WGS06 Linear Rails with 43000 Series Hybrid Motor

**Also available with 57000 Series Hybrid Motor (info available starting on page 5)*

Kerk® Motorized WGS Linear Slide utilizes a screw-driven carriage that offers reliable, continuous linear speed while maintaining accurate positioning. The length and speed of the WGS is not limited by critical screw speed, allowing high RPM, linear speed and long stroke lengths. The WGS slide has a unique, compact profile that provides improved torsional stiffness and stability over RGS and RGW products.

Technical specifications for 43000 Series Size 17 Hybrid Linear Actuator Stepper Motors and Haydon Kerk IDEA™ programmable drives are on page 250, 57000 Series Size 23 specifications are on page 252.

To determine what is best for your application see the Linear Rail Applications Checklist

Linear Rail Check List

WGS06 with 43000 Series Size 17 hybrid linear stepper motor

WGS06 with 43000 Series Size 17 with an optional IDEA™ Drive (not available for Size 23 motor)

Identifying the WGS06 Part Number Codes when Ordering

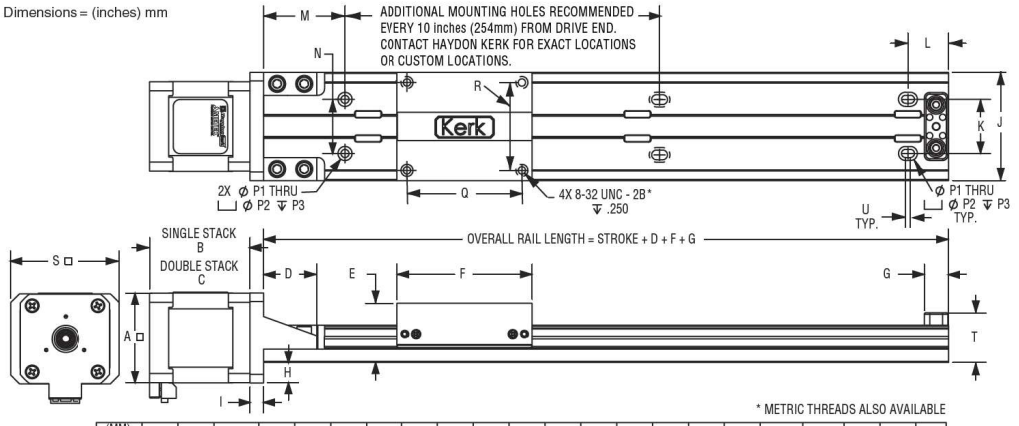
WG	S	06	K	— G	— 0100	— XXX
Prefix	**Frame Style**	**Frame Size Load***	**Lubrication**	**Drive / Mounting**	**Nominal Thread Lead Code**	**Unique Identifier**
WG = Wide Guide Screw	**S** = Standard	**06** = 35 lbs (156 N) (Maximum static load)	**K = TFE Kerkote®**	**M** = Motorized **G** = Motorized + IDEA™ integrated programmable drive – USB communications **J** = Motorized + IDEA™ integrated programmable drive – RS485 communications	**0100 = .100-in (2.54)** **0200 = .200-in (5.08)** **0500 = .500-in (12.70)** **1000 = 1.000-in (25.4)**	**– M43** = 43000 Series-Size 17 Motor **– G43** = 43000 Series Size 17 Motor with IDEA Drive **– M57** = 57000 Series-Size 23 Motor – or a 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 603 213 6290.

WGS06 Linear Slide with 43000 Series Size 17 Linear Actuator

Recommended for horizontal loads up to 35 lbs (156 N)

Dimensions = (inches) mm



* METRIC THREADS ALSO AVAILABLE

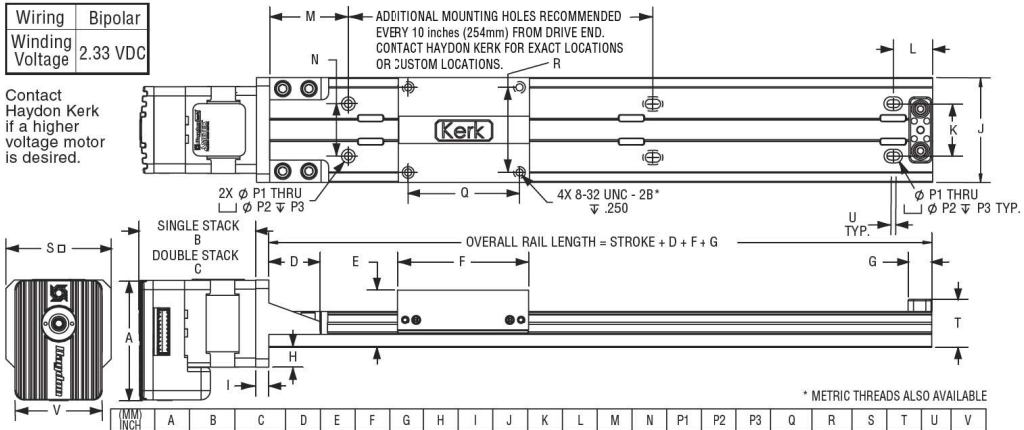
(MM) INCH	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P1	P2	P3	Q	R	S	T	U
-M43 SIZE 17	(42.2) 1.660 MAX.	(33.8) 1.330 MAX.	(47.75) 1.880 MAX.	(24.9) .98	(27.9) 1.1	(63.5) 2.50	(11.2) .44	(9.7) .38	(6.4) .250	(50.8) 2.00	(25.4) 1.000	(19.1) .75	(38.1) 1.50	(25.4) 1.000	(3.81) .150	(6.60) .260	(6.50) .256	(53.95) 2.124	(41.25) 1.624	(50.8) 2.00	(23.3) .92	(2.3) .090

Carriage holes available in Metric sizes M3, M4, M5, M6

...with IDEA™ Drive

Wiring	Bipolar
Winding Voltage	2.33 VDC

Contact Haydon Kerk if a higher voltage motor is desired.



* METRIC THREADS ALSO AVAILABLE

Dimensions = (mm) inch

(MM) INCH	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P1	P2	P3	Q	R	S	T	U	V
-G43 SIZE 17	(58.0) 2.283 MAX.	(63.72) 2.509 MAX.	(77.67) 3.058 MAX.	(24.9) .98	(27.9) 1.1	(63.5) 2.50	(11.2) .44	(9.7) .38	(6.4) .250	(50.8) 2.00	(25.4) 1.000	(19.1) .75	(38.1) 1.50	(25.4) 1.000	(3.81) .150	(6.60) .260	(6.50) .256	(53.95) 2.124	(41.25) 1.624	(50.8) 2.00	(23.3) .92	(2.3) .090	(42.0) 1.66

Carriage holes available in Metric sizes M3, M4, M5, M6

Single Stack

■ 43000 Series Size 17

Size 17: 43 mm (1.7-in) Hybrid Linear Actuator (1.8° Step Angle)					
Wiring	Bipolar			Unipolar**	
Programmable Drive	IDEA™ Drive Option Available			Not Applicable	
Winding Voltage	2.33 VDC*	5 VDC	12 VDC	5 VDC	12 VDC
Current (RMS)/phase	1.5 A	700 mA	290 mA	700 mA	290 mA
Resistance/phase	1.56 Ω	7.2 Ω	41.5 Ω	7.2 Ω	41.5 Ω
Inductance/phase	1.9 mH	8.7 mH	54.0 mH	4.4 mH	27.0 mH
Power Consumption	7 W				

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

Nominal Thread Lead		Lead Code
inches	mm	
0.1	2.54	0100
0.2	5.08	0200
0.5	12.7	0500
1.0	25.4	1000

Size 17
Single Stack
External Linear
with IDEA Drive

Size 17
Single Stack
External Linear

IDEA™ Drive software is simple to use with on-screen buttons and easy-tounderstand programming guides.

- Fully Programmable
- RoHS Compliant
- USB or RS-485 Communication
- Microstepping Capability – Full, 1/2, 1/4, 1/8, 1/16, 1/32, 1/64
- Graphic User Interface
- Auto-population of Drive Parameters
- Programmable Acceleration/Deceleration and Current Control

For more information see the IDEA™ Drive Data Sheet

Double Stack

■ 43000 Series Size 17

Size 17: 43 mm (1.7-in) Double Stack Hybrid Linear Actuator (1.8° Step Angle)			
Wiring	Bipolar		
Programmable Drive	IDEA™ Drive Option Available		
Winding Voltage	2.33 VDC*	5 VDC	12 VDC
Current (RMS)/phase	2.6 A	1.3 A	290 mA
Resistance/phase	0.9 Ω	3.8 Ω	41.5 Ω
Inductance/phase	1.33 mH	8.21 mH	45.1 mH
Power Consumption	10.4 W		

* 43000 Series Single Stack with IDEA programmable drive. Contact Haydon Kerk if higher voltage motor is desired.

Nominal Thread Lead		Lead Code
inches	mm	
0.1	2.54	0100
0.2	5.08	0200
0.5	12.7	0500
1.0	25.4	1000

Size 17
Double Stack
External Linear

Size 17 43000 Series and Size 23 57000 • Stepping Sequence & Wiring

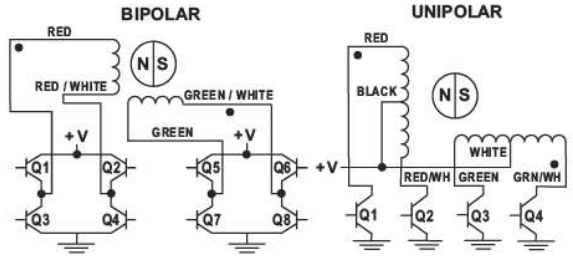
Hybrids: Stepping Sequence

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 ↑

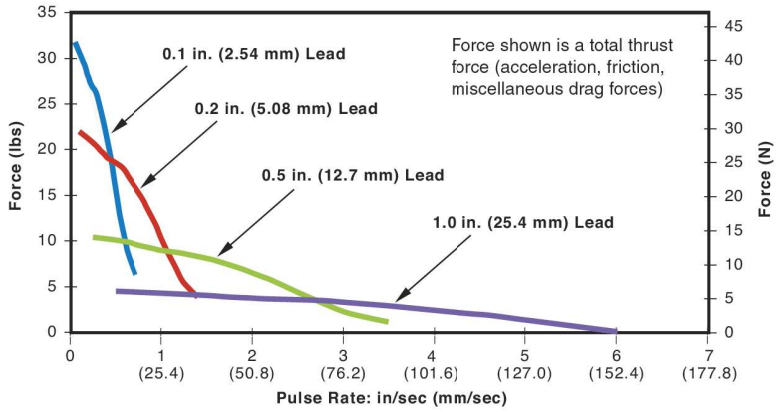
Note: Half stepping is accomplished by inserting an off state between transitioning phases.

Hybrids: Wiring



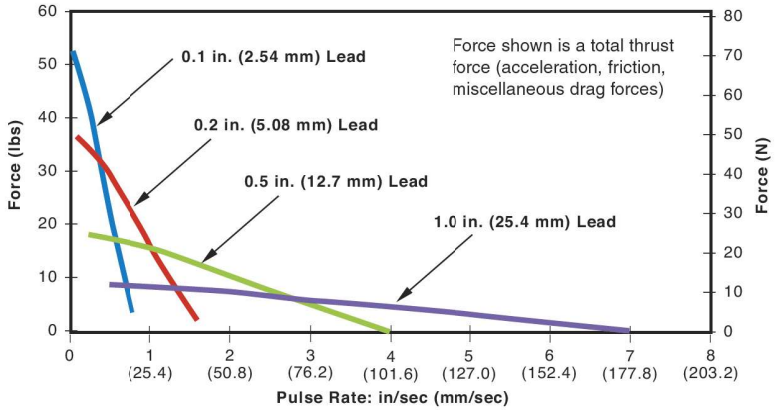
Single Stack

FORCE vs. PULSE RATE
– Chopper – Bipolar – 100% Duty Cycle



Double Stack

FORCE vs. PULSE RATE
– Chopper – Bipolar – 100% 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.

With L/R drives peak force and speeds are reduced, using a unipolar drive will yield a further 30% force reduction

Single Stack

■ 57000 Series Size 23

Size 23: 57 mm (2.3-in) Single Stack Hybrid Linear Actuator (1.8° Step Angle)					
Wiring	Bipolar			Unipolar**	
Winding Voltage	3.25 VDC	5 VDC	12 VDC	5 VDC	12 VDC
Current (RMS)/phase	2.0 A	1.3 A	.54 A	1.3 A	.54 A
Resistance/phase	1.63 Ω	3.85 Ω	22.2 Ω	3.85 Ω	22.2 Ω
Inductance/phase	3.5 mH	10.5 mH	58.0 mH	5.3 mH	23.6 mH
Power Consumption	13 W				

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

Nominal Thread Lead inches	mm	Lead Code
0.1	2.54	0100
0.2	5.08	0200
0.5	12.7	0500
1.0	25.4	1000

Size 23
Single Stack
External Linear

Double Stack

■ 57000 Series Size 23

Size 23: 57 mm (2.3-in) Double Stack Hybrid Linear Actuator (1.8° Step Angle)			
Wiring	Bipolar		
Winding Voltage	3.25 VDC	5 VDC	12 VDC
Current (RMS)/phase	3.85 A	2.5 A	1 A
Resistance/phase	0.8 Ω	2.0 Ω	12.0 Ω
Inductance/phase	2.3 mH	7.6 mH	35.0 mH
Power Consumption	25 W		

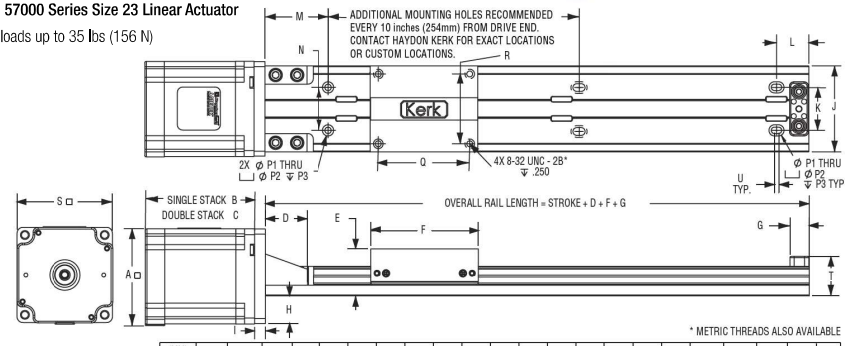
Nominal Thread Lead inches	mm	Lead Code
0.1	2.54	0100
0.2	5.08	0200
0.5	12.7	0500
1.0	25.4	1000

Size 23
Double Stack
External Linear

WGS Series • WGS06 Motorized • Size 23 57000 Series • Dimensional Drawings

■ WGS06 Linear Slide with 57000 Series Size 23 Linear Actuator

Recommended for horizontal loads up to 35 lbs (156 N)



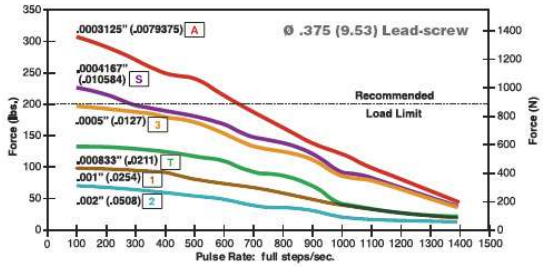
* METRIC THREADS ALSO AVAILABLE

Dimensions = (mm) inch

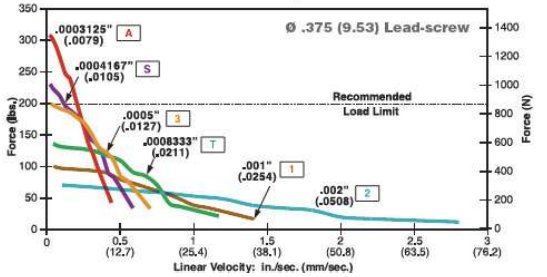
(MM) INCH	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P1	P2	P3	Q	R	S	T	U
-M57 SIZE 23	(56.4) 2.220 MAX.	(45.2) 1.780 MAX.	(66) 2.598 MAX.	(24.9) .98	(27.9) 1.1	(63.5) 2.50	(11.2) .44	(16.5) .65	(6.4) .250	(50.8) 2.00	(25.4) 1.000	(19.1) .75	(38.1) 1.50	(25.4) 1.000	(3.81) .150	(6.60) .260	(6.50) .256	(53.95) 2.124	(41.25) 1.624	(56.4) 2.220 MAX.	(23.3) .92	(2.3) .090

Single Stack

FORCE vs. PULSE RATE
– Chopper – Bipolar – 100% Duty Cycle

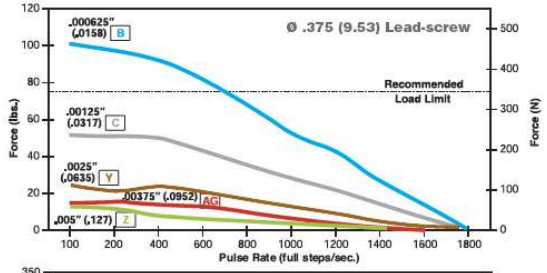


FORCE vs. LINEAR VELOCITY
– Chopper – Bipolar – 100% Duty Cycle

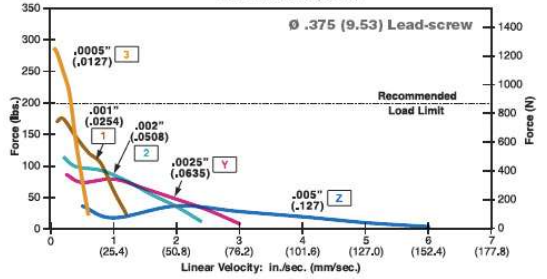


Double Stack

FORCE vs. PULSE RATE
– Chopper – Bipolar – 100% Duty Cycle



FORCE vs. LINEAR VELOCITY
– Chopper – Bipolar – 100% 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.

With L/R drives peak force and speeds are reduced, using a unipolar drive will yield a further 30% force reduction

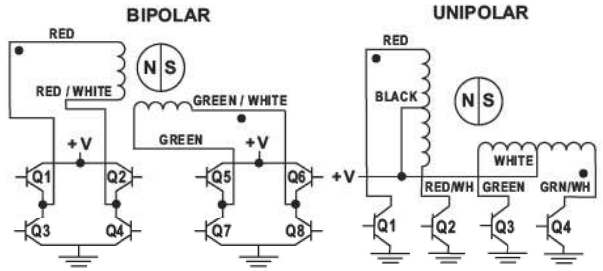
■ 43000 Series Size 17 and 57000 Series Size 23

Hybrids: Stepping Sequence

	Bipolar	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8	
EXTEND CW ↓	Unipolar	Q1	Q2	Q3	Q4	↑ RETRACT CCW
	Step					
	1	ON	OFF	ON	OFF	
	2	OFF	ON	ON	OFF	
	3	OFF	ON	OFF	ON	
	4	ON	OFF	OFF	ON	
	1	ON	OFF	ON	OFF	

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

Hybrids: Wiring



Size 17 43000 Series • Integrated Connectors

Haydon Kerk Hybrid Size 17 Single and Double Stack linear actuators are available with an integrated connector. Offered alone or with a harness assembly, this connector is RoHS compliant and features a positive latch in order for high connection integrity. The connector is rated up to 3 amps and the mating connector will handle a range of wire gauges from 22 to 28. This motor is ideal for those that want to plug in directly to pre existing harnesses. In addition to standard configurations, Haydon Kerk Motion Solutions can custom design this motor to meet your specific application requirements.

Motor Connector: JST part # S06B-PASK-2

Mating Connector: JST part # PAP-06V-S
Haydon Kerk Part #56-1210-5 (12 in. Leads)

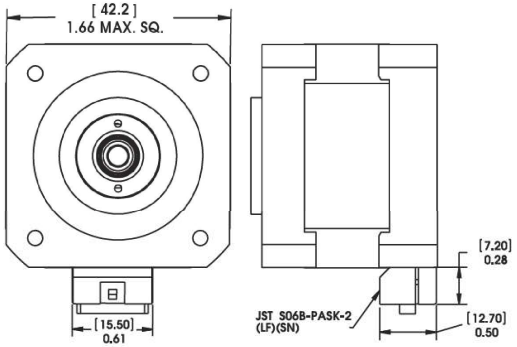
Wire to Board Connector: JST part number SPHD-001T-P0.5

Pin #	Bipolar	Unipolar	Color
1	Phase 2 Start	Phase 2 Start	G/W
2	Open	Phase 2 Common	–
3	Phase 2 Finish	Phase 2 Finish	Green
4	Phase 1 Finish	Phase 1 Finish	R/W
5	Open	Phase 1 Common	–
6	Phase 1 Start	Phase 1 Start	Red

Dimensional Drawings

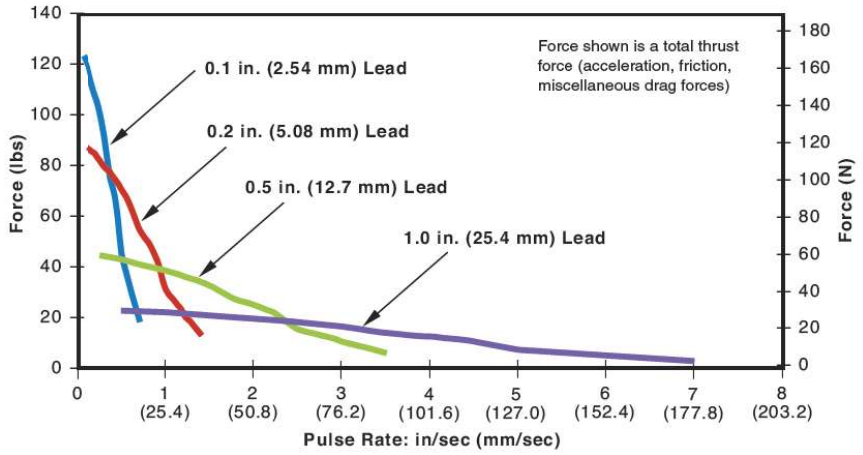
■ Integrated Connector with 43000 Series Size 17

Dimensions = (mm) inches



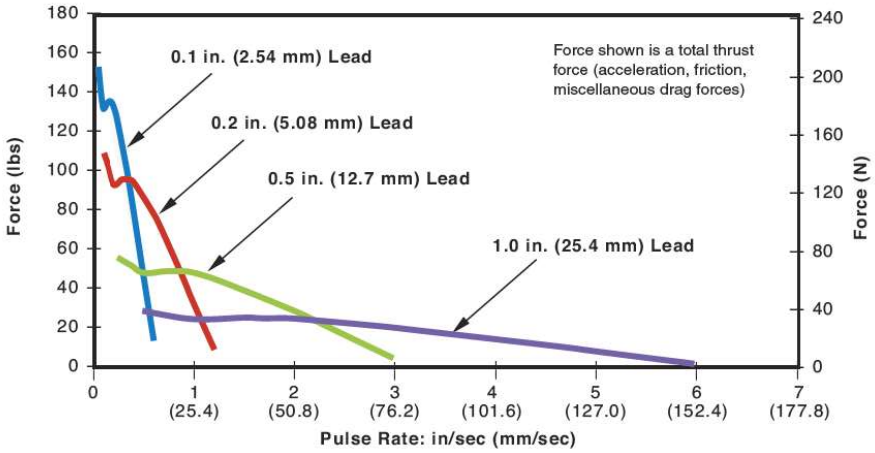
Single Stack

FORCE vs. PULSE RATE
– Chopper – Bipolar – 100% Duty Cycle



Double Stack

FORCE vs. PULSE RATE
– Chopper – Bipolar – 100% 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.

With L/R drives peak force and speeds are reduced, using a unipolar drive will yield a further 30% force reduction

WGS06 Non-Motorized Linear Rails

• Wide, low profile screw driven linear rails

The non-motorized WGS Series features standard wear compensating, anti-backlash driven carriages to ensure repeatable and accurate positioning. All moving surfaces include Kerkite® engineered polymers running on Kerkote® TFE coating, providing a strong, stable platform for a variety of linear motion applications. Recommended for horizontal loads up to 35 lbs (156 N).

WGS06
Non-Motorized
Screw Driven Linear Rail

Identifying the Non-Motorized WGS Part Numbers when Ordering

WG	S	06	K	—	A	0100	—	XXX
Prefix	**Frame Style**	**Frame Size Load**	**Coating**		**Drive / Mounting**	**Nominal Thread Lead Code**		**Unique Identifier**
WG = Wide Guide Screw	**S** = Standard	**06** = 35 lbs (156 N) (Maximum static load)	**K** = TFE Kerkote		**A** = None **B** = Inline Screw Motor Mount	0100 = .100-in (2.54) 0200 = .200-in (5.08) 0500 = .500-in (12.70) 1000 = 1.000-in (2.54)		Suffix used to identify specific motors or a 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 603 213 6290.

Specifications

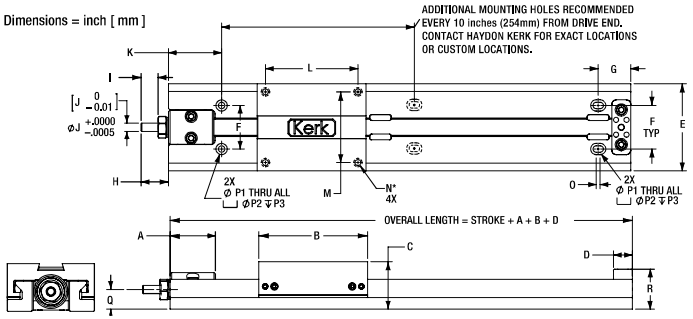
	Inch Lead	Thread Lead Code	Nominal Rail Diam.	Nominal Screw Diam.	Typical Drag Torque	Life @ 1/4 Design Load*	Torque-to-Move Load	Design Load*	Screw Inertia
WGS06 Non-Motorized with Lead Screw	inch (mm)		inch (mm)	inch (mm)	oz - in (N-m)	inch (cm)	oz-inc/lb (Nm/Kg)	lbs (N)	oz-in-sec²/in (kg-m-sec²/m)
	.100 (2.54)	**0100**		3/8 (9,5)	4.0 (0.3)	100,000,000 (254,000,000)	1.0 (.016)	35 (156)	1.5 x 10-5 (4,2 x 10-6)
	.200 (5.08)	**0200**			5.0 (.04)		1.5 (.023)		
	.500 (12.70)	**0500**			6.0 (.04)		2.5 (.039)		
	1.000 (25.40)	**1000**			7.0 (.05)		4.5 (.070)		

NOTE: WGS assemblies with lengths over 36 inches (914.4 mm) and/or leads higher than .5 inch (12.7 mm) will likely have higher drag torque than listed values.
*Determined with load in a horizontal position.

Non-Motorized with Lead Screw Dimensional Drawings

• Screw Driven
• Wide Frame

Dimensions = inch [mm]



WSG06 Wide Series, Non-Motorized, Screw Driven

	A	B	C	D	E	F	G	H	I	J	K	L	M	N*	O	P1	P2	P3	Q	R
inch	1.0	2.5	1.1	.44	2.0	1.0	.75	.63	.39	.187	1.2	2.1	1.62	8-32	.09	.15	.26	.256	.45	.92
mm	25.4	63.5	28	11.2	50.8	25.4	19.1	16	9.9	4.76	39.9	53.9	41.2	UNC-2B	2.3	3.8	6.6	6.5	11.4	23.3

*Metric carriage hole sizes available M3, M4, M5, M6.

Linear Rail Check List

Material Coatings

Kerkite® Polymers

Compounded with lubricants, reinforcements and thermoplastic polymers, Kerkite Polymers are formulated to provide optimum performance in its target conditions and applications.

- Injection molded
- High performance
- Exceptional wear properties

Kerkote® TFE Coating

A dry lubricant, Kerkote will not become dry and paste-like, and does not attract dirt or debris. Kerkote differs from conventional plating and coating because it is soft, more evenly distributed than other lubricants, and decreases erratic drag torques and unpredictable wear.

- Reduces friction
- Cost effective
- Long term and maintenance free

Kerkote provides the maximum level of self-lubrication, requiring no additional external lubrication or maintenance.