

**Haydon® 46000 Series - heavy-duty power, versatility and high output force**

**Specifications**

Ø46mm (1.8-in)  
Captive



Ø46mm (1.8-in)  
Non-captive

Ø 46 mm (1.8-in) motor				
Wiring		Bipolar		
Part No.	Captive	4644	4654	
	Non-captive	4634	4684	
	External	E4644	E4654	
Step angle		7.5°		15°
Winding voltage		5 VDC	12 VDC	5 VDC 12 VDC
Current (RMS)/phase		1.0 A	.41 A	1.0 A .41 A
Resistance/phase		5 Ω	29 Ω	5 Ω 29 Ω
Inductance/phase		9 mH	52 mH	7.1 mH 39 mH
Power consumption		10 W		
Rotor inertia		25.0 gcm <sup>2</sup>		
Insulation Class		Class B		
Weight		9.0 oz (255 g)		
Insulation resistance		20 MΩ		

Step	Linear Travel/Step		Order Code I.D.
	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

Ø 46 mm (1.8-in) motor				
Wiring		Unipolar*		
Part No.	Captive	4646	4656	
	Non-captive	4636	4686	
	External	E4646	E4656	
Step angle		7.5°		15°
Winding voltage		5 VDC	12 VDC	5 VDC 12 VDC
Current (RMS)/phase		1.0 A	.41 A	1.0 A .41 A
Resistance/phase		5 Ω	29 Ω	5 Ω 29 Ω
Inductance/phase		4.5 mH	26 mH	3.5 mH 20 mH
Power consumption		10 W		
Rotor inertia		25.0 gcm <sup>2</sup>		
Insulation Class		Class B		
Weight		9.0 oz (255 g)		
Insulation resistance		20 MΩ		

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).

Other 46000 Series styles available...

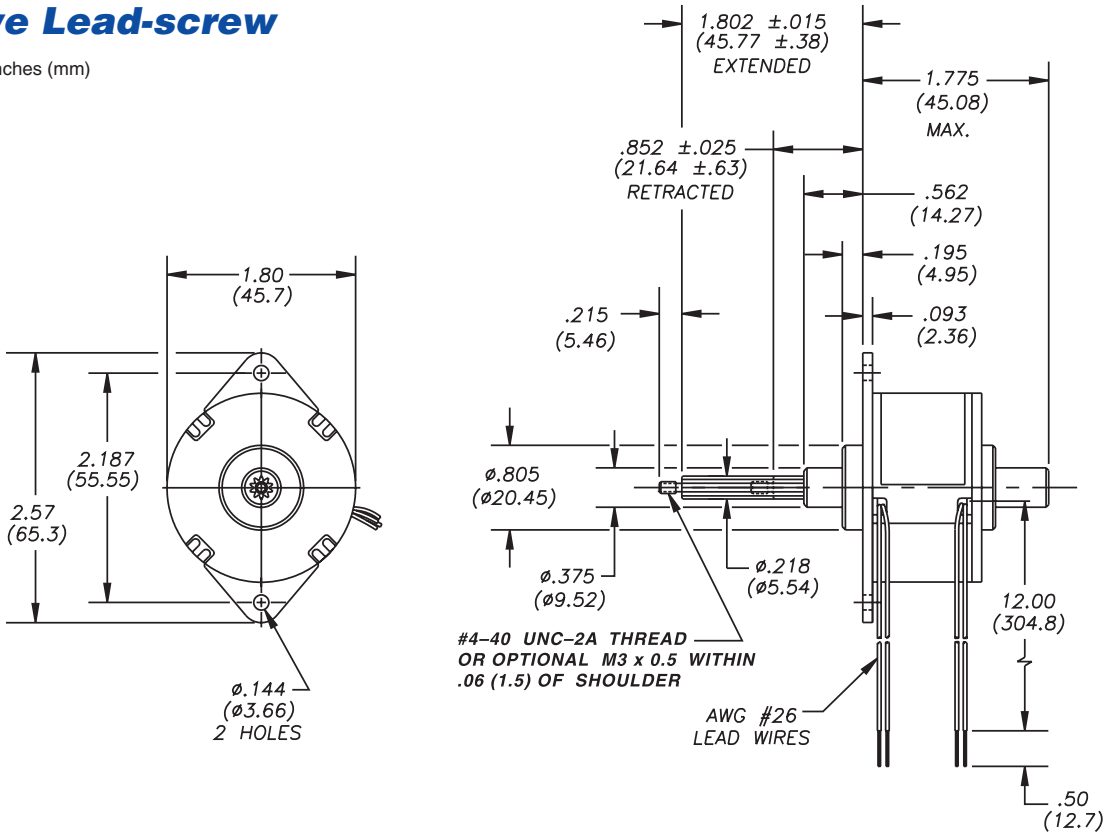
- TFE lead-screw
- High Temperature Option

† Part numbering information on page 5

\* Unipolar drive gives approximately 30% less thrust than bipolar drive.

### Captive Lead-screw

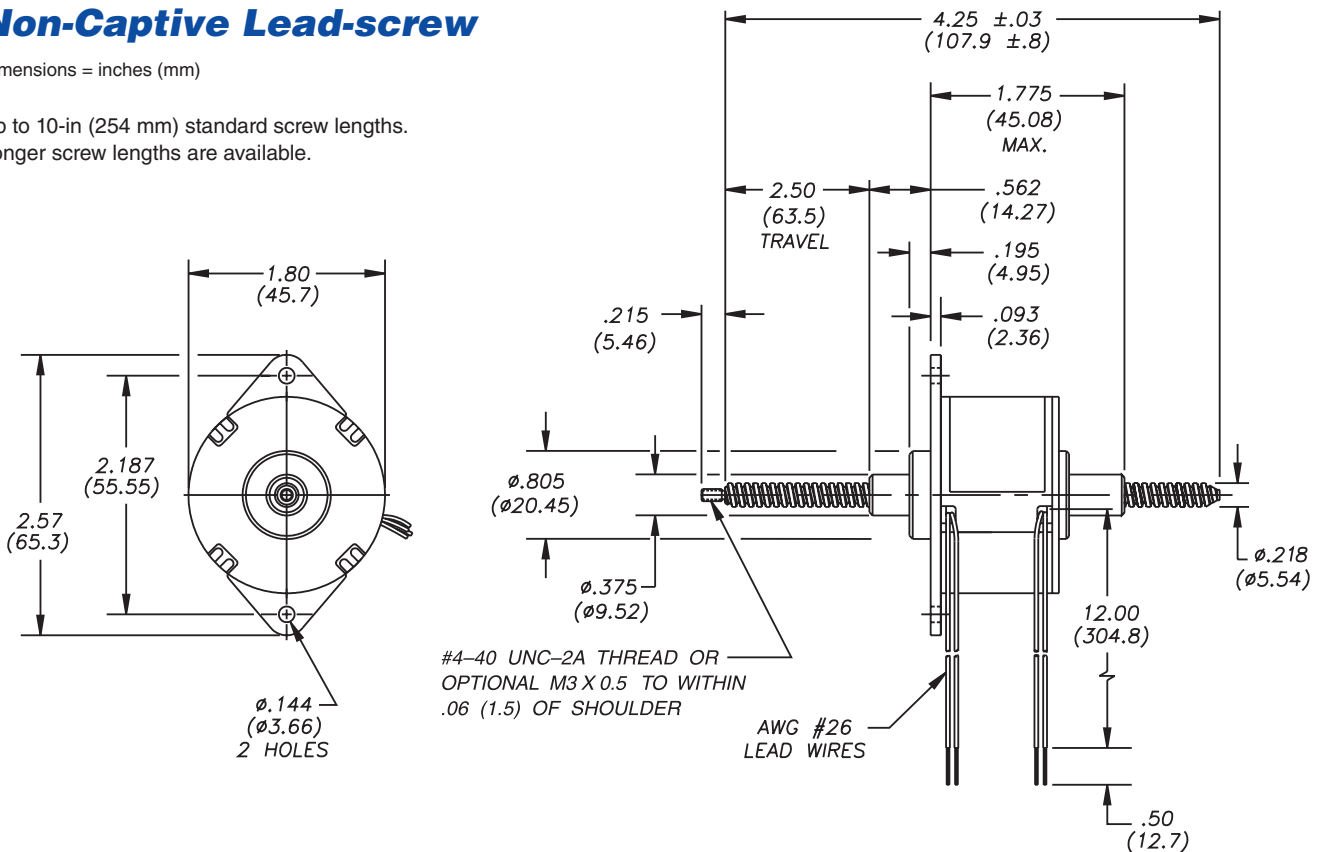
Dimensions = inches (mm)



### Non-Captive Lead-screw

Dimensions = inches (mm)

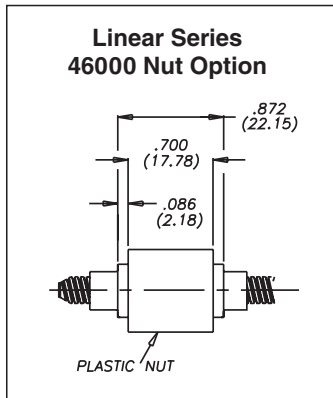
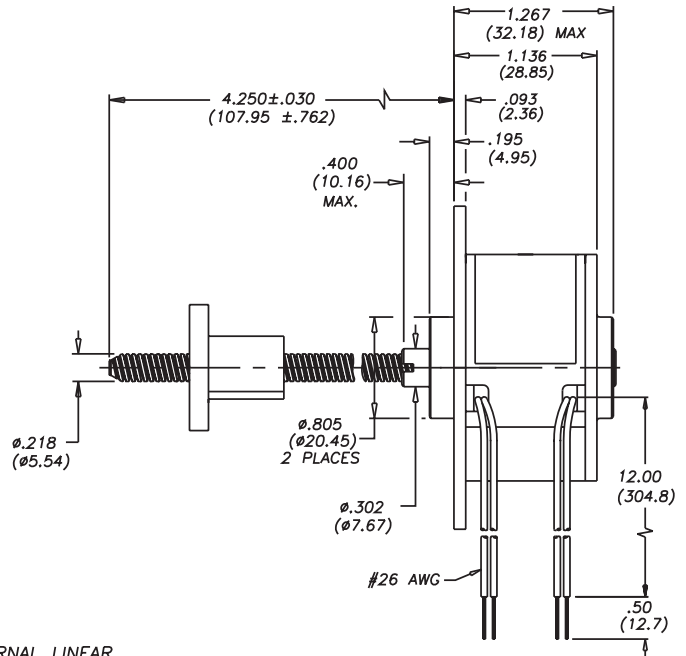
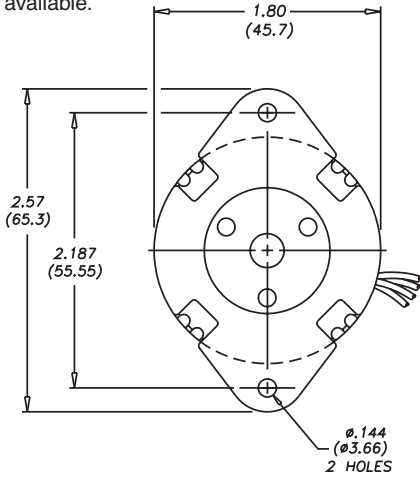
Up to 10-in (254 mm) standard screw lengths.  
 Longer screw lengths are available.



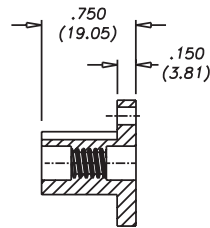
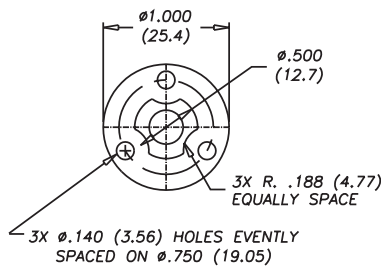
**External Linear**

Dimensions = inches (mm)

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

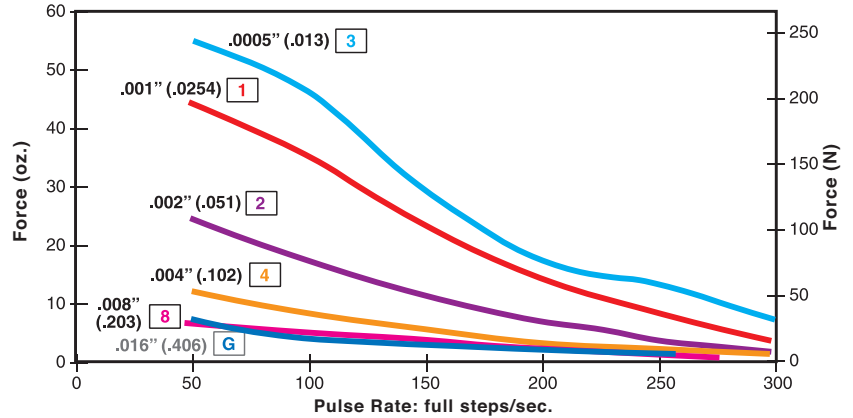


NUT, EXTERNAL LINEAR



**FORCE vs. PULSE RATE**

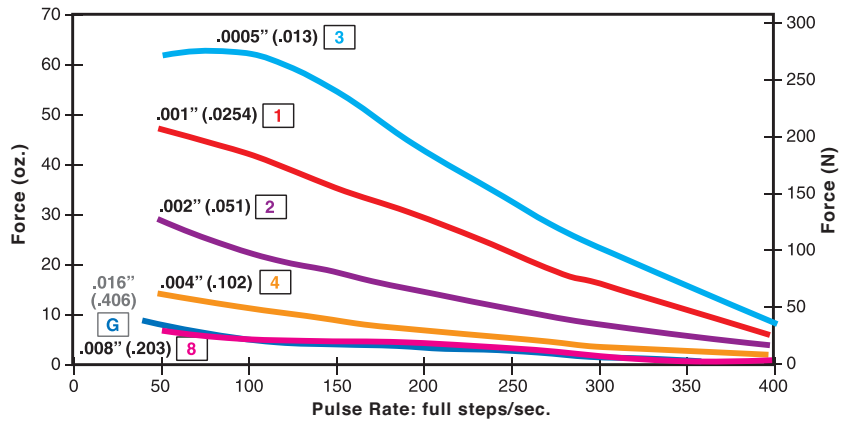
**L/R Drive • Bipolar**  
**100% Duty Cycle**



**FORCE vs. PULSE RATE**

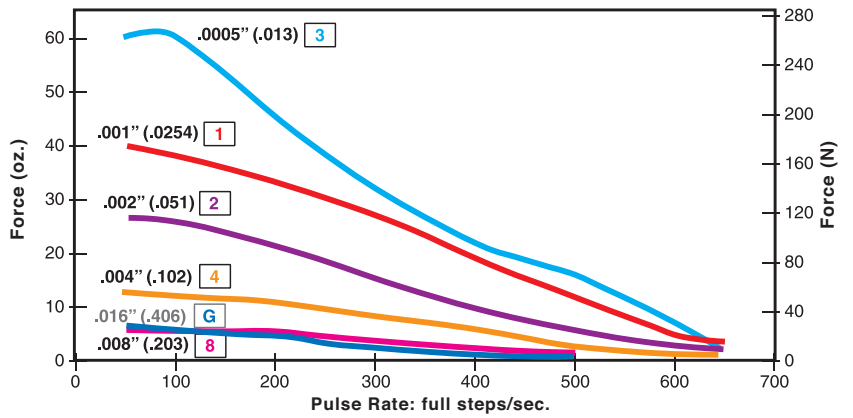
**L/R Drive • Bipolar**  
**25% Duty Cycle**

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



**FORCE vs. PULSE RATE**

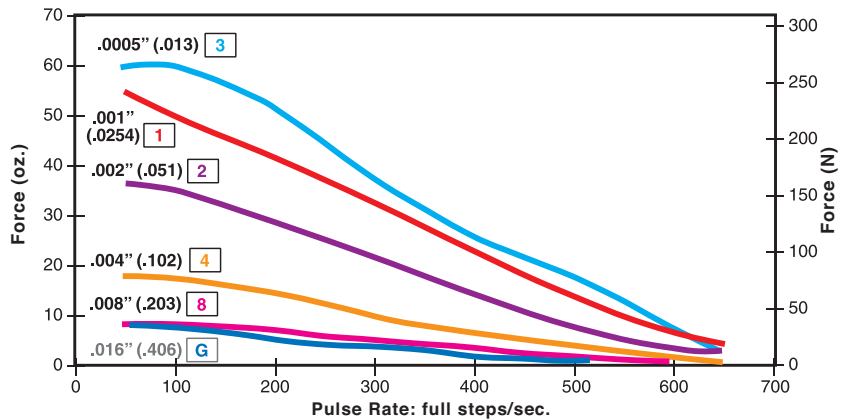
**Chopper Drive • Bipolar**  
**100% Duty Cycle**



**FORCE vs. PULSE RATE**

**Chopper Drive • Bipolar**  
**25% Duty Cycle**

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



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.

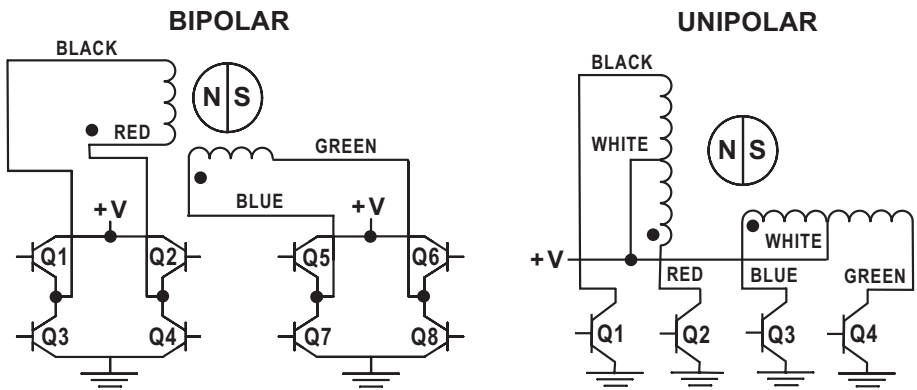
**Identifying the Can-Stack part number codes when ordering**

<b>E</b>	<b>46</b>	<b>4</b>	<b>4</b>	<b>3</b>	-	<b>05</b>	-	<b>900</b>
<b>Prefix</b> (include only when using the following) <b>E</b> = External <b>K</b> = External with 40° thread form <b>P</b> = Proximity Sensor <b>S</b> = Home Switch <b>R</b> = Rare Earth Magnet	<b>Series number designation</b> <b>46 = 46000</b> (Series numbers represent approximate diameters of motor body)	<b>Style</b> <b>3</b> = 7.5° non-captive <b>4</b> = 7.5° Captive or External (use "E" or "K" Prefix for External version) <b>5</b> = 15° Captive or External (use "E" or "K" Prefix for External version) <b>8</b> = 15° non-captive	<b>Coils</b> <b>4</b> = Bipolar (4 wire) <b>6</b> = Unipolar (6 wire)	<b>Code ID Resolution Travel/Step</b> <b>1</b> = .001-in (.0254) <b>2</b> = .002-in (.051) <b>3</b> = .0005-in (.013) <b>4</b> = .004-in (.102) <b>8</b> = .0008-in (.203) <b>G</b> = .016-in (.406)	<b>Voltage</b> <b>05</b> = 5 VDC <b>12</b> = 12VDC <i>Custom V available</i>	<b>Suffix</b> <b>Stroke</b> Example: -900 = external linear with grease & flanged nut <b>Suffix also represents:</b> -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 or order entry, call our engineering team at 203 756 7441.

**Haydon kerk Express**  
 Motion Solutions  
 Standard products available 24-hrs. at [www.haydonkerkexpress.com](http://www.haydonkerkexpress.com)

**Can-Stacks: Wiring**



**Can-Stack Stepper Motor Linear Actuators: OPTIONS**

- **SCREW LENGTH OPTIONS** for non-captive and external linear shaft motors various screw lengths are available to accommodate almost any travel requirement.
- **HOME POSITION SWITCH** for captive shaft can-stack motors
- **TFE COATED LEAD-SCREWS** for can-stack motors
- **NEMA FLANGE** for can-stack motors
- **OPTIONAL ASSEMBLIES** for Can-Stack Linear Actuator Motors.

**Can-Stacks: Stepping Sequence**

	Bipolar	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8
	Unipolar	Q1	Q2	Q3	Q4
	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

← EXTEND CW ↑ RETRACT CCW

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

**TFE coated lead-screws**

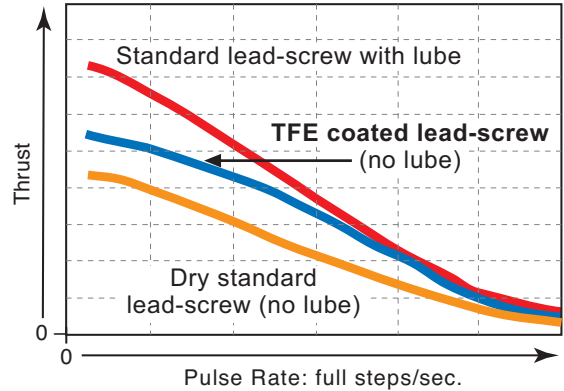


46000 Series, external linear

A TFE coated lead-screw option ideal for applications where conventional oils and greases can not be used for lead-screw lubrication.

A 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 and is available for captive, non-captive and external linear linear actuators.

**Lead-Screw Comparison**  
**FORCE vs. PULSE RATE**  
 L/R Drive • 100% Duty Cycle



**Specially engineered can-stacks for high temperature applications**

Haydon Kerk Motion Solutions, Inc. offers a line of stepping motors specially designed for high temperature environments. The motors are constructed using the proven techniques employed for Haydon<sup>®</sup> motors. Special materials which meet class F temperature ratings are used in construction. Specialized components include high temperature bobbins, coils, lead wires, lubricant and adhesives. For more information contact our applications group.

**Home Position Switch**

A 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.

The switch allows device manufacturers the ability to monitor movements more precisely for greater control and improved Q.C. When ordering motors with the home position switch, the part number should be preceded by an "S". Activation force of 10 oz (2.78 N) required therefore may not be appropriate for smaller can-stack actuators.



**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)
- Contact Resistance: < 20 milliohms typ. initial at 2 - 4 V DC, 100 mA
- Electrical Life: Tested to 60,000 make-and-break cycles at full load
- Schematic:

Multiple contact options available.

**NEMA Flange for Series 46000**

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

