

# RSX EXTREME FORCE HYDRAULIC CLASS ELECTRIC ACTUATORS



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**LINEAR SOLUTIONS MADE EASY**

# RSX Extreme Force, Hydraulic Class Electric Actuator






## WHAT IS THE RSX?

RSX actuators are an ideal choice for replacing hydraulic cylinders. These high force electric actuators are available for forces up to 50,000 lbf (222.4 kN). Designed for 100% duty cycle, rugged service and long life.

The RSX utilizes planetary roller screws for long lasting consistent performance. Additionally, the RSX uses Tolomatic's popular Your Motor Here program which allows RSX to easily mount many servo motor and gearboxes on the market.



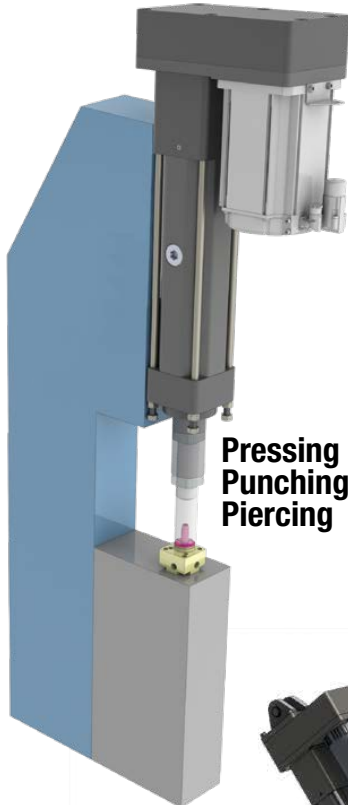
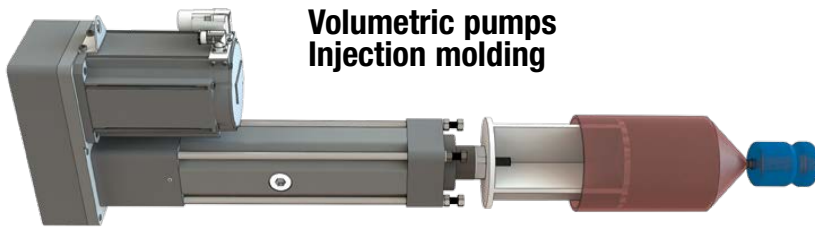
## TOLOMATIC'S ELECTRIC ROD-STYLE ACTUATORS

	ERD	RSA	RSX	GSA	IMA
					
	Rod-Style Actuator	Rod-Style Actuator	Rod-Style Actuator	Guided Rod-Style Actuator	Integrated Servo Actuator
<b>Force up to:</b>	35 kN <i>(7,868 lbf)</i>	58 kN <i>(13,039 lbf)</i>	222.4 kN <i>(50,000 lbf)</i>	4.23 kN <i>(950 lbf)</i>	30.6 kN <i>(6,875 lbf)</i>
<b>Speed up to:</b>	1473 mm/sec <i>(58 in/sec)</i>	3,124 mm/sec <i>(123 in/sec)</i>	760 mm/sec <i>(29.9 in/sec)</i>	3,124 mm/sec <i>(123 in/sec)</i>	1,334 mm/sec <i>(52.5 in/sec)</i>
<b>Stroke Length up to:</b>	1000 mm <i>(39.4 in)</i>	1,524 mm <i>(60 in)</i>	890 mm <i>(35 in)</i>	914 mm <i>(36 in)</i>	457 mm <i>(18 in)</i>
<b>Screw/Nut Type</b>	Solid, Ball & Roller	Solid, Ball & Roller	Roller	Solid & Ball	Ball & Roller
<i>For complete information see <a href="http://www.tolomatic.com">www.tolomatic.com</a> or literature number:</i>					
<b>Literature Number:</b>	2190-4000	3600-4166	2171-4001	3600-4166	2700-4000

*(Not all models deliver maximum values listed, i.e.: Maximum thrust may not be available with maximum speed)*

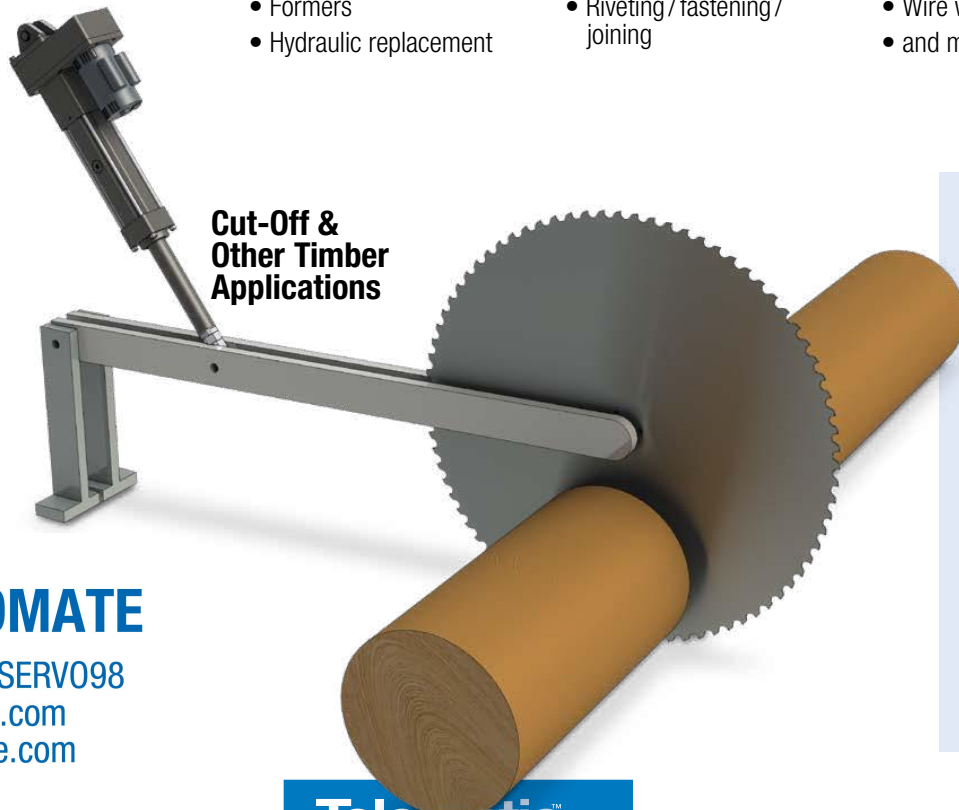
# RSX Extreme Force, Hydraulic Class Electric Actuator

## Applications



### Other Applications:

- Active Security Barrier
- Assembly machinery
- Automatic tool changers
- Automotive
- Clamping
- Converting
- Cycle testing
- Fillers
- Formers
- Hydraulic replacement
- Machine tools
- Open / close doors
- Parts clamping
- Piercing
- Precision grinders
- Product test simulations
- Pressing
- Punching
- Riveting / fastening / joining
- Sawmill equipment
- Stamping
- Tension control
- Test stands
- Tube bending
- Wave generation
- Web guidance
- Welding
- Wire winding
- and many more



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# RSX ELECTRIC ROD-STYLE ACTUATOR

## ENDURANCE TECHNOLOGY<sup>SM</sup>

Endurance Technology features are designed for maximum durability to provide extended service life.

The RSX series high force electric actuators with planetary roller screws are designed for rugged service, long life and are an ideal choice for replacing hydraulic cylinders.

### SUPERIOR CONSTRUCTION

- Steel parts are black or clear zinc plated for corrosion resistance
- Aluminum parts are Type III hardcoat black anodized for high surface hardness

### IP65 STANDARD

- Protection against dust and water spray (static)

### IP67 OPTION

- Resist water ingress 1m deep for up to 30 min (static)

### YOUR MOTOR HERE YOU CAN CHOOSE:

- Specify the motor to be installed and actuator ships with proper mounting hardware
- Specify and ship your device to Tolomatic for factory installation

### HIGH POSITIONAL ACCURACY

#### SCREW ACCURACY

Roller Nut  $\pm 0.0102\text{mm}/300\text{mm}$   $\pm 0.0004\text{"/ft.}$

### FIELD REPLACEABLE CARTRIDGE

- Scraper and dual seal design prevent contaminants from entering the housing for extended life of the actuator
- One piece assembly designed for easy field replacement

### THRUST TUBE

- Steel thrust tube supports extremely high force capabilities
- Salt bath nitride treatment provides excellent corrosion resistance, surface hardness and is very resistant to adherence of potential contaminants

### LUBE ACCESS PORT

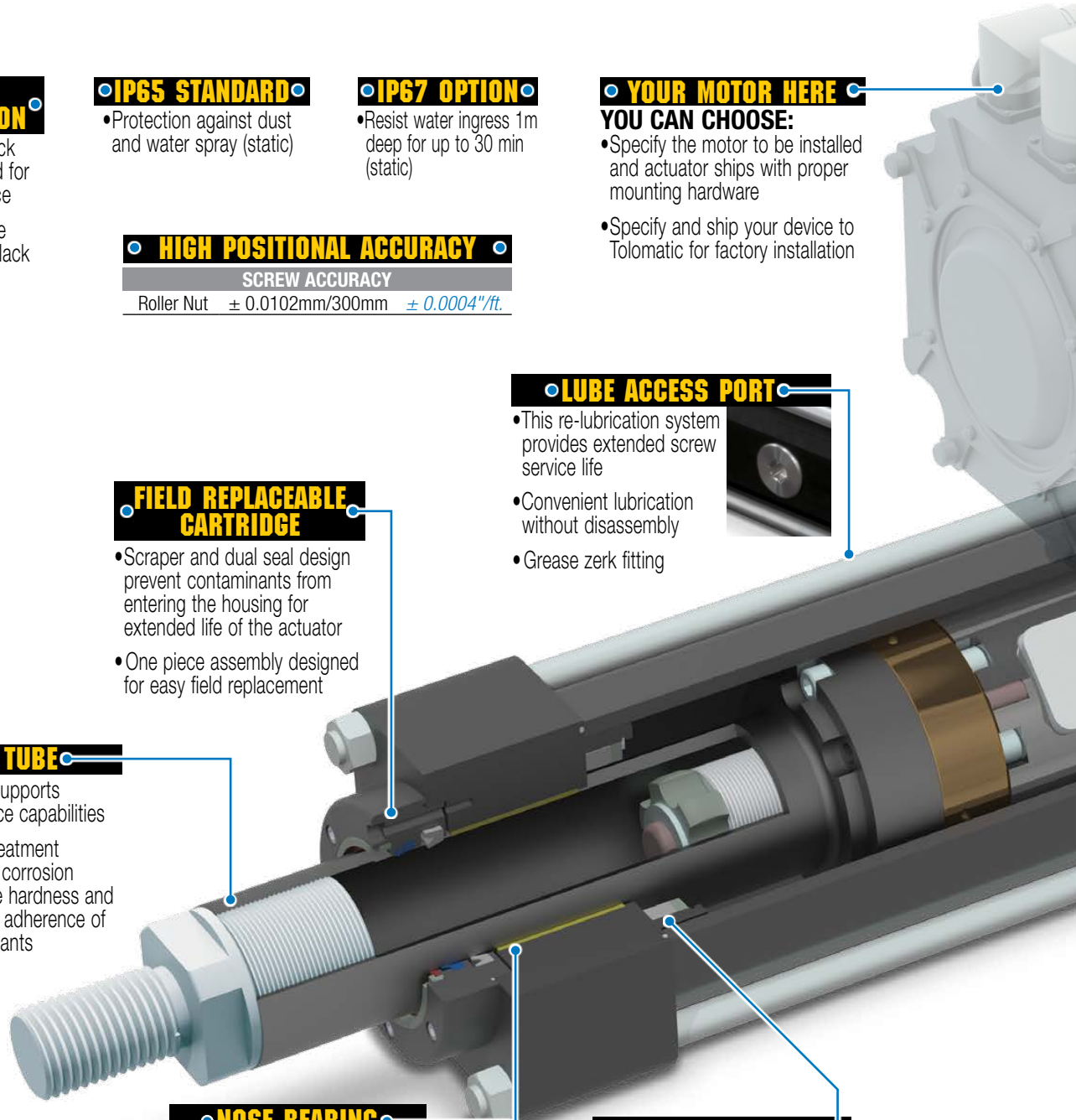
- This re-lubrication system provides extended screw service life
- Convenient lubrication without disassembly
- Grease zerk fitting

### NOSE BEARING

- Support the thrust tube and nut assembly through entire stroke length
- Unique nose bearing material allows for smooth operation

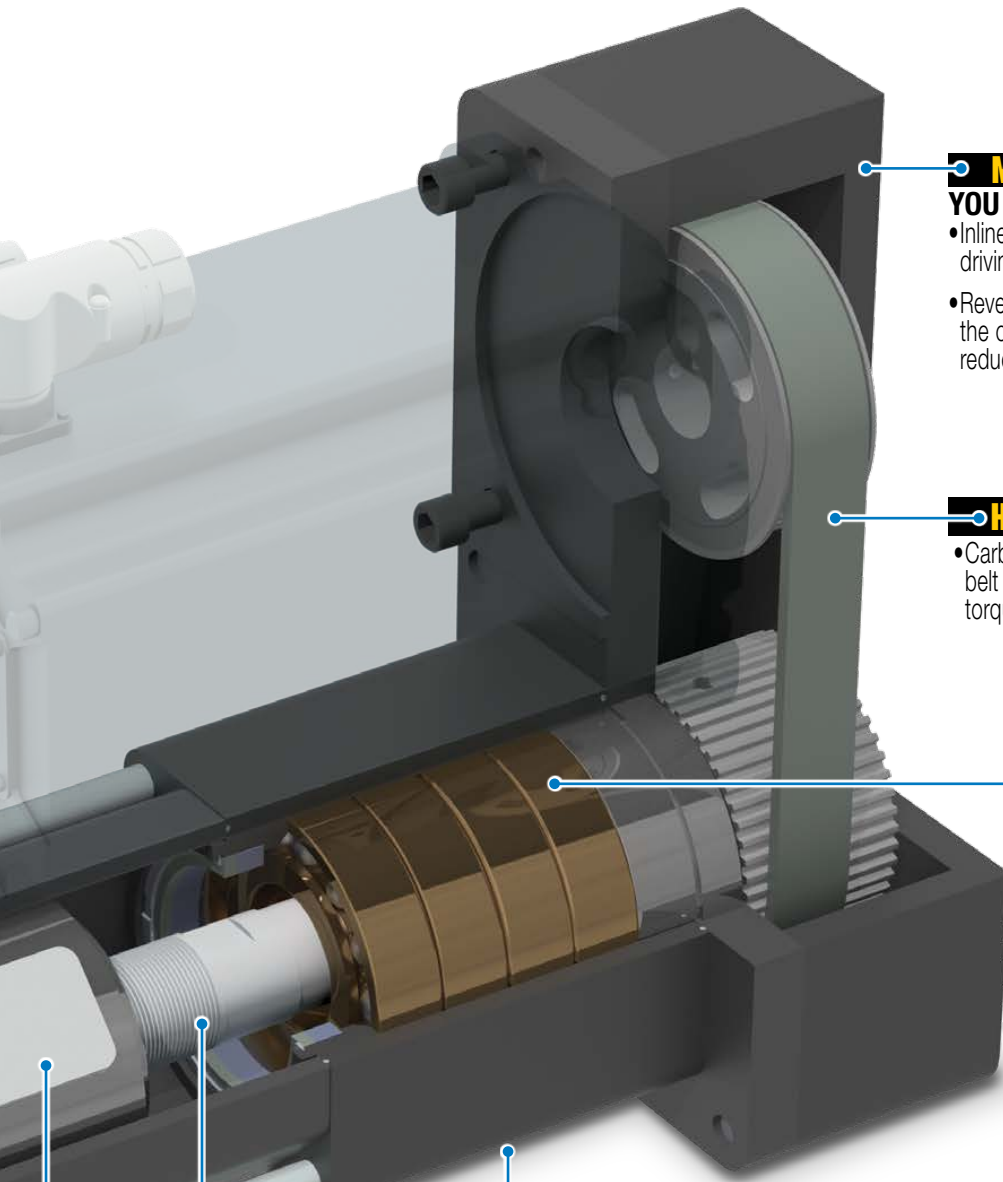
### HEAVY DUTY INTERNAL BUMPER

- Bumpers protect the screw and nut assembly from damage at both ends of stroke



# Tolomatic™... MAXIMUM DURABILITY

EXCELLENCE IN MOTION



## MOTOR ORIENTATION

### YOU CAN CHOOSE:

- Inline option directly couples the driving shaft
- Reverse-parallel option minimizes the overall length and offers a belt reduction drive with a 1:1 or 2:1 ratio

## HIGH POWER TIMING BELT

- Carbon fiber tensile reinforced synchronous belt to ensure smooth transmission of high torques in a compact design.

## HIGH FORCE ANGULAR CONTACT BEARINGS

- Four ball bearings to support high axial loads & forces for long life

## BREATHER/PURGE PORTS



- Standard feature on RSX actuators
- Located on the opposite side of the actuator
- Use as **Breather Port**: allows air flow

into the interior of the actuator. Prevents additional load on the motor caused by air buildup due to fast cycling of the RSX. Use as **Purge Port**: positive pressure with air lines and filters ensure contaminants do not enter the interior of the actuator.

## ROLLER SCREW TECHNOLOGY



- Precision ground planetary roller screws provide the highest force and life ratings available

## INTERNAL ANTI-ROTATE

- Composite bearings prevent rotation of the thrust tube

## MOUNTING OPTIONS

- Front Flange
- Extended Tie Rods
- Trunnion
- Mounting Plates
- Rear Clevis

## ROD END OPTIONS

- Rod Clevis
- Threaded Rod (standard)
- Extended Rod

## SENSOR OPTIONS

- Solid state NPN, PNP or reed
- Tie Rod Clip

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# RSX096P PRESS MODEL

**Tolomatic™**  
EXCELLENCE IN MOTION  
...**MAXIMUM DURABILITY**

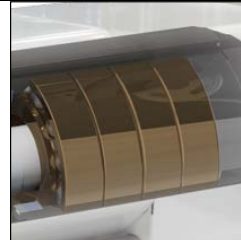
## ● ENDURANCE TECHNOLOGY <sup>SM</sup> ●

*Endurance Technology features are designed for maximum durability to provide extended service life.*

The RSX096P press actuator expands the extend force capability to 40,000 lbf (178 kN) making it well suited for applications such as pressing, riveting, clinching and many others. The RSX096P press model has all the features of the standard RSX on pages 4 & 5 plus oversized tie rods, a bearing system optimized for high force extend, and a high strength steel front flange.

## ● OPTIMIZED BEARING SYSTEM ●

- Angular contact bearing system is designed to handle high axial forces and loads common to press applications

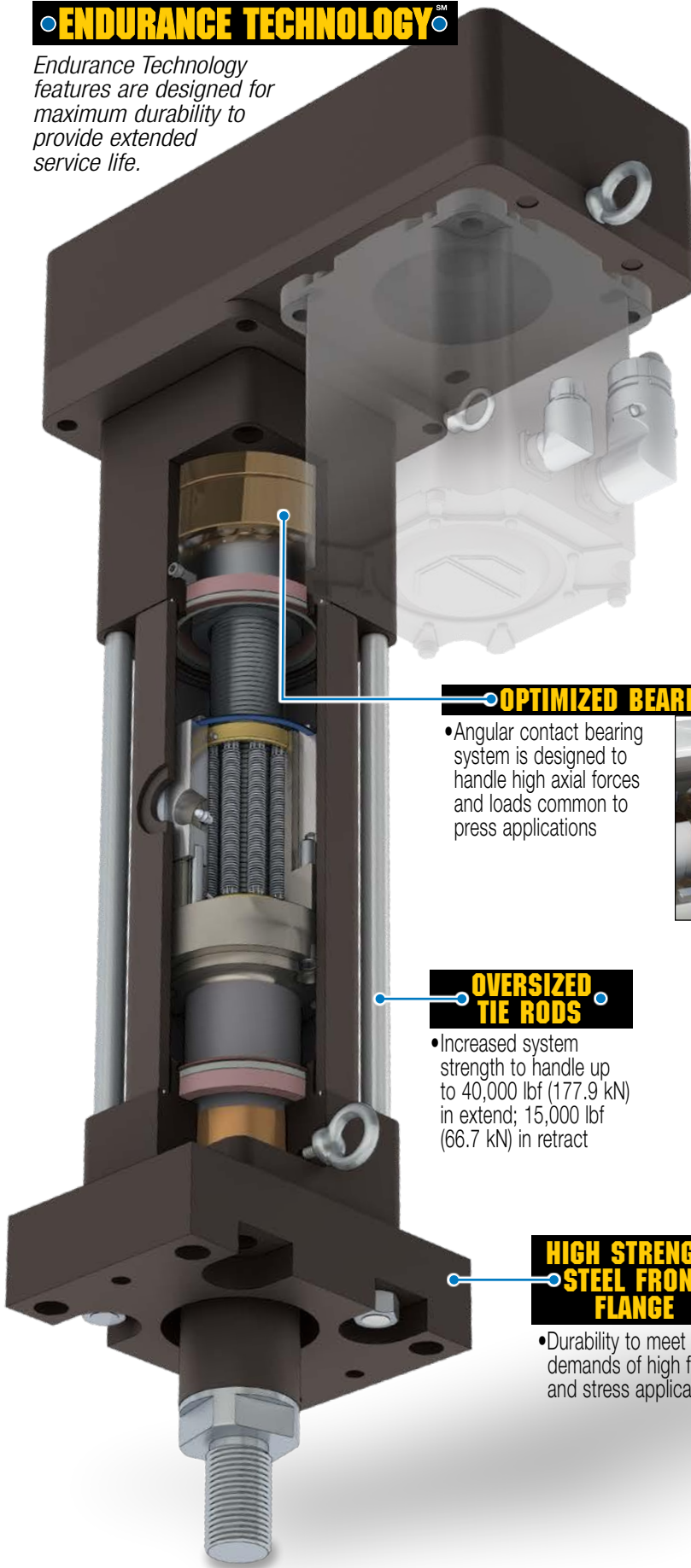


## ● OVERSIZED TIE RODS ●

- Increased system strength to handle up to 40,000 lbf (177.9 kN) in extend; 15,000 lbf (66.7 kN) in retract

## ● HIGH STRENGTH STEEL FRONT FLANGE ●

- Durability to meet the demands of high force and stress applications



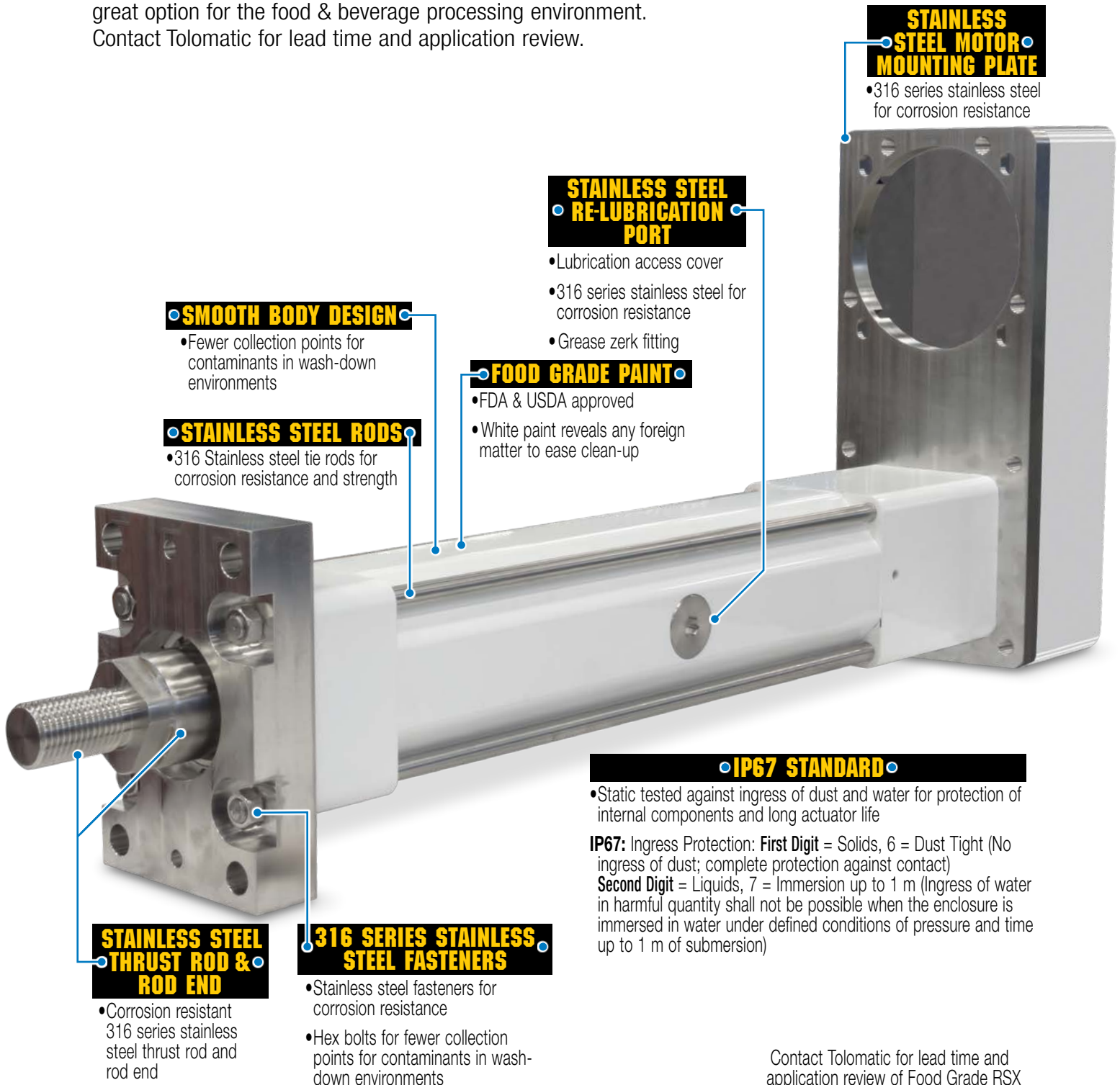
# FOOD GRADE RSX

**Tolomatic™**  
EXCELLENCE IN MOTION  
...**MAXIMUM DURABILITY**

## ENDURANCE TECHNOLOGY™

Endurance Technology features are designed for maximum durability to provide extended service life.

The food grade RSX has all the features of the RSX shown on the previous pages plus additional features that are suited to challenging environments: 316 Stainless steel thrust rod, rod end, tie rods, fasteners; food grade white paint; IP67 rating; and food grade grease. The food grade RSX is a great option for the food & beverage processing environment. Contact Tolomatic for lead time and application review.



### SMOOTH BODY DESIGN

- Fewer collection points for contaminants in wash-down environments

### STAINLESS STEEL RODS

- 316 Stainless steel tie rods for corrosion resistance and strength

### STAINLESS STEEL RE-LUBRICATION PORT

- Lubrication access cover
- 316 series stainless steel for corrosion resistance
- Grease zerk fitting

### FOOD GRADE PAINT

- FDA & USDA approved
- White paint reveals any foreign matter to ease clean-up

### STAINLESS STEEL MOTOR MOUNTING PLATE

- 316 series stainless steel for corrosion resistance

### STAINLESS STEEL THRUST ROD & ROD END

- Corrosion resistant 316 series stainless steel thrust rod and rod end

### 316 SERIES STAINLESS STEEL FASTENERS

- Stainless steel fasteners for corrosion resistance
- Hex bolts for fewer collection points for contaminants in wash-down environments

### IP67 STANDARD

- Static tested against ingress of dust and water for protection of internal components and long actuator life

**IP67:** Ingress Protection: **First Digit** = Solids, 6 = Dust Tight (No ingress of dust; complete protection against contact)  
**Second Digit** = Liquids, 7 = Immersion up to 1 m (Ingress of water in harmful quantity shall not be possible when the enclosure is immersed in water under defined conditions of pressure and time up to 1 m of submersion)

Contact Tolomatic for lead time and application review of Food Grade RSX

# RSX Extreme Force, Hydraulic Class Electric Actuator

## PERFORMANCE

## Specifications

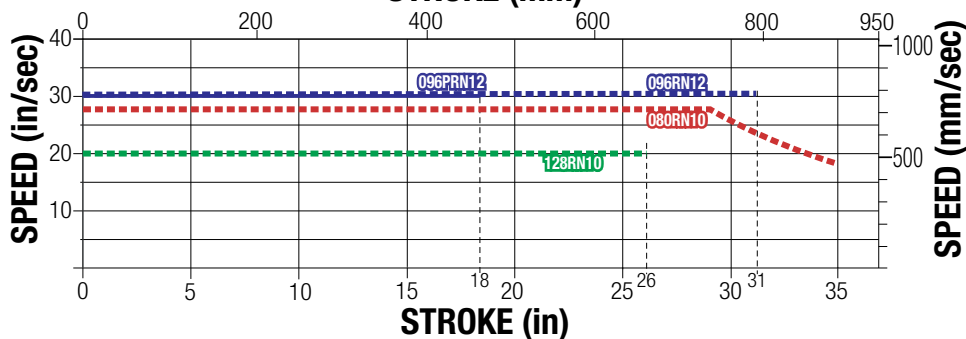
RSX SIZE	*MAX. STROKE		SCREW CODE	SCREW LEAD	LEAD ACCURACY	BACK-LASH	MAX. FORCE	MAX. SPEED	DYNAMIC LOAD RATING	DYNAMIC TORQUE TO OVERCOME FRICTION	
	MIN. STROKE	TRR									
	mm	mm	mm	mm/rev	mm/300mm	mm	kN	mm/sec	kN	N-m	
080	75	890	820	RN10	10.00	0.01	0.030	80.07	701	173.1	6.21
096	75	800	725	RN12	12.00	0.01	0.030	133.45†	759	269.3	6.21
096P	75	450	—	RN12	12.00	0.01	0.030	177.93**	759	269.3	6.21
128	75	665	555	RN10	10.00	0.01	0.030	222.41	500	442.7	8.47
	in	in	in		turns/in	in/ft	in	lbf	in/sec	lbf	lbf-in
080	2.95	35.03	32.28	RN10	2.54	0.0004	0.0012	18,000	27.6	38,914	55.0
096	2.95	31.49	28.54	RN12	2.12	0.0004	0.0012	30,000†	29.9	60,541	55.0
096P	2.95	17.71	—	RN12	2.12	0.0004	0.0012	40,000**	29.9	60,541	55.0
128	2.95	26.18	21.85	RN10	2.54	0.0004	0.0012	50,000	19.7	99,519	75.0

\*Consult Tolomatic for longer strokes. TRR = Trunnion option †Requires HT1 Option \*\*Max. force only in extend (retract force 15,000lbf; 66.7 kN)

RSX SIZE	SCREW CODE	INERTIA					WEIGHT						
		BASE ACTUATOR					PER UNIT	BASE ACTUATOR					PER UNIT
		kg-m <sup>2</sup> x 10 <sup>-4</sup>					kg-m <sup>2</sup> x 10 <sup>-4</sup>	kg					kg per mm
		LMI	RP1ST	RP1HT	RP2ST	RP2HT	per mm	LMI	RP1ST	RP1HT	RP2ST	RP2HT	kg per mm
080	RN10	6.68	12.31		5.03		0.0020	35.17	42.16		42.12		0.031
096	RN12	20.95	25.72	30.39	10.99	12.00	0.0044	65.64	73.18	75.29	73.65	74.16	0.041
096P	RN12	20.95	30.39		12.00		0.0044	68.86	80.22		79.10		0.043
128	RN10	82.76	79.04		31.48		0.0132	176.61	207.70		208.46		0.079
		lb-in <sup>2</sup>					lb-in <sup>2</sup> per in	lb					lb per in
080	RN10	19.56	36.02		14.72		0.15	77.54	92.94		92.85		1.72
096	RN12	61.30	75.27	88.94	32.15	35.12	0.33	144.71	161.34	165.98	162.38	163.49	2.31
096P	RN12	61.30	88.94		35.12		0.33	151.82	176.85		174.40		2.40
128	RN10	242.20	231.29		92.11		0.98	389.37	457.91		459.58		4.40

TEMP. RANGE: Standard 4° to 54°C (40° to 130°F) Extended -40° to 60°C (40° to 140°F)

### SIZE: ALL: CRITICAL SPEED CAPACITIES\*

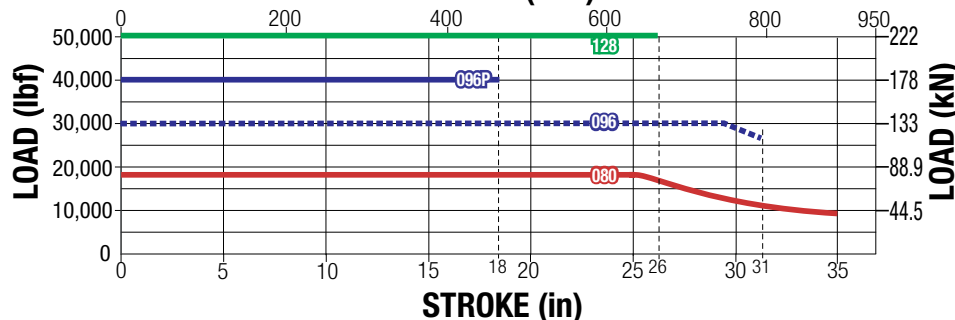


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for fast, accurate  
actuator selection

\*NOTE: When using Trunnion Mount, (TRR) consider the stroke to be longer when determining Critical Speed and Buckling Load:

	mm	in
RSX080	68.1	2.68
RSX096	72.4	2.85
RSX128	108.0	4.25

### SIZE: ALL: SCREW BUCKLING LOAD\*





# RSX Extreme Force, Hydraulic Class Electric Actuator

## ROLLER SCREW LIFE ESTIMATE

## PERFORMANCE

### RSX Standard Actuators Expected Life:

*NOTE: The  $L_{10}$  expected life of a ball or roller screw linear actuator is expressed as the linear travel distance that 90% of properly maintained ball or roller screws manufactured are expected to meet or exceed. This is not a guarantee and this data should be used for estimation purposes only.*

The underlying formula that defines this value is:

$$L_{10} = \left( \frac{C}{P_e} \right)^3 \cdot \ell =$$

$L_{10}$  Travel life in millions of units (in or mm), where:

- C** = Dynamic load rating (lbf) or (N)
- P<sub>e</sub>** = Equivalent load (lbf) or (N)  
If load is constant across all movements then:  
actual load = equivalent load
- ℓ** = Screw lead (in/rev) (mm/rev)

Use the "Equivalent Load" calculation below, when the load is not constant throughout the entire stroke. In cases where there is only minor variation in loading, use greatest load for life calculations.

$$\text{Where: } P_e = \sqrt[3]{\frac{L_1(P_1)^3 + L_2(P_2)^3 + L_3(P_3)^3 + L_n(P_n)^3}{L}}$$

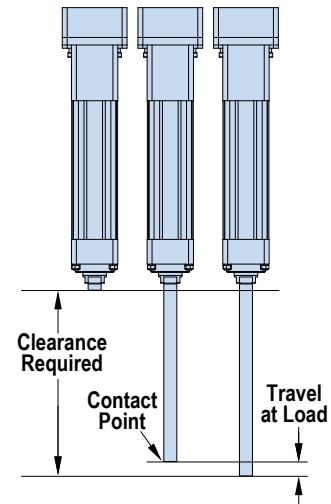
- P<sub>e</sub>** = Equivalent load (lbf) or (N)
- P<sub>n</sub>** = Each increment at different load (lbf) or (N)
- L** = Total distanced traveled per cycle (extend + retract stroke)  
[L = L<sub>1</sub> + L<sub>2</sub> + L<sub>3</sub> + L<sub>n</sub>]
- L<sub>n</sub>** = Each increment of stroke at different load (in) or (mm)

### RSX Press Application Expected Life:

An alternate method for estimating life is used for applications where the force is applied repeatedly over a short area of the stroke. If the distance at max force occurs within one revolution of the screw, contact Tolomatic for assistance determining a life estimate.

Example:

- Travel required is 200mm to load parts and apply the press.
- Contact is made at 190mm extended and continues to 200mm position. Total travel under load is 10mm.
- 10mm is less than the screw lead (distance traveled in one revolution).
- Contact Tolomatic for assistance determining the estimated life.



**NOTE:** The L10 life estimation method does not include failures caused by other conditions such as contamination, misalignment, improper lubrication and exceeding actuator specifications

### RE-LUBRICATION RECOMMENDATION:

Lubrication requirements for electric actuators depend on the motion cycle (velocity, force, duty cycle), type of application, ambient temperature, environmental surrounding and various other factors.

Tolomatic recommends to re-lubricate the actuator at least once per year or every 1,000,000 cycles, whichever comes first, to maximize service life. For more demanding applications such as pressing, high frequency or other

highly stressed applications, the re-lubrication interval for these actuators will vary and will need to be more frequent. In these demanding applications, it is recommended to execute at least 5 full stroke moves every 5,000 cycles of operation (or more frequent if possible) to re-distribute the grease within the actuator.

Re-lubricate with Tolomatic Grease into the grease port located on the side of the actuator.

	RSX080	RSX096(P)	RSX128
Quantity (g)	8.0 + (0.020 x Stroke <sup>mm</sup> )	9.5 + (0.025 x Stroke <sup>mm</sup> )	12.0 + (0.027 x Stroke <sup>mm</sup> )
Quantity (oz)	0.28 + (0.018 x Stroke <sup>in</sup> )	0.34 + (0.022 x Stroke <sup>in</sup> )	0.42 + (0.024 x Stroke <sup>in</sup> )

Stroke<sup>mm</sup> = Stroke length in millimeters    Stroke<sup>in</sup> = Stroke length in inches

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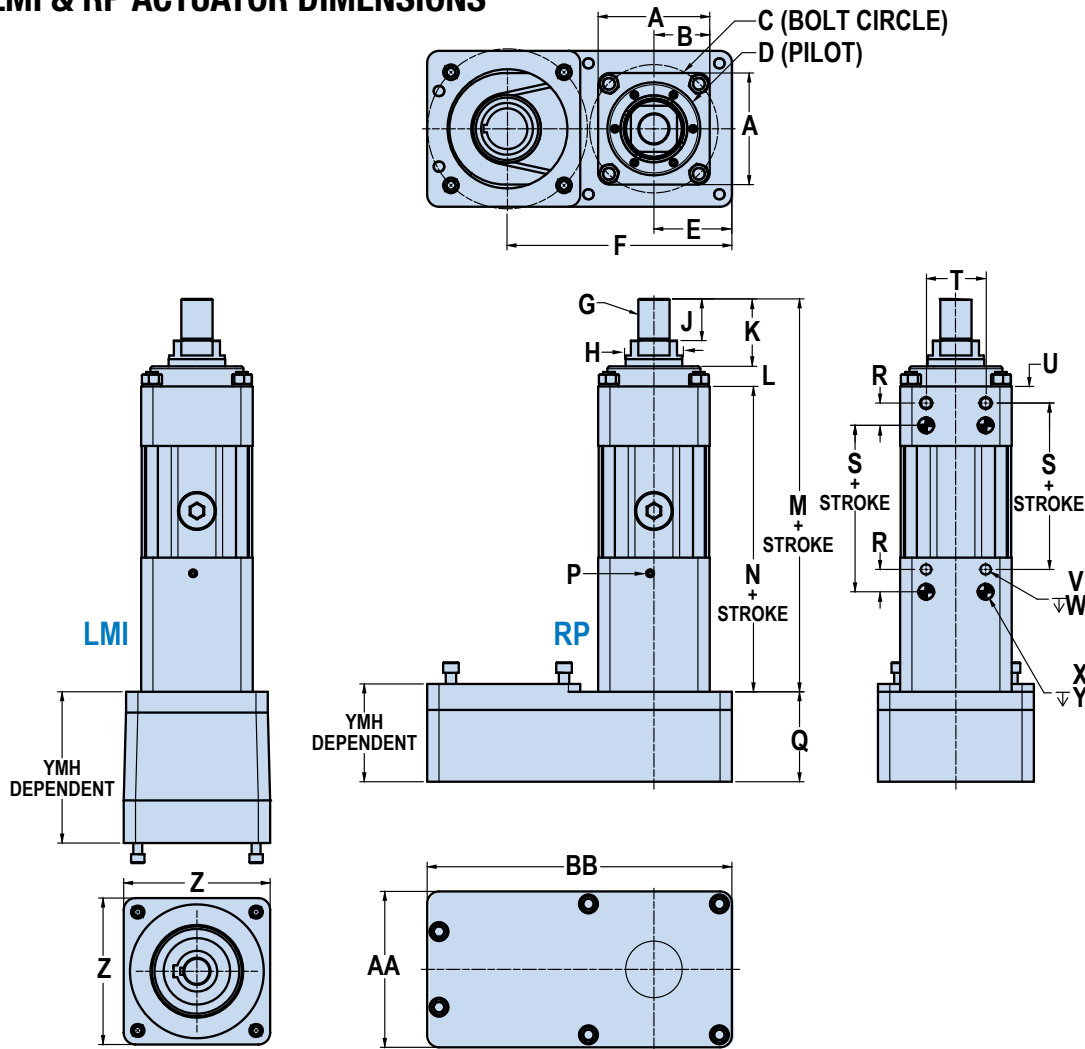
# RSX Extreme Force, Hydraulic Class Electric Actuator

SIZE: ALL

3D CAD available at [www.tolomatic.com](http://www.tolomatic.com)  
Always use configured CAD solid model to determine critical dimensions



## LMI & RP ACTUATOR DIMENSIONS



	080	096	128
<b>A</b>	135.0	150.0	220.0
<b>B</b>	67.5	75.0	110.0
<b>C</b>	150.00	171.0	250.0
<b>D</b>	110.00 (+0.00) (-0.03)	125.00 (+0.00) (-0.03)	175.0 (+0.00) (-0.03)
<b>E</b>	88.9	104.8	142.9
<b>F</b>	RP1 272.9	304.8	422.9
	RP2 271.1	302.3	424.5
	STANDARD		
<b>G</b>	M36 x 3.0-6g	M42 x 4.5-6g	M64 x 3.0-6g
<b>H<sub>0</sub></b>	63.388 / 63.449	76.093 / 76.149	101.488 / 101.549
	THREAD LENGTH		
<b>J</b>	60.0	69.9	105.0
	FULL RETRACT		
<b>K</b>	95.0	104.8	167.0
<b>L</b>	27.0	27.0	33.0
<b>M</b>	474.7	601.1	805.7
<b>N</b>	352.7	469.2	605.8

	080	096	128
<b>P</b>	RC 1/8 -28 X 38.1 DP (Plugged)	RC 1/8 -28 X 38.1 DP (Plugged)	RC 1/4 -19 X 38.1 DP (Plugged)
<b>Q</b>	96.0	124.7	182.9
<b>R</b>	30.0	30.0	40.0
<b>S</b>	210.9	282.4	369.0
<b>T</b>	70.0	80.0	115.0
<b>U</b>	18.0	22.3	35.0
<b>V</b>	M12 x 1.75-6H	M16 x 2.0-6H	M20 x 2.5-6H
<b>W</b>	∇ 18.0 (4)	∇ 20.0 (4)	∇ 20.0 (4)
<b>X</b>	16.025 16.012	20.025 20.013	20.033 20.013
<b>Y</b>	∇ 15.0 (4)	∇ 15.0 (4)	∇ 30.0 (4)
<b>Z</b>	152.4	196.9	279.4
<b>AA</b>	177.8	209.6	285.8
<b>BB</b>	355.6	409.6	584.2

Dimensions in millimeters

	080	096	128
<b>A</b>	5.31	5.91	8.66
<b>B</b>	2.66	2.95	4.33
<b>C</b>	5.905	6.73	9.84
<b>D</b>	4.331 (+0.000) (-0.001)	4.921 (+0.000) (-0.001)	6.89 (+0.000) (-0.001)
<b>E</b>	3.50	4.13	5.63
<b>F</b>	RP1 10.74	12.00	16.65
	RP2 10.67	11.90	16.71
<b>G</b>	SR1 OPTION		
	1 1/2-12 UN-2A	1 7/8-12 UN-2A	2 1/2-8 UN-2A
<b>H<sub>0</sub></b>	2.4956/ 2.4980	2.9958/ 2.9980	3.9956/ 3.9980
	THREAD LENGTH		
<b>J</b>	2.36	2.75	4.13
	FULL RETRACT		
<b>K</b>	3.74	4.13	6.57
<b>L</b>	1.06	1.06	1.30
<b>M</b>	18.69	23.66	31.72
<b>N</b>	13.89	18.47	23.85

	080	096	128
<b>P</b>	RC 1/8 -28 X 38.1 DP (Plugged)	RC 1/8 -28 X 38.1 DP (Plugged)	RC 1/4 -19 X 38.1 DP (Plugged)
<b>Q</b>	3.78	4.91	7.20
<b>R</b>	1.18	1.18	1.57
<b>S</b>	8.30	11.12	14.53
<b>T</b>	2.76	3.15	4.53
<b>U</b>	0.71	0.88	1.38
<b>V</b>	M12 x 1.75-6H	M16 x 2.0-6H	M20 x 2.5-6H
<b>W</b>	∇ .71 (4)	∇ .79 (4)	∇ .79 (4)
<b>X</b>	0.6309 0.6304	0.7884 0.7879	0.7887 0.7879
<b>Y</b>	∇ .59 (4)	∇ .59 (4)	∇ 1.18 (4)
<b>Z</b>	6.00	7.75	11.00
<b>AA</b>	7.00	8.25	11.25
<b>BB</b>	14.00	16.13	23.00

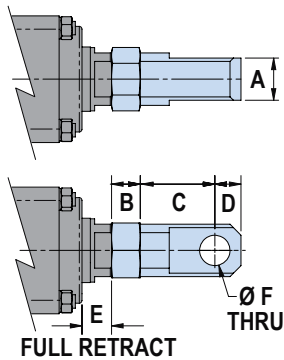
Dimensions in inches

# RSX Extreme Force, Hydraulic Class Electric Actuator

SIZE: ALL

DIMENSIONS

## CLEVIS OPTION (CLV)



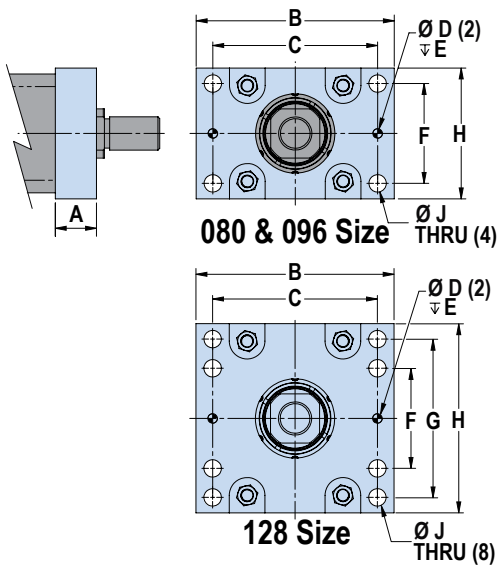
	080	096	128
<b>A</b>	40.00 39.59	50.00 49.59	60.00 59.26
<b>B</b>	29.0	34.0	51.0
<b>C</b>	75.0	88.3	137.0
<b>D</b>	25.0	31.0	45.0
<b>E</b>	35.0	35.0	62.0
<b>F</b>	28.05 28.00	36.06 36.00	45.06 45.00

Dimensions in millimeters

	080	096	128
<b>A</b>	1.575 1.559	1.969 1.953	2.362 2.333
<b>B</b>	1.14	1.34	2.01
<b>C</b>	2.95	3.48	5.39
<b>D</b>	0.98	1.22	1.77
<b>E</b>	1.38	1.38	2.44
<b>F</b>	1.104 1.102	1.420 1.417	1.774 1.772

Dimensions in inches

## FRONT FLANGE OPTION (FFG)



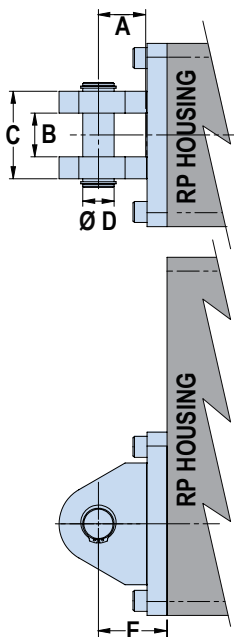
	080	096	128
<b>A</b>	42.0	52.0	85.0
<b>B</b>	225.0	250.0	360.0
<b>C</b>	180.0	208.0	300.0
<b>D</b>	10.013 10.000	12.025 12.013	20.033 20.013
<b>E</b>	12.0	12.0	20.0
<b>F</b>	100.0	126.0	65.0
<b>G</b>	—	—	190.0
<b>H</b>	150.0	165.0	245.0
<b>J</b>	18.0	22.0	26.2

Dimensions in millimeters

	080	096	128
<b>A</b>	1.65	2.05	3.35
<b>B</b>	8.86	9.84	14.17
<b>C</b>	7.09	8.19	11.81
<b>D</b>	0.3942 0.3937	0.4734 0.4729	0.7887 0.7879
<b>E</b>	0.47	0.47	0.79
<b>F</b>	3.94	4.96	2.56
<b>G</b>	—	—	7.48
<b>H</b>	5.91	6.50	9.65
<b>J</b>	0.71	0.87	1.03

Dimensions in inches

## REAR CLEVIS OPTION (PCD)



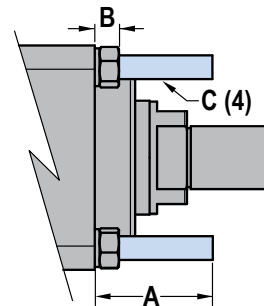
	080	096	128
<b>A</b>	40.5	54.0	93.8
<b>B</b>	40.69 40.31	50.70 50.32	60.80 60.34
<b>C</b>	82.3	100.3	122.3
<b>D</b>	27.978 27.940	35.980 35.940	44.99 44.94
<b>E</b>	63.4	78.4	128.1

Dimensions in millimeters

	080	096	128
<b>A</b>	1.60	2.13	3.69
<b>B</b>	1.602 1.587	1.996 1.981	2.394 2.376
<b>C</b>	3.24	3.95	4.82
<b>D</b>	1.1015 1.1000	1.4165 1.4150	1.771 1.769
<b>E</b>	2.50	3.09	5.04

Dimensions in inches

## EXTENDED TIE ROD OPTION (XT)



		080	096	128
<b>MIN</b>	mm	50.0	50.0	50.0
	in	1.97	1.97	1.97
<b>MAX</b>	mm	100.0	100.0	100.0
	in	3.94	3.94	3.94
<b>B</b>	mm	13.3	15.3	26.9
	in	0.52	0.60	1.06
<b>C (4)</b>		M14 x 2.0-6g	M16 x 1.5-6g	M24 x 3.0-6g

A = Customer Specified Length

## IMPERIAL THREAD OPTION (SRI)

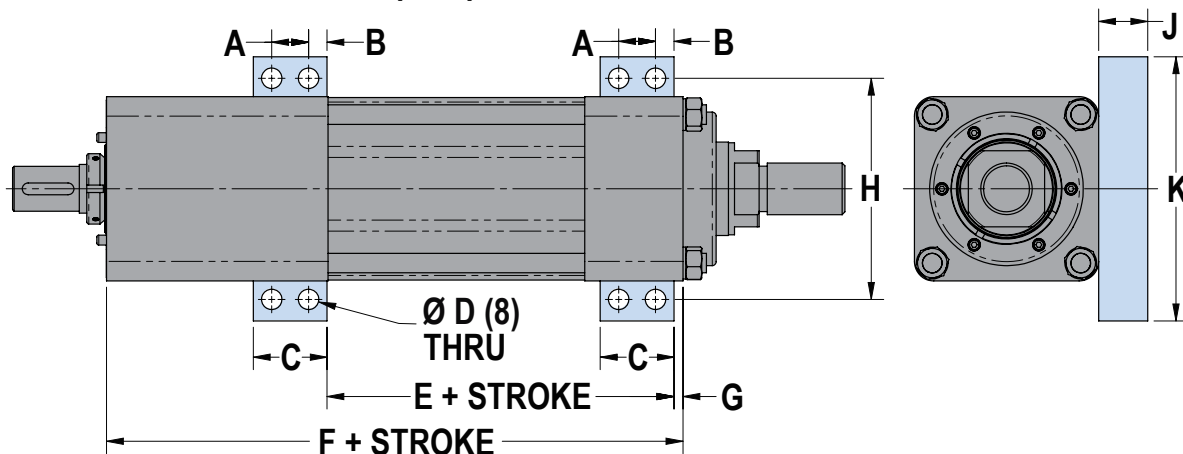
# RSX Extreme Force, Hydraulic Class Electric Actuator

SIZE: ALL

3D CAD available at [www.tolomatic.com](http://www.tolomatic.com)  
Always use configured CAD solid model  
to determine critical dimensions



## MOUNTING PLATE OPTION (MP2) DIMENSIONS



	080	096	128
A	30.0	30.0	40.0
B	12.5	15.0	22.5
C	55.0	60.0	85.0
D	12.7	16.7	21.0
E	210.9	282.4	369.0
F	352.7	469.2	605.8
G	5.5	7.3	12.5

	080	096	128
H	170.0	180.0	260.0
J	31.4	40.0	45.0
K	200.0	215.0	305.0

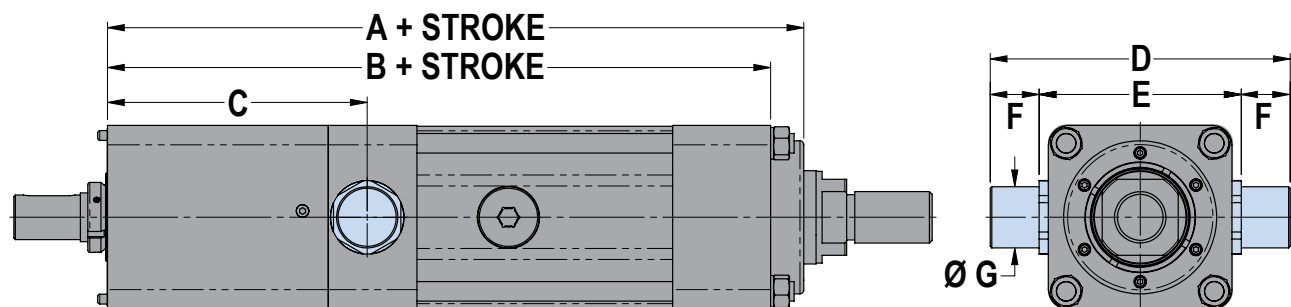
Dimensions in millimeters

	080	096	128
A	1.18	1.18	1.57
B	0.49	0.59	0.89
C	2.17	2.36	3.35
D	0.50	0.66	0.83
E	8.30	11.12	14.53
F	13.89	18.47	23.85
G	0.22	0.29	0.49

	080	096	128
H	6.69	7.09	10.24
J	1.24	1.57	1.77
K	7.87	8.46	12.01

Dimensions in inches

## TRUNNION OPTION (TRR) DIMENSIONS



	080	096	128
A	447.8	568.6	746.7
B	420.8	541.6	713.7
C	171.5	212.1	268.1
D	214.0	245.0	340.0
E	150.0	165.0	240.0

	080	096	128
F	32.0	40.0	50.0
G	39.98	49.98	62.97
	39.95	49.94	62.92

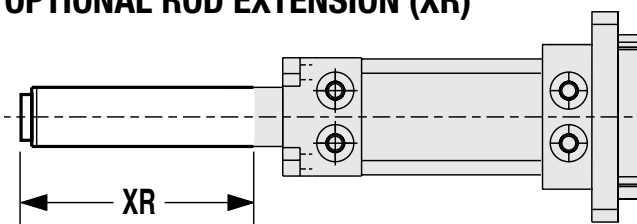
Dimensions in millimeters

	080	096	128
A	17.63	22.39	29.40
B	16.57	21.32	28.10
C	6.75	8.35	10.56
D	8.43	9.65	13.39
E	5.91	6.50	9.45

	080	096	128
F	1.26	1.57	1.97
G	1.574	1.968	2.479
	1.573	1.966	2.477

Dimensions in inches

## OPTIONAL ROD EXTENSION (XR)



The thrust rod length can be extended by specifying the rod extension option. This does not increase the working stroke, only the length of the thrust rod.

**NOTE:** Please consult Tolomatic if your application requires rod extension length greater than 100 mm (3.9 in).

# RSX Extreme Force, Hydraulic Class Electric Actuator

## SWITCHES



RSX actuators offer a wide range of sensing choices. There are 12 switch choices: reed, solid state PNP (sourcing) or solid state NPN (sinking); in normally open or normally closed; with flying leads or quick-disconnect.

Commonly used for end-of-stroke positioning, these switches allow installation anywhere along the entire actuator length. The internal magnet is a standard feature. Switches can be installed in the field at any time.

Switches are used to send digital signals to PLC (programmable logic controller), TTL, CMOS circuit or other controller device. Switches contain reverse polarity protection. Solid state QD cables are shielded; shield should be terminated at flying lead end.

All switches are CE rated and are RoHS compliant. Switches feature bright red or yellow LED signal indicators; solid state switches also have green LED power indicators.



	Order Code	Lead	Switching Logic	Power LED	Signal LED	Operating Voltage	**Power Rating (Watts)	Switching Current (mA max.)	Current Consumption	Voltage Drop	Leakage Current	Temp. Range	Shock / Vibration
REED	<b>R</b> <b>Y</b>	5m	SPST Normally Open	—	Red	5 - 240 AC/DC	**10.0	100mA	—	3.0 V max.	—	14 to 158°F  [-10 to 70°C]	50 G / 9 G
	<b>R</b> <b>K</b>	QD*											
	<b>N</b> <b>Y</b>	5m	SPST Normally Closed	—	Yellow	5 - 110 AC/DC							
	<b>N</b> <b>K</b>	QD*											
SOLID STATE	<b>T</b> <b>Y</b>	5m	PNP (Sourcing) Normally Open	Green	Yellow	10 - 30 VDC	**3.0	100mA	20 mA @ 24V	2.0 V max.	0.05 mA max.		
	<b>T</b> <b>K</b>	QD*											
	<b>K</b> <b>Y</b>	5m	NPN (Sinking) Normally Open	Green	Red								
	<b>K</b> <b>K</b>	QD*											
	<b>P</b> <b>Y</b>	5m	PNP (Sourcing) Normally Closed	Green	Yellow								
	<b>P</b> <b>K</b>	QD*											
	<b>H</b> <b>Y</b>	5m	NPN (Sinking) Normally Closed	Green	Red								
	<b>H</b> <b>K</b>	QD*											

\*QD = Quick-disconnect Enclosure classification IEC 529 IP67 (NEMA 6)

CABLES: Robotic grade, oil resistant polyurethane jacket, PVC insulation

**⚠️ \*\*WARNING:** Do not exceed power rating (Watt = Voltage x Amperage). Permanent damage to sensor will occur.

### SWITCH INSTALLATION



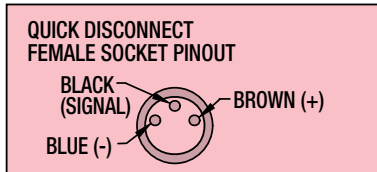
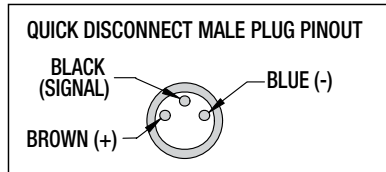
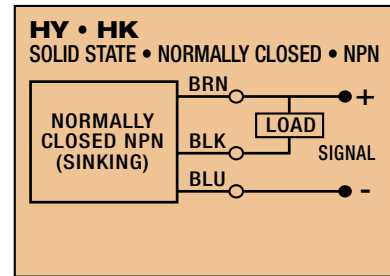
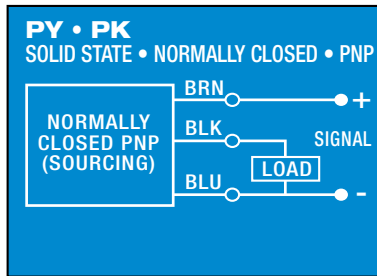
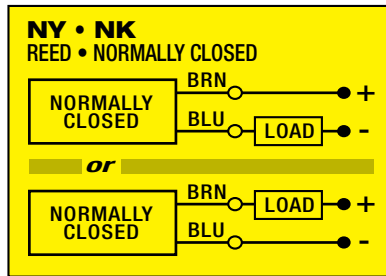
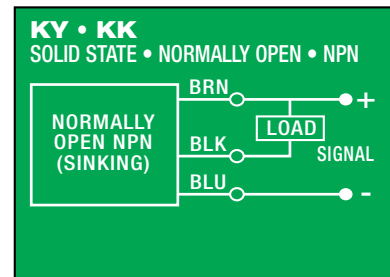
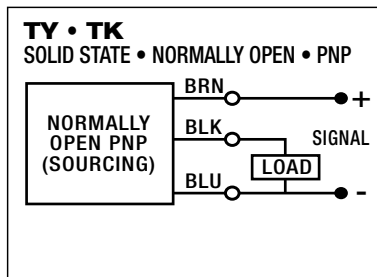
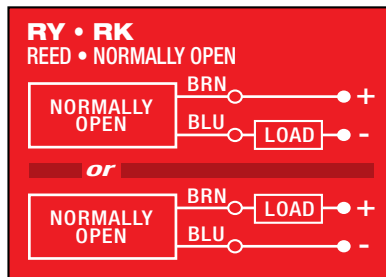
Place switch bracket onto any one of the four tie rods that run the length of the extruded tube. Insert the switch with set screw and the word "Tolomatic" facing up and slide into the mating slot on the bracket. Position the bracket with the switch to the exact location desired, with the bracket tight to the surface of the extrusion, then lock the bracket securely into place by tightening the set screw with the Allen wrench provided. Then tighten the switch into the bracket with a small slotted screwdriver.



# RSX Extreme Force, Hydraulic Class Electric Actuator

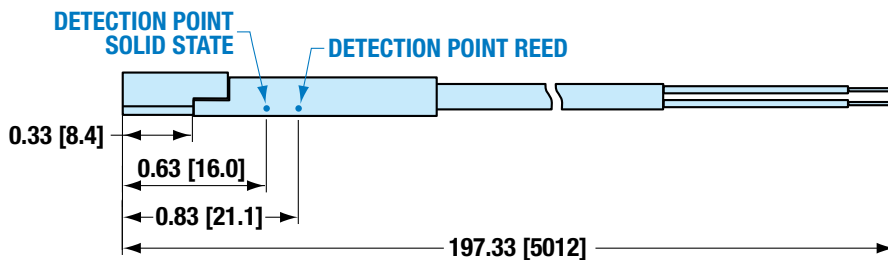
## SWITCHES

### WIRING DIAGRAMS

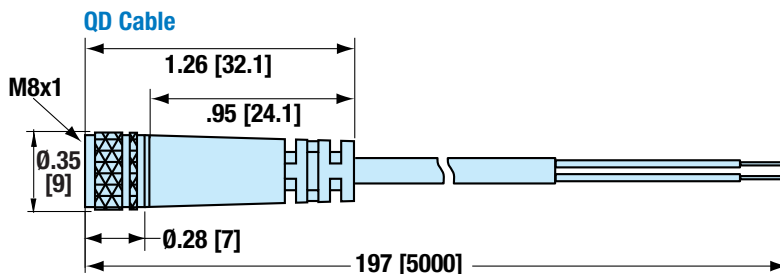
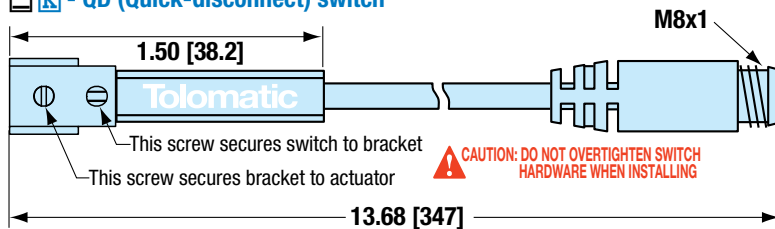


### SWITCH DIMENSIONS

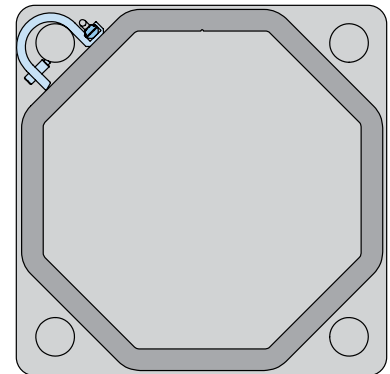
**Y** - direct connect



**X** - QD (Quick-disconnect) switch



### SWITCH MOUNTING



The switch bracket and switch does not extend beyond the profile of the RSX heads.

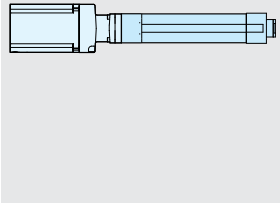
# APPLICATION DATA WORKSHEET

Fill in known data. Not all information is required for all applications

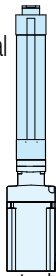
## ORIENTATION

RSX

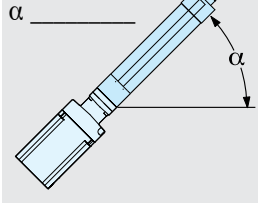
Horizontal



Vertical



Incline °



Load supported by actuator OR  Load supported by other mechanism

## MOVE PROFILE

### EXTEND

Move Distance \_\_\_\_\_

inch  
(US Standard)

millimeters  
(Metric)

Move Time \_\_\_\_\_ sec

Max. Speed \_\_\_\_\_

in/sec

mm/sec

Dwell Time After Move \_\_\_\_\_ sec

### RETRACT

Move Distance \_\_\_\_\_

inch

millimeters

Move Time \_\_\_\_\_ sec

Max. Speed \_\_\_\_\_

in/sec

mm/sec

Dwell Time After Move \_\_\_\_\_ sec

## NO. OF CYCLES

per minute

per hour

## HOLD POSITION?

Required

Not Required

After Move

During Power Loss

NOTE: If load or force changes during cycle use the highest numbers for calculations

### EXTEND

#### LOAD

lb.  
(U.S. Standard)

kg.  
(Metric)

### RETRACT

#### LOAD

lb.  
(U.S. Standard)

kg.  
(Metric)

#### FORCE

lbf.  
(U.S. Standard)

N  
(Metric)

#### FORCE

lbf.  
(U.S. Standard)

N  
(Metric)

## STROKE LENGTH

inch  
(US Standard)

millimeters  
(Metric)

## PRECISION

Repeatability \_\_\_\_\_

inch

millimeters

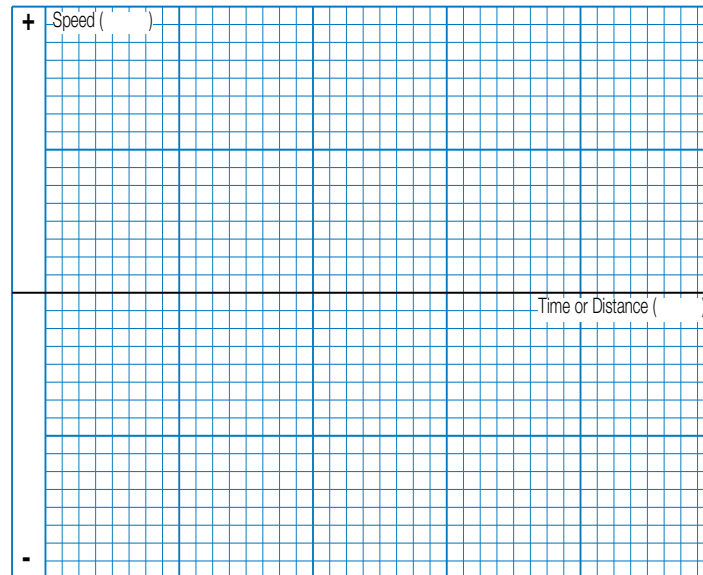
## OPERATING ENVIRONMENT

Temperature, Contamination, Water, etc.

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On-line  
sizing and  
selection at  
[sizeit.tolomatic.com](http://sizeit.tolomatic.com)

Or Call 1-800-328-2174 for  
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## MOTION PROFILE



Graph your most demanding cycle, including accel/decel, velocity and dwell times. You may also want to indicate load variations and I/O changes during the cycle. Label axes with proper scale and units.

## CONTACT INFORMATION

Name, Phone, Email  
Co. Name, Etc.



**USE THE TOLOMATIC SIZING AND SELECTION SOFTWARE AVAILABLE ON-LINE AT [www.tolomatic.com](http://www.tolomatic.com) OR... CALL TOLOMATIC AT 1-800-328-2174.** We will provide any assistance needed to determine the proper actuator for the job.

**FAX 1-763-478-8080**

**EMAIL [help@tolomatic.com](mailto:help@tolomatic.com)**



# RSX Extreme Force, Hydraulic Class Electric Actuator

## Selection Guidelines

### 1 ESTABLISH MOTION PROFILE

Using the application stroke length, desired cycle time, loads and forces, establish the motion profile details including linear velocity and force in each of its segments.

### 2 SELECT ACTUATOR SIZE AND SCREW TYPE

Based on the required velocities and forces, select an actuator size including the lead of the roller screw assembly.

### 3 VERIFY CRITICAL SPEED OF THE SCREW

Verify that the application's peak linear velocity does not exceed the critical speed value for the size and lead of the screw selected.

### 4 VERIFY AXIAL BUCKLING STRENGTH OF THE SCREW

Verify that the peak force does not exceed the critical buckling force for the size of the screw selected.

### 5 COMPARE APPLICATION'S PEAK PARAMETERS TO PEAK CAPACITY (PEAK REGION) OF SELECTED ACTUATOR

Calculate the application's required peak force and peak velocity and compare to the graphs. The selection must satisfy the application's peak requirements.

### 6 CONSIDER LUBRICATION INTERVAL

Evaluate the recommended lubrication interval with respect to the application motion profile. See page RSX\_7 for complete lubrication information.

### 7 TEMPERATURE CONSIDERATIONS

If the application's ambient temperature lies outside of the standard range (see page RSX\_8), contact Tolomatic.

### 8 SELECT A MOTOR-ACTUATOR CONFIGURATION

Select an inline or a reverse-parallel motor configuration.

### 9 ESTABLISH TOTAL TORQUE REQUIREMENTS

Calculate total system inertia, the peak and the RMS torque required from the motor to overcome internal friction, external forces and accelerate/decelerate the load.

### 10 SELECT A MOTOR

Use the obtained total torque value to select a motor and a reduction device (if required). Verify that the peak torque value is below the motor's peak torque curve, and that the continuous torque value is below the motor's continuous torque curve. Verify the minimum torque margin (15%). Verify the inertia match.

### 11 SELECT OPTIONAL POSITION SENSORS

12 sensor choices include: reed, solid state PNP or NPN, all in normally open or normally closed, with flying leads or quick-disconnect couplers.

### 12 SELECT ACTUATOR MOUNTING

Mounting options include: TRN trunnion mount, FFG front flange mount, MP2 mounting plates, PCD clevis mount.

### 13 SELECT ROD END OPTIONS

Rod end options include: CLV clevis rod end.



The above guidelines are for reference only. Use Tolomatic online sizing software for best results.



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selection at  
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# RSX Extreme Force, Hydraulic Class Electric Actuator

## Ordering

**ACTUATOR**      **OPTIONS**

RSX 096 RN12 SM450 RP1 HT1 FFG CLV XR10 KK2 YM

**MODEL & MOUNTING**  
RSX Rod-Style Actuator,

**SIZE**  
**080, 096, 128**  
**096P** Press Model

**NUT/SCREW**

SIZE	CODE	LEAD (mm/rev)
080	RN	10
096	RN	12
128	RN	10

**STROKE LENGTH**  
SM \_\_\_ Enter desired stroke length in millimeters  
Minimum Stroke: 75mm (2.95 in)

SIZE	MAX. STROKE	
	mm	*TRR
080	890	820
096	800	725
096P	450	—
128	665	555
	in	in
080	35.03	32.28
096	31.49	28.54
096P	17.71	—
128	26.18	21.85

\*TRR = Trunnion Option

**MOTOR MOUNTING**  
LMI In-line motor mount  
RP1 1:1 ratio, reverse parallel motor mount  
RP2 2:1 ratio, reverse parallel motor mount

**STANDARD OR HIGH TORQUE**  
ST1\* Standard Actuator  
HT1\*\* High Torque Option

\*Only available with RP option on RSX096

\*\*Use sizing software to determine if HT1 is required for torque and motor specifications

**TRUNNION MOUNT**  
TRR\* Trunnion mount  
**NOTE:** Trunnion mount is not available for field retrofit, contact Tolomatic for details

\*Not available for RSX096P

**IP67**  
IP67 Ingress protection (Note: if not specified standard IP65 actuator will be built)

**ACTUATOR MOUNTING**  
*For all motor mounts:*  
FFG Front Flange Mount  
MP2 Mounting Plates (2 required)  
XT Extended Tie Rods (min. 50mm, max. 100mm)  
*For RP motor mounting only:*  
PCD\* Clevis Mount

\*Not available for RSX096P

**ROD END**  
*Externally threaded rod end is standard*  
CLV\* Clevis Rod End  
SR1\* Imperial Thread

\*Not available for RSX096P

**ROD EXTENSION**  
XR \_\_\_ Enter desired rod extension in millimeters  
**NOTE:** XR option does not increase the working stroke, only the length of the thrust rod.  
**NOTE:** Please consult Tolomatic if your application requires rod extension length greater than 100mm (3.9 in).

**SWITCHES**

TYPE	LOGIC	NORMALLY	QUICK-DISCONNECT	CODE	QUANTITY	LEAD LENGTH
REED	SPST	Open	no	RY	After code enter quantity desired	5 meters (16.4 feet)
		yes	yes	RK		
SOLID STATE	PNP	Closed	no	NY		
		yes	yes	NK		
	NPN	Open	no	TY		
		yes	yes	TK		
PNP	Closed	no	yes	KY		
		yes	yes	KK		
NPN	Closed	no	yes	PY		
		yes	yes	PK		
				HY		
				HK		

**YOUR MOTOR HERE**  
YM \_\_\_\_\_ Motor mount for non-Tolomatic motor.  
[www.tolomatic.com](http://www.tolomatic.com)



Contact Tolomatic for food grade option lead time and application review.

**Not all codes listed are compatible with all options. Contact Tolomatic with any questions.**

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Unique linear actuator solutions with Endurance Technology<sup>SM</sup> to solve your challenging application requirements.



## FAST DELIVERY

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## ACTUATOR SIZING

Online sizing that is easy to use, accurate and always up-to-date. Find a Tolomatic electric actuator to meet your requirements.



## YOUR MOTOR HERE

Match your motor with compatible mounting plates that ship with any Tolomatic electric actuator.



## LIBRARY

Easy to access CAD files available in the most popular formats to place directly into your assembly.



## TECHNICAL SUPPORT

Extensive motion control knowledge: Expect prompt, courteous replies to any application and product questions from Tolomatic's industry experts.

## Also Consider These Other Tolomatic Products:

### Electric Products

Rod & Guided Rod Style Actuators, High Force Actuators, Screw & Belt Drive Rodless Actuators, Motors, Drives and Controllers

"Foldout" Brochure #9900-9074



### Pneumatic Products

Rodless Cylinders: Band Cylinders, Cable Cylinders, Magnetically Coupled Cylinders/Slides; Guided Rod Cylinder Slides

"Foldout" Brochure #9900-9075



### Power Transmission Products

Gearboxes: Float-A-Shaft®, Slide-Rite®; Caliper Disc Brakes; Planetary Roller Screws

"Foldout" Brochure #9900-9076

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