

WARNER LINEAR ACTUATORS



Electric Actuators and Actuator Controls

Warner Linear...

Customer Focused, Quality Driven

Products designed and manufactured for reliable, long-lasting performance



Quality Processes

Warner Linear is dedicated to designing and manufacturing "Best-in-class" electromechanical actuators and controls.

We subscribe to a standard of quality derived from the Altra Business System (ABS), a series of progressive manufacturing methods designed to continuously improve production within our flexible work cell environment.

Our quality starts in product design. It is demonstrated in the attention given to design details and the refinement of prototypes. It is apparent in our fast response to requests for quotes, and our strict adherence to deadlines in every stage of the work flow.

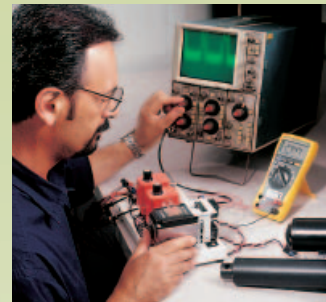


Custom Solutions

We recognize how critical our actuators are to the overall performance of your equipment. Working closely with your engineering and development staff, we strive for an early understanding of how you want your linear actuator to perform.

Building a direct communication line from our engineer to your engineer provides a number of significant benefits.

- A teaming of creative resources.
- Joint understanding of our actuator capabilities and how they can be tailored to your application.
- An understanding of the lowest cost solution to meet your actuator requirements.
- Providing a complete solution that includes controls as required.



Service to our Customers

Our team takes pride in serving our customers with excellence and enthusiasm and demonstrates this in all aspects of our business relationships.

Our knowledgeable staff is involved on a daily basis in customer communications, team based problem solving, and continuous improvement. We are sensitive to satisfying specific customer requirements and expectations.





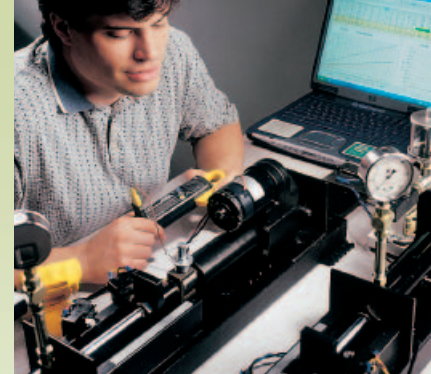
Design and Testing

Our engineers and design specialists work closely with our customers to define both lab and field testing requirements. Our solid model design capabilities, computer assisted testing, and manufacturing floor pre-shipment cycle test, all provide assurance that your Warner Linear actuators will meet or exceed your expectations.

Our linear actuator testing capabilities include dual load life cycling stands, low and high pressure wash down test tanks, lift test stands and thermal shock submersion. Our test service providers add material analysis, noise and vibration evaluation capabilities.

State-of-the-Art Facilities

Our division headquarter's facility is a full function design and manufacturing center located in Belvidere, Illinois. The facility is dedicated to the engineering, testing and assembly of Warner Linear actuators. Selective global sourcing of high quality components from low cost countries provides the ultimate in actuator value.



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Linear actuators to meet your specific requirements

Warner Linear offers a full line of standard electric actuators, each specifically designed to meet the needs of light-duty, general-duty, or rugged-duty applications. All are engineered for maintenance-free, long-life service, providing maximum value for our customers.

QUICK SELECTION GUIDE

Light Duty



M-Track 1

Compact, completely self-contained and sealed to allow for use in small spaces without sacrificing power or capability.

Drive Type:
Acme Screw

Load Capacity & Speed
(lbs. @ in./sec.):
25 @ 1.75
50 @ 0.85
100 @ 0.45
165 @ 0.25

Stand. Stroke Length (in.):
2, 4, 6, 10, 12

Input Voltage (vdc):
12, 24

Typical Applications:

Throttle Control
Air Vent Opening
Remote Window Operation
Remote Mirror Positioning
Gate Opening
Shutter Control

Pg 8-9

General Duty



A-Track 2

Efficient design offering low cost power capability. For use in applications where moisture or environmental contamination exist.

Drive Type:
Acme Screw

Load Capacity & Speed
(lbs. @ in./sec.):
330 @ 1.0
500 @ 0.5

Stand. Stroke Length (in.):
4, 6, 8, 12, 18, 24

Input Voltage (vdc):
12, 24

Typical Applications:

Drum Lifts
Access Panel Lifts
Walk Behind Sweeper/Polishers
Tractor Hood Lifts
Spout Positioning

Pg 12-13



A-Track 5

Efficient design offering moderate power capability. For indoor use or where AC power is available.

Drive Type:
Acme or Ball Screw

Load Capacity & Speed
(lbs. @ in./sec.):
330 @ 1.2
500 @ 0.75
1000 @ 1.0
1300 @ 0.75

Stand. Stroke Length (in.):
4, 6, 8, 12, 18, 24

Input Voltage (vac):
115, 230

Typical Applications:

Work Table Positioning
Conveyor Positioning
Remote Louver Control
Door Opening
Vent Control
Scissor Lift Tables

Pg 14-17

Actuator Controls

Simple extend/retract switch boxes

- SBC-DC
- SBC-AC

Basic controls and digital electronic options

- Adjustable stroke limits
- Fixed electronic stroke limits – ESL
- QS Quick Stop bi-directional current limit control
- Position feedback options – potentiometer or digital outputs

Microprocessor based controls (available for special needs)

- Quick Switch and Twin Track control functions
- Programming pendant
- Adjustable position and current limit options
- Remote mounting capable



Rugged Duty



A-Track 10

Completely self-contained for more demanding outdoor applications requiring moderate load and duty cycle capability.

Drive Type:
Ball Screw

Load Capacity & Speed
(lbs. @ in./sec.):
500 @ 2.0
700 @ 1.0
1300 @ 0.5

Stand. Stroke Length (in.):
4, 6, 8, 12, 18, 24

Input Voltage (vdc):
12, 24

Typical Applications:

Boat Engine Covers
Round Baler Covers
Engine Hoods
Scooter Lifts

Pg 18-19



B-Track K2v1

Intended for severe service requirements and loads up to 750 lbs. Lowest priced model in the B-Track family.

Drive Type:
Hybrid Acme

Load Capacity & Speed
(lbs. @ in./sec.):
250 @ 2.0
500 @ 1.0
750 @ 0.5

Stand. Stroke Length (in.):
2 to 24 in 2" increments

Input Voltage (vdc):
12, 24, 48, 90

Typical Applications:

Fertilizer Gate Control
Mower Decks
Gate Openers
Scooter & Cycle Lifts
Pull Behind Implement
Lifts

Pg 22-23



B-Track K2

Uses a patented straight line load transfer offering high load capability in a small package size. Bronze or Delrin® nut options available for high impact load applications (up to 1,200 lbs.).

Drive Type:
Hybrid Acme

Load Capacity & Speed
(lbs. @ in./sec.):
300 @ 2.0
600 @ 1.0
1200 @ 0.5

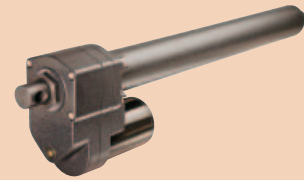
Stand. Stroke Length (in.):
2 to 36 in 2" increments

Input Voltage (vdc):
12, 24, 48, 90

Typical Applications:

Residential Mower Decks
Gate & Valve Operation
Snow Blowers
Spouts & Chutes
Engine Lifts
Tables
Wagon Lifts
Combine Concaves

Pg 24-25



B-Track K2x

Completely sealed, designed for tough, high load applications. Able to perform in harsh environments providing years of trouble-free service.

Drive Type:
Ball Screw & Ball Nut

Load Capacity & Speed
(lbs. @ in./sec.):
600 @ 2.0
1200 @ 1.0
2200 @ 0.5

Stand. Stroke Length (in.):
2 to 36 in 2" increments

Input Voltage (vdc):
12, 24, 48, 90

Typical Applications:

Paving Outriggers
Commercial Mower
Decks
Spray Booms
ATV Dump Box Lifts
Boat Engine Lifts
Hydraulic Cylinder
Replacement
Construction Equipment
Hood Lifts

Pg 26-27

Warner Linear Actuators are available for a wide variety of applications.

Golf Cart Height Adjust

Mower Blade Lift

Solar Panel Adjust

55 Gallon Drum Lift

Fire Engine Valve Adjust

Automated Dumpster

Scissor Lift Table

Round Baler Cover Lift

Walk Behind Floor Washer

Bulldozer Engine Cover

Air Foil Adjust

Construction Sign Positioning

Forage Harvester Spout Positioning

Combine Spout Positioning

Adjustable Height Work Table

Conveyor Lateral Guide Positioning

Street Sweeper Bristle Lift

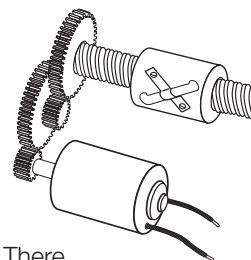
RV/Bus Compartment Extension

Performance Features

Dependable Operation

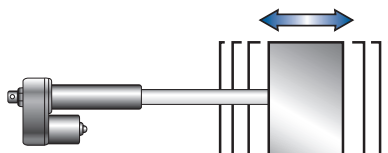
Compact design

A Warner Linear actuator with a two inch stroke can provide up to 2000 pounds of force capacity in a compact package.



Maintenance-free

Units are lubricated for life during assembly. There are no adjustments or maintenance required for units after they have left the factory. Consistent performance is provided for the entire life of the actuator.



Equal capacity in both directions

Warner Linear actuators can push-and-pull or lift-and-lower loads ranging from one pound to over 2000 pounds up to 24 inches with equal capacity in both directions of travel.

Efficient operation

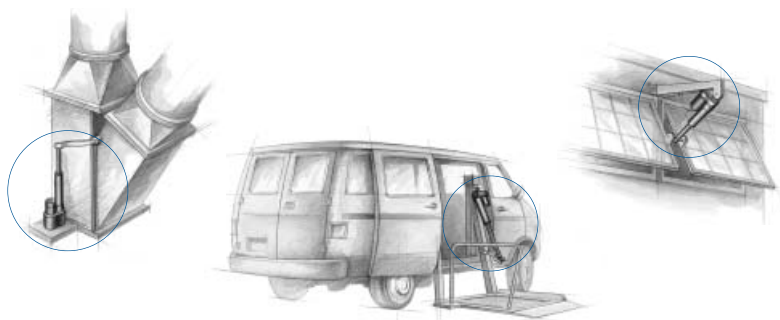
Warner Linear actuators consist of an electric motor combined with a high efficiency gear train and lead screw. This direct conversion of electrical to mechanical energy results in effective, economic linear movement. Units are completely self contained and require minimal installation hardware or wiring.

Superb load holding power

Warner Linear actuators operate loads in both tension and compression equally well. They will hold a load stationary without power in either direction. Static load holding capability will always exceed the dynamic load moving capability.

Advantages

- No hydraulic pumps, hoses, valves, or leaks
- Holds load when power is off
- Overload clutches prevent damage due to excess weight
- Simple to install and use
- Easily adaptable for position control
- Integrated sensors provide electrical position signals



Rugged and reliable

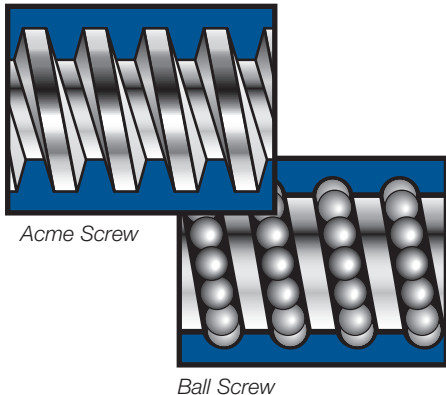
Warner Linear actuators incorporate high strength, high quality components and are designed to assure trouble-free service. Rugged spur gearing, industrial quality synthetic lubricants and high performance motors combine to provide maximum capability and value for the end user. Units are gasketed and sealed for operation in industrial and mobile outdoor applications. Thermal overload switches are included for motor protection; and high performance corrosion protection features are standard.

Energy efficient

Electric control provides clean, smooth linear motion without fluids, plumbing or other expensive components. Warner Linear actuators require power only when in motion. No power is required to hold loads stationary.

Lead screw drive systems

Warner Linear actuators use either acme, hybrid rolled, or highly efficient ball bearing screws. Models which use acme or hybrid rolled screws with bronze or plastic nuts will not backdrive when power is off. A bi-directional load holding brake is a standard feature on all ball bearing units and holds loads in position when power is off.



Acme Screw

Ball Screw

Overload protection

Motors incorporate thermal switches in their windings to shut the actuator motor off in case of overheating or high overcurrent. Reset is automatic after the motor has cooled. A standard overload clutch detents if the load is excessive or reaches end of stroke.

Note: Clutch is not incorporated in M-Track due to size constraints.

Versatile

With their compact size, Warner Linear actuators can be located in confined areas, and move loads from 0 to 2000 pounds. Their static load holding ability ensures that a load will remain in position when power is turned off. Gearing ratios create speeds that range from 1/2 to over 2 inches per second. Standard models are mounted using two parallel pins and require only simple wiring and switches. They are self-contained, lubricated for life, and designed for use where rugged and durable performance is required for almost any lift-and-lower or push-and-pull application.

Available customized features

- Direct drive manual override
- Mounting and end fitting variations
- DC Motor voltage variations
- AC and DC motor options
- Motor lead wire connectors
- Adjustable stroke limit switches – fixed and adjustable
- Position feedback outputs – potentiometer and digital

Also available

- Basic switch box controls
- Integrated electronic position controls

M-Track | Features

Light Duty Actuators

Key Features

- Compact size
- Efficient design
- Easy to use and install

Standard Models

M1



How To Select

Step 1 – Determine Load and Stroke length requirements

Use the Quick Selection guide to identify the model that will provide the load capacity and stroke length needed for your application.

Step 2 – Identify motor type and voltage

Select DC motor and motor voltage.

Step 3 – Confirm Speed and Current draw requirements

Using the charts provided, confirm that unit speed and current draw is appropriate for the intended use.

Step 4 – Confirm the application Duty Cycle

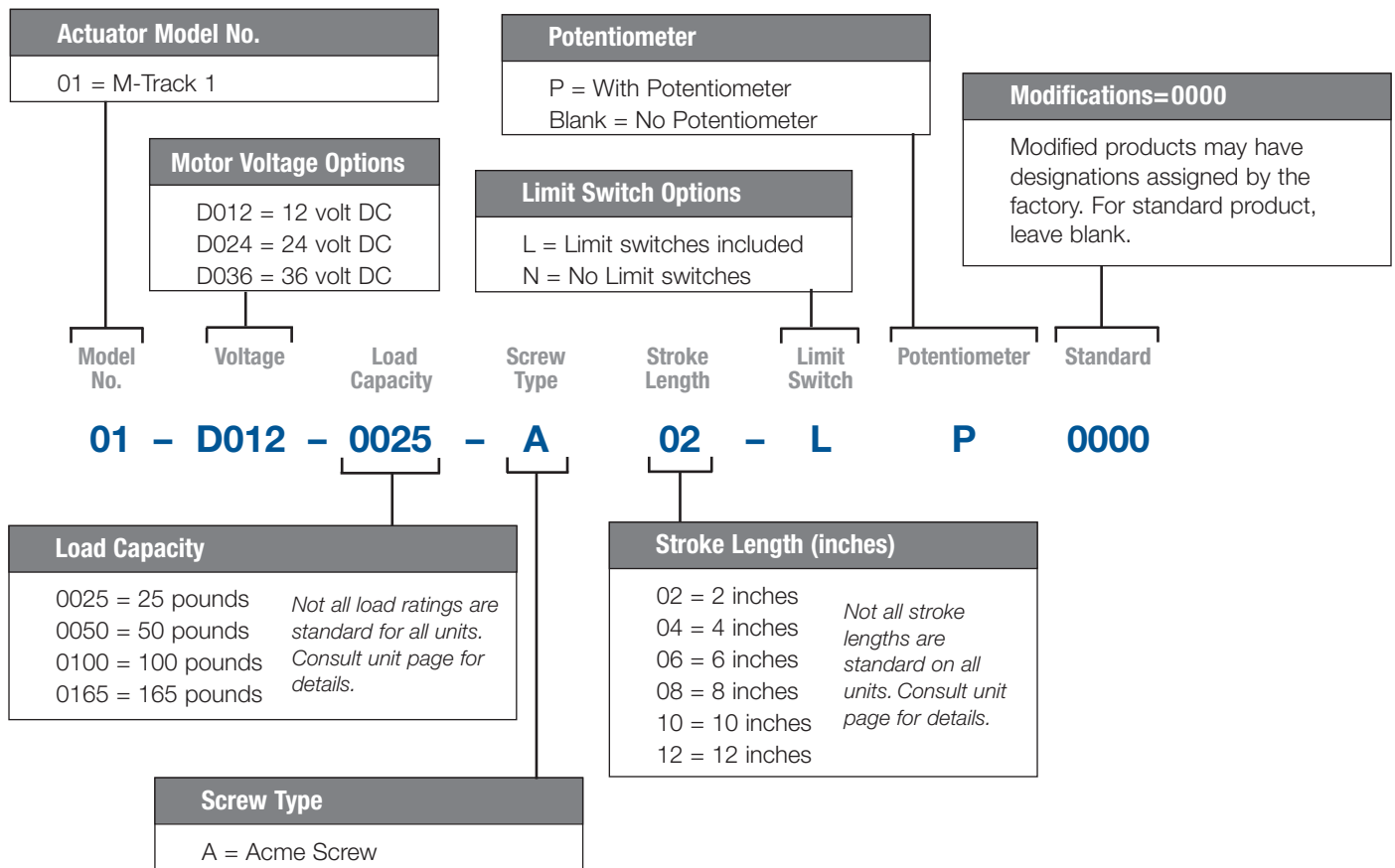
At full load capacity, actuators have a 25% duty cycle. Duty cycle is the amount of 'on-time' compared to cooling time. A unit that runs for 15 seconds should be off for 45 seconds.

Important Unit Restrictions

Side loading and shock loads must be considered in actuator applications. Side loading and cantilevered mounting should be eliminated through proper machine design. Side loading will dramatically reduce unit life. While actuators can withstand limited shock loads, it is recommended that shock loading be avoided wherever possible. (See page 35)

Step 5 – Unit Options

M-Track units include end-of-travel limit switches as a standard feature. For positional feedback, a 10K ohm potentiometer can be factory installed. The changing potentiometer value provides unit movement feedback for units that are not visible to the machine operator.



DC Motor Acme Screw

165 lb. Load Rated



M-Track 1 compact units are completely self-contained and sealed to allow use in small spaces without sacrificing power or capability. The load and length capabilities provide solutions for a diverse range of intermittent duty applications.

Functionally, M-Track 1 actuators are easily interchanged with comparable size hydraulic or pneumatic cylinders on intermittent duty applications. The actuator provides consistent, repeatable performance even for applications with operating conditions including temperature extremes, high humidity, or significant dust.

Features

- An Acme Screw drive delivers up to 165 pounds of force at a minimum extension rate of 0.25 inches per second
- The aluminum zinc alloy housing resists corrosion and provides protection from dirt, dust and humidity
- The M-Track 1 has a temperature operating range of -15° to $+150^{\circ}$ F
- Standard stroke lengths of 2, 4, 6, 8, 10, 12 inches are available
- Internal limit switches automatically shut off the unit at end of stroke
- Optional potentiometer can provide positional location feedback

Typical Applications

Light load and short distance applications such as:

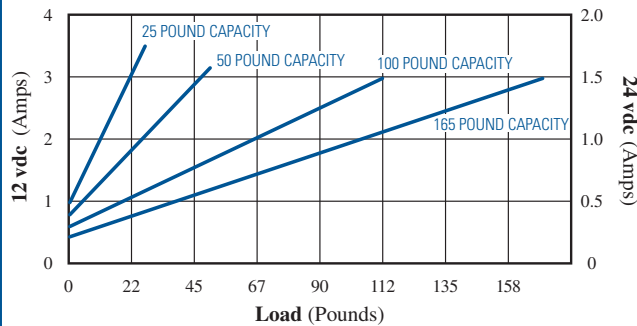
- Valve and vent adjustments
- Light weight tilt or lift positioning
- Vise and clamp operations

Specifications

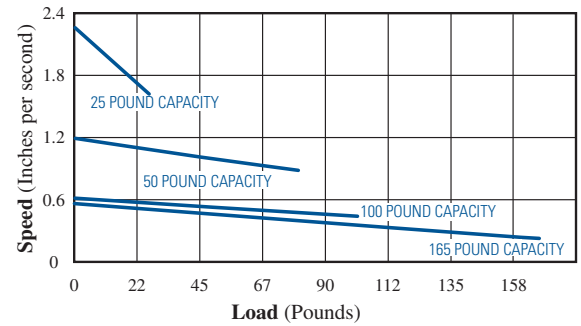
Load Capacity	25 pounds	50 pounds	100 pounds	165 pounds
Speed at Full Load	1.75 in/sec	0.85 in/sec	0.45 in/sec	0.25 in/sec
Input Voltage	12 or 24 volt DC for all models (36 volt optional)			
Static Load Capacity	300 pounds for all models			
Stroke Length	2, 4, 6, 8, 10 and 12 inches for all models			
Clevis Ends	6.4 mm diameter			
Duty Cycle	25% for all models			
Operation Temperature Range	-15° F to $+150^{\circ}$ F for all models			
Limit Switch	Fixed end of stroke limit switches standard for all units			
Potentiometer	10K, 10 turn pot optional on all units			
Restraining Torque	20 inch pounds for all units			

Performance Curves

Current vs Load



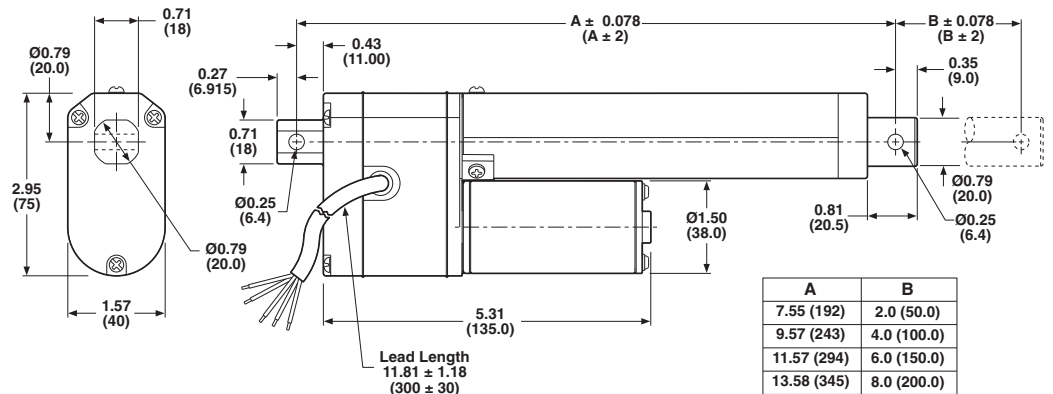
Speed vs Load



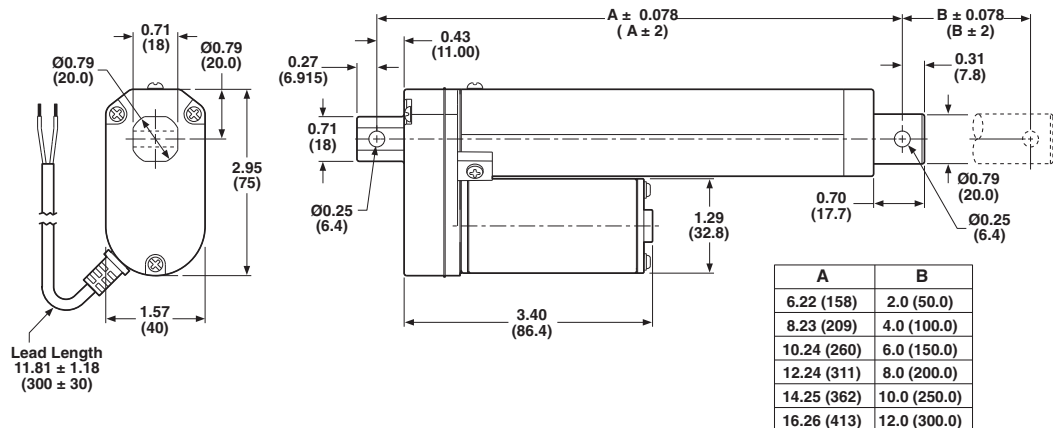
Dimensions

Stroke Length	2		4		6		8		10		12	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
Retracted Length (without POT sensor)	6.22	158	8.23	209	10.24	260	12.24	311	14.25	362	16.26	413
Retracted Length (with POT sensor)	7.56	192	9.57	243	11.57	294	13.58	345	N/A	N/A	N/A	N/A

With Limit Switches
and Potentiometer



With Limit
Switch Only



A-Track | Features

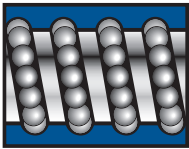
General Duty Actuators

Key Features

- Totally sealed
- Long life motors
- Easy to use and install
- Best value in its class

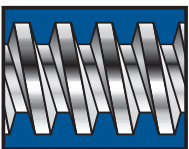
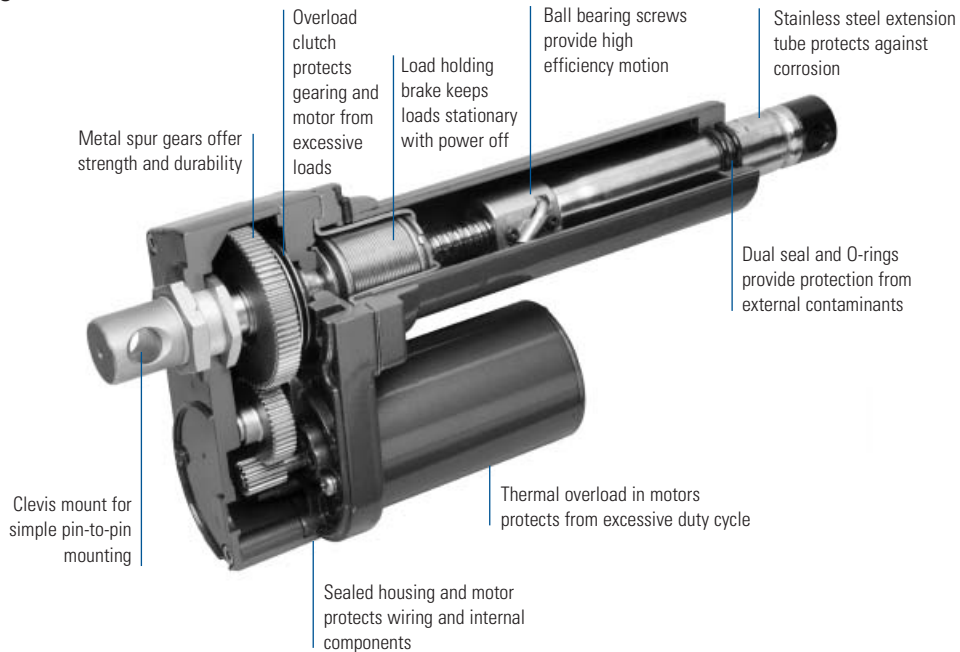
Standard Models

A-Track 2, A-Track 5,
A-Track 10



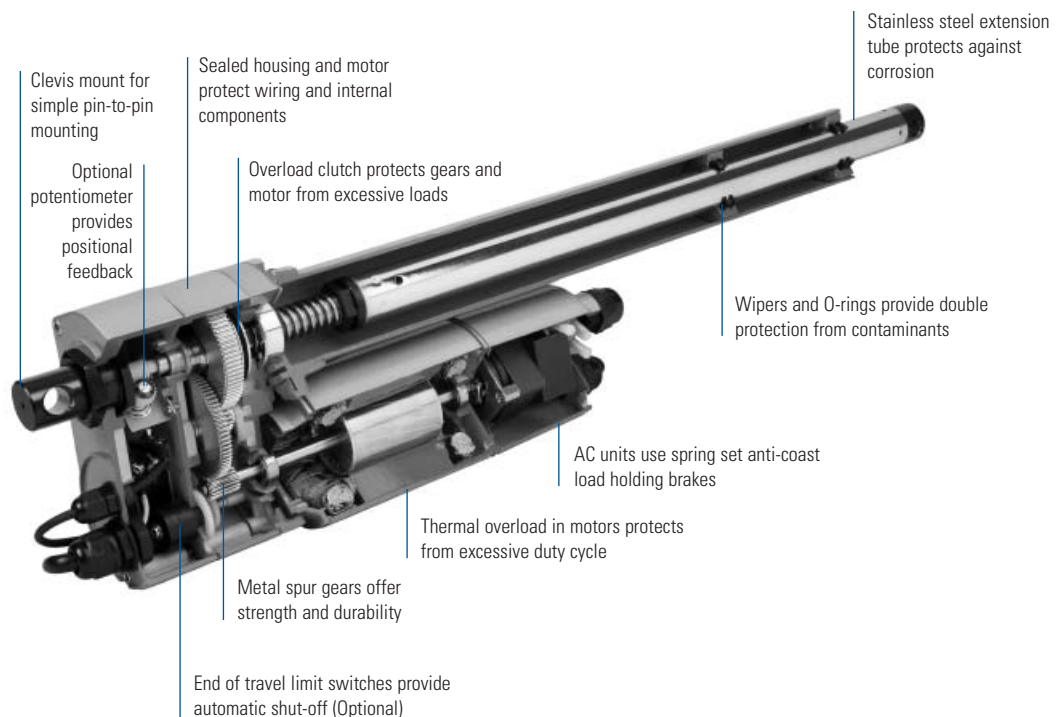
Ball Screw Driven Actuators...

designed for industrial and commercial applications requiring high load capacities.



Acme Screw Driven Actuators...

designed for light to moderate duty applications.



How To Select

Step 1 – Determine Load and Stroke length requirements

Use the Quick Selection guide to identify the model family that will provide the load capacity and stroke length needed for your application.

Step 2 – Identify motor type and voltage

Select AC or DC motor and motor voltage.

Step 3 – Confirm Speed and Current draw requirements

Using the charts provided with each model family, confirm that unit speed and current draw is appropriate for the system design.

Step 4 – Confirm the application Duty Cycle

At full load capacity, actuators have a 25% duty cycle. Duty cycle is the amount of 'on-time' compared to cooling time. A unit that runs for 15 seconds should be off for 45 seconds.

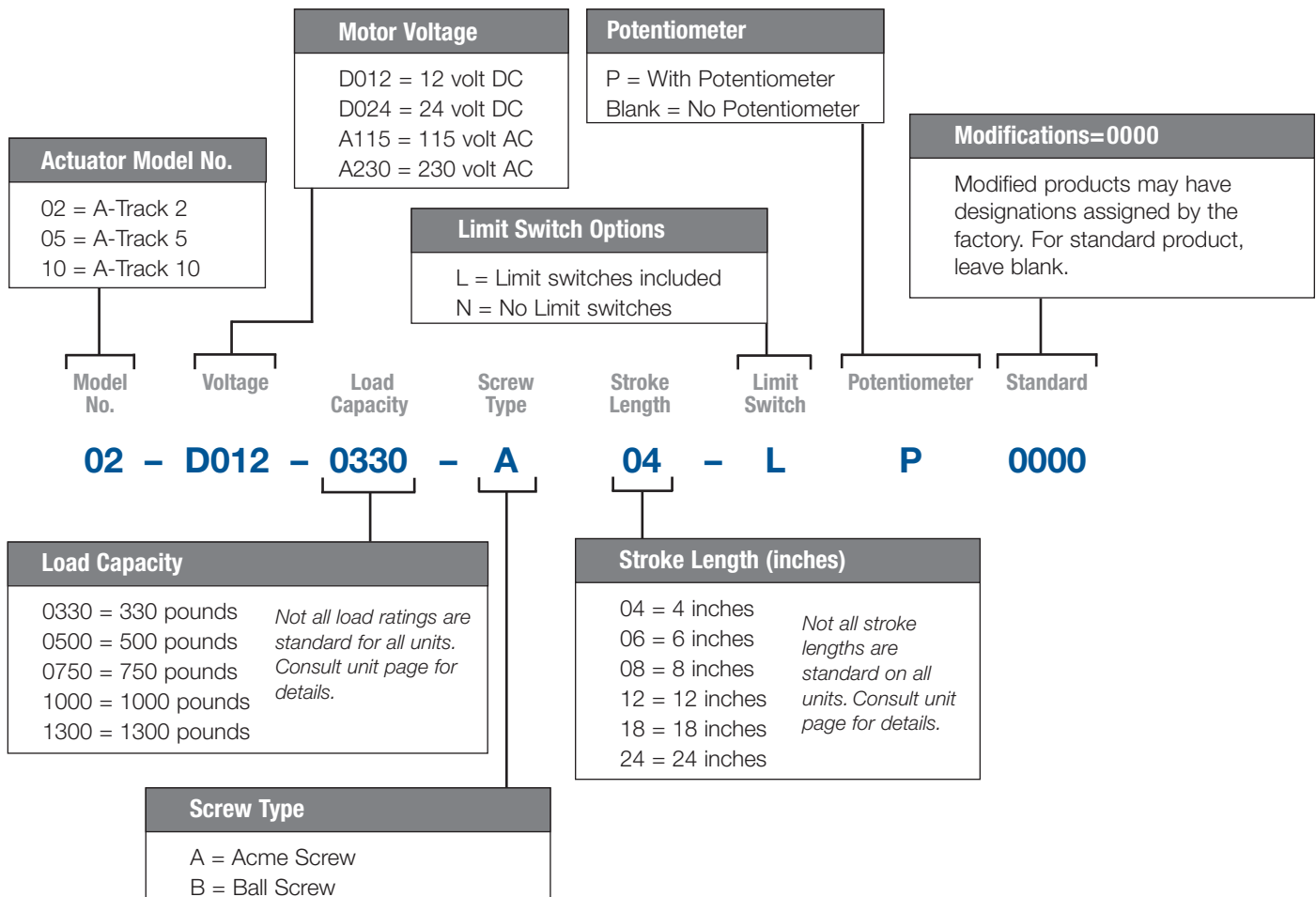
Important Unit Restrictions

Side loading and shock loads must be considered in actuator applications. Side loading and cantilevered mounting should be eliminated through proper machine design. Side loading will dramatically reduce unit life. While actuators can withstand limited shock loads, it is recommended that shock loading be avoided wherever possible. (See page 35)

Step 5 – Unit Options

A-Track units include end-of-travel limit switches as an optional feature. *For positional feedback, a 10K ohm potentiometer can be factory installed. The changing potentiometer value can provide unit movement feedback for units that are not visible to the machine operator.

**Limit switches are only available in the maximum load configuration for each model.*



A-Track | 2

DC Motor Acme Screw

Up to 500 lbs. Load Rated

Up to .98 in./sec. Speed



Features

- Sealed and gasketed for mobile or outdoor applications
- Overload clutch standard
- 4, 6, 8, 12, 18 and 24 inch stroke lengths
- 12 or 24 volt DC motors
- Acme screw drive
- Thermal overload included in double ball bearing motor.

Typical Applications

- Gate and valve positioning
- Tailgate lifts
- Mobile equipment spout positioning control

General Purpose DC Actuator

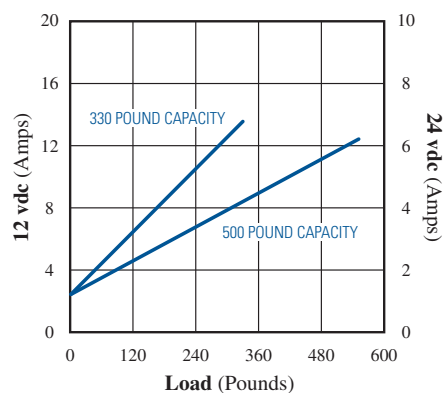
The A-Track 2 incorporates an Acme screw drive system that provides a value priced unit for moderate duty applications. The A-Track 2 includes lubrication for the life of the unit, combined with robust seal and O-ring design, creating a maintenance free design, even when used in applications with high humidity or dust.

Specifications

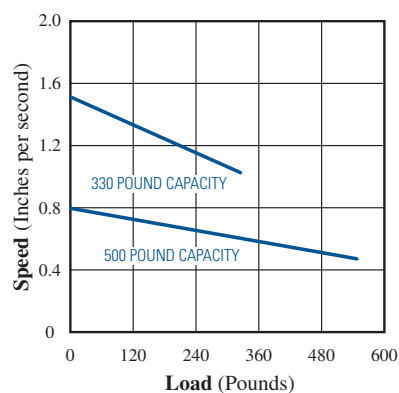
Load Capacity	330 pounds	500 pounds
Speed at Full Load	0.98 in/sec	0.51 in/sec
Input Voltage	12 or 24 volt for all models	
Static Load Capacity	1000 pounds for all models	
Stroke Length	4, 6, 8, 12, 18 and 24 inches for all models	
Clevis Ends	13 mm diameter	
Duty Cycle	25% for all models	
Operation Temperature Range	-15° F to +150° F for all models	
Limit Switch	Optional adjustable travel limit switches (20:1 only) (500 lb.)	
Potentiometer	Optional feedback potentiometer	
Restraining Torque	100 inch pounds	
Thermal Overload	Thermal overload included in all motors	

Performance Curves

Current vs Load



Speed vs Load



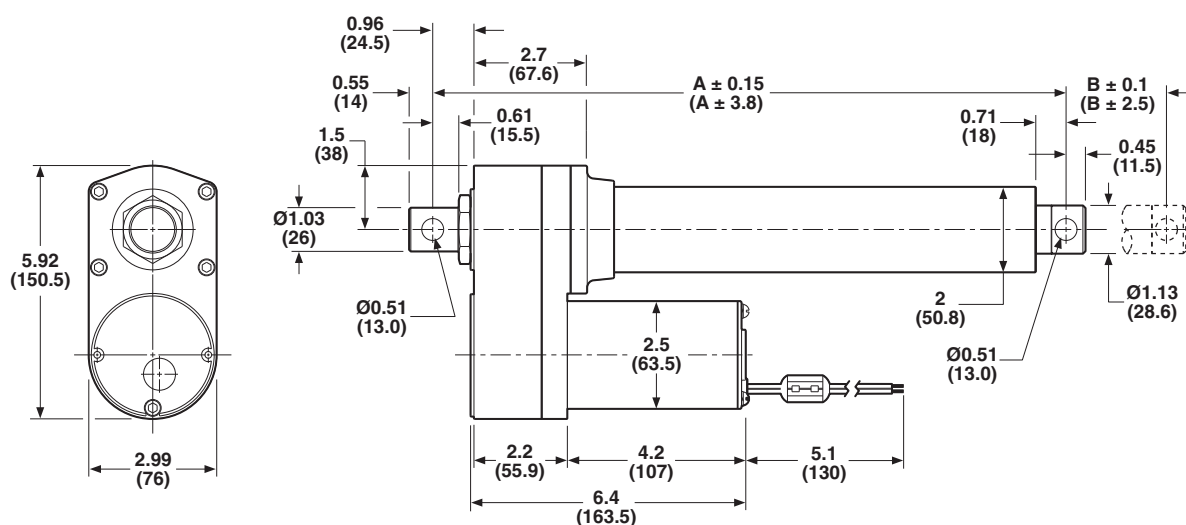
Dimensions

With Limit Switches

A-Track 2	Stroke	4		6		8		12		18		24	
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
	A	13.31	338	15.31	389	17.13	435	21.26	540	30.39	772	36.38	924
	B	4.01	102	6.02	153	7.99	203	12.0	305	17.99	457	24.01	610

Without Limit Switches

A-Track 2	Stroke	4		6		8		12		18		24	
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
	A	10.3	262	12.32	313	14.33	364	18.31	465	27.40	696	33.39	848
	B	4.01	102	6.02	153	7.99	203	12.00	305	17.99	457	24.01	610



AC Motor Acme Screw

Up to 500 lbs. Load Rated

Up to 1.0 in./sec. Speed



Features

- Acme screw drive system
- 115 volt AC (60hz) and 230 volt AC (50hz) motors available
- 4, 6, 8, 12, 18 and 24 inch strokes
- Acme screw drive train
- Overload clutch standard
- Lubricated for life
- Capacitor included with motor

Typical Applications

- Ergonomic lift tables
- Conveyor diverters
- Bin/tank cover lifts
- Roof vents

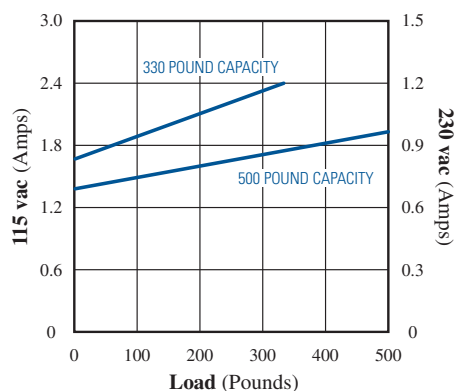
The A-Track 5 Acme screw actuator is a general purpose AC actuator with load capacities of 330 and 500 pounds for use in moderate duty interior applications. The unit includes a power off motor stopping brake for faster stops and extra load holding capability. The Model 5 allows for stroke lengths of 4 to 24 inches for in-plant or protected applications.

Specifications

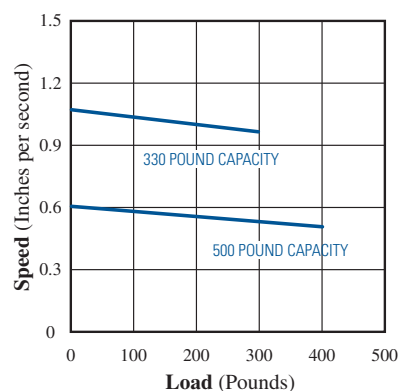
Load Capacity	330 pounds	500 pounds
Speed at Full Load	0.98 in/sec	0.55 in/sec
Input Voltage	115 vac (60hz) and 230 vac (50hz) for both models	
Static Load Capacity	1000 pounds for all models	
Stroke Length	4, 6, 8, 12, 18 and 24 inches for all models	
Clevis Ends	13 mm diameter	
Duty Cycle	25% for all models	
Operation Temperature Range	-15° F to +150° F for all models	
Limit Switch	Optional adjustable travel limit switches (20:1 only) (500 lb.)	
Potentiometer	Optional feedback potentiometer	
Restraining Torque	100 inch pounds	
Thermal Overload	Thermal overload included in all motors	

Performance Curves

Current vs Load



Speed vs Load



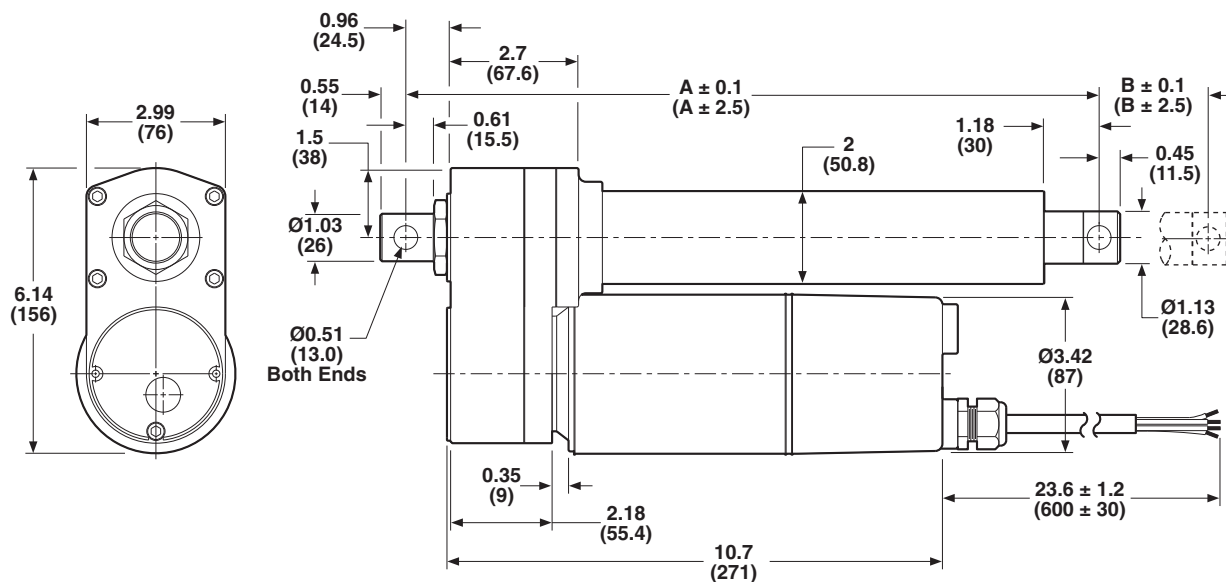
Dimensions

With Limit Switches

A-Track 5 Acme	Stroke	4		6		8		12		18		24	
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
	A	17.95	456	19.92	506	21.89	556	25.91	658	31.89	810	37.87	962
	B	4.01	102	6.02	153	7.99	203	12.00	305	17.99	457	24.01	610

Without Limit Switches

A-Track 5 Acme	Stroke	4		6		8		12		18		24	
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
	A	14.96	380	16.97	431	18.94	481	22.95	583	28.94	735	34.92	887
	B	4.01	102	6.02	153	7.99	203	12.00	305	17.99	457	24.01	610



A-Track | 5

AC Motor Ball Screw

Up to 1300 lbs. Load Rated

Up to 1.89 in./sec. Speed



Features

- Ball bearing screw drive system
- Anti-coast load holding brake
- 4–24 inch stroke length capability
- Load limiting clutch standard
- Thermal overload protection in the motor
- Capacitor included in motor

Typical Applications

- Ergonomic lift tables
- Conveyor diverters
- Bin or tank cover lifts
- Die transfer carts

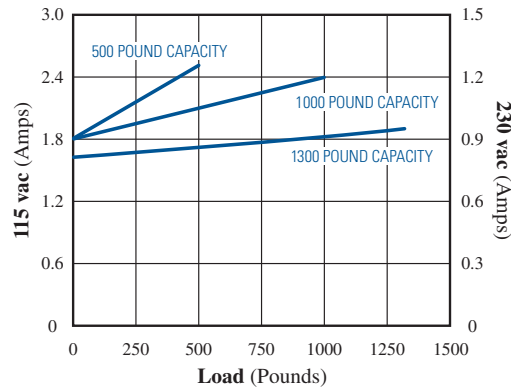
The A-Track 5 Ball Screw is a ball screw drive linear actuator for industrial and commercial applications. The unit provides load capacity up to 1300 pounds with either 115 volt or 230 volt AC motors. This unit includes a power off load holding brake which stops the motor from turning when power is off. The Model 5 allows for stroke lengths of 4 to 24 inches for in-plant or protected applications.

Specifications

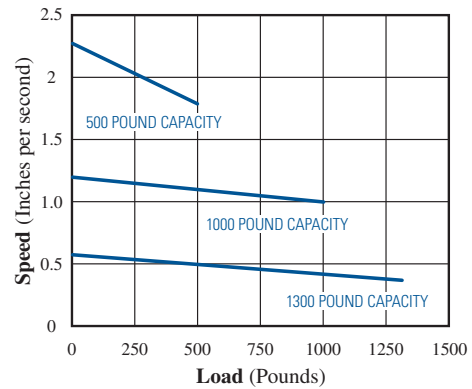
Load Capacity	500 pounds	1000 pounds	1300 pounds
Speed at Full Load	1.89 in/sec	0.98 in/sec	0.47 in/sec
Input Voltage	115 vac (60hz) / 230 vac (50hz)		
Static Load Capacity	3050 pounds for all models		
Stroke Length	4, 6, 8, 12, 18 and 24 inches		
Clevis Ends	13 mm diameter		
Duty Cycle	25% for all models		
Operation Temperature Range	-15° F to +150° F for all models		
Limit Switch	Optional (20:1 only) (1300 lbs.)		
Potentiometer	Optional for all models		
Restraining Torque	100 in. lbs.		
Thermal Overload	Overload clutch and motor thermal overload		

Performance Curves

Current vs Load



Speed vs Load



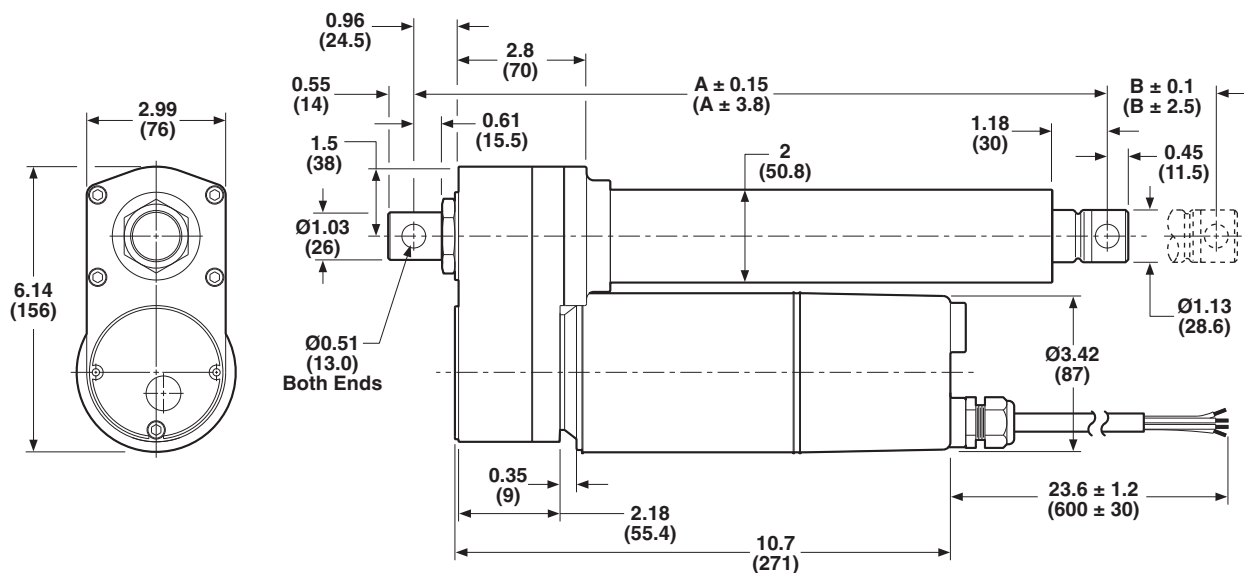
Dimensions

With Limit Switches

A-Track 5 Ball Screw	Stroke	4		6		8		12		18		24	
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
	A	17.95	456	19.92	506	21.89	556	25.91	658	31.89	810	37.87	962
	B	4.01	102	6.02	153	7.99	203	12.00	305	17.99	457	24.01	610

Without Limit Switches

A-Track 5 Ball Screw	Stroke	4		6		8		12		18		24	
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
	A	14.96	380	16.97	431	18.94	481	22.95	583	28.94	735	34.92	887
	B	4.01	102	6.02	153	7.99	203	12.00	305	17.99	457	24.01	610



A-Track | 10

DC Motor Ball Screw

Up to 1300 lbs. Load Rated

Up to 1.35 in./sec. Speeds



Features

- Efficient ball screw drive system
- Load holding brake standard
- Overload clutch standard
- 4 to 24 inch stroke lengths
- Thermal overload incorporated into the motor

Typical Applications

- Heavy duty platform lifts
- Deck and implement lifts for tractors and mobile applications
- Wheelchair and scooter lifts
- Bin and tank cover lifts

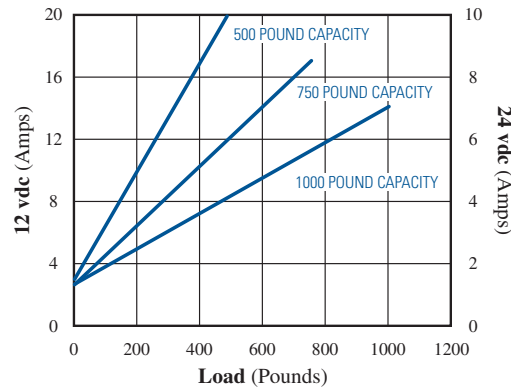
The A-Track 10 actuator is a DC motor driven, ball screw design suitable for applications requiring high load capacity. The A-Track 10 incorporates seals and O-rings to provide protection when used in outdoor, mobile or ambient contamination environments. This unit includes an integral load holding brake to provide stationary load holding while still providing the efficiency of a ball screw design actuator. The Model 10 provides load capacities up to 1300 pounds with stroke lengths to 24 inches.

Specifications

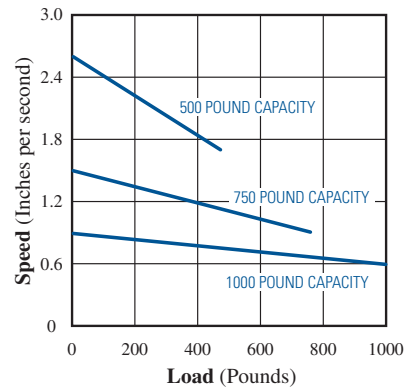
Load Capacity	500 pounds	750 pounds	1300 pounds
Speed at Full Load	1.35 in/sec	0.85 in/sec	0.51 in/sec
Input Voltage	12 or 24 volt DC for all models		
Static Load Capacity	3000 pounds for all models		
Stroke Length	4, 6, 8, 12, 18 and 24 inches for all models		
Clevis Ends	.51 in. / 13mm		
Duty Cycle	25%		
Operation Temperature Range	-15° F to +150° F for all models		
Limit Switch	Optional for all models (20:1 only) (1000 lbs.)		
Potentiometer	Optional for all models		
Restraining Torque	100 in. lbs.		
Thermal Overload	Overload clutch and motor thermal overload for all models		

Performance Curves

Current vs Load



Speed vs Load



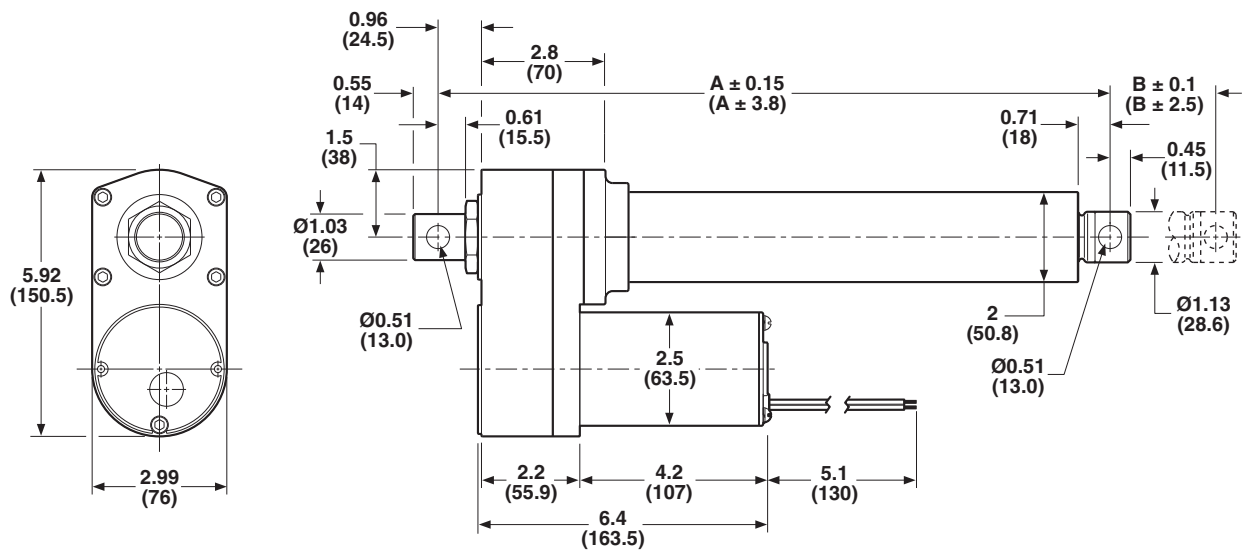
Dimensions

With Limit Switches

A-Track 10	Stroke	4		6		8		12		18		24	
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
	A	14.88	378	16.89	429	18.86	479	22.83	580	31.89	810	37.87	962
	B	3.86	98	5.90	150	7.91	201	11.89	302	17.99	457	24.01	610

Without Limit Switches

A-Track 10	Stroke	4		6		8		12		18		24	
		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
	A	11.89	302	13.90	353	15.90	404	19.88	505	28.94	735	34.92	887
	B	3.86	98	5.90	150	7.91	201	11.89	302	17.99	457	24.01	610



B-Track | Features

Rugged Duty Actuators

Key Features

- Weather-tight sealed
- Patented in-line load transfer
- Heavy wall rod and cover tube
- High performance motors
- Up to 2,200 lb. capacity

Standard Models

K2vL, K2, K2x

Option Models

K2PL/K2XPL

K2JS/K2XJS

K2RA

Threaded rod connection allows optional end fittings.

Nitrotec® treated end fitting for superior strength and corrosion resistance.

Hydraulic Cylinder type Rod Wiper Seal with integral extension rod bearing support for smooth operation and high side load capability.

Ball bearing, Bronze or Delrin® screw nut configurations provide broad load and performance capability.

High strength aluminum gear box provides maximum heat dissipation. High strength stainless thru-bolt fasteners provide high load capability. O-ring sealed and gasketed for washdown use.

Bi-directional holding brake standard on K2x models.

Efficient gear design minimizes motor bearing load. Gear materials selected for high load impact and durability. Gear profile optimized for quiet operation. High performance synthetic lifetime lubes used throughout.

Unique screw end bearing guide provides smooth extension operation, high side load capability and aids in screw re-lubrication. (patented)

Nitrotec® treated steel extension rod provides 40% stronger cross section compared to competitive products.

Heavywall extension tube has 30% stronger cross section compared to competitive products.

Optional electronic control module with integral electronic stroke limits and power connections. Adjustable torque limit option. For more information see Controls Section.

Heavy Duty, Sealed Double Ball Bearing Motors

- Auto reset thermal protection
- Easy field replacement
- 12, 24, 48 or 90 volts (vdc) available (others available on request)
- Standard Packard 56 connector, others available
- Washdown sealed
- Solid mount pinion gear
- Lifetime bearing lube

Mechanical torque limiter for end of stroke and overload protection.

Integrated manual override – standard

Patented in-line design transfers loads to the end fitting via ball bearing screw pivot. Efficient load transfer reduces noise and current draw.

Nitrotec® treated end fittings with integral O-ring seals for superior weather and corrosion resistance. 6 available mounting orientations.

How To Select

Step 1 – Determine Load and Stroke length requirements

Use the Quick Selection guide to identify the model family that will provide the load capacity and stroke length needed for your application.

Step 2 – Determine Gear Ratio

Select gear ratio from performance curves for allowable current draw and needed load.

Step 3 – Identify motor type and voltage

Select DC motor and motor voltage.

Step 4 – Motor Type

Select M for ignition protected motor. Select needed motor voltage.

Step 5 – Confirm the application Duty Cycle

At full load capacity, actuators have a 25% duty cycle. Duty cycle is the amount of 'on-time' compared to cooling time. A unit that runs for 15 seconds should be off for 45 seconds.

Step 6 – Select Nut Type

Select nut for unit selected. (K2x are all ball bearing).

Step 7 – Select Stroke Length

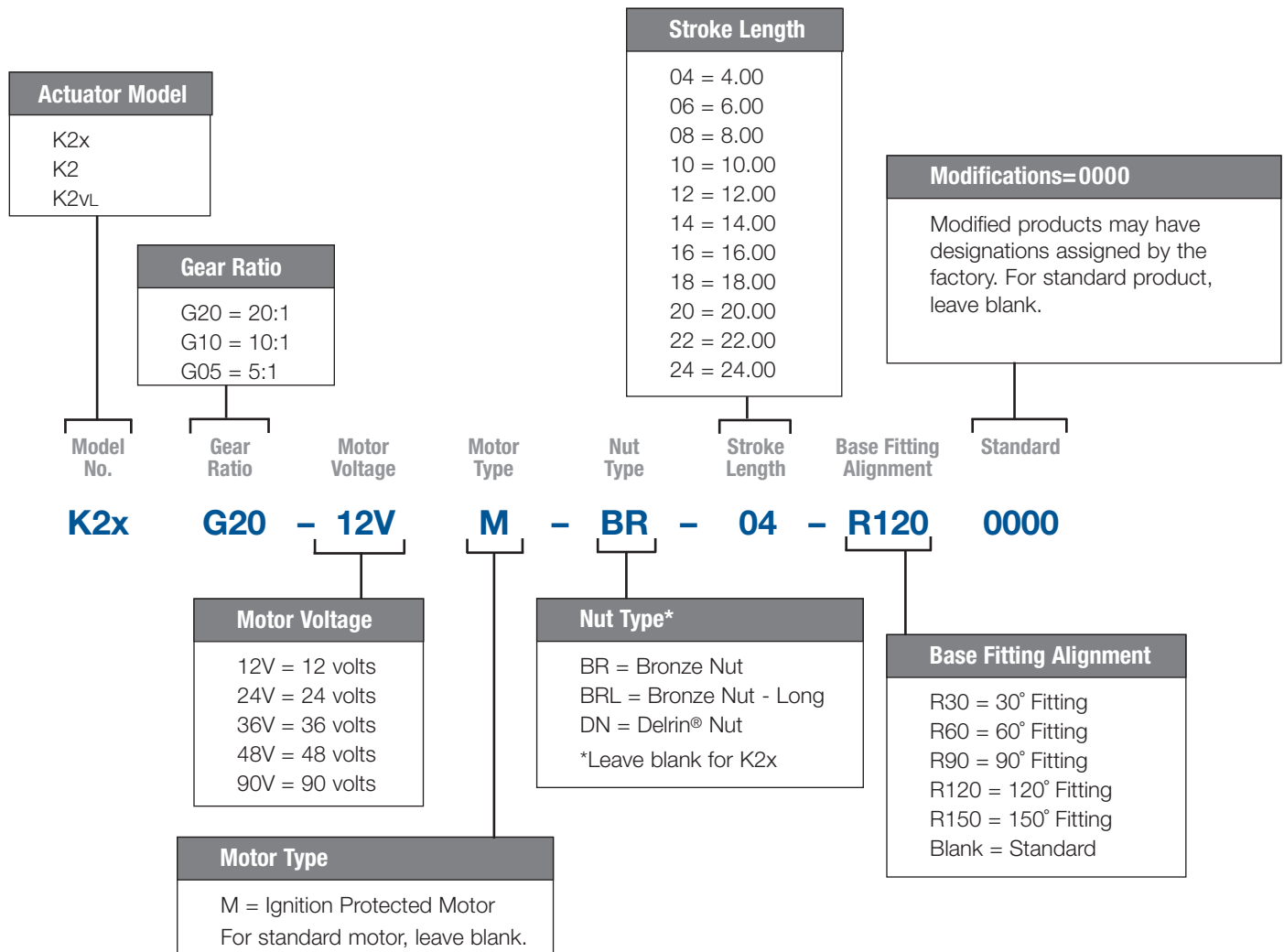
Choose standard lengths from chart. For special length consult factory.

Step 8 – Select end fitting orientation

Leave blank for standard orientation.

Important Unit Restrictions

Side loading and shock loads must be considered in actuator applications. Side loading and cantilevered mounting should be eliminated through proper machine design. Side loading will dramatically reduce unit life. While actuators can withstand limited shock loads, it is recommended that shock loading be avoided wherever possible. (See page 35)



Rugged Duty Actuator DC Motor Acme Screw

Up to 750 lbs. Load Rated
Up to 2.1 in./sec. Speed



This value model of the B-track family is well suited for the toughest applications not needing the full load capability of standard K2 models. The K2vL uses a flange bronze bearing configuration for internal load transfer, offering the lowest cost while maintaining the rugged-duty performance capabilities of the B-track family.

K2vL units feature Nicrotec® corrosion protection on end fittings and rods, high performance powder coat paint on cover tubes and gear box covers, providing a totally sealed, weatherproof, and durable finish for years of trouble-free service.

Features

- Protective coatings and O-ring seals throughout
- Hybrid nut and screw design, no brake needed
- Ball detent overload clutch
- 2 to 24 inch stroke lengths
- Up to 750 pound load capacities
- Speeds up to 2.0 in./sec. travel
- Thermal overload incorporated into the motor
- Heavy wall construction
- Double ball bearing motors
- Heat treated gears
- Rugged extension rod bearing support
- Optional 90 vdc motor for use with SBC-AC control
- Custom mounting options available

Typical Applications

- Flow gate open/close
- Deck and implement lifts for tractors and mobile applications
- Wheelchair and scooter lifts
- Bin and tank cover lifts
- Remote engine clutch engagement

Load/Current/Speed/Duty Cycle

- Maximum Static Rating: 3000 lbs. Static (in-line load)
- Refer to performance chart for load/current/speed capabilities
- Stroke Length Tolerance: +/- .06"
- Motor is protected with auto reset breaker inside motor housing (temperature/current/time dependent)
- Overload clutch setting: +25% over rated dynamic load
- Duty cycle is time/temperature/load dependent, suggested guidelines are:
 - 50% max on-time/50% off-time for loads up to 50% of capability
 - 25% max on-time/75% off-time for loads between 50%-80% of capability
 - 10% max on-time/90% off-time for loads between 80%-100% of capability

(Load/stroke profiles will allow some adjustment variation from these guidelines.)

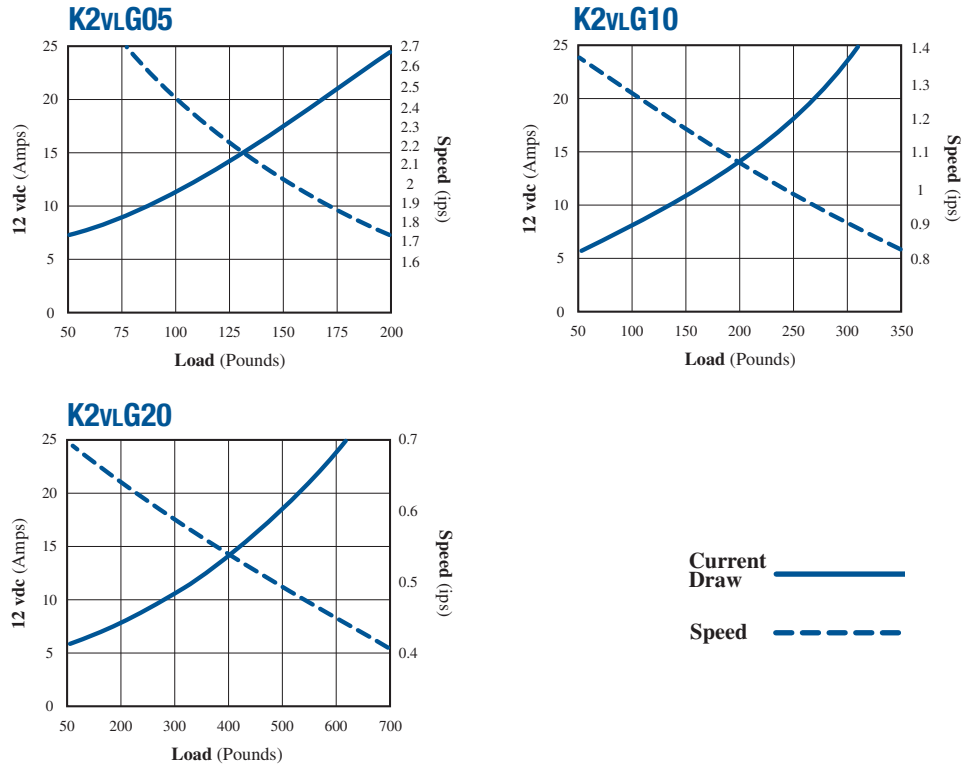
Operating Environment

- Ambient temp range: -30°F to 150°F
- Weather resistant enclosure & seals (IP 65 capable, 250 hour salt spray, 500 hour for paint)
- Normal operating voltage: 10-16 vdc (Ratings are at 12 vdc Normal.)

Control/Connections

- 14 gauge stranded lead wires-UL style 1230 w/PVC insulation Class F 105°C
- Lead wires abrasion protected with braided covering
- Use momentary contact double pole/double throw switch in powering unit for extend/retract operation. (ON)-OFF-(ON) DPDT
- Connectors:
 - Packard 56 series or Delphi Weather-Pack
 - Packard 56 series with 56 series blades (#2984883 & #2962987)
 - Delphi Weather-Pack series (#121015792 & #12010973)

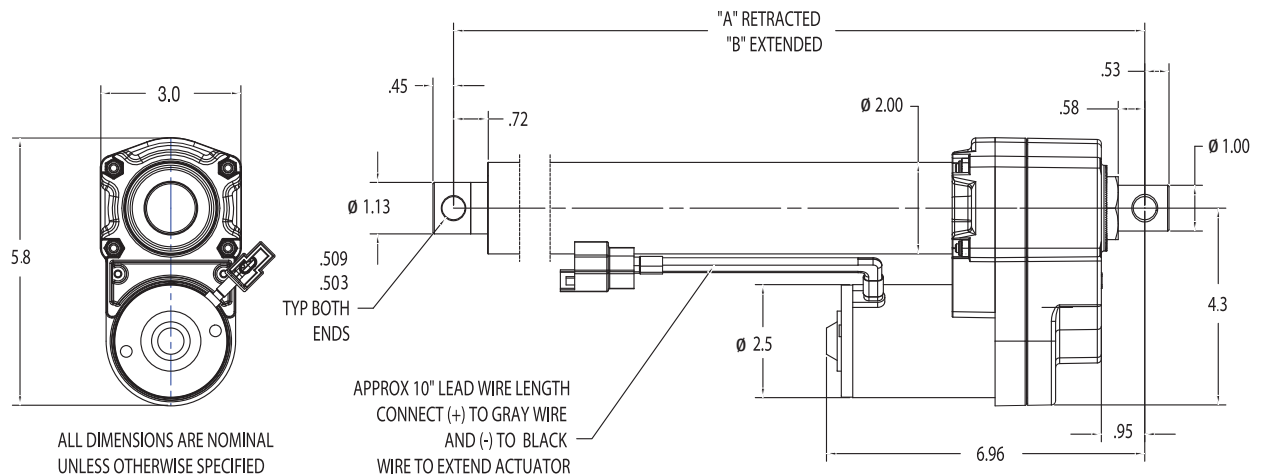
Performance Curves



Dimensions

B-Track K2vL	Stroke	2	4	6	8	10	12	14	16	18	20	22	24
		in	in	in	in	in	in	in	in	in	in	in	in
	A	8.32	10.32	12.32	14.32	16.32	18.32	20.32	22.32	24.32	29.32	31.32	33.32
	B	10.32	14.32	18.32	22.32	26.32	30.32	34.32	38.32	42.32	49.32	53.32	57.32

Note: Special lengths available



Rugged Duty Actuator DC Motor Acme Screw

Up to 1200 lbs. Rated Load

Up to 2.1 in./sec. Travel Speed



Shown with optional BTC control

The K2 is the base model in the B-Track family. It incorporates a patented in-line load transfer design which provides high load capability for rugged-duty use, efficient power use, compact package size, excellent corrosion and washdown protection, and high performance synthetic lubrication for life, all at an affordable price.

The K2 uses a solid bronze or Delrin® nut with a rolled hybrid screw yielding high impact capability and long screw life. Heavy-duty double-ended ball bearing motors, hardened gears, O-ring seals and an extension rod bearing system that provides best in class capabilities.

Features

- Protective coatings and O-ring seals throughout
- Patented in-line load system
- Hybrid nut and screw design, no brake needed
- Ball detent overload clutch
- 2 to 24 inch stroke lengths
- Up to 1200 pound load capacities
- Speeds up to 2.0 in./sec. travel
- Thermal overload incorporated into the motor
- Heavy wall construction
- Double ball bearing motors and heat treated gears
- Rugged extension rod bearing support
- Optional 90 vdc motor for use with SBC-AC control
- Custom mounting options available

Typical Applications

- Heavy duty platform and engine lifts
- Deck and implement lifts for tractors and mobile applications
- Wheelchair and scooter lifts
- Bin and tank cover lifts
- Flow gate open/close
- Table positioning

Load/Current/Speed/Duty Cycle

- Maximum Static Rating: 3000 lbs. Static (in-line load)
- Refer to performance chart for load/current/speed capabilities
- Stroke Length Tolerance: +/- .06"
- Motor is protected with auto reset breaker inside motor housing (temperature/current/time dependent)
- Overload clutch setting: +25% over rated dynamic load
- Duty cycle is time/temperature/load dependent, suggested guidelines are:
 - 50% max on-time/50% off-time for loads up to 50% of capability
 - 25% max on-time/75% off-time for loads between 50%-80% of capability
 - 10% max on-time/90% off-time for loads between 80%-100% of capability

(Load/stroke profiles will allow some adjustment variation from these guidelines.)

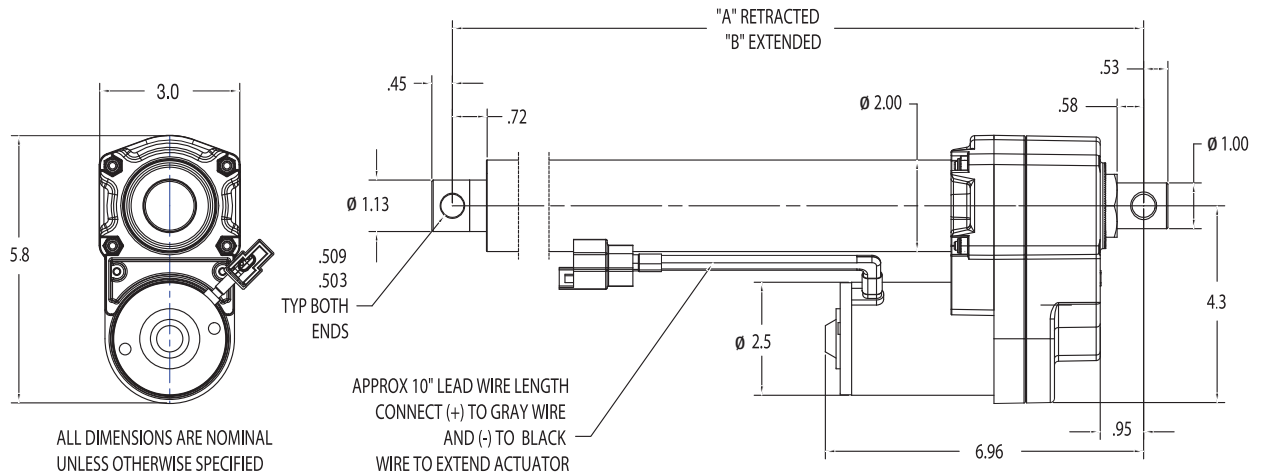
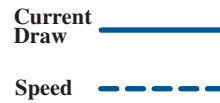
Operating Environment

- Ambient temp range: -30°F to 150°F
- Weather resistant enclosure & seals (IP 65 capable, 250 hour salt spray, 500 hour for paint)
- Normal operating voltage: 10-16 vdc (Ratings are at 12 vdc Normal.)

Control/Connections

- 14 gauge stranded lead wires-UL style 1230 w/PVC insulation Class F 105°C
- Lead wires abrasion protected with braided covering
- Use momentary contact double pole/double throw switch in powering unit for extend/retract operation. (ON)-OFF-(ON) DPDT
- Connectors:
 - Packard 56 series or Delphi Weather-Pack
 - Packard 56 series with 56 series blades (#2984883 & #2962987)
 - Delphi Weather-Pack series (#121015792 & #12010973)

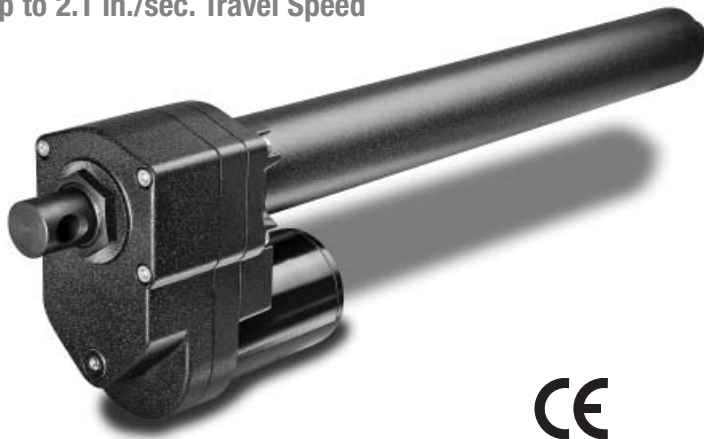
25



Rugged Duty Actuator DC Motor Ball Screw

Up to 2,200 lbs. Rated Load

Up to 2.1 in./sec. Travel Speed



CE

The K2x model provides the highest load rating in its class. This model incorporates all of the base K2 features with a ball nut screw for a 2,200 lb. load capability within a compact package size. The K2x includes a bi-directional wrap spring brake for load holding capability. These units are well suited for the most demanding applications where an alternative to hydraulic or air cylinders is needed or where hydraulic power sources are not available.

Combining the K2x actuator with BTc control functionality results in precision actuator control at a fraction of the cost of more complicated servo actuator systems. See Controls Section for more information on BTc controls.

Features

- Protective coatings and O-ring seals throughout
- Efficient in-line ball screw system
- Integral load holding brake
- Ball detent overload clutch
- 2 to 24 inch stroke lengths
- Up to 2,000 pound load capacities
- Speeds up to 2.0 in./sec. travel
- Thermal overload incorporated into the motor
- Heavy wall construction
- Double ball bearing motors and heat treated gears
- Rugged extension rod bearing support
- Optional 90 vdc motor for use with SBC-AC control
- Custom mounting options available

Typical Applications

- Paving equipment
- Deck and implement lifts for tractors and mobile applications
- Spray booms
- Scissor and dump box lifts

Load/Current/Speed/Duty Cycle

- Maximum Static Rating: 3000 lbs. Static (in-line load)
- Refer to performance chart for load/current/speed capabilities
- Stroke Length Tolerance: +/- .06"
- Motor is protected with auto reset breaker inside motor housing (temperature/current/time dependent)
- Overload clutch setting: +25% over rated dynamic load
- Duty cycle is time/temperature/load dependent, suggested guidelines are:
 - 50% max on-time/50% off-time for loads up to 50% of capability
 - 25% max on-time/75% off-time for loads between 50%-80% of capability
 - 10% max on-time/90% off-time for loads between 80%-100% of capability

(Load/stroke profiles will allow some adjustment variation from these guidelines.)

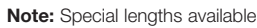
Operating Environment

- Ambient temp range: -30°F to 150°F
- Weather resistant enclosure & seals (IP 65 capable, 250 hour salt spray, 500 hour for paint)
- Normal operating voltage: 10-16 vdc (Ratings are at 12 vdc Normal.)

Control/Connections

- 14 gauge stranded lead wires-UL style 1230 w/PVC insulation Class F 105°C
- Lead wires abrasion protected with braided covering
- Use momentary contact double pole/double throw switch in powering unit for extend/retract operation. (ON)-OFF-(ON) DPDT
- Connectors:
 - Packard 56 series or Delphi Weather-Pack
 - Packard 56 series with 56 series blades (#2984883 & #2962987)
 - Delphi Weather-Pack series (#121015792 & #12010973)

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[illegible]

Power Lift Actuator DC Motor – Acme or Ball Screw

Up to 2,200 lbs. Rated Load

Up to 2.1 in./sec. Travel Speed



Shown with optional direct drive manual override feature without protective cap.



B-Track Power Lift models are modified K2 or K2x actuators. Power Lift units utilize all the standard components and retain all the performance features of the K2 family, without the external cover tube. This allows the Power Lift actuator features to be integrated into a variety of customer designed structures, where a cover tube is not needed.

Extended gear box screws are provided allowing easy attachment to a customer frame. A straight through manual override option is available as shown above.

Features

- Protective coatings and O-ring seals throughout
- Efficient in-line load system
- Patented hybrid nut and screw design, no brake needed in K2 model.
- Integral load holding brake on K2x model
- Ball detent overload clutch
- 2 to 24 inch stroke lengths
- Up to 2200 pound load capacities
- Speeds up to 2.1 in./sec. travel
- Thermal overload incorporated into the motor
- Heavy wall construction
- Double ball bearing motors and heat treated gears
- Optional 90 vdc motor for use with SBC-AC control
- Custom mounting options available

Typical Applications

- Wheelchair and scooter lifts
- Traffic signs
- Beds and tables
- Light masts

Load/Current/Speed/Duty Cycle

- Maximum Static Rating: 3000 lbs. Static (in-line load)
- Refer to performance chart for load/current/speed capabilities
- Stroke Length Tolerance: +/- .06"
- Motor is protected with auto reset breaker inside motor housing (temperature/current/time dependent)
- Overload clutch setting: +25% over rated dynamic load
- Duty cycle is time/temperature/load dependent, suggested guidelines are:
 - 50% max on-time/50% off-time for loads up to 50% of capability
 - 25% max on-time/75% off-time for loads between 50%-80% of capability
 - 10% max on-time/90% off-time for loads between 80%-100% of capability

(Load/stroke profiles will allow some adjustment variation from these guidelines.)

Operating Environment

- Ambient temp range: -20°F to 150°F
- Weather resistant enclosure & seals (IP 65 capable, 250 hour salt spray, 500 hour for paint)
- Normal operating voltage: 10-16 vdc (Ratings are at 12 vdc Normal.)

Control/Connections

- 14 gauge stranded lead wires-UL style 1230 w/PVC insulation Class F 105°C
- Lead wires abrasion protected with braided covering
- Use momentary contact double pole/double throw switch in powering unit for extend/retract operation. (ON)-OFF-(ON) DPDT
- Connectors:
 - Packard 56 series or Delphi Weather-Pack
 - Packard 56 series with 56 series blades (#2984883 & #2962987)
 - Delphi Weather-Pack series (#121015792 & #12010973)

Performance Curves

See page 25 for K2PL performance curves.
See page 27 for K2xPL performance curves.

Dimensions

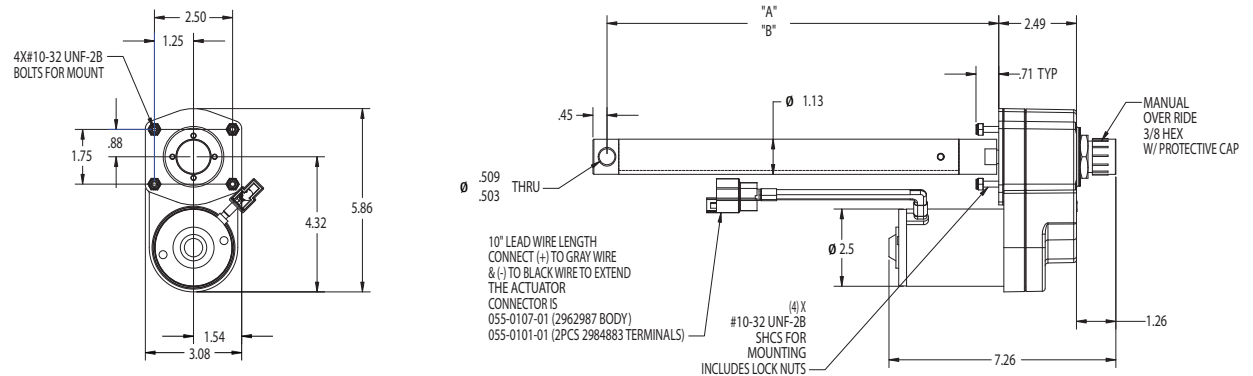
B-Track K2PL	Stroke	4	6	8	10	12	14	16	18	20	22	24
		in	in	in	in	in	in	in	in	in	in	in
	A	7.03	9.03	11.03	13.03	15.03	17.03	19.03	21.03	23.03	25.03	27.03
	B	14.06	18.06	22.06	26.06	30.06	34.06	38.06	42.06	46.06	50.06	54.06

Note: Special lengths available

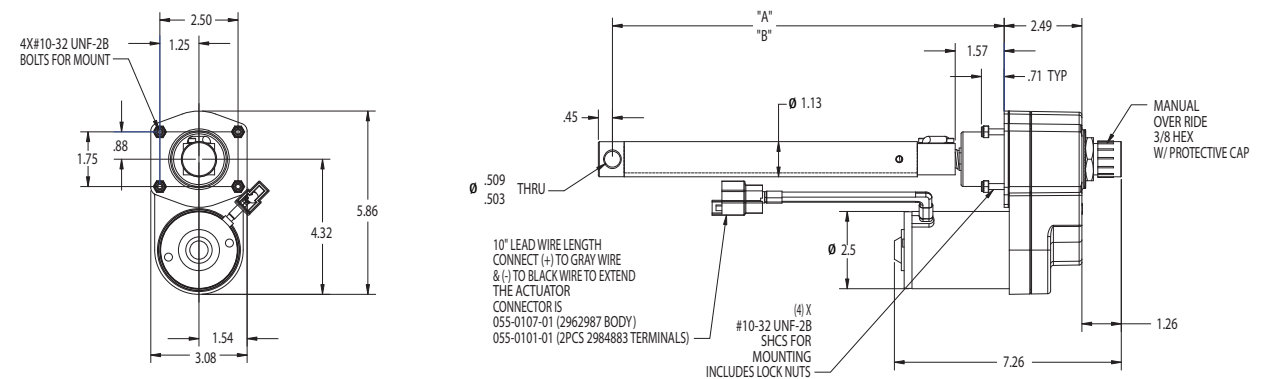
B-Track K2xPL	Stroke	4	6	8	10	12	14	16	18	20	22	24
		in	in	in	in	in	in	in	in	in	in	in
	A	8.53	10.53	12.53	14.53	16.53	18.53	20.53	22.53	24.53	26.53	28.53
	B	12.53	16.53	20.53	24.53	28.53	32.53	36.53	40.53	44.53	48.53	52.53

Note: Special lengths available

B-Track K2PL



B-Track K2xPL



B-Track | K2Js / K2xJs

Jack Stand Actuator DC Motor – Acme or Ball Screw

Up to 2,200 lbs. Rated Load

Up to 2.1 in./sec. Travel Speed



*Shown with optional
switch box, direct drive
manual override, and
footpad.*



The B-Track Jack Stand actuator incorporates a large diameter extension rod providing the maximum offset load capability within the K2 family. The extension rod is slightly smaller than the cover tube and slides on Teflon® bearings within the cover tube. This feature makes the K2Js suitable for large load free-standing use.

A number of mounting options are available including trunnion mounts, or with standard flange plate (as shown). These units can be customized with an integral switch box, direct drive manual override, or pivoting footpad.

Features

- Protective coatings and O-ring seals throughout
- Efficient in-line ball screw system
- Integral load holding brake on K2x model
- Ball detent overload clutch
- 8 to 24 inch stroke lengths
- Up to 2,200 pound load capacities
- Speeds up to 2.1 in./sec. travel
- Thermal overload incorporated into the motor
- Heavy wall construction
- Double ball bearing motors and heat treated gears
- Rugged extension rod bearing support
- Option 90 vdc motor for use with SBC-AC control
- Custom mounting options available

Typical Applications

- Trailer jack stands
- Trailer and vehicle outriggers
- Implement lifts
- Machine height adjustment
- Camper lifts
- Load Levelers

Load/Current/Speed/Duty Cycle

- Maximum Static Rating: 3000 lbs. Static (in-line load)
- Refer to performance chart for load/current/speed capabilities
- Stroke Length Tolerance: +/- .06"
- Motor is protected with auto reset breaker inside motor housing (temperature/current/time dependent)
- Overload clutch setting: +25% over rated dynamic load
- Duty cycle is time/temperature/load dependent, suggested guidelines are:
 - 50% max on-time/50% off-time for loads up to 50% of capability
 - 25% max on-time/75% off-time for loads between 50%-80% of capability
 - 10% max on-time/90% off-time for loads between 80%-100% of capability

(Load/stroke profiles will allow some adjustment variation from these guidelines.)

Operating Environment

- Ambient temp range: -30°F to 150°F
- Weather resistant enclosure & seals (IP 65 capable, 250 hour salt spray, 500 hour for paint)
- Normal operating voltage: 10-16 vdc (Ratings are at 12 vdc Normal.)

Control/Connections

- 14 gauge stranded lead wires-UL style 1230 w/PVC insulation Class F 105°C
- Lead wires abrasion protected with braided covering
- Use momentary contact double pole/double throw switch in powering unit for extend/retract operation. (ON)-OFF-(ON) DPDT
- Connectors:
 - Packard 56 series or Delphi Weather-Pack
 - Packard 56 series with 56 series blades (#2984883 & #2962987)
 - Delphi Weather-Pack series (#121015792 & #12010973)

Performance Curves

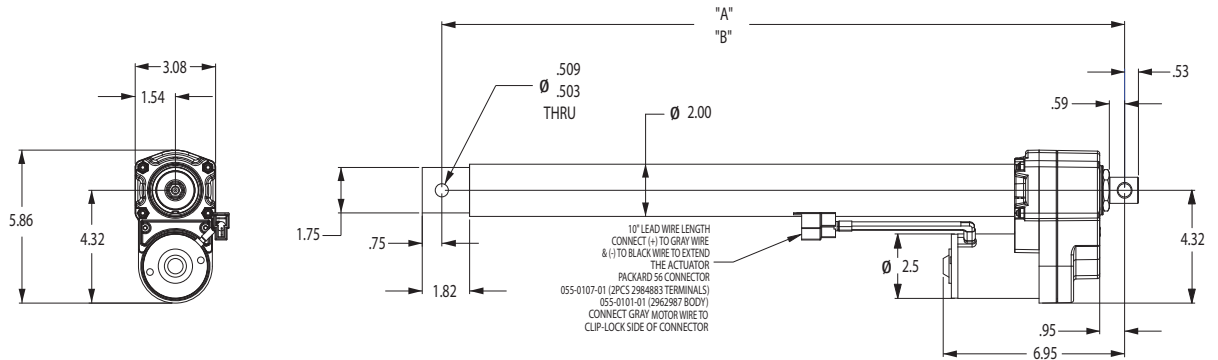
See page 25 for K2Js performance curves.
See page 27 for K2xJs performance curves.

Dimensions

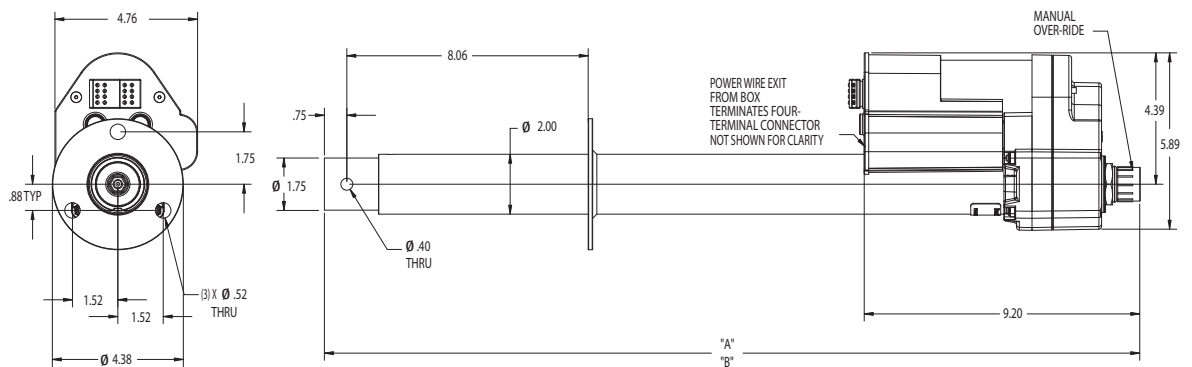
B-Track K2Js/K2xJs	Stroke	8	10	12	14	16
		in	in	in	in	in
	A	20.98	22.98	24.98	26.98	28.98
	B	28.98	32.98	36.98	40.98	44.98

Note: Special lengths available

B-Track K2Js

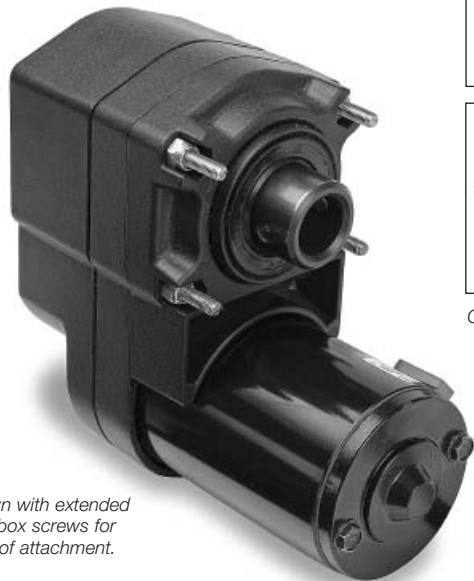


B-Track K2xJs



Rotary Actuator DC Motor

Up to 140 in-lb Torque Output
Speeds from 250 to 850 RPM



Shown with extended gear box screws for ease of attachment.



Optional Configurations



K2RA rotary actuators are motor driven gear boxes and use the base drive design and components of the K2 linear actuator. K2RA models incorporate all of the features of the K2 model providing excellent weatherproofing for outdoor applications. The same long-life motors, hardened gears, corrosion protection, and lubrication are utilized. Several output shaft and mounting configurations are available with the standard configuration shown above.

Features

- Protective coatings and O-ring seals throughout
- Efficient in-line load system
- Ball detent overload clutch
- Speeds up to 850 RPM
- Thermal overload incorporated into the motor
- Heavy wall construction
- Double ball bearing motors and heat treated gears
- Rugged output bearing support
- Customized mounting configurations available
- Optional 24 vdc motor available to provide more speed selections

Typical Applications

- Salt/seed spreaders
- Scooter lift mechanisms
- Spout rotation
- Turntables
- Cable winch

Load/Current/Speed/Duty Cycle

- Maximum Static Rating: 3000 lbs. Static (in-line load)
- Refer to performance chart for current/speed capabilities
- Motor is protected with auto reset breaker inside motor housing (temperature/current/time dependent)
- Overload clutch setting: match customer requirements
- Duty cycle is time/temperature/load dependent, suggested guidelines are:
 - 50% max on-time/50% off-time for loads up to 50% of capability
 - 25% max on-time/75% off-time for loads between 50%-80% of capability
 - 10% max on-time/90% off-time for loads between 80%-100% of capability

(Load/RPM profiles will allow some adjustment variation from these guidelines.)

Operating Environment

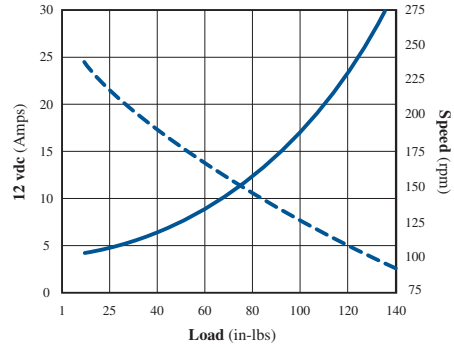
- Ambient temp range: -30°F to 150°F
- Weather resistant enclosure & seals (IP 65 capable, 250 hour salt spray, 500 hour for paint)
- Normal operating voltage: 12, 24, 36, 48 vdc (Ratings are at 12 vdc Normal.)

Control/Connections

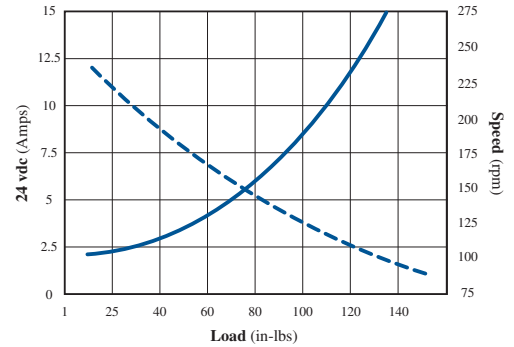
- 14 gauge stranded lead wires - SAE J1128 SXL cross linked polyethylene insulation Class F 257°F
- Lead wires abrasion protected with braided covering
- Use momentary contact double pole/double throw switch in powering unit. (ON)-OFF-(ON) DPDT
- Connectors:
 - Packard 56 series or Delphi Weather-Pack
 - Packard 56 series with 56 series blades (#2984883 & #2962987)
 - Delphi Weather-Pack series (#121015792 & #12010973)

Performance Curves

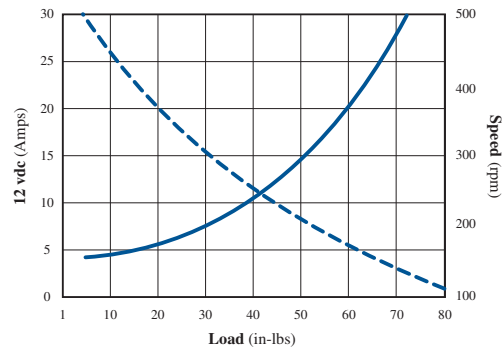
K2RA20 Speed & Load @ 12 VDC



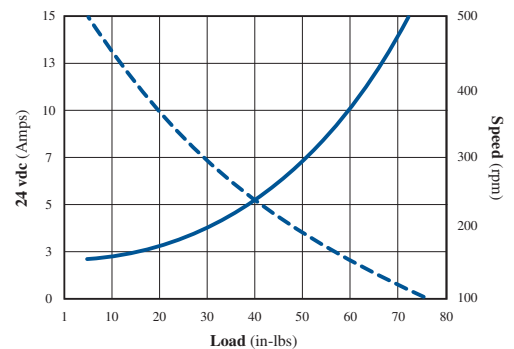
K2RA20 Load & Speed @ 24 VDC



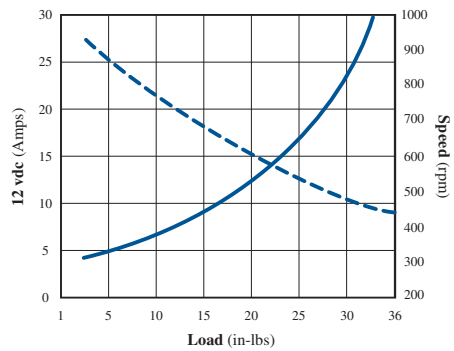
K2RA10 Speed & Load @ 12 VDC



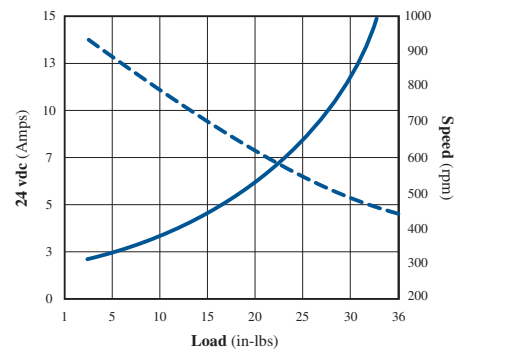
K2RA10 Load & Speed @ 24 VDC



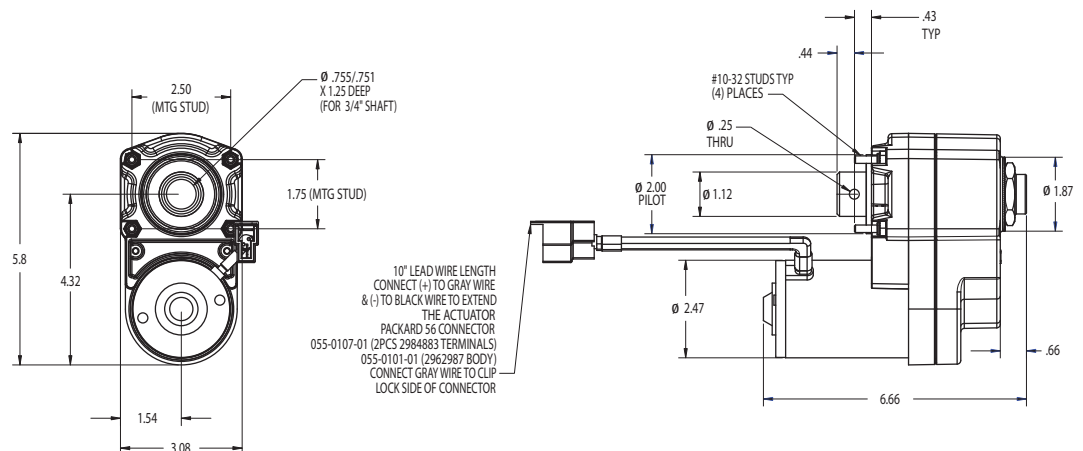
K2RA5 Speed & Load @ 12 VDC



K2RA5 Load & Speed @ 24 VDC



Dimensions



Custom Actuators

Warner Linear offers a broad range of standard actuators to suit many needs. We realize though, that often special application parameters dictate special actuator configurations and modifications. Warner Linear actuators are designed with this in mind, as many of our products can be readily customized to suit specific requirements.

Our products are built on modules that can be mixed and matched in final assembly. Our final assembly operations are configured to provide flexible assembly to accommodate custom orders, quickly and cost effectively.

If your application has a special need that our standard catalog products are unable to fit, please contact your Warner Linear representative or consult with our technical specialists so we can configure a product to fit your need.

A few of our standard special offerings:

- Special pin to pin lengths and stroke lengths
- Special end fittings and mounting configurations
- Special paints and motor lead wire lengths and connectors



Examples of special request features (shown above)

Rod End Mounting Option Examples

(consult factory for more options)

1. 1/2" Threaded rod end
2. 5/8" Threaded rod end
3. 1/2" Spherical rod end
4. 5/8" Spherical rod end
5. 1" Extended rod end
6. Flat sided rod end
7. Vibra mount rod end
8. 1/2" Threaded gear box end
9. 3/8" Rod end insert

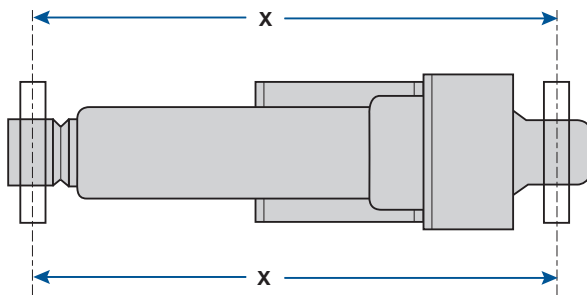


Consult with factory for specific mounting configuration needs.

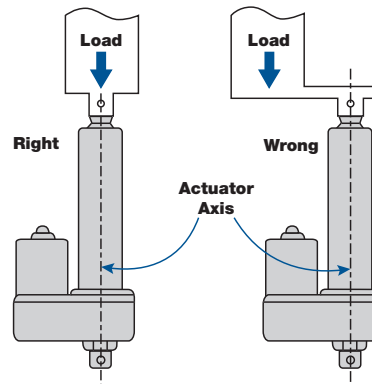
General Mounting Information

Warner Linear actuators are quickly and easily mounted by slipping pins through the holes at each end of the unit and into the brackets on the machine frame and load to be moved.

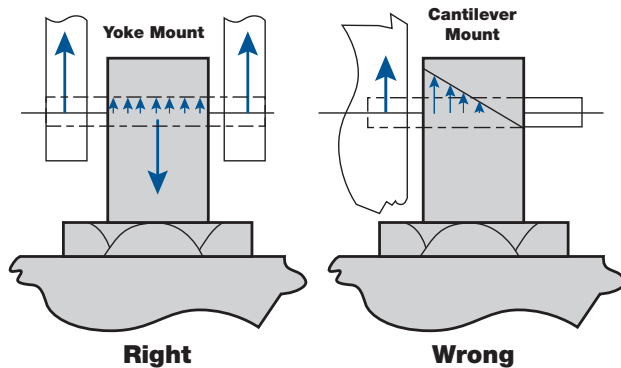
Use of solid pins provide maximum holding capability with a retaining ring or cotter pin on each end to prevent the solid pin from falling out of the mounting bracket (it is best to avoid roll pins and spring pins).



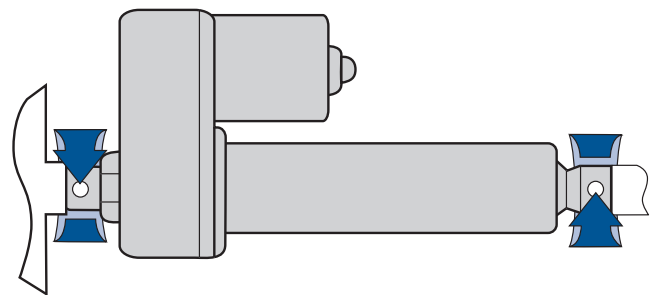
Mounting pins must be parallel to each other as shown above. Pins which are not parallel can cause excess vibration or actuator binding.



Loads should act along the axis of the actuator. Off-center loads may cause binding and lead to premature unit failure.



Ensure that mounting pins are supported at both ends. Cantilevered mounting is unacceptable. Failure to provide proper support will shorten unit life.



Do not attempt to mount M-Track or A-Track actuators by the cover tube. The tube is not designed to support the forces required for tube mounting.

All actuator mounting supports must be capable of withstanding the load and torque developed when the unit extends or retracts. Restraining torque values are also provided with the details on each unit.

M-Track	Torque created 20 inch pounds
All others	Torque created 100 inch pounds

Warner Linear Actuator Controls available for a wide variety of applications

Warner Linear provides a full line of actuator controls well suited for a broad range of application needs.

They range from simple to use switch box controls for basic extend/retract function, to state-of-the-art microprocessor based digital electronic controls using SMT design and manufacturing processes.

Offered functions:

Basic extend and retract

Electric switch and electronic stroke limits

End of stroke outputs

Position feedback potentiometer and encoder outputs

Electronic current limit – fixed and programmable

Electronic dynamic braking

Fixed, manual and electronic adjustable end stops

Signal follower

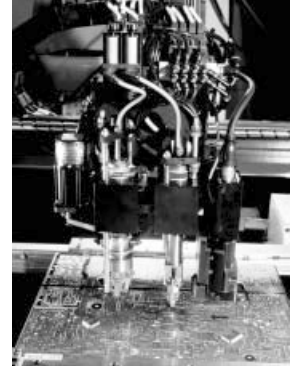
Dependable Operation

Warner Linear controls are state-of-the-art using surface mount electronic components and automated circuit board manufacturing methods. Each control is field durability tested for use in demanding applications.

Rugged and Reliable

Use of SMT manufacturing processes assures consistent performance from control to control.

- Integrated actuator sensors are protected from the environment
- Solid-state electronic components and non-contact sensors (hall effect)
- Actuator mounted or remote mountable



Easy To Use

- Simple plug-and-play switch box controls are hassle-free – just plug in and connect the power clips.
- Basic position controls are integrated with the actuators to simplify ease of use and maintain the rugged duty capabilities of Warner Linear actuators. They are easy to use and plug-and-play ready.
- Advanced microprocessor based controls are also available. They employ digital electronics using SMT processes and offer a broad range of intelligent actuator control options. Consult your Warner Linear technical specialist on how advanced controls might suit your needs.

Warner Linear BTc controls are specifically designed for use with the B-Track line of actuators. Some controls and options are also suitable for use with the M-Track and A-Track models.

Simple and Basic Controls

SBC-DC & SBC-AC Simple Switch Box Controls



DC Switch Box SBC-DC

- Easy to use with 12, 24 and 48 vdc actuators.
- Comes with 20 ft. power connecting cable, two-way momentary toggle switch, dust tight abs enclosure and output connector with 10 inch lead.
- 10 ft. and 8 ft. connecting cables available (switch box to actuator).



AC Switch Box SBC-AC

- Easy to use with 90 vdc motors converting 115/230 vac to 90 vdc.
- Comes with AC to DC converter in weather tight polycarbonate enclosure.
- Two way momentary toggle switch, and weather tight output connector, with 10 inch lead.
- 10 ft. and 8 ft. connecting cables available (switch box to actuator).
- 3 ft. plug in power cord also available.

When ordering, order part numbers:

SBC-DC	DC Switch box
SBPC-DC-10 or 8	DC Power cable
SBC-AC	AC Switch box, order with or without power cord
SBPC-AC-10 or 8	AC Power cable

BTc – Basic Position Controls



BTc control

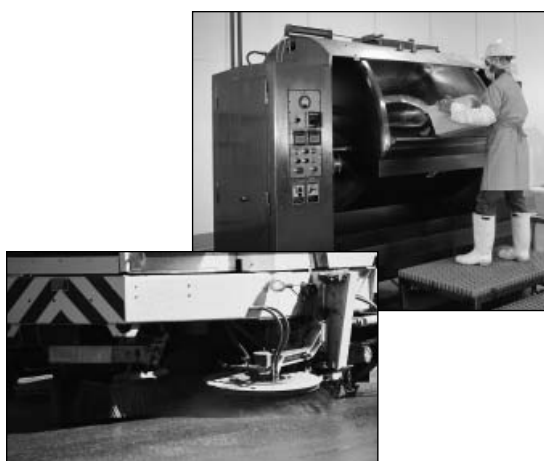


A-Track with sensors

- M-Track and A-Track actuators are available with onboard potentiometer outputs and adjustable limit switches for use with control schemes provided by the actuator user.
- B-Track actuators are available with digital electronics integrated into the actuator referred to as BTc or B-track controls.
 - Electronic Stroke Limit Control (ESL) is an integrated motor mounted control which uses rugged long life non-contact hall effect switches mounted inside the actuator. The switches are magnetically triggered turning power off to the actuator until power is reversed. Options include outputs for PLC interface or indicator lights. Control is potted for rugged environments.

- Quick Stop Control (QS) is a bi-directional current limit control which is motor mounted. This control is set to turn off power to the actuator when a set current level is reached. A different current setting is possible for each direction. The current settings are factory set and the control is potted for rugged environments.
- A Digital Position Feedback Control is also offered. It is motor mounted and uses pulse signals from two inductive sensors integrated into the B-track actuator. Digital pulses are converted to an analog output voltage of 0 to 10 volts relative to the position of the extension rod. The control provides electronic end stroke function, dynamic electronic braking, current limit protection and is potted for rugged environments. Optional end of stroke output signals are available for use with PLC's and to power indicator lights.

When ordering, order by inserting selected model into the actuator configuration as shown on page 37.



BTc Microprocessor Controls

Many applications that use electric actuators also need some form of actuator control that is more than a simple switch to extend and retract the actuator.

Often, actuators are used in applications where they need to go to variable positions, or go to a position and then retract, or where two actuators are used together and must remain in synchronous position with each other. A common example is in raising or lowering large lids on containers or commercial mixers.

For these types of control needs, please contact your Warner Linear representative or consult with our technical specialists for assistance in selecting the right actuator control to suit your need. Warner Linear offers a number of microprocessor-based control capabilities to choose from such as:

- **Twin Trac Control:** Control that keeps two actuators in synchronous position.
- **Quick Switch Control:** Provides push button open/close reversing function.
- **Auto Reverse:** Position selectable to automatically reverse direction when a selected position is reached.
- **Programming Pendant:** Hand held programming box used to select control variables such as:
 - Extend limit
 - Retract limit
 - Extend current limit
 - Retract current limit
 - Length of stroke
 - Also provides position readout and end of stroke LED's

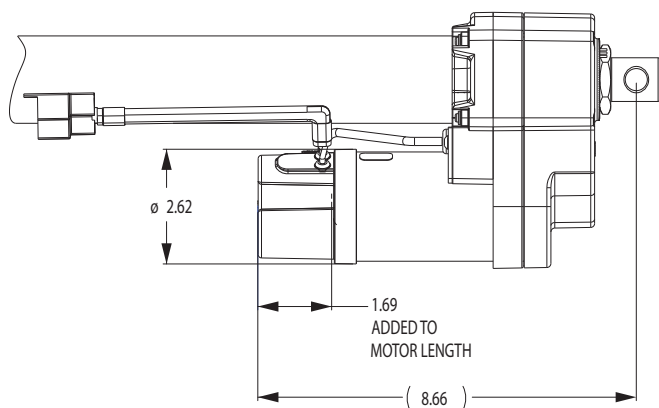
P1-DC Electronic Stroke Limit Control



The P1-DC Control provides end of stroke stopping by turning off power to the motor via an on board relay. Input power polarity must be reversed for the actuator to move again. The control uses solid-state hall effect sensors in combination with electronic dynamic braking to accurately stop at the end of stroke travel. The sensors are non-adjustable and are mounted inside the actuator cover tube for protection where they are switched via a non-contact magnet attached to the rod. The switches are sealed for life and will never wear out.

Specifications

- Supply Power: 12 or 24 vdc versions available
- Maximum Current: 25 Amps @ 12 vdc/12.5 Amps @ 24 vdc (at 25% duty cycle)
- Operating Temperature: -20° to 140° F



Features

- **Motor Power:** Switched by on board relay. The relay allows power to the motor as long as the actuator is not being commanded to go past the end limits.
- **End Limits:** Integrated end of stroke hall effect sensors trigger the control to turn power off to the motor until input power is reversed. Position is factory set.
- **Faster Stopping:** Electronic dynamic braking, (EDB) is applied after every move for accurate and fast stops.
- **Enclosure:** Attaches to back of motor or other surface and is potted to work in harsh environments.
- **Protection:** Zener diode suppression on the input and output for extra protection in noisy (electrical) environments.

Options

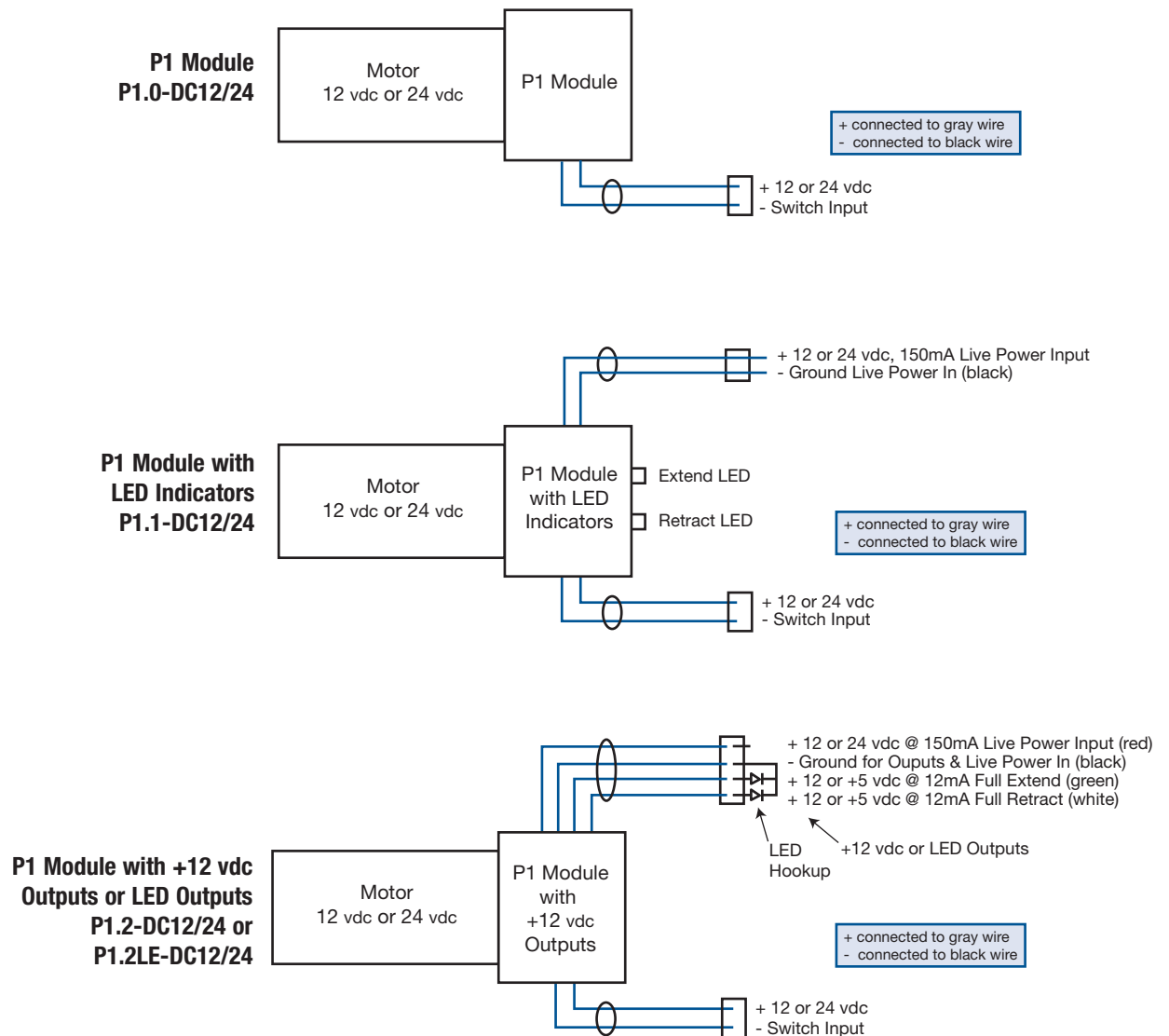
- **LED Indicators:** Two LED's on the outside of the control module to indicate when the end of stroke is reached. Included with the LED's is a live power input that can be used to keep the outputs on when switch power is off. 12/24vdc, 150mA is needed.
- **+12V Outputs:** Two +12 volt, 12mA outputs plus a ground to indicate when the end of stroke is reached. This output can signal a relay, lamp, or isolated PLC input. Included with the outputs is a live power input which can be used to keep the outputs on when switch power is off. 12/24vdc, 150mA is needed.
- **LED Outputs:** Two +5 volt, 25mA outputs plus a ground to indicate when the end of stroke is reached. This output can be used to light an LED. Included with the outputs is a live power input that can be used to keep the outputs on when switch power is off. A 12/24vdc, 150mA supply is needed.

P1 Electronic Stroke Limit Control

Model Selection

Model No.	Input Voltage (vdc)	Maximum Output Current (Amps)	Features
P1.0-DC12	12	25	Base = Electronic Stroke Limit with Electronic Dynamic Braking
P1.0-DC24	24	12.5	
P1.1-DC12	12	25	Base & LED Indicators
P1.1-DC24	24	12.5	
P1.2-DC12	12	25	Base & +12 vdc Outputs
P1.2-DC24	24	12.5	
P1.2LE-DC12	12	25	Base & LED Outputs
P1.2LE-DC24	24	12.5	

Wiring Diagrams



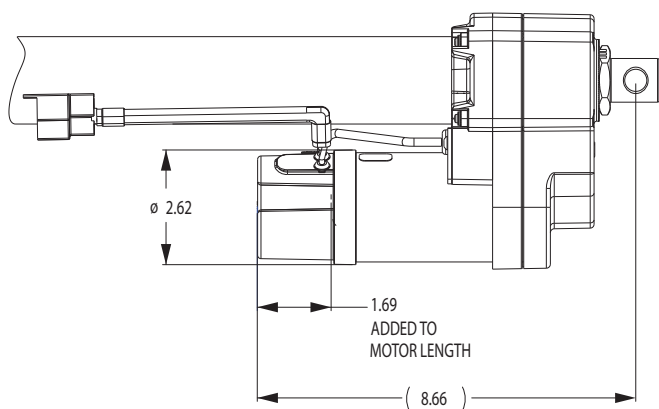
P1QS-DC Quick Stop Control



The P1QS-DC is a bi-directional current limit control which monitors current during actuator motion and quickly stops the actuator if an object gets in the way causing an over limit current draw. Input power polarity must be reversed for the actuator to move again. The control uses solid-state hall effect sensors in combination with electronic dynamic braking to accurately stop at the end of stroke travel. The sensors are non-adjustable and are mounted inside the actuator cover tube for protection where they are switched via a non-contact magnet attached to the rod. The switches are sealed for life and will never wear out.

Specifications

- Supply Power: 12 or 24 vdc
- Maximum Current: 25 Amps @ 12vdc or 12.5 Amps @ 24vdc (at 25% duty cycle)
- Operating Temperature: -20° to 140° F



Features

- **Quick Stop:** Adjustable current limits can be set in either direction. Current limits are set via potentiometers accessible from inside the control housing.
- **Motor Power:** Switched by on board relay. The relay allows power to the motor as long as the actuator is not being commanded to go past the end limits.
- **End Limits:** Integrated end of stroke hall effect sensors trigger the control to turn power off to the motor until input power is reversed. Position is factory set.
- **Faster Stopping:** Electronic dynamic braking, (EDB) is applied after every move for accurate and fast stops.
- **Enclosure:** Attaches to back of motor or other surface and is potted to work in harsh environments.
- **Protection:** Zener diode suppression on the input and output for extra protection in noisy (electrical) environments.

The P1QS-DC may also be used as a QS control only. That is, it can be only a bi-directional current limit without using or needing stroke limit sensors. In this form it can be used with any 12 or 24 volt actuator.

Options

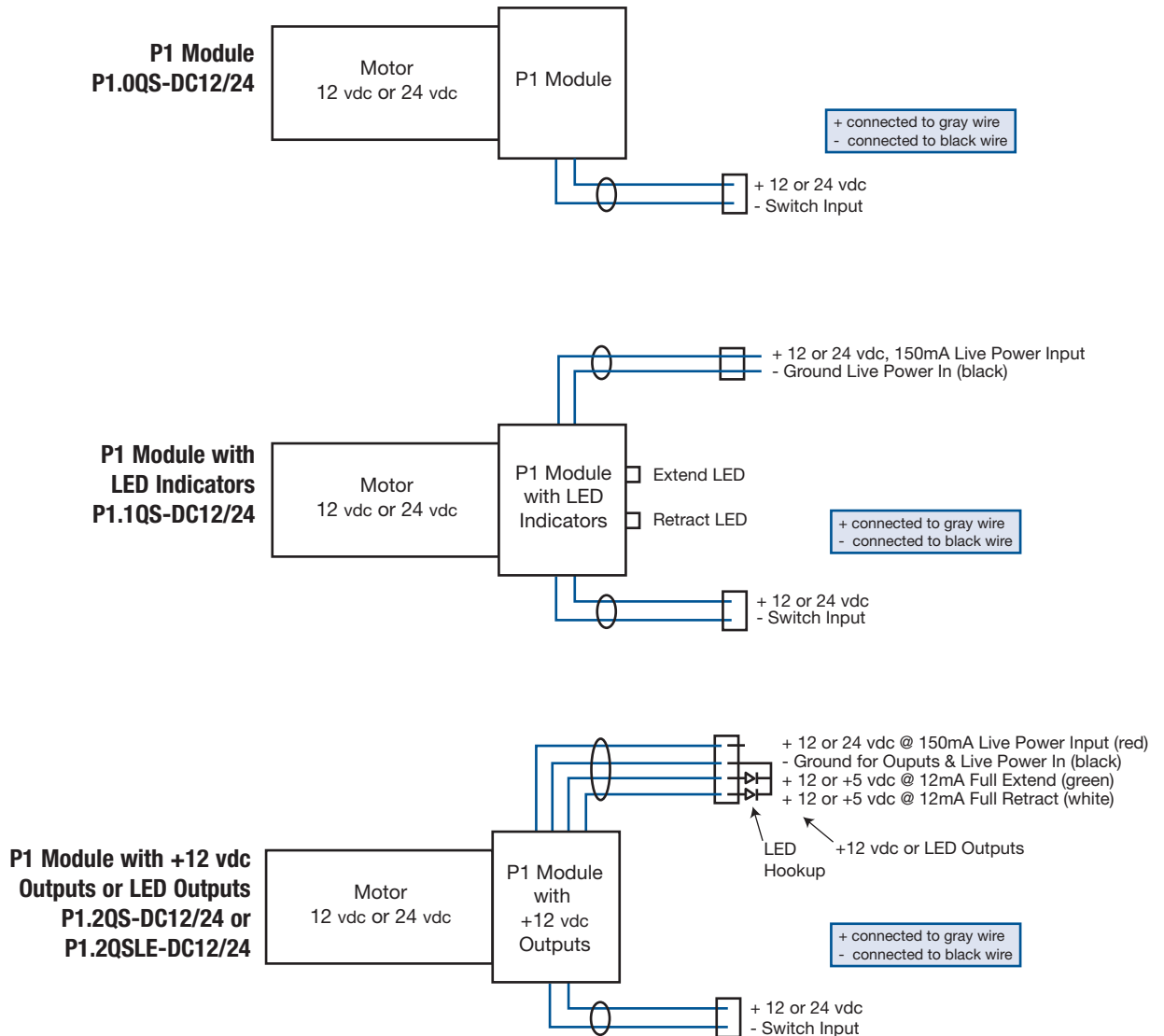
- **LED Indicators:** Two LED's on the outside of the control module to indicate when the end of stroke is reached. The LED's will remain lit until the actuator is moved from the end of stroke position. Included with the LED's is a live power input that can be used to keep the outputs on when switch power is off. 12/24vdc, 150mA is needed.
- **+12V Outputs:** Two +12 volt, 12mA outputs plus a ground to indicate when the end of stroke is reached. This output can signal a relay, lamp, or isolated PLC input. Included with the outputs is a live power input which can be used to keep the outputs on when switch power is off. 12/24vdc, 150mA is needed.
- **LED Outputs:** Two +5 volt, 25mA outputs plus a ground to indicate when the end of stroke is reached. This output can be used to light an LED. Included with the outputs is a live power input that can be used to keep the outputs on when switch power is off. A 12/24vdc, 150mA supply is needed.

P1QS-DC Quick Stop Control

Model Selection

Model No.	Input Voltage (vdc)	Maximum Output Current (Amps)	Features
P1.0QS-DC12	12	25	Base = Electronic Stroke Limit with Mid-stroke Current Limit and Electronic Dynamic Braking
P1.0QS-DC24	24	12.5	
P1.1QS-DC12	12	25	Base & LED Indicators
P1.1QS-DC24	24	12.5	
P1.2QS-DC12	12	25	Base & +12 vdc Outputs
P1.2QS-DC24	24	12.5	
P1.2QSLE-DC12	12	25	Base & LED Outputs
P1.2QSLE-DC24	24	12.5	

Wiring Diagrams



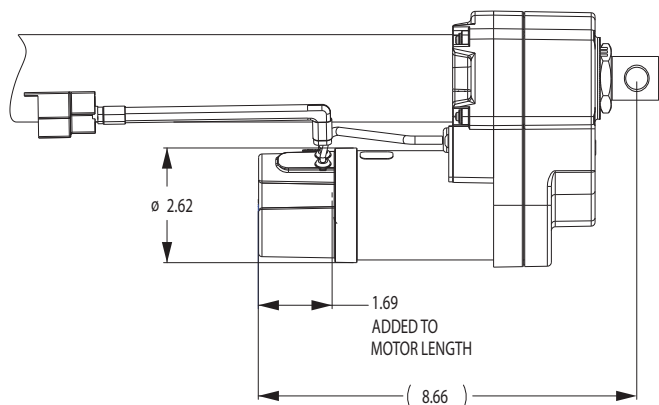
P2-DC Position Feedback Control



The P2 DC is a microprocessor position feedback control providing a 0 -10 volt analog output throughout actuator travel. The control uses two inductive pulse count sensors and a counting wheel to accurately determine position. A third sensor at the full retract position serves as the home or zero position. Factory set end limits turn power off to the motor via a relay until power polarity is reversed. All sensors are non-contact and sealed for life. They are integrated inside the B-Track actuator to protect them from the environment.

Specifications

- Supply Power: 12 or 24 vdc
- Maximum Current: 25 Amps @ 12vdc or 12 Amps @ 24vdc (at 25% duty cycle)
- Operating Temperature: -20° to 140° F



Features

- **Motor Power:** Switched by on board relay. The relay allows power to the motor until the end of stroke is reached.
- **End Limits:** Factory programmed location of .125" from either end. Power is removed from the motor until input polarity is reversed.
- **Faster Stopping:** Electronic dynamic braking, (EDB) is applied after every move for accurate and fast stops.
- **Enclosure:** Attaches to back of motor or other surface and is potted to work in harsh environments.
- **Protection:** Zener diode suppression on the input and output for extra protection in noisy environments.
- **Reset Function:** When the input is grounded, the actuator goes to its full retract position, or home sensor, and this location is set to zero. While performing this function the 0-10 volt output does not change. This feature is useful on initial startup and after service to home the actuator.
- **Analog Output:** 0-10 volt signal throughout the stroke length of the actuator while power is provided to the motor. The output is 0 volts at full retract position and 10 volts at full extend position. The output is 16 bit with a resolution of .15mV. The stop position is remembered when power is removed via on-board memory. A live power input is provided to keep the output on when switch power is off. A 12/24vdc, 150mA supply is needed.
- **Bi-Directional Current Limit:** Set to turn off power to the actuator when a current level is reached.

Options

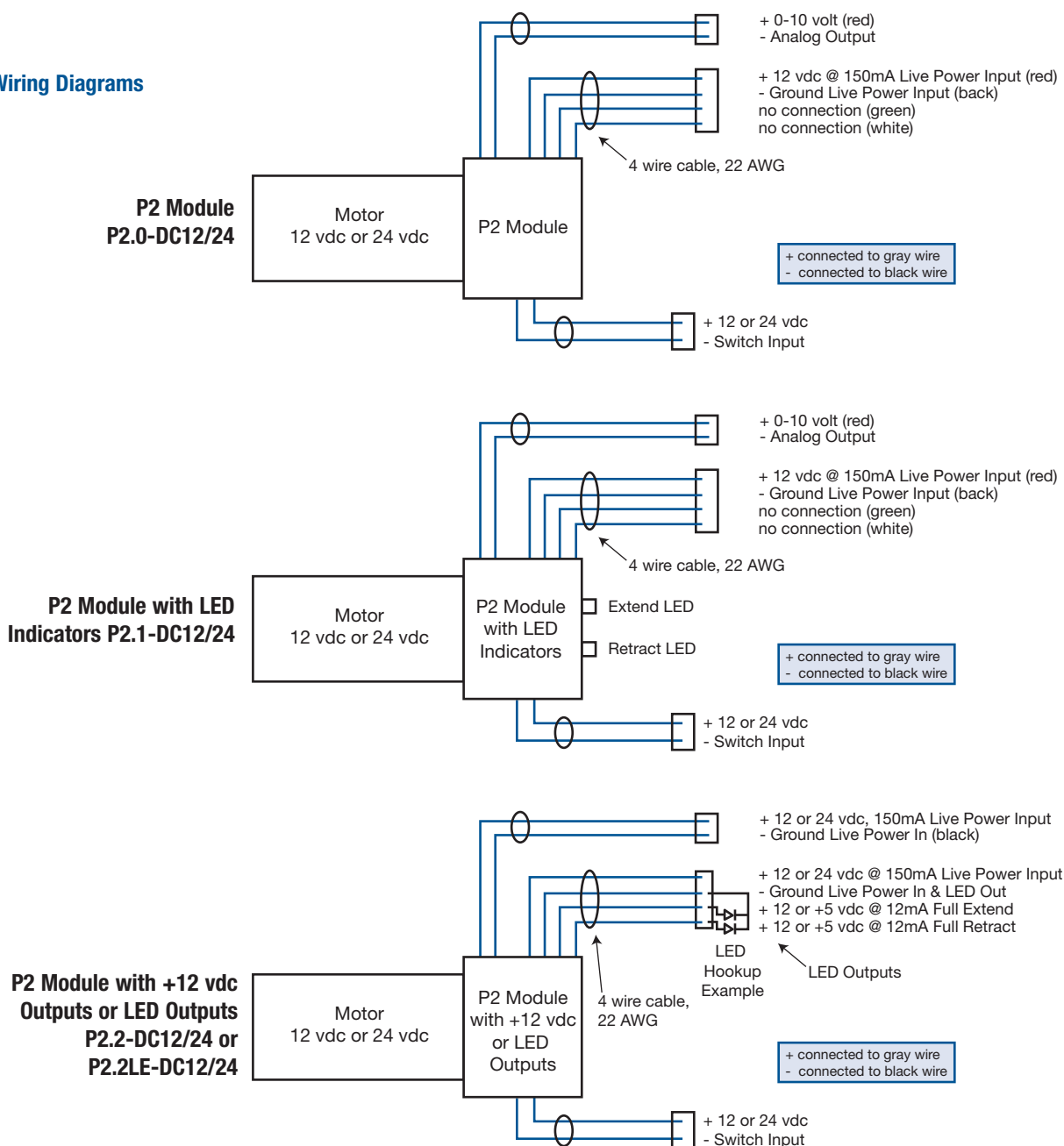
- **LED Indicators:** Two LED's on the outside of the control module to indicate when the end of stroke is reached. The LED's will remain lit until the actuator is moved from the end of stroke position.
- **+12VDC Outputs:** Two +12 volt, 12mA outputs plus a ground to indicate when the end of stroke is reached. This output can signal a relay, lamp, or isolated PLC input. The outputs will remain on until the actuator is moved from the end of stroke position.
- **LED Outputs:** Two +5 volt, 25mA outputs plus a ground to indicate when the end of stroke is reached. This output can be used to light an LED. The outputs will remain on until the actuator is moved from the end of stroke position.

P2-DC Position Feedback Control

Model Selection

Model No.	Input Voltage (vdc)	Maximum Output Current (Amps)	Features
P2.0-DC12	12	25	Base = Electronic Stroke Limits with 0 to +10V Analog Output and EDB
P2.0-DC24	24	12.5	
P2.1-DC12	12	25	Base & LED Indicators
P2.1-DC24	24	12.5	
P2.2-DC12	12	25	Base & +12 vdc Outputs
P2.2-DC24	24	12.5	
P2.2LE-DC12	12	25	Base & LED Outputs
P2.2LE-DC24	24	12.5	

Wiring Diagrams



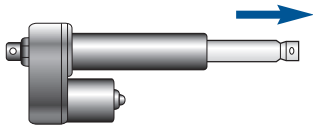


Figure 1 Axial load

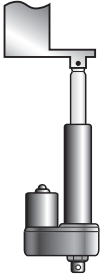


Figure 2 Cantilevered mount

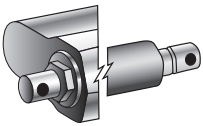


Figure 3 Clevis mount



Figure 4 Compression load

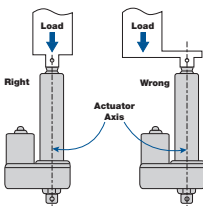


Figure 5 Eccentric load

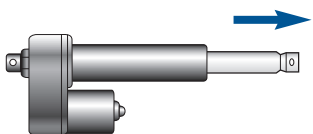


Figure 6 Extended length

Axial load

A load along the axis of the actuator screw (see figure 1).

Back drive

Force applied on a ball bearing nut that causes rotational torque to reverse direction. A force sufficient to cause a unit to reverse direction.

BTc

B-Track control family.

Cantilevered mount

A mounting where the mounting pin is not supported on both sides. Cantilevered mounts are common causes of failure (see figure 2).

Clevis mount

A U-shaped metal piece that has the ends drilled to accept a pin or bolt (see figure 3).

Compression load

Compression loading will press on the unit (see figure 4).

Cover tube

The outer tube or cover that encloses the screw and extension tube for an actuator.

Current vs. load

The load on the motor is measured by amperes (current). Current draw will increase as load increases.

Cycle

Movement from a fully retracted to fully extended position and back to fully retracted.

Duty cycle

The amount of 'on-time' vs total time. A 25% duty cycle means that a unit operates for 10 seconds out of 40 seconds, or 4 seconds out of 16 seconds.

Eccentric load

An off-center load which may cause binding and shorten actuator life (see figure 5).

End play

The amount of backlash or movement between the extension tube and the body of the actuator.

Extension rate

The rate of speed at which the actuator extends or retracts. This will vary based on loading (impact of load on speed is greater on DC units than on AC units).

Efficiency

Ratio of input power to output power.

ESL

Electronic Stroke Limit magnetically activated hall effect switches that turn power off at end of stroke.

Extended length

The overall length of the actuator from the center of the rear clevis to the center of the extension tube pin hole when the unit is at full extension (see figure 6).

Load

The force, measured in pounds, that is applied as an axial load on the actuator.

Load holding

The ability of the actuator to hold a load stationary when power is off.

Peak load

The maximum dynamic load that will be applied to the actuator, or that the actuator is capable of moving.

Pin mount

The use of a dowel or pin through the hole in the clevis mount (on the rear of an actuator) or the extension tube (on the front of an actuator) (see figure 7).

Radial load

A load applied to the side of the extension tube or across the body of the actuator. Normally radial loading will have a negative impact on unit life (see figure 8).

Restraining torque

The torque required to prevent torque within the unit from causing rotation on the body or extension tube of the unit (see figure 9).

Retracted length

The overall length of the actuator from the center of the rear clevis to the center of the extension tube pin hole when the unit is at full retracted position (see figure 10).

Side load

See radial loading (see figure 8).

Static load

The maximum non-operating (or non-moving) load. Static load is the load holding capability of an actuator.

Synchronous position

Having more than one actuator extend and retract together maintaining ± 0.20 position relative to each other.

Tension load

A load that will tend to pull on the unit (see figure 11).

Thermal overload

A switch within the motor that will open if the motor exceeds a predetermined heat level.

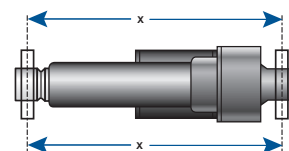


Figure 7 Pin mount

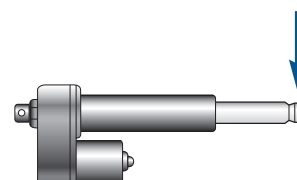


Figure 8 Radial load also side loading

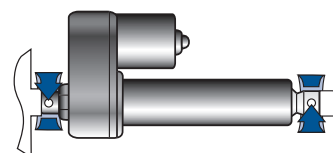


Figure 9 Restraining torque

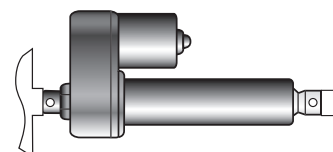


Figure 10 Retracted length

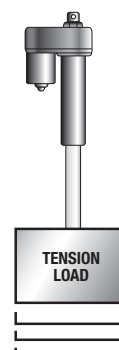


Figure 11 Tension load

Other products available from Altra Industrial Motion



Clutches and Brakes

Warner Electric designed and patented the first electromagnetic clutch/brake over seventy years ago, and has led every major innovation since. Every product in Warner Electric's extensive offering is designed for long life, exceptional reliability, and low cost of operation. Models are available to meet the demands of applications throughout the world.



Enclosed Gear Drives

Boston Gear's comprehensive line of enclosed gear drives, including worm, in-line and parallel-shaft helical, miter, and bevel, provides the product variety you need to get the job done. Boston Gear's speed reducers are preferred by manufacturers worldwide. In fact, every time you specify a Boston Gear product, you incorporate quality, responsiveness, and Boston Gear's 123-year reputation into your design.



Electrically Released Brakes

Spring-set designs are available for stopping or holding a load in the event of a power failure; or choose permanent magnet designs for dynamic stopping or cycling moving loads. Choose from C-face, UniModule or Electro Module series brakes available in shaft mounted or flange mounted designs with a torque range from 35 lb. in. to 400 lb. ft.



Precision Couplings

Huco is recognized as the world leader in the specialized field of precision couplings. By engineering plastics in combination with metals, to develop a full range of innovative misalignment couplings, Huco has achieved an enviable record of application engineering success and a reputation for quality products and service.



Linear Guideways

World-class linear guideways from Warner Linear are engineered for long-lasting, trouble-free performance. Low friction design allows for smooth operation and low noise. Units provide reliability in high speed, high accuracy applications. Models are available for light, medium, heavy and super heavy loads.



Open Gearing

Boston Gear has been a leader and pioneer in manufacturing gearing products since 1877, when we introduced the concept of gear standardization and stock gears - innovations of enormous benefit to power transmission system designers, specifiers, and users. Today, Boston Gear manufactures a wide range of open gearing solutions to meet your specific needs.



Magnetic Headsets

The Precision Tork™ line of hysteresis capping clutches from Warner Electric, utilize the most efficient torque control technology on the market to provide extremely smooth, consistent application of torque with less adjustment and downtime.



Bearing Products

When you want the freedom to select from the widest range of the highest quality bearings, come to the power transmission specialists at Boston Gear. Everything from plain sleeve bearings, ball bearings, rod ends, and spherical bearings to linear bearings, pillow blocks and flanged units are in stock.



Electrical Products

From fractional horsepower AC and DC motor controllers to a complete offering of complementary motors, Boston Gear is prepared to meet the broad spectrum of your adjustable speed needs.

ALTRA INDUSTRIAL MOTION

Warner Electric

Electromagnetic Clutches and Brakes - USA

South Beloit, IL 61080
815-389-3771

For application assistance:
1-800-825-9050

Electromagnetic Clutches and Brakes - Europe

St Barthelemy d'Anjou, France
+33 (0)2 41 21 24 24

For sales office:
+33 (0)2 41 21 24 76

Precision Electric Coils and Electromagnetic Clutches and Brakes - USA

Columbia City, IN 46725
260-244-6183

Inertia Dynamics

Spring Set Brakes; Power On and Wrap Spring Clutch/Brakes

Torrington, CT 06790
860-482-4444

Matrix International

Electromagnetic Clutches and Brakes, Pressure Operated Clutches and Brakes

Brechin, Scotland
+44 (0) 1356 602000

Warner Linear

Linear Actuators and Guideways - USA

Belvidere, IL 61008
815-547-1106

For application assistance:
1-800-825-9050

Boston Gear

Enclosed and Open Gearing, Electrical and Mechanical P.T. Components, Precision Gearheads, Precision Couplings

Quincy, MA 02171
617-328-3300

For customer service:
1-888-999-9860

For application assistance:
1-800-816-5608

Huco Dynatork

Precision Couplings and Air Motors

Hertford, England
+44 (0) 1992 501900

Formsprag Clutch

Overrunning Clutches and Holdbacks

Warren, MI 48089
586-758-5000

For application assistance:
1-800-927-3262

Marland Clutch

Roller Ramp and Sprag Type Overrunning Clutches and Backstops

Burr Ridge, IL 60527
630-455-1752

Stieber Clutch

Overrunning Clutches and Holdbacks

Heidelberg, Germany
+49 (0)6221 30 47 0

Wichita Clutch and Industrial Clutch

Pneumatic and Oil Immersed Clutches and Brakes - USA

Wichita Falls, TX 76302
940-723-3400

Pneumatic Clutches and Brakes - Europe

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Twiflex Limited

Caliper Brakes and Thrusters

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Ameridrives Couplings

Gear Couplings, Mill Spindles, Universal Joints

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+44 (0) 1924 460801

Nuttall Gear and Delroyd Worm Gear

Worm Gear and Helical Speed Reducers

Niagara Falls, NY 14302
716-298-4100

Saftek Friction

Non-asbestos Brake and Clutch Materials

Telford, England
+44 (0) 1952 581122

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