Frequently Asked Questions (FAQ's) about Uni-Lift Actuators:

1. What is the difference between a Machine Screw Actuator and a Ball Screw Actuator?

The machine screw actuator uses an acme threaded screw that is typically self-locking, meaning it will hold its position without a brake. Ball screw actuators use ball screws to convert rotary motion to linear movement, and require 1/3 the horsepower compared to a machine screw actuator. Due to the efficiency of the ball screw, brakes must be used to stop and hold the load screw in position. Brakes are also recommended for use on any actuator if vibration is present.

2. Why use a machine screw vs. a ball screw actuator?

One type of actuator is usually better suited to the operating conditions. Typically, fast operating speeds and frequent cycle times may be more suited to a ball screw actuator, particularly as the load approaches the rated capacity of the actuator. High load at slower speeds, less frequent cycles and the ability to hold the load in position when the system is at rest may be better suited for a machine screw actuator.

3. What is the input torque requirement for a given output load?

The input torque for a specific load and actuator model is calculated using the technical specifications and formulas in the catalog. The input torque (inch pounds) is listed for each actuator model in the Technical Specifications Section titled "Torque Required to Lift One Pound".

4. How do I operate the actuator?

Most actuators are operated by electric motor, but air motors and hydraulic motors can also be used. Handwheels can be used for manual operation.

5. How do I size motors and calculate required horsepower?

The horsepower requirement for Uni-Lift is calculated using the actuator input torque to move the load times the input RPM to the actuator divided by the constant of 63025.

6. Can I use a larger motor than required?

Yes, but it is not recommended. The actuator or system components could be damaged if an oversize motor is used. Electronic position switches or travel limit controls must be used for each end of travel to stop the motor. If using solid mechanical stops, actuator components can be subject to shock load conditions and oversize motors can cause catastrophic failure of stops and other components.

7. What is TPI?

TPI stands for turns per inch and is listed in the Technical Specifications for each actuator model. The value associated with TPI is the number of revolutions required to the input shaft to move the load one inch. This is calculated by dividing the actuator ratio by the lead of the load screw.

8. How do I stop the actuator at the travel limits?

Limit switches or other controls must be used to shut off the motor when the actuator has reached its full extended or retracted position. Solid stops are not recommended. Their continued use can cause severe damage to the actuator. Uni-Lift offers, as an option, a standard rotary limit switch for this purpose. Other electronic devices include Encoders and Linear Position Transducers and can also be provided by Uni-Lift.

9. Can multiple actuators be used in a system?

Yes, but do not exceed 300% of the rated input torque for a given actuator. Use the standard catalog formulas to determine input torque and motor size.

10. Can different size actuators be used in the same system?

Yes, as long as the input turns for 1 inch of travel are equal. This is sometimes done to accommodate varying load conditions.

FREQUENTLY ASKED QUESTIONS

11. What is the system efficiency?

2 actuator system: 95% 3 actuator system: 90%
4-actuator system: 86% 6 actuator system: 82%
Right angle gearbox efficiency is 95%
Helical Gear Reducers: Single reduction 98.5%
Double reduction 97%
Worm Gear Reducers = $\frac{\text{Horsepower out x 100}}{\text{Horsepower in}}$

12. What is the maximum input speed?

Most Uni-Lift units can be run at 1800 RPM (some run up to 2587 RPM). The catalog sizing procedure correlates the Load vs. Input RPM and Duty Limits and Cycle Times. A gear motor, Helical Gear Reducer, or a Worm Gear Reducer is used to reduce the input RPM to the actuator to provide the required travel speed of the load screw (load screw velocity). Many Uni-Lifts can be driven directly by 1800, 1150 and 900 RPM motors. Motors and reducers are available mounted directly to many Uni-Lift models.

13. Can standard Uni-Lift actuators be used for continuous duty?

Yes. The standard catalog sizing procedure includes the formula for determining the duty limits for each actuator model. This unique feature allows you to calculate the duty cycle limits of each Uni-Lift model for your application.

14. What is the duty cycle?

Duty cycle is the time it takes the actuator to heat up under a given set of operating conditions, limited to a maximum temperature of 180° F.

15. What causes heat build up in the actuator?

The actuator is a mechanical gearbox assembly. The friction of the gears, load screw, bearings and seals generate heat while the actuator is operating. The combination of travel, loading, and input speeds all affect the temperature rise of the actuator. Uni-Lift sizing calculations take these variables into account to insure that you select the right actuator model for your application.

16. What is the load screw capacity and travel?

This is based on the relationship of the screw diameter and the length. Screws in tension are rated for the full capacity of the actuator, regardless of length, providing they do not rotate faster than the critical speed. For screws in compression, capacity is limited by the load screw's column strength. The column strength of a screw is reduced as the screw gets longer. Use the maximum extended screw length (ESL) when using the Column Buckle Charts to determine load screw capacity.

17. How do I determine the full-extended screw length?

The Extended Screw Length (ESL) is normally equal to the travel. Allowances must be added for the closed height of a boot and the addition of stop nuts or special closed heights. These allowances increase the length of the screw. For inverted actuators, the thickness of the mounting structure must also be included. This total length (ESL) should be used when determining the column load capacity of the actuator.

18. Should the load being positioned be guided?

It is highly recommended that the load be guided; however, it is not necessary. A guided system will provide more column stability and allow longer load screw travel. Column length is greatly reduced on unguided systems. External load forces common with unguided systems are detrimental to the life and operation of the Uni-Lift.

19. Can the actuator withstand side loading or a bending moment?

Yes, but this is not recommended. Consult Uni-Lift if this condition will be present! These types of loads apply greater forces on the load screw and housing assembly causing premature wear. Guides are highly recommended and should be used to eliminate side and bending loads.

20. Is there backlash between the load screw and gear nut?

Yes. This is necessary to allow for sliding or rolling action of the screw through the nut. Anti-Backlash actuators are available when the backlash needs to be minimized. See the catalog section for these models and features. Input torque requirements are greater for anti-backlash design actuators.

21. Can the actuator withstand shock loading?

This is not recommended. Oversized actuators are required to handle shock loads. Solid thrust bearings are also available in many actuator models when constant vibration and shock are present in an application.

22. What mounting position can the actuator be mounted?

Uni-Lifts can be mounted in any position, vertical, horizontal or in-between. A position other than vertical should be noted on inquires and purchase orders since special accommodations may be required.

23. How is the load screw protected?

Standard translating screw actuators are fitted with a screw protection tube that stores the screw when the actuator is in the closed position. Boots are available and recommended to protect the screw in the extended position. Two (2) boots may be required for rotating actuators with traveling nuts.

24. How do I attach the load to be positioned to the load screw?

For translating actuators, the load screw has a standard threaded end that can be used to attach the load. Top Plates or Clevis Ends are also available. For traveling nut designs, the traveling nut has a flange with mounting holes. The actuator housing has a mounting base and is also available with a clevis mount for double clevis requirements.

25. Will the load screw rotate?

Yes. You need to prevent the load screw from rotating to produce linear motion. The load screw will not rotate in a multi-unit system with all the load screws attached to the same structure. If rotation of the screw cannot be prevented in the application design, a keyed configuration is available for either the Machine or Ball Screw Uni-Lift. Input torque will increase for keyed actuators and the capacity may be reduced to 25% of rating. Contact factory for keyed applications.

26. What is the maximum temperature rating?

400°F. Standard Uni-Lifts are designed to operate at 80°F ambient temperature with a 100°F temperature rise. For higher temperatures, special grease and seals are used to reach temperature ranges up to 400°F. Advise Uni-Lift of these requirements.

27. What is the low range operating temperature?

Minus 100°F with special grease. Advise Uni-Lift of these requirements.

28. Can actuators be used in food industry applications (USDA)?

Uni-Lift uses USDA approved lubrication for these applications. Advise Uni-Lift of these requirements.

29. How do I lubricate a screw actuator?

Use the proper grease. Fill the gearbox by pumping grease into the grease fittings supplied in the actuator housing. The screws should have grease applied directly to them with a rag or paintbrush. This must be done as part of a regularly scheduled maintenance program.

30. How do I select the right actuator?

Determine the direction of the load (compression/tension) and the screw-mounting configuration. Determine the dynamic and static load on each actuator. From the catalog, identify the configuration, Upright, Inverted, Translating, Rotating and required attachments (top plate, clevis, boots, etc). Determine the travel time in minutes (inches per min.). Follow the simple sizing calculations included in the catalog.

31. Who do I call for help?

Uni-Lift, 800-323-9114, Templeton, Kenly, & Co., Inc., Broadview, IL.