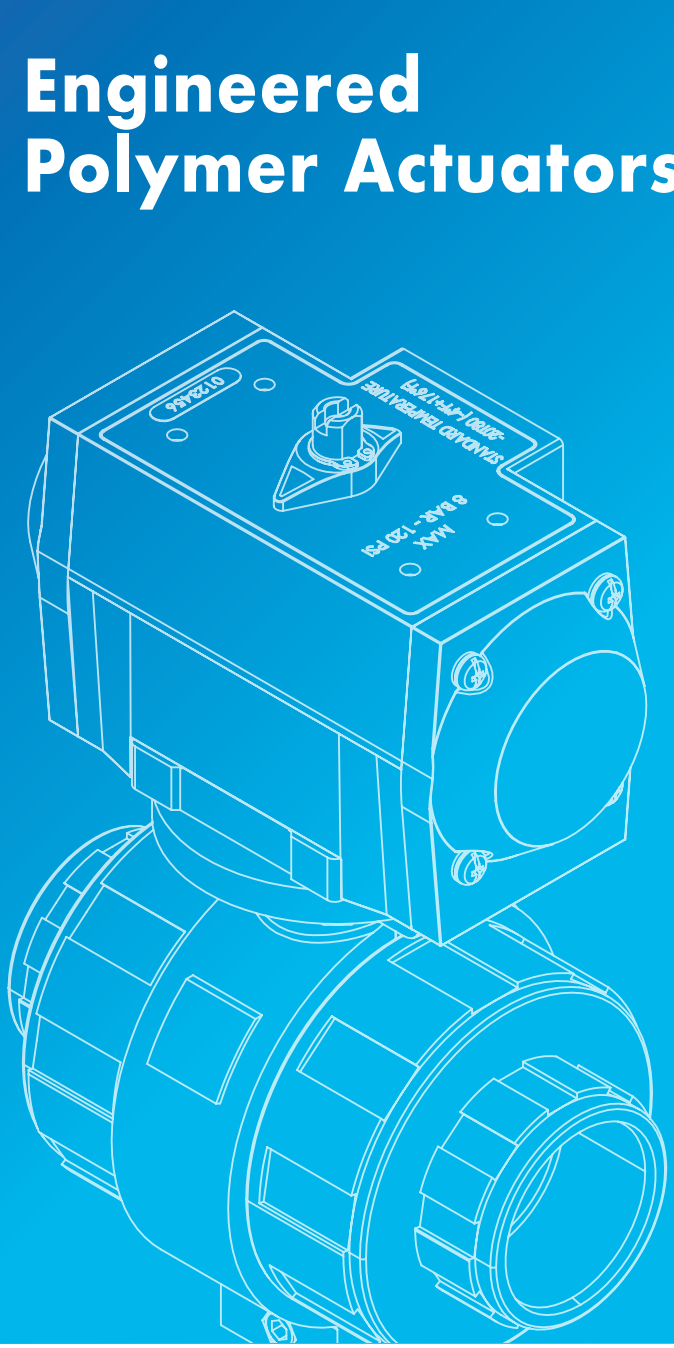
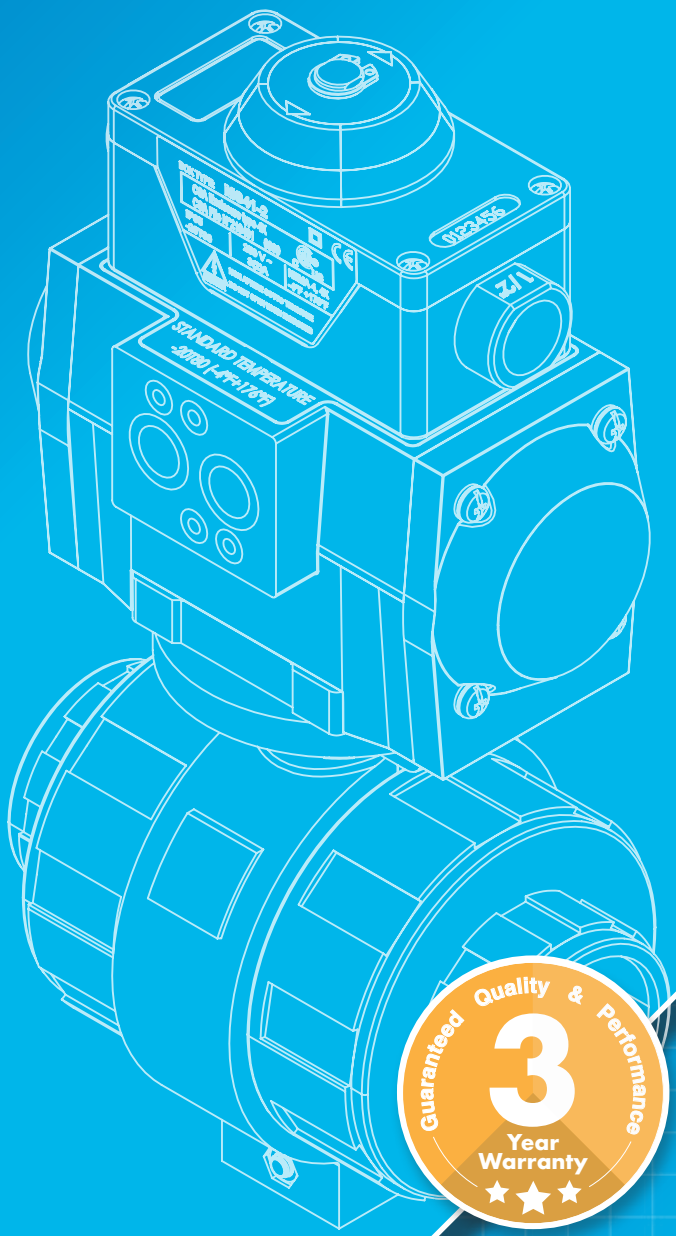
Max-Air

A Brand of Max-Air Technology.

Engineered Polymer Actuators





Guaranteed Quality & Performance 3 Year Warranty

UT Tech Series Technical Brochure

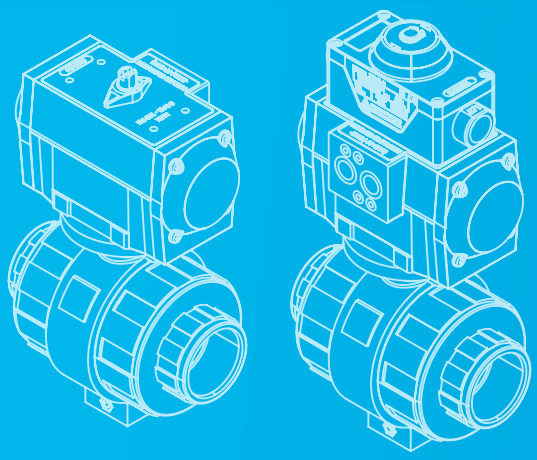
Max-Air Technology Inc. | Rotary Actuators & Valve Automation Solutions

Max-Air Technology, Inc. • 114 Resource Drive • Wentzville, MO 63385 • United States of America
Tel 636.272.4934 • Toll Free 888.842.9998 • Fax 636.272.4937 • maxairtech.com • info@maxairtech.com

Max-Air Technology

UT Tech Series Actuators

Environments w/ hydrocarbons, organic solvents, and fuels.



The Max-Air line of technopolymer 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).

UT Tech Series Part # Builder

A - SERIES	B - SIZE	-	C - CONFIGURATION	-	D - MOUNTING	-	E - OUTPUT DRIVE	-	F - ROTATION
UT	14	-	54	-	FO5	-	CH14	-	-

Example Part # UT14.S4.F05.CH14

EXAMPLE DESCRIPTION: UT14 TECHNOPOLYMER ACTUATOR, 90 DEGREES STANDARD ROTATION, 4+4 SPRING RETURN, F05 MOUNTING BOLT CIRCLE, 14MM DSQ FEMALE DRIVE, STANDARD BUNA SEALS

A - SERIES	B - SIZE	C - CONFIGURATION	D - MOUNTING	E - OUTPUT DRIVE	F - ROTATION
UT	*11* *14* *19*	*DA = Double-Acting* *S2 = 2+2 Springs* *S3 = 3+3 Springs* *S4 = 4+4 Springs* *S5 = 5+5 Springs*	*F03* *F04* *F04/3.25* *F05* *F07*	*CH11 = 11mm DSQ* *CH14 = 14mm DSQ* *CH17 = 17mm DSQ*	*(Omit) = Standard* *FO = Reverse* *C = Standard Perpendicular* *D = Reverse Perpendicular*

Pinion Options

Double-Square
(ISO Standard)

Seals

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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3-YEAR LIMITED WARRANTY

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

Max-Air Technology provides the following warranty regarding its products. 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 shall be delivered 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 applicable warranty period is dependent on the clearly identified brand labeling.

The warranty period for Max-Air, Max-Electric, Delta T, and Sesto Valves brand labeled products is for thirty-six (36) months from the delivery date to the Purchaser.

Any claims regarding this warranty must be in writing and received by Max-Air Technology before the last effective date of the warranty period, failing which this warranty shall expire. 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 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's option. Warranty repair, replacement or re-performance by Seller shall not extend or renew the applicable warranty period. 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, indirect 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 – Wentzville (Missouri) or Max-Air Technology – Agrate Brianza (MB) ITALY without the express written authorization of Max-Air Technology, it is expressly not covered by this warranty. The warranties and remedies are conditioned upon (a) proper storage, installation, use, operation, and maintenance of products, (b) Purchaser keeping accurate and complete records of operation and maintenance during the warranty period and providing Max-Air Technology access to those records, and (c) modification or repair of products only as authorized by Max-Air Technology in writing. Failure to meet any such conditions renders the warranty null and void. Max-Air Technology is not responsible for normal wear and tear. 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.

Engineered Polymers

Since their conception the Max-Air lines of thermoplastic actuators have been installed worldwide in the most arduous environments.

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.

Torque Range	Up to 500 in-lbs (DA) & 230 in-lbs (SR)
Materials	Technopolymer
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

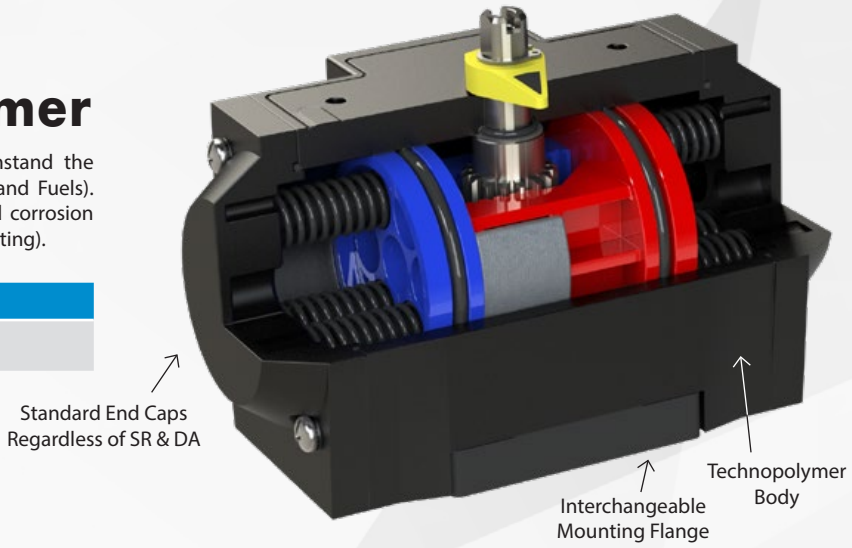
Start from the top of the chart and work down to select the correct Rack & Pinion series.

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			
Environment	Corrosive		Standard		Corrosive		Standard	
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 SS Series UT Tech Series	MT Series w/ Special Coating & Temp Seals SS Series w/ Temp Seals	MT Series UT Tech Series	MT Series w/ Temp Seals	MT Series w/ Special Coating SS Series	MT Series w/ Special Coating & Temp Seals SS Series w/ Temp Seals	MT Series	MT Series w/ Temp Seals

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)

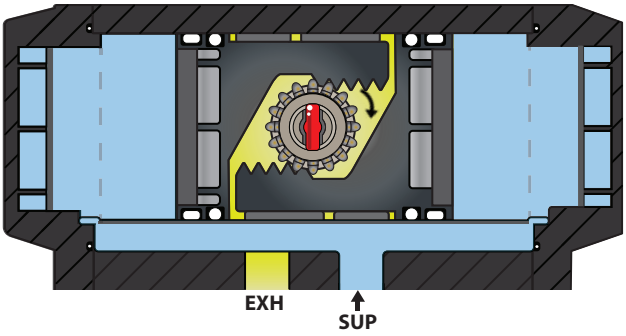


Mounting Variations

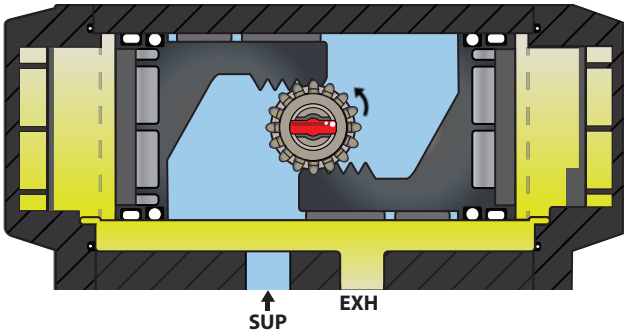
Supply Air

Exhaust to Atmosphere

Standard Rotation

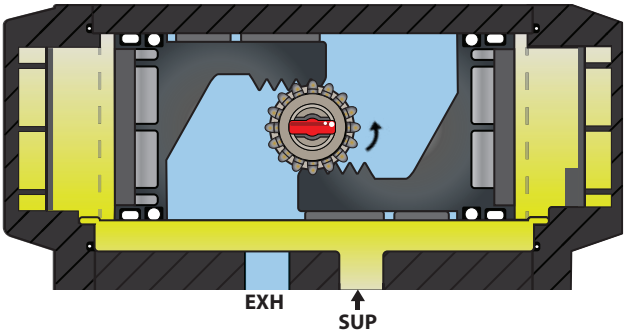


(Fail CW Perpendicular)
Closed Position
De-Energized

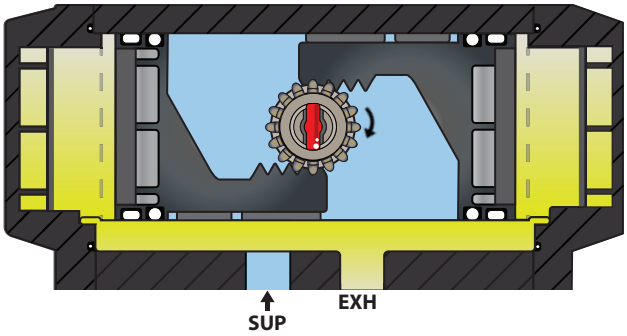


(Fail CW Perpendicular)
Open Position
Energized

Reverse Rotation



(Fail CCW Parallel)
Open Position
De-Energized

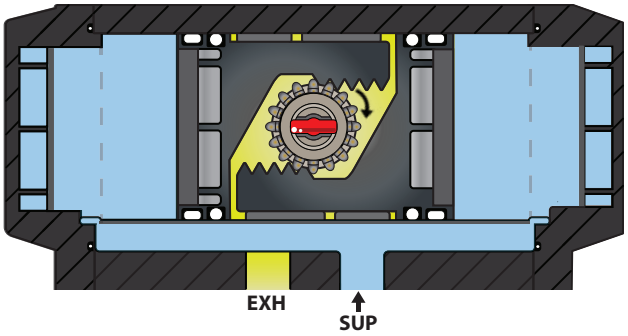


(Fail CCW Parallel)
Closed Position
Energized

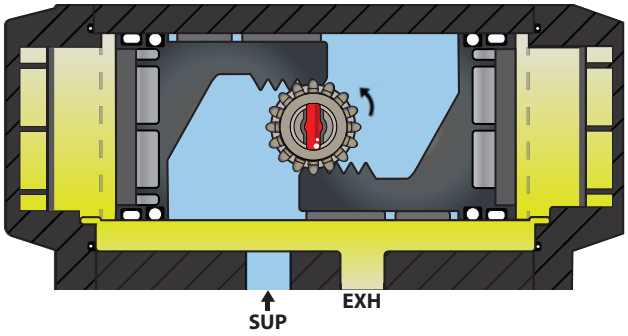
Supply Air

Exhaust to Atmosphere

Standard Parallel

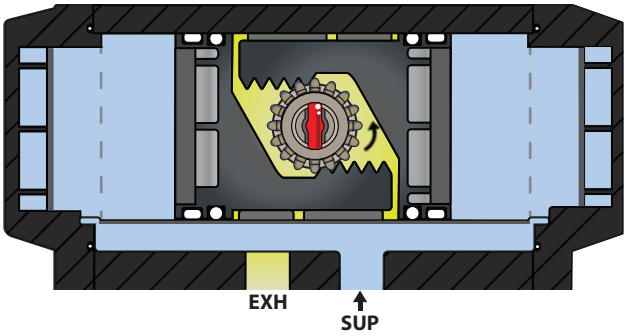


**(Fail CW Parallel)
Closed Position
De-Energized**

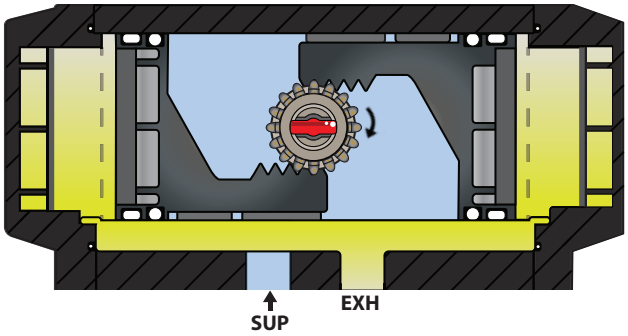


**(Fail CW Parallel)
Open Position
Energized**

Reverse Perpendicular



**(Fail CCW Perpendicular)
Open Position
De-Energized**



**(Fail CCW Perpendicular)
Closed Position
Energized**

Mounting, Operation, & Sizing, References

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

Illustration of Operation: Spring Return

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

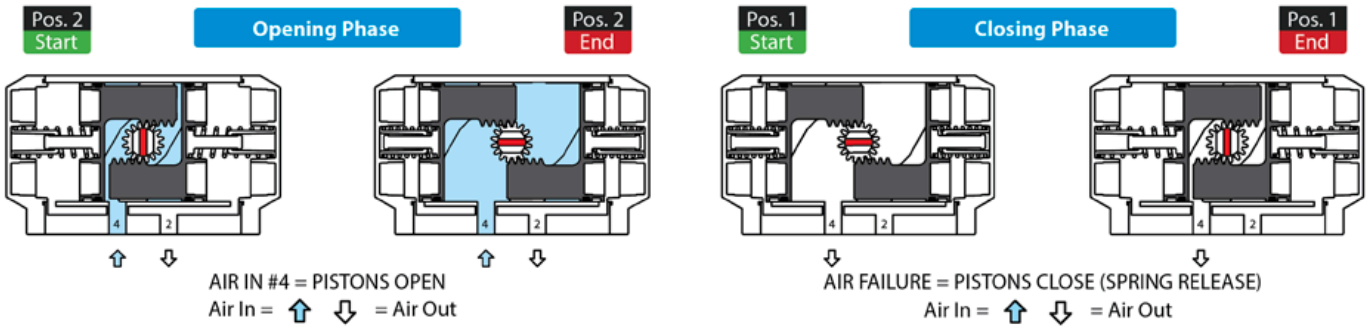
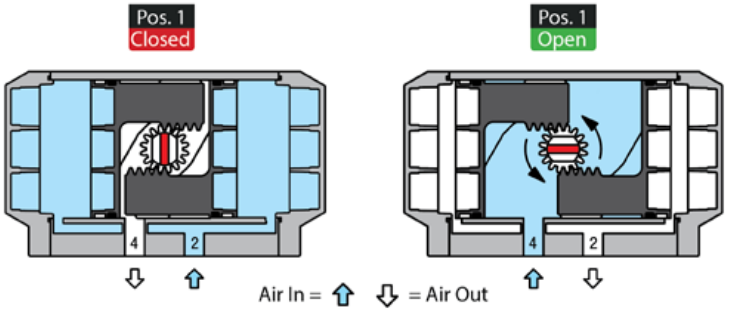


Illustration of Operation: Double Acting

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



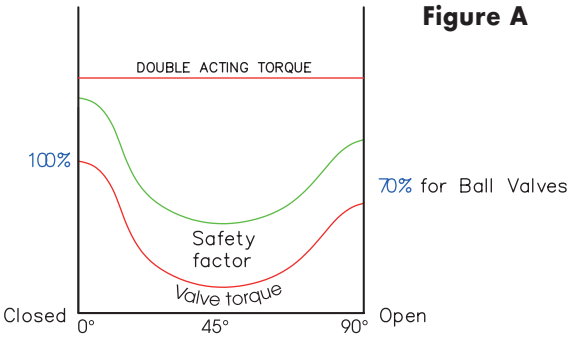
Explanation of Sizing

Double Acting

Rack & Pinion actuator produces a costant 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

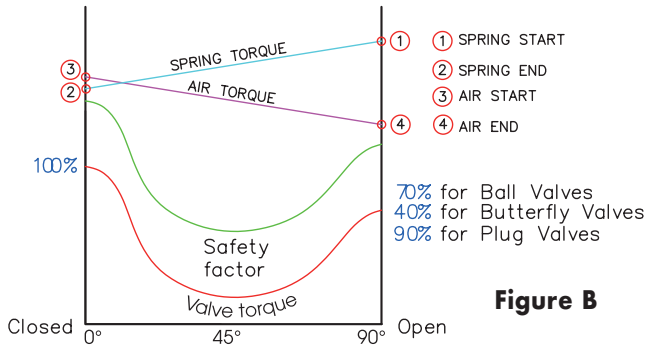


Figure B

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	-

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

Torques: Double Acting & Spring Return

Double Acting Torques

SIZE	40 psi	60 psi	80 psi	100 psi	120 psi
UT11	62	92	123	153	185
UT14	134	201	268	336	403
UT19	177	265	353	442	531

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	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	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	2+2	4	93	64	112.9	83.7	202	172	289	260	378	349	467	438
	3+3	6	139	96	81.0	37.7	170	126	257	214	346	303	435	392
	4+4	8	185	127	--	--	138	80	225	168	315	257	403	346
	5+5	10	231	160	--	--	105	34	193	122	282	211	371	300

Spring Assembly Position

S1 S2 S3 S4 S5

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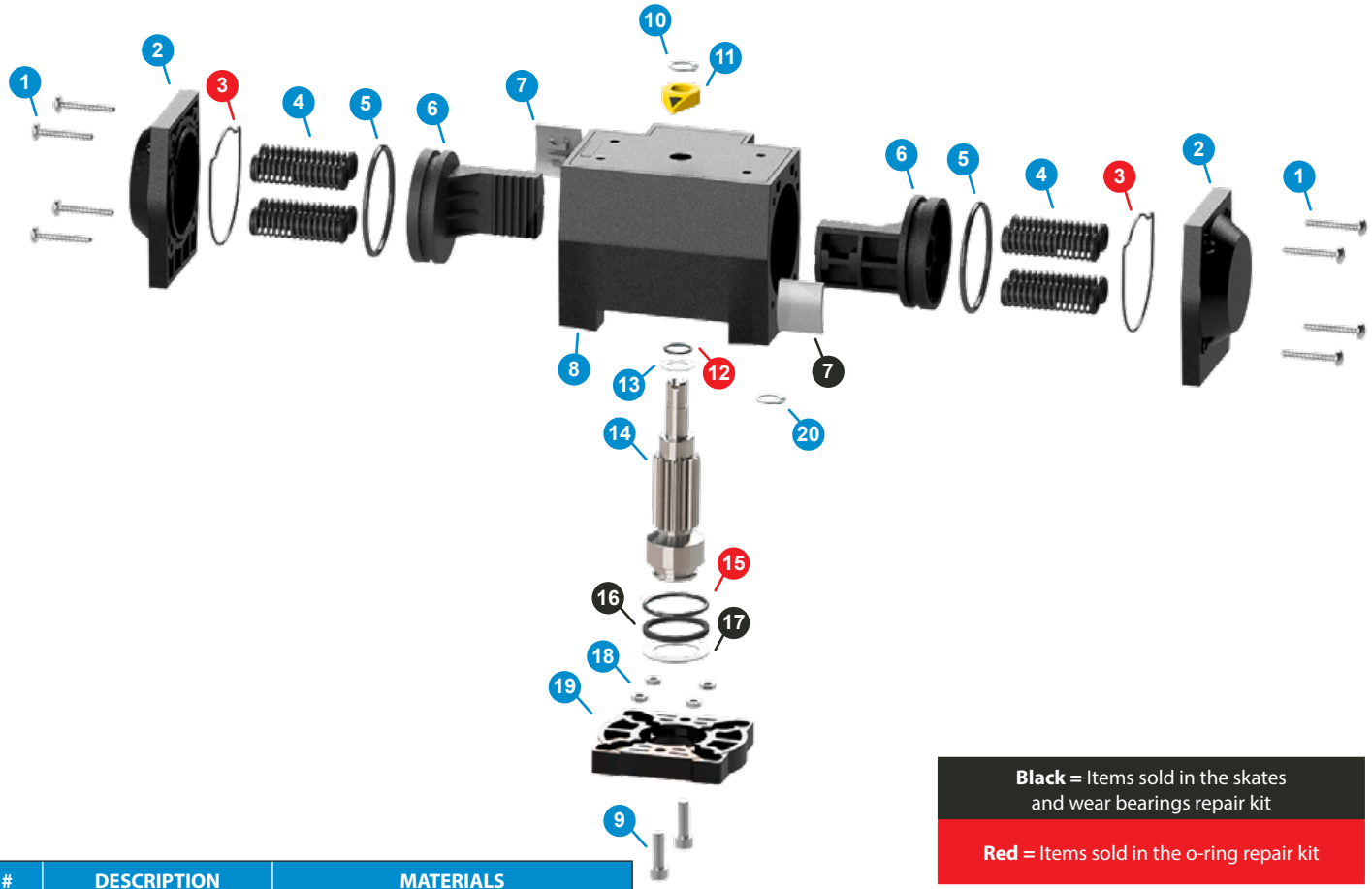
UT11 - UT19

Exploded View & Bill of Materials



Black = Items sold in the skates and wear bearings repair kit

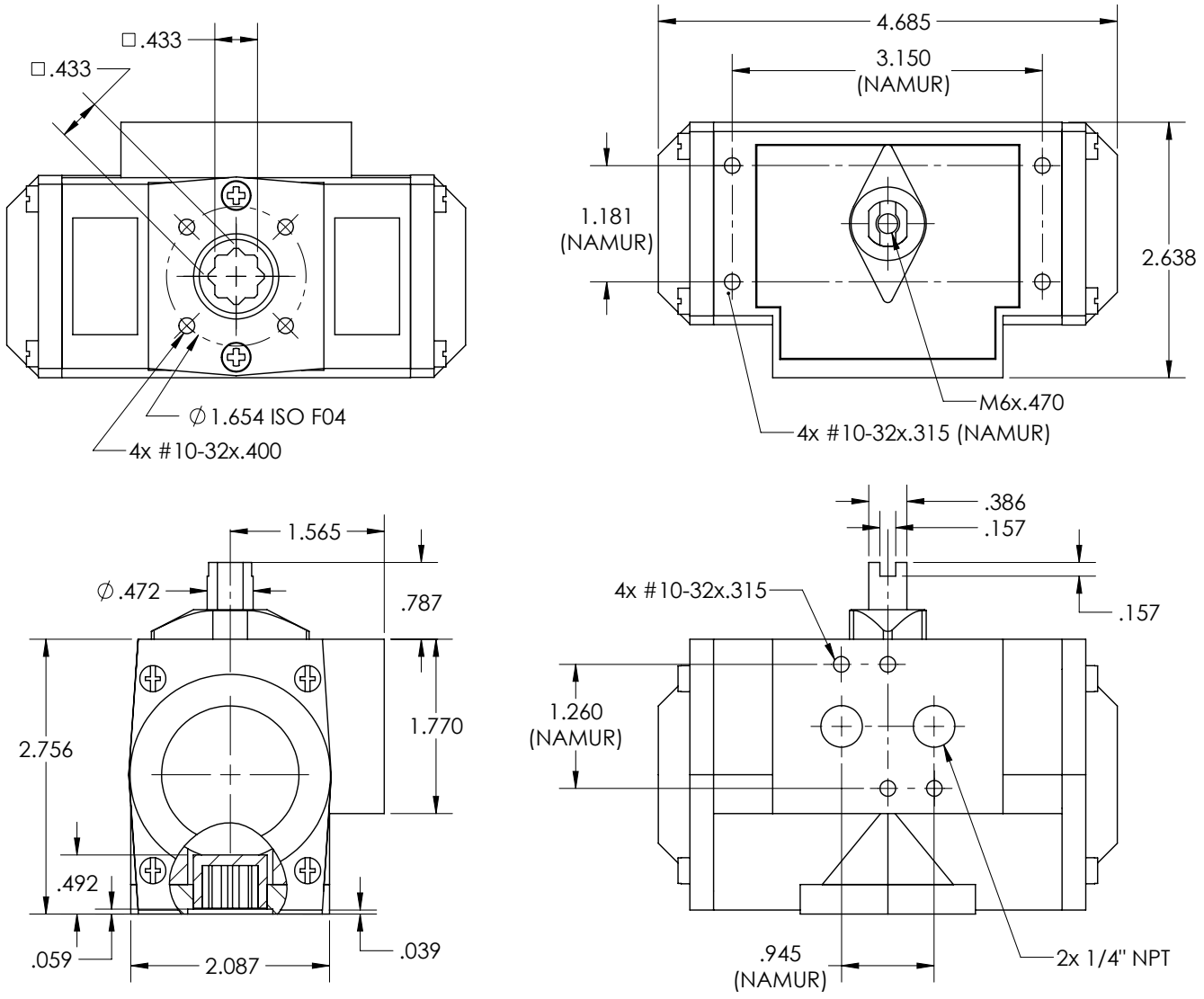
Red = Items sold in the o-ring repair kit

#	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	Mounting Flange Screws	AISI 304 Stainless Steel
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
20	Pinion Snap Ring (Sizes 11 & 19 Only)	AISI 304 Stainless Steel

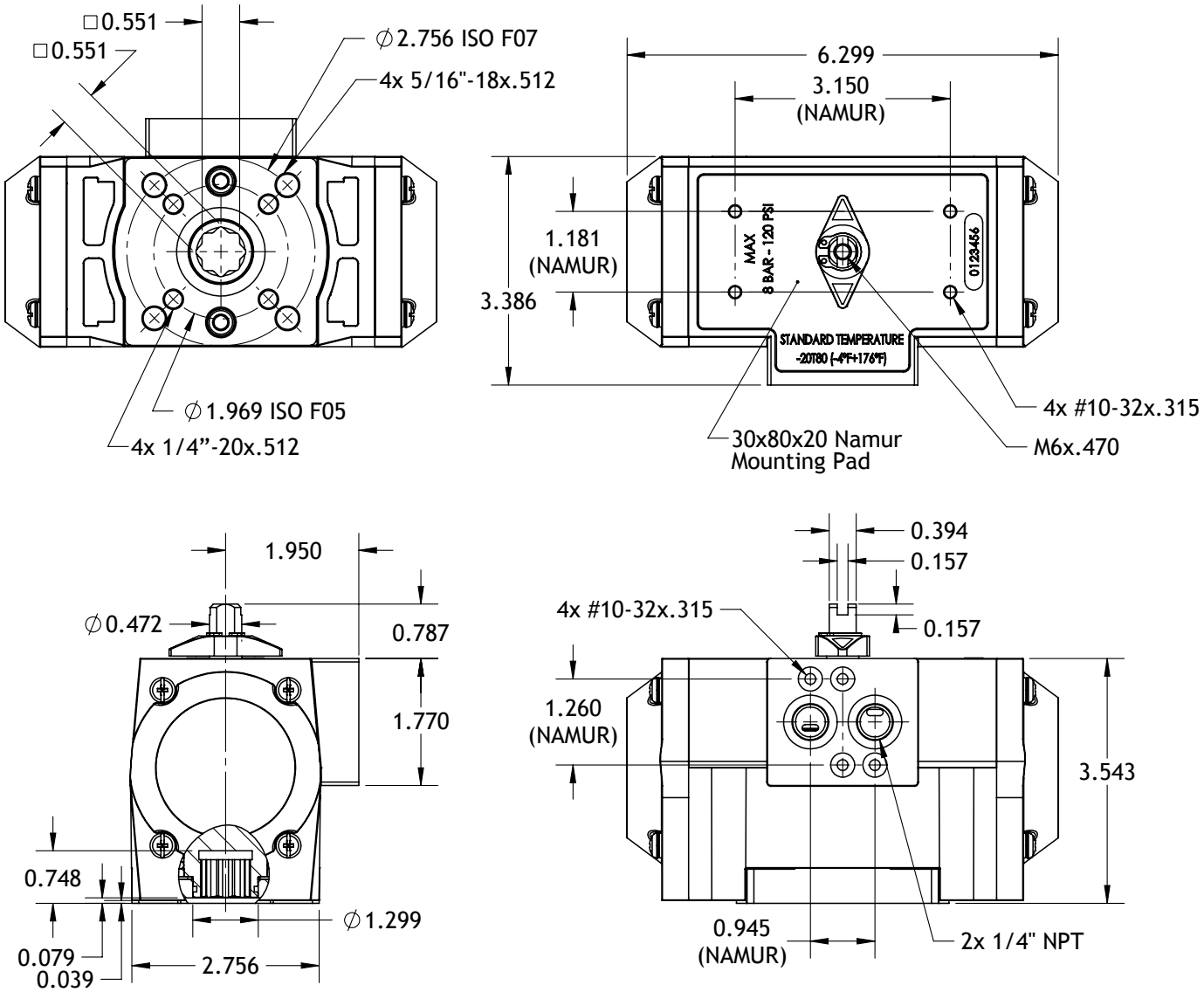
#	DESCRIPTION	MATERIALS
7	Piston Skate	Zinc Alloy
16	Lower Pinion Bearing	Technopolymer
17	Lower Pinion Bearing	Stainless Steel

#	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

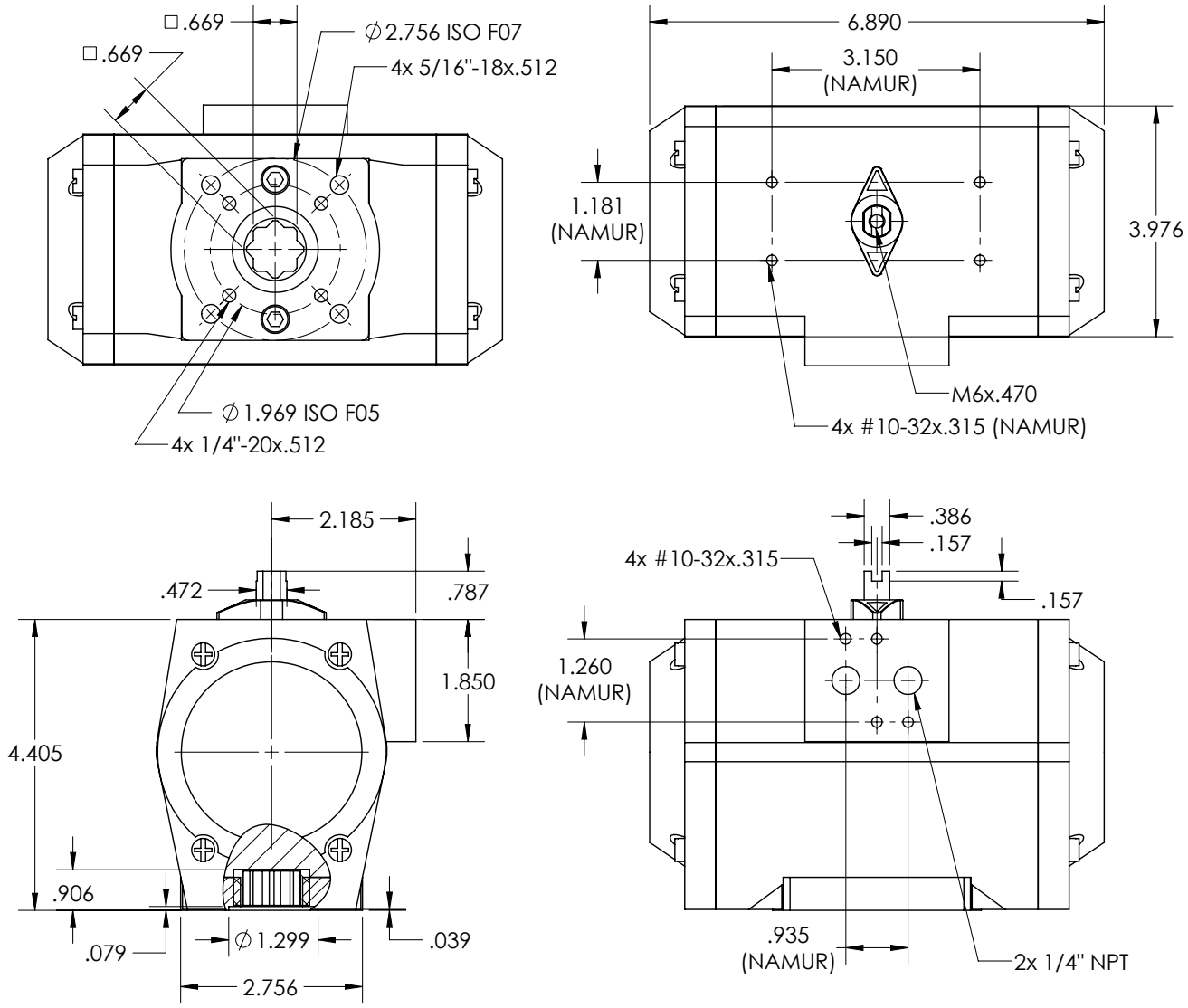
UT11


□.433
□.433
∅1.654 ISO F04
4x #10-32x.400
4.685
3.150
(NAMUR)
1.181
(NAMUR)
2.638
M6x.470
4x #10-32x.315 (NAMUR)
1.565
∅.472
.787
1.770
2.756
.492
.059
2.087
.039
.386
.157
4x #10-32x.315
.157
1.260
(NAMUR)
.945
(NAMUR)
2x 1/4" NPT

UT14


□0.551
□0.551
∅2.756 ISO F07
4x 5/16"-18x.512
∅1.969 ISO F05
4x 1/4"-20x.512
6.299
3.150
(NAMUR)
1.181
(NAMUR)
3.386
MAX
8 BAR - 120 PSI
STANDARD TEMPERATURE
-20T80 (-4°F+176°F)
4x #10-32x.315
30x80x20 Namur
Mounting Pad
M6x.470
1.950
∅0.472
0.787
1.770
0.748
0.079
0.039
∅1.299
2.756
0.394
0.157
4x #10-32x.315
0.157
1.260
(NAMUR)
3.543
0.945
(NAMUR)
2x 1/4" NPT

UT19


□.669
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∅2.756 ISO F07
4x 5/16"-18x.512
∅1.969 ISO F05
4x 1/4"-20x.512
6.890
3.150
(NAMUR)
1.181
(NAMUR)
3.976
M6x.470
4x #10-32x.315 (NAMUR)
2.185
.472
.787
1.850
4.405
.906
.079
∅1.299
.039
2.756
.386
.157
4x #10-32x.315
.157
1.260
(NAMUR)
.935
(NAMUR)
2x 1/4" NPT

Standards, Certifications & Approvals

ISO 5211, CE, Ex Atex, NAMUR

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.

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.

Atex Global Approval:

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

SIL3
Safety Integrity Level

SIL2 Approval

The UT Technopolymer Series have been independently evaluated by approval authorities which have confirmed that our actuators are SIL 3 capable in accordance with the requirements of IEC 61508 provided that they are installed in accordance with the relevant Safety Manual.

NAMUR

All UT Technopolymer Series actuators come with NAMUR accessory interfaces according to VDI/VDE 3845. The air interface is in the ¼" size.

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MAX-AIR TECHNOLOGY

The Best Way To Automate Your Process

Max-Air TECHNOLOGY

Your nearest Max-Air dealer can be found at:

maxairtech.com

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