

# PRIME MOVER™



## **PRIME MOVER™ Precision Linear Actuation**

Using our advanced metal bellows technology, the PRIME MOVER™ is a unique linear actuator that provides superior reliability and maintenance-free performance.

- Operates in harsh environments
- Operates at extreme temperatures
- Actuates across pressure boundaries.

The PRIME MOVER™ is designed to deliver precise linear activation time-after-time from the day you install it.

- Factory preset and tested
- Plug-and-play
- Fast system level integration
- Completely maintenance-free

# The Ultimate in Precision Linear Actuation:



## Construction

What makes the PRIME MOVER™ unique is that it uses a welded metal bellows as the force generating mechanism – instead of a piston. A welded metal bellows is essentially a hermetic spring. If you apply a pressure differential across the bellows, the bellows will compress or extend depending on the direction of the pressure. If pressure is applied external to the metal bellows, the bellows will compress, extending the actuator. If the pressure is removed, the bellows spring force will retract the actuator. Double actuating versions are also available.

## Unique Advantages

By combining sealing and actuator capabilities in one unit, the PRIME MOVER™ delivers a number of unique performance and cost advantages.

- Superior reliability and performance – zero friction – no surfaces that wear or degrade
- Compatible with normal, exotic or corrosive fluids – complete stainless steel construction resists corrosion
- Sturdy construction – operates at temperature extremes from cryogenic to +450°C
- Contamination free actuation
- Cost-effective – simplifies system design with fewer components
- Facilitates system level integration – true plug-and-play, factory preset and tested
- Compact design – By combining a pressure seal and actuator in the same envelope, the PRIME MOVER™ is significantly smaller than conventional actuators
- Completely maintenance free – long life without service
- Pneumatic or hydraulic actuation

## Features

- All metal wetted surfaces
  - No dynamic elastomeric seals to replace from wear or degradation
- Hermetic actuation seal
  - Leak tight actuation across pressure boundaries
- Zero friction
  - Repeatable performance
  - Smooth actuation
  - 1 million minimum cycles
- Ultra-clean actuation, meets ISO-14644-1 Class 1
- Actuation forces up to 1000 lbs.
- Accurate and repeatable positioning
  - Z axis accuracy  $\pm .001$
  - Lateral accuracy  $\pm .005$
  - Unit to unit uniformity  $< .005$

## Materials

Materials selection should take into account the proposed operating environment including temperature and fluid media.

## Housing

- 304L Stainless Steel
- 316L Stainless Steel
- Inconel 625

## Bellows

- AM 350M Stainless Steel
- Inconel 625

## Position Monitoring

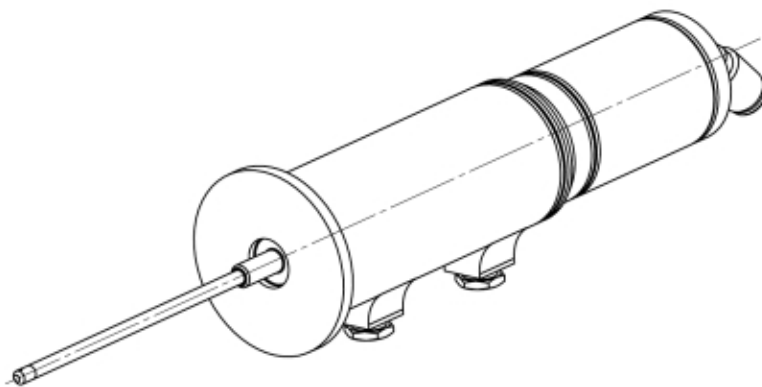
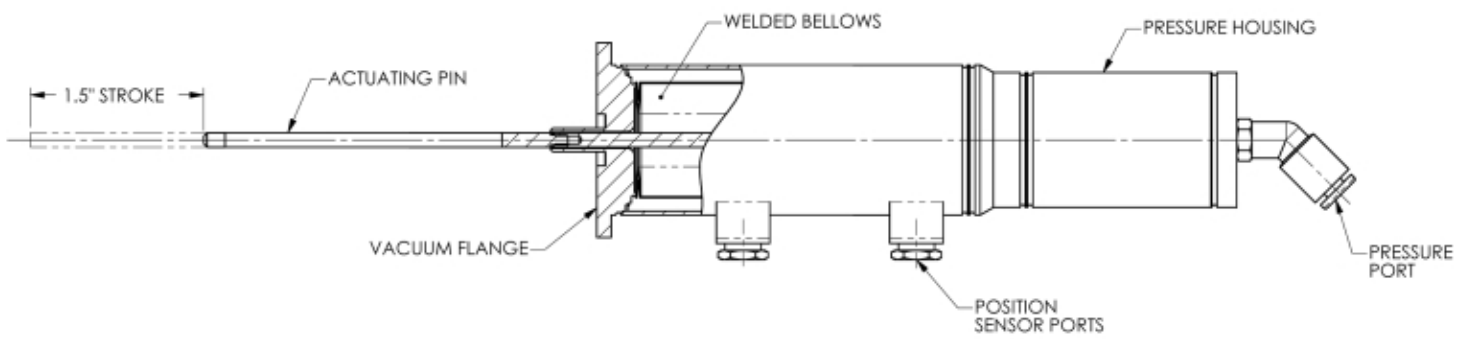
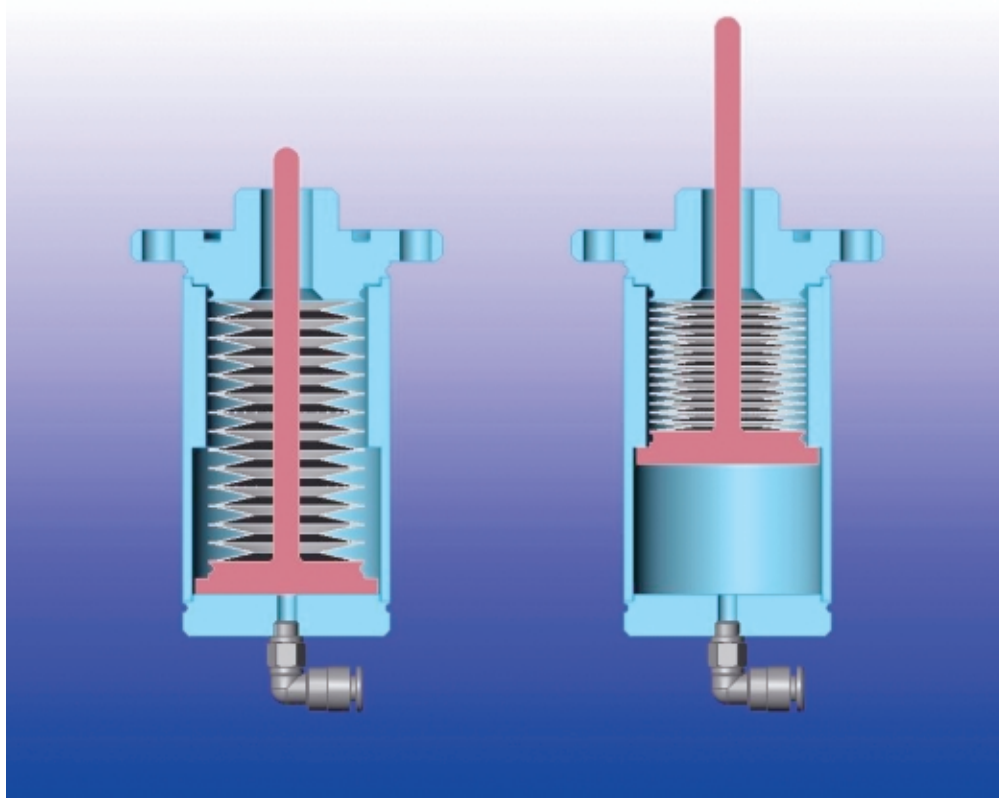
- Magnetic switch
- Fiber Optic Switch
- LVDT

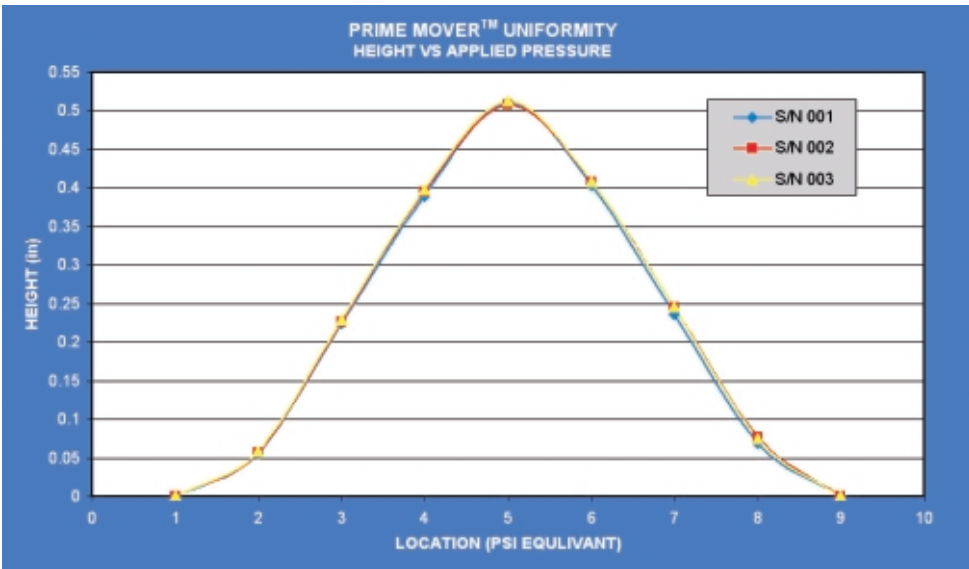
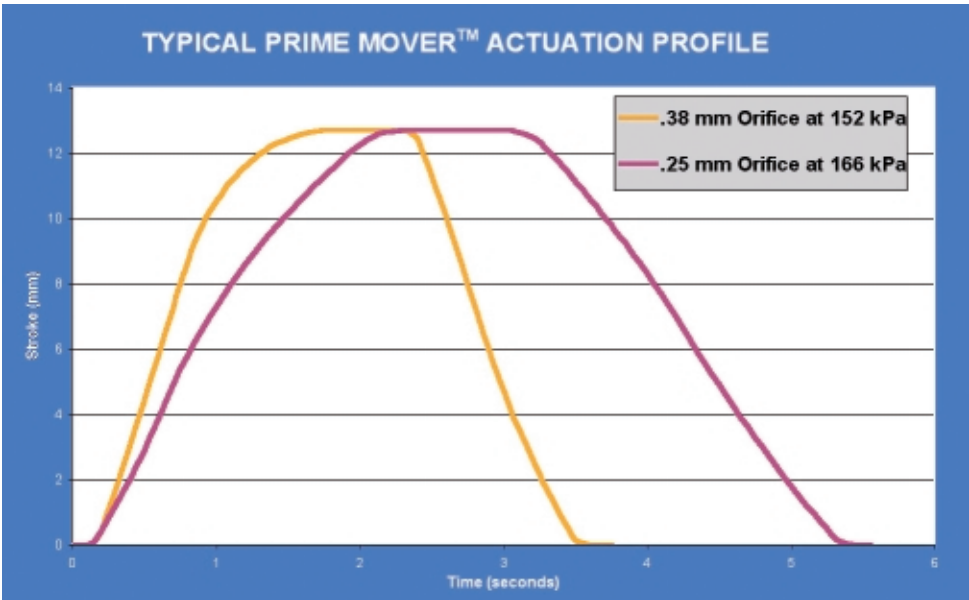
## Applications

The PRIME MOVER™ is ideally suited for a wide range of applications.

- Pin lifters
- Wafer handling
- Shutters
- High temperature valves
- Robotics
- Wherever linear actuation is required

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Senior Aerospace Metal Bellows provides custom engineered solutions to meet and exceed our customers mechanical and electromechanical component and assembly requirements. For more information, visit us at [www.metalbellows.com](http://www.metalbellows.com)

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