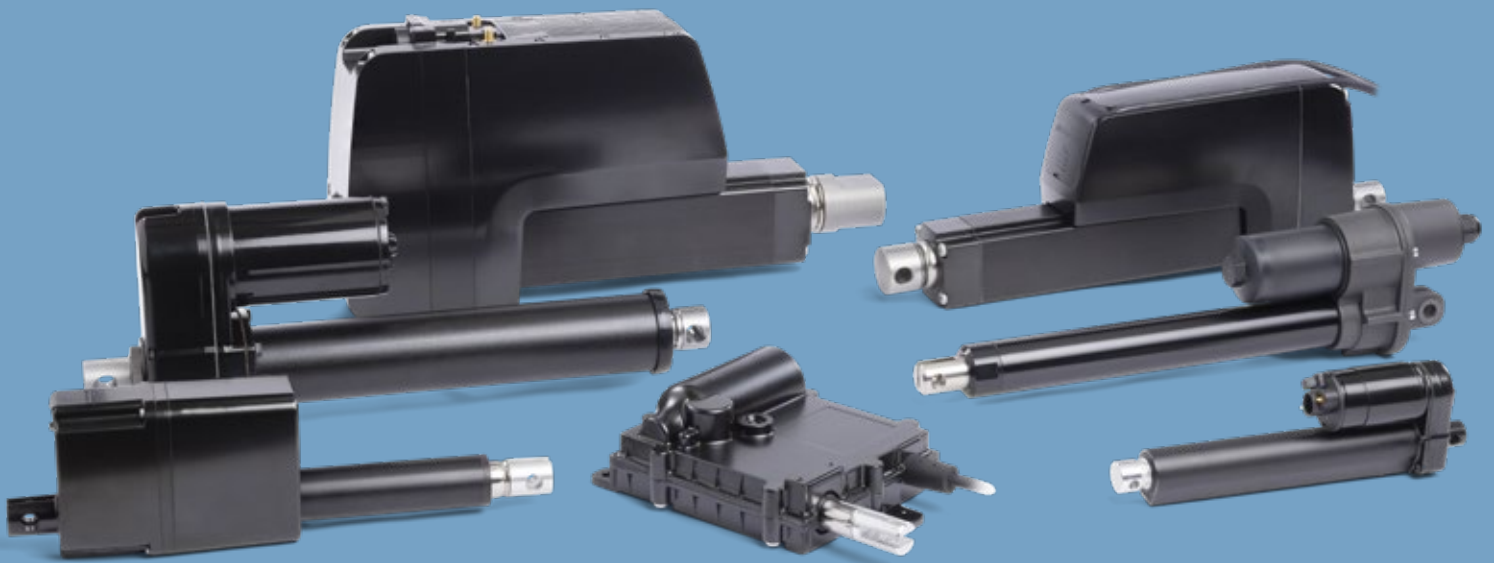




Linear Actuators

Electric Solutions that Deliver Smarter, Stronger and Sturdier Performance to Demanding Applications



Thomson – Engineering Linear Motion for a Rapidly Evolving World

From precision linear motion solutions to fully integrated actuation systems, Thomson delivers intelligent, clean and efficient motion to help customers compete and scale. Whether your application demands speed, load capacity, controllability, compact design or long-term reliability, we help you design the right solution, not just the right part.

Thomson stands apart through:

- One of the industry's most comprehensive portfolios of linear motion and actuation solutions.
- Engineered-to-fit solutions, from configurable standards to application-specific designs developed in close collaboration with your team.
- Eighty years of proven application expertise across medical, industrial automation, aerospace and defense, mobile off-highway, material handling, transportation, robotics and more.

Engage with our engineering teams early to reduce design cycles, improve system integration and maximize long-term value. Product and application information, 3D models, sizing and selection tools, and global contact information are available at thomsonlinear.com



As a leading brand of Regal Rexnord, Thomson uniquely connects linear and actuation solutions with motors, controls, power transmission and drive technologies for enabling smarter integration, expanded design flexibility and enterprise-level support worldwide. Together with Regal Rexnord's 30,000 associates around the world, we help create a better tomorrow with sustainable solutions that power, transmit and control motion.

Local Support Around the Globe



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= SMART ACTUATOR



Why Convert to Electric Actuators?

There are many reasons to switch from pneumatic or hydraulic actuators to electric solutions. Improved controllability, reduced system complexity and a smaller footprint are often the primary drivers. These advantages are complemented by lower energy consumption, cleaner operation and reduced maintenance, along with additional benefits such as improved performance, reduced downtime, and faster assembly and commissioning.

Better Controllability

An electric motor paired with a lead or ball screw is significantly easier to implement than a pneumatic or hydraulic cylinder, as it typically requires little more than electrical power to operate. Electric actuators are easier to control, responding faster, delivering greater accuracy, and eliminating creep at standstill or during power-off. They are also readily equipped with onboard feedback and control capabilities, enabling straightforward integration with higher-level systems.

Reduced Costs and Improved Sustainability

Electric actuators deliver measurable cost and sustainability benefits, including:

- Increased energy efficiency and environment-friendly features
- No need for costly compressors and the supporting infrastructure
- Cleaner and safer to use in places sensitive to contamination
- No risk of leaks – small, undetected leakages add hidden costs, while larger leaks can be hazardous, messy and costly
- No maintenance required, reliable and easy to replace if necessary
- Quick and simple to install and commission

ELECTRIC LINEAR ACTUATORS

IMPROVE

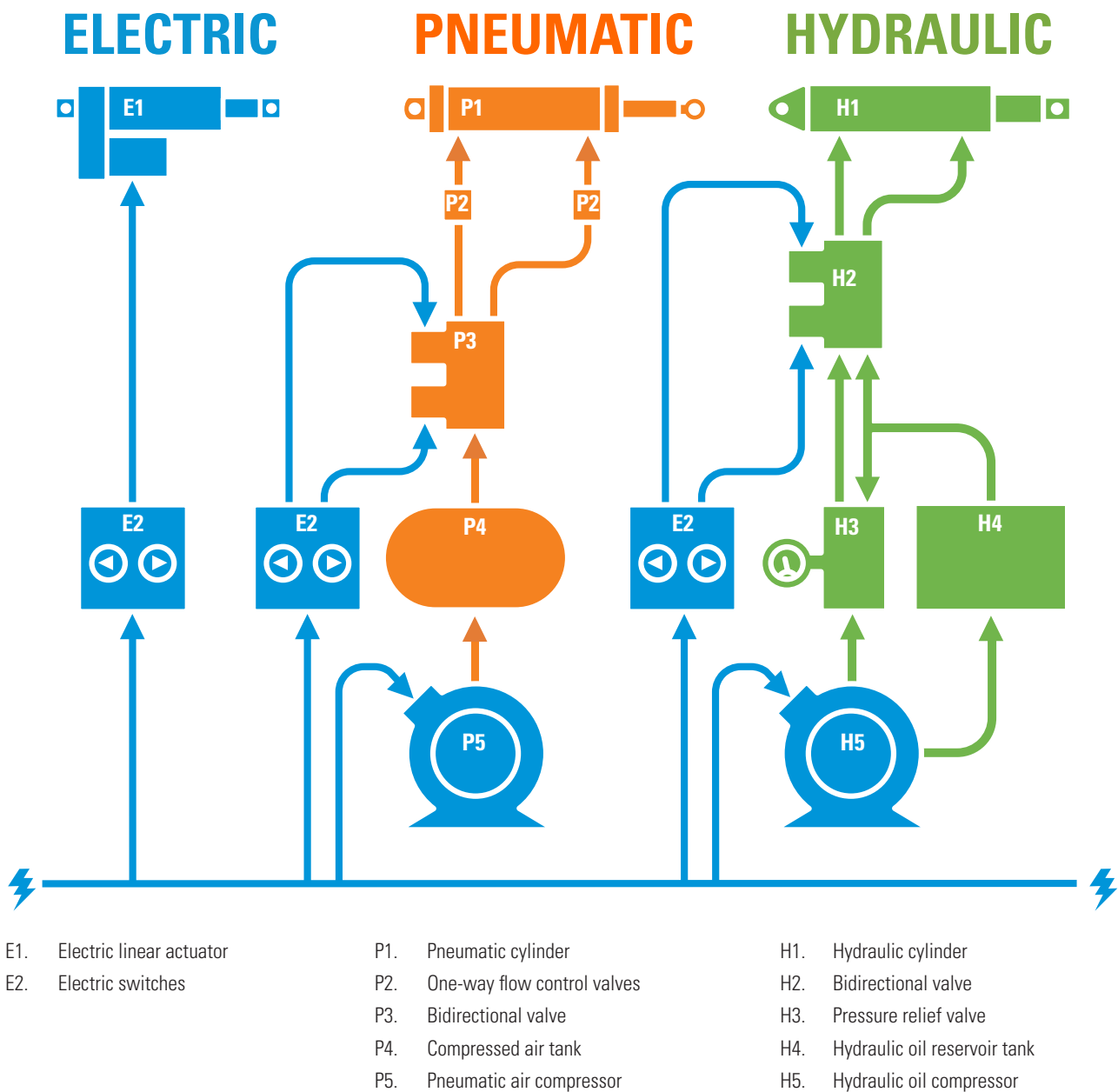
**EFFICIENCY
RELIABILITY
PRODUCTIVITY
PERFORMANCE
CONTROLLABILITY**

REDUCE

**COMPLEXITY
ENGINEERING
COMPONENTS
OVERALL COSTS
INSTALLATION TIME**

Reduced Complexity and Smaller Footprint

The illustration below compares three common approaches for operating an electric actuator, a pneumatic cylinder and a hydraulic cylinder. As shown, both pneumatic and hydraulic options require more complex, space-intensive solutions that add weight and maintenance to the overall system when compared to electric actuators.





Why Choose a Thomson Actuator?

Electric actuators are versatile, easy to use and affordable compared to most alternatives. As long as electric power is available, there is likely a suitable Thomson actuator for the job. The latest generation of actuators are smarter, stronger and sturdier, and have created new possibilities. A standard Thomson actuator can do things today that not long ago were considered too expensive or even impossible to do.

Employing a Thomson electric actuator simplifies the transition from manual to powered motion since electricity is readily available. It doesn't matter if power comes from the grid, a battery or any other source since Thomson offers both AC and DC actuators in the most common voltages. Plug it in and run - it is that simple.

Clean, Maintenance-Free and Cost-Effective Operation

Thomson actuators are inherently clean since there are no messy compressors, filters, oils or other mediums involved. Most of them are, in fact, clean enough to be used right out of the box in areas sensitive to contamination. Thomson electric actuators are also completely maintenance free - there is no need to remember to check or replace anything, and they don't carry hidden ownership costs, sparing you of any unpleasant surprises throughout their lifetime.

Smaller, Stronger and Tougher

Electric motors, drives, batteries and electronic controls have significantly advanced over the past several decades. At the same time, actuators have become better sealed and more robust. These improvements have allowed Thomson to make stronger, smarter and more compact actuators. Our Electrak® XD, HD, LL and MD families represent the pinnacle of modern actuator design. You can



Modern actuators can work in almost any environment

now find Thomson actuators working in the most demanding environments – whether it be hot, cold, dusty, dirty, humid or wet. When it comes to the unique H-Track electro-hydraulic actuator, even applications submerged in water are possible.

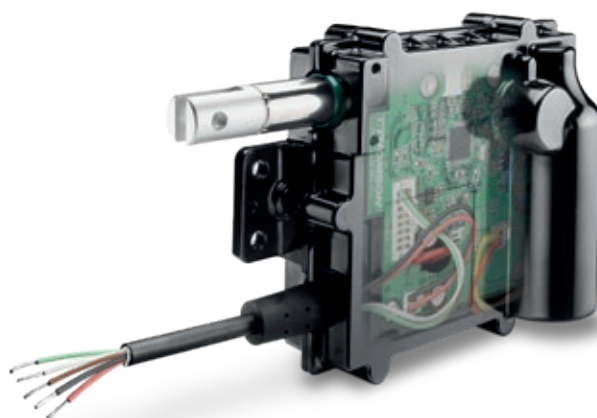
Wide Range of Electric Actuators

Not all applications require the most advanced solutions. Many times simpler is better, and with the wide range of actuators offered by Thomson, you are likely to find the ideal solution. Compact Electrak S, SP, M-Track and E050 models can be used where space is limited or loads are low. Electrak LA and B-Track are work horses that will perform tirelessly almost everywhere. Actuators such as H-Track, Electrak Throttle, LL and Max Jac are designed to excel in specific applications, while Electrak GX is a cost-efficient alternative.

Smart Actuators

Our most advanced actuators today are the Electrak XD, HD, LL, MD and Throttle families. These all feature integrated onboard controls, enabling a level of control that traditionally required complex external componentry.

This advanced controllability allows you to monitor performance and perform diagnostic checks on the fly to help increase efficiency and productivity. Our smart actuators come with a wide range of control functions – from simpler options with only low-level switching to more advanced options with a CAN bus network to enable remote control of several actuators using only two wires.



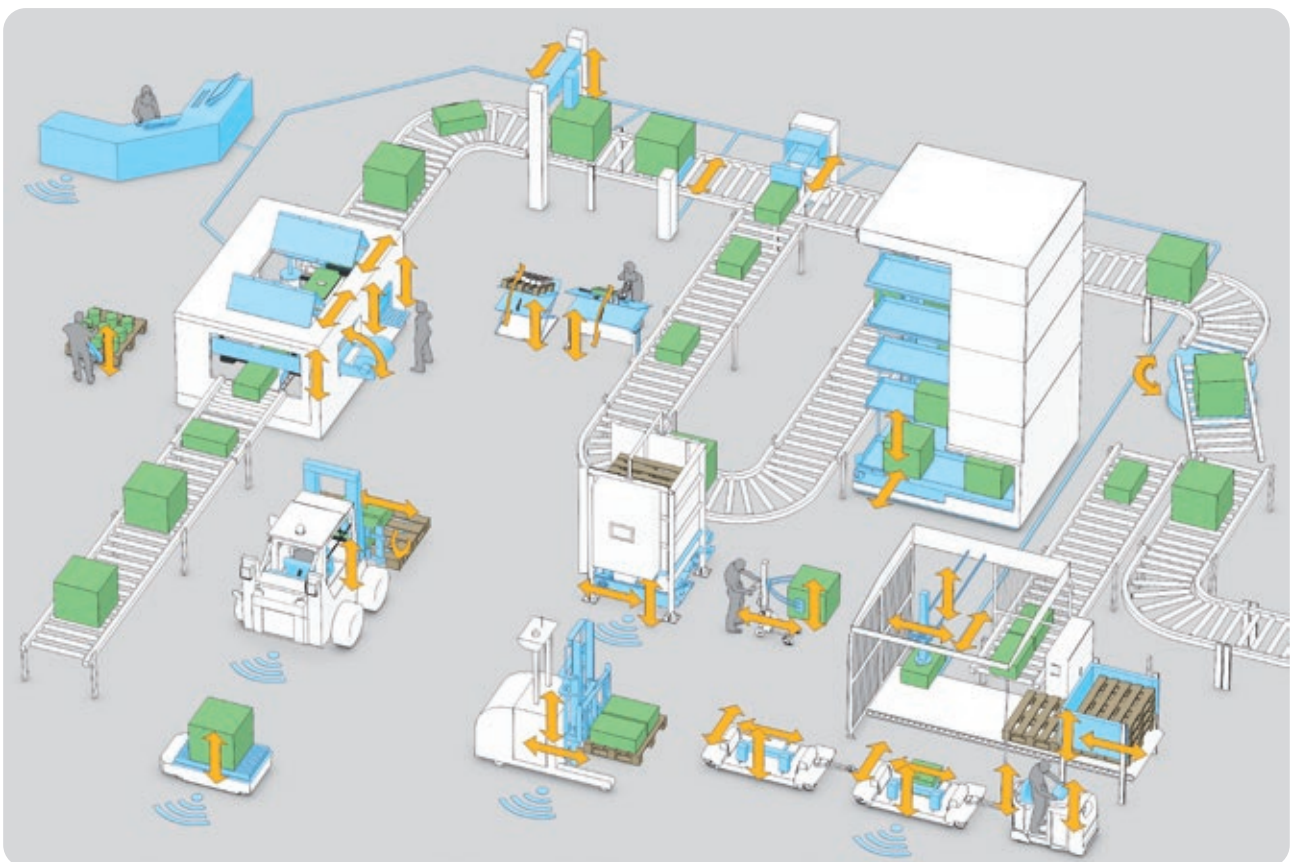
Electrak Throttle, MD, HD and XD smart electric linear actuators

Smart Actuators

As the industrial world becomes increasingly connected, the need for intelligent components that can communicate and operate independently is growing. Thomson is meeting this demand with our smart actuators in which modular onboard controls and bus communication are key features.

Smart Actuator Benefits

- Increased efficiency and productivity
- Fewer components and less cabling
- Minimized complexity and easier installation
- Reduced hardware and software costs
- Decreased machine development time
- Reduced overall system weight
- Improved machine functionality and performance
- Bus communication between host control and actuators
- Position-based synchronization without having to add extra external controls
- Improved, more accurate controllability
- Speed and force control
- Enhanced diagnostic and monitoring capabilities

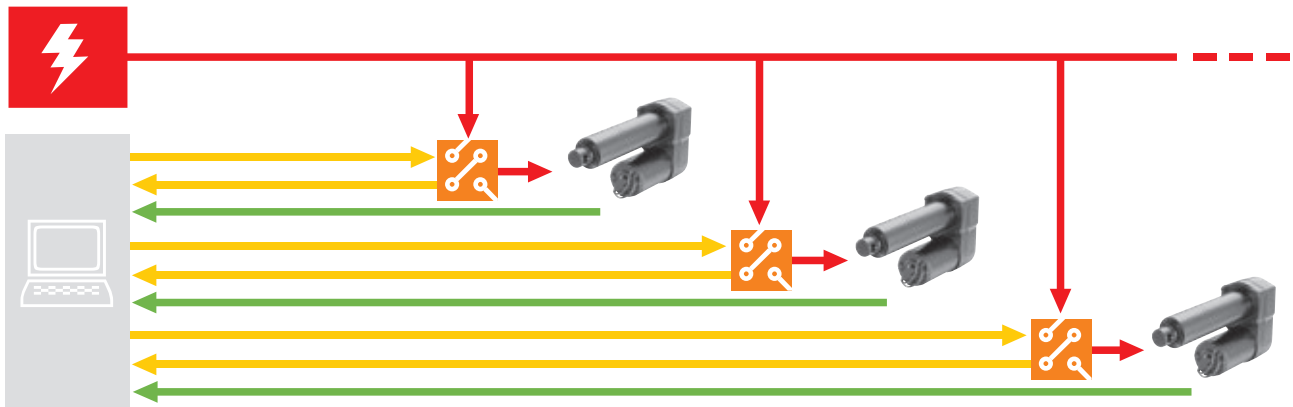


Smart actuators in an industrial automation environment

Traditional vs. Smart Systems

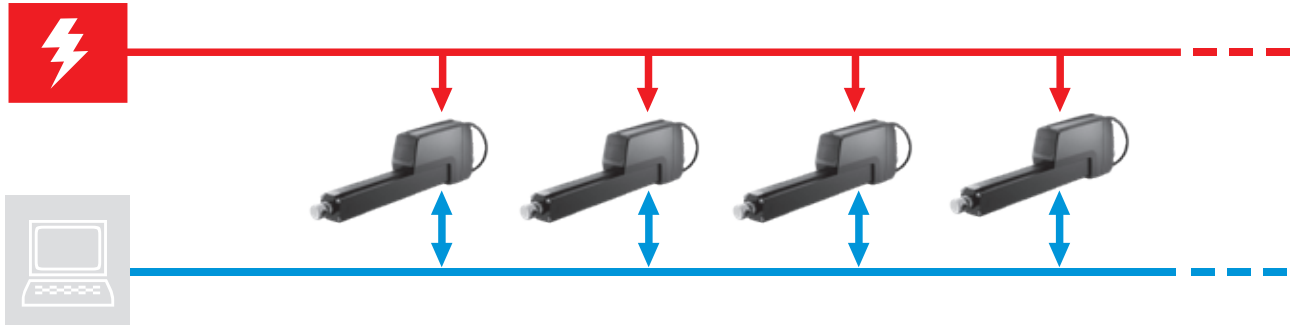
Traditional System

Each actuator with related devices is controlled by the host individually through multiple cables and boxes.



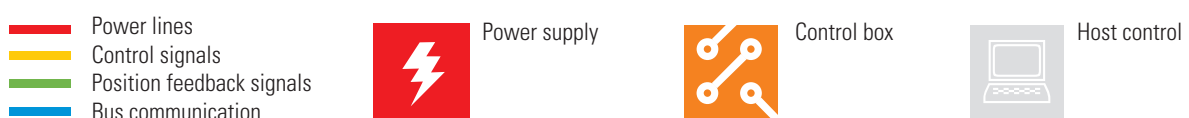
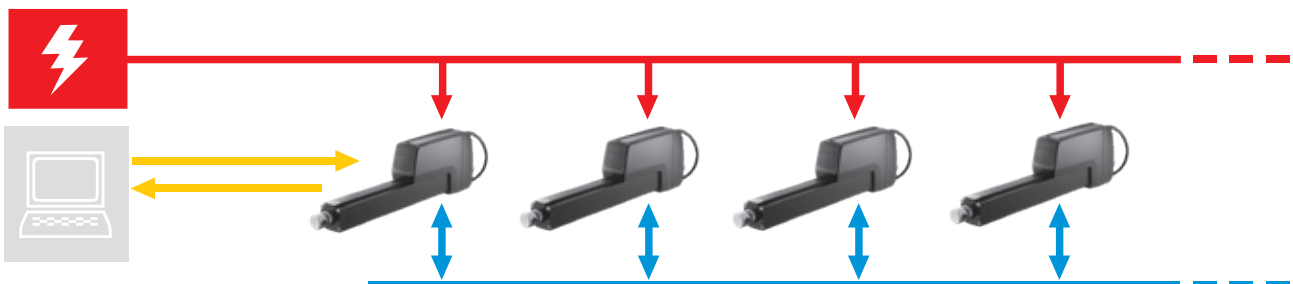
Bus Communication System

All actuators are controlled from the host over the same two-wire bus.



Synchronization System

The host communicates with the master actuator while the others follow it over the bus.



Smart Modular Onboard Controls

Thomson's Electrak® Modular Control System (EMCS) is our onboard modular control system that makes it possible to tailor a smart actuator precisely to your application requirements. It is the base of the system that handles the power to the actuator and acts as a barrier between the outside and inside.

Safety Comes First

The Electronic Monitoring Package (EMP) is the most important module and is, with a few exceptions, always included. The EMP module monitors critical actuator functions and takes appropriate actions when needed.

Electrak Modular Control System (EMCS)



EMCS only



EMCS + Electric Monitoring Package (EMP)



EMCS + EMP + Digital Position Feedback



EMCS + EMP + End-of-Stroke Output



EMCS + EMP + End-of-Stroke Output + Analog Position Output



EMCS + EMP + Low Level Motor Switching



EMCS + EMP + SAE J1939 CAN Bus



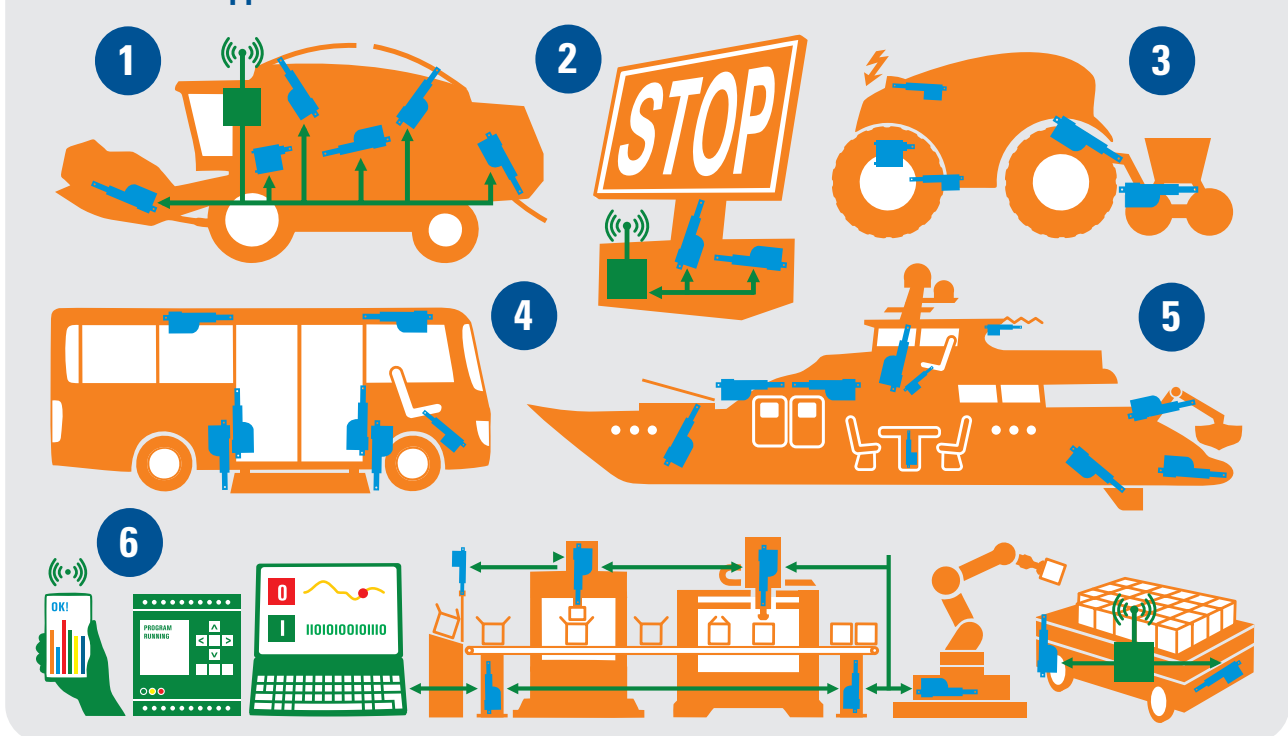
EMCS + EMP + Low Level Motor Switching + Synchronization

Many control module combinations are possible across our smart actuator range, including those shown above

What's On the Control Module Menu?

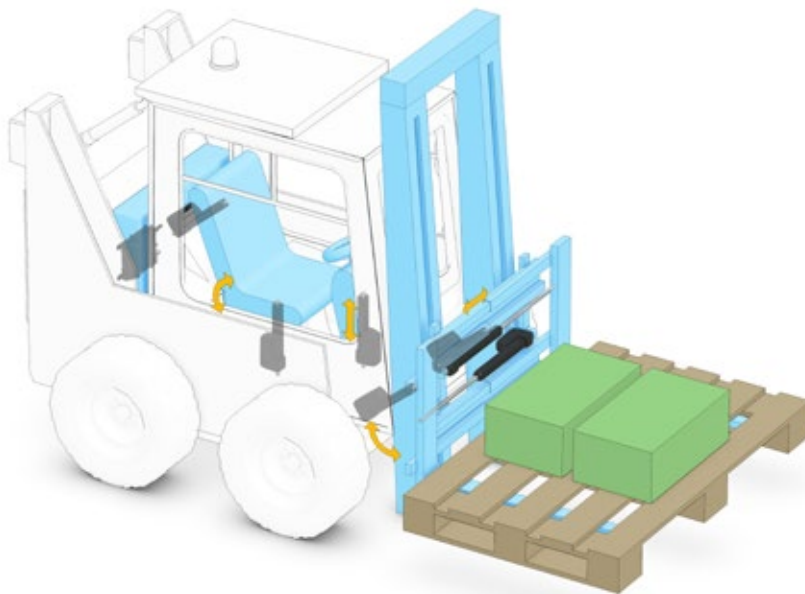
Each smart actuator has its own menu of control modules depending on what type of applications it is geared toward. Typical modules are low-level motor switching, end-of-stroke outputs, position feedback and CAN bus functionality, while modules such as programmable limit switches, force feedback, speed control, signal-follower and synchronization are more specialized. New modules are continuously being added, and custom solutions are also available.

Smart Control Applications



1. The combine uses a CAN bus control and wireless communication to keep track of productivity, adjust on the fly and monitor the actuator status.
2. Remote-controlled road sign/advertising board/arena monitor.
3. Driverless electric tractor with actuators for automatic recharge, steering and throttle control as well as for automatic recharge docking and fertilizer spreader control.
4. Synchronized actuators control the bus ramp and doors, while other actuators control driver seat settings.
5. Multiple smart actuators control the antennas, hatches, doors, sun roofs, tables, beds and many other applications on the yacht.
6. This production cell and AGV truck communicate over a CAN bus system to monitor and adjust the cell on the fly to allow for flexible manufacturing. Force feedback, speed control, position feedback, programmable limit switches and synchronization are just a few of the functions in use here. These and many others functions are offered by Thomson's families of smart electric actuators.

Applications

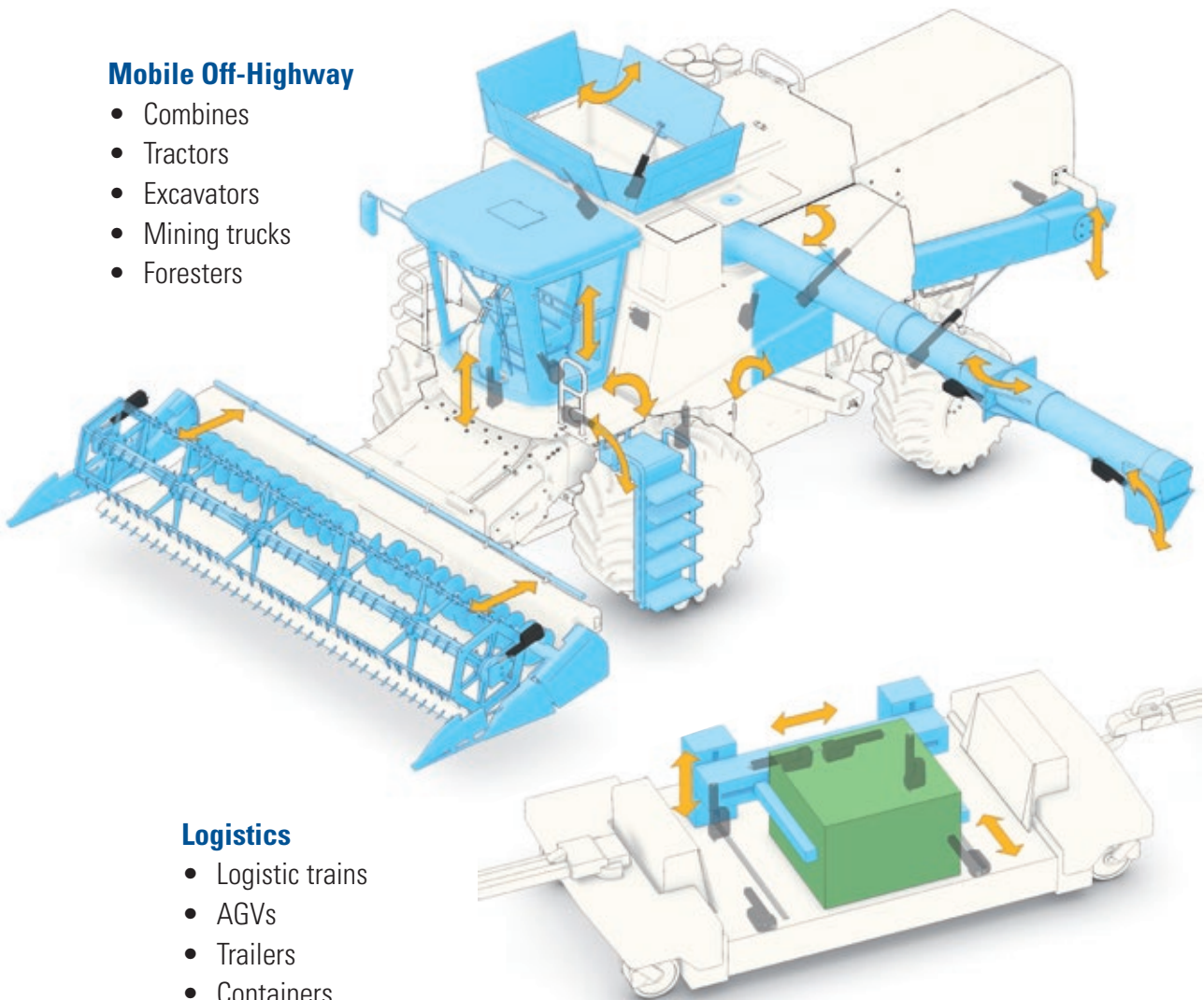


Lifting and Handling

- Fork lifts
- Sky lifts
- Cranes
- Snow machines
- Operator/passenger cabins
- Material handling vehicles

Mobile Off-Highway

- Combines
- Tractors
- Excavators
- Mining trucks
- Foresters

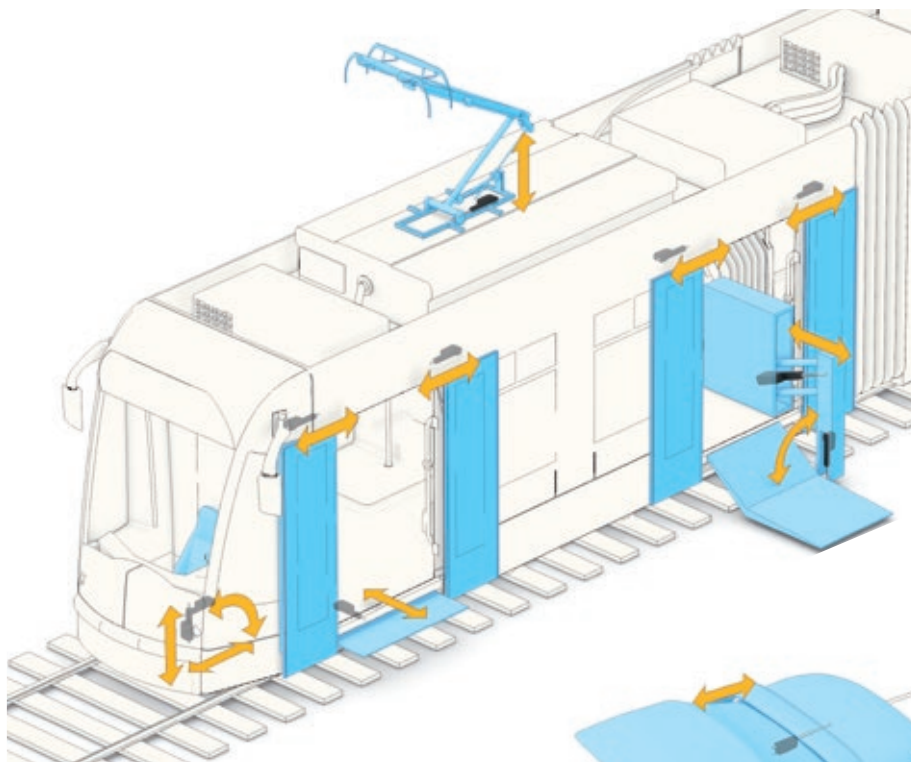
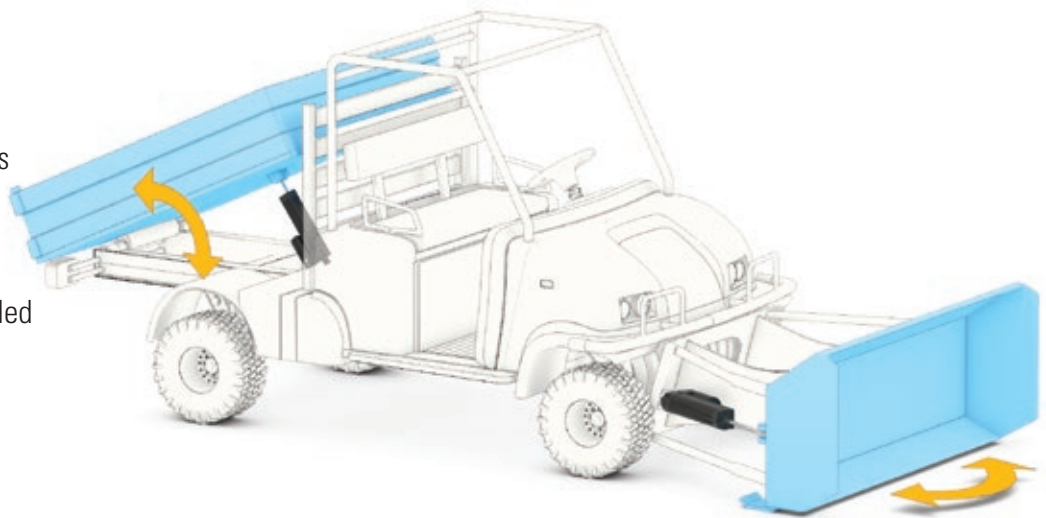


Logistics

- Logistic trains
- AGVs
- Trailers
- Containers

Utility Vehicles

- Garden tractors
- Ride-on lawn mowers
- Golf carts
- Vehicles and adaptations for elderly and/or disabled

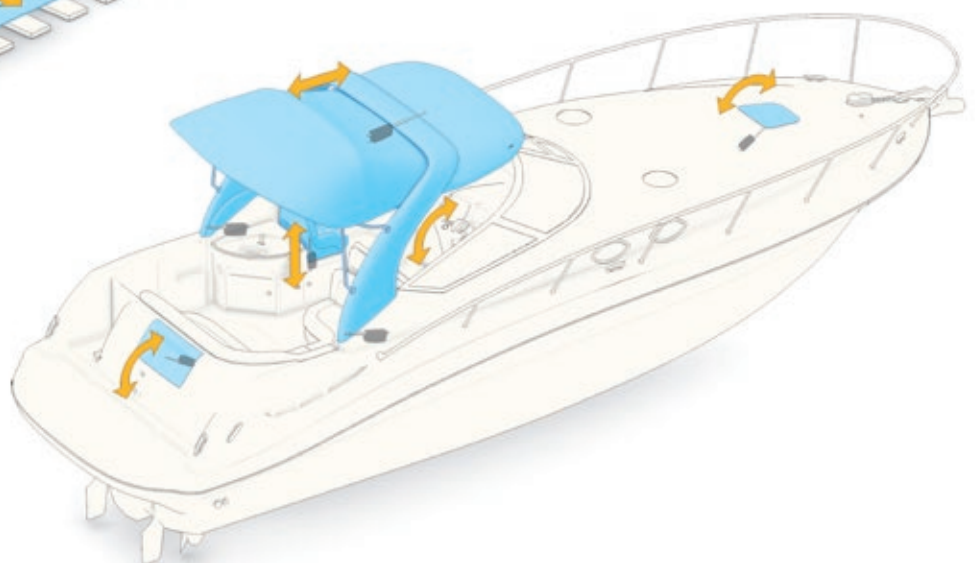


Public Transportation

- Trains
- Trams
- Buses
- Ferries
- Airport logistics

Off-Shore and Marine

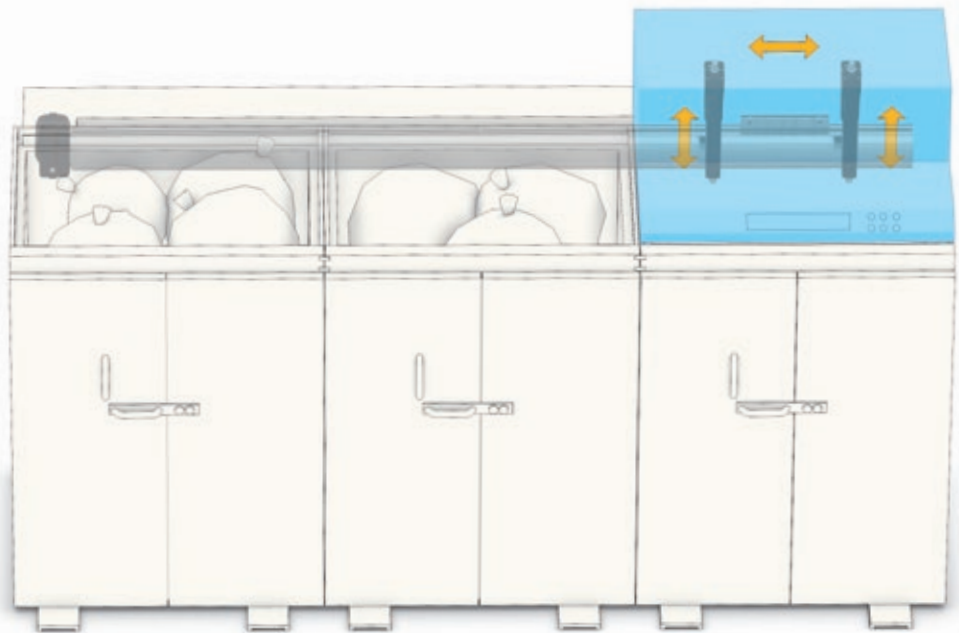
- Boats, yachts and ships
- Oil and gas rigs
- Docks, harbors and shipyards



Applications

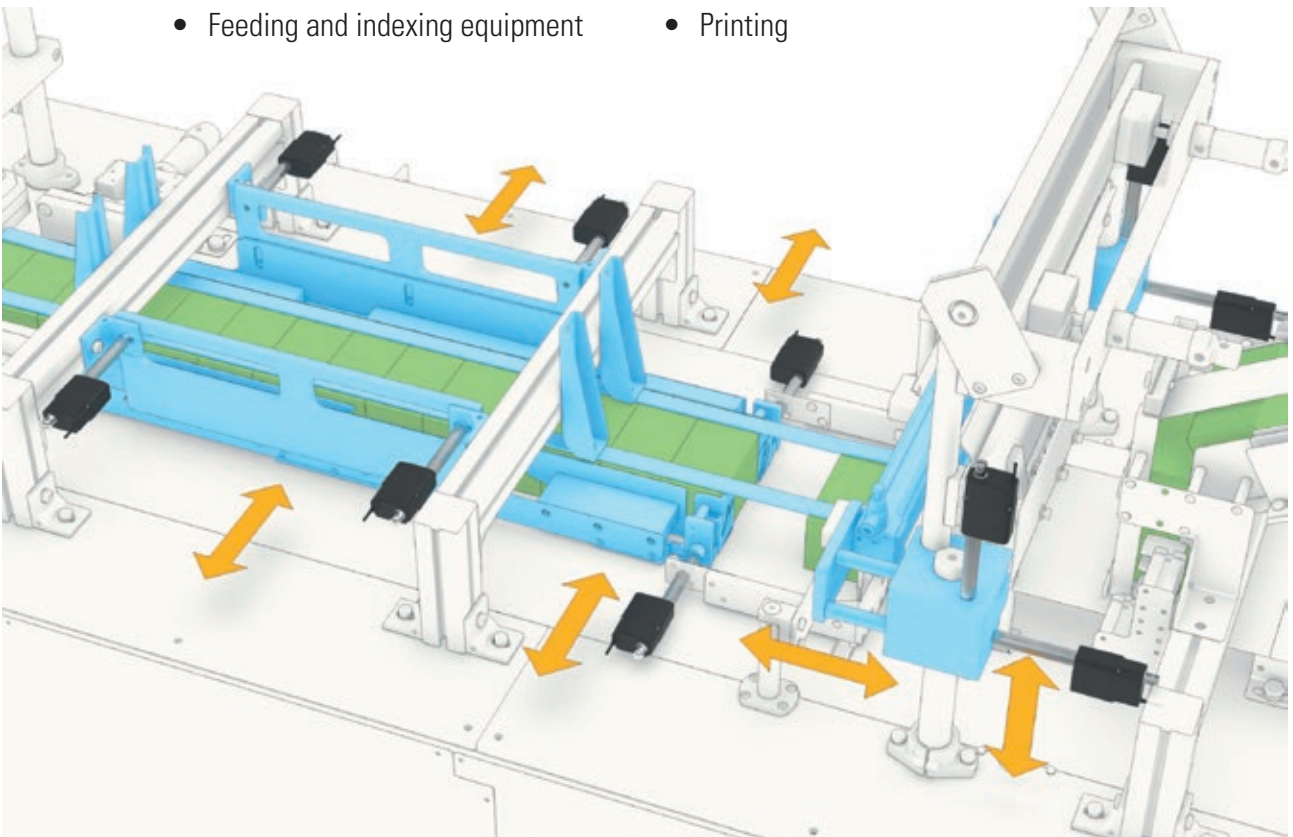
Cleaning and Recycling

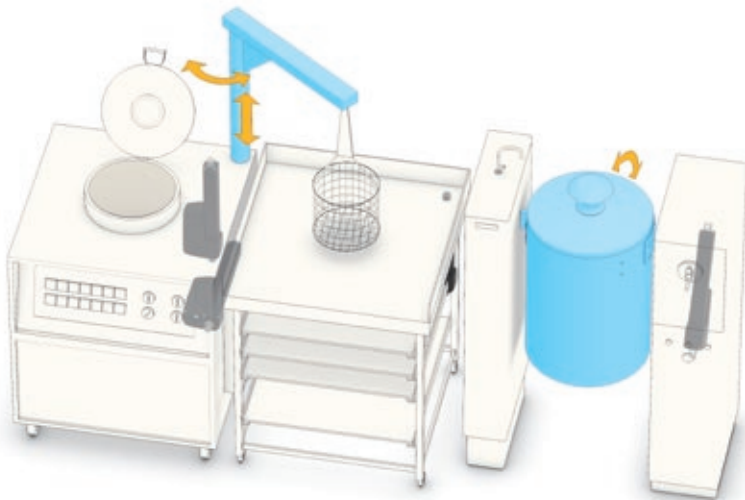
- Recycling stations
- Sorting machines
- Garbage compressors
- Waste management
- Industrial washing



Industrial Automation

- Robots and manipulators
- Machining/machine tools
- Feeding and indexing equipment
- Handling equipment
- Painting/surface treatment
- Printing



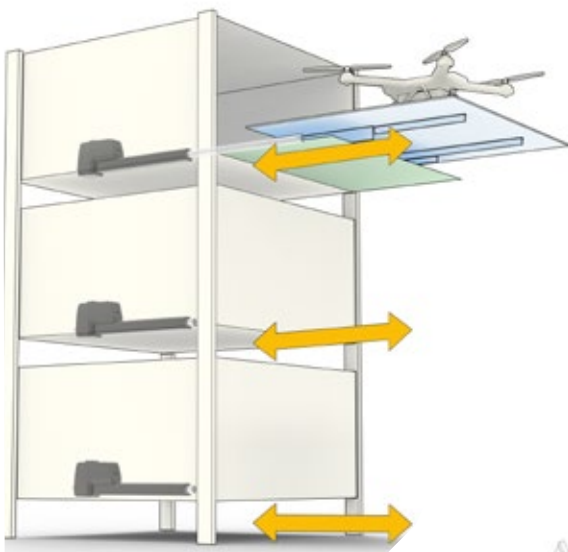


Food and Processing

- Restaurant kitchens
- Food/beverage machinery
- Chemical/medicine equipment
- Vending machines

Unmanned Vehicles

- Drones and drone landing pads
- Driverless cars and trucks
- Robotic lawn mowers
- Robotic cleaning machines

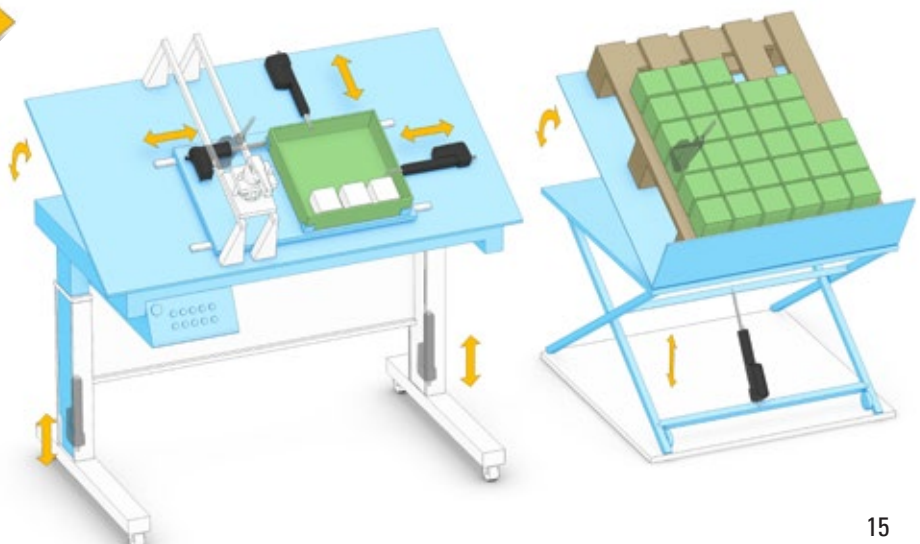


Healthcare and Assistance

- Staircase lifts
- Patient lifts
- Wheelchairs
- Beds and examination tables
- Furniture and training equipment
- Home and office automation

Workstations and Storage

- Fixtures
- Assembly line adjustments
- Automatic storage
- Lifting and positioning aids
- Ergonomic improvements



Online Sizing and Selection Tools

Thomson LinearMotioneering® for linear actuators is a self-service, online sizing and selection tool that saves you time and cost, and helps avoid misapplication. The tool allows you to quickly and accurately find your ideal solution by completing a self-guided, interactive series of questions that taps into the extensive application engineering knowledge base of Thomson experts.

LinearMotioneering is an easy-to-use, step-by-step tool that gathers all necessary information and then presents you with suitable solutions. Once the best candidate among the options is defined, LinearMotioneering allows you to download all of the technical data and a 3D CAD model of the selected actuator, shows you the cost and delivery time, and even lets you purchase it from the Thomson online store.

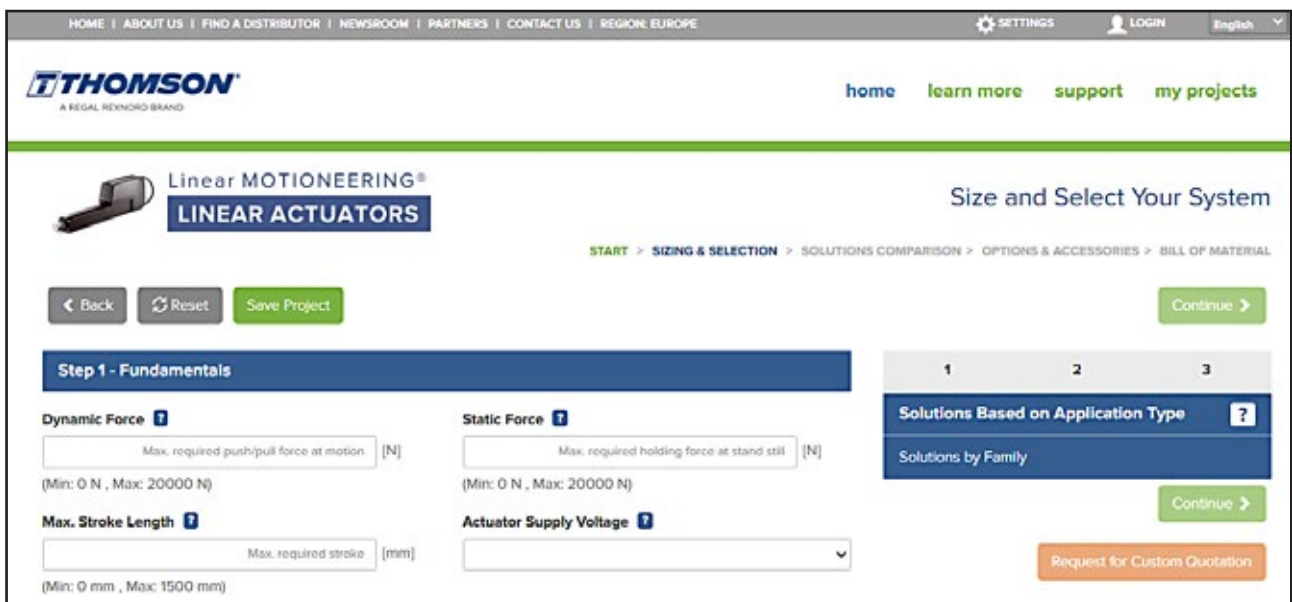
Your Own Project Library

All of your projects are stored in your own library so

that you can return and continue working on them or use an old project as the basis for a new one. Since projects are stored online, you can open them from any computer, mobile phone or tablet – from anywhere in the world

Help with Custom Solutions

If LinearMotioneering can't find a suitable actuator for your project, you have the option to ask for a custom solution. The tool will ask for the necessary data so that our engineers can have a look and help you get what you need.



Do you want help to size and select the best match for your application?
Visit: www.linearactuators.linearmotioneering.com

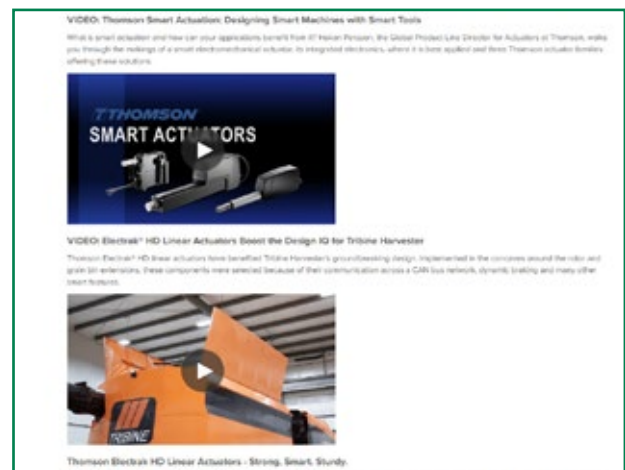
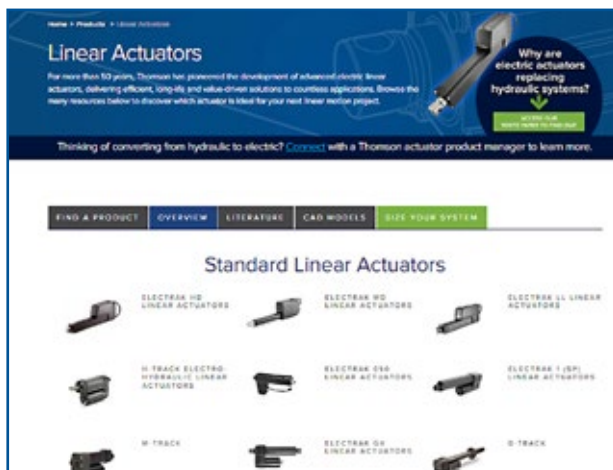
Additional Online Resources

Thomson offers a wide variety of online resources to help you learn more about electric linear actuators. An experienced team of application engineers is also available to help you. To explore additional technical resources and options, contact Thomson customer support at www.thomsonlinear.com/contact.

Linear Actuators on the Web

Find additional information and learn more about electric linear actuators on this content-rich web page. Includes videos, webinar recordings, training, technical articles, customization details and much more.

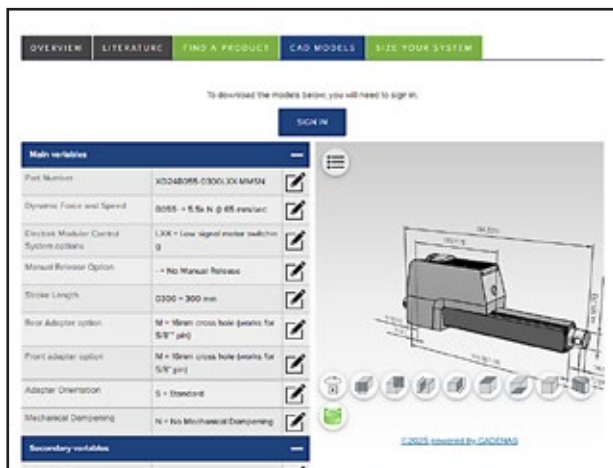
www.thomsonlinear.com/en/products/linear-actuators#overview



Interactive 3D CAD Models

Download free interactive 3D models in the most common CAD formats.

www.thomsonlinear.com/en/products/linear-actuators-drawings



Electrification Guide

Learn more about how converting your actuation to electric can deliver a bevy of benefits to design projects.

www.thomsonlinear.com/en/products/electrification



On the Front Line Since 1967

From the first simple screw and motor linear actuators to today's smart hi-tech models with onboard controls, heavy duty performance and comprehensive environmental protection - Thomson has always been at the forefront of exploring the possibilities of what linear actuators can achieve.

1967

The **Performance Pak** line, the world's first electric linear actuators and designed for farm and garden equipment, are released.



1974

The first line of **parallel motor actuators** are released.



1982

The **Electrak® 10** actuator line is released and becomes the benchmark for all future linear actuators.



1984

Electrak 1, the worlds' first miniature linear actuator is released.



1991

The first series of **lifting columns** are released.



1999

Electrak 050 is released as the first composite housing actuator.



2000

The rodless **LM80 actuator** is released.



2006

Electrak Pro, the first Thomson linear actuator with a modular onboard control concept in a one-size housing, is released.



2013

Both **Electrak Throttle**, Thomson's first CAN bus control actuator, and **Max Jac** heavy duty actuator are released.



Today, our engineers continue improving the electric linear actuator and adapting it to serve in even more roles and applications. You will meet Thomson actuators in the field, at sea, in the workshop, inside machines and in a vast number of other places, relentlessly doing their job.

2016

Electrak HD, the first truly smart actuator and a milestone in actuator engineering, is released, redefining what linear actuators are and can be used for.



2019

Electrak GX is released, setting a new standard for traditional linear actuators.



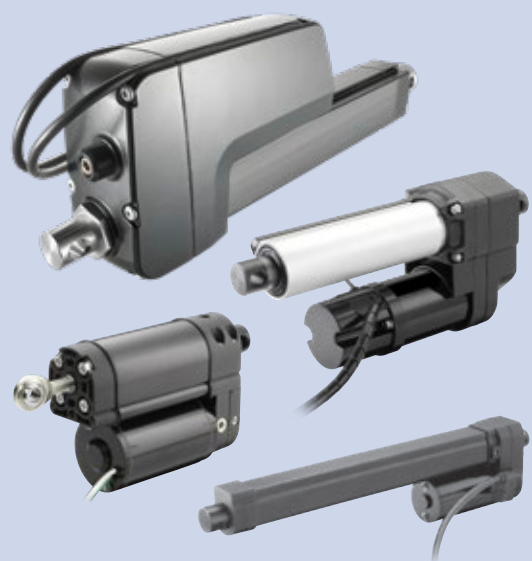
2020

Electrak MD is released, broadening the smart actuator range into the compact segment.



2021

Electrak LL, a smart, long-life synchronous motor actuator with superior environmental protection, is released. The **B-Track**, **M-Track** and **H-Track** are added to the actuator range.



2023

Electrak XD, the first electric actuator to be strong enough to truly contend with hydraulic cylinders, is released, and is equipped with all of the standard advantages associated with Thomson smart actuators.



2025

H-Track Marine, the first electric actuator that can operate while submerged in water for longer periods, is released.



Performance Overview

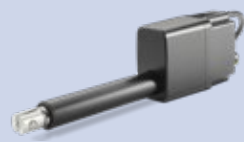
Specifications

		Electrak® XD	Electrak HD	
				
Screw type		ball	ball	
Manual operation		optional	yes	
Static load holding		yes	yes	
End-of-stroke protection		internal limit switches	internal limit switches	
Overload protection		yes	yes	
Available input voltages	[Vdc] [Vac]	24, 48 -	12, 24, 48 -	
Max. static load	[N (lbf)]	32000 (7194)	18000 (4000)	
Max. dynamic load (Fx)	[N (lbf)]	25000 (5620)	16000 (3584)	
Max. speed @ no load / max. load	[mm/s (in/s)]	75 (2.95) ⁽¹⁾	71 / 58 (2.80 / 2.28)	
Max. ordering stroke (S) length	[mm] / [in]	1200 / -	1000 / -	
Restraining torque	[Nm (lbf-in)]	0	0	
Operating temperature limits	[°C (F)]	- 40 – 85 (- 40 – 185)	- 40 – 85 (- 40 – 185)	
Full load duty cycle @ 25 °C (77 °F)	[%]	50	25	
Ingress protection rating - static / dynamic		IP67, IP69K / IP66	IP67, IP69K / IP66	
Control options				
End-of-stroke output		yes	yes	
Analog position feedback		no	yes	
Digital position feedback		yes	yes	
Low-level switching		yes	yes	
Programmable extend and retract limits		yes	yes	
Signal-follower		no	yes	
Synchronization		no	yes	
SAE J1939 CAN bus		yes	yes	
CANopen® CAN bus		yes	yes	
End-of-stroke limit switches		standard	standard	
Page		28	44	



= SMART ACTUATOR

(1) Synchronous constant speed motor

	Electrak LL	Electrak MD	DMHD
	 	 	 
	ball	acme	ball
	yes	yes	yes
	yes	yes (self-locking)	yes
	internal limit switches	internal limit switches	internal limit switches
	yes	yes (optional)	yes
	24, 48 -	12, 24, 48 -	12, 24, 48 -
	15000 (3372)	2000 (450)	18000 (4000)
	6000 (1349)	2000 (450)	16000 (2248)
	54 (2.13) ⁽¹⁾	52 / 43.8 (2.04 / 1.72)	71 / 58 (2.80 / 2.28)
	450 / -	300 / -	600 / -
	0	0	0
	- 40 – 85 (- 40 – 185)	- 40 – 85 (- 40 – 185)	- 40 – 85 (- 40 – 185)
	35	25	25
	IP67, IP69K / IP66	IP67, IP69K / IP66	IP65 / -
	yes	yes	yes
	yes	yes	yes
	no	no	yes
	yes	yes	yes
	no	no	yes
	no	no	yes
	no	no	yes
	yes	yes	yes
	yes	yes	yes
	standard	standard	standard
	60	70	80

(1) Synchronous constant speed motor



Performance Overview

Specifications

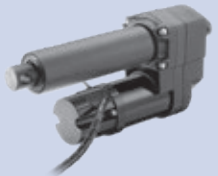
		Electrak® GX DC	Electrak GX AC	
				
Screw type		acme or ball	acme or ball	
Manual operation		optional	optional	
Static load holding		yes	yes	
End-of-stroke protection		clutch	clutch	
Overload protection		yes	yes	
Available input voltages	[Vdc] [Vac]	12, 24, 36, 48, 90 -	- 1 × 115, 1 × 230, 3 × 400	
Max. static load	[N (lbf)]	18000 (4000)	18000 (4000)	
Max. dynamic load (Fx)	[N (lbf)]	9000 (2000)	9000 (2000)	
Max. speed @ no load / max. load	[mm/s (in/s)]	61 / 37 (2.40 / 1.40)	53 / 43 (2.10 / 1.70)	
Max. ordering stroke (S) length	[mm] / [in]	- / 24	- / 24	
Restraining torque	[Nm (lbf-in)]	11.3 (100)	11.3 (100)	
Operating temperature limits	[°C (F)]	- 25 – 65 (- 15 – 150)	- 25 – 65 (- 15 – 150)	
Full load duty cycle @ 25 °C (77 °F)	[%]	25	25	
Ingress protection rating - static / dynamic		IP66, IP69K / -	IP45 / -	
Control options				
End-of-stroke output		no	no	
Analog position feedback		yes	yes	
Digital position feedback		no	no	
Low-level switching		no	no	
Programmable extend and retract limits		no	no	
Signal-follower		no	no	
Synchronization		no	no	
SAE J1939 CAN bus		no	no	
CANopen® CAN bus		no	no	
End-of-stroke limit switches		no	no	
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= SMART ACTUATOR

	Electrak LA14	Electrak LA24	B-Track IC DC	B-Track IC AC
				
	acme or ball	acme or ball	acme or ball	acme or ball
	optional	optional	yes	yes
	yes	yes	yes	yes
	clutch	clutch	yes	yes
	yes	yes	yes	yes
	12, 24, 36 -	- 1 × 115, 1 × 230, 3 × 400	12, 24 -	- 1 × 115, 1 × 230
	18000 (4000)	18000 (4000)	13345 (3000)	13345 (3000)
	6800 (1500)	4500 (1000)	12460 (2800)	12460 (2800)
	61 / 37 (2.40 / 1.40)	53 / 43 (2.10 / 1.70)	73 / 43 (2.85 / 1.7)	44 / 32 (1.75 / 1.28)
	600 / -	600 / -	- / 24	- / 24
	0	0	11.3 (100)	11.3 (100)
	- 25 – 65 (- 15 – 150)	- 25 – 65 (- 15 – 150)	- 29 – 65 (- 20 – 150)	- 29 – 65 (- 20 – 150)
	25	25	25	25
	IP65 / -	IP45 / -	IP66, IP69K / -	IP54 / -
	no	no	yes	yes
	yes	yes	yes	yes
	no	no	no	no
	no	no	yes	no
	no	no	no	no
	no	no	no	no
	no	no	no	no
	no	no	no	no
	no	no	yes	no
	114	122	132	140

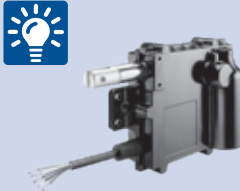
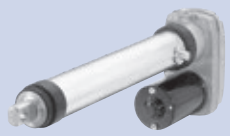
Performance Overview

Specifications			
	B-Track DC	B-Track AC	
			
Screw type	acme or ball	acme or ball	
Manual operation	yes	yes	
Static load holding	yes	yes	
End-of-stroke protection	yes	yes	
Overload protection	yes	yes	
Available input voltages	[Vdc] [Vac]	- 1 × 115, 1 × 230	
Max. static load	[N (lbf)]	13345 (3000)	
Max. dynamic load (Fx)	[N (lbf)]	12460 (2800)	
Max. speed @ no load / max. load	[mm/s (in/s)]	73 / 43 (2.85 / 1.7)	
Max. ordering stroke (S) length	[mm] / [in]	- / 24	
Restraining torque	[Nm (lbf-in)]	11.3 (100)	
Operating temperature limits	[°C (F)]	- 29 – 65 (- 20 – 150)	
Full load duty cycle @ 25 °C (77 °F)	[%]	25	
Ingress protection rating - static / dynamic	IP66, IP69K / -	IP54 / -	
Control options			
End-of-stroke output	no	no	
Analog position feedback	no	no	
Digital position feedback	no	no	
Low-level switching	no	no	
Programmable extend and retract limits	no	no	
Signal-follower	no	no	
Synchronization	no	no	
SAE J1939 CAN bus	no	no	
CANopen® CAN bus	no	no	
End-of-stroke limit switches	no	no	
Page	146	152	

	H-Track	Electrak® 1 S	Electrak 1 SP	M-Track	Electrak 050
					
	none (hydraulic piston)	acme	acme	acme	worm
	yes	no	no	no	no
	yes	yes	yes	yes	yes
	no	internal limit switches	no	internal limit switches	internal limit switches and clutch
	yes	no	no	no	yes
	12, 24, 48 -	12, 24 -	12, 24 -	12, 24 -	12, 24, 36 -
	22241 (5000)	1300 (300)	1300 (300)	1300 (300)	1020 (224)
	21351 (4800)	340 (75)	340 (75)	735 (165)	510 (112)
	111.2 / 111.2 (4.38 / 4.38)	78 / 64 (3.1 / 2.5)	78 / 64 (3.1 / 2.5)	44 / 40 (1.74 / 1.58)	48 / 37 (1.9 / 1.5)
	- / 16	- / 8	- / 8	- / 12	200 / -
	0.1 (0.89)	2.3 (1.7)	0	0	0
	- 26 – 65 (- 20 – 150)	- 25 – 65 (- 13 – 150)	- 25 – 65 (- 13 – 150)	- 25 – 65 (- 13 – 150)	-30 – 80 (-22 – 176)
	25	25	25	25	25
	IP69K, IP67 / IP65	IP66 / -	IP66 / -	IP69K / IP65	IP56 / -
	no	no	no	no	no
	no	no	standard	yes	yes
	no	no	no	no	no
	no	no	no	no	no
	no	no	no	no	no
	no	no	no	no	no
	no	no	no	no	no
	no	no	no	no	no
	no	no	no	no	no
	no	standard	no	standard	yes
	158	170	176	182	188

Performance Overview

Specifications

	Max Jac®	Electrak® Throttle	Electrak PPA	
				
Screw type	worm or ball	worm	ball	
Manual operation	no	no	no	
Static load holding	worm yes, ball no	yes	yes	
End-of-stroke protection	no	internal limit switches and clutch or current sensing	clutch	
Overload protection	no	yes	yes	
Available input voltages	[Vdc] [Vac]	12, 24 -	12, 24, 36 -	
Max. static load	[N (lbf)]	2000 (450)	260 (60)	13350 (3000)
Max. dynamic load (Fx)	[N (lbf)]	800 (180)	130 (30)	6670 (1500)
Max. speed @ no load / max. load	[mm/s (in/s)]	60 / 30 (2.4 / 1.2)	196 / 83 (3.7 / 3.3)	32 / 28 (1.26 / 1.10)
Max. ordering stroke (S) length	[mm] / [in]	300 / -	- / 2	- / 36
Restraining torque	[Nm (lbf-in)]	2 (1.48)	0	22 (200)
Operating temperature limits	[°C (F)]	-40 – 85 (-40 – 185)	-40 – 125 (-40 – 257)	-25 – 65 (-15 – 150)
Full load duty cycle @ 25 °C (77 °F)	[%]	25	50	30
Ingress protection rating - static / dynamic	IP66, IP69K / -	IP69K, IP67 / -	IP54 / -	
Control options				
End-of-stroke output	no	no	no	
Analog position feedback	yes	yes	yes	
Digital position feedback	yes	no	no	
Low-level switching	no	no	no	
Programmable extend and retract limits	no	no	no	
Signal-follower	no	no	no	
Synchronization	no	no	no	
SAE J1939 CAN bus	no	yes	no	
CANopen® CAN bus	no	no	no	
End-of-stroke limit switches	no	yes	yes	
Page	194	200	208	



= SMART ACTUATOR

	DMD	DMA	LM80H	LM80V
				
	acme or ball	acme or ball	trapezoidal or ball	trapezoidal or ball
	optional	optional	no	no
	yes	yes	no	no
	clutch	clutch	spring loaded soft stop	spring loaded soft stop
	yes	yes	no	no
	12, 24 -	- 1 × 230, 3 × 400	12, 24 -	12, 24 -
	18000 (4000)	18000 (4000)	2000 (450)	2000 (450)
	6800 (1500)	6800 (1500)	750 (169)	750 (169)
	61 / 37 (2.40 / 1.40)	61 / 37 (2.40 / 1.40)	110 / 73 (4.3 / 2.9)	110 / 83 (4.3 / 3.3)
	600 / -	600 / -	1500 / -	1500 / -
	0	0	0	0
	- 25 – 85 (- 15 – 185)	- 25 – 85 (- 15 – 185)	0 – 40 (32 – 104)	0 – 40 (32 – 104)
	25	25	15	15
	IP65 / -	IP65 / -	IP44 / -	IP44 / -
	no	no	no	no
	yes	yes	no	no
	no	no	no	no
	no	no	no	no
	no	no	no	no
	no	no	no	no
	no	no	no	no
	no	no	no	no
	no	no	no	no
	216	222	228	234

Electrak® XD – Technical Features



Standard Features

- Constant speed irrespective of load
- Tough, strong and reliable
- Electronic Monitoring Package as standard
- Low-level signal motor switching as standard
- Speed control as standard
- Loads up to 25000 N (5620 lbf)
- Speeds up to 75 mm/s (2.95 in/s)
- Strokes up to 1200 mm
- Optional onboard controls
- Optional manual brake release and override
- Optional shock load dampening feature
- Optional force feedback

General Specifications

Screw type	ball
Nut type	load lock ball nut
Manual override	optional
Anti-rotation	yes
Static load holding brake	yes
Safety features	Electrak monitoring package: current monitoring voltage monitoring temperature monitoring temperature compensation load trip point calibration internal end-of-stroke limit switches ⁽¹⁾ full stroke dynamic braking
Electrical connections Power Signal	integral screw terminals integrated housing connector
Compliance	CE, UKCA, RoHS, REACH (EU)

Optional Electronic Control Features

CANopen® CAN bus
SAE J1939 CAN bus
Programmable limit switches
End-of-stroke indication output
Digital position output

Optional Mechanical Features

Shock load dampening
Manual brake release/override
Variety of front and rear adapters
Alternative adapter orientation
Rear adapter with force feedback sensor

Control Option Combinations

LXX	Electrak Monitoring package + Low-Level Signal Motor Switching + Force Feedback Output
LLX	LXX + Position Feedback Output
LXP	LXX + Analog Position Output
LLP	LXX + Position Feedback Output + End-of-stroke Outputs
PLS	LXX + Position Feedback Output + Programmable End-of-stroke Limits
CNO	SAE J1939 CAN Bus Control + Open-Loop Speed Control
COO	CANopen® CAN Bus Control + Open-Loop Speed Control

Accessories

Signal cable and connector harness

Electrak XD – Technical Specifications

Mechanical Specifications

Max. static load	[kN (lbf)]	see page 22
Max. dynamic load (Fx)	[kN (lbf)]	
XDxx-B055		5.5 (1236)
XDxx-B080		8.0 (1798)
XDxx-B160		16.0 (3597)
XDxx-B200		20.0 (4496)
XDxx-B250		25.0 (5620)
Speed ^{(1) (2)}	[mm/s (in/s)]	
XD24-B055		65 (2.56)
XD48-B055		75 (2.95)
XD24-B080		50 (1.97)
XD48-B080		50 (1.97)
XD24-B160		25 (0.98)
XD48-B160		25 (0.98)
XD24-B200		16 (0.63)
XD48-B200		20 (0.79)
XD24-B250		16 (0.63)
XD48-B250		16 (0.63)
Min. ordering stroke (S) length	[mm]	100
Max. ordering stroke (S) length	[mm]	
XDxx-B055(B080)		1200
XDxx-B160		1000
XDxx-B200		800
XDxx-B250		650
Ordering stroke length increments	[mm]	50
Operating temperature limits	[°C (°F)]	-40 – 85 (-40 – 185)
Max. duty cycle @ 25 °C (77 °F)	[%]	
@ full load		50
@ other load		see page ??
End play, maximum	[mm (in)]	1.2 (0.047)
Restraining torque	[Nm (lbf-in)]	0
Weight of options	[kg (lbs)]	
Shock load dampening		1.16 (2.56)
Manual brake release and override		0.71 (1.56)
Protection class - static (dynamic) ³		IP67/IP69K (IP66)
Salt spray resistance	[h]	500

¹ Speed is constant and load independent from zero to max load.

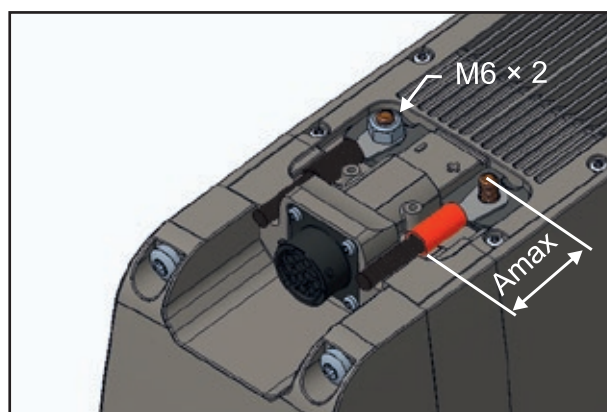
² Do not use PWM voltage for speed control to avoid damaging the onboard electronics.

³ The protection class is valid only with a mating connector attached to the signal connector in the actuator housing.

Electrical Specifications

Available input voltages	[Vdc]	24, 48
Input voltage tolerance	[Vdc]	
XD24 (24 Vdc input voltage)		18 - 32
XD48 (48 Vdc input voltage)		36 - 60
Current draw @ min. / max. load	[A]	
XD24-Bxxx		6 / 28
XD48-Bxxx		3 / 14
Power supply ring terminal size		M6
Ring terminal hole center to insulation end distance, max. (Amax)	[mm]	34.5
Signal connector type*		RTS014N12S03
Female 12 pin Amphenol Ecomate		

* Connector manufacturers designation and part number.



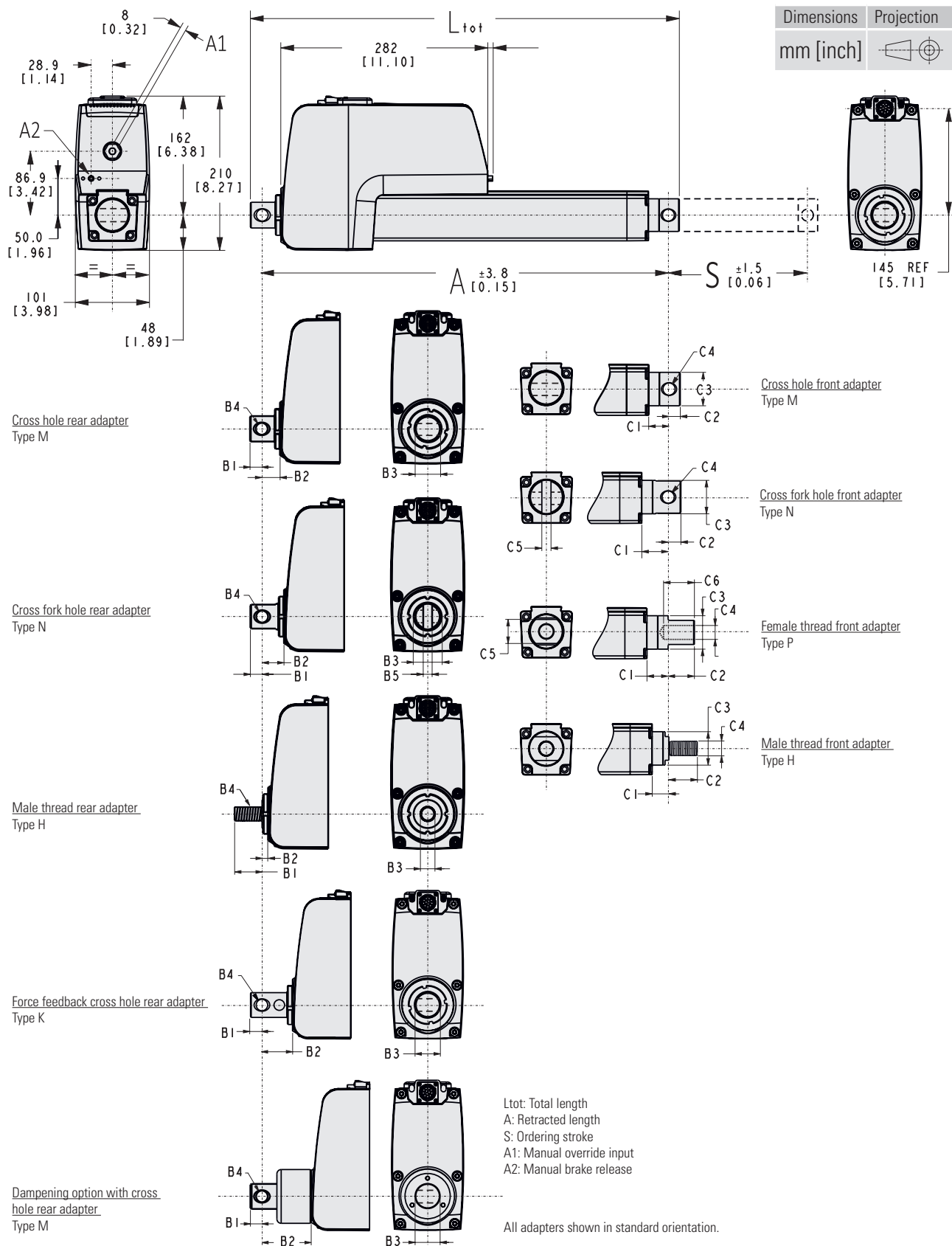
Connector for the control signals and inlets for the power supply wires.

Actuator Base Weight*

Mass	Ordering Stroke (S) [mm]																							
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	
[kg]	11.9	12.4	12.9	13.5	14.0	14.5	15.0	15.6	16.1	16.6	17.1	17.7	18.2	18.7	19.2	19.8	20.3	20.8	21.3	21.9	22.4	22.9	23.4	
[lbs]	26.1	27.3	28.5	29.7	30.8	32.0	33.1	34.3	35.4	36.6	37.8	39.0	40.1	41.3	42.4	43.6	44.7	45.9	47.0	48.2	49.4	50.6	51.7	

* For weight of options, see table above.

Electrak® XD – Dimensions



Stroke, Retracted Length and Total Length Relationships

Ordering stroke (S)	[mm]	100 - 1200 mm in 50 mm increments
Retracted Length (A)	[mm (in)]	$S + 200.8 (7.91) + B2 + C1$
Total Length (Ltot)		$A + B1 + C2$

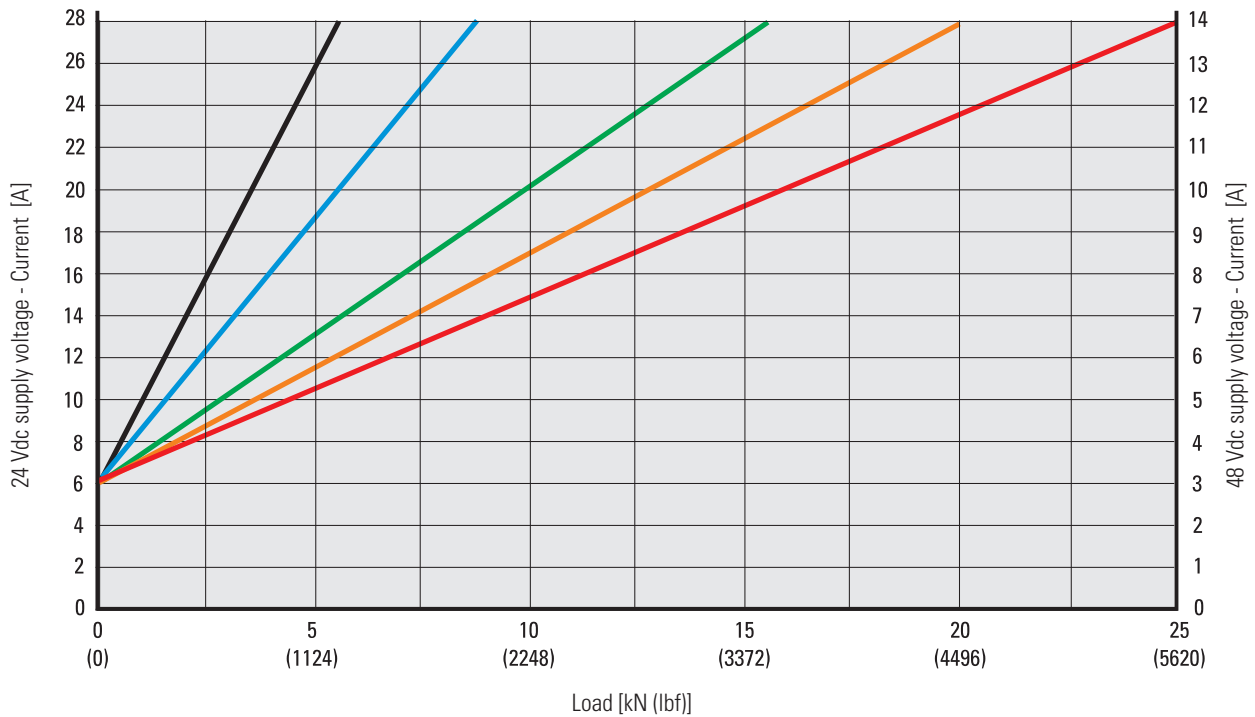
Rear and Front Adapter Dimensions [mm (in)]

	Rear Adapter Types				
	M	N	H	K	M + dampening option
B1	16.1 (0.63)	16.1 (0.63)	38.0 (1.50)	16.1 (0.63)	16.1 (0.63)
B2	25.3 (1.00)	29.9 (1.18)	8.2 (0.32)	43.3 (1.70)	68.9 (2.71)
B3	35.0 (1.38)	35.0 (1.38)	M20 × 1.5	35.0 (1.38)	35.0 (1.38)
B4	16.2 (0.64)	16.2 (0.64)	M20 × 1.5	16.2 (0.64)	16.2 (0.64)
B5	-	12.2 (0.48)	-	--	
	Front Adapter Types				
	M	N	P	H	
C1	27.1 (1.07)	35.1 (1.38)	28.1 (1.11)	22.1 (0.87)	
C2	14.9 (0.59)	16.9 (0.67)	35.0 (1.38)	38.0 (1.50)	
C3	44.5 (1.75)	44.5 (1.75)	44.5 (1.75)	44.5 (1.75)	
C4	16.2 (0.64)	16.2 (0.64)	M20 × 1.5	M20 × 1.5	
C5	-	12.2 (0.48)	32.0 (1.26)	-	
C6	-	-	35.0 (1.38)	-	

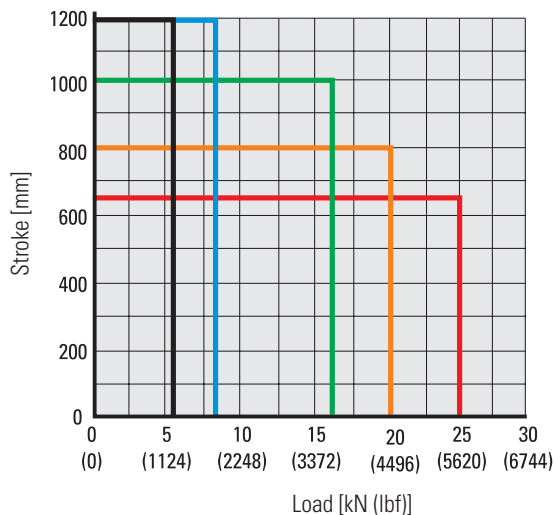


Electrak[®] XD – Performance Diagrams

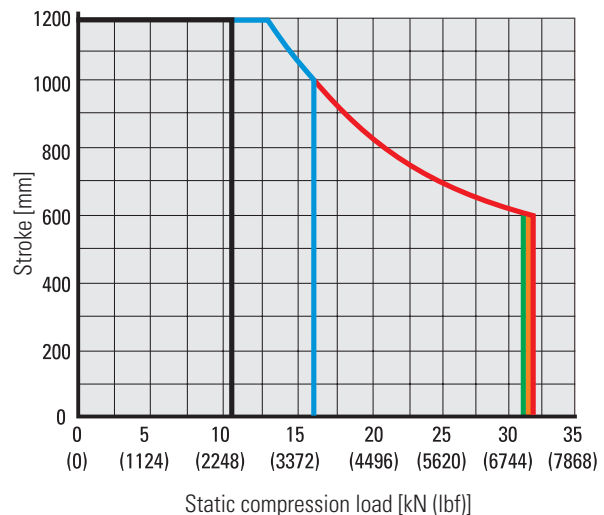
Load vs. Current ⁽¹⁾



Dynamic Load vs. Stroke ⁽²⁾



Static Compression Load vs. Stroke ⁽³⁾



Actuator Dynamic Load Capacity Rating

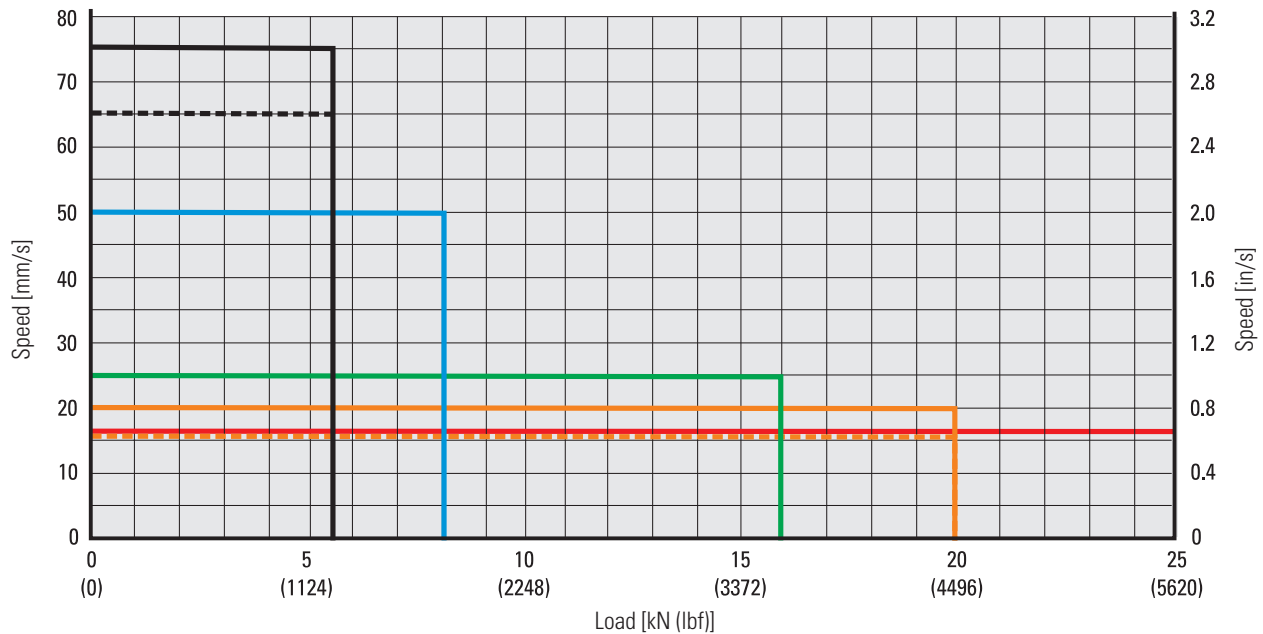


(1) Curves were generated at an ambient temperature of 25°C (77°F).

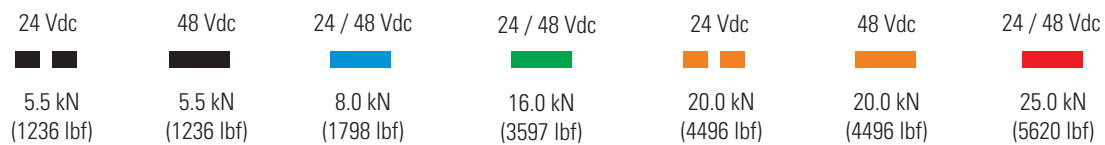
(2) Curves are for both tension and compression loads.

(3) Curves are for compression loads only except for 5.5 kN, which are also valid for tension loads. Contact customer support for non-compression type loads.

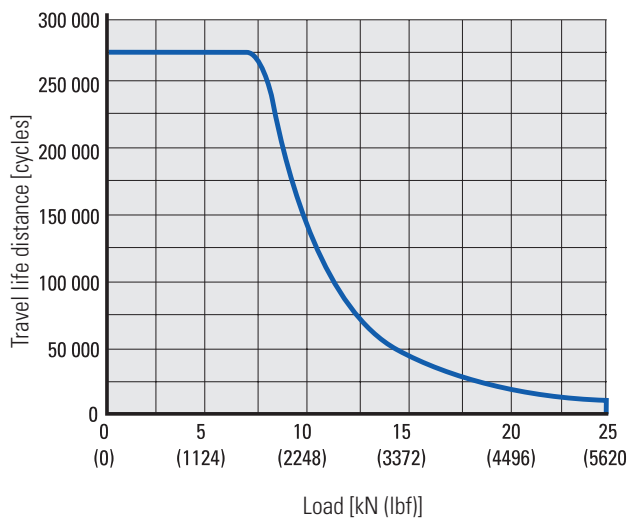
Load vs. Speed



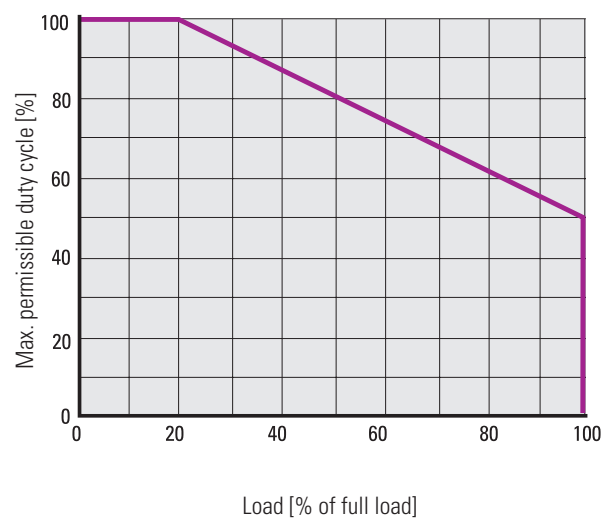
Actuator Dynamic Load Capacity Rating and Supply Voltage



Estimated Life vs. Load



Duty Cycle



Estimation for a fully loaded unit with 300 mm stroke moving a resistive load in both directions at an ambient temperature of 20°C (68°F) and a duty cycle of 40%. A more accurate travel life calculation requires additional application information. Contact customer support for assistance.

Electrak® XD – Control Standard Features

All Electrak® XD controls, except for the CAN bus options (CNO and COO), have as a minimum the basic Electrak Monitoring Package features and low-level switching, speed control and optional force feedback capabilities as described below. This minimum configuration is called control option LXX.

Electrak Monitoring Package Features

The monitoring package includes:

- Current monitoring - shuts down the actuator on overload.
- Temperature and voltage monitoring - protects the actuator by preventing motion when temperature and/or voltage are outside of normal ranges.
- Temperature compensation - enables normal operation at low temperatures.
- Software controlled end-of-stroke limits - protect the actuator and ensure smooth stops.
- Dynamic braking - produces quick, repeatable stops with no coasting.

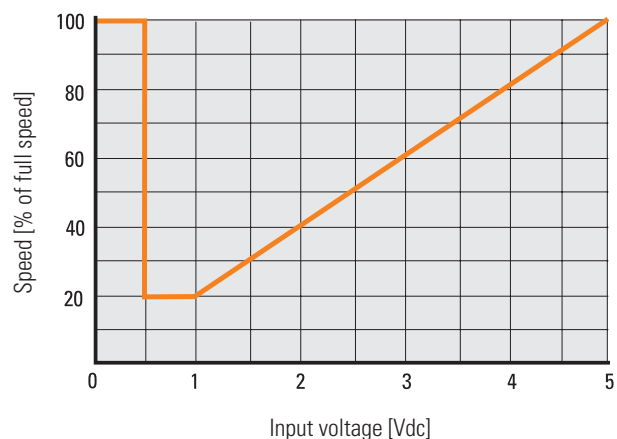
Low-level Switching

With low-level switching, the customer-supplied switches/relays that are connected to the extend and retract inputs only need to handle low-level signals and not the voltage and current of the motor.

Speed Control

If the speed control input is not used when the extend and retract inputs are active, the actuator will move at its full speed as long as the max. load is not exceeded. If a 0 - 5 Vdc signal is connected to the speed control input, the speed of the actuator can be regulated between 20 - 100% of its full speed where 0 - 0.5 V corresponds to full speed and 1 - 5 V corresponds to 20% of full speed up to full speed.

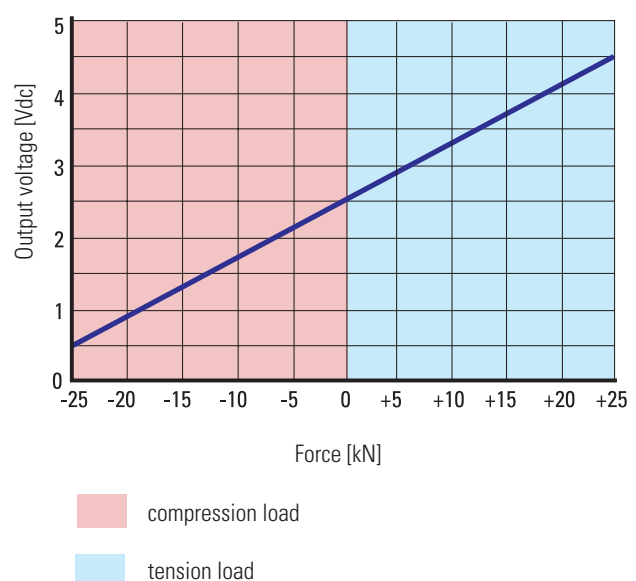
Speed vs. Speed Control Input Voltage



Force Feedback Output

In order to use the force feedback output, the actuator must be equipped with an integral force feedback sensor (rear adapter type K). The force output is a 0 - 5 Vdc signal where 2.5 V is zero force, 0.5 V is 25 kN compression force and 4.5 V is 25 kN tension force. Between 0.5 - 4.5 V, the output changes 1 mV per 12.5 N in change of force.

Force vs. Force Feedback Output Voltage



Electrak XD – Ordering Key

Ordering Key								
1	2	3	4	5	6	7	8	9
XD24	B055-	0200	LXX	-	M	M	S	N
1. Model and input voltage XD24 = Electrak XD, 24 Vdc XD48 = Electrak XD, 48 Vdc				4. Electrak Modular Control System options ^{(3) (4)} LXX = low-level signal motor switching + speed control + force feedback output LXP = LXX + position feedback output LLX = LXX + end-of-stroke indication outputs LLP = LXX + position feedback output + end-of-stroke indication outputs PLS = LXX + position feedback output + programmable end-of-stroke limits COO = CANopen® + closed loop speed control (includes diagnostics, position feedback, overload indication plus static and dynamic force feedback) CNO = CAN bus SAE J1939 + closed loop speed control (includes diagnostics, position feedback, overload indication plus static and dynamic force feedback)				
2. Dynamic load capacity, speed and max. stroke length (S) B055- = 5.5 kN @ 75 mm/s, 1200 mm B080- = 8.0 kN @ 50 mm/s, 1200 mm B160- = 16 kN @ 25mm/s, 1000 mm B200- = 20 kN @ 20 mm/s, 800 mm B250- = 25 kN @ 16 mm/s, 650 mm				5. Manual Brake Release and Override Option – = no manual brake release or override R = manual brake release and override				
3. Ordering stroke length (S) ^{(1) (2)} 0100 = 100 mm 0150 = 150 mm 0200 = 200 mm 0250 = 250 mm 0300 = 300 mm 0350 = 350 mm 0400 = 400 mm 0450 = 450 mm 0500 = 500 mm 0550 = 550 mm 0600 = 600 mm 0650 = 650 mm 0700 = 700 mm 0750 = 750 mm 0800 = 800 mm 0900 = 900 mm 0950 = 950 mm 1000 = 1000 mm 1050 = 1050 mm 1100 = 1100 mm 1150 = 1150 mm 1200 = 1200 mm				6. Rear adapter option M = 16 mm cross hole N = 16 mm forked cross hole H = M20 × 1.5 male thread K = force feedback sensor with 16 mm cross hole ^{(4) (5)}				
				7. Front adapter option M = 16 mm cross hole N = 16 mm forked cross hole H = M20 × 1.5 male thread P = M20 × 1.5 female thread				
				8. Adapter orientation S = standard M = 90° turned				
				9. Mechanical shock load dampening ⁽⁵⁾ N = no dampening M = dampening				
(1) Max. possible stroke length depends on the dynamic load capacity, see position 2. (2) Other stroke lengths available upon request. Please contact customer support. (3) All Electrak XD are as standard equipped with the Electronic Monitoring Package. (4) To use the force feedback function, the actuator must be equipped with rear adapter type K. (5) To equip the actuator with the mechanical shock load dampening option, it also must be equipped with the rear adapter type M. This configuration will render the actuator incompatible with the force feedback option as it requires rear adapter type K.								

Electrak® XD – Mechanical Options

Manual Brake Release and Override Type R		
Weight of option	[kg (lbs)]	0.71 (1.56)
Manual brake release specifications		
Brake release lever pull operation force for full brake release	[N (lbf)]	40 (15)
Brake release lever operation pull distance for full brake release	[mm (in)]	10 (0.4)
Brake lever inside hole thread (a)		10-32"
Brake lever bracket mounting holes (b)		M5
Manual override specifications		
Required override input torque @ full load	[Nm (lbf-in)]	6 (53.1)
Max. permissible override input torque	[Nm (lbf-in)]	9 (79.7)
Max. override input speed	[rpm]	500
Linear movement / override input turn	[mm]	
XDxx-B055		1.3
XDxx-B080		1.3
XDxx-B160		0.5
XDxx-B200		0.31
XDxx-B250		0.31
Rotational direction of the input		
clockwise seen from front		tube extends
counter clockwise seen from front		tube retracts
Maximum run time	[min]	1
Cool-down time between operations	[min]	5
Manual override input hex key sizes	[mm]	
cover plug (c) and		8
override input shaft		8

Electrak® XD can be equipped with the manual brake release and override option, which allows the extension tube to be released and/or manually cranked back and forth.

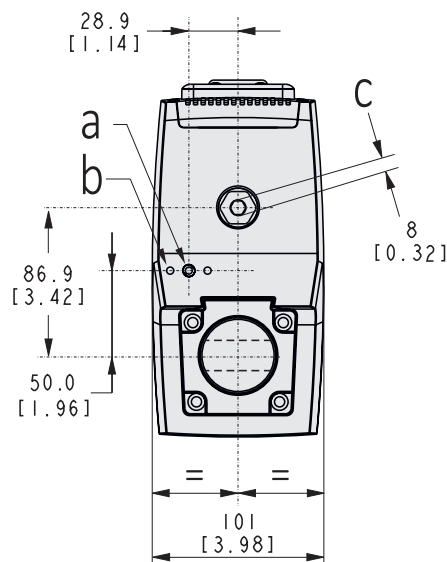
Manual Brake Release

When engaged, the manual brake release will release the extension tube from the brake so that it can move freely. In case of a helping load, the operator must ensure releasing the extension tube will not create a hazardous situation since the tube will immediately move in the direction the force is acting.

It is also critical when releasing a helping load that the actuator is connected to a power source or any other device that can take the regenerated energy from the motor when it is acting as a generator. In order to operate the brake release lever, (a) must be pulled. The mounting holes (b) are provided so that a bracket can be easily installed as a support for a cable assembly used for remote lever operation. To release the brake completely, the lever needs to be pulled in 10 mm (0.4 in) with a force of 40 N (15 lbf). Shorter distance and lower force will open the brake partially and allow for a slower, more controlled movement.

Manual Override Input

Access is granted to the manual override shaft input head (c) by removing the cover plug. Using a hex bit as a crank allows the extension tube to be moved back and forth. Using the manual override does not require the manual brake release to be operated as the override input will disengage the brake by itself while being used. A power tool can be used to operate the manual override as long as it starts and stops smoothly and the input speed doesn't exceed 500 rpm. The override has a maximum run time of one minute and requires a five-minute cool-down between events.



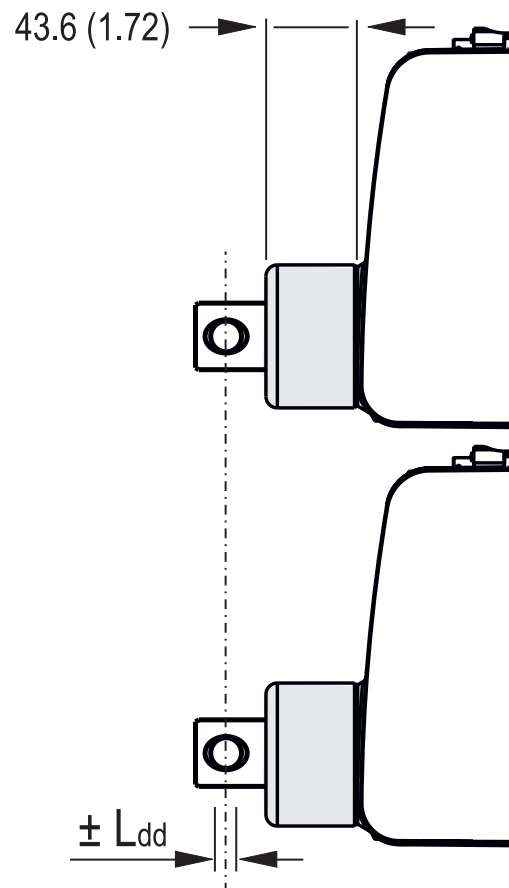
Shock Load Dampening Type M

Max. shock load force	[kN (lbf)]	48 (10791)
Max. dampening distance (max. Ldd)	[mm (in)]	± 2.7 (0.11)
Weight of option	[kg (lbs)]	1.16 (2.56)
Operating temperature limits	[°C (F)]	-40 – 85 (-40 – 185)
Life expectancy		as the actuator
Maintenance		not required

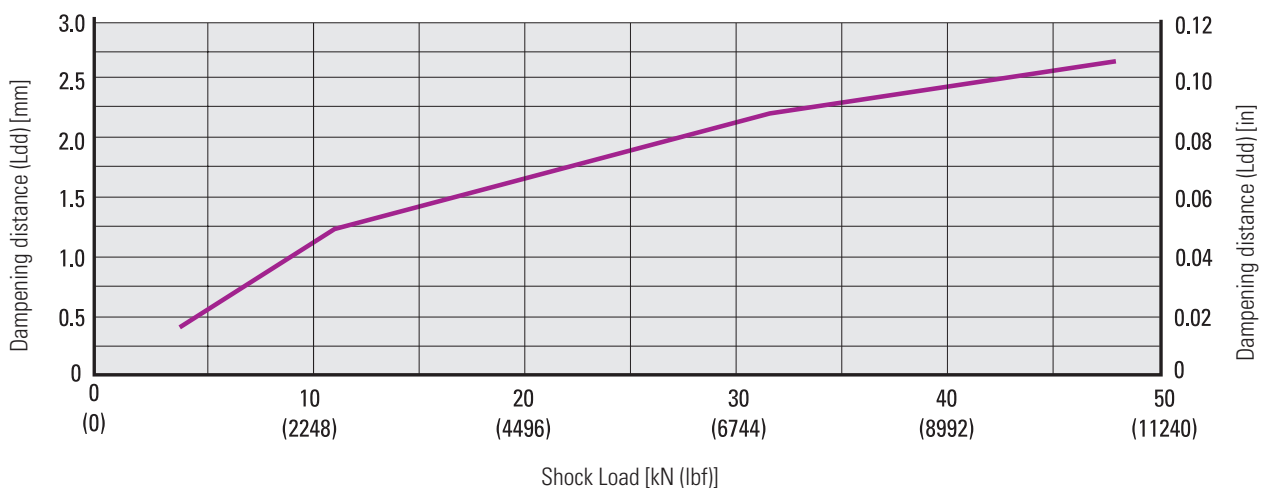
Electrak XD can be equipped with the shock load dampening option, which will absorb shock loads and thus increase the life of the actuator. The dampener consists of a rear adapter combined with a dampener unit that replaces the standard adapter, adding to the total length and weight of the actuator.

Shock Load Dampener

When an extension tube equipped with the shock load dampening option is subjected to a shock load, the dampener will be extended or compressed depending on the direction of the shock load force before returning to its original position. The distance is mainly related to the shock load force (as seen in the diagram), but the load, temperature, shock load speed and mounting position will also affect the distance.



Dampening Distance vs. Shock Load



Electrak® XD – Control Options

All Control Options		
Actuator supply voltage limits	[Vdc]	
XD24		18 - 32
XD48		36 - 60
Current draw @ min. / max. load	[A]	
XD24-Bxxx		6 / 28
XD48-Bxxx		3 / 14
End-of-stroke protection		yes
Overload protection		yes
Temperature monitoring		yes
Temperature compensation		yes
Voltage monitoring		yes
Current monitoring		yes
Speed control possible by supply voltage PWM		no

Fuse

Use a slow blow fuse on the supply voltage input wiring to protect the actuator and the wiring. Size it in accordance with local regulations and the current draw for the application in question.

Voltage Drop

Long supply wires may need an increased cross section in order to prevent the supply voltage to drop to levels below the supply voltage limit of the actuator. Calculations to determine the necessary cross section should take local regulations, application specifics and the actuator supply voltage limits into account.

Speed Control by Pulse Width Modulation (PWM)

The actuator speed can't be changed by PWM control of the supply voltage as the actuator may be harmed by this action. Speed of the actuator can only be controlled by using the speed control input or the CAN bus speed control commands.

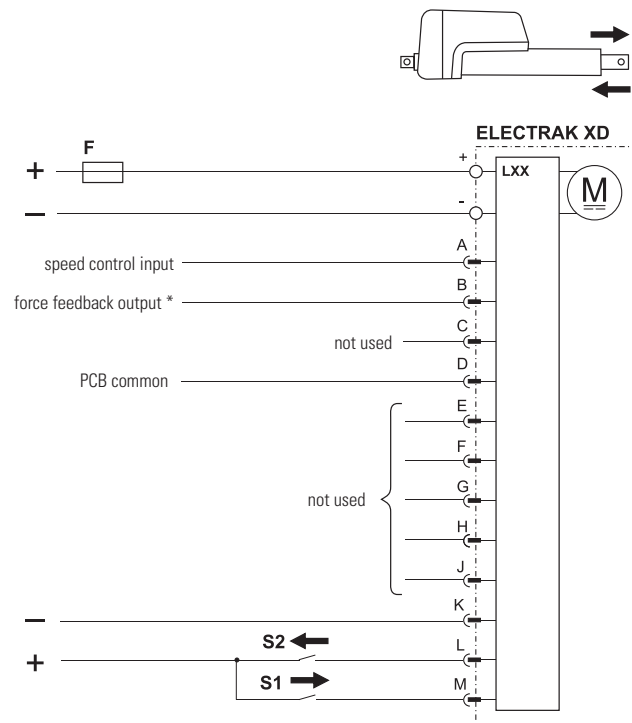
Regeneration Current with Helping Load

When encountering a helping load, the motor acts as a generator and it is important to ensure that the power supply used can handle the power generated back by the motor.

Control Option Type LXX

Extend / retract input voltage	[Vdc]	9 - 64
Extend / retract input current	[mA]	0.35 - 2.75
Speed control input voltage range	[Vdc]	0.5 - 5
Speed control range of full speed	[%]	20 - 100
Force feedback output voltage range *	[Vdc]	0.5 - 4.5
Force feedback linearity*	[%]	± 5
Force feedback resolution*	[N/mV]	12.5

*To be able to use the force feedback output the actuator need to be equipped with the rear adapter option type K that includes the force feedback sensor.



+ / - Supply voltage positive / negative

F Fuse

S1 Extend switch/relay

S2 Retract switch/relay

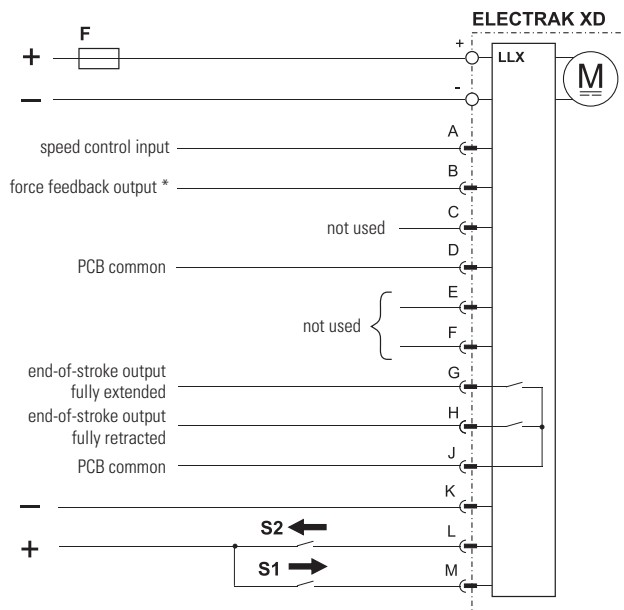
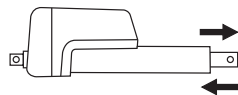
Control option LXX includes all of the basic Electrak Monitoring Package features plus low-level switching, speed control and force feedback capabilities ⁽¹⁾.

(1) To be able to use the force feedback output the actuator need to be equipped with the rear adapter option type K that includes the force feedback sensor.

Control Option Type LLX

Extend / retract input voltage	[Vdc]	9 - 64
Extend / retract input current	[mA]	0.35 - 2.75
Speed control input voltage range	[Vdc]	0.5 - 5
Speed control range of full speed	[%]	20 - 100
Force feedback output voltage range	[Vdc]	0.5 - 4.5
Force feedback linearity	[%]	± 5
Force feedback resolution	[N/mV]	12.5
End-of-stroke output contact type		potential free
Max. end-of-stroke output voltage	[Vdc/ac]	30/120
Max. end-of-stroke output current	[mA]	100

*To be able to use the force feedback output the actuator need to be equipped with the rear adapter option type K that includes the force feedback sensor.



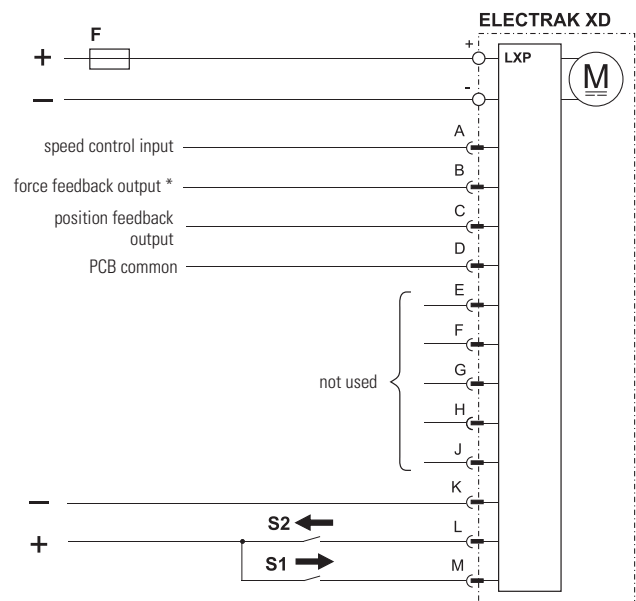
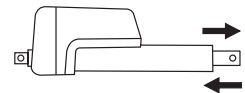
+ / - Supply voltage positive / negative
F Fuse
S1 Extend switch/relay
S2 Retract switch/relay

Control option LLX works as option LXX but also includes two end-of-stroke outputs that indicate when the extension tube is in its fully extended or retracted position.

Control Option Type LXP

Extend / retract input voltage	[Vdc]	9 - 64
Extend / retract input current	[mA]	0.35 - 2.75
Speed control input voltage range	[Vdc]	0.5 - 5
Speed control range of full speed	[%]	20 - 100
Force feedback output voltage range	[Vdc]	0.5 - 4.5
Force feedback linearity	[%]	± 5
Force feedback resolution	[N/mV]	12.5
Position feedback output voltage	[Vdc]	0.5 - 4.5
Position feedback linearity	[%]	± 0.25
Position feedback resolution	[mm/V]	ordering stroke length (S) [mm] / 4

*To be able to use the force feedback output the actuator need to be equipped with the rear adapter option type K that includes the force feedback sensor.



+ / - Supply voltage positive / negative
F Fuse
S1 Extend switch/relay
S2 Retract switch/relay

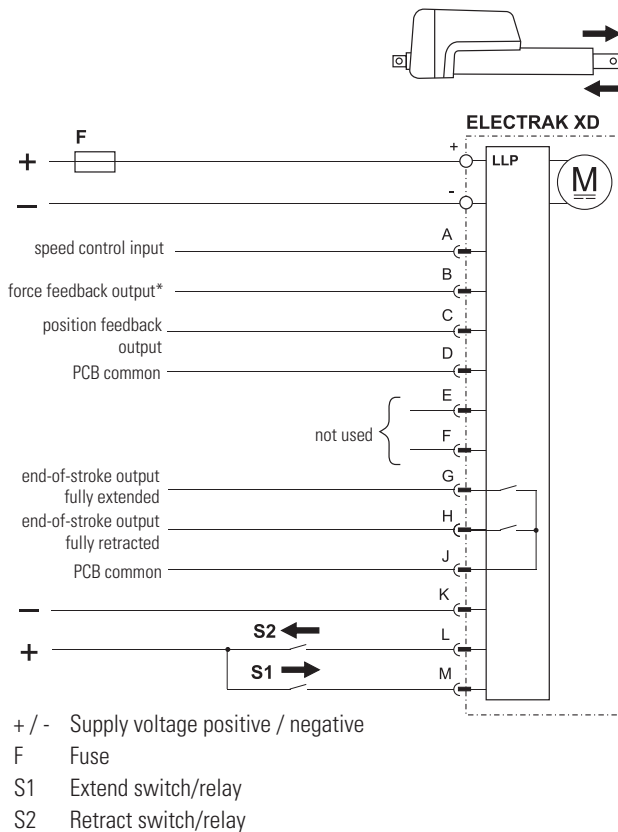
Control option LXP works as option LXX but also includes an analog position output that will provide feedback on the extension tube position.

Electrak® XD – Control Options

Control Option Type LLP

Extend / retract input voltage	[Vdc]	9 - 64
Extend / retract input current	[mA]	0.35 - 2.75
Speed control input voltage range	[Vdc]	0.5 - 5
Speed control range of full speed	[%]	20 - 100
Force feedback output voltage range*	[Vdc]	0.5 - 4.5
Force feedback linearity*	[%]	± 5
Force feedback resolution*	[N/mV]	12.5
End-of-stroke output contact type		potential free
Max. end-of-stroke output voltage	[Vdc/ac]	30/120
Max. end-of-stroke output current	[mA]	100
Position feedback output voltage	[Vdc]	0.5 - 4.5
Position feedback linearity	[%]	± 0.25
Position feedback resolution	[mm/V]	ordering stroke length (S) [mm] / 4

*To be able to use the force feedback output the actuator need to be equipped with the rear adapter option type K that includes the force feedback sensor.

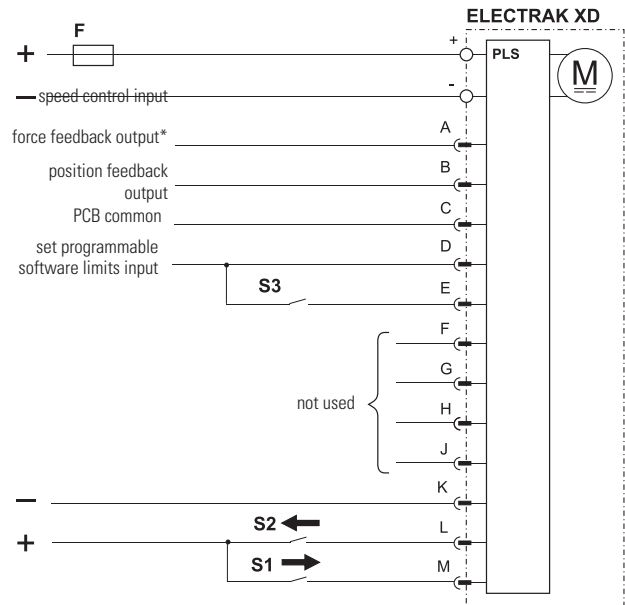
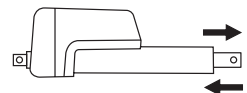


Control option LLP works as option LXP but also includes two end-of-stroke outputs that indicate when the extension tube is in its fully extended or retracted position.

Control Option Type PLS

Extend / retract input voltage	[Vdc]	9 - 64
Extend / retract input current	[mA]	0.35 - 2.75
Speed control input voltage range	[Vdc]	0.5 - 5
Speed control range of full speed	[%]	20 - 100
Force feedback output voltage range*	[Vdc]	0.5 - 4.5
Force feedback linearity*	[%]	± 5
Force feedback resolution*	[N/mV]	12.5
Position feedback output voltage	[Vdc]	0.5 - 4.5
Position feedback linearity	[%]	± 0.25
Position feedback resolution	[mm/V]	ordering stroke length (S) [mm] / 4

*To be able to use the force feedback output the actuator need to be equipped with the rear adapter option type K that includes the force feedback sensor.



+ / - Supply voltage positive / negative
 F Fuse
 S1 Extend switch/relay
 S2 Retract switch/relay
 S3 Set programmable software limits switch

Control option PLS works as option LXP but also includes programmable software extend and retract limits.

Control Option Type CNO and COO

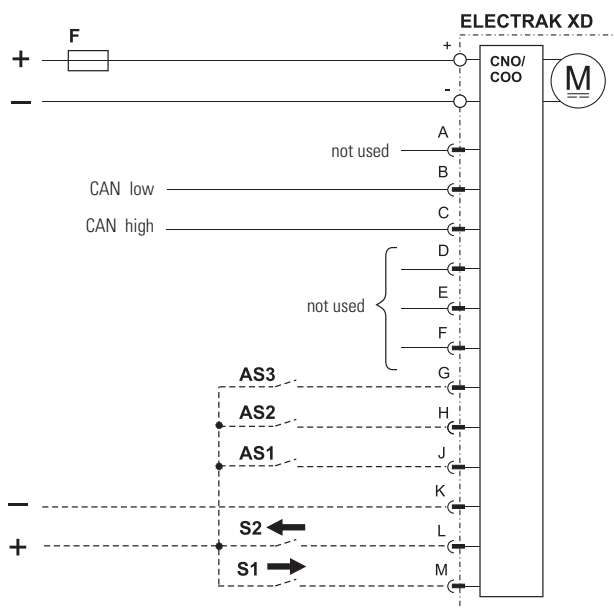
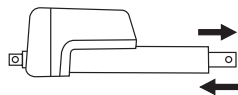
Command data includes:

- position
- speed
- current

Feedback data includes:

- position
- speed
- current
- force (the actuator must also be equipped with the force feedback rear adapter type K)
- other diagnostic information

Extend / retract input voltage	[Vdc]	9 - 64
Extend / retract input current	[mA]	0.35 - 2.75

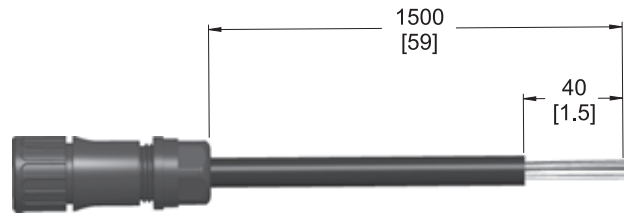


- + / - Supply voltage positive / negative
 F Fuse
 S1 Manual extend switch/relay (optional)
 S2 Manual retract switch/relay (optional)
 AS1 Address selection switch for binary position 1
 AS2 Address selection switch for binary position 2
 AS3 Address selection switch for binary position 3

Control option CNO includes a SAE J1939 CAN bus control interface, COO includes a CANopen® control interface that controls and monitors the actuator. Movement commands are sent via CAN messages on the CAN low and CAN high inputs. Inputs on pins G, H and J can be used as a binary coded decimal (BCD) adder to change the default address of the actuator. This option can be used when multiple CAN bus actuators are located on a single bus. The actuator can be manually forced to extend or retract by using the inputs on pin L and M. When the manual control inputs are used, CAN bus control messages are ignored, but the unit will still provide CAN bus feedback messages. When the inputs are left floating, CAN bus functionality for control messages is restored. When using the address inputs and/or the manual extend and retract switches, pin K must be connected to supply voltage negative.

Electrak[®] XD – Accessories

Signal Cable and Connector Harness		
Length without connector	[mm (in)]	1500 (59)
Lead cross section/size	[mm ² (AWG)]	0.5 (20)
Pin to lead color	A - pink B - brown C - blue D - black E - orange/black F - yellow/black G - white H - red J - green K - grey L - orange M - violet	
Part number	954-9476	



Notes



Electrak[®] HD – Technical Features



Standard Features

- Onboard electronics with many optional functions
- Static load up to 18 kN (4050 lbf)
- Dynamic load up to 16 kN (3584 lbf)
- Stroke up to 1000 mm
- Speed up to 71 mm/s (2.8 in/s)
- Protection class static IP67 / IP69K and dynamic IP66 and tested for 500 hour salt spray resistance

General Specifications

Screw type	ball
Nut type	load lock ball nut
Manual override	yes
Anti-rotation	yes
Static load holding brake	yes
Safety features	Electrak monitoring package: current monitoring voltage monitoring temperature monitoring load trip point calibration internal end-of-stroke limit switches ⁽¹⁾ end-of-stroke dynamic braking
Electrical connections ⁽²⁾	cable(s) with flying leads
Compliances	CE, UKCA, RoHS, REACH

(1) Dynamic braking is included at the ends of stroke for all Electrak HD actuators. Dynamic braking offered throughout the entire stroke length only on low-level switching and SAE J1939 options.

(2) There are one or two cables depending on the control option used. The cable(s) enters the actuator via a connector. The replacement of an actuator can be completed by unplugging the old actuator and plugging in the new one.

Optional Mechanical Features

- Variety of front and rear adapters
- Alternative adapter orientation

Optional Electronic Control Features

- CANopen[®] CAN bus
- SAE J1939 CAN bus
- Synchronization option
- Low-level switching
- Programmable limit switches
- Signal-follower
- End-of-stroke indication output
- Analog position output
- Digital position output

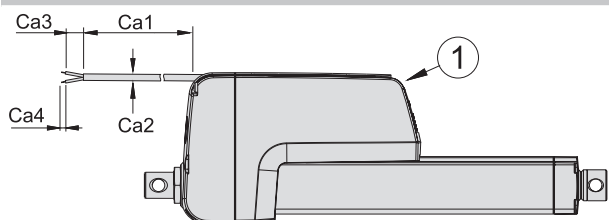
Control Option Combinations

EXX	Electrak Monitoring Package only
ELX	EXX + End-of-Stroke Indication Output
EXP	EXX + Analog Position Output
EXD	EXX + Digital Position Output
ELP	ELX + Analog Position Output
ELD	ELX + Digital Position Output
LXX	EXX + Low-Level Signal Motor Switching
LLX	EXX + LXX + End-of-Stroke Indication Output
LXP	EXX + LXX + Analog Position Output
LPS	EXX + LXX + Programmable Limit Switches + Signal-Follower
CNO	SAE J1939 CAN Bus Control + Open-Loop Speed Control
COO	CANopen CAN Bus Control + Open-Loop Speed Control
SY2	Synchronization Option

Accessories

- Rod end front adapter
- External slot-mounted limit switches

Cable Definitions



The drawing shows the cables exiting the cable slots at the end of the actuator housing, which is the shipping position. The user can adjust the exit point to be anywhere between the connector (1) in the front of the housing and the end of the cable slots.

Electrak HD – Technical Specifications

Mechanical Specifications		
Parameter		Electrak HD
Max. static load ⁽¹⁾	[kN (lbs)]	18 (4050)
Max. dynamic load (Fx)	[kN (lbs)]	
HDxx-B017		1.7 (382)
HDxx-B026		2.6 (585)
HDxx-B045		4.5 (1012)
HDxx-B068		6.8 (1529)
HDxx-B100		10 (2248)
HDxx-B160		16 (3584)
Speed @ no load/max. load ⁽²⁾	[mm/s (in/s)]	
HDxx-B017		71/58 (2.8/2.28)
HDxx-B026		40/32 (1.6/1.3)
HDxx-B045		24/19 (0.94/0.75)
HDxx-B068		18/14 (0.71/0.55)
HDxx-B100		11/9 (0.43/0.35)
HDxx-B160		7/5 (0.27/0.21)
Min. ordering stroke (S) length	[mm]	100
Max. ordering stroke (S) length ⁽³⁾	[mm]	1000
Ordering stroke length increments	[mm]	50
Operating temperature limits	[°C (F)]	-40 – 85 (-40 – 185)
Full load duty cycle @ 25 °C (77 °F)	[%]	25 ⁽⁴⁾
End play, maximum	[mm (in)]	1.2 (0.047)
Restraining torque	[Nm (lbs)]	0
Protection class - static (dynamic)		IP67/IP69K (IP66)
Salt spray resistance	[h]	500

¹ Max. static load at fully retracted stroke.

² For units with the synchronization option, the speed will vary slightly when synchronizing, but will typically remain close to the speed they are rated for at full load. See page ?? for more information on the synchronization option.

³ 500 mm max. for 16 kN.

⁴ For HDxx-B100 and HDxx-160 load, the duty cycle is 15%.

⁵ Do not use PWM voltage for speed control to avoid damaging the onboard electronics.

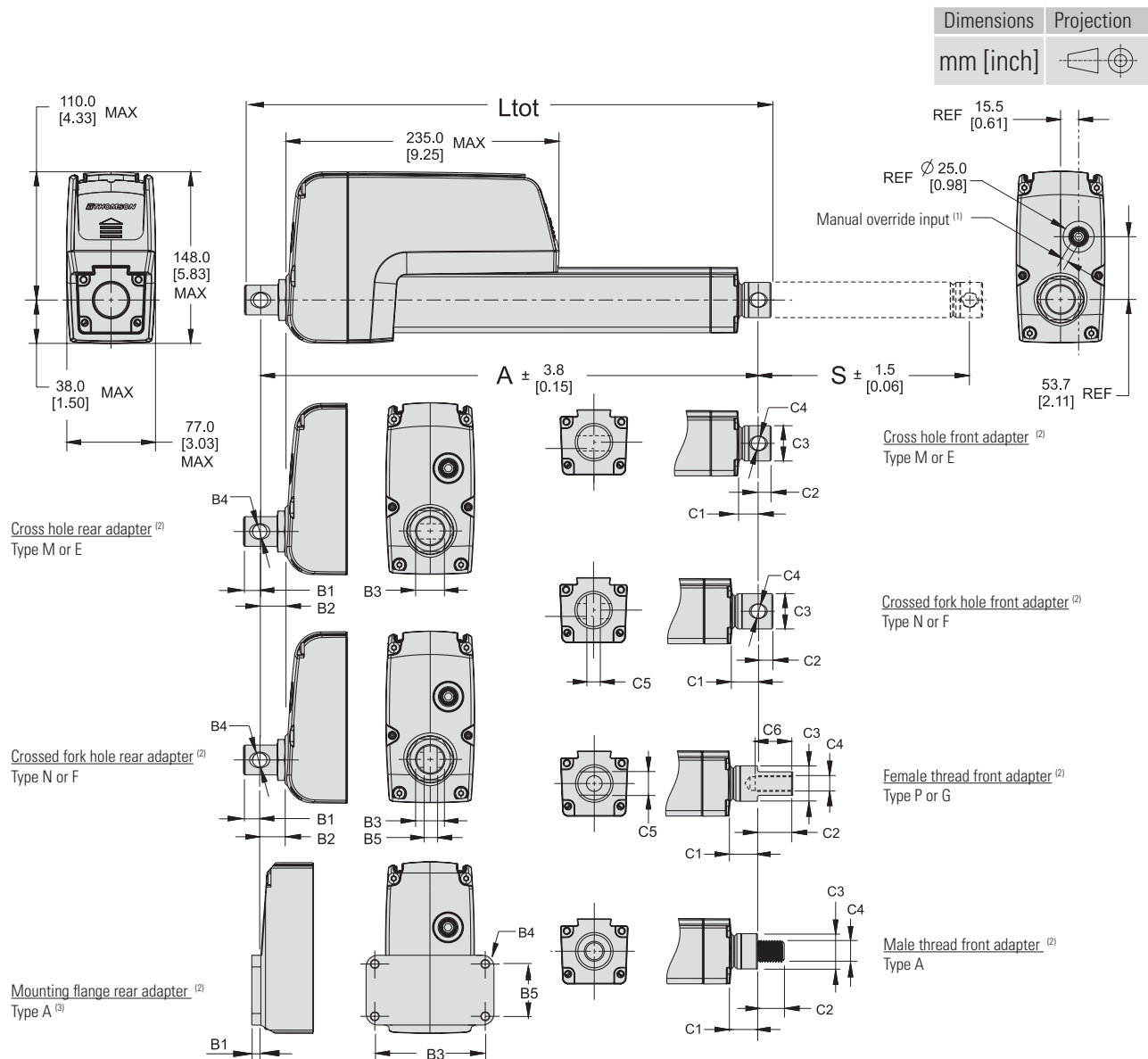
⁶ See previous page for cable definitions.

Electrical Specifications		
Parameter		Electrak HD
Available input voltages ⁽⁵⁾	[Vdc]	12, 24, 48
Input voltage tolerance	[Vdc]	
HD12 (12 Vdc input voltage)		9 - 16
HD24 (24 Vdc input voltage)		18 - 32
HD48 (48 Vdc input voltage)		36 - 64
Current draw @ no load/max. load	[A]	
HD12-B017		3/18
HD24-B017		1.5/9
HD48-B017		0.75/4.5
HD12-B026		3/18
HD24-B026		1.5/9
HD48-B026		0.75/4.5
HD12-B045		3/18
HD24-B045		1.5/9
HD48-B045		0.75/4.5
HD12-B068		3/20
HD24-B068		1.5/10
HD48-B068		0.75/5
HD12-B100		3/18
HD24-B100		1.5/9
HD48-B100		0.75/4.5
HD12-B160		3/20
HD24-B160		1.5/10
HD48-B160		0.75/5
Motor leads cross section	[mm ² (AWG)]	2 (14)
Signal leads cross section	[mm ² (AWG)]	0.5 (20)
Standard cable lengths (Ca1) ⁽⁶⁾	[m (in)]	0.3, 1.5, 5 (11.8, 59, 197)
Cable diameter (Ca2) ⁽⁶⁾	[mm (in)]	7.5 (.295)
Flying lead length (Ca3) ⁽⁶⁾	[mm (in)]	76 (3)
Stripped lead length (Ca4) ⁽⁶⁾	[mm (in)]	6 (0.25)

Actuator Weight [kg]																			
Maximum Dynamic Load (Fx) [kN (lbs)]	Ordering Stroke (S) [mm]																		
	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
1.7 (382)	6.5	6.7	7.0	7.2	7.5	7.7	8.0	8.2	8.5	8.7	9.0	9.2	9.5	9.7	10.0	10.2	10.5	10.7	11.0
2.6 (585)	6.5	6.7	7.0	7.2	7.5	7.7	8.0	8.2	8.5	8.7	9.0	9.2	9.5	9.7	10.0	10.2	11.6	11.9	12.2
4.5 (1012)	6.5	6.7	7.0	7.2	7.5	7.7	8.0	8.2	8.5	8.7	9.0	9.2	10.4	10.7	11.0	11.3	11.6	11.9	12.2
6.8 (1529)	6.5	6.7	7.0	7.2	7.5	7.7	8.0	8.2	8.5	9.5	9.8	10.1	10.4	10.7	11.0	11.3	11.6	11.9	12.2
10 (2248)	6.7	7.0	7.2	7.5	7.7	8.0	8.2	9.1	9.4	9.7	10.0	10.3	10.6	10.9	11.2	11.5	11.8	12.1	12.4
16 (3584)	8.1	8.3	8.5	8.7	8.9	9.1	9.3	9.5	9.7										

Conversion Factors: Millimeter to inch: 1 mm = 0.03937 in, kilogram to pound: 1 kg = 2.204623 lbs

Electrak® HD – Dimensions



Rear and Front Adapter Dimensions [mm]

	Rear Adapter Types						Front Adapter Types						
	M	E	N	F	A ⁽³⁾		M	E	N	F	P	G	A
B1	13.4	13.4	13.4	13.4	7.8	C1	see table on next page						16.5
B2	21.6	21.6	21.6	21.6	-	C2	10.9	10.9	12.9	12.9	30.0	30.0	20.0
B3	25.4	25.4	25.4	25.4	95.0	C3	see table on next page						
B4	12.2	12.8	12.2	12.8	6.6	C4	12.2	12.8	12.2	12.8	M12 × 1.75	1/2-20 UNF-2B	M16 × 2
B5	-	-	8.2	8.2	45.0	C5	-	-	8.2	8.2	19.0	19.0	-
						C6	-	-	-	-	35.0	35.0	-

(1) The input hole is covered with a plastic threaded plug. When removed, a 6 mm socket can be inserted and used as a crank.

(2) All adapters shown in the standard orientation.

(3) Rear mounting flange type A cannot be ordered with a higher maximum static load capacity than 10 kN or/and a maximum stroke of 300 mm.

Maximum Dynamic Load and Stroke Relationships

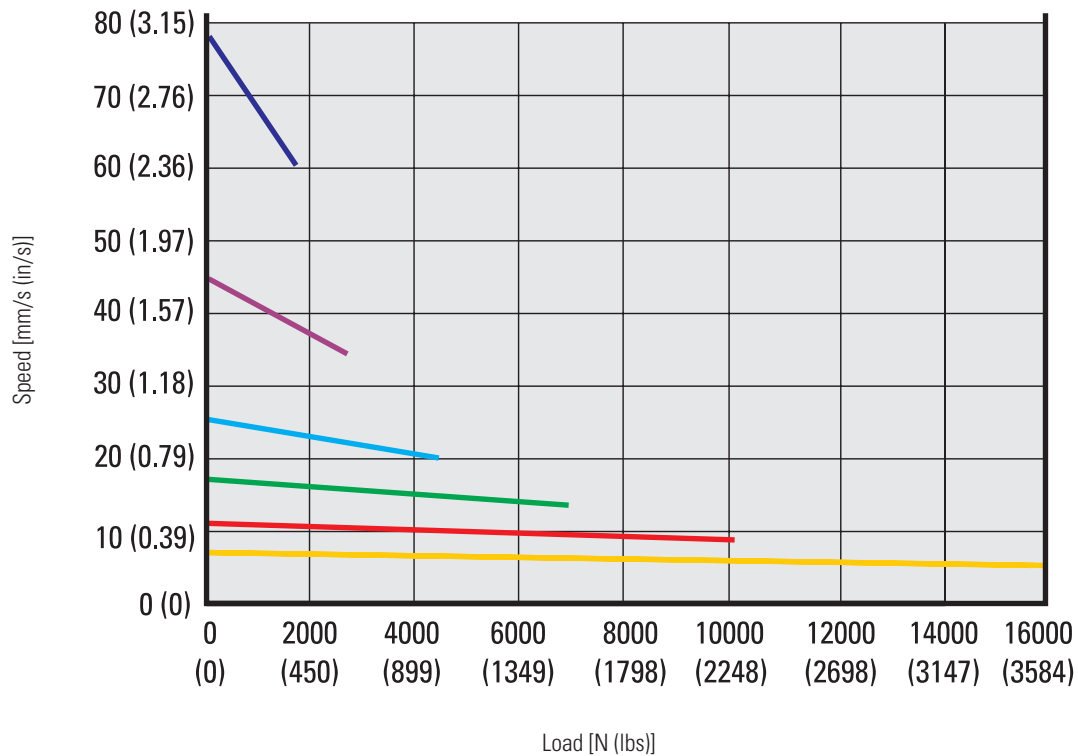
Maximum Dynamic Load (Fx) - kN (lbf.)	Total Length (Ltot), Retracted Length (A) and Front Adapter Dimensions [mm]		Ordering Stroke (S) [mm]									
			50 – 500 ⁽¹⁾	550 – 600	650 – 700	750 – 900	950 – 1000					
1.7 (382)	Ltot		A + B1 + C2									
	A		S + 150.9 + B2 + C1									
	C1	Type M, E	17.5									
		Type N, F	26.5									
		Type P, G	23.9									
	C3		30.2									
2.6 (585)	Ltot		A + B1 + C2				A + B1 + C2					
	A		S + 150.9 + B2 + C1				S + 156.8 + B2 + C1					
	C1	Type M, E	17.5				24.0					
		Type N, F	26.5				27.0					
		Type P, G	23.9				24.9					
	C3		30.2				35.0					
4.5 (1012)	Ltot		A + B1 + C2			A + B1 + C2						
	A		S + 150.9 + B2 + C1			S + 156.8 + B2 + C1						
	C1	Type M, E	17.5			24.0						
		Type N, F	26.5			27.0						
		Type P, G	23.9			24.9						
	C3		30.2			35.0						
6.8 (1529)	Ltot		A + B1 + C2		A + B1 + C2							
	A		S + 150.9 + B2 + C1		S + 156.8 + B2 + C1							
	C1	Type M, E	17.5		24.0							
		Type N, F	26.5		27.0							
		Type P, G	23.9		24.9							
	C3		30.2		35.0							
10 (2248)	Ltot		A + B1 + C2		A + B1 + C2							
	A		S + 150.9 + B2 + C1		S + 156.8 + B2 + C1							
	C1	Type M, E	17.5		24.0							
		Type N, F	26.5		27.0							
		Type P, G	23.9		24.9							
	C3		30.2		35.0							
16 (3584)	Ltot		A + B1 + C2		strokes not available for this model							
	A		S + 180.9 + B2 + C1									
	C1	Type M, E	17.5									
		Type N, F	26.5									
		Type P, G	23.9									
	C3		30.2									

(1) For a unit with 50 mm stroke, A and Ltot dimension are the same as for a unit with 100 mm stroke.



Electrak[®] HD – Performance Diagrams

Load vs. Speed ⁽¹⁾

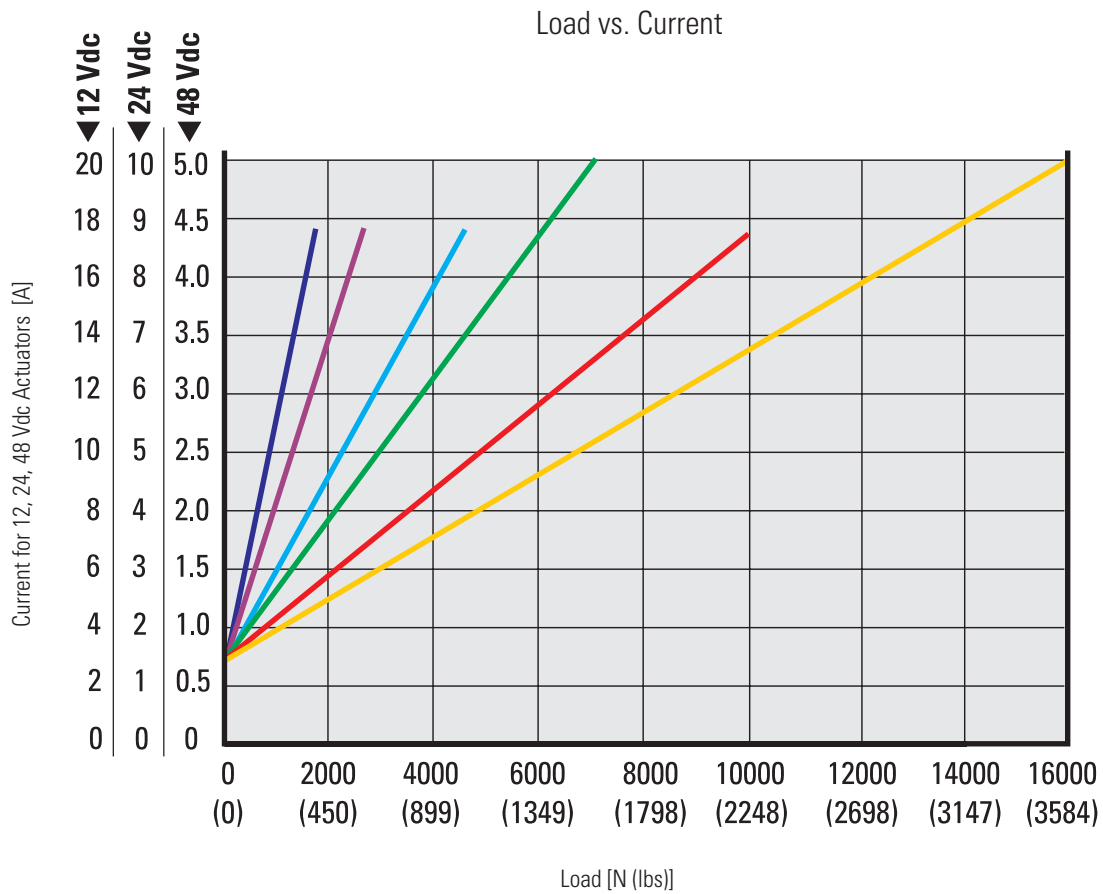


Screw Type and Dynamic Load Capacity

ball screw, 1.7 kN (382 lbs)	ball screw, 4.5 kN (1012 lbs)	ball screw, 10 kN (2248 lbs)
ball screw, 2.6 kN (585 lbs)	ball screw, 6.8 kN (1529 lbs)	ball screw, 16 kN (3584 lbs)

¹ Curves valid for all units except those with the synchronization option, where the speed may vary, but will typically remain close to the speed they are rated for at full load, even if they are running at a lower load.

Note! Curves were generated at an ambient temperature of 21°C (70°F). Different ambient temperature and individual actuator characteristics can produce slightly different values.



Screw Type and Dynamic Load Capacity

ball screw, 1.7 kN (382 lbs)	ball screw, 4.5 kN (1012 lbs)	ball screw, 10 kN (2248 lbs)
ball screw, 2.6 kN (585 lbs)	ball screw, 6.8 kN (1529 lbs)	ball screw, 16 kN (3584 lbs)

Note! Curves were generated at an ambient temperature of 21°C (70°F). Different ambient temperature and individual actuator characteristics can produce slightly different values.



Electrak® HD – Ordering Key

Ordering Key

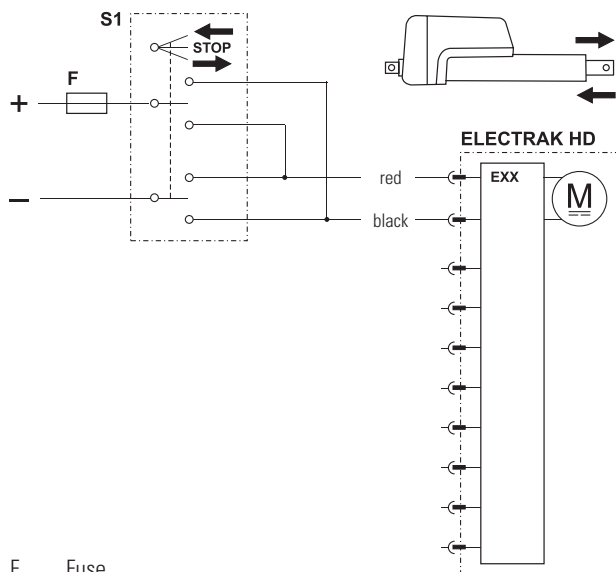
1	2	3	4	5	6	7	8	9
HD12	B026-	0300	LXX	2	M	M	S	D
1. Model and input voltage HD12 = Electrak HD, 12 Vdc HD24 = Electrak HD, 24 Vdc HD48 = Electrak HD, 48 Vdc				4. Electrak Modular Control System options Options available for HD12 and HD24 only EXX = Electronic Monitoring Package only ELX = EXX + end-of-stroke indication output EXP = EXX + analog (potentiometer) position output EXD = EXX + digital position output ELP = ELX + analog (potentiometer) position output ELD = ELX + digital position output LPS = EXX + LXX + programmable limit switches + signal-follower Options available for HD12, HD24 and HD48 LXX = EXX + low-level signal motor switching LLX = EXX + LXX + end-of-stroke indication output LXP = EXX + LXX + analog (potentiometer) position output CNO = SAE J1939 CAN bus + open-loop speed control COO = CANopen CAN bus + open-loop speed control SY2 = LXX + synchronization option				
2. Screw type, dynamic load capacity B017- = ball screw, 1.7 kN (382 lbf) B026- = ball screw, 2.6 kN (585 lbf) B045- = ball screw, 4.5 kN (1012 lbf) B068- = ball screw, 6.8 kN (1529 lbf) B100- = ball screw, 10 kN (2248 lbf) B160- = ball screw, 16 kN (3584 lbf)				5. Cable length 1 = 0.3 m long cables 2 = 1.5 m long cables 3 = 5.0 m long cables				
3. Ordering stroke length ^{(1) (2)} 0050 = 50 mm ⁽³⁾ 0100 = 100 mm 0150 = 150 mm 0200 = 200 mm 0250 = 250 mm 0300 = 300 mm 0350 = 350 mm 0400 = 400 mm 0450 = 450 mm 0500 = 500 mm 0550 = 550 mm 0600 = 600 mm 0650 = 650 mm 0700 = 700 mm 0750 = 750 mm 0800 = 800 mm 0850 = 850 mm 0900 = 900 mm 0950 = 950 mm 1000 = 1000 mm				6. Rear adapter/mounting flange options A = rear mounting flange ^{(4) (5)} M = cross hole for 12 mm pin E = cross hole for ½ inch pin N = forked cross hole for 12 mm pin F = forked cross hole for ½ inch pin				
				7. Front adapter options A = metric M16 male thread M = cross hole for 12 mm pin E = cross hole for ½ inch pin N = forked cross hole for 12 mm pin F = forked cross hole for ½ inch pin P = metric M12 female thread G = inch 1/2-20 UNF-2B female thread				
				8. Adapter orientation S = standard M = 90 ° turned				
				9. Connection options D = flying leads				

(1) Other stroke lengths available upon request. Please contact customer support.
(2) 500 mm is the max. stroke length for 16 kN units.
(3) 50 mm stroke units will have same retracted length and envelope size as a 100 mm unit.
(4) Max. ordering stroke for the rear mounting flange type A is 300 mm.
(5) Max. dynamic load capacity for the rear mounting flange type A is 10 kN.

Electrak HD – Electrical Connections

Option Type EXX

Actuator supply voltage	[Vdc]
HD12	9 - 16
HD24	18 - 32
HD48	-



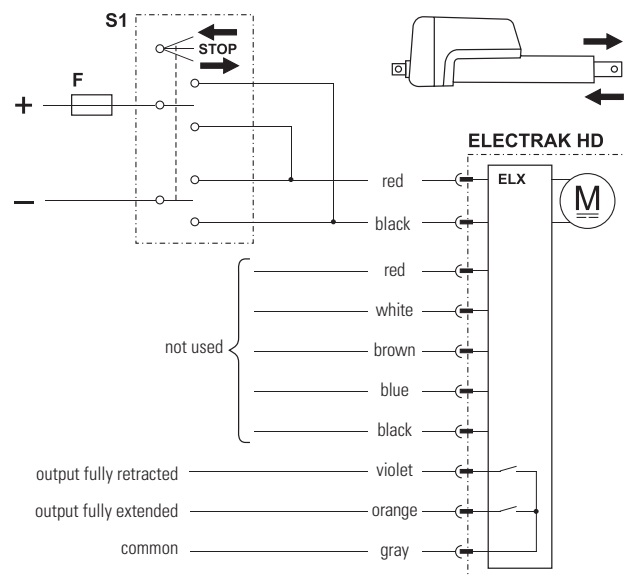
F Fuse

S1 Double pole double throw switch

Control option EXX contains Electrak Monitoring Package features, guaranteeing safe operation of the actuator and equipment. With control option EXX, the polarity of the motor voltage is switched by a customer-supplied switch (switch, relay, etc.) to make the actuator extend or retract. The switch, power supply, wiring and all other components must be able to handle the motor current for the actuator model and load being used, as well as the inrush current (up to three times the max. continuous current for the max. load being used for up to 150 milliseconds).

Option Type ELX

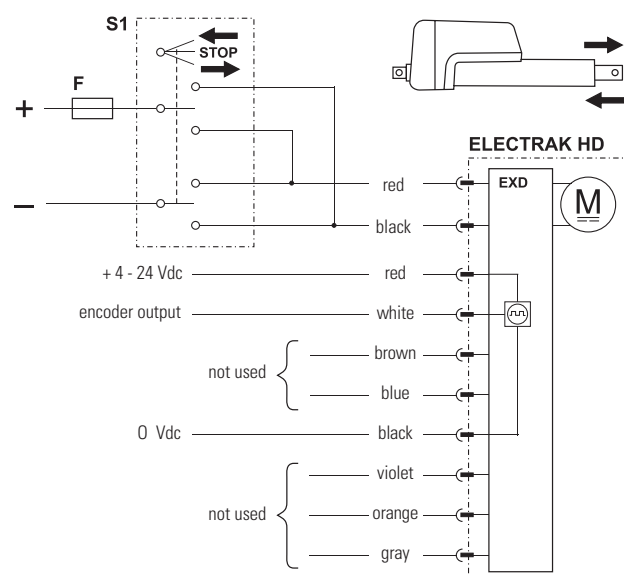
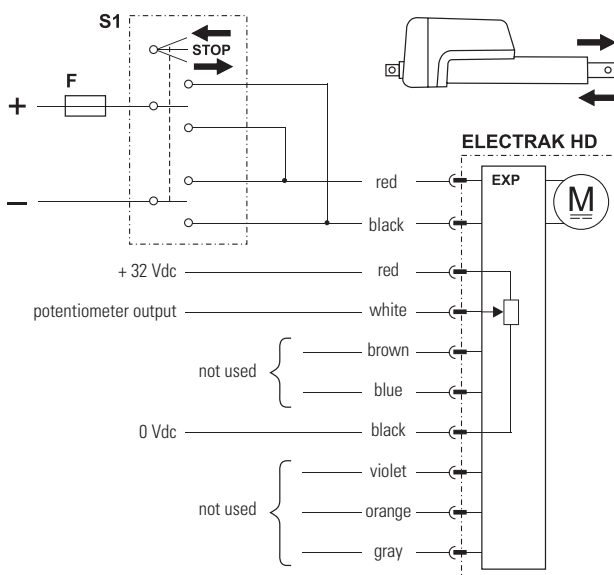
Actuator supply voltage	[Vdc]
HD12	9 - 16
HD24	18 - 32
HD48	-
Output contact type	potential free
Max. output voltage	[Vdc/ac] 30/120
Max. output current	[mA] 100



F Fuse

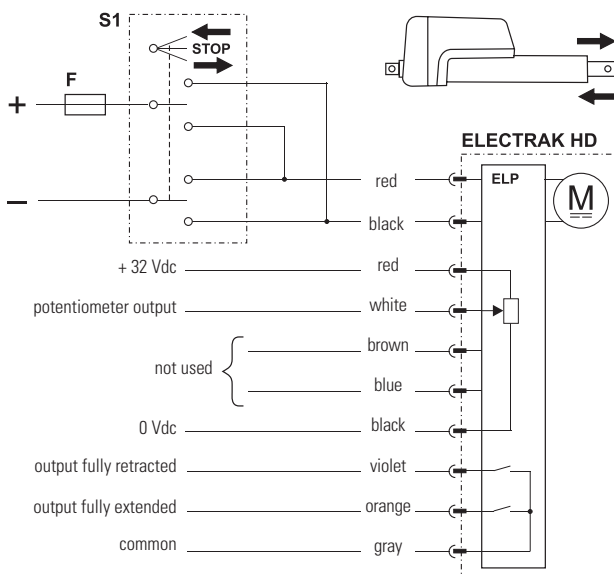
S1 Double pole double throw switch

Control option ELX works as option EXX but also has two outputs that indicate when the extension tube is in its fully extended or retracted position.



Option Type ELP

Actuator supply voltage	[Vdc]	9 - 16 18 - 32 -
Output contact type		potential free
Max. output voltage	[Vdc/ac]	30/120
Max. output current	[mA]	100
Potentiometer type		wire-wound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	1
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	
50 - 100 mm stroke		65.6
150 - 250 mm stroke		32.8
300 - 500 mm stroke		19.7
550 - 1000 mm stroke		9.8

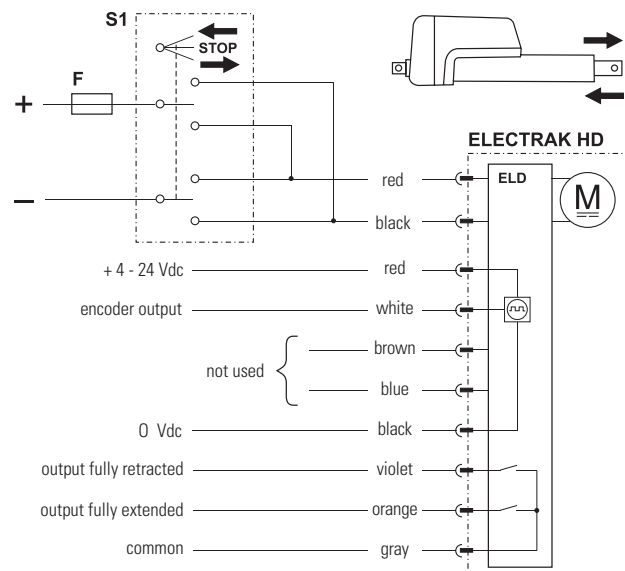


F Fuse
S1 Double pole double throw switch

Control option ELP works as option EXP but also has two outputs that indicate when the extension tube is in its fully extended or retracted position.

Option Type ELD

Actuator supply voltage	[Vdc]	9 - 16 18 - 32 -
Output contact type		potential free
Max. output voltage	[Vdc/ac]	30/120
Max. output current	[mA]	100
Encoder type		hall effect
Encoder input voltage	[Vdc]	4 - 24
Encoder output voltage levels	[Vdc]	0.1 / 0.25
Encoder resolution	[mm/pulse]	
HDxx-B017		0.28
HDxx-B026		0.15
HDxx-B045		0.09
HDxx-B068		0.07
HDxx-B100		0.04
HDxx-B160		0.03



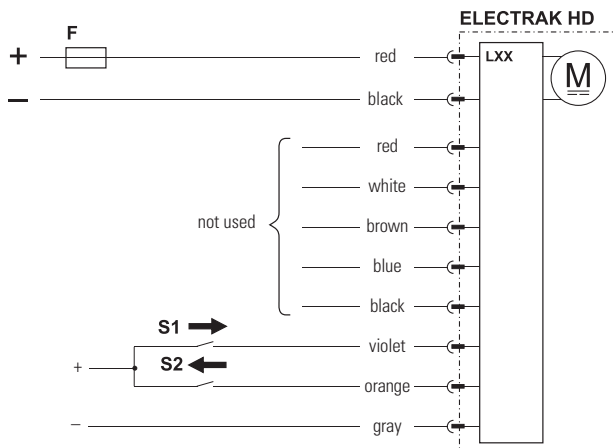
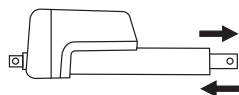
F Fuse
S1 Double pole double throw switch

Control option ELD works as option EXD but also has two outputs that indicate when the extension tube is in its fully extended or retracted position.

Electrak® HD – Electrical Connections

Option Type LXX

Actuator supply voltage	[Vdc]	
HD12		9 - 16
HD24		18 - 32
HD48		36 - 64
Extend / retract input voltage	[Vdc]	
HD12(24)		9 - 32
HD48		12 - 64
Extend / retract input current	[mA]	6 - 22

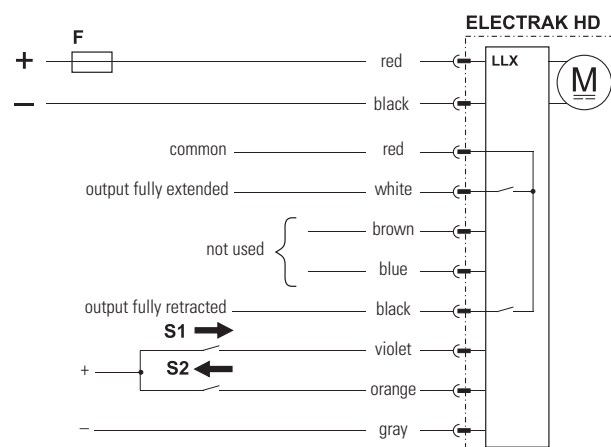
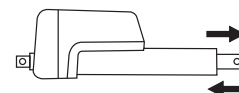


F Fuse
S1 Extend switch
S2 Retract switch

Control option LXX has all the basic Electrak Monitoring Package features included in control option EXX, but the polarity of the motor voltage is switched by the onboard electronics instead. The customer-supplied switches used to command the actuator to extend or retract only need to handle low-level signals. However, the power supply and wiring that supply the actuator must be able to handle the motor current for the actuator model and load being used, as well as the inrush current (up to one and a half times the max. continuous current for the max. load being used for up to 150 milliseconds).

Option Type LLX

Actuator supply voltage	[Vdc]	
HD12		9 - 16
HD24		18 - 32
HD48		36 - 64
Output contact type		potential free
Max. output voltage	[Vdc/ac]	30/120
Max. output current	[mA]	100
Extend / retract input voltage	[Vdc]	
HD12(24)		9 - 32
HD48		12 - 64
Extend / retract input current	[mA]	6 - 22

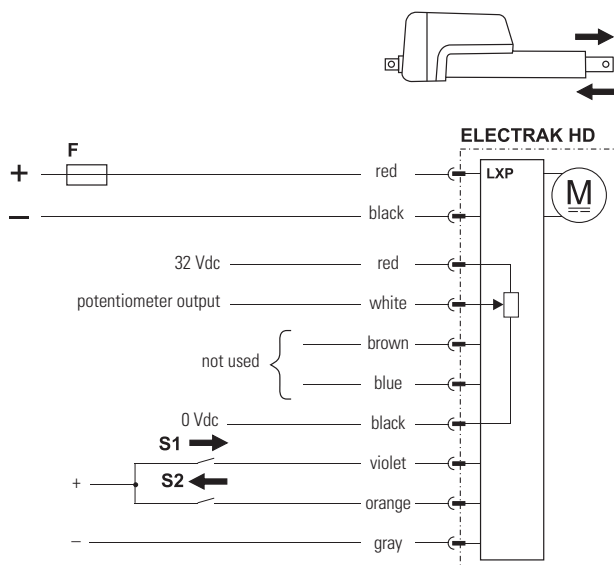


F Fuse
S1 Extend switch
S2 Retract switch

Control option LLX works as option LXX but also has two outputs that indicate when the extension tube is in its fully extended or retracted position.

Option Type LXP

Actuator supply voltage	[Vdc]	9 - 16 18 - 32 36 - 64
Potentiometer type		wire-wound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	1
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	50 - 100 mm stroke 150 - 250 mm stroke 300 - 500 mm stroke 550 - 1000 mm stroke
Extend / retract input voltage	[Vdc]	9 - 32 12 - 64
Extend / retract input current	[mA]	6 - 22



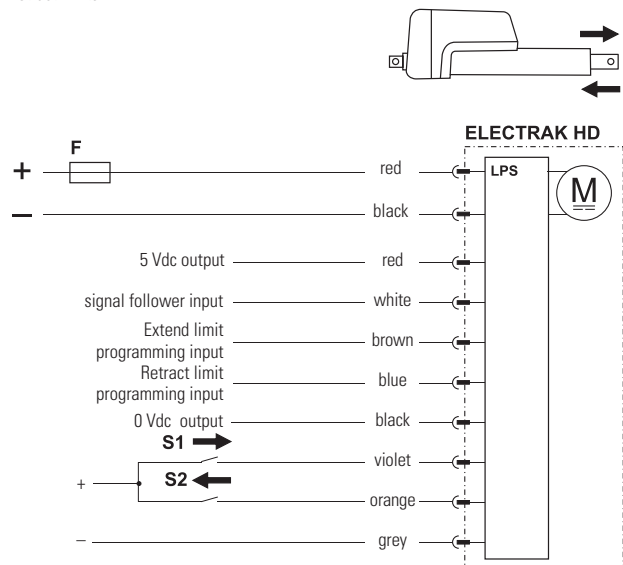
- F Fuse
S1 Extend switch
S2 Retract switch

Control option LXP works as option LXX but also has an analog (potentiometer) output that will provide feedback on the extension tube position.

Option Type LPS

Actuator supply voltage	[Vdc]	9 - 16 18 - 32 -
Signal-follower input voltage	[Vdc]	0.5 - 4.5
Signal-follower max. current	[A]	0.8
Signal-follower movement	[mm/Vdc]	stroke* [mm] / 4
Signal-follower repeatability	[± mm]	0.1
Programming inputs voltage	[Vdc]	9 - 32 -
Extend / retract input voltage	[Vdc]	9 - 32 -
Extend / retract input current	[mA]	6 - 22

* ordering stroke of the actuator or the stroke between any set programmable extend or retract limits.



- F Fuse
S1 Extend switch
S2 Retract switch

Control option LPS works as option LXX but also has programmable mid-stroke software extend and retract limits as well as a signal-follower input that allows the extension tube position to be controlled from a potentiometer or other voltage control. Both functions can be used at the same time.

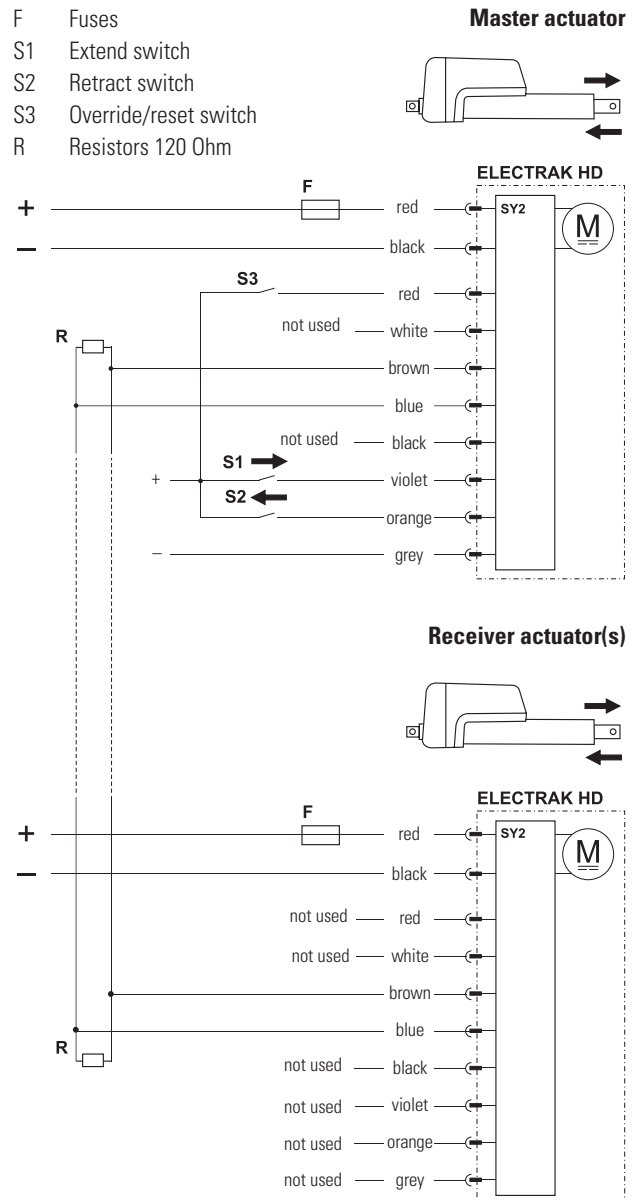
Electrak® HD – Electrical Connections

Option Type SY2		
Actuator supply voltage	[Vdc]	
HD12		9 - 16
HD24		18 - 32
HD48		36 - 64
Actuator current draw	[A]	see page 19
Extend / retract input voltage	[Vdc]	
HD12(24)		9 - 32
HD48		12 - 64
Extend / retract input current	[mA]	6 - 22
Number of synchronized actuators		2 - 8
Max. actuator speed difference	[%]	25
Hold and wait distance	[mm]	
HDxx-B017		25.0
HDxx-B026		15.0
HDxx-B045		10.0
HDxx-B068		7.5
HDxx-B100		5.0
HDxx-B160		2.5

Control option SY2 works as option LXX but also has a synchronization feature, allowing up to eight actuators having the SY2 option to run in integrated motion. When using the low-level extend and retract inputs on the master actuator, the receiver(s) will follow. If there is a need to run an actuator individually, it is possible to put it into an override state by closing a switch (S3) connected to the red lead as shown in the wiring diagram.

Important Design Notes

- All actuators' supply voltages must be within $\pm 10\%$ of each other.
- While uneven loads can be supported, it is suggested that loads be distributed as evenly as possible to avoid overloading a single actuator within the system.
- The speed of the actuators will typically remain close to the speed they are rated for at full load, even if running at a lower load.
- If a unit detects that it is 1 mm further ahead of any other in the network, it will reduce its speed slightly to allow the other to catch up. If the positional difference between an actuator and the rearmost actuator exceeds the hold and wait distance specified in the table above, the unit will stop until the rearmost actuator catches up.
- If one actuator encounters an overload condition or detects that the measured position isn't updating while running the motor, it will trip the overload protection and send a signal to each actuator on the network to stop. The units can be immediately reversed (unless they bind up the system), or they can continue in the same direction after a power reset.

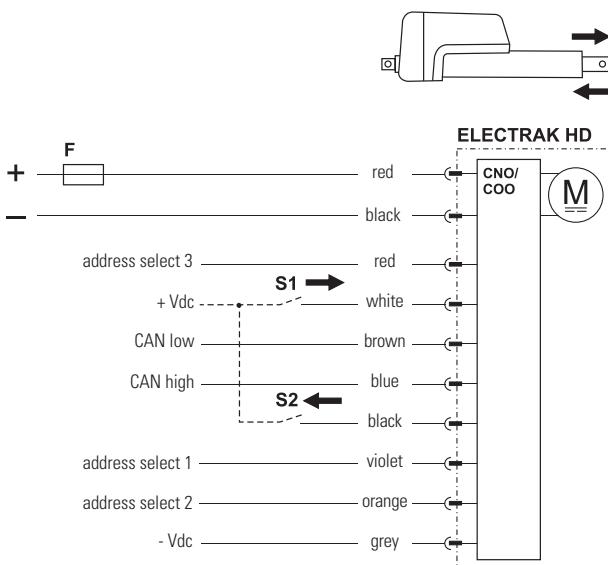


- Each actuator tracks the total number of actuators that are connected to the system. No synchronous motion will be allowed if any actuator detects that fewer than the minimum number of required actuators are connected. This allows the whole system to stop if the power or communication is lost to any actuator in the system.
- Activating the override/reset signal on any of the actuators will reset the minimum number of required actuators that must be connected to the system to 0. If more actuators are connected at any point, the minimum number of required actuators will be updated to the number of actuators that are currently connected.
- In order to give the master and receiver(s) enough time to communicate, a 250 ms delay will be enforced following any motion and before any subsequent motion is allowed.

Option Type CNO and COO

Actuator supply voltage HD12 HD24 HD48	[Vdc]	9 - 16 18 - 32 36 - 64
Command data includes: • position • speed • current		
Feedback data includes: • position • speed • current • other diagnostic information		
Extend / retract input voltage HD12(24) HD48	[Vdc]	9 - 32 12 - 64
Extend / retract input current	[mA]	6 - 22

on a single bus. The actuator can be manually forced to extend or retract by using the inputs on white and black wires. When the manual control inputs are used, CAN bus control messages are ignored, but the unit will still provide CAN bus feedback messages. When the inputs are left floating, CAN bus functionality for control messages is restored.



- F Fuse
S1 Manual extension switch (optional)
S2 Manual retraction switch (optional)

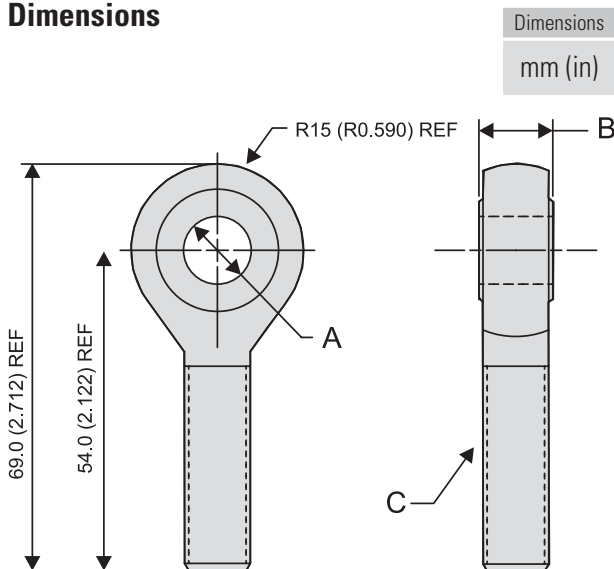
Control option CNO has a SAE J1939 CAN bus control interface, COO has a CANopen control interface that control and monitor the actuator. Extend and retract commands are sent via CAN messages on the CAN low and CAN high pins. Address select 1, 2 and 3 pins can be used as a binary encoded decimal (BCD) address to the default address. This can be used when multiple CAN bus actuators are located



Electrak® HD – Accessories

Rod End Front Adapter		
Type	metric	inch
Material	Cadmium-plated steel	
Dimensions		
A	12.0 ± 0.1 mm	0.5 in
B	16.0 ± 0.1 mm	0.625 in
C	M12	1/2-20 UNF
p/n	756-9021	756-9007

Dimensions



The rod end front adapter comes in one metric and one imperial version. The metric adapter can be mounted to the front of the extension tube if the actuator is equipped with the metric female thread front adapter option (type P), while the inch adapter requires the inch female thread option (type G).

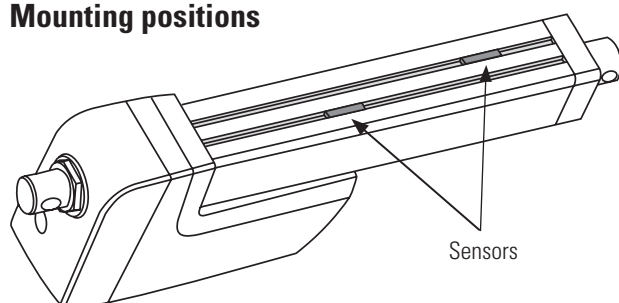
Wire Harness Kits

Part Number	Description
954-9364	0.3 m Power Only (EXX)
954-9365	1.5 m Power Only (EXX)
954-9366	5.0 m Power Only (EXX)
954-9367	0.3 m Power and 8-Wire Signal (ELX, ELP, ELD, LXX, LLX, LXP, CNO, COO, SYN)
954-9368	1.5 m Power and 8-Wire Signal (ELX, ELP, ELD, LXX, LLX, LXP, CNO, COO, SYN)
954-9369	5.0 m Power and 8-Wire Signal (ELX, ELP, ELD, LXX, LLX, LXP, CNO, COO, SYN)
954-9370	0.3 m Power and 3-Wire Signal (EXP, EXD)
954-9471	1.5 m Power and 3-Wire Signal (EXP, EXD)
954-9372	5.0 m Power and 3-Wire Signal (EXP, EXD)

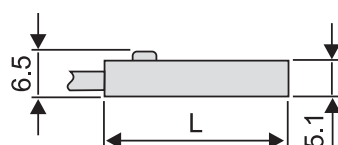
Limit Switches for Cover Tube Mounting

Sensor type	solid state	reed switch
Contact type	normally open (N.O.)	
Output type	PNP	contact
Voltage [VDC/AC]	10 - 30 / –	5 - 115 / 5 - 115
Max. current [mA]	100	
Hysteresis [mm (in)]	1.5 (0.06)	1.0 (0.04)
Operating temperature [°C]	- 20 to + 70	- 20 to + 70
Lead cross section [mm ²]	3 × 0.14	2 × 0.14
Length (L) [mm (in)]	25.3 (1.0)	30.5 (1.2)
Protection class	IP69K	IP67
LED indicator	yes	
Connection	2 m cable with flying leads	
p/n	840-9131	840-9132

Mounting positions



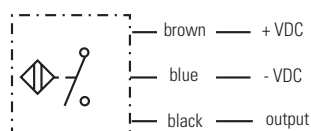
Dimensions



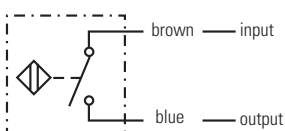
Dimensions
mm

Connection

Solid state



Reed switch



The limit switches are mounted in the cover tube slots and will be switched by a magnet mounted inside of the actuator on the extension tube.

Electrak[®] LL – Technical Features



Standard Features

- Long life expectancy
- High duty cycle
- Constant speed regardless of the load
- Designed and tested to meet the toughest environmental demands
- 24 Vdc versions complies to railway standards EN 50155, EN 60077 and EN 45545 *
- Onboard electronics eliminate the need for standalone controls
- Suitable for pneumatic and hydraulic-to-electric application conversions

* Electrak LL (24 Vdc version only) complies to the railway standards EN 50155, EN 60077 and EN 45545.

General Specifications

Screw type	ball
Nut type	load lock ball nut
Manual override	yes
Anti-rotation	yes
Controlled braking	yes ⁽¹⁾
Static load holding brake	yes
Safety features	Electrak monitoring package: current monitoring voltage monitoring temperature monitoring internal end-of-stroke limit switches
Electrical connections ⁽²⁾	cable(s) with flying leads
Compliances ⁽³⁾	CE, UKCA, RoHS, EN 50155, EN 60077, EN 45545

(1) The actuator is stopped in a controlled manner using a preset deceleration rate.

(2) There are two cables. The cable(s) enters the actuator via a connector. The replacement of an actuator can be completed by unplugging the old actuator and plugging in the new one.

(3) Only the 24 Vdc versions complies to EN 50155, EN 60077 and EN 45545.

Optional Mechanical Features

Variety of front and rear adapters

Alternative adapter orientation

Optional Electronic Control Features

CANopen[®] CAN bus

SAE J1939 CAN bus

Low-level switching

Programmable limit switches

End-of-stroke limit switch inputs

Absolute position output

Control Option Combinations

LEX	Electrak Monitoring Package + low-level signal motor switching + external end-off-stroke limit switch inputs
LXX	Electrak Monitoring Package + low-level signal motor switching
LXP	Electrak Monitoring Package + low-level signal motor switching + absolute position feedback output
CNO	SAE J1939 CAN bus + speed control
COO	CANopen CAN bus + speed control

Accessories

Mechanical	Rod end front adapter
Electrical	External slot-mounted limit switches

Electrak LL – Technical Specifications

Mechanical Specifications

Max. static load ⁽¹⁾	[kN (lbs)]	5 (1124) 10 (2248) 15 (3372)
LLxx-B020 LLxx-B040 LLxx-B060		
Max. dynamic load (Fx)	[kN (lbs)]	2 (450) 4 (899) 6 (1349)
LLxx-B020 LLxx-B040 LLxx-B060		
Speed ⁽²⁾	[mm/s (in/s)]	54 (2.13) 30 (1.18) 15 (0.59)
LLxx-B020 LLxx-B040 LLxx-B060		
Min. ordering stroke (S) length	[mm]	100
Max. ordering stroke (S) length	[mm]	450
Ordering stroke length increments	[mm]	50
Operating temperature limits	[°C (F)]	-40 – 85 (-40 – 185)
Full load duty cycle @ 25 °C (77 °F)	[%]	35
End play, maximum	[mm (in)]	1.2 (0.047)
Restraining torque	[Nm (lbs)]	0
Protection class - static		IP66 / IP69K
Protection class - dynamic		IP66
Salt spray resistance	[h]	500

1) Max. static load at fully retracted stroke

2) Speeds are constant regardless of the load unless using the speed control feature in bus controlled units

3) Do not use PWM voltage for speed control to avoid damaging the onboard electronics

4) Control option LEX not available with 48 Vdc input voltage

Weight [kg]

Ordering Stroke (S) [mm]

100	150	200	250	300	350	400	450
6.8	7.2	7.5	7.9	8.2	8.6	8.9	9.3

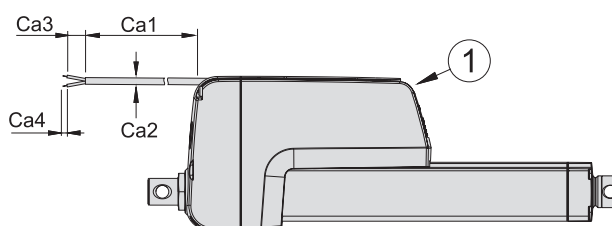
Conversion Factors:

Millimeter to inch: 1 mm = 0.03937 in

Kilogram to pound: 1 kg = 2.204623 lbs

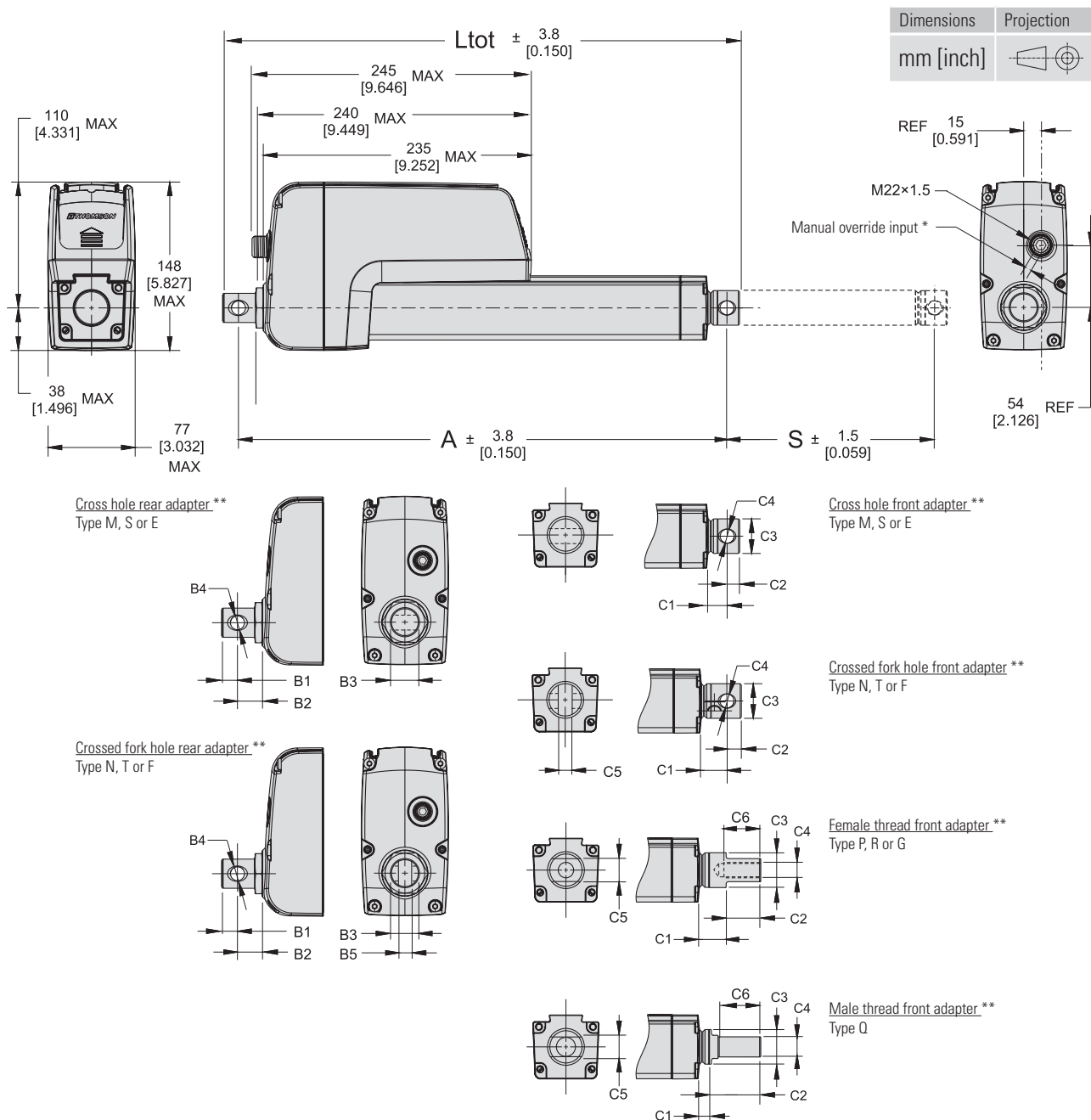
Electrical Specifications

Available input voltages ⁽³⁾⁽⁴⁾	[Vdc]	24, 48
Input voltage tolerance	[Vdc]	16.8 - 32.0 36.0 - 60.0
LL24 (24 Vdc input voltage) LL48 (48 Vdc input voltage)		
Current draw @ no load/max. load	[A]	2/10.50 2/8.50 1/5.25 1/4.25
LL24-B020(40) LL24-B060 LL48-B020(40) LL48-B060		
Motor cable leads cross section	[mm ² (AWG)]	2 (14)
Signal cable leads cross section	[mm ² (AWG)]	0.5 (20)
Standard cable length (Ca1)	[m (in)]	0.3 (11.8)
Cable diameter (Ca2)	[mm (in)]	7.3 (0.29) 6.6 (0.26)
motor cable signal cable		
Flying lead length (Ca3)	[mm (in)]	74 (2.9)
Stripped lead length (Ca4)	[mm (in)]	6 (0.25)



The drawing shows the cables exiting the cable slots at the end of the actuator housing, which is the shipping position. The user can adjust the exit point to be anywhere between the connector (1) in the front of the housing and the end of the cable slots.

Electrak[®] LL – Dimensions



* Manual override input. The input hole is covered with a plastic plug. When removed, a 6 mm female hexagon key can be inserted and used as a crank.

** All adapters shown in the standard orientation.

Ordering Stroke, Retracted Length and Total Length Relationships [mm (in)]

Ordering Stroke (S)	Retracted Length (A)	Total Length (Ltot),
100 - 450 (3.937 - 17.716)	$S + 182 (7.165) + B2 + C1$	$A + B1 + C2$

Rear Adapter Dimensions [mm (in)]

	Adapter Type			
	M, S	E	N, T	F
B1	13.4 (0.53)			
B2	21.6 (0.85)			
B3	25.4 (1.0)			
B4	12.2 E9 (0.48)	12.8 (0.506)	12.2 E9 (0.48)	12.8 (0.506)
B5	-	-	8.2 (0.323)	

Front Adapter Dimensions [mm (in)]

	Adapter Type						
	M, S	E	N, T	F	P, R	G	Q
C1	24.0 (0.945)		27.0 (1.063)		24.9 (0.980)		13.2 (0.519)
C2	10.9 (0.429)		12.9 (0.508)		30 (1.18)		42 (1.654)
C3	34.93 (1.375)						
C4	12.2 E9 (0.48)	12.8 (0.506)	12.2 E9 (0.48)	12.8 (0.506)	M12 × 1.75	1/2-20 NF-2B	M16 × 2
C5	-	-	8.2 (0.323)		19 (0.748)		
C6	-	-	-	-	35 (1.38)		

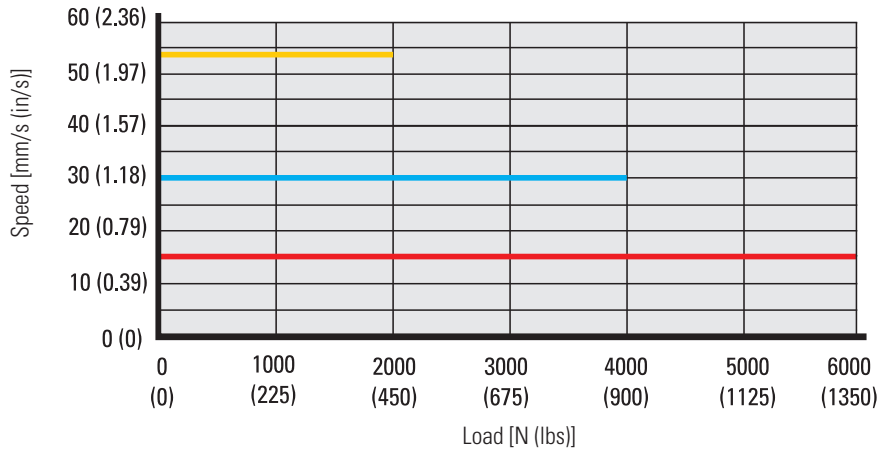


Electrak® LL – Performance Diagrams

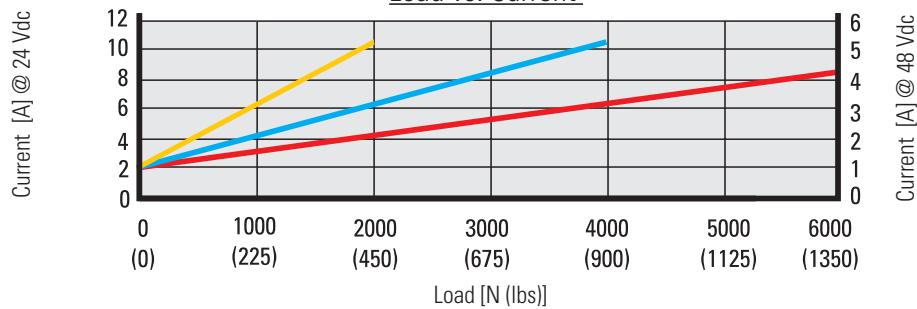
Screw Type and Dynamic Load Capacity

■ ball screw, 2 kN (450 lbs) ■ ball screw, 4 kN (899 lbs) ■ ball screw, 6 kN (1348 lbs)

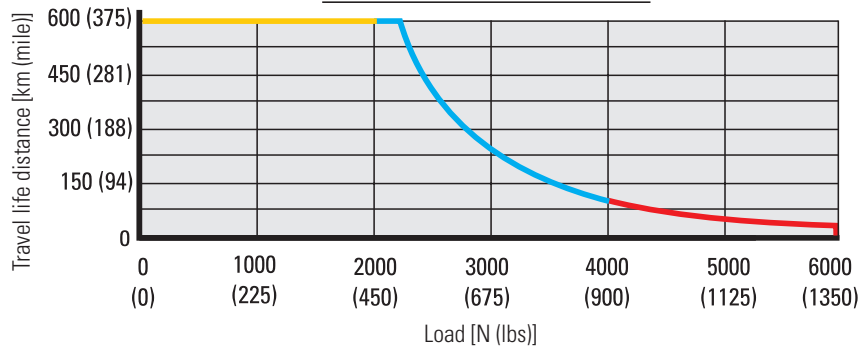
Load vs. Speed



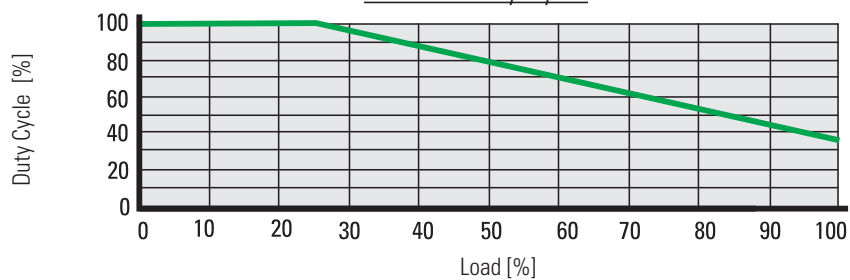
Load vs. Current ⁽¹⁾



Load vs. Travel Life Distance ⁽²⁾



Load vs. Duty Cycle ^{(1) (3)}



1) Curves were generated at an ambient temperature of 25°C (77°F).

2) The exact travel life also depends on temperature and other environmental factors. Contact customer support for more information.

3) Load in percent of the max permissible load for the screw type and dynamic load capacity in question.

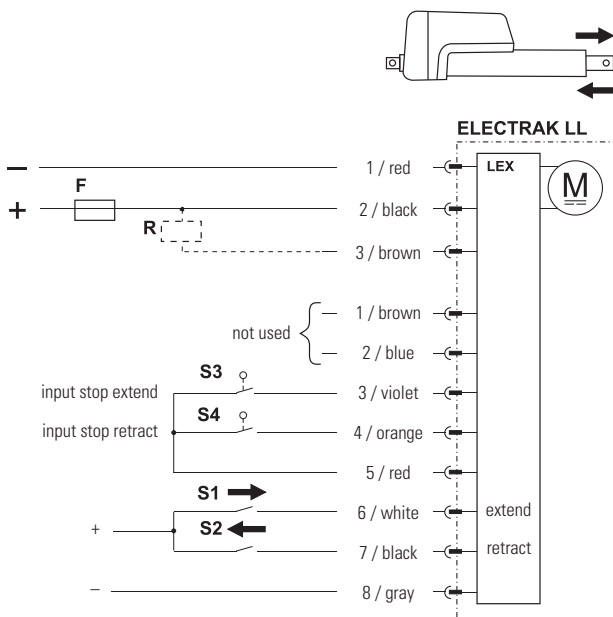
Electrak LL – Ordering Key

Ordering Key								
1	2	3	4	5	6	7	8	9
LL24	B040-	0200	LEX	A	S	S	S	D
1. Model and input voltage LL24 = Electrak LL, 24 Vdc LL48 = Electrak LL, 48 Vdc 2. Screw type, dynamic load capacity B020- = ball screw, 2 kN (450 lbs) B040- = ball screw, 4 kN (899 lbs) B060- = ball screw, 6 kN (1348 lbs) 3. Ordering stroke length ⁽¹⁾ 0100 = 100 mm 0150 = 150 mm 0200 = 200 mm 0250 = 250 mm 0300 = 300 mm 0350 = 350 mm 0400 = 400 mm 0450 = 450 mm 4. Control option LEX = Electrak Monitoring Package + low-level signal motor switching + external end-off-stroke limit switch inputs ⁽²⁾ LXX = Electrak Monitoring Package + low-level signal motor switching ⁽³⁾ LXP = LXX + absolute position feedback output ⁽³⁾ CNO = SAE J1939 CAN bus + speed control ⁽³⁾ COO = CANopen CAN bus + speed control ⁽³⁾ 5. Harness option A = 0.3 m long cables with flying leads (number coded leads) 1 = 0.3 m long halogen-free cables with flying leads (color coded leads) 2 = 1.5 m long halogen-free cables with flying leads (color coded leads) 3 = 5.0 m long halogen-free cables with flying leads (color coded leads)					6. Rear adapter option M = cross hole for 12 mm pin E = cross hole for 0.5 inch pin N = forked cross hole for 12 mm pin F = forked cross hole for 0.5 inch pin S = stainless cross hole for 12 mm pin T = stainless forked cross hole for 12 mm pin 7. Front adapter option M = cross hole for 12 mm pin E = cross hole for 0.5 inch pin N = forked cross hole for 12 mm pin F = forked cross hole for 0.5 inch pin P = metric female thread M12 × 1.75 G = inch female thread 1/2-20 UNF-2B S = stainless cross hole for 12 mm pin Q = stainless metric male thread M16 × 2 R = stainless metric female thread M16 × 2 T = stainless forked cross hole for 12 mm pin 8. Adapter orientation S = standard M = 90° turned 9. Connector option D = flying leads (1) Other stroke lengths available upon request. Please contact customer support. (2) Only available with 24 Vdc input voltage. (3) Available for both 24 and 48 Vdc input voltages.			

Electrak® LL – Electrical Connections

Control Option LEX

Available input voltages	[Vdc]	24
Input voltage tolerance	[Vdc]	16.8 - 32.0
Extend / retract input voltage	[Vdc]	9 - 64
Extend / retract input current	[mA]	0.35 - 2.75

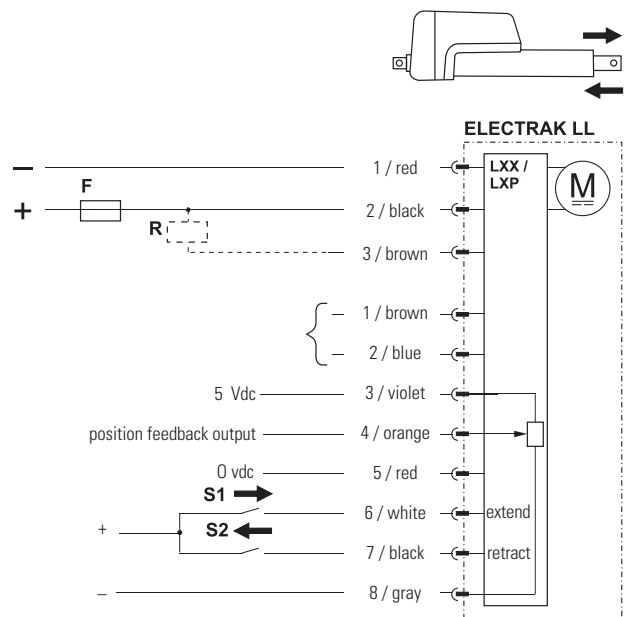


- + / - Positive / negative voltage
- F Fuse
- R Brake resistor
- S1 Switch extend
- S2 Switch retract
- S3 Limit switch stop extend
- S4 Limit switch stop retract

The actuator movement is controlled by connecting a positive voltage to the extend or retract input, and a negative to the common input on lead 8 / gray. There are also external limit switch inputs that stop the actuator from extending or retracting when activated. If you want to detect the position of the extension tube, we recommend using a Thomson reed sensor (part number 840-9132) that mounts directly to the extension tube sensor grooves.

Control Option LXX / LXP

Available input voltages	[Vdc]	24, 48
Input voltage tolerance	[Vdc]	16.8 - 32.0 36.0 - 60.0
Extend / retract input voltage	[Vdc]	9 - 64
Extend / retract input current	[mA]	0.35 - 2.75
Position feedback output voltage	[Vdc]	0.5 - 4.5
Position feedback linearity	[%]	± 0.25
Position feedback resolution	[mm/V]	ordering stroke length (S) [mm] / 4



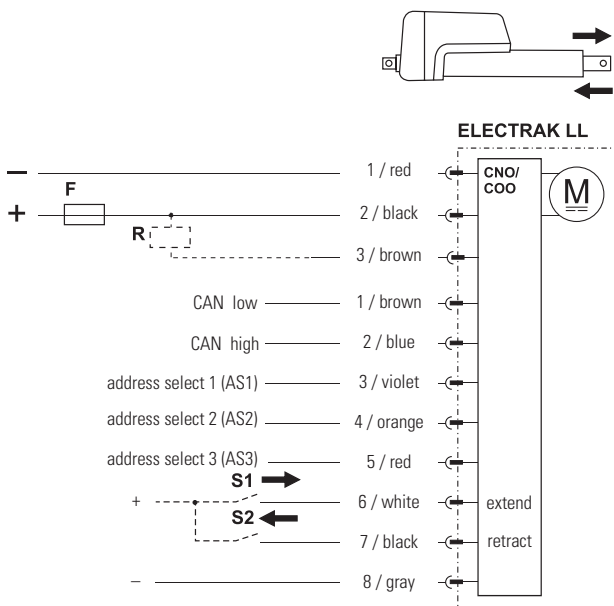
- + / - Positive / negative voltage
- F Fuse
- R Brake resistor
- S1 Switch extend
- S2 Switch retract

On control options LXX and LXP, the actuator movement is controlled by connecting the input voltage positive to the extend or retract input, and the negative to the common input on lead 8 / gray. On the LXP option, there is also an absolute position feedback output.

Control Option Type CNO / COO

Available input voltages	[Vdc]	24, 48
Input voltage tolerance	[Vdc]	16.8 - 32.0
LL24 (24 Vdc input voltage)		36.0 - 60.0
LL48 (48 Vdc input voltage)		
Extend / retract input voltage	[Vdc]	9 - 64
Extend / retract input current	[mA]	0.35 - 2.75
CAN bus command data includes:		
• position • speed • current		
CAN bus feedback data includes:		
• position • speed • current • other diagnostic information		

Control option CNO includes a SAE J1939 CAN bus control interface, and COO includes a CANopen® control interface that controls and monitors the actuator. Movement commands are sent via CAN messages on the CAN low and CAN high inputs. Address inputs AS1, AS2 and AS3J can be used as a binary coded decimal (BCD) adder to change the default address of the actuator. This option can be used when multiple CAN bus actuators are located on a single bus. The actuator can be manually forced to move by connecting a positive voltage to the extend or retract input, and a negative to the common input. When these manual control inputs are used, CAN bus control messages are ignored, but the unit will still provide CAN bus feedback messages. When the inputs are left floating, CAN bus functionality for control messages is restored. When using the address inputs and/or the manual extend and retract switches, the common input on lead 8 / gray must be connected to negative.

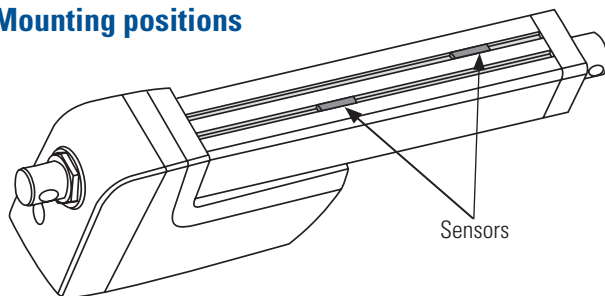


- + / - Positive / negative voltage
- R Brake resistor
- F Fuse
- S1 Switch extend (optional)
- S2 Switch retract (optional)
- AS1 Address selection switch for binary position 1
- AS2 Address selection switch for binary position 2
- AS3 Address selection switch for binary position 3

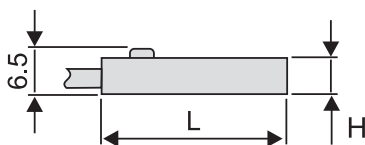
Electrak[®] LL – Accessories

Limit Switches for Cover Tube Mounting		
Sensor type	solid state	reed switch
Contact type	normally open (N.O.)	
Output type	PNP	contact
Voltage [Vdc/Vac]	10 - 30 / –	5 - 120 / 5 - 120
Max. current [mA]	100	
Hysteresis [mm]	1.5	1.0
Operating temperature [°C]	- 20 to + 70	- 20 to + 70
Lead cross section [mm ²]	3 × 0.14	2 × 0.14
Length (L) [mm]	25.3	30.5
Height (H) [mm]	5.1	5.7
Protection class	IP69K	IP67
LED indicator	yes	
Connection	2 m cable with flying leads	
p/n	840-9131	840-9132

Mounting positions

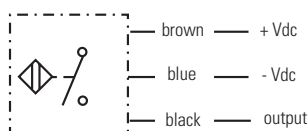


Dimensions [mm]

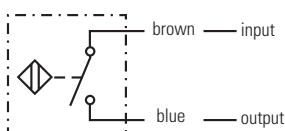


Connection

Solid state



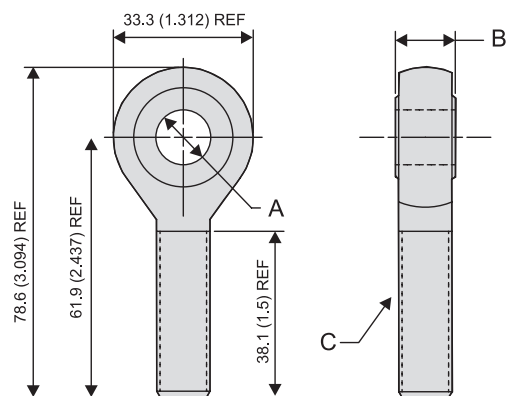
Reed switch



The limit switches are mounted in the cover tube slots and will be switched by a magnet mounted inside of the actuator on the extension tube.

Rod End Front Adapter		
Type	metric	inch
Material	Cadmium-plated steel	
Dimensions		
A	12.0 ± 0.1 mm	0.5 in
B	14.3 ± 0.1 mm	0.625 in
C	M12	1/2-20 UNF
p/n	756-9021	756-9007

Dimensions [mm (in)]



The rod end front adapter comes in a metric or inch version. The metric adapter can be mounted to the front of the extension tube if the actuator is equipped with the metric female thread front adapter option (type P), while the inch adapter requires the inch female thread option (type G).

Notes



Electrak[®] MD – Technical Features



General Specifications

Screw type	acme
Nut type	lead
Manual override	no
Anti-rotation	yes
Static load holding brake	no (self-locking)
Electrical connections	cable with flying leads
Compliance	CE, UKCA, RoHS, REACH, ISO 13766

Standard Features

- Best-in-class power density
- Onboard electronics, including versions with SAE J1939 CAN bus or CANopen CAN bus
- Suitable for pneumatic and hydraulic-to-electric application conversions
- Designed and tested to meet the toughest environmental demands
- Reliable and maintenance free

Optional Features

Mechanical options	Multiple cable length options
	Alternative adapter orientation
Control options	End-of-stroke limit switches
	Analog position feedback
	Low-level signal motor switching
	JSAE 1939 CAN bus
	CANopen CAN bus

Control Options Features

	Control Option							
Feature	XXX	XXP	EXX	EXP	LXX	LXP	CNO	COO
Dynamic braking	no	no	yes	yes	yes	yes	yes	yes
End-of-stroke protection	yes	yes	yes	yes	yes	yes	yes	yes
Overload protection	no	no	yes	yes	yes	yes	yes	yes
Temperature monitoring	no	no	yes	yes	yes	yes	yes	yes
Temperature compensation	no	no	yes	yes	yes	yes	no	no
Voltage monitoring	no	no	yes	yes	yes	yes	yes	yes
PWM voltage compatible	yes	yes	no	no	no	no	no	no

Electrak MD – Technical Specifications

Mechanical Specifications		
Max. static and dynamic load (Fx)	[N (lbs)]	
MDxxA025		250 (56)
MDxxA050		500 (112)
MDxxA100		1000 (225)
MDxxA200		2000 (450)
Speed @ no load/max. load	[mm/s (in/s)]	
MDxxA025		52/43.8 (2.04/1.72)
MDxxA050		28/18.5 (1.1/0.73)
MDxxA100		14.5/11 (0.57/0.43)
MDxxA200		7/5.4 (0.28/0.21)
Min. ordering stroke (S) length	[mm]	50
Max. ordering stroke (S) length	[mm]	300
Ordering stroke length increments	[mm]	50
Operating temperature limits	[°C (F)]	-40 – 85 (-40 – 185)
Full load duty cycle @ 25 °C (77 °F)	[%]	25
End play, maximum	[mm (in)]	1.2 (0.047)
Restraining torque	[Nm (lbs)]	0
Protection class - static		IP67/IP69K
Protection class - dynamic		IP66
Salt spray resistance	[h]	500

Electrical Specifications		
Available input voltages	[Vdc]	12, 24, 48
Input voltage tolerance	[Vdc]	
MD12 (12 Vdc input voltage)		9 - 16
MD24 (24 Vdc input voltage)		18 - 32
MD48 (48 Vdc input voltage)		36 - 60
Current draw @ no load/max. load	[A]	
MD12A025		1.2/5.2
MD24A025		0.6/2.6
MD48A025		0.3/1.3
MD12A050		1.4/6.2
MD24A050		0.7/3.1
MD48A050		0.4/1.6
MD12A100		1.2/5.2
MD24A100		0.6/2.6
MD48A100		0.3/1.3
MD12A200		1.4/6.2
MD24A200		0.7/3.1
MD48A200		0.4/1.6
Motor leads cross section	[mm² (AWG)]	0.75 (18)
Signal leads cross section	[mm² (AWG)]	0.35 (22)
Cable lengths, standard	[mm (in)]	300 (11.81) or 1000 (39.37)
Cable diameter	[mm (in)]	7.5 (0.3)

Actuator Weight [kg (lb)]

Ordering Stroke (S) [mm]					
50	100	150	200	250	300
1.1 (2.4)	1.2 (2.6)	1.3 (2.8)	1.4 (3.1)	1.5 (3.3)	1.6 (3.5)

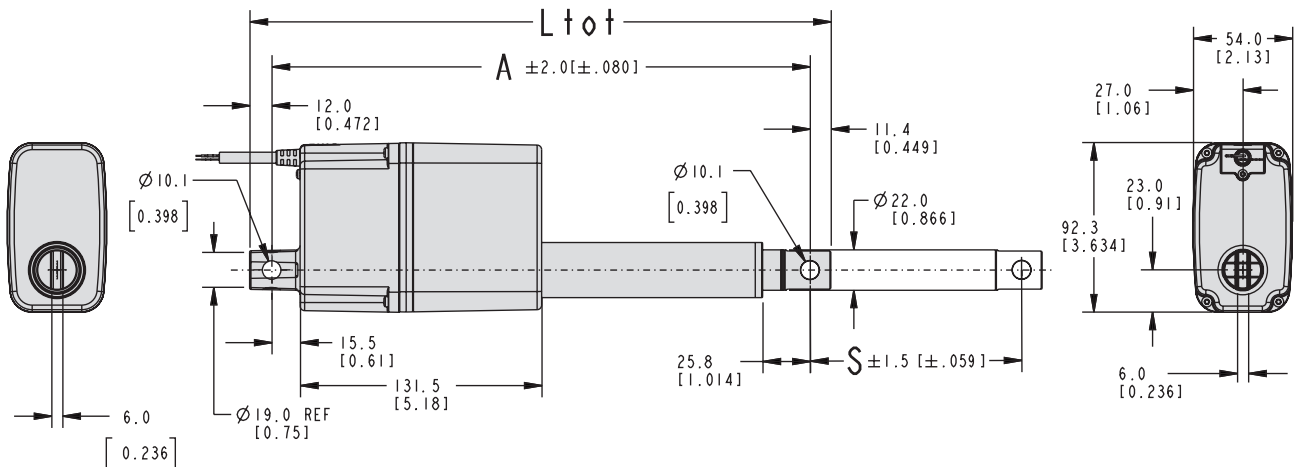


Electrak[®] MD – Ordering Key

Ordering Key								
1	2	3	4	5	6	7	8	9
MD12	A025-	0300	XXX	2	N	N	S	D
1. Model and input voltage MD12 = Electrak MD, 12 Vdc MD24 = Electrak MD, 24 Vdc MD48 = Electrak MD, 48 Vdc				5. Harness option 1 = 0.3 m long cable with flying leads 2 = 1 m long cable with flying leads				
2. Screw type, dynamic load capacity A025- = acme screw, 250 N (56 lbs) A050- = acme screw, 500 N (112 lbs) A100- = acme screw, 1000 N (225 lbs) A200- = acme screw, 2000 N (450 lbs)				6. Rear adapter option N = forked cross hole for 10 mm pin				
3. Ordering stroke length ⁽¹⁾ 0050 = 50 mm 0100 = 100 mm 0150 = 150 mm 0200 = 200 mm 0250 = 250 mm 0300 = 300 mm				7. Front adapter option N = forked cross hole for 10 mm pin				
4. Electrak Modular Control System options XXX = internal end-of-stroke limit switches XXP = XXX + analog (potentiometer) position output EXX = Electronic Monitoring Package ⁽²⁾ EXP = EXX + analog (potentiometer) position output ⁽²⁾ LXX = EXX + low-level signal motor switching LLX = LXX + end-of-stroke indication outputs LXP = LXX + analog (potentiometer) position output LLP = LXP + end-of-stroke indication outputs CNO = EXX + SAE J1939 CAN bus + open-loop speed control COO = EXX + CANopen bus + open-loop speed control				8. Adapter orientation S = standard M = 90 ° turned				
				9. Connector option D = flying leads				
(1) Other stroke lengths available upon request. Please contact customer support. (2) Option not available for models with 48 Vdc supply voltage.								

Electrak MD – Dimensions

Dimensions	Projection
mm [inch]	



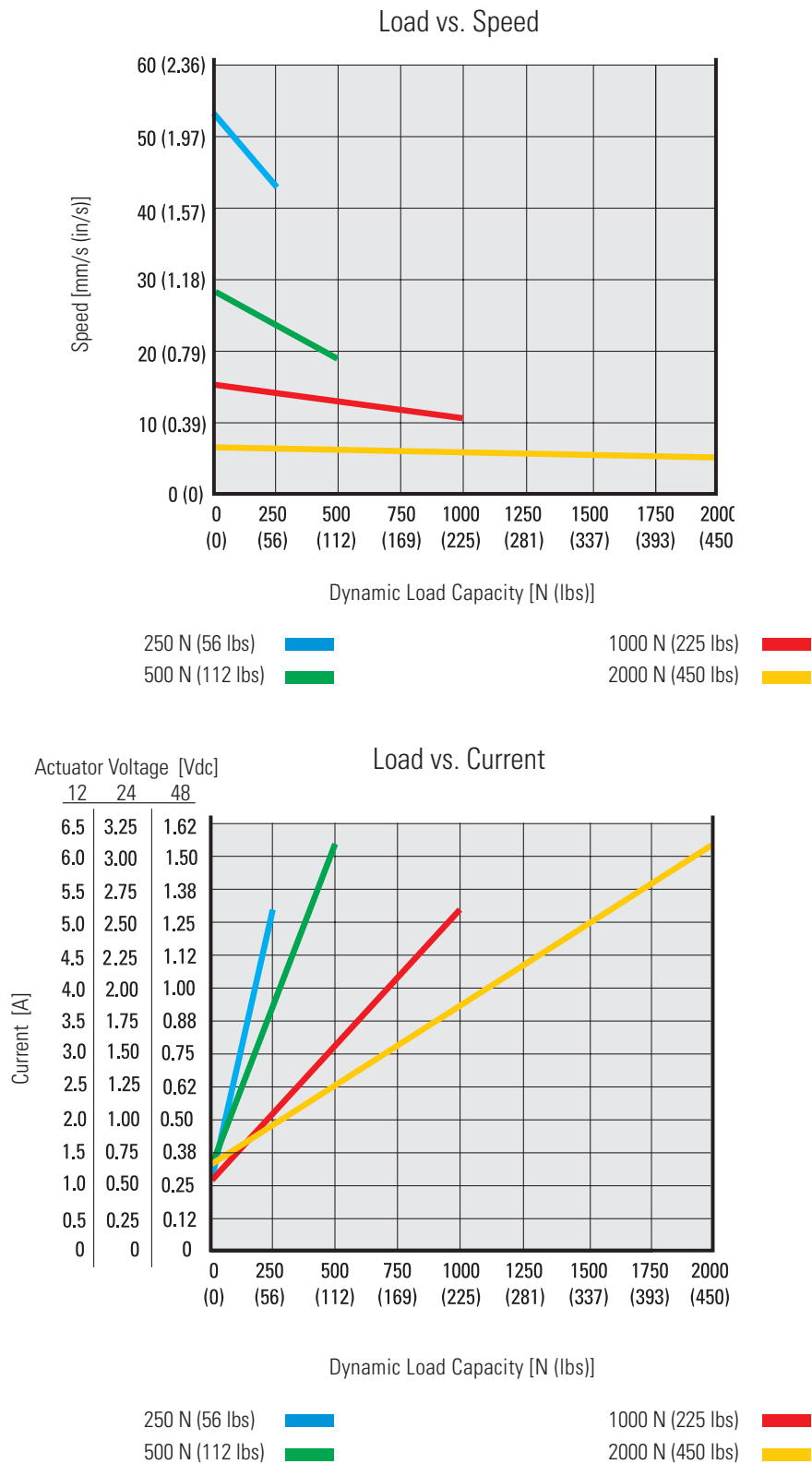
Note: All adapters shown in the standard orientation.

Ordering Stroke (S), Total Length (Ltot) and Retracted Length (A) Relationships

Standard Ordering Strokes (S)	[mm]	50, 100, 150, 200, 250, 300
Total Length (Ltot)	[mm]	$L_{tot} = A + 23.4$
Retracted Length (A)	[mm]	$A = S + 133.2$



Electrak[®] MD – Performance Diagrams

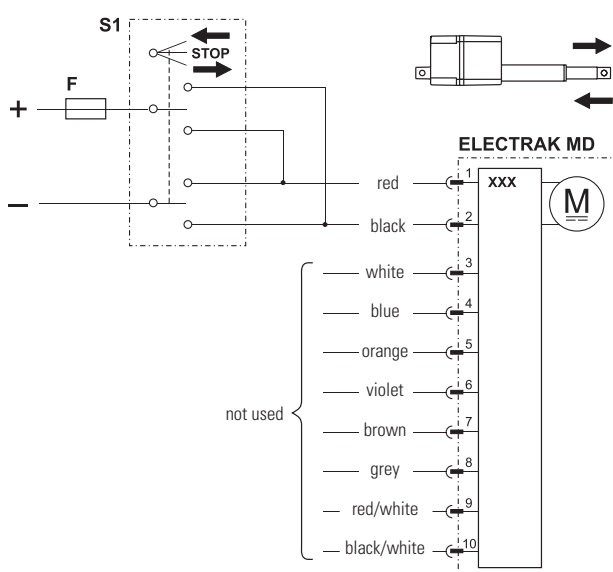


Note! Both curves were generated at an ambient temperature of 21°C (70°F). Different ambient temperature and individual actuator characteristics can produce slightly different values.

Electrak MD – Control Options

Control Option Type XXX

Actuator supply voltage MD12 MD24	[Vdc]	9 - 16 18 - 32
Actuator current draw	[A]	see page 110



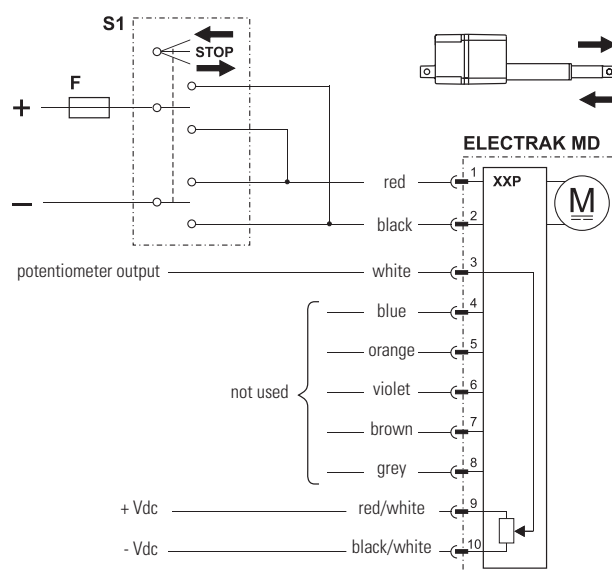
F Fuse

S1 Double pole double throw switch

With control option XXX, the polarity of the motor voltage is switched by a customer-supplied switch (switch, relay, etc.) to make the actuator extend or retract. The actuator will automatically stop when reaching the ends of stroke due to the built-in end- of-stroke limit switches. The switch, power supply, wiring and all other components must be able to handle the motor current for the actuator model and load being used, as well as the inrush current (up to three times the max. continuous current for the max. load being used for up to 150 milliseconds).

Control Option Type XXP

Actuator supply voltage MD12 MD24	[Vdc]	9 - 16 18 - 32
Actuator current draw	[A]	see page 110
Potentiometer type		wire-wound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	1
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	
MDxxA025, all strokes		16.67
MDxxA100, all strokes		16.67
MDxxA050, 50 - 250 mm stroke		33.33
MDxxA200, 50 - 250 mm stroke		33.33
MDxxA050, 300 mm stroke		16.67
MDxxA200, 300 mm stroke		16.67



F Fuse

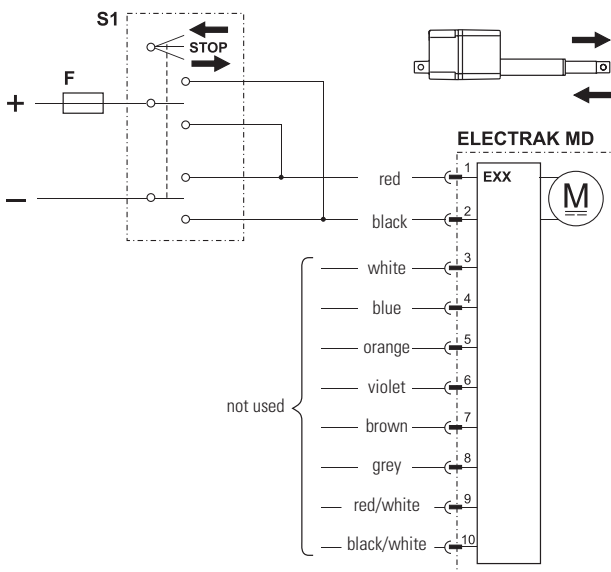
S1 Double pole double throw switch

Control option XXP works as option XXX but also has an analog (potentiometer) output that will provide feedback on the extension tube position.

Electrak® MD – Control Options

Control Option Type EXX

Actuator supply voltage MD12 MD24	[Vdc]	9 - 16 18 - 32
Actuator current draw	[A]	see page 110



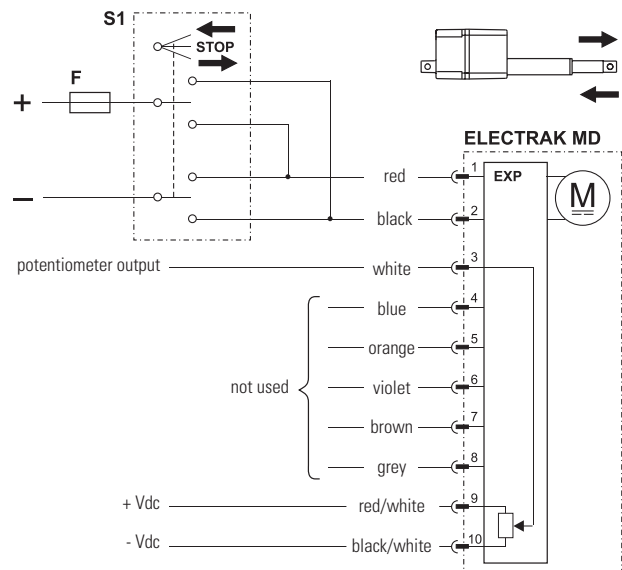
F Fuse

S1 Double pole double throw switch

Control option EXX contains all of the basic Electronic Monitoring Package features described on page six, guaranteeing safe operation of the actuator and equipment. With control option EXX, the polarity of the motor voltage is switched by a customer-supplied switch (switch, relay, etc.) to make the actuator extend or retract. The switch, power supply, wiring and all other components must be able to handle the motor current for the actuator model and load being used, as well as the inrush current (up to three times the max. continuous current for the max. load being used for up to 150 milliseconds).

Control Option Type EXP

Actuator supply voltage MD12 MD24	[Vdc]	9 - 16 18 - 32
Actuator current draw	[A]	see page 110
Potentiometer type		wire-wound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	1
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	
MDxxA025, all strokes		16.67
MDxxA100, all strokes		16.67
MDxxA050, 50 - 250 mm stroke		33.33
MDxxA200, 50 - 250 mm stroke		33.33
MDxxA050, 300 mm stroke		16.67
MDxxA200, 300 mm stroke		16.67



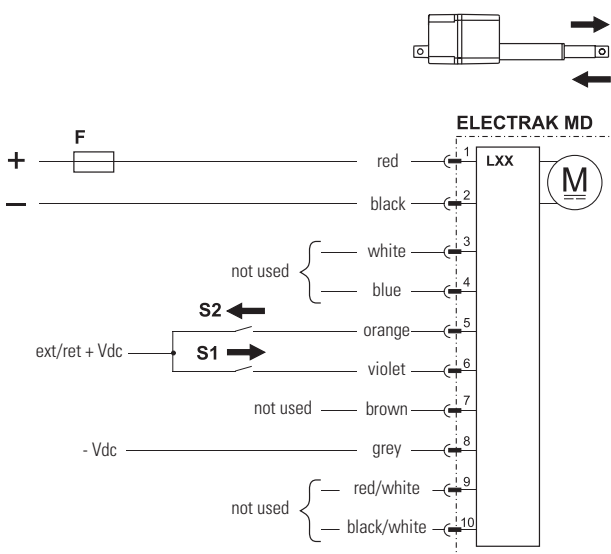
F Fuse

S1 Double pole double throw switch

Control option EXP works as option EXX but also has an analog (potentiometer) output that will provide feedback on the extension tube position.

Control Option Type LXX

Actuator supply voltage MD12 MD24	[Vdc]	9 - 16 18 - 32
Actuator current draw	[A]	see page 110
Extend / retract input voltage	[Vdc]	9 - 32
Extend / retract input current	[mA]	6 - 22

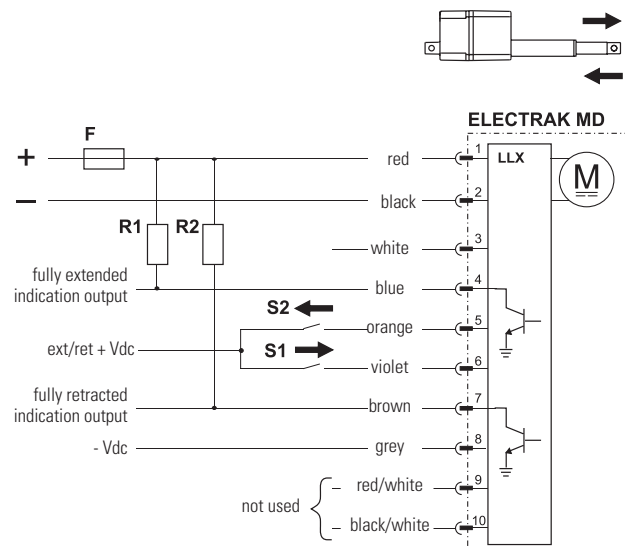


- F Fuse
S1 Extend switch
S2 Retract switch

Control option LXX has all the basic Electronic Monitoring Package features included in control option EXX, but the polarity of the motor voltage is switched by the onboard electronics instead. The customer-supplied switches used to command the actuator to extend or retract only need to handle low-level signals. However, the power supply and wiring that supply the actuator must be able to handle the motor current for the actuator model and load being used, as well as the inrush current (up to one and a half times the max. continuous current for the max. load being used for up to 150 milliseconds).

Control Option Type LLX

Actuator supply voltage MD12 MD24	[Vdc]	9 - 16 18 - 32
Actuator current draw	[A]	see page 110
Extend / retract input voltage	[Vdc]	9 - 32
Extend / retract input current	[mA]	6 - 22
End-of-stroke outputs max. voltage	[Vdc]	32
End-of-stroke outputs max. current	[mA]	25



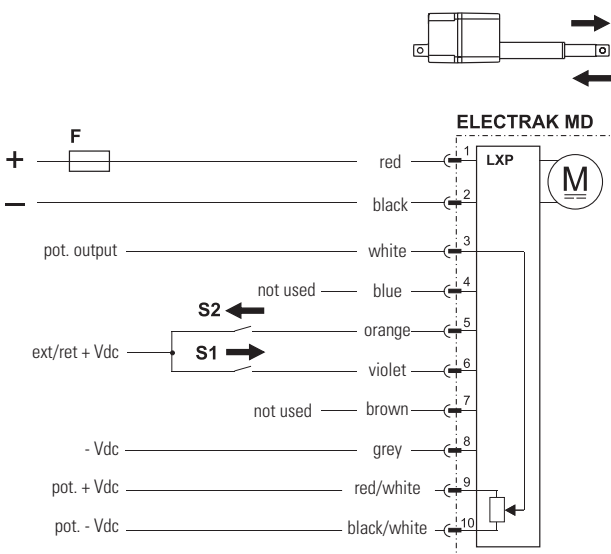
- F Fuse
S1 Extend switch
S2 Retract switch
R1 Pull-up resistor
R2 Pull-up resistor

Control option LLX works as option LXX but also has two end-of-stroke indication outputs that will signal when the actuator is fully extended or fully retracted. Since these outputs are current sinking open collector outputs, they will each require an external pull-up resistor to operate effectively.

Electrak® MD – Control Options

Control Option Type LXP

Actuator supply voltage	[Vdc]	9 - 16 18 - 32
Actuator current draw	[A]	see page 110
Potentiometer type		wire-wound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	1
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	
MDxxA025, all strokes		16.67
MDxxA100, all strokes		16.67
MDxxA050, 50 - 250 mm stroke		33.33
MDxxA200, 50 - 250 mm stroke		33.33
MDxxA050, 300 mm stroke		16.67
MDxxA200, 300 mm stroke		16.67
Extend / retract input voltage	[Vdc]	9 - 32
Extend / retract input current	[mA]	6 - 22

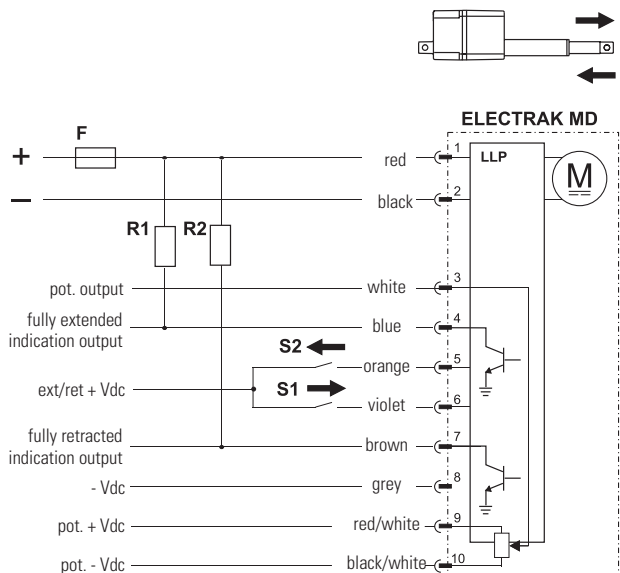


- F Fuse
S1 Extend switch
S2 Retract switch

Control option LXP works as option LXX but also has an analog (potentiometer) output that will provide feedback on the extension tube position.

Control Option Type LLP

Actuator supply voltage	[Vdc]	9 - 16 18 - 32
Actuator current draw	[A]	see page 110
Potentiometer type		wire-wound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	1
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	
MDxxA025, all strokes		16.67
MDxxA100, all strokes		16.67
MDxxA050, 50 - 250 mm stroke		33.33
MDxxA200, 50 - 250 mm stroke		33.33
MDxxA050, 300 mm stroke		16.67
MDxxA200, 300 mm stroke		16.67
Extend / retract input voltage	[Vdc]	9 - 32
Extend / retract input current	[mA]	6 - 22
End-of-stroke outputs max. voltage	[Vdc]	32
End-of-stroke outputs max. current	[mA]	25

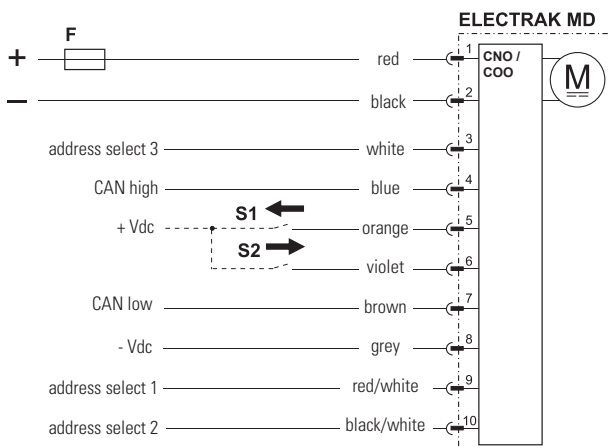
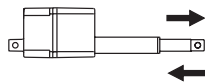


- F Fuse
S1 Extend switch
S2 Retract switch
R1 Pull-up resistor
R2 Pull-up resistor

Control option LLP works as option LLX but also has an analog (potentiometer) output that will provide feedback on the extension tube position.

Control Option Type CNO and COO

Actuator supply voltage MD12 MD24	[Vdc]	9 - 16 18 - 32
Actuator current draw	[A]	see page 110
Command data includes:		
• position • speed • current		
Feedback data includes:		
• position • speed • current • other diagnostic information		
Manual extension/retraction input voltage	[Vdc]	9 - 32
Manual extension/retraction input current	[mA]	6 - 22



- F Fuse
S1 Manual extension switch (optional)
S2 Manual retraction switch (optional)

Control option CNO has a J1939 CAN bus control interface, COO has a CANopen control interface that control and monitor the actuator. Extend and retract commands are sent via CAN messages on the CAN low and CAN high pins. Address select 1, 2 and 3 pins can be used as a binary encoded decimal (BCD) adder to the default address. This can be used when multiple CAN actuators are on a single bus. The actuator can be manually forced to extend or retract by using pin 6 (violet wire) and 5 (orange wire).

DMHD – Technical Features



Powered by the
Electrak® HD

Standard Features

- Self-supporting column in extruded anodized aluminium with high load torque capability
- Onboard electronics with many optional functions
- 12 or 24 Vdc as standard input voltages
- Static load up to 18 kN (4050 lbf)
- Dynamic load up to 16 kN (3584 lbf)
- Stroke up to 600 mm
- Speed up to 71 mm/s (2.8 in/s)
- Protection class static IP65
- T-slot grooves along the entire profile
- Maintenance free

General Specifications

Screw type	ball
Nut type	load lock ball nut
Manual override	no
Anti-rotation	yes
Static load holding brake	yes
Safety features	Electrak monitoring package: current monitoring voltage monitoring temperature monitoring load trip point calibration internal end-of-stroke limit switches ⁽¹⁾ end-of-stroke dynamic braking
Electrical connections	cable with flying leads
Compliances	CE

Optional Electronic Control Features

CANopen CAN bus
SAE J1939 CAN bus
Synchronization option
Low-level switching
Programmable limit switches
Signal-follower
End-of-stroke indication output
Analog position output
Digital position output

Control Option Combinations

EXX	Electrak Monitoring Package only
ELX	EXX + End-of-Stroke Indication Output
EXP	EXX + Analog Position Output
EXD	EXX + Digital Position Output
ELP	ELX + Analog Position Output
ELD	ELX + Digital Position Output
LXX	EXX + Low-Level Signal Motor Switching
LLX	EXX + LXX + End-of-Stroke Indication Output
LXP	EXX + LXX + Analog Position Output
LPS	EXX + LXX + Programmable Limit Switches + Signal-Follower
CNO	SAE J1939 CAN Bus Control + Open-Loop Speed Control
COO	CANopen CAN Bus Control + Open-Loop Speed Control
SY2	Synchronization Option

Accessories

T-slot bolts

Compatible Controls

Contact customer support at www.thomsonlinear.com/cs

(1) Dynamic braking is included at the ends of stroke for all DMHD actuators. Dynamic braking offered throughout the entire stroke length only on low-level switching and J1939 options.

DMHD – Technical Specifications

Mechanical Specifications		
Max. static load ⁽¹⁾	[kN (lbf)]	18 (4050)
Max. dynamic load (Fx)	[kN (lbf)]	
DMHDxxB017		1.7 (382)
DMHDxxB026		2.6 (585)
DMHDxxB045		4.5 (1012)
DMHDxxB068		6.8 (1529)
DMHDxxB100		10 (2248)
DMHDxxB160		16 (3584)
Max. load torque, dyn. and static	[Nm (lbf-in)]	710 (6284)
Speed @ no load/max. load ⁽²⁾	[mm/s (in/s)]	
DMHDxxB017		71/58 (2.8/2.28)
DMHDxxB026		40/32 (1.6/1.3)
DMHDxxB045		24/19 (0.94/0.75)
DMHDxxB068		18/14 (0.71/0.55)
DMHDxxB100		11/9 (0.43/0.35)
DMHDxxB160		7/5 (0.27/0.21)
Min. ordering stroke (S) length	[mm]	100
Max. ordering stroke (S) length ⁽³⁾	[mm]	600
Ordering stroke length increments	[mm]	50
Operating temperature limits	[°C (F)]	-40 – 85 (-40 – 185)
Full load duty cycle @ 25 °C (77 °F)	[%]	25 ⁽⁴⁾
End play, maximum	[mm (in)]	1.2 (0.047)
Protection class - static		IP65

¹ Max. static load at fully retracted stroke.

² For units with the synchronization option, the speed will vary slightly when synchronizing, but will typically remain close to the speed they are rated for at full load. See page 90 for more information on the synchronization option.

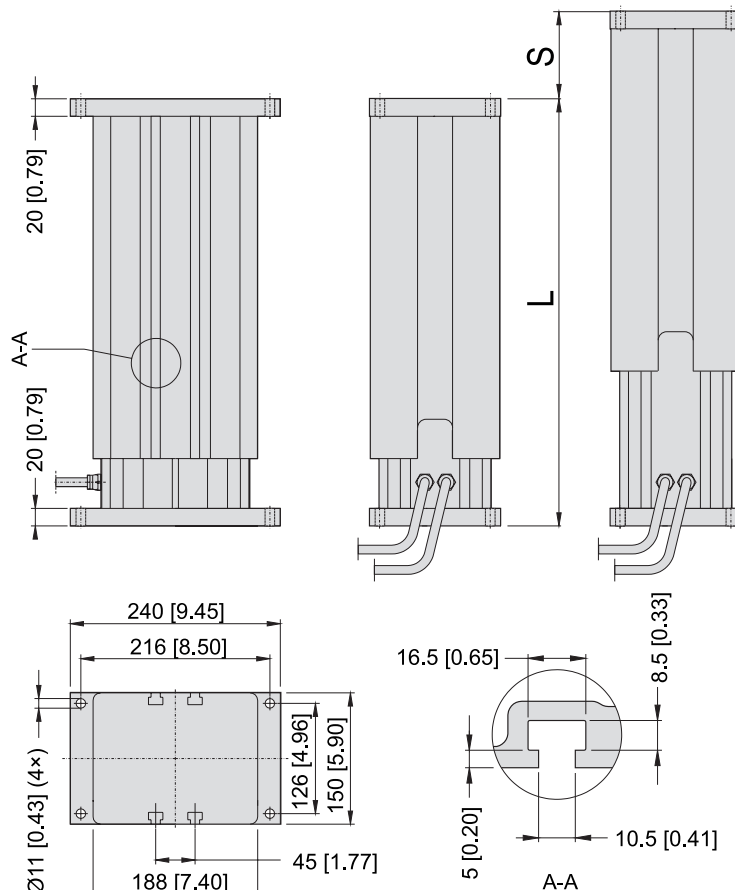
³ 500 mm max. for 16 kN

⁴ For DMHDxx-B100 and DMHDxx-160, unidirectional load, the duty cycle is 15%.

⁵ Do not use PWM voltage for speed control to avoid damaging the onboard electronics.

Electrical Specifications		
Available input voltages ⁽⁵⁾	[Vdc]	12, 24
Input voltage tolerance	[Vdc]	
DMHD12 (12 Vdc input voltage)		9 - 16
DMHD24 (24 Vdc input voltage)		18 - 32
Current draw @ no load/max. load	[A]	
DMHD12B017		3/18
DMHD24B017		1.5/9
DMHD12B026		3/18
DMHD24B026		1.5/9
DMHD12B045		3/18
DMHD24B045		1.5/9
DMHD12B068		3/20
DMHD24B068		1.5/10
DMHD12B100		3/18
DMHD24B100		1.5/9
DMHD12B160		3/20
DMHD24B160		1.5/10
Motor leads cross section	[mm ² (AWG)]	2 (14)
Signal leads cross section	[mm ² (AWG)]	0.5 (20)
Standard cable lengths	[m (in)]	1.5, 5 (59, 197)
Cable diameter	[mm (in)]	7.5 (.295)
Flying lead length	[mm (in)]	76 (3)
Stripped lead length	[mm (in)]	6 (0.25)

DMHD – Dimensions



Dimensions	Projection
mm [inch]	

Note. All models have two cables except models with control option EXX which has one placed in the center of the profile.

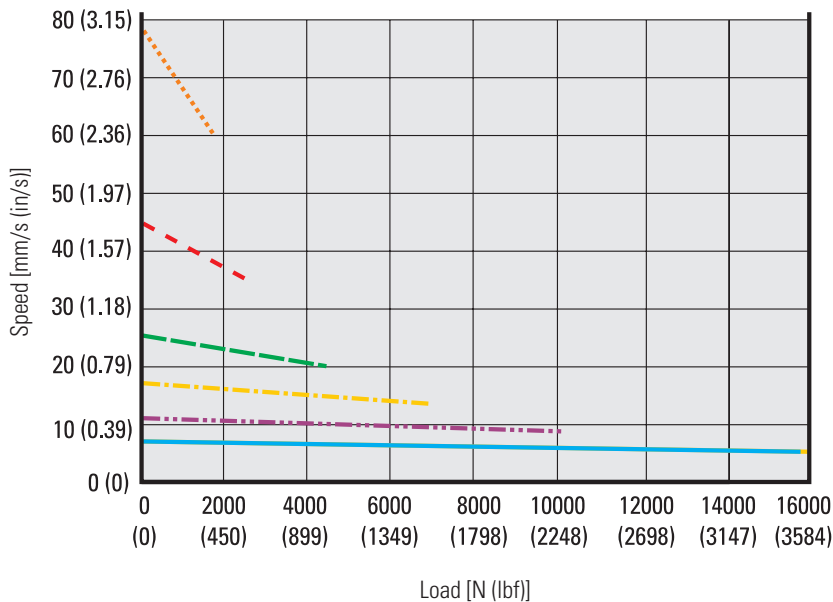
Stroke, Retracted Length and Weight Relationships

Ordering stroke (S)	[mm]	100	150	200	250	300	350	400	450	500	550	600
Retracted length (A) for DMHDxxB017(026,045,068)	[mm]	357	407	457	507	557	657	707	757	807	857	907
	[in]	14.1	16.0	18.0	20.0	21.9	25.9	27.8	29.8	31.8	33.7	35.7
Weight for DMHDxxB017(026,045,068)	[kg]	21.8	23.3	24.9	26.4	28.0	30.8	32.3	33.8	35.5	37.0	38.5
	[lbs]	48.0	51.3	54.8	58.1	61.6	67.8	71.1	74.4	78.1	81.4	84.7
Retracted length (A) for DMHDxxB100	[mm]	407	457	507	557	607	657	707	757	807	857	907
	[in]	16.0	18.0	20.0	21.9	23.9	23.9	27.8	29.8	31.8	33.7	35.7
Weight for DMHDxxB100	[kg]	22.0	23.6	25.1	26.7	28.2	31.1	32.5	34.7	36.4	38.0	39.5
	[lbs]	48.4	51.9	55.2	58.7	62.0	68.4	71.5	76.3	80.1	83.6	86.9
Retracted length (A) for DMHDxxB160 *	[mm]	407	457	507	557	607	657	707	757	807	-	-
	[in]	16.0	18.0	20.0	21.9	23.9	23.9	27.8	29.8	31.8	-	-
Weight for DMHDxxB160 *	[kg]	22.3	23.9	25.4	27.0	28.5	31.4	32.5	34.7	36.4	-	-
	[lbs]	49.1	52.6	55.9	59.4	62.7	69.1	71.5	76.3	80.1	-	-

* Max. stroke for DMHDxxB160 (16 kN (3584 lbf)) is 500 mm.

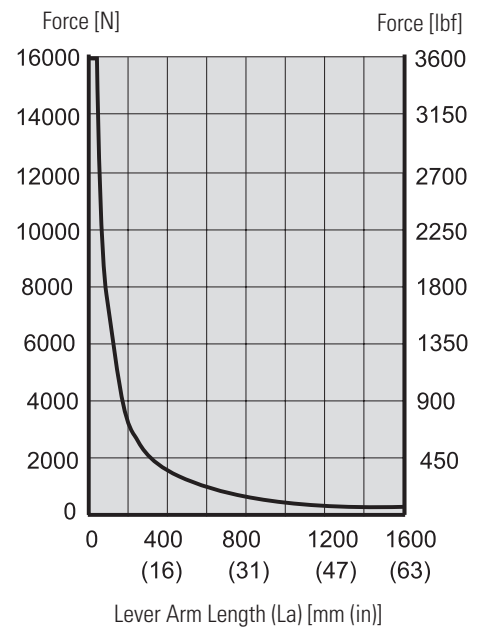
DMHD – Performance Diagrams

Load vs. Speed ⁽¹⁾

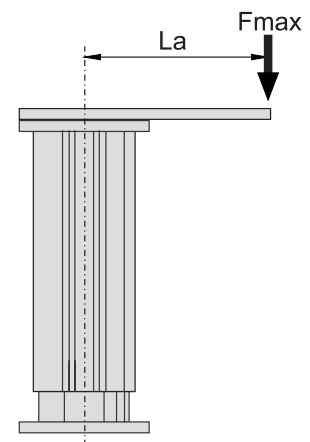
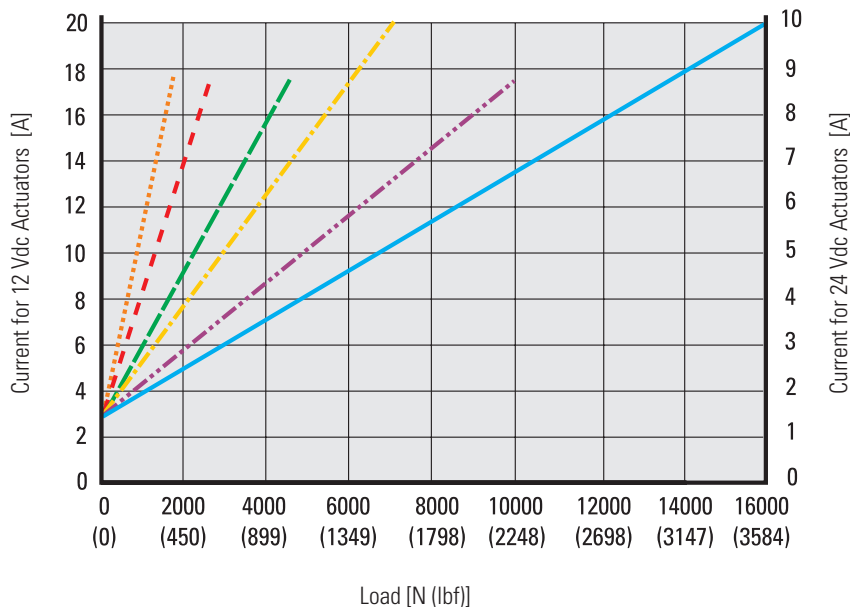


¹ Curves valid for all units except those with the synchronization option, where the speed at any load is 25% lower than for those without.

Off Center Load Capacity



Load vs. Current



DMHDxxB017 (1.7 kN (382 lbf)) DMHDxxB045 (4.5 kN (1012 lbf)) DMHDxxB100 (10 kN (2248 lbf))
 DMHDxxB026 (2.6 kN (585 lbf)) DMHDxxB068 (6.8 kN (1529 lbf)) DMHDxxB160 (16 kN (3584 lbf))

Note! Curves were generated at an ambient temperature of 21°C (70°F). Different ambient temperature and individual actuator characteristics can produce slightly different values.

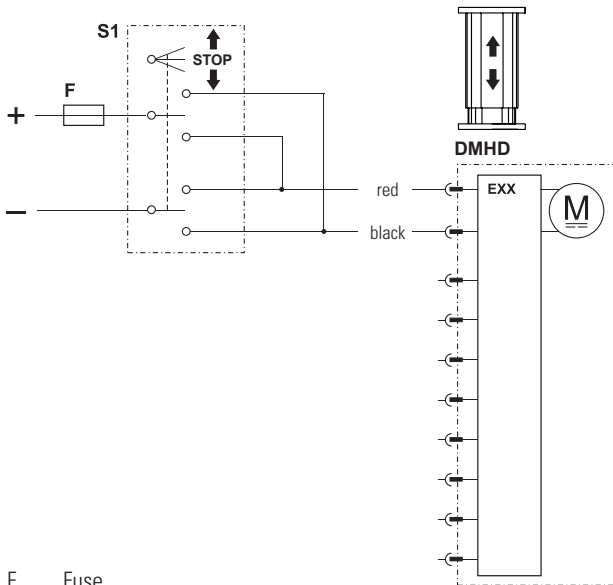
DMHD – Ordering Key

Ordering Key				
1	2	3	4	5
DMHD12-	B026-	0300	LXX	5
1. Model and input voltage DMHD12- = lifting column type DMHD, 12 Vdc DMHD24- = lifting column type DMHD, 24 Vdc		4. Electrak Modular Control System options EXX = Electronic Monitoring Package only ELX = EXX + end-of-stroke indication output EXP = EXX + analog (potentiometer) position output EXD = EXX + digital position output ELP = ELX + analog (potentiometer) position output ELD = ELX + digital position output LXX = EXX + low-level signal motor switching LLX = EXX + LXX + end-of-stroke indication output LXP = EXX + LXX + analog (potentiometer) position output LPS = EXX + LXX + programmable limit switches + signal-follower CNO = SAE J1939 CAN bus + open-loop speed control COO = CANopen CAN bus + open-loop speed control SY2 = LXX + Synchronization option		
2. Screw type, dynamic load capacity B017- = ball screw, 1.7 kN (382 lbf) B026- = ball screw, 2.6 kN (585 lbf) B045- = ball screw, 4.5 kN (1012 lbf) B068- = ball screw, 6.8 kN (1529 lbf) B100- = ball screw, 10 kN (2248 lbf) B160- = ball screw, 16 kN (3584 lbf)		5. Cable length and connection type 1 = 1.5 m long cable with flying leads 2 = 5.0 m long cable with flying leads		
3. Ordering stroke length ^{(1) (2)} 0100 = 100 mm 0150 = 150 mm 0200 = 200 mm 0250 = 250 mm 0300 = 300 mm 0350 = 350 mm 0400 = 400 mm 0450 = 450 mm 0500 = 500 mm 0550 = 550 mm 0600 = 600 mm		(1) Other stroke lengths available upon request. Contact customer support (2) Max. stroke for DMHDxxB160 (16 kN (3584 lbf)) is 500 mm.		

DMHD – Electrical Connections

Option Type EXX

Actuator supply voltage	[Vdc]	
DMHD12		12
DMHD24		24



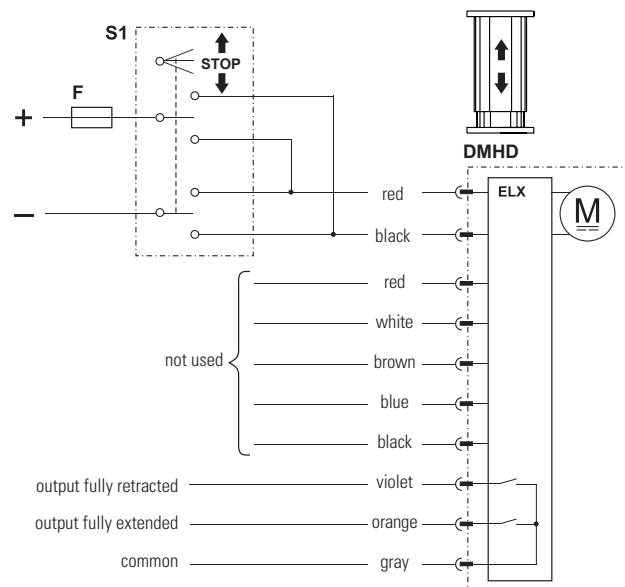
F Fuse

S1 Double pole double throw switch

Control option EXX contains Electrak Monitoring Package features, guaranteeing safe operation of the actuator and equipment. With control option EXX, the polarity of the motor voltage is switched by a customer-supplied switch (switch, relay, etc.) to make the actuator extend or retract. The switch, power supply, wiring and all other components must be able to handle the motor current for the actuator model and load being used, as well as the inrush current (up to three times the max. continuous current for the max. load being used for up to 150 milliseconds).

Option Type ELX

Actuator supply voltage	[Vdc]	
DMHD12		12
DMHD24		24
Output contact type		potential free
Limit switch max. switch voltage	[Vdc]	140
Limit switch max. switch current	[mA]	350
Limit switch max. switch power	[W]	5



F Fuse

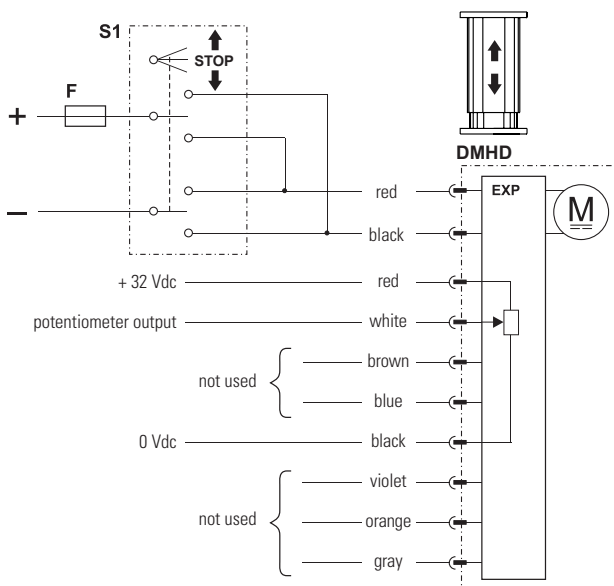
S1 Double pole double throw switch

Control option ELX works as option EXX but also has two outputs that indicate when the extension tube is in its fully extended or retracted position.

DMHD – Electrical Connections

Option Type EXP

Actuator supply voltage DMHD12 DMHD24	[Vdc]	9 - 16 18 - 32
Potentiometer type		wire-wound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	1
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	
50 - 100 mm stroke		65.6
150 - 250 mm stroke		32.8
300 - 500 mm stroke		19.7
550 - 600 mm stroke		9.8

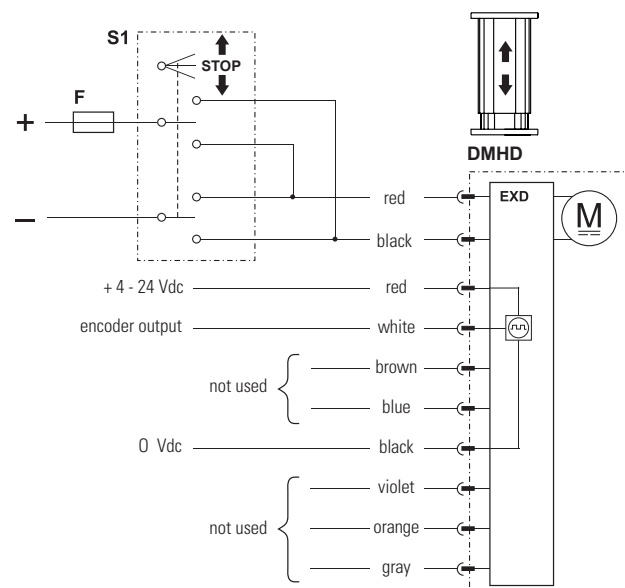


F Fuse
S1 Double pole double throw switch

Control option EXP works as option EXX but also has an analog (potentiometer) output that will provide feedback on the extension tube position.

Option Type EXD

Actuator supply voltage DMHD12 DMHD24	[Vdc]	9 - 16 18 - 32
Encoder type		hall effect
Encoder input voltage	[Vdc]	4 - 24
Encoder output voltage levels low (logical zero), typical / max.	[Vdc]	0.1 / 0.25
Encoder resolution	[mm/pulse]	
DMHDxx-B017		0.28
DMHDxx-B026		0.15
DMHDxx-B045		0.09
DMHDxx-B068		0.07
DMHDxx-B100		0.04
DMHDxx-B160		0.03

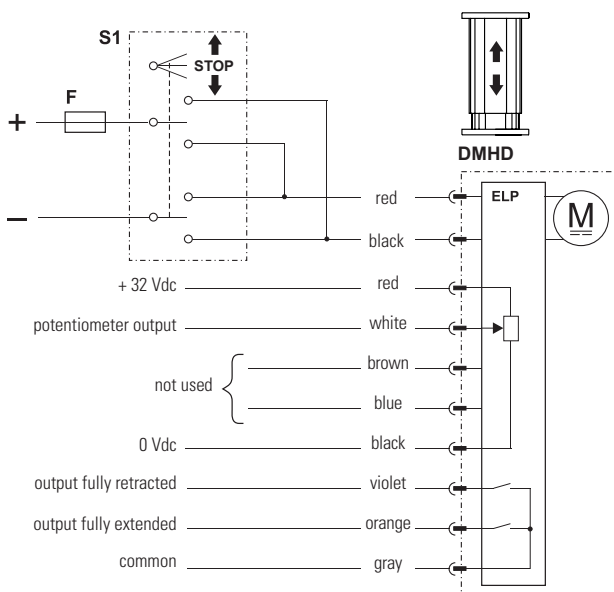


F Fuse
S1 Double pole double throw switch

Control option EXD works as option EXX but also has a single-channel encoder output that will provide feedback on the extension tube position.

Option Type ELP

Actuator supply voltage DM HD12 DMHD24	[Vdc]	9 - 16 18 - 32
Output contact type		potential free
Max. output voltage	[Vdc]	140
Max. output current	[mA]	350
Max. output power	[W]	5
Potentiometer type		wire-wound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	1
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	
50 - 100 mm stroke		65.6
150 - 250 mm stroke		32.8
300 - 500 mm stroke		19.7
550 - 600 mm stroke		9.8



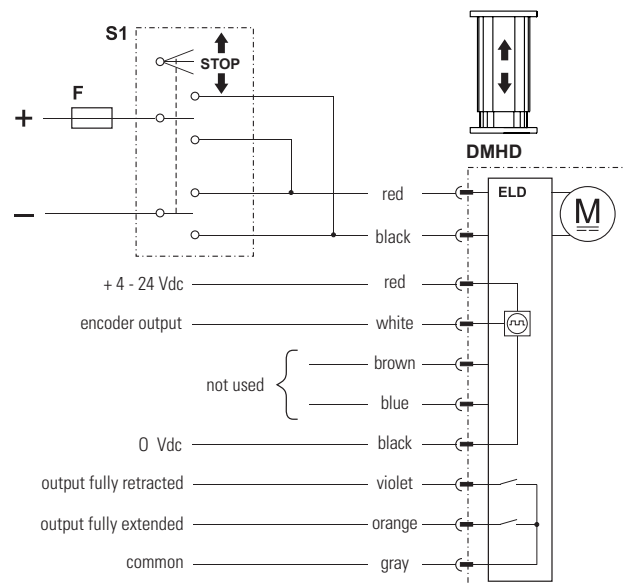
F Fuse

S1 Double pole double throw switch

Control option ELP works as option EXP but also has two outputs that indicate when the extension tube is in its fully extended or retracted position.

Option Type ELD

Actuator supply voltage DMHD12 DMHD24	[Vdc]	9 - 16 18 - 32
Output contact type		potential free
Max. output voltage	[Vdc]	140
Max. output current	[mA]	350
Max. output power	[W]	5
Encoder type		hall effect
Encoder input voltage	[Vdc]	4 - 24
Encoder output voltage levels low (logical zero), typical / max.	[Vdc]	0.1 / 0.25
Encoder resolution	[mm/pulse]	
DMHDxx-B017		0.28
DMHDxx-B026		0.15
DMHDxx-B045		0.09
DMHDxx-B068		0.07
DMHDxx-B100		0.04
DMHDxx-B160		0.03



F Fuse

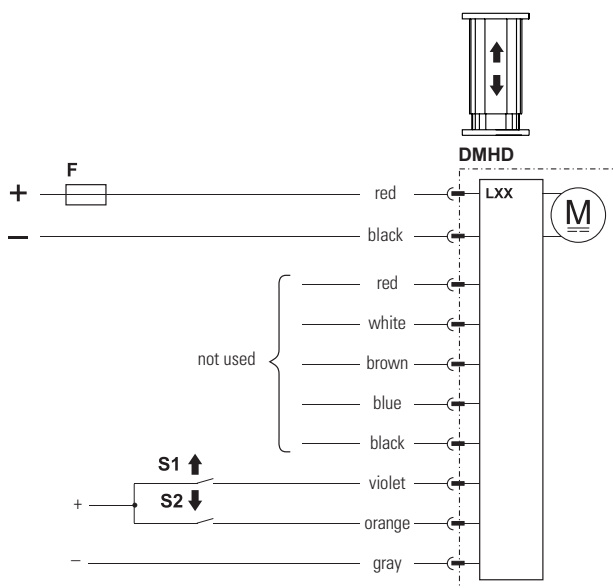
S1 Double pole double throw switch

Control option ELD works as option EXD but also has two outputs that indicate when the extension tube is in its fully extended or retracted position.

DMHD – Electrical Connections

Option Type LXX

Actuator supply voltage DMHD12 DMHD24	[Vdc]	9 - 16 18 - 32
Extend / retract input voltage	[Vdc]	9 - 32
Extend / retract input current	[mA]	6 - 22

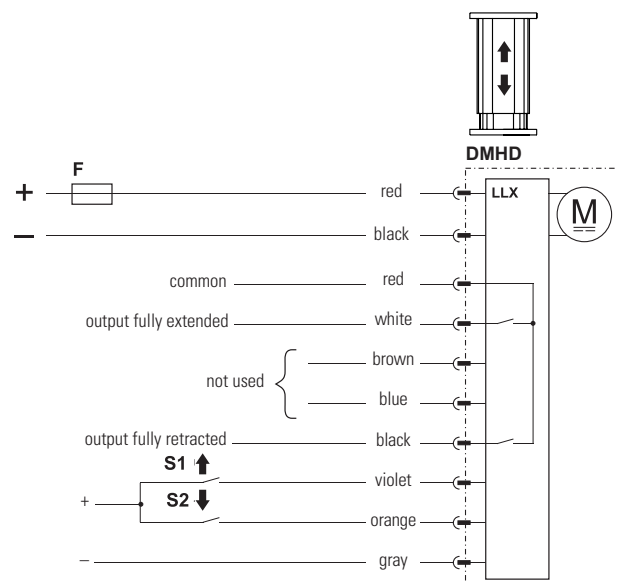


- F Fuse
S1 Extend switch
S2 Retract switch

Control option LXX has all the basic Electrak Monitoring Package features included in control option EXX, but the polarity of the motor voltage is switched by the onboard electronics instead. The customer-supplied switches used to command the actuator to extend or retract only need to handle low-level signals. However, the power supply and wiring that supply the actuator must be able to handle the motor current for the actuator model and load being used, as well as the inrush current (up to one and a half times the max. continuous current for the max. load being used for up to 150 milliseconds).

Option Type LLX

Actuator supply voltage DMHD12 DMHD24	[Vdc]	9 - 16 18 - 32
Output contact type		potential free
Max. switched output voltage	[Vdc]	140
Max. output current	[mA]	350
Max. output power	[W]	5
Extend / retract input voltage	[Vdc]	9 - 32
Extend / retract input current	[mA]	6 - 22

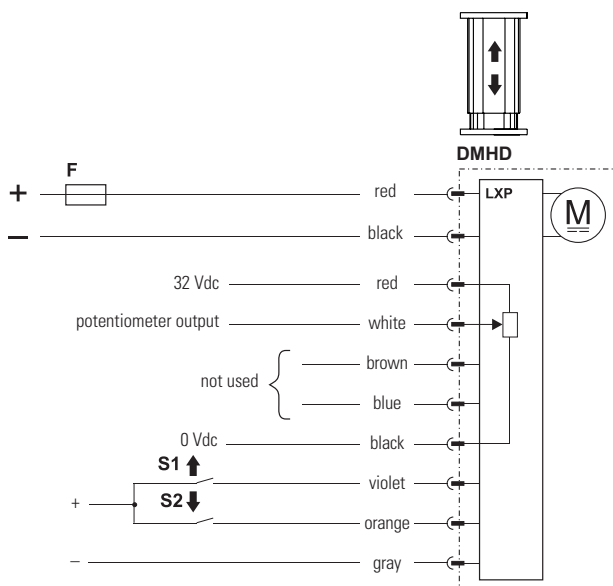


- F Fuse
S1 Extend switch
S2 Retract switch

Control option LLX works as option LXX but also has two outputs that indicate when the extension tube is in its fully extended or retracted position.

Option Type LXP

Actuator supply voltage DMHD12 DMHD24	[Vdc]	9 - 16 18 - 32
Potentiometer type		wire-wound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	1
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	
50 - 100 mm stroke		65.6
150 - 250 mm stroke		32.8
300 - 500 mm stroke		19.7
550 - 600 mm stroke		9.8
Extend / retract input voltage	[Vdc]	9 - 32
Extend / retract input current	[mA]	6 - 22

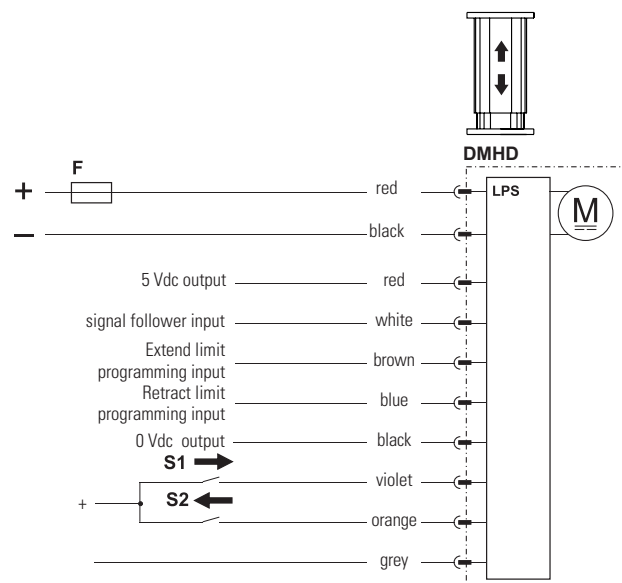


- F Fuse
S1 Extend switch
S2 Retract switch

Control option LXP works as option LXX but also has an analog (potentiometer) output that will provide feedback on the extension tube position.

Option Type LPS

Actuator supply voltage DMHD12 DMHD24	[Vdc]	9 - 16 18 - 32
Signal-follower input voltage	[Vdc]	0.5 - 4.5
Signal-follower max. current	[A]	0.8
Signal-follower movement	[mm/Vdc]	
Signal-follower repeatability	[± mm]	0.1
Programming inputs voltage	[Vdc]	9 - 32
Extend / retract input voltage	[Vdc]	9 - 32
Extend / retract input current	[mA]	6 - 22



- F Fuse
S1 Extend switch
S2 Retract switch

Control option LPS works as option LXX but also has programmable mid stroke software extend and retract limits as well as a signal-follower input that allow the extension tube position to be controlled from a potentiometer or another voltage control.

DMHD – Electrical Connections

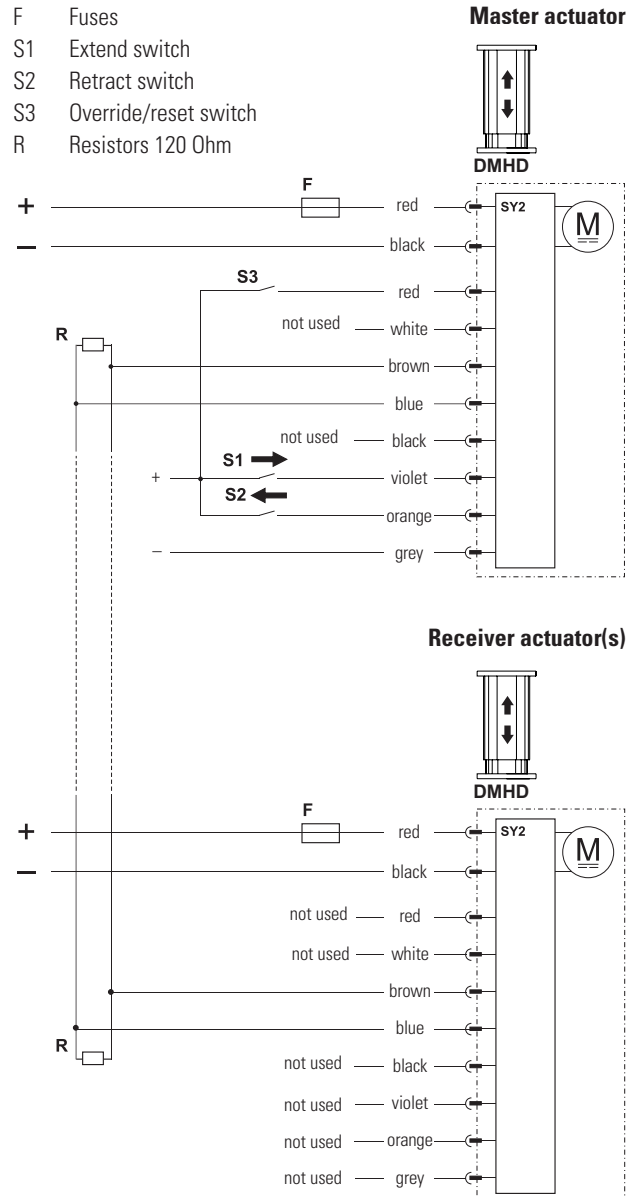
Option Type SY2

Actuator supply voltage	[Vdc]	9 - 16 18 - 32
Extend / retract input voltage	[Vdc]	9 - 32
Extend / retract input current	[mA]	6 - 22
Number of synchronized actuators		2 - 8
Max. actuator speed difference	[%]	25
Hold and wait distance	[mm]	
DMHDxx-B017		25.0
DMHDxx-B026		15.0
DMHDxx-B045		10.0
DMHDxx-B068		7.5
DMHDxx-B100		5.0
DMHDxx-B160		2.5

Control option SY2 works as option LXX but also has a synchronization feature, allowing up to eight actuators having the SY2 option to run in integrated motion. When using the low-level extend and retract inputs on the master actuator, the receiver(s) will follow. If there is a need to run an actuator individually, it is possible to put it into an override state by closing a switch (S3) connected to the red lead as shown in the wiring diagram.

Important Design Notes

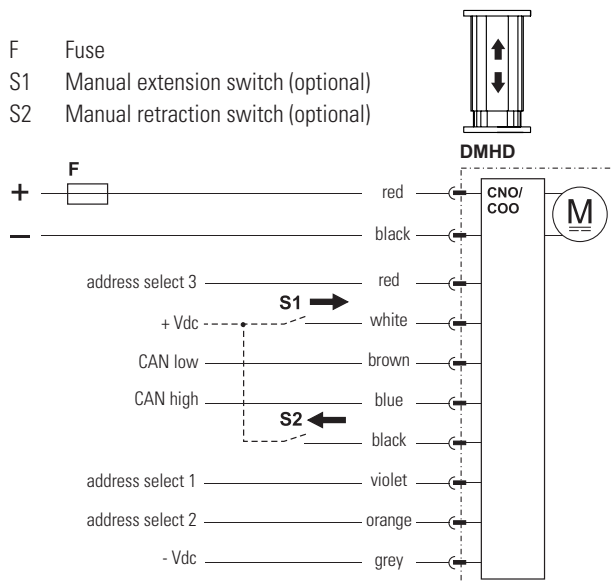
- All actuators' supply voltages must be within $\pm 10\%$ of each other.
- While uneven loads can be supported, it is suggested that loads be distributed as evenly as possible to avoid overloading a single actuator within the system.
- The speed of the actuators will typically remain close to the speed they are rated for at full load, even if running at a lower load.
- If a unit detects that it is 1 mm further ahead of any other in the network, it will reduce its speed slightly to allow the other to catch up. If the positional difference between an actuator and the rearmost actuator exceeds the hold and wait distance specified in the table above, the unit will stop until the rearmost actuator catches up.
- If one actuator encounters an overload condition or detects that the measured position isn't updating while running the motor, it will trip the overload protection and send a signal to each actuator on the network to stop. The units can be immediately reversed (unless they bind up the system), or they can continue in the same direction after a power reset.
- Each actuator tracks the total number of actuators that are connected to the system. No synchronous motion will be allowed if any actuator detects that fewer than the minimum number of required actuators are connected. This allows the whole system to stop if the power or communication is lost to any actuator in the system.



- Activating the override/reset signal on any of the actuators will reset the minimum number of required actuators that must be connected to the system to 0. If more actuators are connected at any point, the minimum number of required actuators will be updated to the number of actuators that are currently connected.
- In order to give the master and receiver(s) enough time to communicate, a 250 ms delay will be enforced following any motion and before any subsequent motion is allowed.

DMHD – Electrical Connections

Option Type CNO and COO		
Actuator supply voltage DMHD12 DMHD24	[Vdc]	9 - 16 18 - 32
Command data includes: • position • speed • current		
Feedback data includes: • position • speed • current • other diagnostic information		
Extend / retract input voltage DMHD12(24)	[Vdc]	9 - 32
Extend / retract input current	[mA]	6 - 22



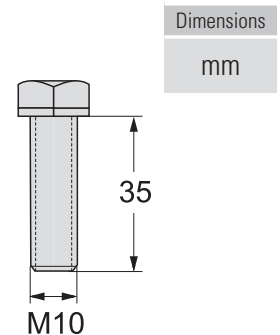
Control option CNO has a SAE J1939 CAN bus control interface and COO a CANopen interface to control and monitor the actuator. Extend and retract commands are sent via CAN messages on the CAN low and CAN high pins. Address select 1, 2 and 3 pins can be used as a binary encoded decimal (BCD) adder to the default address. This can be used when multiple actuators are located on a single bus. The actuator can be manually forced to extend or retract by using the inputs on white and black wires. When the manual control inputs are used, CAN bus messages are ignored, but the unit will still provide CAN bus feedback messages. When the inputs are left floating, CAN bus functionality for control messages is restored.

DMHD – Accessories

T-slot Bolt

Designation	Part Number
M10 T-slot bolt	D800041

The T-slot bolt fits in to the T-slot running along the outer profile of the lifting column. The T-slot bolts can be used to mount the unit instead of using the upper mounting plate, or/and for attaching other components to the profile.





Electrak® GX DC – Technical Features



Standard Features

- Robust and reliable
- 12, 24, 36, 48 or 90 Vdc as standard input voltages
- Acme and ball screw models
- Static load up to 18 kN (4000 lbf)
- Dynamic load up to 9 kN (2000 lbf)
- Stroke up to 24 in (609 mm)
- Speed up to 61 mm/s (2.4 in/s)
- Protection class static IP66
- Overload clutch for mid and end of stroke protection
- Motor with thermal switch
- Maintenance free

General Specifications

Screw type	acme or ball
Nut type Dxxx-xxA (acme screw) Dxxx-xxB (ball screw)	self locking lead nut load lock ball nut
Manual override	no (optional)
Anti-rotation	no
Static load holding brake acme screw models ball screw models	no (self locking) yes
Safety features	overload clutch motor auto reset thermal switch
Electrical connections no potentiometer option with potentiometer option	flying leads with or without connector cable with or without connector
Compliances standard optional	— CE, UKCA ^{(1) (2)}

(1) Actuators used in the EU must be in compliance with CE

(2) The 90 Vdc model cannot be delivered in compliance with CE.

Optional Mechanical Features

Variety of front and rear adapters

Manual override

Optional Electrical Features

Potentiometer feedback

Accessories

Mechanical

Mounting pins

Compatible Controls

Contact customer support at www.thomsonlinear.com/cs

Electrak GX DC – Technical Specifications

Mechanical Specifications		
Max. static load ⁽¹⁾	[N (lbf)]	
Dxx-xxA (acme screw)		11350 (2500)
Dxx-xxB (ball screw)		18000 (4000)
Max. dynamic load (Fx)	[N (lbf)]	
Dxxx-05A5		1100 (250)
Dxxx-10A5		2250 (500)
Dxxx-20A5		2250 (500)
Dxxx-05B5		2250 (500)
Dxxx-10B5		4500 (1000)
Dxxx-20B5		4500 (1000)
Dxxx-21B5		6800 (1500)
Dxxx-2KB5		9000 (2000)
Speed @ no load/max. load	[mm/s (in/s)]	
Dxxx-05A5		54/32 (2.10/1.20)
Dxxx-10A5		30/18 (1.20/0.70)
Dxxx-20A5		15/12 (0.67/0.45)
Dxxx-05B5		61/37 (2.40/1.40)
Dxxx-10B5		30/19 (1.30/0.80)
Dxxx-20B5		15/12 (0.60/0.45)
Dxxx-21B5		15/11 (0.60/0.43)
Dxxx-2KB5		15/9 (0.60/0.40)
Min. ordering stroke (S) length	[in]	2
Max. ordering stroke (S) length ^{(2) (3) (4)}	[in]	24
Ordering stroke length increments	[in]	2
Operating temperature limits	[°C (°F)]	- 25 – 65 (- 15 – 150)
Full load duty cycle @ 25 °C (77 °F)	[%]	25
End play, maximum	[mm (in)]	1.0 (0.04)
Restraining torque	[Nm (lbf-in)]	11.3 (100)
Protection class - static, standard (optional)		IP66 (IP66 & IP69K)
Salt spray resistance	[h]	96

(1) Max. static load at fully retracted stroke

(2) Max. ordering stroke length for Dxx-2KB5 is 12 inches

(3) Max. ordering stroke length for Dxx-21B5 is 20 inches

(4) For other strokes, contact customer support

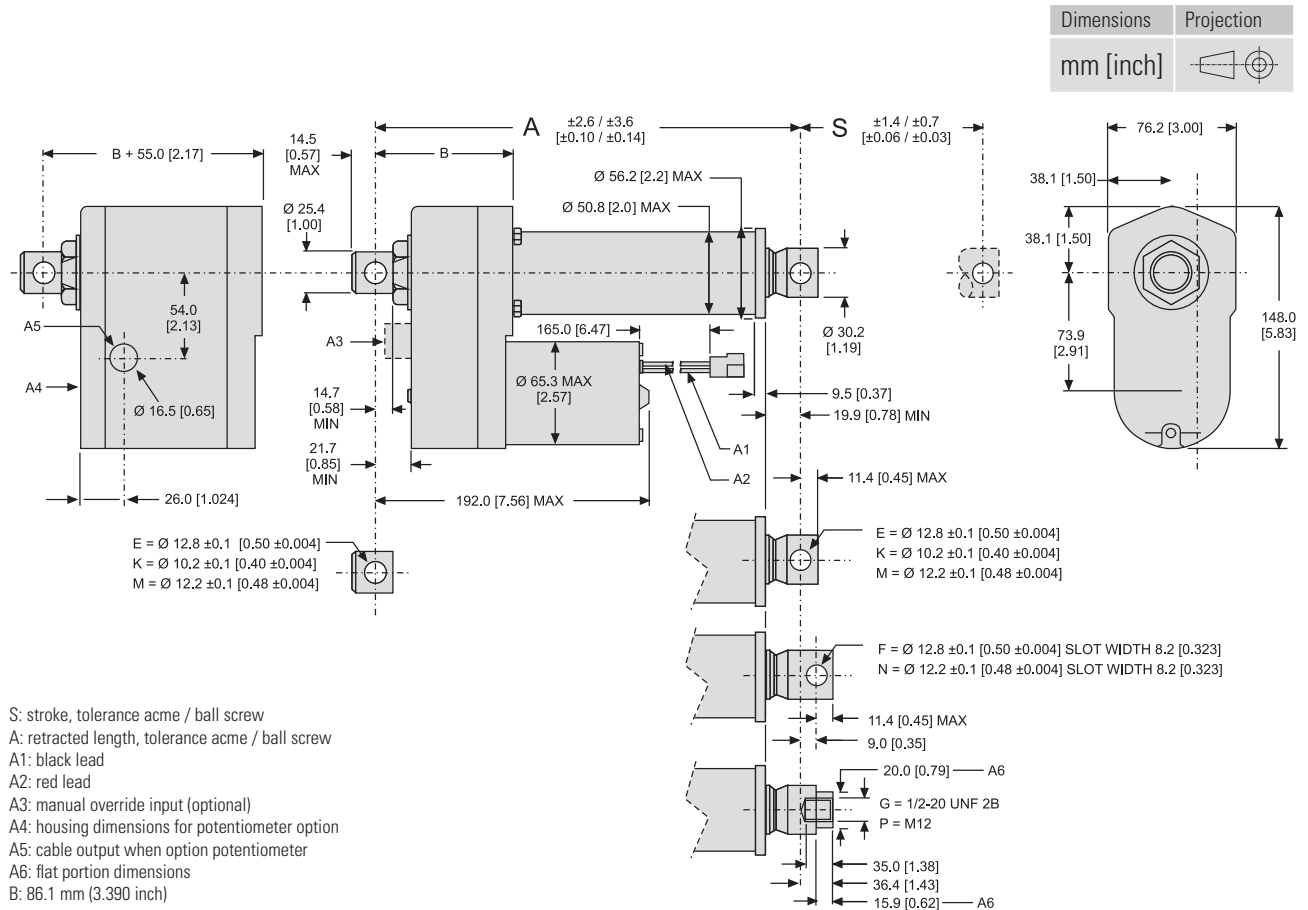
Electrical Specifications		
Available input voltages ^{(1) (2)}	[Vdc]	12, 24, 36, 48, 90
Input voltage tolerance	[%]	± 10
Current draw @ no load/max. load	[A]	
D12x-05A5		12.0/33.0
D12x-10A5		8.0/27.0
D12x-20A5		3.0/15.0
D12x-05B5		8.0/28.0
D12x-10B5		5.0/27.0
D12x-20B5		3.0/13.0
D12x-21B5		3.0/20.0
D12x-2KB5		4.0/25.0
D24x-05A5		6.0/16.5
D24x-10A5		4.0/13.5
D24x-20A5		1.5/7.5
D24x-05B5		4.0/14.0
D24x-10B5		2.5/13.5
D24x-20B5		1.5/7.5
D24x-21B5		1.5/10.0
D24x-2KB5		2.0/12.5
D36x-05A5		4.0/11.0
D36x-10A5		2.67/9.0
D36x-20A5		1.0/5.1
D36x-05B5		2.67/9.3
D36x-10B5		1.67/9.0
D36x-20B5		1.0/5.1
D36x-21B5		1.0/6.7
D36x-2KB5		1.34/8.4
D48x-05A5		3.0/8.3
D48x-10A5		2.0/6.8
D48x-20A5		0.8/3.8
D48x-05B5		2.0/7.0
D48x-10B5		1.3/6.8
D48x-20B5		0.8/3.8
D48x-21B5		0.8/5.0
D48x-2KB5		1.0/6.3
D90x-05A5		1.5/4.1
D90x-10A5		1.0/3.4
D90x-20A5		0.4/1.9
D90x-05B5		1.0/3.5
D90x-10B5		0.6/3.4
D90x-20B5		0.4/1.9
D90x-21B5		0.4/2.5
D90x-2KB5		0.5/3.2
Flying leads length	[mm (in)]	165 (7.5)
Flying leads diameter	[mm (in)]	3 (0.12)
Flying leads cross section	[mm² (AWG)]	2 (14)
Cable length with option pot.	[mm (in)]	600 (24)
Cable diameter with option pot.	[mm (in)]	9 (0.35)
Cable leads cross section with option potentiometer	[mm² (AWG)]	
motor leads		2.5 (14)
potentiometer leads		1.5 (16)

(1) For other input voltages - contact customer support.

(2) 90 Vdc model not CE compliant.



Electrak® GX DC – Dimensions

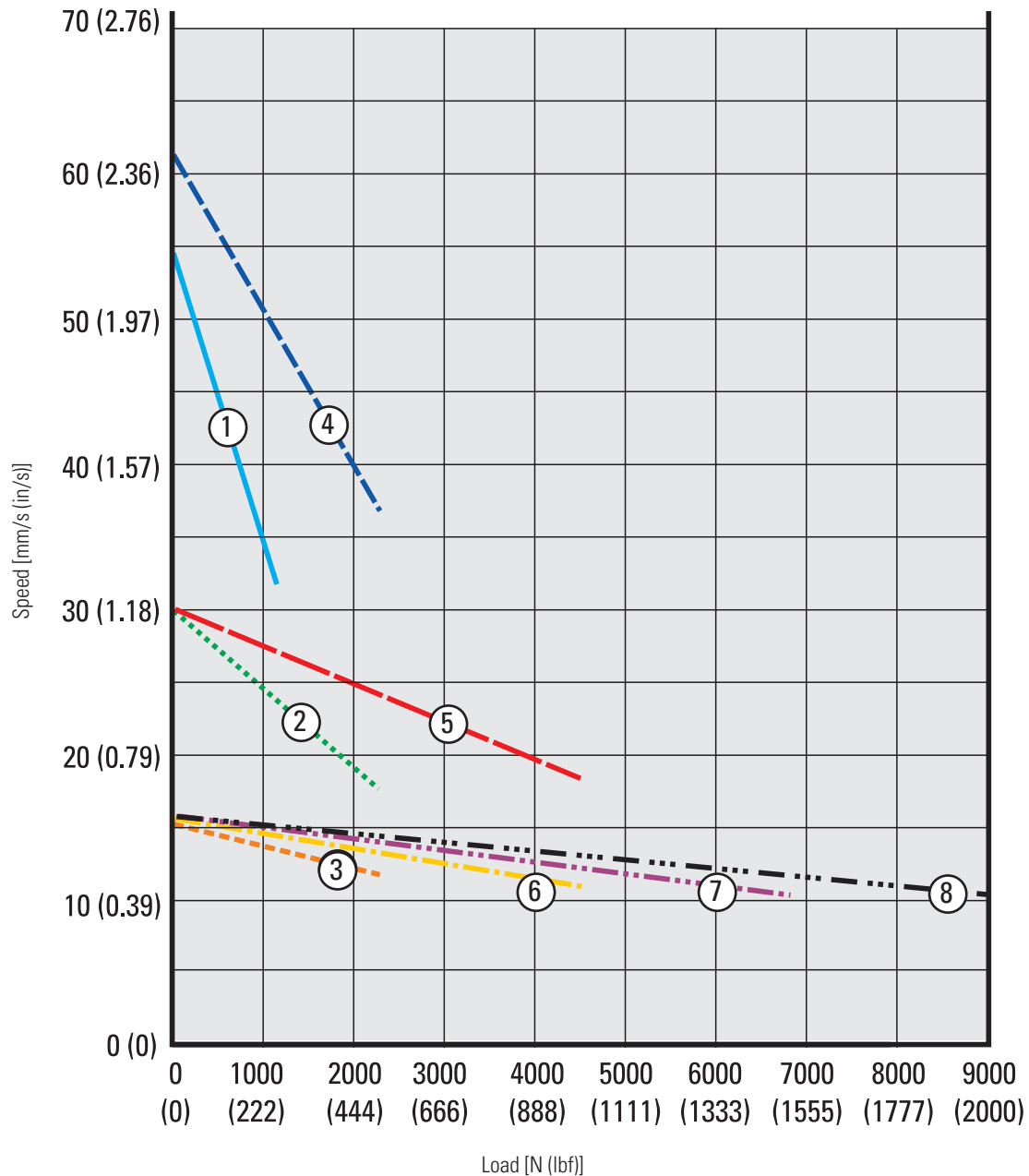


Stroke, Retracted Length and Weight Relationships

Ordering stroke (S)	[in]	2	4	6	8	10	12	14	16	18	20	22	24
Retracted length, acme screw models (A)	[mm]	211.3	262.1	312.9	363.7	414.5	465.3	583.7	634.5	685.3	736.1	786.9	837.7
	[in]	8.32	10.32	12.32	14.32	16.32	18.32	22.98	24.98	26.98	28.98	30.98	32.98
Retracted length, ball screw models (A)	[mm]	251.5	302.3	353.1	403.9	454.7	505.5	623.6	674.4	725.2	776.0	826.8	877.6
	[in]	9.90	11.90	13.90	15.90	17.90	19.90	24.55	26.55	28.55	30.55	32.55	34.55
Add on length for option potentiometer	[mm]	55.0											
	[in]	2.17											
Weight, acme screw models	[kg]	4.4	4.6	4.8	5.0	5.1	5.3	5.5	5.6	5.8	5.9	6.1	6.2
	[lbs]	9.7	10.1	10.6	11.0	11.2	11.7	12.1	12.3	12.8	13.0	13.4	13.6
Weight, ball screw models	[kg]	5.0	5.2	5.4	5.6	5.8	6.0	6.1	6.2	6.4	6.5	6.7	6.9
	[lbs]	11.0	11.4	11.9	12.3	12.8	13.2	13.4	13.6	14.1	14.3	14.7	15.2
Add on weight for option potentiometer	[kg]	1.30											
	[lbs]	2.86											

Electrak GX DC – Performance Diagrams

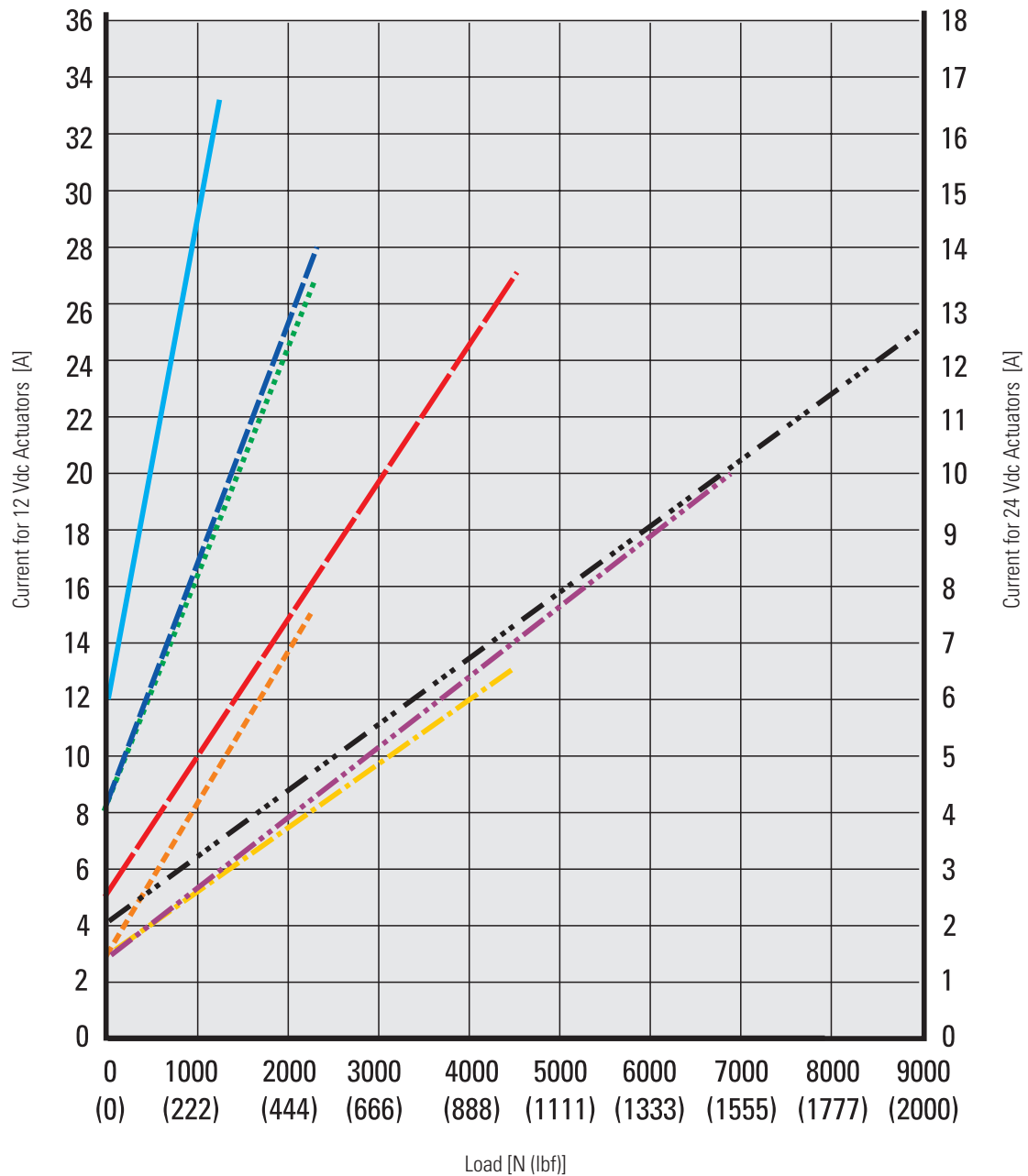
Load vs. Speed



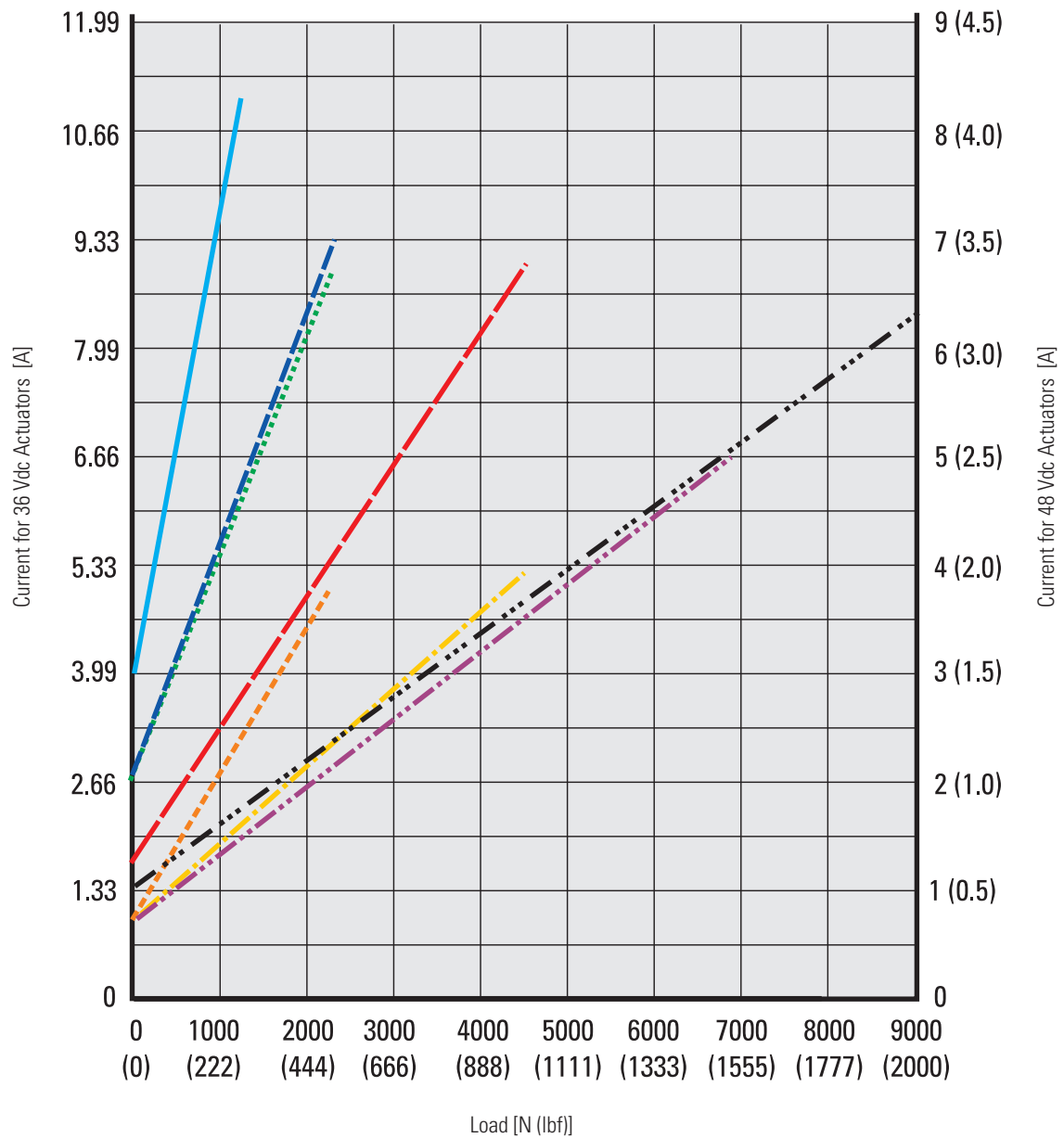
- | | |
|---------------------------------|----------------------------------|
| 1. Dxxx-05A5 (1100 N (250 lbf)) | 5. Dxxx-10B5 (4500 N (1000 lbf)) |
| 2. Dxxx-10A5 (2250 N (500 lbf)) | 6. Dxxx-20B5 (4500 N (1000 lbf)) |
| 3. Dxxx-20A5 (2250 N (500 lbf)) | 7. Dxxx-21B5 (6800 N (1500 lbf)) |
| 4. Dxxx-05B5 (2250 N (500 lbf)) | 8. Dxxx-2KB5 (9000 N (2000 lbf)) |

Electrak® GX DC – Performance Diagrams

Load vs. Current for 12 and 24 Vdc actuators



Load vs. Current for 36 and 48 Vdc actuators



Dxxx-05A5 (1100 N (250 lbf))

Dxxx-10A5 (2250 N (500 lbf))

Dxxx-20A5 (2250 N (500 lbf))

Dxxx-05B5 (2250 N (500 lbf))

Dxxx-10B5 (4500 N (1000 lbf))

Dxxx-20B5 (4500 N (1000 lbf))

Dxxx-21B5 (6800 N (1500 lbf))

Dxxx-2KB5 (9000 N (2000 lbf))

Electrak® GX DC – Ordering Key

Ordering Key

1	2	3	4	5	6	7	8	9
D12C	05A5-	02	M0	N	N	-D	E	E

1. Model, input voltage and CE compliance

D12C = Electrak GX, 12 Vdc, CE compliant
D24C = Electrak GX, 24 Vdc, CE compliant
D36C = Electrak GX, 36 Vdc, CE compliant
D48C = Electrak GX, 48 Vdc, CE compliant
D12N = Electrak GX, 12 Vdc, not CE compliant
D24N = Electrak GX, 24 Vdc, not CE compliant
D36N = Electrak GX, 36 Vdc, not CE compliant
D48N = Electrak GX, 48 Vdc, not CE compliant
D90N = Electrak GX, 90 Vdc, not CE compliant

2. Dynamic load capacity, screw type and maximum speed

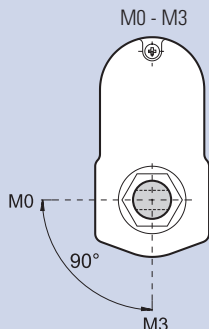
05A5 - = 1100 N, acme, 54 mm/s
10A5 - = 2250 N, acme, 30 mm/s
20A5 - = 2250 N, acme, 15 mm/s
05B5 - = 2250 N, ball, 61 mm/s
10B5 - = 4500 N, ball, 30 mm/s
20B5 - = 4500 N, ball, 15 mm/s
21B5 - = 6800 N, ball, 15 mm/s ⁽¹⁾
2KB5 - = 9000 N, ball, 9 mm/s ⁽²⁾

3. Ordering stroke length

02 = 2 inch (50.8 mm)
04 = 4 inch (101.6 mm)
06 = 6 inch (152.4 mm)
08 = 8 inch (203.2 mm)
10 = 10 inch (254.0 mm)
12 = 12 inch (304.8 mm)
14 = 14 inch (355.6 mm)
16 = 16 inch (406.4 mm)
18 = 18 inch (457.2 mm)
20 = 20 inch (508.0 mm)
22 = 22 inch (558.8 mm)
24 = 24 inch (609.6 mm)

4. Rear adapter hole orientation

M0 = adapter at 0° (standard)
M3 = adapter at 90° ⁽³⁾



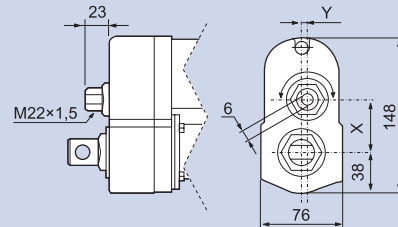
5. Ingress protection rating

N = IP66
K = IP66 and IP69K

6. Options

N = no option
P = potentiometer feedback
H = manual override

Dimensions for manual override option



Model	X	Y
Dxxx05A(B)5-	49.6	0.0
Dxxx10A(B)5-	43.3	5.2
Dxxx20(21, 2K)A(B)5-	38.9	0.0

7. Connector option

-A = AMP terminal 42098-2, house 180908-5
-B = Packard Electric 56 Series
-D = no connector (flying leads)

8. Front adapter option

E = cross hole for 0.5 inch pin
F = forked cross hole for 0.5 inch pin
G = 1/2-20 UNF 2B female thread
K = cross hole for 10 mm pin
M = cross hole for 12 mm pin
N = forked cross hole for 12 mm pin
P = M12 female thread

9. Rear adapter option

E = cross hole for 0.5 inch pin
K = cross hole for 10 mm pin
M = cross hole for 12 mm pin

(1) 21B5 not possible with strokes above 20 inch

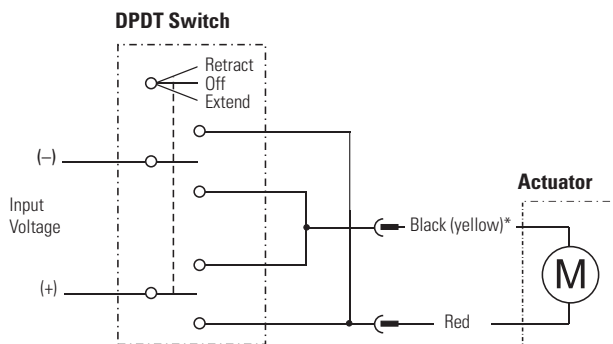
(2) 2KB5 not possible for strokes above 12 inch

(3) Not possible with option manual override

Electrak GX DC – Electrical Connections

Without Option

Actuator supply voltage	[Vdc]	
D12x		12
D24x		24
D36x		36
D48x		48
D90N		90

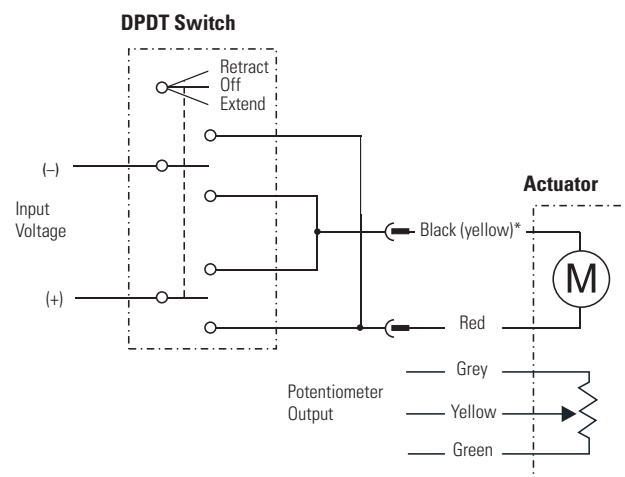


* Lead can be black or yellow

Connect the red lead to positive and black (yellow)* to negative to extend the actuator. Change polarity to retract the actuator.

Option Potentiometer

Actuator supply voltage	[Vdc]	
D12x		12
D24x		24
D36x		36
D48x		48
D90N		90
Potentiometer type		wirewound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	2
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	
2 - 10 inch stroke		39
11 - 20 inch stroke		20
21 - 24 inch stroke		10



* Lead can be black or yellow

Connect the red lead to positive and black (yellow)* to negative to extend the actuator. Change polarity to retract the actuator. The potentiometer output cable has 0 ohm between grey and yellow leads when the actuator is fully extended.

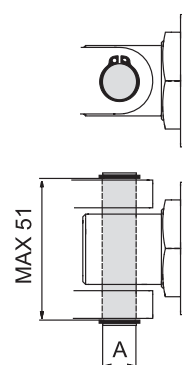


Electrak® GX DC – Accessories

Mounting Pin Kits

Designation	A [mm(in)]	Part Number
Mounting pins (pair)	12.7 (0.5)	D603 028

The mounting pins are used in the rear and front adapter holes of the actuator. The pins have a groove in each end so that it can be secured with snap rings.



Dimensions

mm

Mating Connectors

Designation	Part Number
North American mating connector kit	9100-448-001
Rest of the world mating connector kit	LA100B9P1

The mating connector kit consist of the necessary connector parts required to be able to connect to the connector on the actuator wires.

Notes



Electrak® GX AC – Technical Features



Standard Features

- Robust and reliable
- 1 × 115, 1 × 230 or 3 × 400 Vac as standard input voltages
- Acme and ball screw models
- Static load up to 18 kN (4000 lbf)
- Dynamic load up to 9 kN (2000 lbf)
- Stroke up to 24 in (609 mm)
- Speed up to 61 mm/s (2.4 in/s)
- Protection class static IP45
- Overload clutch for mid and end of stroke protection
- Anti coast brake
- Motor with thermal switch
- Maintenance free

General Specifications

Screw type	acme or ball
Nut type Axxx-xxA (acme screw) Axxx-xxB (ball screw)	self locking lead nut load lock ball nut
Manual override	no (optional)
Anti-rotation	no
Static load holding brake acme screw models ball screw models	no (self locking) yes
Safety features	overload clutch motor auto reset thermal switch
Anti coast brake	yes
Electrical connections no potentiometer option with potentiometer option	cable with flying leads 2 x cable with flying leads
Compliances	CE, UKCA
Certificates	UL, CSA

Optional Mechanical Features

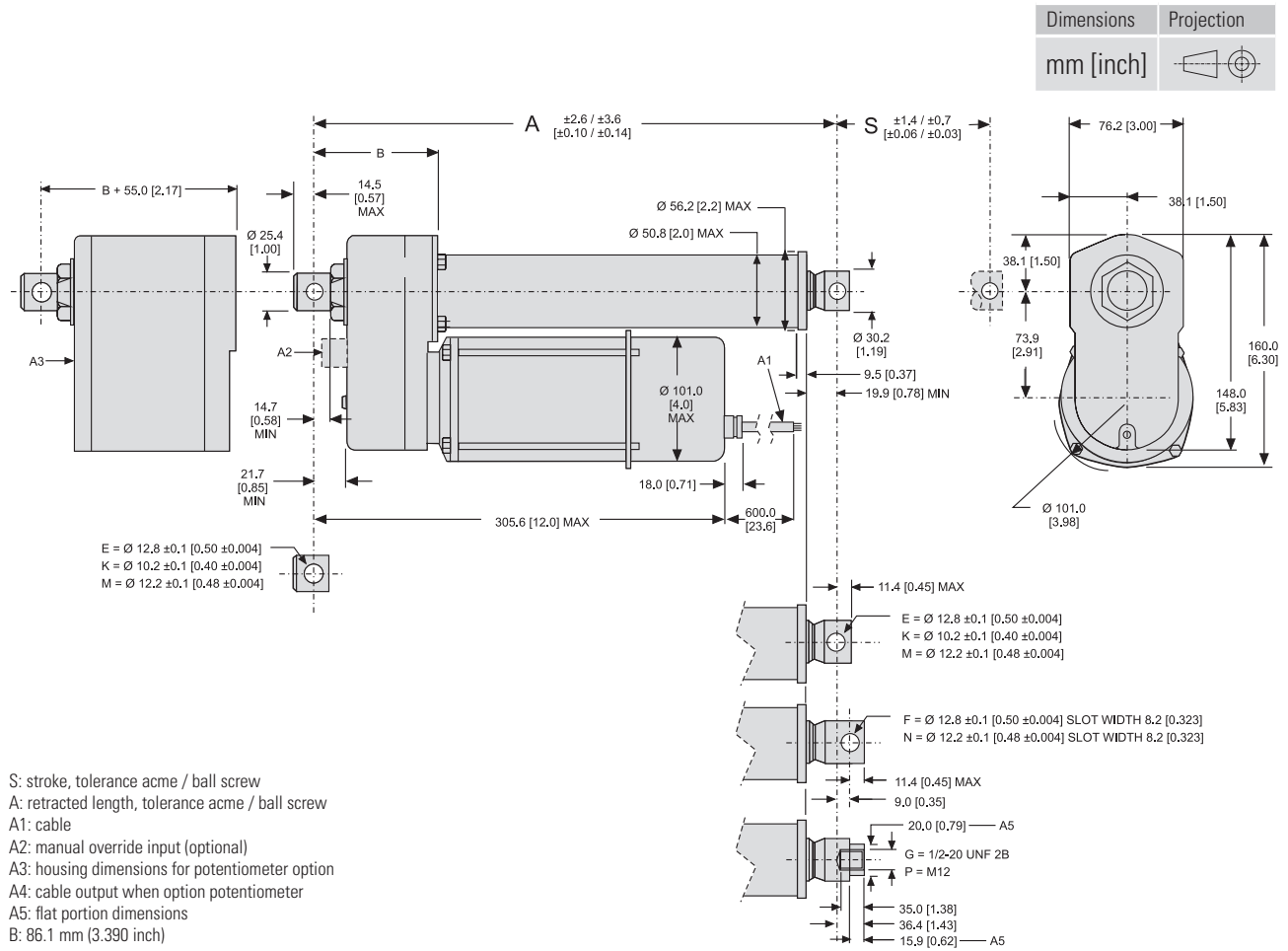
Variety of front and rear adapters

Manual override

Optional Electrical Features

Potentiometer feedback

Electrak® GX AC – Dimensions

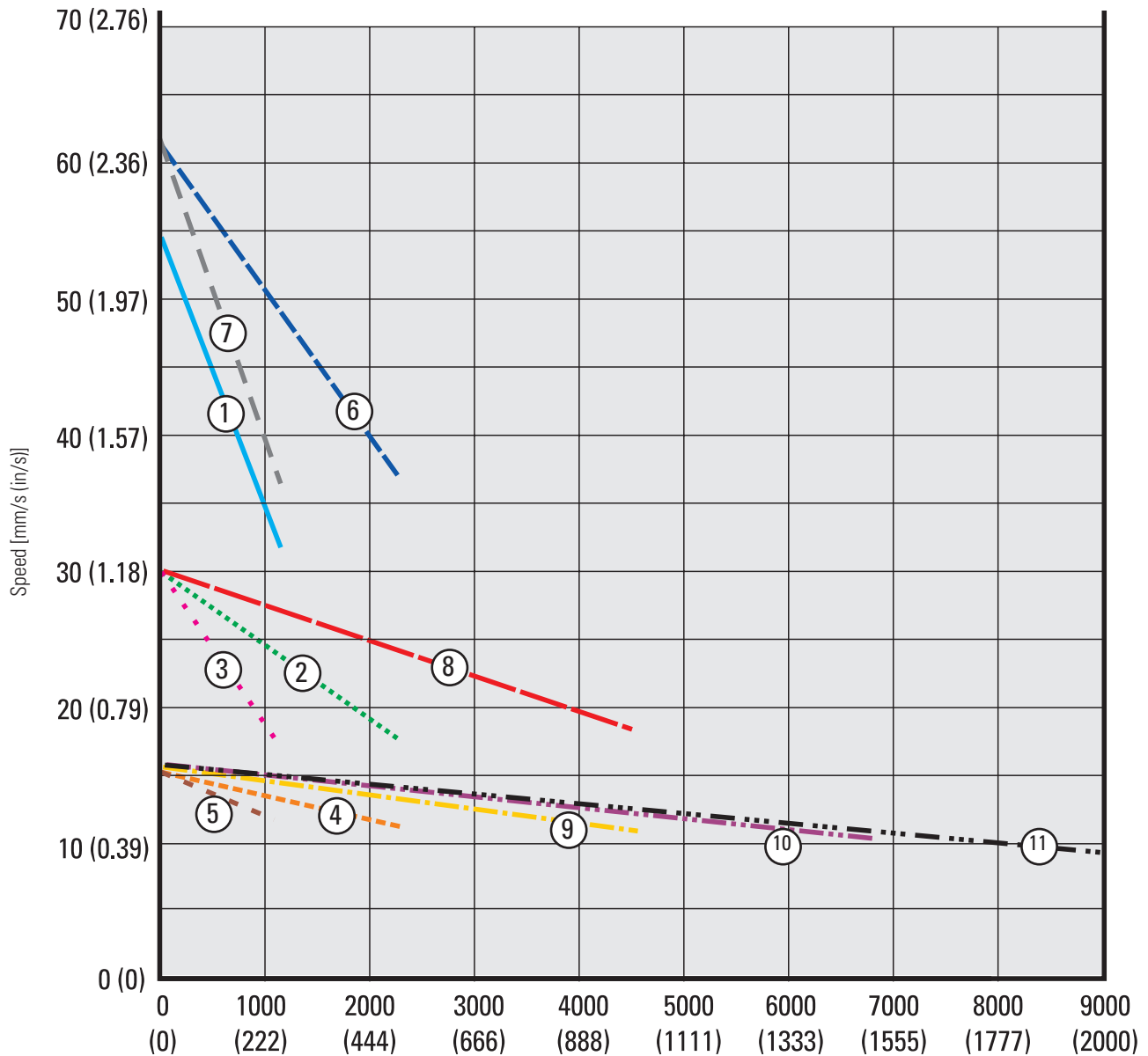


Stroke, Retracted Length and Weight Relationships

Ordering stroke (S)	[in]	6	8	10	12	14	16	18	20	22	24
Retracted length, acme screw models (A)	[mm]	312.9	363.7	414.5	465.3	583.7	634.5	685.3	736.1	786.9	837.7
	[in]	12.32	14.32	16.32	18.32	22.98	24.98	26.98	28.98	30.98	32.98
Retracted length, ball screw models (A)	[mm]	353.1	403.9	454.7	505.5	623.6	674.4	725.2	776.0	826.8	877.6
	[in]	13.90	15.90	17.90	19.90	24.55	26.55	28.55	30.55	32.55	34.55
Add on length for option potentiometer	[mm]	55.0									
	[in]	2.17									
Weight, acme screw models	[kg]	6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	7.9
	[lbs]	13.6	14.1	14.5	15.0	15.4	15.8	16.3	16.7	17.1	17.4
Weight, ball screw models	[kg]	6.8	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.5
	[lbs]	15.0	15.4	15.8	16.3	16.7	17.1	17.6	18.0	18.5	38.3
Add on weight for option potentiometer	[kg]	1.30									
	[lbs]	2.86									

Electrak GX AC – Performance Diagrams

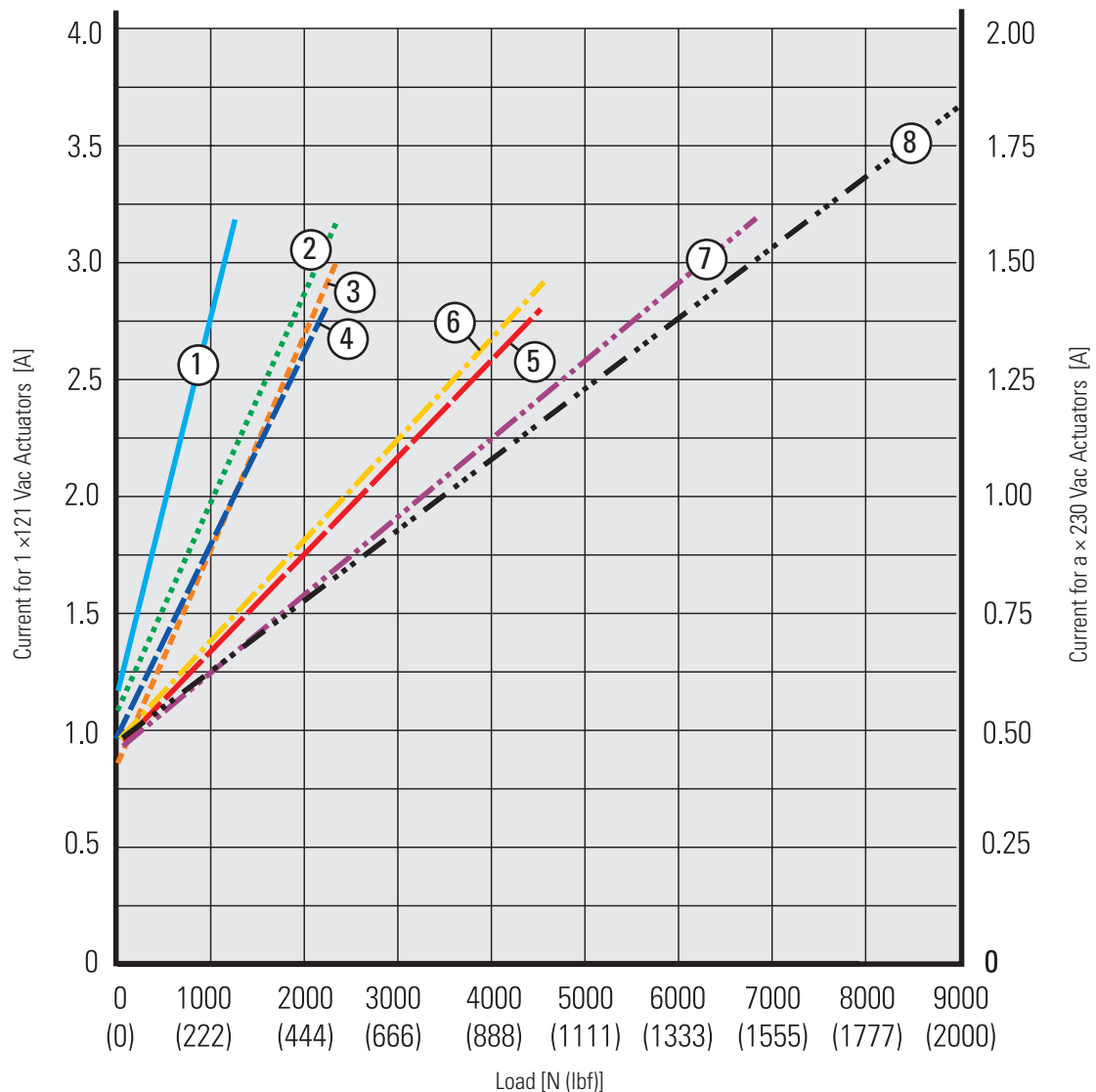
Load vs. Speed



- | | | | |
|-------------------------------------|-------|--------------------------------------|---------|
| 1. Axxx-05A5 (1100 N (250 lbf)) | — | 6. A12(22)x-05B5 (2250 N (500 lbf)) | --- |
| 2. A12(22)x-10A5 (2250 N (500 lbf)) | ... | 7. A42x-05B5 (1100 N (250 lbf)) | - - - |
| 3. A42x-10A5 (1100 N (250 lbf)) | ... | 8. A12(22)x-10B5 (4500 N (1000 lbf)) | --- |
| 4. A12(22)x-20A5 (2250 N (500 lbf)) | --- | 9. A12(22)x-20B5 (4500 N (1000 lbf)) | - . - . |
| 5. A42x-20A5 (1100 N (500 lbf)) | - - - | 10. Axxx-21B5 (6800 N (1500 lbf)) | ... |
| | | 11. Axxx-2KB5 (9000 N (2000 lbf)) | - . . . |

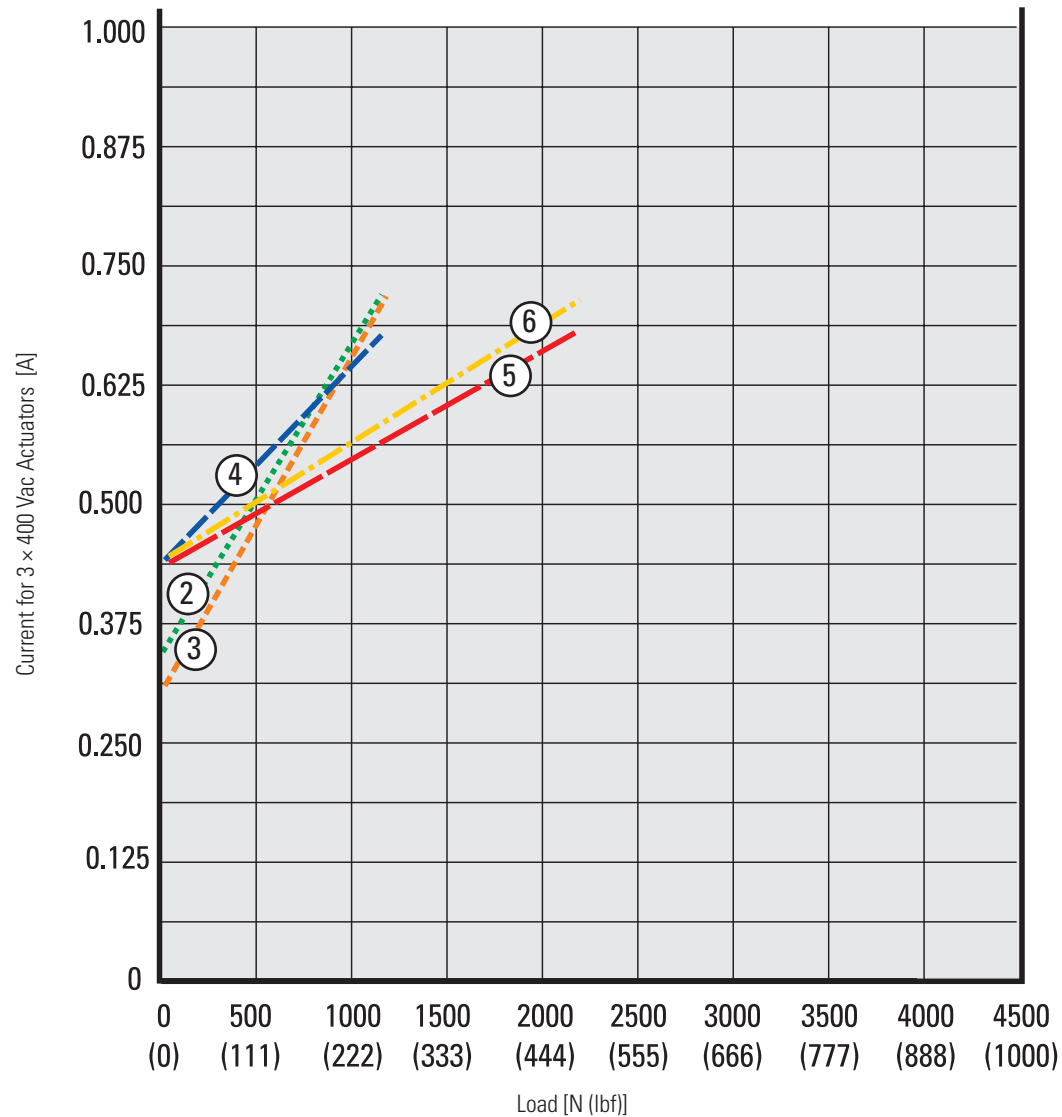
Electrak® GX AC – Performance Diagrams

Load vs. Current for 1 × 115 and 1 × 230 Vac actuators



- | | |
|-------------------------------------|--------------------------------------|
| 1. A12(22)x-05A5 (1100 N (250 lbf)) | 5. A12(22)x-10B5 (4500 N (1000 lbf)) |
| 2. A12(22)x-10A5 (2250 N (500 lbf)) | 6. A12(22)x-20B5 (4500 N (1000 lbf)) |
| 3. A12(22)x-20A5 (2250 N (500 lbf)) | 7. A12(22)x21B5 (6800 N (1500 lbf)) |
| 4. A12(22)x-05B5 (2250 N (500 lbf)) | 8. A12(22)x-2KB5 (9000 N (2000 lbf)) |

Load vs. Current for 3 × 400 Vac actuators

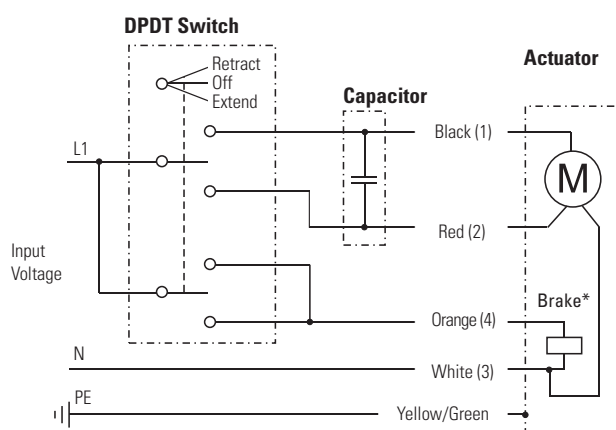


- | | | | |
|---------------------------------|--------------|----------------------------------|--------------|
| 1. A42x-05A5 (1100 N (250 lbf)) | not possible | 5. A42x-10B5 (2250 N (500 lbf)) | |
| 2. A42x-10A5 (1100 N (250 lbf)) | | 6. A42x-20B5 (2250 N (500 lbf)) | |
| 3. A42x-20A5 (1100 N (250 lbf)) | | 7. A42x-21B5 (6800 N (1500 lbf)) | not possible |
| 4. A42x-05B5 (1100 N (250 lbf)) | | 8. A42x-2KB5 (9000 N (2000 lbf)) | not possible |

Electrak GX AC – Electrical Connections

Input Voltage 115 or 230 Vac

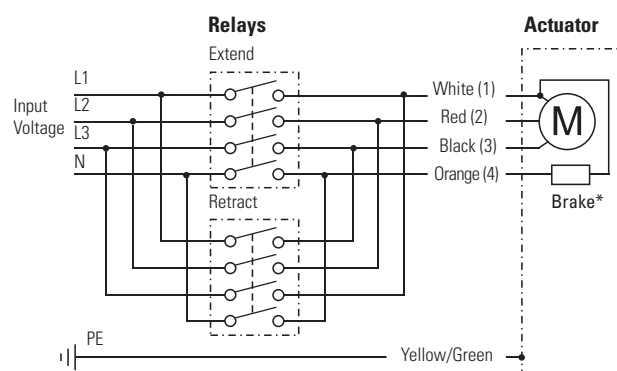
Actuator supply voltage	[Vac]	
A12		1 × 115
A22		1 × 230



Leads can be either color or number marked. To be able to run the actuator, a capacitor must be connected between black (1) and red (2) leads. A 115 Vac actuator requires a 35 μ F capacitor, while a 230 Vac actuator requires a 10 μ F capacitor. See page 54 for ordering of capacitors. Connect black (1) lead to L1 and white (3) lead to N (neutral) to retract the actuator. Change L1 from lead black (1) to lead red (2) to extend the actuator. The anti-coast brake* must also be released during motion, which is done by connecting orange (4) lead to L1.

Input Voltage 400 Vac

Actuator supply voltage	[Vac]	
A42		3 × 400



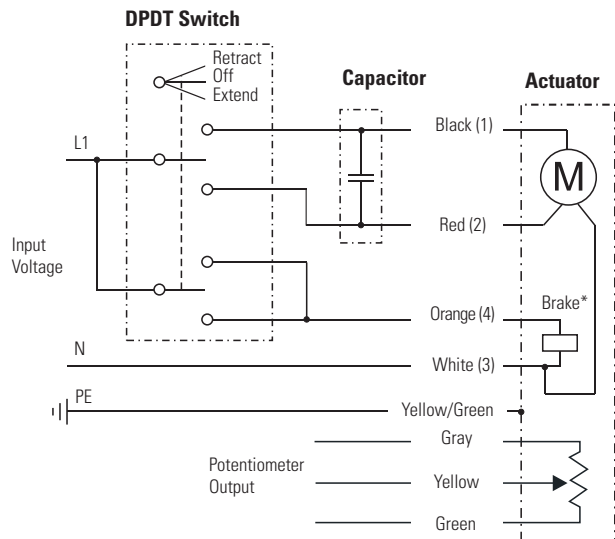
Leads can be either color or number marked. Connect white (1) lead to L1, red (2) lead to L2 and black (3) lead to L3 to extend the actuator. Change the places of white (2) lead and black (3) to retract the actuator. The anti-coast brake* must also be released during motion, which is done by connecting orange (4) lead to neutral (N).

Electrak® GX AC – Electrical Connections

Input Voltage 115 or 230 Vac + Option Potentiometer

Actuator supply voltage	[Vac]	
A12		1 × 115
A22		1 × 230
Potentiometer type		wire-wound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	2
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	
2 - 10 inch stroke		39
11 - 20 inch stroke		20
21 - 24 inch stroke		10

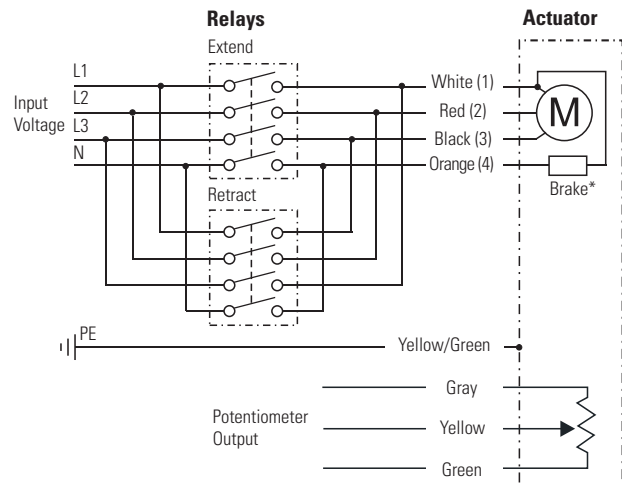
Leads can be either color or number marked. To be able to run the actuator, a capacitor must be connected between black (1) and red (2) leads. A 115 Vac actuator requires a 35 μ F capacitor, while a 230 Vac actuator requires a 10 μ F capacitor. See page 54 for ordering of capacitors. Connect black (1) lead to L1 and white (3) lead to N (neutral) to retract the actuator. Change L1 from lead black (1) to lead red (2) to extend the actuator. The anti-coast brake* must also be released during motion, which is done by connecting orange (4) lead to neutral (N). The potentiometer output cable has 0 ohm between gray and yellow leads when the actuator is fully extended.



Input Voltage 400 Vac + Option Potentiometer

Actuator supply voltage A42	[Vac]	3 × 400
Potentiometer type		wire-wound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	2
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	
2 - 10 inch stroke		39
11 - 20 inch stroke		20
21 - 24 inch stroke		10

Leads can be either color or number marked. Connect white (1) lead to L1, red (2) lead to L2 and black (3) lead to L3 to extend the actuator. Change the places of white (2) lead and black (3) to retract the actuator. The anti-coast brake* must also be released during motion, which is done by connecting orange (4) lead to neutral (N). The potentiometer output cable has 0 ohm between gray and yellow leads when the actuator is fully extended.

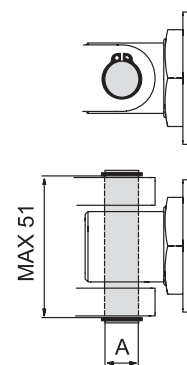


Electrak[®] GX AC – Accessories

Mounting Pin Kits

Designation	A [mm(in)]	Part Number
Mounting pins (pair)	12.7 (0.5)	D603 028

The mounting pins are used in the rear and front adapter holes of the actuator. The pins have a groove in each end so that it can be secured with snap rings.



Dimensions
mm

Capacitor Kits

Designation	Actuator Supply Voltage	Part Number
Capacitor kit	115 Vac	9200-448-002
Capacitor kit	230 Vac	9200-448-003

All 230 and 115 Vac actuators require a capacitor to be wired between the windings to run. The capacitor is bought separately and mounted externally by the customer.

Notes



Electrak® LA14 – Technical Features



Standard Features

- Robust and reliable
- 12, 24 or 36 Vdc as standard input voltages
- Acme and ball screw models
- Static load up to 18 kN (4000 lbf)
- Dynamic load up to 6.8 kN (1500 lbf)
- Stroke up to 24 in
- Speed up to 61 mm/s (2.4 in/s)
- Protection class static IP65
- Overload clutch for mid and end of stroke protection
- Motor with thermal switch
- Corrosion free aluminium cover tube
- Anti-rotation mechanism
- T-slots in the cover tube for magnetic sensors
- Trunnion mounting possible
- Maintenance free

General Specifications

Screw type	acme or ball
Nut type Dxx-xxA (acme screw) Dxx-xxB (ball screw)	self-locking lead nut load lock ball nut
Manual override	no (optional)
Anti-rotation	yes
Static load holding brake acme screw models ball screw models	no (self-locking) yes
Safety features	overload clutch motor auto reset thermal switch
Electrical connections no potentiometer option with potentiometer option	flying leads with or without connector cable with or without connector
Compliances	CE, UKCA

Optional Mechanical Features

Variety of front and rear adapters
Variety of rear adapter orientations
Manual override

Optional Electrical Features

Potentiometer feedback

Accessories

External slot-mounted limit switches
Mounting pin kits
Mounting pin bracket kits
Trunnions mounting kits

Compatible Controls

Contact customer support at www.thomsonlinear.com/cs
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Electrak LA14 – Technical Specifications

Mechanical Specifications

Max. static load ⁽¹⁾	[N (lbf)]	
DAxx-xxA (acme screw)		11350 (2500)
DAxx-xxB (ball screw)		18000 (4000)
Max. dynamic load (Fx)	[N (lbf)]	
DAxx-05A65M		1100 (250)
DAxx-10A65M		2250 (500)
DAxx-20A65M		2250 (500)
DAxx-05B65M		2250 (500)
DAxx-10B65M		4500 (1000)
DAxx-20B65M		4500 (1000)
DAxx-21B65M		6800 (1500)
Speed @ no load/max. load	[mm/s (in/s)]	
DAxx-05A65M		54/32 (2.10/1.20)
DAxx-10A65M		30/18 (1.20/0.70)
DAxx-20A65M		15/12 (0.67/0.45)
DAxx-05B65M		61/37 (2.40/1.40)
DAxx-10B65M		30/19 (1.30/0.80)
DAxx-20B65M		15/12 0.60/0.45)
DAxx-21B65M		15/11 (0.60/0.43)
Min. ordering stroke (S) length	[mm]	50
Max. ordering stroke (S) length ⁽²⁾	[mm]	600
Ordering stroke length increments	[mm]	50
Operating temperature limits	[°C (F)]	- 25 – 85 (- 15 – 185)
Full load duty cycle @ 25 °C (77 °F)	[%]	25
End play, maximum	[mm (in)]	1.0 (0.04)
Restraining torque	[Nm (lbf-in)]	0
Protection class - static		IP65
Salt spray resistance	[h]	96

(1) Max. static load at fully retracted stroke

Electrical Specifications

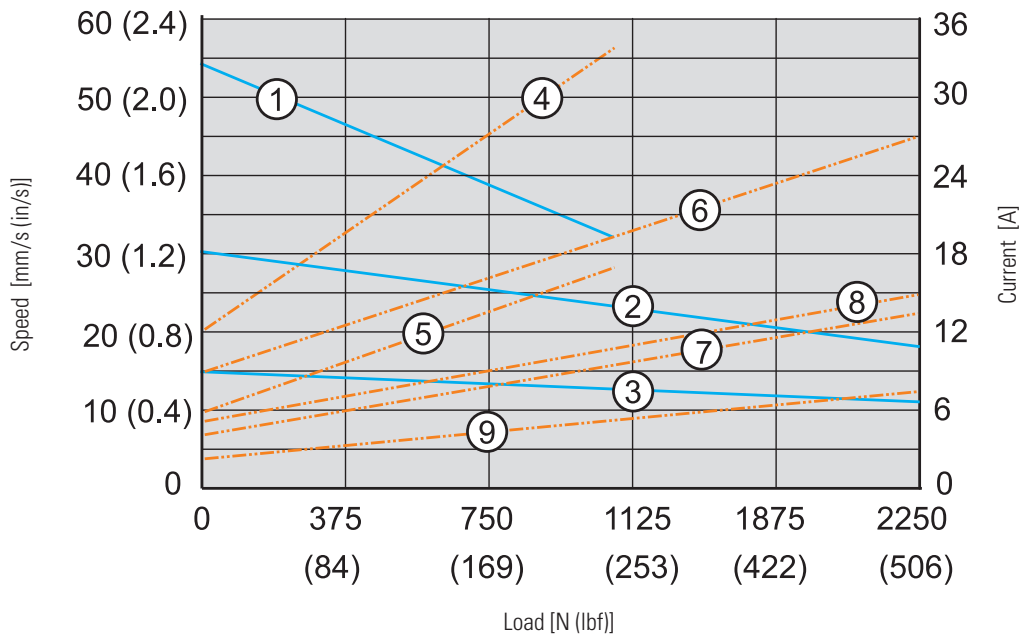
Available input voltages ⁽¹⁾	[Vdc]	12, 24, 36
Input voltage tolerance	[%]	± 10
Current draw @ no load/max. load ⁽²⁾	[A]	
DA12-05A65M		12.0/34.0
DA12-10A65M		9.0/27.0
DA12-20A65M		8.0/15.0
DA12-05B65M		8.0/26.0
DA12-10B65M		5.0/26.0
DA12-20B65M		4.0/14.0
DA12-21B65M		4.0/19.0
DA24-05A65M		6.0/17.0
DA24-10A65M		4.5/13.5
DA24-20A65M		4.0/7.5
DA24-05B65M		4.0/13.0
DA24-10B65M		2.5/13.0
DA24-20B65M		2.0/7.0
DA24-21B65M		2.0/9.5
Flying leads length	[mm (in)]	165 (7.5)
Flying leads diameter	[mm (in)]	3 (0.12)
Flying leads cross section	[mm ² (AWG)]	2 (14)
Cable length with option pot.	[mm (in)]	600 (24)
Cable diameter with option pot.	[mm (in)]	9 (0.35)
Cable leads cross section with option potentiometer motor leads potentiometer leads	[mm ² (AWG)]	2.5 (14) 1.5 (16)

(1) For other input voltages - contact customer support

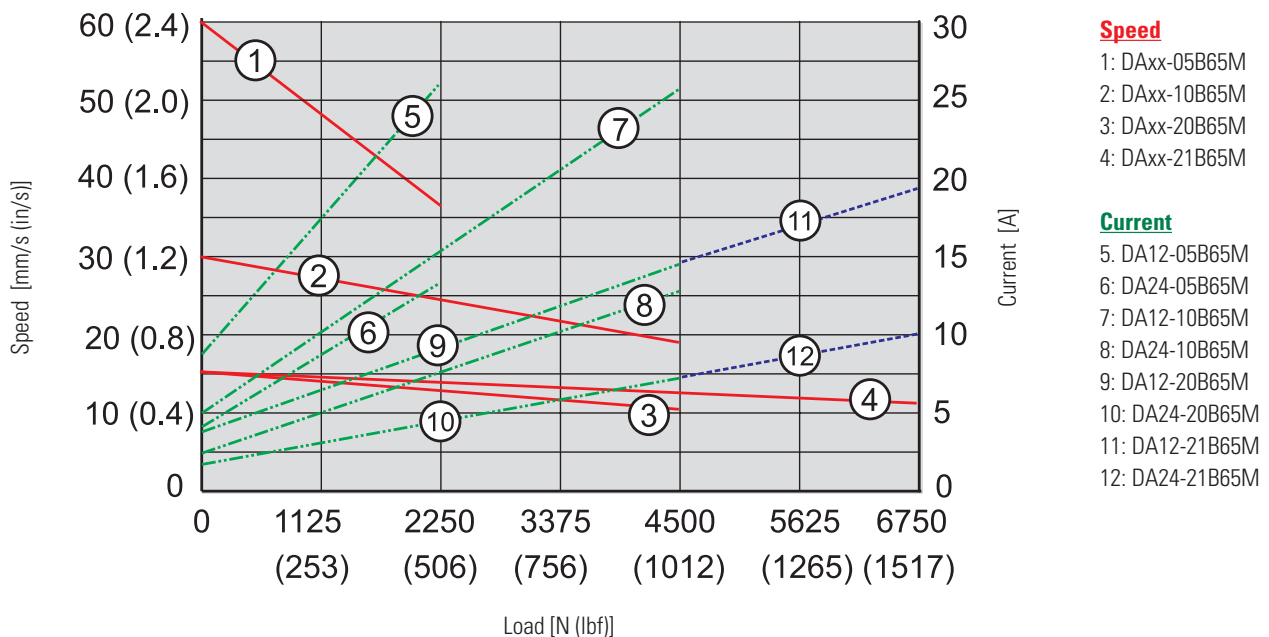
(2) For current draw for 36 Vdc input voltage models - contact customer support

Electrak LA14 – Performance Diagrams

Acme Screw Models
Speed and Current vs. Load



Ball Screw Models
Speed and Current vs. Load



Note: for current draw data for 36 Vdc input voltage models - contact customer support.

Electrak® LA14 – Ordering Key

Ordering Key

1	2	3	4	5	6	7	8
DA12-	05A65M	10	M0	N	-A	F	M

1. Model and input voltage

DA12- = Electrak LA14, 12 Vdc
DA24- = Electrak LA14, 24 Vdc
DA36- = Electrak LA14, 36 Vdc

2. Dynamic load capacity, screw type, maximum speed

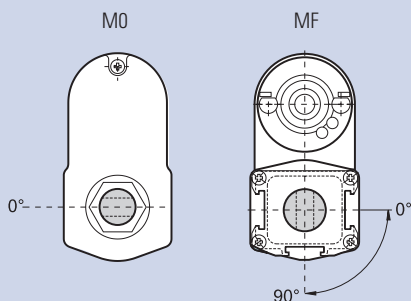
05A65M = 1100 N, acme, 54 mm/s
10A65M = 2250 N, acme, 30 mm/s
20A65M = 2250 N, acme, 15 mm/s
05B65M = 2250 N, ball, 61 mm/s
10B65M = 4500 N, ball, 30 mm/s
20B65M = 4500 N, ball, 15 mm/s
21B65M = 6800 N, ball, 15 mm/s

3. Ordering stroke length

05 = 50 mm (1.97 in)
10 = 100 mm (3.94 in)
15 = 150 mm (5.90 in)
20 = 200 mm (7.87 in)
25 = 250 mm (9.84 in)
30 = 300 mm (11.81 in)
35 = 350 mm (13.78 in)
40 = 400 mm (15.75 in)
45 = 450 mm (17.72 in)
50 = 500 mm (19.69 in)
55 = 550 mm (21.65 in)
60 = 600 mm (23.62 in)

4. Rear / front adapter hole position ⁽¹⁾

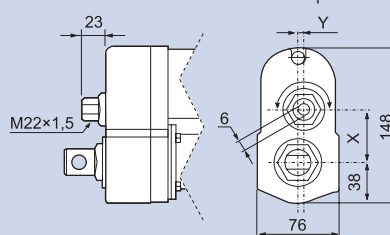
M0 = both adapters at 0° (standard position)
MF = both adapters at 90°



5. Options

N = no option
NPO = potentiometer feedback
NHW = manual override ⁽¹⁾

Dimensions for manual override option



Model	X	Y
DAxx05A(B)65-	49.6	0.0
DAxx10A(B)65-	43.3	5.2
DAxx20(21)A(B)65-	38.9	0.0

6. Connector option

-A = AMP terminal 42098-2, house 180908-5
-B = Packard Electric 56 Series
-D = no connector (flying leads)

7. Front adapter option

E = cross hole for 0.5 inch pin
K = cross hole for 10 mm pin
M = cross hole for 12 mm pin

8. Rear adapter option

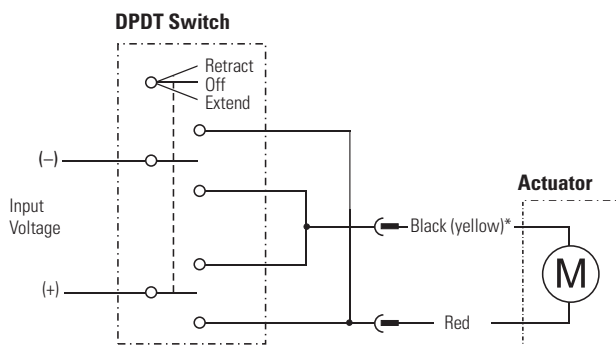
E = cross hole for 0.5 inch pin
K = cross hole for 10 mm pin
M = cross hole for 12 mm pin

(1) Only adapter position M0 possible with option manual override.

Electrak LA14 – Electrical Connections

Without Option

Actuator supply voltage	[Vdc]	
DA12		12
DA24		24
DA36		36

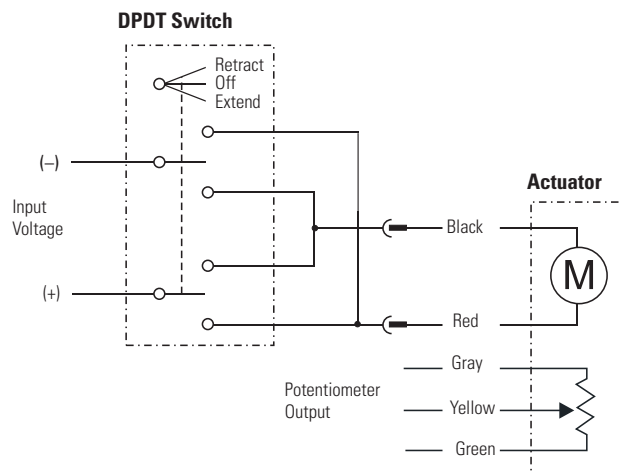


* Lead can be black or yellow

Connect the red lead to positive and black (yellow)* to negative to extend the actuator. Change polarity to retract the actuator.

Option Potentiometer

Actuator supply voltage	[Vdc]	
DA12		12
DA24		24
DA36		36
Potentiometer type		wire-wound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	2
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	
50 - 255 mm stroke		39
256 - 510 mm stroke		20
511 - 600 mm stroke		10



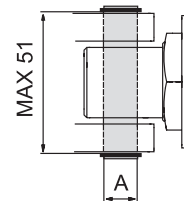
Connect the red lead to positive and black to negative to extend the actuator. Change polarity to retract the actuator. The potentiometer output cable has 0 ohm between gray and yellow leads when the actuator is fully extended.

Electrak® LA14 – Accessories

Mounting Pin Kits

Designation	A [mm (in)]	Part Number
Mounting pins (pair)	12 (0.47)	D603 023

The mounting pins are used in the rear and front adapter holes of the actuator. The pins have a groove in each end so that it can be secured with snap rings.



Dimensions
mm

Mating Connectors

Designation	Part Number
North American mating connector kit (connector option -B in the ordering key)	9100-448-001
Rest of the world mating connector kit (connector option -A in the ordering key)	LA100B9P1

The mating connector kit consist of the necessary connector parts required to be able to connect to the connector on the actuator wires.

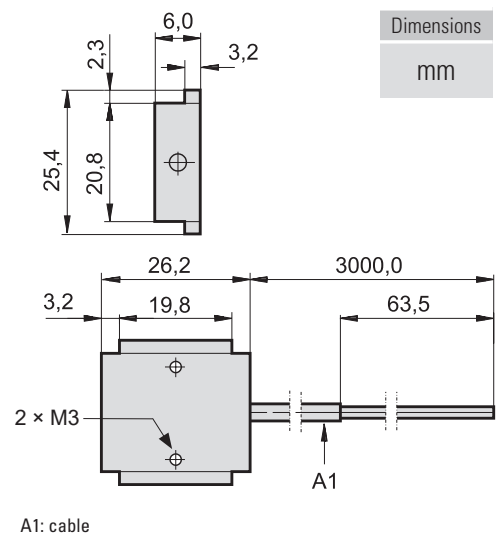
Magnetic Sensor

Designation	Contact Type	Part Number
Magnetic sensor	normally open	D535 070
Magnetic sensor	normally closed	D535 071
Magnetic sensor	changing	D535 073

Specifications

Parameter	D535 070 D535 071	D535 073
Maximum power [W]	10	10
Maximum voltage [Vdc]	100	100
Maximum current [A]	0,5	0,5
Maximum contact resistance [ohm]	20	20
Lead cross section [mm²]	2 × 0,14	3 × 0,14
Cable length [mm]	3000	3000
Protection class	IP67	IP67

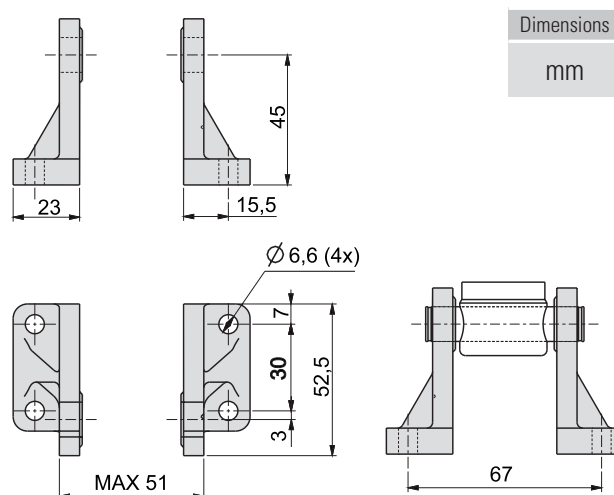
The magnetic sensor fits in to the T-slot running along three sides of the cover tube. The cable is moulded into the sensor.



Mounting Pin Bracket Kits

Designation	Part Number
Mounting pin brackets (pair)	D603 029

The mounting pin brackets are used to attach the front and rear adapter via a pair of mounting pins to the objects to which it is mounted. Note! one pair of brackets is needed per adapter as there must be a bracket on each side of the adapter.

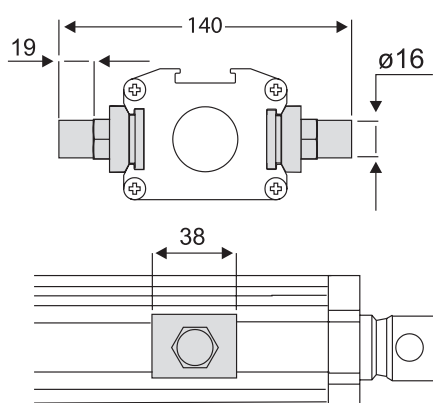


Trunnion Mounting Kits

Designation	Part Number
Trunnions (pair)	D603 022
Trunnion brackets (pair)	D603 030

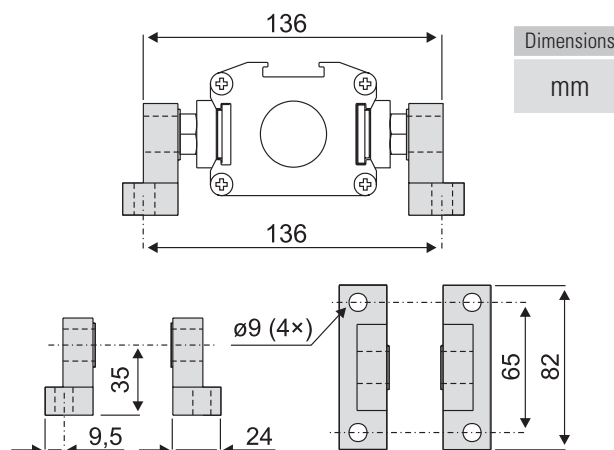
The trunnions can be mounted to the T-slot running along the right and left side of the cover tube.

Trunnions



Dimensions
mm

Trunnion Brackets



Dimensions
mm



Electrak® LA24 – Technical Features



Standard Features

- Robust and reliable
- 1 × 230 or 3 × 400 Vac as standard input voltages
- Acme and ball screw models
- Static load up to 18 kN (4000 lbf)
- Dynamic load up to 4.5 kN (1000 lbf)
- Stroke up to 24 in
- Speed up to 61 mm/s (2.4 in/s)
- Protection class static IP45
- Overload clutch for mid and end of stroke protection
- Motor with thermal switch
- Corrosion free aluminium cover tube
- Anti-rotation mechanism
- T-slots in the cover tube for magnetic sensors
- Maintenance free

General Specifications

Screw type	acme or ball
Nut type Dxx-xxA (acme screw) Dxx-xxB (ball screw)	self-locking lead nut load lock ball nut
Manual override	no (optional)
Anti-rotation	yes
Static load holding brake acme screw models ball screw models	no (self-locking) yes
Safety features	overload clutch motor auto reset thermal switch
Electrical connections no potentiometer option with potentiometer option	cable with flying leads 2 x cable with flying leads
Compliances	CE, UKCA
Certificates	UL, CSA

(1) Mating connector: 2973781 with terminal 2962573 (p/n 9100-448-001)

Optional Mechanical Features

Variety of front and rear adapters
Variety of rear adapter orientations
Manual override

Optional Electrical Features

Potentiometer feedback
Anti-coast brake

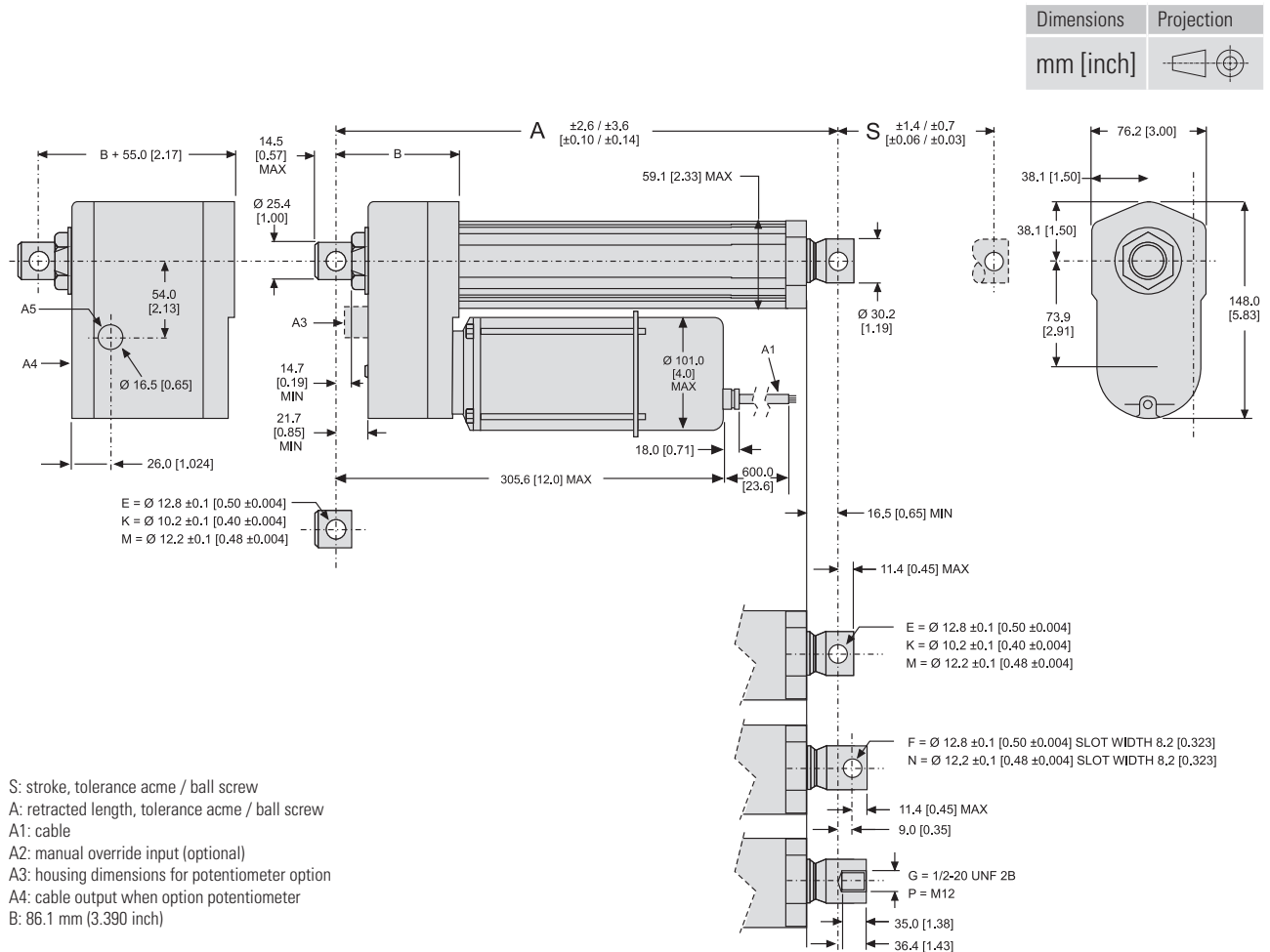
Accessories

External slot-mounted limit switches
Mounting pin kits
Mounting pin bracket kits
Trunnions mounting kits
Capacitors

Compatible Controls

Contact customer support at www.thomsonlinear.com/cs

Electrak® LA24 – Dimensions

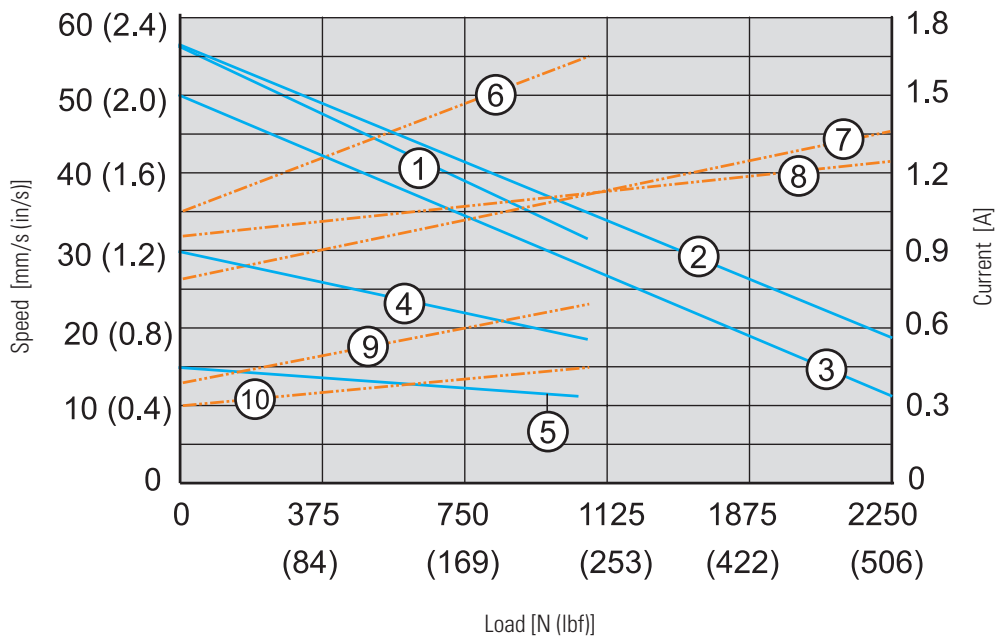


Stroke, Retracted Length and Weight Relationships

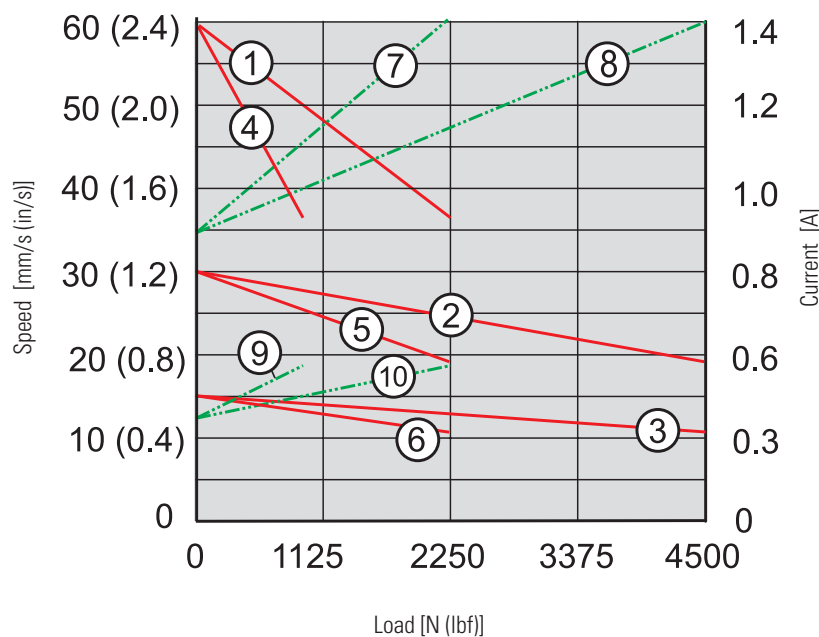
Ordering stroke (S)	[mm]	50	100	150	200	250	300	350	400	450	500	550	600
Retracted length, acme screw models (A)	[mm]	219.9	269.9	319.9	369.9	419.9	469.9	586.6	636.6	686.6	736.6	786.6	836.6
	[in]	8.66	10.62	12.59	14.56	16.53	18.50	23.09	25.06	27.03	29.00	30.97	32.94
Retracted length, ball screw models (A)	[mm]	269.6	319.6	369.6	419.6	469.6	519.6	623.4	673.4	723.5	773.4	823.4	873.4
	[in]	10.61	12.58	14.55	16.52	18.49	20.46	24.54	26.51	28.48	30.45	32.42	34.39
Add on length for option potentiometer	[mm]	55.0											
	[in]	2.17											
Weight, acme screw models	[kg]	6.0	6.2	6.4	6.6	6.8	7.0	7.3	7.5	7.7	7.9	8.1	8.3
	[lbs]	13.2	13.6	14.1	14.5	15.0	15.4	16.1	16.5	16.9	17.4	17.8	18.3
Weight, ball screw models	[kg]	6.8	7.0	7.2	7.4	7.6	7.8	8.1	8.3	8.5	8.7	8.9	9.1
	[lbs]	15.0	15.4	15.8	16.3	16.7	17.2	17.8	18.3	18.7	19.1	19.6	20.0
Add on weight for option potentiometer	[kg]	1.30											
	[lbs]	3.31											

Electrak LA24 – Performance Diagrams

Acme Screw Models
Speed and Current vs. Load



Ball Screw Models
Speed and Current vs. Load

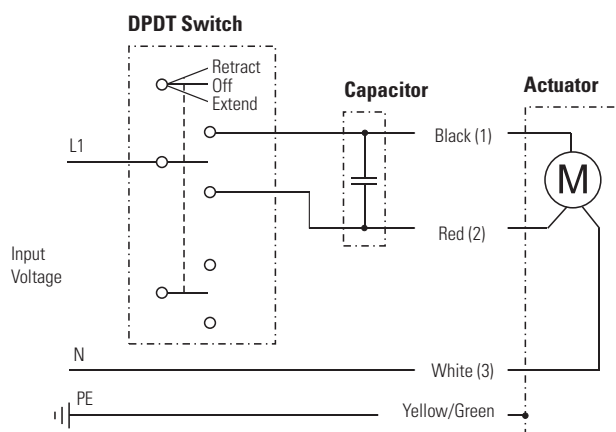


Electrak LA24 – Electrical Connections

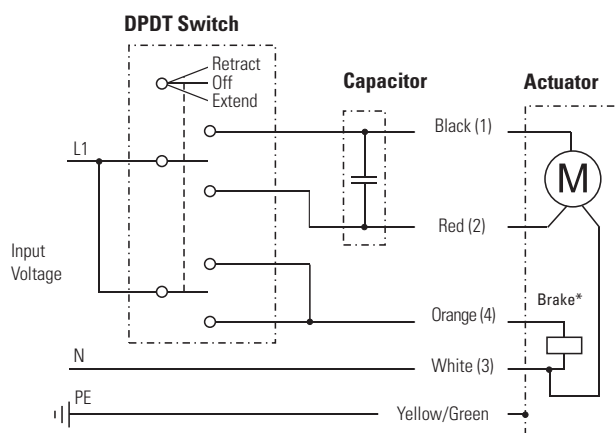
Input Voltage 230 Vac

Actuator supply voltage AA22-	[Vac]	1 × 230
----------------------------------	-------	---------

No anti-coast brake



With anti-coast brake

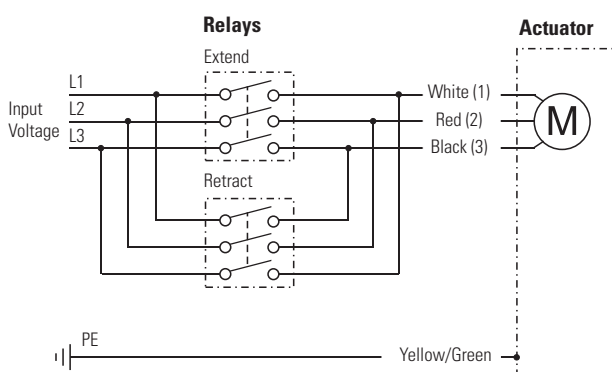


Leads can be either color or number marked. To be able to run the actuator, a 10 µF capacitor must be connected between black (1) and red (2) leads. See page 72 for ordering of capacitors. Connect black (1) lead to L1 and white (3) lead to N (neutral) to retract the actuator. Change L1 from lead black (1) to lead red (2) to extend the actuator. If the actuator has an anti-coast brake*, it must be released during motion, which is done by connecting orange (4) lead to L1.

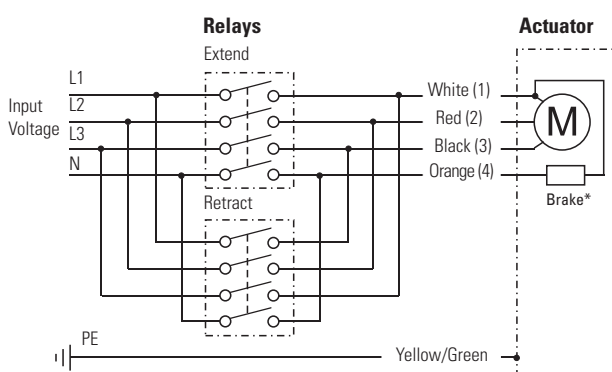
Input Voltage 400 Vac

Actuator supply voltage AA42-	[Vac]	3 × 400
----------------------------------	-------	---------

No anti-coast brake



With anti-coast brake



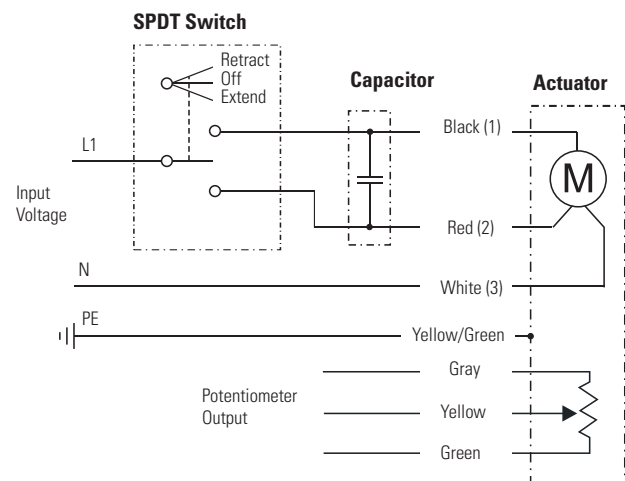
Leads can be either color or number marked. Connect white (1) lead to L1, red (2) lead to L2 and black (3) lead to L3 to extend the actuator. Change the places of white (2) lead and black (3) to retract the actuator. If the actuator has an anti-coast brake*, it must be released during motion, which is done by connecting orange (4) lead to N (neutral).

Electrak® LA24 – Electrical Connections

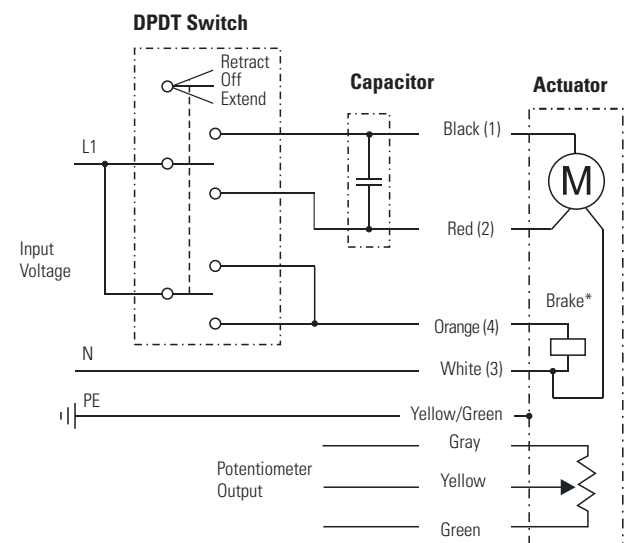
Input Voltage 230 Vac + Option Potentiometer		
Actuator supply voltage	[Vac]	1 × 230
Potentiometer type		wire-wound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	2
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	
50 - 255 mm stroke		39
256 - 510 mm stroke		20
511 - 600 mm stroke		10

Leads can be either color or number marked. To be able to run the actuator, a 10 µF capacitor must be connected between black (1) and red (2) leads. See page 72 for ordering of capacitors. Connect black (1) lead to L1 and white (3) lead to N (neutral) to retract the actuator. Change L1 from lead black (1) to lead red (2) to extend the actuator. If the actuator has an anti-coast brake*, it must be released during motion, which is done by connecting orange (4) lead to L1. The potentiometer output cable has 0 ohm between gray and yellow leads when the actuator is fully extended.

No anti-coast brake



With anti-coast brake

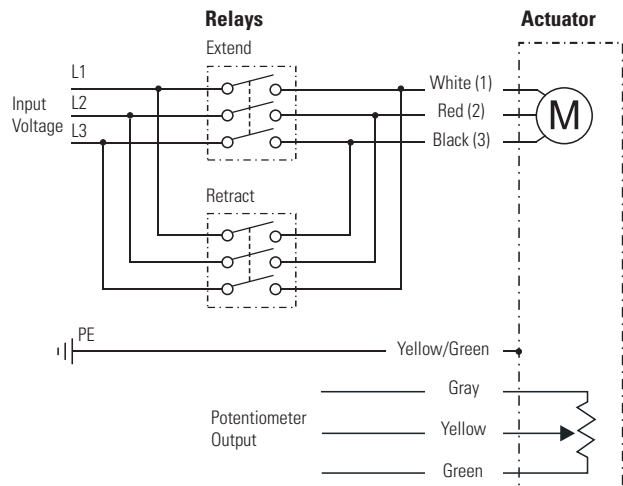


Input Voltage 400 Vac + Option Potentiometer

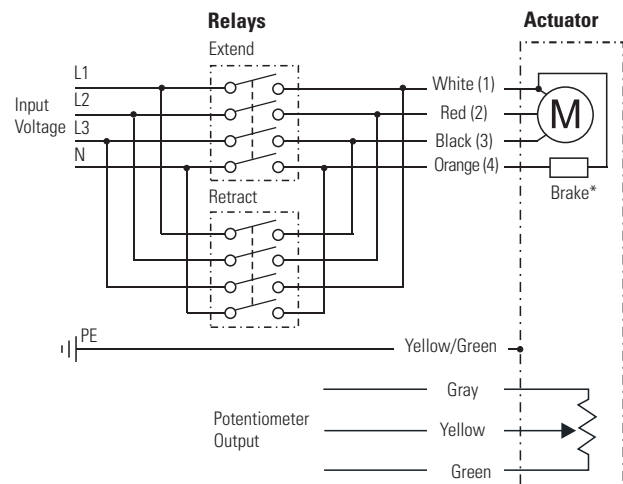
Actuator supply voltage AA42-	[Vac]	3 × 400
Potentiometer type		wire-wound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	2
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	
50 - 255 mm stroke		39
256 - 510 mm stroke		20
511 - 600 mm stroke		10

Leads can be either color or number marked. Connect white (1) lead to L1, red (2) lead to L2 and black (3) lead to L3 to extend the actuator. Change the places of white (2) lead and black (3) to retract the actuator. If the actuator have an anti-coast brake*, it must be released during motion, which is done by connecting orange (4) lead to N (neutral). The potentiometer output cable has 0 ohm between gray and yellow leads when the actuator is fully extended.

No anti-coast brake



With anti-coast brake



Electrak® LA24 – Accessories

Capacitor Kits

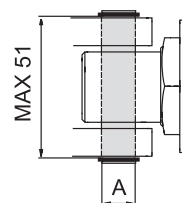
Designation	Actuator Supply Voltage	Part Number
Capacitor kit	230 Vac	9200-448-003

All 230 Vac actuators require a capacitor to be wired between the windings to run. The capacitor is bought separately and mounted externally by the customer.

Mounting Pin Kits

Designation	A [mm (in)]	Part Number
Mounting pins (pair)	12 (0.47)	D603 023

The mounting pins are used in the rear and front adapter holes of the actuator. The pins have a groove in each end so that it can be secured with snap rings.



Dimensions
mm

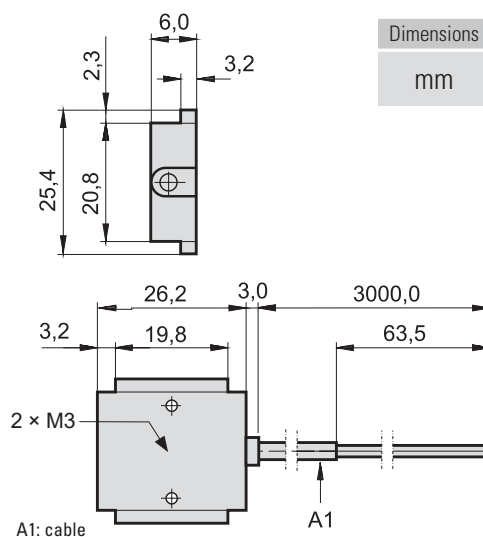
Magnetic Sensor

Designation	Contact Type	Part Number
Magnetic sensor	normally open	D535 070
Magnetic sensor	normally closed	D535 071
Magnetic sensor	changing	D535 073

Specifications

Parameter	D535 070 D535 071	D535 073
Maximum power [W]	10	10
Maximum voltage [Vdc]	100	100
Maximum current [A]	0,5	0,5
Maximum contact resistance [ohm]	20	20
Lead cross section [mm ²]	2 × 0,14	3 × 0,14
Cable length [mm]	3000	3000
Protection class	IP67	IP67

The magnetic sensor fits in to the T-slot running along three sides of the cover tube. The cable is moulded into the sensor.

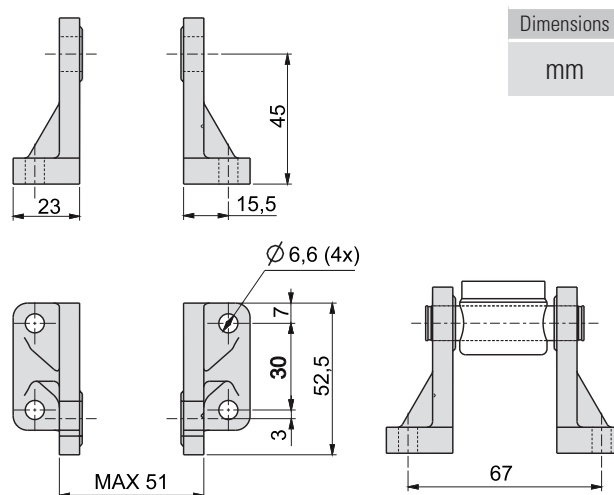


Dimensions
mm

Mounting Pin Bracket Kits

Designation	Part Number
Mounting pin brackets (pair)	D603 029

The mounting pin brackets are used to attach the front and rear adapter via a pair of mounting pins to the objects to which it is mounted. Note! one pair of brackets is needed per adapter as there must be a bracket on each side of the adapter.

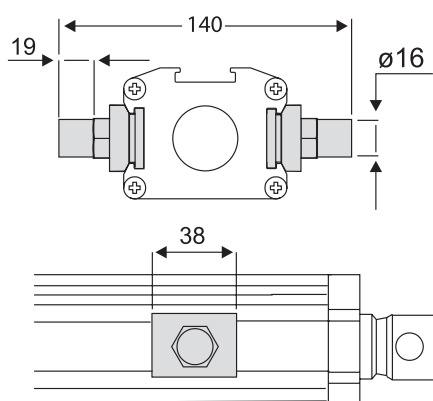


Trunnion Mounting Kits

Designation	Part Number
Trunnions (pair)	D603 022
Trunnion brackets (pair)	D603 030

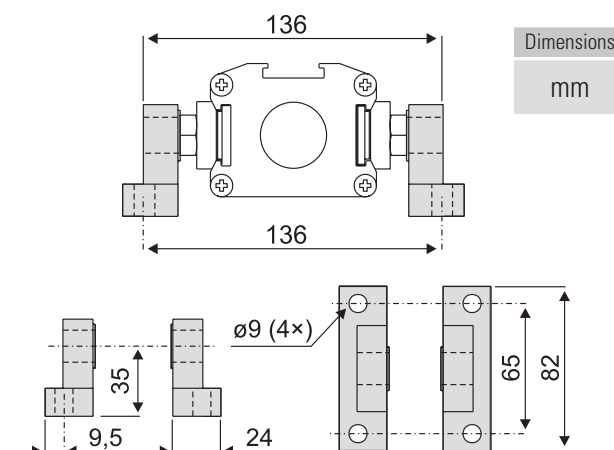
The trunnions can be mounted to the T-slot running along the right and left side of the cover tube.

Trunnions



Dimensions
mm

Trunnion Brackets



Dimensions
mm

B-Track IC DC – Technical Features



Standard Features

- Robust and reliable
- 12 and 24 Vdc as standard input voltages
- Acme and ball screw models
- Strokes up to 24 inch
- Load up to 12460 N (2800 lbf)
- IP66/IP69K protection
- Integrated controls for position feedback, end-of-stroke limit switches and end-of-stroke indication outputs
- Externally adjustable limit switches optional

General Specifications

Screw type	acme or ball
Nut type K2 (acme screw) K2X (ball screw)	self locking lead nut load lock ball nut
Manual override	yes
Anti-rotation	no
Static load holding brake acme screw models ball screw models	no (self locking) yes
Safety features	overload clutch motor auto reset thermal switch
Anti coast brake K2 (acme screw) K2X (ball screw)	no no
Electrical connections power control options	flying leads with Packard 56 connector control option dependent
Compliances	CE

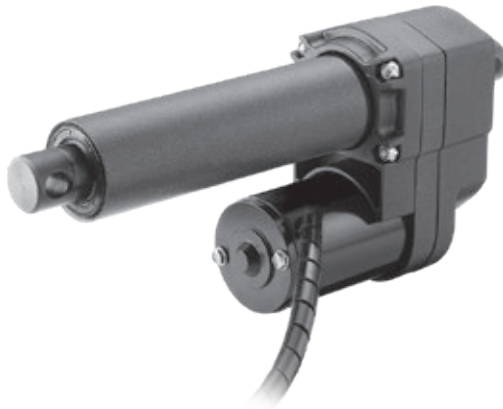
Optional Electrical Features

Integrated end-of-stroke limit switches
Integrated end-of-stroke limit switches + end-of-stroke indication outputs
Externally adjustable end-of-stroke limit switches
Externally adjustable end-of-stroke limit switches + end-of-stroke indication outputs
Analog potentiometer position feedback output
Analog potentiometer position feedback output + externally adjustable end-of-stroke limit switches

Compatible Controls

Contact customer support at www.thomsonlinear.com/cs

B-Track DC – Technical Features



Standard Features

- Robust and reliable
- 12, 24, 36, 48 and 90 Vdc as standard input voltages
- Acme and ball screw models
- Strokes up to 24 inches
- Load up to 12460 N (2800 lbf)
- IP66/IP69K protection

General Specifications

Screw type	acme or ball
Nut type K2 (acme screw) K2X (ball screw)	self-locking lead nut load lock ball nut
Manual override	yes
Anti-rotation	no
Static load holding brake acme screw models ball screw models	no (self-locking) yes
Safety features	overload clutch motor auto reset thermal switch
Anti coast brake K2 (acme screw) K2X (ball screw)	no no
Electrical connection	flying leads with Packard 56 connector
Compliances	CE, UKCA

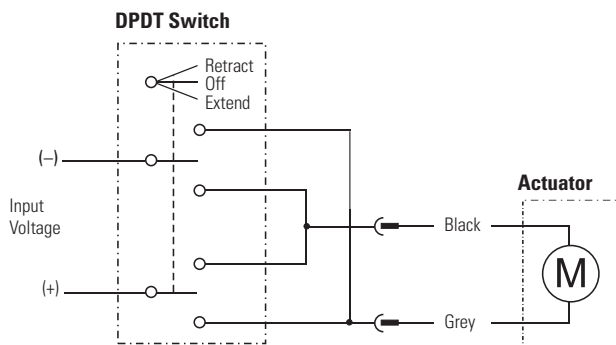
Compatible Controls

Contact customer support at www.thomsonlinear.com/cs

B-Track DC – Electrical Connections

Standard

Actuator supply voltage	[Vdc]
K2xxxxx12V	12
K2xxxxx24V	24
K2xxxxx36V	36
K2xxxxx48V	48
K2xxxxx90V	90



Connect the grey lead to positive and black to negative to extend the actuator. Change polarity to retract the actuator.

