Electrak® Actuators and Controls

Trouble-free, reliable linear motion control.

Design leadership . . .

Warner Linear pioneered the development of ball bearing 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, pushbutton 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 all the Electrak series . . . from the light load, mini-actuator to the high performance Electrak 205, capable of handling loads up to 1500* pounds with up to 10 times more life than any previously available actuator.

Electrak . . . rugged, reliable, remote linear motion control with the push of a button.

* Contact the factory for applications with loads exceeding 1000 pounds.
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Features and Benefits

Electrak design styles
Electrak actuators are available in load ranges from 25 to 1500 pounds, stroke lengths from 2 to 24 inches and operating voltages of 12 and 24 VDC and 115 and 230 VAC. Individual models offer additional features to meet a variety of design needs.

Electrak E050 series
The Electrak E050 is the new quiet, low cost DC actuator that can push or pull up to 112 lb. Available in 12 or 24 VDC models with built in limit switches and stroke lengths to 8 inches. A control with hand held pendant is available for 115 VAC applications.

Electrak E150 series
The Electrak E150 is a lightweight, low cost actuator with a load rating up to 450 lb. Available in 12, 24, or 36 VDC models and a control with pendant is available for 115 VAC operation. Stroke lengths to 16 inches and optional adjustable end of stroke limit switches or feedback potentiometer. Note: Max stroke for pot unit is 14".

Electrak series
The rest of the Electrak family includes compact models with load ranges beginning at 25 pounds up to heavy duty actuators with load capability up to 1500* pounds. There are AC and DC models and also controls to enable the 24 VDC actuators to operate on 115 VAC.

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

* Contact the factory for applications with loads exceeding 1000 pounds.

Efficient operation
Warner linear actuators are comprised of a combination electric motor, gear train and drive screw. The direct conversion of electric to mechanical energy results in effective, economical linear motion. Completely self-contained and sealed Electrak actuators require minimal installation hardware and wiring, and eliminate the need for periodic maintenance and adjustment.

Superb holding power
Electrak actuators operate equally well under tension or compression loads. They will hold a load indefinitely without power, and can be directly interfaced to a programmable controller or other electronic control device.
**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 Warner linear 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, Warner linear 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 24 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.

**Energy efficient**

Electric control offers clean, smooth linear motion without fluids, plumbing or other expensive components. Electrak actuators require power only when in motion and no power when stationary.

**Lead screw drive system**

- **Acme screw**
- **Ball bearing screw**

Electrak 1, 2, 050 and 150 models feature acme screws which will not backdrive when the power is off. Electrak 5, 10, 100 and 205 series actuators are equipped with highly efficient and accurate Warner Linear ball bearing screws. A load holding brake keeps the load in position when power is off.

**Housing gaskets and seals**

Completely gasketed housing and motor safely seals wires and internal components from dirt, dust and water, making most Electrak actuators equally suited for outdoor as well as in-plant applications.

**Low cost, trouble free, electric control**

Electric actuation for fast, responsive, remote control without complex, troublesome and expensive hydraulic or pneumatic components.

**Easy Installation**

Actuators are quickly and easily mounted by several methods.

- **Clevis pin**

  Two parallel clevis pins provide easy installation for Electrak model 1, 2, 5, 10, 050 and 150 actuators to a fixed member.

- **Swivel rod end**

  This mounting provides greater freedom for attaching the load. It is standard on the Electrak 100 and 205 models and attaches to the extension tube.

- **Adjustable mounting bracket**

  The Electrak 100 is mounted by a crosshole on the extension tube and a bracket that can be easily positioned where needed on the cover tube.

* Contact the factory for applications with loads exceeding 1000 pounds.
Features and Benefits

Electrak E050 series

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.

Electrak E150 series

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

Take time to look through the cutaway drawing to see what makes 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.
An inside look at the Electrak 205 . . .

This top of the line actuator features a ball bearing lead screw for maximum reliability, accuracy and long life. It has an operating load capacity of 500, 1000 or 1500* pounds. See the Selection Guide and specification pages for features and performance characteristics of the entire line of Electrak models.

The Electrak family of linear actuators . . .

1  Mini-actuator with feedback for accurate positioning. Mini-actuator with long life limit switches.

2  Economical, general purpose, medium duty DC actuator.

5  General purpose heavy duty AC actuator.

10  General purpose industrial DC actuator.

100  Heavy duty, positional feedback DC actuator for most industrial applications.

205  High load, long life, rugged design industrial actuator with load holding brake and positioning feedback.

Control features

Warner Linear offers a choice in actuator controls.

Whether you plan to operate from a simple pushbutton or a programmable controller, the MCS-2000 series controls make your system design easy to install and simple to operate. They are housed in rugged NEMA 1 enclosures, and feature dynamic braking (DC actuators only), emergency stop/off pushbutton, power on indicator, and percent of stroke meter (for feedback actuators only) for precise position feedback. Multiple step positioning is available for easy integration with programmable controller systems and integral limit switches for automatic control of extend-retract cycles. All MCS-2000 series controls are PC compatible and feature easy-to-use terminal strips for input and output wiring.

* Contact the factory for applications with loads exceeding 1000 pounds.
Applications

The variety of load ranges, sizes, and voltages of the Electrak actuators provides for a wide range of applications from boats to sweepers to van to exercise equipment to diverting products on conveyor lines.

Some of the advantages of electric actuators are:

- Compact and self contained, no hoses, filters, accumulators, dryers
- Maintenance free operation
- Adjustable strokes on some models for changing applications
- Environmentally friendly, no hydraulic leaks
- Easy to install, usually just 2 wires to operate
- New E050 quiet enough for office environments
- Some models with feedback for positioning control
- Holds load with power removed
- All DC models suitable for washdown applications

Floor Sweeper/Scrubber
Electrak actuators apply the downforce on the squeegee to pick up the water during cleaning.

Barrier and Swing gates
Electrak self-contained, weatherproof 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.

Power boats and sailing crafts
Sailboat applications include boom control when raising or lowering the mainsail and downhaul control. Actuators are useful for raising and lowering hatch covers and operating windows and positioning seats all with push-button ease. Actuators are available with CE listing.

Lift tables
Electrak actuators work just as well on elevator platform or scissor lift tables. The materials can be raised and lowered to reach any required height and the load is held in position even when the power is off.
**Bus and van doors**
Compact actuators fit above doors and open or close with the flick of a switch. Actuators are also used to lower stairs and extend flashing “STOP” signs on school buses.

**Conveyor gate diverter**
An Electrak actuator extends the conveyor gate to route boxes to the desired work station. Easily interfaced with Warner Electric Photoscanners or other electrical switching devices.

**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.

**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.

**Wheelchair lift**
Actuators are used for wheelchair lifts, positioning and locking as well as for parking brake engagement and opening and closing doors and vents. With infra-red remote controls, doors and lifts can be operated as the wheelchair approaches the van providing increased security and weather protection.

**Wheelchair**
Actuators are used to tilt and recline the wheelchair and also to raise and lower each leg support.
Selection

Selection procedure

Step 1. Determine load/speed
Select the actuator which has the optimum load and extension speed best suited for your application. See the following specification pages.

Step 2. Compare life and duty cycle
Compare actuator performance based on life vs. load and duty cycle vs. load curves provided for each Electrak actuator.

Step 3. Select length
Choose the desired stroke length from the Quick Selection Guide on pages 8-9 or from the Electrak specifications pages 10-27.

Step 4. Verify design considerations

Duty Cycle. At full load capacity, all Electrak actuators have a 25% duty cycle. Duty cycle is the amount of “on time” vs. “cooling time.” For example, the 25% duty cycle actuator will run 15 seconds and needs 45 seconds rest for a 1 minute total cycle time.

Side loading and shock loading restrictions. Side loading the actuator impairs actuator performance and will dramatically reduce life. Side loading and cantilever mounting should always be eliminated through proper machine design practices. Although actuators can withstand slight shock loads, it is recommended that shock loading be avoided as much as possible.

Mounting. Basically, two mounting styles are available. Be sure that the selected actuator’s mounting configuration is adaptive to the application.

Step 5. Select control
Designed for use with Electrak actuators, the MCS-2000 series controls are available with all the features from simple on-off controls with basic extend/retract functions, or complete controls with membrane control function switches and an LCD digital display for accurate positioning readout. See page 28 for control selection.

Quick Reference Guide

<table>
<thead>
<tr>
<th>Input Voltage</th>
<th>12, 24 VDC</th>
<th>12, 24, 36 VDC, 115 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Capacity (lbs.)</td>
<td>25, 50, 112</td>
<td>110, 225, 450</td>
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<tr>
<td>Stroke Length (inches)</td>
<td>2, 4, 6, 8</td>
<td>1, 2, 4, 6, 8, 10, 12, 14, 16</td>
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<tr>
<td>Type of Load Screw</td>
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<td>Acme screw</td>
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<td>Duty Cycle at Full Load</td>
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<td>25%</td>
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<td>Load Limiting Clutch</td>
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<td>No</td>
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<tr>
<td>Limit Switches</td>
<td>Fixed end of Stroke Standard</td>
<td>Optional adjustable end of stroke</td>
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<tr>
<td>Feedback</td>
<td>Optional Potentiometer</td>
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<td>Motor Overload Protection</td>
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<td>Yes</td>
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<td>Restraining Torque (max)</td>
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<td>None - internally restrained</td>
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<td>Environment</td>
<td>IP56</td>
<td>IP56</td>
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<tr>
<td>Standard Control</td>
<td>DE14-1E - controls 1 actuator</td>
<td>DF14-1F - controls 1 actuator</td>
</tr>
<tr>
<td>Optional Control(s)</td>
<td>DE14-2E - controls 2 actuators</td>
<td>DF14-2F - controls 2 actuators</td>
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* Consult customer service
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
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<th>10</th>
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<td>With feedback potentiometer</td>
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<td>Only with MCS-2007 control</td>
<td>Fixed</td>
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<td>Adjustable</td>
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<td>20 lb. in.</td>
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<td>20 lb.in.</td>
<td>100 lb.in.</td>
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<td>Washdown 96 hour salt spray</td>
<td>Washdown 96 hour salt spray</td>
<td>Washdown 96 hour salt spray</td>
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</tr>
</tbody>
</table>

* Consult customer service
Electrak E050

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

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

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

Specifications

<table>
<thead>
<tr>
<th>Dynamic load</th>
<th>DE12-17W41-XX</th>
<th>DE12-17W42-XX</th>
<th>DE12-17W44-XX</th>
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</thead>
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<tr>
<td>Static load</td>
<td>112 lbs. max.</td>
<td>60 lbs. max.</td>
<td>30 lbs. max.</td>
</tr>
<tr>
<td>Speed</td>
<td>.48&quot;/sec. @ no load</td>
<td>.85&quot;/sec. @ no load</td>
<td>.47&quot;/sec. @ 112 lbs.</td>
</tr>
<tr>
<td></td>
<td>.37&quot;/sec. @ 60 lbs.</td>
<td>.72&quot;/sec. @ 60 lbs.</td>
<td>.37&quot;/sec. @ 30 lbs.</td>
</tr>
<tr>
<td>End play</td>
<td>0.060&quot; max. less clevis</td>
<td>0.060&quot; max. less clevis</td>
<td>0.060&quot; max. less clevis</td>
</tr>
</tbody>
</table>

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°C to +180°C (–34°F to +82°F)

Environment
- IP-56 outdoor use

Duty cycle
- 25% @ rated load and @ 70°F

Anti-rotation
- Tube can rotate max. of 7°

Options

Motor voltage
- 12 or 24 VDC

Rotary pot
- 10k, 10 turn

Rear clevis
- Crossholes shown std., M3=90° rotated

Stroke length
- 8" maximum

Controls

DE14 series actuator controls operate
Warner Linear’s 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 30.
Dimensions ( ) denotes millimeters

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

Performance Curves

How to Order
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
## Electrak E150

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

### 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.

Take time to look through the cutaway drawing on page 4 to see what makes 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 diveters on conveyors
- Position jigs in flexible assembly operations

### Specifications
<table>
<thead>
<tr>
<th></th>
<th>DF12-10W51-XXX</th>
<th>DF12-10W52-XXX</th>
<th>DF12-10W54-XXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic load</td>
<td>450 lbs. max.</td>
<td>225 lbs. max.</td>
<td>110 lbs. max.</td>
</tr>
<tr>
<td>Static load</td>
<td>900 lbs. max.</td>
<td>450 lbs. max.</td>
<td>330 lbs. max.</td>
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<tr>
<td>Speed</td>
<td>.75&quot;/sec. @ no load</td>
<td>1.40&quot;/sec. @ no load</td>
<td>2.8&quot;/sec. @ no load</td>
</tr>
<tr>
<td>End play</td>
<td>0.036&quot; max. less clevis</td>
<td>0.036&quot; max. less clevis</td>
<td>0.046&quot; max. less clevis</td>
</tr>
<tr>
<td>Restraining torque</td>
<td>Restrained internally</td>
<td>Restrained internally</td>
<td>Restrained internally</td>
</tr>
<tr>
<td>Input voltage</td>
<td>12, 24 VDC (36 VDC*, 115 VAC*)</td>
<td>2.5-13 (50 amps @ stall)</td>
<td>Stall, optional limit switches</td>
</tr>
<tr>
<td>Amperage</td>
<td>2.5-13 (50 amps @ stall)</td>
<td>Stall, optional limit switches</td>
<td>Stall, optional limit switches</td>
</tr>
<tr>
<td>Lead wires</td>
<td>16 AWG PVC 800</td>
<td>Internal motor breaker</td>
<td>Internal motor breaker</td>
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<tr>
<td>Connectors</td>
<td>Packard Electric 56 Series</td>
<td>Optional DPDT</td>
<td>Optional DPDT</td>
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<tr>
<td>Power switch</td>
<td>Optional DPDT</td>
<td>Optional DPDT</td>
<td>Optional DPDT</td>
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<tr>
<td>Temperature</td>
<td>-30°, +150° F (-34°, +66° C)</td>
<td>IP-56 outdoor use</td>
<td>IP-56 outdoor use</td>
</tr>
<tr>
<td>Environment</td>
<td>IP-56 outdoor use</td>
<td>IP-56 outdoor use</td>
<td>IP-56 outdoor use</td>
</tr>
<tr>
<td>Duty cycle</td>
<td>25% @ 70°F</td>
<td>IP-56 outdoor use</td>
<td>IP-56 outdoor use</td>
</tr>
<tr>
<td>Anti-rotation</td>
<td>Tube can rotate max. of 7°</td>
<td>Tube can rotate max. of 7°</td>
<td>Tube can rotate max. of 7°</td>
</tr>
</tbody>
</table>

### Options
- Motor voltage: 12, 24 VDC (36 VDC*, 115 VAC*)
- Rotary pot: 10k, 10 turn
- Rear clevis: M-3 rotation (mounting rotated 90°)
- Stroke length: 16" maximum
- Limit switches: Adjustable extend and retract

### 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. For details see page 30.

* Consult Customer Service
**Dimensions** ( ) denotes millimeters

Dimensions are for standard units.

**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**

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

Example: DF12-10W51-04LNHHN
Electrak 1

12 and 24 VDC
25 and 75 lb. load capacities

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.

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

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

Control

The MCS-2005 is specifically designed for use with the Electrak 1 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. For details on the controls see page 32.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>12 VDC and 24 VDC</td>
</tr>
<tr>
<td>Load Capacities</td>
<td>25 or 75 lbs. maximum, depending on model</td>
</tr>
<tr>
<td>Stroke Lengths</td>
<td>2, 4 or 6 inches</td>
</tr>
<tr>
<td>Current Draw</td>
<td>2.8 amps maximum at 24 VDC at rated load</td>
</tr>
<tr>
<td></td>
<td>5.6 amps maximum at 12 VDC at rated load</td>
</tr>
<tr>
<td>Duty Cycle</td>
<td>25% &quot;on time&quot; at rated load per cycle (77° F)</td>
</tr>
<tr>
<td>Motor Protection</td>
<td>Automatic reset thermal overload</td>
</tr>
<tr>
<td>Limit Switches</td>
<td>Limit switch protected for automatic shutoff on</td>
</tr>
<tr>
<td></td>
<td>either end of stroke – non adjustable</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>-15° F to 150° F</td>
</tr>
<tr>
<td>Drive</td>
<td>Acme screw</td>
</tr>
<tr>
<td>End Play</td>
<td>.036 in. maximum</td>
</tr>
<tr>
<td>Housing</td>
<td>Aluminum and zinc for corrosion protection</td>
</tr>
<tr>
<td>Environment Protection</td>
<td>96 hour salt spray tested</td>
</tr>
<tr>
<td>Lead Wires</td>
<td>18 ga. wires 4&quot; long standard</td>
</tr>
<tr>
<td>Connector</td>
<td>Supplied. For replacement see page 39</td>
</tr>
<tr>
<td>Mounting</td>
<td>Clevis mounting only</td>
</tr>
<tr>
<td>Restraining Torque</td>
<td>20 in. lbs.</td>
</tr>
<tr>
<td>Static Load</td>
<td>300 lbs. for all strokes</td>
</tr>
</tbody>
</table>

Control

The MCS-2005 is specifically designed for use with the Electrak 1 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. For details on the controls see page 32.
### Model Numbers — use when ordering

<table>
<thead>
<tr>
<th>Stroke Length</th>
<th>Voltage</th>
<th>With fixed limit switches A</th>
<th>B</th>
<th>With potentiometer A</th>
<th>B</th>
<th>Weight lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>12 VDC</td>
<td>S12-09A4-02 1.82</td>
<td>6.24</td>
<td>SP12-09A4-02 2.31</td>
<td>7.79</td>
<td>1.25</td>
</tr>
<tr>
<td></td>
<td>24 VDC</td>
<td>S24-09A4-02 (46.23)</td>
<td>(158.50)</td>
<td>SP24-09A4-02 (58.67)</td>
<td>(197.87)</td>
<td>1.25</td>
</tr>
<tr>
<td>4</td>
<td>12 VDC</td>
<td>S12-09A4-04 3.82</td>
<td>8.24</td>
<td>SP12-09A4-04 4.53</td>
<td>10.01</td>
<td>1.35</td>
</tr>
<tr>
<td></td>
<td>24 VDC</td>
<td>S24-09A4-04 (97.03)</td>
<td>(209.30)</td>
<td>SP24-09A4-04 (115.06)</td>
<td>(254.25)</td>
<td>1.35</td>
</tr>
<tr>
<td>6</td>
<td>12 VDC</td>
<td>S12-09A4-06 5.82</td>
<td>10.24</td>
<td>SP12-09A4-06 6.75</td>
<td>12.22</td>
<td>1.45</td>
</tr>
<tr>
<td></td>
<td>24 VDC</td>
<td>S24-09A4-06 (147.83)</td>
<td>(260.10)</td>
<td>SP24-09A4-06 (171.45)</td>
<td>(310.39)</td>
<td>1.45</td>
</tr>
</tbody>
</table>

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

### Performance Curves

- **Life vs. Load**
- **Duty Cycle vs. Load (77°F)**
- **Speed vs. Load**
- **Current Draw vs. Load**

### How to Order

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
Electrak 1 Long Life

12 and 24 VDC
25 and 75 lb. load capacities

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.

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

Typical applications
Applications that require frequent cycling
- Sweepers, scrubbers
- Mobile off highway equipment
- Agricultural and industrial machinery

Control
Compatible with MCS-2005 and MCS-2006 control. For details on the controls see page 31.

Specifications
<table>
<thead>
<tr>
<th>Input</th>
<th>12 VDC and 24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Capacities</td>
<td>25 or 75 lbs. maximum</td>
</tr>
<tr>
<td>Stroke Lengths</td>
<td>2, 4 or 6 inches</td>
</tr>
<tr>
<td>Current Draw</td>
<td>3.0 amps maximum at 24 VDC at rated load</td>
</tr>
<tr>
<td></td>
<td>5.0 amps maximum at 12 VDC at rated load</td>
</tr>
<tr>
<td>Duty Cycle</td>
<td>Intermittent, 25% “on time” at rated load per cycle (70° F)</td>
</tr>
<tr>
<td>Motor Protection</td>
<td>Automatic reset thermal overload</td>
</tr>
<tr>
<td>Limit Switches</td>
<td>Internal limit switches shutoff on either end of stroke</td>
</tr>
<tr>
<td>Thermal Protection</td>
<td>Automatic resetting thermal breaker enclosed in motor housing</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>-15° F to 150° F</td>
</tr>
<tr>
<td>Drive</td>
<td>Acme screw</td>
</tr>
<tr>
<td>Connector</td>
<td>Supplied. For replacement see page 39</td>
</tr>
<tr>
<td>Mounting</td>
<td>Clevis mounting only</td>
</tr>
<tr>
<td>Restraining Torque</td>
<td>Actuator is internally restrained. Extension tube is keyed to cover tube.</td>
</tr>
<tr>
<td>Static Load</td>
<td>300 lbs. for all strokes</td>
</tr>
</tbody>
</table>
**Model Numbers** – use when ordering

<table>
<thead>
<tr>
<th>Stroke Length</th>
<th>25 lb. Capacity</th>
<th>75 lb. Capacity</th>
<th>Weight</th>
<th>A</th>
<th>B</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12 VDC</td>
<td>24 VDC</td>
<td>12 VDC</td>
<td>24 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>SL12-09A4-02</td>
<td>SL12-17A8-02</td>
<td>1.900</td>
<td>48.26</td>
<td>6.34</td>
<td>161.04</td>
</tr>
<tr>
<td>4</td>
<td>SL12-09A4-04</td>
<td>SL12-17A8-04</td>
<td>3.900</td>
<td>99.06</td>
<td>8.34</td>
<td>211.84</td>
</tr>
<tr>
<td>6</td>
<td>SL12-09A4-06</td>
<td>SL12-17A8-06</td>
<td>5.900</td>
<td>149.86</td>
<td>10.34</td>
<td>262.67</td>
</tr>
</tbody>
</table>

**Dimensions** ( ) denotes millimeters

---

**Performance Curves**

**Life vs. Load**

**Duty Cycle vs. Load (77°F)**

**Speed vs. Load**

**Current Draw vs. Load**

---

**How to Order**

SL = Electrak 1 DC actuator with long life limit switches
12 = 12 VDC
24 = 24 VDC
09A4 = 25 lb. rating
17A8 = 75 lb. rating
Stroke length in inches

---

**SL 12–17A8–02**
Electrak 2

12 VDC
250 lb. load capacity

Economical, 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.

Control
6932-101-054
Remote switch in enclosure is suitable for operating Electrak 1, 2, 5, 10, and 100 actuators. For details see page 29.

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
Housing Zinc
Connector Packard series 56 (included)
Mounting Clevis mounting only
End Play .080 maximum
Static Load 1000 lbs. for all models
Wiring Diagram See page 29

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

Typical applications
• Medium load and duty cycle
• Battery powered applications

* Consult customer service.
Model Numbers (use when ordering)

<table>
<thead>
<tr>
<th>Stroke Length</th>
<th>Voltage</th>
<th>Model Numbers</th>
<th>250 lb. Load Capacity</th>
<th>A</th>
<th>B</th>
<th>Weight (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>12 VDC</td>
<td>D12-20A5-04D</td>
<td>D12-10A5-04D</td>
<td>4.00 (101.60)</td>
<td>10.32 (262.13)</td>
<td>10.00</td>
</tr>
<tr>
<td>8</td>
<td>12 VDC</td>
<td>D12-20A5-08D</td>
<td>D12-10A5-08D</td>
<td>8.00 (203.20)</td>
<td>14.32 (363.73)</td>
<td>10.72</td>
</tr>
<tr>
<td>12</td>
<td>12 VDC</td>
<td>D12-20A5-12D</td>
<td>D12-10A5-12D</td>
<td>12.00 (304.80)</td>
<td>18.32 (465.33)</td>
<td>11.44</td>
</tr>
</tbody>
</table>

* For longer stroke lengths – contact the factory.

Performance Curves

Life vs. Load

Duty Cycle vs. Load (77°F)

Speed vs. Load

Current Draw vs. Load (12VDC)

How to Order

D = DC actuator
12 = voltage
20 = gear ratio
A = acme screw
5 = screw lead 1/5” or .200
Stroke length in inches
Distributor model
Electrak 5

115 and 230 VAC
500, 1000 and 1500* lb. 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.

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

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. For more details see page 34.

Specifications

<table>
<thead>
<tr>
<th>Input</th>
<th>115 VAC 60 Hz or 230 VAC 50/60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Capacities</td>
<td>500, 1000 or 1500* lbs. maximum</td>
</tr>
<tr>
<td>Stroke Lengths</td>
<td>4, 8, 12, 18, or 24 inches</td>
</tr>
<tr>
<td>Current Draw</td>
<td>2.85 amps maximum at rated load 115 VAC; 1.55 amps maximum at rated load 230 VAC</td>
</tr>
<tr>
<td>Duty Cycle</td>
<td>25% &quot;on time&quot; at rated load per cycle 77° F (max. on time 45 sec.) See page 34 for calculating &quot;Duty Cycle&quot; (Question #1)</td>
</tr>
<tr>
<td>Motor Protection</td>
<td>Automatic reset thermal overload in motor windings</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>-15° F to 150° F</td>
</tr>
<tr>
<td>Drive</td>
<td>Ball bearing screw</td>
</tr>
<tr>
<td>Housing</td>
<td>Zinc</td>
</tr>
<tr>
<td>Cable</td>
<td>18 ga., 5 conductor cable</td>
</tr>
<tr>
<td>Overload Protection</td>
<td>Ball detent overload clutch</td>
</tr>
<tr>
<td>Restraining Torque</td>
<td>100 lb. in. max.</td>
</tr>
<tr>
<td>Capacitor</td>
<td>Included in MCS-2041 or MCS-2042 or must be ordered separately</td>
</tr>
<tr>
<td>Capacitor 115V</td>
<td>35 MFD 240 VAC Part No. 9200-448-002</td>
</tr>
<tr>
<td>Capacitor 230V</td>
<td>10 MFD 370 VAC Part No. 9200-448-003</td>
</tr>
<tr>
<td>End Play</td>
<td>.040 in. max.</td>
</tr>
<tr>
<td>Static Loads</td>
<td>2500 lbs. for all strokes</td>
</tr>
<tr>
<td>Wiring Diagram</td>
<td>See page 34</td>
</tr>
</tbody>
</table>

Electrak 5 actuators are a recognized component per UL E83959 and certified per CSA LR51515 CE label available for selected models – contact the factory.

* Contact the factory for applications with loads exceeding 1000 lbs.
Dimensions ( ) denotes millimeters

Model Numbers – use when ordering

<table>
<thead>
<tr>
<th>Stroke Length</th>
<th>500 lb. Capacity</th>
<th>1000 lb. Capacity</th>
<th>A</th>
<th>B</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>115VAC</td>
<td>230VAC</td>
<td>115VAC</td>
<td>230VAC</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>A12-05B5-04D</td>
<td>A22-05B5-04D</td>
<td>A12-10B5-04D</td>
<td>A22-10B5-04D</td>
<td>4.00 (101.60)</td>
</tr>
<tr>
<td>8</td>
<td>A12-05B5-08D</td>
<td>A22-05B5-08D</td>
<td>A12-10B5-08D</td>
<td>A22-10B5-08D</td>
<td>8.00 (203.20)</td>
</tr>
<tr>
<td>12</td>
<td>A12-05B5-12D</td>
<td>A22-05B5-12D</td>
<td>A12-10B5-12D</td>
<td>A22-10B5-12D</td>
<td>12.00 (304.80)</td>
</tr>
<tr>
<td>18</td>
<td>A12-05B5-18D</td>
<td>A22-05B5-18D</td>
<td>A12-10B5-18D</td>
<td>A22-10B5-18D</td>
<td>18.00 (457.20)</td>
</tr>
<tr>
<td>24</td>
<td>A12-05B5-24D</td>
<td>A22-05B5-24D</td>
<td>A12-10B5-24D</td>
<td>A22-10B5-24D</td>
<td>24.00 (609.60)</td>
</tr>
</tbody>
</table>

Controls  MCS-2041  MCS-2042  MCS-2041  MCS-2042  —  —  —

*Capacitor 9200-448-002  9200-448-003  9200-448-002  9200-448-003  —  —  —

Additional models including end of stroke limit switches are available – contact the factory.

Performance Curves

How to Order

A = AC actuator
12 = 120 volts
22 = 230 volts
10 = gear ratio
B = ball screw
5 = screw lead 1/5” or .200
D = Stroke length in inches

Distributor model
Electrak 10

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. For more details see the controls selection section beginning on page 32.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>12 or 24 VDC</td>
</tr>
<tr>
<td>Load Capacities</td>
<td>500, 1000 or 1500* lbs. maximum, depending on model</td>
</tr>
<tr>
<td>Stroke Lengths</td>
<td>4, 8, 12 inches (also 18 and 24 inches)*</td>
</tr>
<tr>
<td>Current Draw</td>
<td>7 amps at 24 VDC – 1000 lb. capacity at full load</td>
</tr>
<tr>
<td></td>
<td>14 amps at 12 VDC – 1000 lb. capacity at full load</td>
</tr>
<tr>
<td></td>
<td>14 amps at 24 VDC – 500 lb. capacity at full load</td>
</tr>
<tr>
<td></td>
<td>28 amps at 12 VDC – 500 lb. capacity at full load</td>
</tr>
<tr>
<td>Duty Cycle</td>
<td>25% &quot;on time&quot; at rated load per cycle (77° F)</td>
</tr>
<tr>
<td>Motor Protection</td>
<td>Automatic reset thermal overload in motor winding</td>
</tr>
<tr>
<td>Overload Protection</td>
<td>Ball detent overload clutch</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>-15° F to 150° F</td>
</tr>
<tr>
<td>Environment Protection</td>
<td>96 hour salt spray tested</td>
</tr>
<tr>
<td>Drive</td>
<td>Ball bearing screw</td>
</tr>
<tr>
<td>Housing</td>
<td>Zinc</td>
</tr>
<tr>
<td>Connector</td>
<td>Packard series 56 (included)</td>
</tr>
<tr>
<td>Lead Wires</td>
<td>14 gauge</td>
</tr>
<tr>
<td>Mounting</td>
<td>Clevis mounting only</td>
</tr>
<tr>
<td>Restraining Torque</td>
<td>100 in. lb.</td>
</tr>
<tr>
<td>End Play</td>
<td>.040 max.</td>
</tr>
<tr>
<td>Static Load</td>
<td>3000 lbs.</td>
</tr>
<tr>
<td>Wiring Diagram</td>
<td>See page 32</td>
</tr>
</tbody>
</table>

* Contact the factory for applications with loads exceeding 1000 lbs.
**Model Numbers** – use when ordering

<table>
<thead>
<tr>
<th>Stroke Length*</th>
<th>Voltage</th>
<th>500 lbs.</th>
<th>1000 lbs.</th>
<th>A</th>
<th>B</th>
<th>Weight lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>12 VDC</td>
<td>D12-05B5-04</td>
<td>D12-20B5-04</td>
<td>4.00</td>
<td>11.89</td>
<td>11.30</td>
</tr>
<tr>
<td></td>
<td>24 VDC</td>
<td>D24-05B5-04</td>
<td>D24-20B5-04</td>
<td>(101.60)</td>
<td>(302.21)</td>
<td>11.30</td>
</tr>
<tr>
<td>8</td>
<td>12 VDC</td>
<td>D12-05B5-08</td>
<td>D12-20B5-08</td>
<td>8.00</td>
<td>15.89</td>
<td>12.02</td>
</tr>
<tr>
<td></td>
<td>24 VDC</td>
<td>D24-05B5-08</td>
<td>D24-20B5-08</td>
<td>(203.20)</td>
<td>(403.81)</td>
<td>12.02</td>
</tr>
<tr>
<td>12</td>
<td>12 VDC</td>
<td>D12-05B5-12</td>
<td>D12-20B5-12</td>
<td>12.00</td>
<td>19.89</td>
<td>12.74</td>
</tr>
<tr>
<td></td>
<td>24 VDC</td>
<td>D24-05B5-12</td>
<td>D24-20B5-12</td>
<td>(304.80)</td>
<td>(505.41)</td>
<td>12.74</td>
</tr>
</tbody>
</table>

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

**Performance Curves**

**Life vs. Load**

**Duty Cycle vs. Load (77°F)**

**Speed vs. Load**

**Current Draw vs. Load**

**How to Order**

D = DC actuator  
12 = 12 volts  
24 = 24 volts  
10 = gear ratio  
B = ball screw  
5 = screw lead 1/5” or .200  
Stroke length in inches

D 12–10 B 5–04
Electrak 100

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 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. For further details see page 33.

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

* Consult the factory for applications with loads exceeding 1000 lbs.
Dimensions ( ) denotes millimeters

Model Numbers – use when ordering

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

Performance Curves

How to Order

P = Electrak 100 actuator with potentiometer and limit switches
24 = 24 volts
10 = gear ratio
B = ball screw
5 = screw lead 1/5” or .200
Stroke length in inches
Distributor model
Electrak 205

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 page 27.

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. For more details see page 34.

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

Specifications

<table>
<thead>
<tr>
<th>Input</th>
<th>115 VAC 60 Hz only, or 230 VAC 50/60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load Capacities</td>
<td>500, 1000 or 1500* lbs. maximum, depending on model</td>
</tr>
<tr>
<td>Stroke Lengths</td>
<td>4, 8, 12, 18, or 24 inches</td>
</tr>
<tr>
<td>Current Draw</td>
<td>2.85 amps 115 VAC at full load</td>
</tr>
<tr>
<td></td>
<td>1.55 amps 230 VAC at full load</td>
</tr>
<tr>
<td>Duty Cycle</td>
<td>25% “on time” maximum (77° F). See page 37 for calculating “Duty Cycle” (Question #1)</td>
</tr>
<tr>
<td>Motor Protection</td>
<td>Automatic reset thermal overload in motor winding</td>
</tr>
<tr>
<td>Limit Switches</td>
<td>Adjustable limit switch protection for automatic shutoff on either end of stroke, independently, externally adjustable</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>-15° F to 150° F</td>
</tr>
<tr>
<td>Screw</td>
<td>Ball bearing screw</td>
</tr>
<tr>
<td>End Play</td>
<td>.015 in.</td>
</tr>
<tr>
<td>Housing</td>
<td>Zinc die cast</td>
</tr>
<tr>
<td>Conduit/Cable Entrance</td>
<td>1/2” NPT and 3/4” NPT</td>
</tr>
<tr>
<td>Feedback</td>
<td>10,000Ω potentiometer, 385Ω/in. of change</td>
</tr>
<tr>
<td>Capacitor</td>
<td>Included in MCS-2051 or MCS-2052 or must be ordered separately</td>
</tr>
<tr>
<td>MFC of Capacitor</td>
<td>115V = 35 MFD 240 VAC (Part No. 9200-448-002); 230V = 10 MFD 370 VAC (Part No. 9200-448-003)</td>
</tr>
<tr>
<td>Terminal Strip</td>
<td>Accepts up to 14 AWG</td>
</tr>
<tr>
<td>Mounting</td>
<td>Pin to pin, tube mounting optional</td>
</tr>
<tr>
<td>Restraining Torque</td>
<td>100 in. lbs.</td>
</tr>
<tr>
<td>Static Load</td>
<td>Tension load 4000 lb. all strokes. Compression load 2500 lbs. for 24” strokes, 4000 lbs. for all other strokes</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Recommended every 25,000 cycles, grease fitting provided</td>
</tr>
</tbody>
</table>

* Contact the factory for applications with loads exceeding 1000 lbs.
Dimensions ( ) denotes millimeters

Model Numbers – use when ordering

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>ALP12-05B5-04D</td>
<td>ALP22-05B5-04D</td>
<td>ALP12-10B5-04D</td>
<td>ALP22-10B5-04D</td>
<td>4.00 (101.60) 22.20 (563.88)</td>
</tr>
<tr>
<td>8</td>
<td>ALP12-05B5-08D</td>
<td>ALP22-05B5-08D</td>
<td>ALP12-10B5-08D</td>
<td>ALP22-10B5-08D</td>
<td>8.00 (203.20) 26.20 (665.48)</td>
</tr>
<tr>
<td>12</td>
<td>ALP12-05B5-12D</td>
<td>ALP22-05B5-12D</td>
<td>ALP12-10B5-12D</td>
<td>ALP22-10B5-12D</td>
<td>12.00 (304.80) 30.20 (767.08)</td>
</tr>
<tr>
<td>18</td>
<td>ALP12-05B5-18D</td>
<td>ALP22-05B5-18D</td>
<td>ALP12-10B5-18D</td>
<td>ALP22-10B5-18D</td>
<td>18.00 (457.20) 36.20 (919.48)</td>
</tr>
<tr>
<td>24</td>
<td>ALP12-05B5-24D</td>
<td>ALP22-05B5-24D</td>
<td>ALP12-10B5-24D</td>
<td>ALP22-10B5-24D</td>
<td>24.00 (609.60) 42.20 (1071.88)</td>
</tr>
<tr>
<td>Controls</td>
<td>MCS-2051</td>
<td>MCS-2052</td>
<td>MCS-2051</td>
<td>MCS-2052</td>
<td>—</td>
</tr>
</tbody>
</table>

*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

A = AC actuator
L = limit switches, P = potentiometer
12 = 120 volts
22 = 230 volts
10 = gear ratio
B = ball screw
5 = screw lead 1/5" or .200
D = Distributor model
Actuator Controls

Wariner Linear offers a choice in actuator controls

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

<table>
<thead>
<tr>
<th>Control</th>
<th>Description</th>
<th>Input Voltage</th>
<th>Actuator Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote Switch</td>
<td>The enclosed remote switch is used to directly operate any Electrak actuator. AC actuators must also have the capacitor wired into the circuit.</td>
<td>12, 24 VDC 115, 230 VAC</td>
<td>All actuators</td>
</tr>
<tr>
<td>DE-14 Series</td>
<td>Specific control for Electrak 050 actuator. 115 VAC input. Hand held pendant operator.</td>
<td>115 VAC</td>
<td>Electrak 050</td>
</tr>
<tr>
<td>DF-14 Series</td>
<td>Specific control for Electrak 150 actuator. 115 VAC input. Hand held pendant operator.</td>
<td>115 VAC</td>
<td>Electrak 150</td>
</tr>
<tr>
<td>MCS-2005/2006</td>
<td>Compact control for one actuator and an auxiliary device such as a photoscanner. Extend/Retract switch, 120 VAC input.</td>
<td>115 VAC 230 VAC</td>
<td>Electrak 1</td>
</tr>
<tr>
<td>MCS-2007/2008</td>
<td>Similar to MCS-2005, but with LCD digital display for position feedback and limit switch adjustments in the control.</td>
<td>115 VAC 230 VAC</td>
<td>Electrak 1 with feedback</td>
</tr>
<tr>
<td>MCS-2015</td>
<td>Basic power supply for on-off and emergency stop. 115 VAC or 230 VAC input.</td>
<td>115 VAC 230 VAC</td>
<td>Electrak 1 Electrak 10 Electrak 100</td>
</tr>
<tr>
<td>MCS-2025</td>
<td>Intermediate control with power supply for on-off, emergency stop, jog, run and remote control functions.</td>
<td>115 VAC 230 VAC</td>
<td>Electrak 1 Electrak 10 Electrak 100</td>
</tr>
<tr>
<td>MCS-2035</td>
<td>An advanced control with all the features of the MCS-2025 plus a readout display for positional feedback.</td>
<td>115 VAC 230 VAC</td>
<td>Electrak 100</td>
</tr>
<tr>
<td>MCS-2041/2042</td>
<td>Specific control for Electrak 5. MCS-2041 for 115 VAC input and MCS-2042 for 230 VAC input. Extend/Retract switch.</td>
<td>115 VAC 230 VAC</td>
<td>Electrak 5</td>
</tr>
<tr>
<td>MCS-2051/2052</td>
<td>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.</td>
<td>115 VAC 230 VAC</td>
<td>Electrak 205</td>
</tr>
</tbody>
</table>
Remote Switch (6932-101-054)
Use with Electrak 1, 2, 5, 10, 050, 100 and 150

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.

Features
- Double pole, double throw
- 15A rating at 270 VAC
- Center “off”
- Two momentary contacts
- Pigtailed with wire nuts supplied
- Wiring diagram on label
- “L” bracket for easy mounting

Wiring Connections

Electrak 1

Electrak 2, 10, 100

Electrak 5 (A12-A22 Series)
DE14 and DF14 series actuator controls operate Warner Linear’s 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
- DF14-1F 120 VAC, 50/60 Hz
- DF14-2F 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**
Warner linear 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.

**With Limit Switches (Metric)**
To extend actuator, connect red to positive and black to negative. To retract actuator, connect black to positive and blue to negative.

**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.
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 photosensor
- 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)

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
Actuator Controls

**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 Warner Electric Photoscanners

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

**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

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.

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 Warner Electric 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

Wiring Connections
- 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
**Actuator Controls**

**MCS-2041/2042**

*For Electrak 5 actuators*

The MCS-2041 and 2042 linear actuator controls are specifically designed to operate Warner 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 5 Amps@250V
- Prewired capacitor
- Terminal strip for easy field connections
- Compact size

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**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.

**Features**

- 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

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**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.
Dimensions ( ) denotes millimeters

Remote Switch (6932-101-059)

DE14/DF14
Actuator Controls

Dimensions ( ) denotes millimeters


MCS-2015, MCS-2025, MCS-2035

MCS-2051, MCS-2052
Design Considerations

Frequently asked questions about linear actuators . . .

1 Question  What is duty cycle and what is its affect on the use of an actuator?
Answer  Duty cycle = \( \frac{\text{on time}}{\text{on time} + \text{off time}} \)

Example:
\[ \frac{15 \text{ sec.}}{15 \text{ sec.} + 45 \text{ sec.}} = 25\% \]

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.

2 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, 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. Warner linear 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.
**Design Considerations**

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 Warner 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 compression load?

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

17 **Question** Are Warner linear actuators maintenance-free?

**Answer** Warner linear 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 Warner 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.

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Unidirectional</th>
<th>Bidirectional Load (Resolution &amp; Backlash)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrak 100</td>
<td>± .0035&quot;</td>
<td>± .025&quot; (for 24&quot; stroke)</td>
</tr>
<tr>
<td>Electrak 205</td>
<td>± .0025&quot;</td>
<td>± .010&quot; (for 24&quot; stroke)</td>
</tr>
</tbody>
</table>

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.
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.

### Torque Required

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Torque Required in. lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrak 1</td>
<td>20</td>
</tr>
<tr>
<td>All other Electrak Actuators</td>
<td>100</td>
</tr>
</tbody>
</table>

### 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. (Warner 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. (Warner part no. for mating connector is 9100-448-001.)

### Duty Cycle

All Warner linear 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. 8836-K4, or equivalent are recommended and are usually available locally. The required switch can be purchased from Warner Electric 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

Warner 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.

See pages 21 and 27 for the proper capacitor for each actuator and voltage.
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).

Wiring
Warner linear actuators should be connected in accordance with the wiring diagram shown to the right.

Electrak 1

Electrak 2, 10, 100

**Note: Electrak 2 is 12VDC only

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.
Application Data Form    Fax: 800-888-4944

Mail or Fax to:

Warner Electric, Inc.
Application Engineering
449 Gardner Street, South Beloit, Illinois 61080
Phone number: 800-825-9050 • Fax number: 800-888-4944

Date __________________________________________________________________________________________

Company ______________________________________________________________________________________

Address ________________________________________________________________________________________

City________________________________________State_________Zip ____________________________________

Name __________________________________________________________________________________________

Title___________________________________Phone (_____ ) __________________________________________

Basic Application

Load ________ lbs.   Environmental □ Clean □ Damp
Side load ________ lbs.  □ Oil splash □ Outdoors
Speed ________ inches per second   Power available ________VAC
Duty cycle ________ % of time running versus time still ________VDC
Stroke length ________ inches   Quantity ________
Life ________ inches or cycles

Drawing of application