

90° Rack & Pinion Actuators

Air powered rotary actuators for precise action and reliable long-life operation.

Product & Services Sales Guide

Max-Air Technology Inc. | Rotary Actuators & Valve Automation Solutions



The Core of Max-Air Technology

Back in 1999, Max-Air Technology entered the market with rack and pinion actuators featuring a unique, patented design. Today, Max-Air's core product line-up builds on this proven design with the most extensive rack and pinion actuator offering in the world. Alternate housing and seal materials, finishes, coatings, 90° through 180° rotations, and industry best +/-10° travel stops ensure that Max-Air offers the perfect solution.

Standard Features:

- Compact Rack and Pinion Design
- 3D Models Available for All Designs and Sizes
- Direct ISO 5211 Standard Valve Mounting
- Direct NAMUR Accessory Mounting
- Anti-Blowout Bi-Directional Pinion Retention
- High Visibility Open/Closed Beacon
- Pre-Loaded Spring Cartridges



MT Series Aluminum

Max-Air's proven and patented design provides built-in flexibility and repeatable, reliable action. Standard housing is anodized aluminum, with optional coatings available. (See page 5-6)



SS Series Stainless

Actuators with fully stainless steel housing and hardware offer the highest level of corrosion resistance. (See page 5-6)



UT Series Technopolymer

Actuators with polyarylamide epoxy resin housing are suited for environments with hydrocarbons, organic solvents, and fuels. (See page 7)



GP Series GRP

Actuators with glass-reinforced polypropylene housing are ideal for corrosive acidic and alkaline environments. (See page 7)

Torque Range	Up to 47,250 in-lbs (DA) & 22,746 in-lbs (SR)
Materials	Aluminum, Stainless Steel, Technopolymer, Glass Reinforced Polypropylene
Coating/Finish Options	Epoxy, Electroless Nickel Plating, Lock Mesh™ (SS+PTFE), Mirror Polish (SS Only)
Ambient Temp.	-4°F to 176°F Standard (-67°F Low, 300°F High)

Rotation	90°-180° Degrees ±10° Adjustment Spring Return or Double Acting
Operation Media	Gas or Low Pressure Hydraulic Fluid
Mounting	ISO 5211, NAMUR VDI/VDE 3845
Additional Options	DD Pinions, Fast Acting, Extended Travel Stops

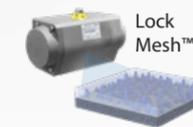
90° Rack and Pinion Series Selection

Start from the top of the chart and work down to select the correct Rack & Pinion series.

	Up to 625 in-lbs DA or 278 in-lbs SR				625 in-lbs - 47,250 in-lbs DA or 278 in-lbs - 14,275 SR			
	Corrosive		Standard		Corrosive		Standard	
Torque								
Environment								
Temperature	Standard	Extreme (High/Low)	Standard	Extreme (High/Low)	Standard	Extreme (High/Low)	Standard	Extreme (High/Low)
Recommended Series/Options	MT Series w/ Special Coating	MT Series w/ Special Coating & Temp Seals	GP Series		MT Series w/ Special Coating	MT Series w/ Special Coating & Temp Seals	MT Series	MT Series w/ Temp Seals
	SS Series		MT Series	MT Series w/ Temp Seals	SS Series	SS Series w/ Temp Seals		
	GP Series	SS Series w/ Temp Seals	UT Tech Series					
	UT Tech Series							

MT Series Aluminum & Coating/Finish Options

The MT Series rack & pinion pneumatic actuators continue the Max-Air tradition of easy integration, flexible customization, and reliable operation. Features include two ISO bolt circle patterns drilled directly in the body, NAMUR standard mounting for accessories, and our patented ±10° adjustment for the open/closed positions, all backed by the best unlimited cycle life warranty.



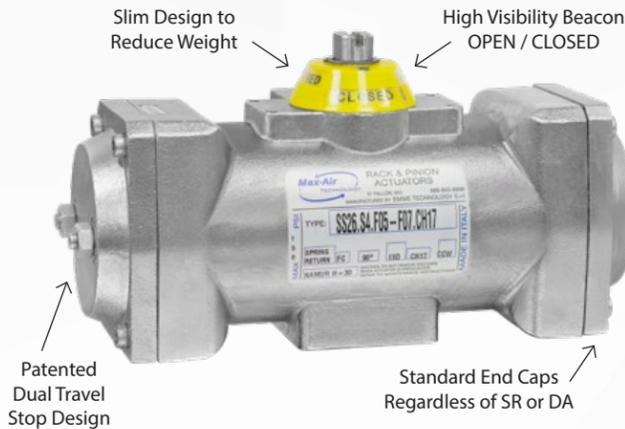
Special Finish/Coatings

Aluminum corrosion resistance can be enhanced by epoxy coating, electro-less nickel plating, or Max-Air's exclusive LockMesh™ SS+PTFE coating.

Available in 17 Sizes!

SS Series Stainless

The MAX-AIR rack & pinion stainless steel pneumatic actuator produces linear torque output in a compact design utilizing the same body and end caps for double acting and spring return units.

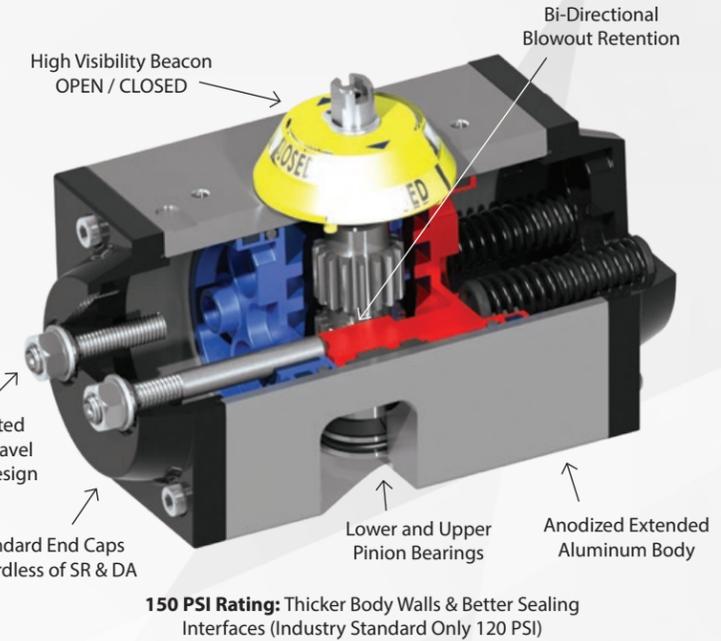


Mirror Polish Options

For stainless steel actuators in sanitary environments, antimicrobial and biofilm resistance can be increased with a mirror polished finish.

AISI 316 Stainless Steel

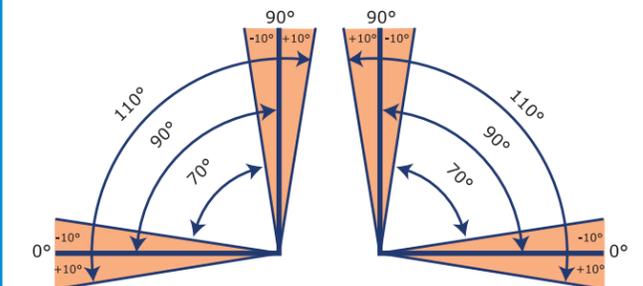
All external components (body, end caps, pinion and fasteners) are made in stainless steel (CF8M or AISI 316) for a superior corrosion resistance



150 PSI Rating: Thicker Body Walls & Better Sealing Interfaces (Industry Standard Only 120 PSI)

Patented Dual Travel Stop Design

Standard on MT Series, SS Series, & UT Series Rack and Pinion Actuators



STANDARD +/- 10° ADJUSTMENT OPEN & CLOSE

- Travel adjustable from 70° up to 110° rotation
- Angle seating capable with standard travel stops
- Compensates for slop in valve/actuator/coupling interface
- Typical industry standard is +/-3°

LINEAR PISTON STOPS, BOTH ON SAME SIDE

- Easier adjustment for tighter space requirements
- Clearly marked "0" (Closed) and "MAX" (Open)
- Extremely high repeatability, no hysteresis
- Allows for greater travel adjustment than rotary cam stops
- Lower degrees per turn allows for more precision
- No uneven side loading or wear on the pinion

OPTIONAL EXTENDED TRAVEL STOPS

- Close adjustment up to 30° or more from full closed
- Open adjustment up to full actuator stroke (90° from open)
- Fail-safe applications where full close shutoff is not desired
- Special rotations where travel is much less than 90° (i.e. 45°, 60°)

Temperature Seal Options

Available for MT Series and SS Series Actuators

Seals	Temperature Range
Super Low Temp. (FVMQ)	-67°F (-55°C) to 250°F continuous & 300°F cyclic
Low Temp. (Silicone)	-49°F (-45°C) to 250°F continuous & 300°F cyclic
Standard (BUNA-N)	-4°F (-20°C) to 176°F (80°C)
High Temp. (VITON)	-10°F (-23°C) to 250°F continuous & 300°F cyclic
Low Temp. Buna	-40°F (-40°C) to 212°F (100°C)

High Cycle Life Design

Precision Honed Bore, High Cycle Wear Bearings, Unlimited Cycle Life Warranty, Rugged Tooth Design



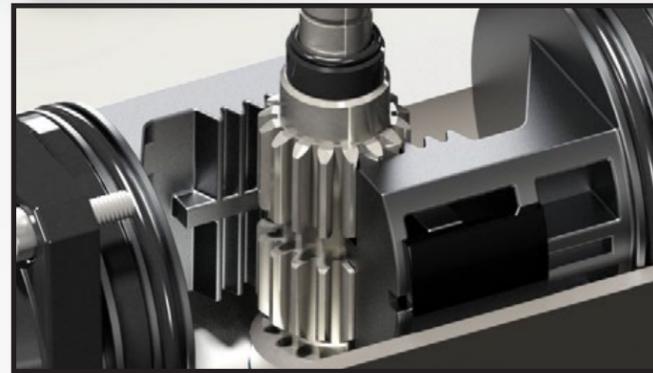
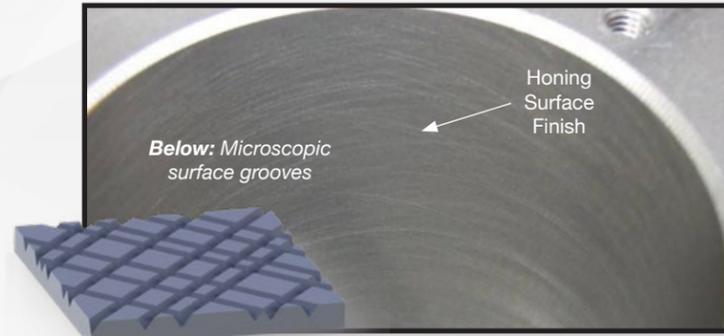
High Cycle Wear Bearings

High performance technopolymer bearings eliminate metal-to-metal sliding contact.

- Low friction, Large contact area
- 2 axial + 1 thrust bearing for pinion
- 2 axial bearings per piston, plus zero travel stop bearing

Precision Honed Bore

This high end feature, is not industry standard. A uniform bore surface provides consistent seal contact and compression. Micro-scratches provide even lubrication which minimizes the "wiping" effect. Our Honed Bore will provide consistent long-life operation with multiple seal materials and greases.



Rugged Tooth Rack and Pinion Design

The MT Series exclusive rack and pinion tooth design was created to better withstand valve "slamming" and other dynamic forces. After years of research and development, Max-Air was able to optimize a tooth profile for higher strength and resiliency, but with minimal backlash.

Unlimited Cycle Life Warranty

MT Series actuators have the best warranty in the industry, made possible by a holistic high-cycle life design. To maximize actuator life and take full advantage of the warranty, Max-Air always recommends clean, dry air for operation and regular preventative maintenance. Rebreathers are readily available and also recommended to keep dirty environmental air out of the internals and prolong the life of seals and grease. The Max-Air MT Series design is tested and verified to over 1,000,000+ cycles under full rated load.

SIL3
Safety Integrity Level

Designed & Tested 1,000,000+ Cycles

Increased Corrosion Resistance & Relative Cost

Materials/Coatings w/ Properties & Limitations

Options	Aluminum: Hard Anodized (Standard)	Aluminum: Anodized w/ Polyamide Epoxy Coating	Aluminum: Electroless Nickel Infused	Aluminum: Teflon Infused SS Mesh "Lock Mesh™" Coating	Stainless Steel: ASTM A351 Grade CF8M
Properties	Good general corrosion properties in most "natural" environments with pH from 4.5 to 8.5. Good resistance to salt air environments. The coating is extremely hard and resistant to abrasion.	The epoxy coating is relatively thick, which creates a barrier against many of the chemicals which anodizing alone cannot adequately resist. It will resist more acidic or basic environments than anodizing alone.	Uniformly thick coating with essentially no porosity and a reasonably high hardness. The coating is pure, tough, hard, and resistant to many types of corrosion media.	This coating provides complete surface coverage and exhibits excellent corrosion resistance properties in a wide variety of applications. In addition, it is FDA approved for food contact.	304 and 316 stainless steel are the most commonly used alloys. Both have good corrosion resistance but 316 is generally considered superior, however more expensive.
Performance Limitations	Highly acidic or basic environments will break down the coating.	Good general corrosion resistance, particularly in salt or alkaline environments. Limited resistance to acids. Surface chalking will occur when exposed to UV radiation. Also suitable for low concentrations of caustic washdown solutions.	The coating will provide enhanced corrosion protection in very acidic environments but will not withstand attack from strong alkaline media. Also suitable for low to medium concentrations of caustic washdown solutions.	These coatings are resistant to any environment into which an actuator would be installed. Provided the integrity of the surface is intact, the coating can resist a broad array of chemical environments at temperatures ranging from sub-zero to 350° F.	Although stainless steel does offer enhanced corrosion resistance, it also is dramatically higher in both cost and weight. The weight differential will often necessitate the use of special support bracketry. Corrosion resistance is superior.

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Engineered Polymers

Since their conception the Max-Air lines of thermoplastic actuators have been installed worldwide in the most arduous environments. The series is now also available in GLASS-REINFORCED POLYPROPYLENE becoming the most effective choice for your corrosion resistance applications.

Standard Features:

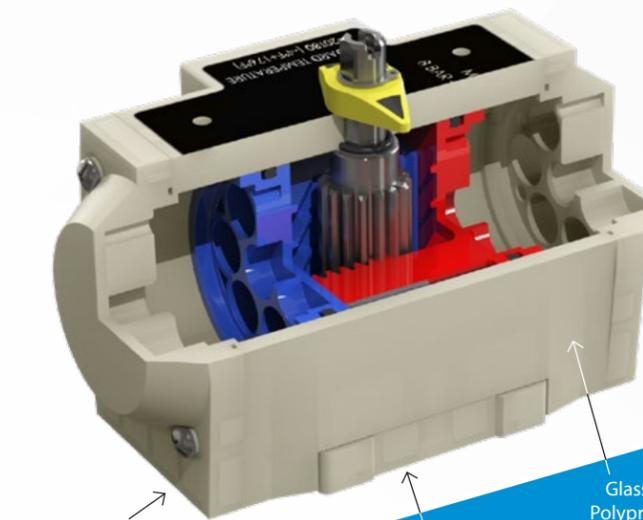
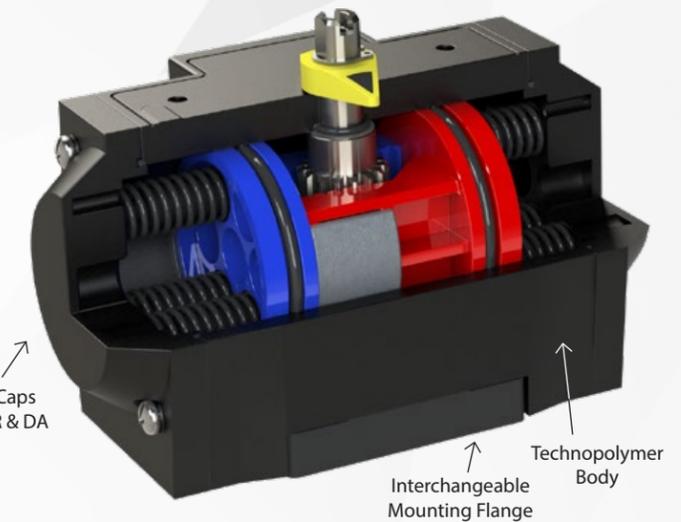
- Compact Rack and Pinion Design
- Direct ISO 5211 Standard Valve Mounting
- Interchangeable Mounting Flange
- Skates and Bearings Isolate for High Cycle Wear Resistance
- Anti-Blowout Bi-Directional Pinion Retention
- Rugged Tooth Rack and Pinion Design (See page 6)
- Pre-Loaded Spring Cartridges for Easy Changeout
- Low Profile Indicator



UT Series Technopolymer

The UT Technopolymer Series actuators are designed to withstand the most extreme environments (Hydrocarbons, Organic Solvents, and Fuels). Available in three sizes, your applications requiring plastics and corrosion resistance are covered with up to 500 in-lbs of torque (Double-Acting).

Seals	Temperature Range
Standard (BUNA-N)	-4°F (-20°C) to 176°F (80°C)



GP Series GRP

The GP Series GRP line of glass-reinforced polypropylene actuators are designed to withstand the most extreme environments (Strong Acid and Alkali Environments). Available in three sizes, your applications requiring plastics and corrosion resistance are covered with up to 500 in-lbs of torque (Double-Acting).

Seals	Temperature Range
Standard (BUNA-N)	-4°F (-20°C) to 176°F (80°C)