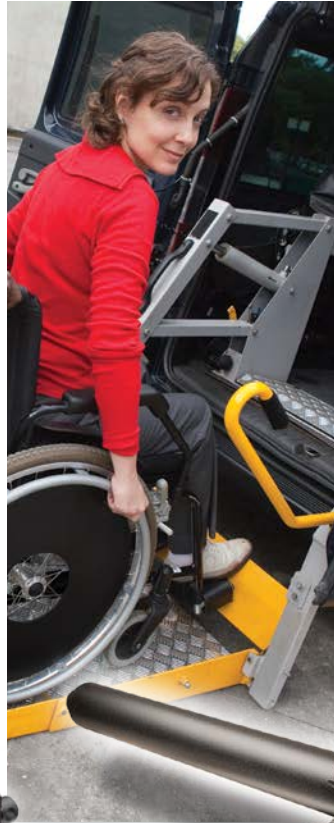


Electric Actuators and Actuator Controls

Measurements in Imperial and Metric Units



An Altra Industrial Motion Company



Warner Linear is dedicated to designing and manufacturing the broadest selection of rugged service electromechanical actuators that serve the...

**Food & Beverage
Mobile Off-Highway
Medical
Packaging
Turf & Garden
Material Handling &
Marine Industries
worldwide**



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. Our electric actuators are engineered and produced using quality components from ISO registered key suppliers.

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.



Our manufacturing facilities are located in Belvidere, IL (USA) and Angers, France.

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 Altra’s operational excellence initiative, a comprehensive business management approach designed to drive world-class performance.

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.

Design and Testing

Our application 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 (for application and technical service call 1-800-825-9050).

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

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.

Please contact our knowledgeable staff with all of your Linear Product needs.



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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.



Scan to watch!

Linear Actuator Basic Selection Video

<https://p.widencdn.net/ydtpk6>

QUICK SELECTION GUIDE		
Light Duty	General Duty	
		
M-Track 1 Compact, completely self-contained and sealed to allow for use in small spaces without sacrificing power or capability.	S-Track & Programmable S-Track Intended for general duty applications with need for controllability and quieter operation.	I-Track Unique inline actuator with power-off release feature and designed to fit in limited space applications for loads up to 200 lbs. (890 N).
IP69K Static IP65 Dynamic	IP69K Static IP65 Dynamic	IP69K Static IP66 Dynamic
Drive Type: Acme Screw	Drive Type: Acme Screw	Drive Type: Ball Screw
Load Capacity & Speed lbs. @ in./sec. (N@mm/sec) 25 @ 1.75 (111@45) 50 @ 0.80 (222@20) 100 @ 0.45 (445@11) 165 @ 0.25 (734@6)	Load Capacity & Speed lbs. @ in./sec. (N@mm/sec) 125 @ 1.0 (556 @ 25) 175 @ 0.75 (778 @ 18) 200 @ 0.50 (890 @ 12) 225 @ 0.62 (1001 @ 15) 300 @ 0.33 (1334 @ 8) 400 @ 0.25 (1779 @ 6)	Load Capacity & Speed lbs. @ in./sec. (N@mm/sec) 200 @ 1.1 (890 @ 26)
Stand. Stroke Length in. (mm) 2, 4, 6, 8, 10, 12 (50, 100, 150, 200, 254, 300)	Stand. Stroke Length in. (mm) 2 to 12 in 2" increments (50 to 300 in 50 mm increments)	Stand. Stroke Length in. (mm) 2 to 12 in 2" increments (50 to 300 in 50 mm increments)
Input Voltage (vdc): 12, 24	Input Voltage (vdc): 12, 24	Input Voltage (vdc): 12, 24
Typical Applications: • Throttle Control • Air Vent Opening • Remote Window Operation • Remote Mirror Positioning • Gate Opening • Shutter Control	Typical Applications: • Indoor Office Equipment • Medical • Deck Lifts • Gate Openers	Typical Applications: • Throttle controls • Hydraulic flow controls • Bus Door Operator • Hatch lift applications • Handicap Van Lifts • Engine Controls • Emergency Door (lock and unlock via VDC)
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Contents Quick Selection Guide

Actuator Controls



Simple extend/retract switch boxes

- SBC-DC
- SBC-AC

Pg. 56-70








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)

- Signal Follower Function
- Programming pendant
- Adjustable position and current limit options
- Remote mounting capable

General Duty	Rugged Duty			
				
B-Track K2vl Intended for severe service requirements and loads up to 600 lbs. (2669 N) Lowest priced model in the B-Track family.	B-Track K2 Uses a patented straight line load transfer offering high load capability in a small package size. Bronze or Delrin® nut options high impact load applications up to 1,500 lbs. (6672 N).	B-Track K2x Completely sealed, designed for tough, high load applications. Able to perform in harsh environments providing years of trouble-free service.	B-Track K2ac Uses a patented straight line load transfer offering high load capability in a small package size. Bronze or Delrin® nut options for high impact load applications up to 1,100 lbs. (4893 N).	B-Track K2xac Completely sealed, designed for tough, high load applications. Able to perform in harsh environments providing years of trouble-free service.
IP69K Static IP66 Dynamic	IP69K Static IP65 Dynamic	IP69K Static IP65 Dynamic	IP54	IP54
Drive Type: Hybrid Acme	Drive Type: Hybrid Acme	Drive Type: Ball Screw & Ball Nut	Drive Type: Hybrid Acme	Drive Type: Ball Screw & Ball Nut
Load Capacity & Speed lbs. @ in./sec. (N@mm/sec) 200 @ 2.0 (890 @ 50) 300 @ 1.0 (1334 @ 25) 600 @ 0.5 (2669 @ 12)	Load Capacity & Speed lbs. @ in./sec. (N@mm/sec) 300 @ 2.0 (1334 @ 50) 600 @ 1.0 (2669 @ 25) 1200 @ 0.5 (5338 @ 12) 1500 @ 0.35 (6672 @ 9)	Load Capacity & Speed lbs. @ in./sec. (N@mm/sec) 600 @ 2.0 (2669 @ 50) 1200 @ 1.0 (5338 @ 25) 2200 @ 0.5 (9786 @ 12) 2800 @ 0.25 (12455 @ 6)	Load Capacity & Speed lbs. @ in./sec. (N@mm/sec) 500 @ 1.0 (2224 @ 25) 750 @ 0.50 (3336 @ 12) 1100 @ 0.33 (4893 @ 0.4)	Load Capacity & Speed lbs. @ in./sec. (N@mm/sec) 500 @ 2.0 (2224 @ 50) 1000 @ 1.0 (4448 @ 25) 1500 @ 0.5 (6672 @ 12) 2000 @ 0.33 (8900 @ 8)
Stand. Stroke Length in. (mm) 2 to 12 in 2" increments (50 to 300 in 50 mm increments)	Stand. Stroke Length in. (mm) 2 to 24 in 2" increments (50 to 600 in 50 mm increments)	Stand. Stroke Length in. (mm) 2 to 24 in 2" increments (50 to 600 in 50 mm increments)	Stand. Stroke Length in. (mm) 4 to 24 in 2" increments (100 to 600 in 50 mm increments)	Stand. Stroke Length in. (mm) 4 to 24 in 2" increments (100 to 600 in 50 mm increments)
Input Voltage (vdc): 12, 24	Input Voltage (vdc): 12, 24, 36, 48, 90	Input Voltage (vdc): 12, 24, 36, 48, 90	Input Voltage (vac): 115, 230	Input Voltage (vac): 115, 230
Typical Applications: <ul style="list-style-type: none"> • Fertilizer Gate Control • Mower Decks • Gate Openers • Scooter & Cycle Lifts • Pull Behind Implement Lifts 	Typical Applications: <ul style="list-style-type: none"> • Residential Mower Decks • Gate & Valve Operation • Snow Blowers • Spouts & Chutes • Engine Lifts • Tables • Wagon Lifts • Combine Concaves 	Typical Applications: <ul style="list-style-type: none"> • Paving Outriggers • Commercial Mower Decks • Spray Booms • ATV Dump Box Lifts • Boat Engine Lifts • Hydraulic Cylinder Replacement • Construction Equipment 	Typical Applications: <ul style="list-style-type: none"> • Engine Lifts • Tables • Indoor Applications • Machine Tools • Egg Rotation 	Typical Applications: <ul style="list-style-type: none"> • Indoor Applications • Machine Tools • HVAC • Hood Lifts • Tables
Pg 24-27	Pg 28-31	Pg 36-39	Pg 32-35	Pg 40-43

Applications and Performance Features



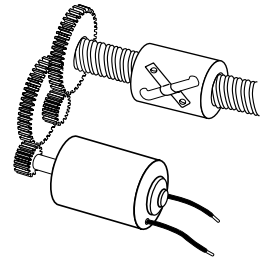
Warner Linear Actuators are available for a wide variety of applications.

- 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

Dependable Operation

Compact design

A Warner Linear actuator with a two inch stroke can provide up to 2800 pounds (12455 N) of force capacity in a compact package.

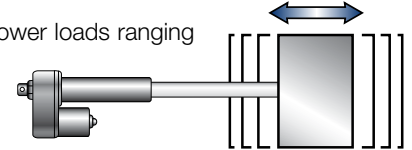


Maintenance-free

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 one pound to over 2800 pounds (12455 N) up to 24 inches (600 millimeters) with equal capacity in both directions of travel.



Efficient operation

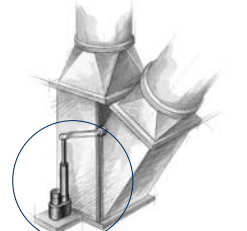
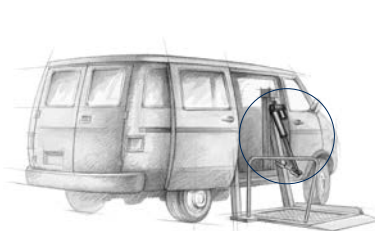
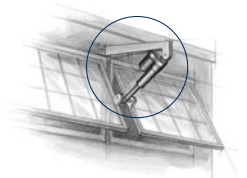
Warner Linear actuators consist of an electric motor combined with a high efficiency gear train and lead screw. This direct conversion of electrical to mechanical energy results in effective, economic linear movement. Units are completely self-contained and require minimal installation hardware or wiring.

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



Warner Linear Actuators are built for performance.

Rugged and reliable

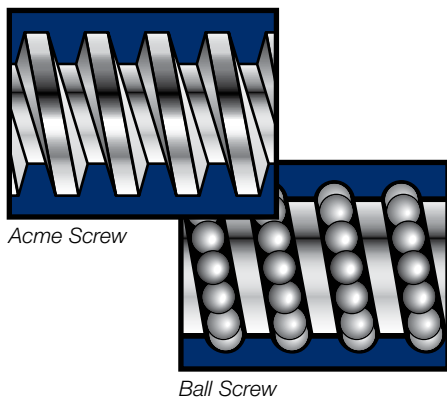
Warner Linear actuators incorporate high strength, high quality components and are designed to assure trouble-free service. Rugged spur gearing, industrial quality synthetic lubricants and high performance motors combine to provide maximum capability and value for the end user. Units are gasketed and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

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

Fuse Recommendation for All Systems:

The fuse should be sized to 135% of full-load steady-state current.

Component Protection and DC Motors:

DC motors can produce large voltage and current spikes when powered on or off. Back-to-back Zener diodes across the motor are recommended to help suppress the large spike from affecting other sensitive components in the system. Use a 20V-30V back-to-back Zener for a 12VDC motor and a 30V-40V back-to-back Zener for a 24VDC motor. Consult the factory for further recommendations.

Versatile

With their compact size, Warner Linear actuators can be located in confined areas, and move loads from 0 to 2800 pounds (12455 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 0.3 to over 2 inches (7 to 50 millimeters) 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
- End of stroke limit switches – fixed or adjustable
- Position feedback outputs (0-10vdc scaled) – potentiometer and digital

Also available

- Basic switch box controls
- Integrated electronic position controls



M-Track Features

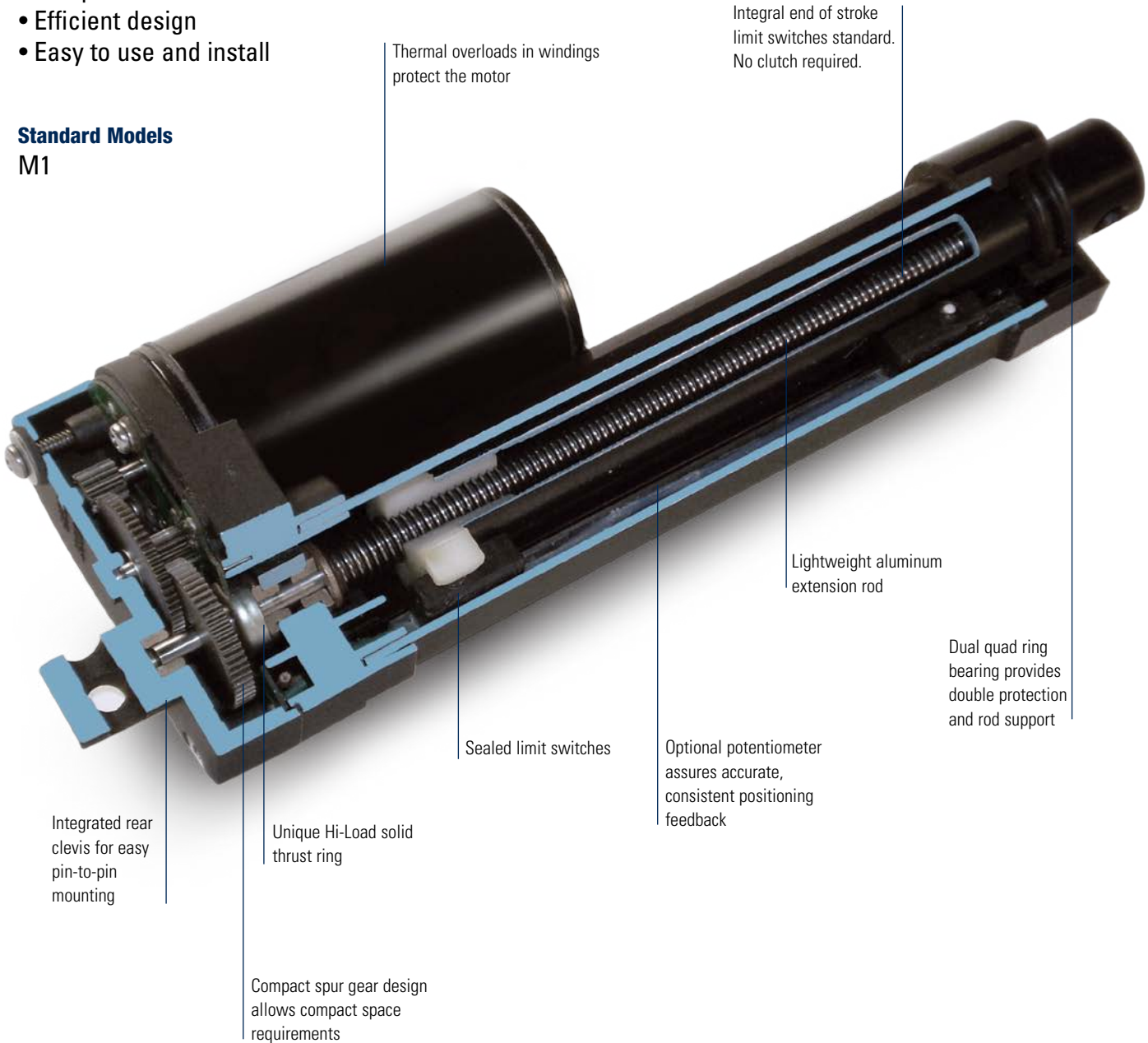
Light Duty Actuators

Key Features

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

Standard Models

M1



IP69K and Temporary Immersion

Neoprene Sealing Boot available upon request. Please see pages 9 & 10 for dimensional information. Consult factory for ordering details.

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 $\frac{\text{on-time}}{\text{on-time} + \text{off-time}}$

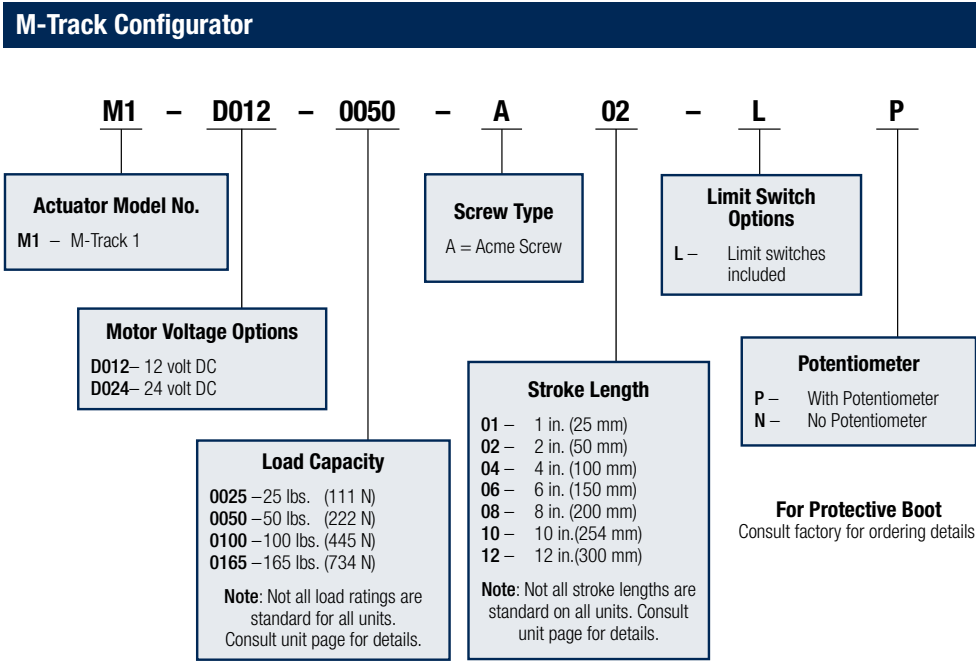
A unit that runs for 15 seconds should be off for 45 seconds.

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 General Mounting Information on page 71)

Step 5 – Unit Options

M-Track units include end-of-travel limit switches as a standard feature. For positional feedback, a 12K linear membrane potentiometer can be factory installed. The changing potentiometer value provides unit movement feedback for units that are not visible to the machine operator.



Scan to watch!
Linear Actuator Basic Selection Video
<https://p.widencdn.net/ydtpk6>

M-Track 1

DC Motor Acme Screw



Up to 165 lb. (734 N) Rated Load
Up to 1.75 in. (45 mm)/sec. Travel Speed

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 (734 N) of force at a minimum extension rate of 0.25 inches (6.35 millimeters) per second.
- **The anodized aluminum alloy** housing resists corrosion and provides protection from dirt, dust and humidity.
- **Temperature operating range** of -20° F to +150° F (-26° to +65° C). -40° F to +185° F (-40° to +80° C) available.
- **Standard stroke lengths** of 1, 2, 4, 6, 8, 10, 12 inches (50, 100, 150, 200, 254, 300 millimeters) are available.
- **Internal limit switches** automatically shut off the unit at end of stroke.
- **Optional potentiometer** can provide positional location feedback.
- **IP69K Static, IP65 Dynamic**
- **Temporary Immersion** with protective boot (see page 10).
- **Rod is non rotating** during operation, can be rotated for mounting purposes.

Typical Applications

Light load and short distance applications such as:

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

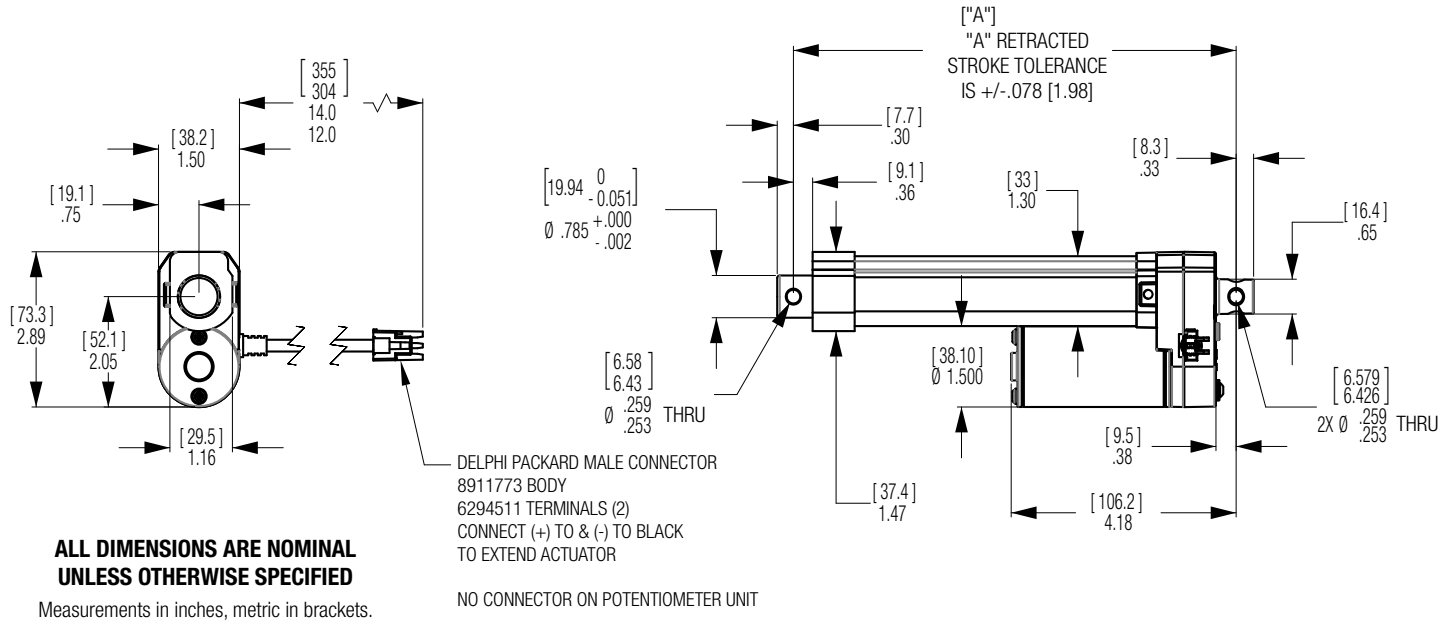
Specifications

Load Capacity	25 lbs. (111 N)	50 lbs. (222 N)	100 lbs. (445 N)	165 lbs. (734 N)
Speed at Full Load	1.75 in. (45 mm)/sec	0.80 in. (20 mm)/sec	0.45 in. (11 mm)/sec	0.25 in. (6 mm)/sec
Input Voltage	12 or 24 volt DC for all models			
Static Load Capacity	300 lbs. (135 N) for all models			
Stroke Length	1, 2, 4, 6, 8, 10 and 12 in. (50, 100, 150, 200, 254, 300 mm) for all models			
Clevis Ends	.25 in. (6.4 mm) diameter			
Duty Cycle	25% for all models			
Operation Temperature Range	-20° F to +150° F (-26° to + 65° C) for all models, -40° F to +185° F (-40° C to +80° C) available			
Environment	IP65 Dynamic, IP69K and Temporary Immersion with Protective Boot			
Limit Switch	Fixed end of stroke limit switches standard for all units			
Potentiometer	Linear membrane potentiometer optional on all units			

Dimensions

M-Track	Stroke	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
	A (w/o POT)	2	50	4	100	6	150	8	200	10	254	12	300
A (POT)	6.22	158.0	8.23	209.0	10.24	260.1	12.24	310.9	14.25	362.0	16.26	413.0	
A (POT)	7.55	191.8	9.57	243.1	11.57	293.9	13.58	344.9	15.58	395.7	17.58	446.5	

Note: Special lengths available; metric stroke length for reference only



- Stroke and its tolerance are based on a unit with no attached load operating at rated voltage +/- .5VDC, 70° F controlled temperature environment. Note normal wear, temperature changes and load variations all affect the stroke tolerance. If stroke tolerance is critical it is advisable that the selected unit be evaluated for performance in the specific application.
- The retract pin to pin dimension and its tolerance are based on a unit with no attached load operating at rated voltage +/- .5VDC, 70° F controlled temperature environment. Note normal unit wear, temperature changes and load variations all affect the stroke tolerance. If the retract pin to pin dimension is critical it is advisable that the selected unit be evaluated for performance in the specific application.
- Rotation of the extension tube is allowed up to one full turn to aid mounting. Rotate rod clockwise until it is fully seated in the unit. Rotate counterclockwise no more than one full turn to align clevis pins.

- Mounting points in the application must allow the actuator to reach full-extend and full-retract to ensure the internal limit switches are activated. If this is not possible another method for shutting off the actuator must be employed.
- If the actuator encounters an obstruction at mid-stroke and is not allowed to reach the internal limit switches the actuator will stall. An internal thermal circuit breaker is designed to protect the motor from damage during stalling and/or overheating due to exceeding duty cycle. If tripped it will self reset after a short period of time. The thermal is rated to protect the motor in the event of a stall condition. It is not designed to protect any other device in the circuit.
- Warner Linear recommends an externally mounted fuse of 6 AMPs max for 12VDC and 3 AMPs max for 24VDC circuit protection. Anything connected to the actuator must be sized to withstand the actuator's power consumption or independently isolated from the circuit.

M-Track 1 with Protective Boot

For Rubber Bellow Application



Features

- All features as M-Track
- Protective Boot for temporary immersion

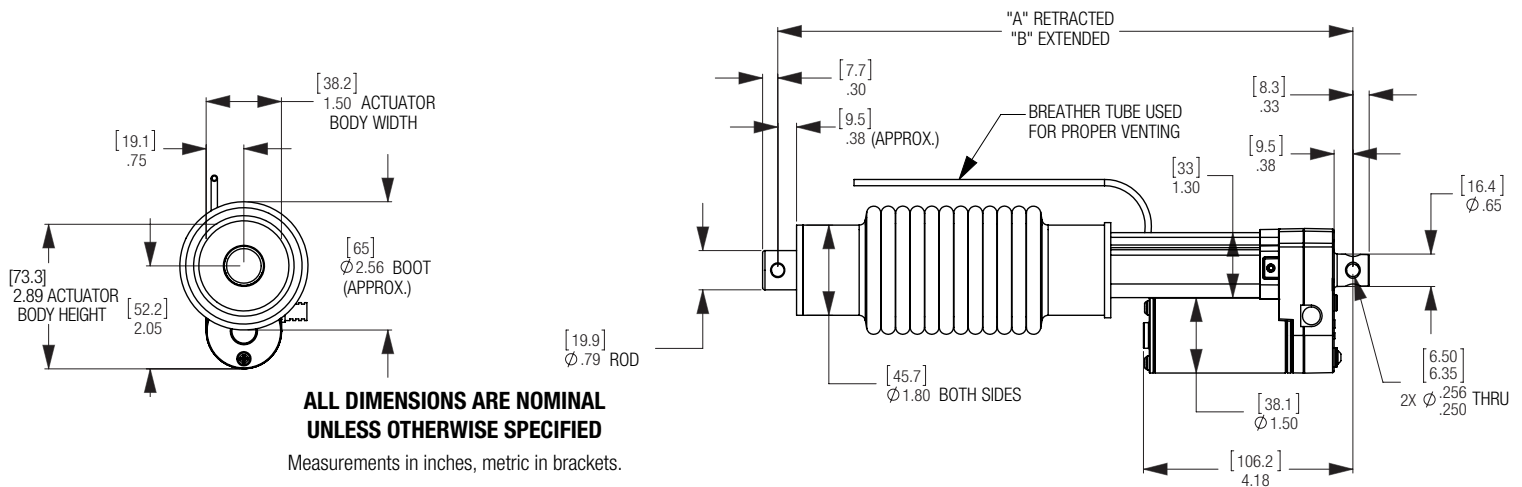
Typical Applications

Light load and short distance applications such as:

- UTV differential locks
- Transmission Shifting

Dimensions		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
M-Track with Boot LN/LP	Stroke	2	50	4	100	6	150	8	200	10	254	12	300
	A	9.48	241	9.48	241	11.48	292	13.48	342	15.48	393	17.48	444
	B	11.48	292	13.48	342	17.48	444	21.48	546	25.48	647	29.48	749

Note: Special lengths available



NOTE: 2" Stroke Length unavailable with a Rubber Boot.
Alternate method is to use 4" Stroke with 2" Limits

Performance Graphs Imperial Measurements*

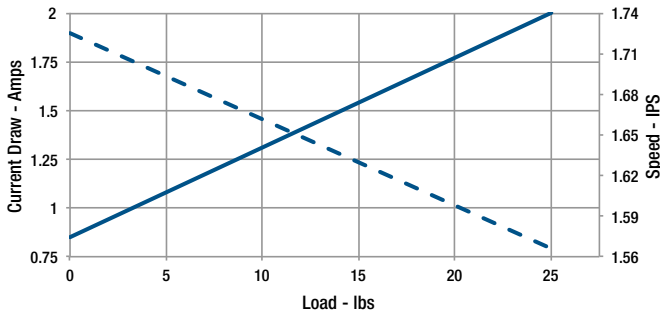
*Performance Chart Measurements are Nominal



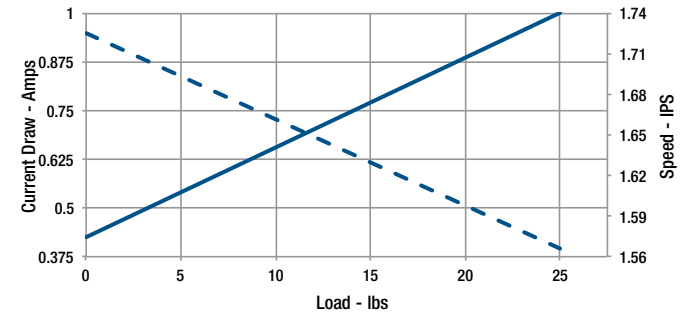
Load Capacity 25 lbs.

For Metric Measurements, see page 12.

M1-D012-0025



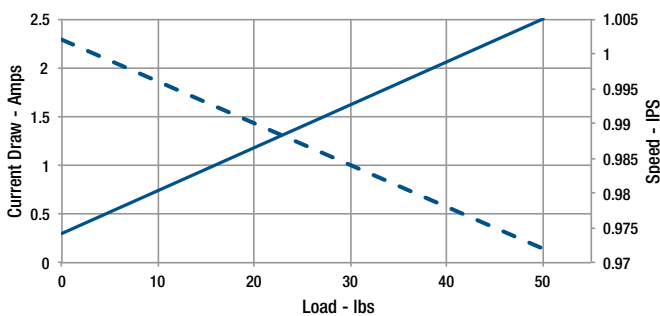
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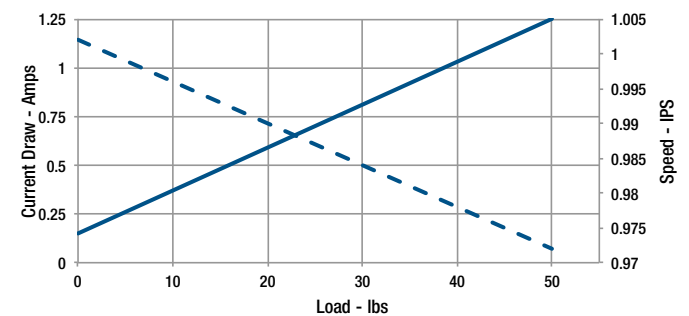
Load Capacity 50 lbs.

For Metric Measurements, see page 12.

M1-D012-0050



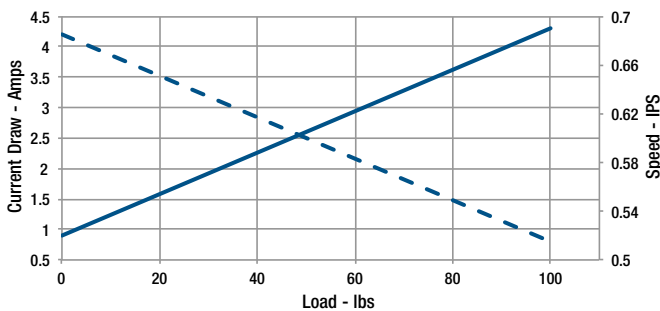
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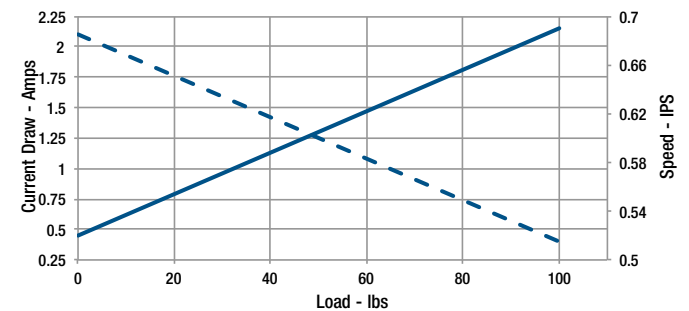
Load Capacity 100 lbs.

For Metric Measurements, see page 12.

M1-D012-0100



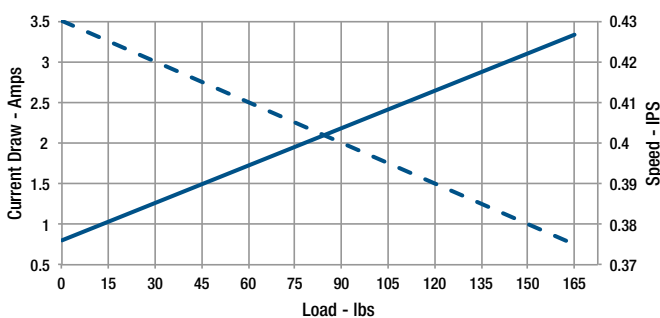
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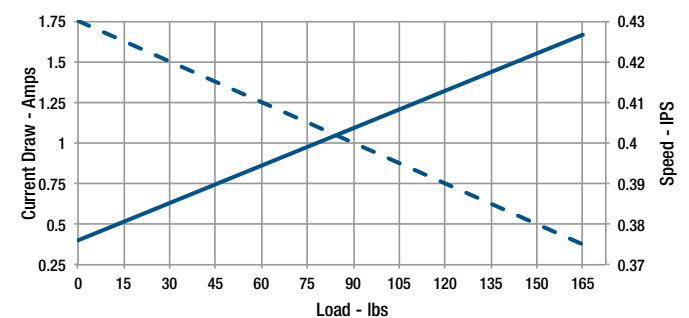
Load Capacity 165 lbs.

For Metric Measurements, see page 12.

M1-D012-0165



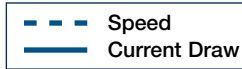
M1-D024-0165



M-Track 1

Performance Graphs Metric Measurements*

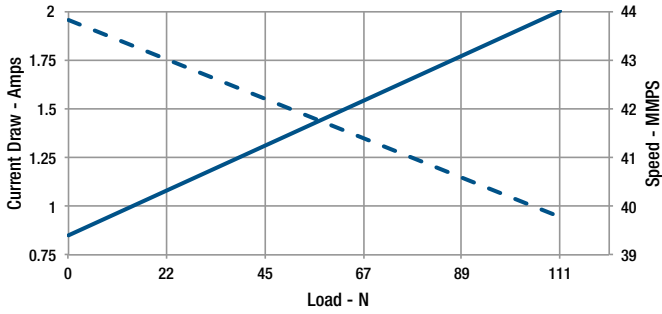
*Performance Chart Measurements are Nominal



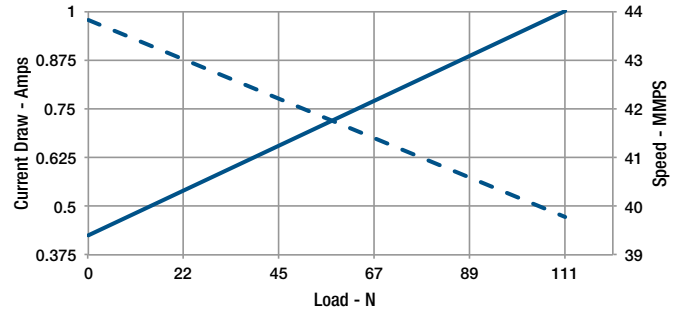
Load Capacity 111 N

For Imperial Measurements, see page 11.

M1-D012-0025



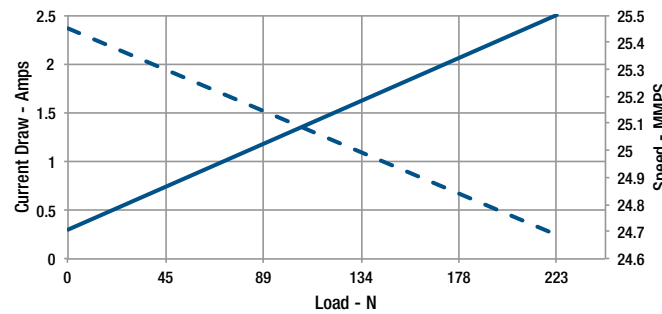
M1-D024-0025



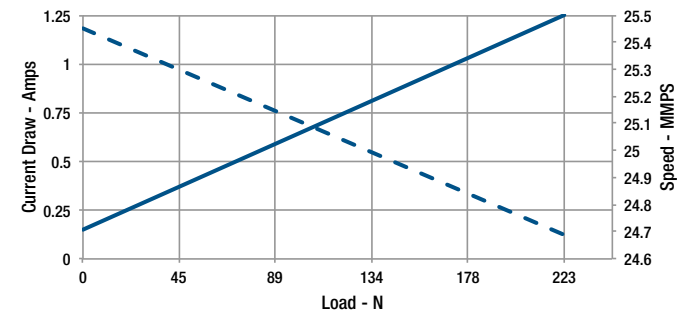
Load Capacity 223 N

For Imperial Measurements, see page 11.

M1-D012-0050



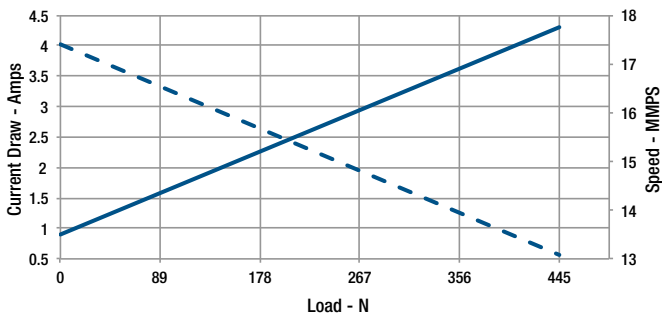
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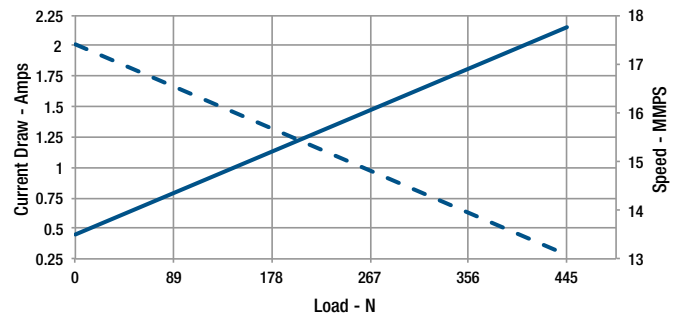
Load Capacity 445 N

For Imperial Measurements, see page 11.

M1-D012-0100



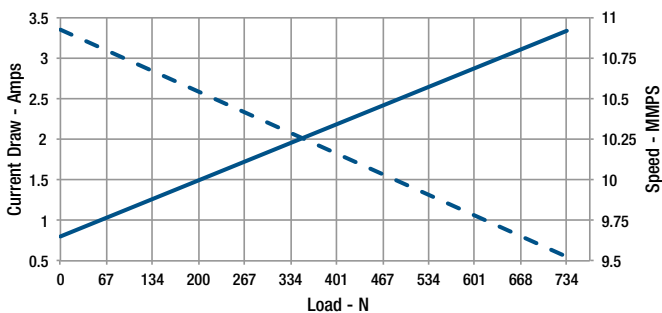
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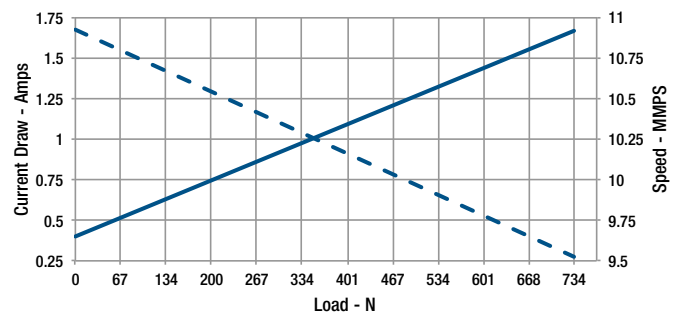
Load Capacity 734 N

For Imperial Measurements, see page 11.

M1-D012-0165



M1-D024-0165



S-Track and Programmable S-Track Features

Acme Screw



Up to 400 lb. (1779 N) Rated Load
Up to 1 in. (25.4 mm)/sec. Travel Speed

New S-Track electric actuators are designed for better control and quieter operation in general duty applications including medical, industrial, turf & garden and recreational vehicles.

S-Track Adjustable Control

The control functions the same as the basic control, but also has the capability to stop at up to four different positions. The stop positions are programmed by using a membrane keypad mounted to the actuator. The main benefit is to be able to change the end limit stop locations and two additional stops if needed.

S-Track Basic Control

The control allows for 12 or 24 VDC switched power operation of the S-Track actuator by turning power off to the motor automatically when the internal end limits are reached.



Specifications						
	G07	G11	G14	G17	G26	G35
Load Capacity	125 lbs. (556 N)	175 lbs. (778 N)	200 lbs. (890 N)	225 lbs. (1001 N)	300 lbs. (1334 N)	400 lbs. (1779 N)
Speed at Full Load	1.0 in. (25 mm)/ sec	0.75 in. (18 mm)/ sec	0.62 in. (15 mm)/ sec	0.50 in. (12 mm)/ sec	0.33 in. (8 mm)/ sec	0.25 in. (6 mm)/ sec
Input Voltage	12 or 24 volt DC for all models					
Static Load Capacity	700 lbs. (315 kg) for all models					
Stroke Length	2, 4, 6, 8, 10 and 12 in. (50, 100, 150, 200, 254, 300 mm) for all models					
Duty Cycle	25% for all models					
Operation Temperature Range	-20° F to +150° F (-29° C to + 65° C) for all models, -40° F to +185° F (-40° C to +80° C) Available					
Environment	IP50 Standard, IP65 Dynamic, IP69K Static Configurable					

Features

- **The end limits** are factory set to the maximum allowable stroke of the actuator.
- **The current and temperature** of the motor are monitored at all times and power will be removed from the motor when exceeded to protect components from failure.
- **Several standard input and output features** through the 8-pin molded connector to monitor the operation of the actuator.
- **0-10 VDC position output** follows linearly with the position of the actuator and is offered in many different voltages and currents.
- **End of stroke limit outputs** indicate when the actuator reaches the fully retracted and extended positions.
- **These outputs can be set at the factory** as, active low or active high independently and are good for up to 1 Amp.
- **Live power feature** is available to maintain all of these output signals when switched power is off.
- **IP50 Standard or IP65 Dynamic, IP69K Static** Configurable.
- **Temporary Immersion Boot** available upon request. Consult factory.

Features to Adjustable Control

- **4 adjustable stop positions** using a simple 4 button membrane keypad.
- **Customer can adjust Retract & Extend stops** using membrane keypad. These values will be stored in permanent EEPROM memory for the life of the actuator.
- **Adjusted stop positions can also be erased** at any time to go back to factory default.
- Retract is Stop 1 and Extend is Stop 2. Stop 3 and Stop 4 can be set anywhere inside these two values.
- When Stop 1 (Retract) and Stop 2 (Extend) positions are reached the actuator will automatically stop and not allow movement in that direction. Power will have to be reversed in the opposite direction to move the actuator.
- If Stop 3 and Stop 4 positions are used, when these positions are reached the control will remove power to the actuator until input power is cycled. Then when power is reapplied it can move in either direction.
- **Positional Accuracy**, under no load conditions from the initial stop position setting is within 0.10". This will improve with loaded applications since there will be less coast.
- **Repeatability** of hitting the same stop position every time is within .010".

Typical Applications

- Indoor Office Equipment
- Deck Lifts
- Medical
- Gate Openers

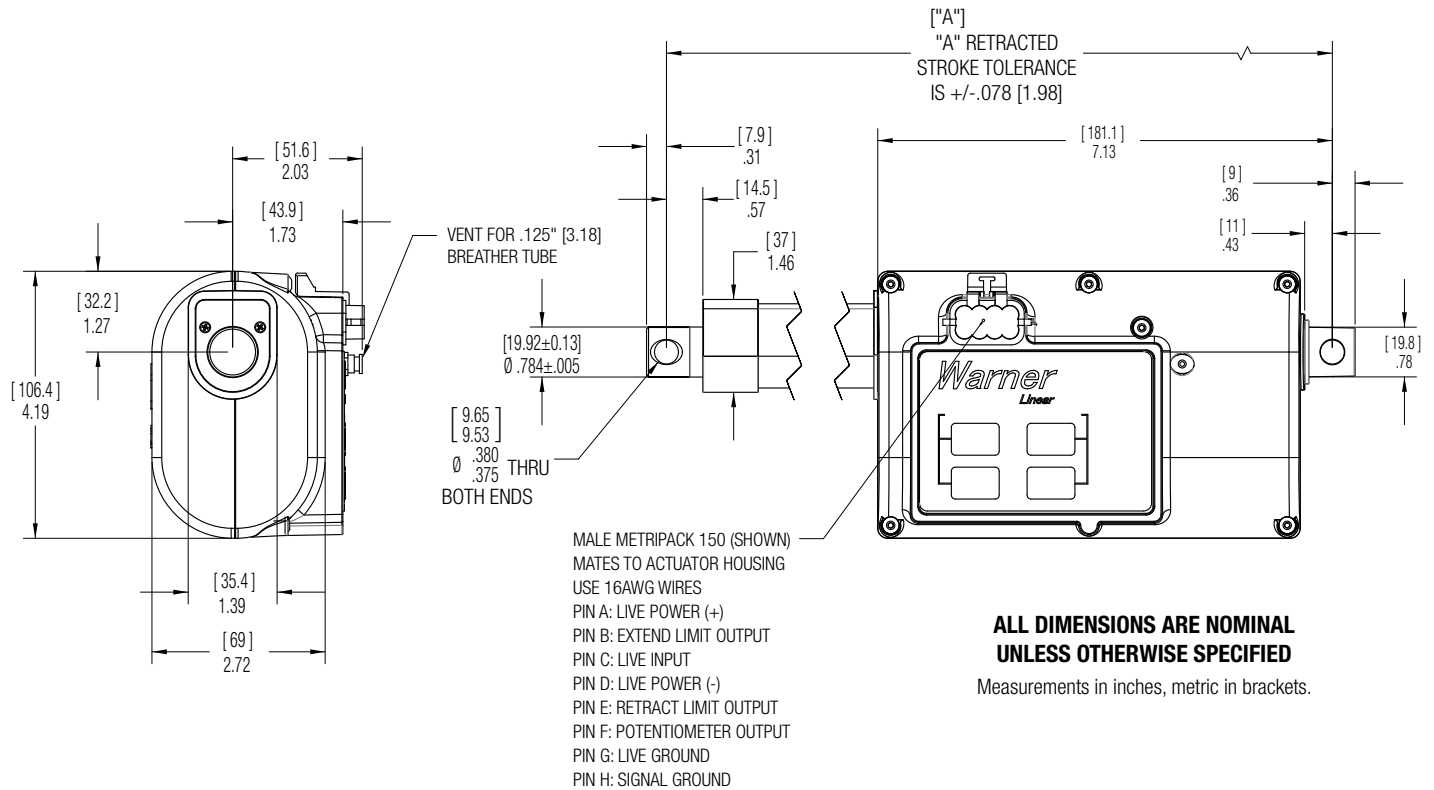
S-Track

Dimensions & Configurator

Dimensions

S-TRACK	Stroke	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
		4	102	6	152	8	203	10	254	12	305
	A	9.32	236.7	11.32	287.5	13.32	338.3	15.32	389.1	17.32	439.9

Note: Special lengths available



S-Track Configurator

S1 P1 G11 - 12V - DN - 08 - 1

Dimensions

Stroke	"A"
2" (50 mm)	9.32
4" (100 mm)	9.32
6" (150 mm)	11.32
8" (200 mm)	13.32
10" (254 mm)	15.32
12" (300 mm)	17.32

Actuator Model No.

S1 - Aluminum Housing
S2 - Plastic Housing

Voltage

12 - 12 VDC
24 - 24 VDC

Stroke Length

02 - 02 in. (50 mm)
04 - 04 in. (100 mm)
06 - 06 in. (150 mm)
08 - 08 in. (200 mm)
10 - 10 in. (250 mm)
12 - 12 in. (300 mm)

IP-Rating

Blank - IP 50
1 - IP 65/IP69K

Output/Limit Switch

P0 - Basic Control, No Outputs
P1 - S-Track Basic Control, POT output and Limit Switches
K1 - Key Pad Control

Gear Ratio

Model	Ratio	Pin	Length	Screw
G07	1"	44	.375	8 screw
G11	.75"	44	.375	12 screw
G14	.62"	44	.375	16 screw
G17	.50"	18	.375	8 screw
G26	.33"	18	.375	12 screw
G35	.25"	18	.375	16 screw

End Fitting

Blank - STD
R90 - 90

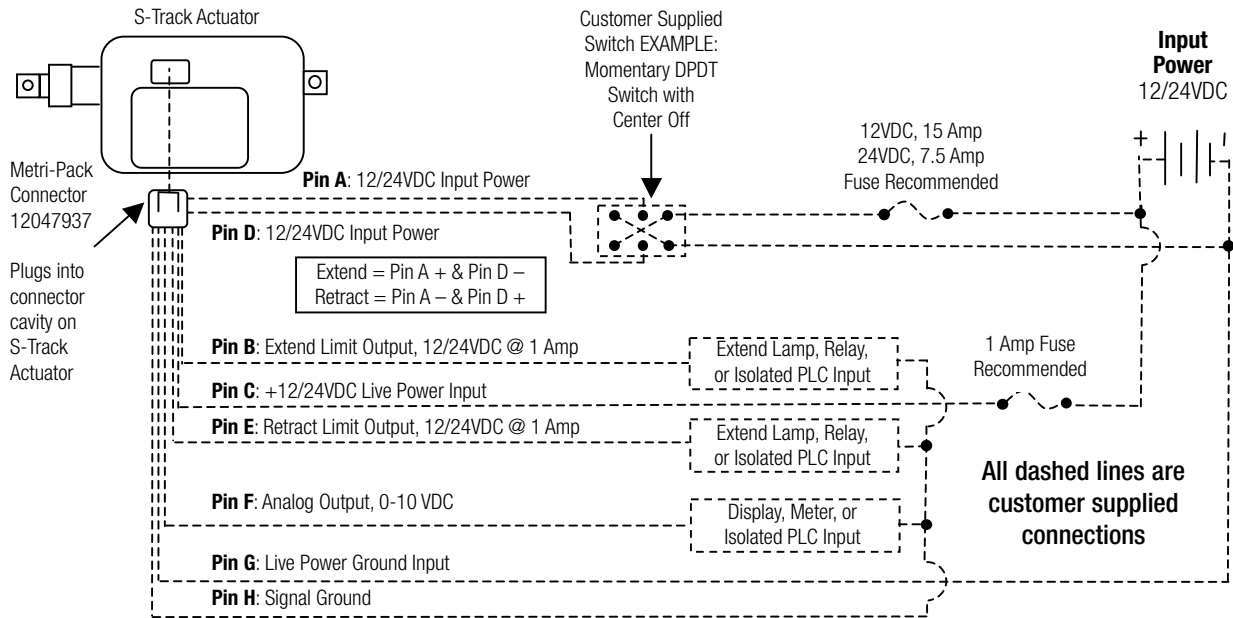


Scan to watch!
Linear Actuator Basic Selection Video
<https://p.widencdn.net/ydtpk6>

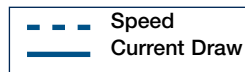
For Protective Boot
Consult factory for ordering details.

Wiring Diagram & Performance Graphs Imperial* Measurements

Wiring Diagram for Basic and Adjustable Control



Performance Graphs Imperial Measurements*

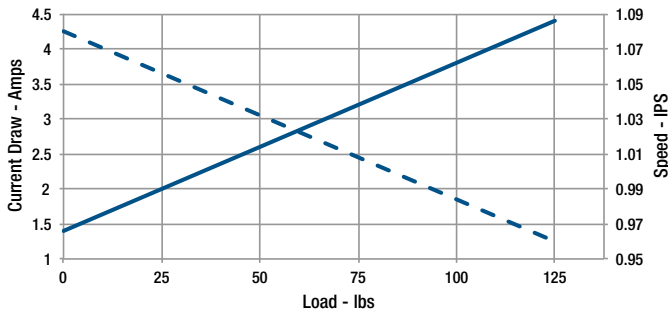


*Performance Chart Measurements are Nominal

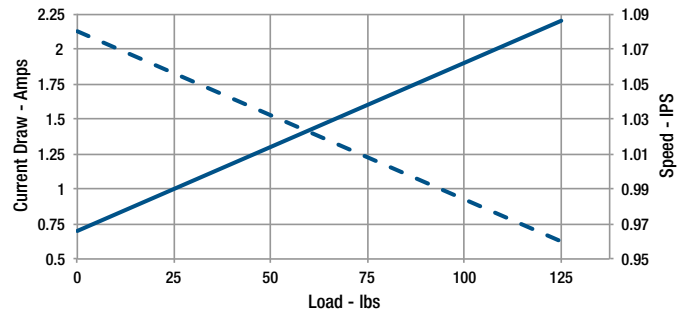
Load Capacity 125 lbs.

For Metric Measurements, see pages 17-18.

S Track G07-12VDC



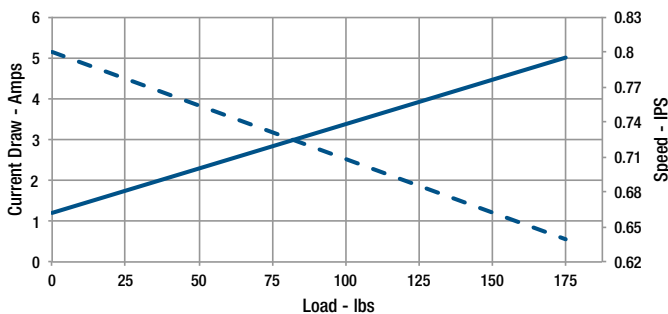
S Track G07-24VDC



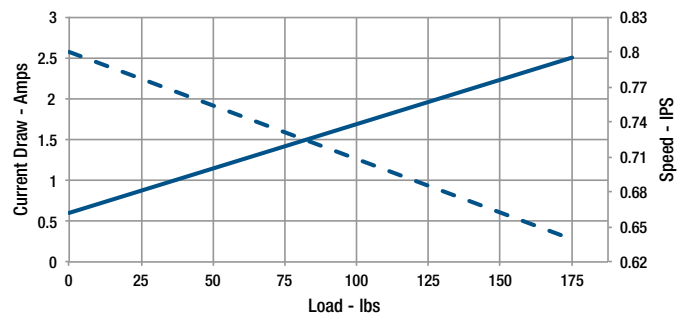
Load Capacity 175 lbs.

For Metric Measurements, see pages 17-18.

S Track G11-12VDC

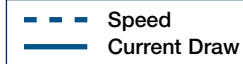


S Track G11-24VDC



S-Track

Performance Graphs Imperial Measurements*

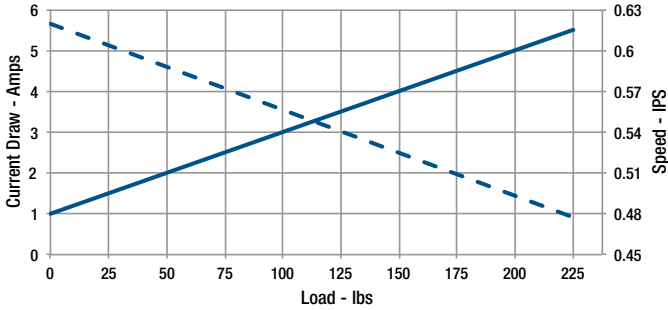


*Performance Chart Measurements are Nominal

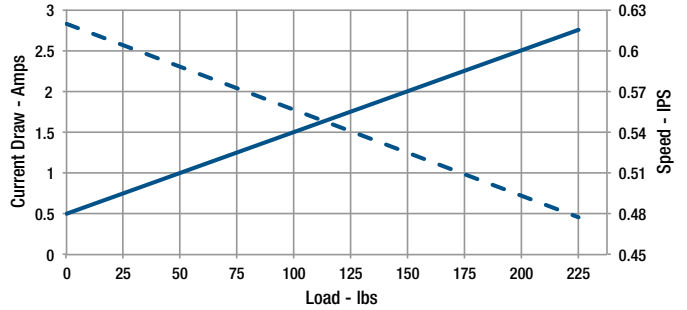
Load Capacity 225 lbs.

For Metric Measurements, see pages 17-18.

S Track G14-12VDC



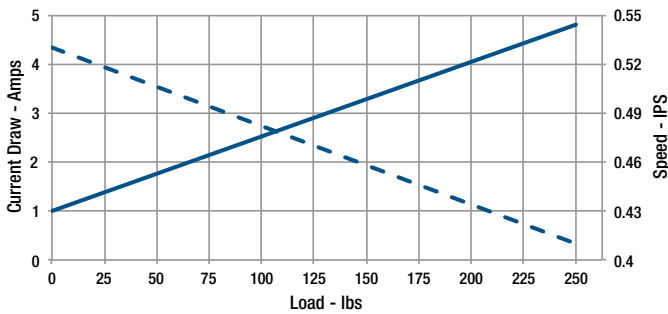
S Track G14-24VDC



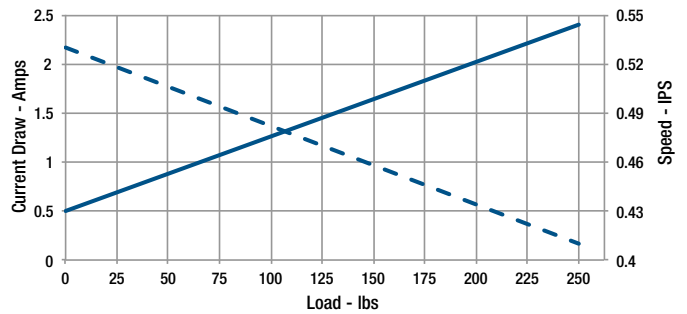
Load Capacity 250 lbs.

For Metric Measurements, see pages 17-18.

S Track G17-12VDC



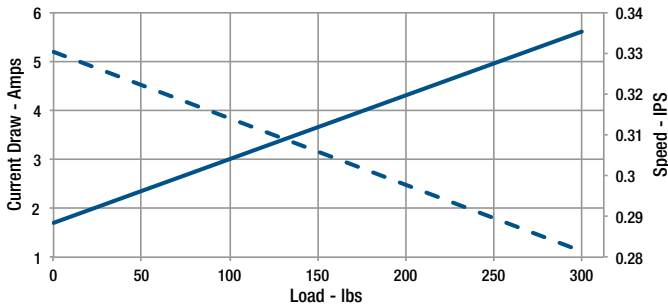
S Track G17-24VDC



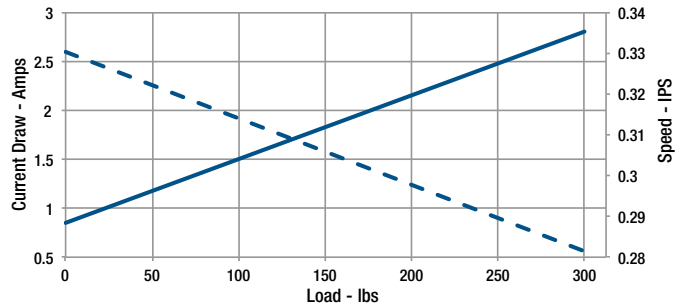
Load Capacity 300 lbs.

For Metric Measurements, see pages 17-18.

S Track G26-12VDC



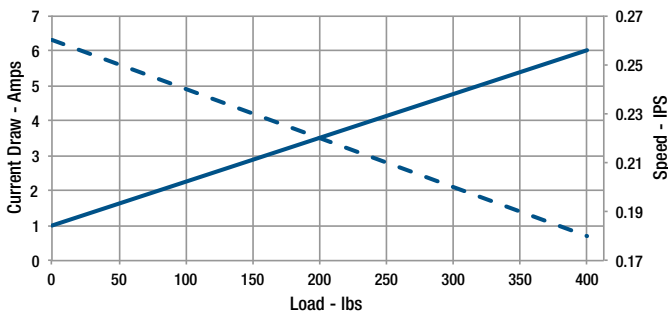
S Track G26-24VDC



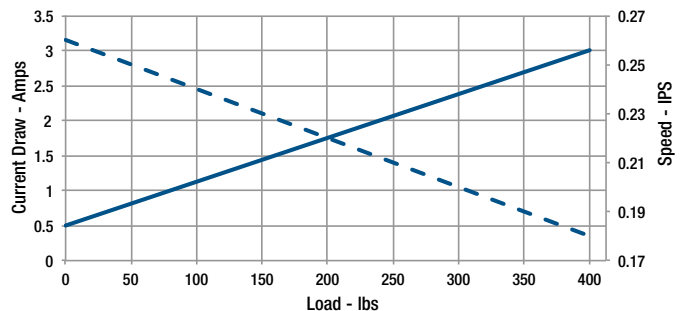
Load Capacity 400 lbs.

For Metric Measurements, see pages 17-18.

S Track G35-12VDC

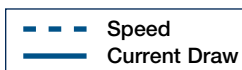


S Track G35-24VDC



Performance Graphs Metric Measurements*

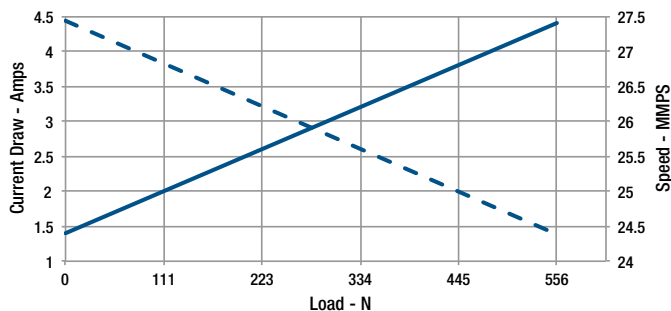
*Performance Chart Measurements are Nominal



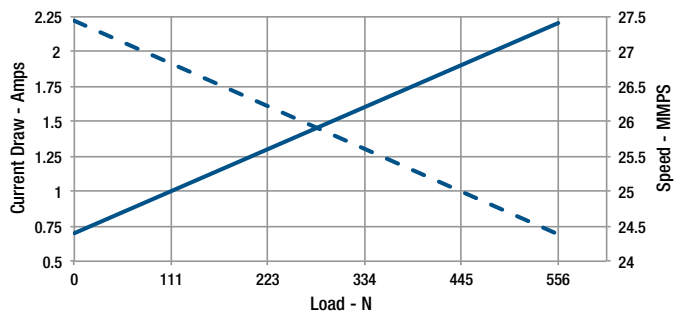
Load Capacity 556 N

For Imperial Measurements, see pages 15-16.

S Track G07-12VDC



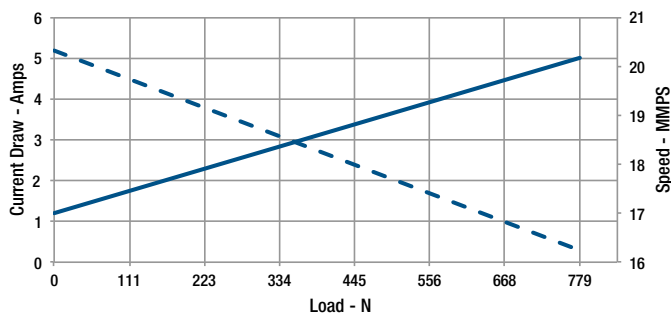
S Track G07-24VDC



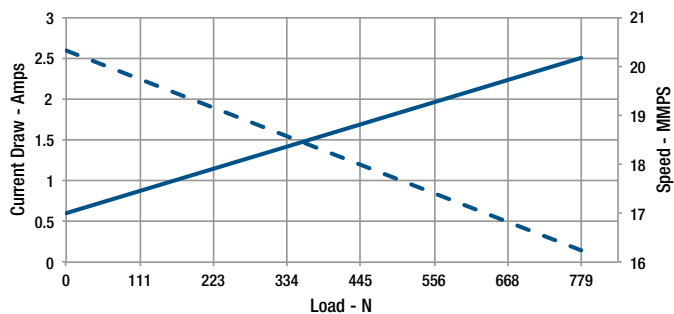
Load Capacity 779 N

For Imperial Measurements, see pages 15-16.

S Track G11-12VDC



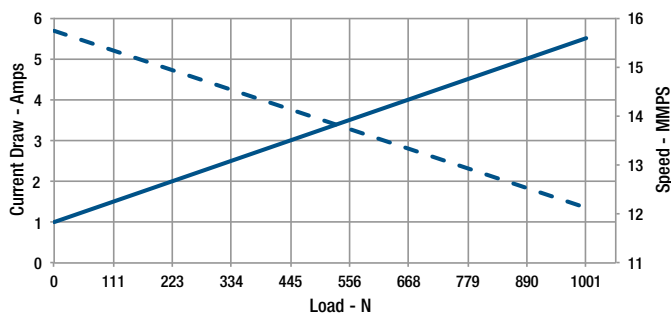
S Track G11-24VDC



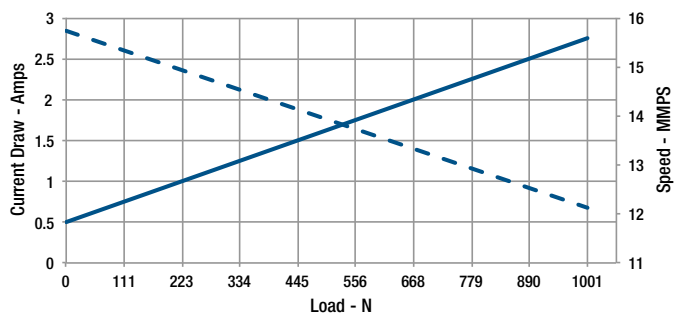
Load Capacity 1001 N

For Imperial Measurements, see pages 15-16.

S Track G14-12VDC



S Track G14-24VDC



S-Track

Performance Graphs Metric Measurements*

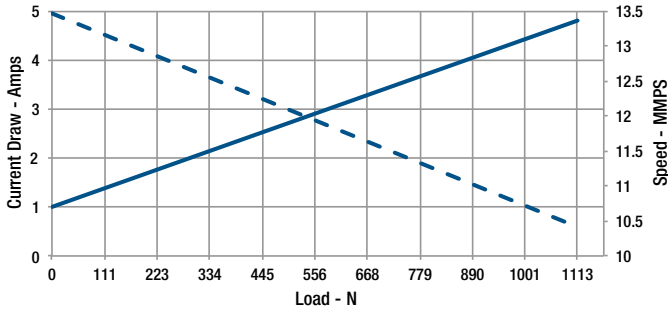
*Performance Chart Measurements are Nominal



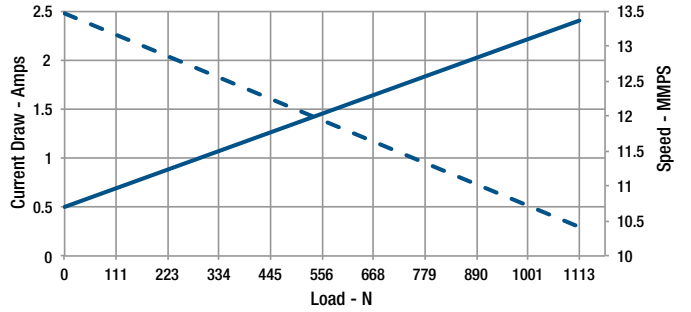
Load Capacity 1113 N

For Imperial Measurements, see pages 15-16.

S Track G17-12VDC



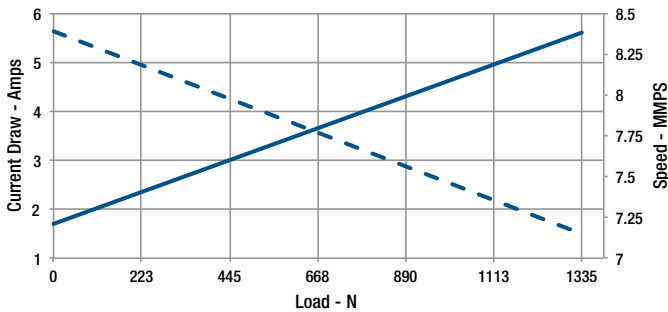
S Track G17-24VDC



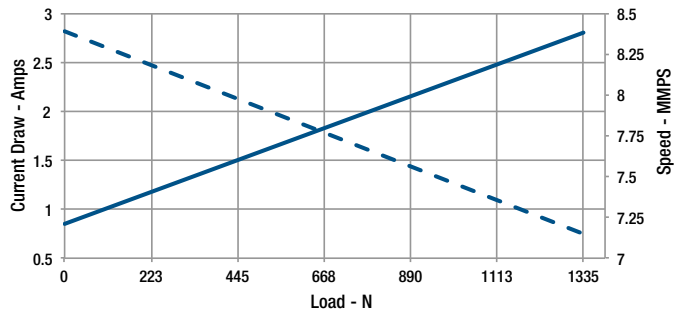
Load Capacity 1335 N

For Imperial Measurements, see pages 15-16.

S Track G26-12VDC



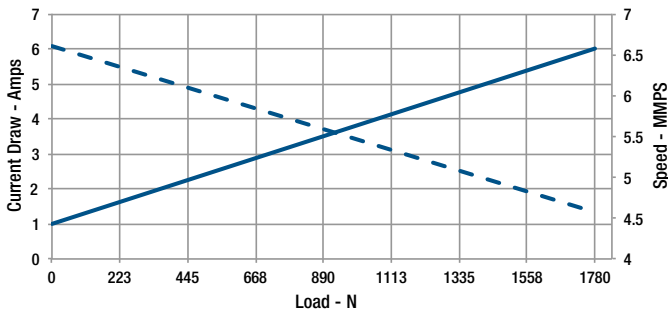
S Track G26-24VDC



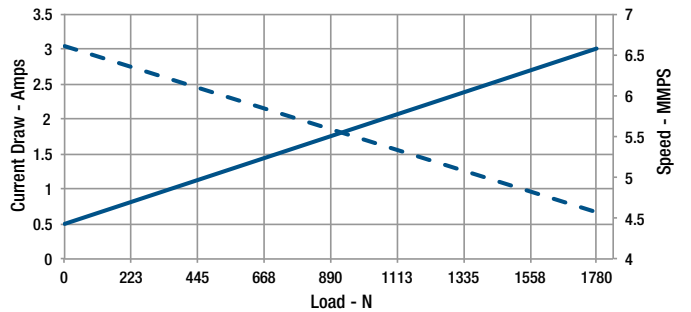
Load Capacity 1780 N

For Imperial Measurements, see pages 15-16.

S Track G35-12VDC



S Track G35-24VDC



General Duty In-line Actuator DC Motor Ball Screw



Up to 200 lbs. (890 N) Rated Load
Up to 1 in. (25 mm)/sec. Travel Speed

I-Track is a general duty inline actuator suited for applications needing a power-off releasing the rod into a float mode. This unit utilizes a ball screw and planetary drive for long life in a compact space. Models can be fitted with a potentiometer that is directly coupled to the rod that will provide position feedback regardless if the rod is in float or locked mode. It can be driven by PWM to control velocity. For controlling the float and locked rod setting there is a separate input independent of the motor connection. The rod can also be configured to be permanently locked for applications where a floating rod is not required. The unit incorporates a ratchet-free overload slip clutch to protect the drive system.

Specifications	
Operating Voltage	9-15VDC or 22-26VDC
Passed EMI Immunity Testing	ISO 11452-4 Certified
Operating Load	200 lbs. (890 N) Thrust, 800 lbs. (3,559 N) Static
Stroke Length	2, 4, 6, 8, 10 and 12
Duty Cycle	25% max.
No-Load Speed	1.1"/SEC (27.94 mm/sec)
Floating Rod Design	
Operation Temperatures Range	-40° F to 185° F (-40° C to 85° C)
Potentiometer	560-10K Optional
Environment	IP69K Static, IP66 Dynamic

Features

- **Models available in 12VDC and 24VDC.**
- **Loads up to 200 lbs** thrust.
- **In-line design** reduces base footprint.
- **Releasing clutch** allows rod to float with clutch power-off. Clutch power is separate from motor power.
- **Clutch also acts as over-load protection.**
- **Motor thermal** for added motor protection.
- **Optional Potentiometer** output scaled to stroke.
- **Can be driven by PWM** (not supplied) controller to achieve multiple velocities.
- **Can be mounted at the body** by trunnions (shoulder bolts) or as traditional clevis.
- **Rod end mounts** are configurable.
- **Ball screw and nut** for long life.
- **Operating temperatures** -40° F to +185° F (-40° C to 85° C).
- **Steel rod** for durability.
- **Nitrile impregnated gaskets** for superior sealing.
- **Black powder coat** for 250 hour salt spray protection.
- **Nitrotec® coated steel components** for 250 hour Salt Spray Protection.
- **IP69K Static; IP66 Dynamic.** Rod bellow will allow for temporary operation IP67 submersion.

Typical Applications

- Throttle controls
- Mobility lifts for vehicles requiring manual operation in emergency situations
- Hydraulic flow controls
- Bus Door Operator
- Hatch lift applications
- Handicap Van Lifts
- Engine Controls
- Emergency Door (lock and unlock via VDC)

I-Track

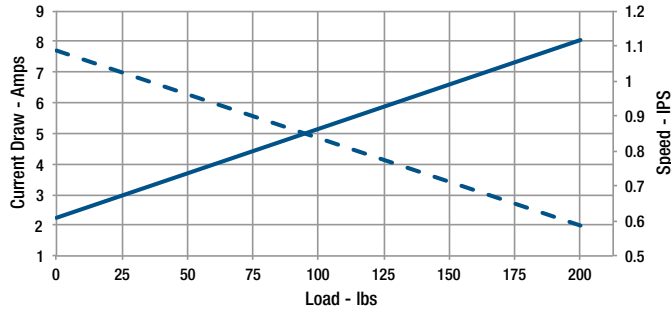
Performance Graphs Imperial & Metric Measurements*



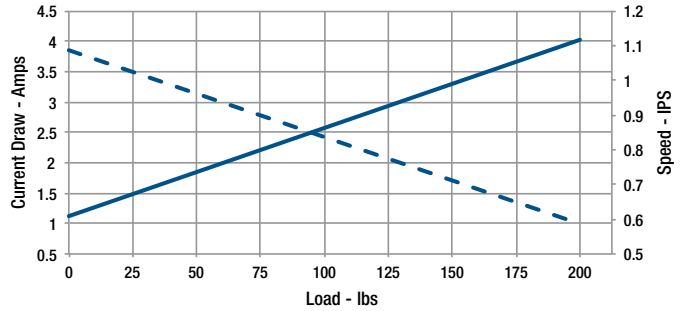
*Performance Chart Measurements are Nominal

Imperial Measurements* I Track Operating Load 200 Lbs.

G05-12VDC

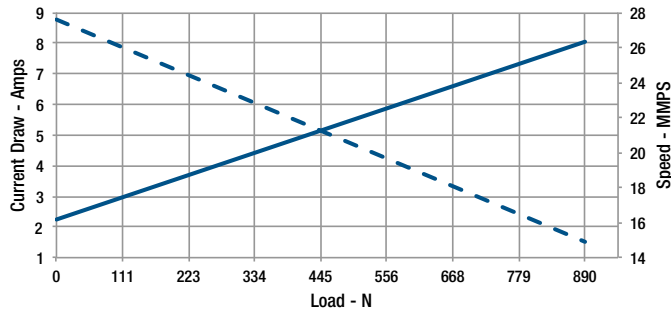


G05-24VDC

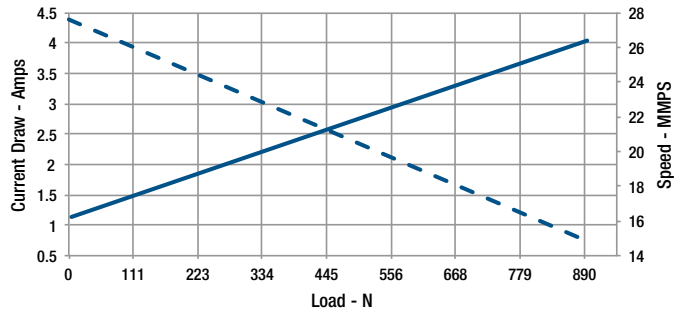


Metric Measurements* I Track Operating Load 890 N

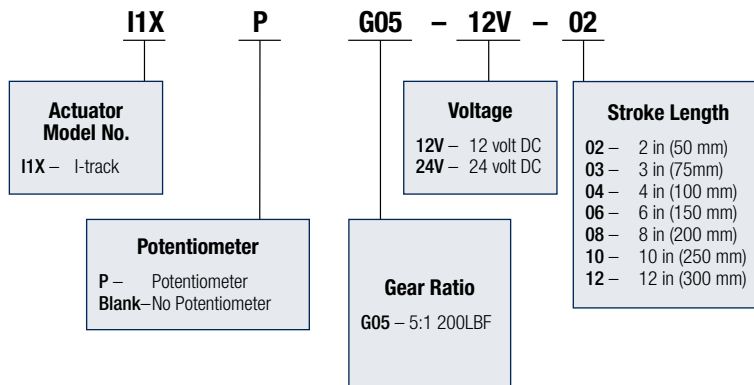
G05-12VDC



G05-24VDC

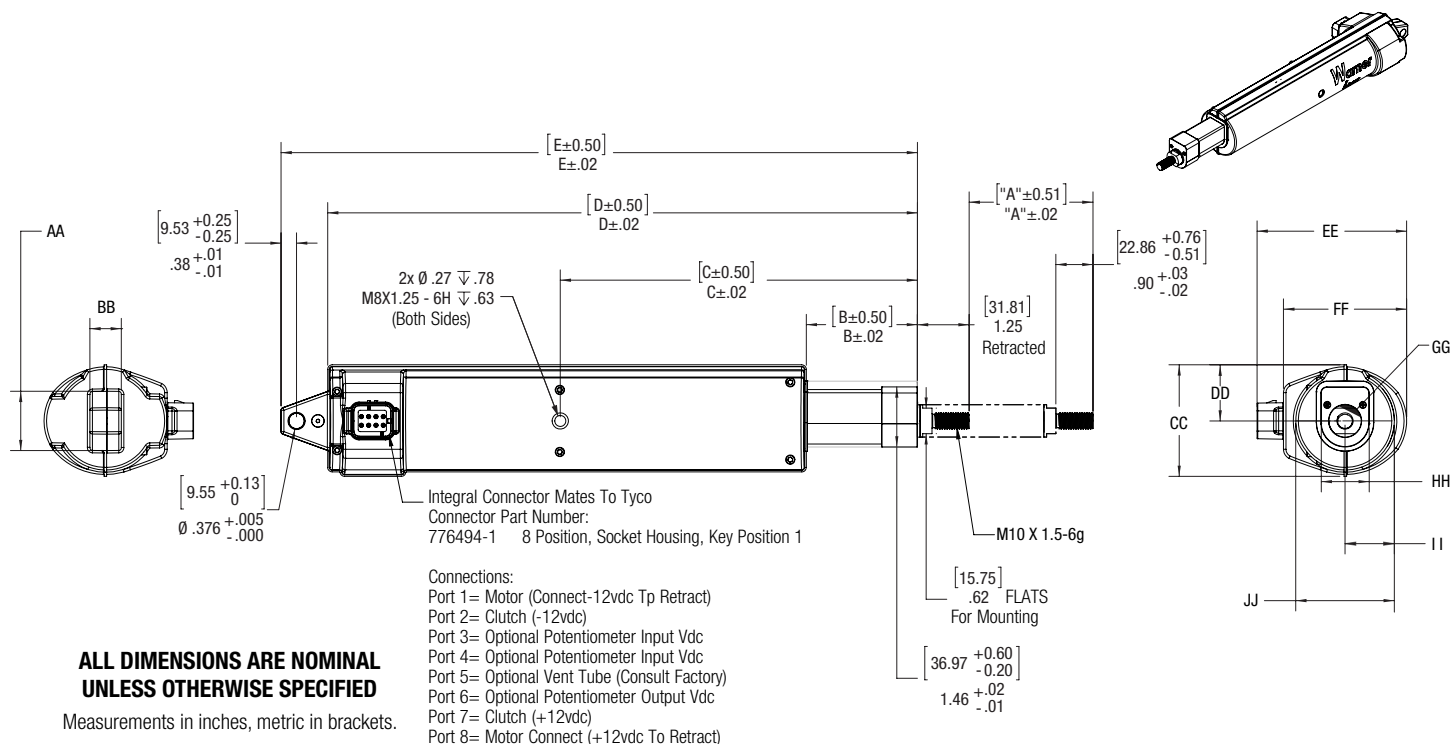


I-Track Configurator



Scan to watch!
Linear Actuator Basic Selection Video
<https://p.widencdn.net/ydtpk6>

Dimensions



**ALL DIMENSIONS ARE NOMINAL
UNLESS OTHERWISE SPECIFIED**

Measurements in inches, metric in brackets.

Dimensions

I-Track	Stroke	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
		2	50	3	75	4	100	6	150	8	200	10	254	12	300
	A	2.00	50.80	3.00	76.20	4.00	101.60	6.00	152.40	8.00	203.20	10.00	254.00	12.00	304.80
	B	1.69	42.93	2.69	68.33	3.69	93.73	5.69	144.53	7.69	195.33	9.69	246.13	11.69	296.93
	C	7.65	194.31	8.65	219.71	9.65	245.11	11.65	295.91	13.65	346.71	15.65	397.51	17.65	448.31
	D	13.29	337.57	14.29	362.97	15.29	388.37	17.29	439.17	19.29	489.97	21.29	540.77	23.29	591.57
	E	14.42	366.27	15.42	391.67	16.42	417.07	18.42	467.87	20.42	518.67	22.42	569.47	24.42	620.27

Note: Special lengths available

Dimensions (Side Views)

AA	$\begin{bmatrix} 36.49 & +0.50 \\ & -0.20 \\ 1.44 & +0.02 \\ & -0.01 \end{bmatrix}$	DD	$\begin{bmatrix} 34.55 \pm 0.51 \\ 1.36 \pm 0.02 \end{bmatrix}$	HH	$\begin{bmatrix} 29.54 & +0.60 \\ & -0.10 \\ 1.16 & +0.02 \\ & -0.00 \end{bmatrix}$
BB	$\begin{bmatrix} 19.35 & +0.40 \\ & -0.20 \\ .76 & +0.02 \\ & -0.01 \end{bmatrix}$	EE	$\begin{bmatrix} 92.02 & +0.50 \\ & -0.20 \\ 3.62 & +0.02 \\ & -0.01 \end{bmatrix}$	II	$\begin{bmatrix} 30.31 \pm 0.51 \\ 1.16 \pm 0.02 \end{bmatrix}$
CC	$\begin{bmatrix} 68.66 & +0.40 \\ & -0.20 \\ 2.70 & +0.02 \\ & -0.01 \end{bmatrix}$	FF	$\begin{bmatrix} 75.79 & +0.40 \\ & -0.20 \\ 2.98 & +0.02 \\ & -0.01 \end{bmatrix}$	JJ	$\begin{bmatrix} 60.63 & +0.40 \\ & -0.20 \\ 2.39 & +0.02 \\ & -0.01 \end{bmatrix}$
		GG	$\begin{bmatrix} 19.91 \pm 0.25 \\ \emptyset .78 \pm 0.01 \end{bmatrix}$		

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 2,800 lb. (12455 N) capacity
- Speeds up to 2" per second

Standard Models

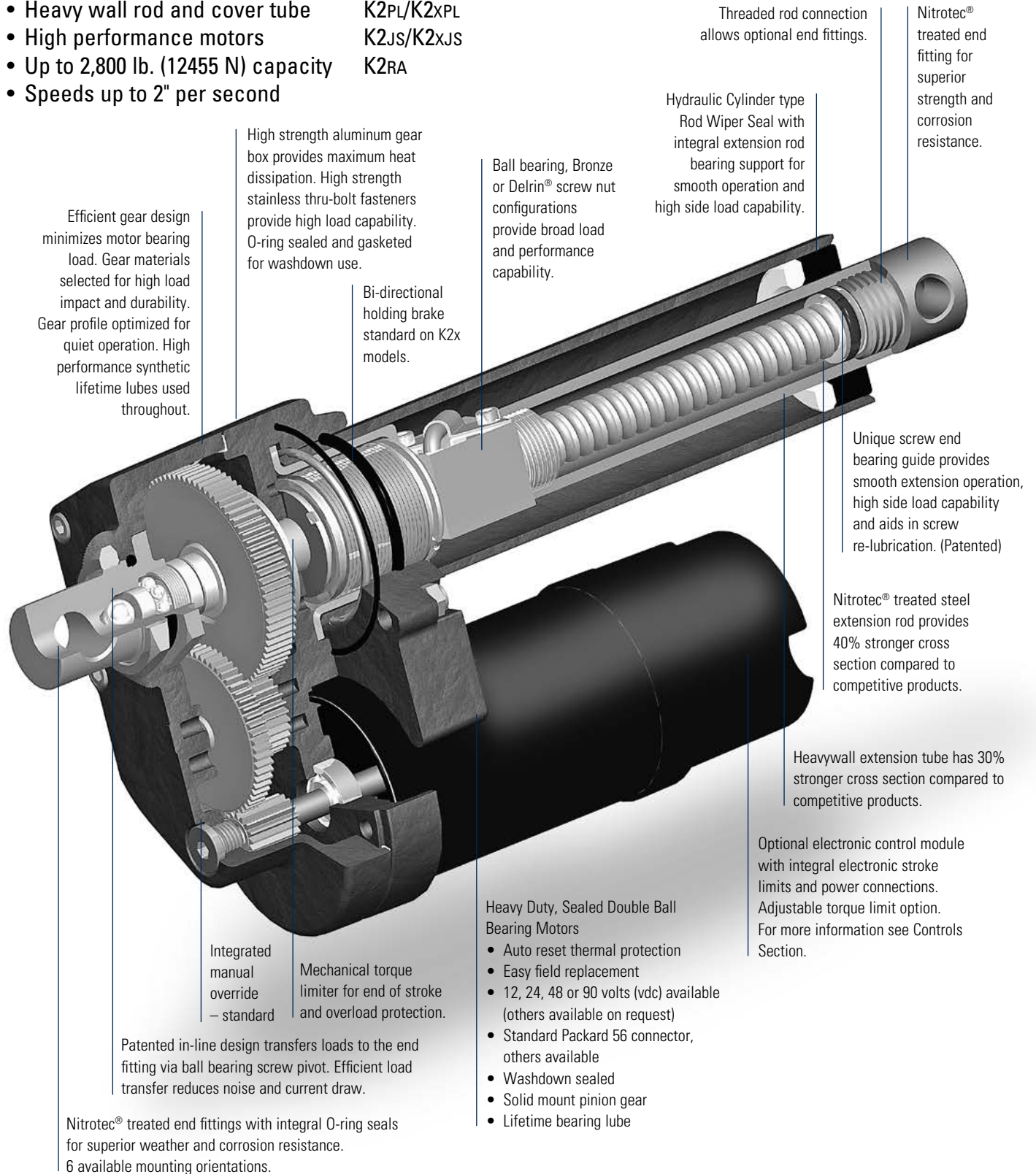
K2VL, K2, K2x, K2AC, K2xAC

Option Models

K2PL/K2xPL

K2JS/K2xJS

K2RA



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.

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.

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

Bi-directional holding brake standard on K2x models.

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.

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

Integrated manual override – standard
Mechanical torque limiter for end of stroke and overload protection.

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 charts 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 (12 VDC only).
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 71)

B-Track Configurator

K2x **P1.x** **G20** **12V** **M** **BR** **04** **R120**

Actuator Model No.

K2x
K2
K2vL

Gear Ratio

G30 = 30:1
G20 = 20:1
G10 = 10:1
G05 = 5:1

Motor Voltage

12V – 12 volts
24V – 24 volts
36V – 36 volts
48V – 48 volts
90V – 90 volts
115V – 115 volts
230V – 230 volts

Nut Type*

Blank – K2x
BR – Bronze Nut
BRL – Bronze Nut - Long
DN – Delrin® Nut

*BRL matches K2x pin to pin

Stroke Length

04 – 4.00 (100 mm)
06 – 6.00 (150 mm)
08 – 8.00 (200 mm)
12 – 12.00 (300 mm)
18 – 18.00 (450 mm)
24 – 24.00 (600 mm)

Base Fitting Alignment

Blank – Standard
R30 – 30° Fitting
R60 – 60° Fitting
R90 – 90° Fitting
R120 – 120° Fitting
R150 – 150° Fitting

Control Model

P1.x Fixed Limit Switch
P2.x Position Feedback
EP1.x Adjustable Limit Switches
RP Low Switching (K2vL Not Available)

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

Motor Type

M – Ignition Protected Motor
For standard motor, leave blank.

CL LOCATION OF CLEVIS PIN



Scan to watch!
Linear Actuator Basic Selection Video
<https://p.widencdn.net/ydtpk6>

B-Track K2vL

General Duty Actuator DC Motor Acme Screw



Up to 600 lbs. (2669 N) Rated Load
Up to 2.7 in. (68.58 mm)/sec. Travel 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 Nitrotec® 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**
- **Stroke lengths** 2 to 12 inches (50 to 300 millimeters)
- **Load capacities** up to 600 pounds (2669 N)
- **Speeds up to** 2.7 inches (68.58 millimeters)/sec. travel
- **Thermal overload** incorporated into the motor
- **Heavy wall construction**
- **Double ball bearing motors**
- **Heat treated gears**
- **Rugged extension rod** bearing support

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: 3,000 lbs. (13345 N) Static (in-line load)
 - Refer to performance chart for load/current/speed capabilities
 - Stroke Length Tolerance: +/- .06" (1.52mm)
 - 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 (-29° C to +65° C)
- Weather resistant enclosure & seals (IP69K Static, IP65 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
- 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 Graphs Imperial Measurements*

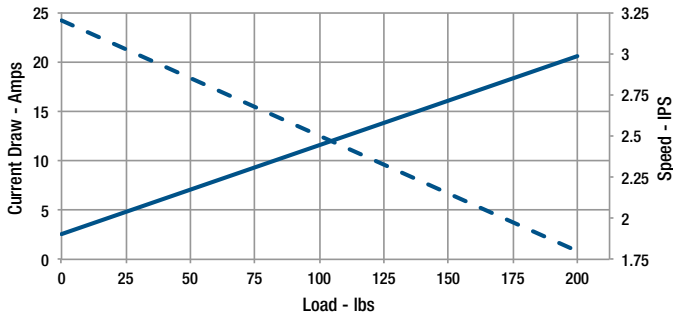
*Performance Chart Measurements are Nominal



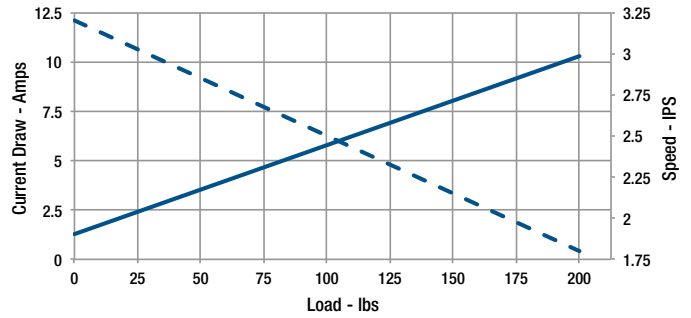
Load Capacity 200 lbs.

For Metric Measurements, see page 26.

K2vL.G05-12VDC



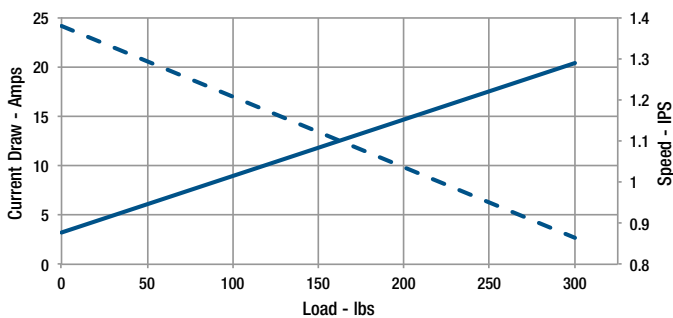
K2vL.G05-24VDC



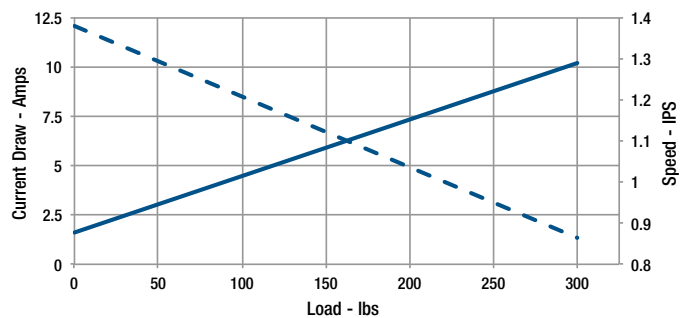
Load Capacity 300 lbs.

For Metric Measurements, see page 26.

K2vL.G10-12VDC



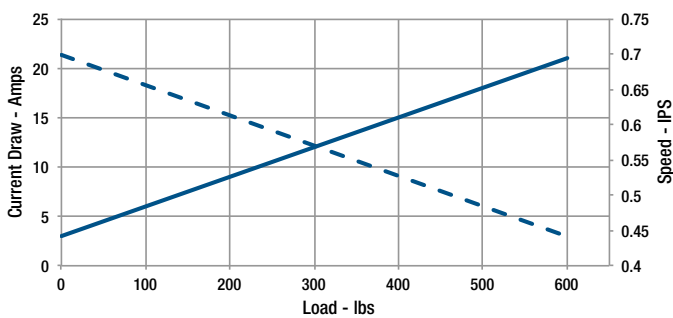
K2vL.G10-24VDC



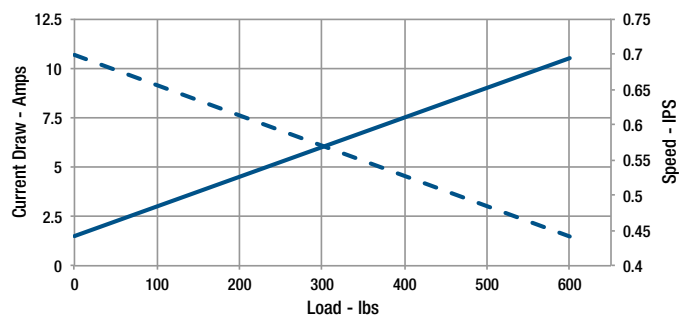
Load Capacity 600 lbs.

For Metric Measurements, see page 26.

K2vL.G20-12VDC



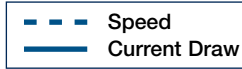
K2vL.G20-24VDC



B-Track K2vL

Performance Graphs Metric Measurements*

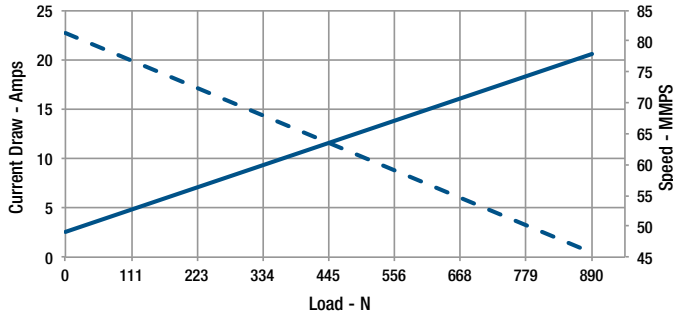
*Performance Chart Measurements are Nominal



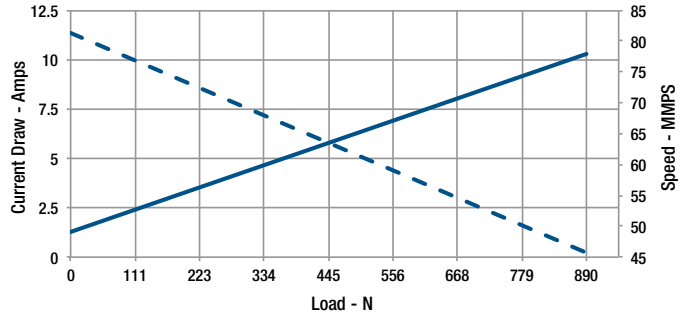
Load Capacity 890 N

For Imperial Measurements, see page 25.

K2vL.G05-12VDC



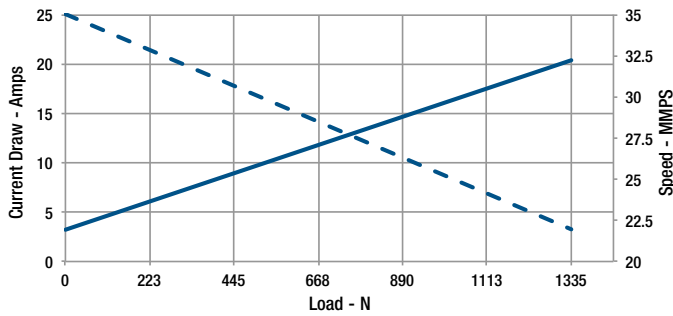
K2vL.G05-24VDC



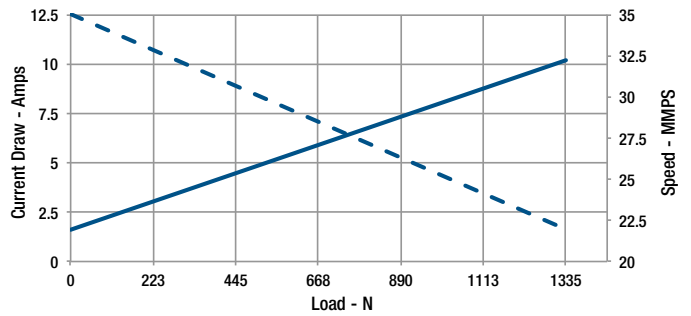
Load Capacity 1335 N

For Imperial Measurements, see page 25.

K2vL.G10-12VDC



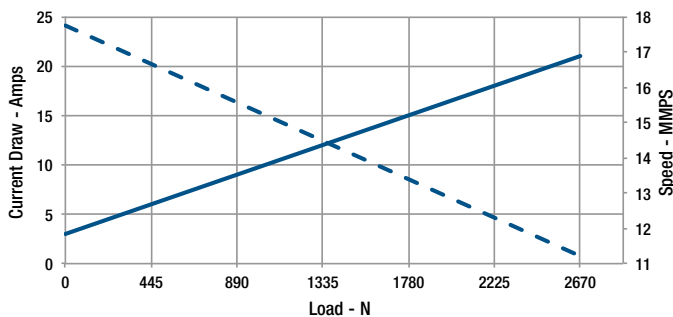
K2vL.G10-24VDC



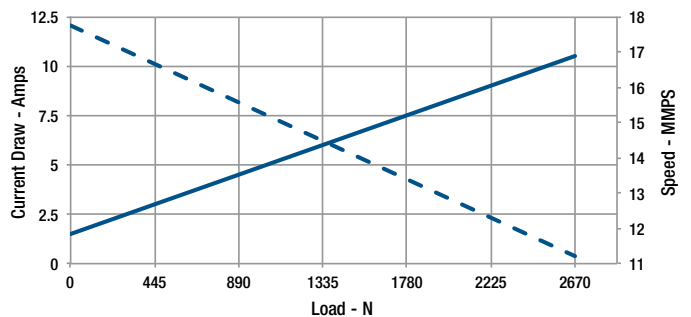
Load Capacity 2670 N

For Imperial Measurements, see page 25.

K2vL.G20-12VDC



K2vL.G20-24VDC

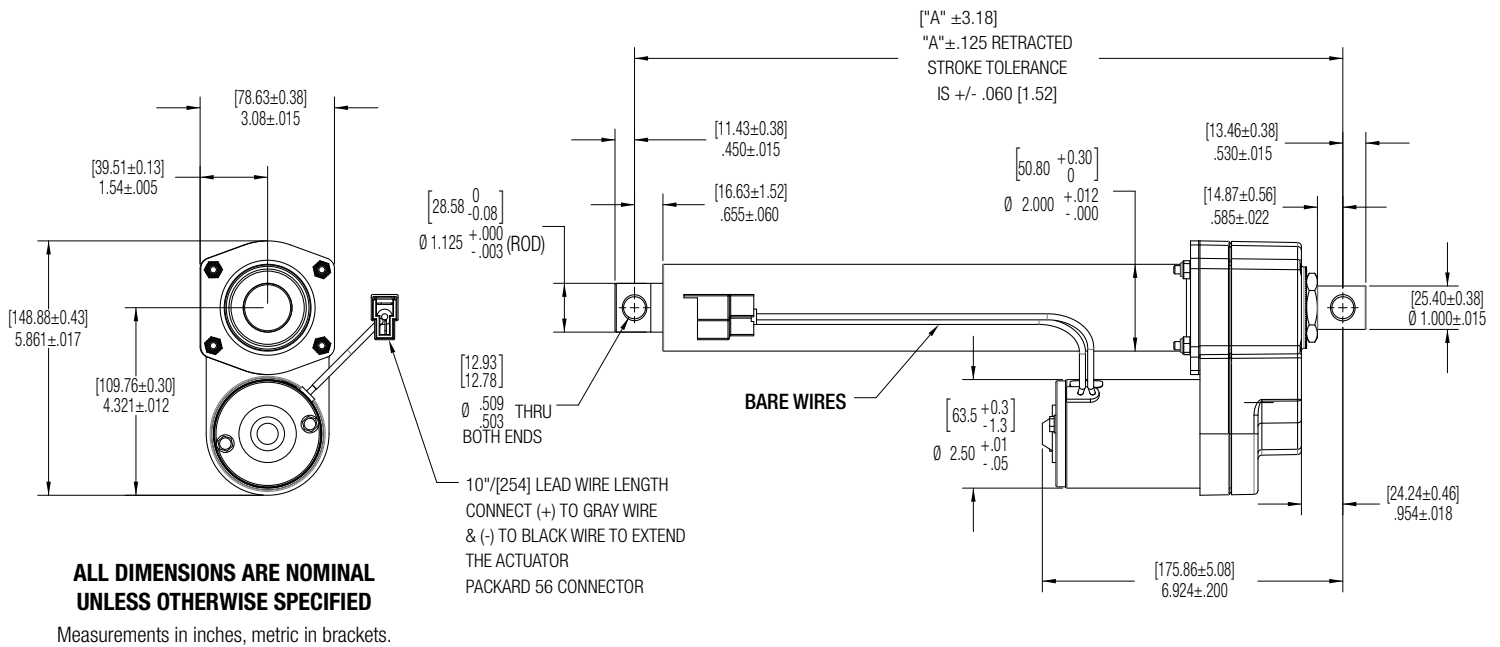


Dimensions

Dimensions

B-Track K2vL	Stroke	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
		2	51	4	102	6	152	8	203	10	254	12	305
	A	8.32	211.3	10.32	262.1	12.32	312.9	14.32	363.7	16.32	414.5	18.32	465.3

Note: Special lengths available



B-Track K2

Rugged Duty Actuator DC Motor Acme Screw



Shown with optional adjustable limit switch feature

Up to 1,500 lbs. (6672 N) Rated Load
Up to 2.7 in. (68.58 mm)/sec. Travel Speed

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 Acme style 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.

Now Available Optional Adjustable Limit Switch These easy to use adjustable switches are mounted in a channel on the cover tube with custom cap for protection. They are easily moved to enable the end-user the flexibility of setting the stroke length at any position within the full stroke capability. Just pop the cap off, loosen the set screw and slide the switch into the desired position.

Features

- **Protective coatings** and O-ring seals throughout
- **Patented in-line load system**
- **Hybrid Acme style nut and screw** design, no brake needed
- **Ball detent overload clutch**
- **Stroke lengths** 2 to 24 inches (50 to 600mm)
- **Load capacities** up to 1500 pounds (6672 N)
- **Speeds up to** 2.7 inches (68.58 millimeters)/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 (IP54)
- **Custom mounting** options available

Typical Applications

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



Scan to watch!

How to Adjust the Limit Switches for a K2 or K2X Actuator with External or EP Limit Switches
<https://p.widencdn.net/imzc9v>

Load/Current/Speed/Duty Cycle

- Maximum Static Rating: 3,000 lbs. (13345 N) Static (in-line load)
- Refer to performance chart for load/current/speed capabilities
- Stroke Length Tolerance: +/- .06" (1.52 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: -20° F to +150° F (-29° C to +65° C), -40° F to +176° F (-40° C to +80° C) Upon Request.
- Weather resistant enclosure & seals (IP69K Static, IP65 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 spiral 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) Upon Request

Performance Graphs Imperial Measurements*

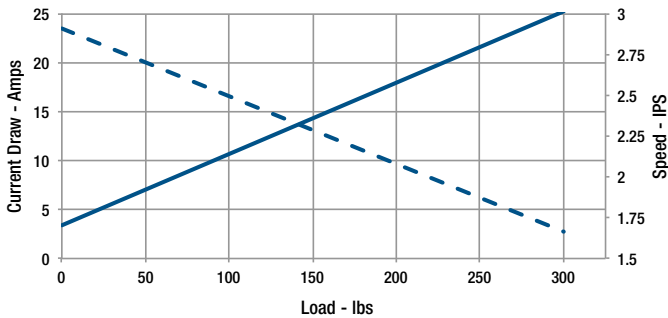
*Performance Chart Measurements are Nominal



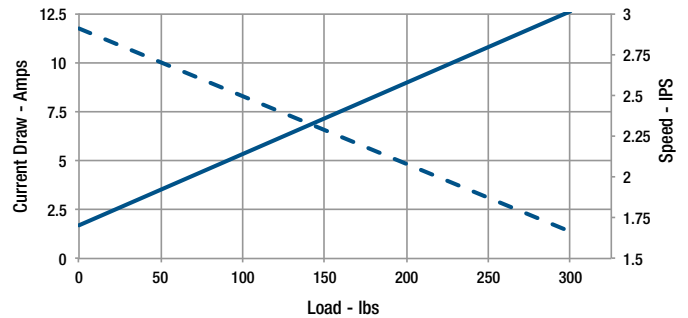
Load Capacity 300 lbs.

For Metric Measurements, see page 30.

K2G05-12VDC



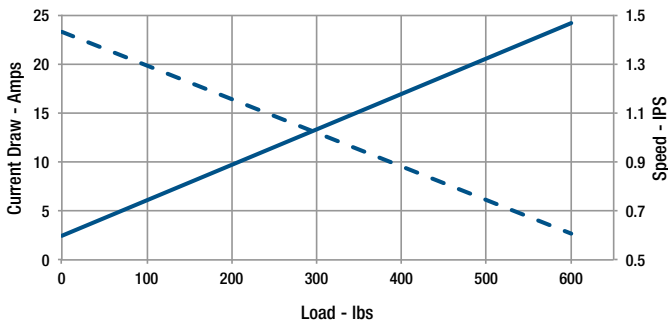
K2G05-24VDC



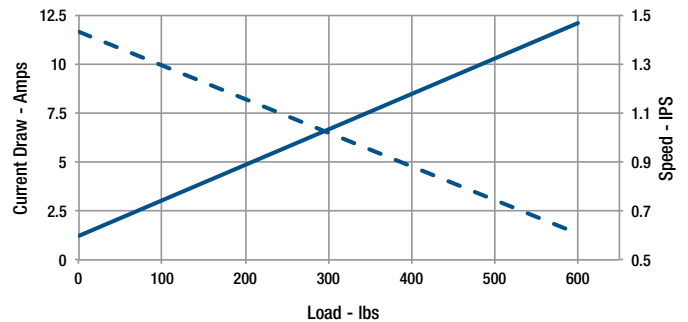
Load Capacity 600 lbs.

For Metric Measurements, see page 30.

K2G10-12VDC



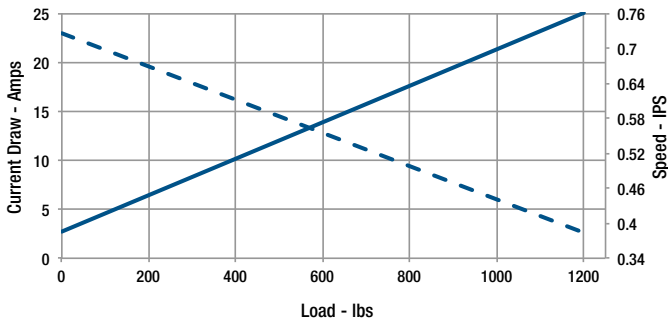
K2G10-24VDC



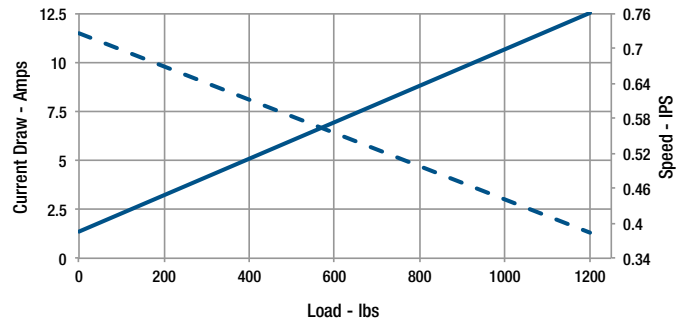
Load Capacity 1200 lbs.

For Metric Measurements, see page 30.

K2G20-12VDC



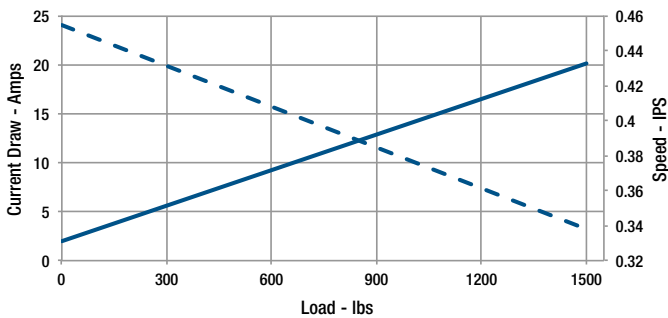
K2G20-24VDC



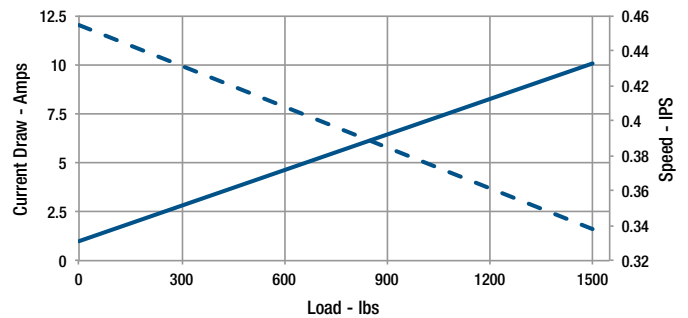
Load Capacity 1500 lbs.

For Metric Measurements, see page 30.

K2G30-12VDC



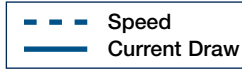
K2G30-24VDC



B-Track K2

Performance Graphs Metric Measurements*

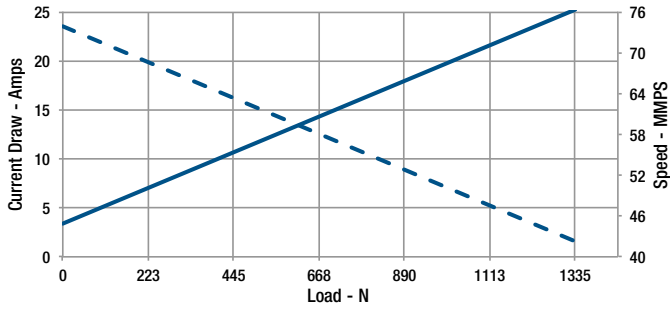
*Performance Chart Measurements are Nominal



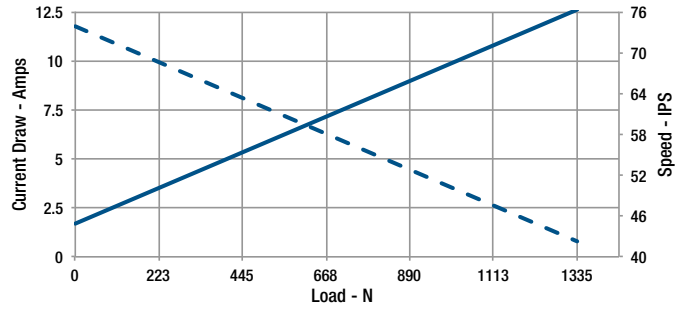
Load Capacity 1335 N

For Imperial Measurements, see page 29.

K2G05-12VDC



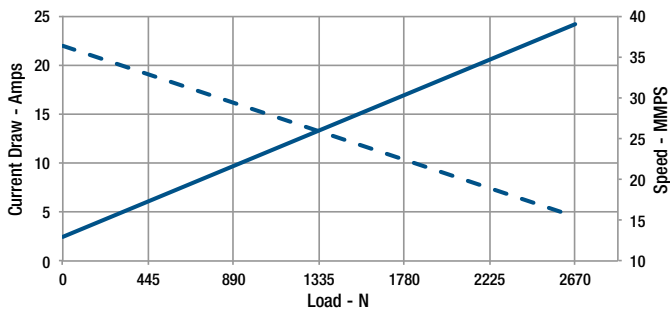
K2G05-24VDC



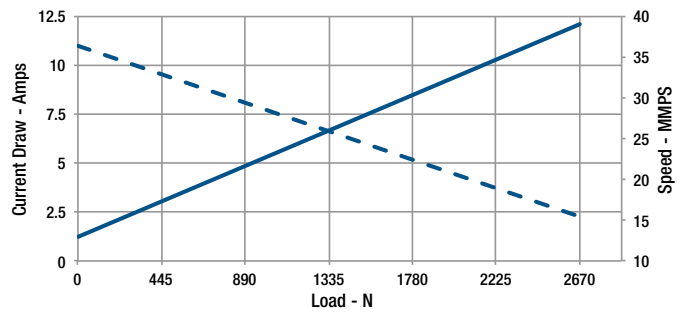
Load Capacity 2670 N

For Imperial Measurements, see page 29.

K2G10-12VDC



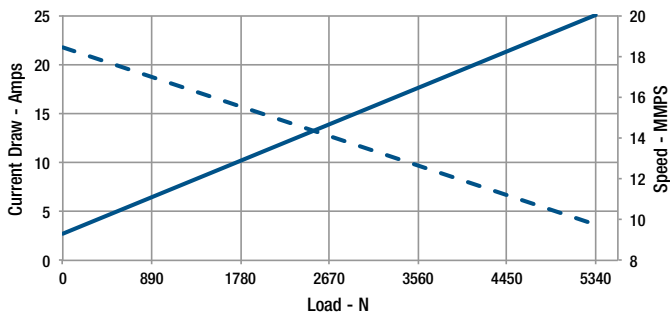
K2G10-24VDC



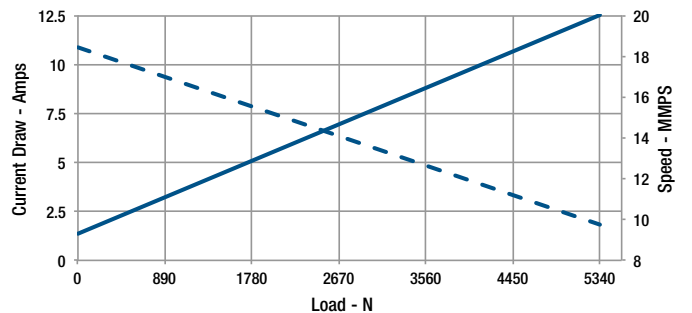
Load Capacity 5340 N

For Imperial Measurements, see page 29.

K2G20-12VDC



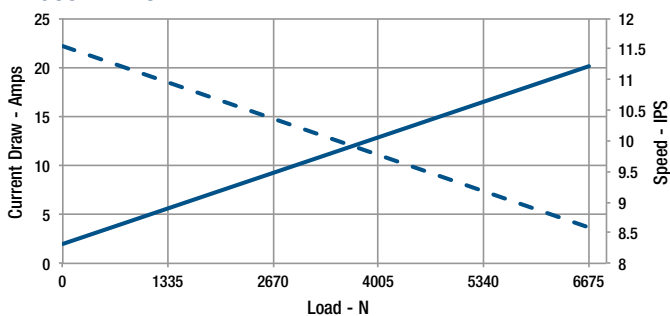
K2G20-24VDC



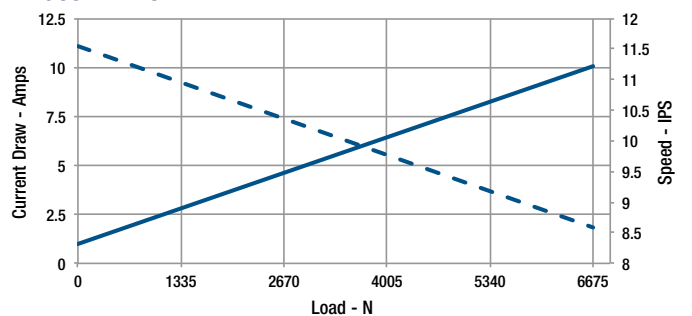
Load Capacity 6675 N

For Imperial Measurements, see page 29.

K2G30-12VDC



K2G30-24VDC



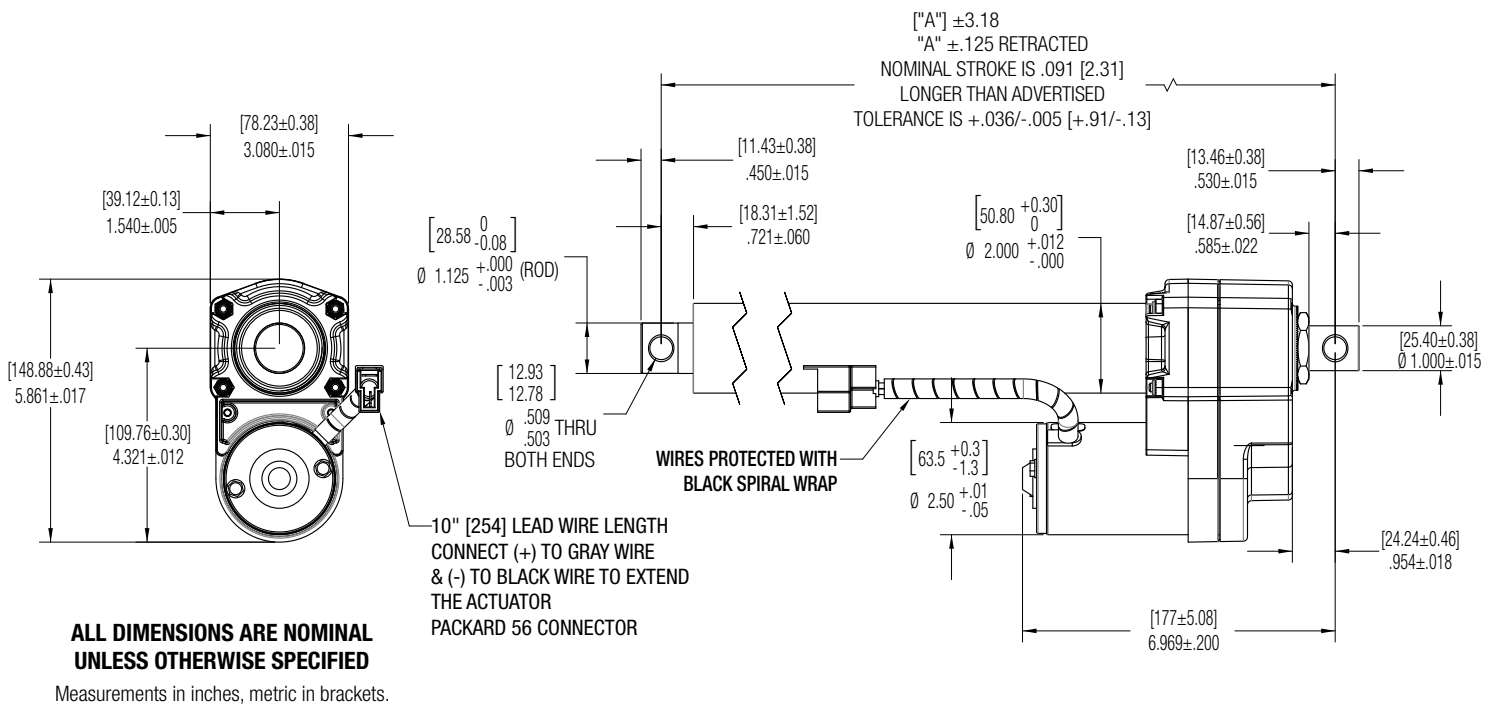
Dimensions

B-Track K2	Stroke	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
		A	2	51	4	102	6	152	8	203	10	254	12
		8.32	211.3	10.32	262.1	12.32	312.9	14.32	363.7	16.32	414.5	18.32	465.3

Note: Special lengths available

B-Track K2	Stroke	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
		A	14	356	16	406	18	457	20	508	22	559	24
		20.32	516.1	22.32	566.9	24.32	617.7	29.32	744.7	31.32	795.5	33.32	846.3

Note: Special lengths available



Rugged Duty Actuator AC Motor Acme Screw



Up to 1,100 lbs. (4893 N) Rated Load
Up to 1 in. (25.4mm)/sec. Travel Speed

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.

Now Available Optional Adjustable Limit Switch These easy to use adjustable switches are mounted in a channel on the cover tube with custom cap for protection. They are easily moved to enable the end-user the flexibility of setting the stroke length at any position within the full stroke capability.

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**
- **Stroke lengths** 4 to 24 inches (100 to 600 millimeters)
- **Load capacities** up to 1100 pounds (4893 N)
- **Speeds up to** 1 inches (25.4 millimeters)/sec. travel
- **Thermal overload** incorporated into the motor
- **Heavy wall construction**
- **Double ball bearing motors**
- **Heat treated gears**
- **Rugged extension rod** bearing support
- **Custom mounting** options available
- **Limit switches** offered only in the adjustable version (EP1.x)

Typical Applications

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



Scan to watch!

How to Adjust the Limit Switches for a K2 or K2X Actuator with External or EP Limit Switches
<https://p.widencdn.net/imzc9v>

Load/Current/Speed/Duty Cycle

- Maximum Static Rating: 3,000 lbs. (13345 N) Static (in-line load)
- Refer to performance chart for load/current/speed capabilities
- Stroke Length Tolerance: +/- .06" (1.52 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: -20° F to +150° F (-29° C to +65° C), -40° F to +176° F (-40° C to +80° C) Upon Request.
- Weather resistant enclosure & seals (IP 54 capable, 250 hour salt spray, 500 hour for paint)
- Normal operating voltage: 115 VAC or 230 VAC

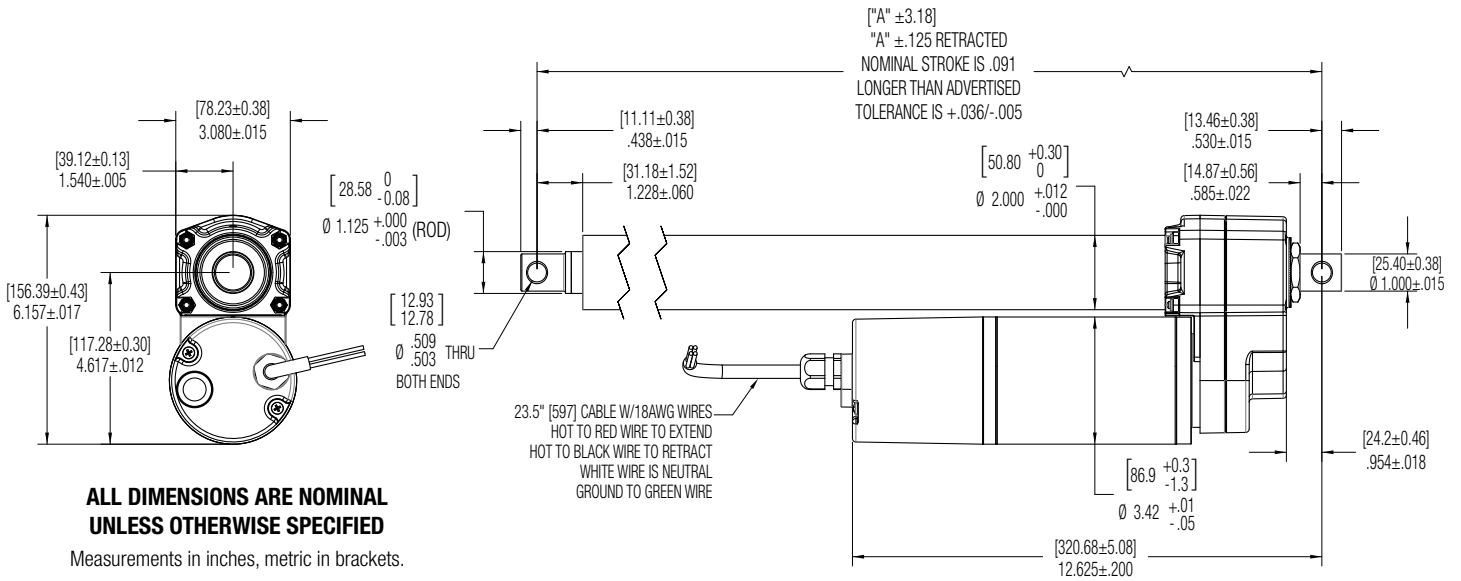
Control/Connections

- 14 gauge stranded lead wires-UL style 1230 w/PVC insulation Class F 105° C
- Use momentary contact switch in powering unit for extend/retract operation. (ON)-OFF-(ON) SPDT

Dimensions

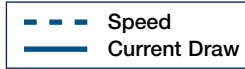
B-Track K2AC	Stroke	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
		4	100	6	150	8	200	12	300	18	450	24	600
	A	14.96	380.0	16.97	431.0	18.94	481.1	22.95	582.9	28.94	735.1	34.92	887.0

Note: Special lengths available



B-Track K2AC

Performance Graphs Imperial Measurements*

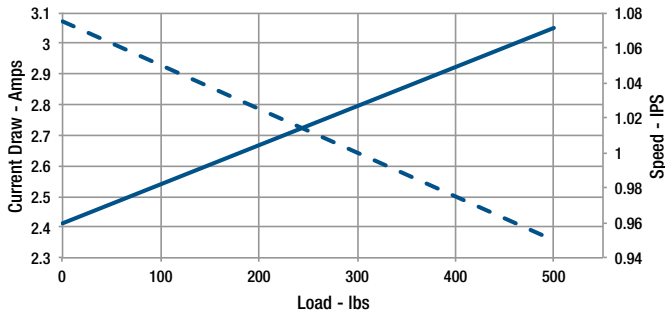


*Performance Chart Measurements are Nominal

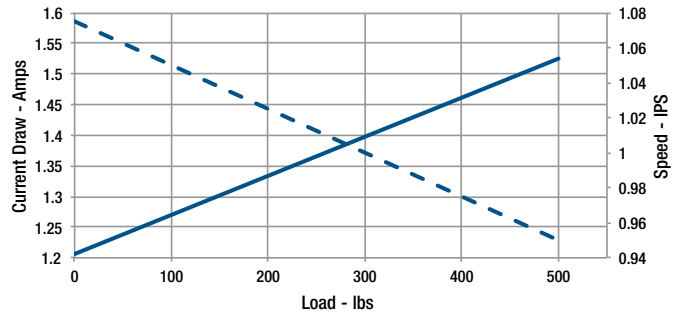
Load Capacity 500 lbs.

For Metric Measurements, see page 35.

K2G10-115VAc



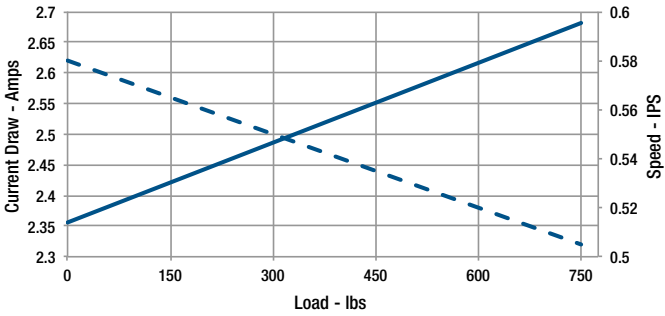
K2G10-230VAc



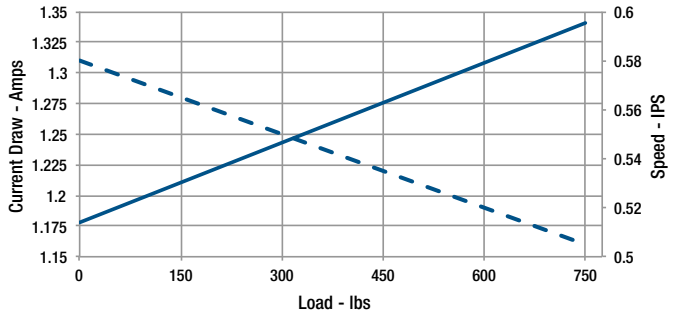
Load Capacity 750 lbs.

For Metric Measurements, see page 35.

K2G20-115VAc



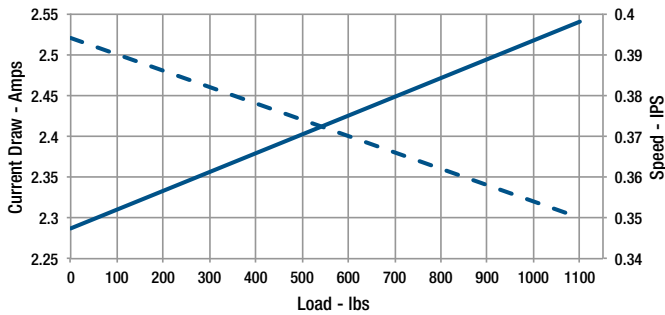
K2G20-230VAc



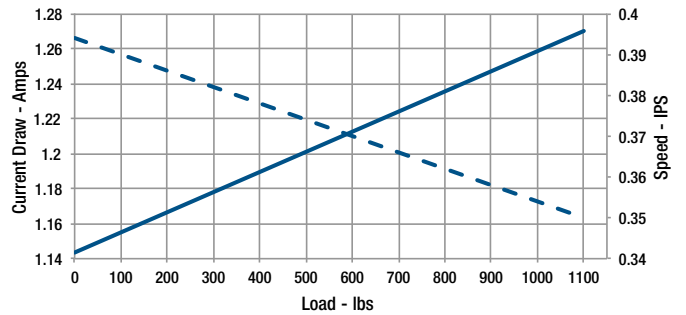
Load Capacity 1100 lbs.

For Metric Measurements, see page 35.

K2G30-115VAc



K2G30-230VAc





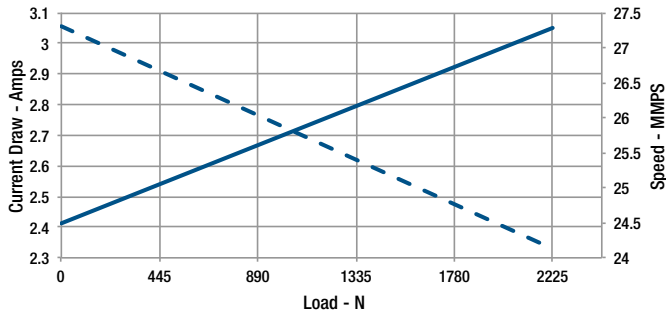
Performance Graphs Metric Measurements*

*Performance Chart Measurements are Nominal

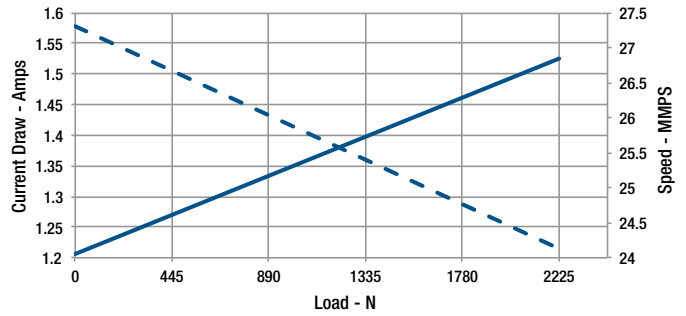
Load Capacity 2225 N

For Imperial Measurements, see page 34.

K2G10-115V_{AC}



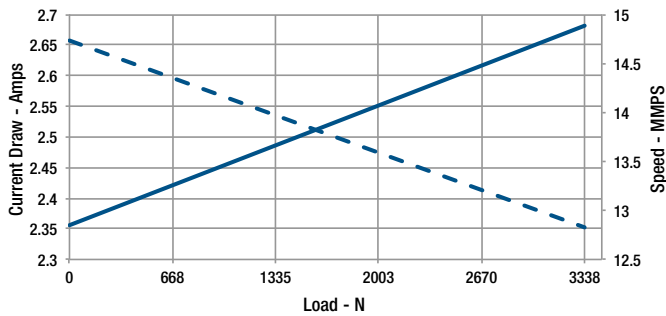
K2G10-230V_{AC}



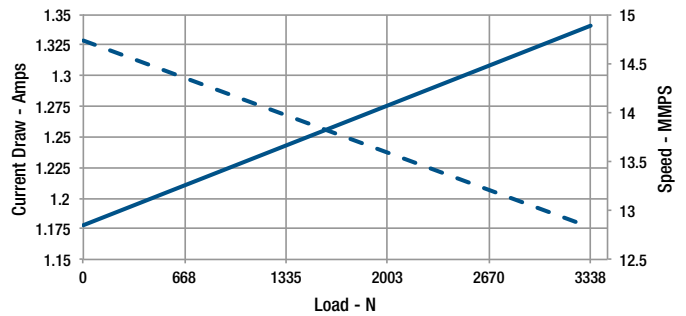
Load Capacity 3338 N

For Imperial Measurements, see page 34.

K2G20-115V_{AC}



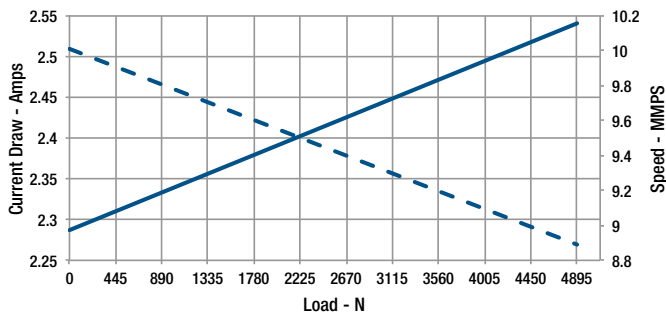
K2G20-230V_{AC}



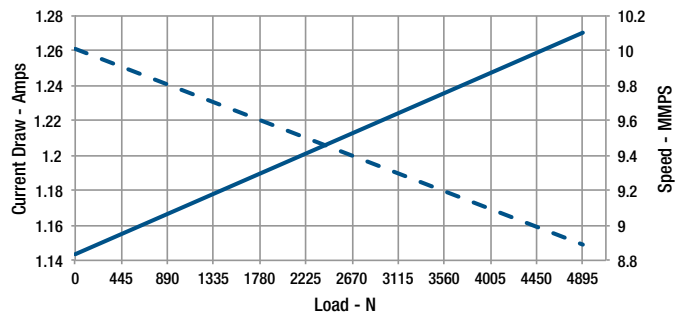
Load Capacity 4895 N

For Imperial Measurements, see page 34.

K2G30-115V_{AC}



K2G30-230V_{AC}



B-Track K2x

Rugged Duty Actuator DC Motor Ball Screw

Up to 2,800 lbs. (12455 N) Rated Load
Up to 2.1 in. (53.34mm)/sec. 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 2,800 lb. (12455 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.

Now Available Optional Adjustable Limit Switch These easy to use adjustable switches are mounted in a channel on the cover tube with custom cap for protection. They are easily moved to enable the end-user the flexibility of setting the stroke length at any position within the full stroke capability.

Features

- **Protective coatings** and O-ring seals throughout
- **Efficient in-line** ball screw system
- **Integral load** holding brake
- **Ball detent overload clutch**
- **Stroke lengths** 2 to 24 inches (50 to 600 millimeters)
- **Load capacities** up to 2,800 pounds (12455 N)
- **Speeds up to** 2.1 inches (53.34 mm)/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 (IP 54)
- **Custom mounting** options available

Typical Applications

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



Scan to watch!

How to Adjust the Limit Switches for a K2 or K2X Actuator with External or EP Limit Switches
<https://p.widencdn.net/imzc9v>

Load/Current/Speed/Duty Cycle

- Maximum Static Rating: 3,000 lbs. (13345 N) Static (in-line load)
- Refer to performance chart for load/current/speed capabilities
- Stroke Length Tolerance: +/- .06" (1.52 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: -20° F to +150° F (-29° C to +65° C), -40°F to +176°F (-40°C to +80°C) Upon Request.
- Weather resistant enclosure & seals (IP69K static, IP65 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 spiral 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) Upon Request

Performance Graphs Imperial Measurements*

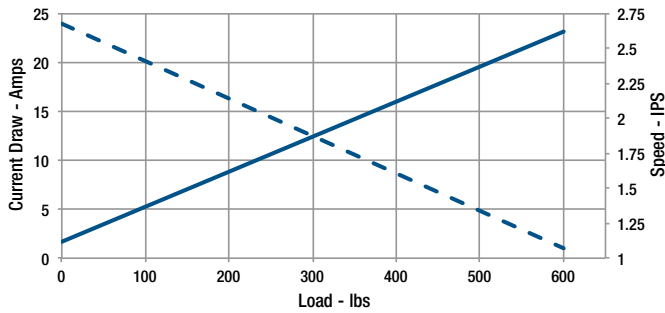
*Performance Chart Measurements are Nominal



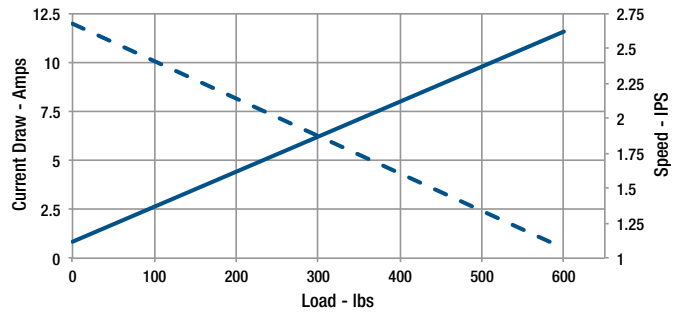
Load Capacity 600 lbs.

For Metric Measurements, see page 38.

K2XG05-12VDC



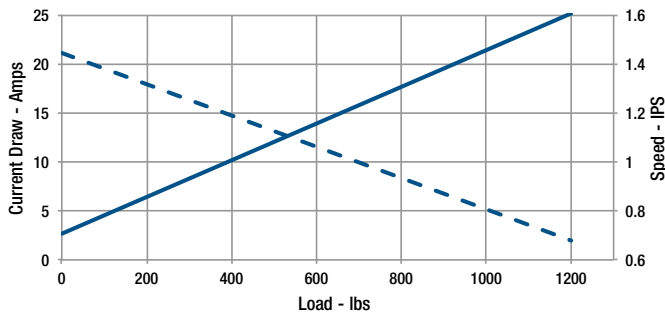
K2XG05-24VDC



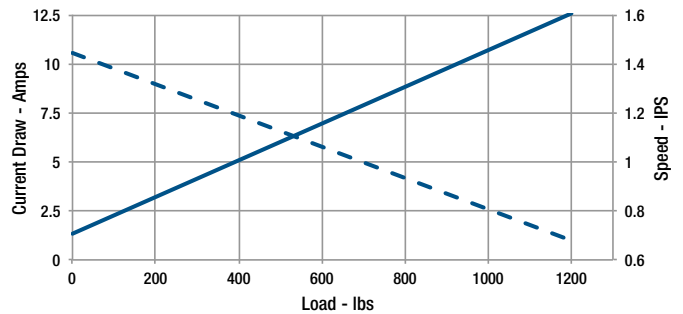
Load Capacity 1200 lbs.

For Metric Measurements, see page 38.

K2XG10-12VDC



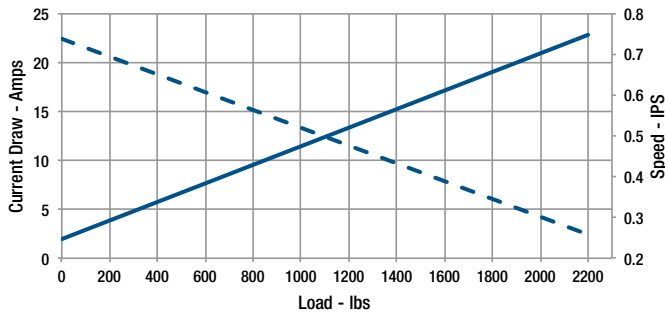
K2XG10-24VDC



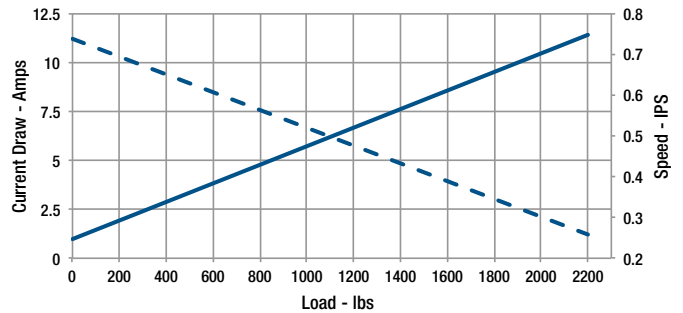
Load Capacity 2200 lbs.

For Metric Measurements, see page 38.

K2XG20-12VDC



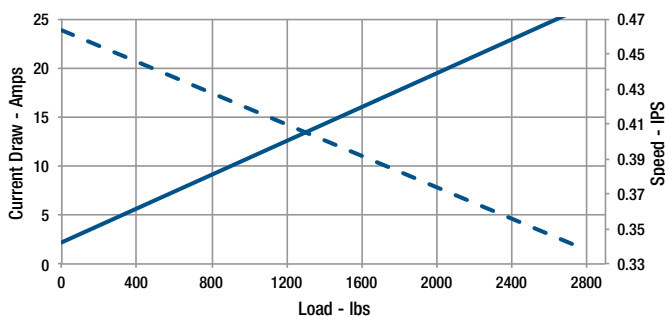
K2XG20-24VDC



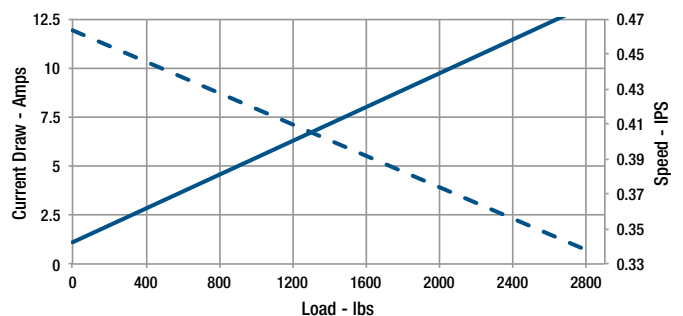
Load Capacity 2800 lbs.

For Metric Measurements, see page 38.

K2XG30-12VDC



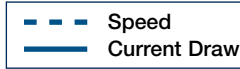
K2XG30-24VDC



B-Track K2x

Performance Graphs Metric Measurements*

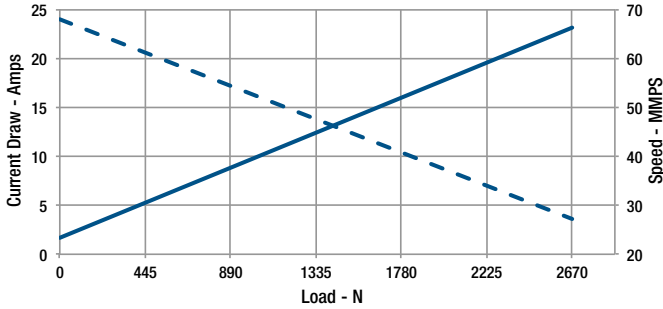
*Performance Chart Measurements are Nominal



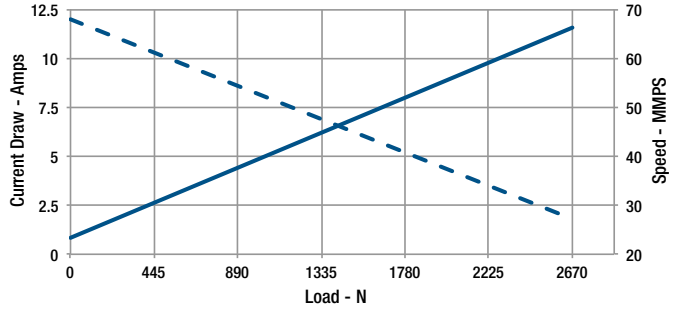
Load Capacity 2670 N

For Imperial Measurements, see page 37.

K2XG05-12VDC



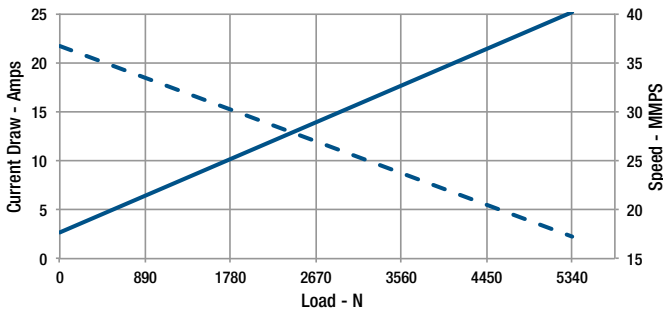
K2XG05-24VDC



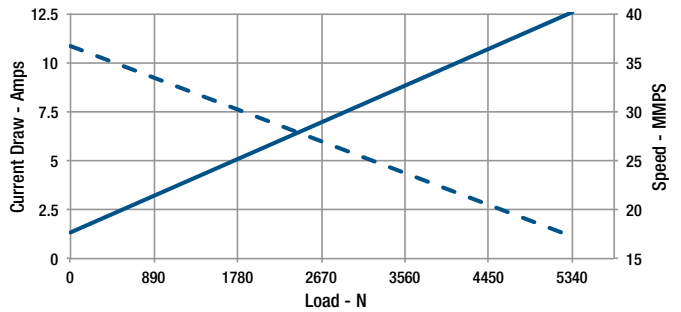
Load Capacity 5340 N

For Imperial Measurements, see page 37.

K2XG10-12VDC



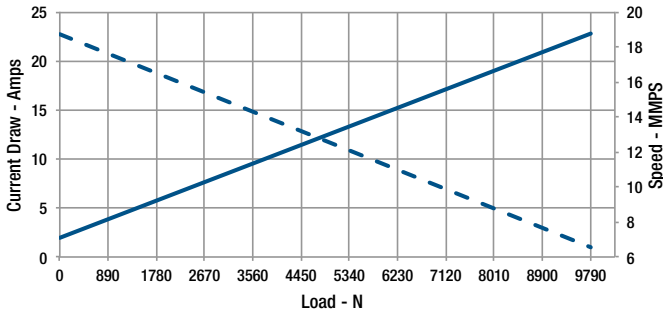
K2XG10-24VDC



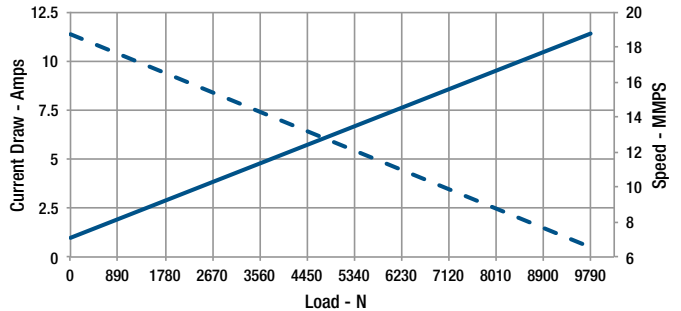
Load Capacity 9790 N

For Imperial Measurements, see page 37.

K2XG20-12VDC



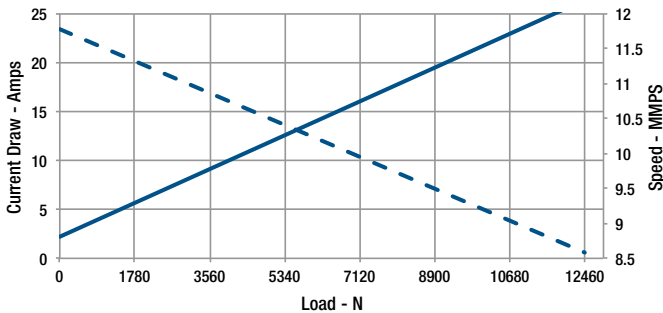
K2XG20-24VDC



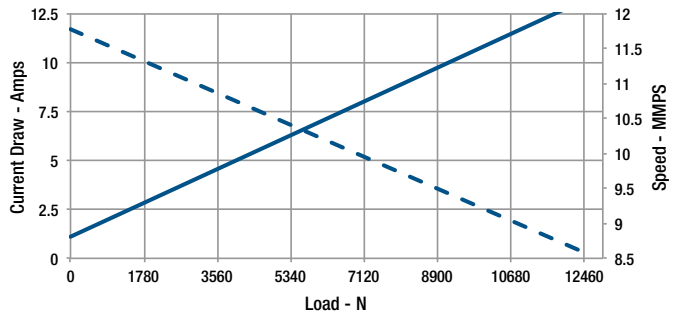
Load Capacity 12,460 N

For Imperial Measurements, see page 37.

K2XG30-12VDC



K2XG30-24VDC



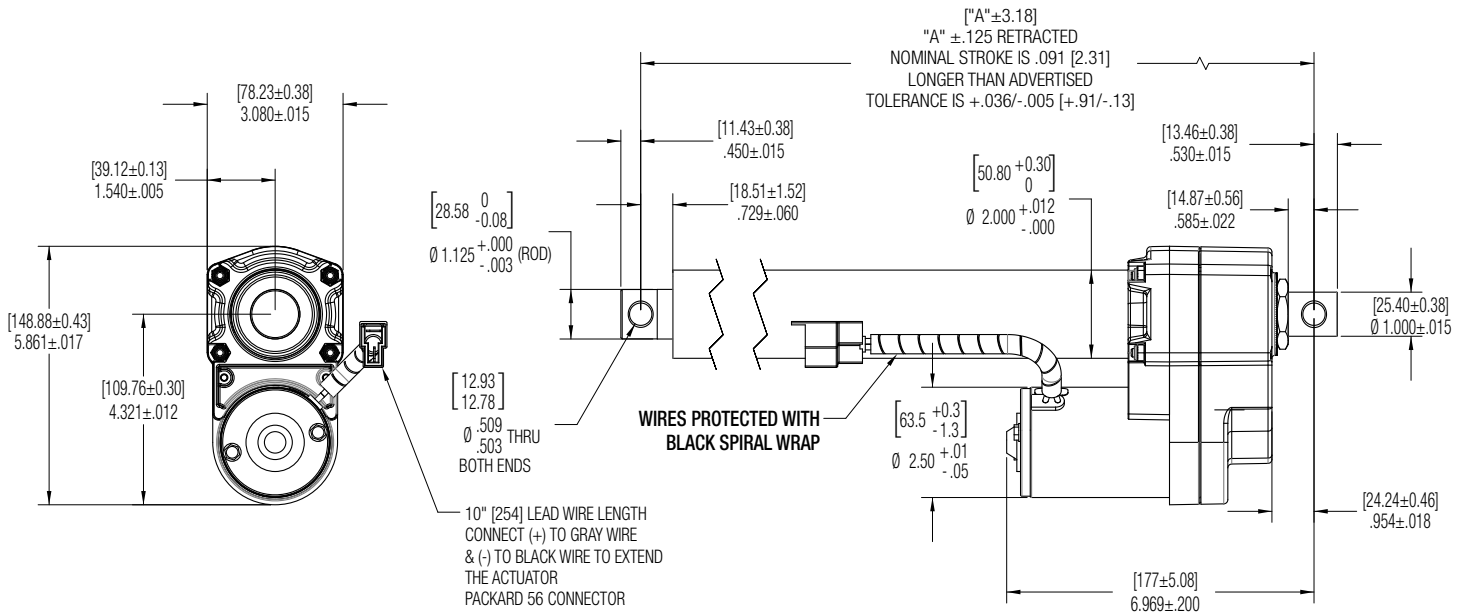
Dimensions

B-Track K2x	Stroke	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
		2	51	4	102	6	152	8	203	10	254	12	305
	A	9.89	251.2	11.89	302.0	13.89	352.8	15.89	403.6	17.89	454.4	19.89	505.2

Note: Special lengths available

B-Track K2x	Stroke	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
		14	356	16	406	18	457	20	508	22	559	24	610
	A	21.89	556.0	23.89	606.8	25.89	657.6	30.89	784.6	32.89	835.4	34.89	886.2

Note: Special lengths available



**ALL DIMENSIONS ARE NOMINAL
UNLESS OTHERWISE SPECIFIED**

Measurements in inches, metric in brackets.

Rugged Duty Actuator AC Motor Ball Screw



Up to 2,000 lbs. (8900 N) Rated Load
Up to 2.1 in. (53.34 mm)/sec. 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 2,000 lb. (8900 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.

Now Available Optional Adjustable Limit Switch These easy to use adjustable switches are mounted in a channel on the cover tube with custom cap for protection. They are easily moved to enable the end-user the flexibility of setting the stroke length at any position within the full stroke capability.

Features

- **Protective coatings** and O-ring seals throughout
- **Efficient in-line ball screw system**
- **Integral load holding brake**
- **Ball detent overload clutch**
- **Stroke lengths** 4 to 24 inches (100 to 600 millimeters)
- **Load capacities** up to 2,000 pounds (8900 N)
- **Speeds up to** 2.1 inches (53.34 millimeters)/sec. travel
- **Thermal overload** incorporated into the motor
- **Heavy wall construction**
- **Double ball bearing motors**
- **Heat treated gears**
- **Rugged extension rod** bearing support
- **Custom mounting** options available
- **Limit switches** offered only in the adjustable version (EP1.x)

Typical Applications

- Engine Lifts
- Tables
- Indoor Applications
- Machine Tools
- Egg Rotation



Scan to watch!

How to Adjust the Limit Switches for a K2 or K2X Actuator with External or EP Limit Switches
<https://p.widencdn.net/imzc9v>

Load/Current/Speed/Duty Cycle

- Maximum Static Rating: 3,000 lbs. (13345 N) Static (in-line load)
 - Refer to performance chart for load/current/speed capabilities
 - Stroke Length Tolerance: +/- .06" (1.52 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: -20° F to +150° F (-29° C to +65° C), -40° F to +176° F (-40° C to +80° C) Upon Request.
- Weather resistant enclosure & seals (IP 54 capable, 250 hour salt spray, 500 hour for paint)
- Normal operating voltage: 110-240 VAC

Control/Connections

- 14 gauge stranded lead wires-UL style 1230 w/PVC insulation Class F 105° C
- Use momentary contact switch in powering unit for extend/retract operation. (ON)-OFF-(ON) SPDT

Performance Graphs Imperial Measurements*

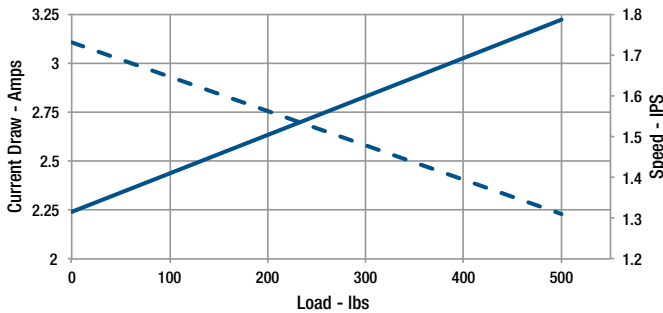
*Performance Chart Measurements are Nominal



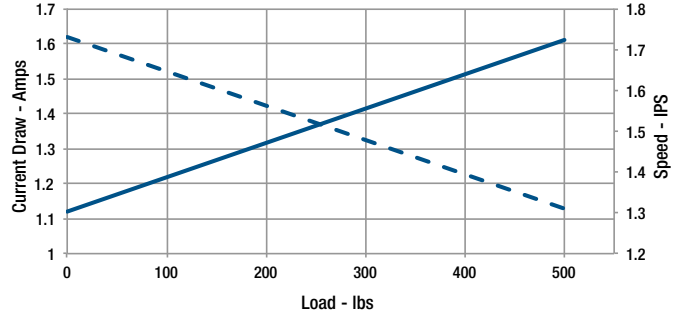
Load Capacity 500 lbs.

For Metric Measurements, see page 42.

K2xG05-115VAC



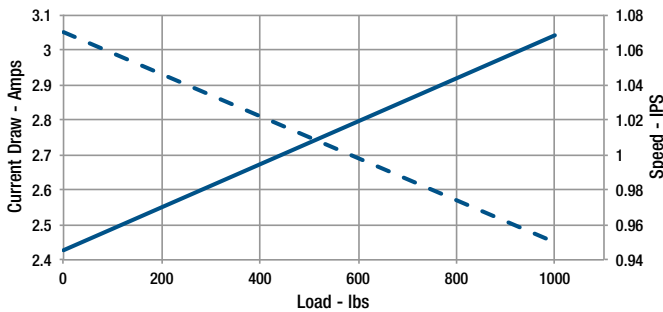
K2xG05-230VAC



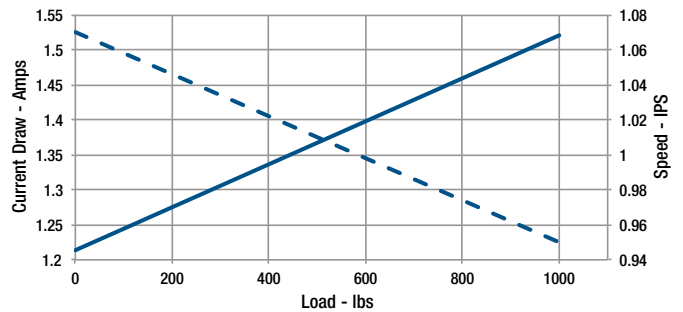
Load Capacity 1000 lbs.

For Metric Measurements, see page 42.

K2xG10-115VAC



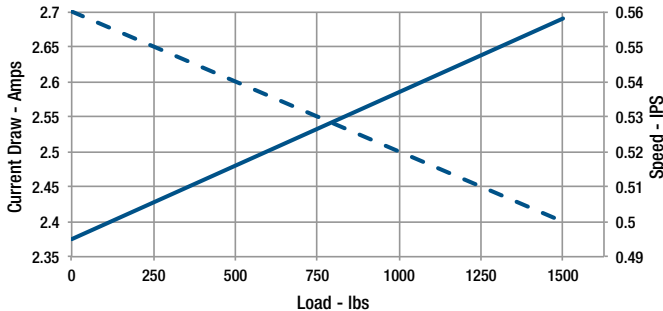
K2xG10-230VAC



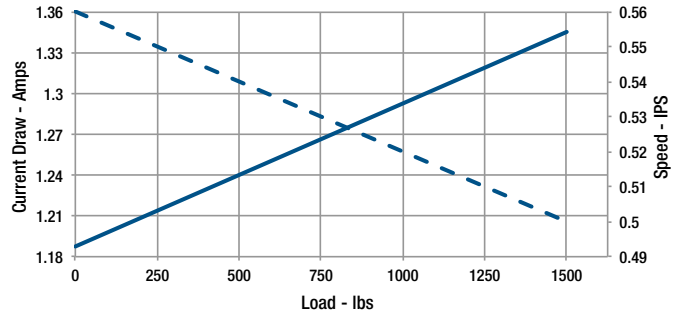
Load Capacity 1500 lbs.

For Metric Measurements, see page 42.

K2xG20-115VAC



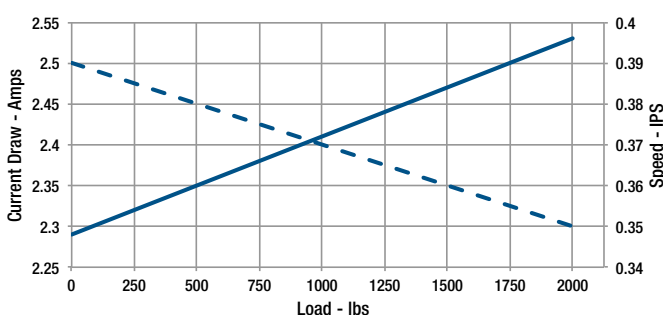
K2xG20-230VAC



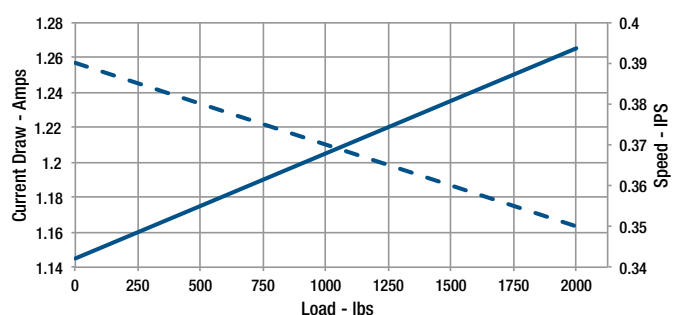
Load Capacity 2000 lbs.

For Metric Measurements, see page 42.

K2xG30-115VAC



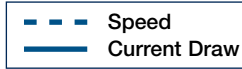
K2xG30-230VAC



B-Track K2xAc

Performance Graphs Metric Measurements*

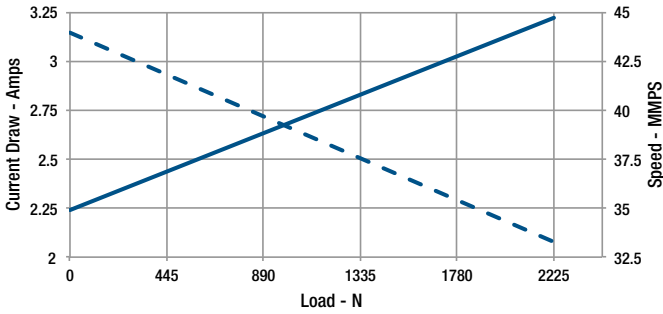
*Performance Chart Measurements are Nominal



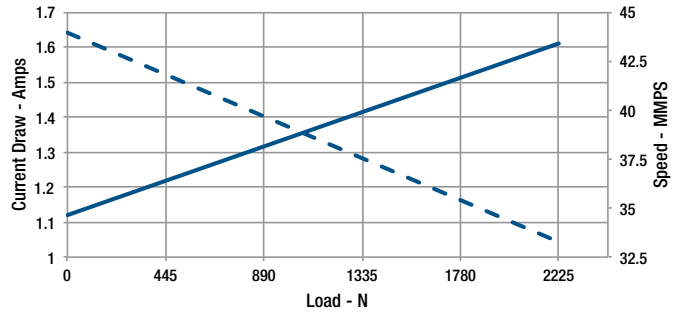
Load Capacity 2225 N

For Imperial Measurements, see page 41.

K2xG05-115VAc



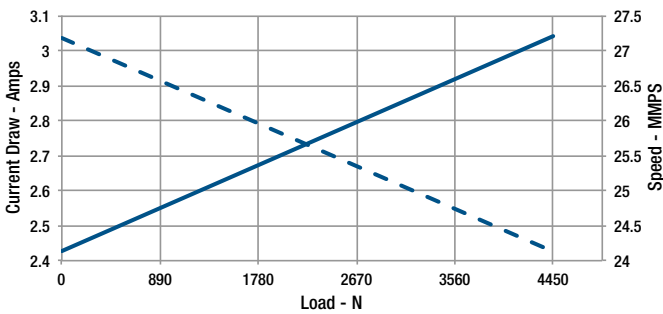
K2xG05-230VAc



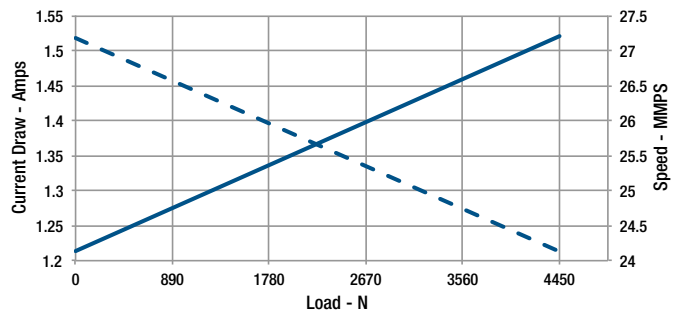
Load Capacity 4450 N

For Imperial Measurements, see page 41.

K2xG10-115VAc



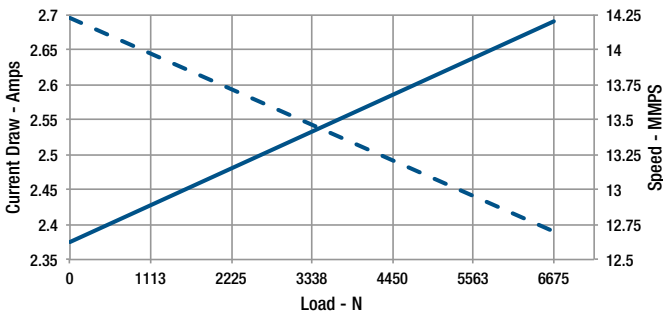
K2xG10-230VAc



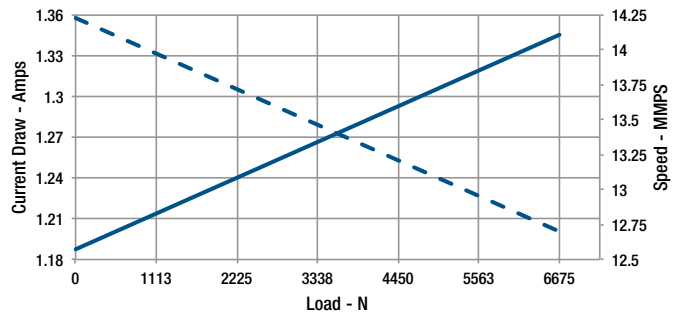
Load Capacity 6675 N

For Imperial Measurements, see page 41.

K2xG20-115VAc



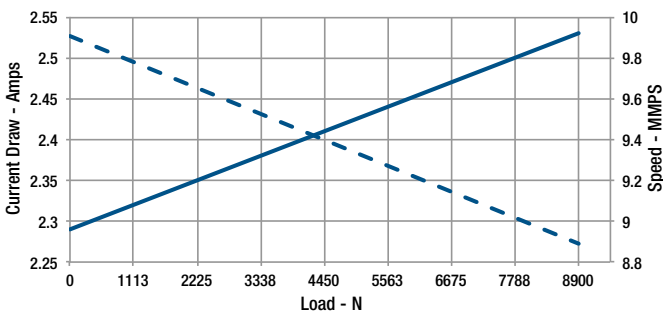
K2xG20-230VAc



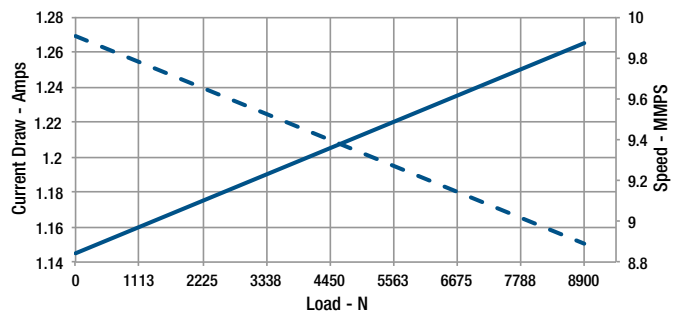
Load Capacity 8900 N

For Imperial Measurements, see page 41.

K2xG30-115VAc



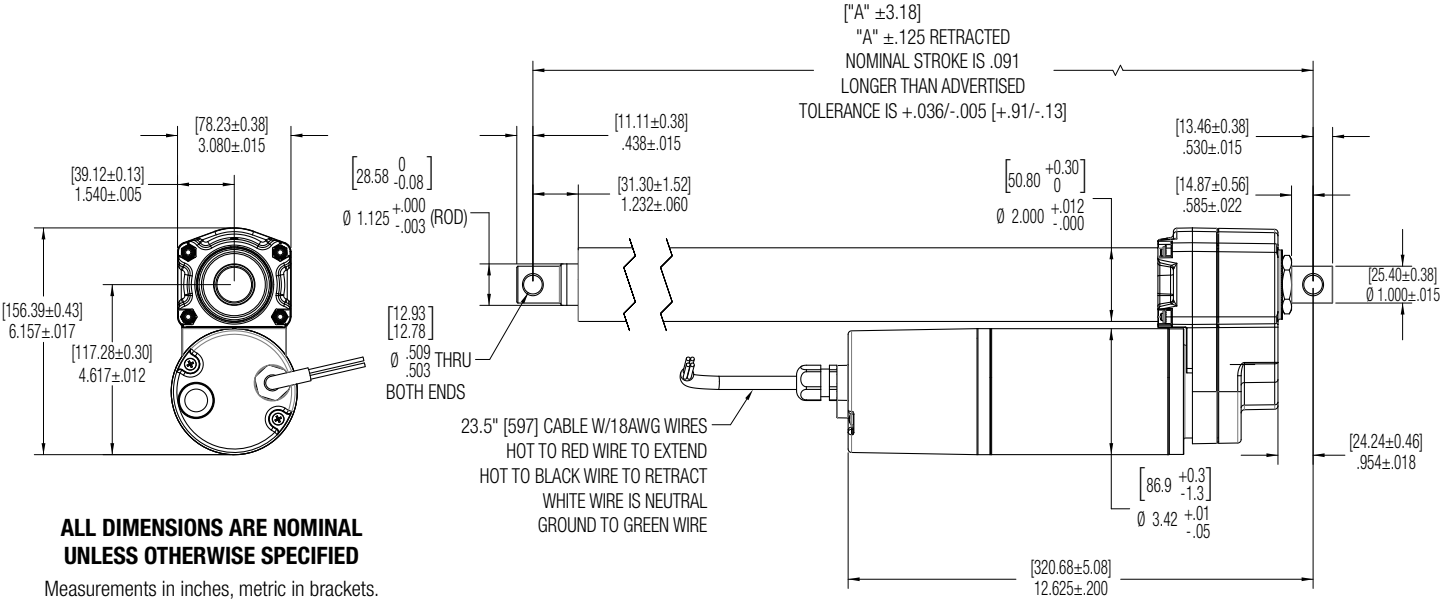
K2xG30-230VAc



Dimensions

B-Track K2xAC	Stroke	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
		4	100	6	150	8	200	12	300	18	450	24	600
	A	14.96	380.0	16.97	431.0	18.94	481.1	22.95	582.9	28.94	735.1	34.92	887.0

Note: Special lengths available



Custom Actuators



Examples of special request features

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.

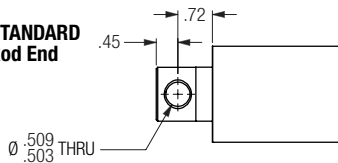
A few of our standard special offerings:

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

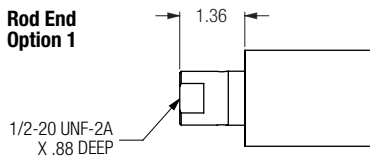
B-Track Rod End Mounting Options

Dimensions are in inches

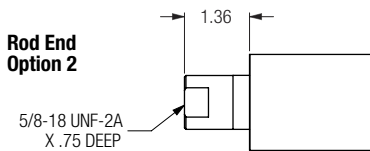
STANDARD Rod End



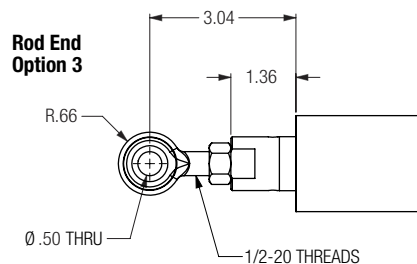
Rod End Option 1



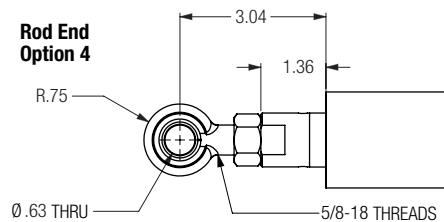
Rod End Option 2



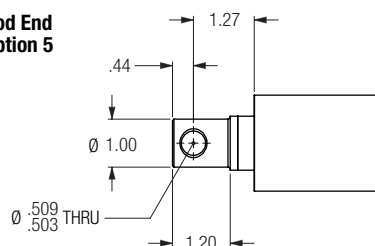
Rod End Option 3



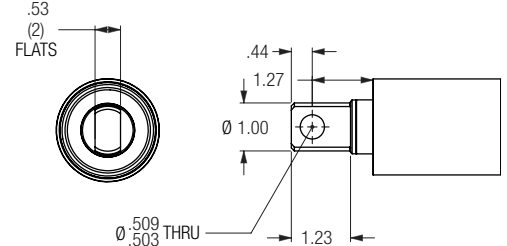
Rod End Option 4



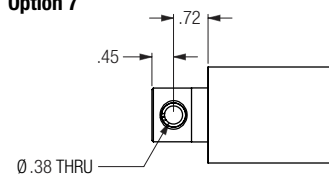
Rod End Option 5



Rod End Option 6



Rod End Option 7



Rod End Mounting Option Examples

(Available for B-Track models only, consult factory for more options)

- | | |
|---------------------------|------------------------|
| 1. 1/2" Threaded rod end | 5. 1" Extended rod end |
| 2. 5/8" Threaded rod end | 6. Flat sided rod end |
| 3. 1/2" Spherical rod end | 7. 3/8" Rod end insert |
| 4. 5/8" Spherical rod end | |

Consult with factory for specific mounting configuration needs.



Standard

Custom Actuator 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.

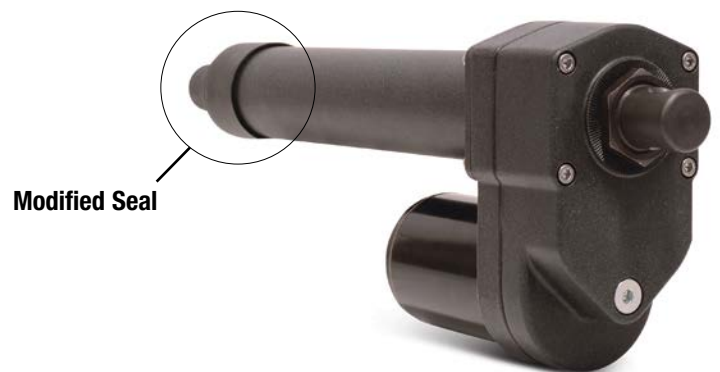
- A teaming of creative resources
- Joint understanding of our actuator capabilities and how they can be tailored to your application
- An understanding of the lowest cost solution to meet your actuator requirements
- Providing a complete solution that includes controls as required

Warner Linear routinely provides actuators modified to meet specific customer application requirements

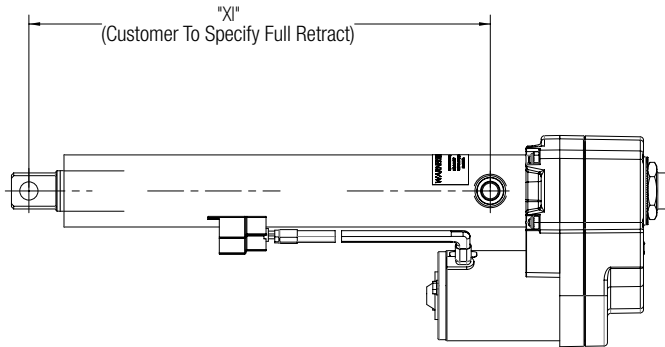
Some common versions of these are shown as our K2PL/K2XPL and K2JS/K2XJS families.

Additional common modifications are:

Modified Seal design for expanded contamination protection



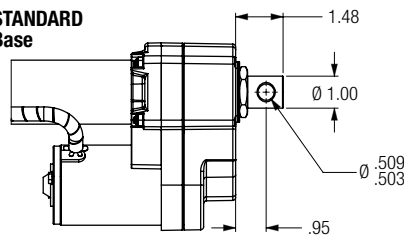
Tube/Trunnion Mount



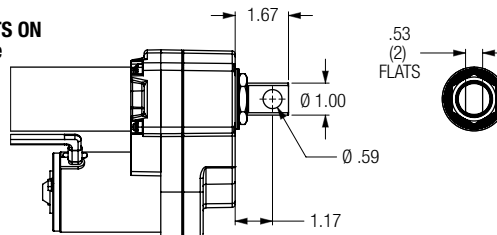
B-Track Base Clevis Options

Dimensions are in inches

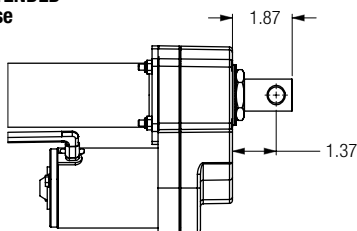
STANDARD Base



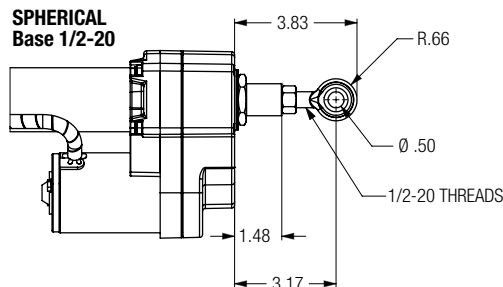
FLATS ON Base



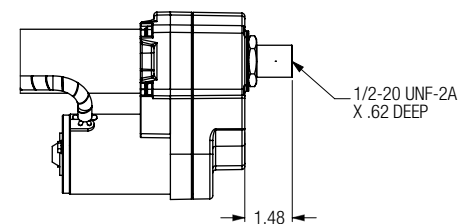
EXTENDED Base



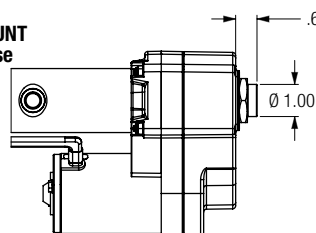
SPHERICAL Base 1/2-20



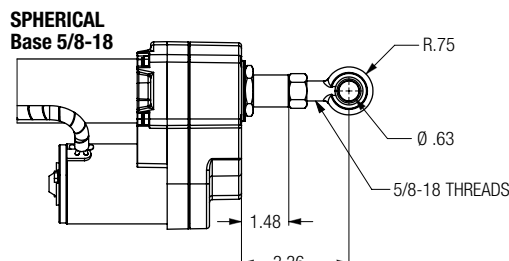
THREADED Base 1/2-20



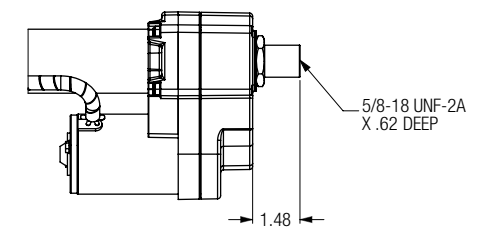
BLUNT Base



SPHERICAL Base 5/8-18



THREADED Base 5/8-18



B-Track K2_{PL} / K2_{XPL}

Power Lift Actuator DC Motor – Acme or Ball Screw

Up to 2,200 lbs. (9786 N) Rated Load
Up to 2.1 in. (53.34 mm)/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. Suggested for tension applications only. Consult factory for compression loading applications.

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**
- **Stroke lengths** 4 to 24 inches (100 to 600 millimeters)
- **Load capacities** up to 2200 pounds (9786 N)
- **Speeds up to** 2.1 inches (53.34 millimeters)/sec. travel
- **Thermal overload** incorporated into the motor
- **Heavy wall construction**
- **Double ball bearing motors**
- **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: 3,000 lbs. (13345 N) Static (in-line load)
- Refer to performance chart for load/current/speed capabilities
- Stroke Length Tolerance: +/- .06" (1.52 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: -20° F to +150° F (-29° C to +65° C), -40° F to +176° F (-40° C to +80° C) Upon Request.
- Weather resistant enclosure & seals (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 spiral 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 Graphs

See pages 29-30 for K2PL performance charts.
See pages 37-38 for K2xPL performance charts.

Dimensions

B-Track K2PL	Stroke	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
		4	102	6	152	8	203	10	254	12	305	14	356
	A	7.03	178.6	9.03	229.4	11.03	280.2	13.03	331.0	15.03	381.8	17.03	432.6

Note: Special lengths available

B-Track K2PL	Stroke	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
		16	406	18	457	20	508	22	559	24	610
	A	19.03	483.4	21.03	534.2	23.03	585.0	25.03	635.8	27.03	686.6

Note: Special lengths available

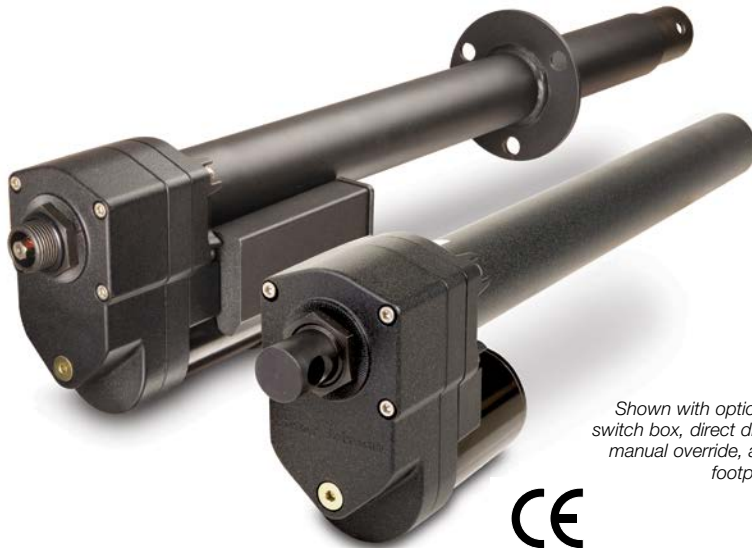
B-Track K2xPL	Stroke	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
		4	102	6	152	8	203	10	254	12	305	14	356
	A	8.53	216.7	10.53	267.5	12.53	318.3	14.53	369.1	16.53	419.9	18.53	470.7

Note: Special lengths available

B-Track K2xPL	Stroke	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
		16	406	18	457	20	508	22	559	24	610
	A	20.53	521.5	22.53	572.3	24.53	623.1	26.53	673.9	28.53	724.7

Note: Special lengths available

Jack Stand Actuator DC Motor – Acme or Ball Screw



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



Up to 2,800 lbs. (12455 N) Rated Load
Up to 2.1 in. (53.34 mm)/sec. Travel Speed

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 high-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**
- **Stroke lengths** 8 to 16 inches (200 to 400 millimeters)
- **Load capacities** up to 2,800 pounds (12455 N)
- **Speeds up to** 2.1 inches (53.34 millimeters)/sec. travel
- **Thermal overload** incorporated into the motor
- **Heavy wall construction**
- **Double ball bearing motors**
- **Heat treated gears**
- **Rugged extension rod** bearing support
- **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: 3,000 lbs. (13345 N) Static (in-line load)
 - Refer to performance chart for load/current/speed capabilities
 - Stroke Length Tolerance: +/- .06" (1.52 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: -20° F to +150° F (-29° C to +65° C), -40° F to +176° F (-40° C to +80° C) Upon Request.
- Weather resistant enclosure & seals (IP 54 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 spiral 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 Graphs

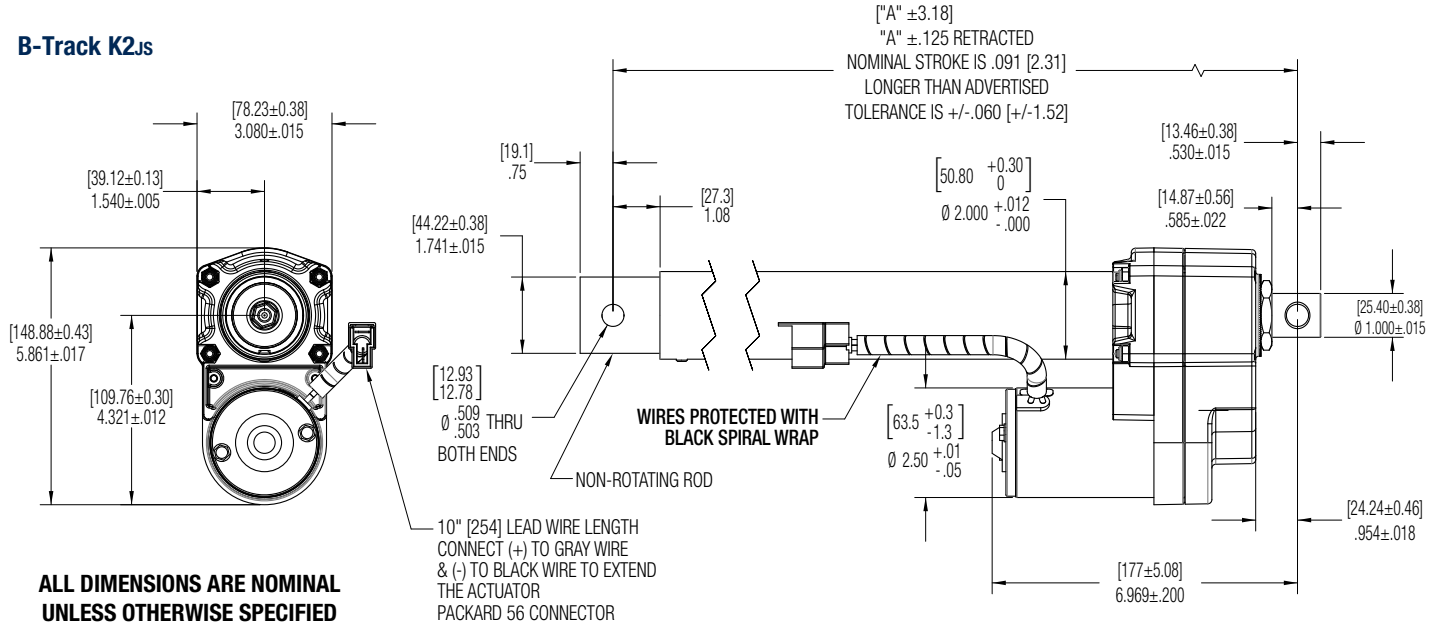
See page 29-30 for K2Js performance charts.
See page 37-38 for K2xJs performance charts.

Dimensions

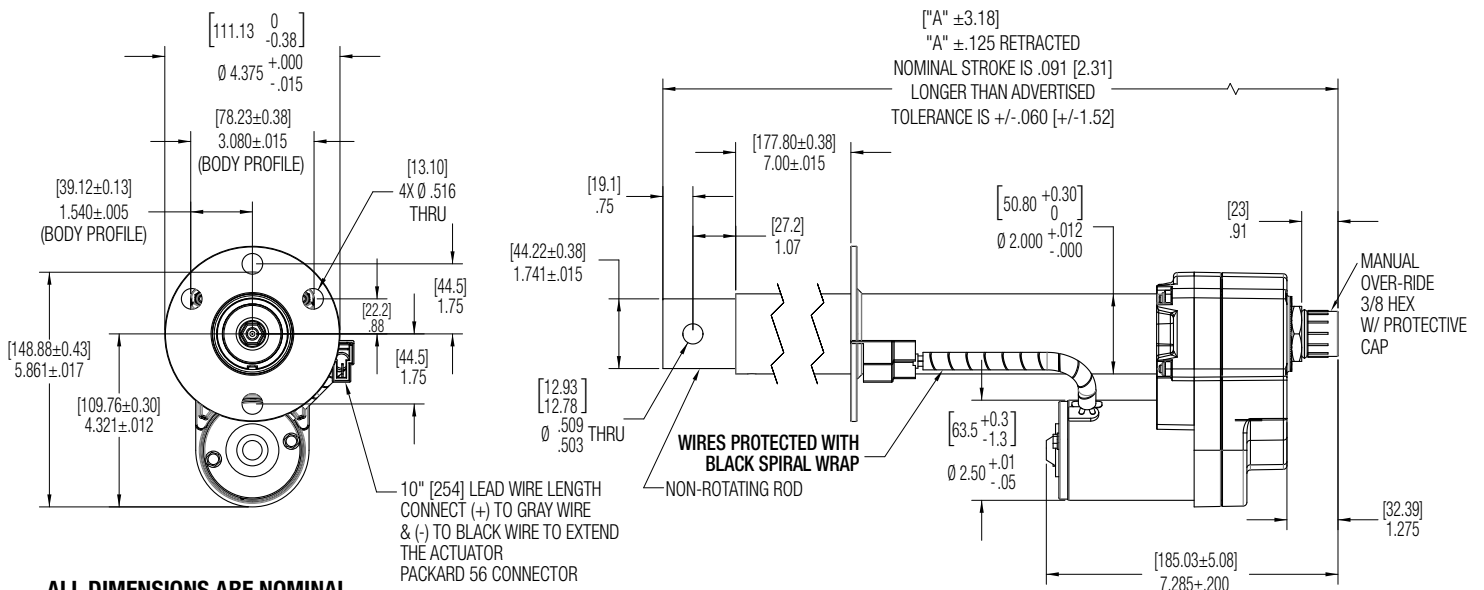
B-TRACK K2Js/ K2xJs	Stroke	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
		A	20.98	532.9	22.98	583.7	24.98	634.5	26.98	685.3	28.98

Note: Special lengths available

B-Track K2Js



B-Track K2xJs



Rotary Actuator DC Motor



Shown with extended gear box screws for ease of attachment.



Optional Configurations



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**
- **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

Up to 140 in.-lb. (16 Nm) Torque Output Speeds from 250 to 850 RPM

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.

Load/Current/Speed/Duty Cycle

- Maximum Static Rating: 3,000 lbs. (13345 N) 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: -20° F to +150° F (-29° C to +65° C), -40° F to +176° F (-40° C to +80° C) Upon Request.
- 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 (125° C)
- Lead wires abrasion protected with spiral 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)

B-Track K2RA

Performance Graphs Imperial Measurements*

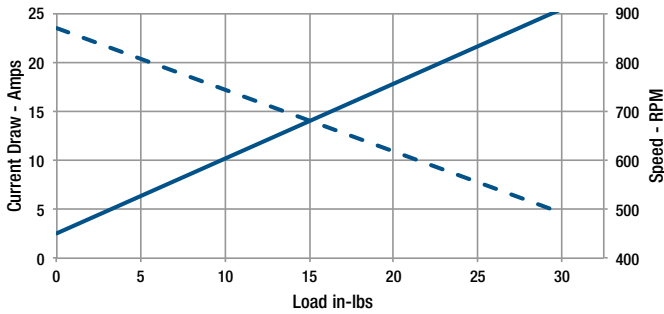
*Performance Chart Measurements are Nominal



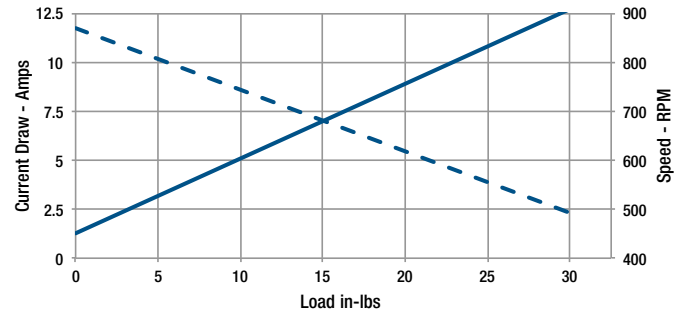
Load Capacity 30 in-lbs.

For Metric Measurements, see page 53.

K2RAG05-12VDC



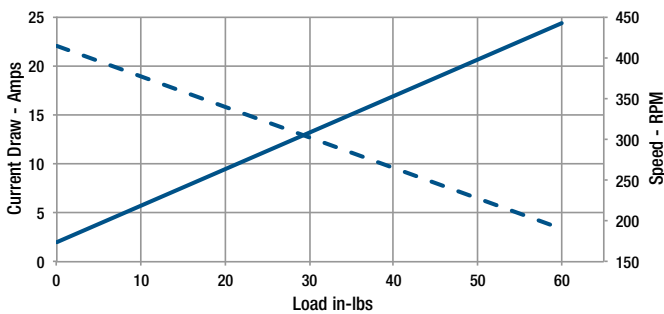
K2RAG05-24VDC



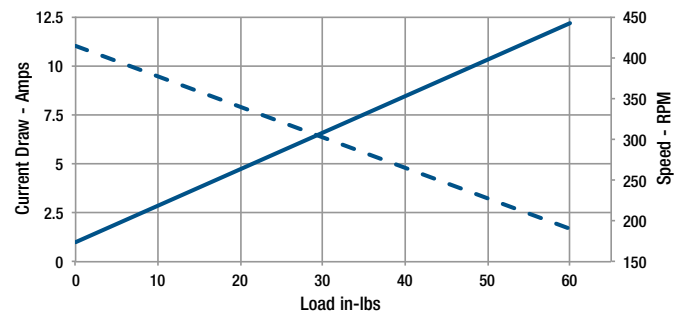
Load Capacity 60 in-lbs.

For Metric Measurements, see page 53.

K2RAG10-12VDC



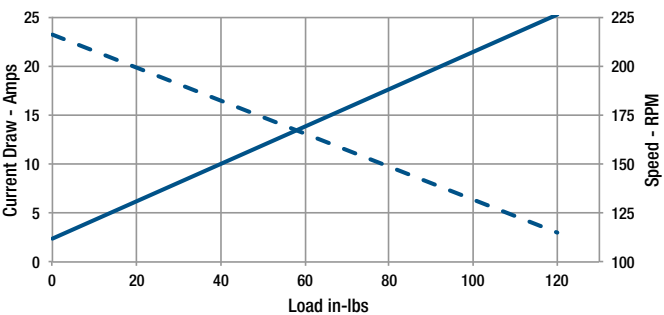
K2RAG10-24VDC



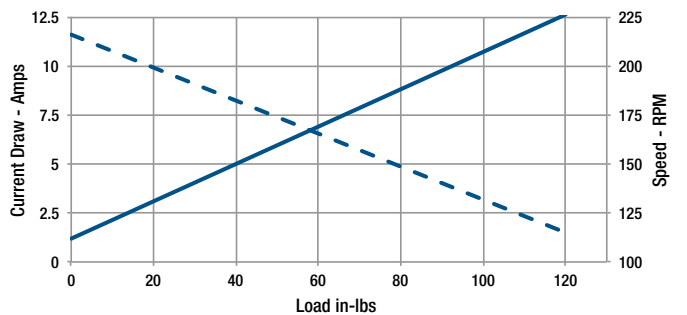
Load Capacity 120 in-lbs.

For Metric Measurements, see page 53.

K2RAG20-12VDC



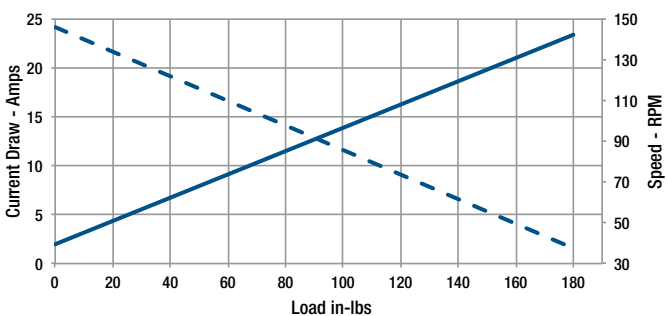
K2RAG20-24VDC



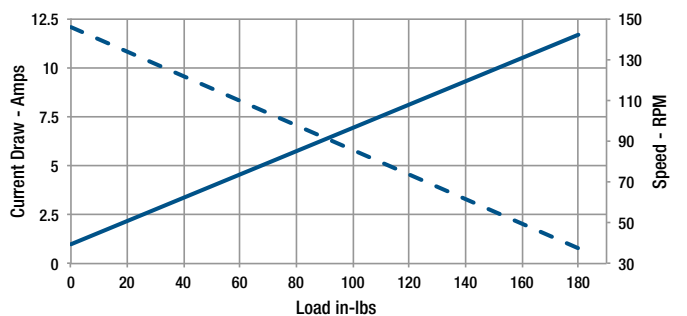
Load Capacity 180 in-lbs.

For Metric Measurements, see page 53.

K2RAG30-12VDC



K2RAG30-24VDC





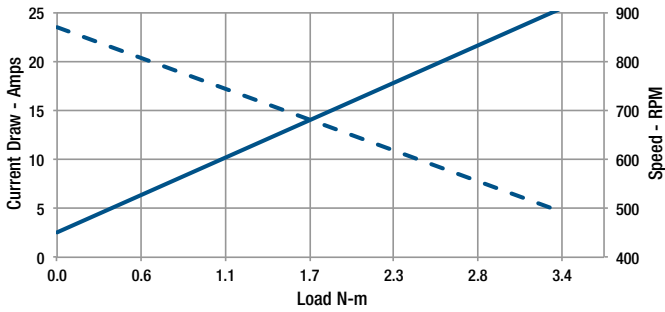
Performance Graphs Metric Measurements*

*Performance Chart Measurements are Nominal

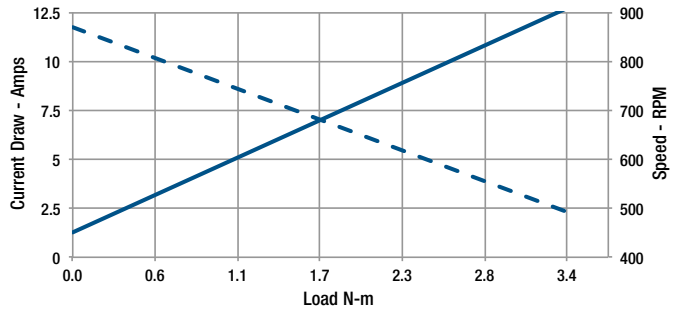
For Imperial Measurements, see page 52.

Load Capacity 3.4 N-m

K2RAG05-12VDC

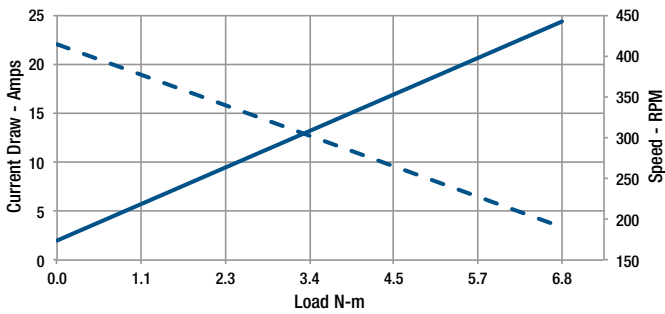


K2RAG05-24VDC

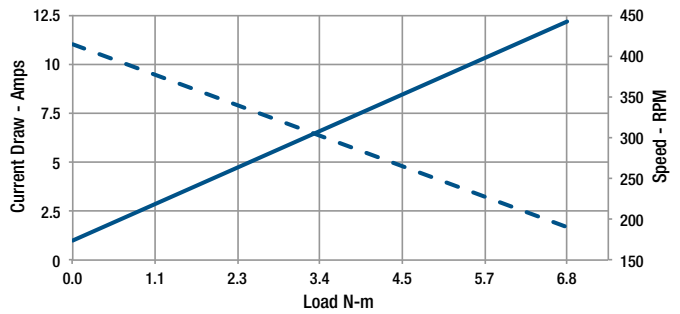


Load Capacity 6.8 N-m

K2RAG10-12VDC

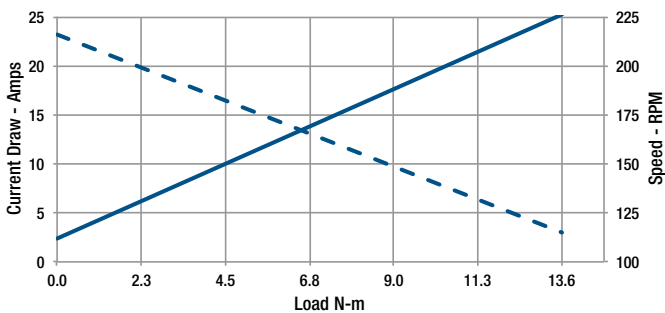


K2RAG10-24VDC

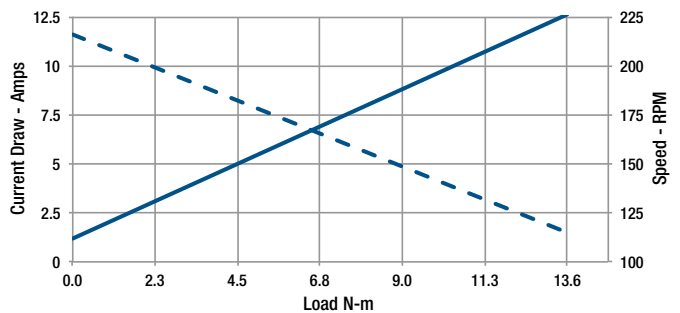


Load Capacity 13.6 N-m

K2RAG20-12VDC

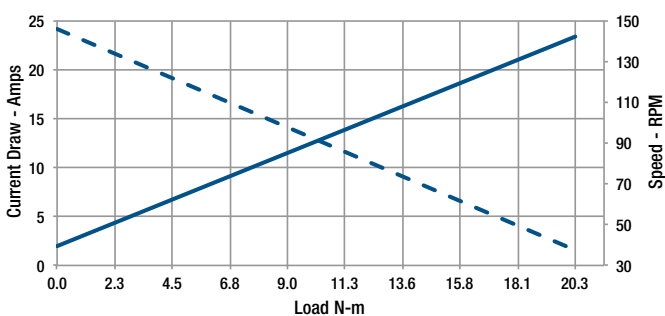


K2RAG20-24VDC

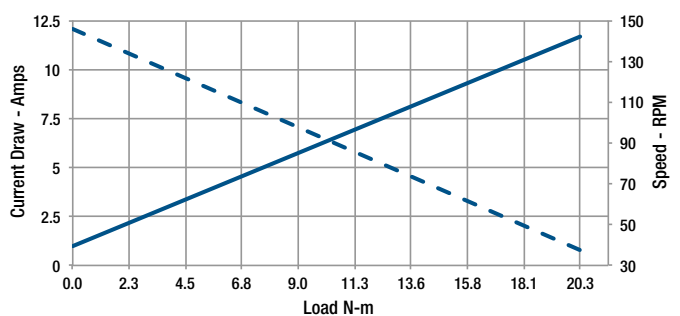


Load Capacity 20.3 N-m

K2RAG30-12VDC



K2RAG30-24VDC



For Imperial Measurements, see page 52.

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 models.



Power Supply/Control/Accessory Selection Guide

Customer Provides Power

Switch Box for 12, 24, or 48 volt motor actuators.	Page 57
Input: 12ft. (3.66m) cable	
Output: 1ft. cable or optional cables (M1, K2, K2x, RA actuators)	
Switch Box for 115 or 230 volt actuators.	Page 57
Input: 6ft (1.83m) cable	
Output: Customer supplied connector (K2 _{AC} , K2 _{XAC} actuators)	

Power Supply Required

12 or 24 volt DC Power Supply for M-Track Actuator	Page 58
Options: AC input with plug	
AC input without plug	
Switch included	
Switch not included	
90 volt DC Power Supply for K2/K2x Actuator	Page 59
Options: AC input with plug	
AC input without plug	
Switch included	
Switch not included	
Speed Potentiometer	
24 volt DC Power Supply for K2/K2x Actuator	Page 60
Options: AC input with plug	
AC input without plug	
Switch included	
Switch not included	

NOTE: All power supply designs are provided with a one foot long cable for connection to actuator. Accessory cables are available in lengths of 5, 10, 20, 25 foot (1.524, 3.048, 6.096, 7.62mm) length.

Controls

End of Travel Limit Switches	Pages 61-62
Factory set/not adjustable (P1)	Pages 63-64
Field Adjustable (EP1)	Page 65
Quick Stop Control	Pages 66-67
Position Feedback Control	Page 68
Low Input Switching Control	Page 69
Wireless Actuator Control	Page 70

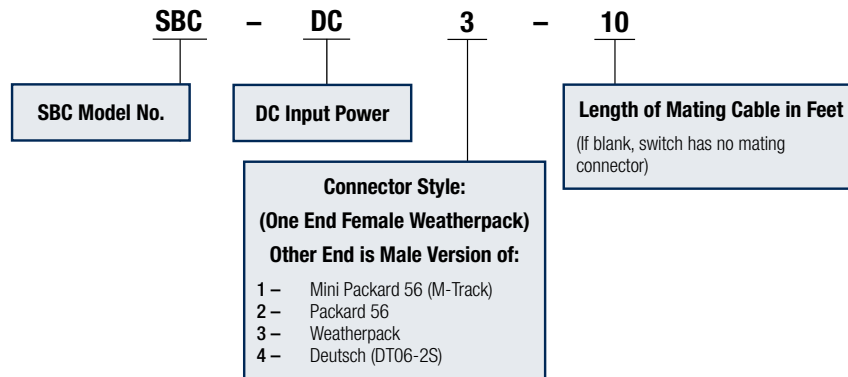
Simple Switch Box Controls

All actuators are controlled using an external-retract-off switching function. The SBC-DC and SBC-AC provide a simple mounted switch compatible with Warner Linear actuators.

SBC-DC



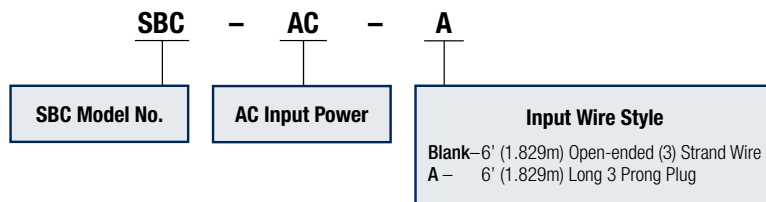
Power: Compatible with 12, 24 and 48 volt DC actuators
Function: Extend, Retract, Off via DPDT momentary toggle switch
Enclosure: ABS plastic enclosure 4.7" L x 3.2" W x 2.2" H (119.38mm L x 81.28mm W x 55.88mm H)
Input Cable: 12ft. (3.66m), 2 wire, 14AWG cable with alligator clip ends
Output Cable: 1ft. (.30m) cable provided. Designate connector appropriate to actuator being used
 Optional extension cables are available in 5-25ft (1.524 - 7.62m) lengths



SBC-AC



Power: Compatible with 115 or 230 volt VAC input
Function: Extend, Retract, Off via DPDT momentary contact switch
Enclosure: 4.72" L x 4.72" W x 3.15" (119.89mm L x 119.89mm W x 80.01mm H) long dust tight enclosure
Protection: Externally mounted 5 Amp fuse on outside of enclosure for easy replacement
Input Cable: 6ft. (1.829m) open ended tinned AC input cable provided
Output Cable: Sealed cable gland included for customer supplied output cable



Optional Extension and Control Power Cables

Power supplies include a 1ft. (.30m) length cable to connect to actuator.

Accessory cables may be ordered in lengths of 5, 10, 20 and 25 feet (1.524, 3.048, 6.096 and 7.62 meters) with the appropriate connector for the actuator selected. (mini-packard, Packard 56, Weatherpack, Deutsch)

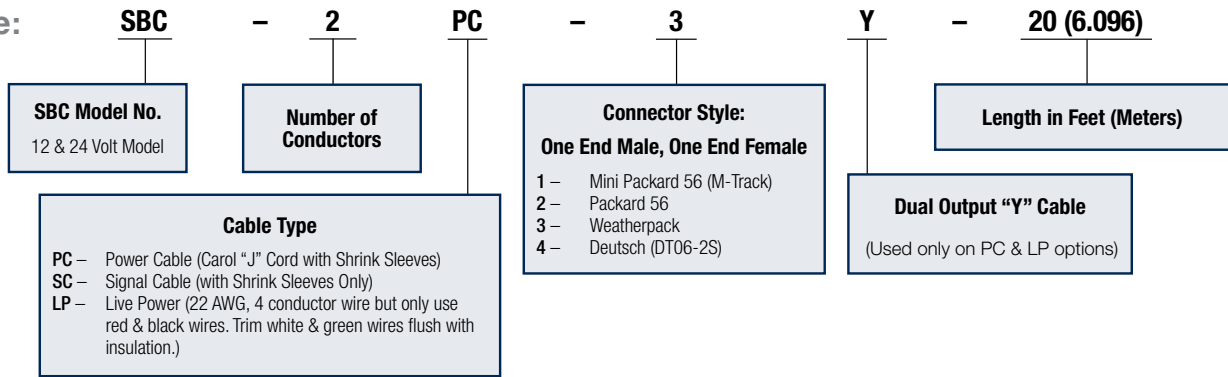
Live Power (LP) cables are required to provide constant power to BTc Limit switch or potentiometer feedback circuits mounted on the actuator. LP cables provide two connectors.

Signal Cables (SC) provide the LP cable with two additional connectors for use with limit switch or potentiometer feedback.

M-Track Power Supply

Extension Cable Part Number

Example:

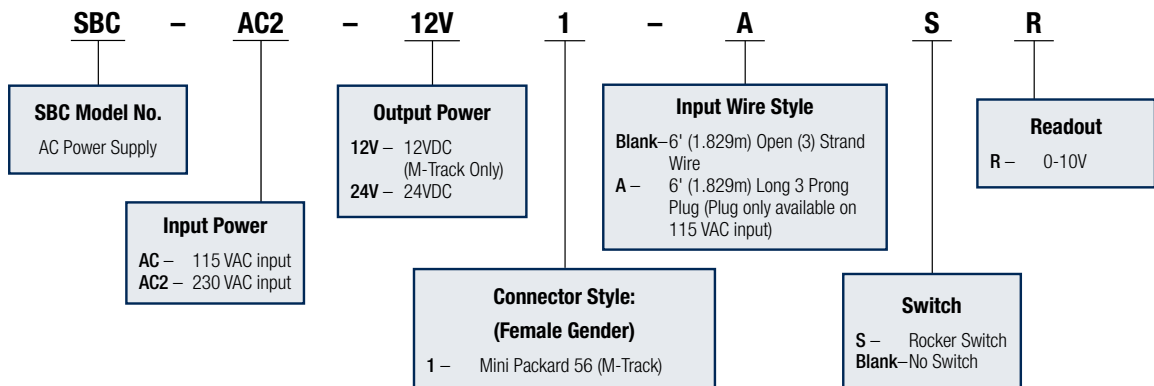


SBC-AC Power Supply



- Input:** 85-264 volts AC
- Output:** 12 volts @ 5.4Amps
24 volts @ 2.7Amps
- Input Cable:** Standard: 6ft. (1.829m) open end, tinned cable
Optional: 6ft. (1.829m) with 115 VAC 3 prong plug
- Output Cable:** 1ft. (.30m) length cable with 2-pin Packard 56 (for M-Track 1)
Optional extension cables can be ordered in 5-25ft. (1.524-7.62m) lengths
- Enclosure:** 4.72” x 4.72” x 3.15” (119.89mm L x 119.89mm W x 80.01mm H)
polycarbonate housing NEMA 4, 4x, 12, 13
- Operating Temperature:** -30° F to 140° F (-34° C to 60° C)
- Ratings:** CE, TUV, UL/cUL Conducted EMI meets EN55022 and ROHS
- Protection:** External fuse provided
- Switching:** No switch or DPDT momentary switch

Example:

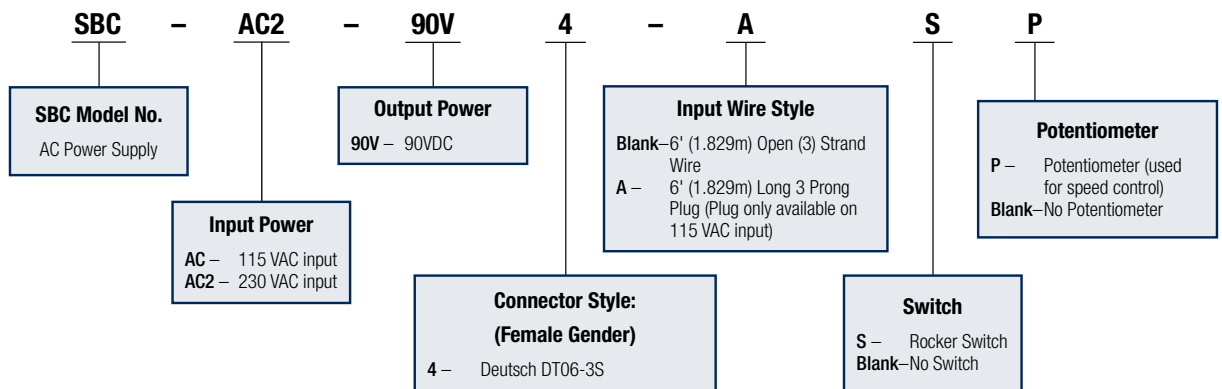


SBC-AC/SBC-AC2 Power Supply 90 volt output



- Input:** AC: 115 volt AC
AC2: 230 volt AC
- Output:** 90 volts DC @ 5 Amps
- Input Cable:** Standard: 6 ft. (1.829m) open end, tinned cable
Optional for 115 AC 6 ft. (1.829m) with 115 VAC 3 prong plug
- Output Cable:** 1 ft. (.30m) cable with 3-pin Deutsch connector
Optional extension cables can be ordered in 5-25 ft. (1.524-7.62m) lengths
- Enclosure:** 4.72"L x 4.72"W x 3.15"H (119.89mm L x 119.89mm W x 80.01mm H) polycarbonate housing NEMA 4, 4x, 12, 13
- Fusing:** External fuse mounted on enclosure for easy replacement
- Switching:** DPDT momentary rocker switch for manual actuator control or Customer may supply their own switch
- Potentiometer:** Optional speed pot allows for output voltage adjustment (varies actuator speed)

Example:



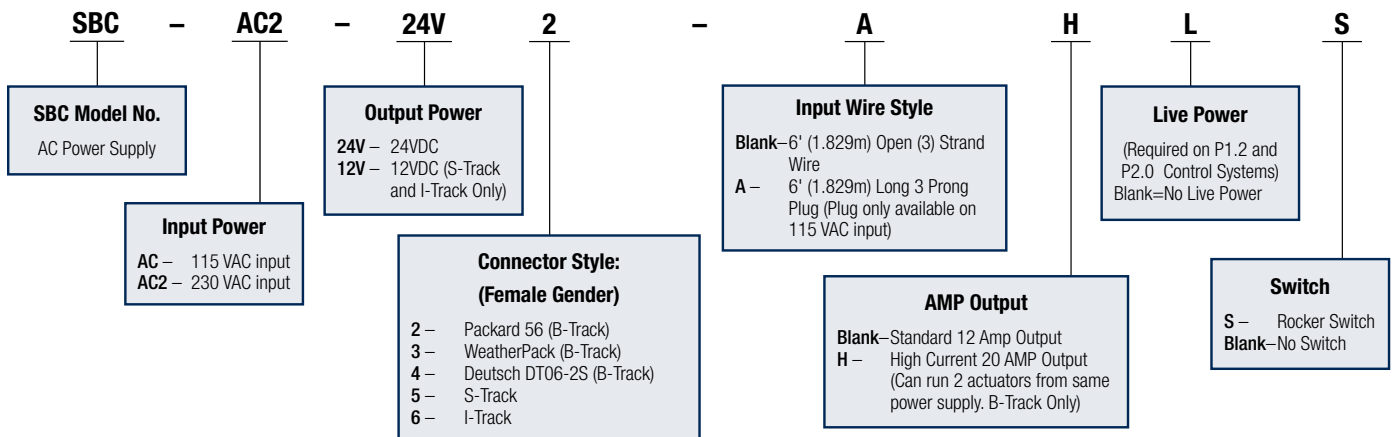
K2/K2x Power Supplies

SBC-AC/SBC-AC2 Power Supply 24 volt output



- Input:** AC: 115 volt AC
AC2: 230 volt AC
- Output:** 24 volts @ 12 Amps
- Input Cable:** Standard: 6 ft. (1.829m) open end, tinned cable
Optional for 115 AC 6 ft. (1.829m) with 115 VAC 3 prong plug
- Output Cable:** Standard 1 ft. (.30m) cable: specify connector to match actuator:
 1. Mini Packard standard for M-Track actuators
 2. Packard 56 standard on K2 and K2x model actuators
 3. Packard WeatherPack optional on K2 and K2x model actuators
 4. Deutsch DT06-2S optional on K2 and K2x model actuators
 5. Optional extension output cables can be ordered in 5-25 ft. (1.524-7.62m) lengths
- Enclosure:** 6.69"L x 6.69"W x 3.54"H (169.93mm L x 169.93mm W x 89.916mm H) polycarbonate housing NEMA 4, 4x, 12, 13
- Fusing:** External fuse mounted on enclosure for easy replacement
- Switching:** DPDT momentary rocker switch for manual actuator control or Customer may supply their own switch
- Live Power Option:** When used with BTc control options (limit switch, potentiometer feedback) the Live Power option is required. Live power option provides a constant output power source for external control components regardless of output power to the actuator. (See Extension Cable selection to select the correct cable for this option.)

Example:



Any of Warner Linear's K2 or K2x actuators can be provided with Hall effect or reed switches to be used by the customer to control actuator start/stopping & positioning. The Hall effect and reed switches are both non-contact, and use a magnet mounted on the screw inside the actuator tube to activate. Actuators can have 2-4 switches dependent on stroke length.

Hall Effect

The Hall effect switch is an NPN output/current sinking and requires a pull-up resistor to operate.

The Hall effect switches can also be configured to provide positioning information. A ten tooth wheel with two switches is used to provide an A and B pulse for position and direction along with a home switch and fully extended switch. This unit would be a "SO4" configuration.

Hall Effect Switch Part Numbers Available, with K2 actuator product:

S02H – 2 end limit switches

Hall Effect Switch Part Numbers Available, with K2E or K2xE actuator product:

S02H – 2 end limit switches

S03W – 2 wheel position switches & home end limit switch

S03H – 2 end & 1 mid limit switches

S04W – 2 wheel position switches & 2 end limit switches

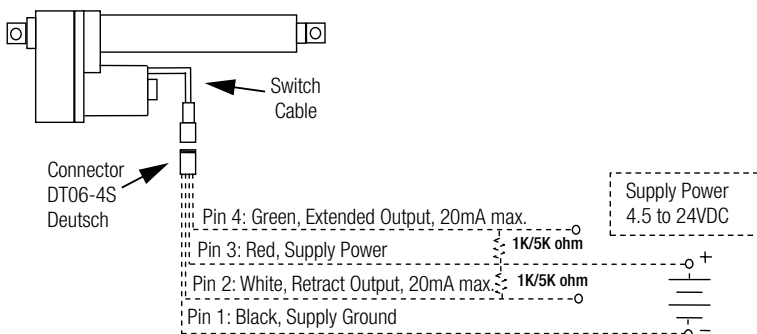
S04H – 2 end & 2 mid limit switches

Note 1: Consult factory for other options if needed

Note 2: Units with 3 switches can be no shorter than 4" and units with 4 switches can be no shorter than 6".

Hall Effect	
Supply Voltage:	4.75 to 24 VDC
Output:	Current sinking, max. of 25mA
Lead Wires:	24 AWG
Operating Temperature:	-40° C to +85° C
Protection:	Reverse polarity protected
Housing:	Rugged thermoplastic, sealed

S02H Hall Effect



All dashed lines are customer supplied connections

Reed

The reed switch can only be provided on a K2E or K2xE actuator (adjustable unit). Switches can be selected as normally open (O) or normally closed (C).

Reed Switch Part Numbers Available, with K2E or K2xE actuator product only:

S02O – 2 Normally Open, adjustable reed switches

S02C – 2 Normally Closed, adjustable reed switches

S03O – 3 Normally Open, adjustable reed switches

S03C – 3 Normally Closed, adjustable reed switches

S04O – 4 Normally Open, adjustable reed switches

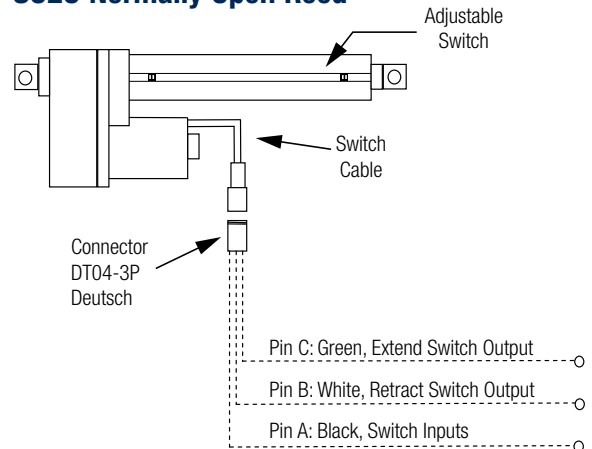
S04C – 4 Normally Closed, adjustable reed switches

Note 1: Consult factory for other options if needed

Note 2: Units with 3 switches can be no shorter than 4" and units with 4 switches can be no shorter than 6".

Reed	
Supply Voltage:	Up to 200 VDC max. O switch Up to 175 VDC max. C switch
Switching Current:	1.2 Amps max. O switch 1.5 Amps max. C switch
Contact Rating:	10 Watts max. O switch 5 Watts max. C switch
Lead Wires:	24 AWG
Operating Temperature:	-40° C to +105° C
Housing:	Hermetically sealed

S02O Normally Open Reed



P1.x Electronic Stroke Limit Control

Standard



The P1.x Limit Switch control provides end of travel positioning through the use of a Hall effect sensor and motor mounted relay.

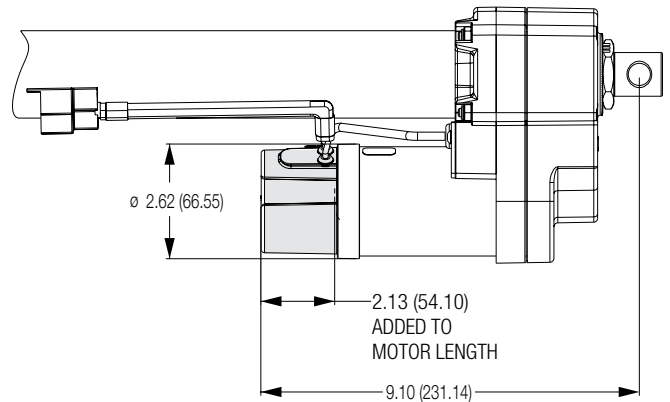
Hall effect sensors are factory mounted within the actuator cover tube. The sensor position is set at the factory and is not field adjustable (See EP.1 for adjustable switch functions). The Hall effect sensors are sealed for life and are not subject to wear.

The Electronic Stroke control package consists of the Hall effect sensors and a motor mounted relay within an enclosure suited for harsh environments.

A Zener diode suppression is used on both input and outputs for added protection from electrical spikes. Unit reversing is achieved by reversing input power polarity to the motor.

Specifications	
Power:	25 Amps max. @ 12 volts 12.5 Amps max. @ 24 volts
Operating Temperature:	-20° F to +150° F (-29° C to 66° C)

Options	
P1.0	Standard Stoke Limit Control
P1.1	Same as P1.0 with two LEDs on the outside of the control module. LEDs indicate when end of travel has been reached.
P1.2	Same as P1.0 with two 12/24 volt, 0.5 Amps outputs that can be used to signal an external switch, relay, lamp or PLC input.
P1.2LE	Two +5 VDC 25ma outputs plus a ground to provide a signal when end of travel is reached. This output can be used to power LEDs.



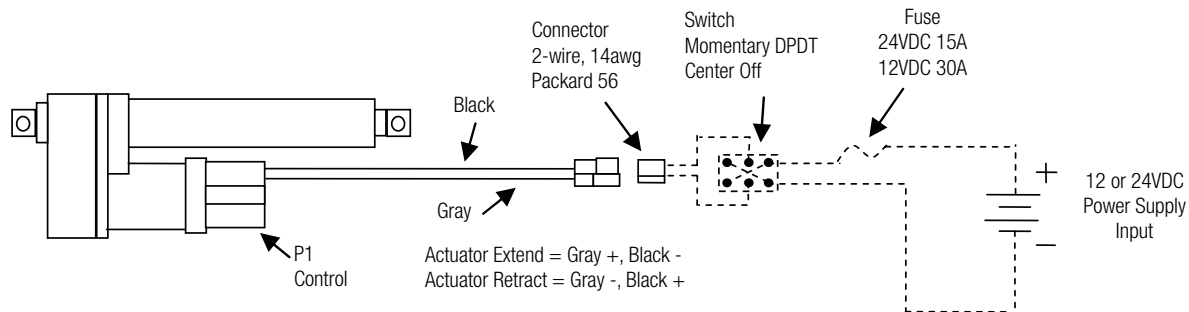
P1 Electronic Stroke Limit Control

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	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

Note: For adjustable external end limits add E before P

Wiring Diagrams

P1 Module P1.0-DC12/24



All dashed lines are customer supplied connections

Operation

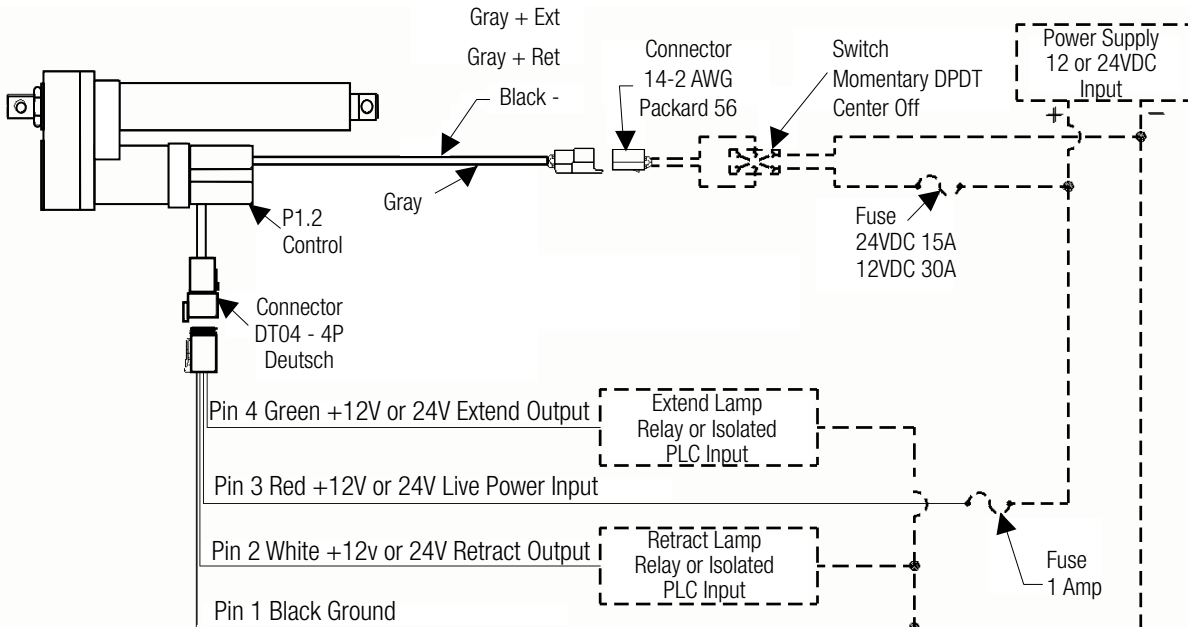
When the “Customer Supplied Switch” is held in the direction allowing positive 12 or 24VDC to the gray wire and 12 or 24VDC ground to the black wire, the actuator will extend until it reaches the end of stroke. At the end of stroke, which is determined by the factory set location of the Hall effect switches inside the actuator cylinder, power will be removed to the actuator by the P1.0 control. The actuator will no longer move in that direction even if the customer supplied switch is held.

When the switch is held in the opposite direction so the positive lead of the 12 or 24VDC signal is on the black wire and the 12 or 24VDC ground is on the gray wire, the actuator will retract until it returns to the full home position which is determined by the factory set location of the second Hall effect switch.

If the actuator does not stop when at either end then something in the actuator or P1.0 control may be damaged. Please call the factory for further analysis.

The actuators are 100% tested before leaving the factory.

P1 Electronic Stroke Limit Control



All dashed lines are customer supplied connections

Operation

When the “Customer Supplied Switch” is held in the direction allowing positive 12 or 24VDC to the gray wire and 12 or 24VDC ground to the black wire, the actuator will extend until it reaches the end of stroke. At the end of stroke the “Extend Output” (green wire) will have +12 or 24 Volts to ground, indicating it is at the end. This signal can be used to light a Lamp, signal a relay coil, or an isolated PLC input that only requires 500mA or less. This output will only be on as long as power is maintained from the “Customer Supplied Switch”.

However, if the output needs to be on even if the “Customer Supplied Switch” is not activated then the “Live Power input” can be used. This will provide power all the time for the output to remain on whenever the Actuator is at either travel end.

Apply +12 VDC (for 12VDC unit) or +24 VDC (for @24VDC unit) to the red wire of the Deutsch (DT04-4P) 4 pin connector and ground to the black wire. This supply needs to be the same supply as the actuator and will require less than 500mA.

When the switch is held in the opposite direction so the positive lead of the 12 or 24VDC signal is on the black wire and the 12 or 24VDC ground is on the gray wire, the actuator will retract until it returns to full home position. At the full home position, the “Retract Output” (white wire) will have +12 or 24 volts to ground.

CAUTION Do not reverse polarity at live power input (i.e. 22GA red & black wires) or damage will occur.

EP1.x Electronic Stroke Limit Control



The EP1.x Limit Switch control provides end of travel positioning through the use of a magnetic switch and motor mounted relay.

The EP1 limit switches are mounted in a channel on the actuator cover tube accessible below a durable cover. (For factory set limit switches see P1.0 designs). The EP1 switches are field adjustable.

The Electronic Stroke control package consists of the magnetic sensors and a motor mounted relay within an enclosure suited for harsh environments.

A Zener diode suppression is used on both input and outputs for added protection from electrical spikes. Unit reversing is achieved by reversing input power polarity to the motor.

Specifications

Power:	25 Amps max. @ 12 volts 12.5 Amps max. @ 24 volts
Operating Temperature:	-20° F to +150° F (-29° C to 66° C)

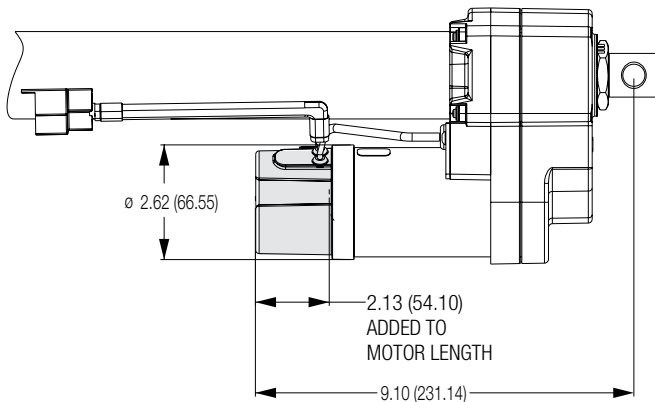
Options

EP1.0	Standard Stroke Limit Control
EP1.1	Same as P1.0 with two LEDs on the outside of the control module. LEDs indicate when end of travel has been reached.
EP1.2	Same as P1.0 with two 12/24 volt, 0.5 Amps outputs that can be used to signal an external switch, relay, lamp or PLC input.
EP1.2LE	Two +5 VDC 25ma outputs plus a ground to provide a signal when end of travel is reached. This output can be used to power LEDs.
EP1.4	Same as P1.0, end limit stopping with 0-10K ohm potentiometer output.
EP1.5	End limit stopping with end limit outputs and 0-10K potentiometer outputs.



Scan to watch!

How to Adjust the Limit Switches for a K2 or K2X Actuator with External or EP Limit Switches
<https://p.widencdn.net/imzc9v>



PQS Quick Stop Control



The PQS is a bi-directional current limit control. The control monitors current during actuator motion and quickly stops the actuator if an object gets in the way or at the end of stroke. The actuator will remain off until power is reapplied. The current limit setting is adjustable with two potentiometers that are accessible through two plugged holes on the side of the housing.

Features

Quick Stop: Field adjustable potentiometers limit the amount of current through the motor in one or both directions. Both potentiometers are factory set to the maximum actuator current unless otherwise specified. Potentiometers field adjustable also.

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 more accurate and faster stops.

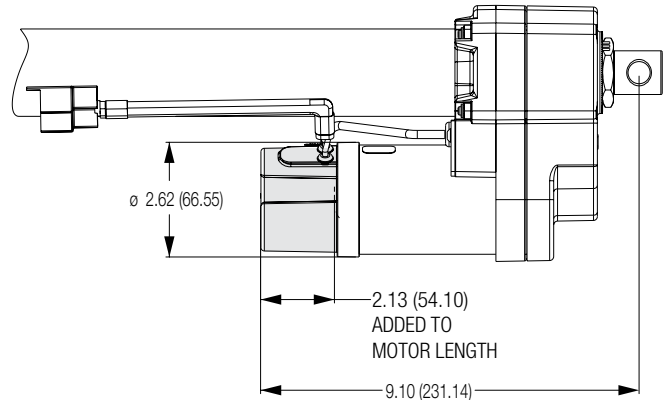
Load Limit Trip Outputs: These outputs indicate when the current limit has been exceeded in either direction. They are active low transistor outputs.

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.

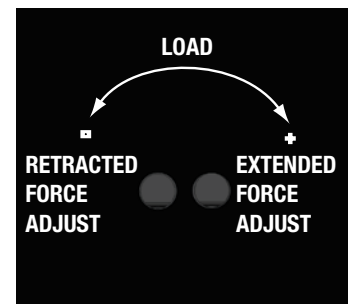
Specifications

Supply Power:	12 or 24 VDC
Maximum Current	25 Amps @ 12VDC / 12.5 Amps @ 24VDC (at 25% duty cycle)
Operating Temperature:	-20° F to +150° F (-29° C to +66° C)



Adjusting Extend &/or Retract Trip Current

- Remove access plugs on the side of control.
- Rotate trim pot counter clockwise for min. load.
- Rotate trim pot clockwise for max. load.
- Adjust the Retract pot to control closing force.
- Adjust the extend pot to control lifting force.
- Adjust as viewed with extension rod pointing up.
- Reinstall access plugs.

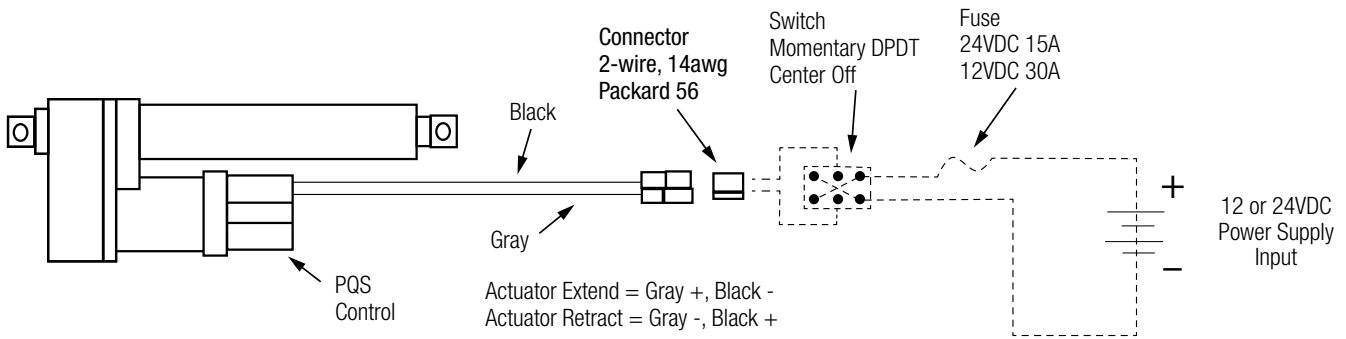


Electric Rating & Model Selection

Model No.	Input Voltage (vdc)	Maximum Output Current (Amps)	Features
PQS-12V	12	25	Base = Electronic Stroke Limit with mid-stroke current limit and Electronic Dynamic Braking
PQS-24V	24	12.5	
PQS.2-12V	12	25	Base & +12VDC Trip Outputs
PQS-24V	24	12.5	Base & +24VDC Trip Outputs

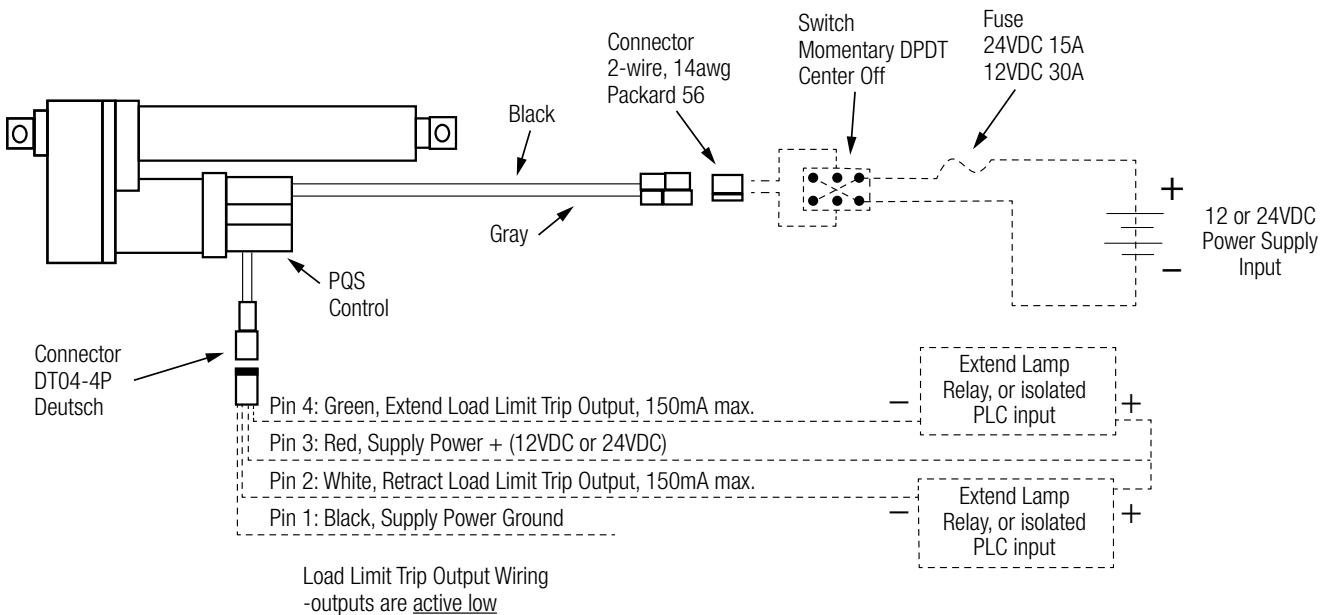
PQS Quick Stop Control Wiring Diagrams

PQS-12V/24V Module



All dashed lines are customer supplied connections

PQS.2-12V/24V Module



All dashed lines are customer supplied connections

BTc Controls P2-DC

P2-DC Position Feedback Control

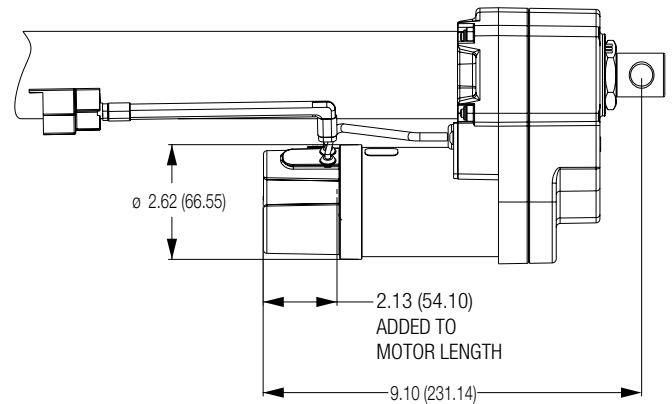


Specifications	
Supply Power:	25 Amps max. @ 12 volts 12.5 Amps max. @ 24 volts
Operating Temperature:	-20° F to +150° F (-29° C to 66° C)
Protection:	Zenerdiode suppression on the input and output for protection from electrical noise.

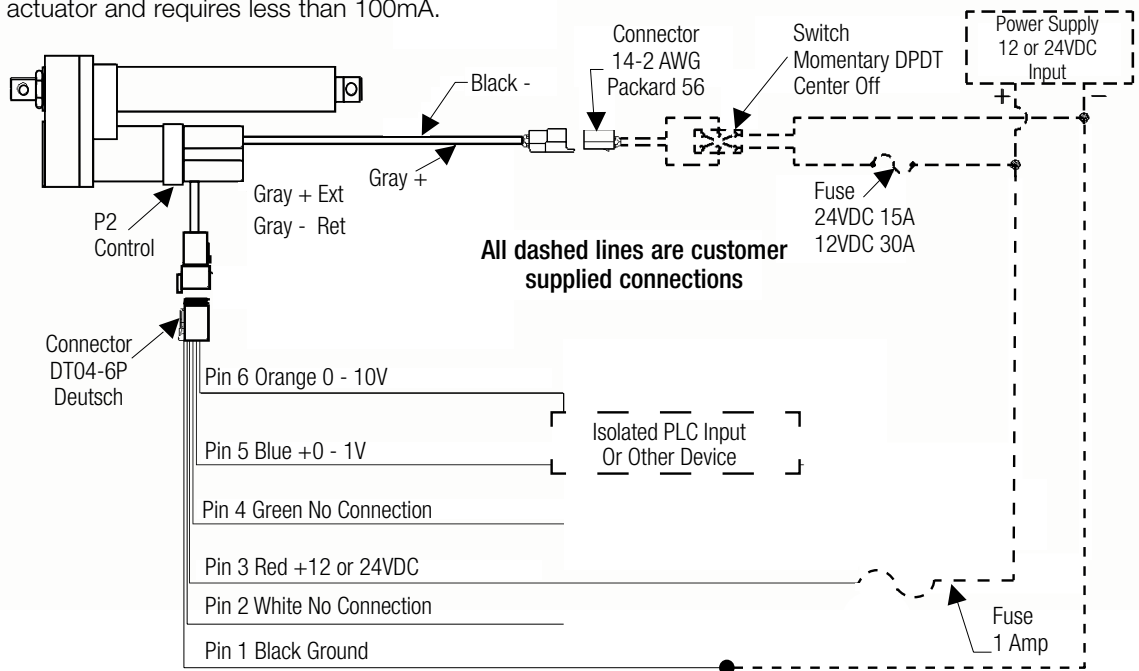
The P2.0 Position Control is a microprocessor position feedback control providing a 0-10 volt DC output indicating actuator travel. The control uses two inductive pulse count sensors and a counting wheel to accurately determine actuator position. A third sensor at the full retract position provides a zero or home position indication.

Hall effect limit switches (those used in the P1.0 control) are used to provide end of travel positioning and will shut off the actuator at both full extend and retract settings. All sensors are non-contact and sealed for life. They are integrated within the actuator and control to protect them from contamination.

Live power is needed to maintain the 0-10VDC analog output signal even when the "Customer Supplied Switch" is not activated. This feature has to be connected to ensure position is saved. The power has to be the same as the switched power supplied to the actuator and requires less than 100mA.



Wiring Diagram P2 Module P2.0-DC12/24



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	Base = Electronic Stroke Limits with 0 to + 10V Analog Output and EDB

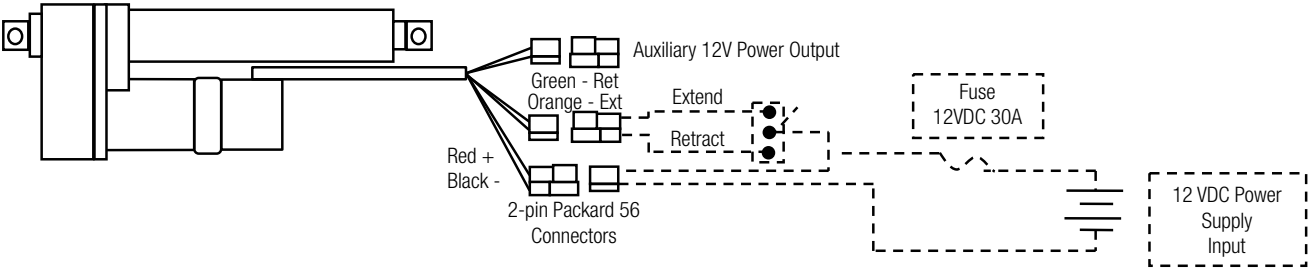
RP Low Input Switching Control



Specifications	
Main Power Input:	12 VDC
Main Input Current:	25 Amps (at 25% duty cycle)
Operating Temperature:	-20° F to +150° F (-29° C to 66° C)
Auxiliary 12V Power Output:	12VDC
Low Input Switching Current:	67mA

This control provides the switching logic to use low current signal inputs for extending and retracting the actuator rod/screw. It mounts on the back end of Warner Linear’s 12VDC B-Track motor/actuator product.

Typical Wiring



All dashed lines are customer supplied connections

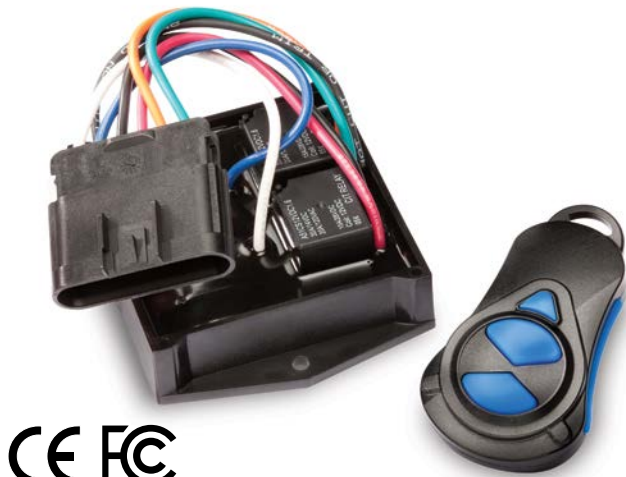
Actuator Extend = Orange +12VDC
Actuator Retract = Green +12VDC

Control Operation

Apply 12 VDC to the main power input. Use the same 12 VDC supply to apply positive voltage to the orange wire to extend the actuator rod. When done extending, remove the positive 12 VDC from the orange wire and apply to the green wire to retract the actuator.

The auxiliary power output is used to power additional 12VDC items as needed. The power is the same as the “Main Power Input” applied by the customer to the 2-pin Packard 56 connector. The total power available is based on the customer supplied Power Input provided. The fuse should then be sized to 135% of the total power needed.

Wireless Actuator Control



Warner Linear's wireless actuator control can be used to remotely control a 12 or 24VDC actuator up to 100 ft. away. It can be used with our standard line of P1 end limit controls. The unit is offered in a single and dual actuator output for the 12VDC unit. The 24VDC unit is only available with two actuator outputs. All models have a manual override feature to operate the actuator without a remote. The wireless system is an RF design operating at 915MHz.

One remote is provided with the receiver unit, but the receiver can have up to four remotes programmed to work with it.

Specifications

Power:	12/24 VDC
Maximum Current:	20 Amps single, 10 Amps dual
Operating Temperature:	-20° F to +150° F (-28° C to 66° C)
Operating Frequency:	915 MHz
Enclosure:	IP67
Replaceable Remote Battery:	CR2032, life expectancy dependent on use, but should last approx. 2 years

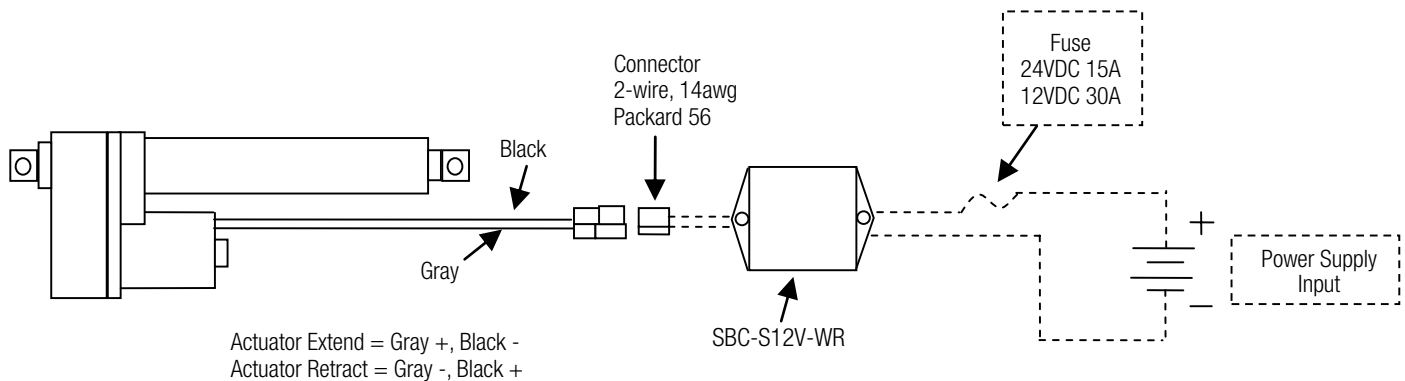
Models Available

SBC-S12V-WR:	20 Amp, Single Output
SBC-D12V-WR:	10 Amp, Dual Output
SBC-D24V-WR:	10 Amp, Dual Output

Specifications

Dual Output:	SBC-DWT
Remote Lanyard:	059-0200-50
Remote Holder w/ Clip:	SBC-HDR
Connector:	Delphi 135 21467 for single output Tyco 350735-1 for dual output

Typical Wiring

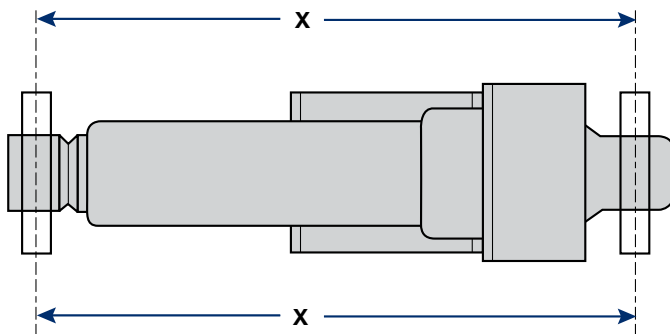


All dashed lines are customer supplied connections

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.

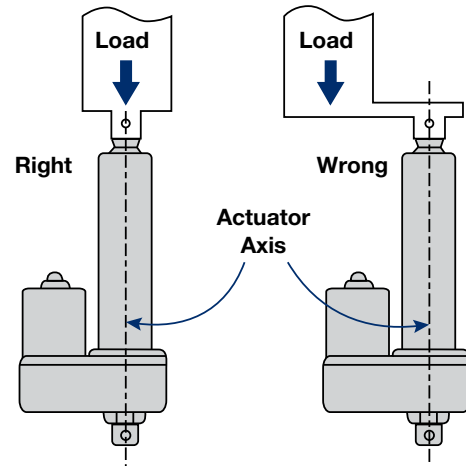
Use of solid pins provide maximum holding capability with a retaining ring or cotter pin on each end to prevent the solid pin from falling out of the mounting bracket (it is best to avoid roll pins and spring pins).



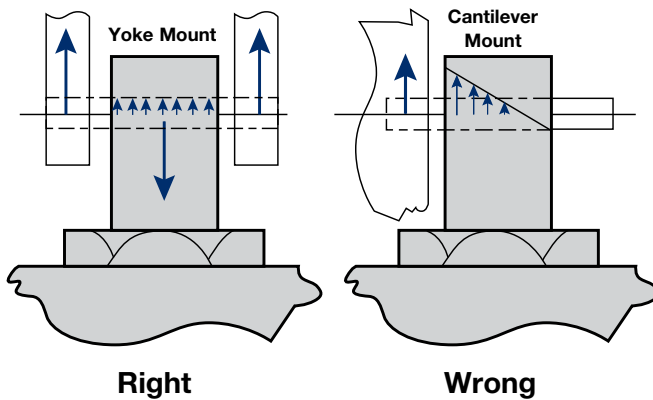
Mounting pins must be parallel to each other as shown above. Pins which are not parallel can cause excess vibration or actuator binding.



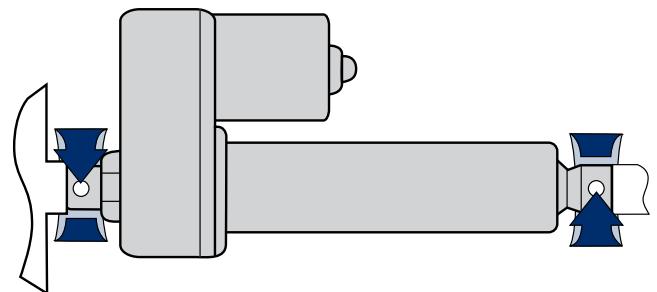
Scan to watch!
Proper Steps and Best Practices for Mounting of Warner Linear Actuators Video
<https://p.widencdn.net/k3etry>



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 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 (2.3 Nm)
All others Torque created 100 inch pounds (2.3 Nm)

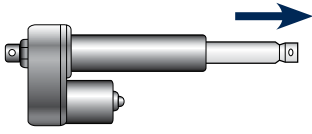


Figure 1 Axial load

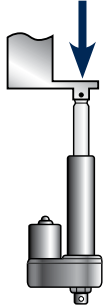


Figure 2 Cantilevered mount

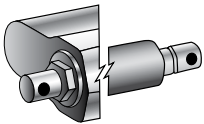


Figure 3 Clevis mount

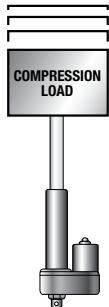


Figure 4 Compression load

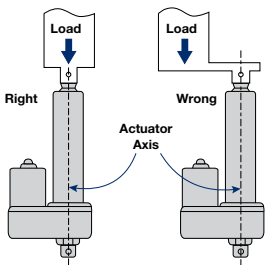


Figure 5 Eccentric load

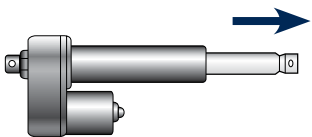


Figure 6 Extended length

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 change 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.

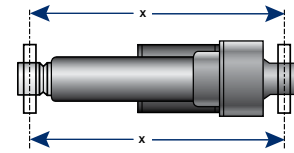


Figure 7 Pin mount

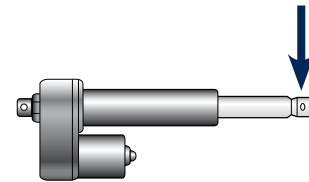


Figure 8 Radial load also side loading

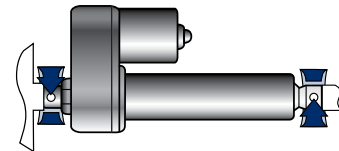


Figure 9 Restraining torque

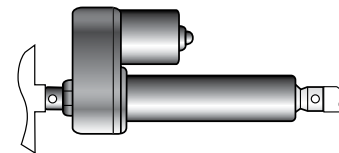


Figure 10 Retracted length

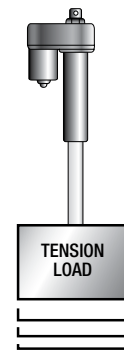


Figure 11 Tension load

General Project Specifications

Mail or Fax to:

Warner Linear
Application Engineering
6593 Revlon Dr. Plant #1,
Belvidere, IL 61008

FAX: 815.389.6678
Phone: 800.825.9050

Date _____
Company _____
Address _____
City _____ State _____ Zip _____
Name _____
Title _____ Phone (____) _____

Project Specifications

Dynamic Load _____ N _____ 0.00 lbs. Environment _____ Operating Temperature:
_____ C Min _____ 32.0 F (0° C)

Side Load _____ N _____ 0.00 lbs Conditions:
_____ C Min _____ 32.0 F (0° C)

Full Load Speed (min): _____ mm/s _____ 0.00 inches/s Corrosives/Salt _____
Duty Cycle (for one full extend + retract)

Full Load Speed (max): _____ mm/s _____ 0.00 inches/s Oil Splash _____
_____ Time On (Time on +Time off)

Stroke: _____ mm _____ 0 inches Moisture _____ _____ Cycles per day

Life: _____ mm _____ 0 inches Mounting Position _____

NOTE: "Life" is total distance traveled in lifetime of product

Maximum Noise Level _____ dB

Load Movement _____

In dumping applications, when load first acts to compress screw and then to retract screw (or vice versa)

Extension Rod Mount _____

Input Voltage Type _____

Gearbox Mount _____

Input Voltage _____

Connector Type _____

Control Needed _____

Mating Connector Required _____

If yes, which control _____

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1-888-829-6637 – Press #7

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Mill Spindles, Ameriflex, Ameridisc
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1-814-480-5000
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1-800-458-0887

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Bibby Turboflex

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+27(0) 11 918 4270

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+44 (0) 1992 501900
Chambersburg, PA - USA
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+55 (11) 4615-6300

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For application assistance:
1-888-829-6637 – Press #7
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1-888-449-9439

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+44 (0) 1356 602000
New Hartford, CT - USA
1-800-825-6544

Warner Electric

Electromagnetic Clutches and Brakes
New Hartford, CT - USA
1-800-825-6544
For application assistance:
1-800-825-9050
Saint Barthélemy d'Anjou, France
+33 (0)2 41 21 24 24
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Columbia City, IN - USA
1-260-244-6183

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Kilian Manufacturing

Engineered Bearing Assemblies
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1-315-432-0700

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Geared Motors
Esslingen, Germany
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Somerset, NJ - USA
1-732-469-8770

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For application assistance:
1-800-816-5608

Nuttall Gear and Delroyd Worm Gear

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Niagara Falls, NY - USA
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1-262-547-3357

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Industrial Brakes and Brake Systems
Vejstrup, Denmark
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1-844-723-3483
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Bedford, England
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1-800-825-6544
For application assistance:
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Saint Barthélemy d'Anjou, France
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Formsprag Clutch

Overrunning Clutches and Holdbacks
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For application assistance:
1-800-348-0881 – Press #2

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Stieber Clutch

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