
Max-Air TECHNOLOGY
Rack & Pinion Pneumatic Actuators



**180° CENTER RETURN ACTUATORS
INSTALLATION, OPERATION
& MAINTENANCE MANUAL**

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CHAPTER 1: PRODUCT DESCRIPTION

Max-Air Technology offers a broad range of pneumatic rack & pinion actuators. **Max-Air Technology** actuators are designed to operate with dry or lubricated air media, but will function equally well with non-corrosive and inert gas or light hydraulic oil.

Max-Air Technology 180° center return actuators are equipped in the standard configuration with the following unique features:

- Double travel stops
- External position indication
- Pre-loaded springs
- Stainless steel pinion up to UT21, carbon steel electroless nickel coated for larger sizes
- Shaft bearings isolate the pinion gear from the housing and support the shaft for high cycle application
- All bodies are internally lapped
- All internal and external surfaces are anodized for corrosion resistance
- End caps and pistons are epoxy powder coated for corrosion resistance
- Angle of rotation: 180° with spring return to center position
- All air line connections are ¼" NPT
- "NAMUR" VDI/VDE 3845 and ISO 5211 dimensions on all sizes

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CHAPTER 2: TECHNICAL FEATURES & DATA

2 – 1 METHOD OF OPERATION

Figure 2.a

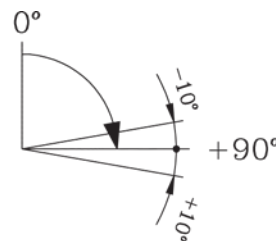
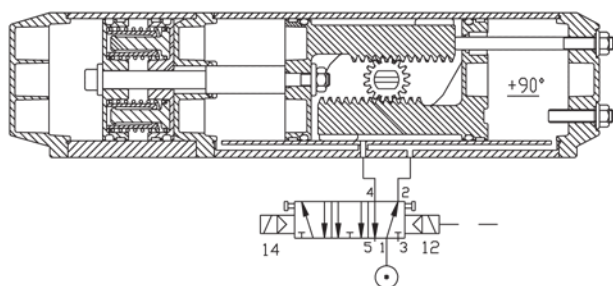
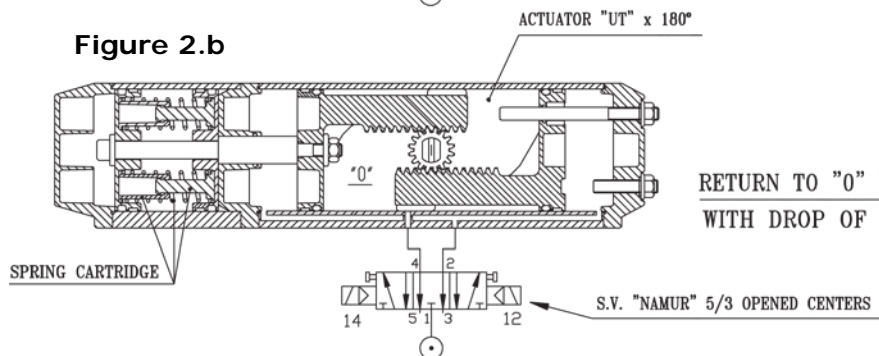
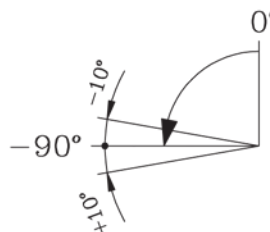
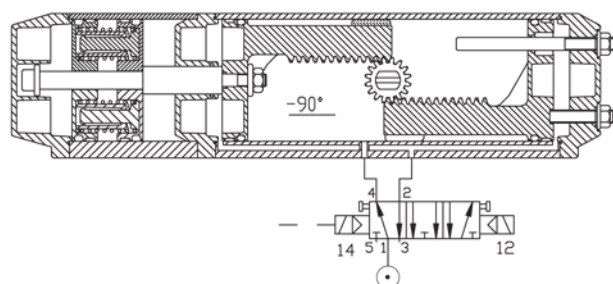


Figure 2.b



RETURN TO "0" POSITION AUTOMATICALLY BOTH
WITH DROP OF POWER AND AIR PRESSURE

Figure 2.c



Max-Air 180° center return actuators are designed for use with an open center NAMUR mount solenoid valve such as the Max-Air S36A, which is available in a variety of voltages. This valve is equipped with dual coils so that powering one coil will cause clockwise rotation (**Figure 2.a**) and release of power (de-energizing) will allow return to the center position (**Figure 2.b**). Similarly, powering the opposite coil will cause counter-clockwise rotation (**Figure 2.c**) and release of power will allow the actuator to return to the center position (**Figure 2.b**).

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2 – 2 TECHNICAL DATA & WORKING CONDITIONS

- Operating Media – Dry or lubricated air, non-corrosive and inert gas or light hydraulic oil.
- Air supply: 30 PSIG (2 Bar) to 150 PSIG (10 Bar) maximum. *A safety valve is normally recommended.*
- Temperature: Standard from –10°F to +176°F. Higher temperature (+250°F continuous and +300°F cyclic) and lower temperature (-55°F) available on request.
- Lubrication: Factory lubricated for life under normal working conditions with **Exxon CAZAR K2** or equivalent
- Application: Suitable for both indoor and outdoor applications.

2 – 3 SPECIAL CONDITIONS

- When the actuator is to be operated with oxygen, the actuator must be perfectly clean and specially lubricated.
- Operating the actuator beyond its designed temperature limitations may damage internal and external components and, therefore, could prove potentially dangerous for operating and maintenance personnel.
- Operating the actuator beyond its designated pressure limitations may result in either an actuator malfunction or an actuator explosion and, therefore, could prove potentially dangerous for operating and maintenance personnel.
- **Note:** Do not disassemble the actuator.

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CHAPTER 3: INSTALLATION

Max-Air 180° center return actuators can be fitted on many styles of 180° turn valves, including ball, plug and dampers in accordance with the instructions contained in this chapter.

Max-Air actuators are designed to be easy to install, for this purpose a mounting flange (ref. 27 of the actuator exploded view page 8 and **Figure 3.a**) has been designed. The flange is an integral part of the body and is equipped with ISO 5211 drilling (**Table a**) in order to allow a male/female or female/male coupling with the valve.



Figure 3.a

Bottom view of
Max-Air actuator

TYPE	DRILLING FLANGE			
UT16	F04 (Ø1.654)	F05 (Ø1.969)	F07 (Ø2.756)	Ø3.250
UT21	F04 (Ø1.654)	F05 (Ø1.969)	F07 (Ø2.756)	Ø3.250
UT26	F04 (Ø1.654)	F05 (Ø1.969)	F07 (Ø2.756)	Ø3.250
UT31	F04 (Ø1.654)	F05 (Ø1.969)	F07 (Ø2.756)	Ø3.250
UT36	F07(Ø2.756) + F10 (Ø4.016)	Ø3.250 + F12 (Ø4.921)	Ø3.250 + Ø5	
UT41	F07(Ø2.756) + F10 (Ø4.016)	Ø3.250 + F12 (Ø4.921)	Ø3.250 + Ø5	
UT46	F07(Ø2.756) + F10 Ø4.016)	Ø3.250 + F12 (Ø4.921)	Ø3.250 + Ø5	
UT51	F10 (Ø4.016)	F12 (Ø4.921)		
UT56	F10 (Ø4.016)	F12 (Ø4.921)		
UT61	F10 (Ø4.016)	F12 (Ø4.921)	F14 (Ø5.512)	
UT66	F10 (Ø4.016)	F12 (Ø4.921)	F14 (Ø5.512)	

Table a

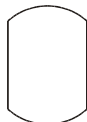
 = Standard

Note: The bracketed numbers indicate the diameter between the holes.

The pinion presents a double – square female drive to allow a large flexibility in mounting; it allows the assembling on valves stem, or coupling, with square key at 45° or at 90° indifferently. On request, bottom pinion female key may be done as double D or cylindrical with one or two keyways.



Double Square key



Double D key



Keyways key

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On the top face of **Max-Air** actuators there is a NAMUR standard mounting pattern for easy installation of accessories for position survey and/or control devices (Micro Switch Boxes, Positioners, etc)

Figure 3.b shows an actuator in the normal position (closed) with the pinion flats and the indicator – drive milling perpendicular to the body



Figure 3.b
Top view of **Max-Air** actuator

The Ports are NAMUR standard for easy solenoid valve connection

Installation procedure.

1. Check the coupling female pinion drive – valve stem.
2. Make sure that the valve and the actuator are both in the **center** position before proceeding (see **Figure 3.b**).
3. Install mounting bracket on the valve and hand tighten all fasteners; be sure not to fully torque bolts until entire assembly is correctly aligned and installed.

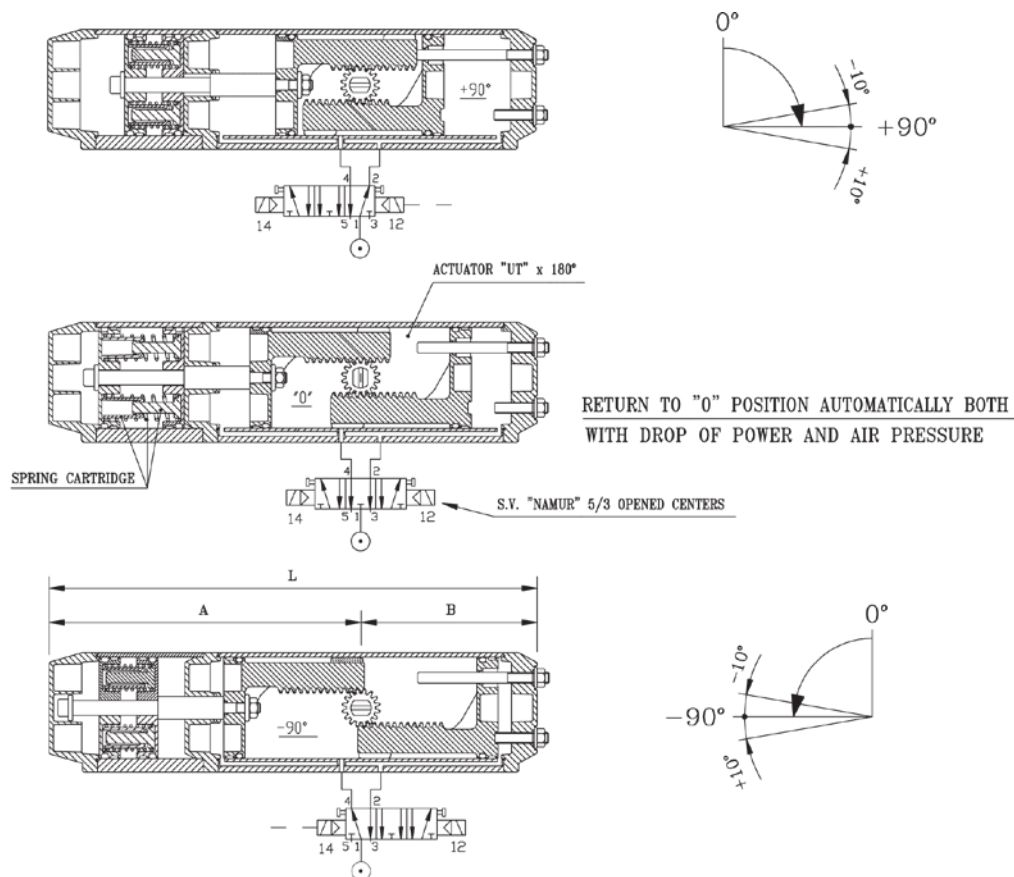
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4. a) **Mounting with brackets:** Place coupling on valve stem and the actuator on mounting bracket. Align valve and actuator in order to eliminate forces on the system; tighten all the assembly fasteners.
b) **Direct mounting:** Position the actuator on valve; use caution while inserting the valve stem into the double square female pinion drive. Insert the screws from the bottom side of flange and manually tighten them and align the assembly in order to eliminate the forces on the system; tighten all assembly fasteners.
5. Actuate the unit several times to ensure that it works properly. If the unit does not work properly, disassemble the unit and repeat steps 1 – 4. If the problem persists, contact your local **Max-Air** representative.
6. After the completion of the mounting operations, it is necessary to set the actuator stroke through the travel stops to ensure that the valve works properly. **Max-Air** 180° center return actuators have a regulation range from -100° to -80° and from 80° to 100° ($\pm 10^\circ$ in both CW and CCW directions).
7. Rotate actuator and valve assembly to desired degree.

CHAPTER 4: MAINTENANCE

Factory service is required on all Max-Air 180° center return actuators. Each actuator is balanced and calibrated to operate at optimum performance – attempting to disassemble can undo this calibration and will void warranty.



		DIMENSIONS AND ORDERING CODE									
		UT16	UT21	UT26	UT31	UT36	UT41	UT46	UT51	UT56	UT61
UP TO S3	A	8.583	9.213	10.787	11.299	12.598	14.213	17.874	17.323	21.260	21.496
	B	4.606	4.961	6.496	6.535	6.858	7.913	10.000	9.843	11.969	12.165
	L	13.189	14.173	17.283	17.835	19.449	22.126	27.874	27.165	33.228	33.661
	CODE	RC16-3XXXX	RC21-3XXXX	RC26-3XXXX	RC31-3XXXX	RC36-3XXXX	RC41-3XXXX	RC46-3XXXX	RC51-3XXXX	RC56-3XXXX	RC61-3XXXX
UP TO S6	A	10.906	10.906	14.055	14.488	15.984	18.150	22.559	22.441	26.929	27.795
	B	4.606	4.961	6.496	6.535	6.858	7.913	10.000	9.843	11.969	12.165
	L	15.512	16.693	20.551	21.024	22.835	26.063	32.559	32.283	38.898	39.961
	CODE	RC16-6XXXX	RC21-6XXXX	RC26-6XXXX	RC31-6XXXX	RC36-6XXXX	RC41-6XXXX	RC46-6XXXX	RC51-6XXXX	RC56-6XXXX	RC61-6XXXX

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WARRANTY

Max-Air Technology provides the following warranty regarding products manufactured by it. THE WARRANTY STATED HEREIN IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESSED OR IMPLIED, OR STATUTORY, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. *Max-Air Technology* warrants its products to be free from defects in materials and workmanship when these products are used for the purpose for which they were designed and manufactured. *Max-Air Technology* does not warrant its products against chemical or stress corrosion or against any other failure other than from defects in materials or workmanship. The warranty period is for twelve (12) months from installation date or eighteen (18) months from shipment date, whichever date comes first. Any claims regarding this warranty must be in writing and received by *Max-Air Technology* before the last effective date of the warranty period. Upon *Max-Air Technology* receipt of a warranty claim, *Max-Air Technology* reserves the right to inspect the product(s) in question at either the field location or at *Max-Air Technology* Manufacturing plant. If, after inspection of the product(s) in question, *Max-Air Technology* determines that the purchaser's claim is covered by this warranty, *Max-Air Technology's* sole liability and the purchaser's sole remedy under this warranty is limited to the refunding of the purchase price or repair or replacement thereof a *Max-Air Technology* option. *Max-Air Technology* will not be liable for any repairs, labor, material or other expenses that are not specifically authorized in writing by *Max-Air Technology*, and in no event shall *Max-Air Technology* be liable for any direct or consequential damages arising out of any defect from any cause whatsoever. If any *Max-Air Technology* product is modified or altered at any location other than *Max-Air Technology* – St. Louis (Missouri) or *Max-Air Technology* – Sesto San Giovanni (Milan) ITALY without the express written authorization of *Max-Air Technology* are not covered by this warranty. The warranty for such products shall be subject only to the warranty relief, if any, provided by the suppliers and/or manufacturers of such products

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