



SERIES F-09130-C0 LINEAR ACTUATOR WITH POTENTIOMETER

FEATURES & BENEFITS

- Compact, flexible design is suitable for combustion and process control applications.
- Stepping motor stops and starts instantaneously: eliminates coast and provides precision positioning.
- High starting torque overcomes static friction.
- Impedance-protected motor is not damaged if overload stalling occurs.
- Standard 6" range of travel.
- 30, 60, and 120 second nominal stroke times.
- 75, 150, and 300 lb. thrust ranges. Equivalent to 18.75, 37.5, and 75.0 ft. lbs.
- Operates on switched line voltage input.
- Optional handwheel.
- Optional isolated auxiliary end switch.
- Optional adjustable starting position switches.
- Available NEMA 3 (weather-resistant) housing.
- Linkage: clevis and shaft lever arm, spring link for tight closed valve applications.

INTRODUCTION

Cleveland Controls F-09130-C0 Linear Actuators are compact and versatile. They offer long life, safety, reliable operation, and easy maintenance. A full range of options is available for maximum flexibility in any open or closed loop combustion control or process control application.

Series F-09130-C0 Linear Actuators accept electrical line voltage signals from a switched output controller to position a final control element, such as a damper, control valve, louver, stoker lever, variable speed transmission, or any similar device, over a six-inch range of travel.

Optional features are available to suit any open or closed loop combustion control or process control application. These include adjustable starting position switches, an isolated auxiliary end-of-travel switch, weather-resistant housing, hand wheel, and an externally or internally generated position feedback signal.

Series F-09130-C0 Linear Actuators require no mechanical brake assembly. The inherent braking-action of the synchronous stepping motor prevents over-travel without the wear and stress associated with friction or "DC" braking. As shown in the **Specifications** section of this bulletin, three stroke times and thrust ranges are available for all models. For special stroke time or thrust requirements, please consult your local **Cleveland Controls** representative.



For convenient comparison with competing rotary actuators, equivalent torque ratings (in ft lbs) for the thrust ratings of F-09130-C0 linear motion actuators are provided in the specifications on page 4 in this bulletin. The torque ratings are valid for a 3" lever traveling through a 90° arc.

GENERAL OPERATIONS

Line voltage signals control the reversible motor in finite increments to drive an acme screw through a nonslip timing belt drive and pulley system. The screw drives through a travel nut-and-bearing arrangement to extend or retract the drive tube. The nut and screw assembly self-locks in the case of power failure, in order to maintain the final drive tube position.

End switches shut off power to the motor when the unit reaches either the inward or the outward travel extreme. All applications use the full six-inch travel of the drive arm. Linear or nonlinear movement of the final control element, as well as its total range of travel, is controlled by adjustment of the linkage connecting the actuator's drive arm to the operating lever of the final control element. Overload stalling will not damage the motor.

Series F-09130-C0 Linear Actuators can be mounted in any position on any flat, rigid surface that is free from excessive vibration. All wiring connections are easily accessible for maintenance. The ambient temperature limit is 140 °F (60 °C).

A full range of linkage components and accessories is available. Feedback potentiometers (135Ω, 1000Ω, or 4000Ω) are standard. For high-performance electronic draft control applications, the adjustable start position switch option allows preset damper positioning during burner pilot ignition.



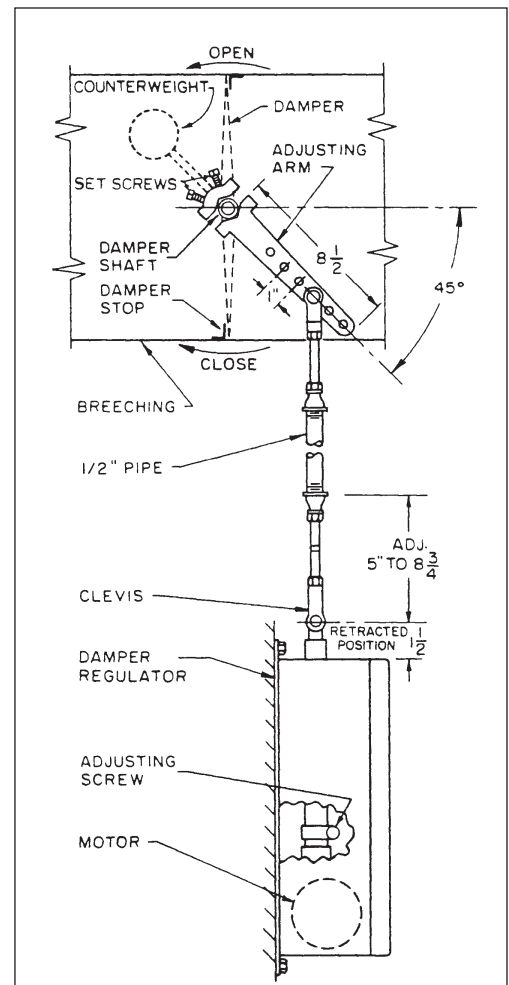
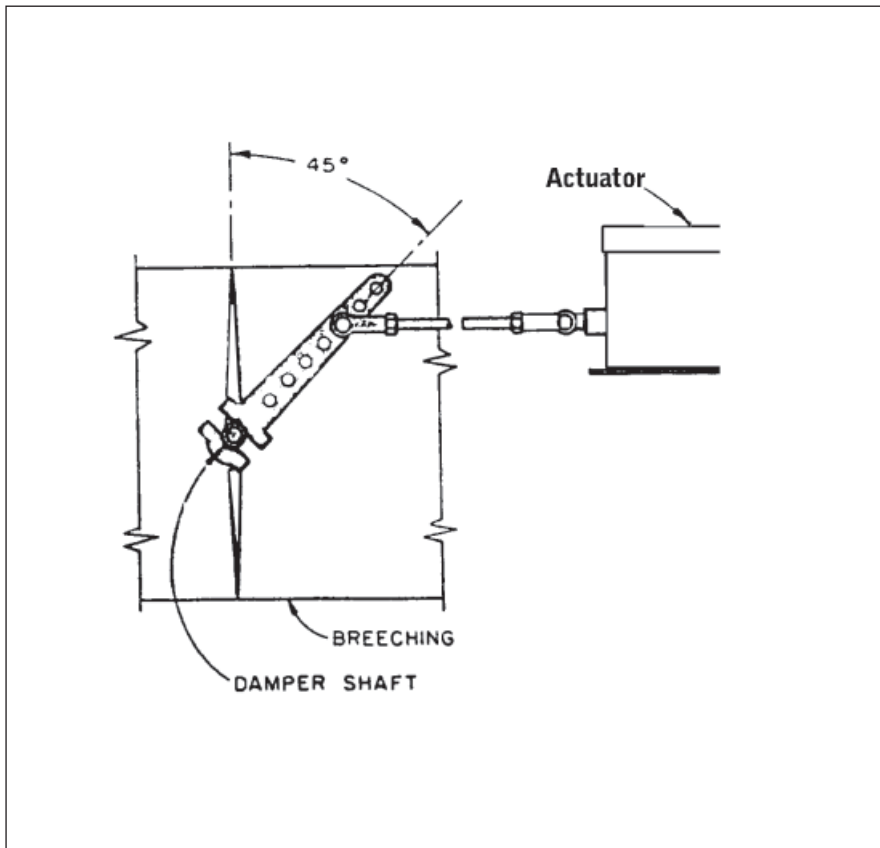
LINKAGE

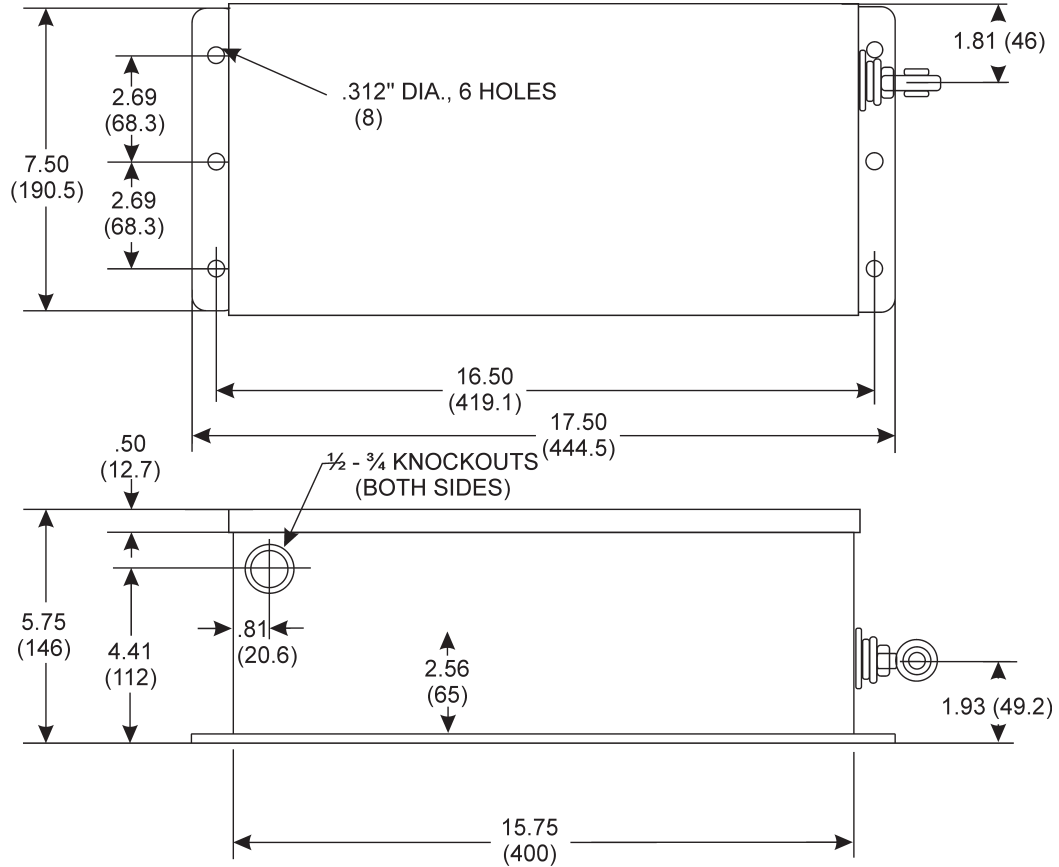
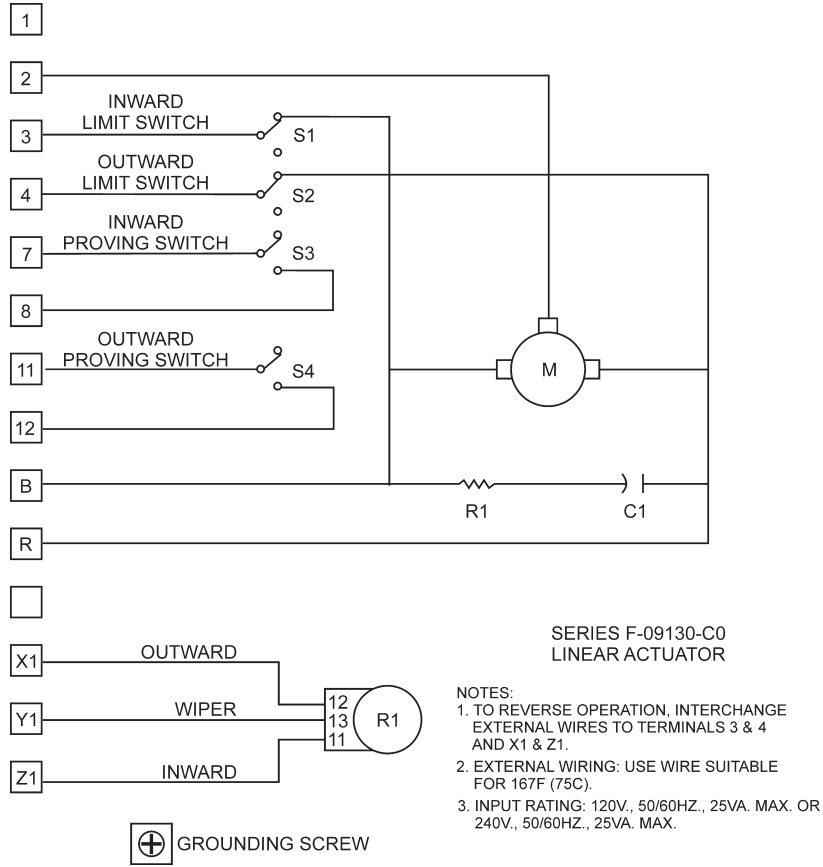
The following linkage items (sold separately) are available for use with the **Series F-09130-C0 Electric Linear Actuator**. *Above, from left:

*Not to scale. See Mounting Kits Bulletin & Spring Link Bulletin.

- **P/N 11372 Damper Lever Arm:** A two-piece aluminum alloy casting, with bushing, bolts, and nuts. Adjusts for 1/2 to 1-1/2" shafts.
- **P/N 26908 Clevis Assembly:** A clevis yoke and pin with a threaded adjusting rod, reducing coupling, and two 1/2 - 20 hex nuts.
- **P/N 12677 Spring Link:** Provides tight closure for valve applications.

Typical linkage arrangements: Horizontal (below) and Vertical (right).





SPECIFICATIONS

PHYSICAL

Power Requirements: 120 VAC or 240 VAC, 50/60 Hz.

Motor: Commercially available 72 RPM stepping motor operated in synchronous mode.

Input Signal: Switched line voltage input.

Wiring Connections: Numbered screw-type terminals for power to motor and for all alarm and control connections.

Ambient Temperature: 0 to 140F (-19 to 60C).

Mounting: Any position.

Case Dimensions: 15.75" long x 7.5" wide x 5.75" high.

Case Material: Dust-tight and drip-proof; NEMA 3 units are gasketed as required.

Finish: Wear-resistant sealed black polyurethane enamel.

Shipping Weight: 35 lbs.

APPLICATION

Travel: Six-inch linear travel.

Stroke Time: 30, 60, or 120 seconds per 6" of travel at 60 Hz.

Thrust: 75, 150, or 300 lbs. (Equivalent to 18.75, 37.5, and 75 foot-pounds with a 3" lever arm.)

Positioning accuracy: +/- 0.25%.

End Switches: High and low end limit snap switches are standard. Adjustable "Safe Start" position switches or an isolated auxiliary end of travel switch are optional.

Handwheel: Continuous rotation type (optional).

Feedback Potentiometer: 1000Ω standard. Optional 4000Ω and 135Ω available.

PERFORMANCE

Resolution:

- 30-second speed: 0.50% of full stroke.
- 60-second speed: 0.25% of full stroke.
- 120-second speed: 0.12% of full stroke.

Dead band: <0.2% of full stroke.

Radial Load Limit: Linkage axis not to exceed 15° deflection from drive tube axis.

Expected Service Life: 15 years at 70% duty cycle and 70% rated load.

Specifications are subject to change.

• HOW TO ORDER

- The basic catalog number for the Cleveland Controls Se-ries F-09130 Linear Actuator is shown below. Replace suffi xes A through F with the desired selections from the table below.

• F-0913A-BCD-E-F

- **A. Nominal Stroke Time/ Thrust Range:**
A1=30 seconds/75 lbs. thrust (18.75 ft. lbs.)
A2=60 seconds/150 lbs. thrust (37.5 ft. lbs.)
A3=120 seconds/300 lbs. thrust (75.0 ft. lbs.)
- **B. Position Feedback Potentiometer:**
B0= None
B1=1000Ω (Standard)
B2=4000Ω
B3=135Ω
- **C. Custom Positioning Options:**
C=0 None
C=1 Isolated Auxiliary End-of-Travel Switch
C=2 Adjustable Start Position Switch
- **D. Custom Housing Options:**
D=0 None
D=1 Handwheel (Continuous Rotation Type)
D=2 NEMA 3 Rated (Weather-Resistant)
- **E. Power Requirements:**
E=1 120 VAC 50/60 Hz.
E=2 240 VAC 50/60 Hz.
- **F. Current Model Designation:** C

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