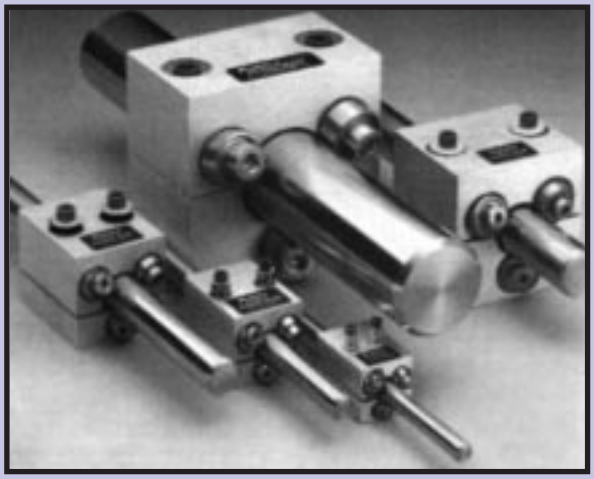
Roh'lix Linear Actuators



- ✓ Rotary to Linear Movement
- ✓ Low Cost Linear Actuation
- ✓ Easy to Install
- ✓ No lubrication Required
- ✓ Adjustable Slip
- ✓ Rapid Transit (up to 150 mm/rev)
- ✓ Fail Safe Clutch Feature
- ✓ High Speed (up to 1750mm/sec)

Roh'lix actuators comprise six precision ball bearings,three at each end of a two piece aluminium block. Mounted at a set helix angle relative to the drive shaft axis. The bearings convert rotary into linear motion.

The distance traveled per revolution is termed "lead". The linear thrust capability is determined by friction between the bearings and the drive shaft. Thrust capacity can be adjusted by the cap screws located at the top of the unit. Loads exceeding the thrust settings will cause the unit to slip, allowintg the bearings to rotate while the shaft continues to turn.

Characteristics of the Roh'lix Linear Actuator

Efficiency

The six bearings provide efficient rolling contact between the outer race of the bearings and the drive shaft resulting in smooth quiet linear motion and a mechanical efficiency exceeding 90%.

Backlash

Roh'lix actuator springs preload the bearings against the drive shaft, reducing backlash to less than 0.025 mm.

Position Accuracy and Repeatablity

The accuracy of the Roh'lix is the difference between the nominal lead and the actual distance that the Roh'lix moves in a given revolution. Repeatability refers to the difference in the distance traveled from any given revolution to the next. The Roh'lix is a friction drive device and is sensitve to load changes. Therefore, the Roh'lix does not always return to exact, predetermined locations. As a general rule, the Roh'lix can have an accumulted error of up to +/- .038 mm per revolution. For this reason, **the following application suggestions are offered.:**

Open Loop Systems: a system where postion is not critical or is only critical at one or both extremes of travel. No feedback is required to track the position of the Roh'lix.

- Use limit switches at the extremes of travel to shut down the drive or reverse it.
- Use mechanical stops at one or both ends of travel to give the Roh'lix a homing postion. This cancels the accumulative error.
- Use cams, pneumatic cylinders, or solenoids to actuate mechanical stops in and out of the path of the Roh'lix when concerned about repeating specific points along the travel.

Closed loop systems: used where specific, repeated points or random points are targeted along the linear path of the Roh'lix. A feedback system is required to track the position of the Roh'lix.

Use linear encoders as a method of feedback to control the position of the Roh'lix.

- Glass scales
- Magnetic scales
- Specially adapted rotary encoders

Overload protection:

If the thrust setting of the Roh'lix is exceeded, the Roh'lix will stop while the drive shaft continues to rotate. This provides overload protection if an obstruction is encountered in the system. This unique advantage ove other types of linear actuators can prevent sytem damage and downtime.

Roh'lix Life Expectancy:

Tests at the factory and many years of application experience suggest the minimum life to expect is 51,000 metres of linear travel to as high as 2,540,000 metres of linear travel. These factors should be considered to maximize the life of the Roh'lix:

- **Thrust:** Roh'lix life is increased when the thrust setting is less than the maximum allowable catalogue rating for a given block size. Selecting an oversized Roh'lix is advisable to achieve the greatest lifetime from the unit. In no case should the cap screws be tightened beyond the maximum thrust capacity of the unit.

- **Lead:** A Roh'lix with a high lead will have longer life than units with a low lead because fewer bearing revolutions are required to travel an equal linear distance.

Overloading: Occasional slippage for short periods of time is acceptable, but frequent or extended periods of slippage will lower the expected linear life expectancy

● **Other Factors to Consider for Maximum Life Expectancy:** Operate the Roh'lix in an ambient temperature within -12°C to +82°C, keep shaft clean, keep speed as slow as practical, and minimize side loads and twisting loads on the Roh'lix.

Backdriving: By applying a thrust load to the Roh'lix, the drive shaft can be made to rotate. This will cause the Roh'lix and any device attached to it to move along the shaft. Therefore, the Roh'lix should *never* be relied upon as the sole device to hold position.

Tandem Roh'lix: Two Roh'lix may be used on a common shaft in series, or on separate parallel shafts, but because of machining tolerances, the combined thrust rating of the two units must be derated by 25% in low lead units and 10% in high lead units. When installing the units, be sure to tighten the thrust adjustment screws on both units an equal number of turns.

Lubrication: Roh'lix bearings are factory lubricated and are designed to run on a clean, nonlubricated drive shaft.

Shafting: Recommended drive shaft material is C-1060 hardened and ground steel shafting with a minimum hardness of Rockwell 58C. Its hardness will provide optimum life expectancy and its ground surface provides a uniform friction surface. Stainless steel shafting, although slightly less in hardness, is adequate for many applications requiring corrosion protection.

Temperature: Standard Roh'lix units will operate in an ambient range of -12°C to +82°C. Special bearing greases are available for operation above or below the standard ambient range.

Maintenance: Shafting should be kept free of any foreign matter that may accumulate.

Installation: The Roh'lix should only be axially loaded because this method allows for an even load distribution over all of the six bearings. *Side loads and twisting loads* (Figure 2) *should be avoided because they cause uneven bearing loads and will shorten life expectancy. Whenever possible, the load weight on the Roh'lix should be supported by a separate carriage. Side loads should be subtracted from the thrust capacity of the unit and never exceed 50% of the unit's thrust capacity.* If this is not possible, select an oversized Roh'lix.

To install on the shaft, merely remove the two cap screws, springs, and washers (when supplied), then separate the two block halves (Figure 3). Position the block halves on the drive shaft using the guide pins for proper end-to-end placement. Re-install the cap screws, springs, and washers, then tighten screws with an equal number of turns (Figure 4). Test the unit to be sure the thrust setting is adequate to carry the load. A simple spring scale may be used (Figure 5). Figure 6 may be used as a guide for establishing the proper thrust setting. *Do not exceed the thrust rating of the unit.*

Fig. 2

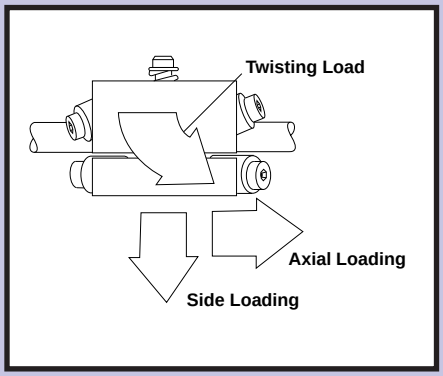


Fig. 3

Fig. 4

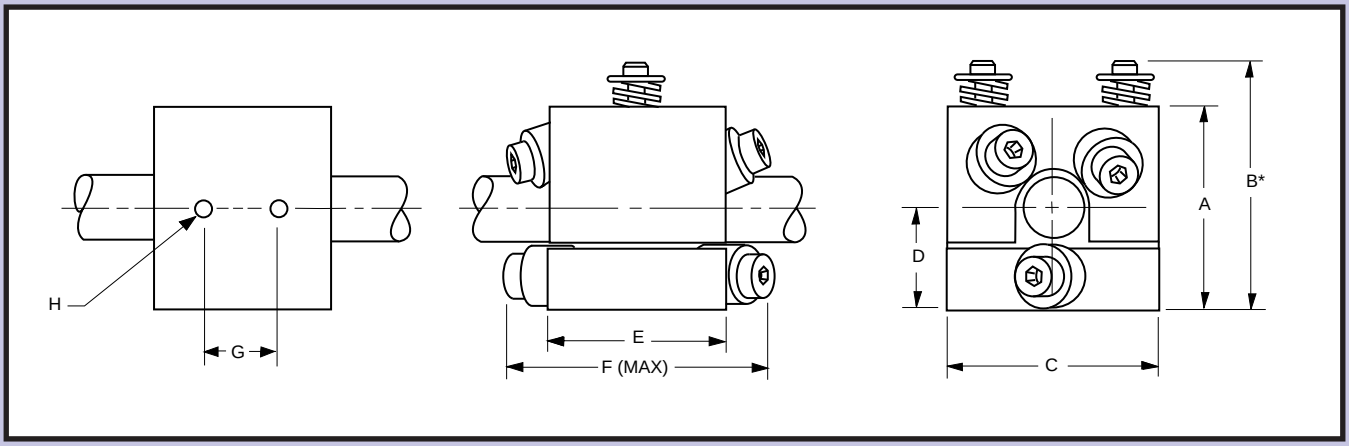
Fig.5

Model No.	Screw Length (mm)	Screw Size	Thrust Per Turn (N)
1	32	M3 x 0.5	0.68
2	38	M5 x 0.8	3.82
3	50	M6 x 1.0	5.62
4	57	M6 x 1.0	5.62
5	64	M10 x 1.5	7.87

Fig. 6.

Dimensions & Specifications

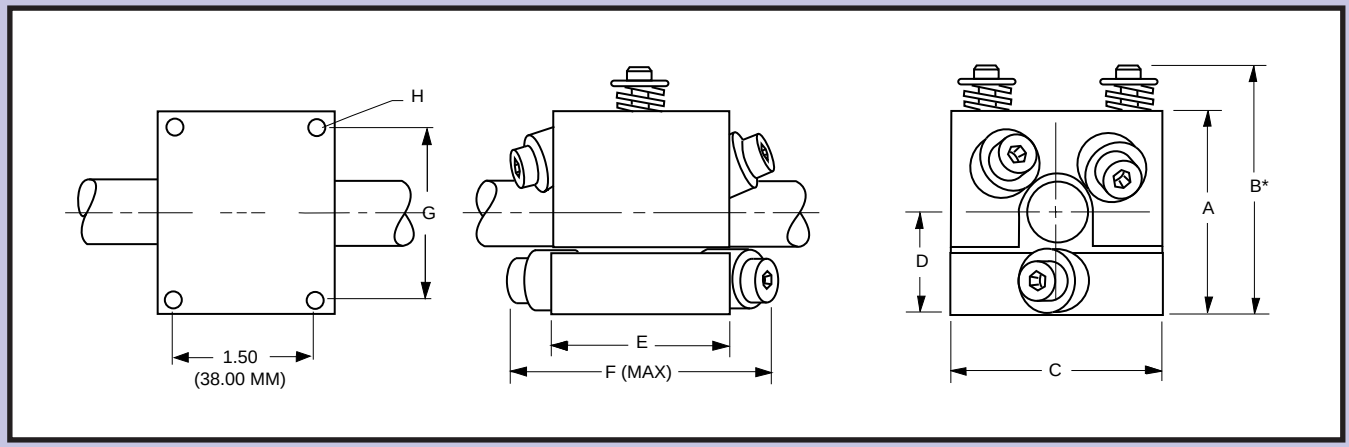
Roh'lix Sizes 1-3



Size	Dimensions							H-Tapped Mounting Holes
	A	B*	C	D	E	F	G	
1	29	42.2	28.6	14.5	41.3	57.2	19	M3 x 0.5 x 9.53 DP
2	38.6	48.5	38.1	19.3	50.8	71.4	25.4	M5 x 0.8 x 9.53 DP
3	51.3	68.3	50.8	25.6	63.5	86.9	31.1	M6 x 1.0 x 12.7 DP

*Dimension at Zero Thrust Setting

Roh'lix Sizes 4-5



Size	Dimensions							H-Tapped Mounting Holes
	A	B*	C	D	E	F	G	
4	76.2	88.9	76.2	38.1	63.5	90.4	63.5	M6 x 1.0 x 12.7 DP
5	114.3	118.9	114.3	57.2	69.9	118.9	101.6	M6 x 1.0 x 12.7 DP

*Dimension at Zero Thrust Setting

Standard Metric Models (RH Lead)

Size	Model No. (use this No. in ordering)	Shaft Diameter (mm)	Lead (mm)	Thrust Rating (newton)
1	1901 1902	8 8	1.3 2.5	22 22
2	2901 2902	8 8	2.5 15.0	133 133
	2903 2904 2905	12 12 12	5.0 15.0 25.0	133 133 133
3	3901 3902	12 12	2.5 10.0	266 266
	3913 3914 3915	16 16 16	2.5 15.0 25.0	266 266 266
4	4901 4902 4903	25 25 25	2.5 5.0 25.0	444 444 444
5	5901	40	10.0	889
	5902 5903	50 50	5.0 50.0	889 889

Leads are available from a minimum of 0.625mm to a maximum of 3 times the shaft diameter.
Drive shaft diameters may be as small as 8mm to as large as 50mm.

Special Models
Stainless steel hardware and bearings may be supplied along with a clear chromated block for use in corrosive atmospheres in sizes 1 through 4, however thrust rating must be derated by 25%
Anodised or stainless steel blocks are not available as standard.