



## *Industrial Linear Actuators*



## Thomson Electrak and Performance Pak Industrial Linear Actuators

Danaher Motion pioneered the development of Thomson ball screw actuators for NC machine tools and jet aircraft landing gears, wing flap control, wing sweeps, thrust reversers...all the way to the docking platform and manipulator arm on the space shuttle.

The first generation of general purpose actuators were developed for remote push button control of accessory drives on garden tractors and automated farm equipment.

The Industrial Actuators presented in this catalog represent proven design concepts that you'll find in the entire Electrak and PPA series. From light load E-050s to the high performance Electrak 205, capable of handling loads in excess of 1000 lbs, and 10 times the life of other available actuators.

We have brought together the combined offering of the clevis to clevis mount Electrak series, and the trunnion mount PPA units, to represent the most versatile selection of industrial actuators available.

Thomson Industrial Actuators...rugged, reliable remote linear motion control with the push of a button.

### Features and Benefits:

#### Easy Wiring

Control leads are safely and easily wired. See specific model descriptions for details.

#### Compact Design

An Electrak actuator with a four inch stroke length can produce 1500\* pounds of force from a 12" package. Electrak 1 series actuators fit small areas with package lengths as short as six inches.

#### Maintenance-free

Since all adjustments and lubrication are made during assembly, no maintenance is required or recommended. Consistent, repeatable performance is provided for the entire lifetime of the actuator.

#### Bidirectional

Electrak and PPA actuators can push and pull loads ranging from one pound to 3/4\* of a ton, and can extend up to 36 inches. With MCS-2000 series controls, you can create the actuator control system to meet your particular motion control requirements..

#### Rugged and reliable

Electrak actuators incorporate strong, high quality components to assure trouble-free service. Rugged spur gearing, aircraft quality lubricants and high performance motors provide the maximum life and value for the user. Gasketed and sealed throughout for maximum protection. Stainless steel or aluminum extension tubes prevent corrosion. Cover tube stiffeners increase load support. Thermal overload switch protects motors.

#### Versatile

Motors used on Electrak and PPA actuators utilize thermal switches in their windings to shut the actuator off in case of overheating. Reset is automatic after the motor has cooled. A standard overload clutch automatically ratchets if the load is too great or at the end of a stroke. Again, reset is automatic upon load reduction or direction reversal. With their compact size, Electrak actuators can be located in confined areas, yet will move loads from 25 to 1500\* pounds. Linear actuators will hold their loads with no power draw. Stroke lengths of 1 to 36 inches are available and speeds are as high as two inches per second. Weatherproofing makes these actuators ideal for use on outdoor equipment. Actuators are easy to apply and easy to install and offer advantages over mechanical and hydraulic systems in many linear motion applications. They are self-contained, rugged, and durable, making them ideal for almost any lift, push, or pull application.

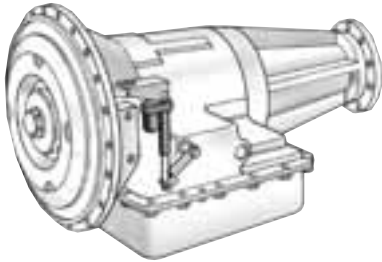
#### Easy Installation

Actuators are quickly and easily mounted by several methods and require only 2 wires for operation.

\* Consult applications for loads above 1000 lb.

## Industrial Linear Actuator Applications

Industrial Linear Actuators provide a wide range of applications...



### Transmission shift

Actuators provide "shift by wire" instead of cumbersome mechanical linkages, binding cables or messy hydraulics. Feedback, built into the actuator, can be used to make multiple step points or shift positions.



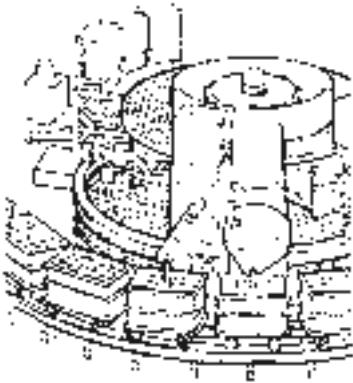
### Floor Sweeper/Scrubber

Electrak actuators apply the downforce on the squeegee to pick up the water during cleaning.

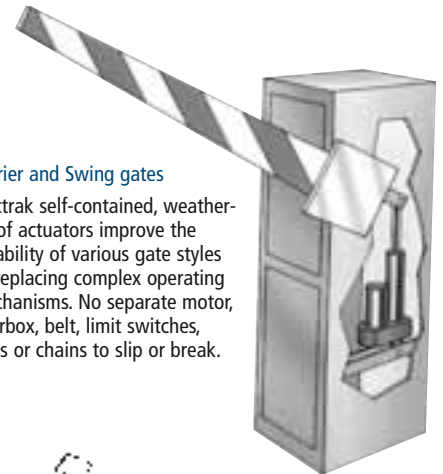


### Adjusting

A single PPA actuator coupled with linkages will accommodate all the required positions of a motorized hospital bed.

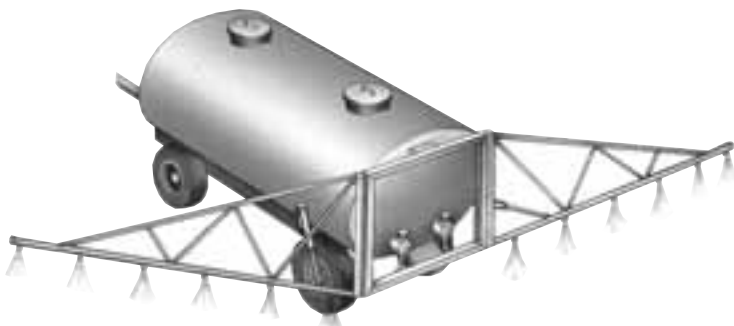


Automatic operation of dispensing valves are easily accomplished with reliable, repeatable, electro-mechanical linear actuators.



### Barrier and Swing gates

Electrak self-contained, weather-proof actuators improve the reliability of various gate styles by replacing complex operating mechanisms. No separate motor, gearbox, belt, limit switches, belts or chains to slip or break.



### Sprayer booms and heads

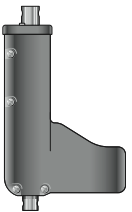










The load limiting clutch prevents damage to the actuator or equipment when extending or retracting the spray booms. Sprayer nozzles can be precisely positioned.






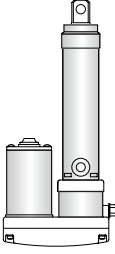
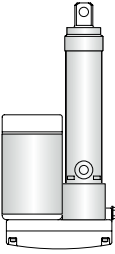






### Positioning

The PPA actuator combines all-weather design and dependability for trouble-free actuation of residential and commercial satellite dishes.

## Quick Reference Guide

	Electrak E050/Q050	Electrak E150	Electrak 1			Electrak 2	Electrak 5
							
Input Voltage	12, 24 VDC	12, 24, 36 VDC, 115 VAC	12VDC 24VDC	12VDC 24VDC	12VDC 24VDC	12 VDC	115VAC 230VAC
Load Capacity (lbs.)	25, 50, 112	110, 225, 450	25 75	25 75	25 75	250	500 1000, 1500*
Stroke Length (inches)	2, 4, 6, 8	1, 2, 4, 6, 8, 10, 12, 14, 16	2, 4, 6	2, 4, 6	2, 4, 6	4, 8, 12 18*, 24*	4, 8, 12, 18, 24
Type of Lead Screw	Acme screw	Acme screw	Acme screw	Acme screw	Acme screw	Acme screw	Ball screw
Duty Cycle at Full Load	25%	25%	25%	25%	25%	25%	25%
Load Limiting Clutch	Yes	No	No	No	No	Yes	Yes
Limit Switches	Fixed end of Stroke Standard	Optional adjustable end of stroke	Fixed	Only with MCS-2007 control	Fixed	No	No
Feedback	Optional Potentiometer	Optional Potentiometer	No	Potentiometer	No	No	No
Motor Overload Protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Restraining Torque (max)	None - internally restrained	None - internally restrained	20 lb. in.	20 lb.in.	20 lb.in	100 lb. in.	100 lb. in.
Environment	IP56	IP56	Washdown 96 hour salt spray	Washdown 96 hour salt spray	Washdown 96 hour salt spray	Washdown 96 hour salt spray	Oily, damp, dirty Outdoors with drip shield over motor & proper grounding & ground fault protection
Standard Control	DE14-1E - controls 1 actuator	DF14-1F - controls 1 actuator	MCS-2005 (115VAC) MCS-2006 (230VAC)	MCS-2007 (115VAC) MCS-2008 (230VAC)	MCS-2005 (115VAC) MCS-2006 (230VAC)	6932-101-054	MCS-2041 (115VAC) MCS-2042 (230VAC)
Optional Control(s)	DE14-2E - controls 2 actuators	DF14-2F - controls 2 actuators		 MCS-2015 MCS-2025		 Relay Supplied by Customer	
Catalog Page	D-8	D-12	D-14	D-14	D-14	D-18	D-20

## Quick Reference Guide

Quick Reference Guide					Special Purpose Actuators		
Electrak 10	Electrak 100	Electrak 205	Performance Pak Actuators (DC)	Performance Pak Actuators (AC)	T-90	T-130	MovoAct
							
12VDC 24VDC	24VDC	115VAC 230VAC	12,24,36,90 VDC	110,220 VAC	Dependant on motor/ control selected	Dependant on motor/ control selected	12, 24VDC 115, 230VAC
500 1000, 1500*	500 1000, 1500*	500 1000, 1500*	750 1500	500 1500	2250	9000	1000
4, 8, 12, 18*, 24*	4, 8, 12, 18, 24	4, 8, 12 18, 24	4, 8, 12 18, 24, 36	4, 8, 12 18, 24, 36	59	78	4,8,12,18,24
Ball screw	Ball screw	Ball screw	Ball screw	Ball screw	Ball screw	Ball screw	Acme or Ball screw
25%	25%	25%	30%	30%	100%	100%	25%
Yes	Yes	No	Yes	Yes	No	No	Yes
No	Adjustable	Adjustable	Optional	Optional	Optional	Optional	Optional
No	Potentiometer	Potentiometer	Optional	Optional	Optional	Optional	Optional
Yes	Yes	Yes	Yes	Yes	No	No	Yes
100 lb. in.	100 lb. in.	100 lb. in.	100 lb. in.	100 lb. in.	N/A	N/A	N/A
Washdown 96 hour salt spray	-	-	Washdown 96 hour salt spray	Oily, damp, dirty. Outdoors with drip shield over motor & proper grounding & ground fault protection	-	-	Indoor
MCS-2025 	MCS-2035 	MCS-2051 (115VAC) MCS-2052 (230VAC) 	P/N 7820406 110VAC in 90 VDC out Variable Speed for 90 VDC Units Only	-	-	-	DF14-1F MCS-2015 MCS-2041
MCS-2015	MCS-2015MCS-20						
D-22	D-24	D-26	D-30	D-35	D-41	D-42	D-43

## Industrial Linear Actuators Application Analysis Worksheet

For selection assistance, fax to your local Danaher Motion distributor or Danaher Motion at 1-800-445-0329.

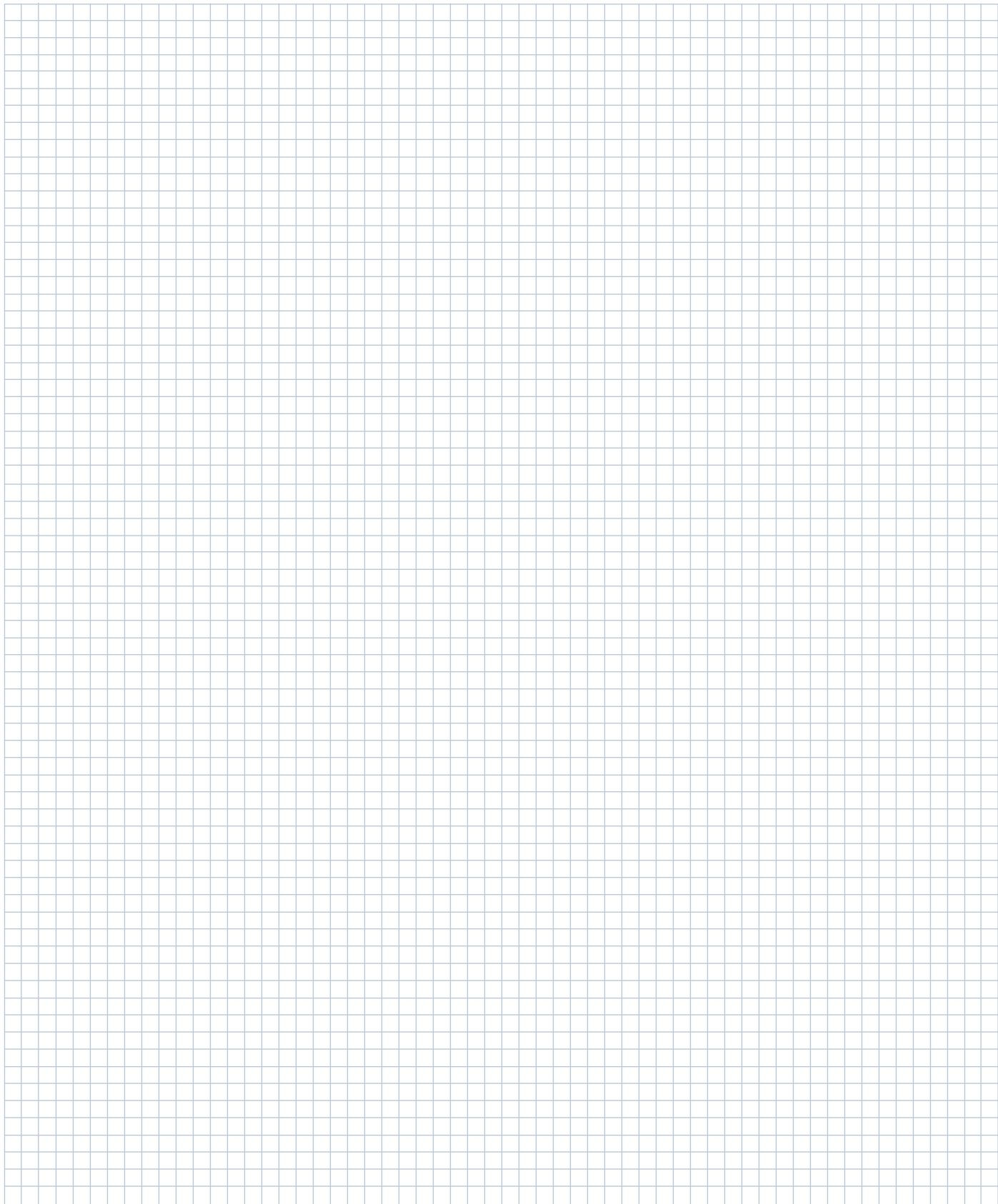
Date \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ ZipCode \_\_\_\_\_  
Name \_\_\_\_\_  
Title \_\_\_\_\_ Phone (\_\_\_\_) \_\_\_\_\_  
Fax (\_\_\_\_) \_\_\_\_\_

### Basic Application

Load \_\_\_\_\_ lbs.  
Side Load \_\_\_\_\_ lbs.  
Speed \_\_\_\_\_ inches per second  
Duty Cycle \_\_\_\_\_ % of time running versus time still  
Stroke length \_\_\_\_\_ inches  
Life \_\_\_\_\_ inches or cycles  
Environmental  Clean  Damp  Oil splash  Outdoors  
Power available \_\_\_\_\_ VAC  
\_\_\_\_\_ VDC  
Quantity \_\_\_\_\_

Please use the worksheet to the right for drawings and additional information..

**NOTES:**



\* Trademark of Danaher Motion. DANAHER MOTION is registered in the U.S. Patent and Trademark Office and in other countries.

**12 and 24 VDC**  
**30, 60, 112 lb. load capacities**



## Features

- Short retracted length
- Low cost
- Quiet operation
- IP-56 rated for outdoor use
- Durable, lightweight, corrosion resistant plastic housing
- Available DC voltages: 12 or 24
- Estimated life at rated load is 40,000 cycles minimum

## Compact, low cost plastic housing

The Electrak E050 actuator is the new compact, quiet, low priced actuator suitable for a variety of markets and applications. This feature packed actuator has a very short retracted length for applications where space is a premium:

- It is designed to be quiet for medical or office applications.
- It has built in limit switches for end of stroke protection and a clutch for mid stroke protection.
- The colors are molded into the plastic to both eliminate the need for paint and touchup of scratches.
- The actuator has a breather tube in the wiring harness to allow the actuator to operate without drawing water through the seals on the cover tube.
- It is available with a control and pendant for one or two actuators.

The entire actuator has been designed for ease of installation, light weight, quiet operation, no maintenance and low cost.

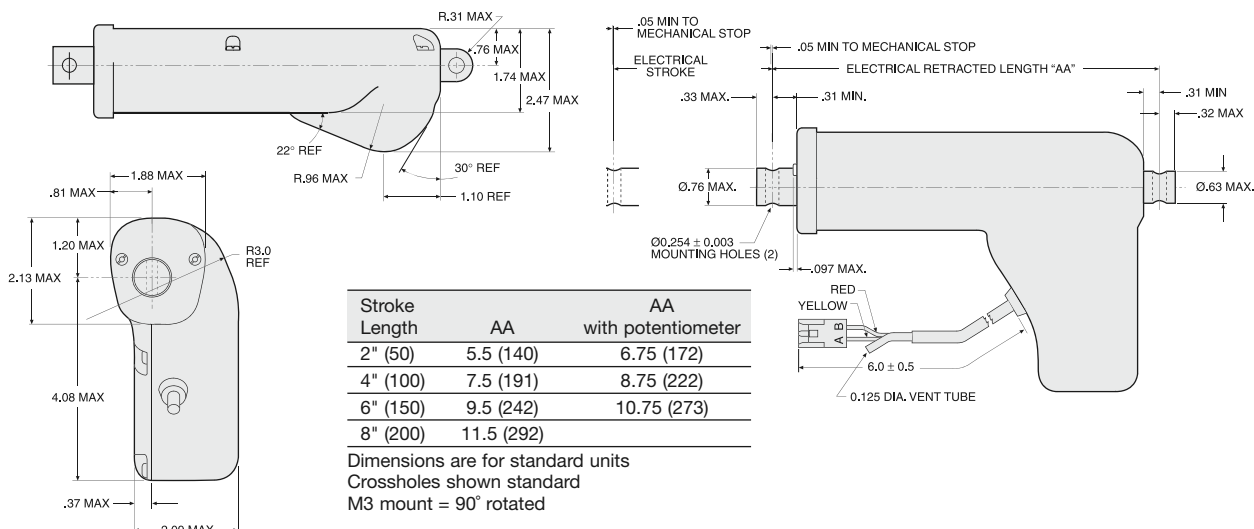
## Typical applications

- Raising and lowering leg supports on powered wheelchairs
- Boat seat back adjustment
- Squeegee lift on floor cleaner
- Throttle control on salt spreader
- Positioning/hiding stereo speakers in autos
- Air valves/damper controls
- Special effects on commercial video games
- Jet ski trim actuator

## Controls

DE14 series actuator controls operate Thomson E050 actuators. Available with one or two 24 VDC outputs, the DE14 has a handset to manually control bi-directional motion on each of its control outputs independently. For details see page D-47.

## Dimensions





**Specifications**

	DE12-17W41-XX	DE12-17W42-XX	DE12-17W44-XX
Dynamic load	112 lbs. max.	60 lbs. max.	30 lbs. max.
Static Load	224 lbs. max.	120 lbs. max.	60 lbs. max.
Speed	.48"/sec @ no load .37"/sec @ 112 lbs.	.95"/sec @ no load .72"/sec @ 60 lbs.	1.9"/sec @ no load 1.45"/sec @ 30 lbs.
End play	0.060" max less clevis	0.060" max less clevis	0.060" max less clevis
Restraining torque		Restrained internally	
Input voltage		12 or 24 VDC	
Amperage (12 VDC)		3.8 amp max. at rated dynamic load	
End of stroke		Fixed limit switches	
Mid stroke protection		Load limiting clutch	
Thermal protection		Internal motor breaker	
Lead wires		18 AWG PVC 800	
Connectors		Packard Electric Pack-Con	
Power switch		Optional DPDT	
Temperature		-30° to +180° F (-34° to 82° C)	
Environment		12 or 24 VDC	
Duty cycle		25% @ rated load and @ 70° F	
Anti-rotation		Tube can rotate max. of 7°	

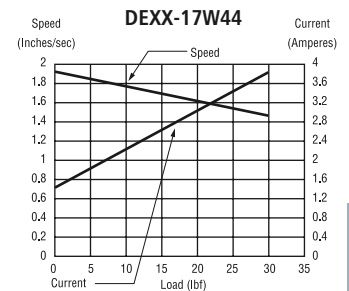
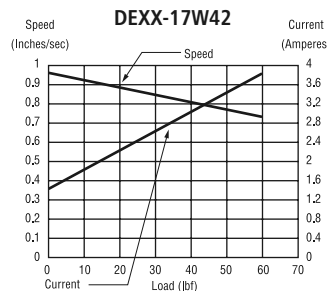
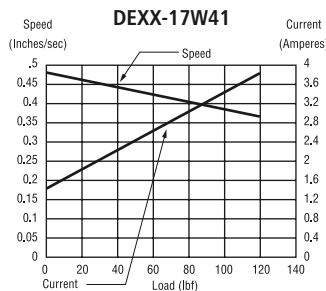
**Performance Curves**

**DE 12 Motor Curve**

Input voltage: 10-16 volts

Nominal performance at 12 VDC and 70°F (21°C)

Amperage: 3.8 amps max. at rated dynamic load and 70°F (21°C) ambient

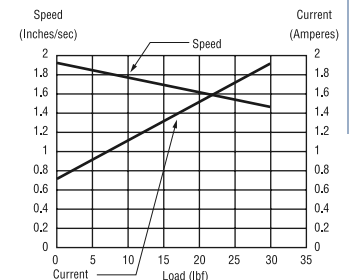
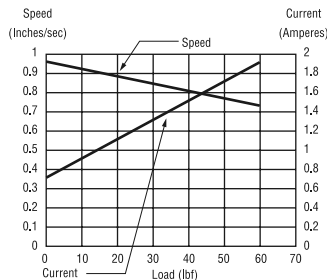
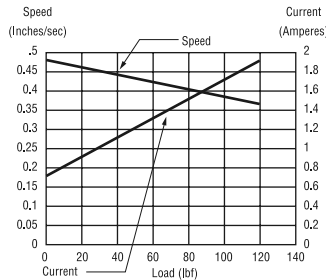


**DE 24 Motor Curve**

Input voltage: 20-28 volts

Nominal performance at 24 VDC and 70°F (21°C)

Amperage: 1.9 amps max. at rated dynamic load and 70°F (21°C) ambient



**How To Order**

**D E X X - 1 7 W 4 X - X X X X X X X**

- Motor Type: D = DC
- Actuator Type: E = E050
- Motor Voltage: 12 or 24
- = OEM Version; D=Distributor Version
- Gear Ratio: 17:1
- Screw Type: W = Worm
- Screw Diameter: (tenths of an inch)
- Screw Lead: (tenths of an inch) 1,2,4
- Stroke Length: Inches

- Other Options: N = None, W = White Housing
- Front Mounting: H = Crosshole
- Rear Mounting: H = Crossholes are shown above, M = M3, rotated 90°
- Feedback: N = None, P = Potentiometer
- Limit Switches: F = Fixed Limits

**Example: DE12-17W41-04FNHHN**



12 and 24 VDC  
30, 60, 112 lb. load capacities



## Features

- Short retracted length
- Low cost
- Quiet operation
- IP-51 rating standard
- Durable, lightweight, corrosion resistant plastic housing
- Available for 12 or 24 VDC input
- Estimated life at rated load is 40,000 cycles minimum
- Optional IP-56 sealing

## Trouble-free, reliable motion control

The Electrak Q050 actuator is the new compact, ultra-quiet low priced actuator specifically designed for office, healthcare or consumer applications. This feature-packed actuator can be ordered with a hand held pendant control to make installation and operation plug and play.

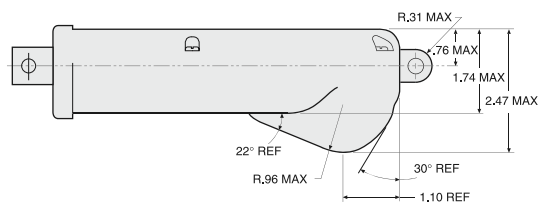
- Designed to be quiet for medical or office applications.
- Built in limit switches for end of stroke protection.
- Built in overload clutch for mid-stroke stall protection.
- Short retracted length for applications where space is a premium.
- Color molded into the plastic housing to eliminate the need for paint and for touch up of scratches.
- Available with control and hand held pendant for one or two actuators.

The entire actuator and control has been designed for ease of installation, quiet operation, no maintenance and low cost.

## Controls

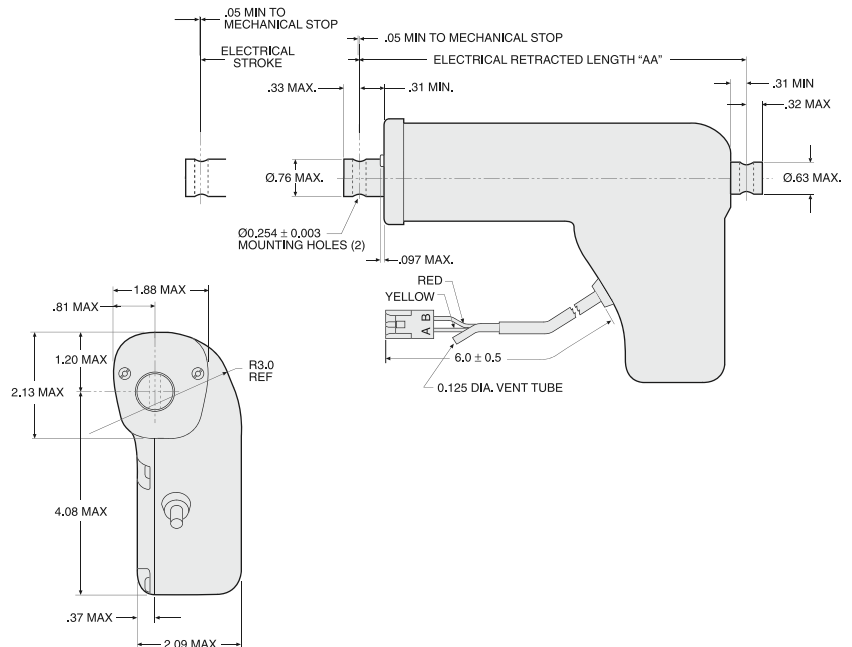
DE14 series actuator controls operate Thomson Q050 actuators. Available with one or two 24 VDC outputs, the DE14 has a handset to manually control bi-directional motion on each of its control outputs independently. See page D-47.

## Dimensions



Stroke Length	"AA"	"AA" With Potentiometer
2"	5.5	6.75
4"	7.5	8.75
6"	9.5	10.75
8"	11.5	-

Dimensions are for standard units.  
Crossholes shown std.  
M3 mount=90° rotated



**Specifications**

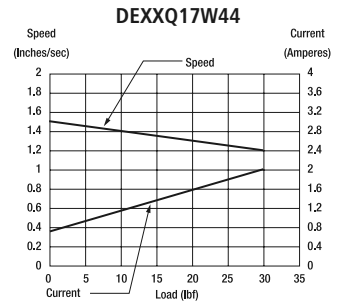
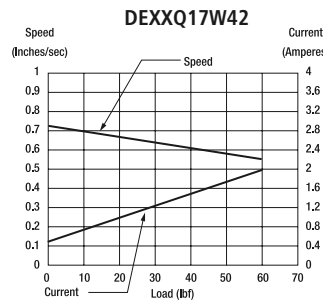
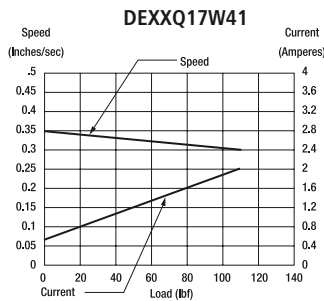
	DE12Q17W41-XX	DE12Q17W42-XX	DE12Q17W44-XX
Dynamic load	112 lbs. max.	60 lbs. max.	30 lbs. max.
Static Load	224 lbs. max.	120 lbs. max.	60 lbs. max.
Speed	.36"/sec @ no load .30"/sec @ 112 lbs.	.70"/sec @ no load .55"/sec @ 60 lbs.	1.5"/sec @ no load 1.2"/sec @ 30 lbs.
End play	0.060" max less clevis	0.060" max less clevis	0.060" max less clevis
Restraining torque	Restrained internally		
Input voltage	12 or 24 VDC		
Amperage (12 VDC)	2.5 amp max. at rated dynamic load		
End of stroke	Fixed limit switches		
Mid stroke protection	Load limiting clutch		
Thermal protection	Internal motor breaker		
Lead wires	18 AWG PVC 800		
Connectors	Packard Electric Pack-Con		
Power switch	Optional DPDT		
Temperature	-30° to +180° F (-34° to 82° C)		
Environment	IP-51 standard		
Duty cycle	25% @ rated load and @ 70° F		
Anti-rotation	Tube can rotate max. of 7°		

**Performance Curves**

**DE12Q Motor Curve**  
 Input voltage: 10–16 volts

Nominal performance at 12 VDC and 70°F (21°C)

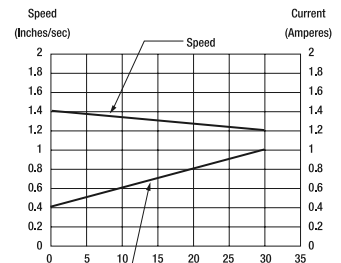
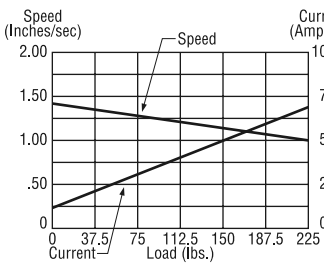
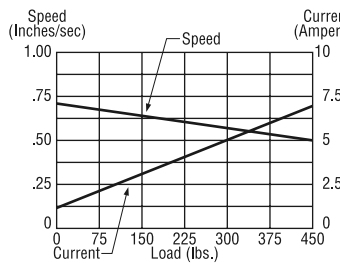
Amperage: 2.5 amps max. at rated dynamic load and 70°F (21°C) ambient



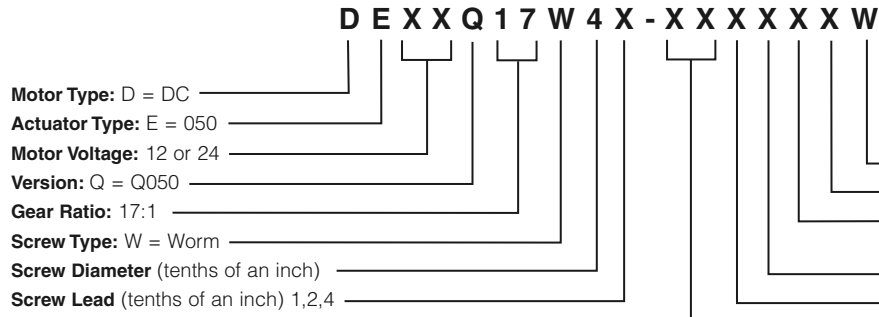
**DE24Q Motor Curve**  
 Input voltage: 20–28 volts

Nominal performance at 24 VDC and 70°F (21°C)

Amperage: 1.2 amps max. at rated dynamic load and 70°F (21°C) ambient



**How To Order**



**Customer Special\*\* and Drawing Ref. No.**

\*\*If actuator is a customer special then the 15th and 16th characters are always numeric (drawing ref.) instead of alpha. The last 2 characters are alpha for customer identification.

- Example: DE12Q17W41-04FNHHW**
- Other Options:** N = None, W = White Housing
  - Front Mtg.:** H = Crosshole
  - Rear Mtg.:** H = Crossholes are shown above, M3 = Rotated 90°
  - Feedback:** N = None, P = Potentiometer
  - Limit Switches:** F = Fixed Limits
  - Stroke Length:** Inches



\* Trademark of Danaher Motion. DANAHER MOTION is registered in the U.S. Patent and Trademark Office and in other countries.

## 12 and 24 VDC 110, 225, 450 lb. load capacities



### Features

- Low cost
- Quiet operation
- Optional adjustable limit switches
- IP-56 rated for outdoor use
- Durable, lightweight, plastic housing
- Available DC voltages: 12 or 24
- Estimated life at rated load is 40,000 cycles minimum

### Compact, low cost plastic housing

The Electrak 150 is the first of a new series of low priced, quiet actuators with different load and speed ranges.

There are a number of design features that make this actuator different. The optional limit switches are designed to operate with fewer parts. The plastic cover is designed to be recyclable. The actuator has a breather tube in the wiring harness to allow the actuator to operate without drawing water through the seals on the cover tube. The colors are molded into the plastic to both eliminate the need for paint and touchup of scratches. The anodized aluminum cover tube is corrosion resistant and also hides scratches. The extension tube is stainless steel and the front and rear adapters are zinc die castings for corrosion resistance. All of the thrust is resolved through the screw with the plastic housing providing environmental protection but carrying no load. The entire actuator has been created for ease of installation, quiet operation, no maintenance, light weight, and low cost.

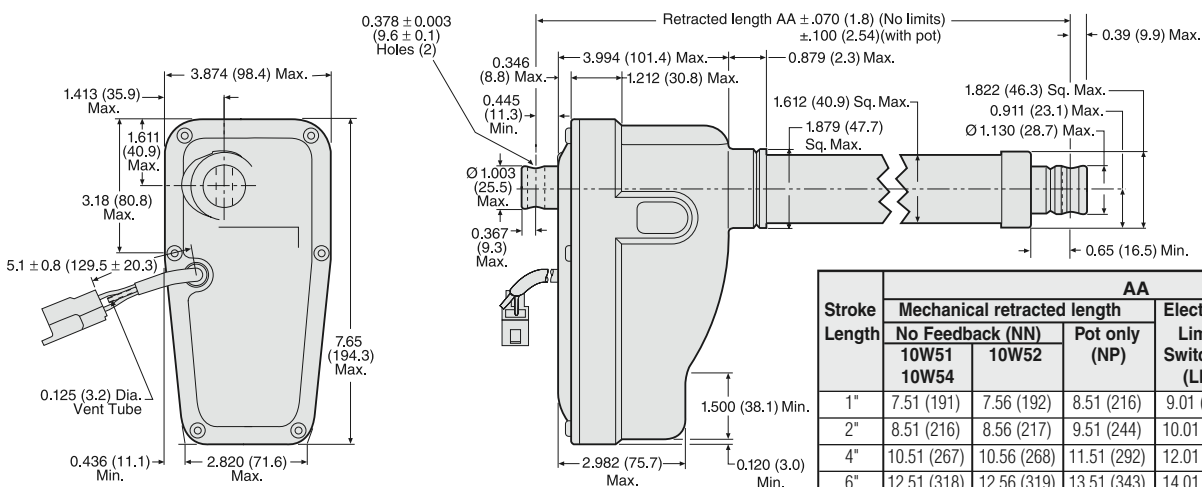
### Typical applications

- Automatic security gate positioning
- Raise/lower the deck on riding mowers
- Position ladders, vents, discharge chutes on combines
- Tilt/recline on powered wheelchairs
- Position ergonomic tables, chairs
- Position diverters on conveyors
- Position jigs in flexible assembly operations

### Controls

DF14 controls operate one or two Electrak 150 actuators. Available with one or two 24 VDC outputs with a handset to manually control bi-directional motion on each of the control outputs. Each actuator can be operated independently and sequentially but not simultaneously. It has quick disconnect sockets for the handset, cable adapters for 5, 10 and 15 foot lengths to connect to each actuator. See page D-47.

### Dimensions



Stroke Length	AA					Wt. lbs.
	Mechanical retracted length		Electrical Limit Switches (LN)	Pot and Limit Switches (LP)		
	No Feedback (NN)	Pot only (NP)				
1"	7.51 (191)	7.56 (192)	8.51 (216)	9.01 (229)	9.01 (229)	4.79
2"	8.51 (216)	8.56 (217)	9.51 (244)	10.01 (254)	10.01 (254)	4.89
4"	10.51 (267)	10.56 (268)	11.51 (292)	12.01 (305)	12.01 (305)	5.18
6"	12.51 (318)	12.56 (319)	13.51 (343)	14.01 (356)	14.01 (356)	5.46
8"	14.51 (369)	14.56 (370)	15.51 (394)	16.01 (407)	16.01 (407)	5.75
10"	16.51 (419)	16.56 (421)	17.51 (445)	18.01 (458)	18.01 (458)	6.03
12"	18.51 (470)	18.56 (471)	19.51 (496)	20.01 (508)	20.01 (508)	6.32
14"	20.51 (521)	20.56 (522)	21.51 (546)	22.01 (559)	22.01 (559)	6.60
16"	22.51 (572)	22.56 (573)	N/A	24.01 (610)	N/A	6.88

Dimensions are for standard units.

**Specifications**

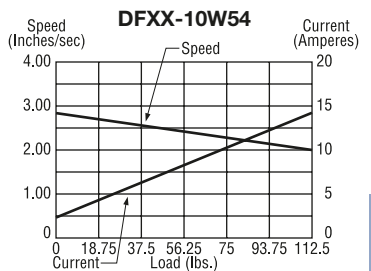
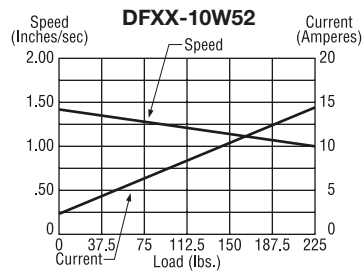
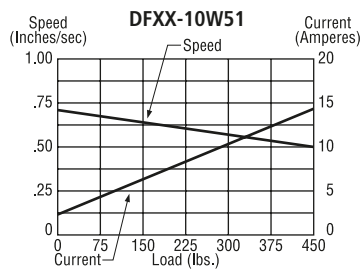
	DF12-10W51-XXX	DF12-10W52-XXX	DF12-10W54-XX
Dynamic load	450 lbs. max.	225 lbs. max.	110 lbs. max.
Static Load	900 lbs. max.	400 lbs. max.	330 lbs. max.
Speed	.75"/sec @ no load .4"/sec @ 450 lbs.	1.40"/sec @ no load .8"/sec @ 225 lbs.	2.8"/sec @ no load 1.6"/sec @ 110 lbs.
End play	0.036" max less clevis	0.036" max less clevis	0.046" max less clevis
Restraining torque	Restrained internally		
Input voltage	12, 24 VDC (36 VDC*, 115 VAC*)		
Amperage (12 VDC)	2.5-13 (50 amp @ stall)		
End of stroke	Stall, optional limit switches		
Thermal protection	Internal motor breaker		
Lead wires	16 AWG PVC 800		
Connectors	Packard Electric Pack-Con		
Power switch	Optional DPDT		
Temperature	-30° to +150° F (-34° to 66° C)		
Environment	IP-56 outdoor use		
Duty cycle	25% @ 70° F		
Anti-rotation	Tube can rotate max. of 7°		

\* consult customer service

**Performance Curves**

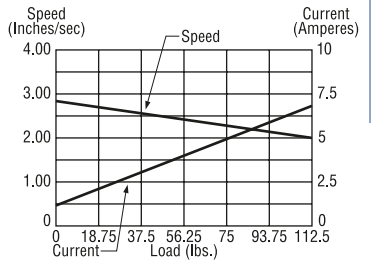
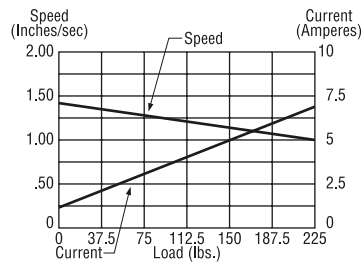
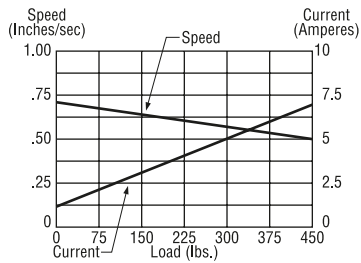
**DF 12 Motor Curve**

Input voltage: 10–16 volts  
 Nominal performance at 12 VDC and 70°F (21°C)  
 Amperage: 13 amps max. at rated dynamic load and 70°F (21°C) ambient  
 Max. amp draw at stall: 50 amps



**DF 24 Motor Curve**

Input voltage: 20–28 volts  
 Nominal performance at 24 VDC and 70°F (21°C)  
 Amperage: 6.5 amps max. at rated dynamic load and 70°F (21°C) ambient  
 Max. amp draw at stall: 25 amps



**How To Order**

**DFXX-10W5X-XXXXXX**

- Motor Type: D = DC
- Actuator Type: F = E150
- Motor Voltage: 12, 24, 36
- Gear Ratio: 10:1
- Screw Type: W = Worm
- Screw Diameter: (tenths of an inch)
- Screw Lead: (tenths of an inch) 1,2,4
- Stroke Length: Inches

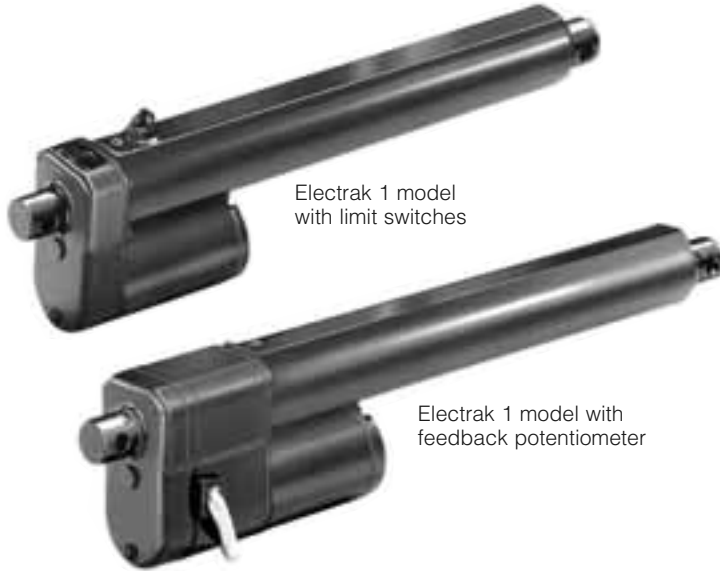
- Other Options: N = None
- Front Mounting: H = Crosshole
- Rear Mounting: H = Crossholes are shown above, M = Both front and rear rotated 90°
- Feedback: N = None, P = Potentiometer
- Limit Switches: L = Limits, N = None

**Example: DF12-10W51-04LNHHN**



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## 12 and 24 VDC 25 and 75 lb. load capacities



### Features

- Acme screw drive delivers as much as 75 pounds of force at a minimum extension speed of .6 in./sec.
- Aluminum/zinc alloy housing resists corrosion and provides protection from dirt, dust and humidity. Operates in temperatures from -15° to 150°F
- Clevis style mounting
- 2, 4, or 6 inch stroke lengths standard
- Completely self-contained in a compact housing – 6 inches of travel from a 10 inch package
- Internal limit switches automatically shut-off unit at the end of stroke or feedback potentiometer provides position signal
- Thermal overload protection in motor

### Compact, light duty DC actuators

Completely self-contained and sealed for indoor and outdoor use, Electrak 1 actuators fit into small areas without sacrificing power or reliability. The load/ length configurations available cover a diverse range of intermittent duty applications.

Functionally, Electrak 1 actuators are easily interchanged with comparable size hydraulic or pneumatic cylinders used on intermittent duty applications. The actuator provides consistent, repeatable performance, even for applications with rigorous operating conditions including extreme temperatures, high humidity, and power input variations. Added advantages include no need for adjustment or maintenance due to wear. Electrak 1 actuators are designed for intermittent duty applications requiring lifting, positioning, sorting, opening, clamping and adjusting.

Electrak 1 actuators are available in 2 load ranges, each range offering stroke lengths of 2, 4, or 6 inches. All models feature 12 or 24 VDC input with a plug-in connector and clevis style mounting for easy installation.

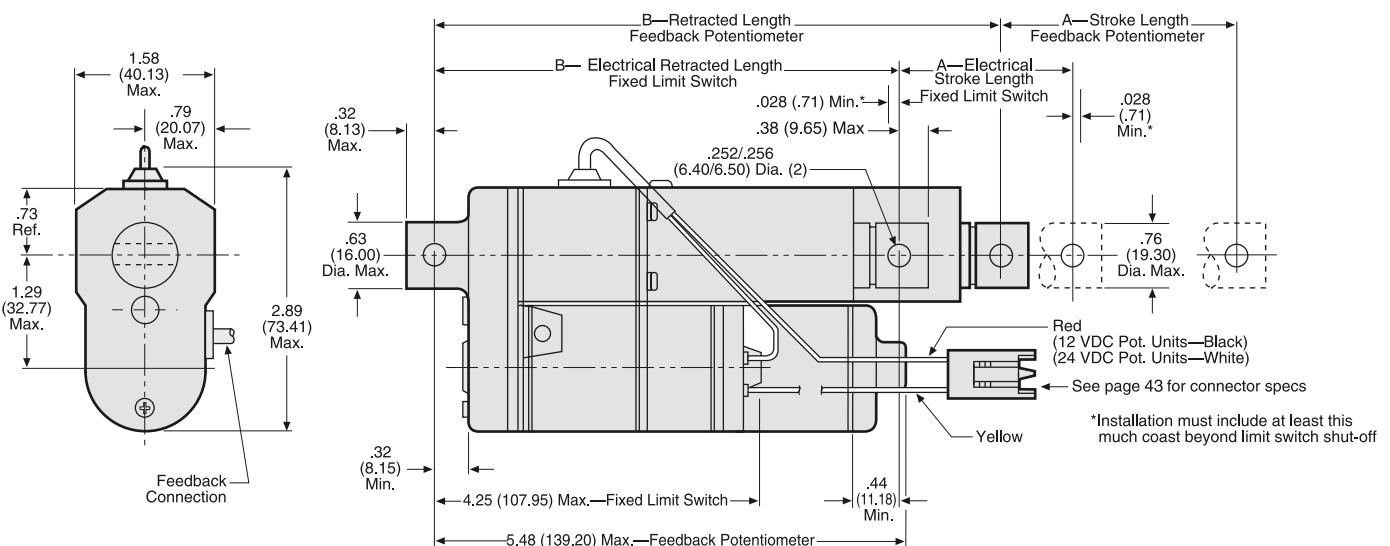
### Typical applications

- Light load and duty applications
- Short distance operations
- Low cost installations
- Space limitations

### Controls

The MCS-2005 is specifically designed for use with the Electrak 1 (24 VDC) actuator and the MCS-2007 for the Electrak 1 actuator with feedback. This actuator can also be operated with the MCS-2015 or MCS-2025 control. See page D-47.

### Dimensions



## Specifications

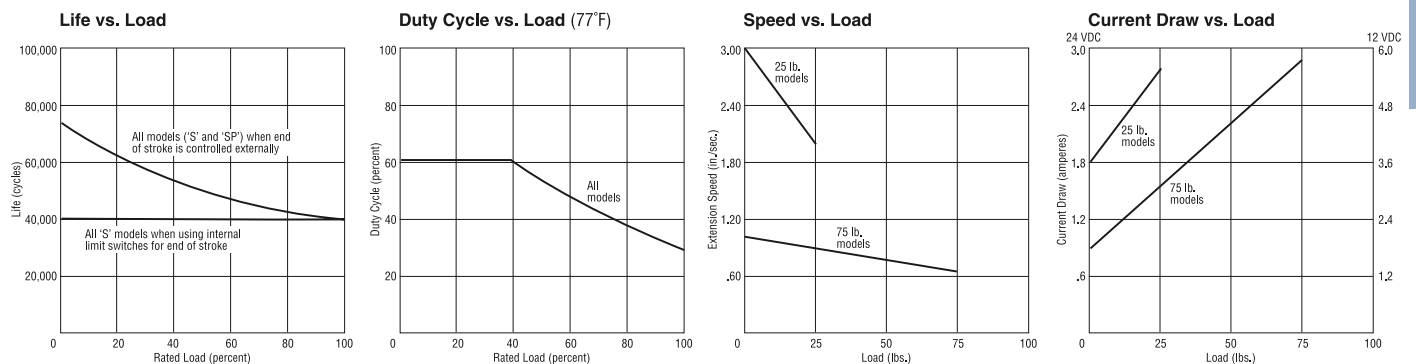
<b>Input</b>	12 VDC and 24 VDC
<b>Load capacities</b>	25 or 75 lbs. max.
<b>Stroke lengths</b>	2, 4 or 6 inches
<b>Current draw</b>	3.0 amps maximum at 24 VDC at rated load 5.0 amps maximum at 12 VDC at rated load
<b>Duty cycle</b>	Intermittent, 25% "on time" at rated load per cycle (77° F)
<b>Motor protection</b>	Automatic reset thermal overload
<b>Limit switches</b>	Internal limit switches shutoff on either end of stroke
<b>Thermal Protection</b>	Automatic resetting thermal breaker enclosed in motor housing
<b>Temperature range</b>	-15° F to 150° F
<b>Drive</b>	Acme screw
<b>Connector</b>	Supplied
<b>Mounting</b>	Clevis mounting only
<b>Restraining Torque</b>	Actuator is internally restrained. Extension tube is keyed to cover tube
<b>Static Load</b>	300 lbs. for all strokes

## Model Numbers – use when ordering

Stroke Length	Voltage	With fixed limit switches				With potentiometer				Weight lbs.
		Load Capacity		A	B	Load Capacity		A	B	
		25 lbs.	75 lbs.	±.020 (.51)	±.065 (1.65)	25 lbs.	75 lbs.	±.065 (1.65)	±.120 (3.05)	
2	12 VDC	S12-09A4-02	S12-17A8-02	1.82	6.30	SP12-09A4-02	SP12-17A8-02	2.31	7.79	1.25
	24 VDC	S24-09A4-02	S24-17A8-02	(46.23)	(159.89)	SP24-09A4-02	SP24-17A8-02	(58.67)	(197.87)	1.25
4	12 VDC	S12-09A4-04	S12-17A8-04	3.82	8.30	SP12-09A4-04	SP12-17A8-04	4.53	10.01	1.35
	24 VDC	S24-09A4-04	S24-17A8-04	(97.03)	(210.69)	SP24-09A4-04	SP24-17A8-04	(115.06)	(254.25)	1.35
6	12 VDC	S12-09A4-06	S12-17A8-06	5.82	10.30	SP12-09A4-06	SP12-17A8-06	6.75	12.22	1.45
	24 VDC	S24-09A4-06	S24-17A8-06	(147.83)	(261.49)	SP24-09A4-06	SP24-17A8-06	(171.45)	(310.39)	1.45

Note: Feedback rate is based on a full range of 4800 ohms, ie: 2" stroke = 2400 ohms per inch, 4" stroke = 1200 ohms per inch, 6" stroke = 800 ohms per inch.

## Performance Curves



## How To Order

**S 12-17A8-02**

- S = Electrak 1 DC actuator with limit switches
- SP = Electrak 1 DC actuator with potentiometer
- 12 = 12 VDC
- 24 = 24 VDC
- 09A84 = 25 lb. rating
- 17A8 = 75 lb. rating
- Stroke length in inches





## 12 and 24 VDC 25 and 75 lb. load capacities



### Features

- Fixed mechanical limit switches
- 2, 4 and 6 inch stroke lengths
- Completely self-contained in a compact housing – 6 inches of travel from a 10 inch package
- Acme screw drive delivers as much as 75 pounds of force at a minimum extension speed of .6 in./sec.
- Aluminum/zinc alloy housing resists corrosion and provides protection from dirt, dust and humidity. Operates in temperatures from -15° to 150°F.
- Clevis style mounting
- Thermal overload protection in motor

### Extended life, compact DC actuators

This is a long life version of the Electrak 1 actuator with fixed mechanical limit switches and an 80,000+ cycle capacity – more than double the life of the standard Electrak 1 actuator. The limit switches control the power to the motor directly to stop the actuator at the end of stroke and do not require power switching relays.

The performance of the actuator is identical to the standard Electrak 1. It is completely self-contained and sealed for indoor and outdoor use and fits into small areas without sacrificing power or reliability. The load/length configurations available cover a diverse range of intermittent duty applications requiring lifting, positioning, sorting, opening, clamping and adjusting.

Physically the only difference is the long life unit is 0.68" taller to accommodate the fixed limit switches. The long life actuator is available in 12 or 24 VDC version, 25 and 75 lb. load ranges, and with 2, 4 and 6 inch stroke lengths. 24 volt versions are compatible with the MCS 2005 and 2006 Electrak controls.

### Typical Applications

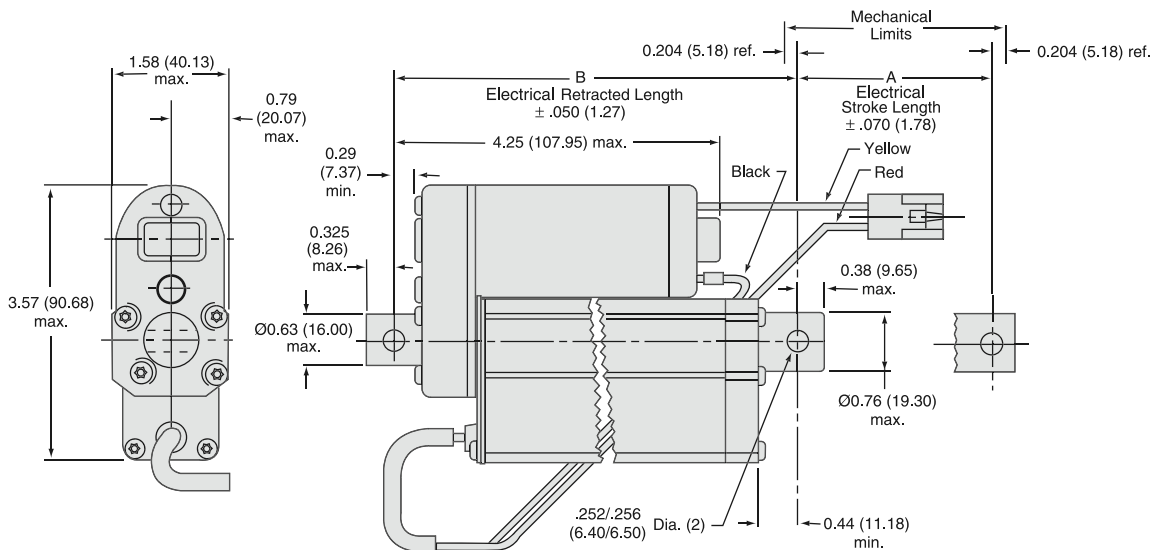
Applications that require frequent cycling

- Sweepers, scrubbers
- Mobile off highway equipment
- Agricultural and industrial machinery

### Control

24 VDC actuators are compatible with MCS-2005 and MCS-2006 control. See page D-47.

### Dimensions





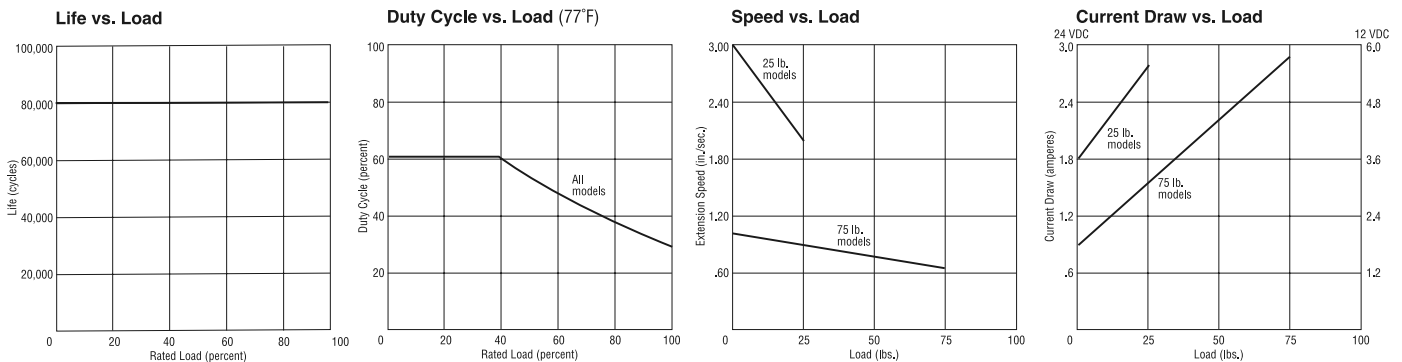
## Specifications

Input	12 VDC and 24 VDC
Load capacities	25 or 75 lbs. max.
Stroke lengths	2, 4 or 6 inches
Current draw	3.0 amps maximum at 24 VDC at rated load 5.0 amps maximum at 12 VDC at rated load
Duty cycle	Intermittent, 25% "on time" at rated load per cycle (77° F)
Motor protection	Automatic reset thermal overload
Limit switches	Internal limit switches shutoff on either end of stroke
Thermal Protection	Automatic resetting thermal breaker enclosed in motor housing
Temperature range	-15° F to 150° F
Drive	Acme screw
Connector	Supplied
Mounting	Clevis mounting only
Restraining Torque	Actuator is internally restrained. Extension tube is keyed to cover tube
Static Load	300 lbs. for all strokes

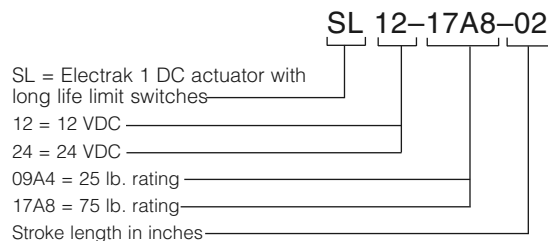
## Model Numbers – use when ordering

Stroke Length	25 lb. Capacity		75 lb. Capacity		A	B	Weight lbs.
	12 VDC	24 VDC	12 VDC	24 VDC			
2	SL12-09A4-02	SL24-09A4-02	SL12-17A8-02	SL24-17A8-02	1.900 (48.26)	6.34 (161.04)	1.70
4	SL12-09A4-04	SL24-09A4-04	SL12-17A8-04	SL24-17A8-04	3.900 (99.06)	8.34 (211.84)	1.90
6	SL12-09A4-06	SL24-09A4-06	SL12-17A8-06	SL24-17A8-06	5.900 (149.86)	10.34 (262.67)	2.10

## Performance Curves



## How To Order



**12 VDC**  
**250 lb. load capacities**



## Features

- 250 lb. load capacity
- 4, 8, or 12 inch stroke models
- 12 VDC operation
- Steel spur gears in drive system
- Maintenance free operation
- Clevis mounting
- Stainless steel extension tube
- Self-locking acme screw drive system
- Thermal overload protection in motor
- 25% duty cycle
- Two speed ranges available

## Economic, general purpose DC actuator

The Electrak 2 linear actuator is an economical model designed for relatively light load applications. It incorporates most of the features found in higher priced models, but utilizes a heavy duty acme screw drive system.

The Acme screw is self-locking and therefore does not need a brake to prevent backdriving the load.

A built in overload clutch slips when the factory-set load limit is exceeded.

The 12 VDC motor is weather-protected and ideally suited for battery powered applications such as custom vans, garden tractors, or emergency power supplies. The motor also has built in thermal switches which prevent the motor from overheating due to too high a duty cycle.

## Typical applications

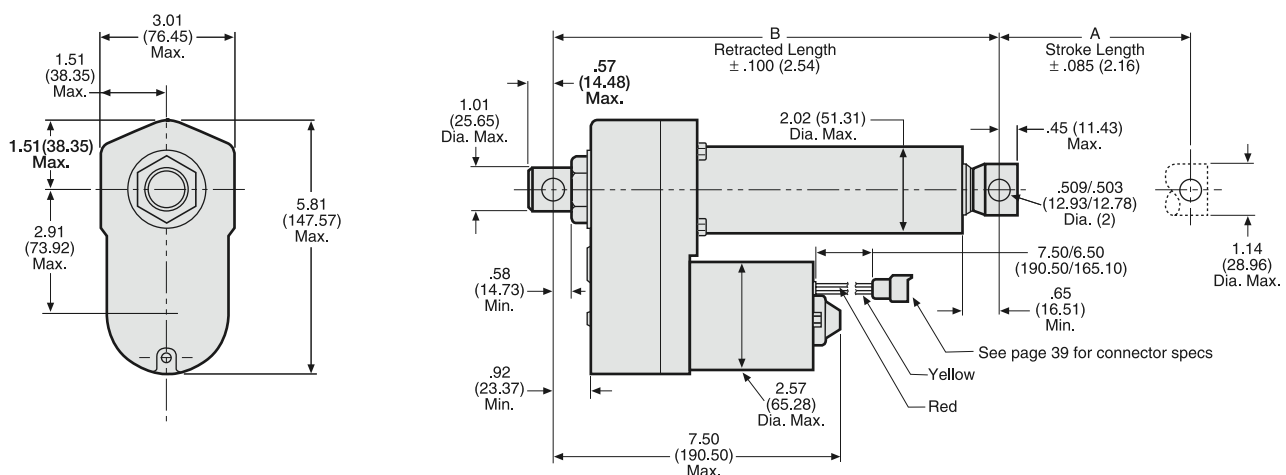
- Medium load and duty cycle
- Battery powered applications

## Control

6932-101-054

Remote switch in enclosure is suitable for operating Electrak 1, 2, 5, 10, and 100 actuators. See page D-47.

## Dimensions



## Specifications

Input	12 VDC
Load capacities	250 lbs.
Stroke lengths	4, 8 or 12 inches (also 18 and 24 inches)*
Current draw	20 amps maximum for high speed model, 11 amps maximum for standard model
Duty cycle	25% "on time" at rated load and 77° F
Motor protection	Automatic reset, thermal overload
Overload Protection	Ball detent overload clutch
Temperature range	-15° F to 150° F
Drive	Acme screw
Lead Wires	14 gauge
Connector	Packard series 56 (included)
Mounting	Clevis mounting only
End Play	.080 maximum
Static Load	1000 lbs. for all models
Wiring Diagram	See page D-59

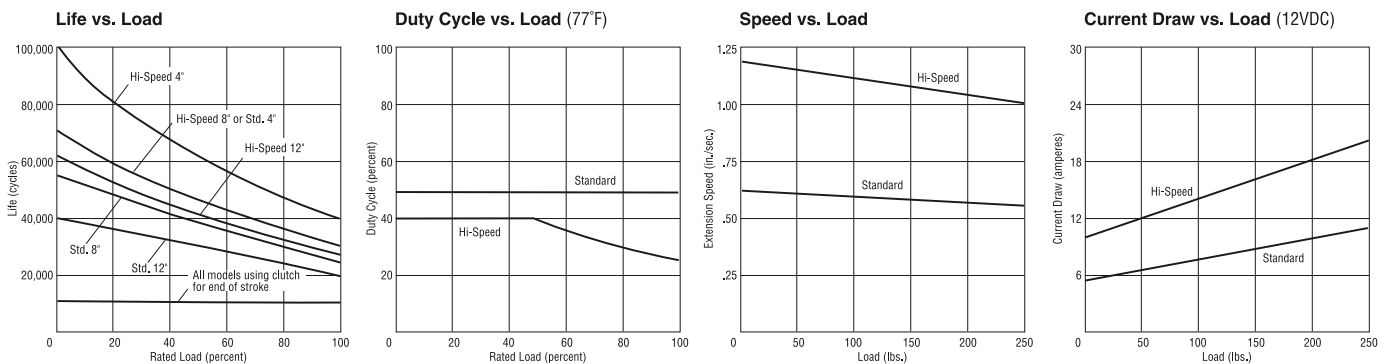
\*Consult customer service

## Model Numbers (use when ordering)

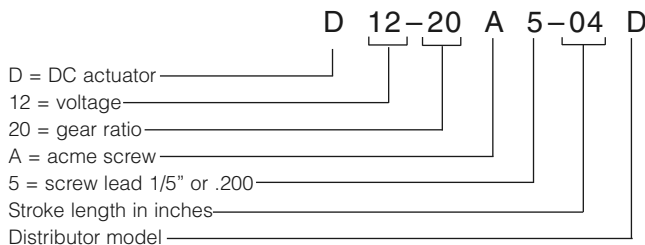
Stroke* Length	Voltage	250 lb. Load Capacity		A	B	Weight lbs.
		Standard	High-speed			
4	12 VDC	D12-20A5-04D	D12-10A5-04D	4.00 (101.60)	10.32 (262.13)	10.00
8	12 VDC	D12-20A5-08D	D12-10A5-08D	8.00 (203.20)	14.32 (363.73)	10.72
12	12 VDC	D12-20A5-12D	D12-10A5-12D	12.00 (304.80)	18.32 (465.33)	11.44

\* For longer stroke lengths – contact the factory.

## Performance Curves



## How To Order



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## 115 and 230 VAC

500, 1000 and 1500 lb. load capacities



### General purpose AC actuator

The Electrak 5 is designed for intermittent duty applications and provides maximum thrust of 500 pounds or 1000 pounds. Since it is powered by 115 VAC or 230 VAC, the Electrak 5 actuator can be easily wired and can be controlled by a simple pushbutton switch or relay for remote control of hard-to-reach operations such as opening or closing an overhead window.

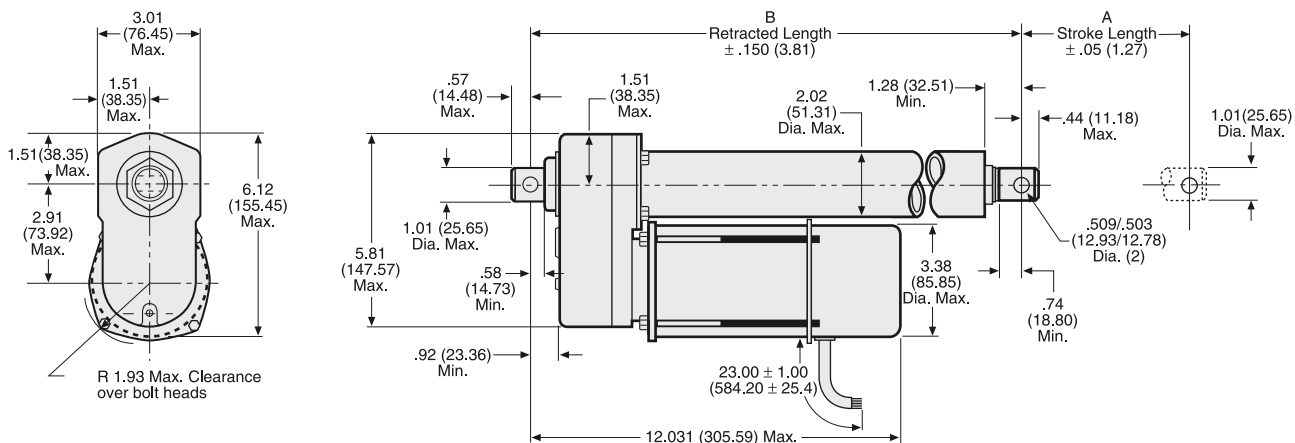
Consisting of an AC motor, gear train and ball bearing screw drive system, Electrak 5 actuators feature quality construction with a stainless steel extension tube and slip clutch to protect the unit from overloading.

Rated for 25% duty cycle for in-plant applications, the Electrak 5 must be clevis mounted. Standard lengths include 4, 8, 12, 18 and 24" strokes. A capacitor is not included with the actuator.

### Control

The MCS-2041 and MCS-2042 controls were designed specifically to operate the Electrak 5 actuators. The capacitor is prewired to the terminal strip and a convenient rocker switch on the cover extends or retracts the actuator. See page D-43.

### Dimensions



\*Consult customer service

### Features

- 500, 1000 and 1500\* lb. load capacity models
- New stronger housing
- UL recognized and CSA certified
- Highly efficient ball bearing screw drive system
- 4, 8, 12, 18, or 24 inch stroke models
- Load limiting clutch
- Metal spur gears
- Stainless steel extension tube
- Anti-coast motor brake for accurate positioning
- Heavy duty 115 VAC 60 Hz only or 230 VAC 50/60 Hz single phase motor
- Thermal overload protects actuator in the event of a stall or an overload or high duty cycle condition. Resets automatically.

Note: A capacitor must be ordered when not using the MCS-2041 or MCS-2042 controls.

Note: Maximum life is 50,000 starts and stops assuming that external limit switches are used for end of stroke direction instead of ratcheting the clutch.

### Typical Applications

- Ergonomic lift tables
- Conveyor diverter
- Open and close windows, bins

**Specifications**

Input	115 VAC 60 Hz or 230 VAC 50/60 Hz
Load capacities	500, 1000 or 1500* lbs. maximum
Stroke lengths	4, 8, 12, 18, or 24 inches
Current draw	2.85 amps maximum at rated load 115 VAC; 1.55 amps maximum at rated load 230 VAC
Duty cycle	25% "on time" at rated load per cycle 77° F (max. on time 45 sec.)
Motor protection	Automatic reset thermal overload in motor windings
Overload Protection	Ball detent overload clutch
Temperature range	-15° F to 150° F
Drive	Ball bearing screw
Housing	Zinc
Cable	18 ga., 5 conductor cable
Connector	Packard series 56 (included)
Capacitor	Included in MCS-2041 or MCS-2042 or must be ordered separately
Capacitor	115V = 35 MFD 240 VAC Part No. 9200-448-002 230V = 10 MFD 370 VAC Part No. 9200-448-003
End Play	.040 in. max.
Static Load	2500 lbs. for all strokes
Restraining Torque	100 lb. in. max.
Wiring Diagram	See page D-59

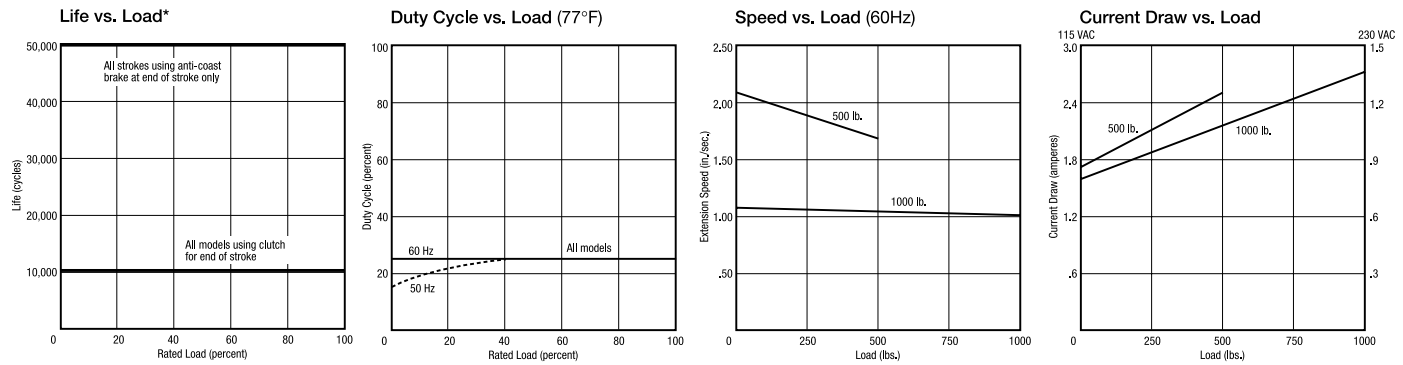
\*Consult customer service

**Model Numbers** – use when ordering

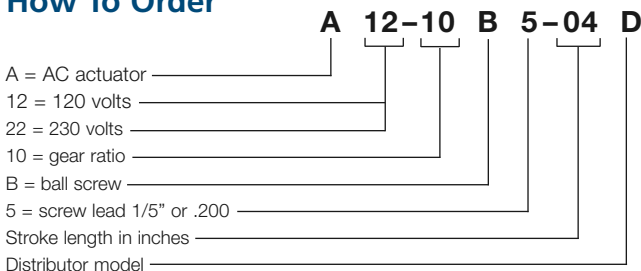
Stroke Length	500 lb. Capacity		1000 lb. Capacity		A	B	Weight lbs.
	115VAC	230VAC	115VAC	230VAC			
4	A12-05B5-04D	A22-05B5-04D	A12-10B5-04D	A22-10B5-04D	4.00 (101.60)	14.95 (379.73)	14.40
8	A12-05B5-08D	A22-05B5-08D	A12-10B5-08D	A22-10B5-08D	8.00 (203.20)	18.95 (481.33)	15.24
12	A12-05B5-12D	A22-05B5-12D	A12-10B5-12D	A22-10B5-12D	12.00 (304.80)	22.95 (582.93)	16.08
18	A12-05B5-18D	A22-05B5-18D	A12-10B5-18D	A22-10B5-18D	18.00 (457.20)	28.95 (735.33)	17.34
24	A12-05B5-24D	A22-05B5-24D	A12-10B5-24D	A22-10B5-24D	24.00 (609.60)	34.95 (887.73)	18.60
Controls	MCS-2041	MCS-2042	MCS-2041	MCS-2042	—	—	—
*Capacitor	9200-448-002	9200-448-003	9200-448-002	9200-448-003	—	—	—

\* Capacitor must be ordered when not using the MCS-2041 or MCS-2042 controls. Additional models including end of stroke limit switches are available – contact the factory.

**Performance Curves**



**How To Order**



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## 12 and 24 VDC 500, 1000 and 1500 lb. load capacities



### General purpose DC actuator

Electrak 10 models incorporate a ball bearing screw drive system for applications requiring maximum load capacity. A specially designed anti-back driving brake holds tension or compression loads in position when the actuator is not in use. This holding brake activates automatically when the actuator is turned off and will continue to hold the load in position without power consumption, until the actuator is started.

Design features such as strong alloy housing, reinforced end plugs and rugged spur gearing are standard with the Electrak 10 series.

The Electrak 10 series provides as much as 1500\* pounds of force from a 12" long package. Twelve inches of linear travel is available from an overall package length of just 20 inches.

### Features

- Clevis mounting
- Protective seal
- Sturdy steel cover tube
- Ball bearing screw drive systems
- Overload clutch
- 4, 8 or 12" stroke lengths
- Stainless steel extension tube
- Rugged spur gearing
- 12 or 24 VDC
- Lifetime lubrication of gears
- Thermal overload protection

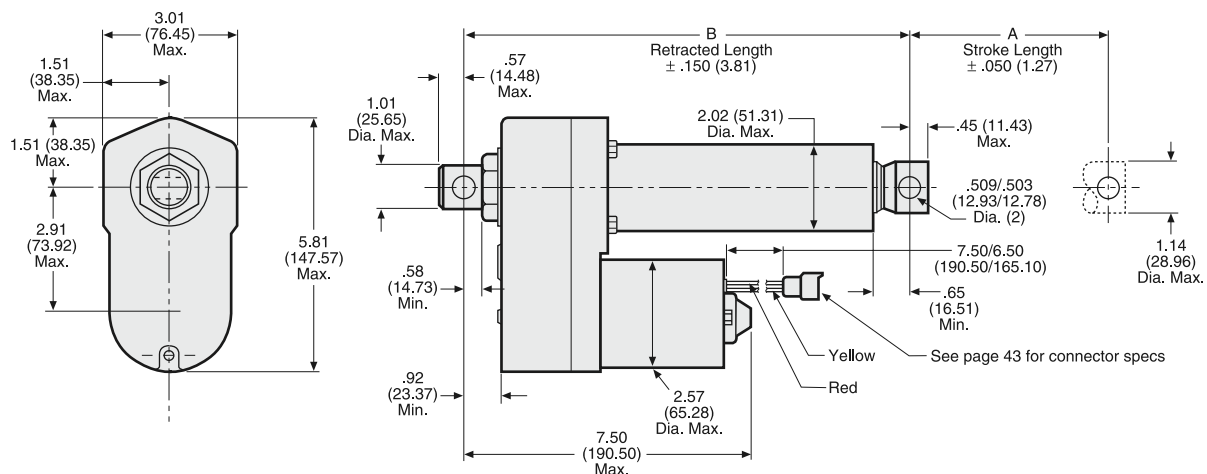
### Typical Applications

- Heavy duty platform lifts
- Bench clamps
- Door control
- Battery powered applications

### Control

The MCS-2025 control provides 24 VDC output power for use with the Electrak 10 actuator. Membrane switches, dynamic braking and other features make the control and actuator an efficient, reliable system. The MCS-2015 control can also be used to operate this actuator. See page D-47.

### Dimensions



**Specifications**

<b>Input</b>	12 or 24 VDC
<b>Load capacities</b>	500, 1000 or 1500* lbs. maximum, depending on model
<b>Stroke lengths</b>	4, 8, 12 inches (also 18 and 24 inches)*
<b>Current draw</b>	7 amps at 24 VDC – 1000 lb. capacity at full load 14 amps at 12 VDC – 1000 lb. capacity at full load 14 amps at 24 VDC – 500 lb. capacity at full load 28 amps at 12 VDC – 500 lb. capacity at full load
<b>Duty cycle</b>	25% "on time" at rated load per cycle (77° F)
<b>Motor protection</b>	Automatic reset thermal overload in motor winding
<b>Overload Protection</b>	Ball detent overload clutch
<b>Temperature range</b>	-15° F to 150° F
<b>Environment protection</b>	96 hour salt spray tested
<b>Drive</b>	Ball bearing screw
<b>Housing</b>	Zinc
<b>Lead wires</b>	14 gauge
<b>Mounting</b>	Clevis Mounting only
<b>Capacitor</b>	Included in MCS-2041 or MCS-2042 or must be ordered separately
<b>Restraining torque</b>	100 in. lb.
<b>End Play</b>	.040 in. max.
<b>Static Load</b>	3000 lbs.
<b>Wiring diagram</b>	See page D-59

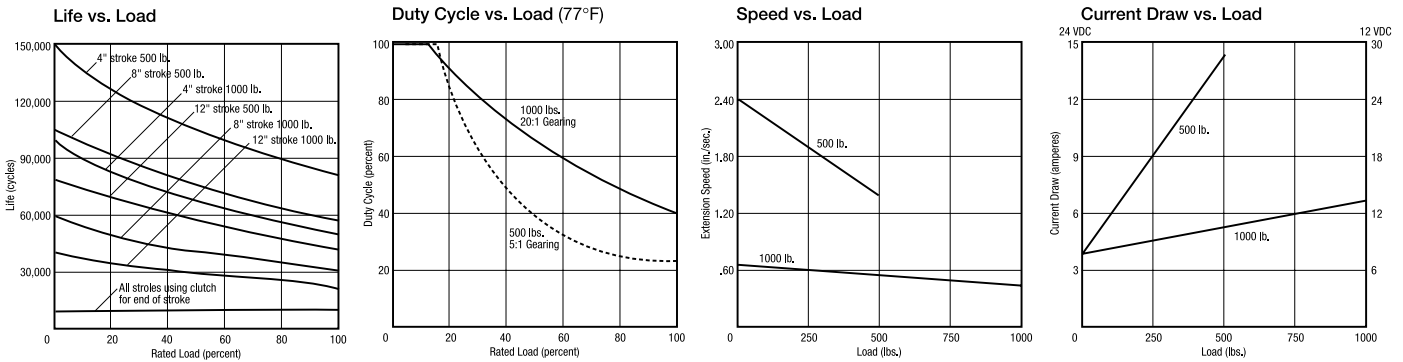
\*Consult customer service

**Model Numbers** – use when ordering

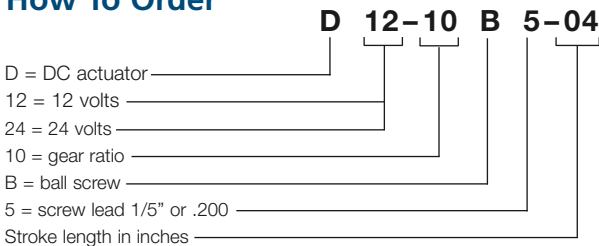
Stroke Length*	Voltage	Load Capacity		A	B	Weight lbs.
		500 lbs.	1000 lbs.			
4	12 VDC	D12-05B5-04	D12-20B5-04	4.00	11.89	11.30
	24 VDC	D24-05B5-04	D24-20B5-04	(101.60)	(302.21)	11.30
8	12 VDC	D12-05B5-08	D12-20B5-08	8.00	15.89	12.02
	24 VDC	D24-05B5-08	D24-20B5-08	(203.20)	(403.81)	12.02
12	12 VDC	D12-05B5-12	D12-20B5-12	12.00	19.89	12.74
	24 VDC	D24-05B5-12	D24-20B5-12	(304.80)	(505.41)	12.74

\*For longer stroke versions or models including other options – contact the factory.

**Performance Curves**

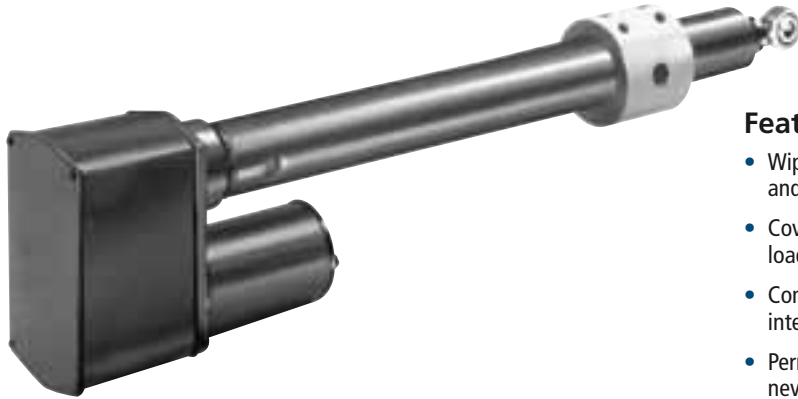


**How To Order**



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## 24 VDC 500, 1000 and 1500 lb. load capacities



### DC actuator with feedback

The Electrak 100 features a potentiometer for precise positioning feedback to a MCS-2035 control unit. Multiple step positioning is available when the Electrak 100 is integrated with a programmable controller system. Integral adjustable limit switches automatically shut off the actuator within the operating ranges you set.

Fully gasketed housing and motor safely seals all internal components from harsh environments. Additional O-ring and wiper seals on the extension tube make the Electrak 100 equally effective for use indoors or outside.

Electrak 100 actuators are available in 3 load ranges; 500, 1000 or 1500\* pounds. Each range offers stroke lengths of 4, 8, 12, 18 or 24 inches. All models accept 24 VDC input and include a swivel rod end and adjustable tube mount for flexible mounting.

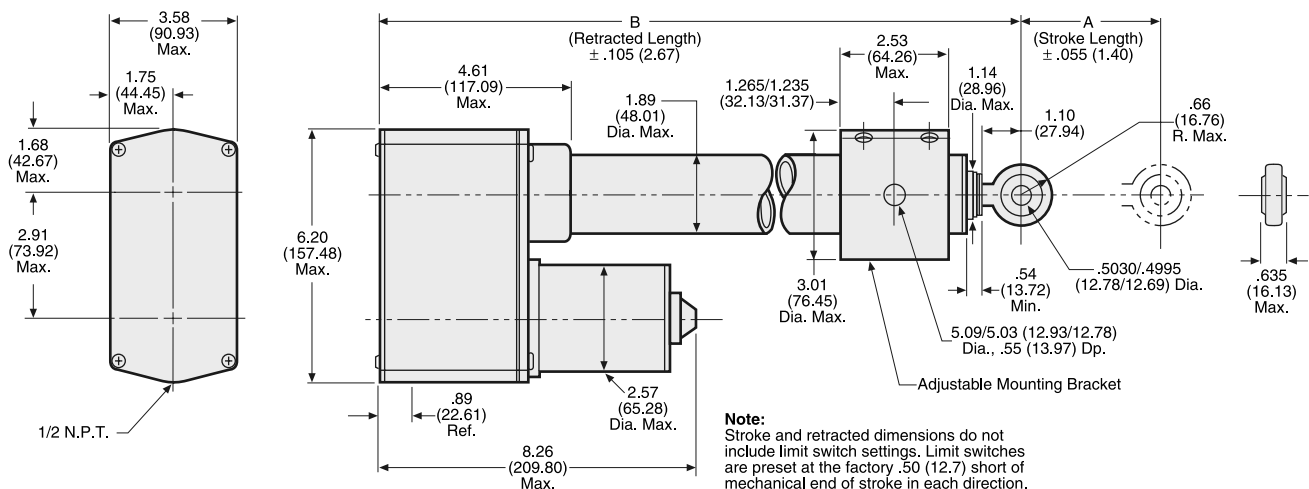
### Features

- Wiper and O-ring seals give double protection against dirt, dust and water contamination
- Cover tube stiffeners provide smooth extension and increase load support
- Completely gasketed housing and motor safely seals all wires and internal components for equally effective use indoors or outside
- Permanently lubricated with aircraft quality lubricants – you'll never need to add or change lubricant
- Stainless steel extension tube protects against corrosion
- Warner Linear ball bearing screws are used for high efficiency and positioning accuracy
- Integral holding brake holds position when power is off
- Ball detent overload clutch
- 10,000Ω potentiometer provides accurate, consistent positioning feedback
- Metal spur gears for strength and durability
- Control leads are safely and easily wired to the terminal strip through the 1/2" conduit entrance
- Integral limit switches shut off the actuator automatically within adjustable preset operating ranges

### Control

The MCS-2035 was designed exclusively for the Electrak 100 (24 VDC) actuator. The analog meter displays the position of the extension tube as a percent of full stroke. Other control options are the MCS-2015 or MCS-2025. See page D-47.

### Dimensions





**Specifications**

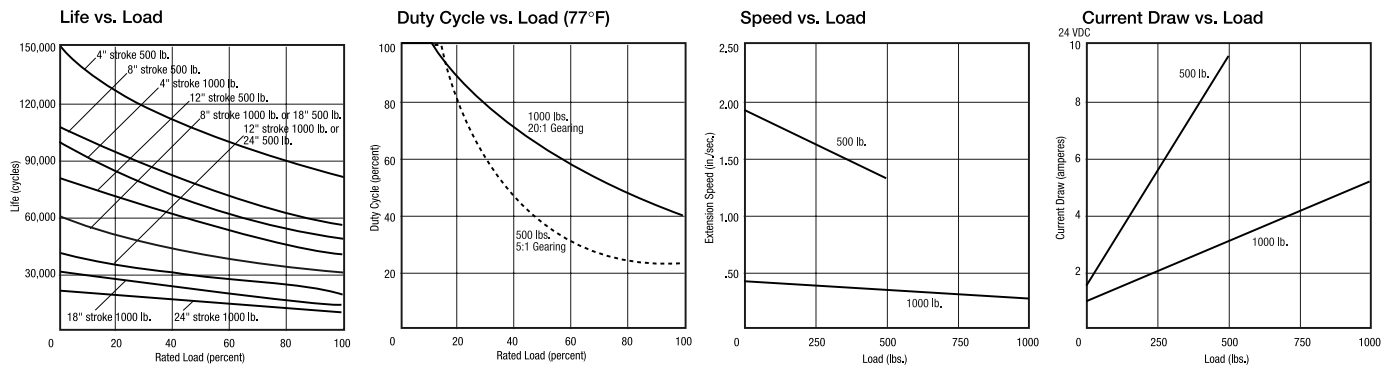
Input	24 VDC
Load Capacities	500, 1000 or 1500* lbs. maximum, depending on model
Stroke Lengths	4, 8, 12, 18, or 24 inches
Current Draw	9.1 amps at 24 VDC – 500 lb. capacity at full load 4.8 amps at 24 VDC – 1000 lb. capacity at full load
Duty Cycle	25% "on time" at rated load per cycle (77° F)
Motor Protection	Automatic reset thermal overload in motor winding
Limit Switches	Adjustable limit switch protection for automatic shutoff on either end of stroke
Temperature Range	-15° F to 150° F
Drive	Ball bearing screw
End Play	.035 in. max.
Housing	Zinc
Environment Protection	96 hour salt spray tested
Terminal Strip	Accept up to #14 AWG
Conduit/Cable Entrance	1/2" NPT
Overload Protection	Ball detent overload clutch
Feedback	10KΩ potentiometer, 250Ω/in. change
Mounting	Tube mounting – universal mounting clamp included
Restraining Torque	100 in. lbs.
Static Load	2500 lbs.

\*Consult customer service

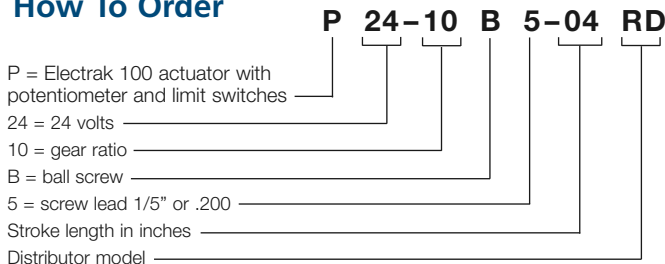
**Model Numbers** – use when ordering

Stroke Length	Load Capacity		A	B	Weight lbs.
	500 lbs.	1000 lbs.			
4	P24-05B5-04RD	P24-20B5-04RD	4.00 (101.60)	16.37 (415.80)	15.60
8	P24-05B5-08RD	P24-20B5-08RD	8.00 (203.20)	20.37 (517.40)	16.44
12	P24-05B5-12RD	P24-20B5-12RD	12.00 (304.80)	24.37 (619.00)	17.28
18	P24-05B5-18RD	P24-20B5-18RD	18.00 (457.20)	30.37 (771.40)	18.54
24	P24-05B5-24RD	P24-20B5-24RD	24.00 (609.60)	36.37 (923.80)	19.80

**Performance Curves**



**How To Order**



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## 115 and 230 VAC 500, 1000 and 1500\* lb. load capacities

### Extended life AC actuator with feedback

The Electrak 205 features a 10-turn potentiometer for precise positioning feedback to an MCS-2051 or MCS-2052 control unit. Multiple step positioning is available when the Electrak 205 is integrated with a programmable controller system. Independently adjustable integral limit switches automatically shut off the actuator within the operating ranges you set.

Fully gasketed housing and motor safely seals all internal components from harsh industrial environments. Additional O-ring and wiper seals on the extension tube make the Electrak 205 effective for use indoors in damp, dirty or oily environments.

Electrak 205 actuators are available in 3 load ranges: 500, 1000 or 1500\* pounds. Each range offers stroke lengths of 4, 8, 12, 18 or 24 inches. Models are available for 115 or 230 VAC input and include a swivel rod end and rear clevis for mounting. A capacitor is not included with the actuator.

Order by model number with the appropriate stroke length and load capacity. See chart on next page.

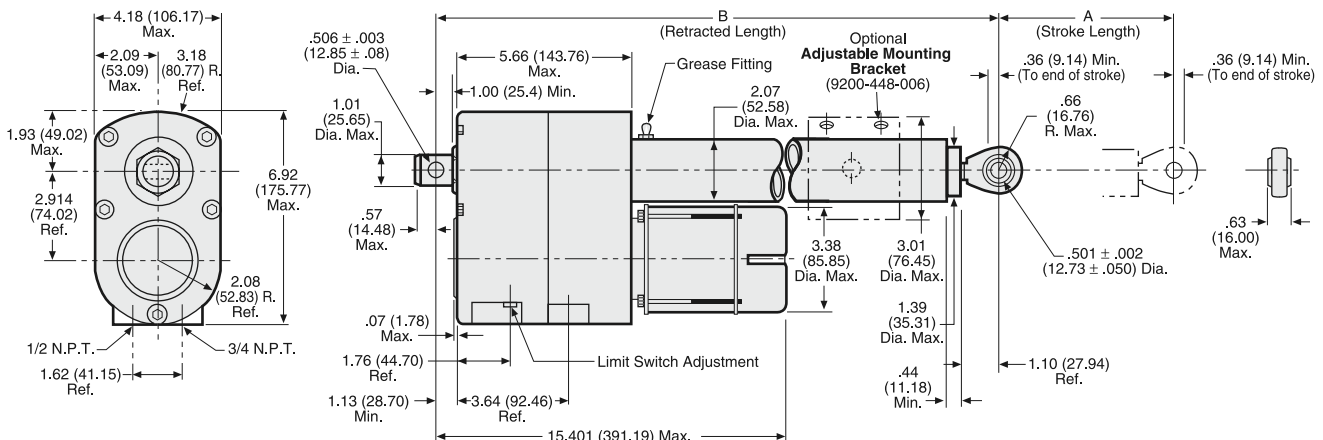
Note: Capacitor must be ordered when not using the MCS-2051 or MCS-2052 controls.

Note: ER Brake must be replaced every 500,000 cycles. Potentiometers must be replaced every 250,000 to 800,000 cycles depending on stroke length. Motor must be replaced every 375,000 to 1,000,000 cycles depending on stroke length.

### Control

The MCS-2051 and MCS-2052 controls were designed specifically for the Electrak 205. Digital position display, membrane switches and prewired capacitor make the control easy to use and install. See page 47.

### Dimensions



### Features

- Wiper and O-ring seals give double protection against dirt, dust and water contamination
- Cover tube stiffeners provide smooth extension and increase load support
- Completely gasketed housing and motor safely seals all wires and internal components
- Lubricated with aircraft quality lubricants – grease fitting for easy lubrication of thrust bearings
- Rear clevis for pin to pin mounting
- Tube mounting optional
- Integral limit switches shut off the actuator automatically within adjustable preset operating ranges
- 10 turn position potentiometer provides accurate, consistent positioning feedback
- Control leads are safely and easily wired to the terminal strip through the cable entrances
- Metal spur gears for strength and durability
- Thermal overloads in motor windings to protect the motor
- ER brake limits coast and holds position when power is off
- Warner Linear ball bearing screws are used for high efficiency and positioning accuracy
- Stainless steel extension tube protects against corrosion

**Specifications**

Input	115 or 230 VAC
Load Capacities	500, 1000 or 1500* lbs. maximum, depending on model
Stroke Lengths	4, 8, 12, 18, or 24 inches
Current Draw	2.85A amps at 115VAC – 500 lb. capacity at full load 1.55A amps at 230 VAC – 1000 lb. capacity at full load
Duty Cycle	25% "on time" at rated load per cycle (77° F)
Motor Protection	Automatic reset thermal overload in motor winding
Limit Switches	Adjustable limit switch protection for automatic shutoff on either end of stroke
Temperature Range	-15° F to 150° F
Drive	Ball bearing screw
End Play	.035 in. max.
Housing	Zinc
Environment Protection	96 hour salt spray tested
Terminal Strip	Accept up to #14 AWG
Conduit/Cable Entrance	1/2" NPT
Overload Protection	Ball detent overload clutch
Feedback	10KΩ potentiometer, 250Ω/in. change
Mounting	Tube mounting – universal mounting clamp included
Restraining Torque	100 in. lbs.
Static Load	Tension loads 4,000 lb, compression load 2500 lbs. for 24" strokes, 4000 lb for all other strokes

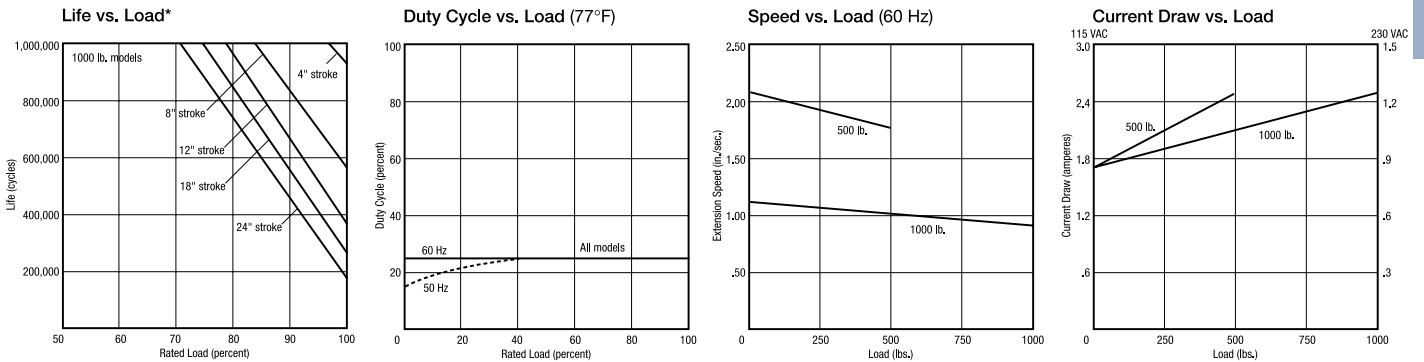
\*Consult customer service

**Model Numbers** – use when ordering

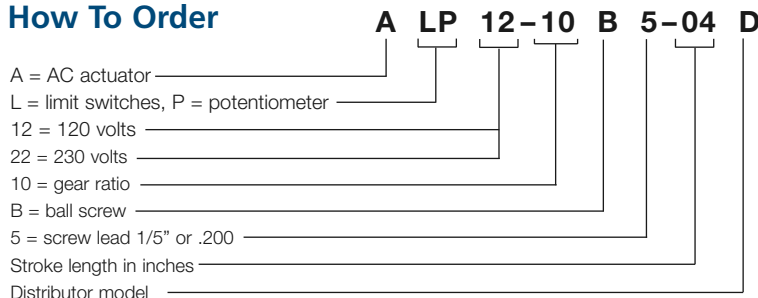
Stroke Length	500 lb. Capacity†		1000 lb. Capacity†		A	B	Weight lbs.
	115VAC	230VAC	115VAC	230VAC			
4	ALP12-05B5-04D	ALP22-05B5-04D	ALP12-10B5-04D	ALP22-10B5-04D	4.00 (101.60)	22.20 (563.88)	25.50
8	ALP12-05B5-08D	ALP22-05B5-08D	ALP12-10B5-08D	ALP22-10B5-08D	8.00 (203.20)	26.20 (665.48)	27.50
12	ALP12-05B5-12D	ALP22-05B5-12D	ALP12-10B5-12D	ALP22-10B5-12D	12.00 (304.80)	30.20 (767.08)	29.50
18	ALP12-05B5-18D	ALP22-05B5-18D	ALP12-10B5-18D	ALP22-10B5-18D	18.00 (457.20)	36.20 (919.48)	32.50
24	ALP12-05B5-24D	ALP22-05B5-24D	ALP12-10B5-24D	ALP22-10B5-24D	24.00 (609.60)	42.20 (1071.88)	35.50
Controls	MCS-2051	MCS-2052	MCS-2051	MCS-2052	—	—	—
* Capacitor	9200-448-002	9200-448-003	9200-448-002	9200-448-003	—	—	—

\* Capacitor must be ordered when not using the MCS-2051 or MCS-2052 controls. † For higher load applications – contact the factory.

**Performance Curves**



**How To Order**



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## 12, 24 and 36 VDC PPA Actuator for a Wide Variety of Mobile Applications

### Features

- Trunnion to Clevis mounting
- Permanent magnet motor
- Integral brake
- Dynamic motor braking
- 30% rated duty cycle

### Applications

These actuators are designed for mobile and control applications where a 12, 24 or 36 VDC power source is available. They are ideal for:

- Antenna dish actuation
- Home and garden tractor accessories
- Remote control security gates
- ATVs; RVs; automotive
- Farm equipment

## 90 VDC PPA Actuator for Fixed and Variable Travel Rate Applications

### Features

- Operable on 110 VAC power source with optional rectifier/speed controller
- Constant speed with varying loads
- Variable speed capability
- Heavy-duty motor option available

### Applications

Where variable speed is desired and 110 VAC power is available, the solid state rectifier/speed controller with closed loop feedback (Part Number 7820406) provides speed regulation down to 1/10 of the maximum travel rate. The feedback system maintains the selected travel rate even though the load may change.

## 220 VAC PPA Actuator for Industrial Applications

### Features

- Quiet operation
- Single phase 50/60 Hz motor design
- Ready to install

### Applications

All industrial applications requiring 220 VAC 50/60 Hz operation

## 110 VAC PPA Actuator for Commercial, Institutional and Industrial Uses

### Features

- Appliance-type applications
- Integral brake
- Permanent split capacitor motor
- Thermal overload protection

### Applications

- Home appliances
- Institutional and plant equipment which requires intermittent-duty cycles

Also available with an optional electric brake, these 110 VAC actuators are ideal for positioning applications. The electric brake virtually eliminates coasting. Thus, point-to-point travel along the stroke can be obtained.

## PPA Actuators with Position Sensors or Limit Switches

### Features

- Both Hall Effect and potentiometer-type sensing available
- High accuracy – permits program control
- Limit switches adjust stroke for varying application needs

### Applications

Any application where it is necessary or desirable to control actuator positioning and/or stroke length.

## High-Speed PPA Actuators

### Features

- Up to 5 times faster than conventional PPA actuators
- Available in all models

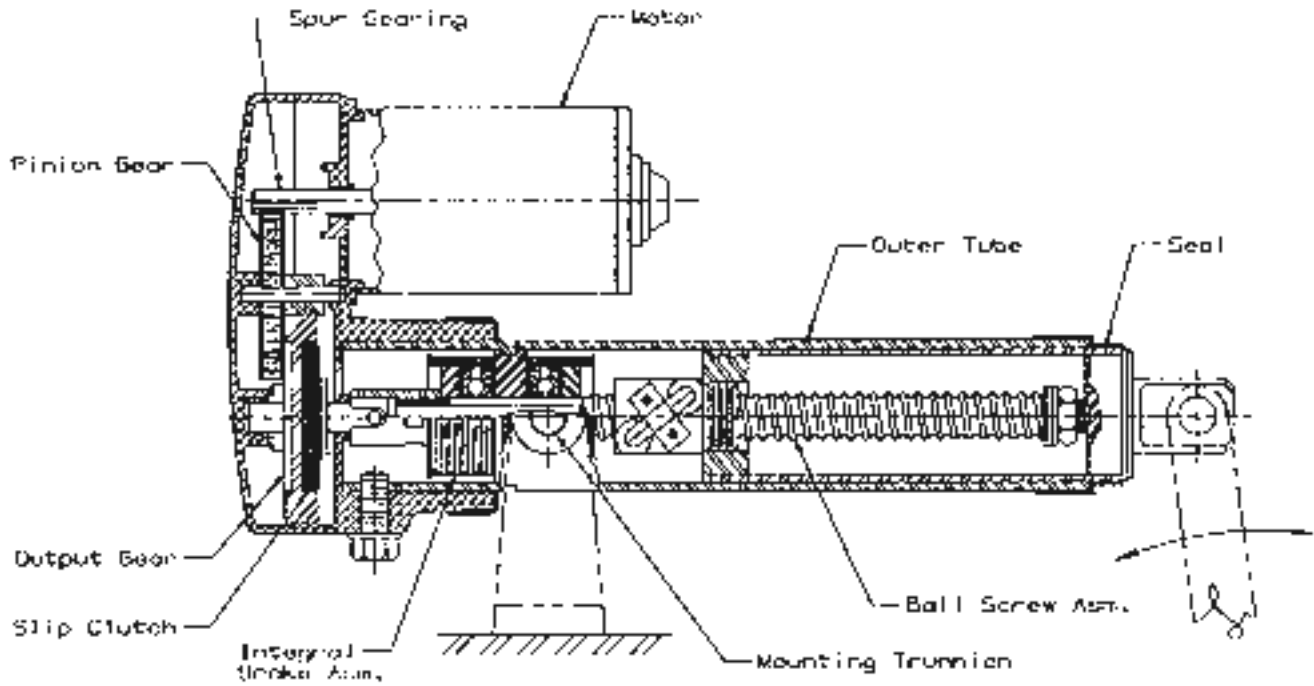
### Applications

Positioning applications requiring quicker response with lighter loads.

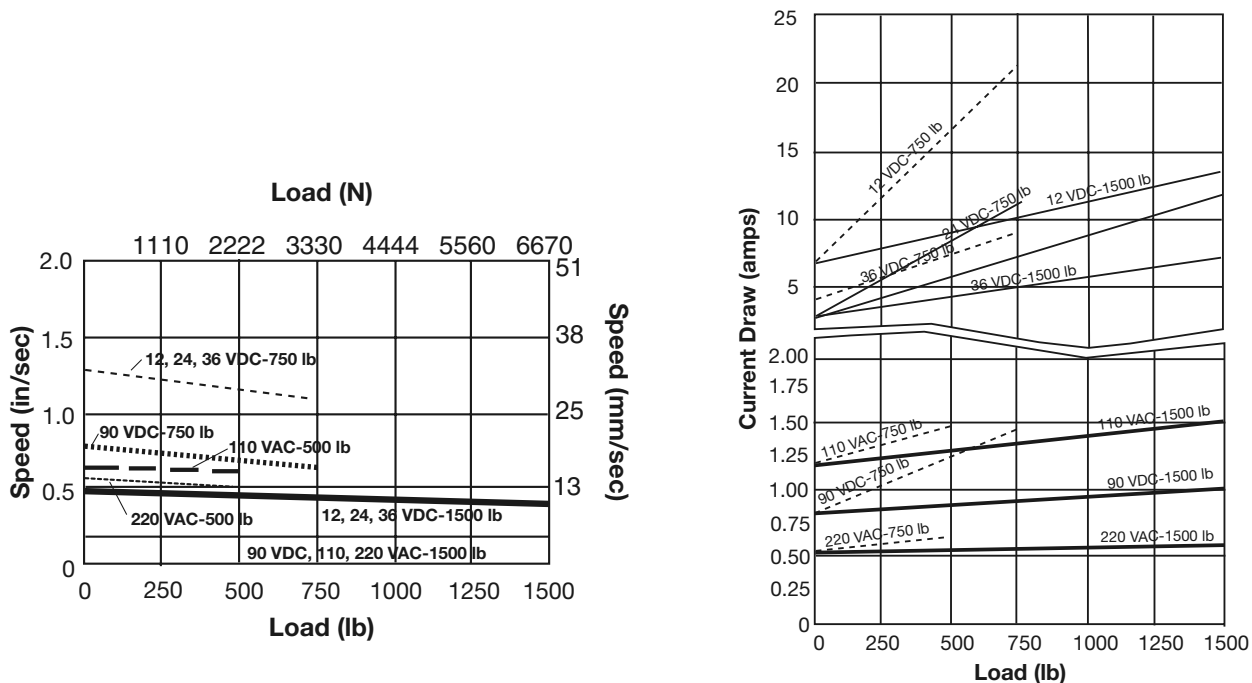
## Manual Operation Feature and Patented Anti-Rotate Design

An optional hand crank attachment is available to permit manual retraction or extension in case of a power failure.

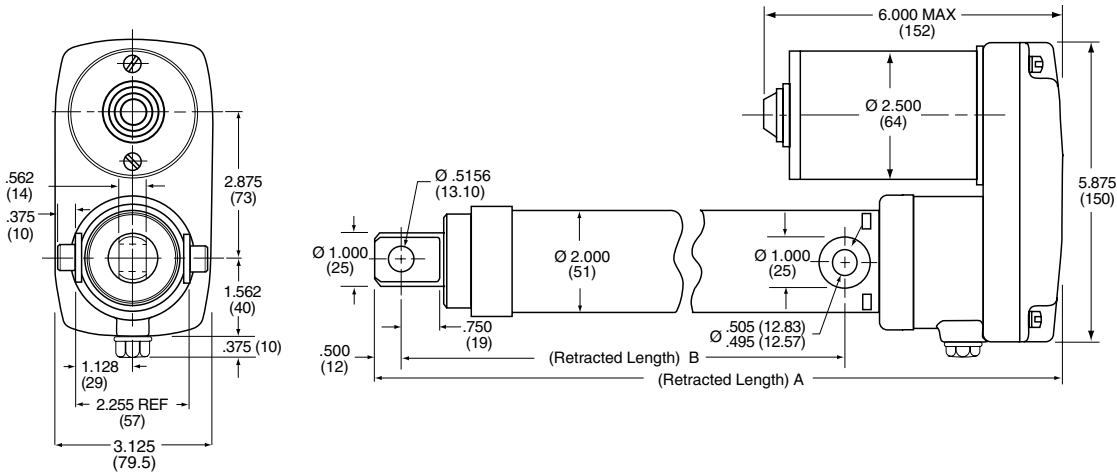
An optional anti-rotate design in the tube assembly is available for non-rigid clevis attachment applications such as chain or cable.



## Performance Curves

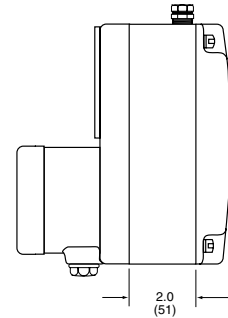


**12 VDC Performance Pak\* Linear Actuator**



Dimensions are in inches.  
 Dimensions in brackets ( ) are in mm.

**Limit Switch/  
 Sensor Housing**



NOTE: PPA\* actuator units with a sensor or limit switch require an additional 2.0 inches (51 mm) of overall length.

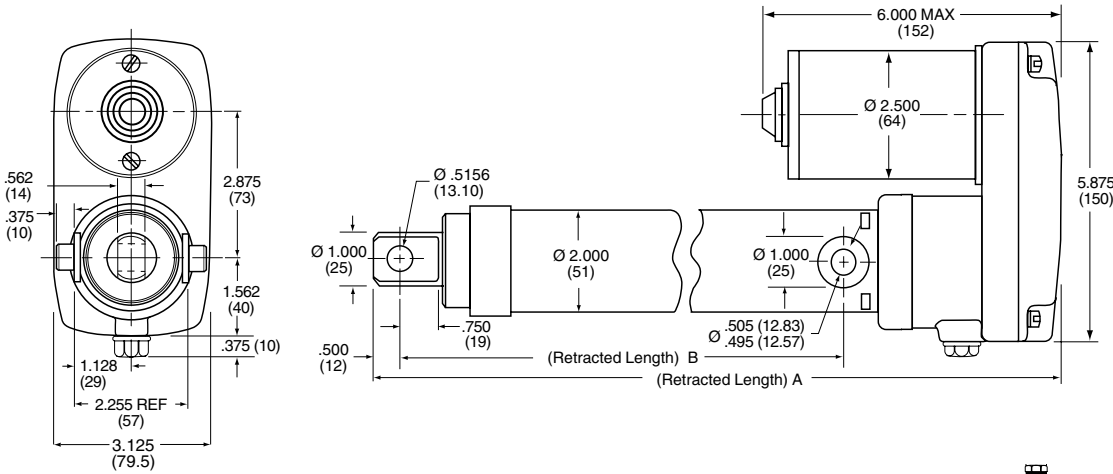
**12 VDC Performance Pak Actuators**

Standard Unit Part Number	Potentiometer Position Sensor Part Number	Hall Effect Position Sensor Part Number	Limit Switch Part Number	Stroke		Dimensions				Dim. A (With Sensor or Limit Switch)		Rated Load		Amp Draw†	Travel Rate‡	
				(in)	(mm)	A (in)	A (mm)	B (in)	B (mm)	A (in)	A (mm)	lb	N		in/sec	mm/sec
5703605	7821401	7821335	7822837	4	102	13.7	350	8.8	224	15.7	401	750	3330	22	1.1	28
7821187	7821402	7821336	7822838	8	203	17.7	456	12.8	326	19.7	502					
5703552	7821403	7821337	7822839	12	305	21.7	553	16.8	427	23.7	604					
7821058	7821404	7821338	7822840	18	457	29.7	756	24.8	631	31.7	807					
7821188	7821405	7821339	7822841	24	610	35.7	909	30.8	783	37.7	959					
7821189	7821406	7821340	7822842	36	914	47.7	1214	42.8	1088	49.7	1264	1500	6670	15	0.4	10
5704114	7821407	7821345	7822843	4	102	13.7	350	8.8	224	15.7	401					
7821190	7821408	7821346	7822844	8	203	17.7	456	12.8	326	19.7	502					
5704273	7821409	7821347	7822845	12	305	21.7	553	16.8	427	23.7	604					
7821059	7821410	7821348	7822846	18	457	29.7	756	24.8	631	31.7	807					
7821191	7821411	7821349	7822847	24	610	35.7	909	30.8	783	37.7	959					
7821192	7821412	7821350	7822848	36	914	47.7	1214	42.8	1088	49.7	1264					

† At rated load

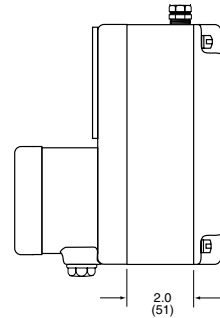


## 24 VDC Performance Pak Linear Actuator



Dimensions are in inches.  
Dimensions in brackets ( ) are in mm.

### Limit Switch/ Sensor Housing



NOTE: PPA\* actuator units with a sensor or limit switch require an additional 2.0 inches (51 mm) of overall length.

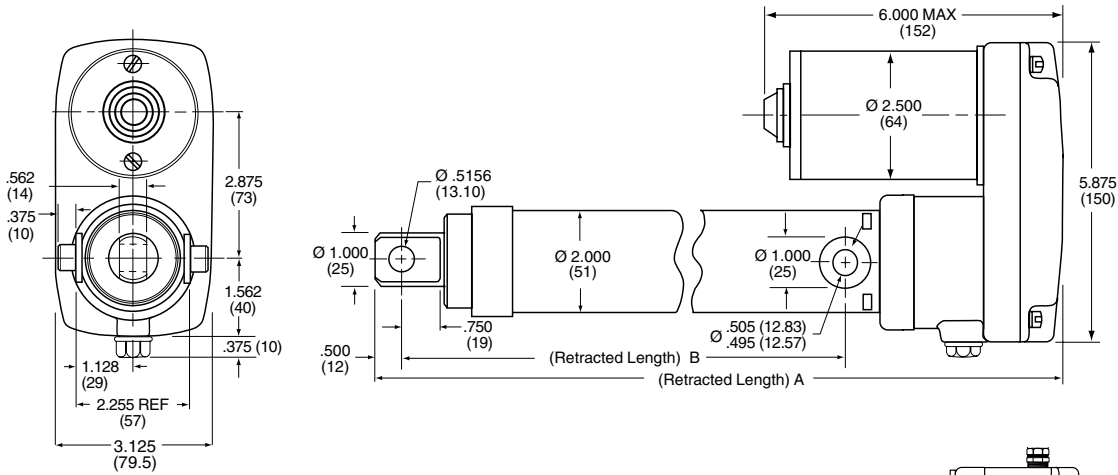
## 24 VDC Performance Pak Actuators

Standard Unit Part Number	Potentiometer Position Sensor Part Number	Hall Effect Position Sensor Part Number	Limit Switch Part Number	Stroke		Dimensions				Dim. A (With Sensor or Limit Switch)		Rated Load		Amp Draw†	Travel Rate‡	
				(in)	(mm)	A (in)	A (mm)	B (in)	B (mm)	A(in)	A(mm)	lb	N			
7828532	7828544	7828556	7828568	4	102	13.7	401	8.8	224	15.7	401	750	3330	11	1.1	28
7828533	7828545	7828557	7828569	8	203	17.7	502	12.8	326	19.7	502					
7828534	7828546	7828558	7828570	12	305	21.7	604	16.8	427	23.7	604					
7828535	7828547	7828559	7828571	18	457	29.7	807	24.8	631	31.7	807					
7828536	7828548	7828560	7828572	24	610	35.7	959	30.8	783	37.7	959					
7828537	7828549	7828561	7828573	36	914	47.7	1264	42.8	1088	49.7	1264					
7828538	7828550	7828562	7828574	4	102	13.7	401	8.8	224	15.7	401	1500	6670	11	0.4	10
7828539	7828551	7828563	7828575	8	203	17.7	502	12.8	326	19.7	502					
7828540	7828552	7828564	7828576	12	305	21.7	604	16.8	427	23.7	604					
7828541	7828553	7828565	7828577	18	457	29.7	807	24.8	631	31.7	807					
7828542	7828554	7828566	7828578	24	610	35.7	959	30.8	783	37.7	959					
7828543	7828555	7828567	7828579	36	914	47.7	1264	42.8	1088	49.7	1264					

† At rated load

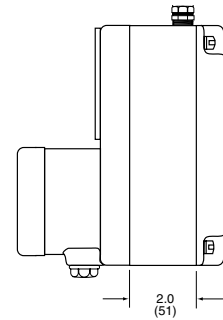


**36 VDC Performance Pak Linear Actuator**



Dimensions are in inches.  
 Dimensions in brackets ( ) are in mm.

**Limit Switch/  
 Sensor Housing**



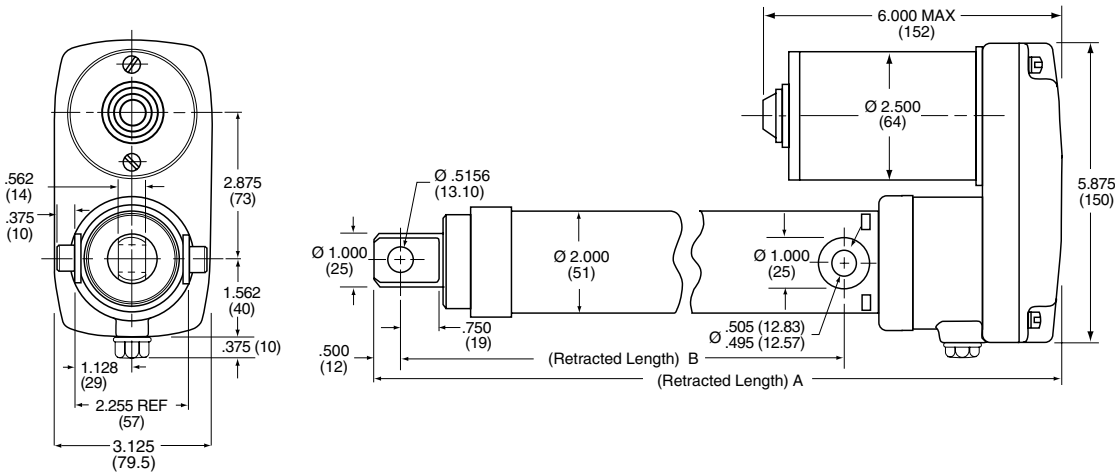
NOTE: PPA\* actuator units with a sensor or limit switch require an additional 2.0 inches (51 mm) of overall length.

**36 VDC Performance Pak Actuators**

Standard Unit Part Number	Potentiometer Position Sensor Part Number	Hall Effect Position Sensor Part Number	Limit Switch Part Number	Stroke		Dimensions				Dim. A (With Sensor or Limit Switch)		Rated Load		Amp Draw†	Travel Rate‡	
				(in)	(mm)	A (in)	A (mm)	B (in)	B (mm)	A (in)	A (mm)	lb	N		in/sec	mm/sec
7821213	7821413	7821355	7822849	4	102	13.7	350	8.8	224	15.7	401	750	3330	8	1.1	28
7821214	7821414	7821356	7822850	8	203	17.7	456	12.8	326	19.7	502					
7821215	7821415	7821357	7822851	12	305	21.7	553	16.8	427	23.7	604					
7821216	7821416	7821358	7822852	18	457	29.7	756	24.8	631	31.7	807					
7821217	7821417	7821359	7822853	24	610	35.7	909	30.8	783	37.7	959					
7821218	7821418	7821360	7822854	36	914	47.7	1214	42.8	1088	49.7	1264					
7821219	7821419	7821361	7822855	4	102	13.7	350	8.8	224	15.7	401	1500	6670	6	0.4	10
7821220	7821420	7821362	7822856	8	203	17.7	456	12.8	326	19.7	502					
7821221	7821421	7821363	7822857	12	305	21.7	553	16.8	427	23.7	604					
7821222	7821422	7821302	7822858	18	457	29.7	756	24.8	631	31.7	807					
7821223	7821423	7821328	7822859	24	610	35.7	909	30.8	783	37.7	959					
7821224	7821424	7821364	7822860	36	914	47.7	1214	42.8	1088	49.7	1264					

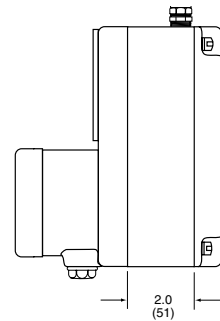
† At rated load

## 90 VDC Performance Pak Linear Actuators for Fixed and Variable Travel Rate Applications



Dimensions are in inches.  
Dimensions in brackets ( ) are in mm.

### Limit Switch/ Sensor Housing



NOTE: PPA\* actuator units with a sensor or limit switch require an additional 2.0 inches (51 mm) of overall length.

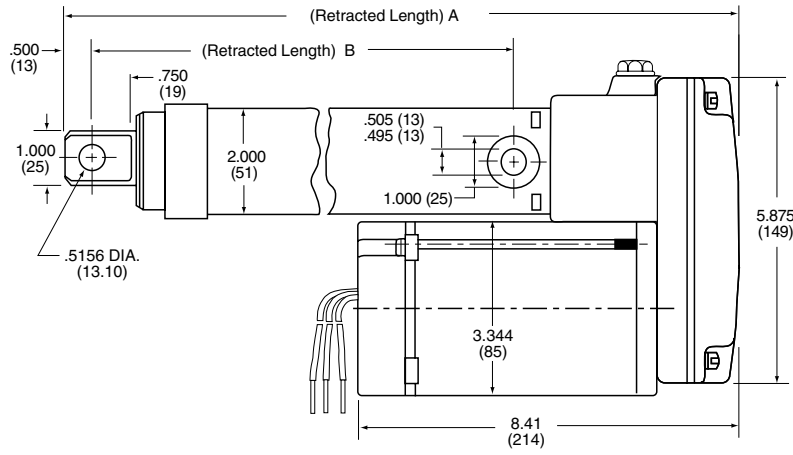
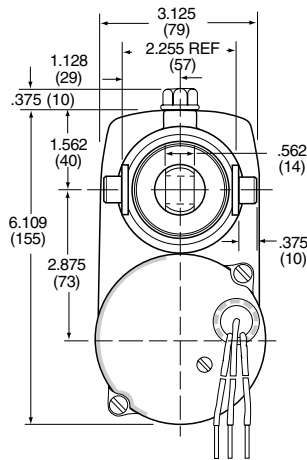
### 90 VDC Performance Pak Actuators

Standard Unit Part Number	Potentiometer Position Sensor Part Number	Hall Effect Position Sensor Part Number	Limit Switch Part Number	Stroke		Dimensions				Dim. A (With Sensor or Limit Switch)		Rated Load		Amp Draw†	Travel Rate‡			
				(in)	(mm)	A (in)	A (mm)	B (in)	B (mm)	A(in)	A(mm)	lb	N		in./sec mm/sec			
7820254	7821425	7821365	7822861	4	102	13.7	350	8.8	224	15.7	401	750	3330	1.4	0.6	15	0.6-	1.5
7821241	7821426	7821366	7822862	8	203	17.7	456	12.8	326	19.7	502							
7820256	7821427	7821367	7822863	12	305	21.7	553	16.8	427	23.7	604							
7821064	7821428	7821368	7822864	18	457	29.7	756	24.8	631	31.7	807							
7821242	7821429	7821369	7822865	24	610	35.7	909	30.8	783	37.7	959							
7821243	7821430	7821370	7822866	36	914	47.7	1214	42.8	1088	49.7	1264	1500	6670	1	0.2	5	0.2-	.5
7820258	7821431	7821371	7822867	4	102	13.7	350	8.8	224	15.7	401							
7821244	7821432	7821372	7822868	8	203	17.7	456	12.8	326	19.7	502							
7820260	7821433	7821373	7822869	12	305	21.7	553	16.8	427	23.7	604							
7821065	7821143	7821374	7822870	18	457	29.7	756	24.8	631	31.7	807							
7821245	7821434	7821375	7822871	24	610	35.7	909	30.8	783	37.7	959							
7821246	7821435	7821376	7822872	36	914	47.7	1214	42.8	1088	49.7	1264							

† At rated load

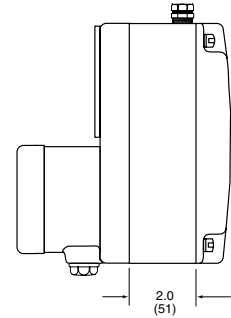
# PPA 110 VAC - Integral Brake

## 110 VAC Performance Pak Linear Actuators with Integral Brake, Sensing Option and Limit Switch



Dimensions are in inches.  
 Dimensions in brackets ( ) are in mm.

Limit Switch/  
 Sensor Housing



NOTE: PPA\* actuator units with a sensor or limit switch require an additional 2.0 inches (51 mm) of overall length.

### 110 VAC Performance Pak Actuators with integral brake

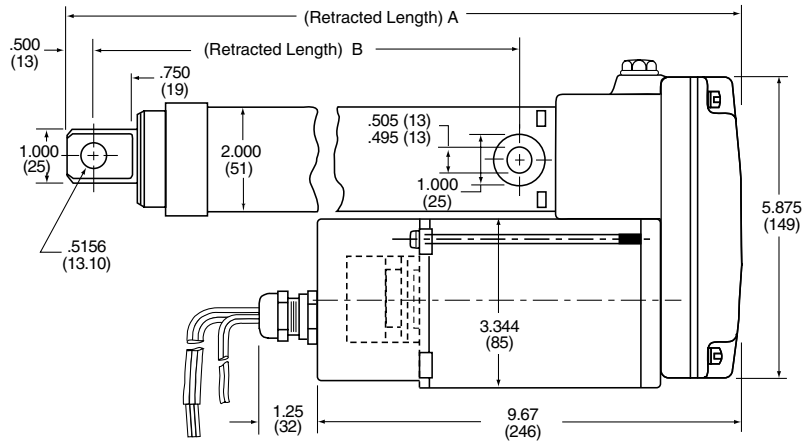
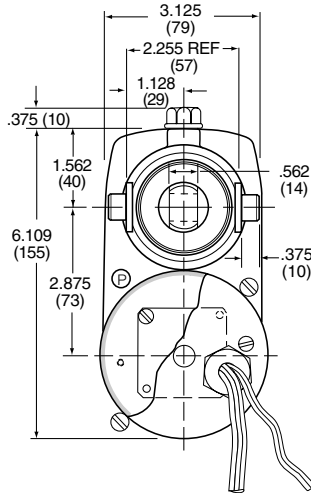
Standard Unit Part Number	Potentiometer Position Sensor Part Number	Hall Effect Position Sensor Part Number	Limit Switch Part Number	Stroke		Dimensions				Dim. A (With Sensor or Limit Switch)		Rated Load		Amp Draw†		Travel Rate‡	
				(in)	(mm)	A (in)	A (mm)	B (in)	B (mm)	A(in)	A(mm)	lb	N			in./sec	mm/sec
7825368	7825433	7825409	7825445	4	102	13.7	350	8.8	224	15.7	401	500	2220	1.5	0.6	15	
7825391	7825434	7825410	7825446	8	203	17.7	456	12.8	326	19.7	502						
7825367	7825435	7825411	7825447	12	305	21.7	553	16.8	427	23.7	604						
7825382	7825436	7825412	7825448	18	457	29.7	756	24.8	631	31.7	807						
7825392	7825437	7825413	7825449	24	610	35.7	909	30.8	783	37.7	959						
7825393	7825438	7825414	7825450	36	914	47.7	1214	42.8	1088	49.7	1264	1500	6670	1.5	0.2	5	
7825375	7825439	7825415	7825451	4	102	13.7	350	8.8	224	15.7	401						
7825394	7825440	7825416	7825452	8	203	17.7	456	12.8	326	19.7	502						
7825376	7825441	7825417	7825453	12	305	21.7	553	16.8	427	23.7	604						
7825384	7825442	7825418	7825454	18	457	29.7	756	24.8	631	31.7	807						
7825395	7825443	7825419	7825455	24	610	35.7	909	30.8	783	37.7	959						
7825396	7825444	7825420	7825456	36	914	47.7	1214	42.8	1088	49.7	1264						

† At rated load



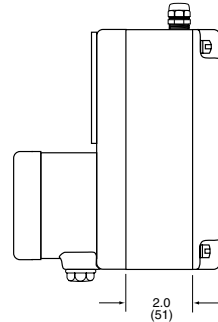
\* Trademark of Danaher Motion. DANAHER MOTION is registered in the U.S. Patent and Trademark Office and in other countries.

## 110 VAC Performance Pak Linear Actuators with Electric Brake



Dimensions are in inches.  
Dimensions in brackets ( ) are in mm.

### Limit Switch/ Sensor Housing



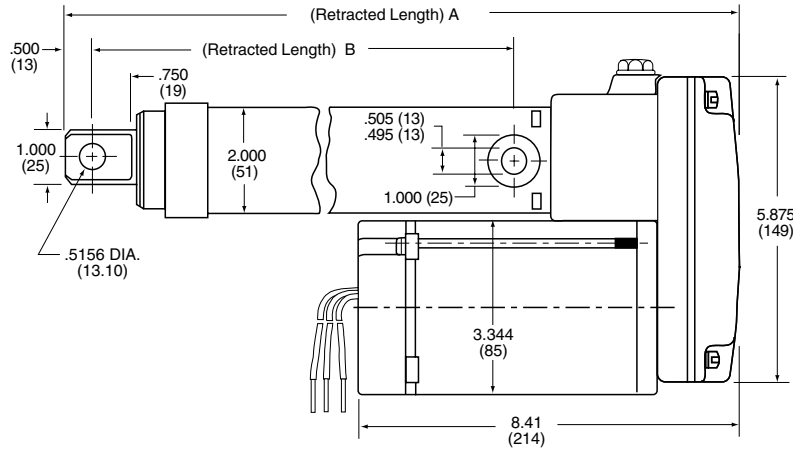
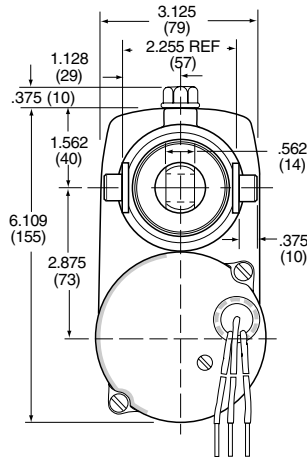
NOTE: PPA\* actuator units with a sensor or limit switch require an additional 2.0 inches (51 mm) of overall length.

### Standard 110 VAC Performance Pak Actuators with electric brake

Standard Unit Part Number	Potentiometer Position Sensor Part Number	Hall Effect Position Sensor Part Number	Limit Switch Part Number	Stroke		Dimensions				Dim. A (With Sensor or Limit Switch)		Rated Load		Amp Draw†	Travel Rate‡	
				(in)	(mm)	A (in)	A (mm)	B (in)	B (mm)	A(in)	A(mm)	lb	N		in./sec	mm/sec
7825684	7829174	7829162	7829150	4	102	13.7	350	8.8	224	15.7	401	500	2220	1.5	0.6	15
7825685	7829175	7829163	7829151	8	203	17.7	456	12.8	326	19.7	502					
7825686	7829176	7829164	7829152	12	305	21.7	553	16.8	427	23.7	604					
7825687	7829177	7829165	7829153	18	457	29.7	756	24.8	631	31.7	807					
7825688	7829178	7829166	7829154	24	610	35.7	909	30.8	783	37.7	959					
7825689	7829179	7829167	7829155	36	914	47.7	1214	42.8	1088	49.7	1264	1500	6670	1.5	0.2	5
7825690	7829180	7829168	7829156	4	102	13.7	350	8.8	224	15.7	401					
7825691	7829181	7829169	7829157	8	203	17.7	456	12.8	326	19.7	502					
7825692	7829182	7829170	7829158	12	305	21.7	553	16.8	427	23.7	604					
7825693	7829183	7829171	7829159	18	457	29.7	756	24.8	631	31.7	807					
7825694	7829184	7829172	7829160	24	610	35.7	909	30.8	783	37.7	959					
7825695	7829185	7829173	7829161	36	914	47.7	1214	42.8	1088	49.7	1264					

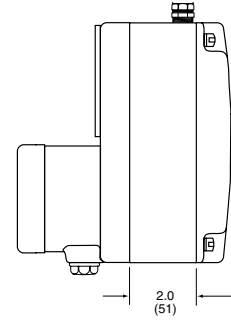
# PPA 220 VAC - Integral Brake

## 220 VAC Performance Pak Linear Actuators with Integral Brake, Sensing Option and Limit Switch



Dimensions are in inches.  
 Dimensions in brackets ( ) are in mm.

### Limit Switch/Sensor Housing



NOTE: PPA\* actuator units with a sensor or limit switch require an additional 2.0 inches (51 mm) of overall length.

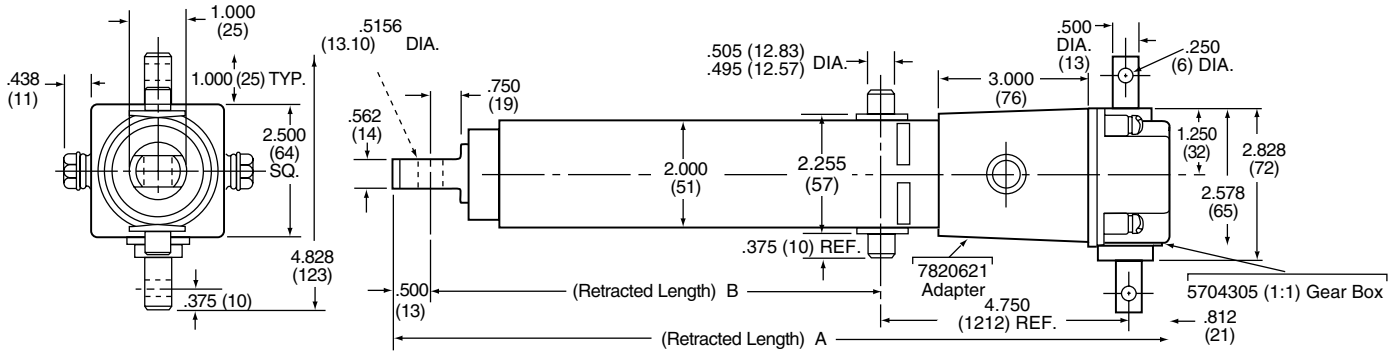
### Standard 220 VAC Performance Pak Actuators

Standard Unit Part Number	Potentiometer Position Sensor Part Number	Hall Effect Position Sensor Part Number	Limit Switch Part Number	Stroke		Dimensions				Dim. A (With Sensor or Limit Switch)		Rated Load		Amp Draw†	Travel Rate‡	
				(in)	(mm)	A (in)	A (mm)	B (in)	B (mm)	A(in)	A(mm)	lb	N		in./sec	mm/sec
7825605	7829210	7829198	7829186	4	102	13.7	350	8.8	224	15.7	401	500	2220	0.65	0.5	12.7
7825606	7829211	7829199	7829187	8	203	17.7	456	12.8	326	19.7	502					
7825607	7829212	7829200	7829188	12	305	21.7	553	16.8	427	23.7	604					
7825608	7829213	7829201	7829189	18	457	29.7	756	24.8	631	31.7	807					
7825609	7829214	7829202	7829190	24	610	35.7	909	30.8	783	37.7	959					
7825610	7829215	7829203	7829191	36	914	47.7	1214	42.8	1088	49.7	1264	1500	6670	0.65	0.2	5
7825617	7829216	7829204	7829192	4	102	13.7	350	8.8	224	15.7	401					
7825618	7829217	7829205	7829193	8	203	17.7	456	12.8	326	19.7	502					
7825619	7829218	7829206	7829194	12	305	21.7	553	16.8	427	23.7	604					
7825620	7829219	7829207	7829195	18	457	29.7	756	24.8	631	31.7	807					
7825621	7829220	7829208	7829196	24	610	35.7	909	30.8	783	37.7	959					
7825277	7829221	7829209	7829197	36	914	47.7	1214	42.8	1088	49.7	1264					

† At rated load



## Manual Performance Pak Actuators



Dimensions are in inches.  
Dimensions in brackets ( ) are in mm.

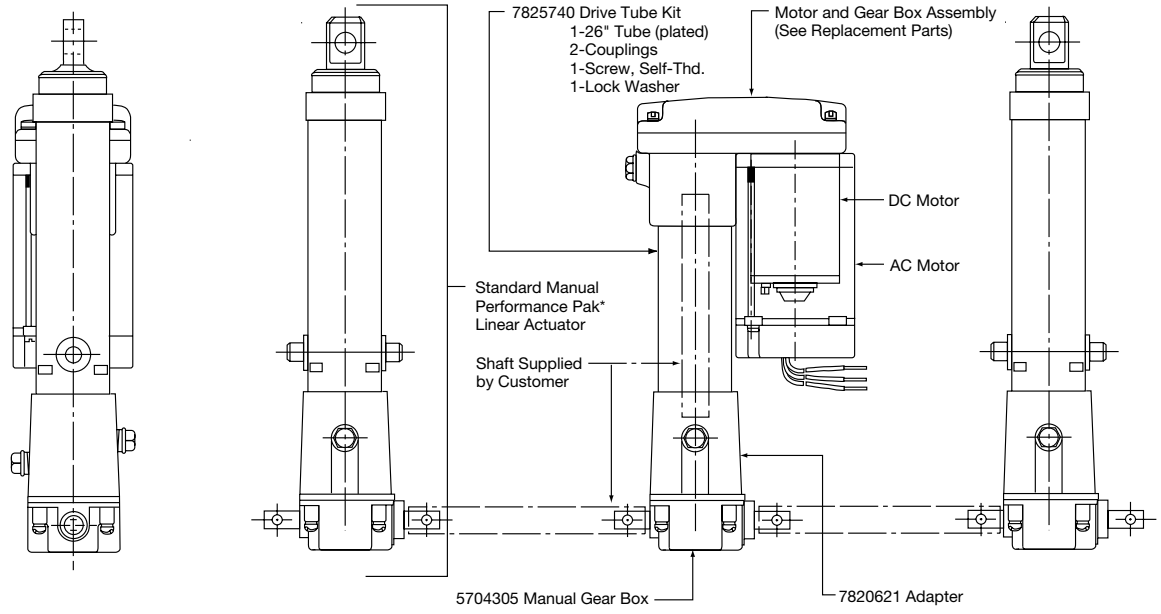
## Standard Manual Performance Pak Actuators

Part Number	Stroke		Dimensions				Rated Load		Travel <sup>†</sup> per Turn		Torque <sup>‡</sup> Input	
	(in)	(mm)	A (in)	A (mm)	B (in)	B (mm)	lb	N	in	mm	in/lb	kg/m
7820619	4	102	14.8	378	8.8	224	1500	6670	.200	5	80	143
7821568	8	203	18.8	480	12.8	326						
7820620	12	305	22.8	581	16.8	427						
7821067	18	457	30.8	785	24.8	631						
7821569	24	610	36.8	937	30.8	783						
7821570	36	914	48.8	1242	42.8	1088						

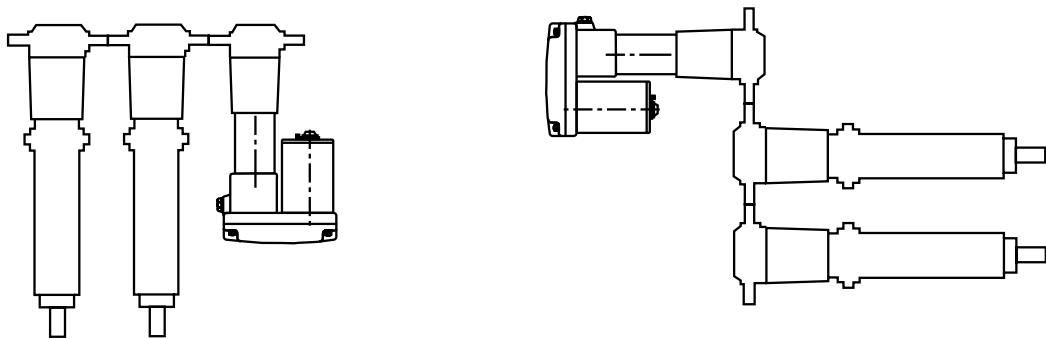
† To be operated @ 100 rpm max.

‡ At rated load

**Synchronizing Ball Screw Actuators**



NOTE: 1500 lb motor-gear box recommended for synchronizing manual gear boxes.



Part Description	Part Number	Part Description	Part Number
Actuator Kit – 4 in (101.6 mm) stroke	.7820146	Motor-Gear Box 90 VDC, HP 18:1	.7825259
Actuator Kit – 6 in (152.4 mm) stroke	.7827142	Motor-Gear Box 90 VDC, HP 58:1	.7825260
Actuator Kit – 8 in (203.2 mm) stroke	.7820950	Motor-Gear Box 110 VAC, 18:1 w/Sol. Brake	.7825377
Actuator Kit – 12 in (304.8 mm) stroke	.7820147	Motor-Gear Box 110 VAC, 58:1 w/Sol. Brake	.7825378
Actuator Kit – 18 in (457.2 mm) stroke	.7821066	Motor-Gear Box 110 VAC, 18:1	.7825379
Actuator Kit – 24 in (609.6 mm) stroke	.7821193	Motor-Gear Box 110 VAC, 58:1	.7825380
Actuator Kit – 36 in (914.4 mm) stroke	.7822047	Motor-Gear Box 110 VAC, 18:1 w/Elec. Brake	.7830123
		Motor-Gear Box 110 VAC, 58:1 w/Elec. Brake	.7829838
Gear Set – 17:1 Gear Ratio/ Steel (pre-1982)		Motor-Gear Box 220 VAC, 18:1	.7825811
Output Gear has 70 teeth	.7820695	Motor-Gear Box 220 VAC, 58:1	.7825812
Gear Set – 55:1 Gear Ratio/ Steel (pre-1982)		Motor-Gear Box 220 VAC, 18:1 w/Sol. Brake	.7829371
Output Gear has 91 teeth	.7820696	Motor-Gear Box 220 VAC, 58:1 w/Sol. Brake	.7829372
Gear Set – 18:1 Gear Ratio/ Delrin Material/Cross Pin		Capacitor Kit – 110 VAC	.5704687
Output Gear has 52 teeth	.7821093	Capacitor Kit – 110 VAC, Heavy Duty	.7825590
Gear Set – 58:1 Gear Ratio/ Delrin Material/Cross Pin		Capacitor Kit – 220 VAC	.7825579
Output Gear has 68 teeth	.7821094	Solenoid Brake – 110 VAC	.5704199
Motor-Gear Box 12 VDC, 18:1	.7820240	Solenoid Brake – 220 VAC	.7825568
Motor-Gear Box 12 VDC, 58:1	.7820241	Brush and Spring Kit – 90 VDC HP	.7820408
Universal Mounting Bracket	.7824295	Limit Switch Kit – 12 VDC, w/HSG	.7823091
Universal Mounting Bracket	.7827320	Limit Switch Kit – 24 VDC, 36 VDC, 90 VDC, 110 VAC, 220 VAC, w/HSG	.7822519
Side Mounted Brackets		Hall Effect Sensor Kit (with housing)	.7822048
• Heavy Duty – 1,500 lb	.7821783	Hall Effect Sensor Kit (without housing)	.7821764
• Light Duty – 2 piece	.7822520	10K Potentiometer Kit (Ball Screw)	.7821157
Motor-Gear Box 24 VDC, 18:1	.7830934	Boot Kit 4", 8", 12" & 18"	.7821908
Motor-Gear Box 24 VDC, 58:1	.7830935	Boot Kit 24"	.7821909
Motor-Gear Box 36 VDC, 18:1	.7821239	Boot Kit 36"	.7821910
Motor-Gear Box 36 VDC, 58:1	.7821240		
Motor-Gear Box 90 VDC, 18:1	.7820262		
Motor-Gear Box 90 VDC, 58:1	.7820264		
Gear Set – 18:1 Gear Ratio/ Delrin Material/Blade			
Output Gear has 52 teeth	.7831650		
Gear Set – 58:1 Gear Ratio/ Delrin Material/Blade			
Output Gear has 68 teeth	.7831655		

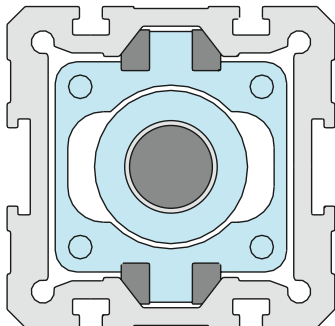


# T90 Special Purpose Actuator



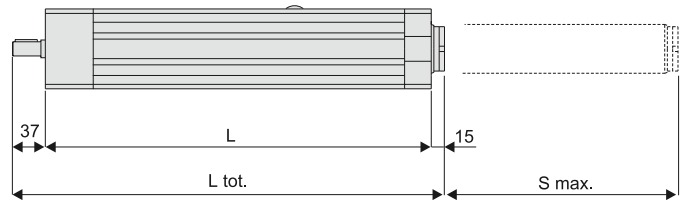
## Screw drive, sliding guide

- Hard-chromed extension tube
- High load
- High speed
- 100% duty cycle
- Push or pull operation
- High sealing degree
- Extension tube anti rotation mechanism
- Resistant to shock loads and vibrations
- Silent
- Lubricated for life
- T-slot for magnetic sensor



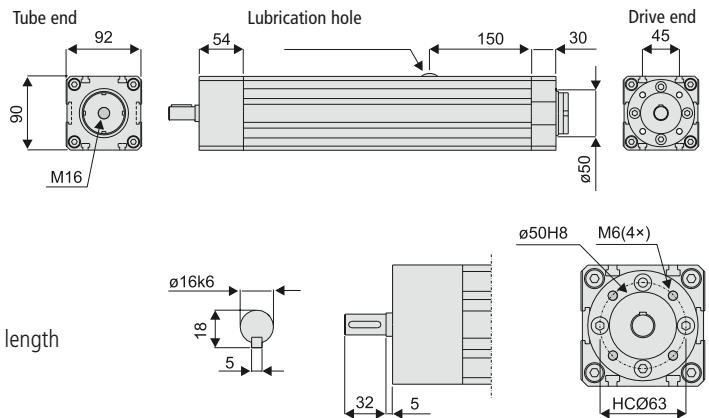
T90		
Designation	T09-B2510	T09-B2525
Max stroke [m]	1,5	1,5
Max. speed [m/s]	0,5	0,5
Max. input speed [rpm]	3000	3000
Temperature range [°C]	-20 – +70	-20 – +70
Weight (L in m) [kg]	4 + 16,2 x L	4 + 16,2 x L
Weight extension tube [kg]	5,5 x L	5,5 x L
Max. load Fx [N]	10000	10000
Max. load Fr [N]	60	60
Max. torque Mta [Nm]	35	35
Max. force Frd [N]	800	800
Screw diameter [mm]	25	25
Screw lead [mm/revolution]	10	25
Repeatability [±mm]	0,05	0,05
Resolution [mm]	0,1	0,1

## Ordering length in millimeters

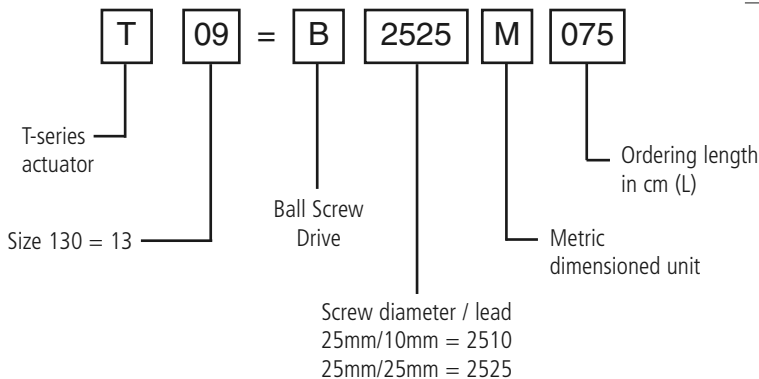


Model	Designation	Total length	Length to order
		L tot	L
T90	T09-B	L tot = L + 52	L = S max + 195

## Dimensions (metric)



## How To Order



# T130 Special Purpose Actuator

Phone: 1-800-554-8466  
Website: www.linearactuators.com

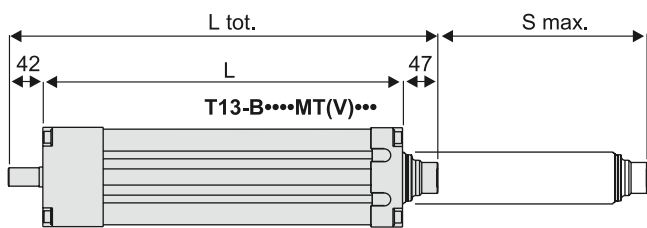
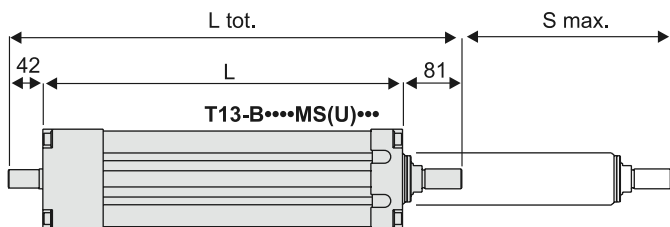


## Screw drive, sliding guide

- Hard-chromed extension tube
- High load
- High speed
- 100% duty cycle
- Push or pull operation
- High sealing degree
- Extension tube anti rotation mechanism
- Resistant to shock loads and vibrations
- Silent
- Lubricated for life
- T-slot for magnetic sensor

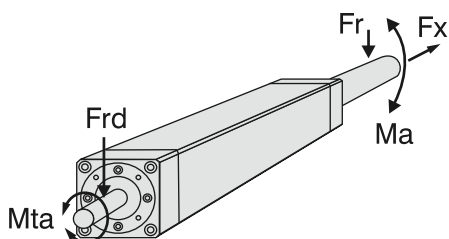
	T130	T130	T130
Designation	T13-B4010M	T13-B4020M	T13-B4040M
Max stroke [m]	2	2	2
Max. speed [m/s]	0,4	1	2
Max. input speed [rpm]	2500	3000	3000
Temperature range [°C]	-20 – +70	-20 – +70	-20 – +70
Weight (L in m) [kg]	18,5+ (30 x (L - 0,293))	18,5+ (30 x (L - 0,293))	18,5+ (30 x (L - 0,293))
Max dynamic load Fx [N]	40000	35000	15000
Max static load Fx [N]	45000	45000	45000
Max. load Fr [N]	800	800	800
Max. torque Ma [Nm]	300	300	300
Max. torque Mta [Nm]	140	140	140
Max. force Frd [N]	2000	2000	2000
Screw diameter [mm]	40	40	40
Screw lead [mm/revolution]	10	20	40
Repeatability [±mm]	0,05	0,05	0,05
Resolution [mm]	0,1	0,1	0,1

## Ordering length in millimeters

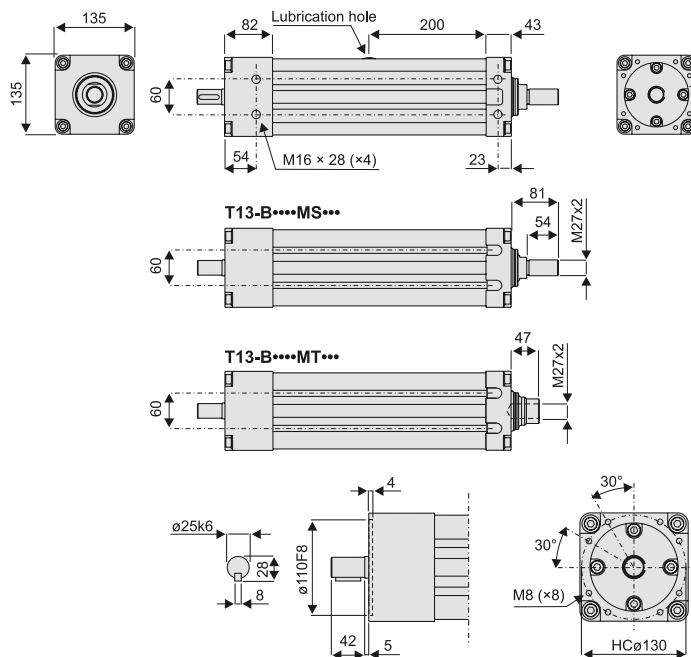


Designation	Designation	Total length
T13-B...MS (U)...	L tot = L + 123	L = S max + 293
T13-B...MT (V)...	L tot = L + 89	L = S max + 293

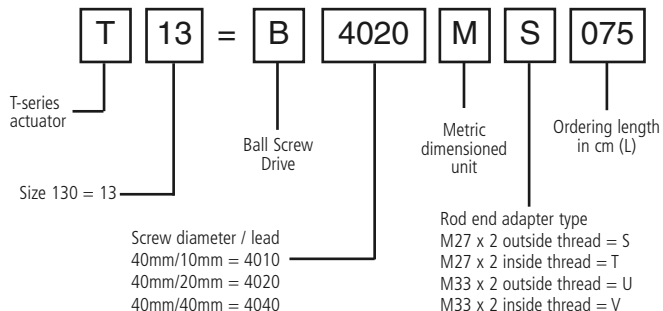
## Forces



## Dimensions (metric)



## How To Order



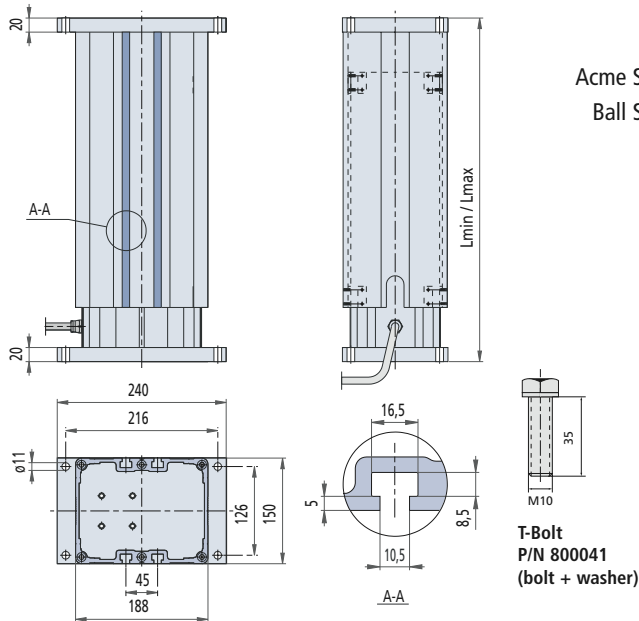


The MOVOACT is a self-supporting, height adjustable column based on anodized extruded aluminum profiles which slide into each other. The motion is assured by a built-in linear Thomson actuator.

The result is a compact, all-in-one package ready for use. The model and rating of the linear actuator used can be specified by the customer.

MOVOACT provides a strong, rugged, industrial column with excellent torque capability for height adjustment of work-tables, conveyors, loaders/unloaders and many other applications. This height adjustment especially serves to adjust the work environment to the specific ergonomic requirements of different operators.

**Dimensions (metric)**

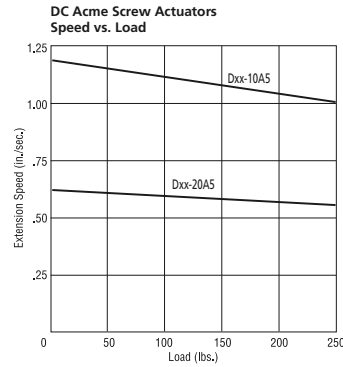
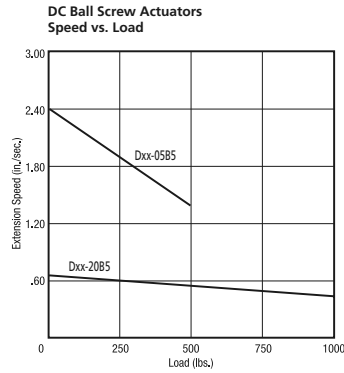
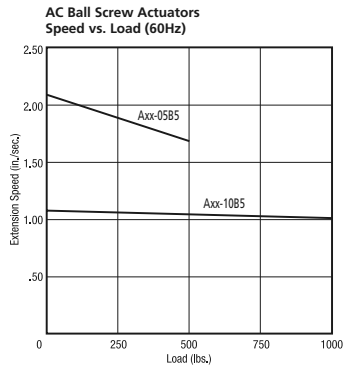


Acme Screw  
 Ball Screw

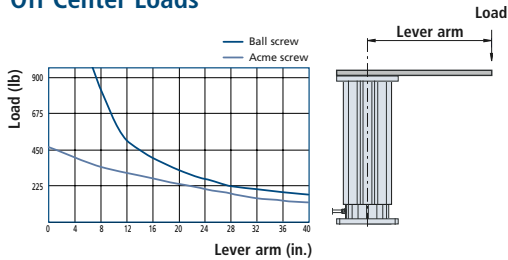
Stroke Length 0 - 12 in.		Stroke Length 13-24 in.	
Lmin	Lmax	Lmin	Lmax
Stroke + 9 in.	Stroke + Lmin	Stroke + 11 in.	Stroke + Lmin
Stroke + 10.6 in.	Stroke + Lmin	Stroke + 12.5 in.	Stroke + Lmin

T-Bolt  
 P/N 800041  
 (bolt + washer)

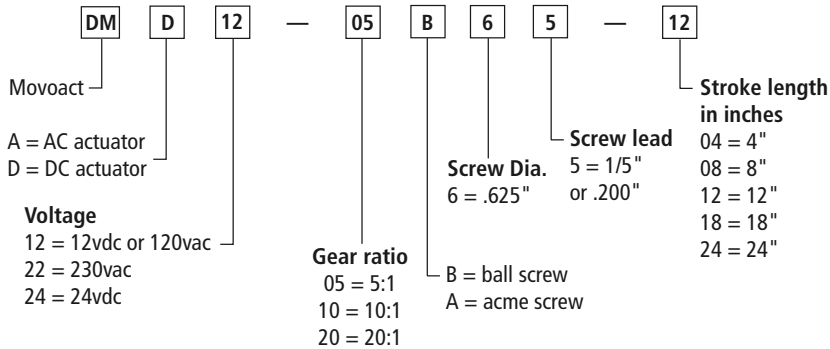
## Performance Curves



## Off Center Loads



## How To Order



# Rotary Actuators

## 12, 24 and 36 VDC Motors Intermittent Duty Rotary Actuator



**Features:**

- Multiple design variations
- Mix and match motor voltage with gear reductions to yield the combination best suited for your application.
- 12, 24 and 36 Volt DC Motors
- 5/1, 10/1, 20/1, 30/1 Gear reductions available
- Overload clutch protection
- Thermal protected DC motor
- Variety of standard output shaft configurations
- Weatherpak connectors available
- Easy mounting
- IP-56 Sealed

**Intermittent Duty  
 Rotary Actuator**

New rotary actuators are available for DC applications with a variety of mounting configuration and options. These actuators operate both CW and CCW and have a load limiting clutch to protect the actuator from overloads.

**Typical Applications:**

- Snowblower spout rotation control
- Valve control
- Agricultural MOH applications
- HVAC
- Turf and garden equipment

**Specifications**

Input Voltage	12, 24, 36 VDC
Overload Protection	Ball detent clutch set to slip at 85-90 in.lbs. of torque. Other clutch settings are available.
Thermal Protection	Automatic resetting thermal breaker enclosed in motor housing. External fuse is recommended for additional protection.
Lead Wires	14 AWG stranded copper with 80°C GPT insulation per SAE J1128.
Connector	Packard Electric 56 Series female body no. 2984883 with (2) male blade terminals no. 2962987. Mating male connector no. 2973781 with (2) female terminals no. 2962573 (provided).
Power Switch	Double pole-double throw type with center off and momentary contacts (not provided). For CW output, connect red lead to positive and yellow lead to negative. For CCW output, connect yellow lead to positive and red lead to negative.
Temperature Environment	Operating ambient -15°F to 150°F (-26°C to 66°C)
Duty Cycle	Actuator is weather protected for outdoor use. Duty cycle is time and temperature related and needs to be evaluated under actual operating conditions.



Snow Blower Spout Rotation

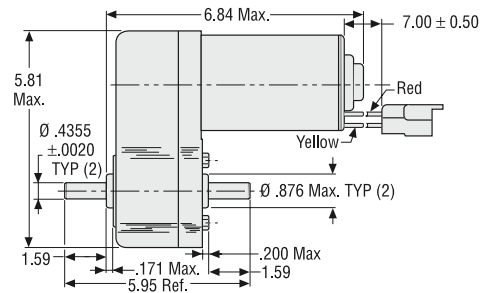
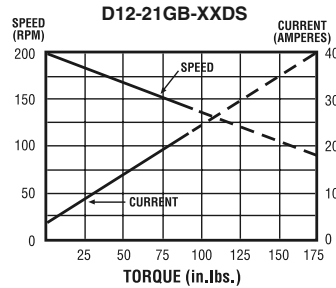


## Power From Dual Output Shafts

Dimensions ( ) denotes millimeters

### Performance Curves

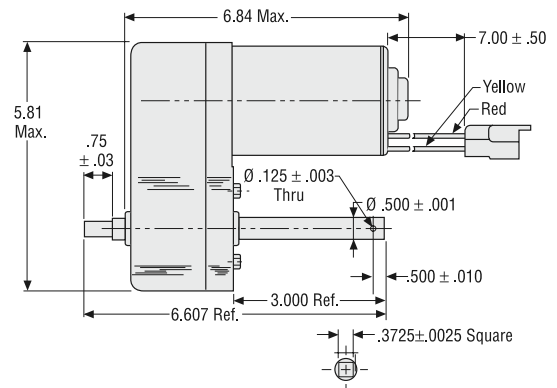
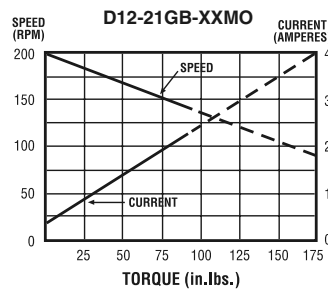
Nominal performance at 12 VDC and 70°F (21°C)



## Manual Override

### Performance Curves

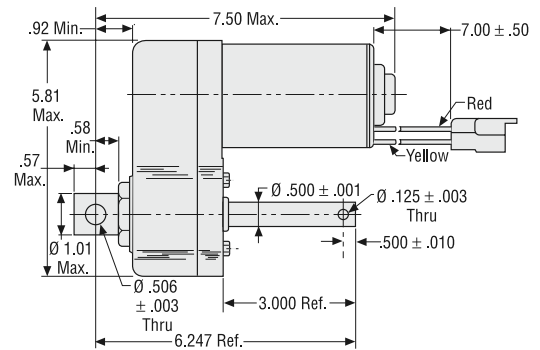
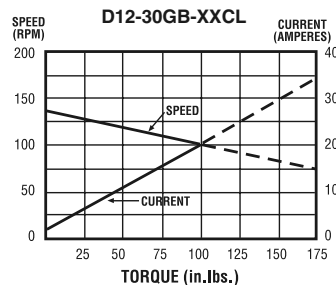
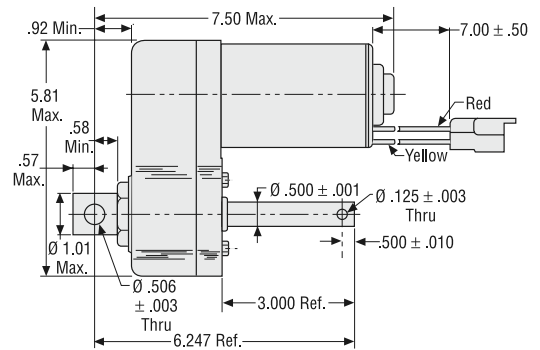
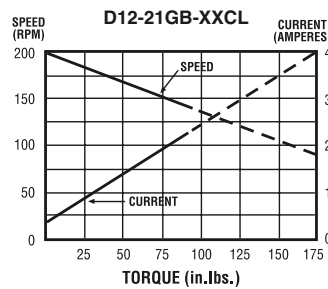
Nominal performance at 12 VDC and 70°F (21°C)



## Clevis Mount

### Performance Curves

Nominal performance at 12 VDC and 70°F (21°C)






## How To Order

Consult the factory

Whether you plan to operate from a simple pushbutton or a programmable controller, the MCS-2000 series controls can make your system easy to design and install and simple to operate. Designed to drive Electrak actuators, MCS-2000 series controls are equipped with easy-to-use terminal strip input and output wiring, built-in power supply for DC actuators or capacitor for AC models, and three controls have touch sensitive membrane key pads.

## Quick Reference Guide

Control	Description	Input Voltage	Actuator Model
<b>Remote Switch</b> 	The enclosed remote switch is used to directly operate any Electrak actuator. AC actuators must also have the capacitor wired into the circuit.	12, 24 VDC 115, 230 VAC	All actuators
<b>DE-14 Series</b> 	Specific control for Electrak 050 actuator. m 115 VAC input. Hand held pendant operator.	115 VAC	Electrak 050
<b>DF-14 Series</b> 	Specific control for Electrak 150 actuator. 115 VAC input. Hand held pendant operator.	115 VAC	Electrak 150
<b>MCS-2005/2006</b> 	Compact control for one actuator and an auxiliary device such as a photoscanner. Extend/Retract switch, 120 VAC input.	115 VAC 230 VAC	Electrak 1
<b>MCS-2007/2008</b> 	Similar to MCS-2005, but with LCD digital display for position feedback and limit switch adjustments in the control.	115 VAC 230 VAC	Electrak 1 with feedback
<b>MCS-2015</b> 	Basic power supply for on-off and emergency stop. 115 VAC or 230 VAC input.	115 VAC 230 VAC	Electrak 1 Electrak 10 Electrak 100
<b>MCS-2025</b> 	Intermediate control with power supply for on-off, emergency stop, jog, run and remote control functions.	115 VAC 230 VAC	Electrak 1 Electrak 10 Electrak 100
<b>MCS-2035</b> 	An advanced control with all the features of the MCS-2025 plus a readout display for positional feedback.	115 VAC 230 VAC	Electrak 100
<b>MCS-2041/2042</b> 	Specific control for Electrak 5. MCS-2041 for 115 VAC input and MCS-2042 for 230 VAC input. Extend/Retract switch.	115 VAC 230 VAC	Electrak 5
<b>MCS-2051/2052</b> 	Specific control for the new Electrak 205. MCS-2051 for 115 VAC input and MCS-2052 for 230 VAC input. All the advanced features of the MCS-2035 except dynamic braking.	115 VAC 230 VAC	Electrak 205

## Remote Switch

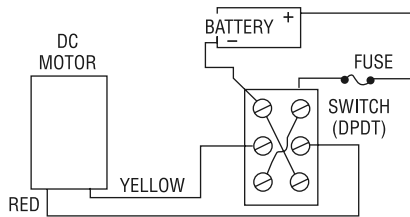
Use with Electrak 1, 2, 5, 10, 050, 100 and 150

### Features

- Double pole, double throw
- 15A rating at 270 VAC
- Center "off"
- Two momentary contacts
- Pigtails with wire nuts supplied
- Wiring diagram on label
- "L" bracket for easy mounting
- 2 versions available (with or without enclosure)

### Remote Switch (830-8004-016) without enclosure

Actuators require double-pole double-throw switches. McGill switch no. 0121-004, Cutler-Hammer switch no. 8835-K4, or equivalent are recommended and are usually available locally. The required switch can be purchased from Danaher Motion under part number 830-8004-016.



Remote Switch Wiring Connection

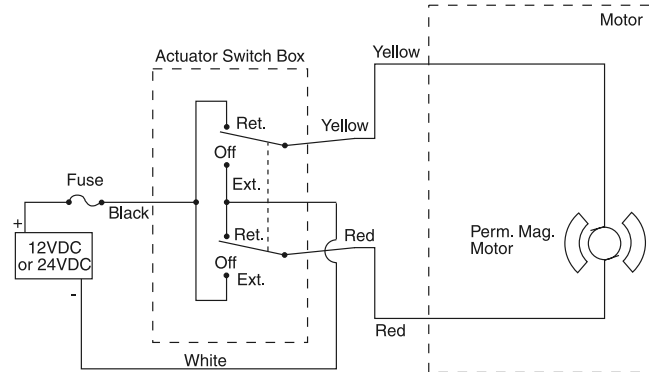
### Remote Switch (6932-101-054) with enclosure



The enclosed remote switch is used to directly operate any Electrak actuator. AC actuators must also have the capacitor wired into the circuit. The switch has a mounting bracket and the wiring diagram is included on the label. The switch is wired between the power supply and the actuator and two momentary contacts are used to extend or retract the actuator.

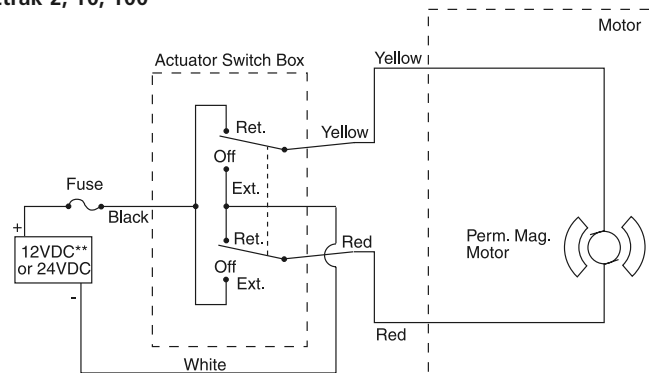
## Wiring Connections

### Electrak 1



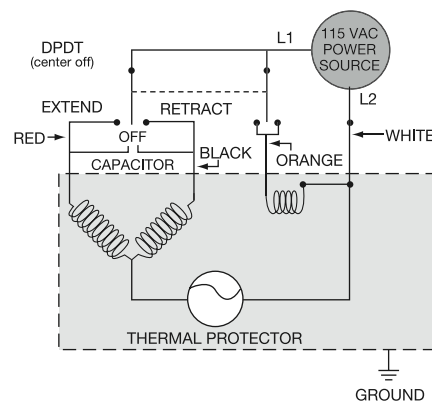
\* Note: Red for Electrak 1  
White for 12 VDC Electrak 1 with feedback  
Black for 24 VDC Electrak 1 with feedback

### Electrak 2, 10, 100



\*\* Note: Electrak 2 is 12 VDC

### Electrak 5 (A12-A22 Series)





# Actuator Controls

## DE14 series

Use with Electrak E050

## DF14 series

Use with Electrak E150



DE14 and DF14 series actuator controls operate Electrak E050 and E150 actuators respectively. Available with one or two 24 VDC outputs, each has a handset to manually control bi-directional motion on each of its control outputs, independently. It has quick disconnect sockets and cable adapters in 5, 10, and 15 ft. lengths to connect to the actuator. Each output has a circuit breaker that automatically resets approximately 20 seconds after a short circuit is removed. DF14 control also has a built in ELS circuit to protect the Electrak 150 actuator at end of stroke.

## Specifications

Input	DE14-1E	120 VAC, 50/60 Hz
	DE14-2E	120 VAC, 50/60 Hz
Output	DE14-1E	24 VDC, one output, 2.5 amps max.
	DE14-2E	24 VDC, two output, 2.5 amps per channel max., 5.0 amps total
	DF14-1F	24 VDC, one output 6.5 amps max.
	DF14-2F	24 VDC, two output 6.5 amps per channel max. 6.5 amps total

Ambient Temperature  
 15° to 104°F (-26° to 40°C)

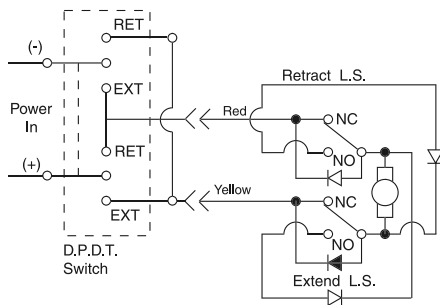
Duty Cycle 25% max.

## Wiring Connections

### E050 Wiring

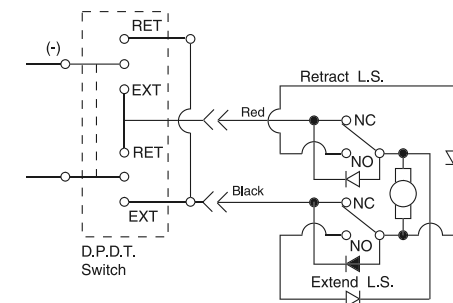
Electrak actuators should be connected in accordance with the wiring diagram shown below.

Make sure the power is off before attempting to wire the actuator. To extend the actuator, connect yellow to positive and red to negative. To retract the actuator, connect red to positive and yellow to negative.



### Metric Version

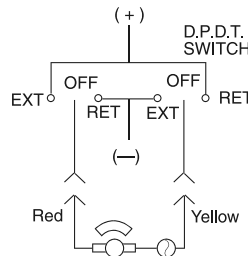
To extend the actuator, connect black to positive and red to negative. To retract the actuator, connect red to positive and black to negative.



### E150 Wiring

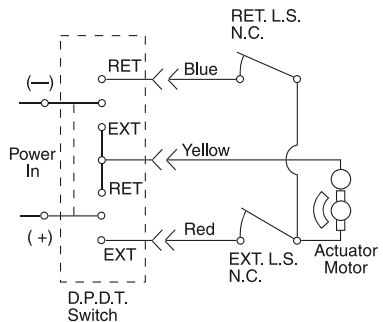
#### Without Limit Switches

To extend actuator, connect red to positive and yellow to negative. To retract actuator, connect red to negative and yellow to positive.



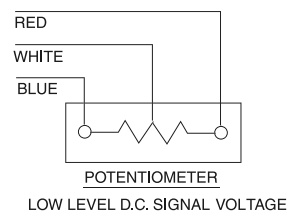
#### With Limit Switches

To extend actuator, connect red to positive and yellow to negative. To retract actuator, connect yellow to negative and blue to positive.



#### Potentiometer

Resistance measured across the white and blue leads will increase as the actuator extends and decrease as the actuator retracts. Resistance measured across the white and red leads will decrease as the actuator extends and increase as the actuator retracts.



## MCS-2005/MCS-2006 For Electrak 1 actuators



The MCS-2005 linear actuator control converts 120 VAC input current to 24 VDC output to operate an Electrak 1 actuator. This compact control is designed to operate one actuator and an auxiliary device such as a photoscanner simultaneously. The control has two outputs, a 24 VDC source controlled by the rocker switch on the cover and a second 24 VDC source which is unswitched. The source operated by the rocker switch is used when operation through the control is desired. The constant output source is used when a remote switch is to control the actuator. An auxiliary device, such as a photoelectric control which draws up to 200 mA may also be connected to the auxiliary output.

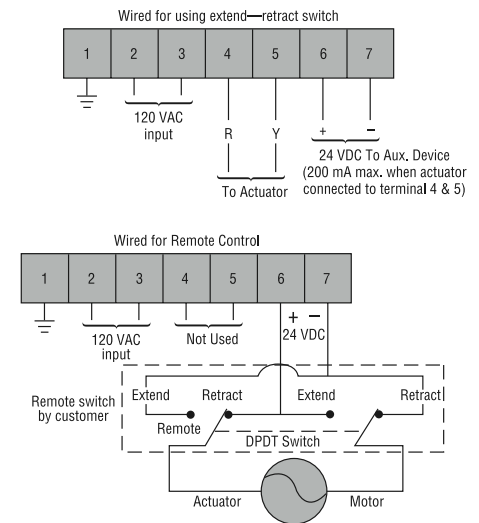
When the extend side of the rocker switch is pressed the actuator will begin to extend and will continue until either the switch is released or the actuator reaches the end of its stroke and the limit switch stops it. The actuator may be stopped by the control anywhere along the

total stroke length but it must not be stalled in mid-stroke. A fused output protects the motor against overloads and stalling mid-stroke. Depressing the retract side of the rocker switch will cause the actuator to retract as long as the switch is held or until the actuator reaches the end of its stroke and the limit switch again stops it.

### Features

- Standard 120 VAC input (MCS-2005)
- Standard 240 VAC input (MCS-2006)
- One 24 VDC actuator output for operation by front panel rocker switch
- One 24 VDC output for auxiliary device such as a photoelectric sensor
- Fused ratings – 1 Amp, 250 VAC (within control) – protects actuator in case of stalling caused by overload
- Compact size
- “Power On” light illuminates whenever power applied to the control
- Terminal strip for easy electrical connection
- Output filtered, but unregulated. Varies from 20-30 VDC, depending on input voltage. (2.8 amps rated continuous)

### Wiring Connections



## MCS-2007/MCS-2008 For Electrak 1 actuators with feedback



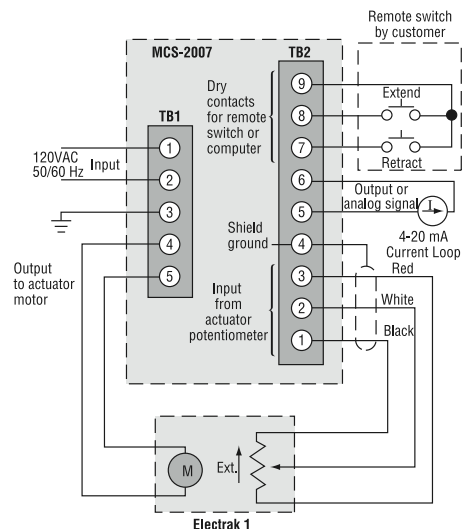
Compact control displays the feedback position on a digital LCD meter on the front cover. The control provides a 4-20 mA signal for a remote meter.

Extend and retract limit switches are set by adjusting two trim pots in the control.

### Features

- Standard 120 VAC input (MCS-2007)
- Standard 240 VAC input (MCS-2008)
- One 24 VDC actuator output (2.8 amps rated continuous)
- Extend/retract switch
- Fuse protection
- Compact size
- 4-20 mA current loop for remote meter
- Dynamic braking
- LCD digital readout on front cover displays position feedback
- Extend/retract limit switches set by adjusting trim pots in control. Actuator need not be accessible to set limit switches.
- Accepts switch/inputs

### Wiring Connections



**MCS-2015**  
 For Electrak 1, 10, and 100



**Common Features**

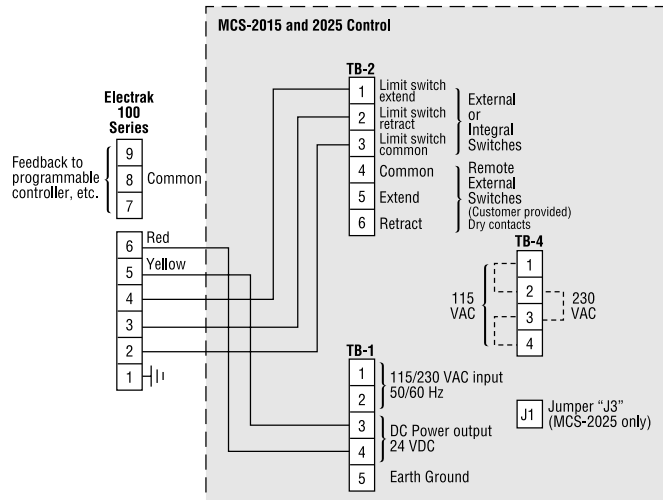
- 115 VAC or 230 VAC input
- 24 VDC output to Electrak 1, 10 and 100 actuators
- 8 amps output continuous
- Dynamic braking
- Compatible with programmable controllers and Danaher Motion Photoscanners
- Power on indicator
- Emergency stop/off pushbutton remains in position when activated
- NEMA 1 enclosure
- Accepts switch/inputs
- Provisions for 2 external limit switches or integral actuator limit switches

**On-off power supply**

The MCS-2015 is a basic power supply providing on-off and emergency stop functions.

**Wiring Connections**

**MCS-2025**  
 For Electrak 1, 10, and 100



**Combined control and power supply**

The MCS-2025 intermediate control and power supply is equipped with cover mounted membrane switches and LED indicator lights for extend, retract, jog, run and remote control.

**Additional features of the MCS-2025**

- 8 amps output continuous
- Cover mounted membrane switches with LED indicator lights for extend, retract, jog, run and remote control
- Internal jumper for automatic return from end of stroke in run mode

**Terminal Block Codes**

Wiring to Electrak 1 Series

Wire Terminal Block 4 as shown. Connect the yellow lead from the actuator to terminal 4 of TB-1 and the red lead to terminal 3 of TB-1. TB-2 can be used for external switch connections. If limit switches are not used, terminals 1, 2 and 3 on TB-2 must be jumpered.

**Wiring to Electrak 10 Series**

Wire Terminal Blocks 1 and 4 as shown, TB-2 can be used for external limit switch connections. If limit switches are not used, terminals 1, 2 and 3 on TB-2 must be jumpered.

**“Run” mode**

Inserting jumper “J1” causes the actuator to reverse automatically upon reaching the extend limit switch. The actuator automatically retracts until reaching the other switch.

**Remote control**

When used with these controls a programmable controller, photoscanner or other such remote control device must have a minimum output rating of 24 VDC at 15 mA (MCS-2015 requires 48 VDC at 15 mA). The maximum saturation voltage of the remote control solid state output is 2 VDC. The maximum allowable leakage current of the remote control output is 2 mA.

## MCS-2035

For Electrak 100 actuators with feedback



### Features

- 115 VAC or 230 VAC input
- 24 VDC output to Electrak 100 actuators
- 8 amps output continuous
- Dynamic braking
- Compatible with programmable controllers and photoscanners
- Power on indicator
- Emergency stop/off pushbutton remains in position when activated
- Cover mounted membrane switches with LED indicator lights for extend retract, jog, run and remote control
- NEMA 1 enclosure
- Accepts switch/inputs
- Internal jumper for automatic return from end of stroke in run mode
- Provisions for 2 external limit switches or integral actuator limit switches
- Percent of full stroke meter
- Receives potentiometer feedback from Electrak 100 actuators
- Output current loop (0-20 or 4-20 mA) for use with a remote meter

### Positioning control and power supply

The MCS-2035 is an advanced control unit with cover mounted membrane switches for extend, retract, jog, run and remote control functions plus a percent of full stroke meter.

### Terminal Block Codes

#### AC Line Voltage Selection

Jumper connections on TB-4 must be set for line voltage to be used. For 115 VAC, jumper terminals 1 to 2 and 3 to 4 on TB-4. For 230 VAC jumper terminals 2 to 3 only on TB-4. There are no external wiring connections to TB-4.

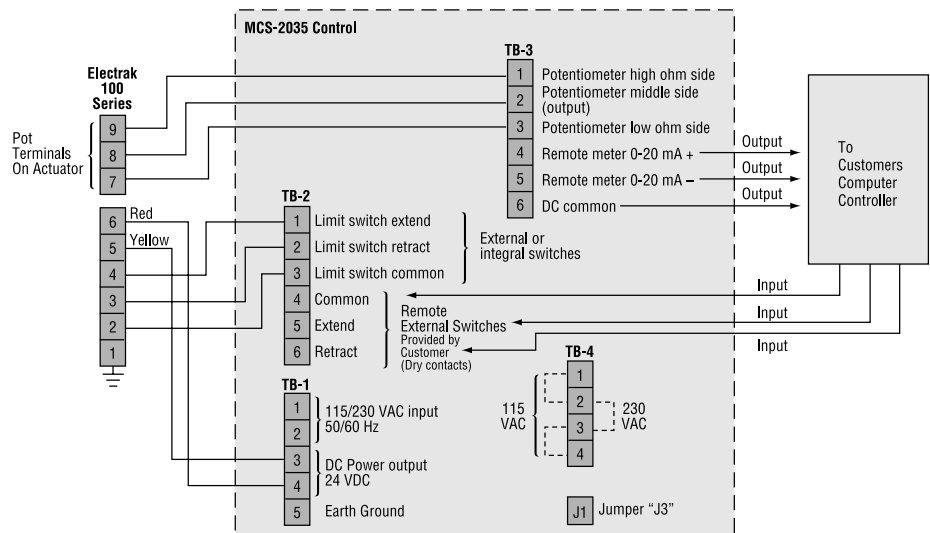
#### “Run” mode

Inserting jumper “J1” causes the actuator to reverse automatically upon reaching the extend limit switch. The actuator automatically retracts until reaching the other switch.

#### Remote control

When used with the MCS-2035 control, a programmable controller, photoscanner or similar remote control device must have a minimum output rating of 24 VDC at 15 mA. The maximum saturation voltage of the remote control solid state output is 2 VDC. The maximum allowable leakage current of the remote control output is 2 mA. The remote meter output loop is a 0-20 or 4-20 mA signal.

### Wiring Connections



**MCS-2041/2042**  
 For Electrak 5 actuators



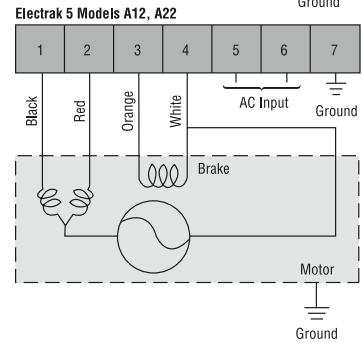
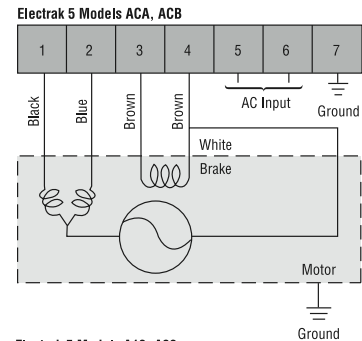
The MCS-2041 and 2042 linear actuator controls are specifically designed to operate Danaher Motion Electrak 5 linear actuators. These compact controls switch both the actuator motor and its anti-coast brake to provide optimum performance. When the extend side of the rocker switch is pressed, the actuator will begin to extend and will continue until either the switch is released or the actuator reaches the end of its stroke and the ball detent clutch slips. Depressing the retract side of the rocker switch will cause the

actuator to retract as long as the switch is held or until the actuator reaches the other end of its stroke. The ball detent clutch will also slip on overloads. The actuator's brake engages when the switch is released or in case of power failure.

**Features**

- 115 or 230 VAC versions
- 15 amps output continuous
- Rocker switch to control extend and retract movement
- "Power On" light illuminates whenever power applied to the control
- Fuse ratings  
 MCS-2041 10Amps@250V  
 MCS-2042 5Amps@250V
- Prewired capacitor
- Terminal strip for easy field connections
- Compact size

**Wiring Connections**



**MCS-2051/2052**  
 For Electrak 205 actuators with feedback



An advanced control unit for the new Electrak 205 actuator with a digital LCD meter to display the feedback position and a 4-20 mA output signal to operate a remote meter or provide an input to a programmable controller. Same membrane function switches as the MCS-2035.

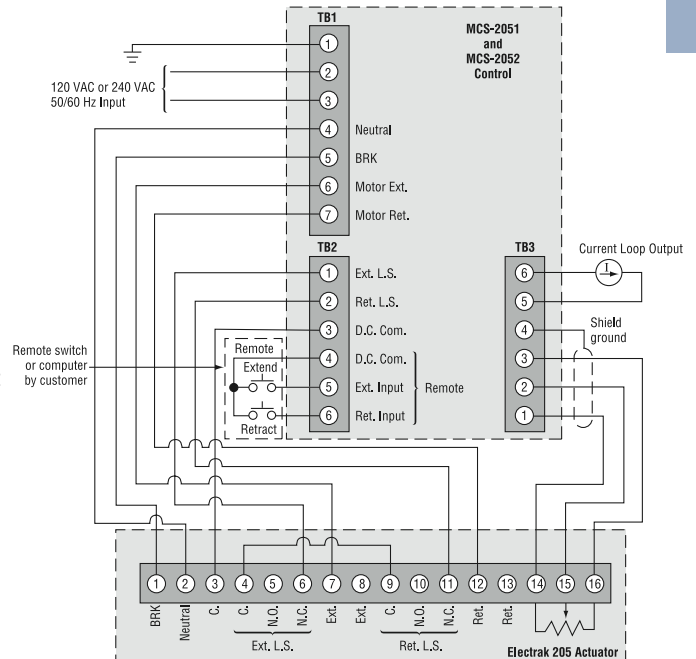
- NEMA 1 enclosure
- Accepts switch/inputs
- Internal jumper for automatic return from end of stroke in run mode
- Provisions for 2 external limit switches or integral actuator limit switches

- LCD display for feedback position
- Receives potentiometer feedback from Electrak 205 actuators
- Output current loop (4-20mA) for use with remote meter

**Remote control**

When used with the MCS-2051 or MCS-2052 control, a programmable controller, photoscanner or similar remote control device must have a minimum output rating of 24 VDC at 15 mA. The maximum saturation voltage of the remote control solid state output is 2 VDC. The maximum allowable leakage current of the remote control output is 2 mA. The remote meter output loop is a 4-20 mA signal.

**Wiring Connections**

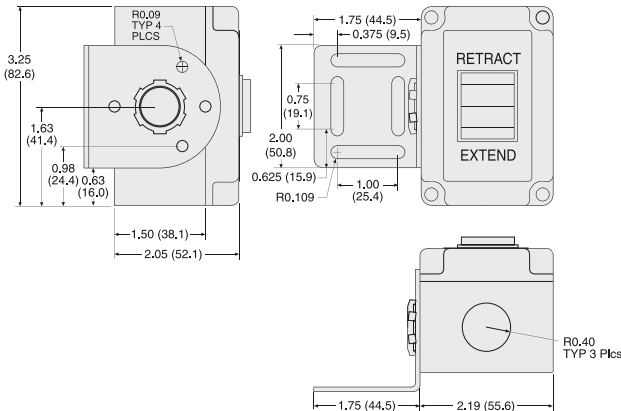


**Features**

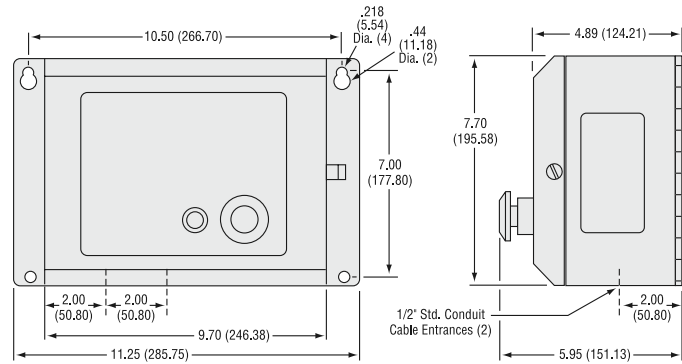
- 15 amps output continuous
- Compatible with programmable controllers and photoscanners
- Power on indicator
- Emergency stop/off pushbutton remains in position when activated
- Cover mounted membrane switches with LED indicator lights for extend, retract, jog, run and remote control



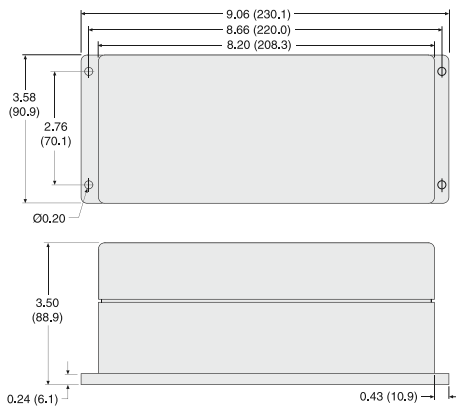
## Remote Switch (6932-101-054)



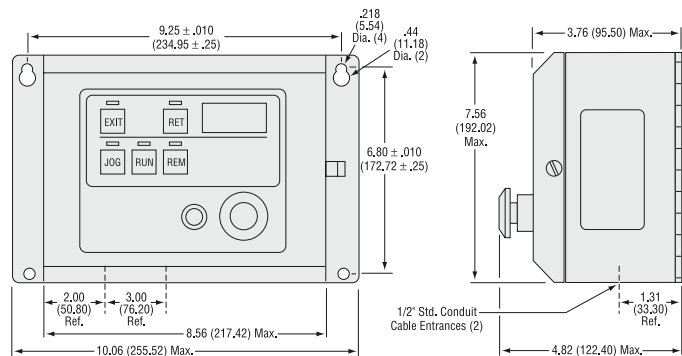
## MCS-2015, MCS-2025, MCS-2035



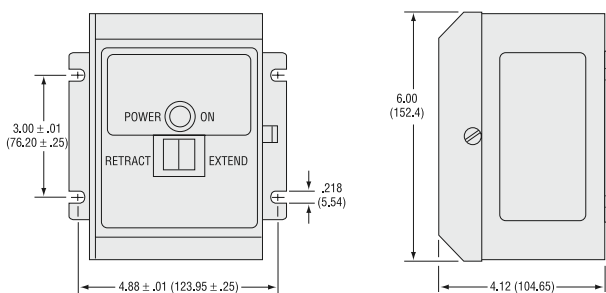
## DE14/DF14



## MCS-2051, MCS-2052



## MCS-2005/2006, MCS-2007/2008, MCS-2041/2041



Dimensions in ( ) denotes millimeters

### Available Front Adapters for Electrak 2, 5, 10 Actuators:

- Clevis
- Clevis with flats
- Custom crosshole diameters
- Tapped hole
- Rod end
- Threaded stud

### Available Rear Adapters:

- Clevis
- Custom crosshole diameters
- Custom distance crosshole to housing
- Threaded stud
- Tapped hole
- Rod end

### Manual Override:

- On the screw
- On the motor (flat or slotted shaft end)
- Integrated into the pinion gear

705 Screw option - Higher loads/Longer length

Special Retracted Length

Special Stroke Lengths - Longer than 24" and odd stroke lengths

Expanded Standard Connectors (Weather pack, Amp, Metripack, etc.)

Clutch Rating option - (250, 500, 700, 1000, 1500, 2000) lb

Higher Load ball screw actuators - 1500 and 2000 pound loads

Acme A5/A8

Higher load acme actuators - 500 pound A5 and 1000 pound A8

Bare screw - No cover tube

Anti-rotation cover tube

Elongated rear housing with potentiometer

Welded trunnions (male and female)

12VDC, 24VDC, 36VDC, 48VDC, 90VDC, 115VAC, 230VAC

Limit switch options

Feedback options - potentiometer, Hall effect, Encoder

UL approval (115, 230VAC)

CE approval (12, 24, 36 and 48VDC, 115 and 230VAC)

UL Marine approval

Packaging and labels per customer requirements

Custom testing of customer application and equipment in Danaher facility

Not all options are available for all models, contact the factory.



## Frequently asked questions about linear actuators . . .

**1** Question What is duty cycle and what is its effect on the use of an actuator?

Answer  

$$\text{Duty cycle} = \frac{\text{on time}}{\text{on time} + \text{off time}}$$

Example:

$$\begin{aligned} &15 \text{ seconds on; } 45 \text{ seconds off} \\ &= \frac{15 \text{ sec.}}{15 \text{ sec.} + 45 \text{ sec.}} = 25\% \end{aligned}$$

The duty cycle is a function of load for DC actuators. The duty cycle charts for each actuator should be reviewed when lower loads and higher duty cycles are needed. All actuators have at least a 25% duty cycle at full rated load. Ambient temperatures above 77°F may affect the final rating.

**3** Question Can two or more actuators be synchronized?

Answer No. Motor speed cannot be controlled with enough precision to ensure that the actuators will remain synchronized and a binding effect could take place.

**3** Question What is the maximum extension speed of an Electrak actuator?

Answer The extension speed of an actuator is a function of the load. To determine the speed of an Electrak actuator at a given load, consult the speed/load charts. If a higher linear travel rate is required, simple mechanical linkages can be employed.

**4** Question Can actuators operate above rated load?

Answer No, operation above rated load will adversely affect life.

**5** Question When should an electric actuator be used instead of other linear motion devices?

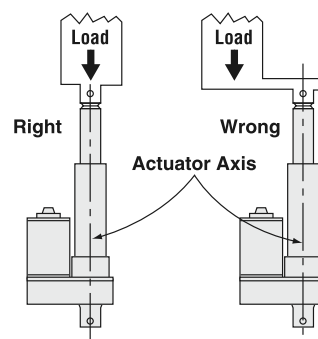
Answer If the load, duty cycle and speed requirements are within the performance parameters of an actuator, an Electrak actuator is highly recommended. In contrast to other linear motion devices, an Electrak system has only two or three components, minimizing initial installation cost and eliminating maintenance. Electrak actuators will perform as new throughout their entire operational lifetime, will hold a load indefinitely without power, and can be directly interfaced to a programmable controller or other electronic control device.

**6** Question Are actuators suitable for tough environments such as washdown areas or unheated warehouses?

Answer Yes. Electrak actuators can operate in temperatures ranging from -15° to 150°F. DC actuators are suitable for washdown areas and have passed 96 hour salt spray tests. (Equivalent to 2 years in a seaside environment.) AC actuators are TENV construction and are suitable for damp, dirty and oily environments. They can also be used outdoors with a drip shield over the motor and proper grounding and ground fault protection.

**7** Question Can actuators be side loaded?

Answer No. Through proper design practices, side loading of the actuator should be eliminated.



**8** Question What is the typical life of an Electrak actuator?

Answer Life is a function of load and stroke length. The specific load/life charts for each actuator will provide a life estimate for your particular application.

**9** Question Can I extend the life of the actuator?

Answer Using external limit switches to limit the stroke length instead of ratcheting the clutch will extend the life of the actuators without limit switches. Reducing the load on the actuator will also increase the life. Refer to the load/life charts for each actuator for more details.

**10** Question Is it possible for a load to backdrive an Electrak actuator?

Answer No. Ball bearing screw models incorporate an anti-back driving holding brake and acme screw models are self locking due to friction in the screw mechanism.

**11** Question How is a load prevented from coasting to a stop when the actuator is switched off?

Answer Electrak 5 and 205 actuators feature an anti-coast brake and the Electrak 1, 10 and 100 series actuators used in conjunction with MCS-2000 series controls are braked dynamically. Electrak 2 actuators may be dynamically braked by shorting the motor leads together after power is removed.

**12** Question What does the slip clutch do?

Answer The clutch slips when a factory-set load limit is exceeded. This prevents the actuator from jamming at the end of stroke or stalling and overheating due to an overload.



**13** Question How much backlash do actuators have?

Answer Backlash or endplay values differ among the models of the Electrak series.

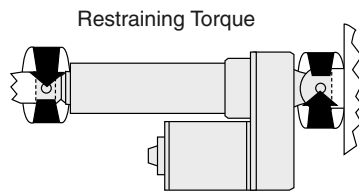
Electrak 1	.036 in.
Electrak 2	.080 in.
Electrak 5	.040 in.
Electrak 10	.040 in.
Electrak 050	.060 in.
Electrak 100	.035 in.
Electrak 150	.046 in.
Electrak 205	.015 in.

**14** Question Are our controls programmable?

Answer Our controls are not programmable but they will provide input to and accept low voltage signals from a programmable controller to operate the actuator. Electrak 2000 controls are fully programmable. Ask for publication P-1023 for more details or contact your local Danaher Motion distributor or sales representative.

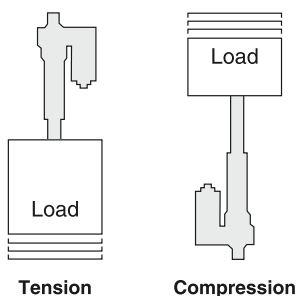
**15** Question What special mounting consideration do actuators require?

Answer Only two – Electrak actuators must be mounted so they are not subject to side loading. Also the brackets and associated hardware must be able to withstand 20 in. lbs. of restraining torque for Electrak 1 series or 100 in. lbs. for Electrak 2, 5, 10, 100 and 205 series.



**16** Question What's the difference between a tension and a compression load?

Answer A tension load tries to stretch the actuator and a compression load tries to compress the actuator.



**17** Question Are Danaher Motion Linear Products actuators maintenance-free?

Answer Electrak actuators never require lubrication, maintenance or adjustments for wear. The life of the Electrak 205 will be greatly extended by periodic lubrication using the grease fitting on the actuator. Lubrication is recommended for every 25,000 cycles.

**18** Question Can actuators perform complex multi-positional linear motion functions?

Answer An Electrak actuator and control system, used in conjunction with a programmable controller, can be programmed to perform motion profiles within the limitations of the actuator's stroke length and duty cycle. Electrak 2000 controls are fully programmable. Ask for publication P-1023 for more details or contact your local Danaher Motion distributor or sales representative.

**19** Question What are the most common reasons for premature actuator failure?

Answer Side loading due to incorrect mounting, shock loading, incorrect wiring, and exceeding the maximum duty cycle are the most prominent causes for premature failure.

**20** Question Why do our DC actuators not have a UL label?

Answer DC actuators do not need UL approval because of the low voltage involved.

**21** Question What is the Electrak 100 and Electrak 205 resolution using the potentiometer and what does backlash do to resolution?

Answer Under an unidirectional load (vertical) backlash does not affect resolution. Under a bidirectional load the backlash must be added to the resolution of the potentiometer.

Resolution	Unidirectional	Bidirectional Load (Resolution & Backlash)
Electrak 100	± .0035"	± .025" (for 24" stroke)
Electrak 205	± .0025"	± .010" (for 24" stroke)

**22** Question How can I slow the actuator down?

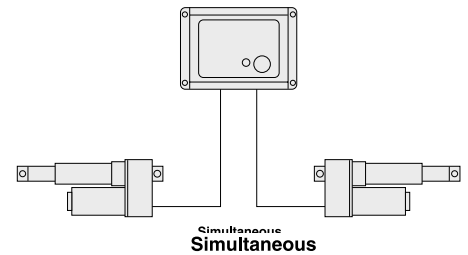
Answer The DC actuators can be run at reduced voltage (up to half voltage) to reduce the speed and still achieve the performance specs in the catalog.

**23** Question Can the actuator's positioning capability be improved?

Answer Running the actuator at a slower speed will allow better control of the actuator and improve positioning capability.

**24** Question Can an MCS-2000 series control operate more than one actuator?

Answer For the control to operate more than one actuator simultaneously, the combined current draw of the actuators must not exceed the maximum rated current output of the control. One set of limit switches will limit the stroke of all actuators connected to the control.



## AC Actuators

Danaher Motion Linear Products recommends using 16 gauge wire for applications with distances up to 20 feet from power source to actuator for AC units. For distances ranging from 20 to 60 feet, 14 gauge wire is recommended.

### Connection

AC actuator motor leads are pre-stripped for installation convenience.

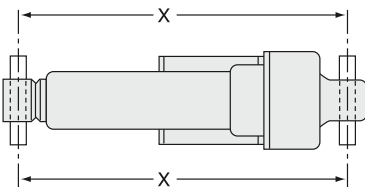
### Mounting

Danaher Motion Linear Products actuators are quickly and easily mounted by slipping pins through the holes on each end of the unit and into brackets on the machine frame and the load. Electrak 100 units must be mounted by the cover tube and a swivel rod end. The Electrak 205 can be mounted by either the rear clevis or by a tube mount.

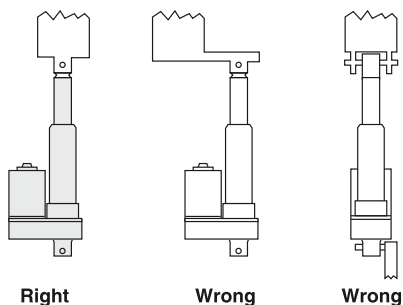
Half inch diameter solid pins (1/4" solid pins for Electrak 1) provide maximum holding strength and a retaining or cotter pin on each end will prevent the solid pin from falling out of its mounting bracket. Roll or spring type mounting pins should be avoided.

The mounting pins must be parallel to each other as shown below. Pins which are not parallel may cause the actuator to bind.

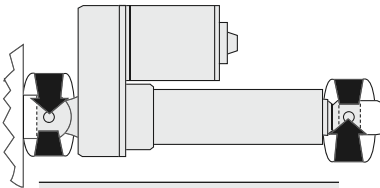
The load should act along the axis of the actuator since off center loads may cause binding.



The actuator mounting brackets must be able to withstand the torque which is developed when



the unit extends or retracts. Restraining torque required varies with the model being used.



Actuator	Torque Required in. lbs.
Electrak 1	20
All other Electrak Actuators	100

### Synchronization

Using two or more actuators together to move the same load is not recommended. Normal tolerances in motor specifications can cause one actuator to run faster than the other, causing binding.

### Connectors

#### Electrak 1

Packard Electric Pack-Con male 8911773 with terminal 6294511. Mating connector Pack-Con 8911772 with terminal 8911639. (Danaher Motion part no. for mating connector is 9300-448-001.)

#### Electrak 2 and 10

Packard Electric connector 56 series no. 2984883 and terminal no. 2962987. Male blade provided on DC actuators. Mating connectors are Packard 56 series connector body no. 2973781 with terminal 2962573. (Danaher Motion part no. for mating connector is 9100-448-001.)

#### Electrak 050

Packard Electric Pack-Con male 8911773 with terminal 6294511. Mating connector Pack-Con 8911772 with terminal 12040508

#### Electrak 150

With limit switches, Packard Electric Pack-Con 56 series male 2984678 with terminal 2962987. Mating connector Pack-Con 56 series 2984378 with terminal 2962573

Without limit switches, Packard Electric Pack-Con 56 series male 2984883 with terminal 2962987. Mating connector Pack-Con 56 series 2973781 with terminal 2962573

### Duty Cycle

All Electrak actuators are designed for intermittent operation. Continuous cycling is to be avoided. All Electrak actuators are capable of operating at rated load with a duty cycle of 25% "on" time. Exceeding these recommended duty cycles will cause the motor thermal

protectors to automatically stop the actuator. After the motor has cooled the thermal protector will reset automatically. Repeated overloads will shorten the life of the actuator. Electrak 1 actuators have no thermal protectors. Overheating the motor will shorten the useful life.

### Holding Brakes

The Electrak 1, 2, 050 and 150 incorporate an acme screw which is inherently self-locking while Electrak 5, 10, 100 and 205 actuators have a ball bearing screw drive incorporating a special anti-backdriving brake. In addition, the Electrak 5 and 205 employ a coast limiting electromechanical brake which is automatically operated.

### Electrak 1, 2, 5, 10, 050, 100, 150 Remote Switches

Actuators require double-pole double-throw switches. McGill switch no. 0121-004, Cutler-Hammer switch no. 8835-K4, or equivalent are recommended and are usually available locally. The required switch can be purchased from Danaher Motion under part number 830-8004-016. Here are required switch parameters.

- Double-pole, double-throw
- 15 Amp at 270 VAC
- Lever seal to keep out dirt and moisture
- Center "off"
- Two momentary contacts
- 15/32" bushing
- Screw terminals

### Temperature Range

All Electrak actuators are operable at temperatures ranging from -15° to 150° F.

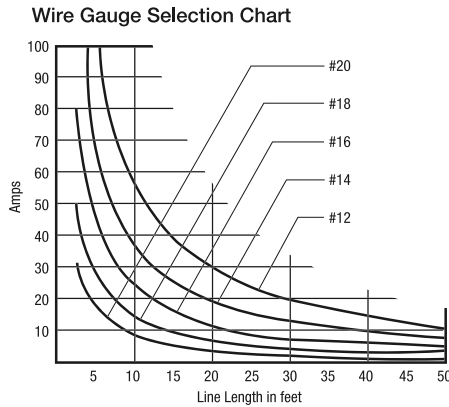
### Capacitors

Danaher Motion Electrak 5 and 205 actuators use permanent split capacitor motors which require a capacitor for successful operation. The capacitor is installed across the red/black (ext/retract) leads.

## Wire Gauge Selection

### DC Actuators

Long lead wires between the power source and the actuator will result in a voltage drop for DC units. This voltage drop can be avoided by sizing the wires in accordance with the following wire gauge selection chart, which is based on a 24 VDC power source. In order to use the chart, find the point of intersection of the two known factors, such as amperage and distance, and read the required wire gauge from the curves on the chart. Example: A D24-05B5 actuator draws 14 amps current at rated load. The intersection of the maximum current and the distance between the actuator and power source (44 feet, for example) indicates the wire gauge required (#12).



### Overload Clutch

Electrak 2, 5, 10, 050 and 100 series linear actuators are protected by a load limiting clutch which prevents the motor from stalling at either end of the actuator stroke. It will also slip when the factory-set load limit is exceeded. The clutch is a ball detent design, assuring a consistent slip point and long life.

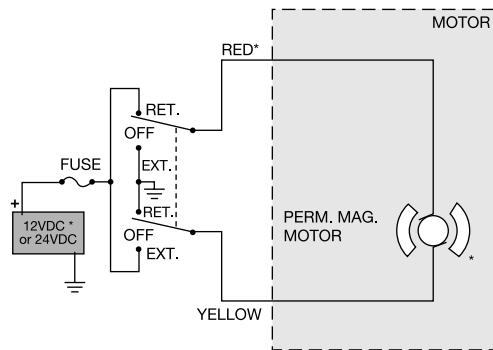
### Limit Switches

Electrak 1, 050, 100, 150 and 205 actuators are provided with electrical end of stroke shut-off. Electrak 1 with feedback must be used with the MCS-2007 control for end of stroke shut-off.

### Wiring

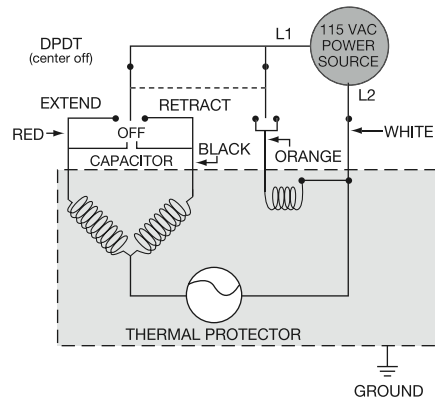
Electrak actuators should be connected in accordance with the wiring diagram shown to the right.

#### Electrak 1

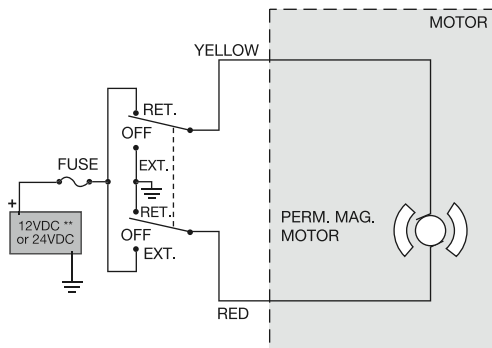


\*Note: Red for Electrak 1  
 White for 12VDC Electrak 1 with Feedback  
 Black for 24VDC Electrak 1 with Feedback

#### Electrak 5 (A12-A22 Series)



#### Electrak 2, 10, 100



\*\*Note: Electrak 2 is 12VDC only

#### Electrak 205

