

WARNER ELECTRIC



Electric Linear Actuators and Controls

Warner Linear...

Customer Focused, Quality Driven

Products designed and manufactured for reliable, long-lasting performance

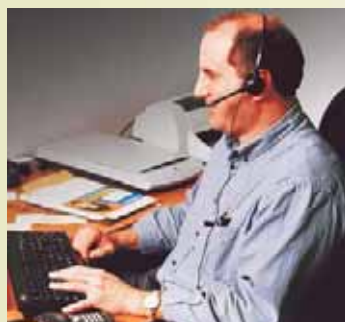


Quality Processes

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.

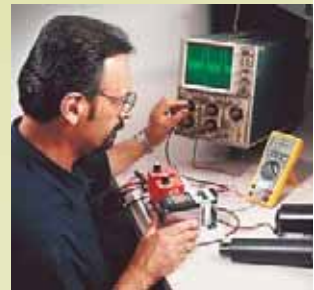


Custom Solutions

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.





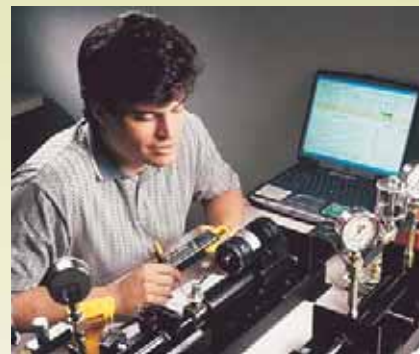
Design and Testing

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 centre 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.



Contents

Applications/ Performance Features	4-5
M-Track Design Features	6
M-Track Configurator	7
M-Track 1	8-9
A-Track Design Features	10
A-Track Configurator	11
A-Track 2	12-13
A-Track 5	14-15
A-Track 5	16-17
A-Track 10	18-19
B-Track Design Features	20
B-Track Configurator	21
B-Track K2vL	22-23
B-Track K2	24-25
B-Track K2x	26-27
B-Track K2PL/K2XPL	28-29
B-Track K2Js/K2XJs	30-31
B-Track K2RA	32-33
Custom Actuators	34
Mounting Information	35
Performance Features	36
Controls – Simple & Basic	37-38
Controls – Advanced	39
Controls – BTc P1-DC	40-41
Controls – BTc PQS-DC	42-43
Controls – BTc P2-DC	44-45
Glossary	46-47
Application Data Form	48

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:
120 N @ 45 mm/s
240 N @ 24 mm/s
500 N @ 13 mm/s
750 N @ 06 mm/s

Stroke Length (mm):
50, 100, 150, 250, 300

Input Voltage (VDC):
12, 24

Typical Applications:

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

Pages 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:
1500 N @ 25 mm/s
2300 N @ 13 mm/s

Stroke Length (mm):
100, 150, 200, 300, 450, 600

Input Voltage (VDC):
12, 24

Typical Applications:

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

Pages 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:
1500 N @ 25 mm/s
2300 N @ 46 mm/s
4500 N @ 25 mm/s
6000 N @ 12 mm/s

Stroke Length (mm):
100, 150, 200, 300, 450, 600

Input Voltage (VAC):
115, 230

Typical Applications:

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

Pages 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 (for special needs)

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



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:
2300 N @ 45 mm/s
3500 N @ 22 mm/s
4500 N @ 13 mm/s

Stroke Length (mm):
100, 150, 200, 300, 450, 600

Input Voltage (VDC):
12, 24

Typical Applications:

Boat Engine Covers
Round Baler Covers
Engine Hoods
Scooter Lifts

Pages 18-19

Rugged Duty



B-Track K2vL

Intended for severe service requirements and loads up to 3500 N. Lowest priced model in the B-Track family.

Drive Type:
Hybrid Acme

Load Capacity & Speed:
900 N @ 50 mm/s
1500 N @ 25 mm/s
3400 N @ 12 mm/s

Stroke Length (mm):
50-600 in 50 mm increments

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

Typical Applications:

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

Pages 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.

Drive Type:
Hybrid Acme

Load Capacity & Speed:
1300 N @ 50 mm/s
2700 N @ 25 mm/s
5400 N @ 12 mm/s

Stroke Length (mm):
50-900 in 50 mm 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

Pages 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:
2600 N @ 50 mm/s
5400 N @ 25 mm/s
9800 N @ 12 mm/s

Stroke Length (mm):
50-900 in 50 mm 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

Pages 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

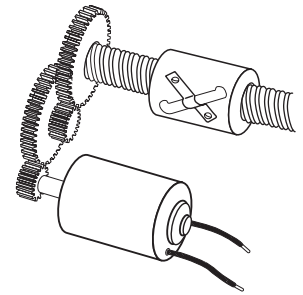
RV/Bus Compartment Extension

Performance Features

Dependable Operation

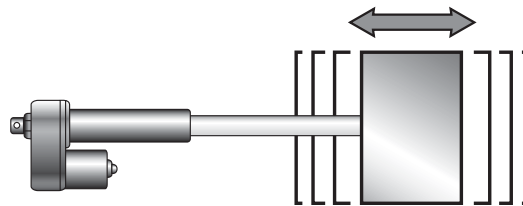
Compact design

A Warner Linear actuator with a 50 mm stroke can provide up to 9000 N 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 5 N to over 9000 N up to 600 mm 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

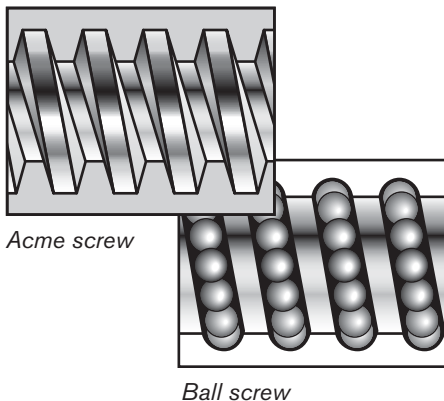
Warner Linear actuators incorporate high strength, high quality components and are designed to assure trouble-free service. Rugged spur gearing, industrial quality synthetic lubricants and high performance motors combine to provide maximum capability and value for the end user. Units are gasketed and 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.



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 9000 N. 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 12 to over 50 mm 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

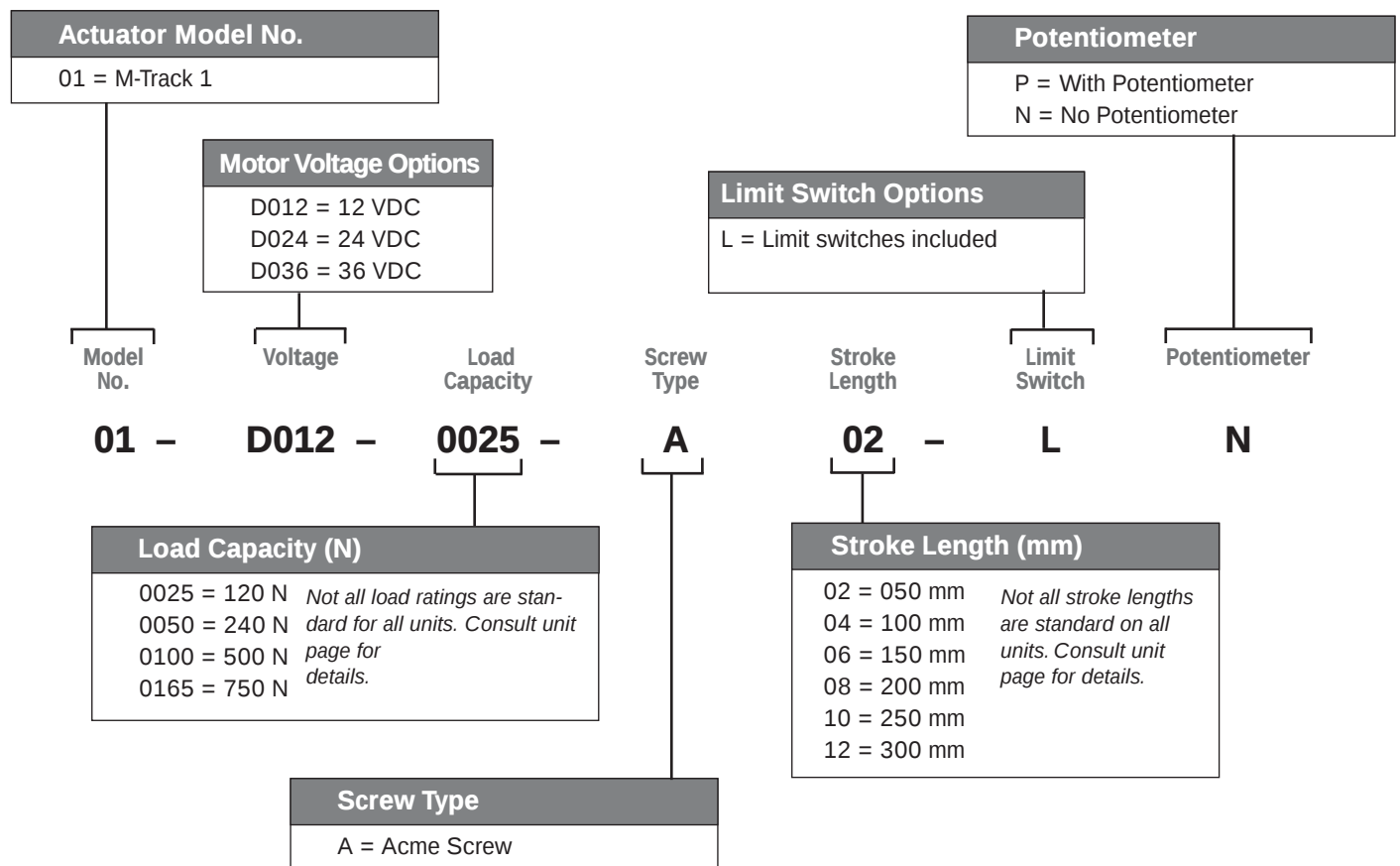
At full load capacity, actuators have a 25% duty cycle. Duty cycle is the amount of 'on-time' compared to cooling time. A unit that runs for 15 seconds should be off for 45 seconds.

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.



M-Track 1

DC motor acme screw

750 N 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 750 N of force at a minimum extension rate of 6 mm 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 -25°C to $+65^{\circ}\text{C}$
- Standard stroke lengths of 50, 100, 150, 200, 250 and 300 mm are available
- Internal limit switches automatically shut off the unit at end of stroke
- Optional potentiometer can provide positional location feedback

Typical applications

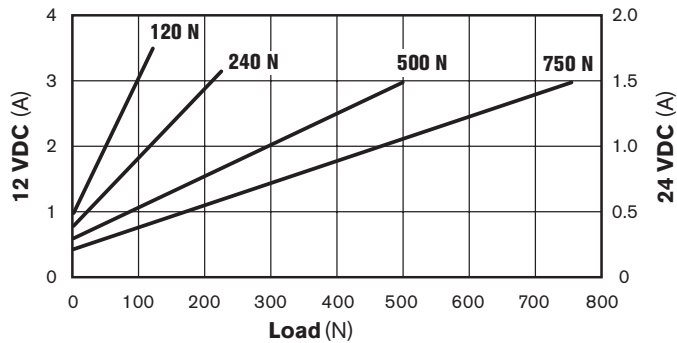
- Light load and short distance applications such as:
- Valve and vent adjustments
- Light weight tilt or lift positioning
- Vise and clamp operations

Specifications

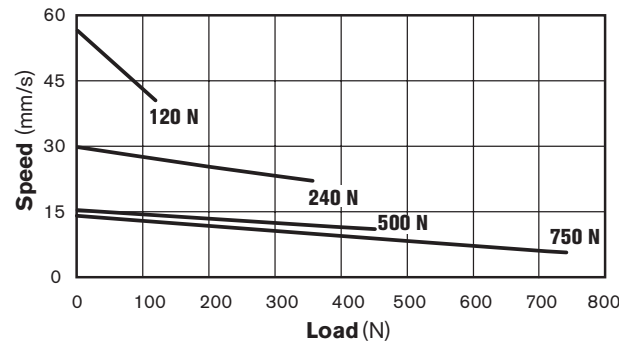
Load Capacity	N	120	240	500	750
Speed at Full Load	mm/s	45	24	13	06
Input Voltage	VDC	12 or 24 VDC (36 VDC optional)			
Static Load Capacity	N	1300			
Stroke Length	mm	50, 100, 150, 200, 250, 300			
Clevis Ends	mm	$\varnothing 6,4$			
Duty Cycle	%	25%			
Operation Temperature Range	$^{\circ}\text{C}$	-25°C to $+65^{\circ}\text{C}$			
Limit Switch	-	Fixed end of stroke limit switches standard			
Potentiometer	Ohm	10K, 10 turn pot optional			
Restraining Torque	Nm	2,24			

Performance curves

Current vs load

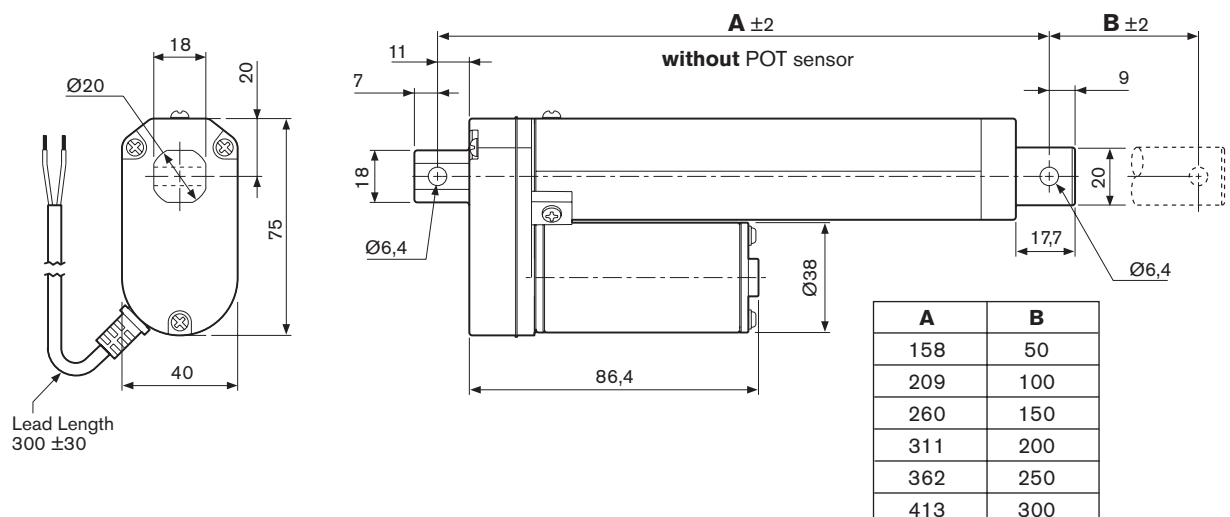
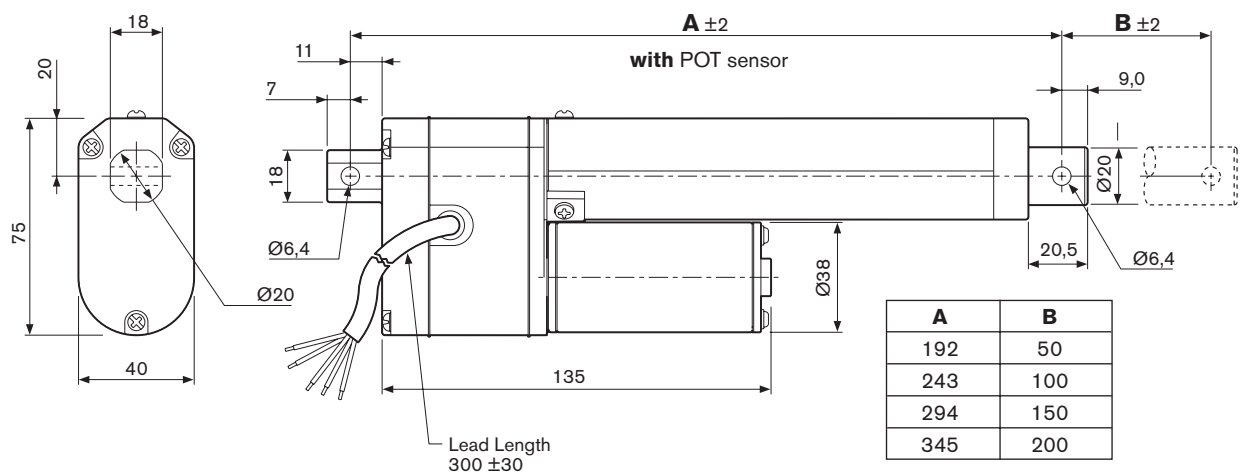


Speed vs load



Dimensions (mm)

B: Stroke Length	50	100	150	200	250	300
A: Retracted Length (with POT sensor)	192	243	294	345	N/A	N/A
A: Retracted Length (without POT sensor)	158	209	260	311	362	413



A-Track - Features

General Duty Actuators

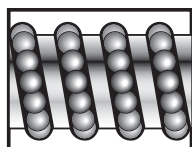
Key Features

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

Standard models

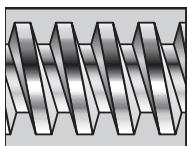
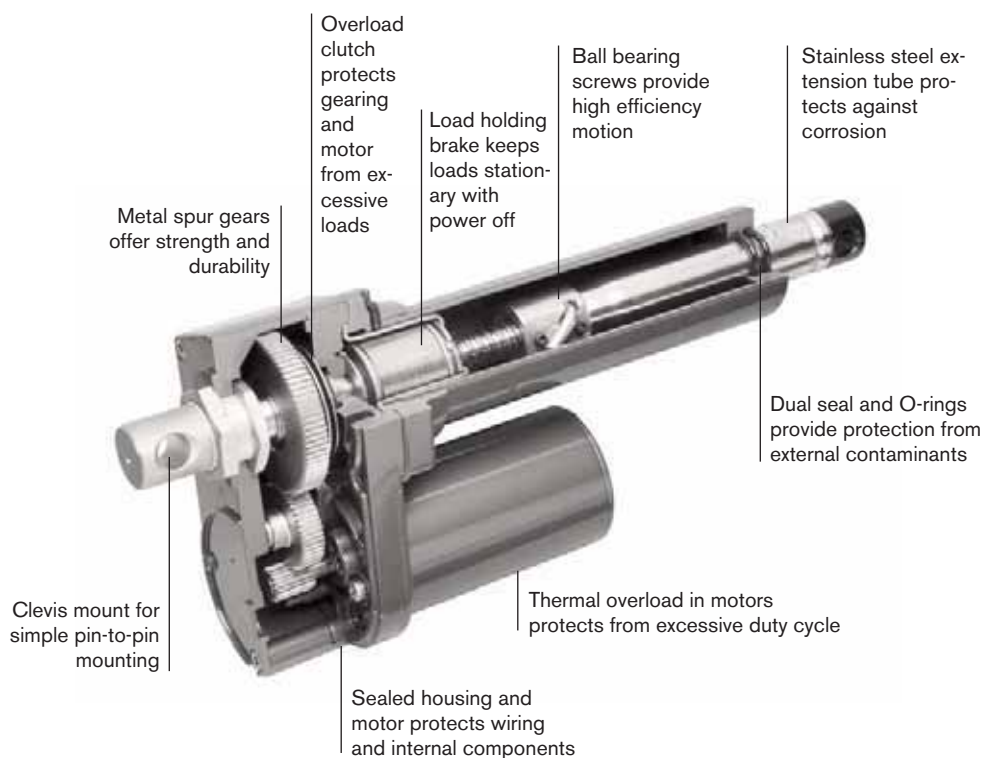
A-Track 2, A-Track 5

A-Track 10



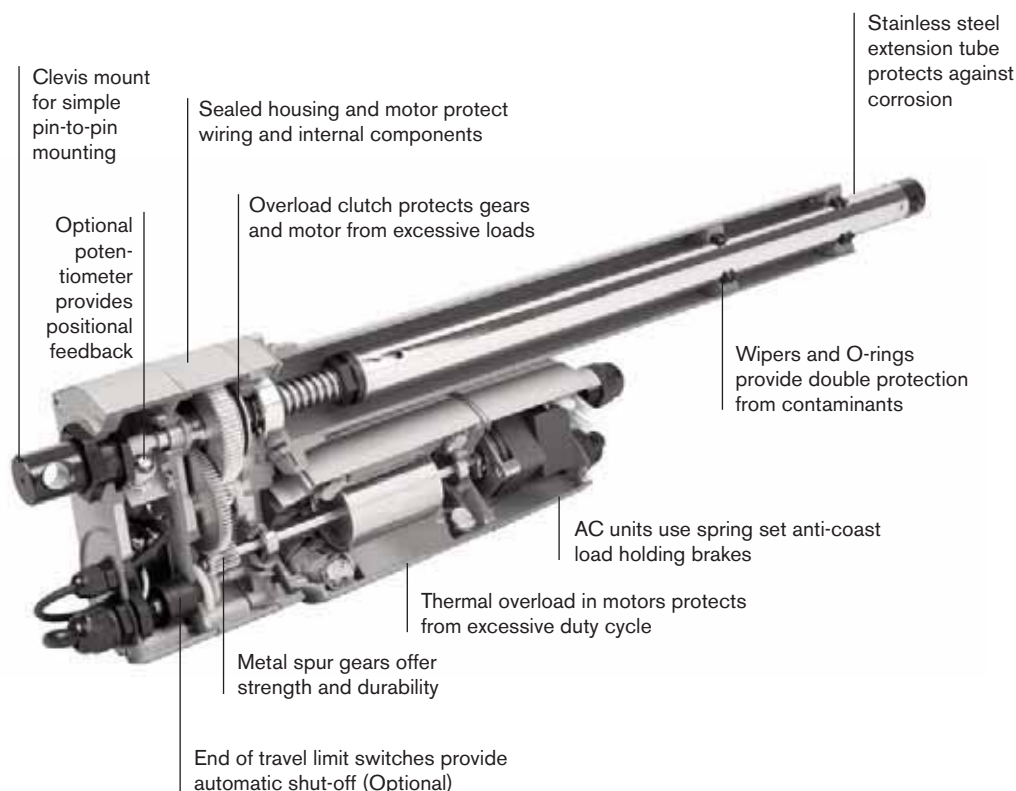
Ball Screw Driven Actuators...

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 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.

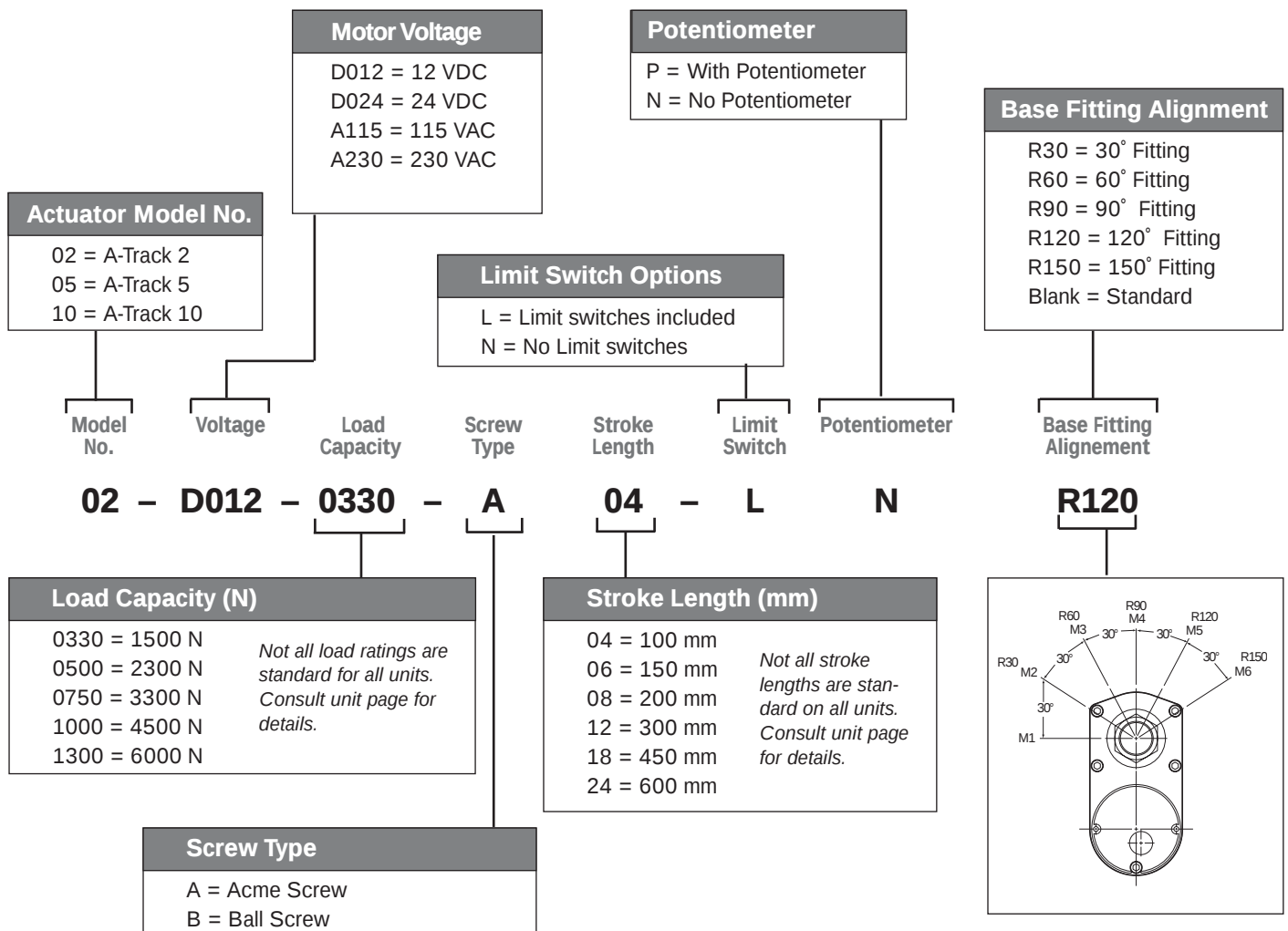
Important unit restrictions

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 provides 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 2300 N load rated

Up to 25 mm/s Speed



Features

- Seale and gasketed for mobile or outdoor applications
- Overload clutch standard
- 100, 150, 200, 300, 450 and 600 mm stroke lengths
- 12 or 24 VDC 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

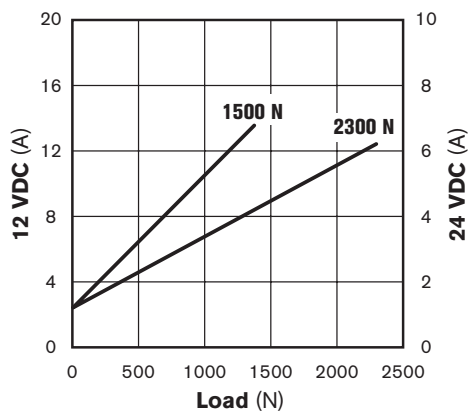
The **A-Track 2** incorporates an Acme screw drive system that provides a value priced unit for moderate duty applications. The **A-Track 2** includes lubrication for the life of the unit, combined with robust seal and O-ring design, creating a maintenance free design, even when used in applications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

Specifications

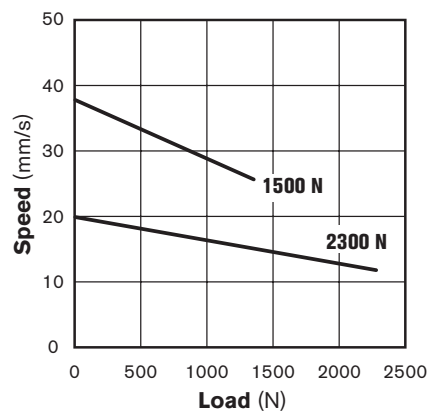
Load Capacity	N	1500	2300
Speed at Full Load	mm/s	25	13
Input Voltage	VDC	12 or 24 VDC	
Static Load Capacity	N	4500	
Stroke Length	mm	100, 150, 200, 300, 450 and 600	
Clevis Ends	mm	Ø 13	
Duty Cycle	%	25%	
Operation Temperature Range	°C	-25°C to +65°C	
Limit Switch	-	Optional adjustable travel limit switches (20:1 only) (2300 N)	
Potentiometer	Ohm		Optional feedback potentiometer
Restraining Torque	Nm	11,2	
Thermal Overload	-	Thermal Overload included all motors	

Performance curves

Current vs load



Speed vs load



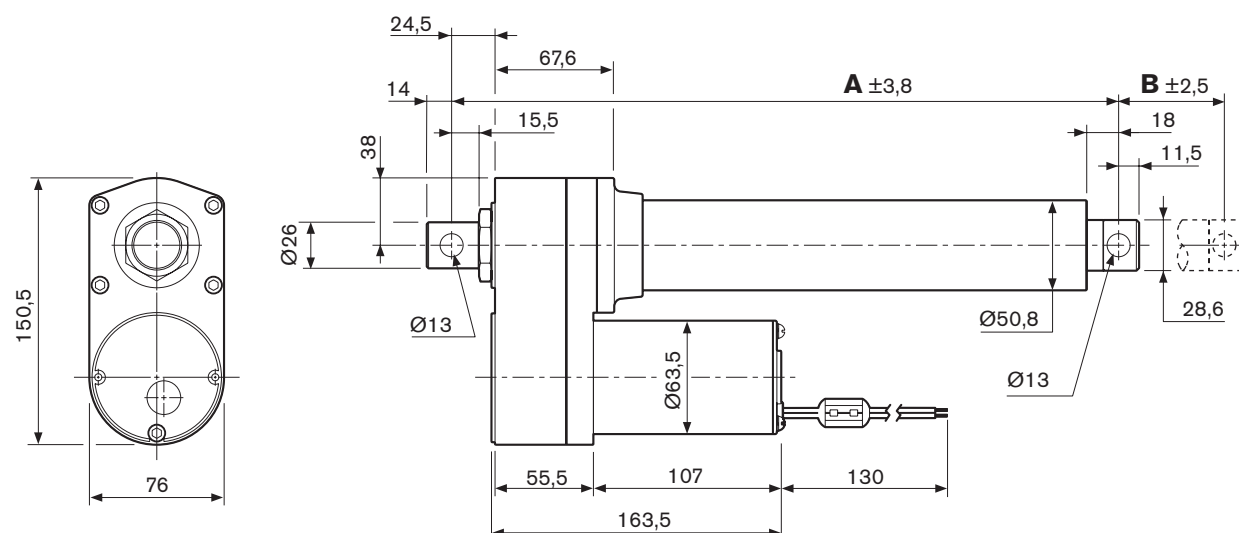
Dimensions (mm)

With Limit Switches

A-Track 2 Acme Screw	Stroke	100	150	200	300	450	600
	A	338	389	438	540	772	924
	B	102	153	203	305	457	610

Without Limit Switches

A-Track 2 Acme Screw	Stroke	100	150	200	300	450	600
	A	262	313	364	465	696	848
	B	102	153	203	305	457	610



A-Track 5

AC motor acme screw

Up to 2300 N load rated

Up to 25 mm/s Speed



The **A-Track 5 Acme screw** actuator is a general purpose AC actuator with load capacities of 1500 and 2300 N 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 100 to 600 mm for in-plant or protected applications.

Features

- Acme screw drive system
- 115 VAC (60hz) and 230 VAC (50hz) motors available
- 100, 150, 200, 300, 450 and 600 mm strokes
- Acme screw drive train
- Overload clutch standard
- Lubricated for life
- Capacitor included with motor

Typical applications

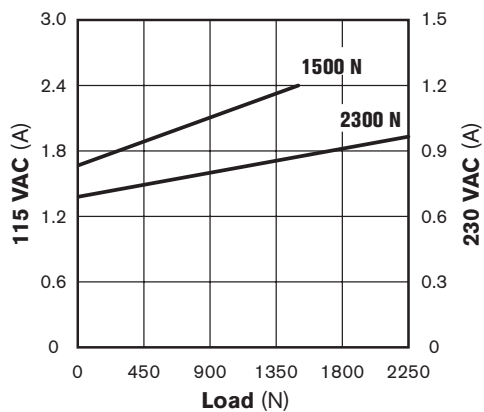
- Ergonomic lift tables
- Conveyor diverters
- Bin/tank cover lifts
- Roof vents

Specifications

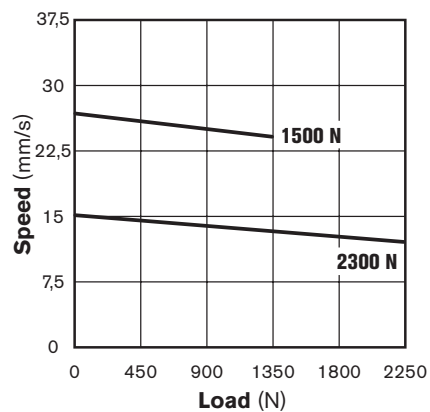
Load Capacity	N	1500	2300
Speed at Full Load	mm/s	25	14
Input Voltage	VAC	115 VAC (60 Hz) and 230 VAC (50 Hz)	
Static Load Capacity	N	4500	
Stroke Length	mm	100, 150, 200, 300, 450 and 600	
Clevis Ends	mm	Ø 13	
Duty Cycle	%	25%	
Operation Temperature Range	°C	-25°C to +65°C	
Limit Switch	-	Optional adjustable travel limit switches (20:1 only) (2300 N)	
Potentiometer	Ohm		Optional feedback potentiometer
Restraining Torque	Nm	11,2	
Thermal Overload	-	Thermal Overload included in all motors	

Performance curves

Current vs load



Speed vs load



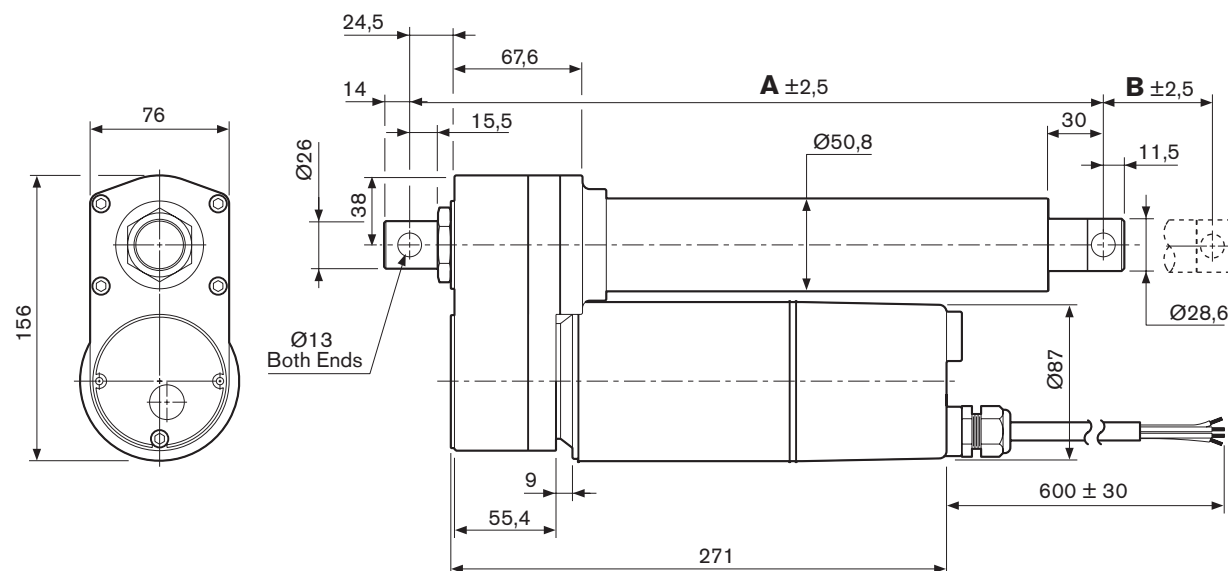
Dimensions (mm)

With Limit Switches

A-Track 5 Acme Screw	Stroke	100	150	200	300	450	600
	A	456	506	556	658	810	962
	B	102	153	203	305	457	610

Without Limit Switches

A-Track 5 Acme Screw	Stroke	100	150	200	300	450	600
	A	380	431	481	583	735	887
	B	102	153	203	305	457	610



A-Track 5

AC motor ball screw

Up to 6000 N load rated

Up to 48 mm/s Speed



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 6000 N with either 115 or 230 VAC 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 100 to 600 mm for in-plant or protected applications.

Features

- Ball bearing screw drive system
- Anti-coast load holding brake
- 100–600 mm stroke length capability
- Load limiting clutch standard
- Thermal overload protection in the motor
- Capacitor included in motor

Typical applications

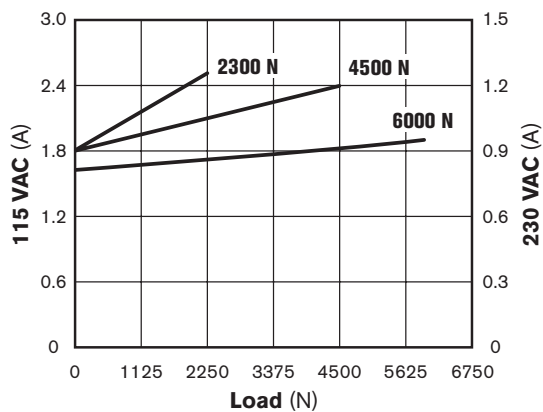
- Ergonomic lift tables
- Conveyor diverters
- Bin or tank cover lifts
- Die transfer carts

Specifications

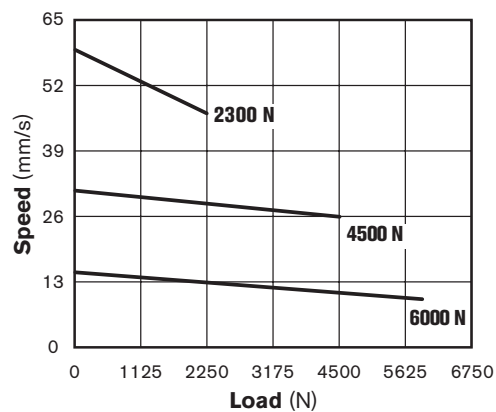
Load Capacity	N	2300	4500	6000
Speed at Full Load	mm/s	48	25	12
Input Voltage	VAC	115 VAC (60 Hz) / 230 VAC (50 Hz)		
Static Load Capacity	N	13500		
Stroke Length	mm	100, 150, 200, 300, 450 and 600 mm		
Clevis Ends	mm	Ø 13		
Duty Cycle	%	25%		
Operation Temperature Range	°C	-25°C to +65°C		
Limit Switch	-	Optional adjustable travel limit switch (20:1 only) (6000 N)		
Potentiometer	Ohm			Optional
Restraining Torque	Nm	11,2		
Thermal Overload	-	Optional feedback potentiometer		

Performance curves

Current vs load



Speed vs load



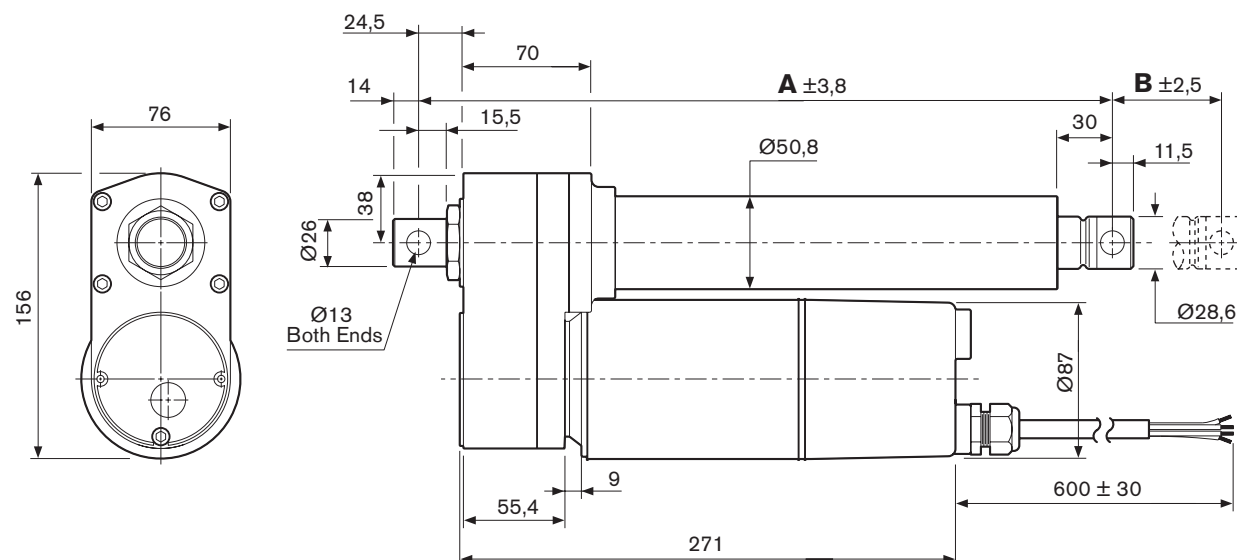
Dimensions (mm)

With Limit Switches

A-Track 5 Ball screw	Stroke	100	150	200	300	450	600
	A	456	506	556	658	810	962
	B	102	153	203	305	457	610

Without Limit Switches

A-Track 5 Ball screw	Stroke	100	150	200	300	450	600
	A	380	431	481	583	735	887
	B	102	153	203	305	457	610



A-Track 10

DC motor ball screw

Up to 4500 N load rated

Up to 45 mm/s Speed



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 4500 N with stroke lengths to 600 mm.

Features

- Efficient ball screw drive system
- Load holding brake standard
- Overload clutch standard
- 100 to 600 mm 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

Specifications

Load Capacity	N	2300	3500	4500
Speed at Full Load	mm/s	45	22	13
Input Voltage	VDC	12 or 24 VDC		
Static Load Capacity	N	13500		
Stroke Length	mm	100, 150, 200, 300, 450 and 600		
Clevis Ends	mm	Ø 13		
Duty Cycle	%	25%		
Operation Temperature Range	°C	-25°C to +65°C		
Limit Switch	-	Optional adjustable travel limit switch (20:1 only) (4500 N)		
Potentiometer	Ohm	Optional		
Restraining Torque	Nm	11,2		
Thermal Overload	-	Overload clutch and motor thermal overload		



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 9800 N capacity

Standard models

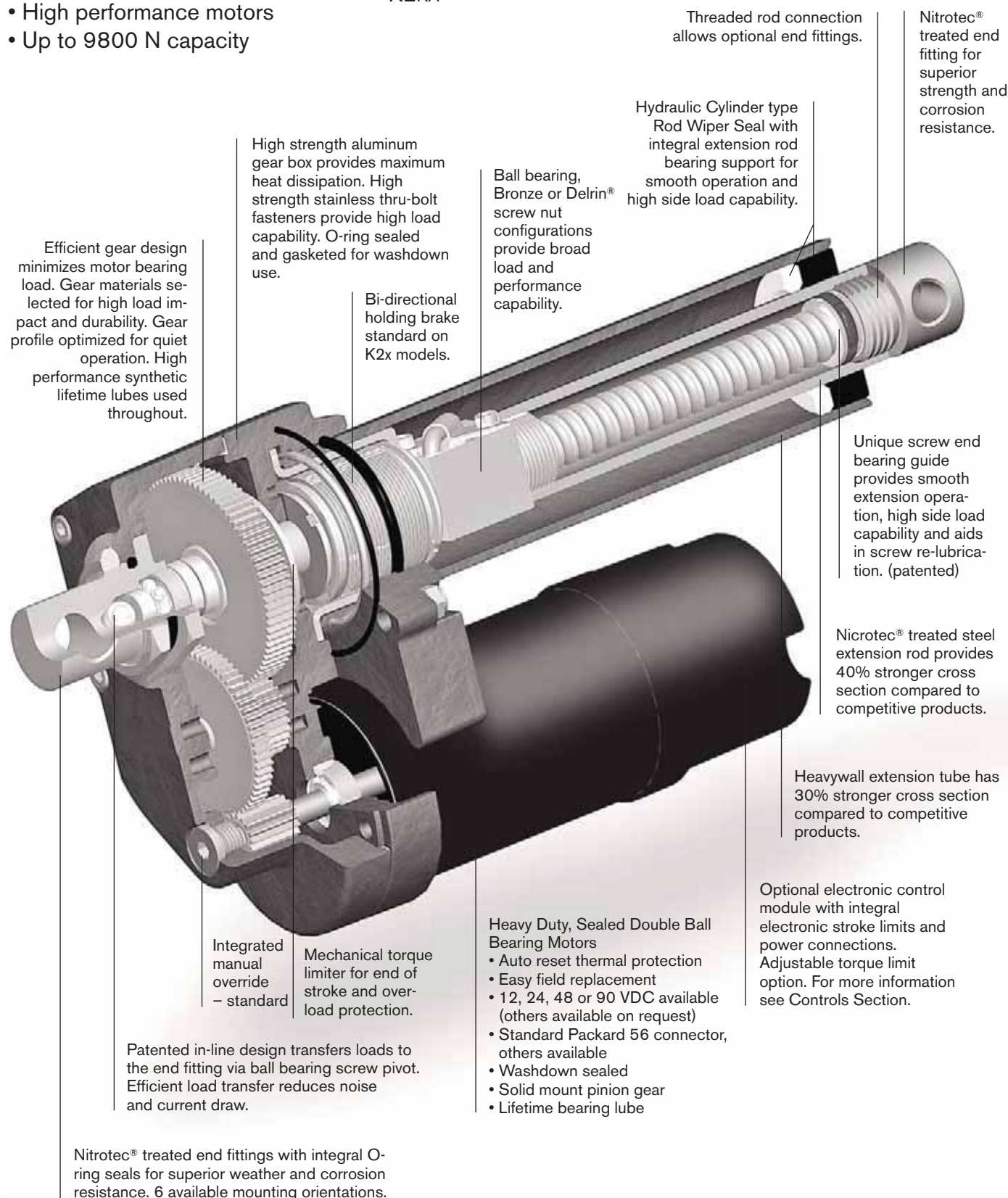
K2VL, K2, K2X

Option models

K2PL/K2XPL

K2JS/K2XJS

K2RA



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

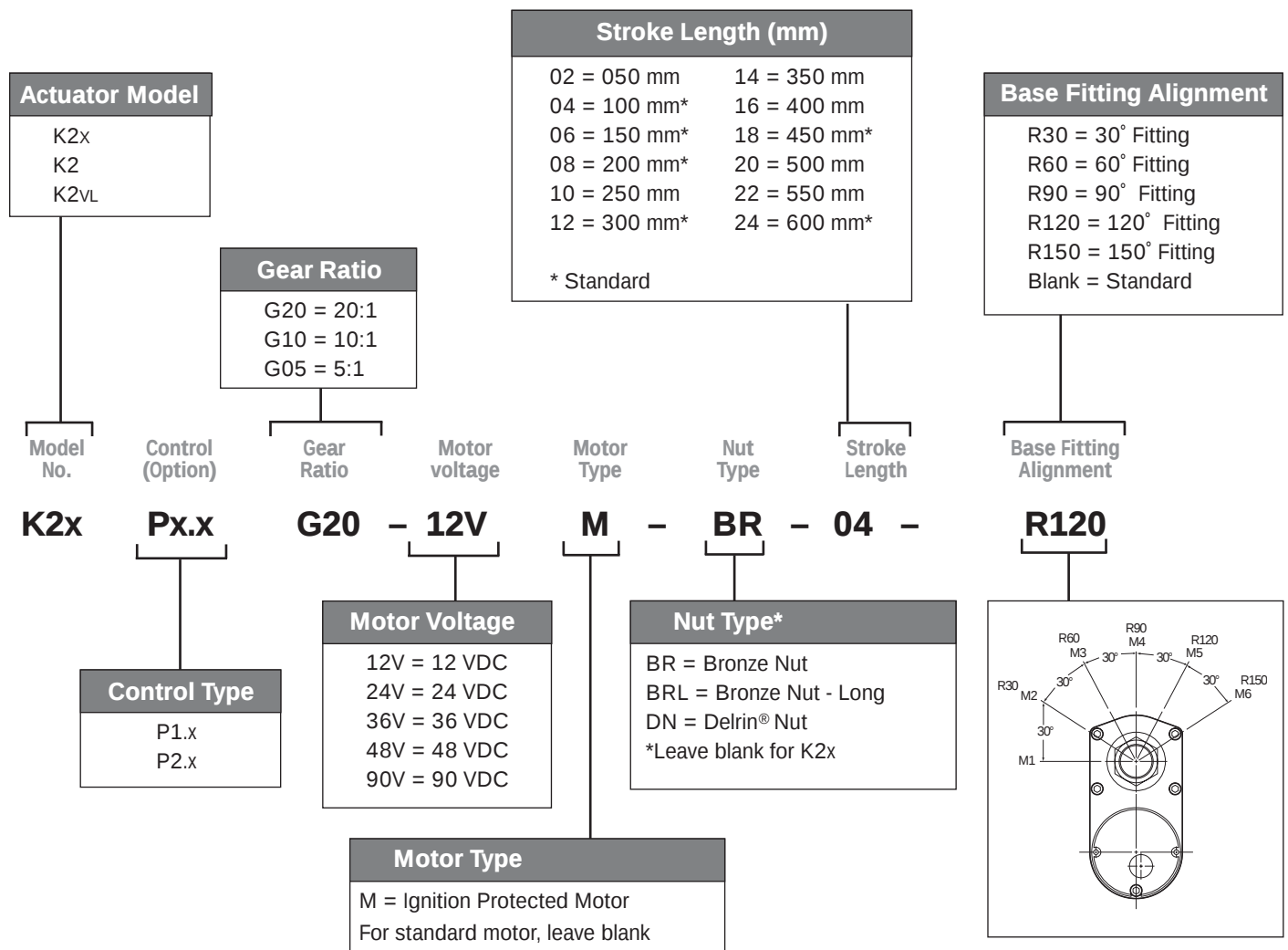
Choose standard lengths from chart. For special length consult factory.

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).



B-Track - K2vL

Rugged Duty Actuator DC Motor Acme Screw

Up to 3400 N load rated

Up to 50 mm/s 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
- 50 to 600 mm stroke lengths
- Up to 3400 N load capacities
- Speeds up to 50 mm/s 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: 13500 N Static (in-line load)
- Refer to performance chart for load/current/speed capabilities
- Stroke Length Tolerance: +/- 1,5 mm
- 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.)

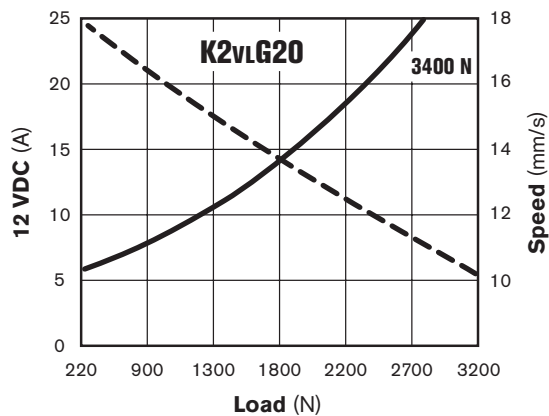
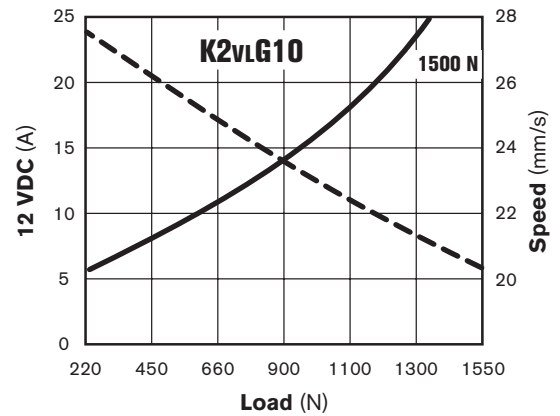
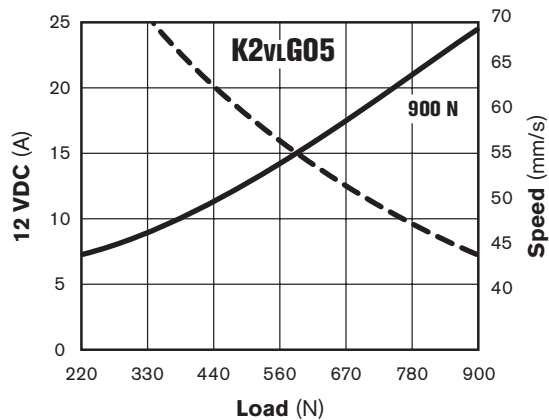
Operating Environment

- Ambient temp range: -35°C to +65°C
- 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

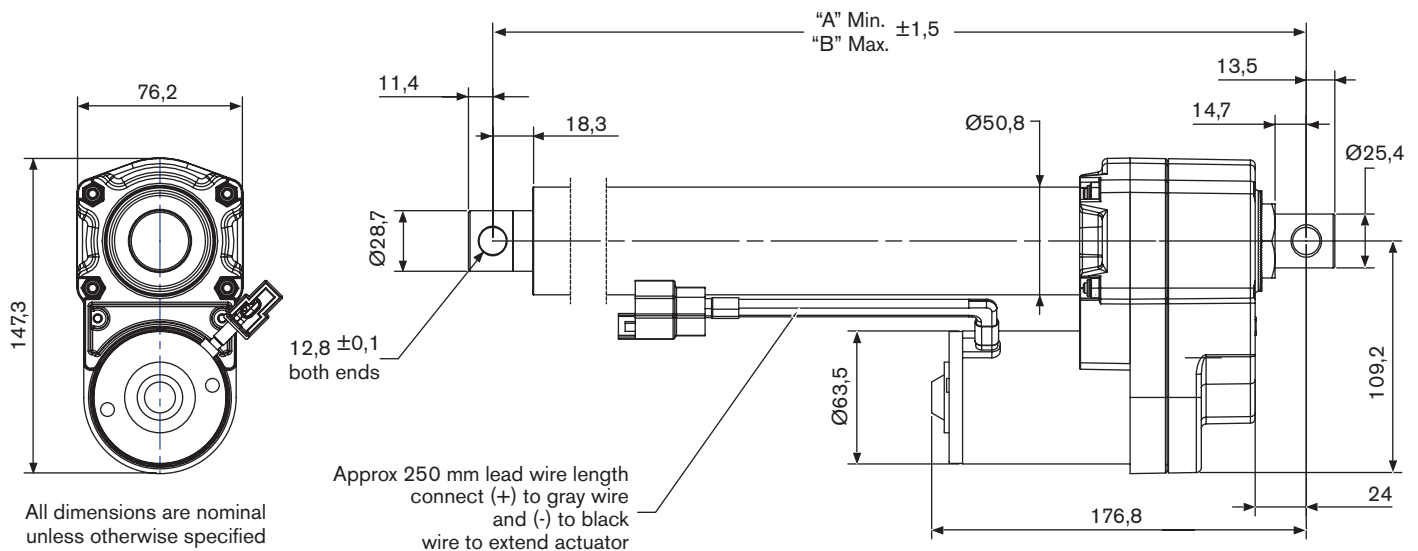


Current draw ———
Speed - - - - -

Dimensions (mm)

B-Track K2vL	Stroke	050	100	150	200	250	300	350	400	450	500	550	600
	A Min.	211	262	312	364	414	465	516	567	618	745	795	846
	B Max.	262	363	465	567	668	770	872	973	1075	1253	1354	1456

Note: Special lengths available



B-Track - K2

Rugged Duty Actuator DC Motor Acme Screw

Up to 5400 N load rated

Up to 50 mm/s 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
- 50 to 600 mm inch stroke lengths
- Up to 5400 N load capacities
- Speeds up to 50 mm/s 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: 13500 Nm Static (in-line load)
- Refer to performance chart for load/current/speed capabilities
- Stroke Length Tolerance: +/- 1,5 mm
- 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.)

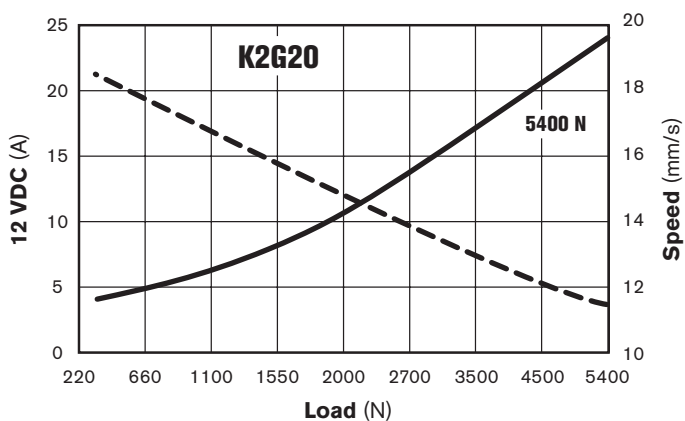
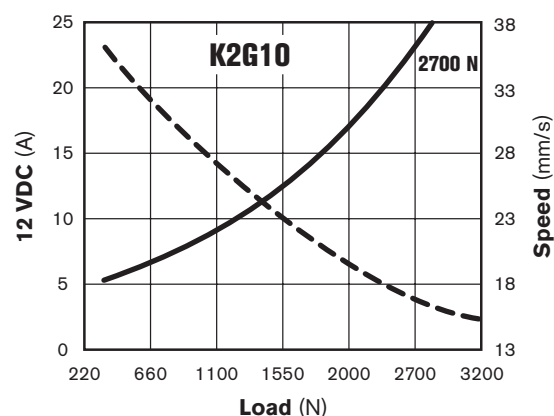
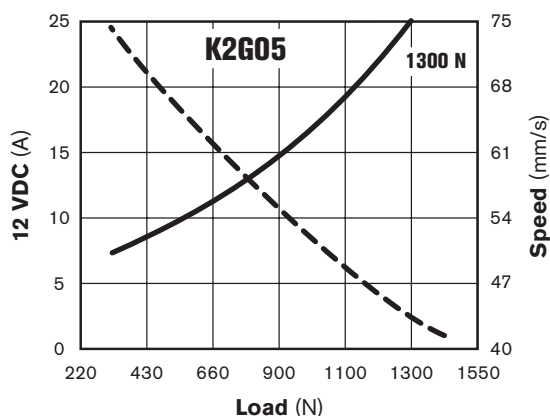
Operating Environment

- Ambient temp range: -35°C to +65°C
- 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

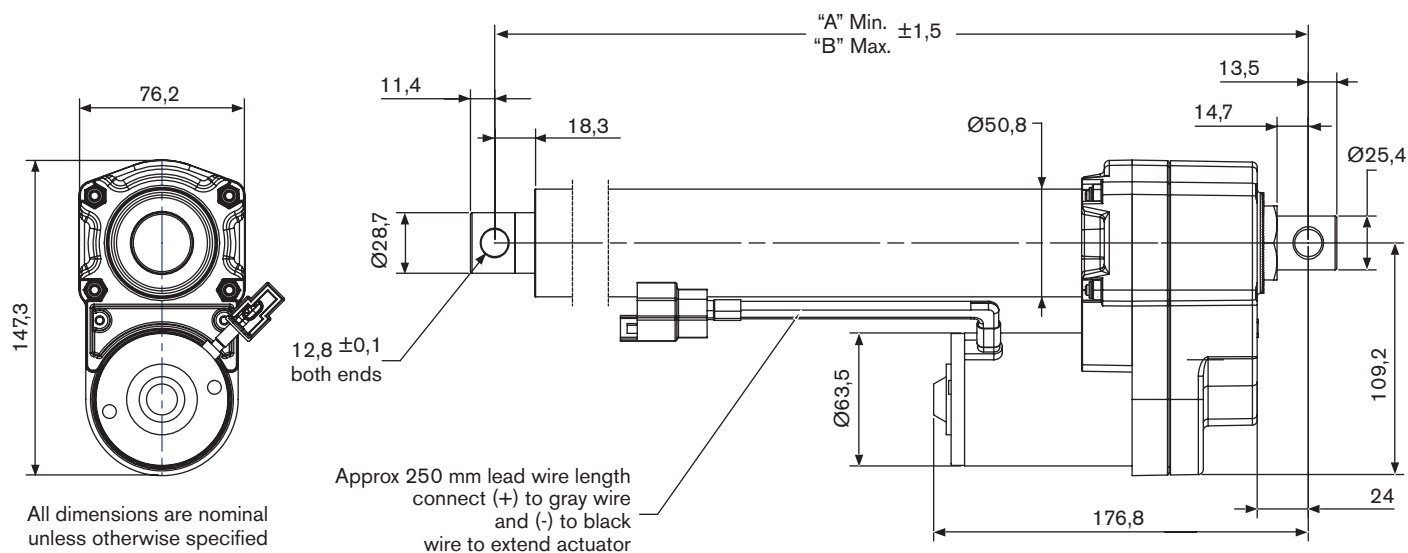


Current draw ———
Speed - - - - -

Dimensions (mm)

B-Track K2	Stroke	050	100	150	200	250	300	350	400	450	500	550	600
	A Min.	211	262	312	364	414	465	516	567	618	745	795	846
	B Max.	262	363	465	567	668	770	872	973	1075	1253	1354	1456

Note: Special lengths available



B-Track - K2x

Rugged Duty Actuator DC Motor - Ball Screw

Up to 9800 N load rated

Up to 50 mm/s. Travel Speed



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 9800 N 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
- 50 to 600 mm stroke lengths
- Up to 9800 N load capacities
- Speeds up to 50 mm/s 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: 13500 Static (in-line load)
- Refer to performance chart for load/current/speed capabilities
- Stroke Length Tolerance: +/- 1,5 mm
- 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.)

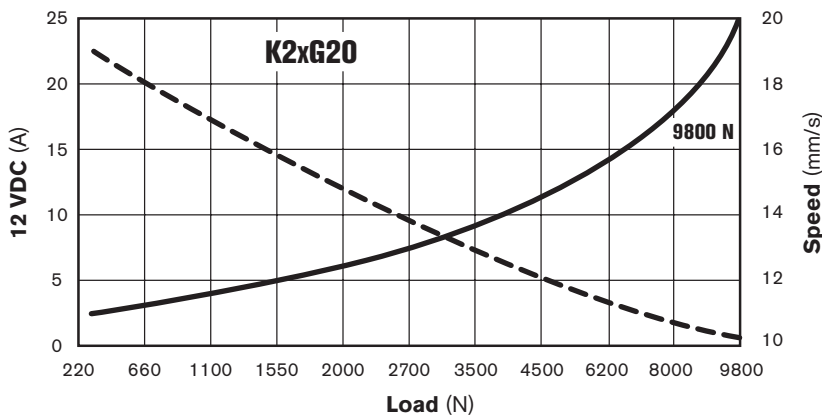
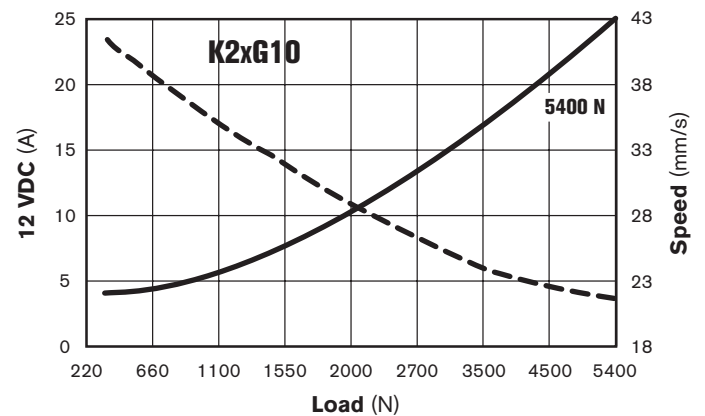
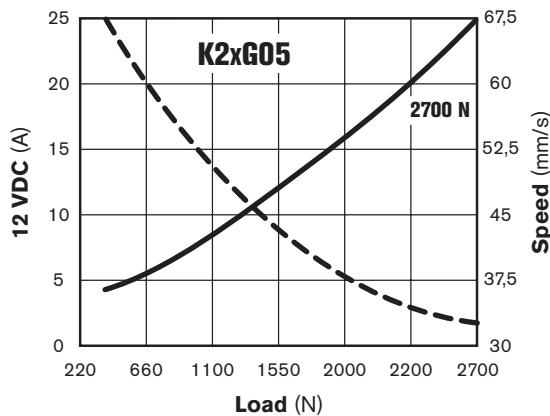
Operating Environment

- Ambient temp range: -35°C to +65°C
- 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

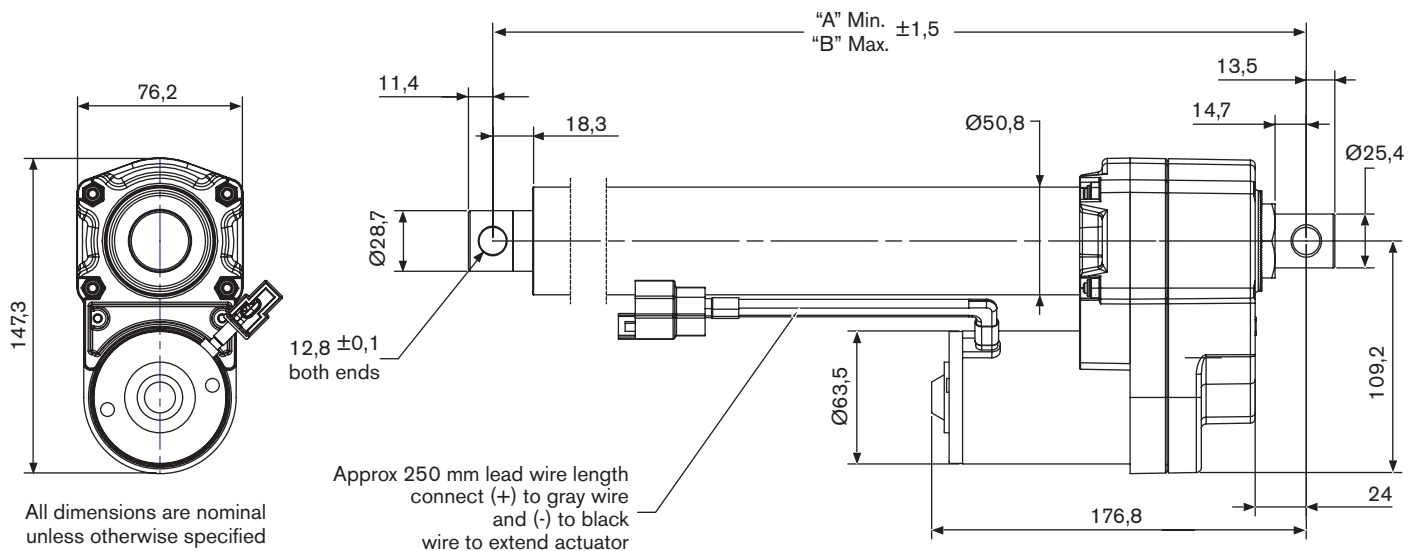


Current draw ———
Speed - - - - -

Dimensions (mm)

B-Track K2x	Stroke	050	100	150	200	250	300	350	400	450	500	550	600
	A Min.	251	302	353	404	454	505	556	607	658	785	835	886
	B Max.	302	404	505	607	708	810	912	1013	1115	1293	1394	1490

Note: Special lengths available

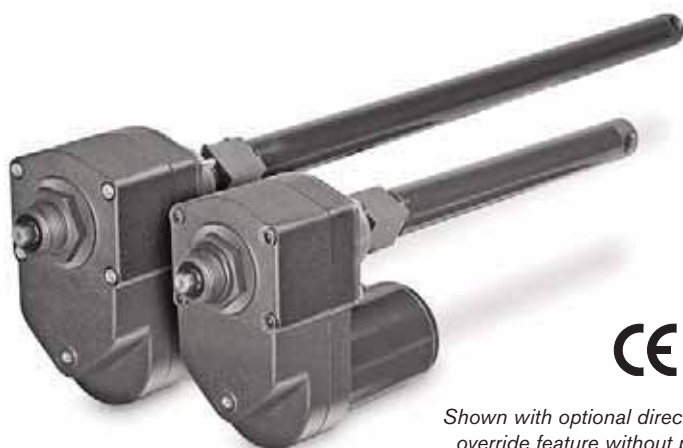


B-Track - K2PL / K2XPL

Power Lift Actuator DC Motor - Acme or Ball Screw

Up to 9800 N load rated

Up to 50 mm/s 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 ball screw system
- Patented hybrid nut and screw design, no brake needed in K2 model.
- Integral load holding brake on K2x model
- Ball detent overload clutch
- 100 to 600 mm stroke lengths
- Up to 9800 N load capacities
- Speeds up to 50 mm/s 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: 13500 N Static (in-line load)
- Refer to performance chart for load/current/speed capabilities
- Stroke Length Tolerance: +/- 1,5 mm
- 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°C to +65°C
- 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)

B-Track - K2PL / K2XPL

Performance curves

See page 25 for K2PL and page 27 for K2XPL

Dimensions (mm)

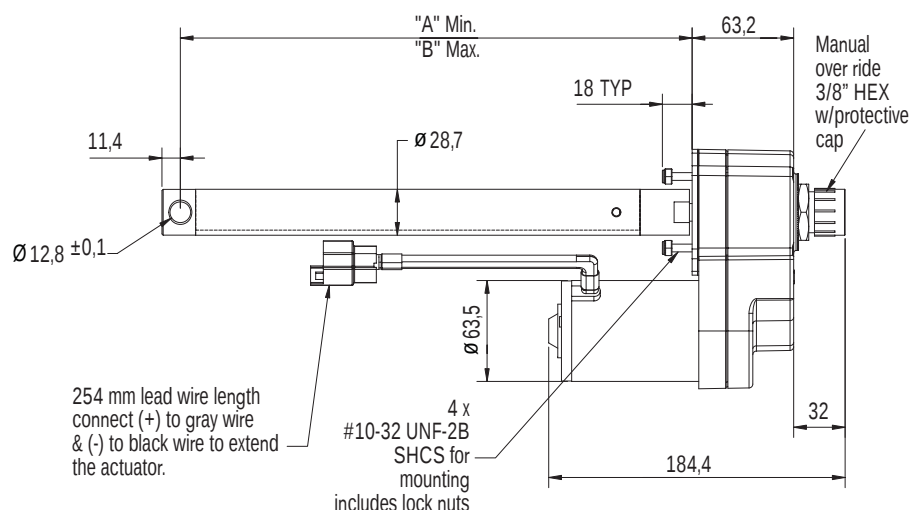
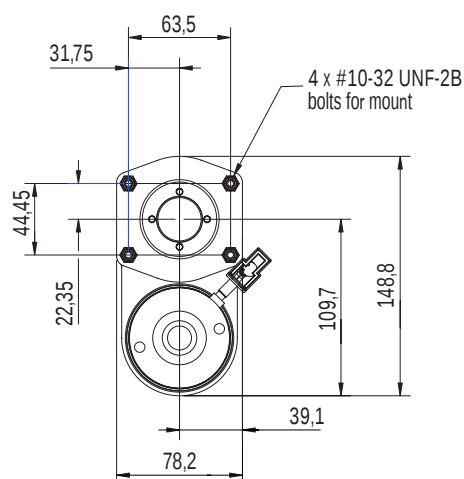
B-Track K2PL	Stroke	100	150	200	250	300	350	400	450	500	550	600
	A Min.	178	229	280	331	382	432	483	534	585	636	687
	B Max.	357	459	560	662	764	865	967	1068	1170	1272	1373

Note: Special lengths available

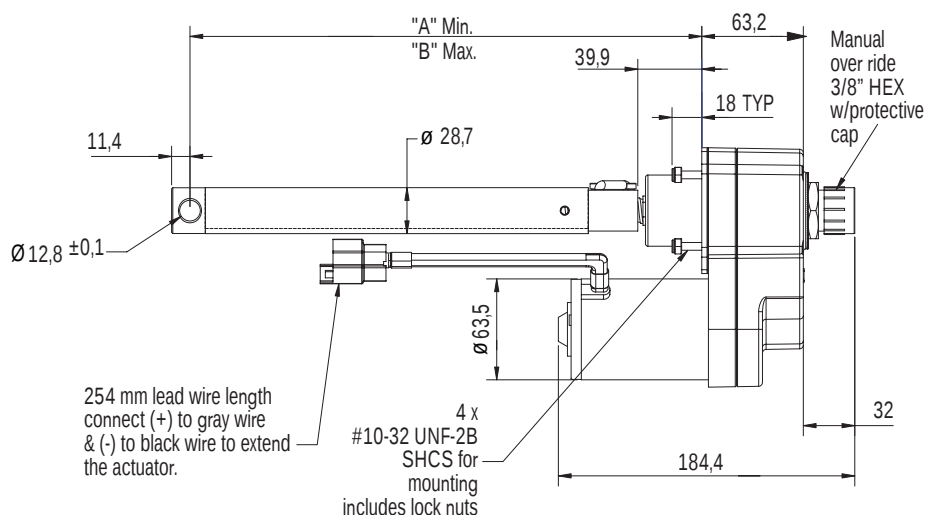
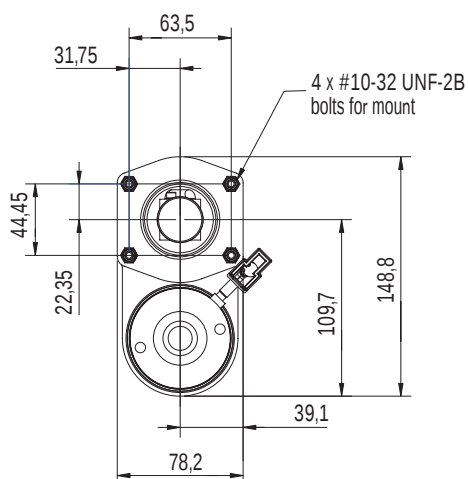
B-Track K2XPL	Stroke	100	150	200	250	300	350	400	450	500	550	600
	A Min.	216	267	318	369	420	470	521	572	623	674	725
	B Max.	318	420	521	623	725	826	928	1029	1131	1233	1334

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 9800 N load rated

Up to 50 mm/s 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
- 200 to 400 mm stroke lengths
- Up to 9800 N load capacities
- Speeds up to 50 mm/s 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

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

Load/Current/Speed/Duty Cycle

- Maximum Static Rating: 13500 N Static (in-line load)
- Refer to performance chart for load/current/speed capabilities
- Stroke Length Tolerance: +/- 1,5 mm
- 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: -35°C to +65°C
- 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)

B-Track - K2Js / K2xJs

Performance curves

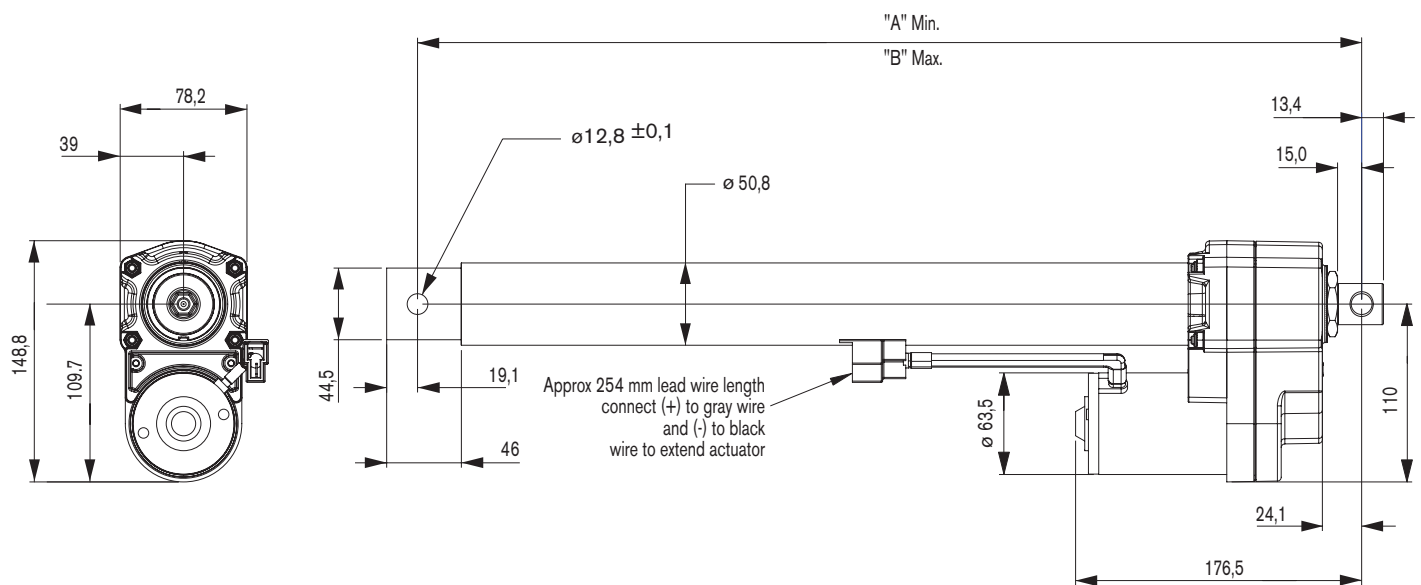
See page 25 for K2Js
and page 27 for K2xJs

Dimensions (mm)

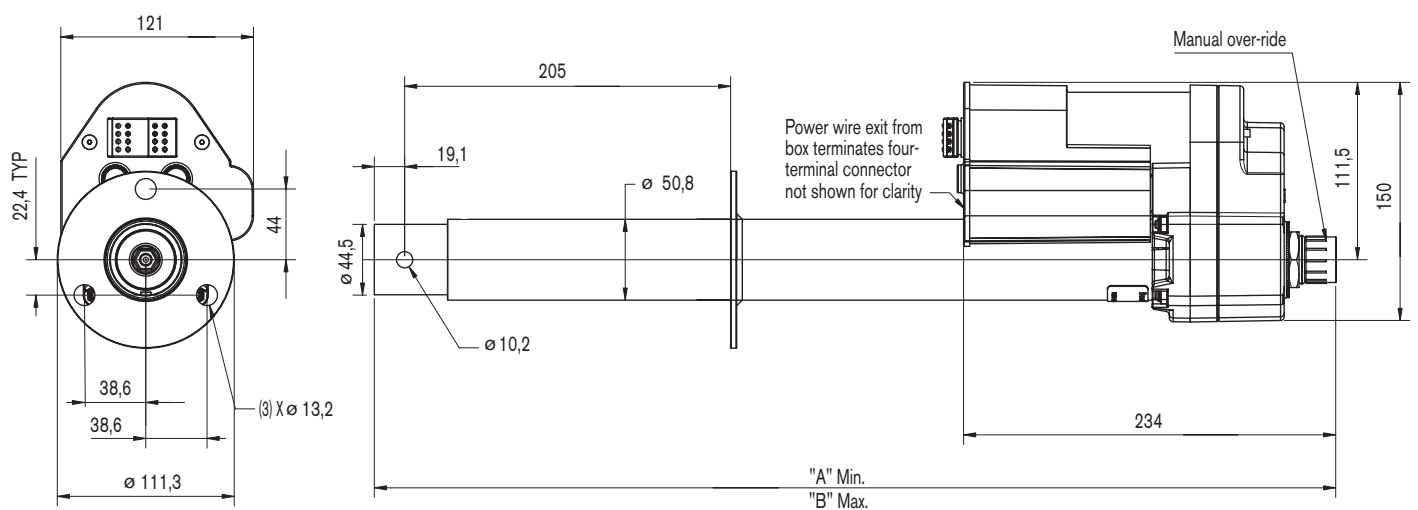
B-Track K2Js K2xJs	Stroke	200	250	300	350	400
	A Min.	533	583	634	685	736
	B Max.	736	838	939	1041	1142

Note: Special lengths available

B-Track K2Js



B-Track K2xJs



B-Track - K2RA

Rotary Actuator DC Motor

Up to 15,8 Nm load rated

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 ball screw 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: 13500 N Static (in-line load)
- Refer to performance chart for load/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/stroke profiles will allow some adjustment variation from these guidelines.)

Operating Environment

- Ambient temp range: -35°C to +65°C
- 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

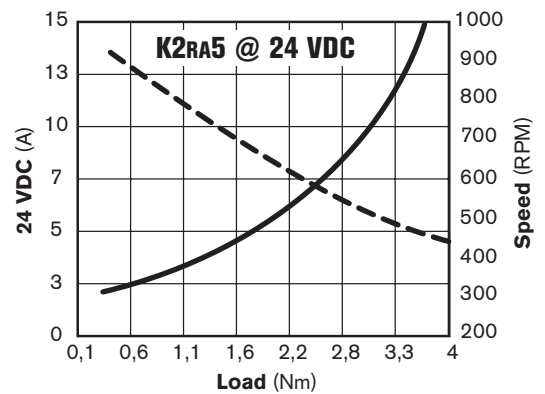
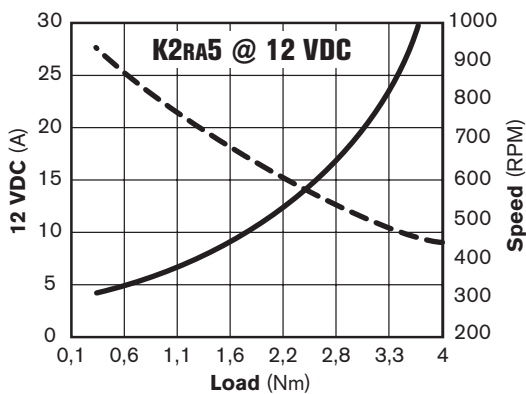
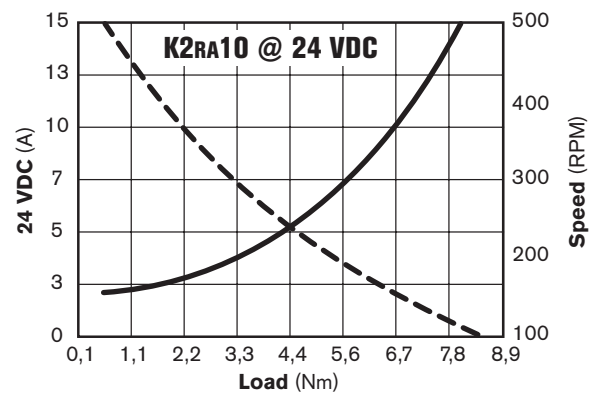
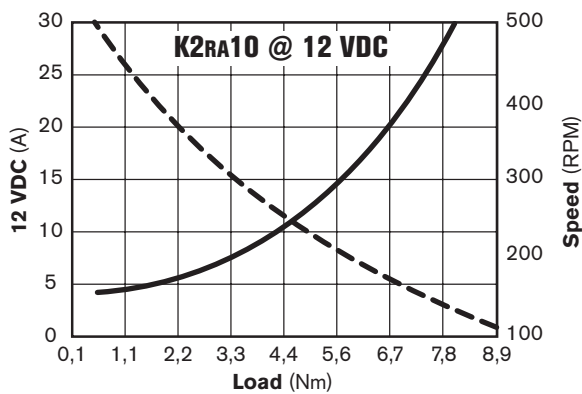
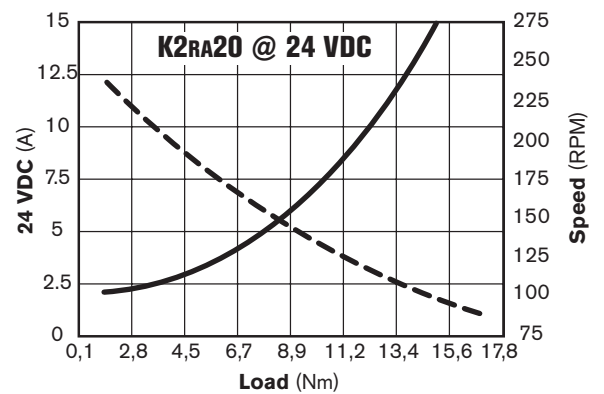
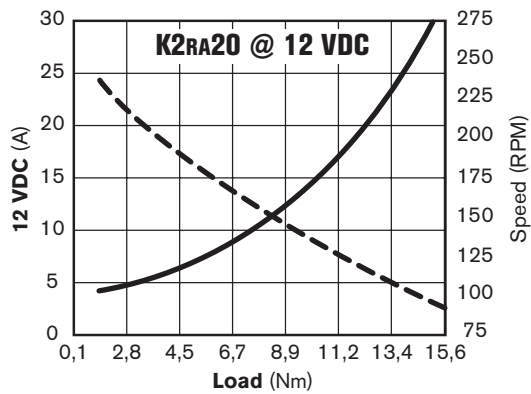
- 14 gauge stranded lead wires- SAE J1128 SXL cross linked polyethylene insulation class F 125°C
- Lead wires abrasion protected with braided covering
- Use momentary contact double pole/double throw switch in powering unit. (ON)-OFF-(ON) DPDT
- Connectors:
 - Packard 56 series or Delphi Weather-Pack
 - Packard 56 series with 56 series blades (#2984883 & #2962987)
 - Delphi Weather-Pack series (#121015792 & #12010973)

Performance curves

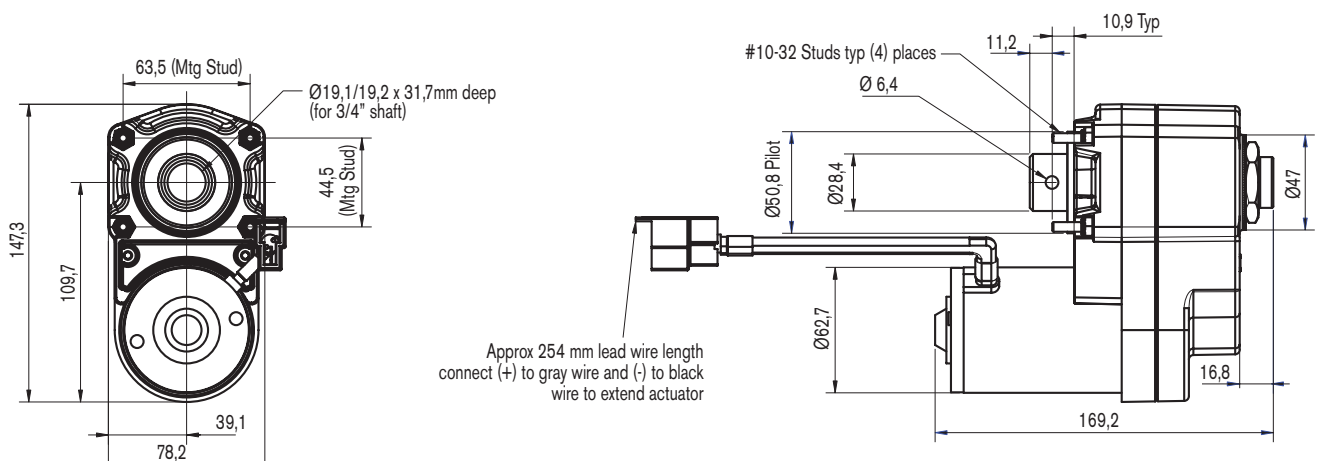
Speed & load

Current draw ————

Speed - - - - -



Dimensions (mm)



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 catalogue 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" (12,7 mm) Threaded rod end
2. 5/8" (15,9 mm) Threaded rod end
3. 1/2" (12,7 mm) Spherical rod end
4. 5/8" (15,9 mm) Spherical rod end
5. 1" (25,4 mm) Extended rod end
6. Flat sided rod end
7. Vibra mount rod end
8. 1/2" (12,7 mm) Threaded gear box end
9. 3/8" (9,4 mm) Rod end insert

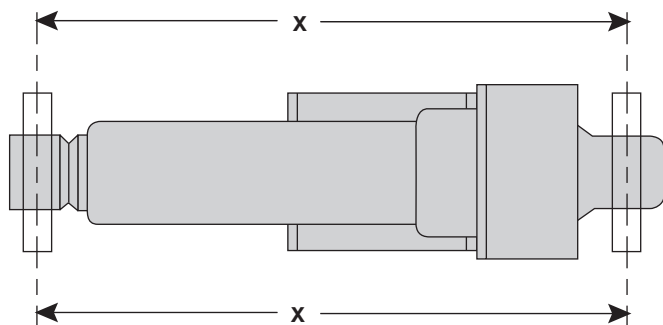


Consult with factory for specific mounting configuration needs.

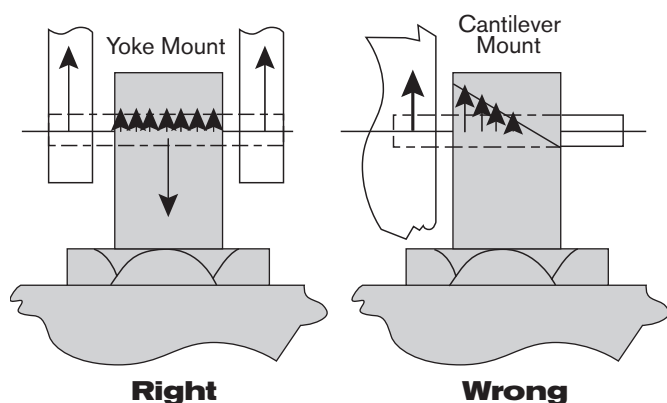
General Mounting Information

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).



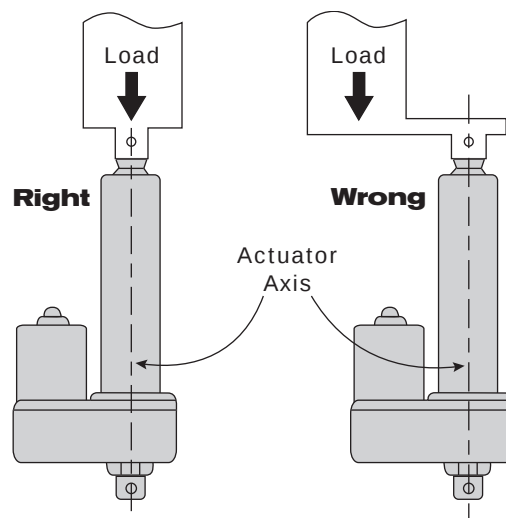
Mounting pins must be parallel to each other as shown above. Pins which are not parallel can cause excess vibration or actuator binding.



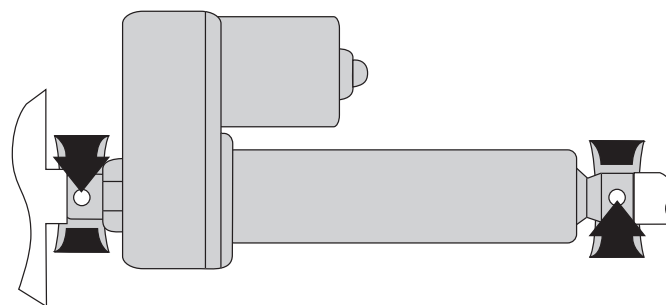
Ensure that mounting pins are supported at both ends. Cantilevered mounting is unacceptable. Failure to provide proper support will shorten unit life.

It is very important to use the right cable size in order to supply enough current to the actuator. Otherwise we may face a huge voltage drop which will affect the operation speed and the motor lifetime. Please find below a guide line for the cable size :

Wire section (mm ²)	Current (A)	Remark
1,5	16	
2,5	20*	*or 16 A for long lead length
4	25	
6	32	



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



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 2,24 Nm
All others Torque created 11,2 Nm

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 micro-processor 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

Performance Features

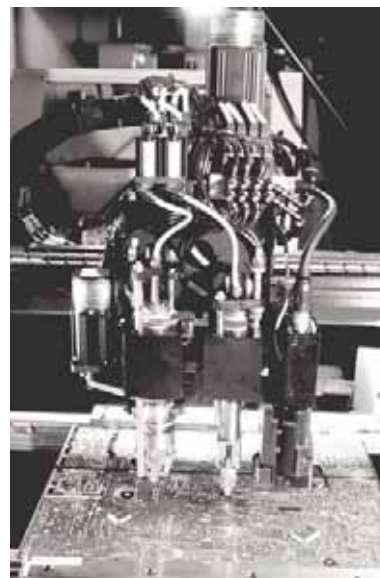
Dependable Operation

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.

B-Track BTc examples:



Switch Box Control



Basic Position Control



Advanced Electronic Control

How to select

Step 1 – Determine what type of control function is needed.

Step 2 – Compare control function needed with the different controls and control capabilities described on the following pages (pages 38-45).

Step 3 – If your choice is a simple switch box control, order the control as a separate part number, including connecting cables as needed.

Step 4 – If you are selecting an integrated control feature with a B-Track actuator, insert applicable BTc control function into the selected actuator model configuration scheme as shown below.

B-Track BTc Configurator

Actuator Type	Control Model	Gear ratio	Motor Voltage	Motor Type	Nut Type	Stroke Length	Base Fitting
K2	Px.x	G20	- 12V	M	- BR	- 03	- R120
	Control Model P1.x P2.x						

Note: See control pages for full listing of model numbers.

When ordering a BTc control with a B-Track actuator, insert BTc model prefix after the base actuator model number, such as K2 P1.1 or K2xP1.1.

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 to reverse power to the actuator using the DPDT momentary toggle switch on the cover
- Enclosed in a dust tight, black ABS plastic, 120 x 82 x 56 mm enclosure
- Supplied with 3,60 m, 2-wire, 2 mm² input power cable with alligator clip ends
- Supplied with 30 cm power output cable and 2-pin Weatherpack connector on the end to connect to actuator - extension cable offered in 1,5, 3, 6, or 7,5 m lengths. See extension cable part number section for ordering.



AC Switch Box SBC-AC

- Easy to use with 115 or 230 VAC input to reverse AC power to the actuator using the DPDT momentary toggle switch on the cover
- Terminal block provided inside light gray, 120 x 120 x 80 mm NEMA, polycarbonate enclosure
- Protected with externally mounted 5 Amp fuse on outside of enclosure for easy replacement
- Supplied with 1,80 m open ended, tinned AC input cable
- Supplied with sealed cable gland for customer output cable

DC Power Supply	Input Power	Connector Style
SBC	- DC	3
Connector Style: (One End Female Weatherpack) Other End is Male version of:		
1 = Mini Packard 56 (M-Track)		
2 = Packard 56		
3 = WeatherPack		
4 = Deutsch (DT06-2S)		

Mating Cable
10
Length of Mating Cable in Feet
(If blank, switch has no mating connector)

AC Power Supply	Input Power	Input Wire Style
SBC	- AC	A
Input Wire Style		
Blank = 150 mm Open (3) Strand Wire		
A = 150 mm Long 3 Prong Plug		

AC to DC Power Supply Products



M-Trak 12 VDC or 24 VDC Output

- Switching power supply with 85-264 VAC auto-ranging input. Supplied with 1,80 m open ended, tinned cable. 115 VAC, 3-prong plug can be provided also
- 12 VDC at 5,4 Amp or 24 VDC at 2,7 Amp versions available
- CE, TUV, UL/cUL, Conducted EMI meets EN55022 and ROHS
- Enclosed in a 120 x 120 x 80 mm, watertight NEMA 4, 4x, 12 & 13 polycarbonate, light gray housing
- External fuse mounted on enclosure for easy replacement
- Can be provided with DPDT momentary rocker switch to reverse power to the actuator
- 30 cm actuator power output cable with 2-pin Packard 76 connector. Extension cable offered in 1,5, 3, 6, or 7,5 m lengths. See extension cable part number section for ordering

AC Power Supply	Input Power	Output Power	Connector Style	Input Wire Style	Switch
SBC	- AC2	- 12 V	1	A	S
Input power					
AC = 115 VAC Input					
AC2 = 230 VAC Input					
Output power					
12 V = 12 VDC (M-Track Only)					
24 V = 24 VDC					
Connector Style (Female Gender)					
1 = Mini Packard 56 (M-Track)					
Input Wire Style					
Blank = 150 mm Open (3) Strand Wire					
A = 150 mm Long 3 Prong Plug (Plug only available on 115 VAC input)					
Switch					
S = Rocker Switch					
Blank = No Switch					

Extension Cable Part Number

AC Power Supply	Number of Conductors	Cable Type	Connector Style	Dual Output	Length in cm
SBC	- 2	PC	3	Y	- 50
Cable Type					
PC = Power Cable (Carol "J" Cord with Shrink Sleeves)					
SC = Signal Cable (with Shrink Sleeves Only)					
LP = Live Power (22 AWG, 4 conductor wire but only use red & black wires. Trim white & green wires flush with insulation)					
Connector Style: One End Male One End Female					
1 = Mini Packard 56 (M-Track)					
2 = Packard 56					
3 = WeatherPack					
4 = Deutsch					
Dual Output "Y" Cable					
(Used only on PC & LP options)					

Power Supplies and Configuration



B-Trak 24 VDC Output

- Linear supply with 115 or 230 VAC input options available. Supplied with 1,80 m open ended, tinned cable. 115 VAC, 3-prong plug can be provided also
- Outputs 24 VDC at 12 Amp on 30 cm power cable to actuator with 2-pin Packard or weatherpack connector to mate with actuator
- Enclosed in a 170 x 170 x 90 mm, watertight NEMA 4, 4x, 12 & 13 polycarbonate, light gray housing
- External fuse mounted on enclosure for easy replacement
- Can be provided with DPDT momentary rocker switch to reverse power to the actuator
- 30 cm actuator power output cable with 2-pin Packard 56 connector. Extension cable offered in 1,5, 3, 6, or 7,5 m lengths. See extension cable part number section for ordering
- When used with a BTc control Live Power output is needed to provide power to the control when switched power is off. This keeps outputs from the BTc control on all the time for diagnostics
- A 20 Amp output unit is offered to run two actuators. It is in a 240 x160 x 90 mm enclosure

AC Power Supply / 24 V Output

AC Power Supply	Input Power	Output Power	Connector Style	Input Wire Style	Amp Output	Live Power	Switch
SBC	- AC2	- 24 V	2	- A	H	L	S
Input power AC = 115 VAC Input AC2 = 230 VAC Input	Connector Style (Female Gender) 1 = Mini Packard (M-Track Only) 2 = Packard 56 (A & B-Track) 3 = WeatherPack (A & B-Track) 4 = Deutsch DT06-2S (A & B-Track)		Input Wire Style Blank = 150 mm Open (3) Strand Wire A = 150 mm Long 3 Prong Plug (Plug only available on 115 VAC unit)		AMP Output Blank = Standard 12 Amp Output H = High Current 20 Amp Output (Can run 2 actuators from same power supply, required for most twin track systems).	Switch S = Rocker Switch Blank = No Switch	
Output power 24 V = 24 VDC						Live Power (Required on P2, P3 P4 Control Systems) Blank = No Live Power	



B-Trak 90 VDC Output

- SCR 90 VDC drive with 115 or 230 VAC input options. Supplied with 1,80 m open ended, tinned cable. 115 VAC, 3-prong plug can be provided also
- 90 VDC at 5 Amp maximum power output provided on a 30 cm cable with 3-pin Deutsch connector. Extension cable is offered in 1,5, 3, 6, or 7,5 m lengths. See extension cable part number section for ordering
- Enclosed in a 120 x 120 x 80 mm, watertight NEMA 4, 4x, 12 & 13 polycarbonate, light gray housing
- External fuse mounted on enclosure for easy replacement
- Can be provided with DPDT momentary rocker switch to reverse power to the actuator
- Speed pot option available to vary voltage output to actuator which changes the speed

AC Power Supply / 90 V Output

AC Power Supply	Input Power	Output Power	Connector Style	Input Wire Style	Switch	Potentiometer
SBC	AC	90 V	4	A	S	P
Input power AC = 115 VAC Input	Output power 90 V = 90 VDC		Connector Style (Female Gender) 4 = Deutsch DT06-3S	Input Wire Style Blank = 150 mm Open (3) Strand Wire A = 150 mm Long 3 Prong Plug	Switch S = Rocker Switch Blank = No Switch	Potentiometer Potentiometer (used for speed control) Blank = No Pot

BTc Controls - P1-DC

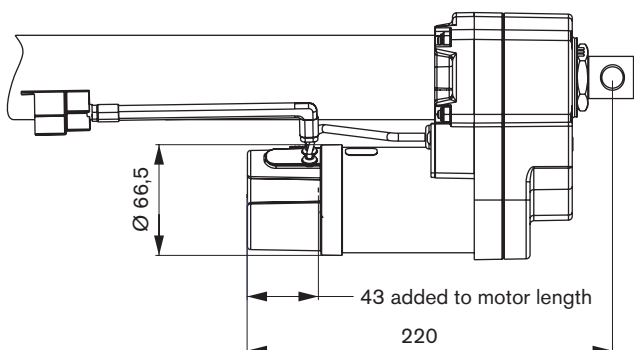
P1-DC Electronic Stroke Limit Control



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 A @ 12 VDC/12.5 A @ 24 VDC (at 25% duty cycle)
- Operating Temperature: -30°C to +60°C



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 in 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

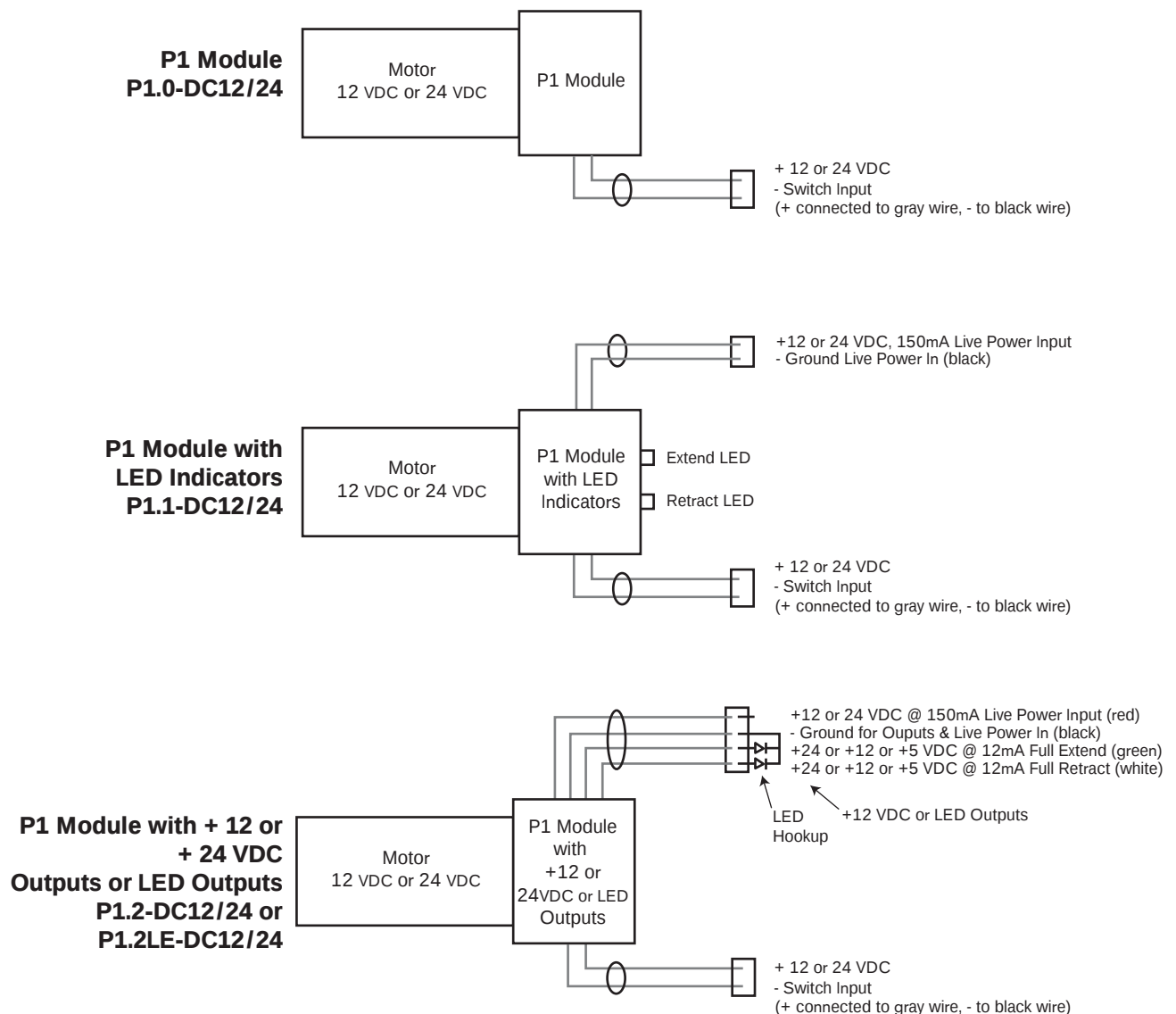
- **LED Indicators:** Two LED's on the outside of the control module to indicate when the end of stroke is reached. Included with the LED's is a live power input that can be used to keep the outputs on when switch power is off. 12/24 VDC, 150 mA is needed.
- **+12 VDC Outputs:** Two +12 VDC, 12 mA outputs 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. 12/24 VDC, 150 mA is needed.
- **LED Outputs:** Two +5 V, 25 mA 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 12/24 VDC, 150 mA supply is needed.

P1 Electronic Stroke Limit Control

Model Selection

Model No.	Input Voltage (VDC)	Maximum Output Current (A)	Features
P1.0 (DC12)	12	25	Base = Electronic Stroke Limit with Electronic Dynamic Braking
P1.0 (DC24)	24	12.5	Base = Electronic Stroke Limit with Electronic Dynamic Braking
P1.1 (DC12)	12	25	Base & LED Indicators on housing
P1.1 (DC24)	24	12.5	Base & LED Indicators on housing
P1.2 (DC12)	12	25	Base & +12 VDC Outputs
P1.2 (DC24)	24	12.5	Base & +24 VDC Outputs
P1.2LE (DC12)	12	25	Base & LED Outputs +5 VDC
P1.2LE (DC24)	24	12.5	Base & LED Outputs +5 VDC

Wiring Diagrams



BTc Controls PQS-DC

PQS-DC Quick Stop Control



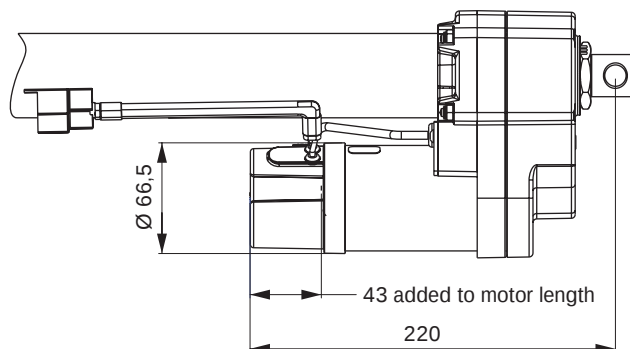
The **PQS-DC** is a bi-directional current limit control which monitors current during actuator motion and quickly stops the actuator if an object gets in the way causing an over limit current draw. Input power polarity must be reversed for the actuator to move again. The precise current limit can be set via potentiometers accessible from the side of the control housing. The current limit can be adjusted for each direction independently for those applications that need a lighter setting in one direction only.

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.
- **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.

Specifications

- Supply Power: 12 or 24 VDC
Maximum Current: 25 A @ 12 VDC or 12 A @ 24 VDC (at 25% duty cycle)
- Operating Temperature: -30°C to +60°C

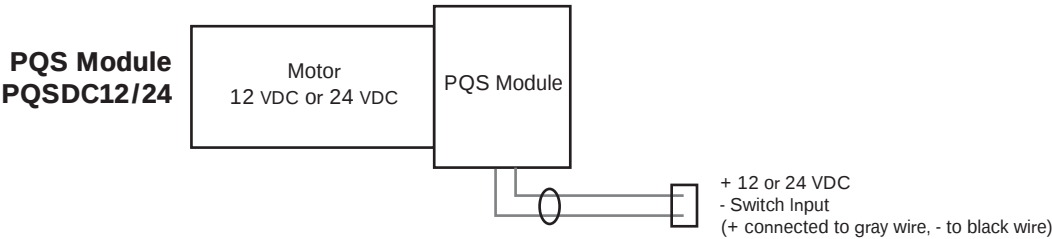


PQS-DC Quick Stop Control

Model Selection

Model No.	Input Voltage (VDC)	Maximum Output Current (A)	Features
PQS	12	25	Base = Electronic Stroke Limit with Mid-stroke Current Limit and Electronic Dynamic Braking
PQS	24	12.5	

Wiring Diagrams



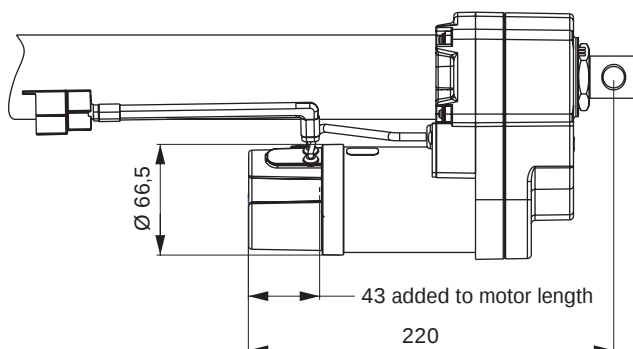
P2-DC Position Feedback Control



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 versions available
Maximum Current: 25 A @ 12 VDC/12 Amps @ 24 VDC (at 25% duty cycle)
- Operating Temperature: -30°C to +60°C



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 3 mm 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 V output does not change. This feature is useful on initial startup and after service to home the actuator.
- **Analog Output:** 0-10 V signal throughout the stroke length of the actuator while power is provided to the motor. The output is 0 V at full retract position and 10 V at full extend position. The output is 16 bit with a resolution of 15 mV. 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 12/24 VDC, 150 mA supply is needed.
- **Bi-Directional Current Limit:** Set to turn off power to the actuator when a current level is reached.

Options

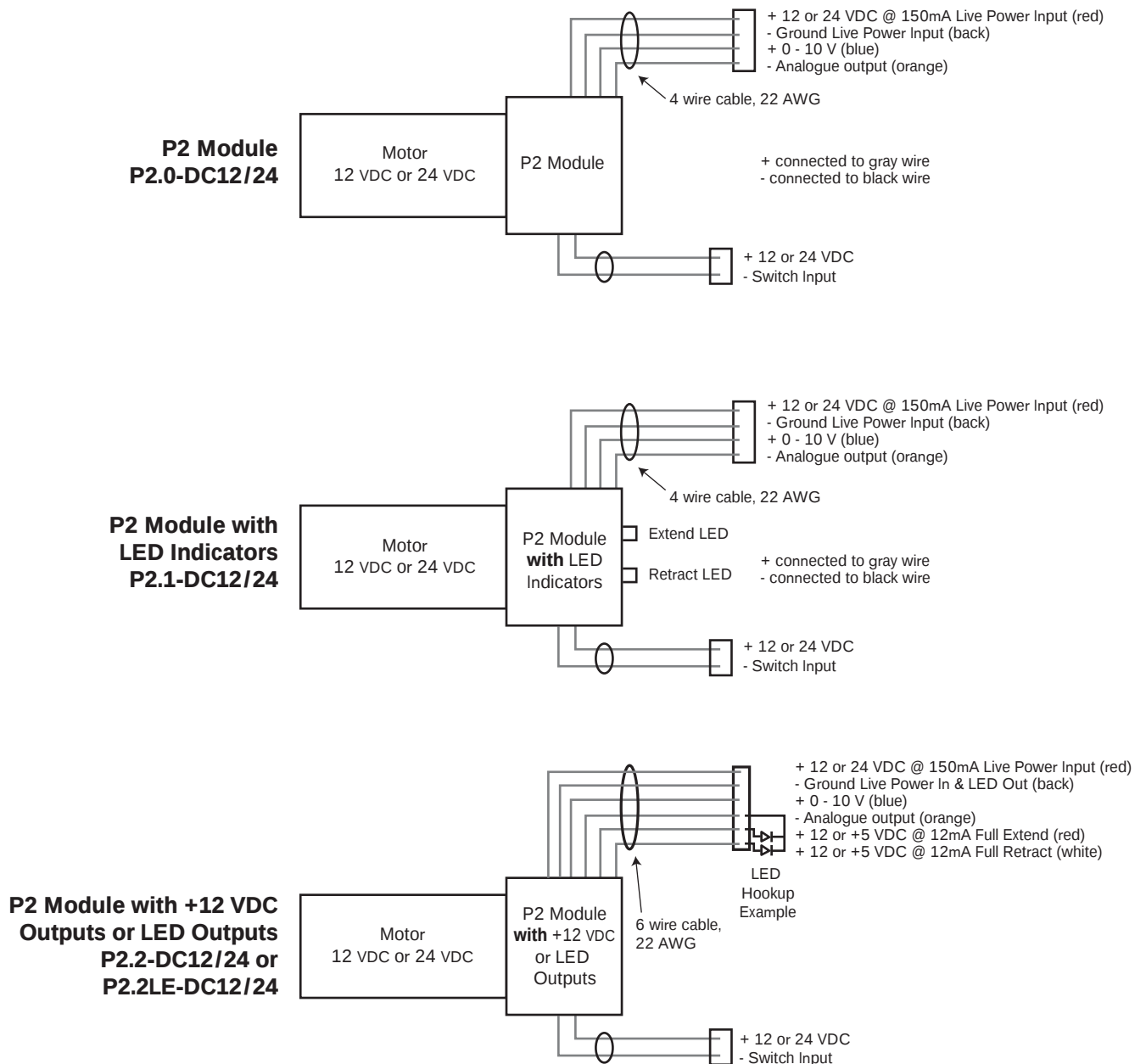
- **LED Indicators:** Two LED's on the outside of the control module to indicate when the end of stroke is reached. The LED's will remain lit until the actuator is moved from the end of stroke position
- **+12 VDC Outputs:** Two +12 VDC, 12 mA outputs plus a ground to indicate when the end of stroke 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 V, 25 mA 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 (A)	Features
P2.0	(DC12)	12	25	Base = Electronic Stroke Limit with 0 to 10 V Analog Output and EDB
P2.0	(DC24)	24	12.5	Base = Electronic Stroke Limit with 0 to 10 V Analog Output and EDB
P2.1	(DC12)	12	25	Base & LED Indicators on housing
P2.1	(DC24)	24	12.5	Base & LED Indicators on housing
P2.2	(DC12)	12	25	Base & +12 VDC Outputs
P2.2	(DC24)	24	12.5	Base & +12 VDC Outputs
P2.2LE	(DC12)	12	25	Base & LED Outputs +5 VDC
P2.2LE	(DC24)	24	12.5	Base & LED Outputs +5 VDC

Wiring Diagrams



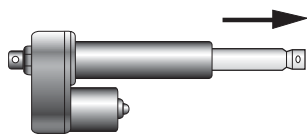


Figure 1 Axial load

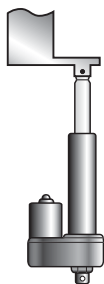


Figure 2 Cantilevered mount

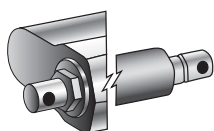


Figure 3 Clevis mount



Figure 4 Compression load

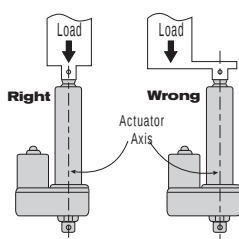


Figure 5 Eccentric load

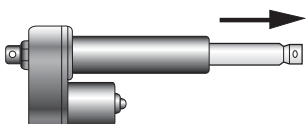


Figure 6 Extended length

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).

Efficiency

Ratio of input power to output power.

End play

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

ESL

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

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).

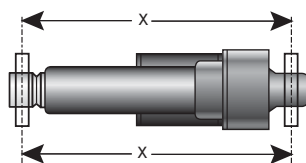


Figure 7 Pin mount

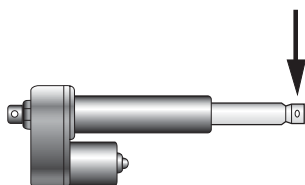


Figure 8 Radial load also side bearing

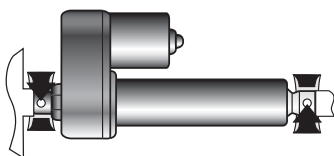


Figure 9 Restraining torque

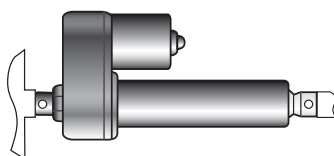


Figure 10 Retracted length

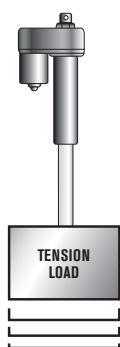


Figure 11 Tension load

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 ± 5 mm 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

ALTRA INDUSTRIAL MOTION

Altra Industrial Motion

Altra Industrial Motion, Inc.
14 Hayward Street
Quincy, MA 02171, U.S.A.
Tel. +01 (617) 328 3300, Fax +01 (617) 689 6202

EUROPE

FRANCE
WARNER ELECTRIC EUROPE
Siège social et usine
7, rue Champfleury, BP 20095
F-49182 St Barthélemy d'Anjou Cedex
Tél. +33 (0)2 41 21 24 24, Fax +33 (0)2 41 21 24 00
e-mail: sales.dept@warnerelectric-eu.com

ASIA

HONG KONG + P.R. CHINA
WARNER - SHUI HING Ltd
Unit 4A, 3rd Floor
Join-In Hang Sing Centre
71-75 Container Port Road
Kwai Chung, Hong Kong
Tel. +852 2615 9313, Fax +852 2615 9162

INDIA
M/s. FRANCIS KLEIN & Co. Pvt. Ltd.
70/1, Mission Road
IND - Bangalore 560 027
Tel. +91 802 272781, Fax +91 802 276324

KOREA + SINGAPORE
WARNER ELECTRIC SINGAPORE
30 Pioneer Road
Singapore 628502
Tel. +65 487 4464, Fax +65 487 6674

TAIWAN
WARNER ELECTRIC Ltd
3rd Fl., No. 35, Lane 32
Kwang-Fu South Road
105 Taipei, TAIWAN R.O.
Tel. +886 2 2577 8156, Fax +886 2 2570 6358

THAILAND
WARNER ELECTRIC Co. Ltd
199/19 Soi Anamai
Srinakharin Rd. Prawes
Bangkok 10250, Thailand
Tel. +66 2 322 0481, Fax +66 2 320 2380

AMERICA

U.S.A.
WARNER ELECTRIC, Gardner Street 449
South Beloit, Illinois 61080 U.S.A.
Tel. +01 (815) 389 3771
Fax +01 (815) 389 2582

OCEANIA

AUSTRALIA
WARNER ELECTRIC AUSTRALIA
Unit 1/11, Packard Avenue
Castle Hill, N.S.W. 2154
Tel. +612 9894 0133, Fax +612 9894 0368

DISTRIBUTION

Most products are available through authorised local distributors, please contact your nearest WARNER office for information. Distributors are located in the following countries:

Argentina	Greece	Portugal
Austria	Holland	Scotland
Belgium	India	Slovakia
Brazil	Ireland	Slovenia
Croatia	Israel	South Africa
Bosnia	Italy	Spain
Czech Rep.	Lithuania	Sweden
Egypt	New Zealand	Switzerland
Finland	Norway	Turkey
France	Poland	U.S.A.

www.warnerelectric-eu.com



LA576r-gb-0308 - © 2008
Printed in France