

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

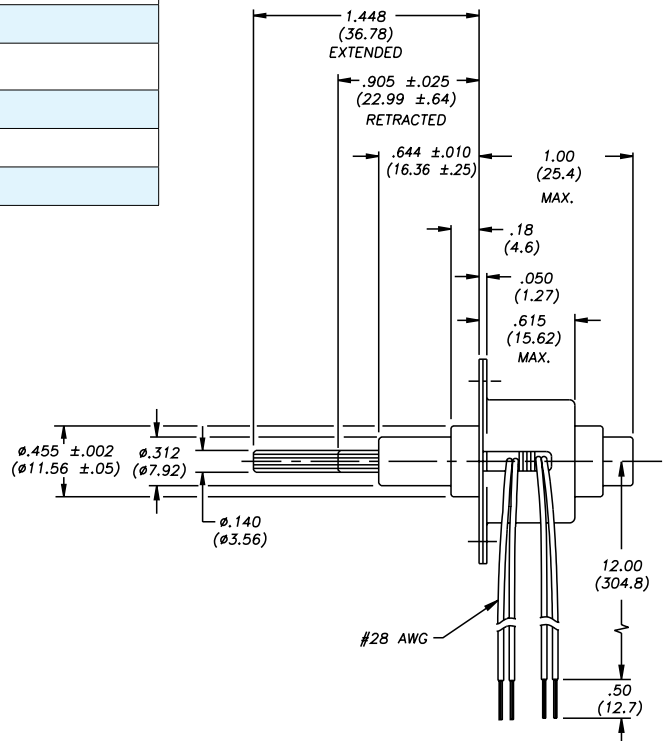
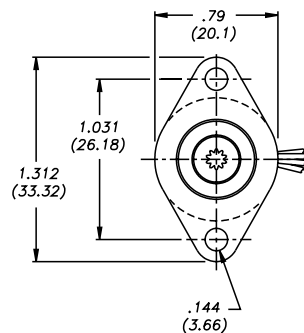
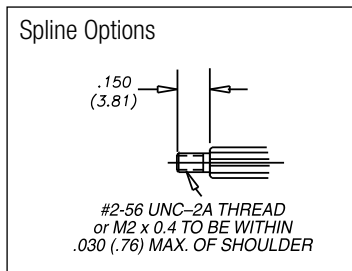
Ø 20 mm (.79-in) Z-Series Motor		
Part No.	Captive	Z2054 - - - - - †
	Non-Captive	Z2084 - - - - - †
	External Linear*	Z2054 - - - - 9 †
Wiring	Bipolar	
Step angle	15°	
Winding Voltage	5 VDC	12 VDC
Current (RMS)/phase	250 mA	100 mA
Resistance/phase	20 Ω	118 Ω
Inductance/phase	5.4 mH	27 mH
Power Consumption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

Linear Travel / Step 15° Step Angle		Order Code I.D.
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).

†Part numbering information on page 4.

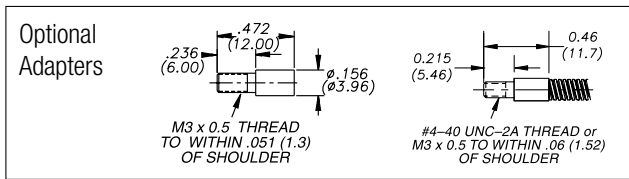
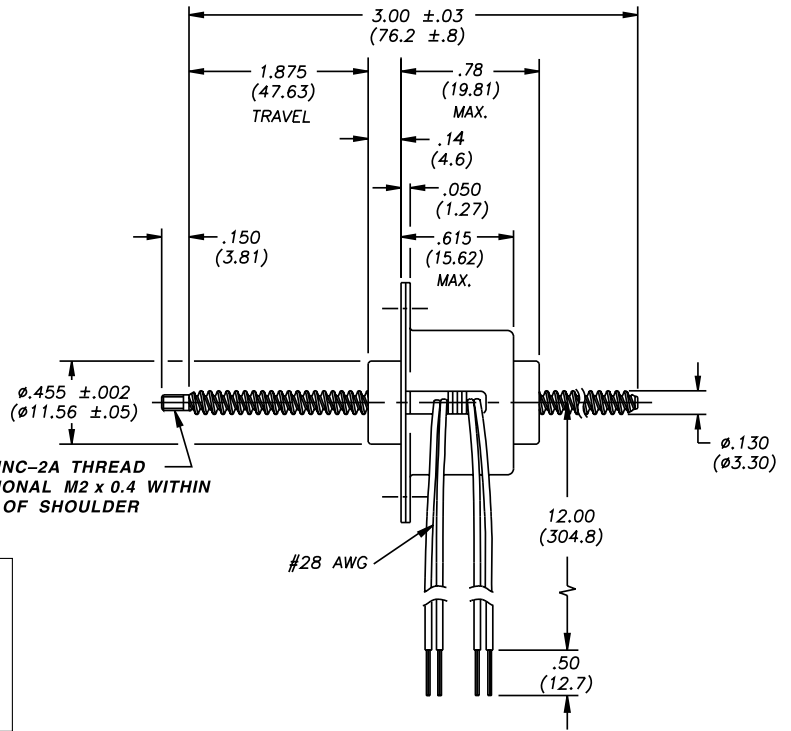
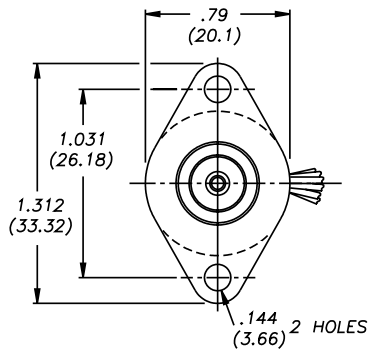
*When ordering Z-Series External Linear motors, add -900 to end of the Part Number.



Non-Captive Lead Screw

Dimensions = (mm) inches

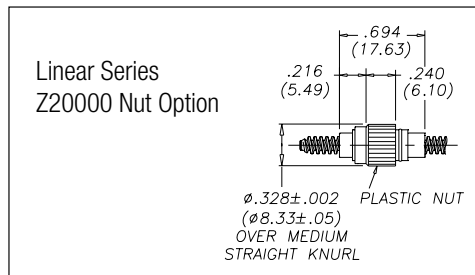
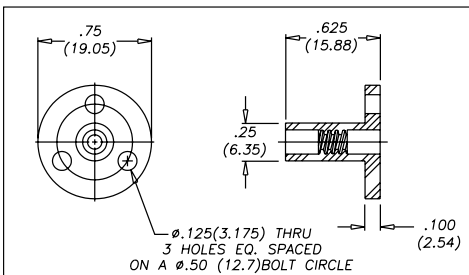
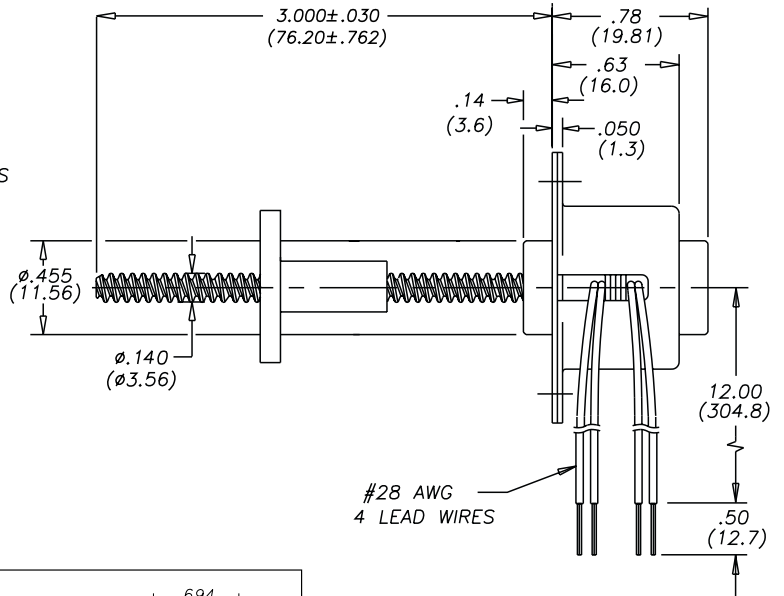
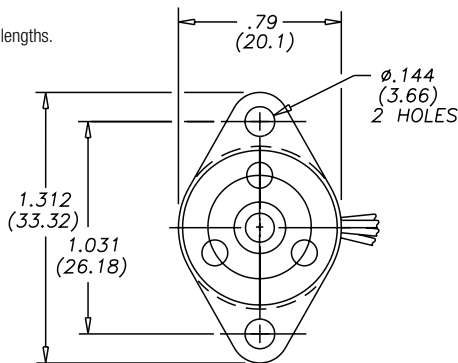
Up to 6-in (152 mm) standard screw lengths.
Longer screw lengths are available.



External Linear

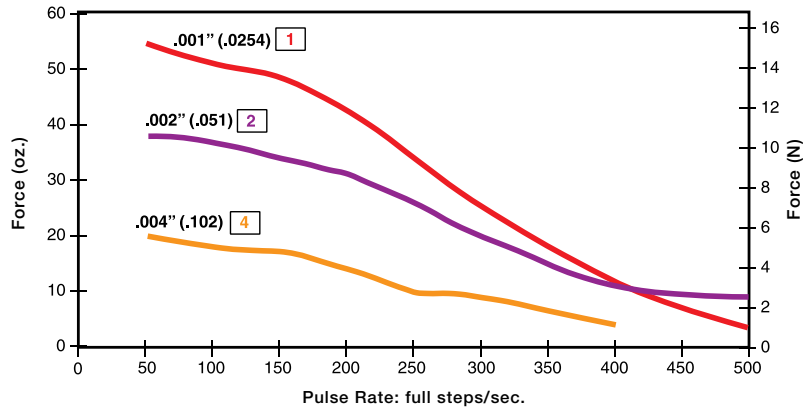
Dimensions = (mm) inches

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



FORCE vs. PULSE RATE

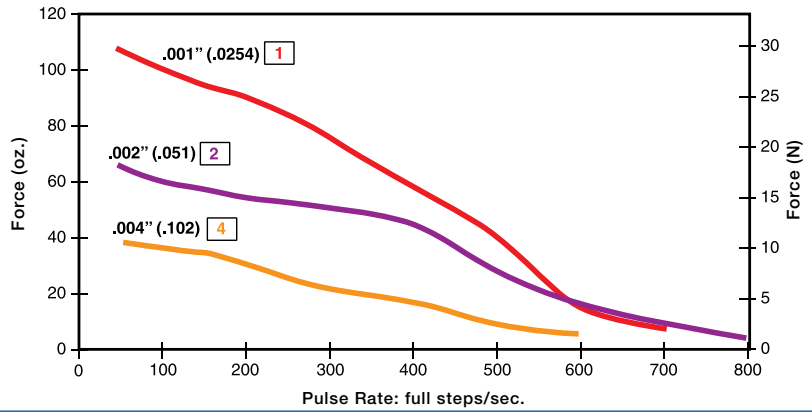
- L/R Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

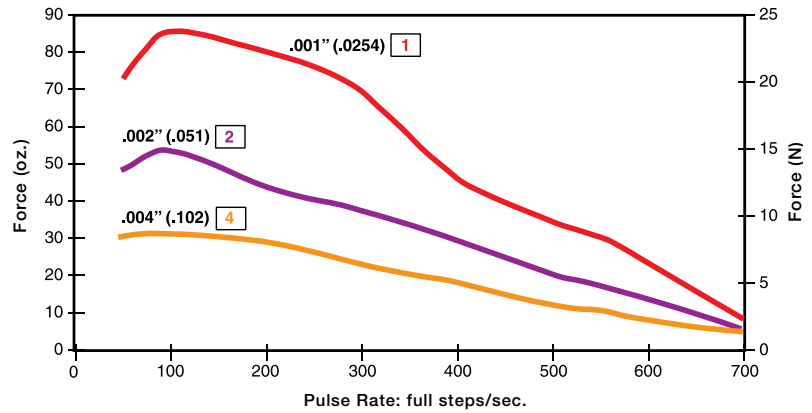
- L/R Drive
- Bipolar
- 25% Duty Cycle

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



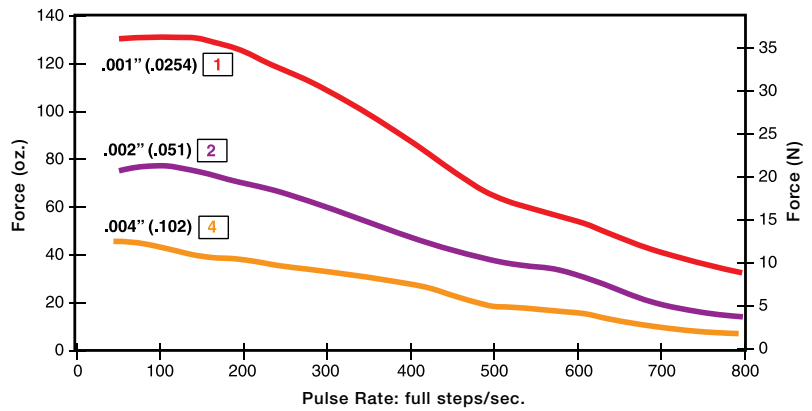
FORCE vs. PULSE RATE

- 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.

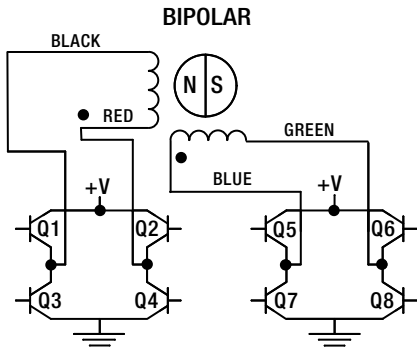
Ramping can increase the performance of a motor either by increasing the top speed or getting a heavier load accelerated up to speed faster. Also, deceleration can be used to stop the motor without overshoot.

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	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

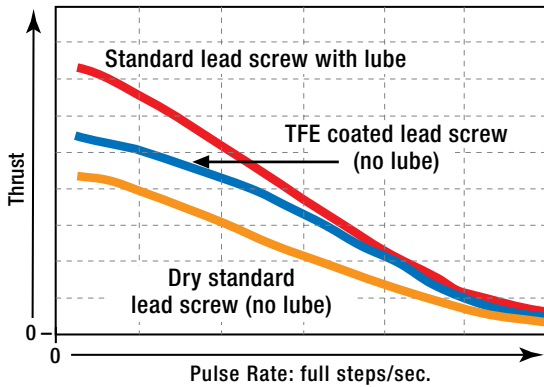
TFE Coated Lead Screws for applications that require a permanent, dry lubricant

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.

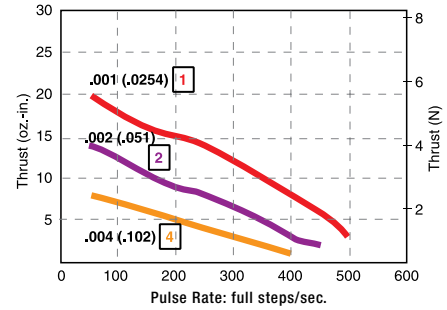
Lead Screw Comparison: FORCE vs. PULSE RATE – L/R Drive – 100% Duty Cycle



Z20000 Series Non-Captive

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

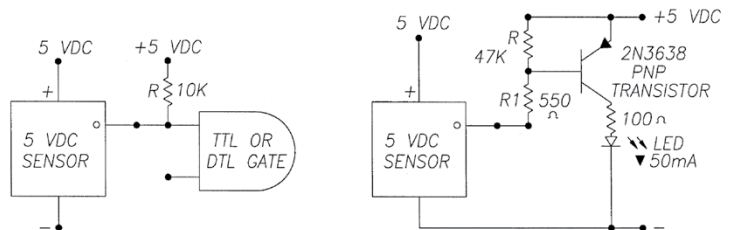
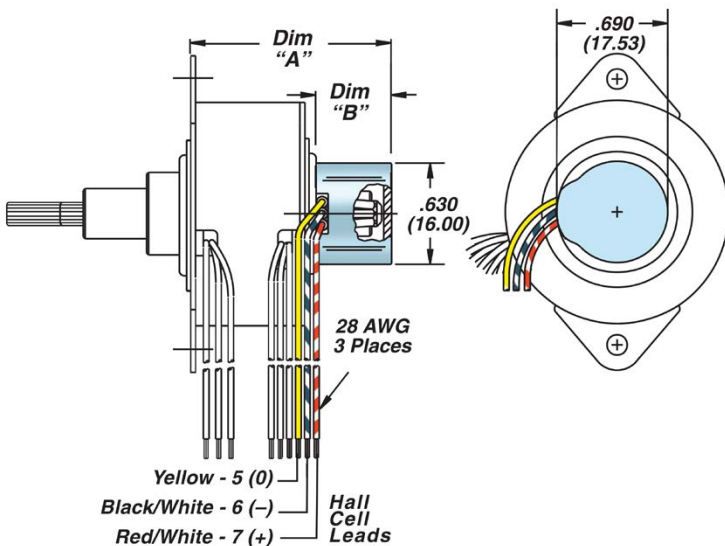
Miniature electronic home position switch capable of monitoring the home positions of linear actuators. The switch mounts on the rear sleeve of captive linear motors and allows the user to identify start, stop or home positions. Depending on your preference, contacts can be normally open or normally 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% 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



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