

LRS04 Motorized Linear Rails with 43000 Series

The LRS Linear Rail System in a variety of configurations, both motorized and non-motorized. These precision linear rail systems consist of a stationary base and a load bearing carriage that travels along a rigid extruded aluminum rail. The LRS Linear Rail System is available with several in-line motor options including a single stack or double stack size 17 stepper motor, a stepper motor with an integral chopper drive, or the IDEA™ programmable linear actuator, consisting of the stepper motor, drive, and controller programmed through a graphic user interface (GUI). The LRS is also available without a motor, easily allowing the designer flexibility to integrate with a variety of motor types and belt and pulley configurations.

Key Product Features

- "T" slots integrated into exterior rail bottom and sides that accommodate full length support and various mounting options.
- Loads easily attach to the compact, moving carriage with four or six M4 x 0.7 size screws.
- Load bearing carriage moves efficiently and smoothly within the internal rail geometry of this specially designed aluminum extrusion.
- Automatic adjustments of slide bearing play with a patented "anti-backlash" linear bearing.
- Rated life equals that of the existing lead screws of similar size.
- Lead screw end configurations adapt to various rotary motion sources.
- Kerkolet® or Black Ice® TFE coatings on a 303 stainless steel lead screw.
- Designed to Metric global engineering standards.
- For extreme control, LRS can be used with CMP or WDG high-precision anti-backlash nuts, as well as a freewheeling general purpose nut.



Linear Rail Check List

Identifying the LRS04 Part Number Codes when Ordering

LR	W	04	B	M	0025	XXX
Prefix	Frame Style	Frame Size Load*	Lubrication	Drive / Mounting	Nominal Thread Lead Code	Unique Identifier
LR = Linear Rail System (LRS)	B = BRV nut C = CMP nut W = WDG nut G = Guide only	04 = 50 lbs (222 N) (Maximum static load)	S = Uncoated B = Black Ice® TFE N = No screw	A = None M = Motorized 43000 Series Size 17 Hybrid G = Motor with IDEA™ integrated programmable drive - USB communications J = Motor with IDEA™ integrated programmable drive - RS485 communications	0000 = No screw 0025 = .25-in (6.35) 0031 = .03125-in (.794) 0039 = .0394-in (1.0) 0050 = .05-in (1.27) 0063 = .0625-in (1.588) 0079 = .0787-in (2.0) 0100 = .01-in (2.54) 0125 = .125-in (3.175) 0197 = .1989-in (5.0) 0250 = .25-in (6.35) 0394 = .3937-in (10.0) 0500 = .5-in (12.7) 0750 = .75-in (19.05) 1000 = 1.0-in (25.4)	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 (P) as shown above. For assistance call our Engineering Team at 603.213.6290.

LRS04 Linear Rail with 43000 Series Size 17 Linear Actuator

Recommended for horizontal loads up to 50 lbs (222 N)

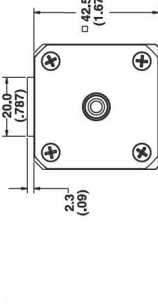
SPECIFICATIONS

Width	Length of Stroke (max)	Speed (max)	Straight Line Accuracy	Twist
1-5/8-in square (4.3 cm square)	40-in (1000 mm)	20-in/sec (0.5 M/sec)	+/- 0.012-in/ft (+/- 1.0 mm/M)	+/- 0.25"/ft (+/- 0.75"/M)

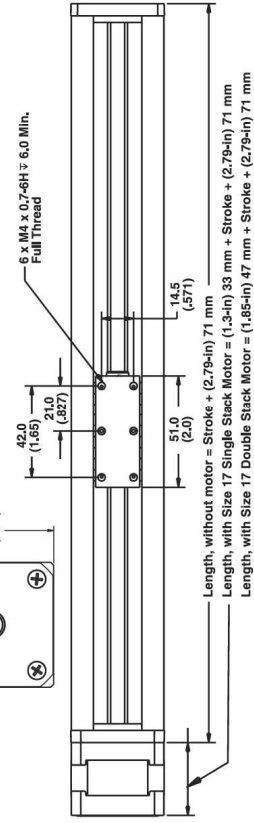
LOAD RATINGS (max)

Top Load "Z" Direction / Gantry Hanging	Pitch Moment	Max. Moment	Roll Moment	Max. Yaw
50 lbs (225 N)	75-in-lbs (8.5 N-m)	75-in-lbs (8.5 N-m)	75-in-lbs (8.5 N-m)	75-in-lbs (8.5 N-m)

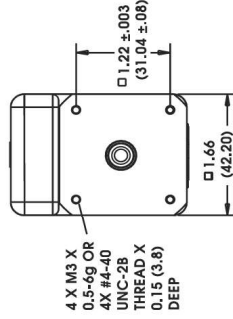
Carriage holes available in Metric sizes M3, M4, M5, M6



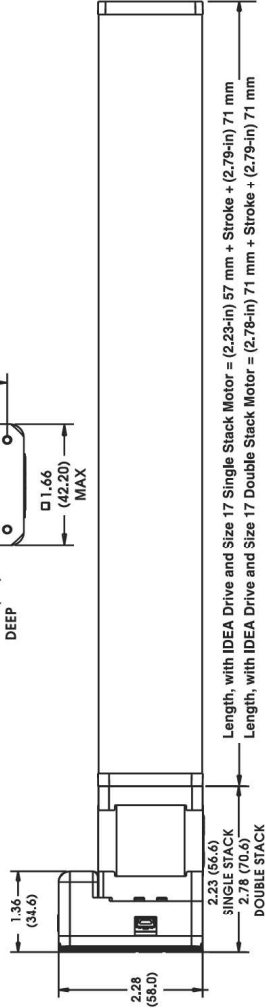
Dimensions = (inches) mm



...with IDEA™ Drive



Dimensions = (inches) mm



Single Stack

43000 Series Size 17

Size 17: 43 mm (1.7-in) Hybrid Linear Actuator (1.8° Step Angle)		Bipolar	Unipolar**
Wiring		Bipolar	Unipolar**
Programmable Drive	IDEA™ Drive Option Available	Not Applicable	Not Applicable
Winding Voltage	2.33 VDC*	5 VDC	12 VDC
Current (RMS)/phase	1.5 A	700 mA	290 mA
Resistance/phase	1.56 Ω	7.2 Ω	41.5 Ω
Inductance/phase	1.9 mH	8.7 mH	54.0 mH
Power Consumption		7 W	270 mH
Rotor Inertia		37 gcm ²	
Insulation Class		Class B (Class F available)	
Weight		8.5 oz (241 g)	
Insulation Resistance		20 MΩ	

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

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

Double Stack

43000 Series Size 17

Size 17: 43 mm (1.7-in) Double Stack Hybrid Linear Actuator (1.8° Step Angle)		Bipolar	
Wiring		Bipolar	
Programmable Drive	IDEA™ Drive Option Available		
Winding Voltage	2.33 VDC*	5 VDC	
Current (RMS)/phase	2.6 A	1.3 A	
Resistance/phase	0.9 Ω	3.8 Ω	
Inductance/phase	1.33 mH	8.21 mH	
Power Consumption		10.4 W Total	
Rotor Inertia		78 gcm ²	
Insulation Class		Class B (Class F available)	
Weight		12.5 oz (352 g)	
Insulation Resistance		20 MΩ	

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

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

Size 17
Single Stack
External Linear
with IEA Drive



Size 17
Single Stack
External Linear

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

- Fully Programmable
- RoHS Compliant
- USB or RS-485 Communication
- Interoperable with 1162, 1163, 1164
- Full 12 Bit User Interface
- Graphical User Interface
- Auto-position of Drive Parameters
- Programmable Acceleration/Deceleration and Current Control

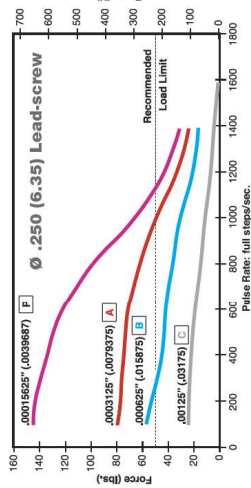
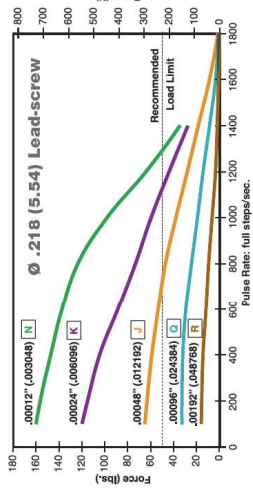
For more information see the
IDEA™ Drive Data Sheet

Size 17
Double Stack
External Linear

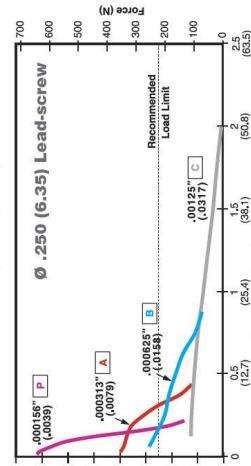
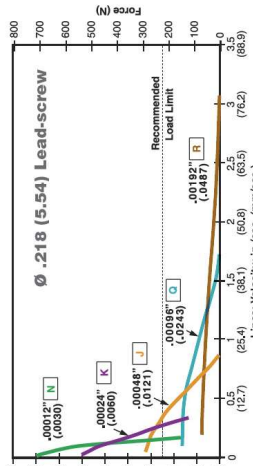


Single Stack

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

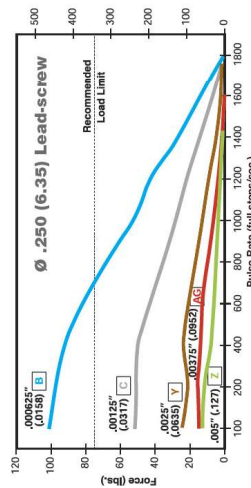


FORCE vs. LINEAR VELOCITY
- Chopper - Bipolar - 100% Duty Cycle

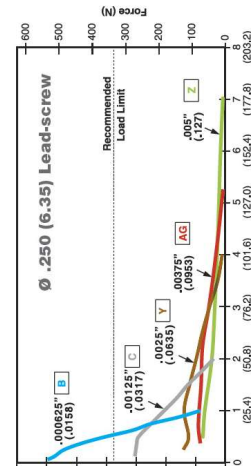


Double Stack

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

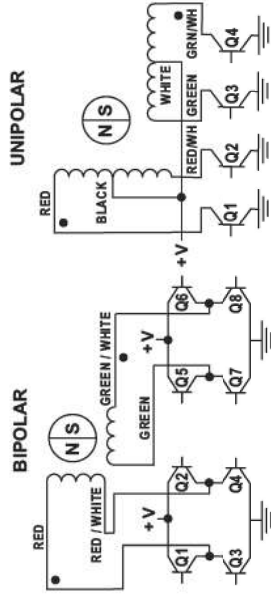
Hybrids: Stepping Sequence

Hybrids: Wiring

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

RETRACT CCW ↑

EXTEND CW ↓



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

Hybrid Size 17 linear actuators are available with an integrated connector. Offered as a complete assembly, the 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.



Size 17 43000 Series • Integrated Connectors

Motor Connector: JST part # S06B-PASK-2

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

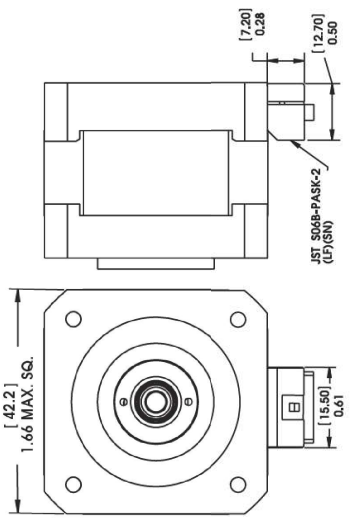
Wire to Board Connector: JST part number SPHD-001T-P0.5

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



Motorized Size 17

LRS04 Non-Motorized Linear Rails

- T-slots integrated into exterior rail bottom and sides that accommodate full length support and various mounting options

The non-motorized LRS Linear Rail System consists of a stationary base and a load-bearing carriage that travels along a rigid extruded aluminum rail. Easily allows flexibility to integrate with a variety of motor types, belt and pulley configurations. Also available with several inline motor options, including a single stack or double stack-Size 17 stepper motor, with or without a programmable IDE™ Drive. For extreme loads, the LRS04 can be used with CMP or WDG high precision anti-backlash nuts, as well as a freewheeling general purpose nut.



LRS04 Non-Motorized Shown with Back-Loc™ TFE Coated Lead Screw

Linear Rail Check List

Identifying the Non-Motorized LRS Part Numbers when Ordering

LR	W	04	B	A	0025	XXX
Prefix LR = Linear Rail System	Frame Style B = 57V Nut C = CMP Nut W = WDG Nut G = Guide only	Frame Size Load 04 = 50 lbs (225 N) (Maximum static load)	Coating S = Uncoated B = Black Ice TFE N = No screw	Drive / Mounting A = None	Nominal Thread Lead Code 0000 = No screw 0025 = 0.25-in (6.35) 0031 = 0.3125-in (7.94) 0039 = .0394-in (1.0) 0050 = .05-in (1.27) 0063 = 0.025-in (1.588) 0079 = 0.079-in (2.0) 0100 = 1.00-in (2.54) 0125 = 0.125-in (3.175) 0197 = 0.197-in (5.0) 0250 = 0.250-in (6.35) 0384 = 0.3937-in (10.0) 0500 = 500-n (12.70) 0750 = 0.75-n (19.05) 1000 = 1.0-n (25.4)	Unique Identifier Suffix, used to identify specific motors or a proprietary suffix, as great to a specific customer application. The identifier can apply to either a standard or custom part.

NOTE: Dashes must be included in Part Number (2) as shown above. For assistance call our Engineering Team at 832.213.6290

Dimensional Drawings

