
Can-Stack
Linear
Actuators

Haydon® linear actuators provide both a broader range and, for a given size, significantly higher thrust

The basic motors incorporate a threaded rotor in conjunction with a (lead-screw) shaft to provide rapid linear movement in two directions (inward and outward). Available step increments vary with the motor frame sizes and are dependent on the step angle of the motor and the lead-screw pitch. A captive or non-captive shaft (lead-screw) option can be supplied for every basic size. Most of the basic sizes also offer an external linear option. The captive shaft configuration features a built-in "anti-rotation" design whereas the non-captive shaft requires the customer to provide external anti-rotation. Both unipolar and bipolar coil configurations are available.

Unique features impart ruggedness and reliability that assure long life and consistent performance. Rare earth magnets are available for even higher thrust. All basic frame sizes are built with dual ball bearings for greater motion control, precise step accuracy and long life. Most of the Haydon® brand motors can also be electronically microstepped for tighter controls.

Applications include medical instrumentation, office equipment, machinery automation, robotics, sophisticated pumping systems and other automated devices which require precise remote controlled linear movement in a broad range of temperature environments.

G4 Series

The G4 Can-Stack Series represents advanced motion control with the industry's most robust and most powerful linear actuators.
The series features:

- Enhanced teeth geometry
- High energy neodymium magnets
- Optimized magnetic circuit design
- High-tech engineered polymers
- Oversized spline (captive)
- Larger ball bearings

Available body-width diameters include Ø 20 mm (.79-in), Ø 26 mm (1-in), Ø 36 mm (1.4-in).

Available with captive, non-captive and external linear lead-screws

G4 19000
Captive
Ø 20 mm (.79-in)

G4 25000
Non-Captive
Ø 25 mm (1-in)

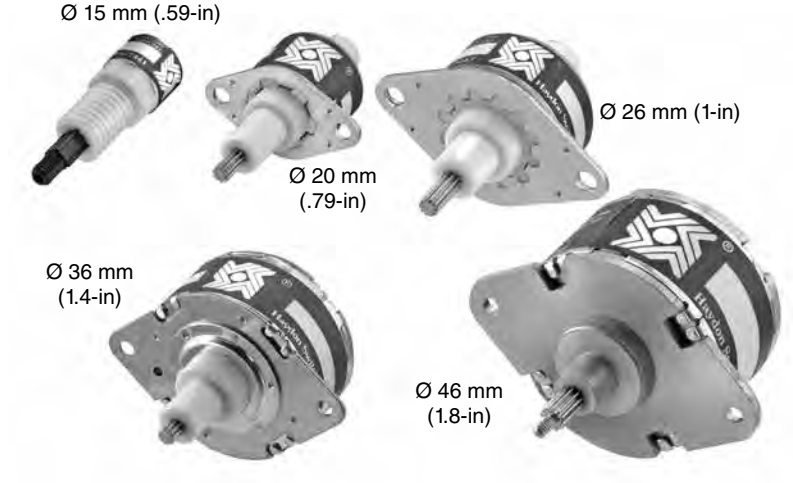
G4 37000
External Linear
Ø 36 mm (1.4-in)

Can-Stack Series

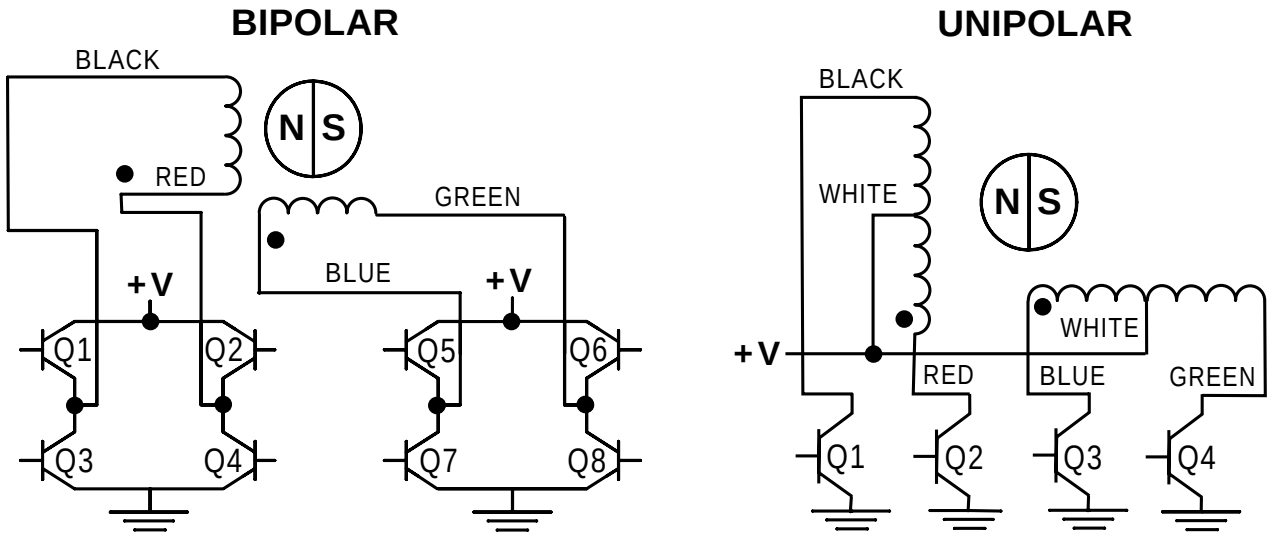
Four basic frame sizes are available – Ø 20 mm (.79-in), Ø 26 mm (1-in), Ø 36 mm (1.4-in) and Ø 46 mm (1.8-in) – as well as a series of extremely compact, Ø 15 mm (.59-in) motors.

All Can-Stacks are available with captive, non-captive and external linear lead-screws except Ø 15 mm (.59-in) which is available with a captive and external linear lead-screw only.

Captive stepper motor linear actuators shown.



Can-Stack Linear Actuator: Bipolar and Unipolar Wiring



Can-Stack Linear Actuator: 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.

Haydon® 19000 Series generates the highest force of any similar size linear actuator stepper motor.

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

Ø20mm (.79-in) Non-captive

Ø20mm (.79-in) External Linear

Ø20mm (.79-in) Captive

Specifications

Ø 20 mm (.79-in) motor					
Wiring		Bipolar			
Part No.	Captive	1944 ■–■■–■■■■		1954 ■–■■–■■■■	
	Non-captive	1934 ■–■■–■■■■		1984 ■–■■–■■■■	
	External	E1944 ■–■■–■■■■		E1954 ■–■■–■■■■	
Step angle		7.5°		15°	
Winding voltage		5 VDC	12 VDC	5 VDC	12 VDC
Current (RMS)/phase		350 mA	160 mA	338 mA	140 mA
Resistance/phase		14.0 Ω	74.5 Ω	14.8 Ω	85.5 Ω
Inductance/phase		6.24 mH	31.2 mH	6.84 mH	37.8 mH
Rotor inertia		1.052 gcm²		.548 gcm²	
Power consumption		3.38 W			
Insulation Class		Class B			
Weight		1.24 oz (35 g)			
Insulation resistance		20 MΩ			

Linear Travel/Step			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).

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www.HaydonKerkExpress.com
Standard products available 24-hrs.

Identifying the Can-Stack part number codes when ordering

E – **19** – **4** – **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 = 12VDC
Custom V available

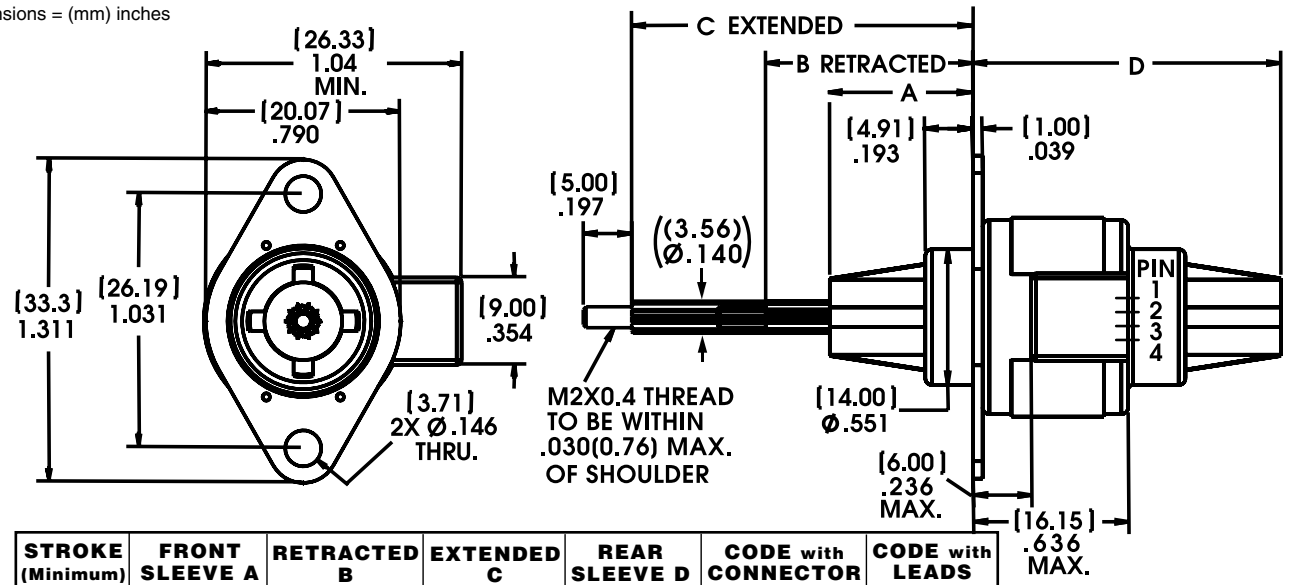
Suffix
Stroke
Example: –1005 = captive 13mm stroke with leads
Suffix also represents:
–XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (–) as shown above. For assistance or order entry, call our engineering team at 203 756 7441.

SCREW LENGTH OPTIONS and other **OPTIONAL ASSEMBLIES** also available

Captive Lead-screw

Dimensions = (mm) inches

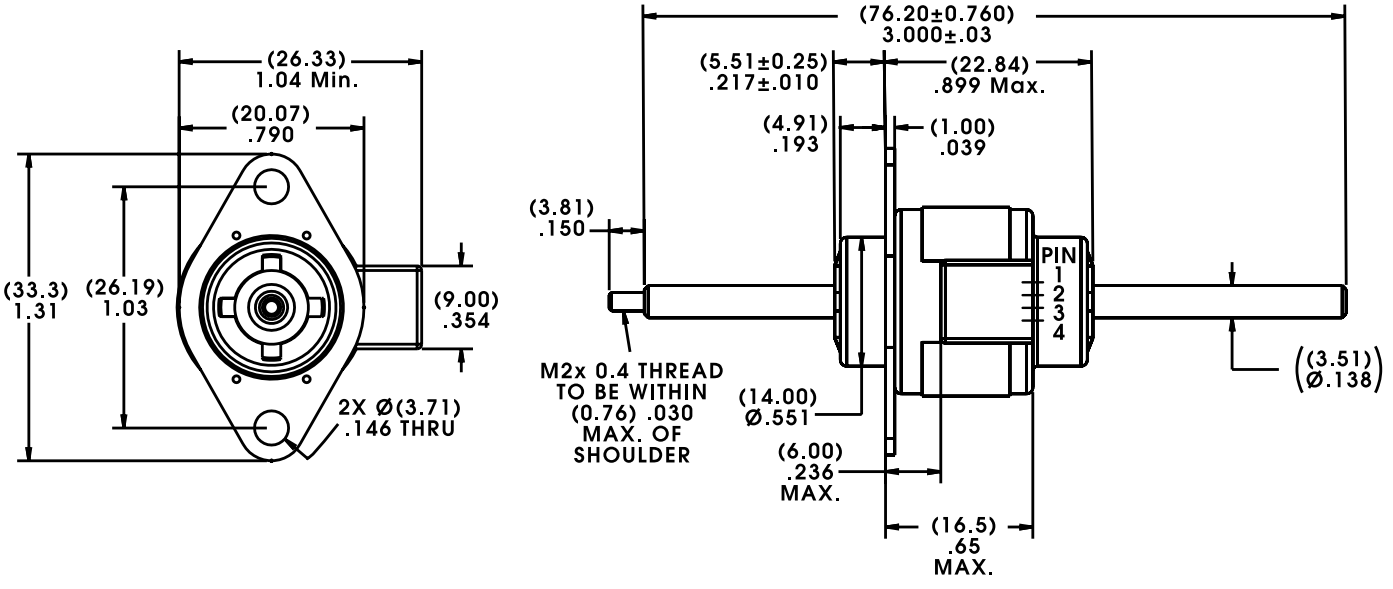


STROKE (Minimum)	FRONT SLEEVE A	RETRACTED B	EXTENDED C	REAR SLEEVE D	CODE with CONNECTOR	CODE with LEADS
(13 mm) .512	(14.75±0.25) .581±.010	(21.37±0.64) .841±.025	(35.17±0.38) 1.385±.015	(32.08 Max.) 1.263 Max.	– 905	– 1005
(18 mm) .708	(20.05±0.25) .789±.010	(26.67±0.64) 1.050±.025	(45.77±0.38) 1.802±.015	(37.38 Max.) 1.472 Max.	– 907	– 1007
(25 mm) .984	(27.05±0.25) 1.065±.010	(33.67±0.64) 1.325±.025	(59.77±0.38) 2.353±.015	(44.38 Max.) 1.747 Max.	– 910	– 1010
(31 mm) 1.22	(33.05±0.25) 1.301±.010	(39.67±0.64) 1.562±.025	(71.77±0.38) 2.826±.015	(63.08 Max.) 2.483 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.



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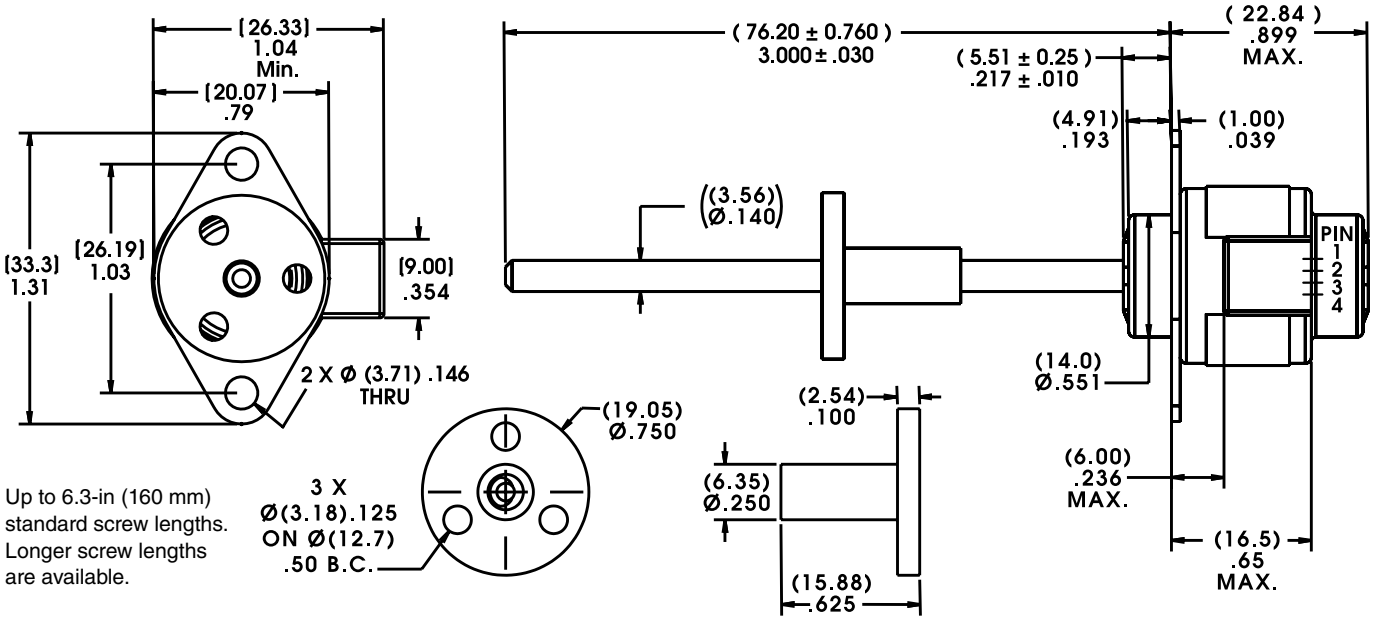
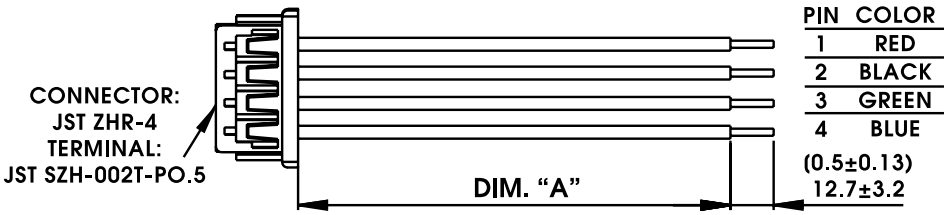
External Linear

Dimensions = (mm) inches



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

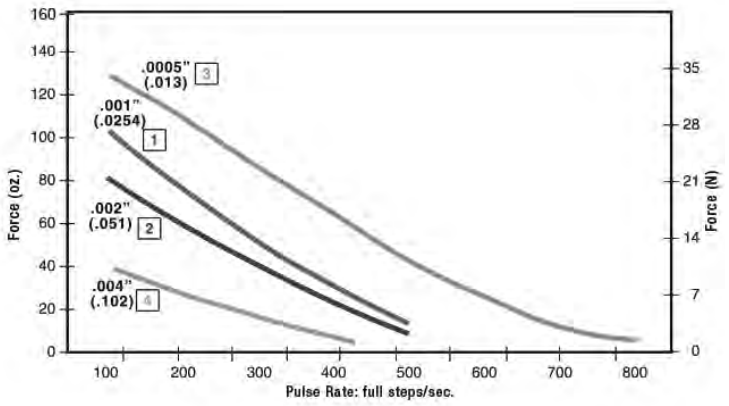
Connector



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

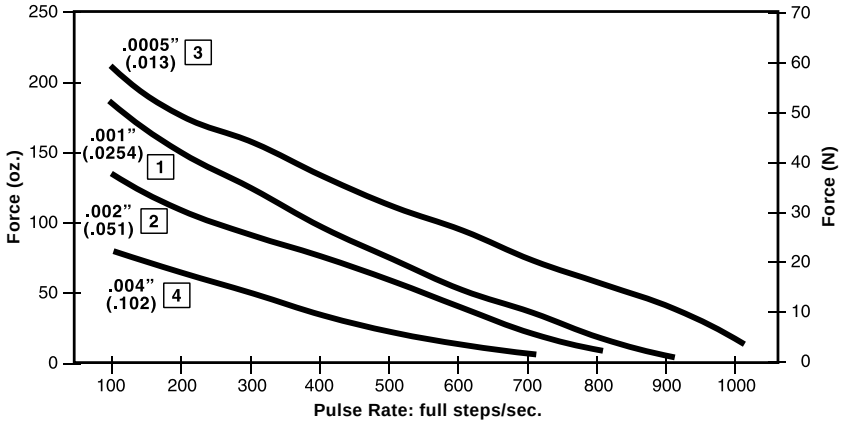
- L/R Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

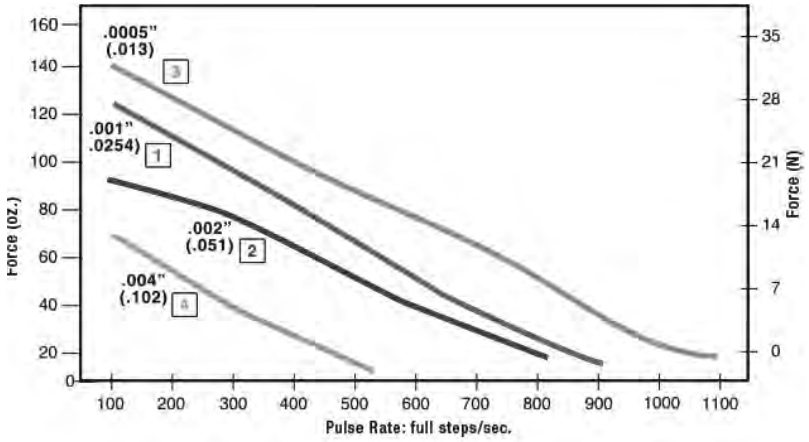
- L/R Drive
- Bipolar
- 25% Duty Cycle

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



FORCE vs. PULSE RATE

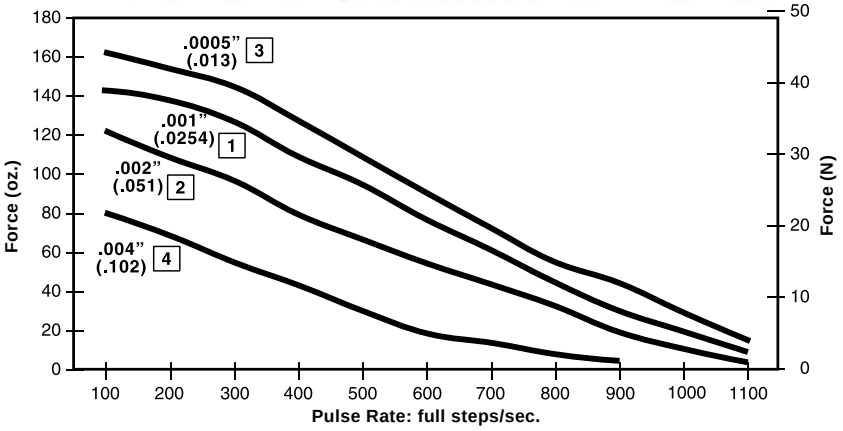
- Chopper Drive
- Bipolar
- 100% Duty Cycle
- 8:1 Motor Coil to Drive Supply Voltage



FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 25% Duty Cycle
- 8:1 Motor Coil to Drive Supply Voltage

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.

G4 19000 Series, Captive

TFE coated lead-screws for applications that require a permanent, dry lubricant

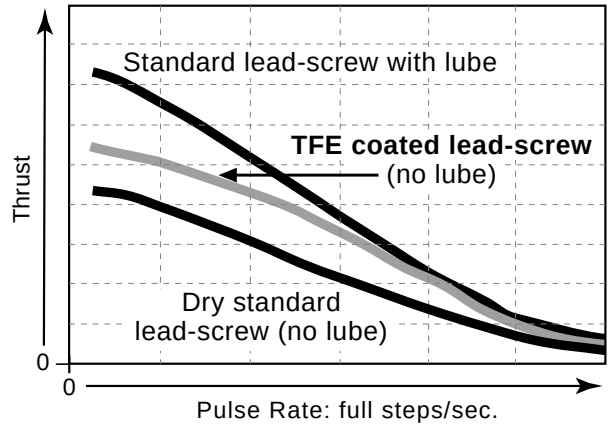
Haydon Kerk Motion Solutions, Inc. offers a TFE coated lead-screw option for its Can-Stack 19000 G4 Series linear actuators. This lead-screw option is ideal for applications where conventional oils and greases can not be used for lead-screw lubrication.

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 the Haydon® captive, non-captive and external linear linear actuators.

The TFE coated lead-screw is typically used for applications where contamination from grease or lubricants must be avoided, such as silicon wafer handling, clean rooms, medical equipment, laboratory instrumentation or anywhere precise linear motion is required.

Lead-Screw Comparison

FORCE vs. PULSE RATE L/R Drive • 100% Duty Cycle

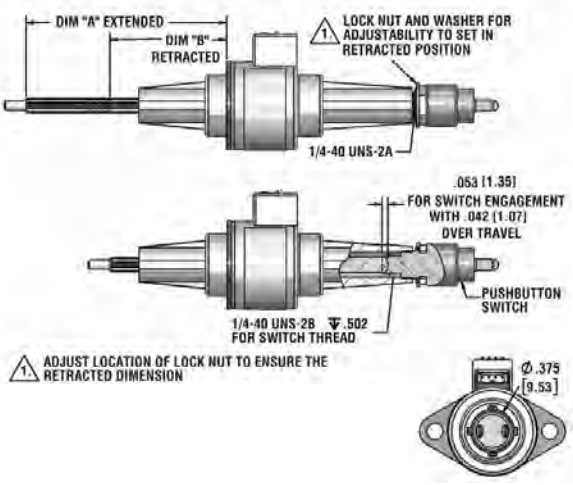


Home Position Switch

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 postions. 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.

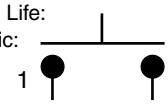
The switch allows device manufacturers the ability to monitor movements more precisely for greater control and improved Q.C. When ordering motors with the home position switch, the part number should be preceded by an "S".

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.

Dimensions = inches (mm)

S19000 Series Home Position Switch		
STROKE	**DIM "A" Extended**	**DIM "B" Retracted**
.512 (13)	1.385 (35.17)	.841 (21.37)
.708 (18)	1.802 (45.77)	1.050 (26.67)
.984 (25)	2.353 (59.77)	1.325 (33.67)
1.22 (31)	N/A-Contact Customer Service	

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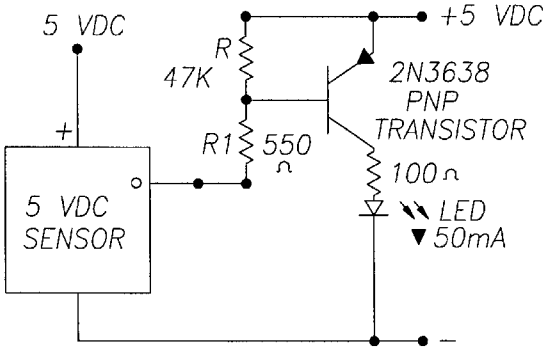
End of Stroke Proximity Sensor

The sensor incorporates a hall effect device, which is activated by a rare earth magnet embedded in the end of the internal screw. The compact profile of the sensor allows for installation in limited space applications.

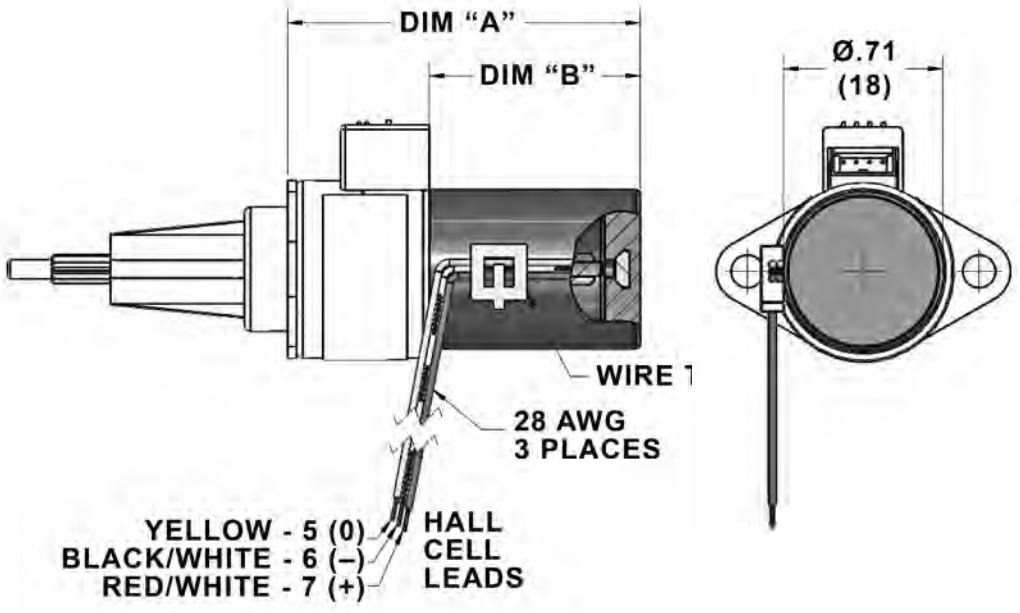
Specifications

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 operations should be performed at workstations with conductive tops and operators grounded.

Dimensional Drawings



Dimensions = inches (mm)

P19000 G4 SERIES		
STROKE	**DIM "A"**	**DIM "B"**
.512 (13)	1.360 (34.55)	.73 (18.55)
.708 (18)	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.

Haydon® 25000 Series – generates higher force than all other competitors.

Offers high durability and exceptional performance.
All units are built with high energy neodymium magnets and dual ball bearings.

Ø25mm (1.0-in) External Linear

Ø25mm (1.0-in) Non-captive

Ø25mm (1.0-in) Captive

Specifications

Ø 25 mm (1.0-in) motor					
Wiring		Bipolar			
Part No.	Captive	2544 ■–■■–■■■■		2554 ■–■■–■■■■	
	Non-captive	2534 ■–■■–■■■■		2584 ■–■■–■■■■	
	External	E2544 ■–■■–■■■■		E2554 ■–■■–■■■■	
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
Rotor inertia		1.07 gcm²			
Power consumption		3.85 W			
Insulation Class		Class B			
Weight		1.74 oz (49 g)			
Insulation resistance		20 MΩ			

Linear Travel/Step			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).

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Standard products available 24-hrs.

Identifying the Can-Stack part number codes when ordering

E	25	5	4	4	–	12	–	1010

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
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 = 12VDC
Custom V available

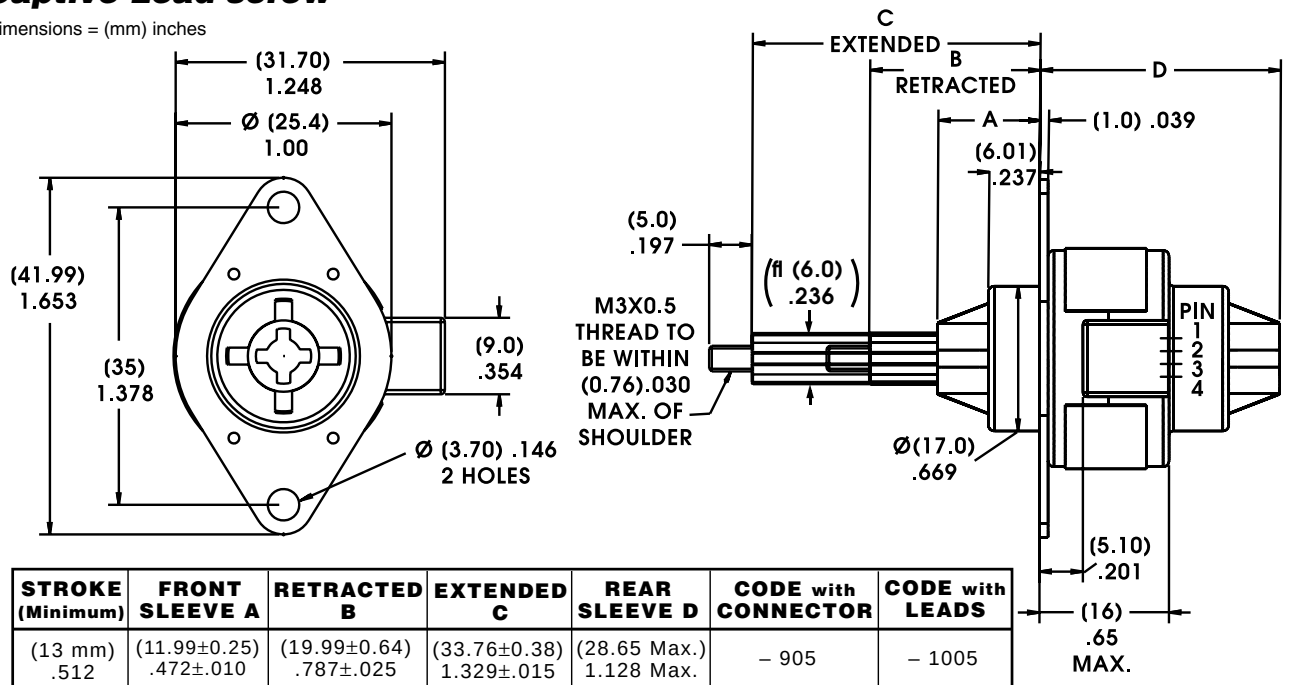
Suffix
Stroke
Example: –1010 = captive 25mm stroke with leads
Suffix also represents:
–XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (–) as shown above. For assistance or order entry, call our engineering team at 203 756 7441.

SCREW LENGTH OPTIONS and other **OPTIONAL ASSEMBLIES** also available

Captive Lead-screw

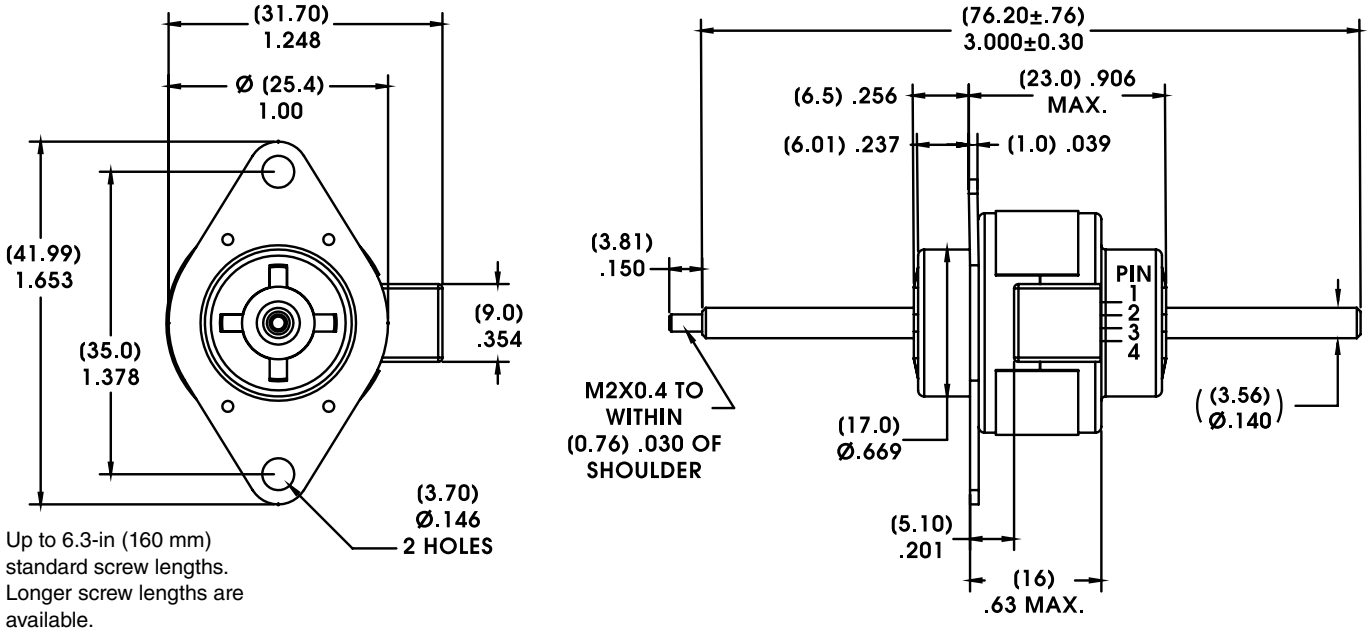
Dimensions = (mm) inches



STROKE (Minimum)	FRONT SLEEVE A	RETRACTED B	EXTENDED C	REAR SLEEVE D	CODE with CONNECTOR	CODE with LEADS
(13 mm) .512	(11.99±0.25) .472±.010	(19.99±0.64) .787±.025	(33.76±0.38) 1.329±.015	(28.65 Max.) 1.128 Max.	– 905	– 1005
(18 mm) .708	(17.28±0.25) .680±.010	(25.25±0.64) .994±.025	(44.27±0.38) 1.743±.015	(33.94 Max.) 1.336 Max.	– 907	– 1007
(25 mm) .984	(24.26±0.25) .955±.010	(32.23±0.64) 1.269±.025	(58.24±0.38) 2.293±.015	(40.92 Max.) 1.611 Max.	– 910	– 1010
(31 mm) 1.22	(30.25±0.25) 1.191±.010	(38.23±0.64) 1.505±.025	(70.23±0.38) 2.765±.015	(46.91 Max.) 1.847 Max.	– 912	– 1012

Non-Captive Lead-screw

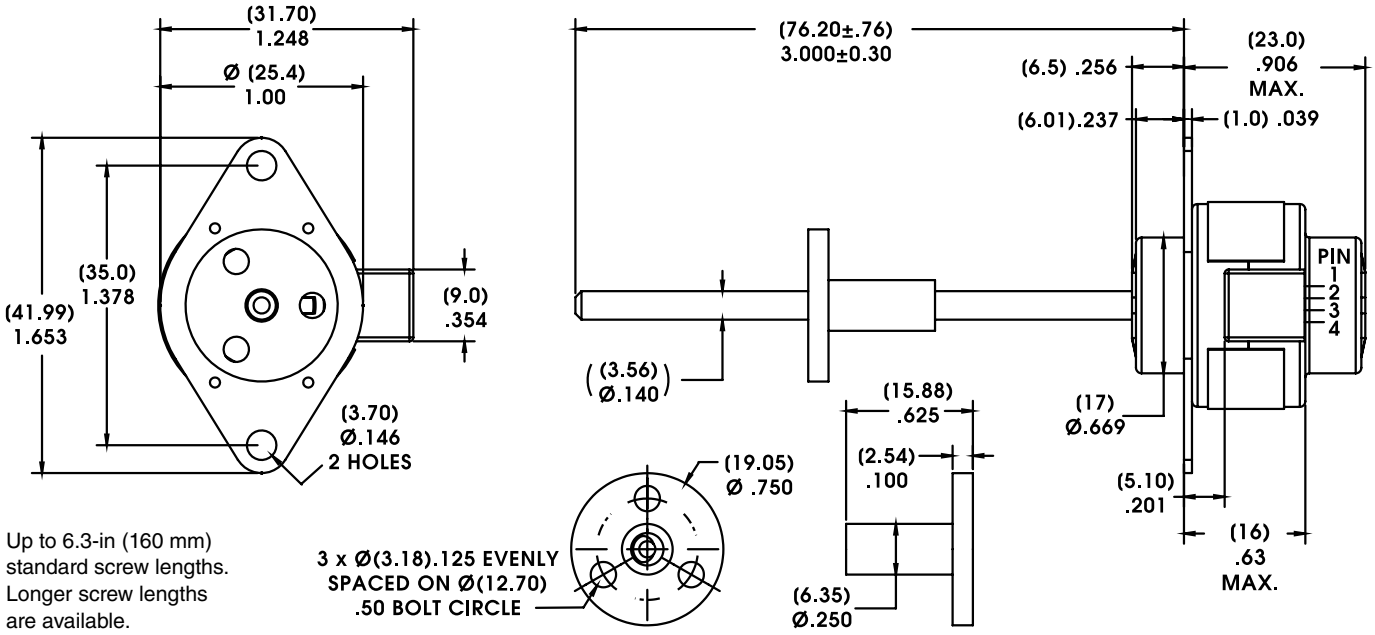
Dimensions = (mm) inches



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

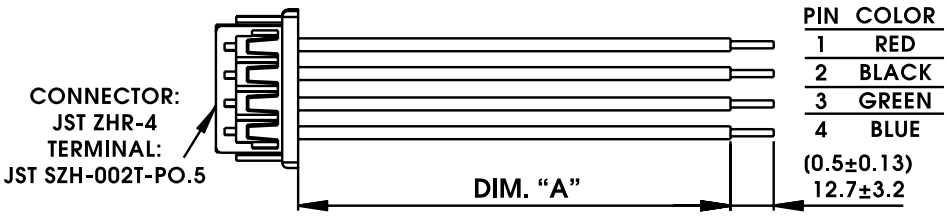
External Linear

Dimensions = (mm) inches



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

Connector

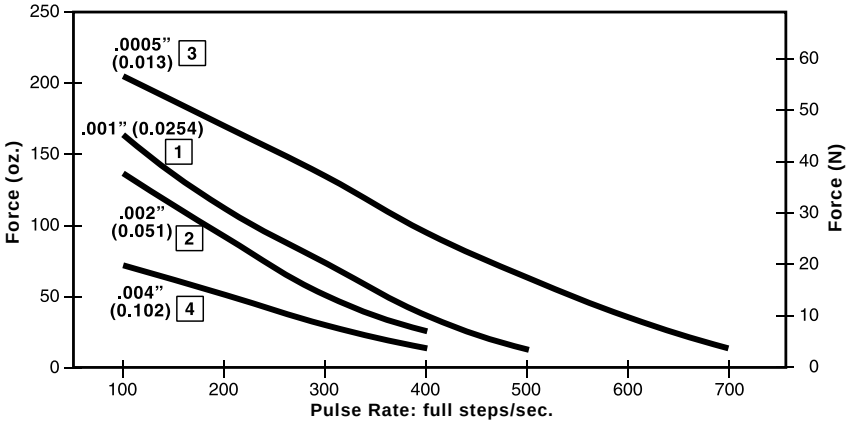


PIN	COLOR
1	RED
2	BLACK
3	GREEN
4	BLUE

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

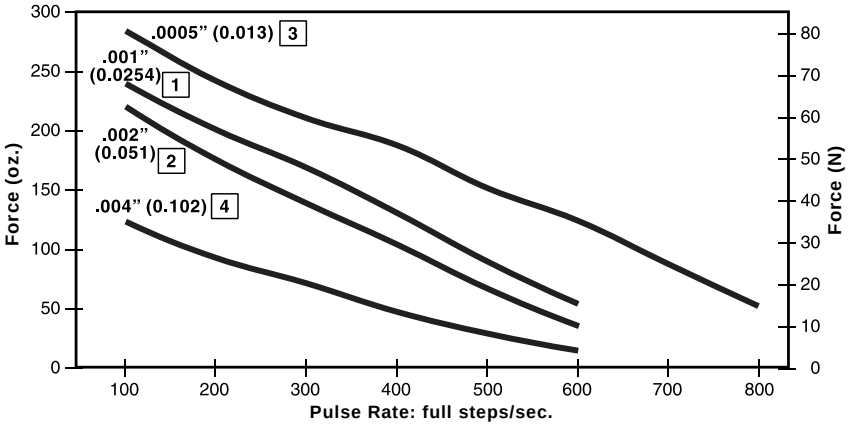
- L/R Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

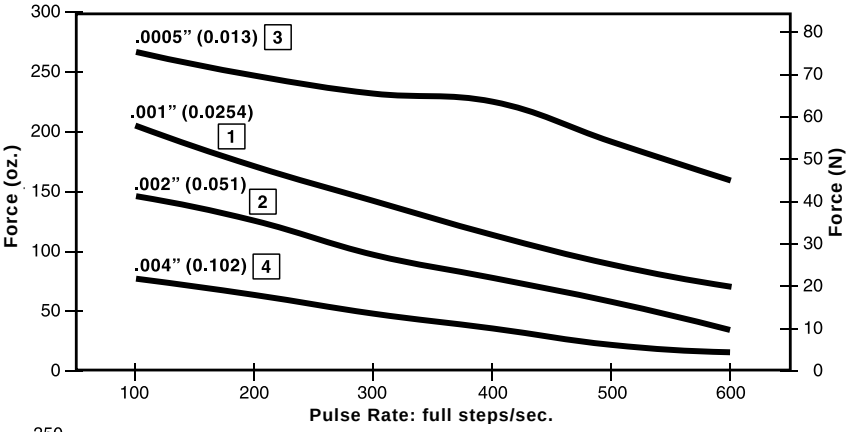
- L/R Drive
- Bipolar
- 25% Duty Cycle

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



FORCE vs. PULSE RATE

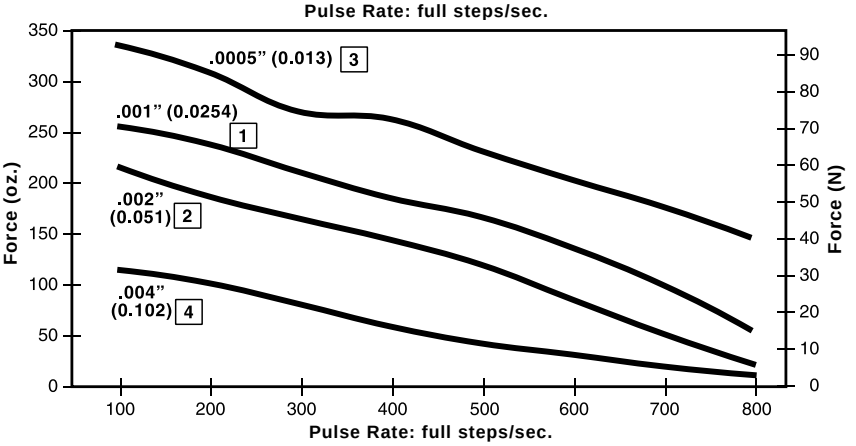
- Chopper Drive
- Bipolar
- 100% Duty Cycle
- 8:1 Motor Coil to Drive Supply Voltage



FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 25% Duty Cycle
- 8:1 Motor Coil to Drive Supply Voltage

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.

G4 25000 Series, Non-captive

TFE coated lead-screws for applications that require a permanent, dry lubricant

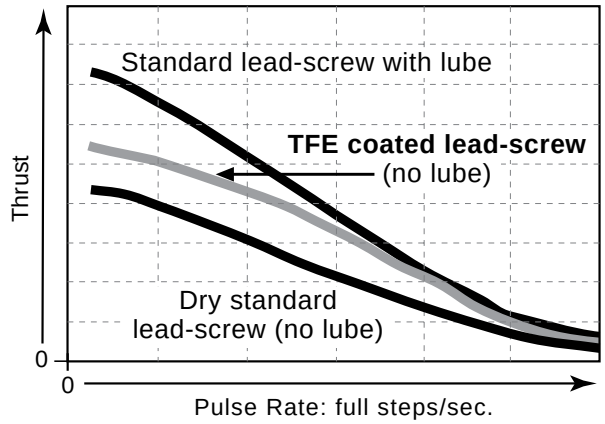
Haydon Kerk Motion Solutions, Inc. offers a TFE coated lead-screw option for its Can-Stack 25000 G4 Series linear actuators. This lead-screw option is ideal for applications where conventional oils and greases can not be used for lead-screw lubrication.

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 the Haydon® captive, non-captive and external linear linear actuators.

The TFE coated lead-screw is typically used for applications where contamination from grease or lubricants must be avoided, such as silicon wafer handling, clean rooms, medical equipment, laboratory instrumentation or anywhere precise linear motion is required.

Lead-Screw Comparison

FORCE vs. PULSE RATE L/R Drive • 100% Duty Cycle

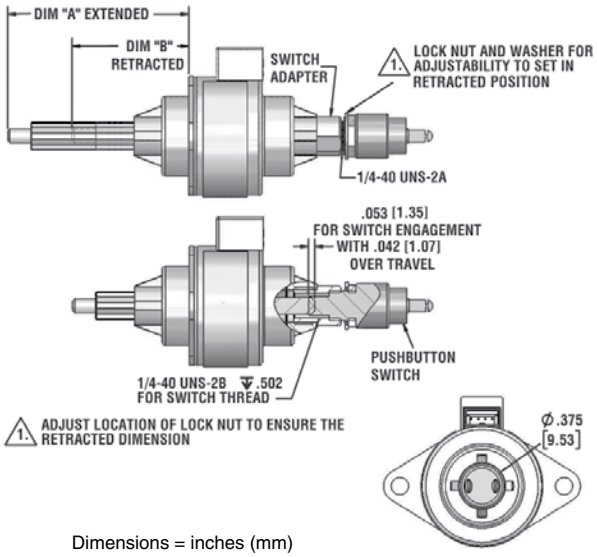


Home Position Switch

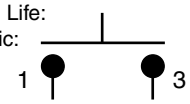
A miniature electronic home position switch capable of monitoring the home positions of linear actuators. The switch mounts on the rear sleeve of captive linear motors and allows the user to identify start, stop or home postions. Depending on your preference, contacts can be normally open or normally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

Dimensions = inches (mm)

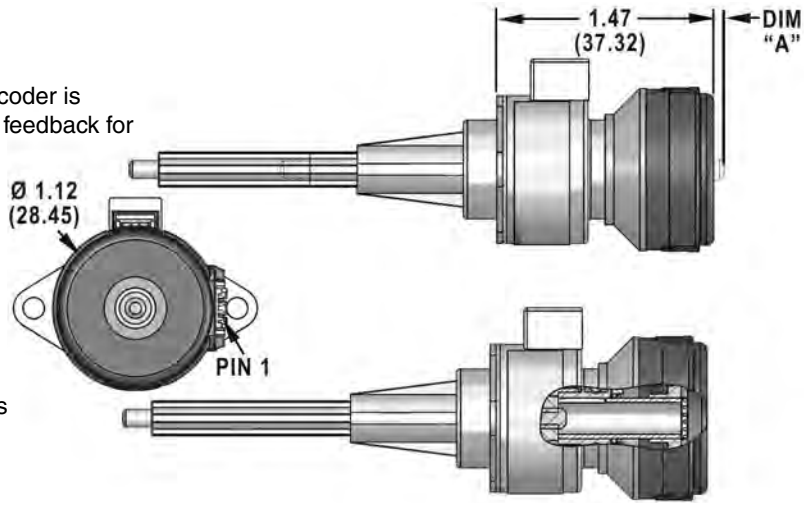
S25000 Series Home Position Switch		
STROKE	**DIM "A" Extended**	**DIM "B" Retracted**
.512 (13)	1.329 (33.76)	.787 (19.99)
.708 (18)	1.743 (44.27)	.994 (25.25)
.984 (25)	2.293 (58.24)	1.269 (32.23)
1.22 (31)	2.765 (70.23)	1.505 (38.23)

G4 25000 Series E8T Encoder

The **G4 25000 Series E8T** transmissive optical encoder is designed to provide the digital quadrature encoder feedback for high volume, compact space applications.

Features:
- 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



Dimensions = inches (mm)

25000 G4 SERIES with E8T	
STROKE	**DIM "A"**
.512 (13)	0
.708 (18)	0
.984 (25)	.071 (1.80)
1.22 (31)	.307 (7.80)

25000 G4 SERIES SINGLE ENDED PINS	
PIN #	**DESCRIPTION**
1	+5 VDC Power
2	A Channel
3	Ground
4	B Channel

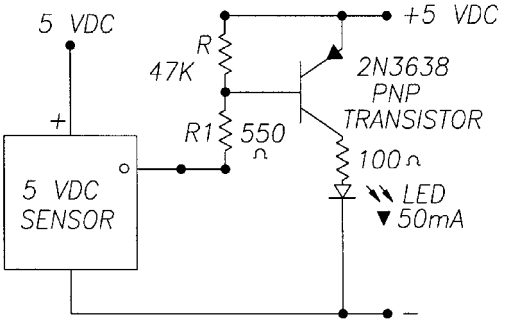
25000 G4 SERIES DIFFERENTIAL	
PIN #	**DESCRIPTION**
1	Ground
2	A Channel
3	A– Channel
4	+5 VDC Power
5	B Channel
6	B– Channel

End of Stroke Proximity Sensor

The sensor incorporates a hall effect device, which is activated by a rare earth magnet embedded in the end of the internal screw. The compact profile of the sensor allows for installation in limited space applications.

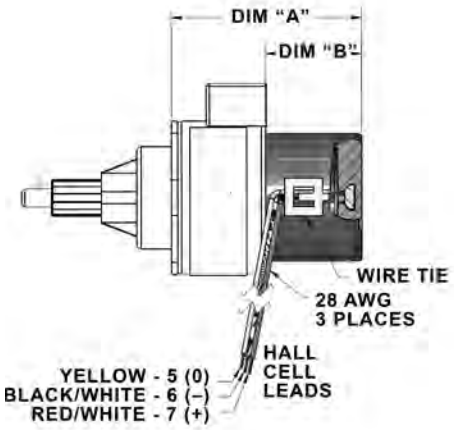
Specifications

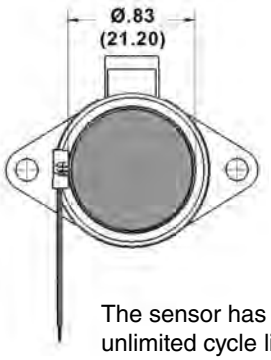
Supply Voltage (VDC): 3.8 min. to 24 max.
Current consumption: 10 mA max.
Output voltage (operated): 0.15 typ., 0.40 max.; Sinking 20 mA max.
Output current: 20 mA max.
Output leakage current (released): 10µA max. @ Vout = 24 VDC; Vcc = 24 VDC
Output switching time
Rise, 10 to 90%: .05 µs typ., 1.5 µs 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 operations should be performed at workstations with conductive tops and operators grounded.

Dimensional Drawings





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

Dimensions = inches (mm)

P25000 G4 SERIES		
STROKE	**DIM "A"**	**DIM "B"**
.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)

Haydon® 37000 Series – exceptionally high linear force-to-size ratio, ideal for precision motion.

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

Ø36 mm (1.4-in)
Non-captive

Ø36 mm (1.4-in)
External Linear

Ø36 mm (1.4-in)
Captive

Specifications

Ø 36 mm (1.4-in) motor					
Wiring		Bipolar			
Part No.	Captive	3744 ■–■■–■■■■		3754 ■–■■–■■■■	
	Non-captive	3734 ■–■■–■■■■		3784 ■–■■–■■■■	
	External	E3744 ■–■■–■■■■		E3754 ■–■■–■■■■	
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
Rotor inertia		8.5 gcm^2			
Power consumption		5.6 W			
Insulation Class		Class B			
Weight		4.2 oz (49 g)			
Insulation resistance		20 MΩ			

Linear Travel/Step			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).

Haydon kerk Express℠
www.HaydonKerkExpress.com
Standard products available 24-hrs.

Identifying the Can-Stack part number codes when ordering

E	37	4	4	2	–	05	–	1015

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
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 = 12VDC
Custom V available

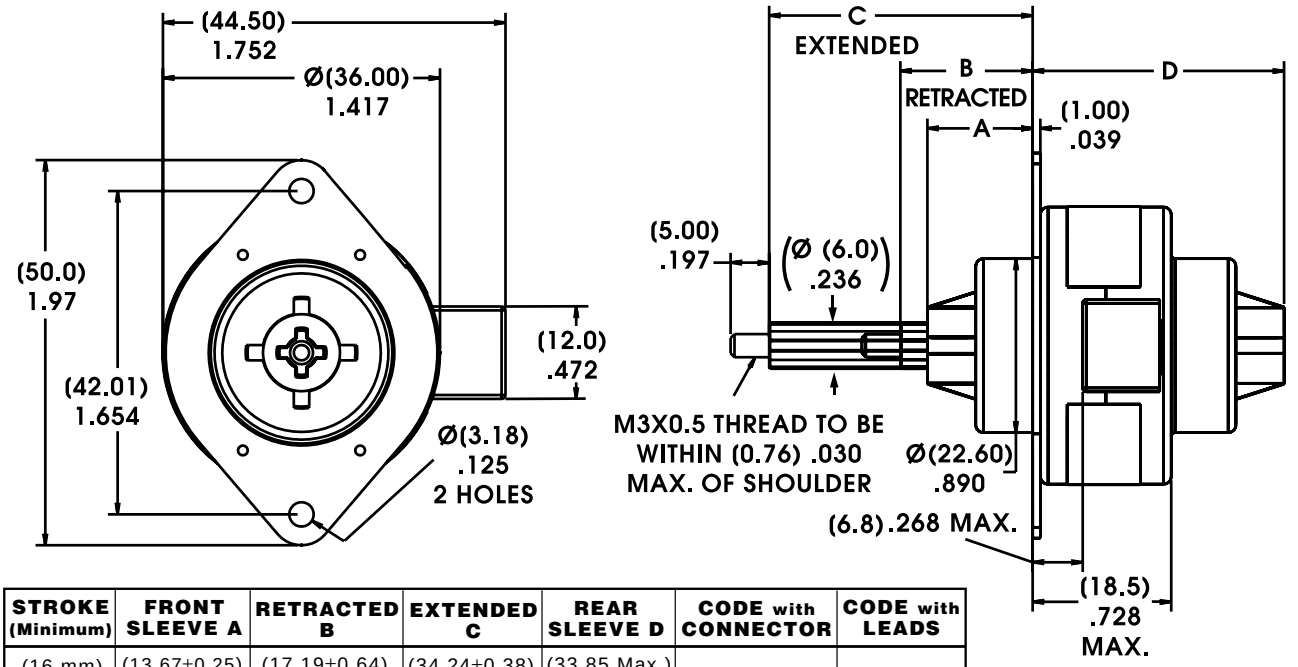
Suffix
Stroke
Example: –1015 = captive 38.1mm stroke with leads
Suffix also represents:
–XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (–) as shown above. For assistance or order entry, call our engineering team at 203 756 7441.

SCREW LENGTH OPTIONS and other **OPTIONAL ASSEMBLIES** also available

Captive Lead-screw

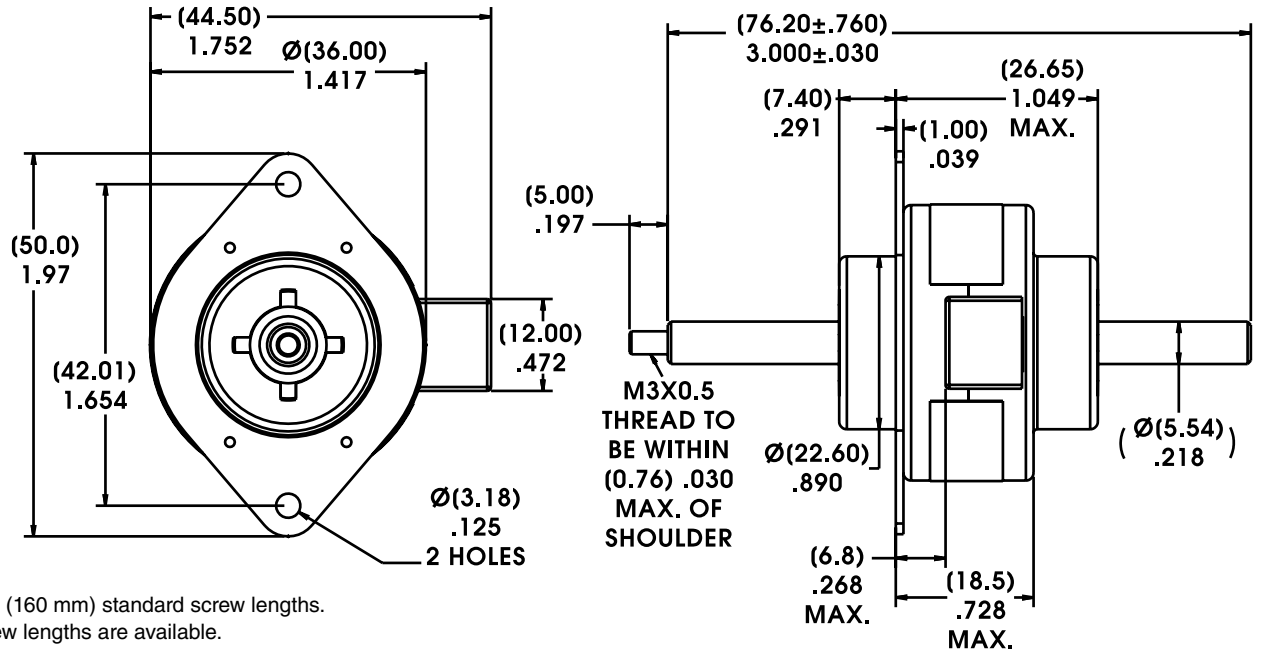
Dimensions = (mm) inches



STROKE (Minimum)	FRONT SLEEVE A	RETRACTED B	EXTENDED C	REAR SLEEVE D	CODE with CONNECTOR	CODE with LEADS
(16 mm) .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	– 1005
(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	– 1010
(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	– 1015

Non-Captive Lead-screw

Dimensions = (mm) inches

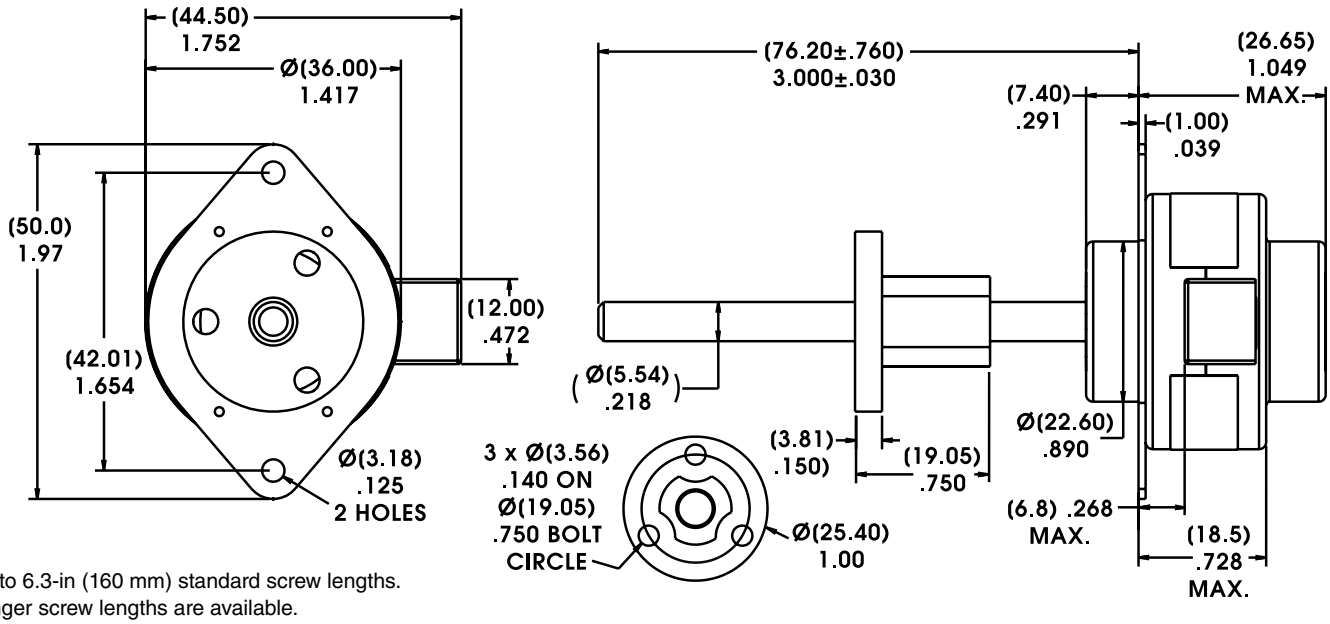


Up to 6.3-in (160 mm) standard screw lengths.
Longer screw lengths are available.

Haydon Kerk Motion Solutions, Inc. • www.haydonkerkpittman.com • Phone: 800 243 2715 • International: 203 756 7441

External Linear

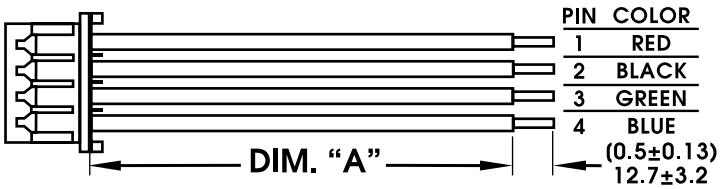
Dimensions = (mm) inches



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

Connector

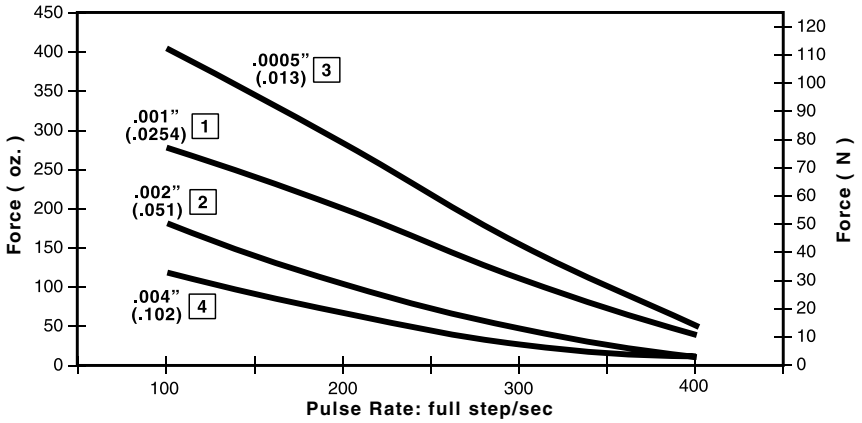
CONNECTOR:
JST PHR-4
TERMINAL: JST
SPH-002T-PO.5S



Part Number	Dimension "A"
56-1436-1	(6.0 ±0.39) 152 ±10 mm
56-1436-2	(12 ±0.39) 305 ±10 mm

FORCE vs. PULSE RATE

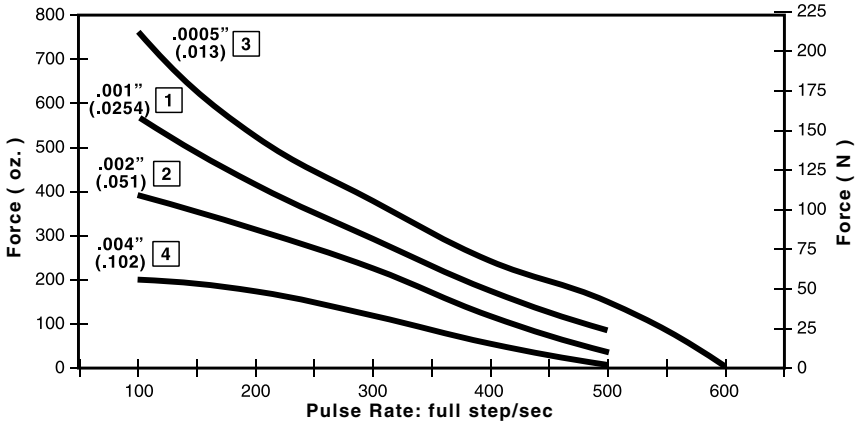
- L/R Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

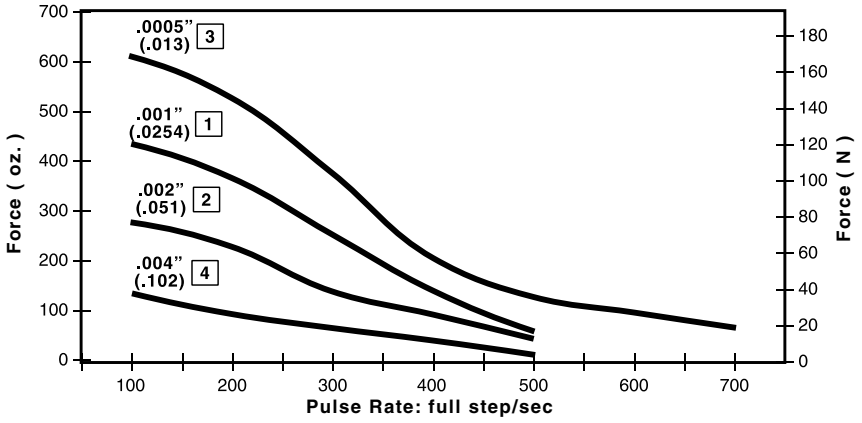
- L/R Drive
- Bipolar
- 25% Duty Cycle

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



FORCE vs. PULSE RATE

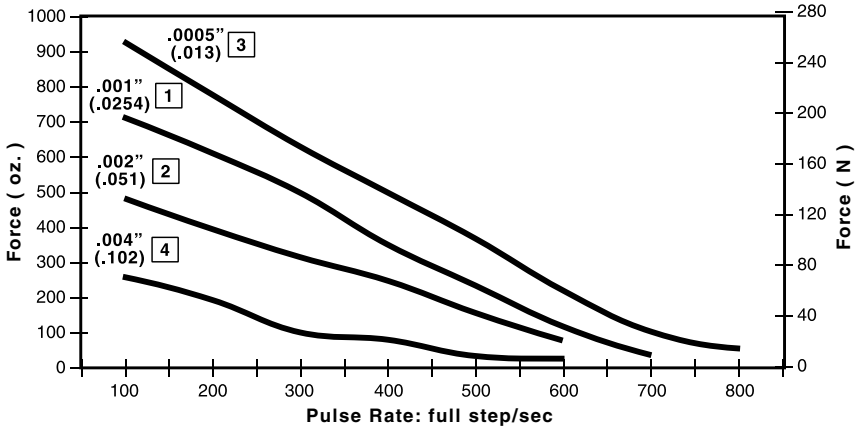
- Chopper Drive
- Bipolar
- 100% Duty Cycle
- 8:1 Motor Coil to Drive Supply Voltage



FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 25% Duty Cycle
- 8:1 Motor Coil to Drive Supply Voltage

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.

G4 37000 Series, External Linear

TFE coated lead-screws for applications that require a permanent, dry lubricant

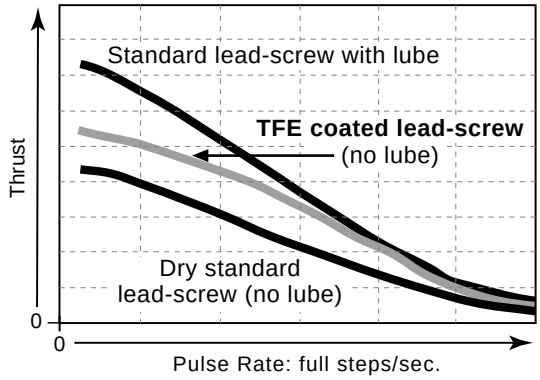
Haydon Kerk Motion Solutions, Inc. offers a TFE coated lead-screw option for its Can-Stack 37000 G4 Series linear actuators. This lead-screw option is ideal for applications where conventional oils and greases can not be used for lead-screw lubrication.

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 the Haydon® captive, non-captive and external linear linear actuators.

The TFE coated lead-screw is typically used for applications where contamination from grease or lubricants must be avoided, such as silicon wafer handling, clean rooms, medical equipment, laboratory instrumentation or anywhere precise linear motion is required.

Lead-Screw Comparison

FORCE vs. PULSE RATE L/R Drive • 100% Duty Cycle

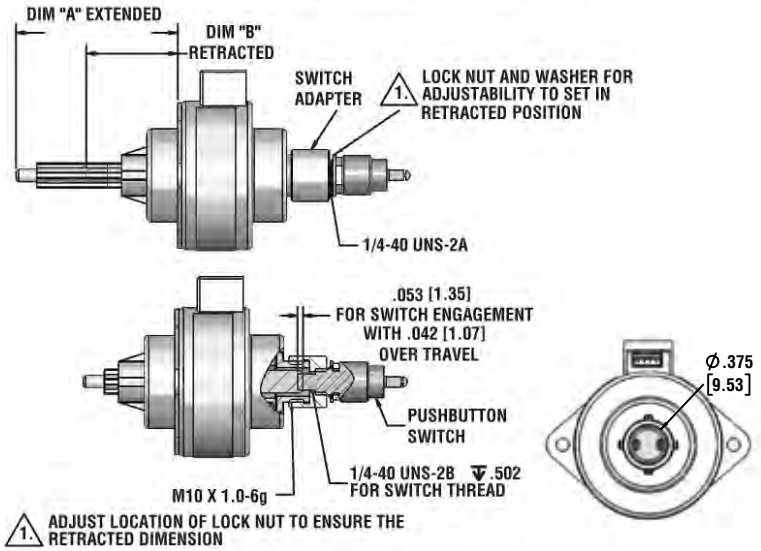


Home Position Switch

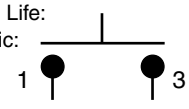
A miniature electronic home position switch capable of monitoring the home positions of linear actuators. The switch mounts on the rear sleeve of captive linear motors and allows the user to identify start, stop or home postions. Depending on your preference, contacts can be normally open or normally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

Dimensions = inches (mm)

S37000 G4 SERIES		
STROKE	**DIM "A"**	**DIM "B"**
.631 (16)	1.348 (34.24)	.677 (17.19)
1.00 (25.4)	2.348 (56.94)	1.177 (28.89)
1.50 (38.1)	3.348 (85.04)	1.677 (42.59)

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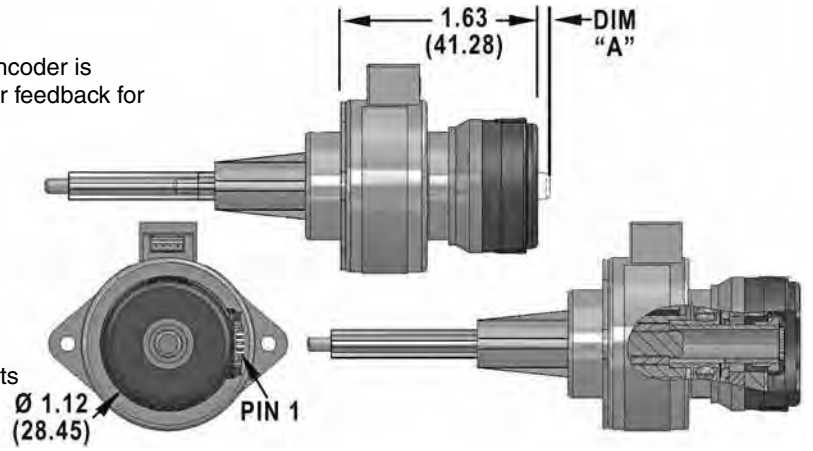
G4 37000 Series E8T Encoder

The **G4 37000 Series E8T** transmissive optical encoder is designed to provide the digital quadrature encoder feedback for high volume, compact space applications.

Features:
- 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



Dimensions = inches (mm)

37000 G4 SERIES with E8T	
STROKE	**DIM "A"**
.631 (16)	0
1.00 (25.4)	.098 (2.50)
1.50 (38.1)	.598 (15.20)

37000 G4 SERIES SINGLE ENDED PINS	
PIN #	**DESCRIPTION**
1	+5 VDC Power
2	A Channel
3	Ground
4	B Channel

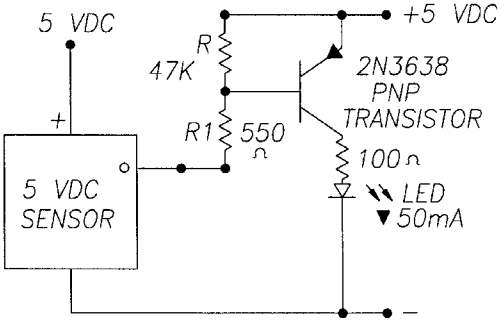
37000 G4 SERIES DIFFERENTIAL	
PIN #	**DESCRIPTION**
1	Ground
2	A Channel
3	A– Channel
4	+5 VDC Power
5	B Channel
6	B– Channel

End of Stroke Proximity Sensor

The sensor incorporates a hall effect device, which is activated by a rare earth magnet embedded in the end of the internal screw. The compact profile of the sensor allows for installation in limited space applications.

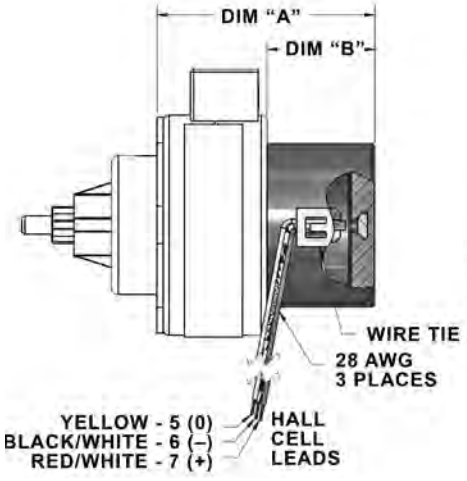
Specifications

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 operations should be performed at workstations with conductive tops and operators grounded.

Dimensional Drawings



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

Dimensions = inches (mm)

P37000 G4 SERIES		
STROKE	**DIM "A"**	**DIM "B"**
.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)

Haydon® 15000 Series: The world's smallest commercial linear stepper motor.

The motor features bi-directional travel, ball bearings and a light weight. Motors are available in captive and external linear versions.

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

* Values truncated

Specifications

Ø 15 mm (.59-in) motor				
Wiring		Bipolar		
Part No.	Captive	LC1574 ■–■■–■■■		
	External Linear	LE1574 ■–■■–■■■		
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		
Weight		1 oz (28 g)		
Insulation resistance		100 MΩ		
Stroke		0.5-in. (12.7 mm)		

Connectors for Series 15000

Standard Connectors Available	JST PHR-4
	12 inches (304.8 mm) flying leads
	Molex 51021-0400

Connector Information

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

Flying Leads

Length inches	mm	Order Code I.D. Suffix (add to end on I.D.)
12.0	304.8	– 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 part number codes when ordering

Haydon kerk Express℠
www.HaydonKerkExpress.com
Standard products available 24-hrs.

LC	15	7	4	W	–	04	–	999

Prefix
LC = Captive
LE = External Linear

Series number designation
15 = 15000
(Series numbers represent approximate diameters of motor body)

Style
7 = 18° captive

Coils
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)

Voltage
04 = 4 VDC
05 = 5 VDC
12 = 12VDC
Custom V available

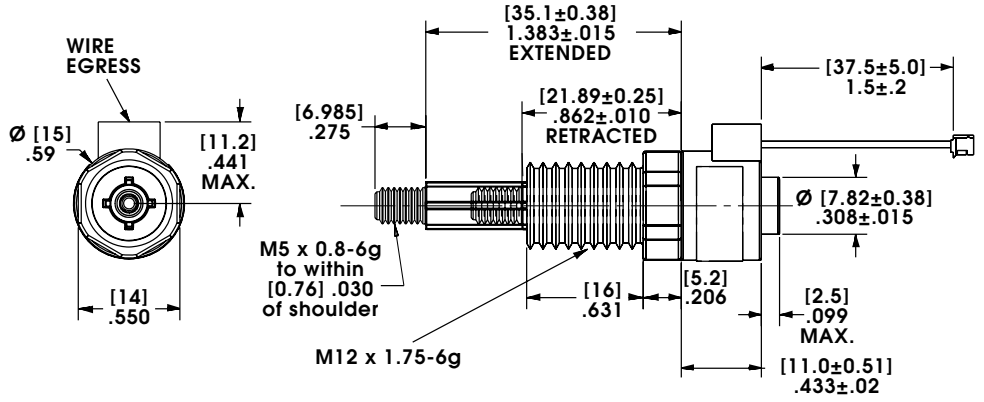
Suffix
Example: –999 = 12-in. leads
Suffix also represents:
–XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (–) as shown above. For assistance or order entry, call our engineering team at 203 756 7441.

SCREW LENGTH OPTIONS and other **OPTIONAL ASSEMBLIES** also available

Captive Lead-screw

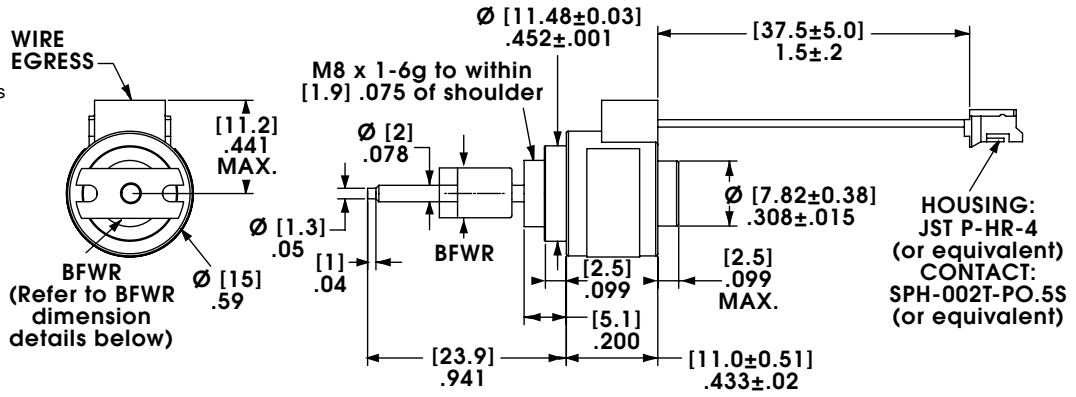
Dimensions = (mm) inches



External Linear

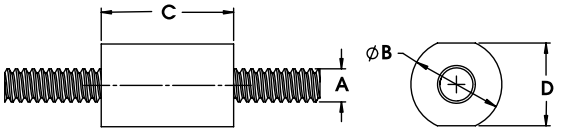
Dimensions = (mm) inches

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



MICRO Series Nut Styles

Standard nut styles. Consult the factory for custom solutions.

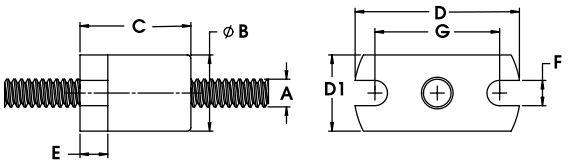


Barrel Nut Style

BFW Nut Style		Screw Diameter A inch (mm)	Nut Diameter B inch (mm)	Nut Length C inch (mm)	Nut Flats D inch (mm)	Dynamic Load lbs (Kg)	Drag Torque oz-in. (N-m)
BFWB	Barrel Mount	5/64 (2)	0.22 (5.5)	0.32 (8)	0.20 (5.08)	10 (4.5)	Free Wheeling

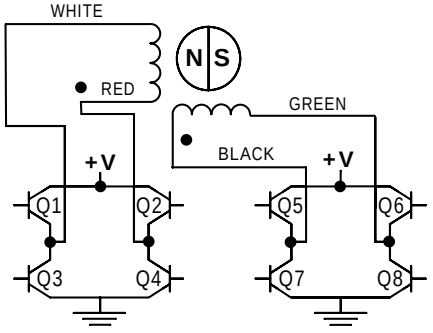
Rectangular Nut Style

An optional **ZBMR Anti-Backlash Nut** is also available, please see page 29 for more information.



BFW Nut Style		Screw Diameter A inch (mm)	Nut Diameter B inch (mm)	Nut Length C inch (mm)	Flange Height D1 inch (mm)	Flange Width D inch (mm)	Flange Thickness E inch (mm)	Slot Width F inch (mm)	Bolt Circle Diameter G inch (mm)	Dynamic Load lbs (Kg)	Drag Torque oz-in. (N-m)
BFWR	Rectangular Flange	5/64 (2)	0.22 (5.5)	0.32 (8)	0.22 (5.5)	0.47 (11.9)	0.08 (2.0)	0.07 (1.8)	0.35 (9.0)	10 (4.5)	Free Wheeling

15000 L Series Wiring



15000 L Series Stepping Sequence

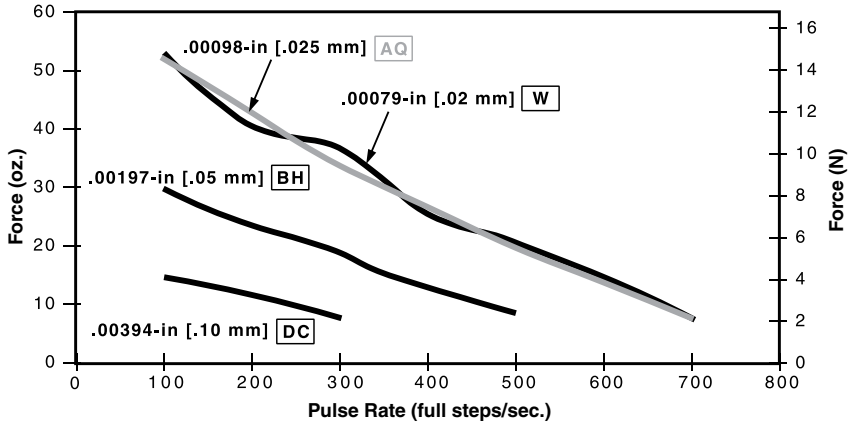
Bipolar Step	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8
1	ON	OFF	ON	OFF
2	OFF	ON	ON	OFF
3	OFF	ON	OFF	ON
4	ON	OFF	OFF	ON
1	ON	OFF	ON	OFF

EXTEND CW ↓ / RETRACT CCW ↑

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

FORCE vs. PULSE RATE

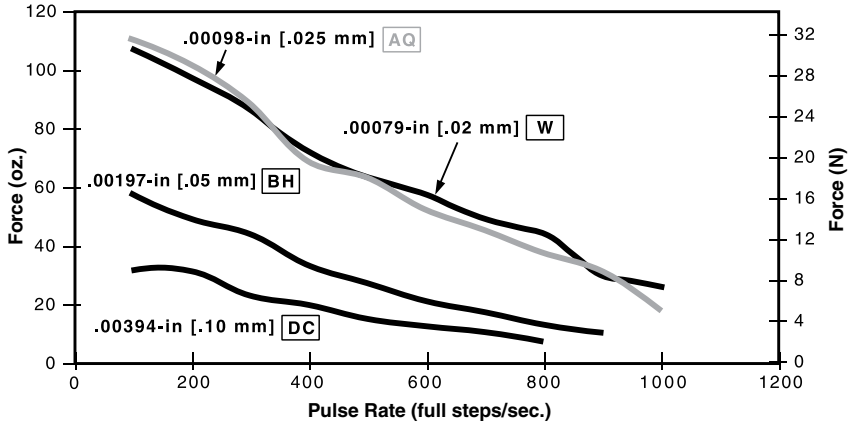
- L/R Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

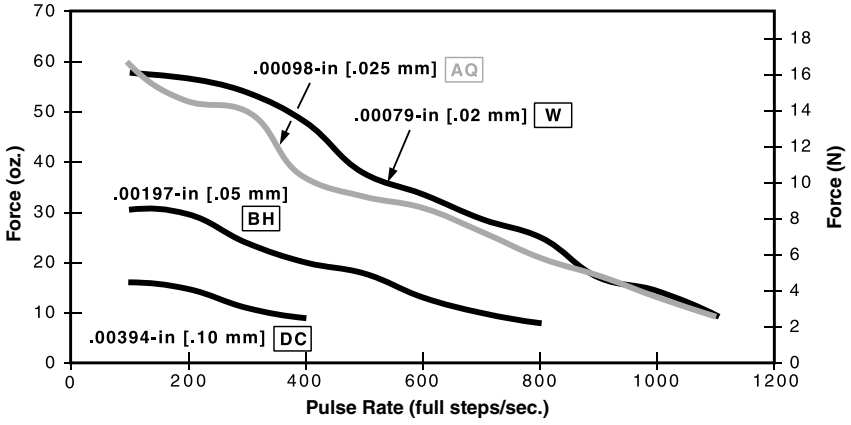
- L/R Drive
- Bipolar
- 25% Duty Cycle

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



FORCE vs. PULSE RATE

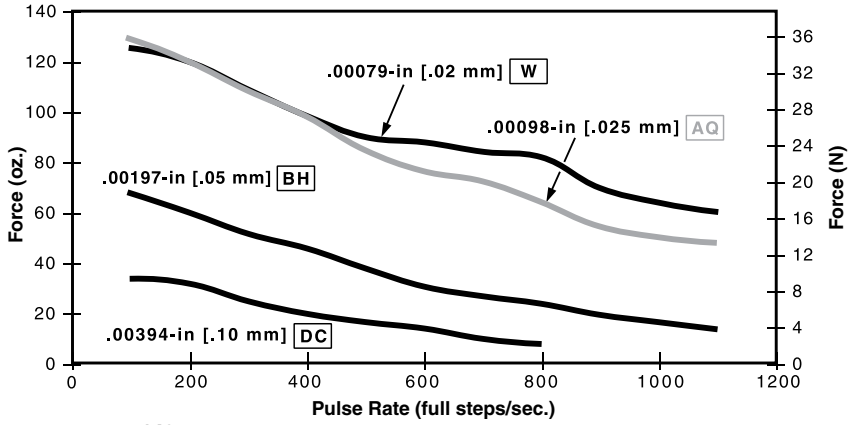
- Chopper Drive
- Bipolar
- 100% Duty Cycle
- 8:1 Motor Coil to Drive Supply Voltage



FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 25% Duty Cycle
- 8:1 Motor Coil to Drive Supply Voltage

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.

Haydon® Z20000 Series – economical stepper motors for high volume, applications.

Utilizing rare earth (neodymium) magnets, the Haydon® 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.

Three motors are available... captive, non-captive and external linear. All units are built with reliable dual ball bearings.

Specifications

Ø 20 mm (.79-in) Z-Series motor			
Wiring		Bipolar	
Part No.	Captive	Z2054 ■–■■–■■■	
	Non-captive	Z2084 ■–■■–■■■	
	External*	Z2054 ■–■■–9■■*	
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 M Ω	

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).

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

Identifying the Can-Stack part number codes when ordering

Haydon kerk Express℠
www.HaydonKerkExpress.com
Standard products available 24-hrs.

Z	20	5	4	2	–	05	–	900

Prefix
Z = Series Code

(For a AC Synchronous compatibility information, see page 190.)

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 = 12VDC

Custom V available

Suffix

Stroke
Example: –900 used to code Z-Series external linear

Suffix also represents:
–XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

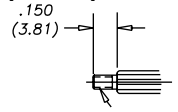
NOTE: Dashes must be included in Part Number (–) as shown above. For assistance or order entry, call our engineering team at 203 756 7441.

OPTIONS
- SCREW LENGTH OPTIONS
- "EARLESS" NO FLANGE
- TFE COATED LEAD-SCREWS
- HIGH TEMPERATURE ASSEMBLY
- HOME POSITION SWITCH
- PROXIMITY SENSOR
- OPTIONAL ASSEMBLIES

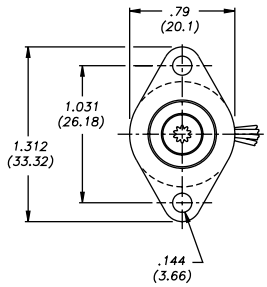
Captive Lead-screw

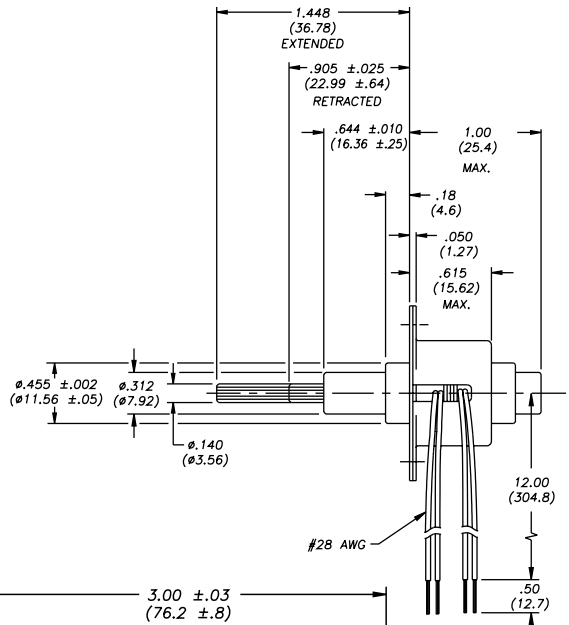
Dimensions = inches (mm)

Spline Options



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

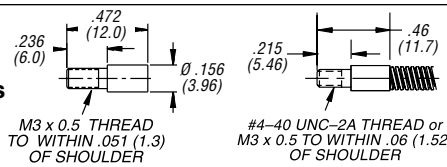




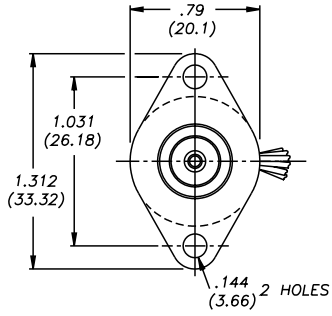
Non-Captive Lead-screw

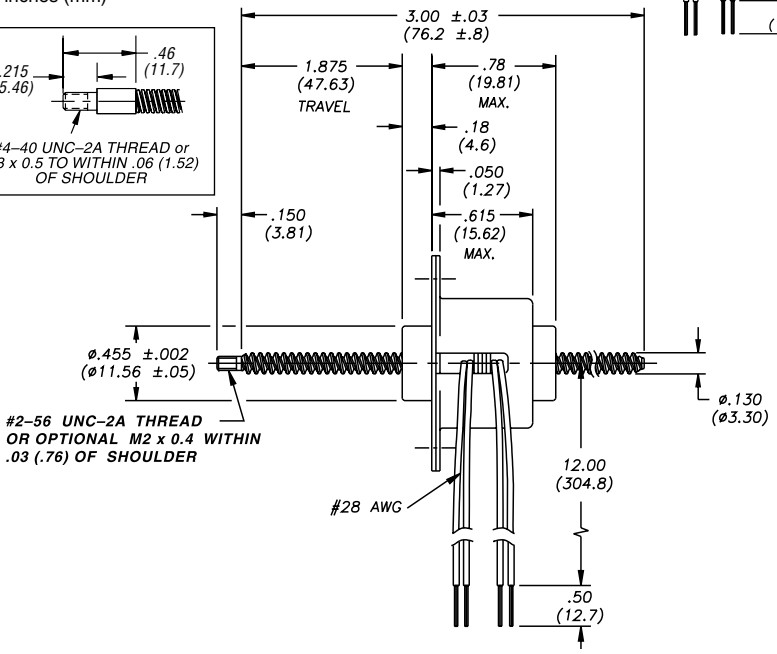
Dimensions = inches (mm)

Optional Adapters



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

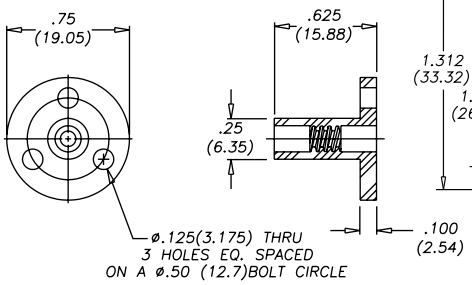


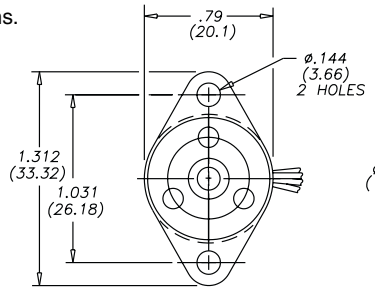


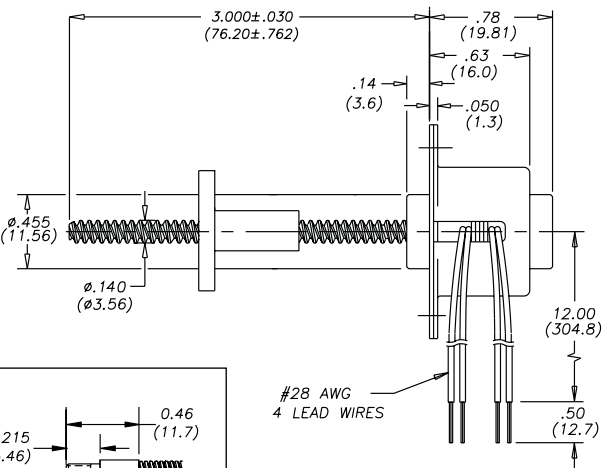
External Linear

Dimensions = inches (mm)

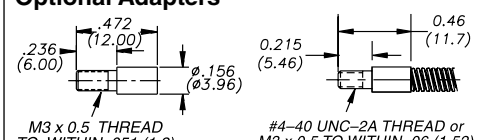
Up to 6-in (152 mm) standard screw lengths.
Longer screw lengths are available.





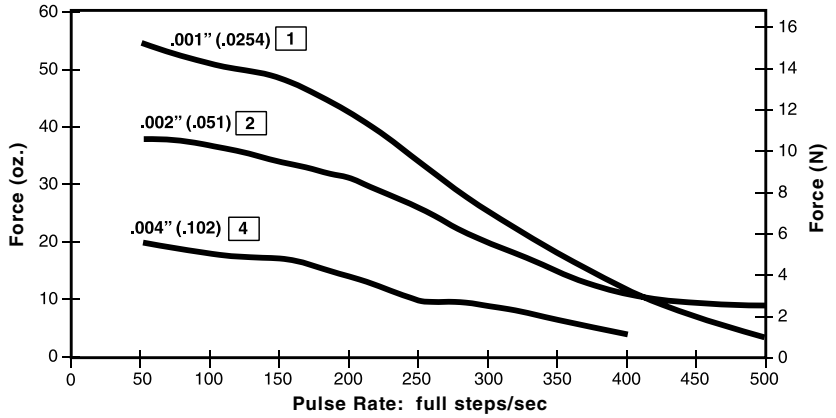


Optional Adapters



FORCE vs. PULSE RATE

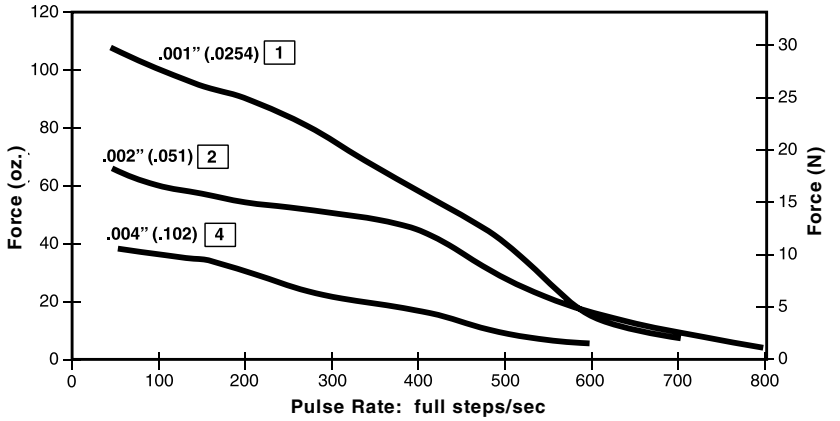
- **L/R Drive**
- **Bipolar**
- **100% Duty Cycle**



FORCE vs. PULSE RATE

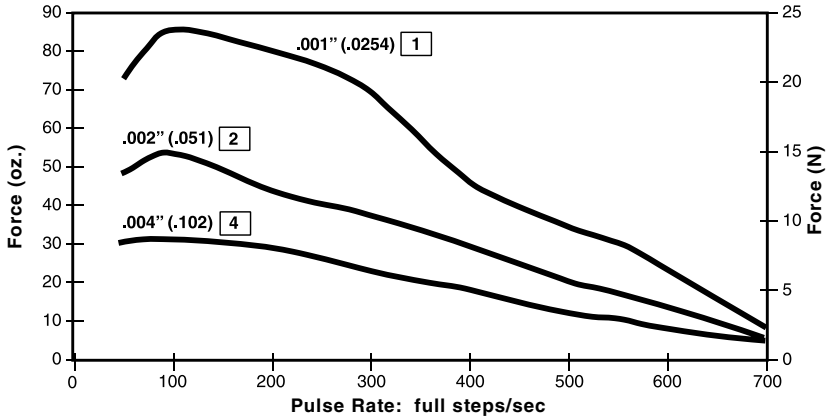
- **L/R Drive**
- **Bipolar**
- **25% Duty Cycle**

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



FORCE vs. PULSE RATE

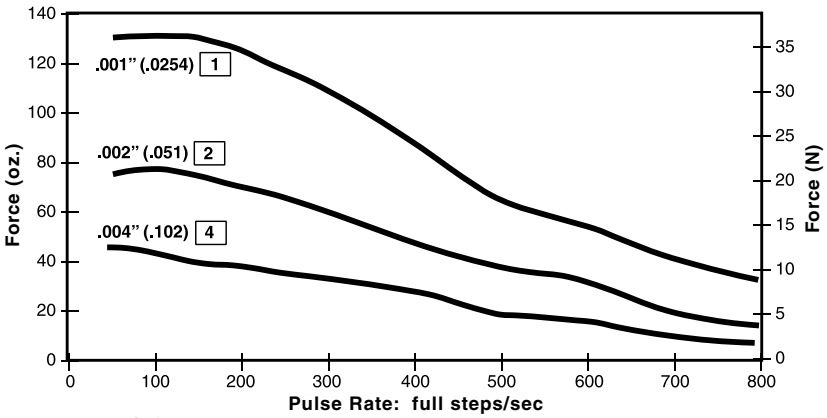
- **Chopper Drive**
- **Bipolar**
- **100% Duty Cycle**
- **8:1 Motor Coil to Drive Supply Voltage**



FORCE vs. PULSE RATE

- **Chopper Drive**
- **Bipolar**
- **25% Duty Cycle**
- **8:1 Motor Coil to Drive Supply Voltage**

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.

TFE Coated Lead-screws

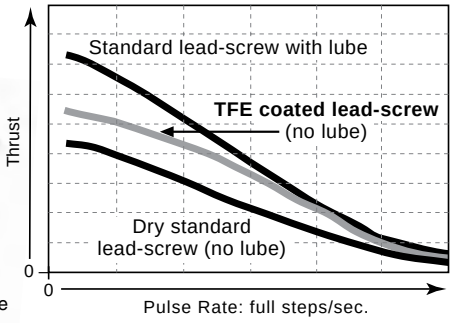
Haydon Kerk Motion Solutions, Inc. offers a TFE coated lead-screw option for its Can-Stack Series linear actuators. This lead-screw option is ideal for applications where conventional oils and greases can not be used for lead-screw lubrication.

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 the Haydon® captive, non-captive and external linear linear actuators.

Z20000 Series, non-captive

Lead-Screw Comparison
FORCE vs. PULSE RATE

L/R Drive
100% Duty Cycle

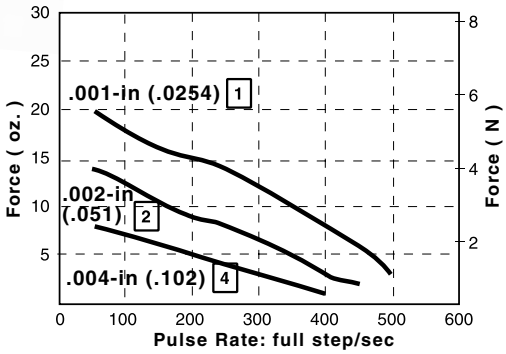


Specially engineered can-stack linear actuators for high temperature applications

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® 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.

Z20000 Series HIGH TEMPERATURE
FORCE vs. PULSE RATE

L/R Drive
100% Duty Cycle



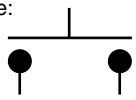
Home Position Switch

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 postions. 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.

End of Stroke Proximity Sensor

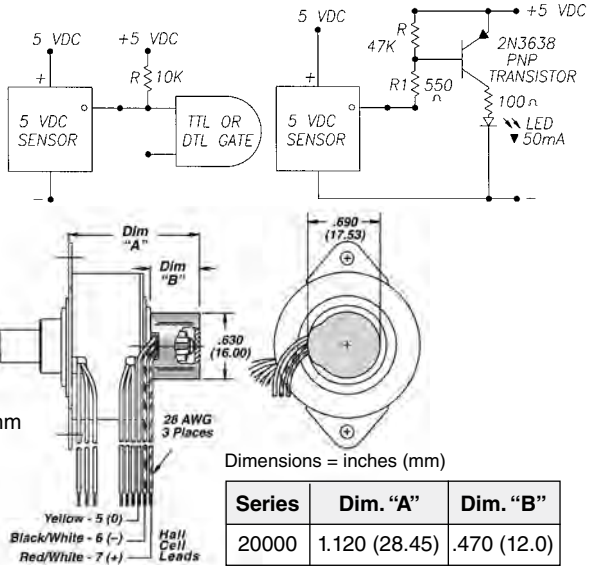
The sensor incorporates a hall effect device, which is activated by a rare earth magnet embedded in the end of the internal screw. The compact profile of the sensor allows for installation in limited space applications.

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

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 operations should be performed at workstations with conductive tops and operators grounded.



Dimensions = inches (mm)

Series	Dim. "A"	Dim. "B"
20000	1.120 (28.45)	.470 (12.0)

Haydon® Z26000 Series – designed to accommodate high volume applications.

Specifications

Ø 26 mm (1-in) Z-Series motor					
Wiring		Bipolar			
Part No.	Captive	Z2644 ■-■■-■■■†		Z2654 ■-■■-■■■†	
	Non-captive	Z2634 ■-■■-■■■†		Z2684 ■-■■-■■■†	
	External**	Z2644 ■-■■-■■■†**		Z2654 ■-■■-9■■†**	
Step angle		7.5°		15°	
Winding voltage		5 VDC	12 VDC	5 VDC	12 VDC
Current (RMS)/phase		340 mA	140 mA	340 mA	140 mA
Resistance/phase		14.7 Ω	84 Ω	14.7 Ω	84 Ω
Inductance/phase		8.5 mH	55 mH	6.7 mH	44 mH
Power consumption		3.4 W			
Rotor inertia		1.4 gcm²			
Insulation Class		Class B			
Weight		1.2 oz (34 g)			
Insulation resistance		20 MΩ			

Ø 26 mm (1-in) Z-Series motor					
Wiring		Unipolar*			
Part No.	Captive	Z2646 ■-■■-■■■†		Z2656 ■-■■-■■■†	
	Non-captive	Z2636 ■-■■-■■■†		Z2686 ■-■■-■■■†	
	External**	Z2646 ■-■■-9■■†**		Z2656 ■-■■-9■■†**	
Step angle		7.5°		15°	
Winding voltage		5 VDC	12 VDC	5 VDC	12 VDC
Current (RMS)/phase		340 mA	140 mA	340 mA	140 mA
Resistance/phase		14.7 Ω	84 Ω	14.7 Ω	84 Ω
Inductance/phase		4.3 mH	24 mH	3.4 mH	19 mH
Power consumption		3.4 W			
Rotor inertia		1.4 gcm²			
Insulation Class		Class B			
Weight		1.2 oz (34 g)			
Insulation resistance		20 MΩ			

† Part numbering information on page 155.
* 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.

The Z26000 Series motors are ideal for high volume. Utilizing rare earth (neodymium) magnets. Also, available in a special "earless" configuration without a mounting flange.

All units are built with durable dual ball bearings.

Linear Travel/Step			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

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).

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).

Identifying the Can-Stack part number codes when ordering

Haydon kerk Express℠
www.HaydonKerkExpress.com
Standard products available 24-hrs.

Z	26	4	4	2	–	05	–	900

Prefix

Z = Series Code

(For a AC Synchronous compatibility information, see page 190.)

Series number designation

26 = 26000

(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)
AS = .04166-in (.00164)

Voltage

05 = 5 VDC
12 = 12VDC

Custom V available

Suffix

Stroke
Example: –900 used to code Z-Series external linear

Suffix also represents:

–XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

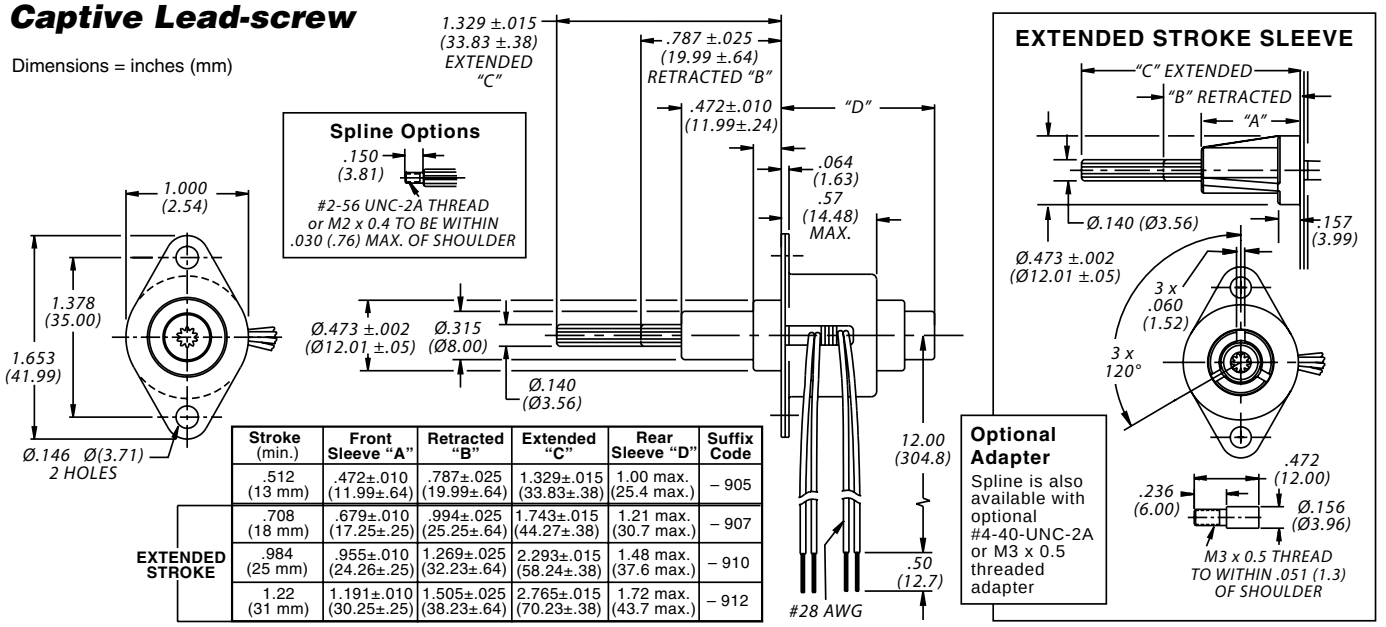
NOTE: Dashes must be included in Part Number (–) as shown above. For assistance or order entry, call our engineering team at 203 756 7441.

OPTIONS

- SCREW LENGTH OPTIONS
- EXTENDED CAPTIVE LEAD-SCREW
- TFE COATED LEAD-SCREWS
- HIGH TEMPERATURE ASSEMBLY
- HOME POSITION SWITCH
- PROXIMITY SENSOR
- OPTIONAL ASSEMBLIES

Captive Lead-screw

Dimensions = inches (mm)

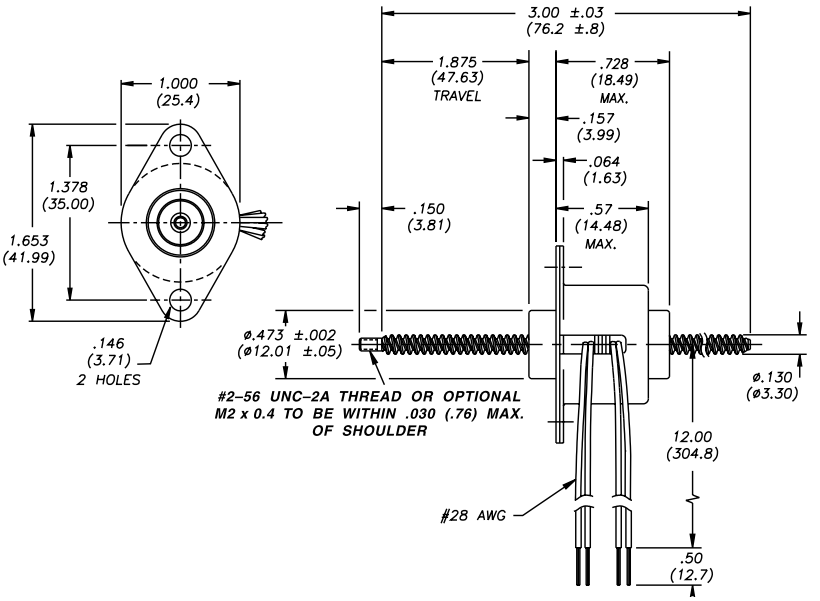


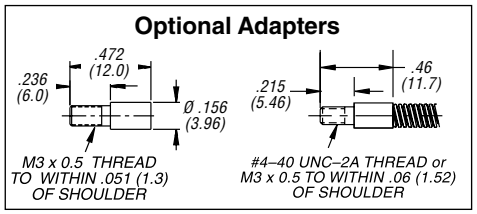
	Stroke (min.)	Front Sleeve "A"	Retracted "B"	Extended "C"	Rear Sleeve "D"	Suffix Code
	.512 (13 mm)	.472±.010 (11.99±.64)	.787±.025 (19.99±.64)	1.329±.015 (33.83±.38)	1.00 max. (25.4 max.)	– 905
EXTENDED STROKE	.708 (18 mm)	.679±.010 (17.25±.25)	.994±.025 (25.25±.64)	1.743±.015 (44.27±.38)	1.21 max. (30.7 max.)	– 907
	.984 (25 mm)	.955±.010 (24.26±.25)	1.269±.025 (32.23±.64)	2.293±.015 (58.24±.38)	1.48 max. (37.6 max.)	– 910
	1.22 (31 mm)	1.191±.010 (30.25±.25)	1.505±.025 (38.23±.64)	2.765±.015 (70.23±.38)	1.72 max. (43.7 max.)	– 912

Non-Captive Lead-screw

Dimensions = inches (mm)

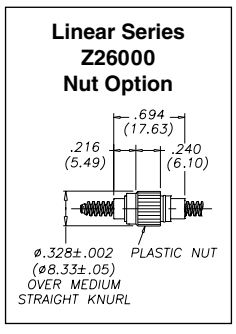
Up to 6-in (152 mm) standard screw lengths. Longer screw lengths are available.

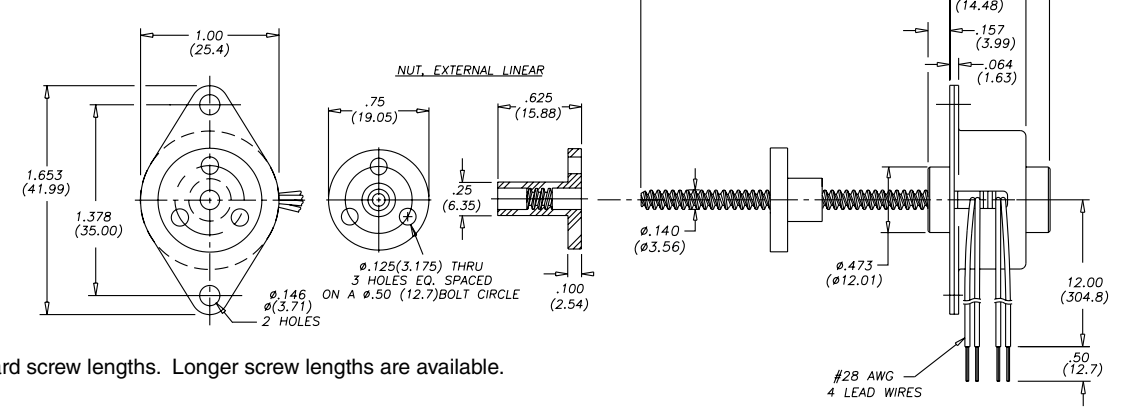




External Linear

Dimensions = inches (mm)

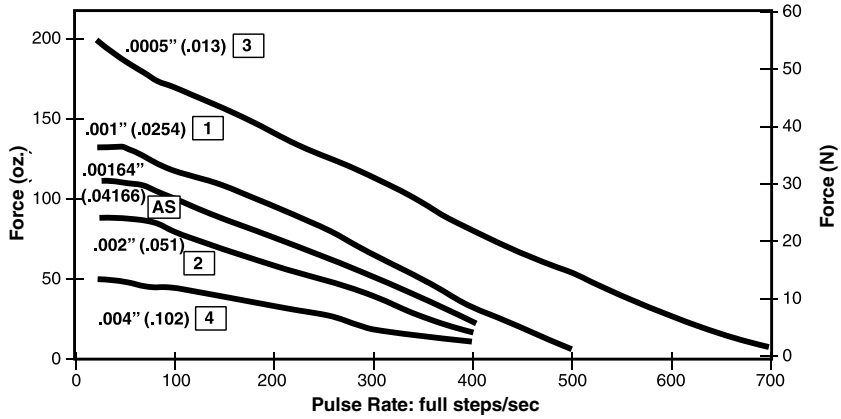




Up to 6-in (152 mm) standard screw lengths. Longer screw lengths are available.

FORCE vs. PULSE RATE

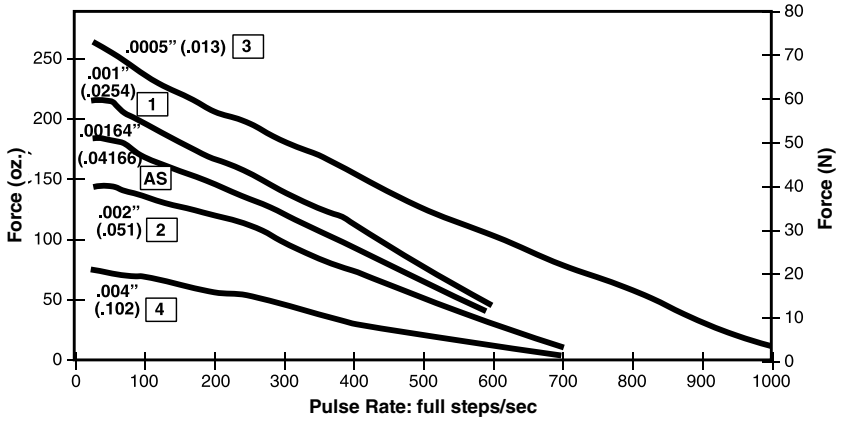
- L/R Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

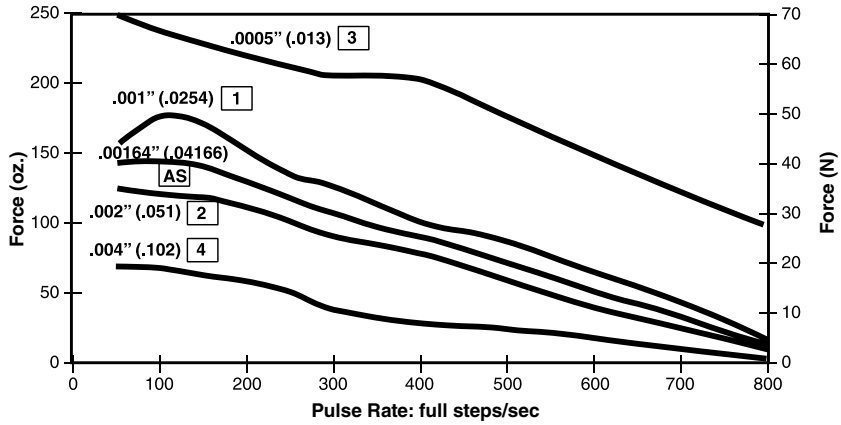
- L/R Drive
- Bipolar
- 25% Duty Cycle

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



FORCE vs. PULSE RATE

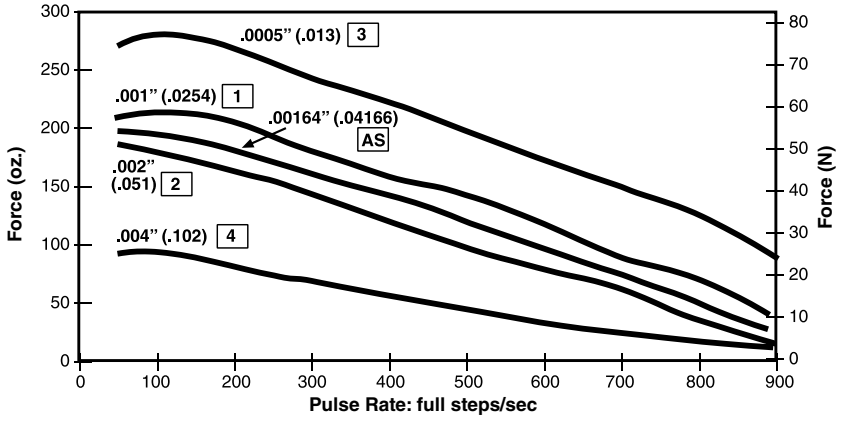
- Chopper Drive
- Bipolar
- 100% Duty Cycle
- 8:1 Motor Coil to Drive Supply Voltage



FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 25% Duty Cycle
- 8:1 Motor Coil to Drive Supply Voltage

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.

Haydon Kerk Motion Solutions, Inc. • www.haydonkerkpittman.com • Phone: 800 243 2715 • International: 203 756 7441

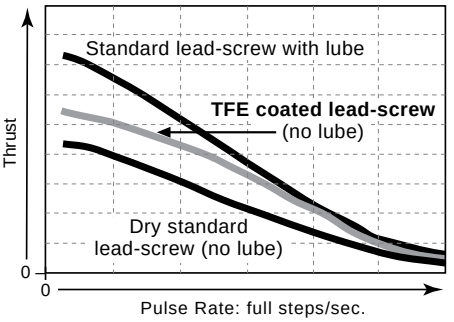
TFE Coated Lead-screws

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 the Haydon® captive, non-captive and external linear linear actuators.

Z26000 Series, external linear

Lead-Screw Comparison *FORCE vs. PULSE RATE*

L/R Drive
100% Duty Cycle

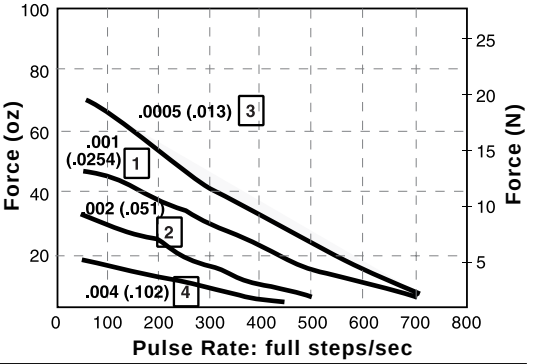


Specially engineered can-stack linear actuators for high temperature applications

Special materials 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.

Z26000 Series HIGH TEMPERATURE *FORCE vs. PULSE RATE*

L/R Drive
100% Duty Cycle



Home Position Switch

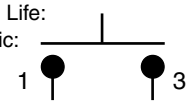
A miniature electronic home position switch capable of monitoring the home positions of linear actuators. The switch mounts on the rear sleeve of captive linear motors and allows the user to identify start, stop or home postions. Depending on your preference, contacts can be normally open or normally 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
Schematic:	at full load

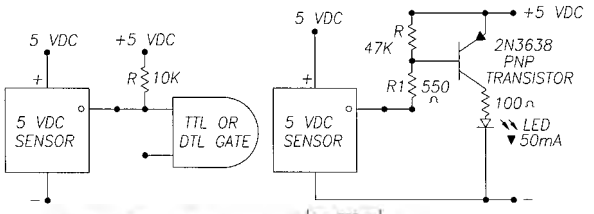


Multiple contact options available.

End of Stroke Proximity Sensor

The sensor incorporates a hall effect device, which is activated by a rare earth magnet embedded in the end of the internal screw. The compact profile of the sensor allows for installation in limited space applications.

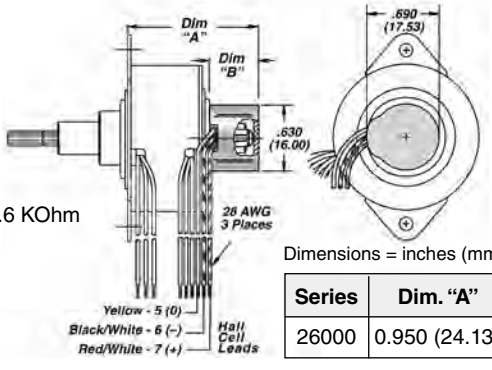
The sensor has virtually unlimited cycle life. Special cabling and connectors can also be provided.



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 operations should be performed at workstations with conductive tops and operators grounded.



Dimensions = inches (mm)

Series	Dim. "A"	Dim. "B"
26000	0.950 (24.13)	.370 (9.4)

Haydon® 36000 Series – more powerful, versatile and robust

Specifications

Ø 36 mm (1.4-in) motor					
Wiring		Bipolar			
Part No.	Captive	3644 ■–■■–■■■†		3654 ■–■■–■■■†	
	Non-captive	3634 ■–■■–■■■†		3684 ■–■■–■■■†	
	External	E3644 ■–■■–■■■†		E3654 ■–■■–■■■†	
Step angle		7.5°		15°	
Winding voltage		5 VDC	12 VDC	5 VDC	12 VDC
Current (RMS)/phase		460 mA	190 mA	460 mA	190 mA
Resistance/phase		11 Ω	63 Ω	11 Ω	63 Ω
Inductance/phase		7.2 mH	45 mH	5.5 mH	35 mH
Power consumption		4.6 W			
Rotor inertia		10.5 gcm²			
Insulation Class		Class B			
Weight		3 oz (86 g)			
Insulation resistance		20 MΩ			

Ø 36 mm (1.4-in) motor					
Wiring		Unipolar**			
Part No.	Captive	3646 ■–■■–■■■†		3656 ■–■■–■■■†	
	Non-captive	3636 ■–■■–■■■†		3686 ■–■■–■■■†	
	External	E3646 ■–■■–■■■†		E3656 ■–■■–■■■†	
Step angle		7.5°		15°	
Winding voltage		5 VDC	12 VDC	5 VDC	12 VDC
Current (RMS)/phase		460 mA	190 mA	460 mA	190 mA
Resistance/phase		11 Ω	63 Ω	11 Ω	63 Ω
Inductance/phase		3.8 mH	19 mH	3 mH	15 mH
Power consumption		4.6 W			
Rotor inertia		10.5 gcm²			
Insulation Class		Class B			
Weight		3 oz (86 g)			
Insulation resistance		20 MΩ			

† Part numbering information on page 161.

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

Linear Travel/Step			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	0.002	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).

*** High resolution steppers for applications requiring fine step increments down to 0.000125-in (0.0032 mm).** See page 160.

Motors can also be electronically micro-stepped.

Other 36000 Series styles available...

- TFE lead-screw
- High Temperature Option

Haydon® 36000 Series High Resolution – the big motor with more precise control with resolutions down to .00025 inches (.0064 mm) and 0.000125-in (.0032 mm)

Specifications

Ø 36 mm (1.4") High Resolution Motor					
Wiring		Bipolar		Unipolar**	
Part No.	Captive	3624 ■–■■–■■■†		3626 ■–■■–■■■†	
	Non-captive	3614 ■–■■–■■■†		3616 ■–■■–■■■†	
	External	E3624 ■–■■–■■■†		3626 ■–■■–■■■†	
Step angle		3.75°			
Winding voltage		5 VDC	12 VDC	5 VDC	12 VDC
Current (RMS)/phase		460 mA	190 mA	460 mA	190 mA
Resistance/phase		11 Ω	63 Ω	11 Ω	63 Ω
Inductance/phase		9.2 mH	53 mH	4.6 mH	26 mH
Power consumption		4.6 W			
Rotor inertia		10.5 gcm²			
Insulation Class		Class B			
Weight		3 oz (86 g)			
Insulation resistance		20 MΩ			

Linear Travel/Step			Order Code I.D.
Step	inches	mm	
3.75° Angle	0.000125	0.0032	7
	0.00025	0.0064	9

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).

The Haydon® High Resolution 36000 Series features a choice of two extremely small step increments, 0.000125-in (0.0032 mm) and 0.00025-in (0.0064 mm). Motors can also be electronically micro-stepped.

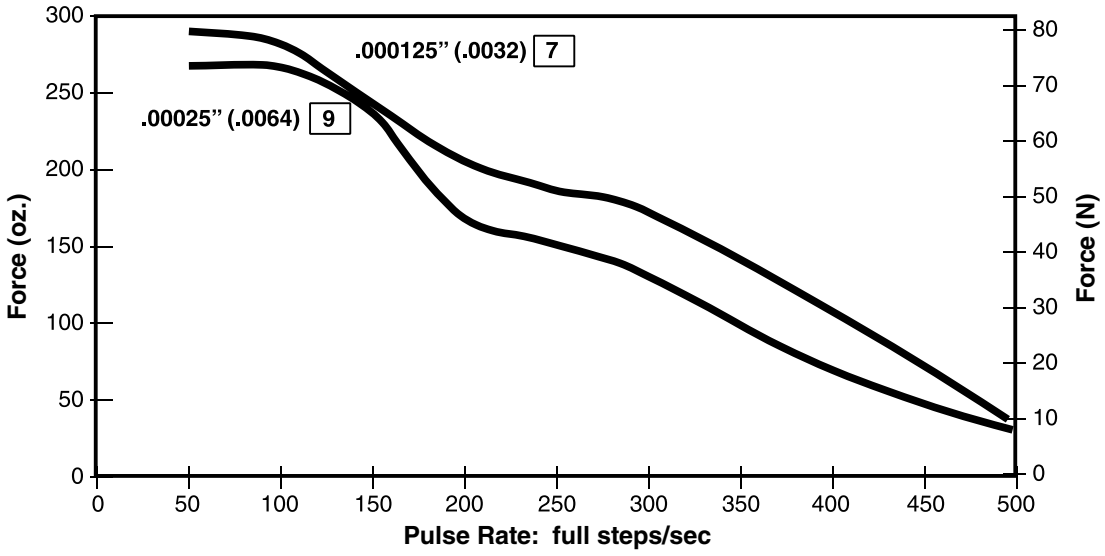
† Part numbering information on page 161.

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

CAN-STACK LINEAR ACTUATOR MOTORS

FORCE vs. PULSE RATE
for the Can-Stack 36000 High Resolution Motor

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



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.

Identifying the Can-Stack part number codes when ordering

E	36	4	4	2	–	05	–	900

Prefix
(include only when using the following)

A = A Coil (See AC Synchronous page 190)
E = External
K = External with 40° thread form
P = Proximity Sensor
S = Home Position Switch
R = Rare Earth Magnet

Series number designation

36 = 36000

(Series numbers represent approximate diameters of motor body)

Style

1 = High Resolution 3.75° non-captive
2 = High Resolution 3.75° Captive or External (use "E" or "K" Prefix for External version)
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)

High Resolution

7 = .000125-in (.0032)
9 = .00025-in (.00635)

Voltage

05 = 5 VDC
12 = 12VDC

Custom V available

Suffix

Stroke
Example: –900 = external linear with grease & flanged nut

Suffix also represents:

–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.

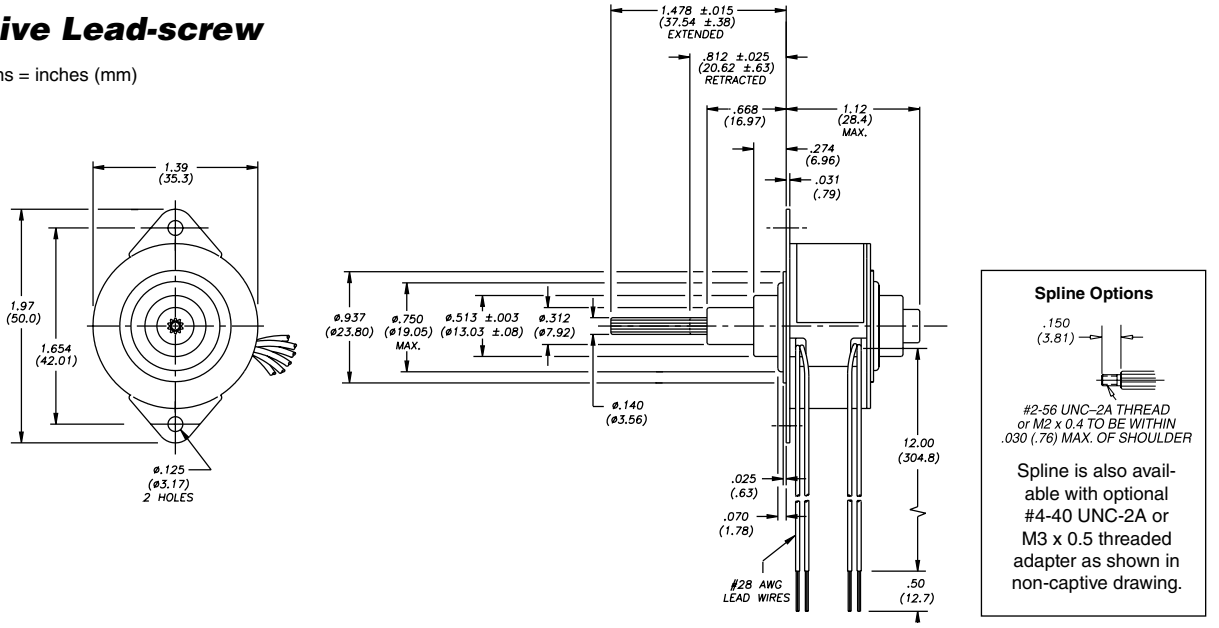
Haydon kerk Express℠
www.HaydonKerkExpress.com
Standard products available 24-hrs.

OPTIONS

- SCREW LENGTH OPTIONS
- TFE COATED LEAD-SCREWS
- HIGH TEMPERATURE ASSEMBLY
- HOME POSITION SWITCH
- PROXIMITY SENSOR
- OPTIONAL ASSEMBLIES

Captive Lead-screw

Dimensions = inches (mm)



Spline Options

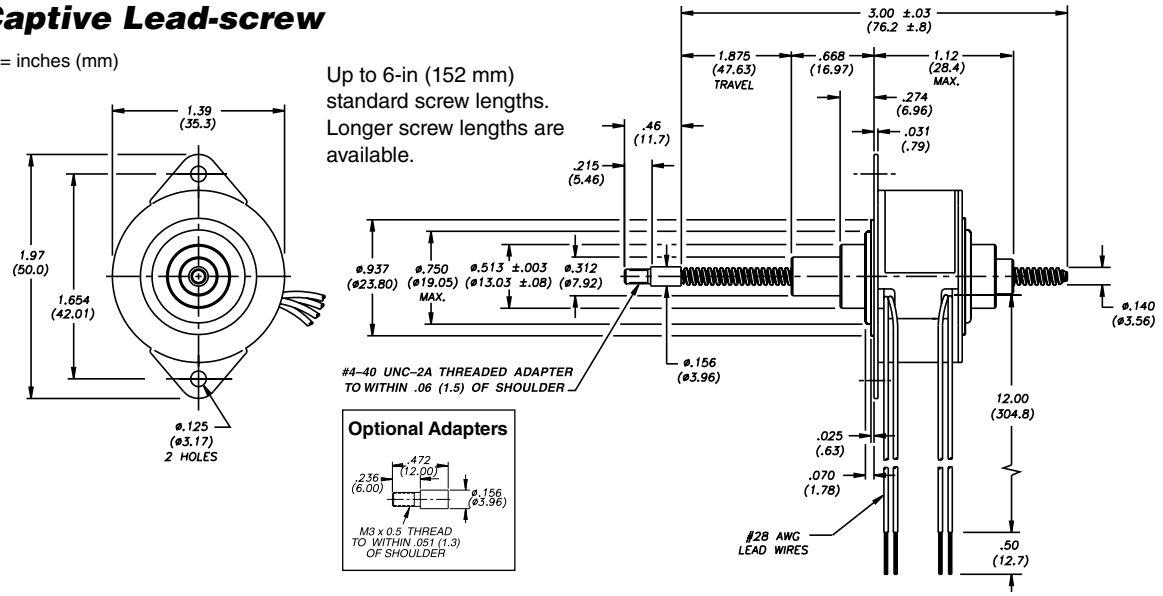
#2-56 UNC–2A THREAD
or M2 x 0.4 TO BE WITHIN
.030 (.76) MAX. OF SHOULDER

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

Non-Captive Lead-screw

Dimensions = inches (mm)

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

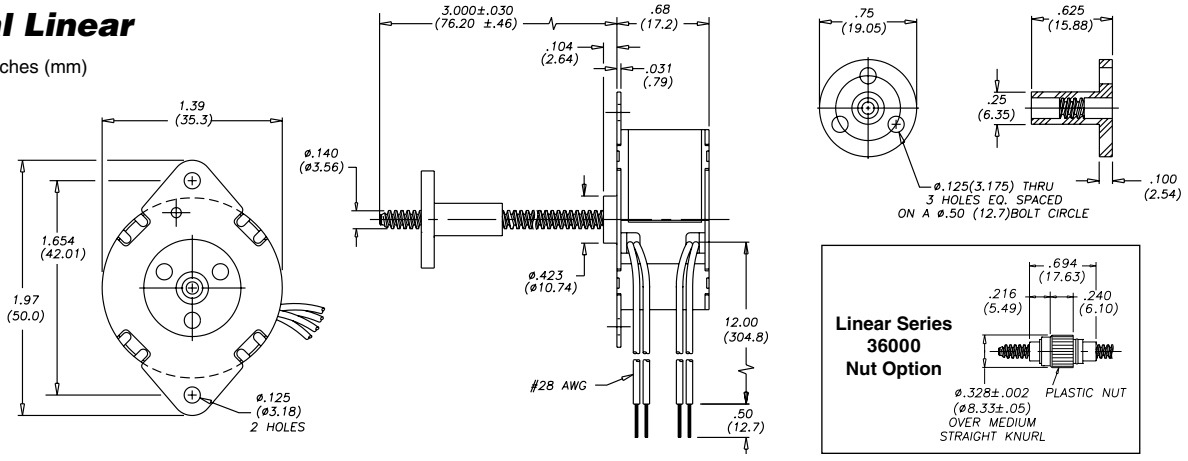


Optional Adapters

External Linear

Dimensions = inches (mm)

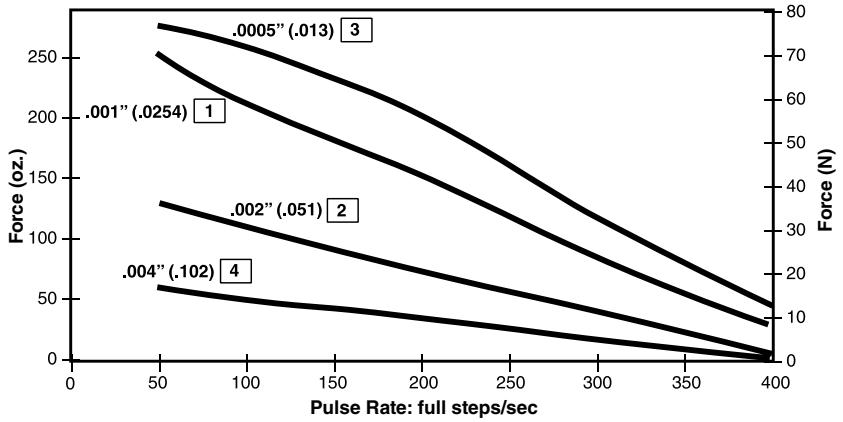
Up to 6-in (152 mm) standard screw lengths. Longer screw lengths are available.



Linear Series 36000 Nut Option

FORCE vs. PULSE RATE

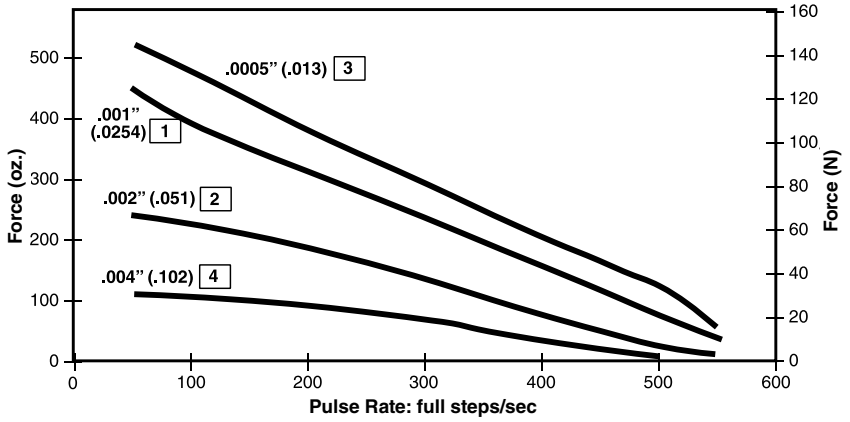
- L/R Drive
- Bipolar
- 100% Duty Cycle



FORCE vs. PULSE RATE

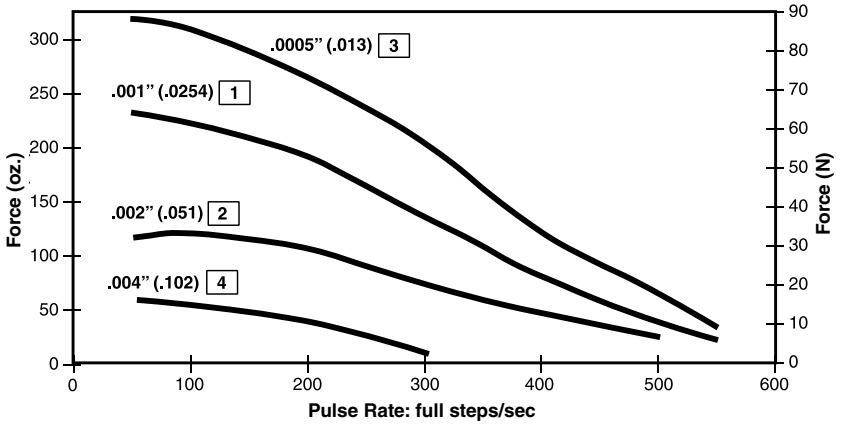
- L/R Drive
- Bipolar
- 25% Duty Cycle

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



FORCE vs. PULSE RATE

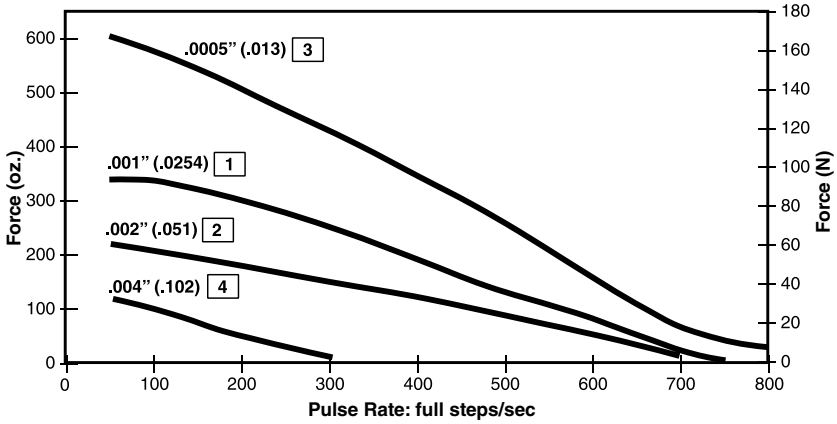
- Chopper Drive
- Bipolar
- 100% Duty Cycle
- 8:1 Motor Coil to Drive Supply Voltage



FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 25% Duty Cycle
- 8:1 Motor Coil to Drive Supply Voltage

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.

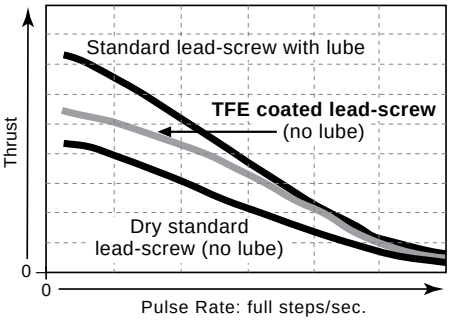
TFE Coated Lead-screws


36000 Series, non-captive

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 the 36000 Series captive, non-captive and external linear linear actuators.

Lead-Screw Comparison *FORCE vs. PULSE RATE*

L/R Drive
100% Duty Cycle

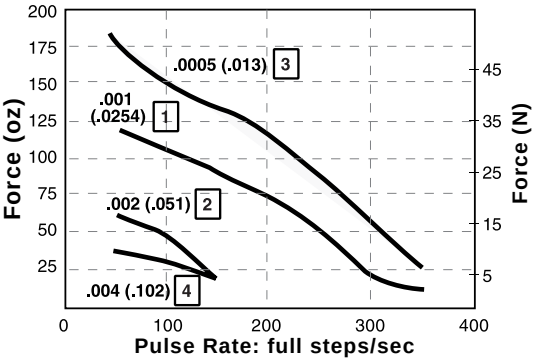


Specially engineered can-stack linear actuators for high temperature applications

Special materials 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.

36000 Series HIGH TEMPERATURE *FORCE vs. PULSE RATE*

L/R Drive
100% Duty Cycle



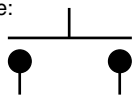
Home Position Switch for 36000 Series Can-Stack

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 postions. 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.

End of Stroke Proximity Sensor

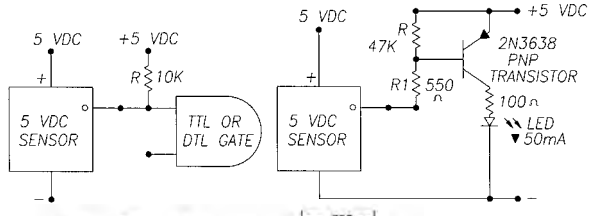
The sensor incorporates a hall effect device, which is activated by a rare earth magnet embedded in the end of the internal screw. The compact profile of the sensor allows for installation in limited space applications.

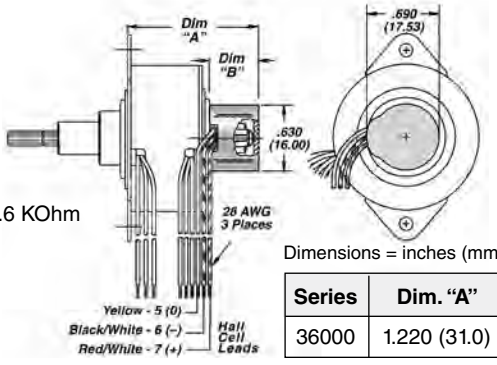
The sensor has virtually unlimited cycle life. Special cabling and connectors can also be provided.

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 operations should be performed at workstations with conductive tops and operators grounded.





Dimensions = inches (mm)

Series	Dim. "A"	Dim. "B"
36000	1.220 (31.0)	.470 (12.0)

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

Specifications

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^2			
Insulation Class		Class B			
Weight		9.0 oz (255 g)			
Insulation resistance		20 MΩ			

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^2			
Insulation Class		Class B			
Weight		9.0 oz (255 g)			
Insulation resistance		20 MΩ			

† Part numbering information on page 166.

Linear Travel/Step			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).

Other 46000 Series styles available...

- TFE lead-screw
- High Temperature Option

Identifying the Can-Stack part number codes when ordering

E	46	4	4	3	–	05	–	900

Prefix
(include only when using the following)

- **A** = A Coil (See AC Synchronous page 190)
- **E** = External
- **K** = External with 40° thread form
- **P** = Proximity Sensor
- **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 = 12VDC

Custom V available

Suffix

Stroke
Example: –900 = external linear with grease & flanged nut

Suffix also represents:

–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℠
www.HaydonKerkExpress.com
Standard products available 24-hrs.

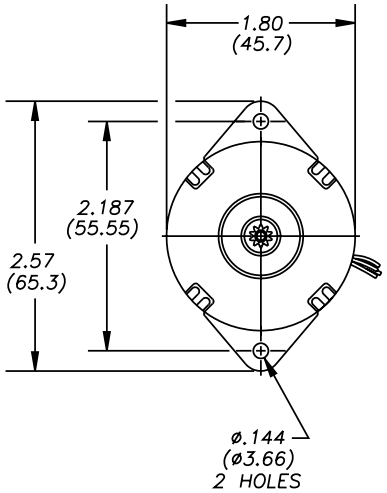
OPTIONS

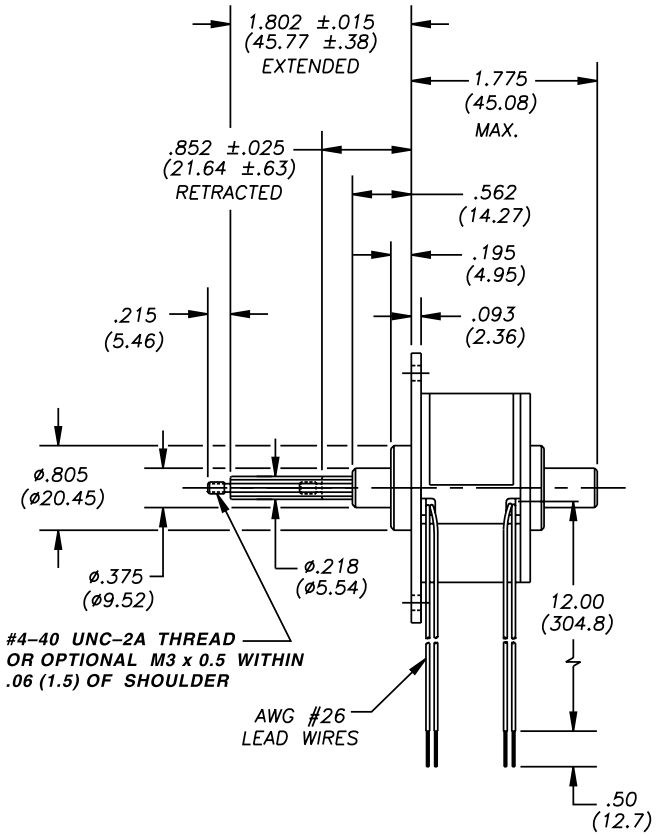
- SCREW LENGTH OPTIONS
- TFE COATED LEAD-SCREWS
- HIGH TEMPERATURE ASSEMBLY
- HOME POSITION SWITCH
- NEMA FLANGE (SIZE 23)
- OPTIONAL ASSEMBLIES

46000 Series Can-Stack Dimensional Drawings

Captive Lead-screw

Dimensions = inches (mm)

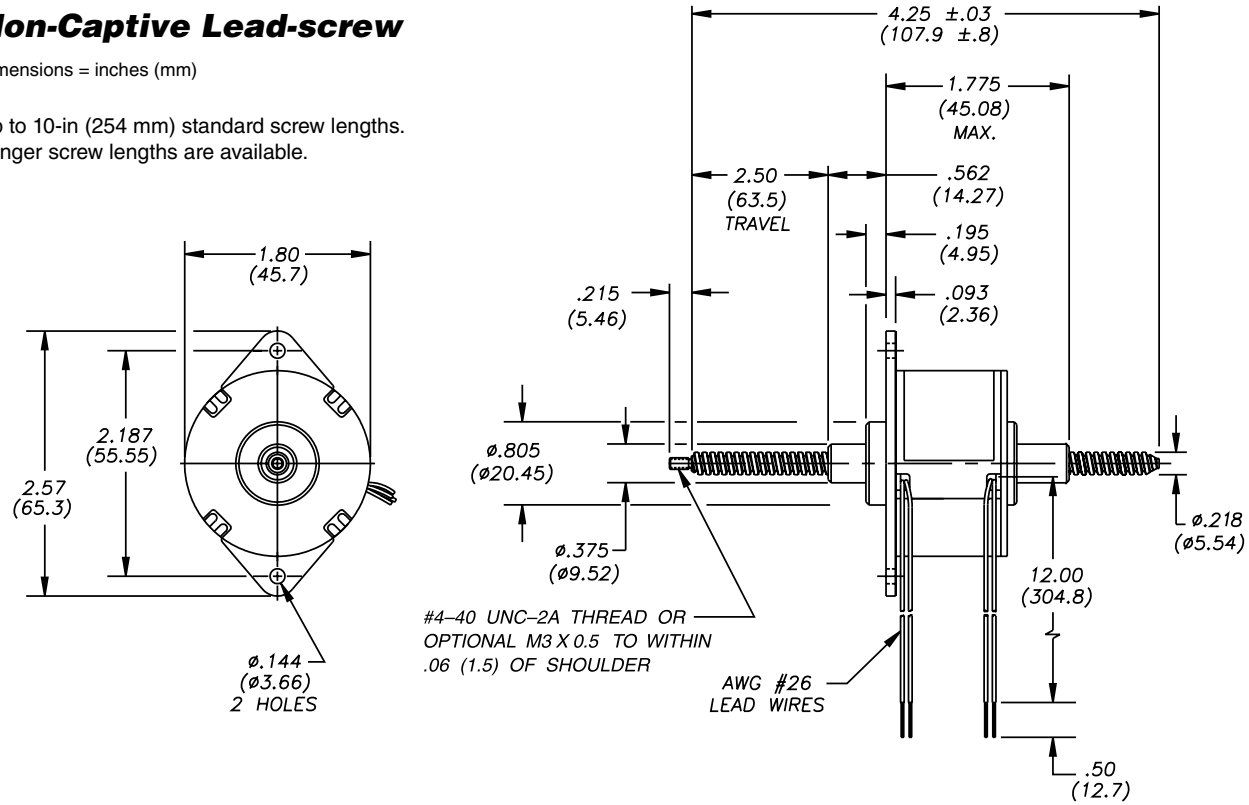




Non-Captive Lead-screw

Dimensions = inches (mm)

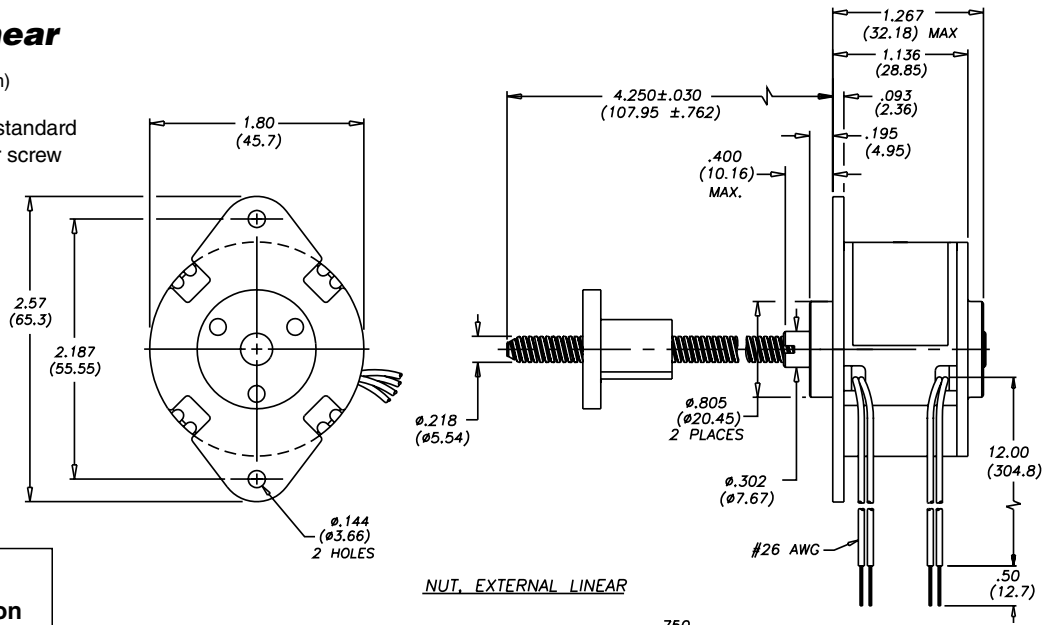
Up to 10-in (254 mm) standard screw lengths. Longer screw lengths are available.



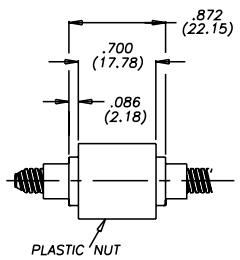
External Linear

Dimensions = inches (mm)

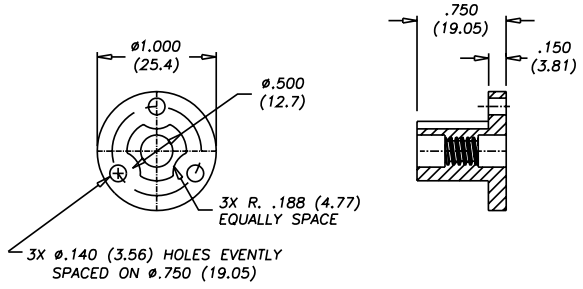
Up to 10-in (254 mm) standard screw lengths. Longer screw lengths are available.



Linear Series 46000 Nut Option

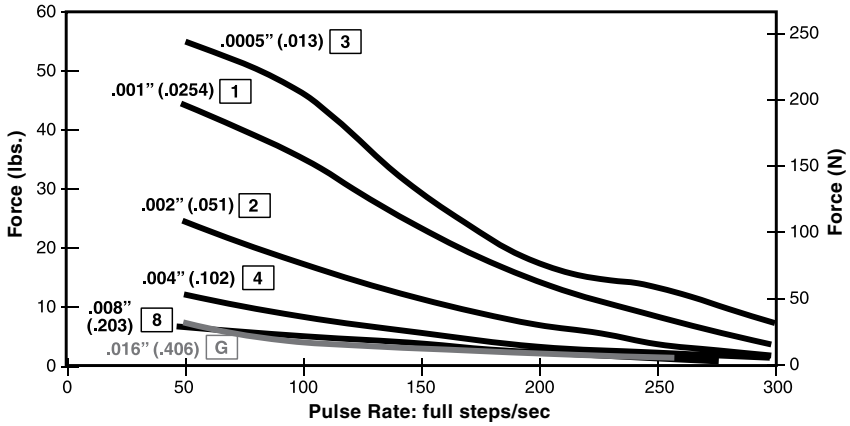


NUT, EXTERNAL LINEAR



FORCE vs. PULSE RATE

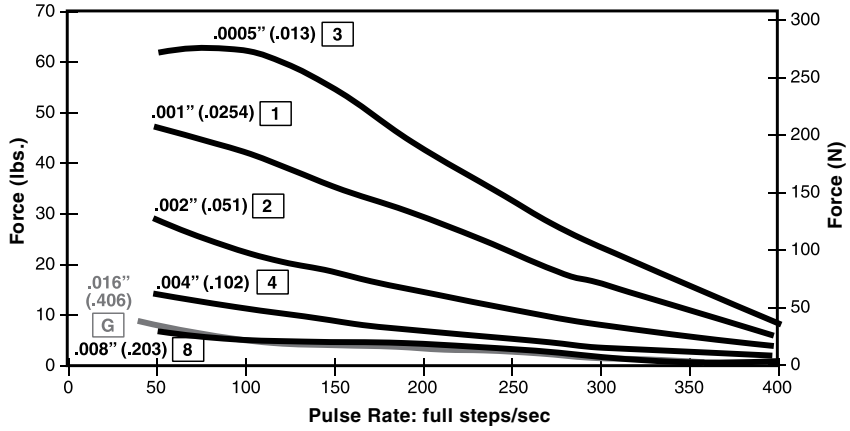
- **L/R Drive**
- **Bipolar**
- **100% Duty Cycle**



FORCE vs. PULSE RATE

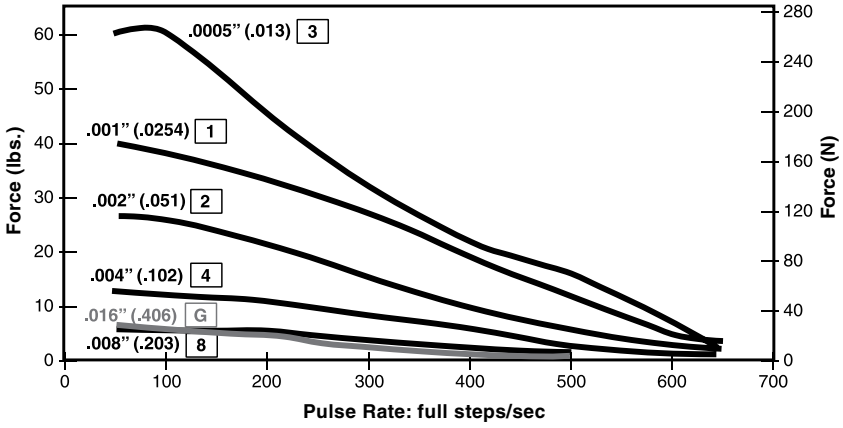
- **L/R Drive**
- **Bipolar**
- **25% Duty Cycle**

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



FORCE vs. PULSE RATE

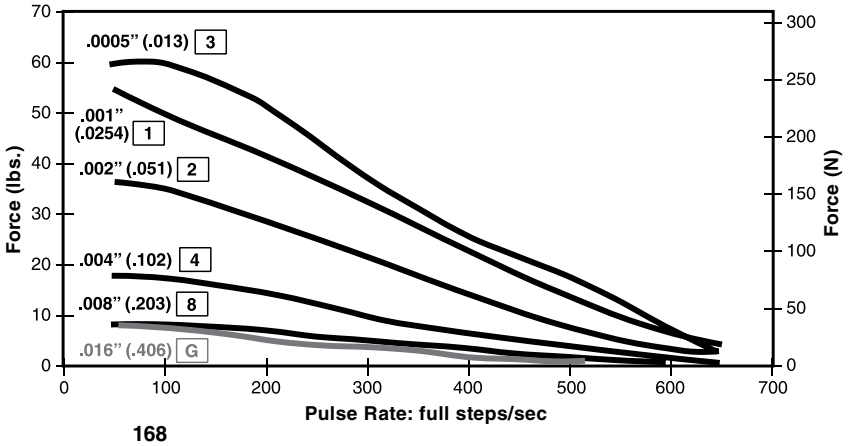
- **Chopper Drive**
- **Bipolar**
- **100% Duty Cycle**
- **8:1 Motor Coil to Drive Supply Voltage**



FORCE vs. PULSE RATE

- **Chopper Drive**
- **Bipolar**
- **25% Duty Cycle**
- **8:1 Motor Coil to Drive Supply Voltage**

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.

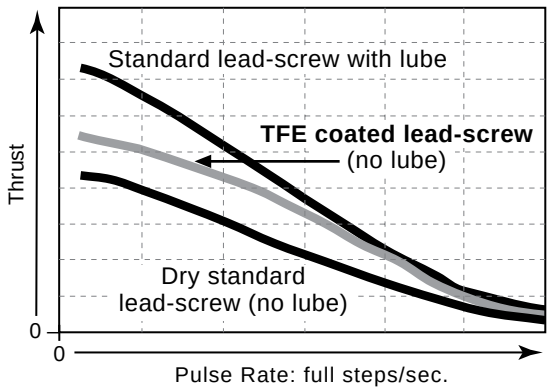
Ramping can increase the performance of a motor either by increasing the top speed or getting a heavier load accelerated up to speed faster. Also, deceleration can be used to stop the motor without overshoot.

TFE coated lead-screws for 46000 Series

46000 Series,
external linear

46000 series is also available with an optional, non-lubricated TFE coated lead-screw for 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

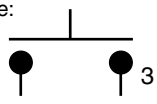
Haydon Kerk Motion Solutions, Inc. offers a line of stepping motors specially designed for high temperature environments. The motors are constructed using the proven techniques employed for Haydon® motors. Special materials which meet class F temperature ratings are used in construction. Specialized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

Home Position Switch for 46000 Series Can-Stacks

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 postions. 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.

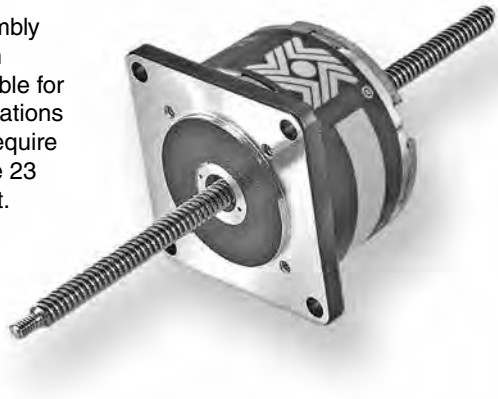
The switch allows device manufacturers the ability to monitor movements more precisely for greater control and improved Q.C. When ordering motors with the home position switch, the part number should be preceded by an "S". Activation force of 10 oz (2.78 N) required therefore may not be appropriate for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

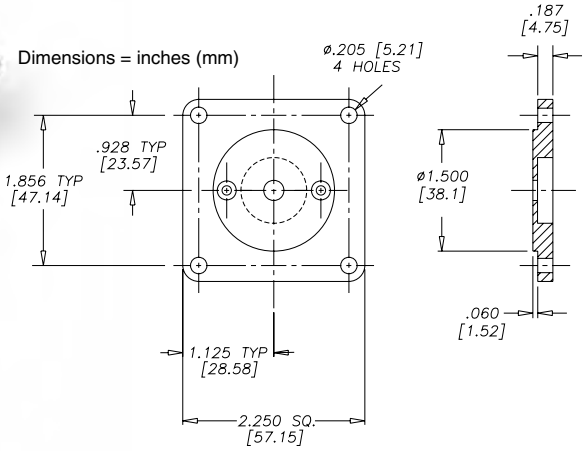
Specifications

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.





Can-Stack Rotary Stepper Motors

Haydon Kerk Motion Solutions, Inc. • www.haydonkerkpittman.com • Phone: 800 243 2715 • International: 203 756 7441

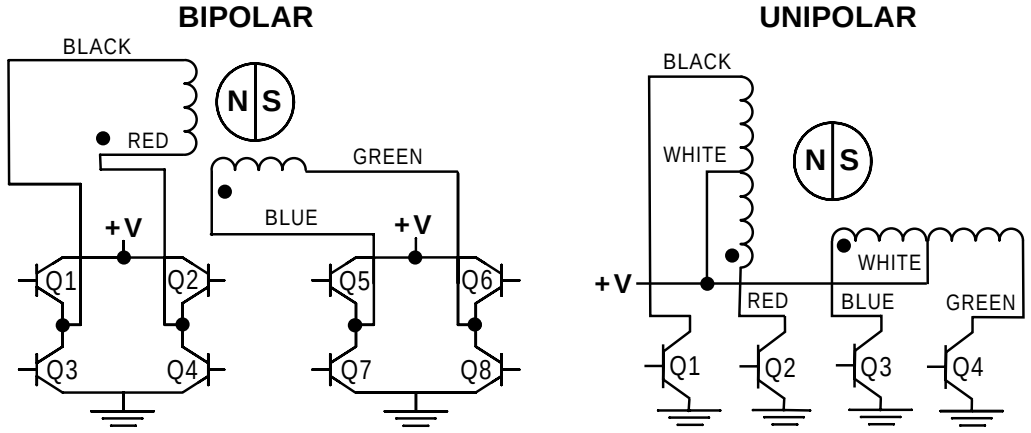
Haydon Kerk Motion Solutions, Inc. also offers rotary motors that are built to provide exceptionally high torque to size ratios.

By utilizing a patented enlarged rotor with low inductance coils, the motors provide superior torque and continuous, reliable high performance. At rated voltage, the 46 mm motor produces 16 oz.-in. of holding torque, the 36 mm motor produces 4.5 oz.-in., the 26 mm motor produces 1.8 oz.-in. and the 20 mm motor produces 0.65 oz.-in. Optional rare earth magnets may be specified for even higher torque. Bronze sleeve bearings are standard, ball bearings are also available.

Haydon Kerk Motion Solutions, Inc. has patented technology and the facilities to produce these motors in high volume. We provide rapid turn-around for prototypes and production orders. Custom designs and special engineering requirements such as special shaft diameters, lengths and mounting flanges are welcome.

Some typical applications for Haydon rotary motors include medical equipment, bar code scanning devices, printing equipment, laboratory instrumentation and other high torque, small space mechanisms.

*Rotary Stepper Motors: **Wiring***



*Rotary Stepper Motors: **Stepping Sequence***

Note: Half stepping is accomplished by inserting an off state between transitioning phases. Shaft rotation as viewed from the output shaft.

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

CW ↓ CCW ↑

Haydon® Rotary Motors Z20000 Series Sleeve or Ball Bearing economically designed rotary motors.

Ø 20mm (.79-in)
Sleeve Bearing
Z20000 Series

Ø 20mm (.79-in)
Ball Bearing
Z20000 Series

Specifications

Ø 20 mm (3/4 - .79 inch) Z Series Rotary Motor		
Wiring	**Bipolar**	
Part No. (Sleeve)*	Z20540-05	Z20540-12
Step angle	15°	
Winding voltage	5 VDC	12 VDC
Current (RMS)/phase	250 mA	100 mA
Resistance/phase	20 Ω	118 Ω
Inductance/phase	5.5 mH	32 mH
Hold torque	.65 oz-in. (.46 N-cm)	
Detent torque	.17 oz-in. (.12 N-cm)	
Power consumption	2.5 W	
Rotor Inertia	1.13 gcm^2	
Weight	.80 oz. (22.7 g)	
Insulation resistance	20 MΩ	
Insulation Class	Class B	

*For Ball Bearings add " –999" to the end of this number

Haydon Kerk Express℠
www.HaydonKerkExpress.com
Standard products available 24-hrs.

Identifying the rotary motor part number codes when ordering

Z	20	5	4	0	–	05	–	001

Prefix
Z = Economy Series

Series number designation
20 = 20000
(Series numbers represent approximate diameters of motor body)

Style
5 = 15°

Coils
4 = Bipolar

Code ID Resolution Travel/Step
0 = Rotary motor

Voltage
05 = 5 VDC
12 = 12VDC
Custom V available

Suffix
–999 = ball bearings
–001 = ball bearings for Z Series Rotary Stepper Motors
–000 = sleeve bearings

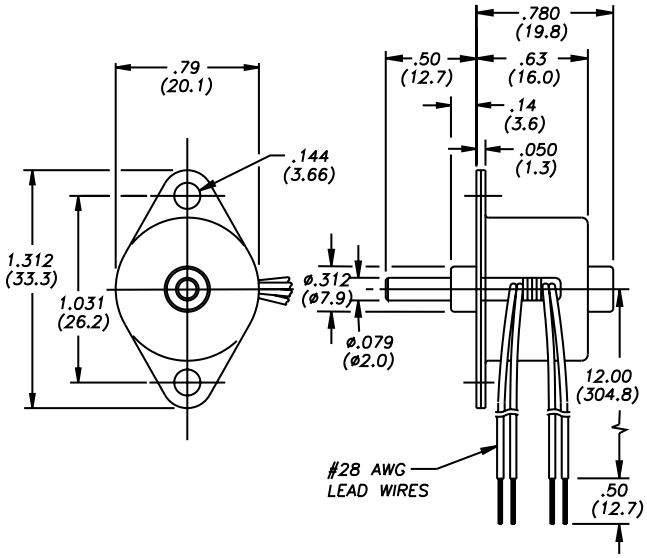
Suffix also represents:
–XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (–) as shown above. For assistance or order entry, call our engineering team at 203 756 7441.

Z20000 Series: Ø 20 mm (.79-in) Rotary Motors

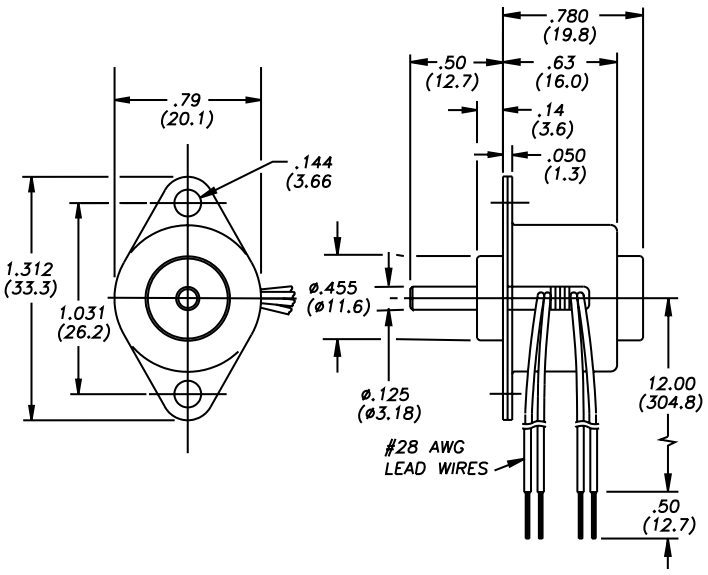
Sleeve Bearing Motor

Dimensions = inches (mm)



Ball Bearing Motor

Dimensions = inches (mm)

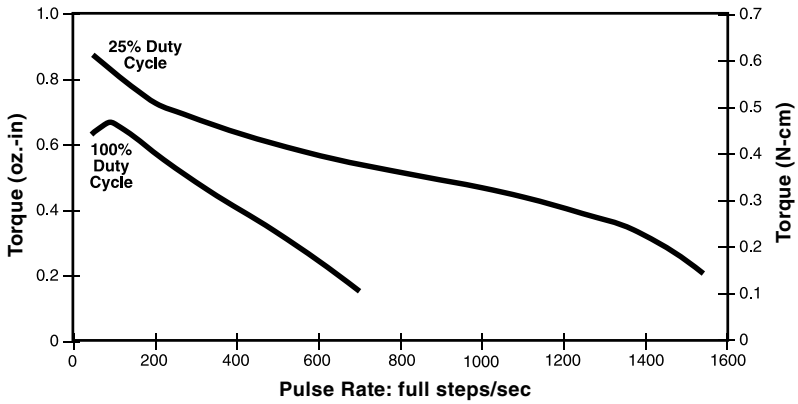


TORQUE vs. PULSE RATE

L/R Drive • Bipolar • 15% Step Angle

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

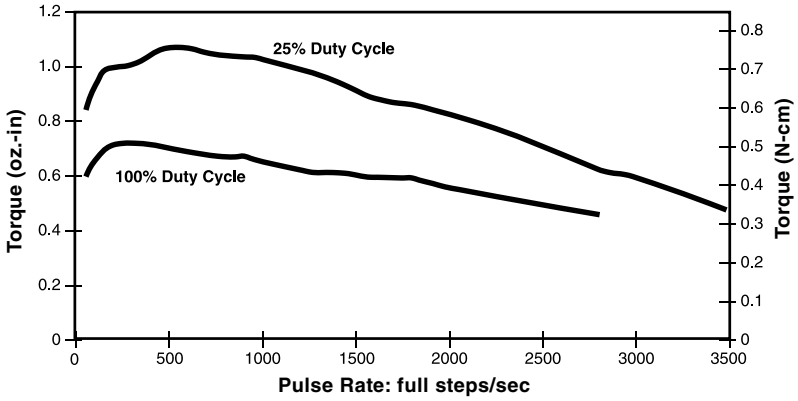
NOTE: All chopper drive curves were created with a 5 Volt motor and a 40 Volt power supply.



TORQUE vs. PULSE RATE

Chopper • Bipolar • 15% Step Angle • 8:1 Motor Coil to Drive Supply Voltage

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.



Haydon® Rotary Motors 26000 Series Sleeve or Ball Bearing designs

A HIGH TEMPERATURE option is also available for this motor. 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.

Specifications

Ø 26 mm (1-in) Rotary Motor				
Wiring	Bipolar			
Part No. (Sleeve)*	26440-05	26440-12	26540-05	26540-12
Step angle	7.5°		15°	
Winding voltage	5 VDC	12 VDC	5 VDC	12 VDC
Current (RMS)/phase	340 mA	140 mA	340 mA	140 mA
Resistance/phase	14.7 Ω	84 Ω	14.7 Ω	84 Ω
Inductance/phase	8.5 mH	55 mH	6.7 mH	44 mH
Hold torque	1.6 oz-in. (1.13 N-cm)		1.3 oz-in. (.92 N-cm)	
Detent torque	.12 oz-in. (.09 N-cm)		.14 oz-in. (.10 N-cm)	
Power consumption	3.4 W			
Rotor Inertia	1.2 gcm^2			
Weight	1 oz. (28 g)			
Insulation resistance	20 MΩ			
Insulation Class	Class B			

Ø 26 mm (1-in) Rotary Motor			
Unipolar			
26460-05	26460-12	26560-05	26560-12
7.5°		15°	
5 VDC	12 VDC	5 VDC	12 VDC
340 mA	140 mA	340 mA	140 mA
14.7 Ω	84 Ω	14.7 Ω	84 Ω
4.3 mH	24 mH	3.4 mH	19 mH
1.2 oz-in (.85 N-cm)		.9 oz-in. (.64 N-cm)	
.12 oz-in (.09 N-cm)		.14 oz-in. (.10 N-cm)	
3.4 W			
1.2 gcm^2			
1 oz. (28 g)			
20 MΩ			
Class B			

*For Ball Bearings add " –999" to the end of this number

Haydon kerk Express℠
www.HaydonKerkExpress.com
Standard products available 24-hrs.

Identifying the rotary motor part number codes when ordering

	26	4	4	0	–	05	–	999

Prefix (include only when using the following)
T = High Temperature
R = Rare Earth Magnet

Series number designation
26 = 26000
(Series numbers represent approximate diameters of motor body)

Style
4 = 7.5°
5 = 15°

Coils
4 = Bipolar (4 wire)
6 = Unipolar (6 wire)

Code ID Resolution Travel/Step
0 = Rotary motor

Voltage
05 = 5 VDC
12 = 12VDC
Custom V available

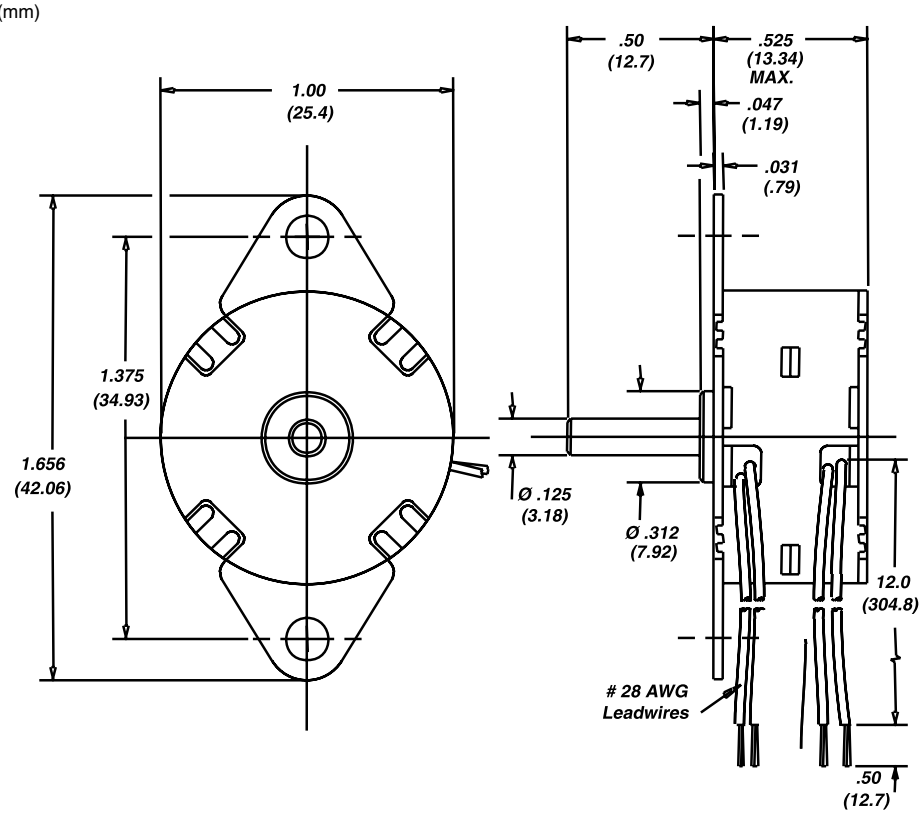
Suffix
–999 = ball bearings
–001 = ball bearings for Z Series Rotary Stepper Motors
–000 = sleeve bearings
Suffix also represents:
–XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

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 Motion Solutions, Inc. • www.haydonkerkpittman.com • Phone: 800 243 2715 • International: 203 756 7441

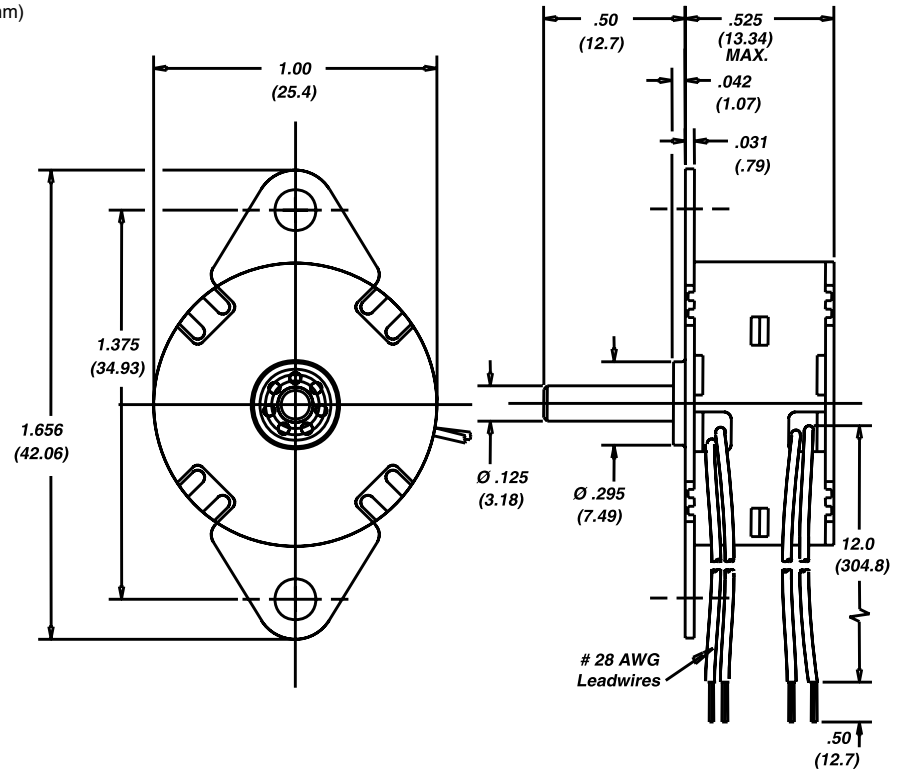
Dimensional Drawings: Sleeve Bearing

Dimensions = inches (mm)



Dimensional Drawings: Ball Bearing

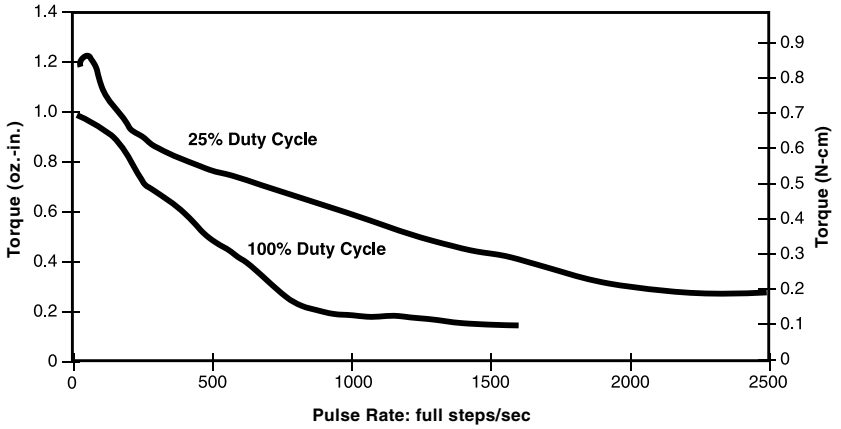
Dimensions = inches (mm)



TORQUE vs. PULSE RATE

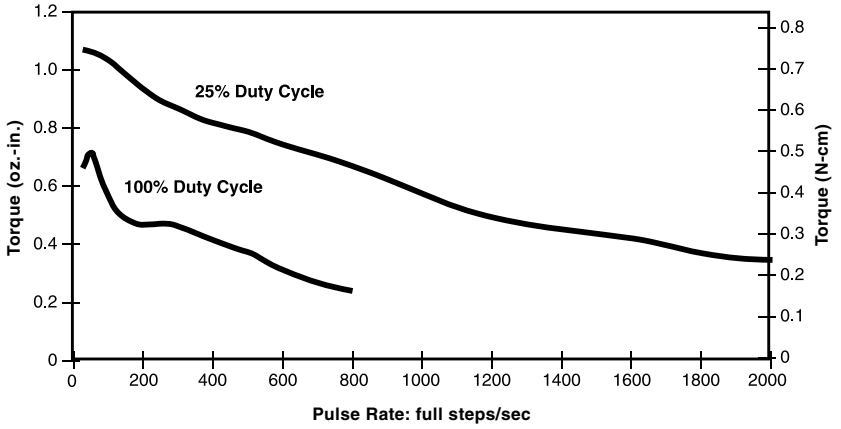
- L/R Drive
- Bipolar
- 7.5° Step Angle

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



TORQUE vs. PULSE RATE

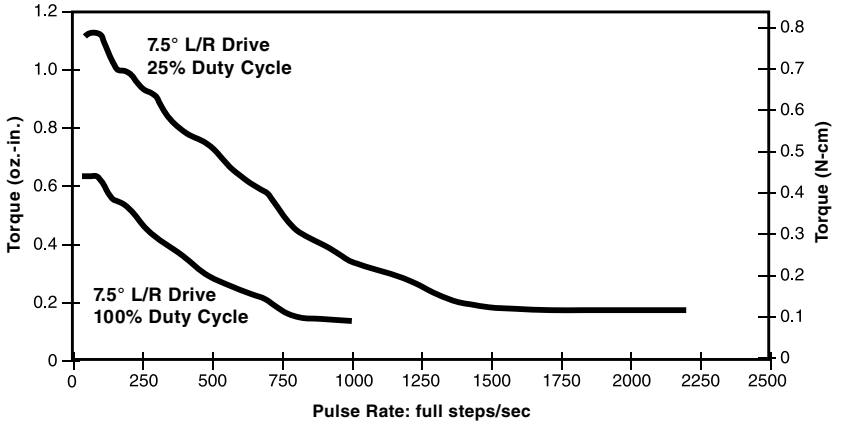
- L/R Drive
- Bipolar
- 15° Step Angle



TORQUE vs. PULSE RATE

- L/R Drive
- Unipolar
- 7.5° Step Angle

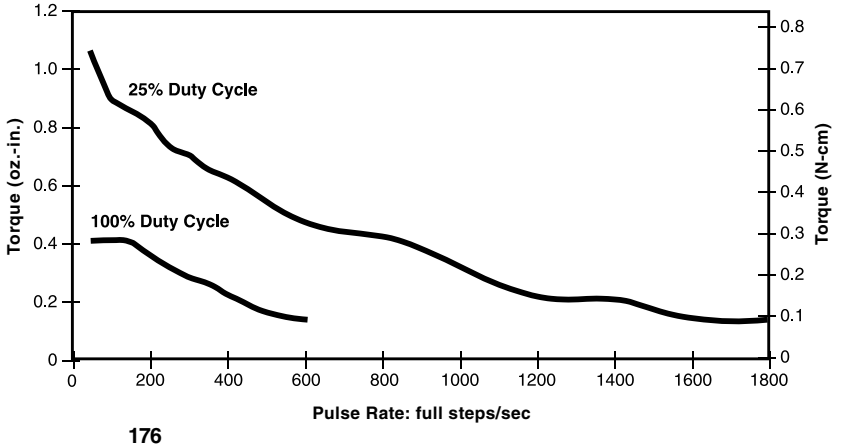
25% duty cycle is obtained by a special winding or running a standard motor at double the rated voltage.



TORQUE vs. PULSE RATE

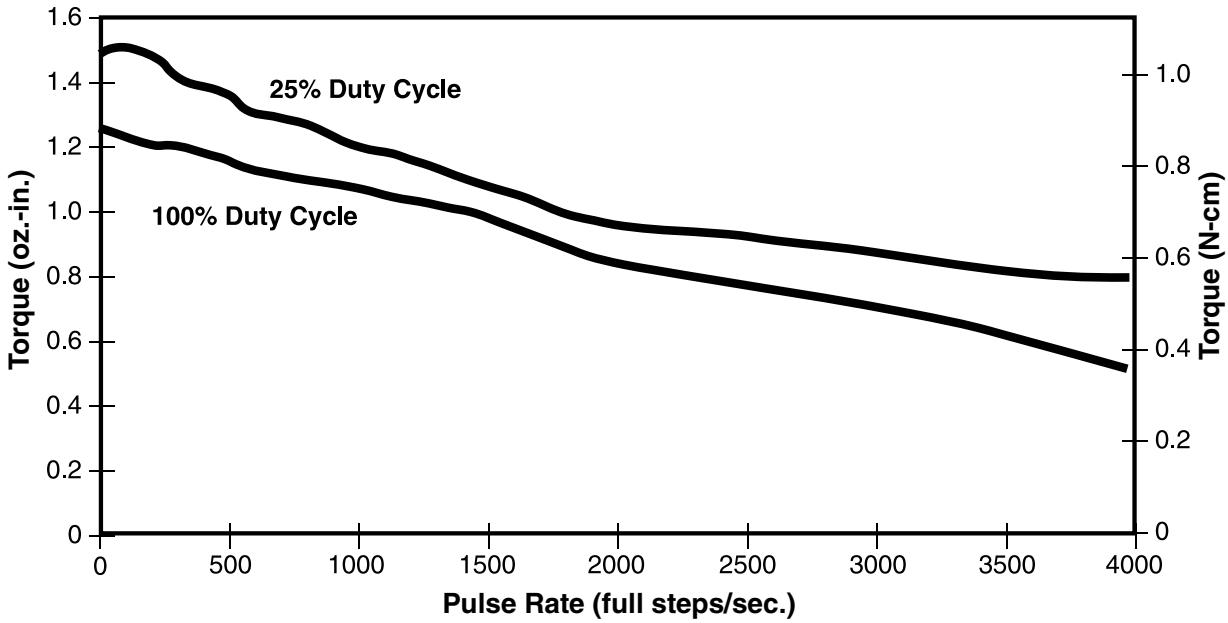
- L/R Drive
- Unipolar
- 15° Step Angle

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.



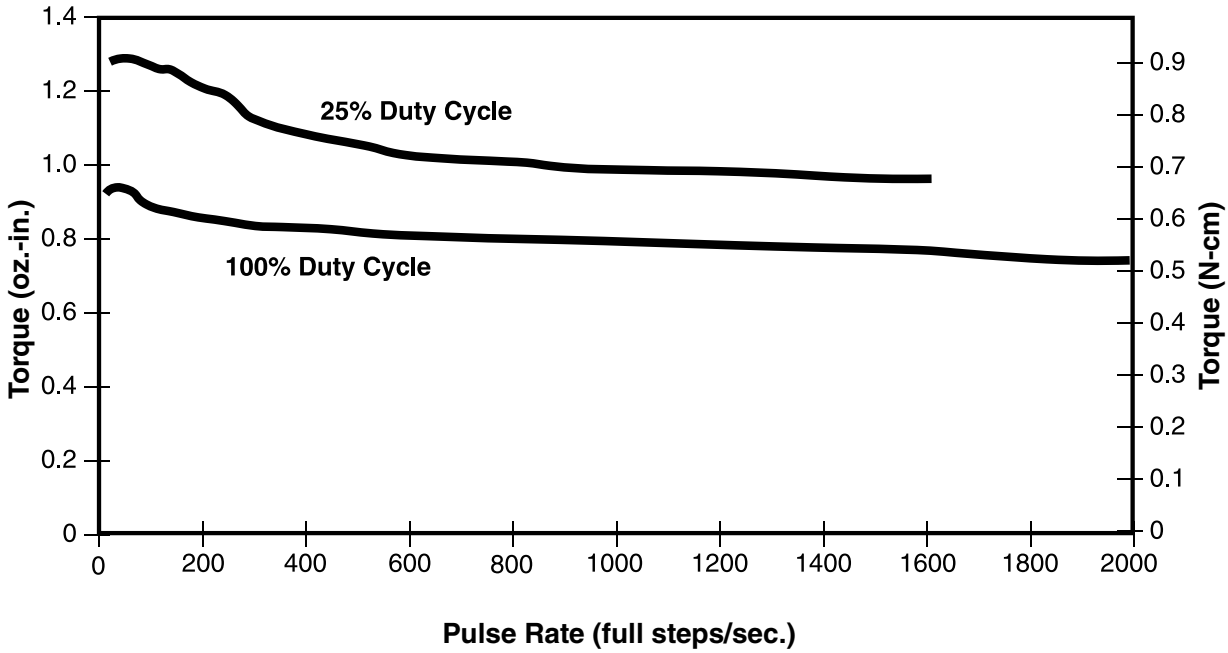
TORQUE vs. PULSE RATE

Chopper Drive • Bipolar • 7.5% Step Angle • 8:1 Motor Coil to Drive Supply Voltage



TORQUE vs. PULSE RATE

Chopper Drive • Bipolar • 15% Step Angle • 8:1 Motor Coil to Drive Supply Voltage



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

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.

Haydon® Rotary Motors Z26000 Series Sleeve or Ball Bearing designs for high volume production

Ø 26mm (1-in) Ball Bearing Z26000 Series

Ø 26mm (1-in) Sleeve Bearing Z26000 Series

Specifications

Ø 26 mm (1-in) Z Series Rotary Motor				
Wiring	Bipolar			
Part No. (Sleeve)*	Z26440-05	Z26440-12	Z26540-05	Z26540-12
Step angle	7.5°		15°	
Winding voltage	5 VDC	12 VDC	5 VDC	12 VDC
Current (RMS)/phase	340 mA	140 mA	340 mA	140 mA
Resistance/phase	14.7 Ω	84 Ω	14.7 Ω	84 Ω
Inductance/phase	8.5 mH	55 mH	6.7 mH	44 mH
Hold torque	1.8 oz-in. (1.27 N-cm)		1.5 oz-in. (1.06 N-cm)	
Detent torque	.25 oz-in (.18 N-cm)		.35 oz-in. (.25 N-cm)	
Power consumption	3.4 W			
Rotor Inertia	1.40 gcm^2			
Weight	1.15 oz. (32.6 g)			
Insulation resistance	20 MΩ			
Insulation Class	Class B			

Ø 26 mm (1-in) Z Series Rotary Motor			
Unipolar			
Z26460-05	Z26460-12	Z26560-05	Z26560-12
7.5°		15°	
5 VDC	12 VDC	5 VDC	12 VDC
340 mA	140 mA	340 mA	140 mA
14.7 Ω	84 Ω	14.7 Ω	84 Ω
4.3 mH	24 mH	3.4 mH	19 mH
1.3 oz-in. (.92 N-cm)		1 oz-in. (.71 N-cm)	
.25 oz-in (.18 N-cm)		.35 oz-in (.25 N-cm)	
3.4 W			
1.40 gcm^2			
1.15 oz. (32.6 g)			
20 MΩ			
Class B			

*For Ball Bearings add " –999" to the end of this number

Identifying the rotary motor part number codes when ordering

Haydon kerk Express℠ www.HaydonKerkExpress.com
Standard products available 24-hrs.

Z	26	4	4	0	–	05	–	001

Prefix
Z = Economy Series

Series number designation
26 = 26000
(Series numbers represent approximate diameters of motor body)

Style
4 = 7.5°
5 = 15°

Coils
4 = Bipolar (4 wire)
6 = Unipolar (6 wire)

Code ID Resolution Travel/Step
0 = Rotary motor

Voltage
05 = 5 VDC
12 = 12VDC
Custom V available

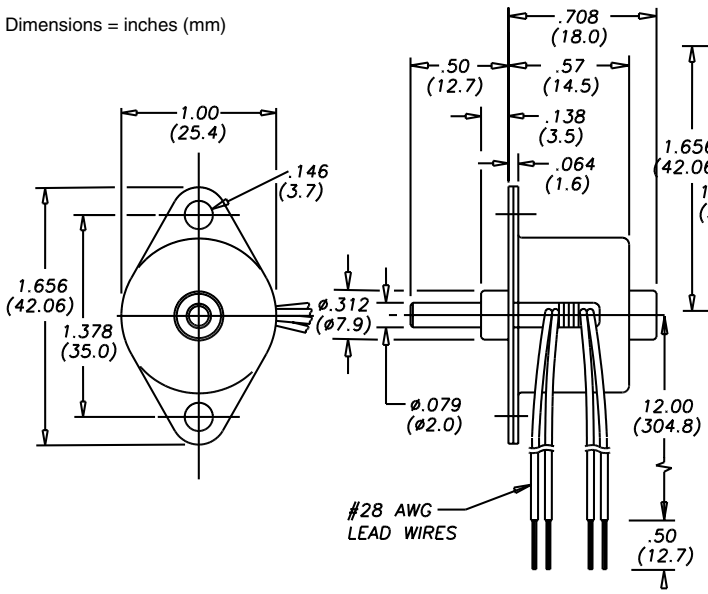
Suffix
–999 = ball bearings
–001 = ball bearings for Z Series Rotary Stepper Motors
–000 = sleeve bearings
Suffix also represents:
–XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (–) as shown above. For assistance or order entry, call our engineering team at 203 756 7441.

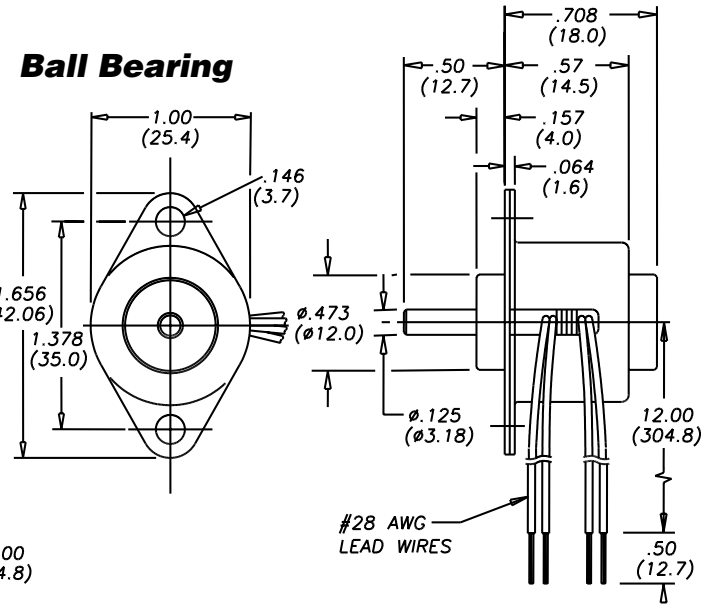
Dimensional Drawings: Z26000 Series

Sleeve Bearing

Dimensions = inches (mm)



Ball Bearing



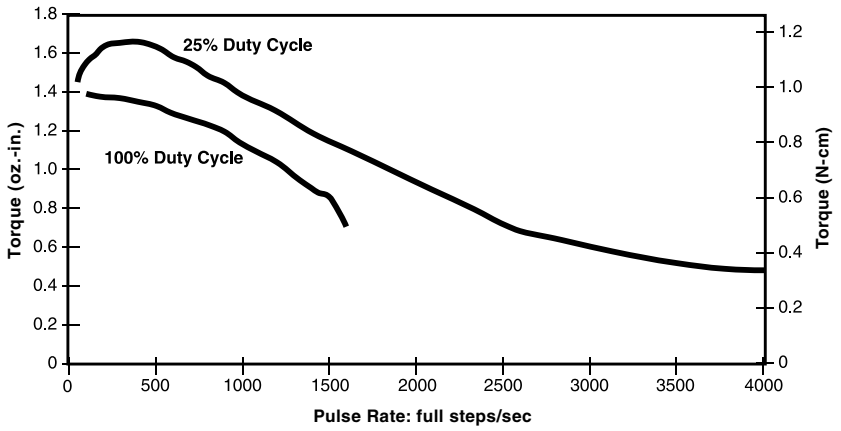
Z26000 ROTARY SERIES: Chopper Drive Performance Curves

TORQUE vs. PULSE RATE

- **Chopper Drive**
- **Bipolar**
- **7.5° Step Angle**
- **8:1 Motor Coil to Drive Supply Voltage**

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

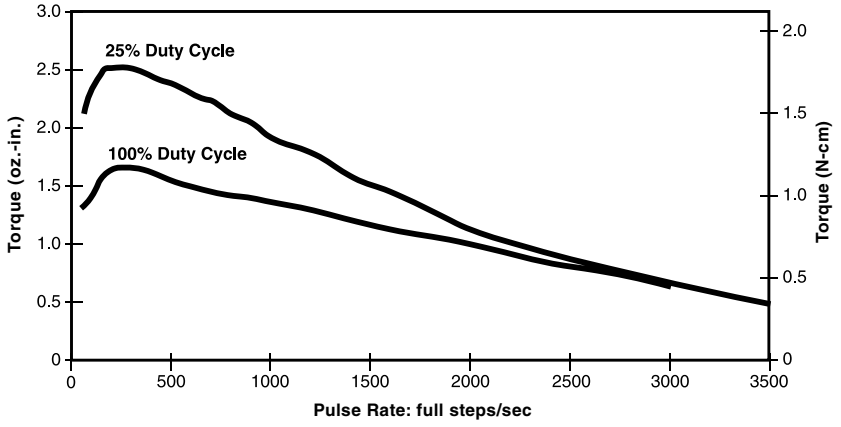
NOTE: All chopper drive curves were created with a 5 Volt motor and a 40 Volt power supply.



TORQUE vs. PULSE RATE

- **Chopper Drive**
- **Bipolar**
- **15° Step Angle**
- **8:1 Motor Coil to Drive Supply Voltage**

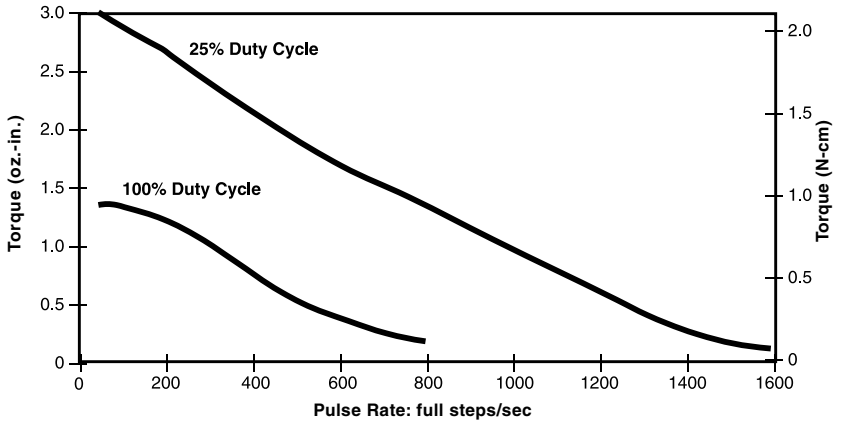
NOTE: Ramping can increase the performance of a motor either by increasing the top speed or getting a heavier load accelerated up to speed faster. Also, deceleration can be used to stop the motor without overshoot.



TORQUE vs. PULSE RATE

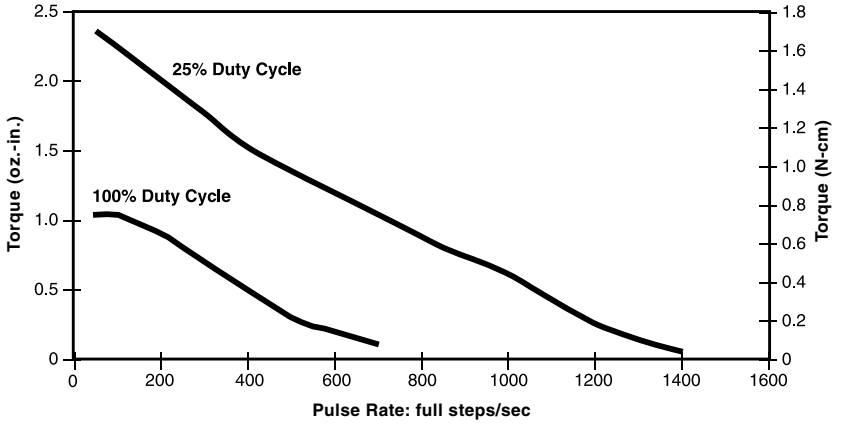
- L/R Drive
- Bipolar
- 7.5° Step Angle

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



TORQUE vs. PULSE RATE

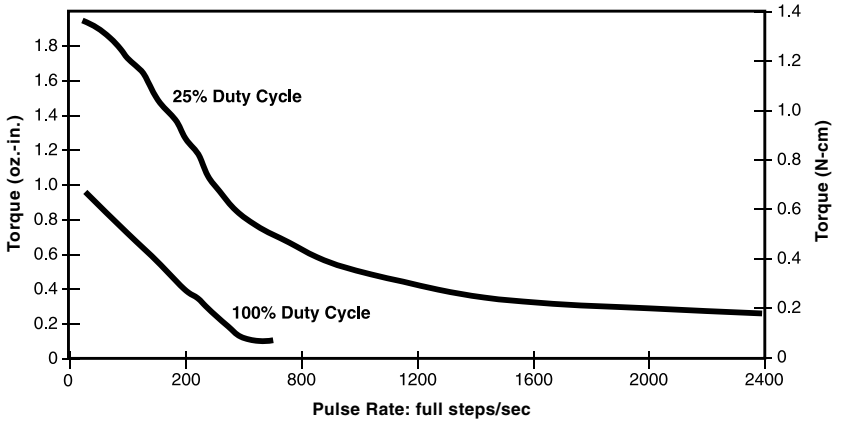
- L/R Drive
- Bipolar
- 15° Step Angle



TORQUE vs. PULSE RATE

- L/R Drive
- Unipolar
- 7.5° Step Angle

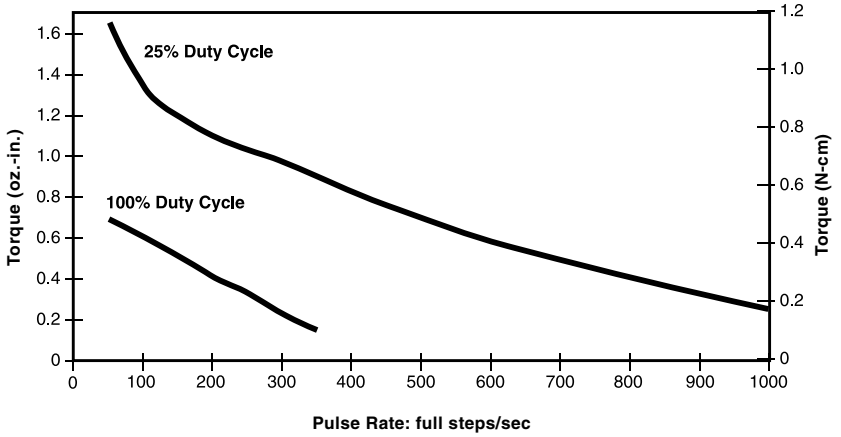
25% duty cycle is obtained by a special winding or running a standard motor at double the rated voltage.



TORQUE vs. PULSE RATE

- L/R Drive
- Unipolar
- 15° Step Angle

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.



Haydon® Rotary Motors 36000 Series Sleeve or Ball Bearing designs

A HIGH TEMPERATURE option is also available for this motor. 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.

Ø 36mm (1.4-in) Ball Bearing 36000 Series

Ø 36mm (1.4-in) Sleeve Bearing 36000 Series

Specifications

Ø 36 mm (1.4-in) Rotary Motor				
Wiring	Bipolar			
Part No. (Sleeve)*	36440-05	36440-12	36540-05	36540-12
Step angle	7.5°		15°	
Winding voltage	5 VDC	12 VDC	5 VDC	12 VDC
Current (RMS)/phase	460 mA	190 mA	460 mA	190 mA
Resistance/phase	11 Ω	63 Ω	11 Ω	63 Ω
Inductance/phase	7.2 mH	45 mH	5.5 mH	35 mH
Hold torque	4.5 oz-in. (3.18 N-cm)		2.9 oz-in. (2.05 N-cm)	
Detent torque	.28 oz-in. (.20 N-cm)		.37 oz-in. (.26 N-cm)	
Power consumption	4.6 W			
Rotor Inertia	10.5 gcm^2			
Weight	2.5 oz. (70 g)			
Insulation resistance	20 MΩ			
Insulation Class	Class B			

Ø 36 mm (1.4-in) Rotary Motor			
Unipolar			
36460-05	36460-12	36560-05	36560-12
7.5°		15°	
5 VDC	12 VDC	5 VDC	12 VDC
460 mA	190 mA	460 mA	190 mA
11 Ω	63 Ω	11 Ω	63 Ω
3.8 mH	19 mH	3.0 mH	15 mH
3.0 oz-in. (2.12 N-cm)		2.0 oz-in. (1.41 N-cm)	
.28 oz-in. (.20 N-cm)		.37 oz-in. (.26 N-cm)	
4.6 W			
10.5 gcm^2			
2.5 oz. (70 g)			
20 MΩ			
Class B			

*For Ball Bearings add " –999" to the end of this number

Haydon kerk Motion Solutions Express℠
www.HaydonKerkExpress.com
Standard products available 24-hrs.

Identifying the rotary motor part number codes when ordering

E – **36** – **5** – **4** – **0** – **12** – **000**

Prefix (include only when using the following)
- **T** = High Temperature
- **R** = Rare Earth Magnet

Series number designation
36 = 36000
(Series numbers represent approximate diameters of motor body)

Style
- **4** = 7.5°
- **5** = 15°

Coils
- **4** = Bipolar (4 wire)
- **6** = Unipolar (6 wire)

Code ID Resolution Travel/Step
- **0** = Rotary motor

Voltage
- **05** = 5 VDC
- **12** = 12VDC

Custom V available

Suffix
- **–999** = ball bearings
- **–001** = ball bearings for Z Series Rotary Stepper Motors
- **–000** = sleeve bearings

Suffix also represents:
–*XXX* = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

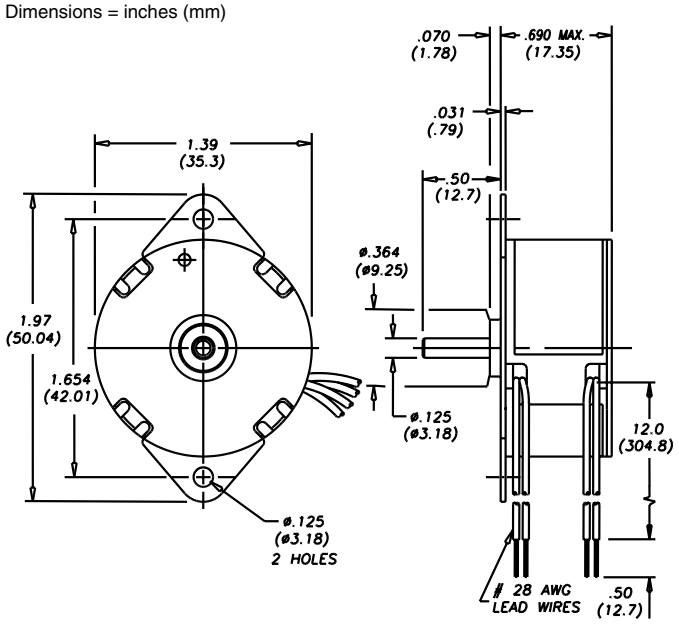
NOTE: Dashes must be included in Part Number (–) as shown above. For assistance or order entry, call our engineering team at 203 756 7441.

Haydon Kerk Motion Solutions, Inc. • www.haydonkerkpittman.com • Phone: 800 243 2715 • International: 203 756 7441

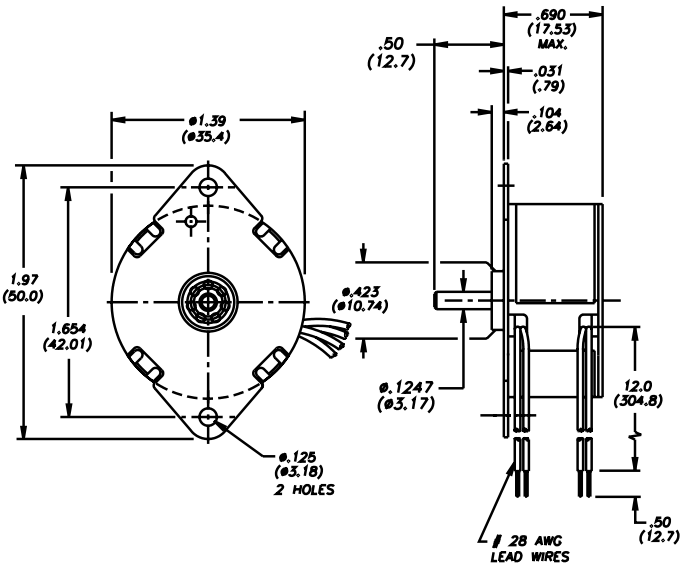
Dimensional Drawings: 36000 Series

Sleeve Bearing

Dimensions = inches (mm)



Ball Bearing



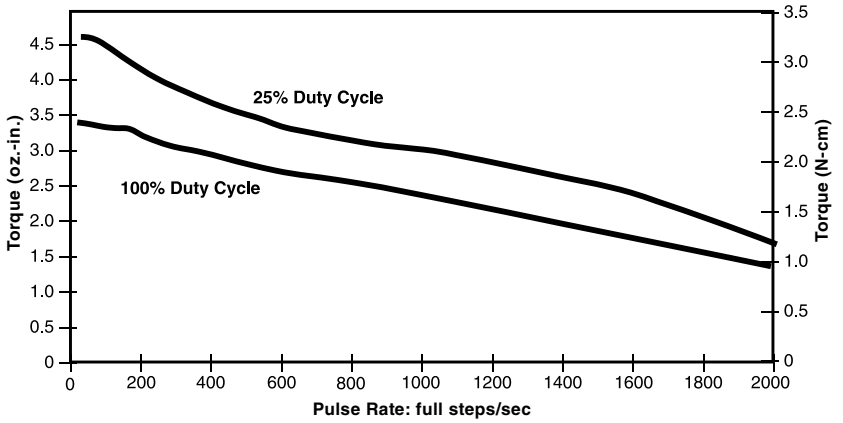
36000 ROTARY SERIES: Chopper Drive Performance Curves

TORQUE vs. PULSE RATE

- **Chopper Drive**
- **Bipolar**
- **7.5° Step Angle**
- **8:1 Motor Coil to Drive Supply Voltage**

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

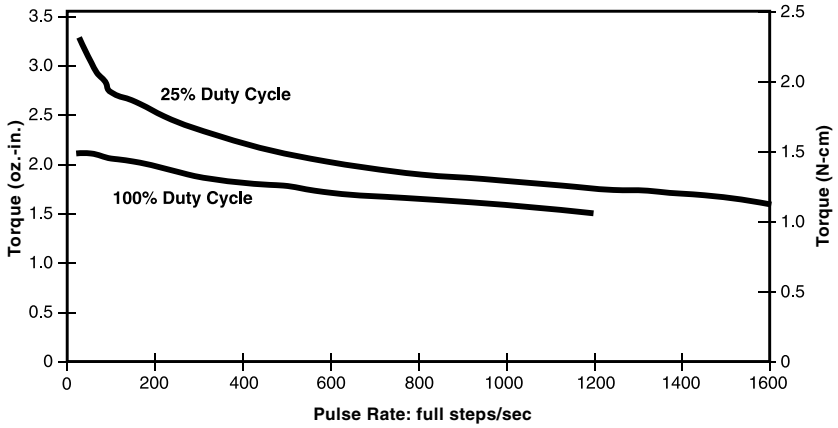
NOTE: All chopper drive curves were created with a 5 Volt motor and a 40 Volt power supply.



TORQUE vs. PULSE RATE

- **Chopper Drive**
- **Bipolar**
- **15° Step Angle**
- **8:1 Motor Coil to Drive Supply Voltage**

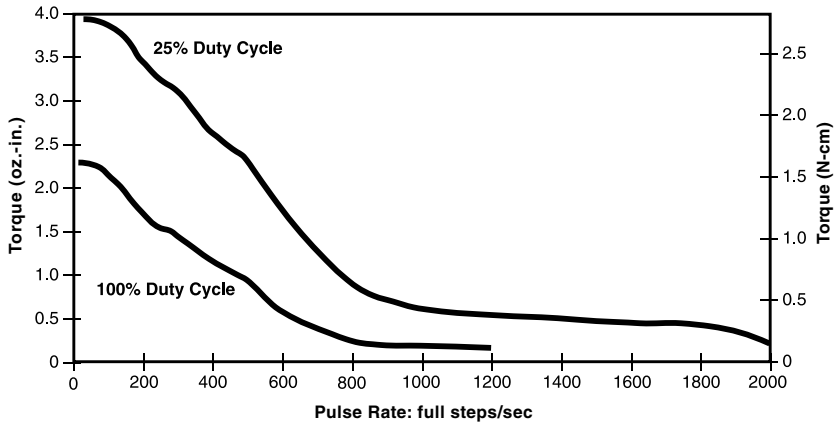
NOTE: Ramping can increase the performance of a motor either by increasing the top speed or getting a heavier load accelerated up to speed faster. Also, deceleration can be used to stop the motor without overshoot.



TORQUE vs. PULSE RATE

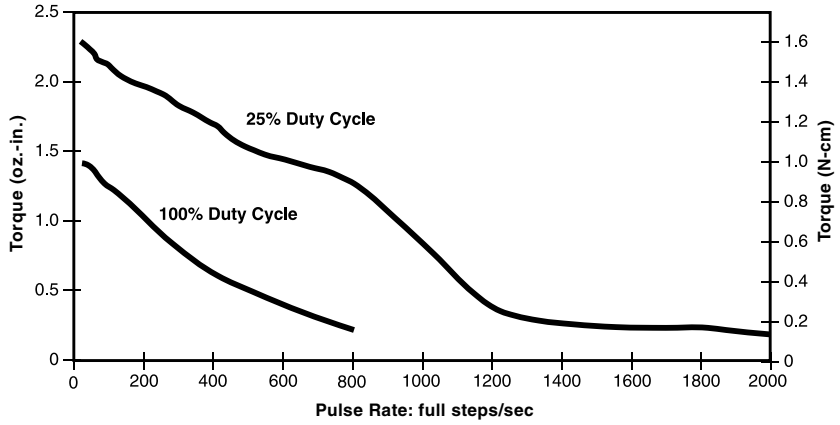
- L/R Drive
- Bipolar
- 7.5° Step Angle

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



TORQUE vs. PULSE RATE

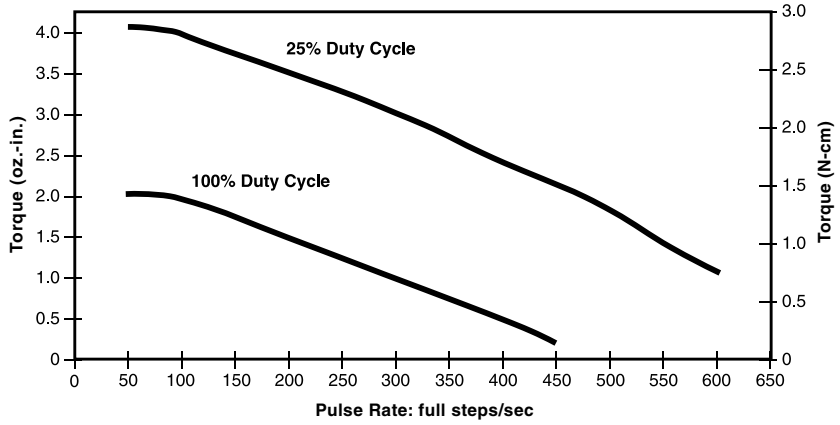
- L/R Drive
- Bipolar
- 15° Step Angle



TORQUE vs. PULSE RATE

- L/R Drive
- Unipolar
- 7.5° Step Angle

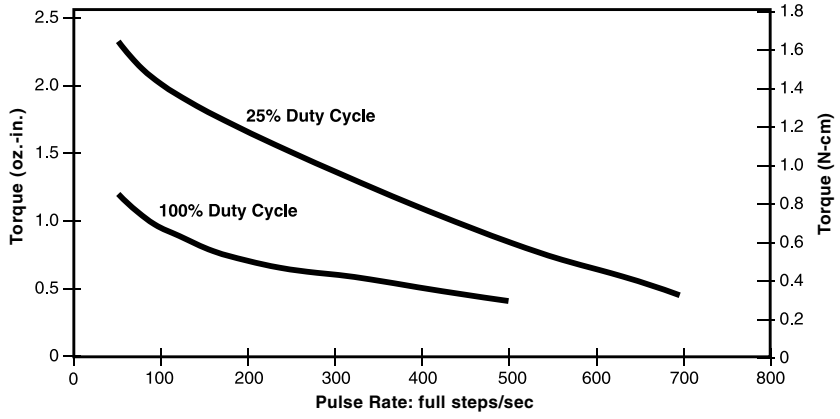
25% duty cycle is obtained by a special winding or running a standard motor at double the rated voltage.



TORQUE vs. PULSE RATE

- L/R Drive
- Unipolar
- 15° Step Angle

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.



Haydon® Rotary Motors 46000 Series Sleeve or Ball Bearing designs

Our most powerful rotary motor

A HIGH TEMPERATURE option is also available for this motor. 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.

Ø 46mm (1.8-in) Ball Bearing 46000 Series

Ø 46mm (1.8-in) Sleeve Bearing 46000 Series

Specifications

Ø 46 mm (1.8-in) Rotary Motor				
Wiring	Bipolar			
Part No. (Sleeve)*	46440-05	46440-12	46540-05	46540-12
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	9.0 mH	52 mH	7.1 mH	39 mH
Hold torque	16 oz-in. (11.30 N-cm)		8.5 oz-in. (6.00 N-cm)	
Detent torque	.90 oz-in. (.64 N-cm)		1.0 oz-in. (.71 N-cm)	
Power consumption	10 W			
Rotor Inertia	25.0 gcm^2			
Weight	7.8 oz. (220 g)			
Insulation resistance	20 MΩ			
Insulation Class	Class B			

Ø 46 mm (1.8-in) Rotary Motor			
Unipolar			
46460-05	46460-12	46560-05	46560-12
7.5°		15°	
5 VDC	12 VDC	5 VDC	12 VDC
1.0 A	.41 A	1.0 A	.41 A
5 Ω	29 Ω	5 Ω	29 Ω
4.5 mH	26 mH	3.5 mH	20 mH
13.0 oz-in. (9.18 N-cm)		6.0 oz-in. (4.24 N-cm)	
.90 oz-in (.64 N-cm)		1.0 oz-in. (.71 N-cm)	
10 W			
25 gcm^2			
7.8 oz. (220 g)			
20 MΩ			
Class B			

*For Ball Bearings add " –999" to the end of this number

Haydon Kerk Express℠
www.HaydonKerkExpress.com
Standard products available 24-hrs.

Identifying the rotary motor part number codes when ordering

T – **46** – **4** – **4** – **0** – **12** – **999**

Prefix (include only when using the following)
- **T** = High Temperature
- **R** = Rare Earth Magnet

Series number designation
36 = 36000
(Series numbers represent approximate diameters of motor body)

Style
- **4** = 7.5°
- **5** = 15°

Coils
- **4** = Bipolar (4 wire)
- **6** = Unipolar (6 wire)

Code ID Resolution Travel/Step
- **0** = Rotary motor

Voltage
- **05** = 5 VDC
- **12** = 12VDC

Custom V available

Suffix
- **–999** = ball bearings
- **–001** = ball bearings for Z Series Rotary Stepper Motors
- **–000** = sleeve bearings

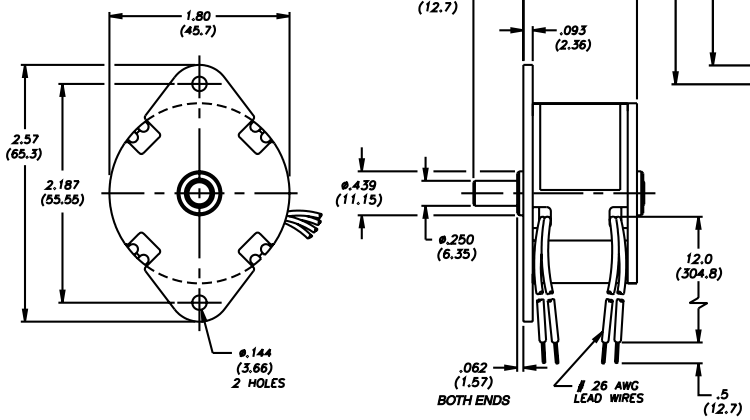
Suffix also represents:
–*XXX* = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (–) as shown above. For assistance or order entry, call our engineering team at 203 756 7441.

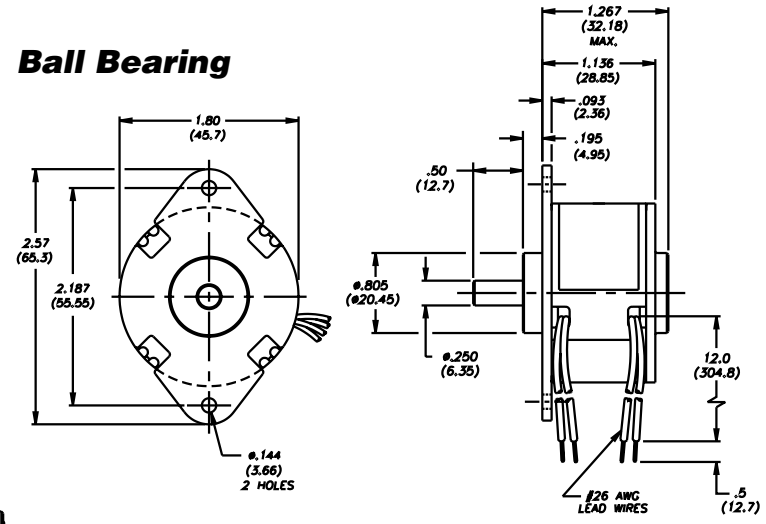
Dimensional Drawings:

Sleeve Bearing

Dimensions = inches (mm)



Ball Bearing



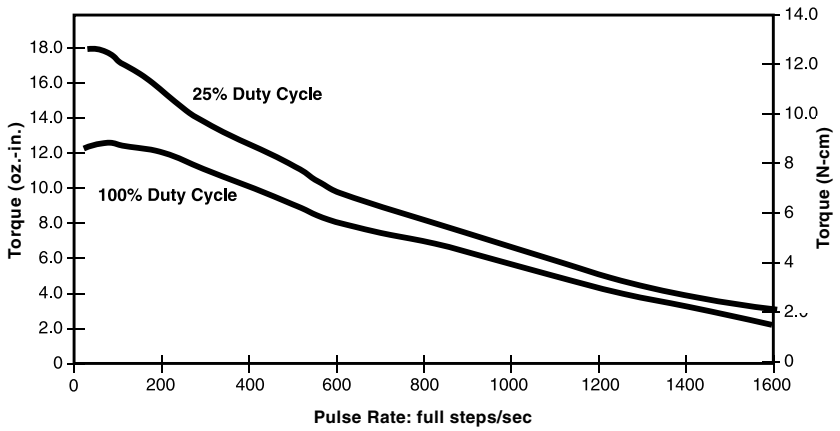
46000 ROTARY SERIES: Chopper Drive Performance Curves

TORQUE vs. PULSE RATE

- **Chopper Drive**
- **Bipolar**
- **7.5° Step Angle**
- **8:1 Motor Coil to Drive Supply Voltage**

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

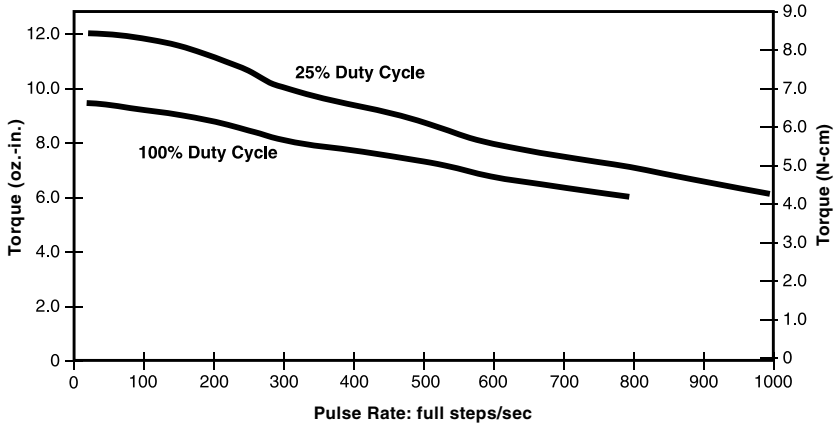
NOTE: All chopper drive curves were created with a 5 Volt motor and a 40 Volt power supply.



TORQUE vs. PULSE RATE

- **Chopper Drive**
- **Bipolar**
- **15° Step Angle**
- **8:1 Motor Coil to Drive Supply 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.



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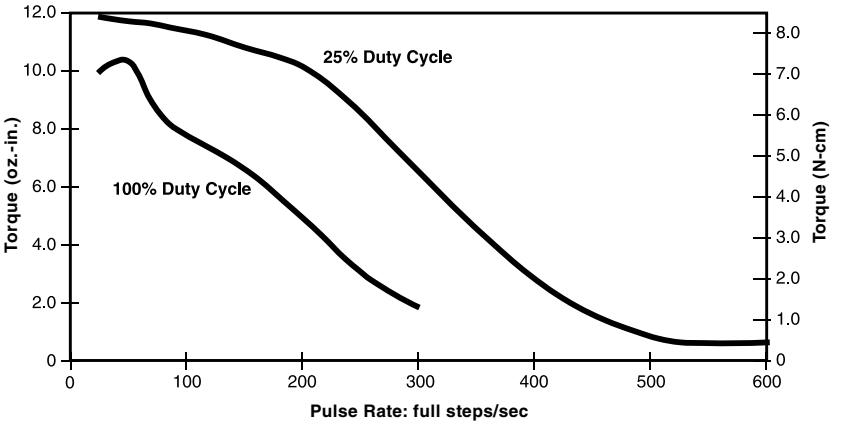
TORQUE vs. PULSE RATE

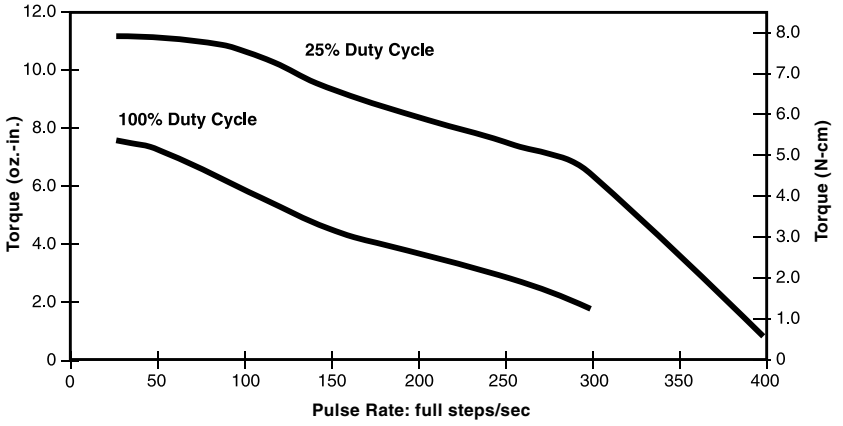
- L/R Drive
- Bipolar
- 7.5° Step Angle

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



TORQUE vs. PULSE RATE

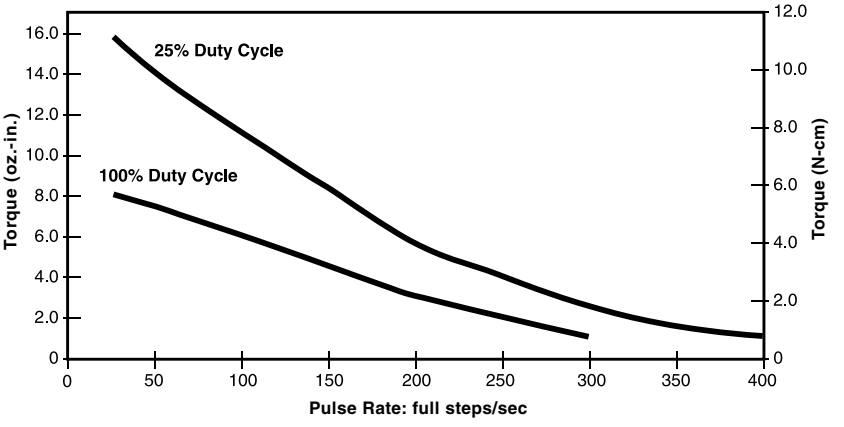
- L/R Drive
- Bipolar
- 15° Step Angle



TORQUE vs. PULSE RATE

- L/R Drive
- Unipolar
- 7.5° Step Angle

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



TORQUE vs. PULSE RATE

- L/R Drive
- Unipolar
- 15° Step Angle

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.