



# Electrak<sup>®</sup> HD Technical Features



Onboard electronics eliminate the need for standalone controls. Higher power opens a wider range of hydraulic-to-electric conversions. Meets the most extreme OEM component environmental acceptance tests.

General Specifications	
Parameter	Electrak HD
Screw type	ball
Nut type	load lock ball nut
Manual override	yes
Anti-rotation	yes
Dynamic braking	yes <sup>(1)</sup>
Static load holding brake	yes
End-of-stroke protection	internal end-of-stroke limit switches
Overload protection	yes
Temperature monitoring	yes
Temperature compensation	yes
Voltage monitoring	yes
Electrical connections <sup>(2)</sup>	cable(s) with flying leads
Compliance	CE

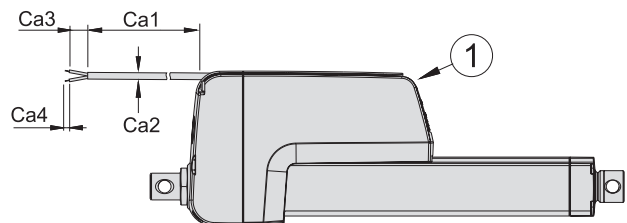
(1) Dynamic braking is included at the ends of stroke for all Electrak HD actuators. Dynamic braking offered throughout the entire stroke length only on low-level switching and SAE J1939 options.

(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 Features	
Parameter	Electrak HD
Mechanical options	Variety of front and rear adapters
	Alternative adapter orientation
Control options (see page 24)	End-of-stroke output
	Analog position feedback
	Digital position feedback
	Programmable limit switches
	Signal-follower
	Low-level signal motor switching
	CANopen CAN bus
	SAE J1939 CAN bus
Synchronization	

Accessories	
Parameter	Electrak HD
Mechanical	Rod end front adapter
Electrical	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 <sup>(1)</sup>	[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 <sup>(2)</sup>	[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 <sup>(3)</sup>	[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 <sup>(4)</sup>
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

<sup>1</sup> Max. static load at fully retracted stroke.

<sup>2</sup> For units with the synchronization option, the speed is 25% lower at any load.

<sup>3</sup> 500 mm max. for 16 kN

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

<sup>5</sup> Do not use PWM voltage for speed control to avoid damaging the onboard electronics

<sup>6</sup> See previous page for cable definitions

Electrical Specifications		
Parameter		Electrak HD
Available input voltages <sup>(5)</sup>	[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 <sup>2</sup> (AWG)]	2 (14)
Signal leads cross section	[mm <sup>2</sup> (AWG)]	0.5 (20)
Standard cable lengths (Ca1) <sup>(6)</sup>	[m (in)]	0.3, 1.5, 5 (11.8, 59, 197)
Cable diameter (Ca2) <sup>(6)</sup>	[mm (in)]	7.5 (.295)
Flying lead length (Ca3) <sup>(6)</sup>	[mm (in)]	76 (3)
Stripped lead length (Ca4) <sup>(6)</sup>	[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 (1592)	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



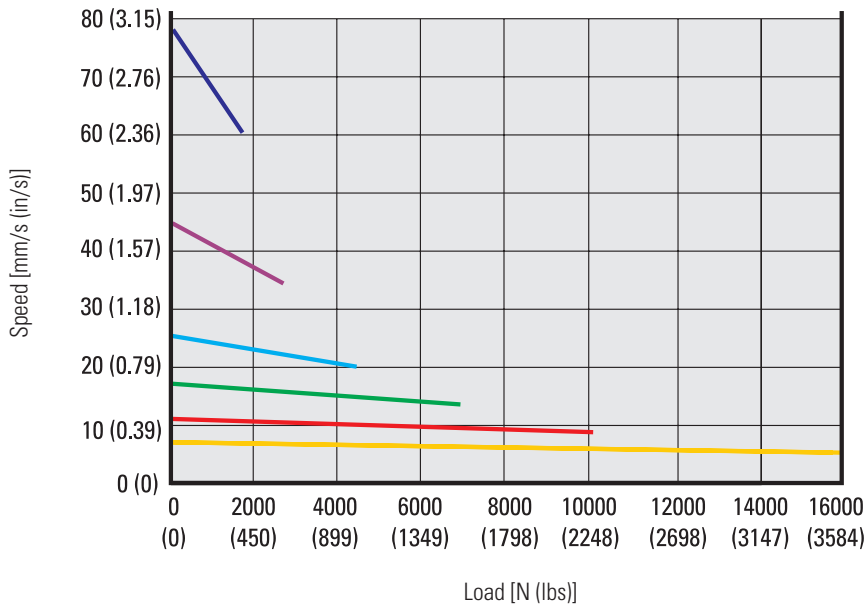
# How to Order the Electrak<sup>®</sup> HD

This ordering key provides a quick overview of the product versions available. It is important to consider many application details when selecting a product, including the loads, speeds and control options required, as well as the product environment and necessary accessories. More information can be found at [www.thomsonlinear.com/hd](http://www.thomsonlinear.com/hd).

Ordering Key								
1	2	3	4	5	6	7	8	9
<b>HD12</b>	<b>B026-</b>	<b>0300</b>	<b>LXX</b>	<b>2</b>	<b>M</b>	<b>M</b>	<b>S</b>	<b>D</b>
<p><b>1. Model and input voltage</b>            HD12 = Electrak HD, 12 Vdc            HD24 = Electrak HD, 24 Vdc            HD48 = Electrak HD, 48 Vdc</p> <p><b>2. Screw type, dynamic load capacity</b>            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)</p> <p><b>3. Ordering stroke length <sup>(1) (2)</sup></b>            0050 = 50 mm <sup>(3)</sup>            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</p> <p><small>(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.</small></p>					<p><b>4. Electrak Modular Control System options</b></p> <p>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</p> <p>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            SYN = LXX + synchronization option</p> <p><b>5. Cable length</b>            1 = 0.3 m long cables            2 = 1.5 m long cables            3 = 5.0 m long cables</p> <p><b>6. Rear adapter/mounting flange options</b>            A = rear mounting flange <sup>(4) (5)</sup>            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> <p><b>7. Front adapter options</b>            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</p> <p><b>8. Adapter orientation</b>            S = standard            M = 90 ° turned</p> <p><b>9. Connection options</b>            D = flying leads</p>			

# Performance Diagrams

Load vs. Speed <sup>(1)</sup>



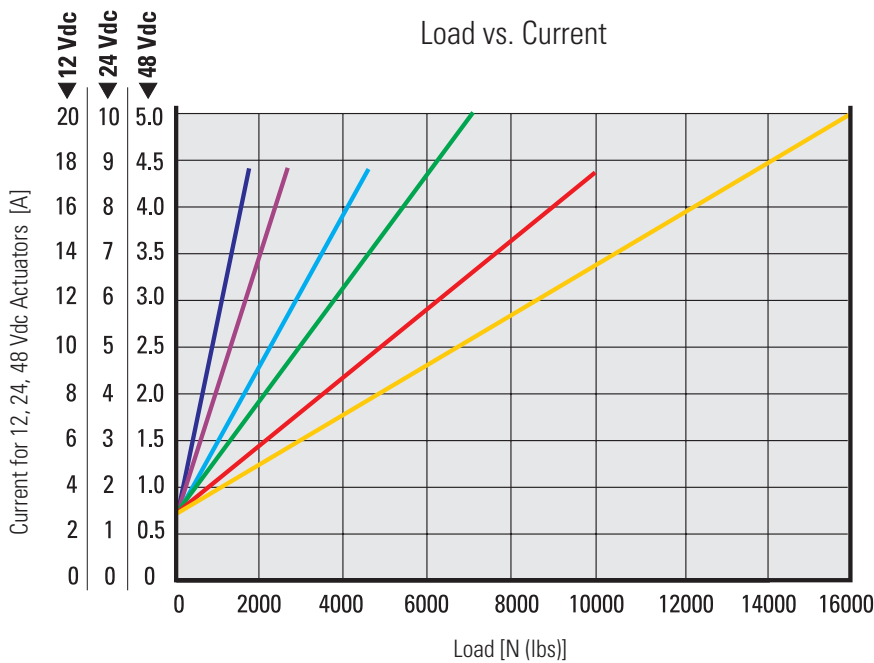
<sup>1</sup> Curves valid for all units except those with the synchronization option, where the speed at any load is 25% lower than for those without.

Load vs. Life

Load (kN)	Stroke (mm)	Life (cycles)
1.7	300	60,000
2.6		40,000
4.5		20,000
6.8		10,000
10		7,500
16		4,000

The life of an actuator is dependent upon the application in which it is used. The table above provides estimates based on a 300 mm stroke that is fully loaded throughout the entire cycle. If you have any questions regarding the life of the Electrak HD in your specific application, please contact Thomson Customer Support.

Load vs. Current



Screw Type and Dynamic Load Capacity

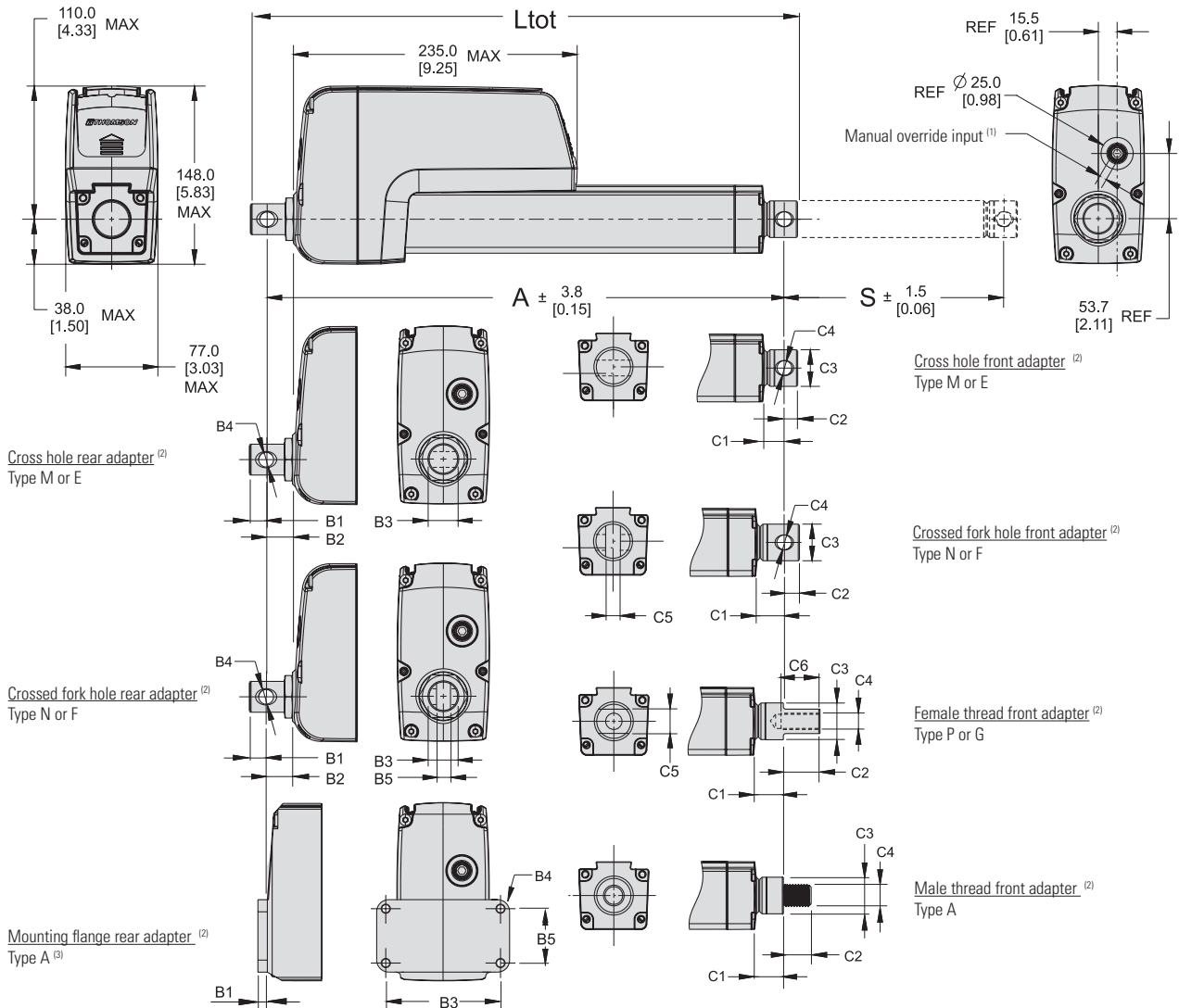
- ball screw, 1.7 kN (382 lbs) █
- ball screw, 4.5 kN (1012 lbs) █
- ball screw, 10 kN (2248 lbs) █
- ball screw, 2.6 kN (585 lbs) █
- ball screw, 6.8 kN (1529 lbs) █
- ball screw, 16 kN (3584 lbs) █

**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.



# Dimensions

Dimensions	Projection
mm [inch]	



Rear and Front Adapter Dimensions [mm (in)]

	Rear Adapter Types						Front Adapter Types						
	M	E	N	F	A <sup>(3)</sup>		M	E	N	F	P	G	A
B1	13.4 (0.53)				7.8 (0.31)	C1	see table on next page						16.5 (0.65)
B2	21.6 (0.85)				-	C2	10.9 (0.43)	12.9 (0.51)		30.0 (1.18)		20.0 (0.79)	
B3	25.4 (1.0)				95.0 (3.70)	C3	see table on next page						
B4	12.2 (0.48)	12.8 (0.51)	12.2 (0.48)	12.8 (0.51)	6.6 (0.26)	C4	12.2 (0.48)	12.8 (0.51)	12.2 (0.48)	12.8 (0.51)	M12 × 1.75	1/2-20 UNF-2B	M16 × 2
B5	-	-	8.2 (0.32)		45.0 (1.77)	C5	-	-	8.2 (0.32)		19.0 (0.75)		-
						C6	-	-	-	-	35.0 (1.38)		-

(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.

## Dimensions

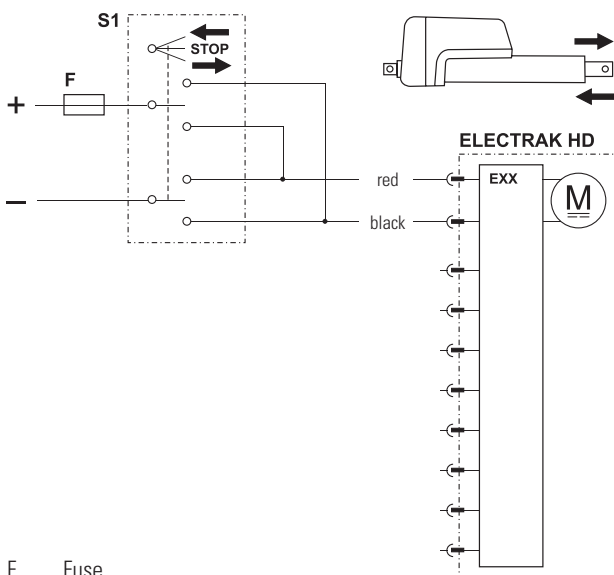
Maximum Dynamic Load and Stroke Relationships							
Maximum Dynamic Load (Fx) - kN (lbs.)	Total Length (Ltot), Retracted Length (A) and Adapter Dimensions [mm]	Ordering Stroke (S) [mm]					
		100 – 500	550 – 600	650 – 700	750 – 900	950 – 1000	
1.7 (382)	Ltot	A + B1 + C2					
	A	S + 150.9 + B2 + C1					
	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 (2012)	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 + 180.9 + B2 + C1		S + 182 + 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					
	A	S + 182 + B2 + C1					
	C1	Type M, E	24.0				
		Type N, F	27.0				
		Type P, G	24.9				
C3	35.0						



# Control Options

Electrak® HD electric linear actuators feature the Electrak Modular Control System, and each unit is shipped with the Electronic Monitoring Package. A generous offering of optional control and feedback features can be configured to fit most applications – all within the same design envelope. Details for each control option and its wiring are described on the following pages. Please contact customer support for more information at [www.thomsonlinear.com/cs](http://www.thomsonlinear.com/cs).

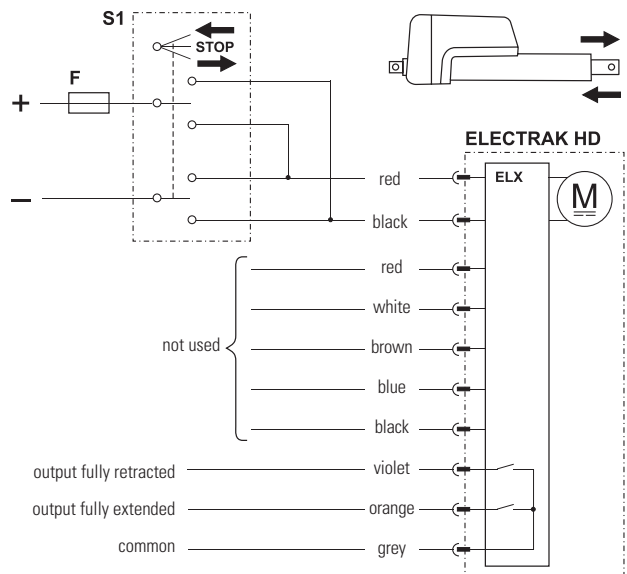
Control Option Type EXX		
Actuator supply voltage	[Vdc]	
HD12		9 - 16
HD24		18 - 32
HD48		-
Actuator current draw	[A]	see page 19



F Fuse  
S1 Double pole double throw switch

Control option EXX contains all of the basic Electronic Monitoring Package features described on page 7, 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 ELX		
Actuator supply voltage	[Vdc]	
HD12		9 - 16
HD24		18 - 32
HD48		-
Actuator current draw	[A]	see page 19
Output contact type		potential free
Limit switch max. switch voltage	[Vdc/ac]	30/120
Limit switch max. switch current	[mA]	100

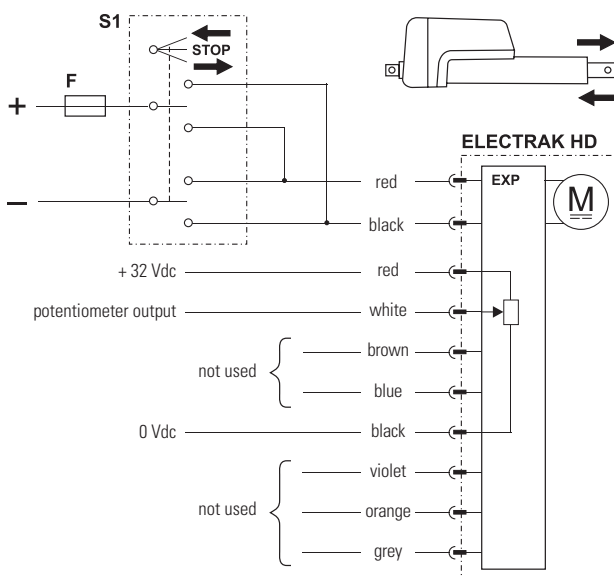


F Fuse  
S1 Double pole double throw switch

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.

## Control Options

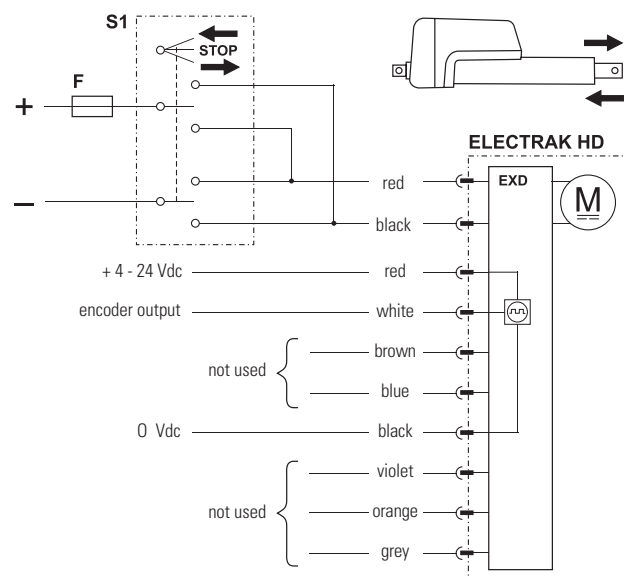
Control Option Type EXP		
Actuator supply voltage	[Vdc]	
HD12		9 - 16
HD24		18 - 32
HD48		-
Actuator current draw	[A]	see page 19
Potentiometer type		wirewound
Potentiometer max. input voltage	[Vdc]	32
Potentiometer max. power	[W]	1
Potentiometer linearity	[%]	± 0.25
Potentiometer output resolution	[ohm/mm]	
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 EXP works as option EXX but also has an analog (potentiometer) output that will provide feedback on the extension tube position.

Control Option Type EXD		
Actuator supply voltage	[Vdc]	
HD12		9 - 16
HD24		18 - 32
HD48		-
Actuator current draw	[A]	see page 19
Encoder type		hall effect
Encoder input voltage	[Vdc]	4 - 24
Encoder output voltage levels	[Vdc]	
low (logical zero), typical / max.		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



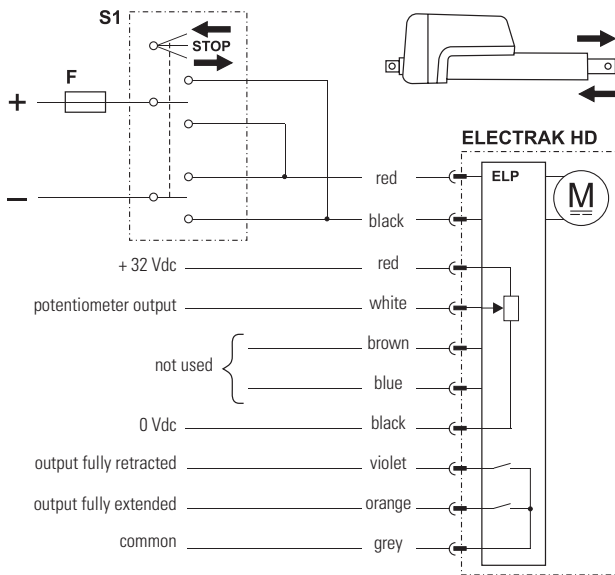
F Fuse  
S1 Double pole double throw switch

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



# Control Options

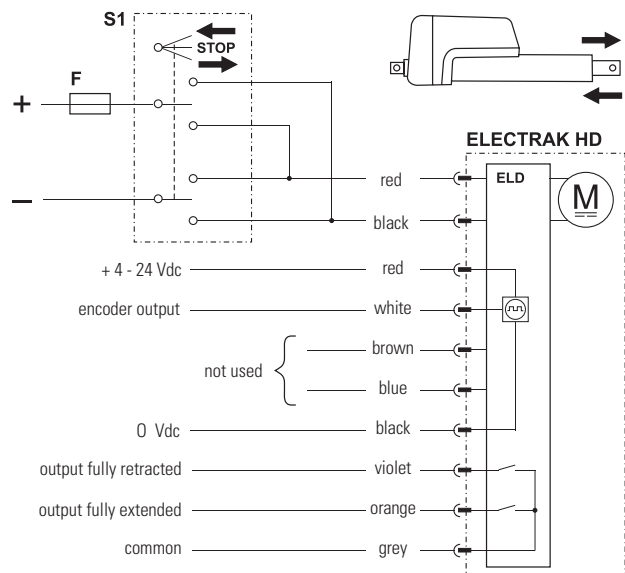
Control Option Type ELP		
Actuator supply voltage	[Vdc]	
HD12		9 - 16
HD24		18 - 32
HD48		-
Actuator current draw	[A]	see page 19
Output contact type		potential free
Limit switch max. switch voltage	[Vdc/ac]	30/120
Limit switch max. switch current	[mA]	100
Potentiometer type		wirewound
Potentiometer 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.

Control Option Type ELD		
Actuator supply voltage	[Vdc]	
HD12		9 - 16
HD24		18 - 32
HD48		-
Actuator current draw	[A]	see page 19
Output contact type		potential free
Limit switch max. switch voltage	[Vdc/ac]	30/120
Limit switch max. switch current	[mA]	100
Encoder type		hall effect
Encoder input voltage	[Vdc]	4 - 24
Encoder output voltage levels	[Vdc]	
low (logical zero), typical / max.		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

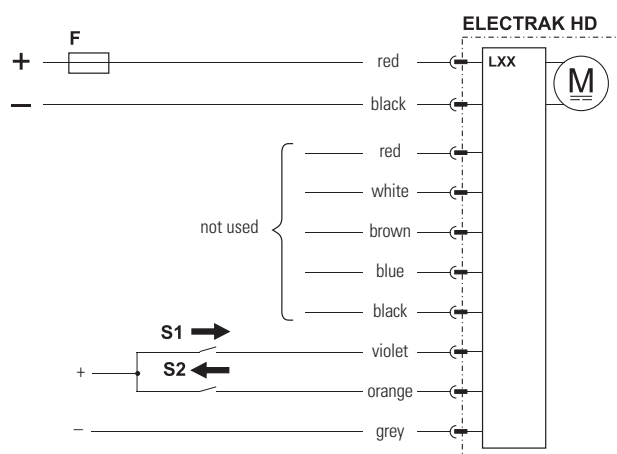
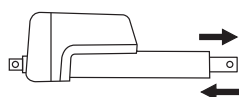


F Fuse  
S1 Double pole double throw switch

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.

## Control Options

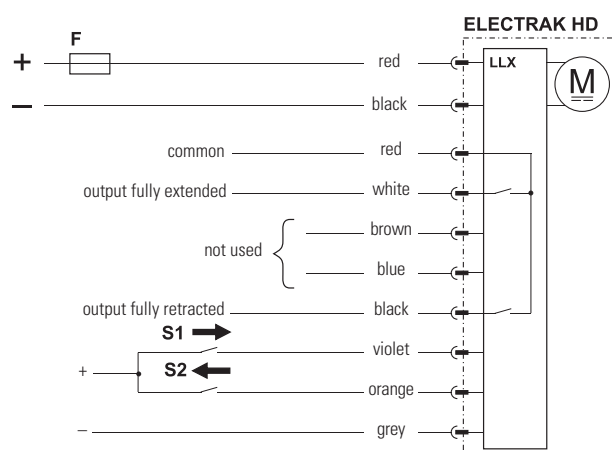
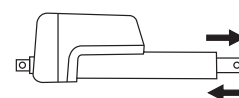
Control Option Type LXX		
Actuator supply voltage	[Vdc]	
HD12		9 - 16
HD24		18 - 32
HD48		36 - 64
Actuator current draw	[A]	see page 19
Extend / retract input voltage	[Vdc]	
HD12(24)		9 - 32
HD48		12 - 64
Extend / retract input current	[mA]	6 - 22



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	[Vdc]	
HD12		9 - 16
HD24		18 - 32
HD48		36 - 64
Actuator current draw	[A]	see page 19
Output contact type		potential free
Limit switch max. switch voltage	[Vdc/ac]	30/120
Limit switch max. switch 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.

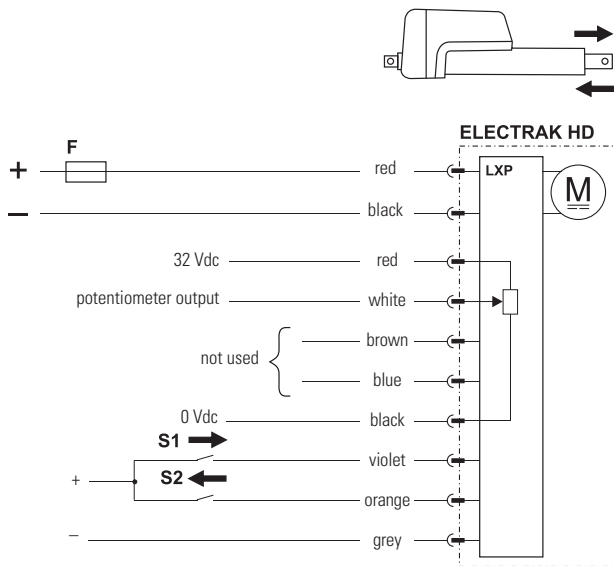


# Control Options

Control Option Type LXP		
Actuator supply voltage	[Vdc]	
HD12		9 - 16
HD24		18 - 32
HD48		36 - 64
Actuator current draw	[A]	see page 19
Potentiometer type		wirewound
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
Extend / retract input voltage	[Vdc]	
HD12(24)		9 - 32
HD48		12 - 64
Extend / retract input current	[mA]	6 - 22

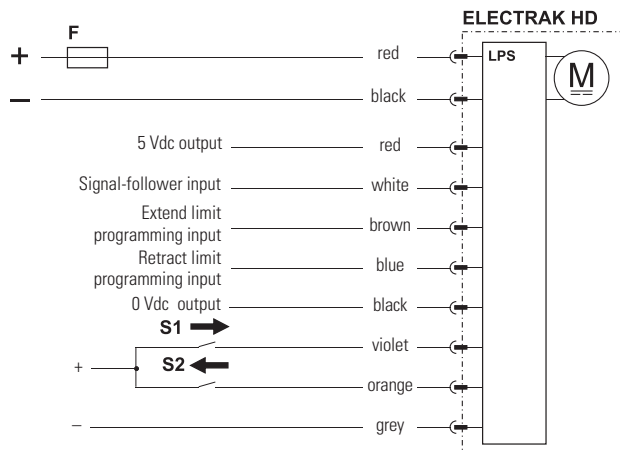
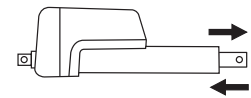
Control Option Type LPS		
Actuator supply voltage	[Vdc]	
HD12		9 - 16
HD24		18 - 32
HD48		-
Actuator current draw	[A]	see page 19
Signal-follower input voltage	[Vdc]	0.5 - 4.5
Signal-follower max. output current	[A]	0.8
Signal-follower movement	[mm/Vdc]	stroke* [mm] / 4
Signal-follower repeatability	[± mm]	0.1
Programming inputs voltage	[Vdc]	
HD12(24)		9 - 32
HD48		-
Extend / retract input voltage	[Vdc]	
HD12(24)		9 - 32
HD48		-
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 LXP works as option LXX but also has an analog (potentiometer) output that will provide feedback on the extension tube position.



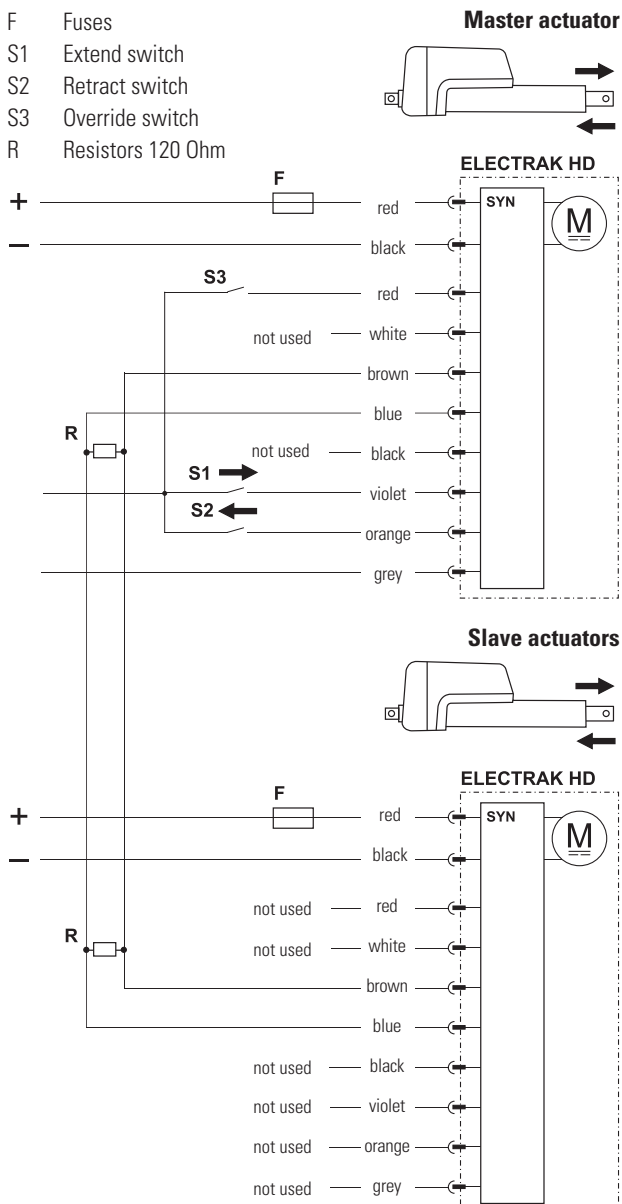
- F Fuse
- S1 Extend switch
- S2 Retract switch

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.

## Control Options

Control Option Type SYN		
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 +
Max. actuator speed difference	[%]	25

- F Fuses  
 S1 Extend switch  
 S2 Retract switch  
 S3 Override switch  
 R Resistors 120 Ohm



Control option SYN works as option LXX but also has a synchronization feature, allowing two or more actuators having the SYN option to run in integrated motion.

When using the low-level extend and retract inputs on the master actuator, the slave(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:

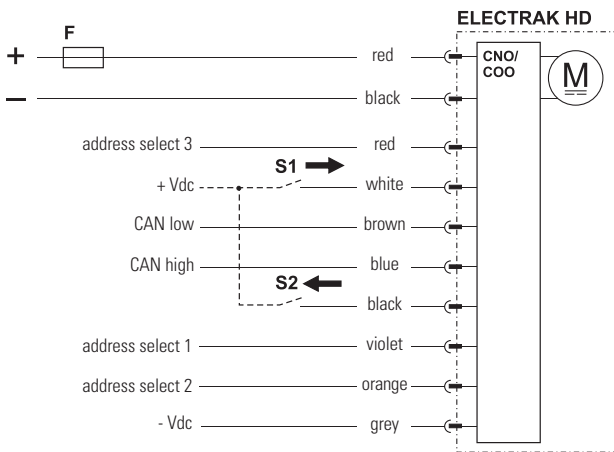
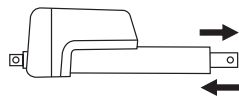
- Ensure that supply voltage to each actuator is within  $\pm 1.0$  V.
- Uneven loading between the actuators is not recommended, but the synchronization option can withstand its effects up to a 25% speed loss.
- For units with the synchronization option, the speed at a given load is 25% lower than for those without. This is true irrespective of the unit being in synchronization or override mode, or simply run individually.
- If one actuator encounters an overload condition, 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.
- If power is lost at any time to any actuator, the actuators still powered will continue their last commanded move until told to stop, either by an individual current overload trip, or a stop signal sent from the master actuator.
- If communication is lost (i.e. brown/blue wires cut), the slaves will continue their last commanded move until they reach end of stroke or trip current overload. The master will continue its last commanded move unless commanded to stop with the switching leads, reaching end of stroke, or tripping current overload.
- After a large number of mid-stroke movements, the time difference between each unit receiving a signal to move (master vs. slave) will add to small variances in when the units start and stop. Since they are designed to run at the same speed, these small differences amount to a variance of position over time – even when load is applied. To address this concern, Thomson suggests running the units either to a fully extended or fully retracted position each cycle to re-align the units with each other to take out these added variances.
- In order to give the master and slave(s) enough time to communicate there must be at least 250 ms between each start and stop command.



# Control Options

Control Option Type CNO and COO		
Actuator supply voltage	[Vdc]	
HD12		9 - 16
HD24		18 - 32
HD48		36 - 64
Actuator current draw	[A]	see page 19
Command data includes:		
<ul style="list-style-type: none"> <li>• position</li> <li>• speed</li> <li>• current</li> </ul>		
Feedback data includes:		
<ul style="list-style-type: none"> <li>• position</li> <li>• speed</li> <li>• current</li> <li>• other diagnostic information</li> </ul>		
Extend / retract input voltage	[Vdc]	
HD12(24)		9 - 32
HD48		12 - 64
Extend / retract input current	[mA]	6 - 22

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 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.



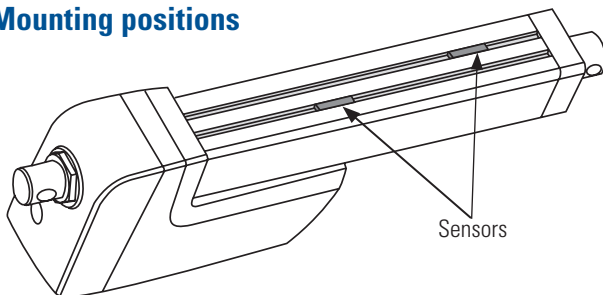
- F Fuse
- S1 Manual extension switch (optional)
- S2 Manual retraction switch (optional)

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.

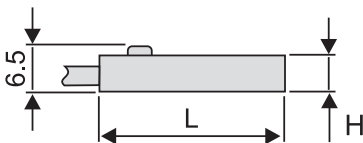
## Accessories

Limit Switches for Cover Tube Mounting			
Sensor type	solid state	reed switch	
Contact type	normally open (N.O.)		
Output type	PNP	contact	
Voltage [VDC/AC]	10 - 30 / -	5 -120 / 5 -120	
Max. current [mA]	100		
Hysteresis [mm]	1.5	1.0	
Operating temperature [°C]	- 25 to + 85	- 25 to + 70	
Lead cross section [mm²]	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

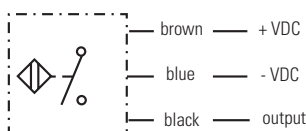


### Dimensions [mm]

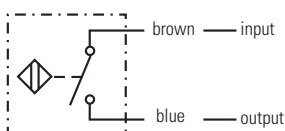


### Connection

Solid state



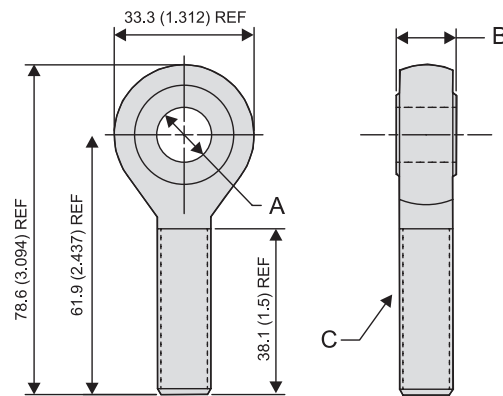
Reed switch



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).

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)
954-9371	1.5 m Power and 3-Wire Signal (EXP, EXD)
954-9372	5.0 m Power and 3-Wire Signal (EXP, EXD)