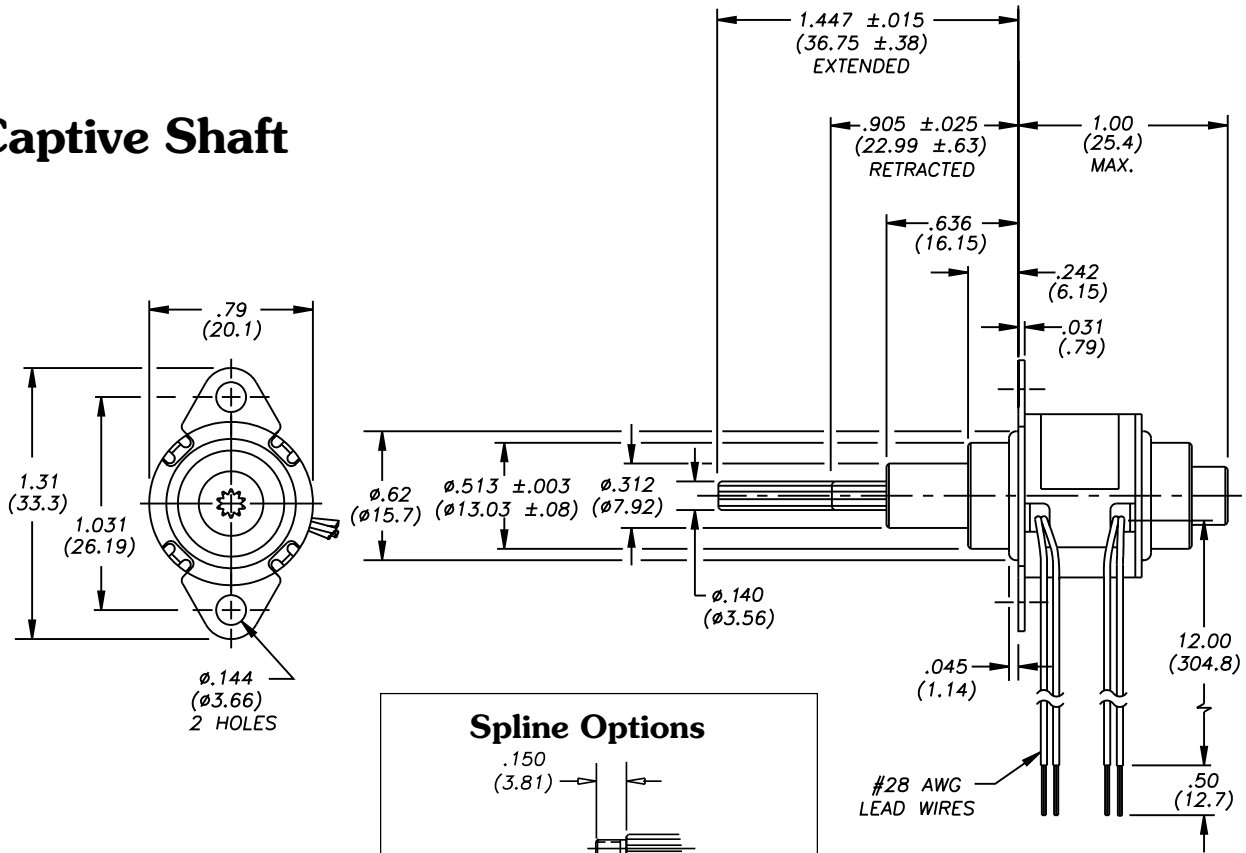




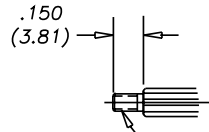
# Linear Series 20000 Dimensional Drawings

HAYDON INCORPORATED • 800.243.2715 (203.756.7441) • WWW.HSI-INC.COM

## Captive Shaft



### Spline Options



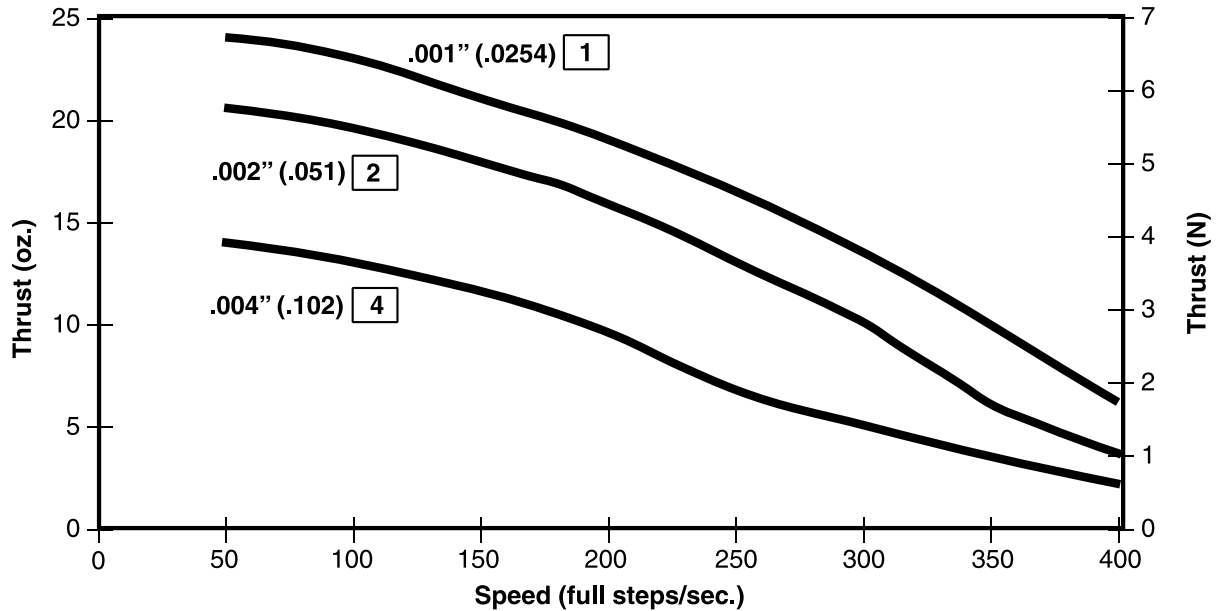
#2-56 UNC-2A THREAD  
or M2 x 0.4 TO BE WITHIN  
.030 (.76) MAX. OF SHOULDER

Spline is also available with  
optional #4-40 UNC-2A  
or M3 x 0.5 threaded adapter as  
shown in non-captive drawing.

# Linear Series 20000 Step Rate vs. Thrust Curves

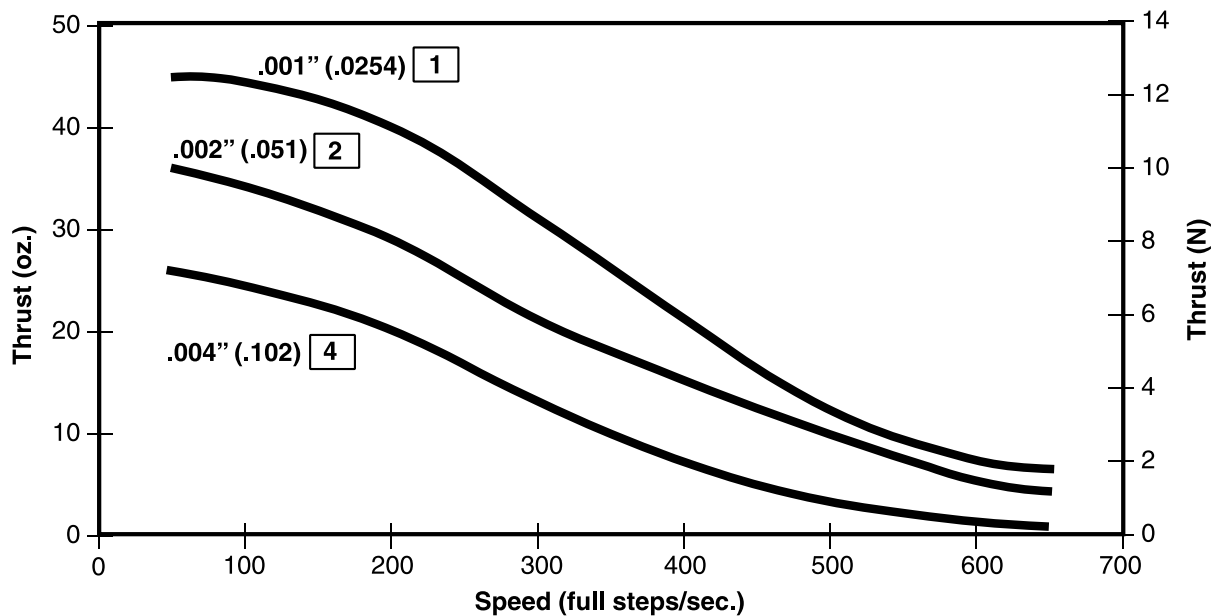
HAYDON INCORPORATED • 800.243.2715 (203.756.7441) • WWW.HSI-INC.COM

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



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

25% duty cycle is obtained by a special winding or by running a standard motor at double the rated voltage.

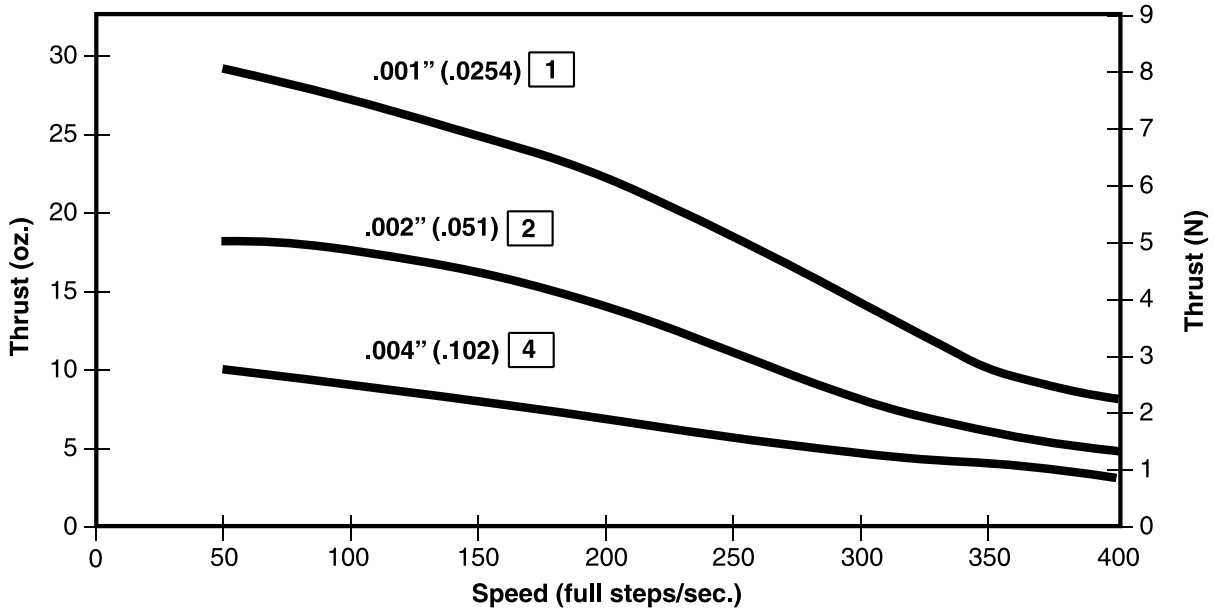


**NOTE:** Ramping can increase the performance of a motor either by increasing the top speed or getting a heavier load accelerated up to speed faster. Also, deceleration can be used to stop the motor without overshoot.

# Linear Series 20000 Step Rate vs. Thrust Curves

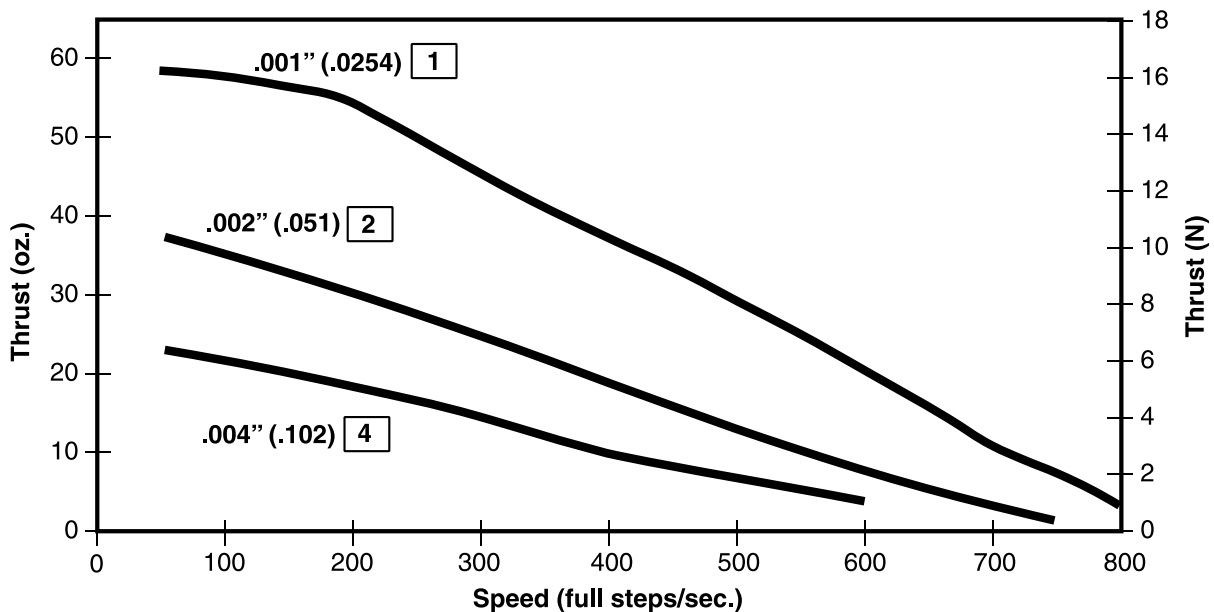
HAYDON INCORPORATED • 800.243.2715 (203.756.7441) • WWW.HSI-INC.COM

## Bipolar • Chopper Drive • 100% Duty Cycle



## Bipolar • Chopper Drive • 25% Duty Cycle

25% duty cycle is obtained 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.

# Linear Actuators Step Movement Selector Chart

HAYDON INCORPORATED • 800.243.2715 (203.756.7441) • WWW.HSI-INC.COM

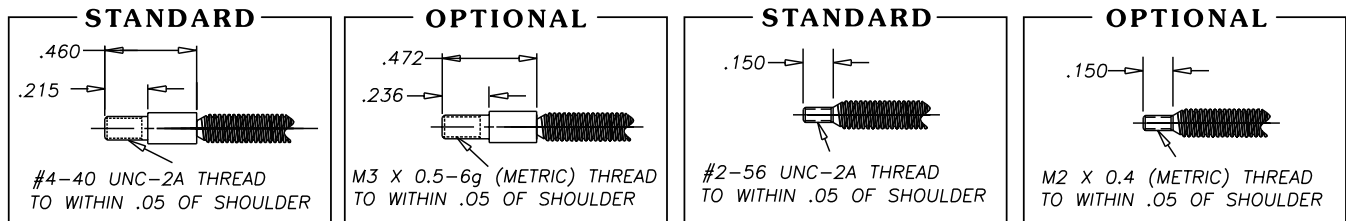
| Travel Per Step Code Letters or Digits | Linear Travel Per Step |             | 15000 Series <sup>1</sup> | 20000 Series            | 26000 Series            | 36000 Series            | 46000 Series            | Z20000 Series           | Z26000 Series           |
|--|------------------------|-------------|---------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|  |                        |             | Ø 15mm (0.59")            | Ø 20mm (0.79")          | Ø 26mm (1.0")           | Ø 36mm (1.4")           | Ø 46mm (1.8")           | Ø 20mm (.079")          | Ø 26mm (1.0")           |
|  | Inches                 | Millimeters | Screw Ø 5mm (0.197")      | Screw Ø 3.56mm (0.140") | Screw Ø 3.56mm (0.140") | Screw Ø 3.56mm (0.140") | Screw Ø 5.54mm (0.218") | Screw Ø 3.30mm (0.130") | Screw Ø 3.30mm (0.130") |
| 7                                      | 0.000125*              | 0.0032*     |                           |                         |                         | ●                       |                         |                         |                         |
| 9                                      | 0.00025*               | 0.0064*     |                           |                         | ●                       | ●                       |                         |                         |                         |
| 3                                      | 0.0005                 | 0.013       |                           |                         | ●                       | ●                       | ●                       |                         | ●                       |
| W                                      | 0.00079                | 0.02        | ●                         |                         |                         |                         |                         |                         |                         |
| 1                                      | 0.001                  | 0.0254      |                           | ●                       | ●                       | ●                       | ●                       | ●                       | ●                       |
| AS                                     | 0.00164                | 0.04166     |                           |                         |                         |                         |                         |                         | ●                       |
| 2                                      | 0.002                  | 0.051       |                           | ●                       | ●                       | ●                       | ●                       | ●                       | ●                       |
| 4                                      | 0.004                  | 0.102       |                           | ●                       | ●                       | ●                       | ●                       | ●                       | ●                       |
| 8                                      | 0.008                  | 0.203       |                           |                         |                         |                         | ●                       |                         |                         |
| G                                      | 0.016                  | 0.406       |                           |                         |                         |                         | ●                       |                         |                         |

\* Specialty and high resolution step movements

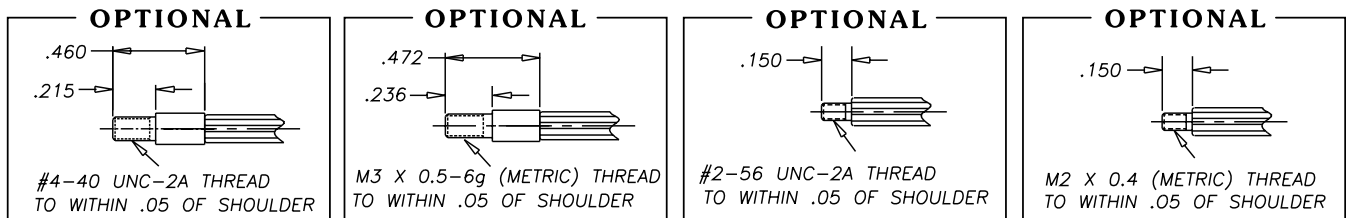
<sup>1</sup> The 15000 Series is currently available with captive screw only

## Optional Threaded End Forms for all Z-Series, 20000, 26000 and 36000 Series Motors.

### NON-CAPTIVE



### CAPTIVE



Customized ends and adapters are available for most actuators upon request.

# Identifying Part Numbers for Orders

HAYDON INCORPORATED • 800.243.2715 (203.756.7441) • WWW.HSI-INC.COM

**A standard Haydon motor part number consists of 7 digits – XXXXX-VV** (excluding 15000 Series Motors). The digits represent:

The **first and second** digits indicate the motor's series or diameter (in mm).

Example: 26000 Series = 26 mm diameter

The **third** digit indicates the motor's step angle (see *Salient Characteristics* tables)

*Not all step increments are available for every frame size. See each motor listing for step increments that are available for a given frame size.*

The **fourth** digit indicates the number of leads.

4 (leads) = bipolar; 6 (leads) = unipolar

The **fifth** digit indicates the pitch of the lead-screw or the travel per step (see *Selector Chart Code Letters or Code Digits*)

**Note:** When ordering Rotary Motors this digit is always "0"

The **sixth and seventh** digits indicate the motor's **Voltage**.

Standard voltages are 5 (05) and 12 (12) volt. Custom voltages are available.

**PREFIX Codes** positioned **before** the part number designate specialty requirements. All options listed below may not be applicable to all motors. Please see individual motor listings for available options.

**E** = Prefix used when requesting External Linear Motors

**LC** = Prefix used to indicate 15000 Series motor

**P** = Prefix indicating Proximity Sensor

**S** = Prefix indicating Home Position Switch

**T** = Prefix indicating High Temperature option

**SUFFIX Codes: -999** positioned **after** the part number indicates

**Rotary** motors with **BALL BEARINGS**.

**-900** denotes standard external motor with grease and flanged nut.

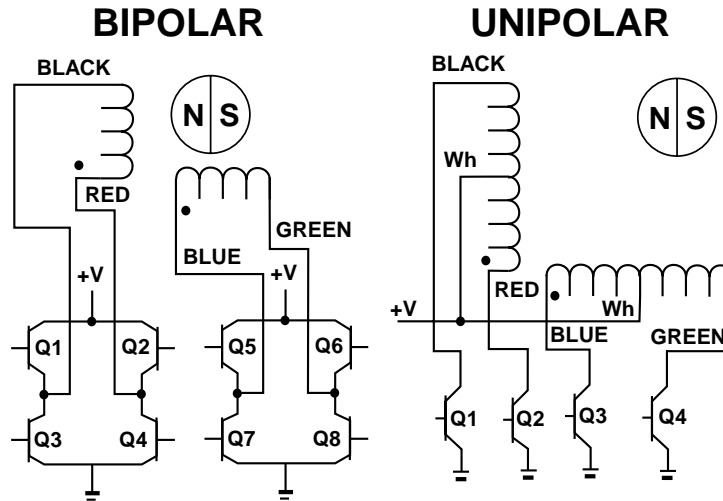
## Screw Length Options:

- For non-captive and external linear shaft motors various screw lengths are available to accommodate almost any travel requirement.

***For assistance with building a part number or with a custom design, please consult the sales or applications department.***

# Linear Actuators: Wiring Diagram

HAYDON INCORPORATED • 800.243.2715 (203.756.7441) • WWW.HSI-INC.COM



# Linear Actuators: 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    |   |
| ▼ | 5        | ON    | OFF   | ON    | OFF   | ▲ |

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