut Style

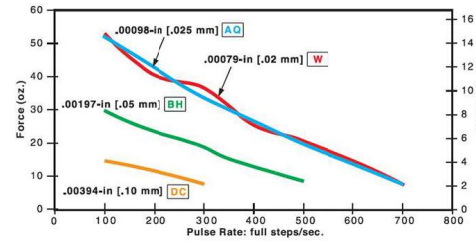


Rectangular Nut Style



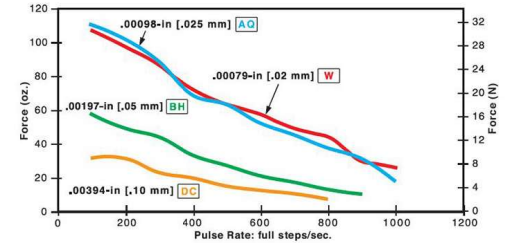
FORCE vs. PULSE RATE

- L/R Drive - Bipolar - 100% Duty Cycle



FORCE vs. PULSE RATE

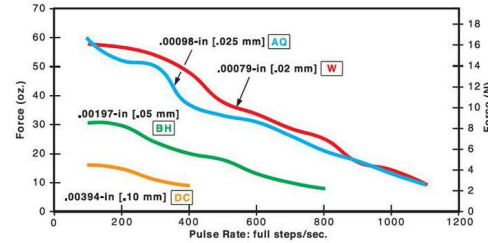
- L/R Drive - Bipolar - 25% Duty Cycle



Obtained by a special winding or by running a standard motor at double the rated current.

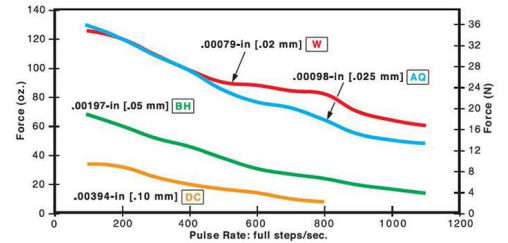
FORCE vs. PULSE RATE

- Chopper Drive - Bipolar - 100% Duty Cycle



FORCE vs. PULSE RATE

- Chopper Drive - Bipolar - 25% Duty Cycle

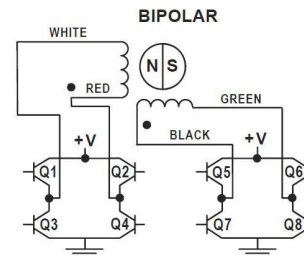


NOTE: All chopper drive curves were created with a 5 volt motor and a 40 volt power supply.

Ramping can increase the performance of a motor either by increasing the top speed or getting a heavier load accelerated up to speed faster. Also, deceleration can be used to stop the motor without overshoot.

15000 Series • Can-Stack Stepper Motor Linear Actuators Wiring & Stepping Sequence

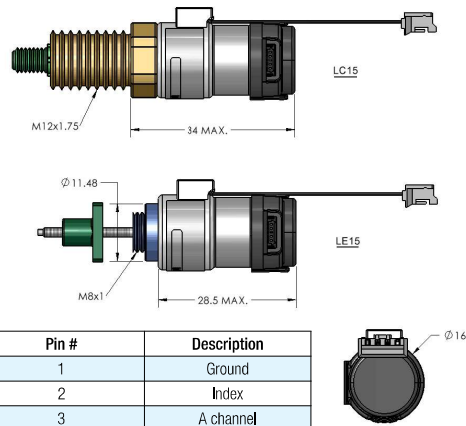
Can-Stacks: Wiring



Can-Stacks: Stepping Sequence

Step	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8
1	ON	OFF	ON	OFF
2	OFF	ON	ON	OFF
3	OFF	ON	OFF	ON
4	ON	OFF	OFF	ON
1	ON	OFF	ON	OFF

Note: Half stepping is accomplished by inserting an off state between transitioning phases.



Pin #	Description
1	Ground
2	Index
3	A channel
4	+5VDC power
5	B channel

NEW! 15000 Series E16 Encoder

15000 Series E16 optical encoder is designed to provide A, B and Index digital quadrature signals for high volume, restricted space applications.

- Resolutions from 250/256 to 4000/4096
- Single-ended only
- Low power consumption, 5V @ 26mA max

Assembly Options:
 – Detachable cable

Z20000 Series
 Ø 20 mm (.79-in) Can-Stack Stepper Motor Linear Actuators

Utilizing rare earth (neodymium) magnets, the Z-Series Linear Actuators consistently deliver exceptional performance at an economical price. Also available in a special "earless" configuration without a mounting flange, which is ideal for space constrained applications.

Economical motors for high volume applications

Multiple versions available

- Captive
- Non-Captive
- External Linear



Specifications

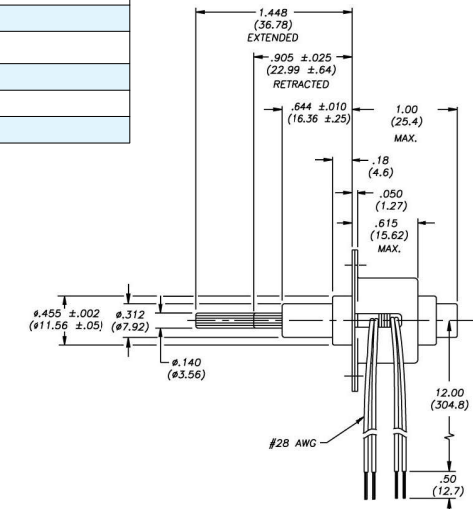
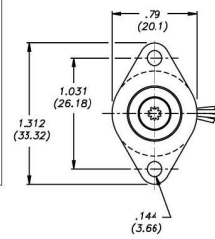
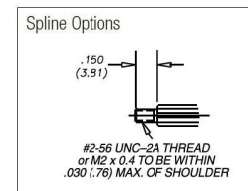
Ø 20 mm (.79-in) Z-Series Motor		
Part No.	Captive	Z2054 – – – †
	Non-Captive	Z2084 – – – †
	External Linear*	Z2054 – – 9 †
Wiring	Bipolar	
Step angle	15°	
Winding Voltage	5 VDC	12 VDC
Current (RMS)/phase	250 mA	100 mA
Resistance/phase	20 Ω	118 Ω
Inductance/phase	5.4 mH	27 mH
Power Consumption	2.5 W	
Rotor Inertia	1.13 gcm ²	
Insulation Class	Class B	
Weight	.85 oz. (24.1 g)	
Insulation Resistance	20 MΩ	

*Part numbering information on page 168.

*When ordering Z-Series External Linear motors, add -900 to end of the Part Number.

Linear Travel / Step		Order Code I.D.
15° Step Angle		
inches	mm	
0.001	0.0254	1
0.002	0.051	2
0.004	0.102	4

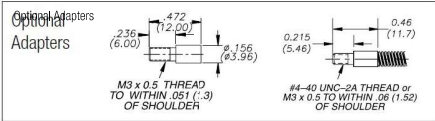
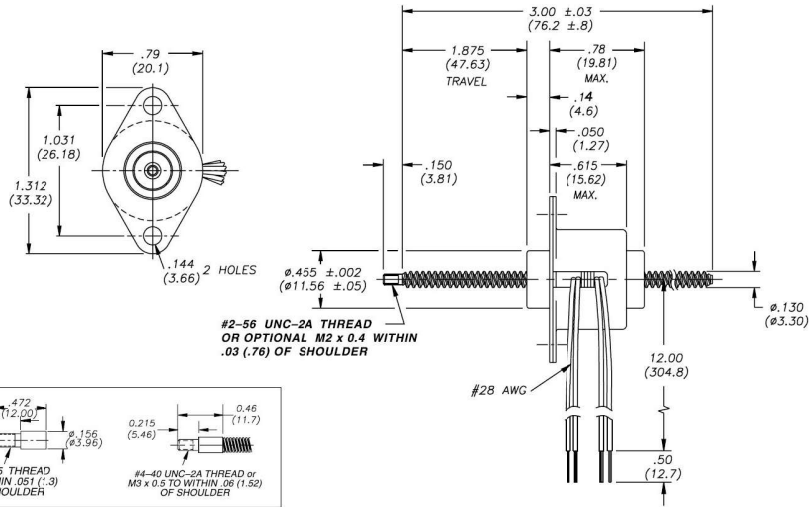
Special drive considerations may be necessary when leaving shaft fully extended or fully retracted. Standard motors are Class B rated for maximum temperature of 130° C (266° F).



Non-Captive Lead Screw

Dimensions = (mm) inches

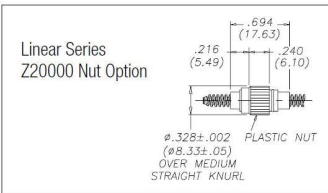
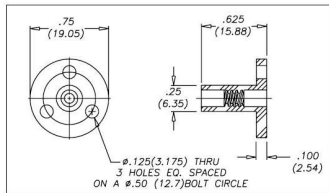
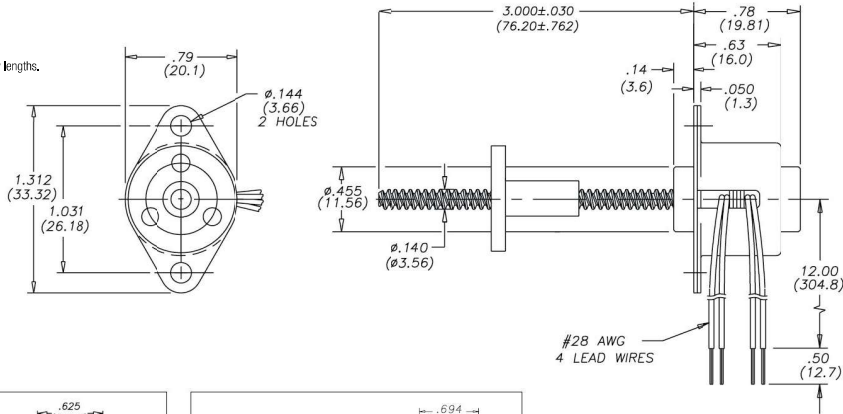
Up to 6-in (152 mm) standard screw lengths. Longer screw lengths are available.



External Linear

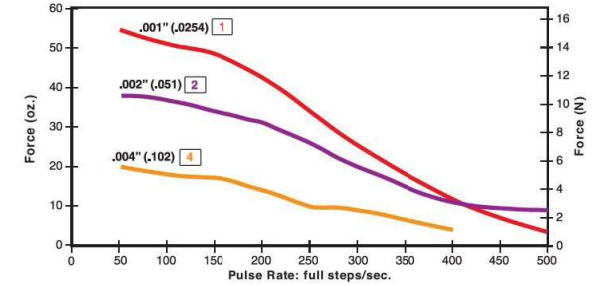
Dimensions = (mm) inches

Up to 6-in (152 mm) standard screw lengths. Longer screw lengths are available.



FORCE vs. PULSE RATE

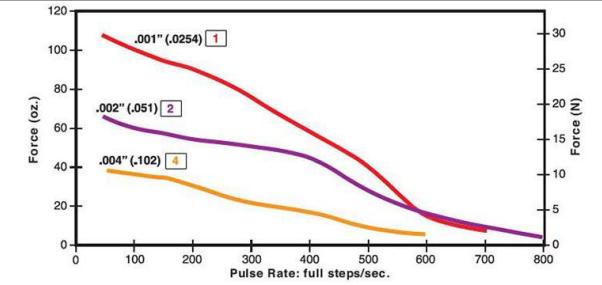
- L/R Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

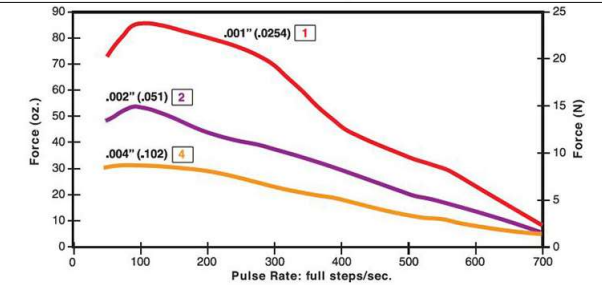
- L/R Drive
- Bipolar
- 25% Duty Cycle

Obtained by a special winding or by running a standard motor at double the rated current.



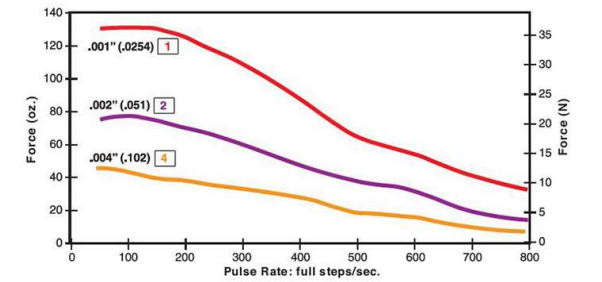
FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 25% Duty Cycle



NOTE: All chopper drive curves were created with a 5 volt motor and a 40 volt power supply.

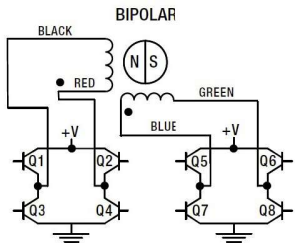
Ramping can increase the performance of a motor either by increasing the top speed or getting a heavier load accelerated up to speed faster. Also, deceleration can be used to stop the motor without overshoot.

Identifying the Can-Stack Number Codes when Ordering

Z	20	5	4	2	05	900
Prefix Z = Series Code	Series Number Designation 20 = 20000 (Series numbers represent approximate diameters of motor body)	Style 5 = 15° Captive or External (use -900 Suffix for External version) 8 = 15° Non-Captive	Coils 4 = Bipolar (4 wire)	Code ID Resolution Travel/Step 1 = .001-in (.0254) 2 = .002-in (.051) 4 = .004-in (.102)	Voltage 05 = 5 VDC 12 = 12 VDC Custom V available	Suffix Stroke Example: -900 used to code Z-Series external linear -XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (-) as shown above. For assistance call our Engineering Team at 203.756.7441.

Can-Stacks: Wiring



Can-Stacks: Stepping Sequence

Bipolar Step	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8
1	ON	OFF	ON	OFF
2	OFF	ON	ON	OFF
3	OFF	ON	OFF	ON
4	ON	OFF	OFF	ON

Note: Half stepping is accomplished by inserting an off state between transitioning phases.

Can-Stack Stepper Motor Linear Actuators Options

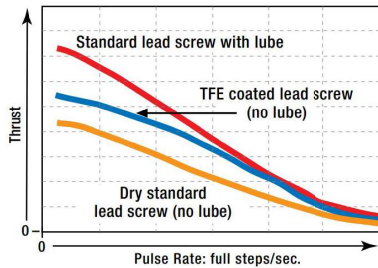
TFE Coated Lead Screws for applications that require a permanent, dry lubricant

Ideal for applications where conventional oils and greases cannot be used for lead screw lubrication.

Non-lubricated TFE Coated Lead Screw provides improved performance in both life and thrust as compared to a "dry" stainless steel lead screw. TFE can be applied to a wide variety of lead screw pitches. Available captive, non-captive and external linear.

Typical applications: where contamination from grease or lubricants must be avoided; silicon wafer handling, clean rooms, medical equipment or laboratory instrumentation.

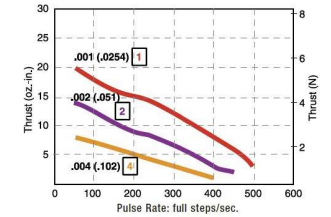
Lead Screw Comparison: FORCE vs. PULSE RATE – L/R Drive – 100% Duty Cycle



Can-Stack Stepper Motor Linear Actuators Options

Specially Engineered Can-Stack Linear Actuators for high temperature applications

Stepping motors specially designed for high temperature environments. Materials meeting class F temperature ratings are used in construction. Specialized components include high temperature bobbins, coils, lead wires, lubricant and adhesives.



Home Position Switch monitors movements more precisely for greater control and improved quality control

Miniature electronic home position switch capable of monitoring the home positions of linear actuators. The switch mounts on the rear sleeve of captive linear motors and allows the user to identify start, stop or home positions. Depending on your preference, contacts can be normally open or normally closed. The contact closure is repeatable to within one step position, identifying linear movements as low as 0.0005-in (0.0013 cm) per step. Multiple contact switches are also available.

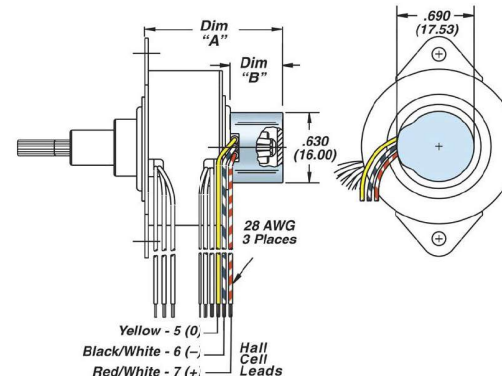
Activation force of 10 oz (2.78 N) required therefore may not be appropriate for smaller can-stack actuators.

When ordering motors with the home position switch, the part number should be preceded by an "S".

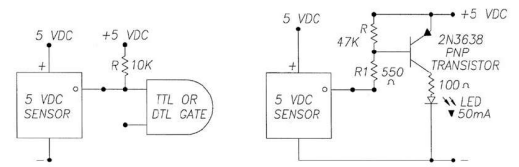
Specifications	
Contact Ratings (Standard)	1.00 AMP @ 120 VAC 1.00 AMP @ 28 VDC
Operating Temperature	-30°C to +55°C (-22°F to 131°F)
Electrical Life	< 20 milliohms typ. initial at 2 - 4 V DC, 100 mA Tested to 60,000 make-and-break cycles at full load
Schematic	 Multiple contact options available.

End of Stroke Proximity Sensor incorporates a hall effect device, activated by a rare earth magnet embedded in the end of the internal screw

Compact profile of the sensor allows for installation in limited space applications. Virtually unlimited cycle life. Special cabling and connectors available.



Specifications	
Supply Voltage (VDC)	3.8 min. to 24 max.
Current Consumption	10 mA max.
Output Voltage (operated)	0.15 typ., 0.40 max. Sinking 20 mA max.
Output Current	20 mA max.
Output Leakage Current (released)	10µA max. @ Vout = 24 VDC; Vcc = 24 VDC
Output Switching Time	Rise, 10 to 90%: .05 µs typ., 1.5 µs max. @ Vcc = 12 V, RL = 1.6 KOhm Fall, 90 to 10%: .15 µs typ., 1.5 µs max. @ CL = 20 pF
Temperature	-40 to +150°C



NOTE: Sensor is category 2 ESD sensitive per DOD-STD-1686A. Assembly operators should be performed at workstations with conductive tops and operators grounded.

Z26000 Series Ø 26 mm (1-in) Can-Stack Stepper Motor Linear Actuators

Designed to accommodate high volume applications

Z26000 Series motors utilize rare earth (neodymium) magnets. Also, available in a special "earless" configuration without a mounting flange. All units are built with durable dual ball bearings.

Multiple versions available
— Captive — Non-Captive — External Linear

NOW AVAILABLE! Shorter motor body option available (see page 174)



Specifications

Ø 26 mm (1-in) Z-Series Motor								
Part No.	Captive	Z2644			Z2654			Z2656
	Non-Captive	Z2634			Z2684			Z2686
	External Linear*	Z2644	-9	1"	Z2654	-9	1"	Z2656
Wiring		Bipolar				Unipolar*		
Step angle		7.5°		15°		7.5°		15°
Winding Voltage		5 VDC	12 VDC	5 VDC	12 VDC	5 VDC	12 VDC	5 VDC
Current (RMS)/phase		340 mA	140 mA	340 mA	140 mA	340 mA	140 mA	340 mA
Resistance/phase		14.7 Ω	84 Ω	14.7 Ω	84 Ω	14.7 Ω	84 Ω	14.7 Ω
Inductance/phase		8.5 mH	55 mH	6.7 mH	44 mH	4.3 mH	24 mH	3.4 mH
Power Consumption		3.4 W						
Rotor Inertia		1.4 gcm ²						
Insulation Class		Class B						
Weight		1.2 oz (34 g)						
Insulation Resistance		20 MΩ						

*Part numbering information on page 4. *Unipolar drive gives approximately 40% less thrust compared to bipolar drive. ** When ordering Z-Series External Linear motors, add -900 to end of the Part Number.

Linear Travel / Step 15° Step Angle			Order Code I.D.
step	inches	mm	
7.5° Angle	0.0005	0.013	3
	0.001	0.0254	1
	0.002	0.051	2
15° Angle	0.00164	0.04166	AS
	0.002	0.051	2
	0.004	0.102	4

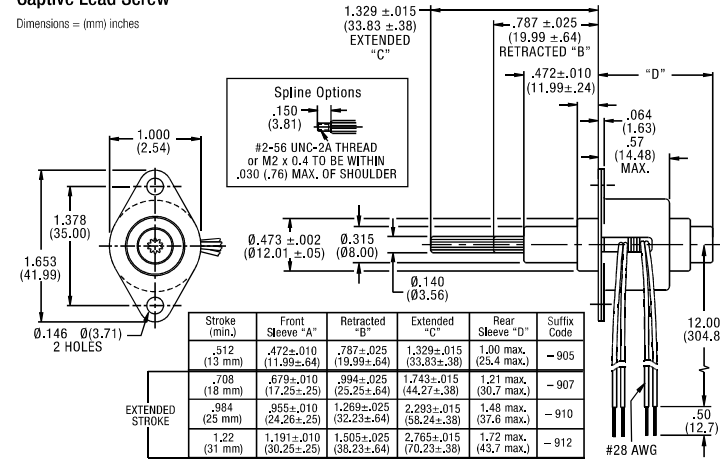
Also available, specially engineered Z26000 (Ø 26 mm, 1-in) linear actuators that extend captive lead screw travel beyond 12.7 mm (1/2-in).



Special drive considerations may be necessary when leaving shaft fully extended or fully retracted. Standard motors are Class B rated for maximum temperature of 130° C (266° F).

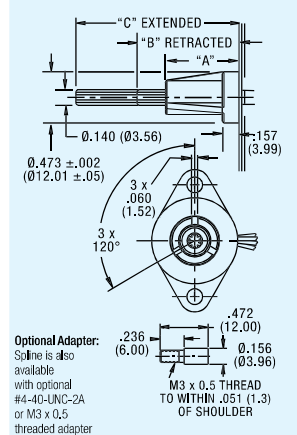
Captive Lead Screw

Dimensions = (mm) inches



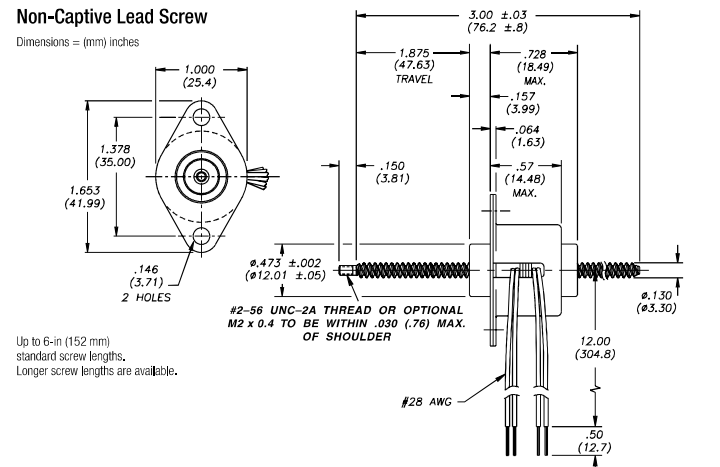
Extended Stroke Sleeve

Dimensions = (mm) inches



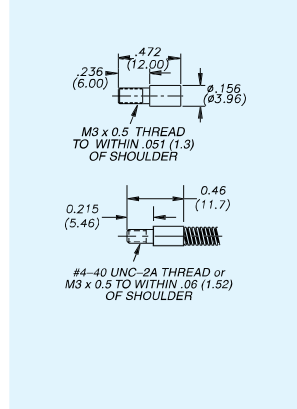
Non-Captive Lead Screw

Dimensions = (mm) inches



Extended Stroke Sleeve

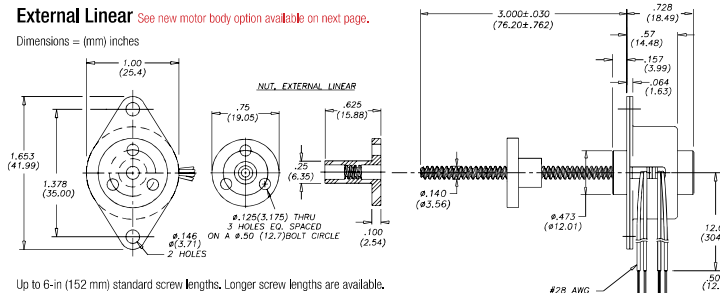
Dimensions = (mm) inches



External Linear

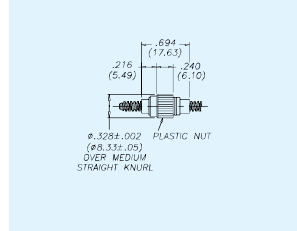
See new motor body option available on next page.

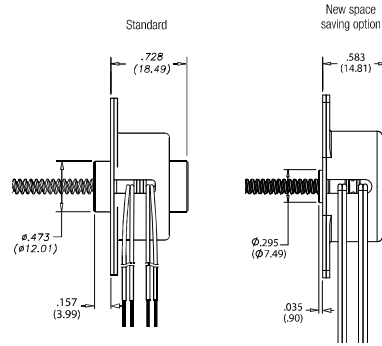
Dimensions = (mm) inches



Linear Series Z26000 Nut Option

Dimensions = (mm) inches





NOW AVAILABLE! Shorter External Linear Option

Designed to accommodate applications with space limitations

The Z26000 series now offers both the .728 and .583 motor body lengths with all existing Z26 motor advantages, including cost competitiveness and availability of customizations like rare earth magnets and earless options.

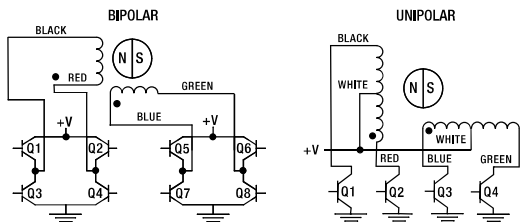
When ordering, the shorter motor option can be referenced using the last three suffix digits (-XXX).

Identifying the Can-Stack Number Codes when Ordering

Z	26	4	4	2	05	900
Prefix	Series Number	Style	Coils	Code ID Resolution Travel/Step	Voltage	Suffix
Z = Series Code	26 = 26000 (Series numbers represent approximate diameters of motor body)	3 = 7.5° Non-Captive 4 = 7.5° Captive or External (use "E" or "K" Prefix for External version) 5 = 15° Captive or External (use "E" or "K" Prefix for External version) 8 = 15° Non-Captive	4 = Bipolar (4 wire) 6 = Unipolar (6 wire)	1 = .001-in (.0254) 2 = .002-in (.051) 3 = .0005-in (.013) 4 = .004-in (.102) AS = .04166-in (.00164)	05 = 5 VDC 12 = 12 VDC Custom V available	Stroke Example: -900 used to code Z-Series external linear -XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (-) as shown above. For assistance call our Engineering Team at 203 756 7441.

Can-Stacks: Wiring



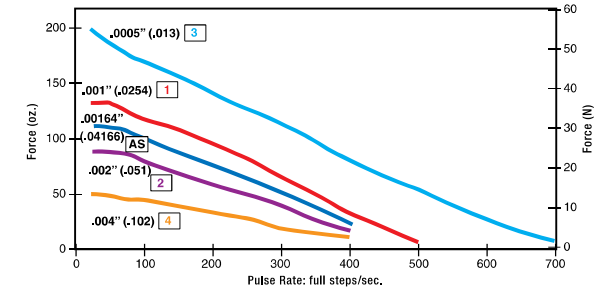
Can-Stacks: Stepping Sequence

Step	Bipolar	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8
1	ON	OFF	ON	OFF	OFF
2	OFF	ON	ON	OFF	OFF
3	OFF	ON	OFF	ON	OFF
4	ON	OFF	OFF	ON	ON
1	ON	OFF	OFF	ON	OFF

Note: Half stepping is accomplished by inserting an off state between transitioning phases.

FORCE vs. PULSE RATE

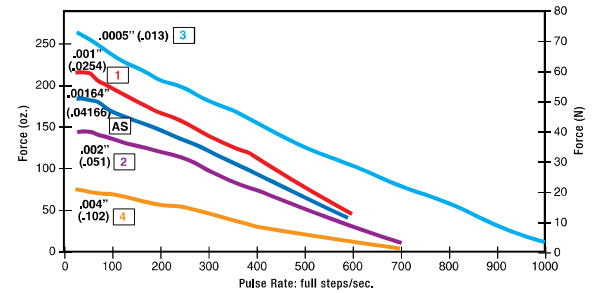
- L/R Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

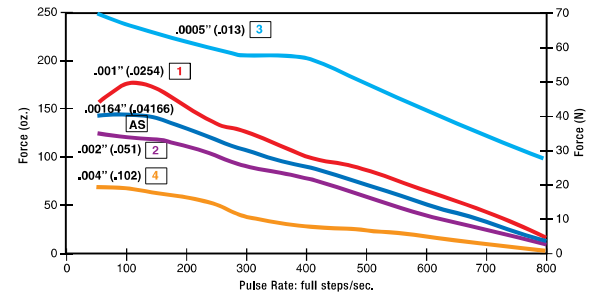
- L/R Drive
- Bipolar
- 25% Duty Cycle

Obtained by a special winding or by running a standard motor at double the rated current.



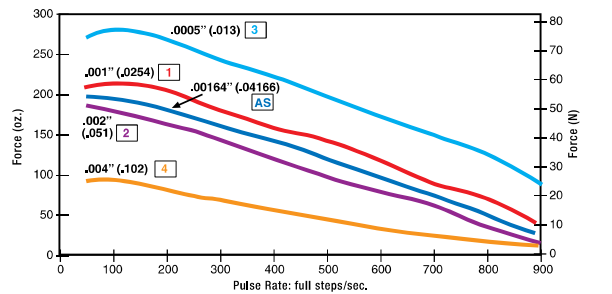
FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 25% Duty Cycle



NOTE: All chopper drive curves were created with a 5 volt motor and a 40 volt power supply.

Ramping can increase the performance of a motor either by increasing the top speed or getting a heavier load accelerated up to speed faster. Also, deceleration can be used to stop the motor without overshoot.

46000 Series Ø 46 mm (1.8-in) Can-Stack Stepper Motor Linear Actuators

Heavy-duty power, versatility and high output force

Multiple versions available

- Captive
- Non-Captive
- External Linear



Specifications

Ø 46 mm (1.8-in) Motor									
Part No.	Captive	4644	-	-	†	4654	-	-	†
	Non-Captive	4634	-	-	†	4684	-	-	†
	External Linear	E4644	-	-	†	E4654	-	-	†
Wiring		Bipolar				Unipolar*			
Step angle		7.5°		15°		7.5°		15°	
Winding Voltage		5 VDC	12 VDC	5 VDC	12 VDC	5 VDC	12 VDC	5 VDC	12 VDC
Current (RMS)/phase		1.0 A	.41 A	1.0 A	.41 A	1.0 A	.41 A	1.0 A	.41 A
Resistance/phase		5 Ω	29 Ω	5 Ω	29 Ω	5 Ω	29 Ω	5 Ω	29 Ω
Inductance/phase		9 mH	52 mH	7.1 mH	39 mH	4.5 mH	26 mH	3.5 mH	20 mH
Power Consumption		10 W							
Rotor Inertia		25.0 gcm ²							
Insulation Class		Class B							
Weight		9.0 oz (255 g)							
Insulation Resistance		20 MΩ							

*Part numbering information on page 177. *Unipolar drive gives approximately 30% less thrust than bipolar drive.

Linear Travel / Step 15° Step Angle			Order Code I.D.
step	inches	mm	
7.5° Angle	0.0005	0.013	3
	0.001	0.0254	1
	0.002	0.051	2
	0.004	0.102	4
	0.008	0.203	8
15° Angle	0.004	0.102	4
	0.008	0.203	8
	0.016	0.406	G

Special drive considerations may be necessary when leaving shaft fully extended or fully retracted. Standard motors are Class B rated for maximum temperature of 130° C (266° F).

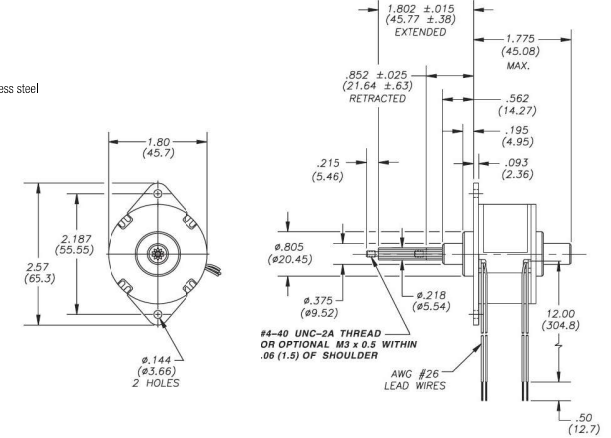
NOTE: All chopper drive curves were created with a 5 volt motor and a 40 volt power supply. Ramping can increase the performance of a motor either by increasing the top speed or getting a heavier load accelerated up to speed faster. Also, deceleration can be used to stop the motor without overshoot.

- Other 46000 Series styles available:
- TFE lead screw
 - High temperature option

Captive Lead Screw

Dimensions = (mm) inches

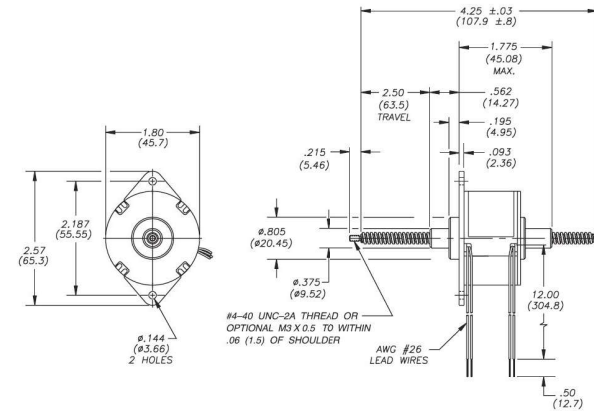
Pinion shafts available as electroless nickel plated brass (standard) or stainless steel (optional) threaded end.



Non-Captive Lead Screw

Dimensions = (mm) inches

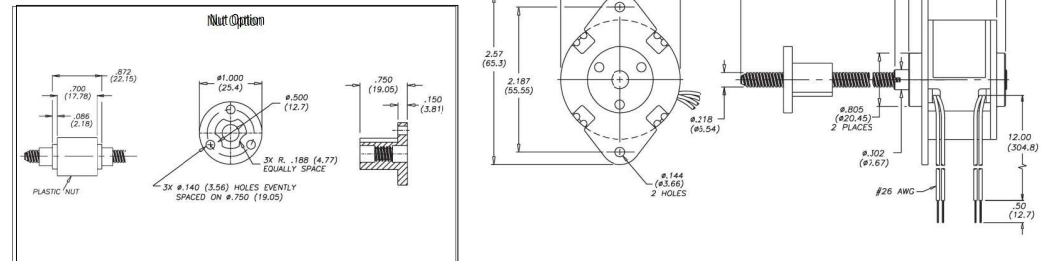
Up to 10-in (254 mm) standard screw lengths. Longer screw lengths are available.



External Linear

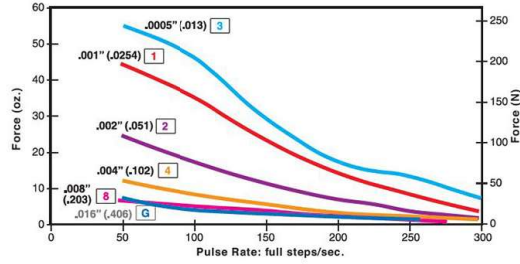
Dimensions = (mm) inches

Up to 10-in (254 mm) standard screw lengths. Longer screw lengths are available.



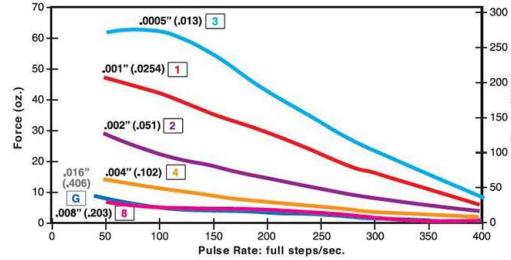
FORCE vs. PULSE RATE

- L/R Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

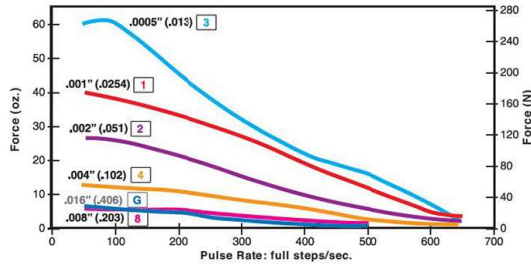
- L/R Drive
- Bipolar
- 25% Duty Cycle



Obtained by a special winding or by running a standard motor at double the rated current.

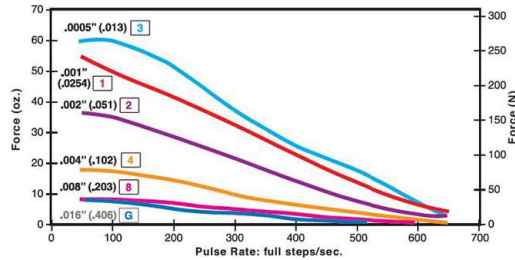
FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 25% Duty Cycle



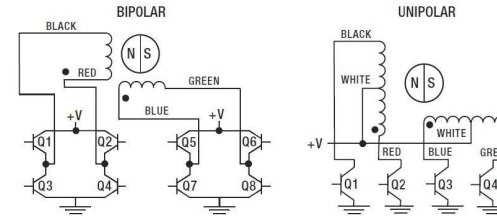
NOTE: All chopper drive curves were created with a 5 volt motor and a 40 volt power supply. Ramping can increase the performance of a motor either by increasing the top speed or getting a heavier load accelerated up to speed faster. Also, deceleration can be used to stop the motor without overshoot.

Identifying the Can-Stack Number Codes when Ordering

E	46	4	4	3	05	900
Prefix (include only when using the following) E = External K = External with 40° thread form S = Home Position Switch R = Rare Earth Magnet	Series Number Designation 46 = 46000 (Series numbers represent approximate diameters of motor body)	Style 3 = 7.5° Non-Captive 4 = 7.5° Captive or External (use "E" or "K" Prefix for External version) 5 = 15° Captive or External (use "E" or "K" Prefix for External version) 8 = 15° Non-Captive	Coils 4 = Bipolar (4 wire) 6 = Unipolar (6 wire)	Code ID Resolution Travel/Step 1 = .001-in (.0254) 2 = .002-in (.051) 3 = .0005-in (.013) 4 = .004-in (.102) 8 = .0008-in (.203) G = .016-in (.406)	Voltage 05 = 5 VDC 12 = 12 VDC Custom V available	Suffix Stroke Example: -900= external linear with grease and flanged nut -XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (-) as shown above. For assistance call our Engineering Team at 203.756.7441.

Can-Stacks: Wiring



Can-Stacks: Stepping Sequence

Bipolar Step	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8
1	ON	OFF	ON	OFF
2	OFF	ON	ON	OFF
3	OFF	ON	OFF	ON
4	ON	OFF	OFF	ON
1	ON	OFF	ON	OFF

Note: Half stepping is accomplished by inserting an off state between transitioning phases.

■ Can-Stack Stepper Motor Linear Actuators Options

TFE Coated Lead Screws for applications that require a permanent, dry lubricant

Ideal for applications where conventional oils and greases cannot be used for lead screw lubrication.

Non-lubricated TFE Coated Lead Screw provides improved performance in both life and thrust as compared to a "dry" stainless steel lead screw. TFE can be applied to a wide variety of lead screw pitches. Available captive, non-captive and external linear.

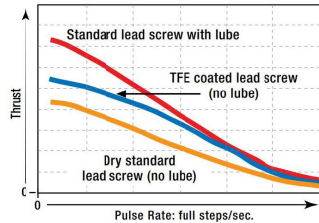
Typical applications: where contamination from grease or lubricants must be avoided; silicon wafer handling, clean rooms, medical equipment or laboratory instrumentation.

46000 Series, External Linear



Lead Screw Comparison: FORCE vs. PULSE RATE

— L/R Drive — 100% Duty Cycle

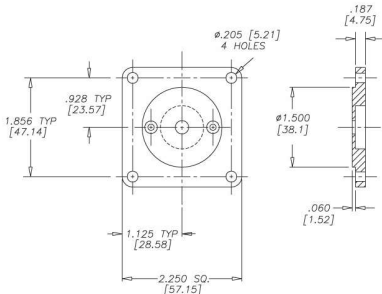


Specially engineered can-stack linear actuators for high temperature applications

Special materials meet class F temperature ratings are used in construction. Specialized components include high temperature bobbins, coils, lead wires, lubricant and adhesives.

NEMA Flange

Assembly option available for applications that require a Size 23 mount.



Home Position Switch monitors movements more precisely for greater control and improved quality control

Miniature electronic home position switch capable of monitoring the home positions of linear actuators. The switch mounts on the rear sleeve of captive linear motors and allows the user to identify start, stop or home positions. Depending on your preference, contacts can be normally open or normally closed. The contact closure is repeatable to within one step position, identifying linear movements as low as 0.0005-in (0.0013 cm) per step. Multiple contact switches are also available.

Activation force of 10 oz (2.78 N) required therefore may not be appropriate for smaller can-stack actuators.

When ordering motors with the home position switch, the part number should be preceded by an "S".



Specifications

Contact Ratings (Standard)	1.00 AMP @ 120 VAC 1.00 AMP @ 28 VDC
Operating Temperature	-30°C to +55°C (-22°F to 131°F)
Electrical Life	< 20 milliohms typ. initial at 2 - 4 V DC, 100 mA Tested to 60,000 make-and-break cycles at full load
Schematic	 Multiple contact options available.