Can-Stack Actuators

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

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

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

The highest force of any similar size linear actuator stepper motor

Multiple versions available

- Captive
- Non-Captive
- External Linear



Ø20mm (.79-in) External Linear

Ø20mm (.79-in) Captive

Specifications

	Ø 20 mm (.79-in) Motor					
	Captive	1944 –	- †	1954 –	- †	
Part No.	Non-Captive	1934 –	- †	1984 –	- †	
	External Linear*	E1944 –	- †	E1954 –	- †	
Wiring			Bip	olar		
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	
Resist	ance/phase	14.0 Ω	74.5 Ω	14.8 Ω	85.5 Ω	
Induct	ance/phase	6.24 mH	31.2 mH	6.84 mH	37.8 mH	
Power	Power Consumption 3.38 W					
Insul	ation Class	Class B				
١	Veight	1.24 oz (35 g)				
Insulatio	on Resistance		20	MΩ		

Lin	Order		
step	0000 I.D.		
7.5°	0.0005	0.013	3
	0.001	0.0254	1
7 tilgio	0.002	0.051	2
15° Angle	0.001	0.0254	1
	0.002	0.051	2
7 trigio	0.004	0.102	4

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

[†]Part numbering information on page 147.

Captive Lead Screw

Dimensions = (mm) inches





Non-Captive Lead Screw





External Linear



Connector



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

FORCE vs. PULSE RATE

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

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

FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 100% Duty Cycle

FORCE vs. PULSE RATE

- Chopper Drive
- Bipolar
- 25% Duty Cycle

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

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

Can-Stacks: Wiring

Can-Stacks: Stepping Sequence

Bipolar	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8	
Step					
1	ON	OFF	ON	OFF	
2	OFF	ON	ON	OFF	CCW
3	OFF	ON	OFF	ON	RACT
4	ON	OFF	OFF	ON	E
1	ON	OFF	ON	OFF	
	Bipolar Step 1 2 3 4 1	BipolarQ2-Q3Step11ON2OFF3OFF4ON1ON	Bipolar Q2-Q3 Q1-Q4 Step 1 ON OFF 2 OFF ON 3 OFF ON 4 ON OFF 1 ON OFF	Bipolar Q2-Q3 Q1-Q4 Q6-Q7 Step	Bipolar Q2-Q3 Q1-Q4 Q6-Q7 Q5-Q8 Step

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

Can-Stack Stepper Motor Linear Actuators Options

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

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

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

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

Lead Screw Comparison: FORCE vs. PULSE RATE

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

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

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

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

Specifications	
Contact Ratings (Standard)	1.00 AMP @ 120 VAC 1.00 AMP @ 28 VDC
Operating Temperature	-30°C to +55°C (-22°F to 131°F)
Electrical Life	< 20 milliohms typ. initial at 2 - 4 V DC, 100 mA Tested to 60,000 make-and-break cycles at full load
Schematic	1 P 3 Multiple contact options available.

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

NOTE:

Can-Stack Stepper Motor Linear Actuators Options

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

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

Specificati	ons		
Supply Voltage (VDC)		3.8 min. to 24 max.	
Current Co	onsumption	10 mA max.	
Output Voltage (operated)		0.15 typ., 0.40 max. Sinking 20 mA max.	
Output Current		20 mA max.	
Output Leal (rele	kage Current ased)	10μA max. @ Vout = 24 VDC; Vcc = 24 VDC	
Output	Rise, 10 to 90%	.05 μs typ., 1.5 μs max. @ Vcc = 12 V, RL = 1.6 KOhm	
Time	Fall, 90 to 10%	.15 μs typ., 1.5 μs max. @ CL = 20 pF	
Tempe	erature	− 40 to +150°C	

5 VDC		+5 VDC
Ţ.	47K	2N3638
+	J R1≥ 550	TRANSISTOR
5 VDC 0-		\$ 100 m
SENSOR		↓ ↓ LED ↓ 50mA

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

Stroke inches (mm)	Dim "A" Extended inches (mm)	Dim "B" Retracted inches (mm)
.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.

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

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

Generates higher force than other competitors

Multiple versions available

- Captive
- Non-Captive
- External Linear

Captive

Specifications

	Ø 25 mm (1.0-in) Motor				
	Captive	2544 –	- †	2554 –	- †
Part No.	Non-Captive	2534 –	- †	2584 –	- t
	External Linear*	E2544 –	- †	E2554 –	- [†]
	Wiring		Bip	olar	
Step angle		7.	5°	15	5°
Winding Voltage		5 VDC	12 VDC	5 VDC	12 VDC
Current (RMS)/phase		385 mA	160 mA	385 mA	160 mA
Resist	tance/phase	13 Ω	72 Ω	13 Ω	72 Ω
Induct	tance/phase	10.8 mH	60 mH	8.08 mH	48 mH
Power Consumption		3.85 W			
Rot	or Inertia	1.07 gcm ²			
Insul	ation Class	Class B			
<u>ا</u>	Weight	1.74 oz (49 g)			
Insulatio	on Resistance		20	MΩ	

Lir	Order		
step	0000 1.D.		
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
7 a igio	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).

(1 (6.0)

RETRACTED

Ø(17.0)

(6.01)

(1.0) .039

*Part numbering information on page 153.

Captive Lead Screw

Dimensions = (mm) inches

Stroke (Minimum) inches (mm)	Front Sleeve A inches (mm)	Retracted B inches (mm)	Extended C inches (mm)	Rear Sleeve D inches (mm)	Code with Connector	Code with Leads
.512 (13 mm)	.472 +/010 (11.99 +/- 0.25)	.787 +/025 (19.99 +/- 0.64)	1.329 +/015 (33.76 +/- 0.38)	1.128 Max. (28.65 Max.)	- 905	- 1005
.708 (18 mm)	.680 +/010 (17.28 +/- 0.25)	.994 +/025 (25.25 +/- 0.64)	1.743 +/015 (44.27 +/- 0.38)	1.336 Max. (33.94 Max.)	- 907	- 1007
.984 (25 mm)	.955 +/010 (24.26 +/- 0.25)	1.269 +/025 (32.23 +/- 0.64)	2.293 +/015 (58.24 +/- 0.38)	1.611 Max. (40.92 Max.)	- 910	- 1010
1.22 (31 mm)	1.191 +/010 (30.25 +/- 0.25)	1.505 +/025 (38.23 +/- 0.64)	2.765 +/015 (70.23 +/- 0.38)	1.847 Max. (46.91 Max.)	- 912	- 1012

Non-Captive Lead Screw

Dimensions = (mm) inches

External Linear

Dimensions = (mm) inches

Up to 6.3-in (160 mm) standard screw lengths. Longer screw lengths are available. (31.70)(76.20±.76) 1.248 (23.0)3.000±0.30 (6.5) .256 .906 Ø (25.4) MAX. 1.00 (1.0) .039 (6.01).237 $^{\circ}$ PIN ٠ (35.0)1.378 (9.0) 0 0 (41.99) .354 1,653 \cap (3.56) (15.88)Ø.140 (17) (3.70).625 Ø.669 Ø.146 (2.54)2 HOLES (19.05) (5.10).100 Ø.750 .201 (16).63 3 x Ø(3.18).125 EVENLY SPACED ON Ø(12.70) MAX. (6.35).50 BOLT CIRCLE Ø.250

G4 25000 Series • Can-Stack Stepper Motor Linear Actuators

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.

Can-Stacks: Wiring

Can-Stacks: Stepping Sequence

	Bipolar	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8	
R	Step					
FES	1	ON	OFF	ON	OFF	
S S	2	OFF	ON	ON	OFF	
	3	OFF	ON	OFF	ON	ETD //
V	4	ON	OFF	OFF	ON	
	1	ON	OFF	ON	OFF	

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

Can-Stack Stepper Motor Linear Actuators Options

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

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

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

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

Lead Screw Comparison: FORCE vs. PULSE RATE

- L/R Drive - 100% Duty Cycle

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

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

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

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

Specifications	
Contact Ratings (Standard)	1.00 AMP @ 120 VAC 1.00 AMP @ 28 VDC
Operating Temperature	-30°C to +55°C (-22°F to 131°F)
Electrical Life	< 20 milliohms typ. initial at 2 - 4 V DC, 100 mA Tested to 60,000 make-and-break cycles at full load
Schematic	1 T J 3 Multiple contact options available.

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

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

Can-Stack Stepper Motor Linear Actuators Options

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

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

Specificati	ons		
Supply Vol	tage (VDC)	3.8 min. to 24 max.	
Current Co	onsumption	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	Rise, 10 to 90%	.05 μs typ., 1.5 μs max. @ Vcc = 12 V, RL = 1.6 KOhm	
Time	Fall, 90 to 10%	.15 μs typ., 1.5 μs max. @ CL = 20 pF	
Temperature		− 40 to +150°C	

Dim "A" Extended inches (mm)	Dim "B" Retracted inches (mm)
1.248 (31.71)	.632 (16.05)
1.449 (36.81)	.833 (21.15)
1.723 (43.76)	1.106 (28.10)
1.959 (49.76)	1.343 (34.10)
	Dim "A" Extended inches (mm) 1.248 (31.71) 1.449 (36.81) 1.723 (43.76) 1.959 (49.76)

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

G4 25000 Series E8T Encoder

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

• Single-ended / Differential

• Low power consumption, 5 V @ 30 mA max

- Resolutions from 180 to 720
- Frequency response to 100 kHz
- High retention polarized connector

Assembly Options:

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

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

www.haydonkerkpittman.com

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

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

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

Multiple versions available

- Captive
- Non-Captive
- External Linear

Ø 37mm (1.4-in) Non-Captive

> Ø 37mm (1.4-in)) External Linear

Ø 37mm (1.4-in) Captive

Specifications

Ø 36 mm (1.4-in) Motor					
	Captive	3744 –	- +	3754 –	+
Part No.	Non-Captive	3734 –	- †	3784 –	- †
	External Linear	E3744 –	- †	E3754 –	- †
١	Wiring		Bip	olar	
Ste	ep angle	7.	5°	1!	ō°
Windi	ing 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
Induct	ance/phase	11.6 mH	65 mH	8.5 mH	46 mH
Power Consumption 5.6 W			5 W		
Rotor Inertia			8.5 (gcm ²	
Insula	ation Class	Class B			
٧	Veight	4.2 oz (120 g)			
Insulatio	on Resistance	20 MΩ			

Lin	Order Code L D		
step	inches	0000 1.D.	
	0.0005	0.013	3
7.5° Angle	0.001	0.0254	1
	0.002	0.051	2
	0.001	0.0254	1
15° Angle	0.002	0.051	2
Angle	0.004	0.102	4

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

[†]Part numbering information on page 159.

Captive Lead Screw

Dimensions = (mm) inches

L (44 50)	
1.752	EXTENDED
Ø(36.00)	RETRAC
1.417	A
	(5.00)
(50.0)	.197 + (236)
Ø(3.1	8) MISKUS THREAD TO BE (WITHIN (0.76) .030 Ø(22.6
2 HOL	ES MAX. OF SHOULDER .890
	(6.)

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

Non-Captive Lead Screw

Dimensions = (mm) inches

External Linear

Dimensions = (mm) inches

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

G4 37000 Series • Can-Stack Stepper Motor Linear Actuators

NOTE: All chopper drive curves were created with a 5 volt motor and a 40 volt power supply. Actuator bearings are rated for 75 lbs. Ramping can increase the performance of a motor either by increasing the top speed or getting a heavier load accelerated up to speed faster. Also, deceleration can be used to stop the motor without overshoot.

Identifying the Can-Stack Number Codes when Ordering						
E	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 $3 = 7.5^{\circ}$ Non-Captive $4 = 7.5^{\circ}$ Captive or External (use "E" or "K" Prefix for External version) $5 = 15^{\circ}$ Captive or External (use "E" or "K" Prefix for External version $8 = 15^{\circ}$ Non-Captive	Coils 4 = Bipolar (4 wire)	Code ID Resolution Travel/Step 1 = .001-in (.0254) 2 = .002-in (.051) 3 = .0005-in (.013) 4 = .004-in (.102)	Voltage 05 = 5 VDC 12 = 12 VDC Custom V available	Suffix Stroke Example: -1015 = captive 38.1mm stroke with leads -XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.

Can-Stacks: Wiring

Can-Stacks: Stepping Sequence

	Bipolar	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8	
F	Step					•
FEN	1	ON	OFF	ON	OFF	
N N	2	OFF	ON	ON	OFF	CCW
	3	OFF	ON	OFF	ON	RACT
	4	ON	OFF	OFF	ON	H
	1	ON	OFF	ON	OFF	

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

Can-Stack Stepper Motor Linear Actuators Options

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

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

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

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

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

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

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

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

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

Specifications	
Contact Ratings (Standard)	1.00 AMP @ 120 VAC 1.00 AMP @ 28 VDC
Operating Temperature	-30°C to +55°C (-22°F to 131°F)
Electrical Life	< 20 milliohms typ. initial at 2 - 4 V DC, 100 mA Tested to 60,000 make-and-break cycles at full load
Schematic	1 P 3 Multiple contact options available.

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

Stroke	Dim "A" Extended	Dim "B" Retracted	Dim "C" Ref.
inches (mm)	inches (mm)	inches (mm)	inches (mm)
.631 (16)	1.348 +/025	.677 +/025	2.218 +/025
	(34.24 +/- 0.64)	(17.19 +/- 0.64)	(56.33 +/- 0.64)
1.00 (25.4)	2.348 +/025	1.177 +/025	2.718 +/025
	(56.94 +/- 0.64)	(29.89 +/- 0.64)	(69.03 +/- 0.64)
1.50 (38.1)	3.348 +/025	1.677 +/025	3.218 +/025
	(85.04 +/- 0.64)	(42.59 +/- 0.64)	(81.73 +/- 0.64)

Can-Stack Stepper Motor Linear Actuators Options

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

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

Specifications			
Supply Vol	tage (VDC)	3.8 min. to 24 max.	
Current Co	onsumption	10 mA max.	
Output Voltage (operated)		0.15 typ., 0.40 max. Sinking 20 mA max.	
Output Current		20 mA max.	
Output Leak (rele	kage Current ased)	10µA max. @ Vout = 24 VDC; Vcc = 24 VDC	
Output	Rise, 10 to 90%	.05 μs typ., 1.5 μs max. @ Vcc = 12 V, RL = 1.6 KOhm	
Time	Fall, 90 to 10%	.15 μs typ., 1.5 μs max. @ CL = 20 pF	
Temperature		− 40 to +150°C	

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

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

G4 37000 Series E8T Encoder

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

• Single-ended / Differential

• Low power consumption, 5 V @ 30 mA max

- Resolutions from 180 to 720
- Frequency response to 100 kHz
- High retention polarized connector

Assembly Options:

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

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

www.haydonkerkpittman.com

15000 Series • Can-Stack Stepper Motor Linear Actuators

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

Delivering force of up to 8 lbs (35N) without compromising long life or cost. Lightweight models can also be micro- stepped for even finer resolution. Bi-directional travel motor. Available as connector stator or "space saving" flying leads type motor bodies.

The world's smallest commercial linear stepper motor

Multiple versions available

- Captive
- External Linear with free-wheeling BFW nut
- External Linear with ZBM anti-backlash nut*
- *May not be available in all leads

Specifications

Ø 15 mm (.59-in) Motor			
Dort No.	Captive	LC1574 –	- [†]
Part NO.	External Linear	LE1574 – – [†]	
Wiring		Bipolar	
Step angle		18°	
Winding Voltage	4 VDC	5 VDC	12 VDC
Current (RMS)/phase	0.2 A 0.16 A 0.07 A		0.07 A
Resistance/phase	20 Ω 31 Ω 180 9		180 Ω
Inductance/phase	5.6 mH 8.7 mH 48.8 mH		
Power Consumption	1.6 W		
Rotor Inertia		0.09 gcm ²	
Insulation Class	Class B (Class F available)		
Weight	LC15 0.49 oz (14 g) LE15 0.39 oz (11 g)		
Insulation Resistance	20 ΜΩ		
Stroke	Captive 0.5-in. (12.7 mm)		12.7 mm)
JUUNE	External Linear up to 1.79-in. (45.4 mm)		

New encoder available! See page 182.

> Ø15mm (.59-in) Captive

Ø15mm (.59-in) External Linear with ZBMR Nut

Linear Tra	Order Code LD		
inches mm		00001.0.	
.00059*	.015	BZ**	
.00079*	.02	W**	
.00098*	.025	AQ**	
.00197*	.05	BH	
.00394*	.10	DC	

*Values truncated **Black Ice not available

Available Standard Connectors for Series 15000				
Connector	PIN			
CONNECTOR	1	2	3	4
JST PHR-4	Red	White	Green	Black
Molex 51021-0400	Black	Green	White	Red

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

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

[†]Part numbering information below.

Identifying the Can-Stack Number Codes when Ordering LC 4 W 999 15 7 04 Prefix Series Number Coils **Code ID Resolution** Voltage Suffix **Step Angle** Designation Travel/Step 04 = 4 VDC**LC** = Captive **7** = 18° 4 = Bipolar Stroke 15 = 15000(4 wire) **BZ** = .00059-in (.015) Example: -999 = 12-in leads LE = External **05** = 5 VDC (Series numbers Linear **W** = .00079-in (.02) 12 = 12 VDC -XXX = Proprietary suffix assigned represent AQ = .00098-in (.025) to a specific customer application. approximate Custom V The identifier can apply to either diameters of **BH** = .00197-in (.05) available a standard or custom part. motor body) **DC** = .00394-in (.10)

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

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15000 Series • Can-Stack Stepper Motor Linear Actuators

External Linear

MICRO Series

Dimensions = (mm) inches

Standard nut styles. Consult the factory for custom solutions.

MICRO Series Nut Styles			
Part No.	BFW Nut Style	Dynamic Load Ibs (Kg)	Drag Torque oz-in (NM)
BFWB	Barrel Mount	10 (4 5) Eroo W/booli	
BFWR	Rectangular Flange	10 (4.5)	FIEE Wheeling

Barrel Nut Style

Rectangular Nut Style

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

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

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

Can-Stacks: Wiring

Can-Stacks: Stepping Sequence

	Bipolar	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8]
Ŗ	Step					
FEND	1	ON	OFF	ON	OFF	
Š	2	OFF	ON	ON	OFF	
	3	OFF	ON	OFF	ON	
	4	ON	OFF	OFF	ON] [
	1	ON	OFF	ON	OFF	

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

NEW! 15000 Series E16 Encoder

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

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

Assembly Options:

- Detachable cable

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

Custom Free-Wheeling Nuts

Modified and custom free-wheeling nuts are available for the LE external linear versions. Custom geometries and materials can be combined for a wide variety of product application requirements, to help eliminate additional adjacent components as well as to deliver cost and space-saving benefits.

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

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

Economical motors for high volume applications

Multiple versions available

- Captive
- Non-Captive
- External Linear

Specifications

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

Linear Travel / Step 15° Step Angle					
mm	Code I.D.				
0.0254	1				
0.051	2				
0.102	4				
	vel / Step p Angle mm 0.0254 0.051 0.102				

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

[†]Part numbering information on page 168.

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

Captive

Non-Captive Lead Screw

Z20000 Series • Can-Stack Stepper Motor Linear Actuators

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

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

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

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

Can-Stacks: Wiring

Can-Stacks: Stepping Sequence

	Bipolar	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8	
Ę	Step					♠
TEND	1	ON	OFF	ON	OFF	
CW –	2	OFF	ON	ON	OFF	CCW
	3	OFF	ON	OFF	ON	RACT
V	4	ON	OFF	OFF	ON	RFT
	1	ON	OFF	ON	OFF	

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

Can-Stack Stepper Motor Linear Actuators Options

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

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

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

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

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

186

.001 (.0254) 1

8

6

30

25

Can-Stack Stepper Motor Linear Actuators Options

Specially Engineered Can-Stack Linear Actuators for high temperature applications

Stepping motors specially designed for high temperature environments.

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

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

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

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

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

Specifications	
Contact Ratings (Standard)	1.00 AMP @ 120 VAC 1.00 AMP @ 28 VDC
Operating Temperature	-30°C to +55°C (-22°F to 131°F)
Electrical Life	< 20 milliohms typ. initial at 2 - 4 V DC, 100 mA Tested to 60,000 make-and-break cycles at full load
Schematic	1 T 3 Multiple contact options available.

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

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

Specificati	ons			
Supply Vo	ltage (VDC)	3.8 min. to 24 max.		
Current Co	onsumption	10 mA max.		
Output Voltage (operated)		0.15 typ., 0.40 max. Sinking 20 mA max.		
Output Current		20 mA max.		
Output Leal (rele	kage Current ased)	10µA max. @ Vout = 24 VDC; Vcc = 24 VDC		
Output	Rise, 10 to 90%	.05 μs typ., 1.5 μs max. @ Vcc = 12 V, RL = 1.6 KOhm		
Time	Fall, 90 to 10%	.15 μs typ., 1.5 μs max. @ CL = 20 pF		
Tempe	erature	− 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.

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

Designed to accommodate high volume applications

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

Multiple versions available

- Captive - Non-Captive - External Linear

Ø 26mm (1-in) Non-Captive

Ø 26mm (1-in) External Linear Ø 26mm (1-in) Captive

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

Specifications

	Ø 26 mm (1-in) Z-Series Motor								
	Captive	Z2644 –	- †	Z2654 –	- †	Z2646 –	- †	Z2656 –	- †
Part No.	Non-Captive	Z2634 –	- †	Z2684 –	- †	Z2636 –	- †	Z2686 –	- †
	External Linear*	Z2644 –	- 9 ^{†**}	Z2654 –	- 9 ^{†**}	Z2646 –	- 9 ^{†**}	Z2656 –	- 9
	Wiring		Bip	olar			Unip	olar*	
	Step angle	7.	5°	1:	5°	7.	5°	1	5°
Winding Voltage		5 VDC	12 VDC	5 VDC	12 VDC	5 VDC	12 VDC	5 VDC	12 VDC
Current (RMS)/phase		340 mA	140 mA	340 mA	140 mA	340 mA	140 mA	340 mA	140 mA
Res	istance/phase	14.7 Ω	84 Ω	14.7 Ω	84 Ω	14.7 Ω	84 Ω	14.7 Ω	84 Ω
Indu	ictance/phase	8.5 mH	55 mH	6.7 mH	44 mH	4.3 mH	24 mH	3.4 mH	19 mH
Powe	er Consumption				3.4	W			
R	lotor Inertia				1.4 (gcm ²			
Insulation Class					Clas	ss B			
	Weight				1.2 oz	(34 g)			
Insula	tion Resistance				20	MΩ			

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

Lin	Order							
step	inches	mm	COUE I.D.					
	0.0005	0.013	3					
7.5° Angle	0.001	0.0254	1					
7 angio	0.002	0.051	2					
	0.00164	0.04166	AS					
15° Angle	0.002	0.051	2					
,gio	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).

18 mm (.708-in) Captive Extended 25 mm (.984-in) Captive Extended

31mm (1.22-in) Captive Extended

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ø.140 -

(ø3.56)

.100 (2.54)

βĘ

`*'*0

1.378 (35.00)

Ø.146 Ø(3.71) 2 HOLES ON

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

(6.35)

Ø.125(3.175) THRU 3 HOLES EQ. SPACED Ø.50 (12.7)BOLT CIRCLE

ø.473 – (ø12.01)

#28 AWG 4 LEAD WIRES m

12.00 (304.8)

.50 (12.7)

Maydon(kerk) /

PLASTIC NUT

Ø.328+.002

(#8.33±.05) OVER MEDIUM STRAIGHT KNURL

NOW AVAILABLE! Shorter External Linear Option

Designed to accommodate applications with space limitations

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

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

New space

	Identifying the Can-Stack Number Codes when Ordering										
Z	26	4	4	2	05	900					
Prefix Z = Series Code	Series Number Designation 26 = 26000 (Series numbers represent approximate diameters of motor body)	Style $3 = 7.5^{\circ}$ Non-Captive $4 = 7.5^{\circ}$ Captive or External (use "E" or "K" Prefix for External version) $5 = 15^{\circ}$ Captive or External (use "E" or "K" Prefix for External version $8 = 15^{\circ}$ 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 = 12 VDC Custom V available	Suffix Stroke Example: -900 used to code Z-Series external linear -XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.					

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

Can-Stacks: Wiring

Can-Stacks: Stepping Sequence

	Bipolar	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8	
EXTI	Step					Ī
B	1	ON	OFF	ON	OFF	
CW	2	OFF	ON	ON	OFF	3
	3	OFF	ON	OFF	ON	RACT
¥	4	ON	OFF	OFF	ON	ETP
	1	ON	OFF	ON	OFF	

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

Z26000 Series • Can-Stack Stepper Motor Linear Actuators

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AC (Alternating Current) Synchronous Actuators

Stepping motors can also be run on AC (Alternating Current). However, one phase must be energized through a properly selected capacitor. In this case the motor is limited to only one synchronous speed. For instance, if 60 hertz is being supplied, there are 120 reversals or alterations of the power source. The phase being energized by a capacitor is also producing the same number of alterations at an offset time sequence. The motor is really being energized at the equivalent of 240 steps per second.

Alternating Current (AC) Hybrid Linear Actuators

Stepping motors can also be run on Alternating Current (AC). However, one phase must be energized through a properly selected capacitor. In this case, the motor is limited to only one synchronous speed.

For instance, if 60 hertz is being supplied, there are 120 reversals or alterations of the power source. The phase being energized by a capacitor is also producing the same number of alterations at an offset time sequence. The motor is really being energized at the equivalent of 240 steps per second.

In the case of a linear actuator the linear speed produced is dependent on the resolution per step of the motor. For example, if 60 hertz is supplied to a .001-in/ step motor the resulting speed is .240-in per second (240 steps per second times .001-in/step). Many of our stepping motors are available as 300 or 600 RPM AC synchronous motors.

Electrical Data												
Series	Cizo Wotto		A	Capacitor	Capacitor	Coil Resista	Connection					
	Size V	Walls	Amps	(Mfd) @ 60 Hz	(Mfd) @ 50 Hz	Main Wind.	Cap. Wind.	Diagram				
35000	14	5.7	0.21	15	15	300	300	3				
43000	17	6.5	0.27	15	15	104	104	3				
57000	23	13.0	0.60	30	40	35	35	3				
87000*	34	30.0	2.00	200	200	2.3	2.3	4				

* With 12 OHM, 100 watt resistor in series.

Identifying the AC Hybrid Part Number Codes when Ordering

А	35	Н	4		Ν		24	8
A Prefix A = A Coil)	35 Series Number Designation 35 = 35000 (Size 14) 43 = 43000 (Size 17) 57 = 57000 (Size 23) 87 = 87000 (Size 34)	H Style F = 1.8° Non-captive H = 1.8° Captive or External (use "E" or "K" Prefix for External version) J = 0.9° Non-captive or External (use "E" or "K" Prefix for External (use "E" or	4 Coils 4 = Bipolar (4 wire)	$\begin{array}{l} eq:sphere$	$\begin{tabular}{lllllllllllllllllllllllllllllllllll$	87000 Series Code ID Resolution Travel/Step 3 = .0005-in (.0127) B = .000625-in (.0158) C = .00125-in (.0317) Y = .0025-in (.0635) Z = .005-in (.127)	- 24 Voltage 24 = 24 VDC	-800 linear Capt part -> Pro suffix to a cus app The can ei star cust
		version)		$\mathbf{V} = .000078 \text{-in} (.00198)$	X = .00020833-in (.00529166)			
					9 = .00025-in (.0635)			

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

Motor part numbers are for a captive shaft. For a non-captive shaft, change the middle letter from an "H" to an "F". Example 1: A35H4N-24 with a non-captive shaft becomes A35F4N-24.

Exception: A43K4U-24 (high resolution) and A43K4V-24 (High resolution), for a non-captive shaft substitute "J" in place of the "K". Example 2: A43K4U-24 with a non-captive shaft becomes A43J4U-24.

For an external linear shaft, add the three digit suffix – 800 to the captive shaft part number. Example 3: A35H4N-24 with an external linear shaft becomes A35H4N-24–800. All standard motors operate at 24 Volts, represented in the part number by the number – 24 (A35H4N-24). No other suffix is required.

AC Can-Stack Linear Actuators

Stepping motors can also be run on Alternating Current (AC). However, one phase must be energized through a properly selected capacitor. In this case, the motor is limited to only one synchronous speed.

For instance, if 60 hertz is being supplied, there are 120 reversals or alterations of the power source. The phase being energized by a capacitor is also producing the same number of alterations at an offset time sequence. The motor is really being energized at the equivalent of 240 steps per second.

In the case of a linear actuator the linear speed produced is dependent on the resolution per step of the motor. For example, if 60 hertz is supplied to a .001-in/ step motor the resulting speed is .240-in per second (240 steps per second times .001-in/step). Many of our stepping motors are available as 300 or 600 RPM AC synchronous motors.

240 Steps per Revolution x 60 Seconds	_	600 DDM
24 Steps per Revolution	=	

	Identifying the AC Can-Stack Part Number Codes when Ordering									
А	35	5	4		2		24	800		
Prefix A = A Coil Z = Economy Series (For 2000 and 26000 Series only)	Series Number Designation 20 = 20000 (Ø20mm, .79-in) 26 = 26000 (Ø26mm, 1-in) 36 = 36000 (Ø36mm, 1.4-in) 46 = 46000 (Ø46mm, 1.8-in)	Style $3 = 7.5^{\circ}$ Non-Captive $4 = 7.5^{\circ}$ Captive or External (use "E" or "K" Prefix for External version) $5 = 15^{\circ}$ Captive or External (use "E" or "K" Prefix for External version $8 = 15^{\circ}$ Non-Captive	Coils 4 = Bipolar (4 wire)	20000 and Z20000 Series Code ID Resolution Travel/Step 1 = .001-in (.0254) 2 = .002-in (.051) 4 = .004-in (.102)	26000 Series Code ID Resolution Travel/Step 1 = .001 - in (.0254) 2 = .002 - in (.051) 3 = .0005 - in (.013) 4 = .004 - in (.102) 9 = .00025 - in (.00635) Z26000 Series 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)	36000 Series 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 (.0035) 46000 Series 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 24 = 24 VDC	Suffix -800 = External linear (added to Captive shaft part number) -XXX = Proprietary suffix assigned to a specific customer application. The identifier can apply to either a standard or custom part.		
		NO	TE: Dashes must b	e included in Part Number (–) as show	n above. For assistance call our Engineeri	ng Team at 203 756 7441.				

Motor part numbers are for a captive shaft. For a non-captive shaft, change the third digit from a "4" to an "3". Example 1: A26441-24 with a non-captive shaft becomes A26341-24. Exception: When the third digit is "5" for a non-captive shaft substitute "8". Example 2: A26544-24 with a non-captive shaft becomes A26844-24.

For an external linear shaft, add the three digit suffix – 800 to the captive shaft part number. Example 3: A26441-24 with an external linear shaft becomes A26441-24 – 800. All standard motors operate at 24 Volts, represented in the part number by the suffix - 24 (A36443-24).

Specifications						
Motor Part No.	Linear Speed @ 60 Hz		Linear Speed @ 50 Hz		Maximum Force	
	(inches/sec.)	(cm/sec.)	(inches/sec.)	(cm/sec.)	(lbs.)	(Newtons)
Z20541-24-700	0.24	0.610	0.20	0.508	5.5	24
Z20542-24-700	0.48	1.219	0.40	1.016	3.0	13
Z20544-24-700	0.96	2.438	0.80	2.032	1.8	8
A26443-24	0.12	0.305	0.10	0.254	7.4	33
A26441-24	0.24	0.610	0.20	0.508	4.4	20
A26542-24	0.48	1.219	0.40	1.016	3.5	16
A26544-24	0.96	2.438	0.80	2.032	2.0	9
Z26443-24-700	0.12	0.305	0.10	0.254	13.0	58
Z26441-24-700	0.24	0.610	0.20	0.508	8.3	37
Z26542-24-700	0.48	1.219	0.40	1.016	6.6	29
Z26544-24-700	0.96	2.438	0.80	2.032	3.3	15
A36443-24**	0.12	0.305	0.10	0.254	16.0	71
A36441-24**	0.24	0.610	0.20	0.508	12.0	53
A36442-24**	0.48	1.219	0.40	1.016	6.0	27
A36544-24**	0.96	2.438	0.80	2.032	3.0	13
A46443-24**	0.12	0.305	0.10	0.254	43	191
A46441-24**	0.24	0.610	0.20	0.508	34	151
A46442-24**	0.48	1.219	0.40	1.016	20	89
A46544-24**	0.96	2.438	0.80	2.032	11	49
A46548-24**	1.92	4.877	1.60	4.064	5.4	24
A4654G-24**	3.84	9.754	3.20	8.128	2.7	12

** Select motors available with 24 Volts or 120 Volts (replace 24 with 120).

NOTE: Capacitors not furnished with production units.

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