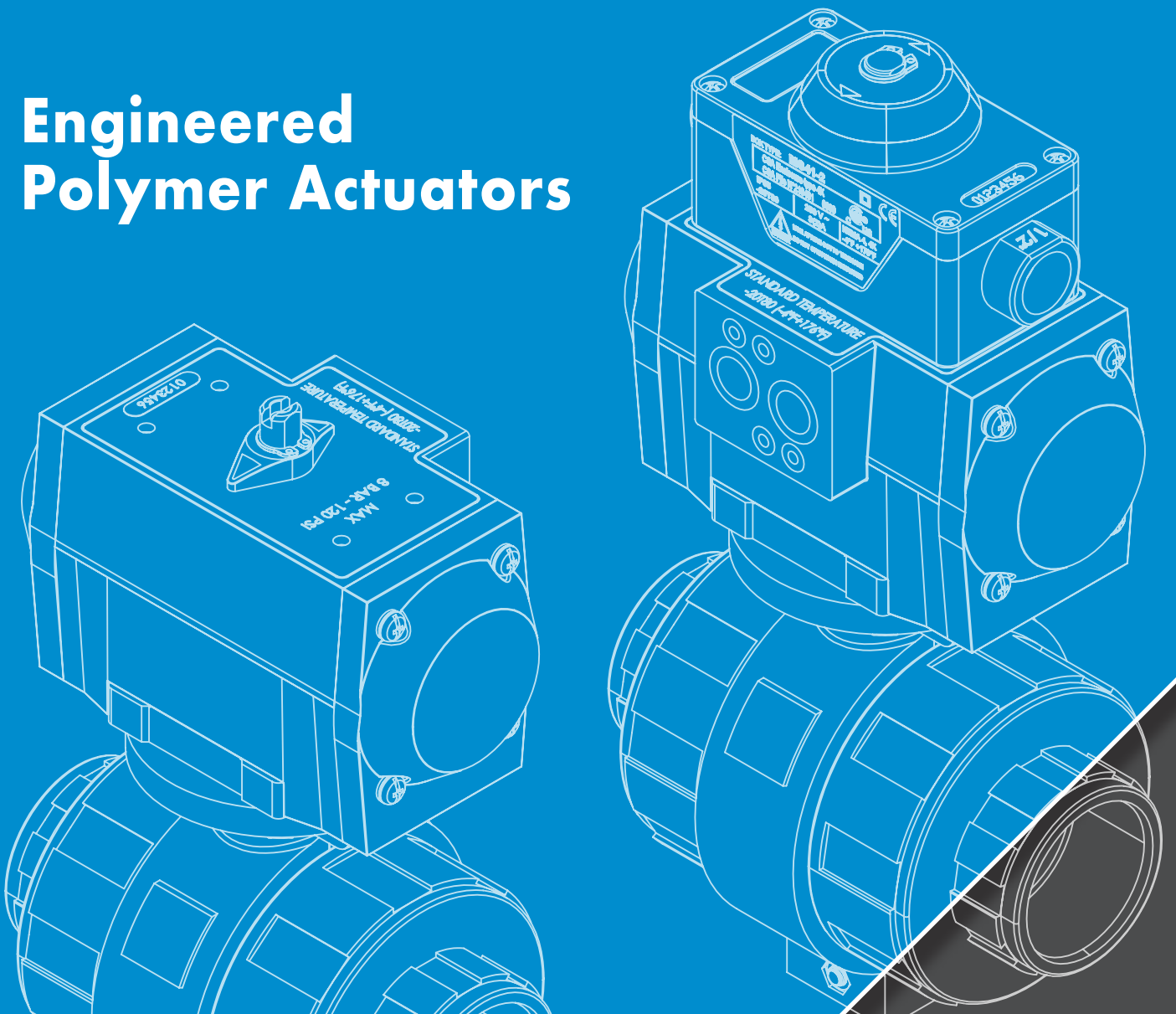




The Best Way To Automate Your Process

Engineered Polymer Actuators



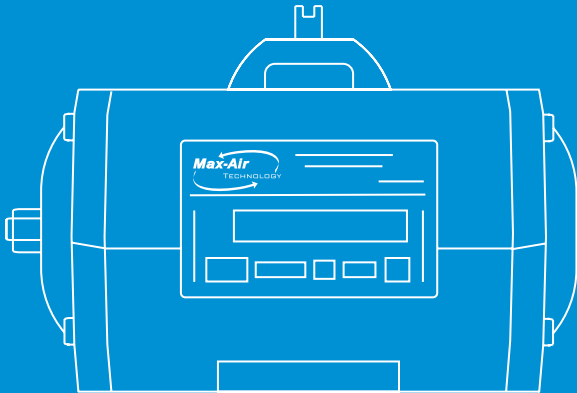
UT Tech & GP Series Technical Brochure

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

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UT Tech & GP Series Actuators

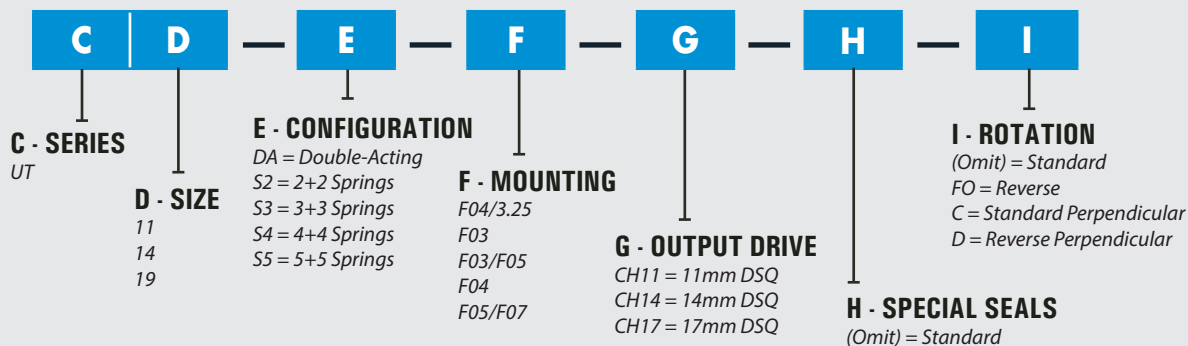
Environments w/ hydrocarbons, organic solvents, and fuels or strong acid and alkali environments.



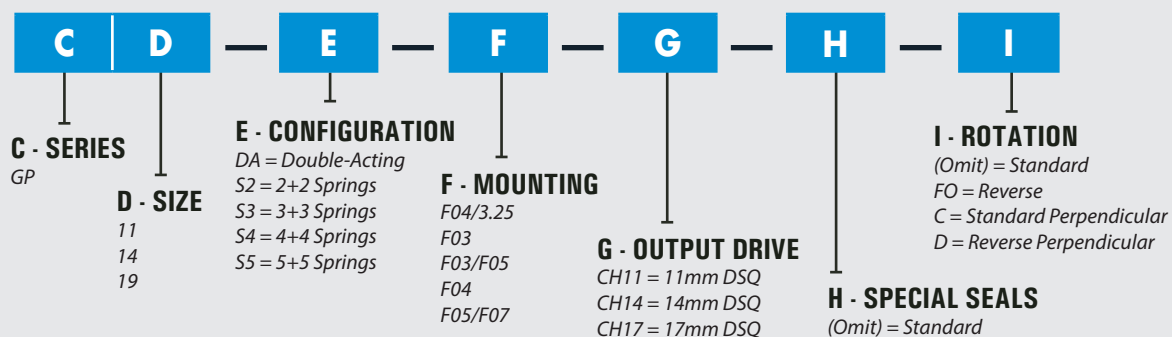
SIL3
Safety Integrity Level

The Max-Air line of technopolymer actuators are designed to withstand the most extreme environments (Hydrocarbons, Organic Solvents, and Fuels). The Max-Air 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).

UT Series Part Number Builder



GP Series Part Number Builder



Pinion Options



Double-Square
(ISO Standard)

Seal Options

SEALS	CODE	TEMP RANGE
Standard (BUNA-N)	STD	-4°F (-20°C) to 176°F (80°C)

*Note: 1) Not all combinations available, and special solutions not shown are possible. Please call factory for details. 2) Max-Air Technology reserves the right to change or modify products without prior notice & without incurring any obligation to make such changes on products previously or subsequently sold.





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STANDARD WARRANTY

Max-Air Technology Inc. | The Best Way to Automate Your Process

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's 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 the 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 at 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) UNITED STATES or Max-Air Technology – Agrate Brianza (MB) ITALY without the express written authorization of Max-Air Technology, said product is 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.

Features & Benefits

Environments w/ hydrocarbons, organic solvents, and fuels or strong acid and alkali environments.

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

Actuators with polyarylamide epoxy resin housing are suited for environments with hydrocarbons, organic solvents, and fuels.



GP Series GRP

Actuators with glass-reinforced polypropylene housing are ideal for corrosive acidic and alkaline environments.

Torque Range	Up to 47,250 in-lbs (DA) & 22,746 in-lbs (SR)
Materials	Technopolymer, Glass Reinforced Polypropylene
Ambient Temp.	-4°F to 176°F Standard

Rotation	90° Spring Return or Double Acting
Operation Media	Gas or Low Pressure Hydraulic Fluid
Mounting	ISO 5211, NAMUR VDI/VDE 3845

90° Rack and Pinion Series Selection

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

Torque	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	
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/ Temp Seals	MT Series w/ Special Coating	MT Series w/ Special Coating & Temp Seals	MT Series	MT Series w/ Temp Seals
	SS Series	SS Series w/ Temp Seals	MT Series	MT Series w/ Temp Seals	SS Series	SS Series w/ Temp Seals	MT Series	MT Series w/ Temp Seals
	GP Series	SS Series w/ Temp Seals	UT Tech Series					
	UT Tech Series							

UT Tech & GP Series Technical Brochure

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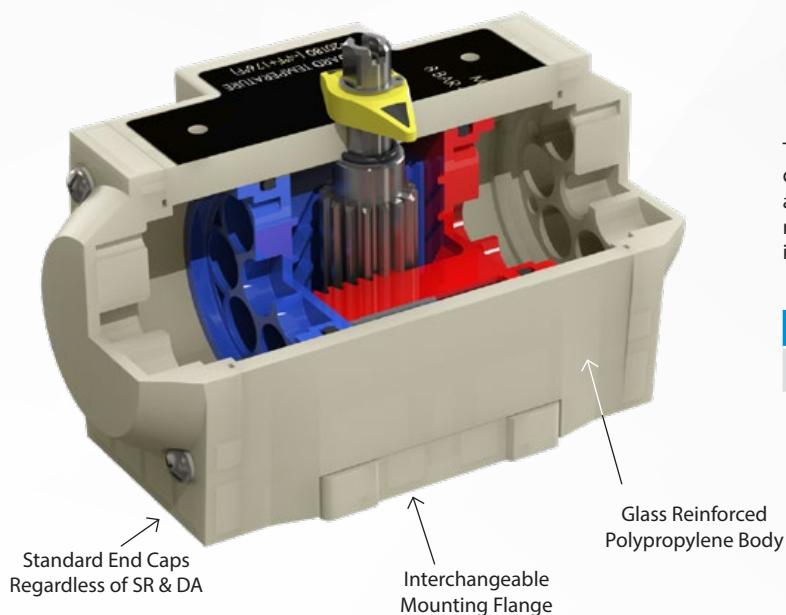
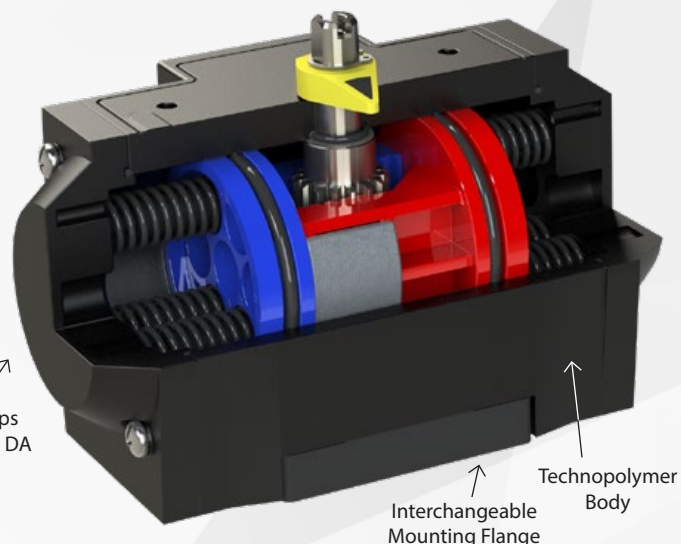


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UT Series Technopolymer

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)

Mounting, Operation, & Sizing, References

Mounting Variations, Operation Illustrations, Explanation of Sizing, & Other Reference Tables

Mounting Variations

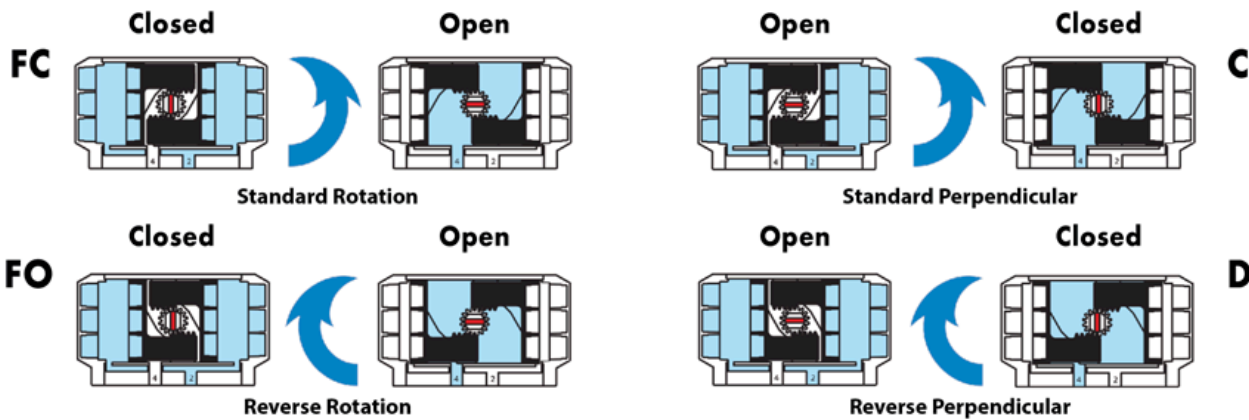


Illustration of Operation: Spring Return

Below show the operation of a Spring Return actuator when air is applied to either port.

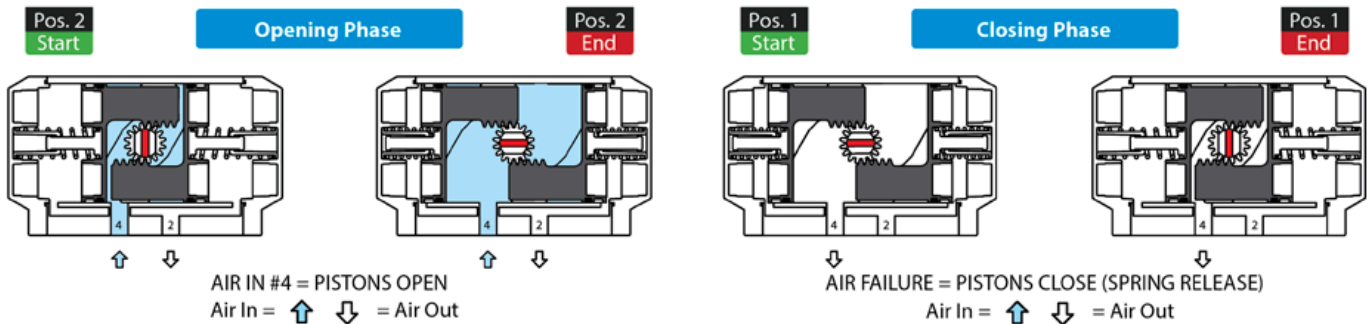
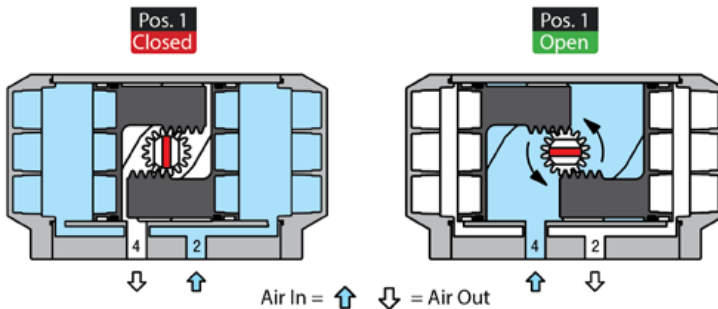


Illustration of Operation: Double Acting

Below show the operation of a Double Acting actuator when air is applied to either port.





Explanation of Sizing

Double Acting

Rack & Pinion actuator produces a constant torque output (Fig A) that depends on the internal diameter and the air supply pressure: increasing one or both factors, torque increases.

Valve's operation torque is not constant but presents a trend different depending on valve's type.

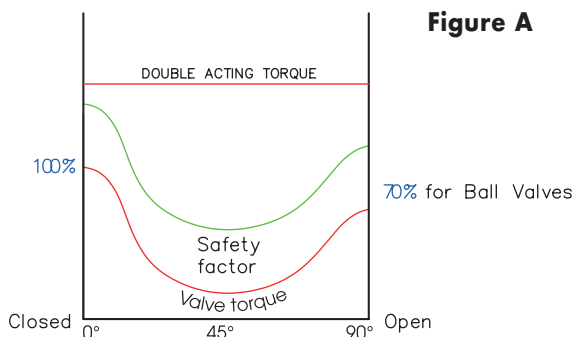


Figure A

Prior to sizing it's necessary to obtain the following information and data:

- Type of valve and rated torque
- Air supply pressure

The sizing is as follows:

1. Define the maximum torque of the valve to automate, increasing to 5% ÷ 50% the rated torque of the valve (according to the type of valve working conditions).
2. Once the necessary torque value is set, with the torque chart, and, in relation to the corresponding air pressure, find the torque value exact or exceeding.
3. Once the torque value is set, the left column of the torque summary table will show the required

Spring Return

The spring return actuator has a decreasing torque output throughout the stroke (Fig B). During the opening phase, the torque decreases, because the springs are compressed, and, working against the piston's stroke, absorb energy.

In the closing phase instead, the springs release this energy.

So the torque is stated with 4 values:

- Opening Start/Pos. 2
- Opening End/Pos. 2
- Close Start/Pos. 1
- Close End/Pos. 1

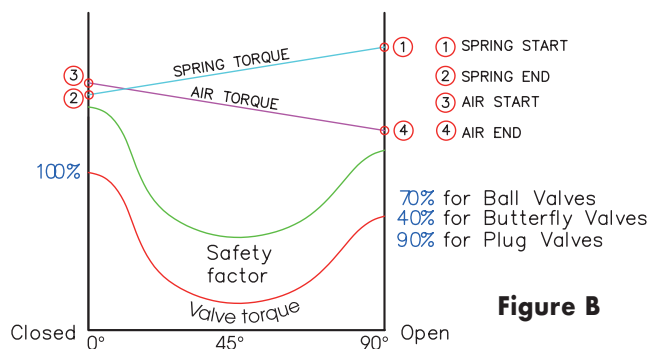


Figure B

To size and choose an actuator, proceed as follows:

1. To determine the needed torque, increase of 25% ÷ 50%, depending on the type of the valve and working conditions, the value of the rated valve torque.
2. Using the "Spring return 90°" table, locate the End/Pos. 1 column, with the torque value either exact or exceeding the needed torque.
3. According to the air pressure supply, locate the End/Pos. 2 column, with the torque value either exact or exceeding the needed torque.

Reference Tables

Mounting Reference

SIZE	Drive (mm)	Drive (in)	Standard ISO Pattern	Optional Pattern
UT11	11	0.433	F03/F04	-
UT14	14	0.551	F04/F05	3.25
	14	0.551	F05/F07	-
UT19	17	0.670	F04	3.25
	17	0.670	F05/F07	-
GP11	11	0.433	F04	-
GP14	14	0.551	F05/F07	-
GP19	17	0.670	F05/F07	-

Weights & Air Consumption

SIZE	Double Acting		Spring Return	
	Weight (lbs)	Air Consumption (cu-in)	Weight (lbs)	Air Consumption (cu-in)
UT11	1.26	13.5	1.44	8.0
UT14	2.62	22.0	3.06	10.8
UT19	4.34	40.6	5.16	17.5
GP11	1.15	13.5	1.34	8.0
GP14	2.25	22.0	2.69	10.8
GP19	3.55	40.6	4.37	17.5

Torque Data

Torques, Sizing & Spring Configuration

Torques: Double Acting & Spring Return

Double Acting Torques

SIZE		40 psi	60 psi	80 psi	100 psi	120 psi
UT11	GP11	62	92	123	153	185
UT14	GP14	134	201	268	336	403
UT19	GP19	244	366	490	610	732

Spring Return Torques

SIZE		SPRING CONFIG	# OF SPRINGS	SPRING TORQUES (IN-LBS)		40 psi		60 psi		80 psi		100 psi		120 psi	
				START	END	START	END	START	END	START	END	START	END	START	END
UT11	GP11	1+1	2	33	22	39.6	28.9	70	60	100	90	131	121	163	152
		2+2	4	65	44	--	--	48	27	78	57	109	88	141	119
		3+3	6	99	66	--	--	--	--	56	24	87	55	118	86
UT14	GP14	2+2	4	74	53	81.1	59.9	148	127	213	194	283	261	350	328
		3+3	6	112	81	53.7	22.7	121	90	188	157	255	224	322	291
		4+4	8	150	107	--	--	94	52	161	119	229	186	296	253
		5+5	10	187	134	--	--	68	15	135	82	202	149	269	216
UT19	GP19	2+2	4	122	92	152	122	274	244	398	368	518	488	640	610
		3+3	6	184	138	106	60	228	182	352	306	472	426	594	548
		4+4	8	245	184	--	--	182	121	306	245	426	365	548	487
		5+5	10	306	230	--	--	136	60	260	184	380	304	502	426

Spring Assembly Position



S1



S2



S3



S4



S5

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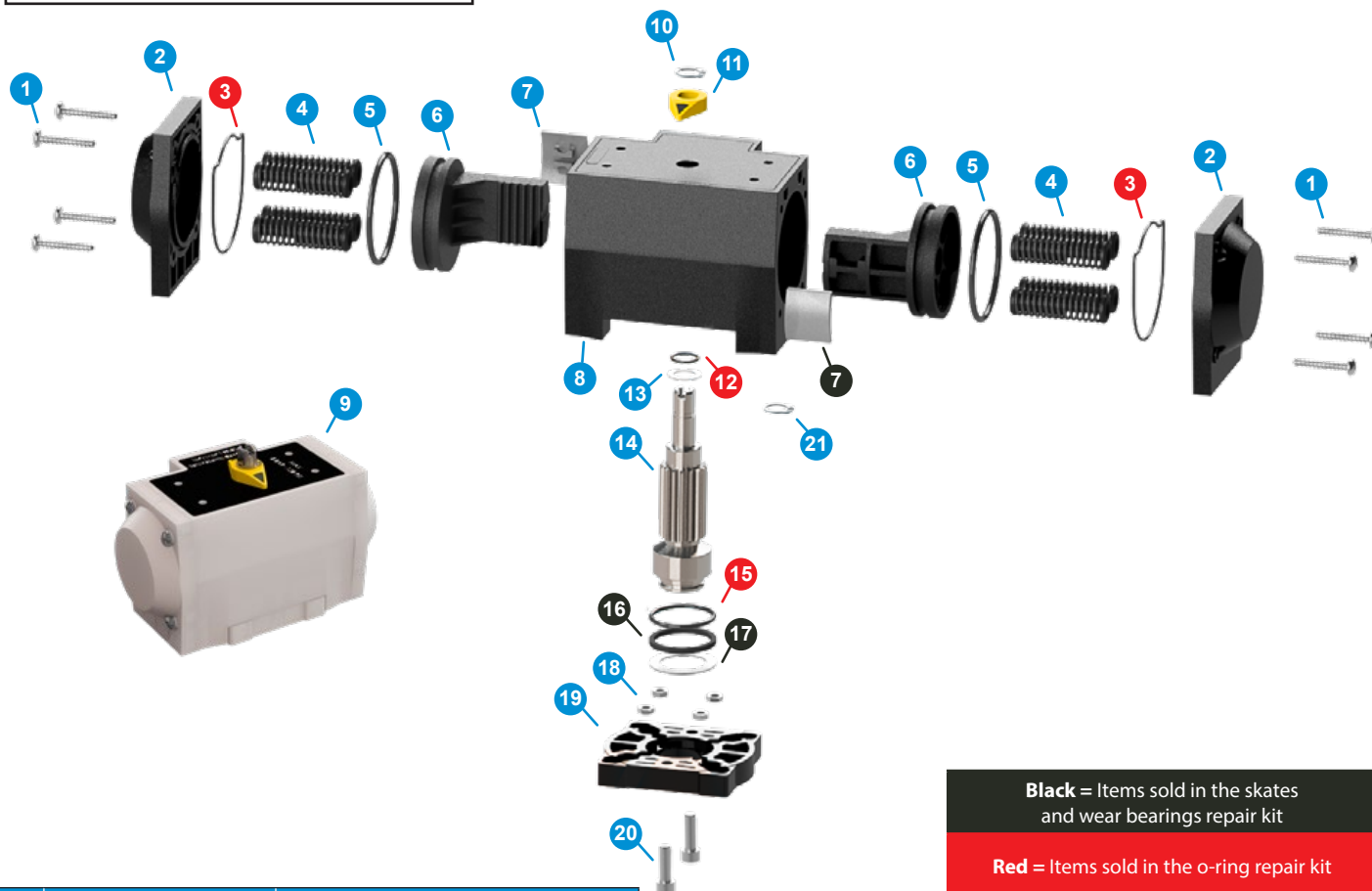
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Technical Data

Exploded View, Materials of Construction, & Dimensional Data

UT11/GP11 - UT19/GP19

Exploded View & Bill of Materials



#	DESCRIPTION	MATERIALS
1	End Cap Bolts	AISI 304 Stainless Steel
2	End Caps	Technopolymer
4	Springs	Epoxy Coated Carbon Steel
6	Left Piston	Anodized Aluminum
8	Actuator Body	Technopolymer
9	Actuator Body	Glass-Reinforced Polypropylene
10	Indicator Snap Ring	AISI 304 Stainless Steel
11	Open/Closed Indicator	Technopolymer
13	Upper Pinion Washer	Technopolymer
14	Pinion	Nickel Plated Carbon Steel (UT Standard), AISI 316 Stainless Steel (UT Optional, GP Standard)
18	Flange Nuts	ANSI 304 Stainless Steel
19	Mounting Flange	Technopolymer
21	Pinion Snap Ring (Sizes 11 & 19 Only)	AISI 304 Stainless Steel

#	DESCRIPTION	MATERIALS
7	Piston Skate	Zinc Alloy
16	Lower Pinion Bearing	Technopolymer
17	Lower Pinion Bearing	Stainless Steel

#	DESCRIPTION	MATERIALS
3	End Cap O-Ring	BUNA-N
5	Piston O-Ring	BUNA-N
12	Upper Pinion O-Ring	BUNA-N
15	Lower Pinion O-Ring	BUNA-N

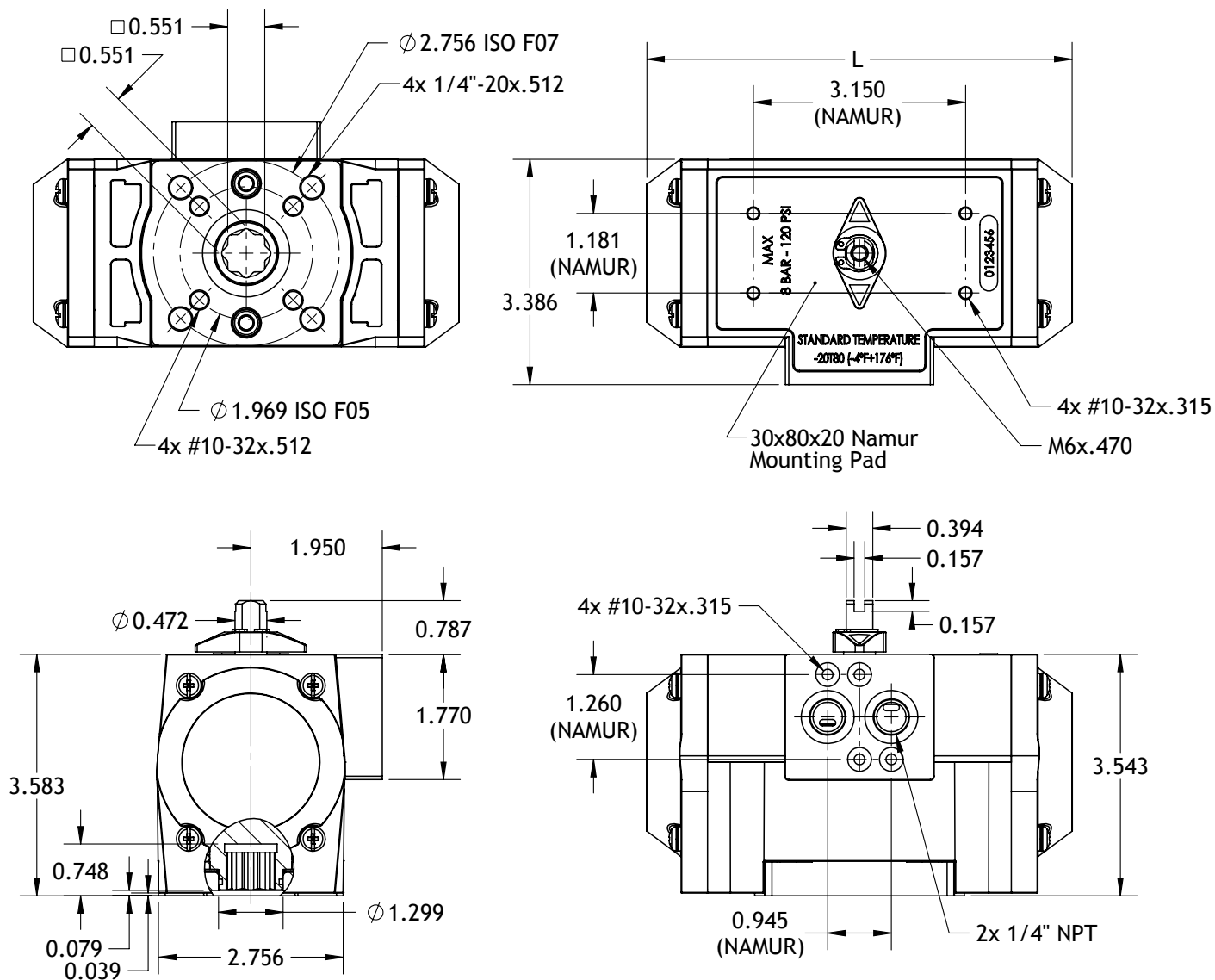
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Technical Data

Exploded View, Materials of Construction, & Dimensional Data

UT14 & GP14



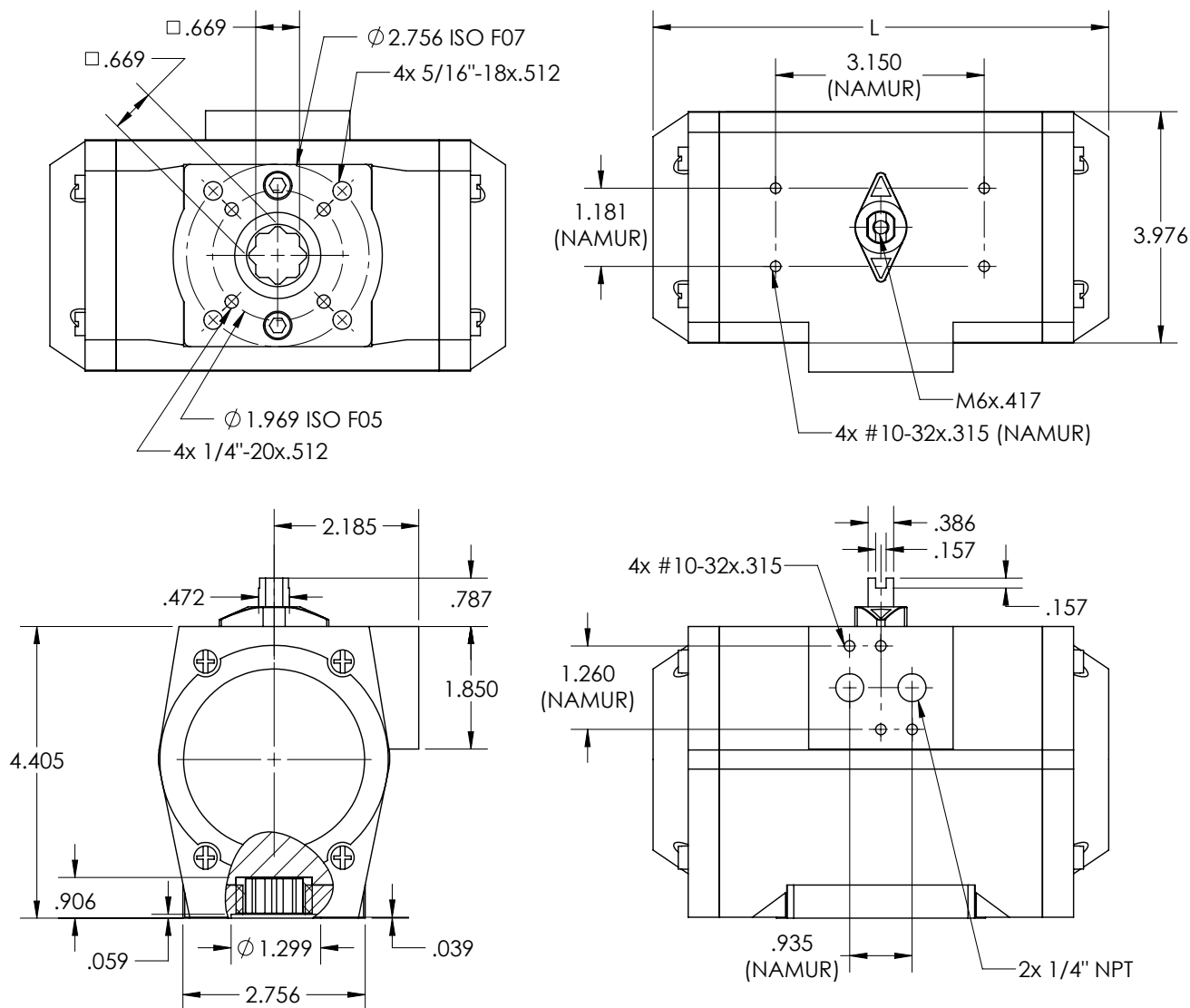
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UT19 & GP19



Certifications & Approvals



ISO 5211 Mounting

This standard defines a standardized interface system between industrial valves and the part turn actuators used operate them. It details the dimensional requirements for both the mounting flanges on both devices as well as the driving and driven components. This standardization simplifies the design of or eliminates the need for interface components between part turn valves and actuators.



Atex Global Approval:

In addition to being designed and produced according to sound engineering practice, the MT series actuators have also been certified to the relevant Atex standards for safety (Machinery Directive, annex VIII B). Additionally it carries a CE mark and is in compliance with Annex VII B of the Machinery Directive and regulation 80079-36.



CE Marking

This is a mandatory conformity marking for certain products sold within the European Economic Area (EEA) since 1985. The CE marking is also found on products sold outside the EEA that are manufactured in, or designed to be sold in, the EEA. This makes the CE marking recognizable worldwide even to people who are not familiar with the European Economic Area. It is in that sense similar to the FCC Declaration of Conformity used on certain electronic devices sold in the United States. The CE marking is the manufacturer's declaration that the product meets the requirements of the applicable EC directives.



NAMUR

All MT series actuators (with the exception of the MT04 size) come with NAMUR accessory interfaces according to VDI/VDE 3845. The air interface is in the 1/4" size.



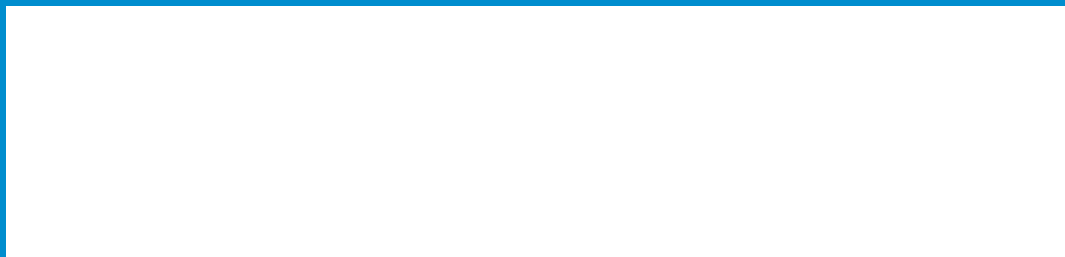
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