Key Points to Consider When Properly Sizing an Actuator

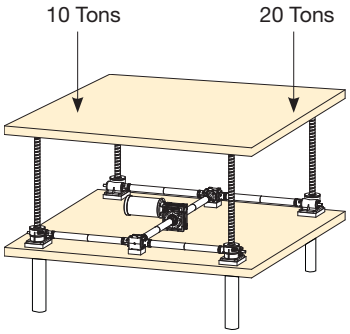
- Total system load
- Application loading conditions
- Operating intervals of the actuator
- Linear velocity requirements
- Ambient temperature
- Environmental conditions
- Mounting position requirements
- Load screw configuration
- Screw length requirements
- End mounting requirements
- System components needed

Refer to technical specifications on pages 14 & 36.

Total Load Requirements

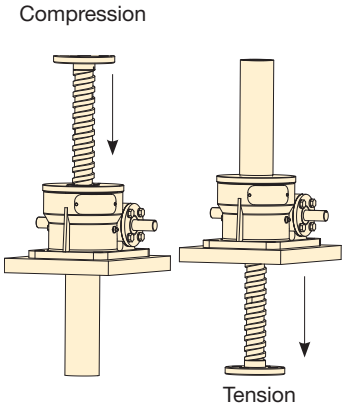
UNI-LIFT® Actuators can be used individually or in combination with each other to move a load.

- When a single actuator is used, the maximum load is the highest force value the actuator will have to sustain in a particular application.
- When more than one actuator is used, the load can be evenly distributed or unbalanced where one or more actuators in the system are subjected to a higher force in the system.
- The maximum load in an unbalanced system is equal to the highest force applied to a single actuator in the system. In the case of an unbalanced load, size the actuator based on the maximum force applied to a single actuator.



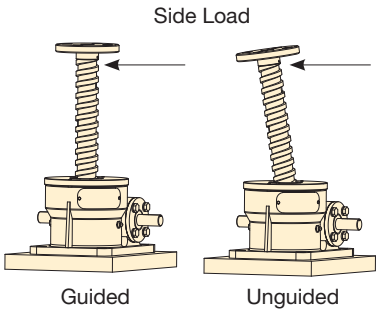
Application Loading Conditions

Loading conditions are factors that can affect the load screw during the operation. The orientation of the actuator to the load can cause the load screw to be axially loaded in compression or tension. If the load screw will see both compression and tension loads, the use of the anti-backlash design is recommended. *Refer to page 72.*



- **Guided loads** describe a loading condition where proper alignment between the actuator and the load is maintained by external guiding in the structure. With longer columns guided loads allow you to double your load screw length for a given load.
- **Unguided loads** describe a loading condition where the actuators must rely on the load screw to maintain alignment of the system. Side loads are not recommended in an unguided system.

Refer to the Yellow Pages 71 & 76 for Column Buckle information to properly size your actuator.



Usage Requirements

- **Operating Cycle Requirements**
  To determine the type and size of the actuator, calculate the required duty and operating cycles.

Refer to the Yellow Pages 70 & 75 for Duty Cycle information to properly size your actuator.

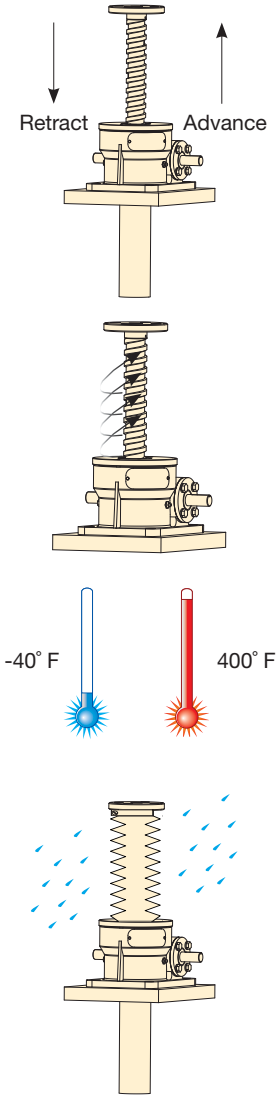
- **Linear Velocity Requirements**
  Linear velocity is the speed that the actuator moves the load based on the output speed of the motor. Turns Per Inch (TPI) is the number of rotations of the actuator's input shaft required for one-inch of travel. Actuators are available in two to three different gear ratios.

- **Operating Temperature**
  To determine the duty cycle limit you will need the maximum temperature the actuator will be exposed to. For severe conditions, Enerpac offers seal and grease options capable of operating in temperatures from -40° F to 400° F.

For detailed information on Safety, Installation and Maintenance refer to page 80 of the Yellow Pages.

- **Environmental Conditions**
  The actuator may require a boot to protect the load screw. Boots are used when the load screw may be exposed to contamination, corrosive environments, where an exposed screw is viewed as a hazard or where it is critical to ensure lubrication is retained within the actuator to meet cleanliness requirements.

Refer to Accessory page 62 for detailed information on Boot Sizing.

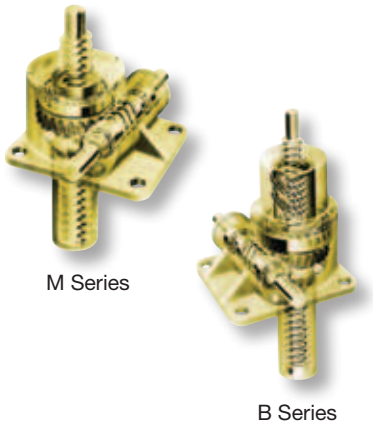


Determine Which Actuator Best Suits the Application

- **M-Series Machine Screw Actuator**
  General applications where the load screw uses a precision rolled acme, self locking screw thread that requires no cribbing to hold load into position.

- **B-Series Ball Screw Actuator**
  Used in high cycle applications, the load screw uses a precision rolled ball screw. A ball screw is 90% efficient, offering a smoother, faster operation. A mechanical break is required to hold position.

Refer to M- and B-Series Overview pages 12 and 36 for detailed information on actuator models.

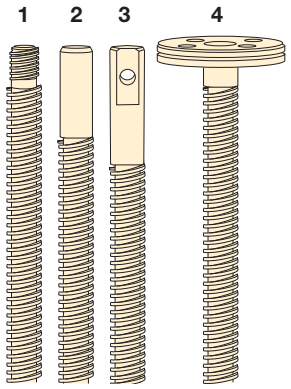


M Series

B Series

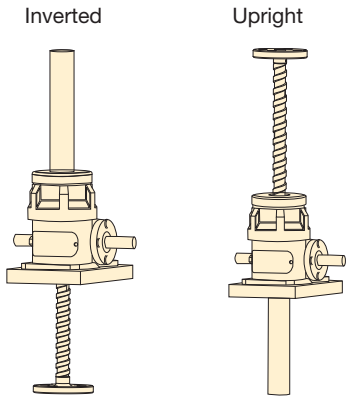
End Configurations

- **Threaded End (1)**
  The end of the load screw is machined to include a standard unified V-thread form strong enough to sustain the load capacity of the actuator. This option can be used to attach customer supplied mounting configurations.
- **Plain End (2)**
  The end of the load screw is machined to provide a smooth, unthreaded portion suitable for engaging pillow blocks or other bearing supports. Bearing supports are highly recommended when long load screws are used. This option is only available with the Rotating design.
- **Clevis End (3)**
  The end of the load screw features a cross hole for mounting with a pinned connection. This option is used in applications that require a pivoting mount.
- **Top Plate (4)**
  The end of the load screw is adapted with a flange to provide mounting to surfaces perpendicular to the load screw. This option will easily adapt to mounting structures.



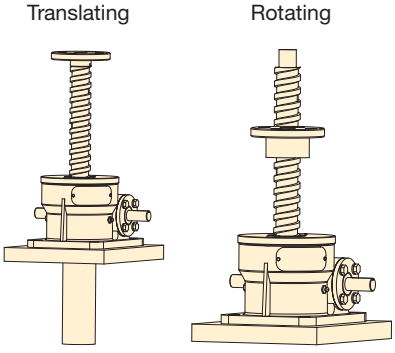
Determine The Mounting Style

- **Inverted Configuration**
  The load screw protrudes from the same side as the machined mounting face on the housing.
- **Upright Configuration**
  The load screw protrudes from side opposite the machined mounting face on the housing.
- **Double Clevis Configuration**
  The mounting points for the housing and the screw are clevis and pin type. (Illustration not shown.)



Determine Load Screw Configuration

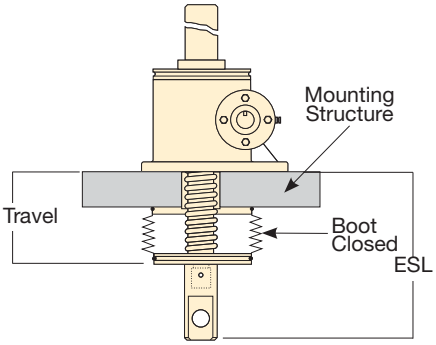
- **Translating Design**
  The load screw is threaded into the driven gear. Rotation of the input shaft turns the driven gear which moves the load screw in and out of housing.
- **Rotating Design**
  The load screw is pinned to the driven gear. Rotation of the input shaft turns the driven gear which rotates the load screw. An auxiliary nut travels the exposed length of the load screw.
- **Keyed Screw Design**
  A key prevents the load screw rotation. Due to the inefficiency of this design, they are down rated to 25% of the load rated capacity. (Illustration not shown.)
- **Anti-Backlash Design**
  An adjustable nut on the load screw eliminates axial endplay. (Illustration not shown.)
  Refer to page 72 for details.



Determine The Extended Screw Length (ESL)

The length of screw that is needed to achieve the required movement, and allow for boot closed heights, traveling nuts, stop nuts and the thickness of the supporting structure between the actuator and the load.

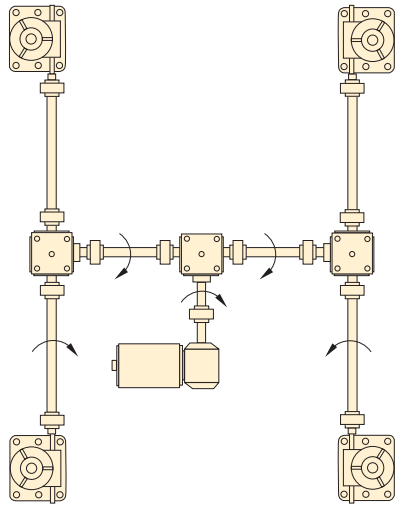
Refer to the Yellow Pages 71 & 76 for more information on ESL.



System Arrangement

Actuators can be configured in multiple system arrangements to allow synchronized lifting. Even when the loads are unequally distributed, the system can lift uniformly. Enerpac offers a complete line of power transmission equipment that can be used to set up your system.

- Determine the system arrangement that best fits the application. Calculate the required torque and horsepower requirements for the system.
- Select a motor with a power rating greater than the horse power requirement and with starting and running torque capability greater than calculated torque requirements.
- Select system torque transmission equipment (reducers, mitre gear boxes, couplings, etc.) with ratings greater than the torque to be transmitted.
- Size shafting for system starting torque to be transmitted.



Refer to the Yellow Pages for more information on Motor Sizing and System Arrangements.

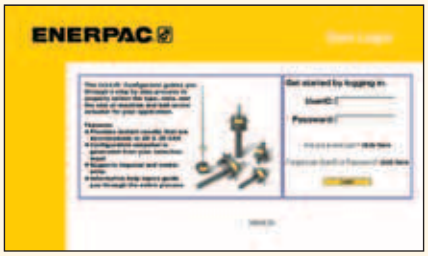
Enerpac understands that no two projects are alike; therefore, we offer specialized engineering and design expertise to complete your system integration. Whether you are driving a single actuator or a multiple actuator system, our comprehensive range of control technologies and accessories brings your system together. Enerpac Application Engineers will deliver the precise technical information and support to specify actuator sizing, motor sizing, controls, reducers, mitre boxes, couplings, shafting and pillow blocks to accommodate any system arrangement.

Enerpac's extensive manufacturing capabilities provides a single source for all of your equipment requirements.

Sample system arrangements are shown to help generate ideas. Additional information is included in the Yellow Pages starting on page 64 or contact Enerpac for assistance.

UNI-LIFT® Actuators were the ideal choice for adjusting complex scaffolding required in aircraft maintenance. Their precision movement allowed safe, efficient control and positioning.

Online UNI-LIFT® Configurator



The UNI-LIFT® Configurator guides you through a step-by-step process to properly configure the actuator for your system.

The configurator calculates the torque and horsepower requirements of your system with downloadable and scaled 2D and 3D drawings.

Please visit **www.enerpac.com/unilift** to learn more about UNI-LIFT® Actuators.

Machine Screw Actuators

UNI-LIFT® M-Series, Machine Screw Actuators offer positive mechanical action and precise positioning.

Page: 12

Ball Screw Actuators

UNI-LIFT® B-Series, Ball Screw Actuators, provide a high speed, high cycle precision lift system.

Page: 34

UNI-LIFT® System Accessories

UNI-LIFT® provides all power transmission components for your positioning applications.

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System Arrangement Reference Numbers

① *UNI-LIFT® Actuator*

② *Shafting*

③ *Motor Adaptor*

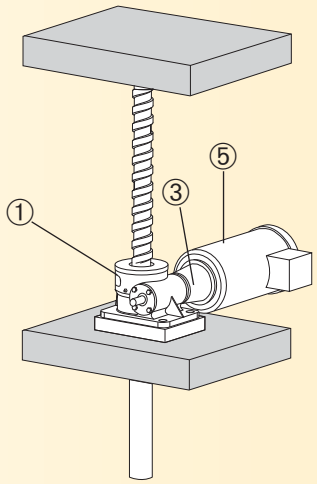
④ *Worm Gear Reducer*

⑤ *Motor*

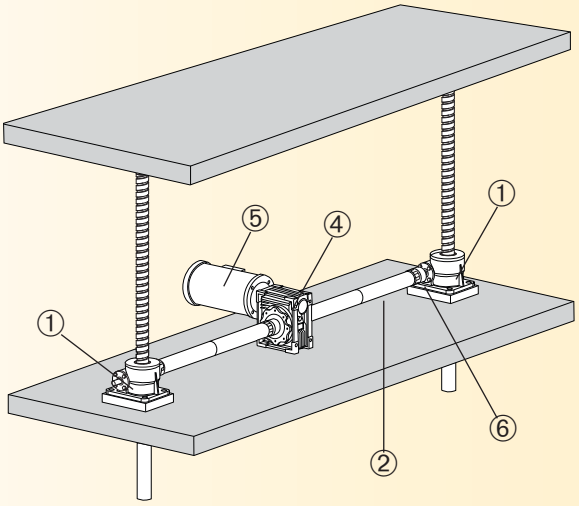
⑥ *Coupler*

⑦ *Mitre Gear Box*

▼ **Single Point Actuator System**



▼ **Two Point Actuator System**



▼ **Four Point Actuator System**