Tolomatic
EXCELLENCE *IN MOTION*®

ENDURANCE TECHNOLOGY℠

RSX

EXTREME FORCE, HYDRAULIC CLASS ELECTRIC ACTUATORS

LINEAR SOLUTIONS MADE EASY

RSX Extreme Force, Hydraulic Class Electric Actuator

WHAT IS THE RSX?

The RSX is an extreme force electric actuator designed for rugged service, long life and is an ideal choice for replacing hydraulic cylinders. The RSX utilizes roller screws for long lasting consistent performance. Additionally, the RSX uses Tolomatic's popular Your Motor Here program which allows RSX to easily mount most 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 Motor Rod-Style Actuator**
Thrust up to:	35 kN *(7,868 lbf)*	58 kN *(13,039 lbf)*	133.5 kN *(30,000 lbf)*	4.23 kN *(950 lbf)*	30.6 kN *(6,875 lbf)*
Speed up to:	1473 mm/sec *(58 in/sec)*	3,124 mm/sec *(123 in/sec)*	760 mm/sec *(29.9 in/sec)*	3,124 mm/sec *(123 in/sec)*	1,334 mm/sec *(52.5 in/sec)*
Stroke Length up to:	1219 mm *(48 in)*	1,524 mm *(60 in)*	1500 mm *(59 in)*	914 mm *(36 in)*	457 mm *(18 in)*
Screw/Nut Type	Solid, Ball & Roller	Solid, Ball & Roller	Roller	Solid & Ball	Ball & Roller
	For complete information see www.tolomatic.com or literature number:				
Literature Number:	2190-4000	3600-4166	2171-4001	3600-4166	2700-4000

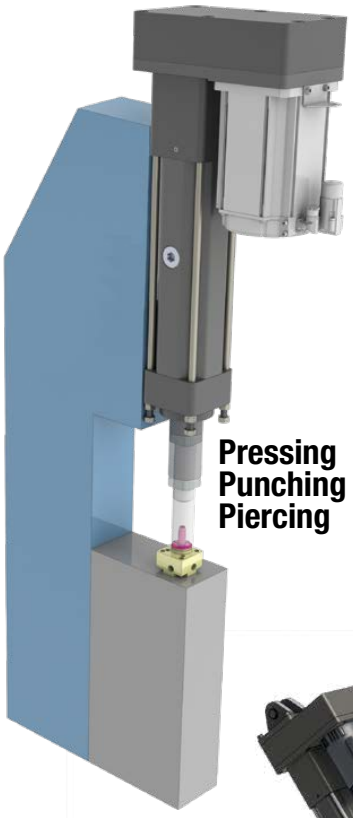
(Not all models deliver maximum values listed, i.e.: Maximum thrust may not be available with maximum speed)

RSX Extreme Force, Hydraulic Class Electric Actuator

Applications

Volumetric pumps
Injection molding

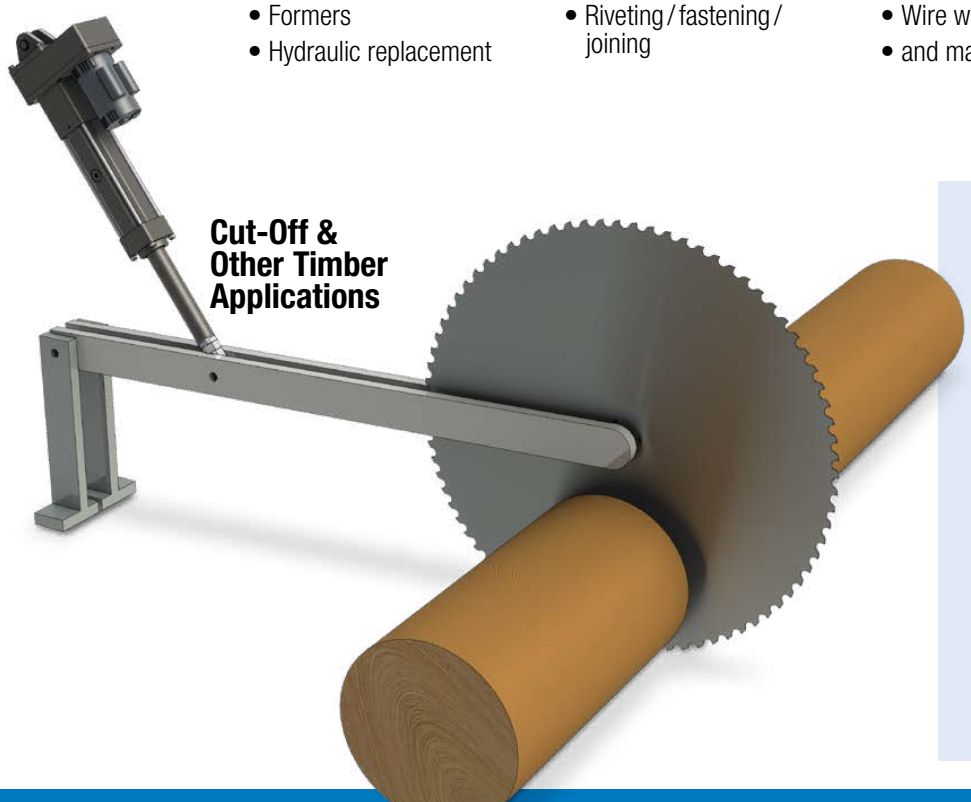
Motion simulators



Pressing
Punching
Piercing

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



Cut-Off &
Other Timber
Applications

CONTENTS

RSX ELECTRIC ROD-STYLE ACTUATOR

ENDURANCE TECHNOLOGY℠

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)

HIGH POSITIONAL ACCURACY

SCREW ACCURACY		
Roller Nut	± 0.0102mm/300mm	*± 0.0004"/ft.*

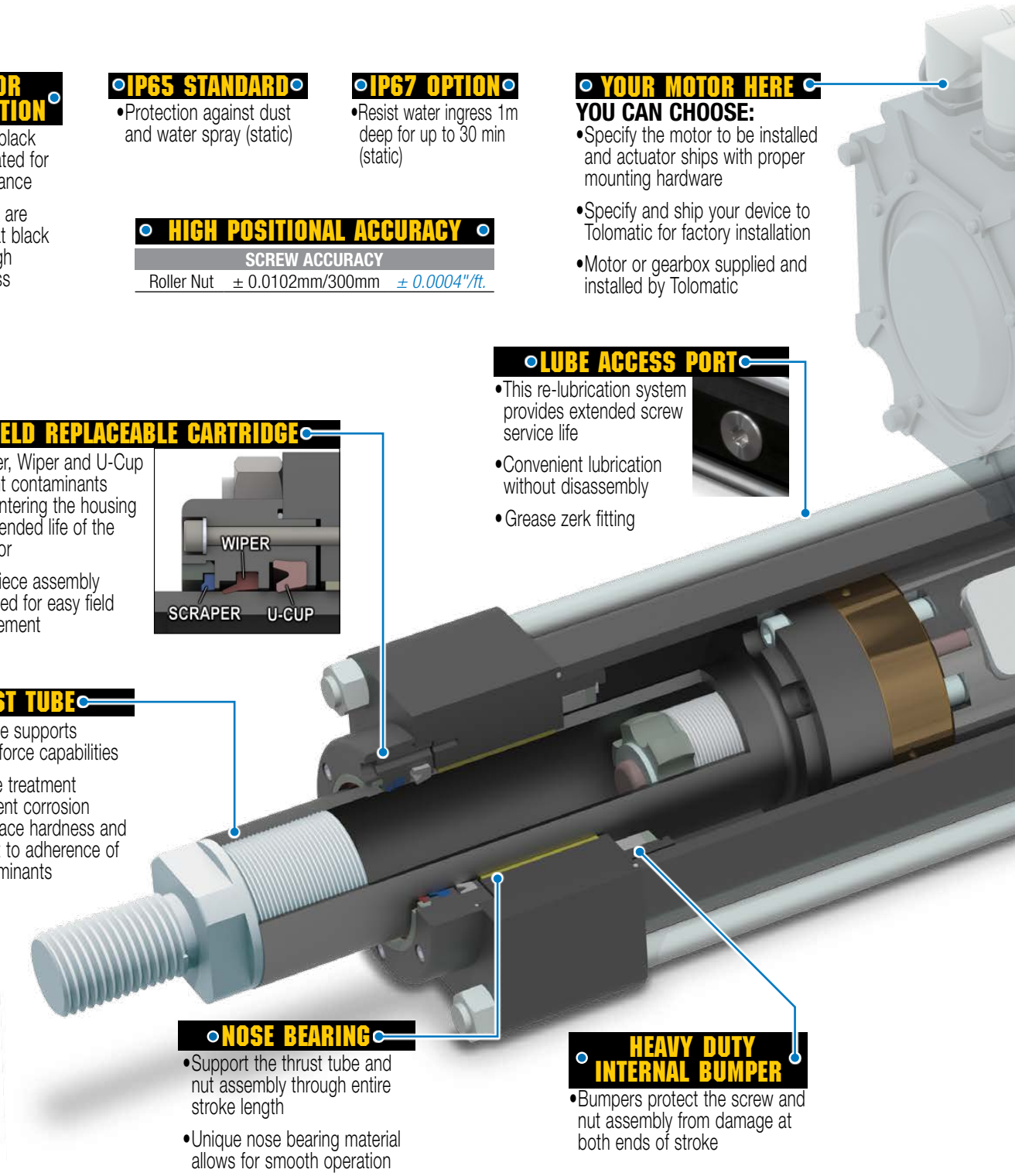
YOUR MOTOR HERE

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
- Motor or gearbox supplied and installed by Tolomatic

LUBE ACCESS PORT

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



FIELD REPLACEABLE CARTRIDGE

- Scraper, Wiper and U-Cup 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

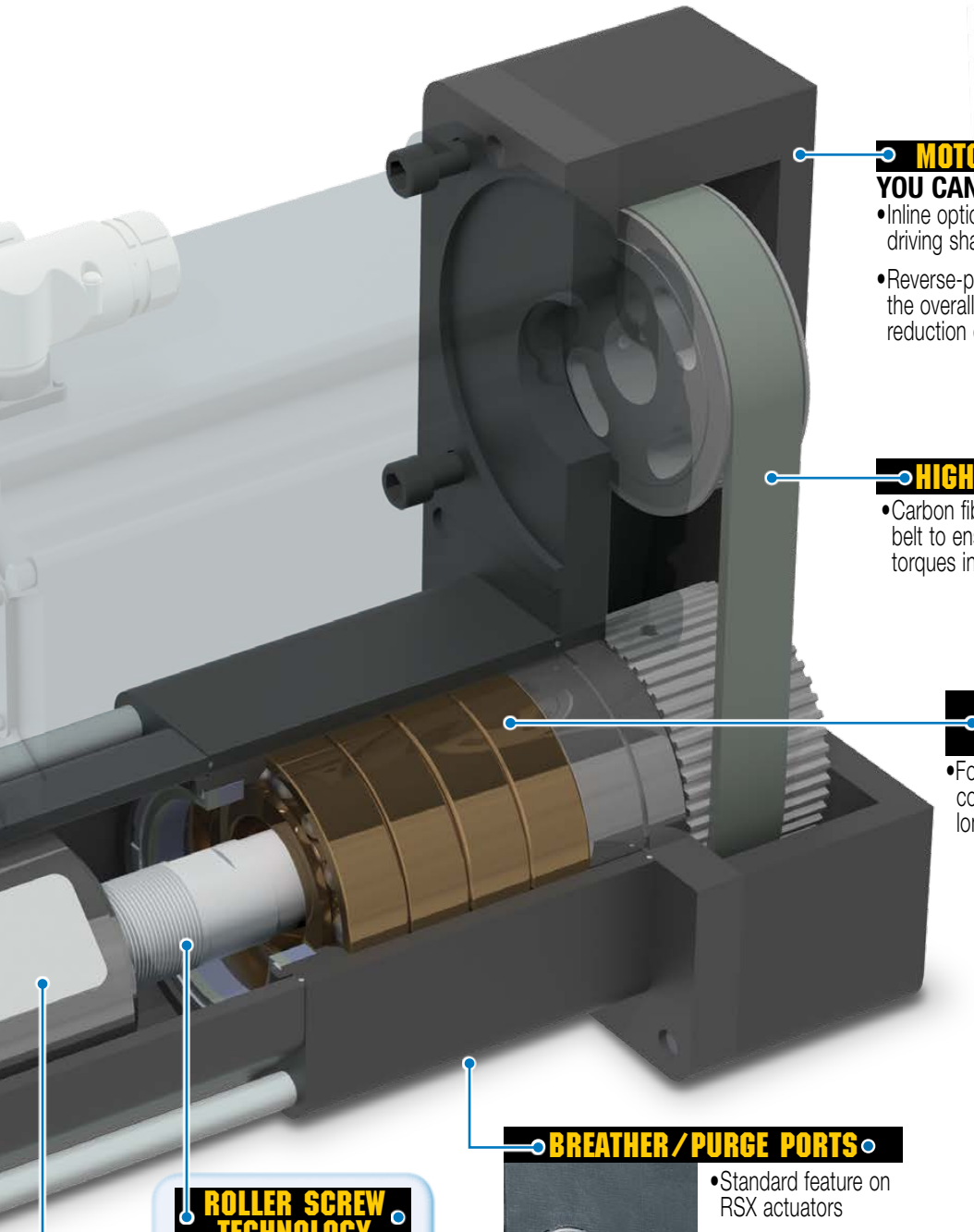
NOSE BEARING

- 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

...MAXIMUM DURABILITY



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 THRUST BEARING

- Four high thrust angular contact ball bearings for long life

ROLLER SCREW TECHNOLOGY

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

BREATHER / PURGE PORTS

- Standard feature on RSX actuators
- As seen in this view, located on both the bottom and 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.

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

SENSORS

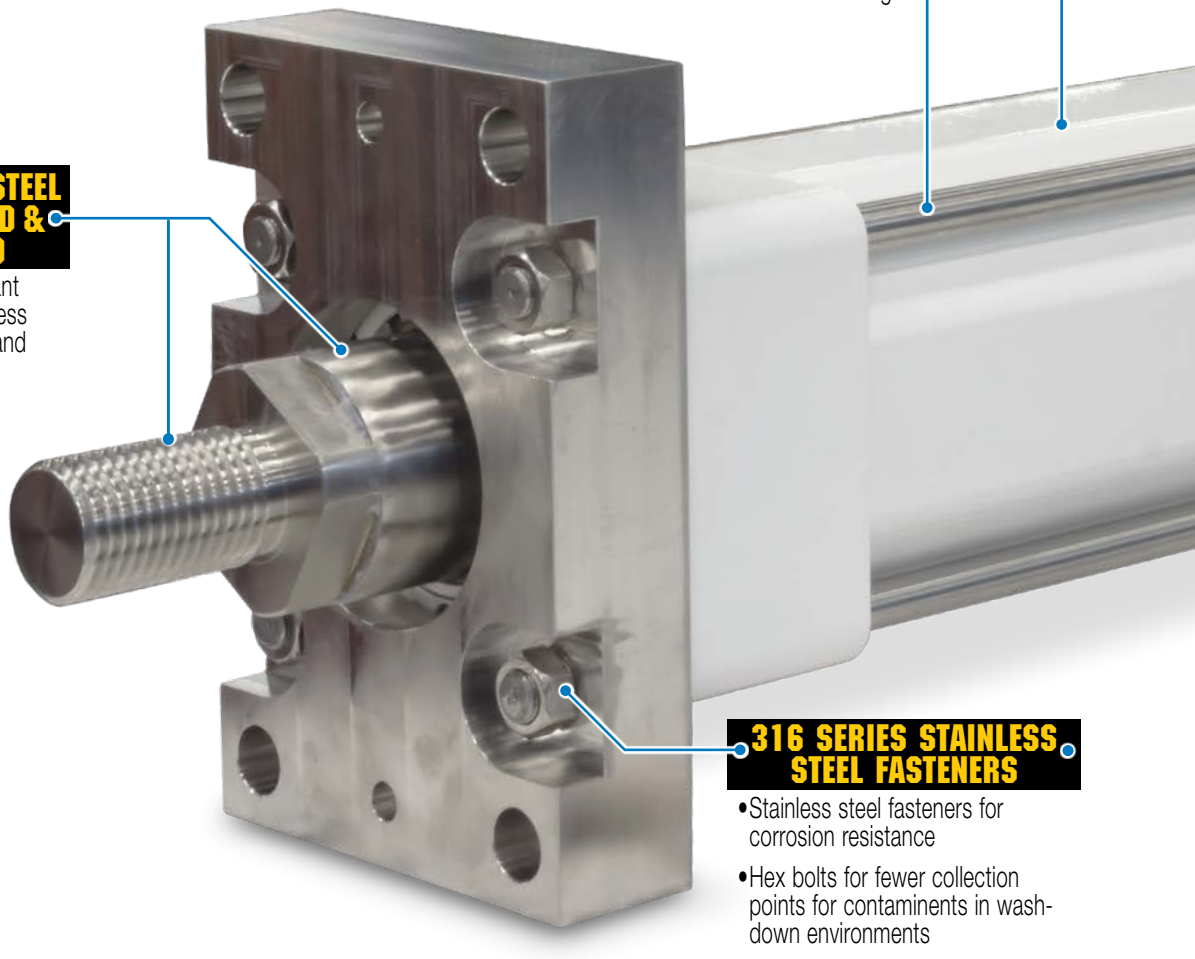
- Tie Rod Clip

FOOD GRADE RSX

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 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 contaminents in wash-down environments

...MAXIMUM DURABILITY

STAINLESS STEEL MOTOR MOUNTING PLATE

- 316 series stainless steel for corrosion resistance

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

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)

Specifications

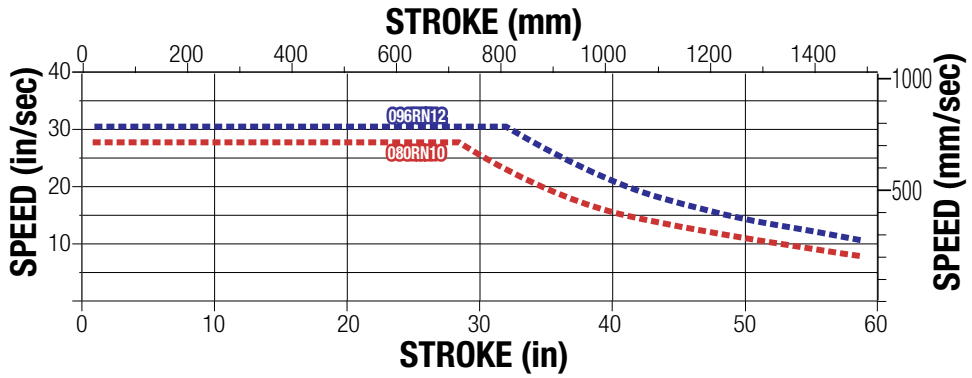
RSX SIZE	MIN. STROKE	*MAX. STROKE	SCREW CODE	SCREW LEAD	LEAD ACCURACY	BACKLASH	MAX. THRUST	MAX. SPEED	DYNAMIC LOAD RATING	DYNAMIC TORQUE TO OVERCOME FRICTION
	mm	mm		mm/rev	mm/300mm	mm	kN	mm/sec	kN	N-m
080	75	1500	RN10	10.00	0.01	0.030	80.07	701	173.1	6.21
096	75	1500	RN12	12.00	0.01	0.030	133.45	759	269.3	6.21
	in	in		turns/in	in/ft	in	lbf	in/sec	lbf	lbf-in
080	2.95	59.06	RN10	2.540	0.0004	0.0012	18,000	27.6	38,914	55.0
096	2.95	59.06	RN12	2.117	0.0004	0.0012	30,000	29.9	60,541	55.0

*Consult Tolomatic for longer strokes. Trunnion option reduces max. stroke of RSX096 by 60 mm (2.36")

RSX SIZE	SCREW CODE	INERTIA						WEIGHT					
		BASE ACTUATOR					PER UNIT	BASE ACTUATOR					PER UNIT
		kg-m² x 10⁴					kg-m² x 10⁴ per mm	kg					kg per mm
		LMI	RP1 ST	RP1HT	RP2 ST	RP2 HT		LMI	RP1 ST	RP1HT	RP2 ST	RP2 HT	
080	RN10	56.89	102.80		42.02		0.01772	35.16	40.81		40.77		0.03072
096	RN12	178.72	216.17	253.72	92.44	100.5	0.03804	65.60	73.13	75.23	73.60	74.11	0.04125
		lb-in²					lb-in² per in	lb					lb per in
080	RN10	19.44	35.13		14.36		0.154	77.51	89.96		89.88		1.72
096	RN12	61.07	73.87	86.70	31.59	34.19	0.330	144.63	161.22	165.86	162.27	163.38	2.31

TEMP. RANGE: Standard 10° to 40°C; Extended -20° to 60°C (Contact Tolomatic if operation in the Extended Range is required)
Standard 50° to 104°F; Extended -4° to 140°F (Contact Tolomatic if operation in the Extended Range is required)

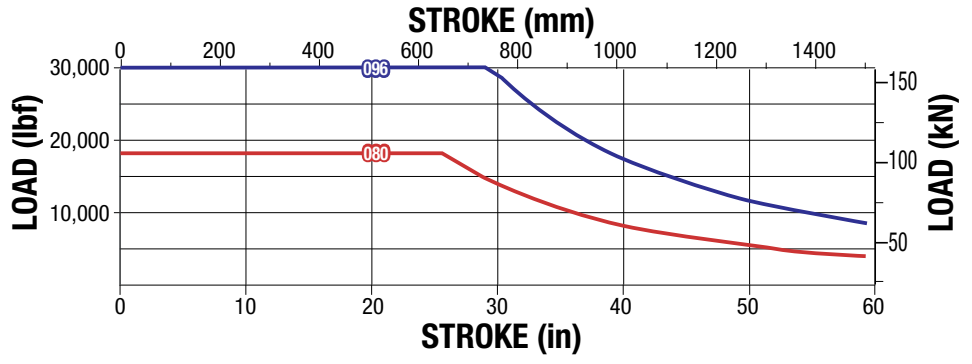
SIZE: ALL: CRITICAL SPEED CAPACITIES*



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

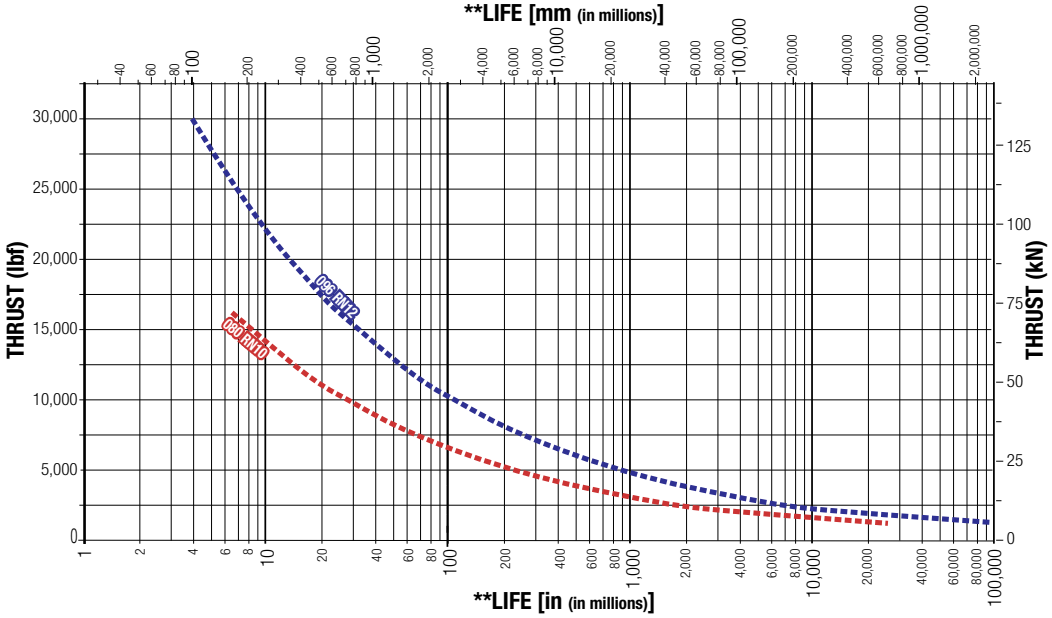
	mm	in
RSX080	68.1	2.68
RSX096	72.4	2.85

SIZE: ALL: SCREW BUCKLING LOAD*



RSX Extreme Force, Hydraulic Class Electric Actuator

SIZE: ALL: ROLLER SCREW LIFE GRAPH — PERFORMANCE



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

The underlying formula that defines this value is:

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

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

C = Dynamic load rating (lbf) or *(N)*
$\mathbf{P_e}$ = 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.*

Where:

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

$\mathbf{P_e}$ = Equivalent load (lbf) or *(N)*
$\mathbf{P_n}$ = Each increment at different load (lbf) or *(N)*
L = Total distanced traveled per cycle (extend + retract stroke) $[L = L_1 + L_2 + L_3 + L_n]$
$\mathbf{L_n}$ = Each increment of stroke at different load (in) or *(mm)*

CALCULATING RMS THRUST, RMS VELOCITY AND POWER LIMIT

Roller screw actuators have two different operating regions which must be sized: RMS and peak. Peak operation is the maximum speed and/or maximum thrust the actuator that does not factor in dwells. RMS operation is the root mean square calculation of the entire motion cycle including dwells (time at rest). It is extremely important to include all dwells (time at rest) in the RMS calculation. There are instances where peak and RMS specifications can be exceeded, but must be approved by Tolomatic. RMS Thrust, RMS Velocity and Power Limit are calculated using these equations:

$$T_{RMS} = \sqrt{\frac{\sum (T_i^2 \times t_i)}{\sum (t_i)}}$$

$$V_{RMS} = \sqrt{\frac{\sum (V_i^2 \times t_i)}{\sum (t_i)}}$$

$$P = T_{RMS} \times V_{RMS}$$

(Watts) (N) (m/sec)

Where:
$\mathbf{T_{RMS}}$ = RMS Thrust
$\mathbf{V_{RMS}}$ = RMS Velocity
$\mathbf{T_i}$ = Thrust during interval i
$\sum$ = sum
i = 1 to n
$\mathbf{V_i}$ = Average velocity during interval i
$\mathbf{t_i}$ = Time interval i
P = Power limit

NOTE: Denominator represents full cycle time including dwells. Do NOT include dwell times in the numerator.

Power Limit	080	096
	426 W	690 W

Use software at sizeit.tolomatic.com for fast, accurate actuator selection

LUBRICATION

RSX roller screw actuators require periodic re-lubrication to maintain optimal performance. Below are formulas to help determine lubrication interval. See parts sheets for formula definitions, complete instructions and examples.

STEP 1: $t_{BL} = 4500 \times (V_{RMS})^{-1.57}$

STEP 2: $K_T = K_{Co}\left(\frac{T_{PEAK}}{T_{MAX}}\right) - 0.15$

STEP 3: $t_L = t_{BL} \times K_T$

	080		096	
	RN10	RN20	RN12	RN24
K_{Co}	0.154	0.155	0.210	0.210

Re-lubricate with Tolomatic Grease into the grease zerk located on the roller nut housing.

Where:
$\mathbf{t_{BL}}$ = Basic Lubrication Interval *(hours)*
$\mathbf{V_{RMS}}$ = RMS Velocity *(in/sec)*
$\mathbf{K_T}$ = Thrust Correction Factor
$\mathbf{K_{Co}}$ = Screw Static Load Factor
$\mathbf{T_{PEAK}}$ = Actuator Peak Thrust Rating
$\mathbf{T_{MAX}}$ =Maximum Cycle Thrust
$\mathbf{t_L}$ = Lubrication Interval *(hours)*

	RSX080	RSX096
Quantity (g)	8.0 + (0.020 x Stroke^{mm})	9.5 + (0.025 x Stroke^{mm})
Quantity (oz)	0.28 + (0.018 x Stroke^{in})	0.34 + (0.022 x Stroke^{in})

Stroke^{mm} = Stroke length in millimeters Stroke^{in} = Stroke length in inches

In some applications oil may leak from the grease zerk. In contamination sensitive applications replace grease zerk with plug.

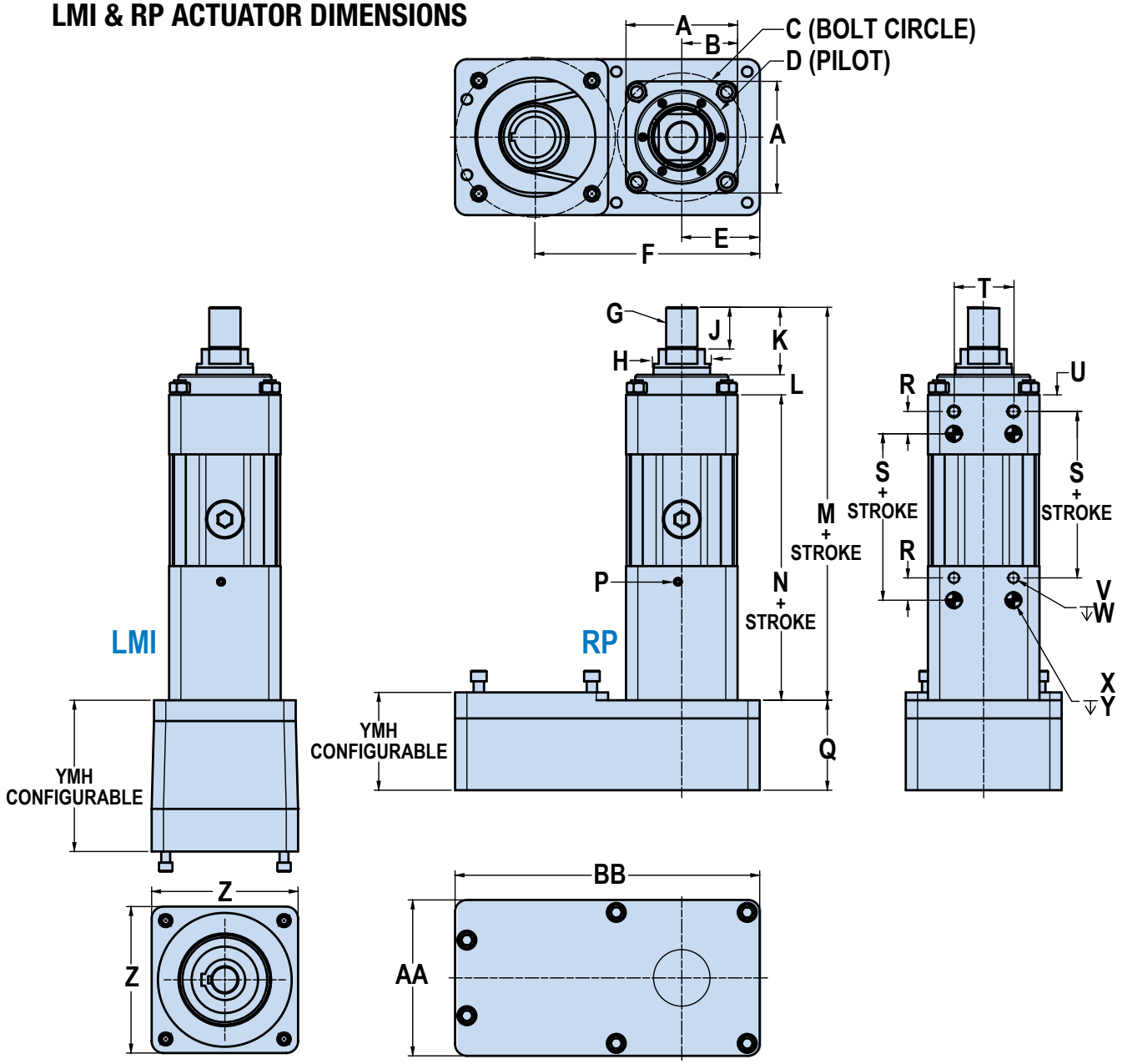
RSX Extreme Force, Hydraulic Class Electric Actuator

SIZE: **ALL**

3D CAD available at www.tolomatic.com
Always use configurated CAD solid model to determine critical dimensions

DIMENSIONS

LMI & RP ACTUATOR DIMENSIONS



	080	096
A	135.0	150.0
B	67.5	75.0
C	150.00	171.0
D	110.00 (+0.00) (-0.03)	125.00 (+0.00) (-0.03)
E	88.9	104.8
F	RP1	
	272.9	304.8
	RP2	
	271.1	302.3
G	STANDARD	
	M36 x 3.0-6g	M42 x 4.5-6g

	080	096
Hø	63.388 / 63.449	76.093 / 76.149
THREAD LENGTH		
J	60.0	69.9
FULL RETRACT		
K	95.0	104.8
L	27.0	27.0
M	379.7	601.1
N	352.7	469.2
P	RC 1/8 -28 X 38.1 DP (Plugged)	RC 1/8 -28 X 38.1 DP (Plugged)
Q	96.0	124.7
R	30.0	30.0

	080	096
S	210.9	282.4
T	70.0	80.0
U	18.0	22.3
V	M12 x 1.75-6H	M16 x 2.0-6H
W	↧18.0 (4)	↧20.0 (4)
X	16.025 16.012	20.025 20.013
Y	↧15.0 (4)	↧15.0 (4)
Z	152.4	196.9
AA	177.8	209.6
BB	35.6	409.6

Dimensions in millimeters

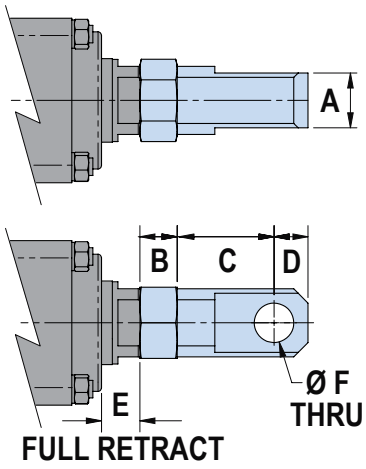
	080	096
A	*5.31*	*5.91*
B	*2.66*	*2.95*
C	*5.905*	*6.73*
D	*4.331 (+0.000) (-0.001)*	*4.921 (+0.000) (-0.001)*
E	*3.50*	*4.13*
F	RP1	
	10.74	*12.00*
	RP2	
	10.67	*11.90*
G	SR1 OPTION	
	1½-12 UN-2A	*1⅞-12 UN-2A*

	080	096
Hø	*2.4956/ 2.4980*	*2.9958/ 2.9980*
THREAD LENGTH		
J	*2.36*	*2.75*
FULL RETRACT		
K	*3.74*	*4.13*
L	*1.06*	*1.06*
M	*14.95*	*23.66*
N	*13.89*	*18.47*
Q	*3.78*	*4.91*
R	*1.18*	*1.18*
S	*8.30*	*11.12*
U	*0.71*	*0.88*
T	*2.76*	*3.15*

	080	096
V	M12 x 1.75-6H	M16 x 2.0-6H
W	↧*.71 (4)*	↧*.79 (4)*
X	*Ø.6309 Ø.6304*	*Ø.7884 Ø.7879*
Y	↧*.59 (4)*	↧*.59 (4)*
Z	*6.00*	*7.75*
AA	*7.00*	*8.25*
BB	*14.00*	*16.13*

Dimensions in inches

CLEVIS OPTION (CLV)



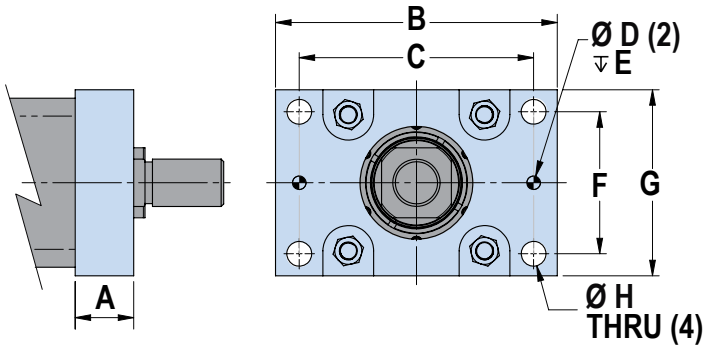
	080	096
A	40.00 39.59	50.00 49.59
B	29.0	34.0
C	75.0	88.3
D	25.0	31.0
E	35.0	35.0
F	28.05 28.00	36.06 36.00

Dimensions in millimeters

	080	096
A	*1.575* *1.559*	*1.969* *1.953*
B	*1.14*	*1.34*
C	*2.95*	*3.48*
D	*0.98*	*1.22*
E	*1.38*	*1.38*
F	*1.104* *1.102*	*1.420* *1.417*

Dimensions in inches

FRONT FLANGE OPTION (FFG)



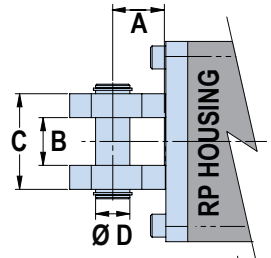
	080	096
A	42.0	52.0
B	225.0	250.0
C	180.0	208.0
D	10.013 10.000	12.025 12.013
E	12.0	12.0
F	100.0	126.0
G	150.0	165.0
H	18.0	22.0

Dimensions in millimeters

	080	096
A	*1.65*	*2.05*
B	*8.86*	*9.84*
C	*7.09*	*8.19*
D	*0.3942* *0.3937*	*0.4734* *0.4729*
E	*0.47*	*0.47*
F	*3.94*	*4.96*
G	*5.91*	*6.50*
H	*0.71*	*0.87*

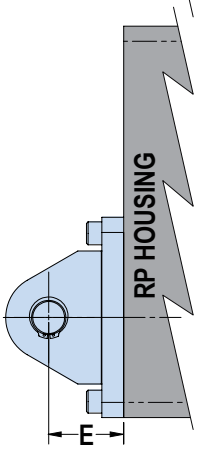
Dimensions in inches

REAR CLEVIS OPTION (PCD)



	080	096
A	40.5	54.0
B	40.69 40.31	50.70 50.32
C	82.3	100.3
D	27.978 27.940	35.980 35.940
E	63.4	78.4

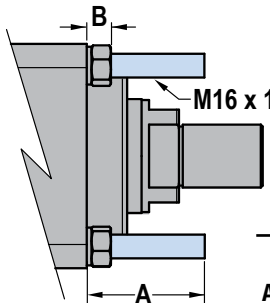
Dimensions in millimeters



	080	096
A	*1.60*	*2.13*
B	*1.602* *1.587*	*1.996* *1.981*
C	*3.24*	*3.95*
D	*1.1015* *1.1000*	*1.4165* *1.4150*
E	*2.50*	*3.09*

Dimensions in inches

EXTENDED TIE ROD OPTION (XT)



			080	096
A	MIN	mm	50.0	50.0
		in	*1.97*	*1.97*
	MAX	mm	100.0	100.0
		in	*3.94*	*3.94*
B		mm	13.3	15.3
		in	*0.52*	*0.60*

A = Customer Specified Length

IMPERIAL THREAD OPTION (SRI)

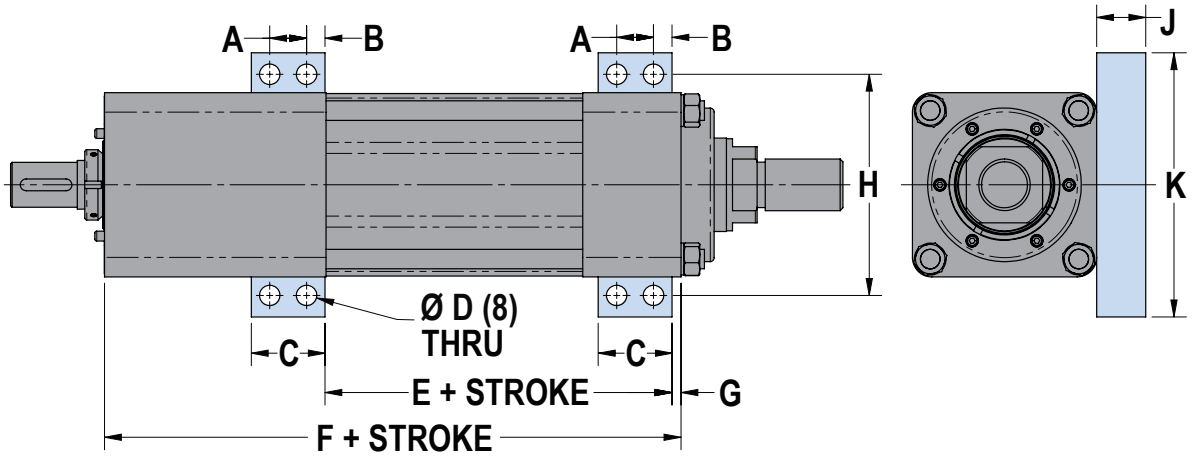
RSX Extreme Force, Hydraulic Class Electric Actuator

SIZE: **ALL**

3D CAD available at www.tolomatic.com
Always use configurated CAD solid model to determine critical dimensions

DIMENSIONS

MOUNTING PLATE OPTION (MP2) DIMENSIONS



	080	096
A	30.0	30.0
B	12.5	15.0
C	55.0	60.0
D	12.7	16.7
E	210.9	282.4
F	352.7	469.2
G	5.5	7.3

	080	096
H	170.0	180.0
J	31.4	40.0
K	200.0	215.0

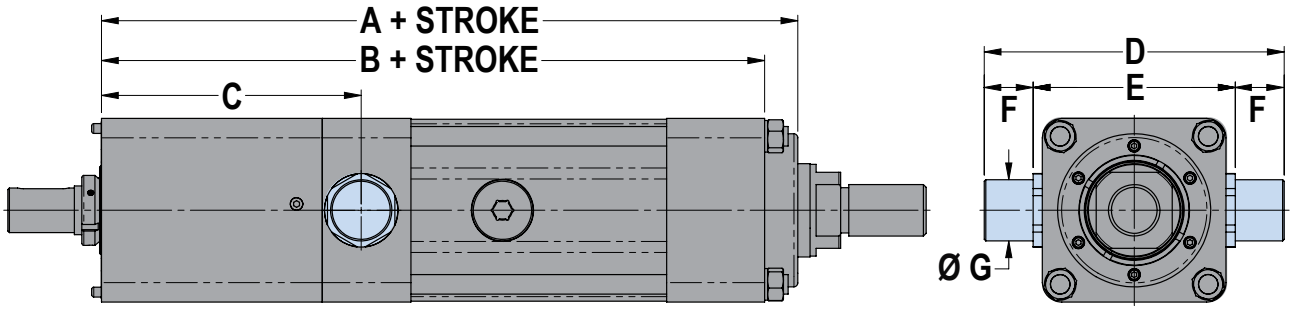
Dimensions in millimeters

	080	096
A	*1.18*	*1.18*
B	*0.49*	*0.59*
C	*2.17*	*2.36*
D	*0.50*	*0.66*
E	*8.30*	*11.12*
F	*13.89*	*18.47*
G	*0.22*	*0.29*

	080	096
H	*6.69*	*7.09*
J	*1.24*	*1.57*
K	*7.87*	*8.46*

Dimensions in inches

TRUNNION OPTION (TRR) DIMENSIONS



	080	096
A	447.8	568.6
B	420.8	541.6
C	171.5	212.1
D	214.0	245.0
E	150.0	165.0

	080	096
F	32.0	40.0
G	39.98 39.95	49.98 49.94

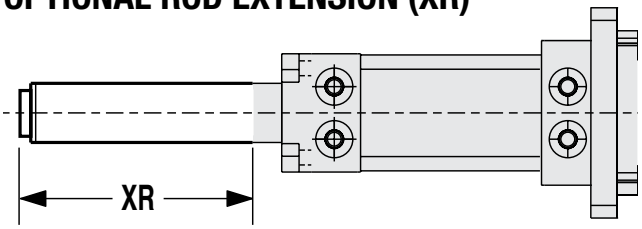
Dimensions in millimeters

	080	096
A	*17.63*	*22.39*
B	*16.57*	*21.32*
C	*6.75*	*8.35*
D	*8.43*	*9.65*
E	*5.91*	*6.50*

	080	096
F	*1.26*	*1.57*
G	*1.574* *1.573*	*1.968* *1.966*

Dimensions in inches

OPTIONAL ROD EXTENSION (XR)



In **vertical applications only,** 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: the XR dimension in the configurator string (extension + stroke) should not exceed the maximum stroke of the specified actuator. Consult Tolomatic for extensions greater than the maximum stroke length.

	MAXIMUM STROKE RSX		
SIZE		mm	*in*
080	LMI	1500	*59*
080	RP	1500	*59*
096	LMI	1500	*59*
096	RP	1500	*59*

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.

RoHS COMPLIANT CE

	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	RY	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
	RK	QD*		Tolomatic 81009082									
	NY	5m	SPST Normally Closed	—	Yellow	5 - 110 AC/DC							
	NK	QD*		Tolomatic 81009084									
SOLID STATE	TY	5m	PNP (Sourcing) Normally Open	Green	Yellow	10 - 30 VDC	**3.0	100mA	20 mA @ 24V	2.0 V max.	0.05 mA max.		
	TK	QD*		Tolomatic 81009088									
	KY	5m	NPN (Sinking) Normally Open	Green	Red								
	KK	QD*		Tolomatic 81009090									
	PY	5m	PNP (Sourcing) Normally Closed	Green	Yellow								
	PK	QD*		Tolomatic 81009092									
	HY	5m	NPN (Sinking) Normally Closed	Green	Red								
	HK	QD*		Tolomatic 81009094									

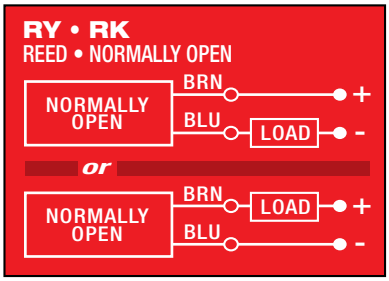
*QD = Quick-disconnect Enclosure classification IEC 529 IP67 (NEMA 6) CABLES: Robotic grade, oil resistant polyurethane jacket, PVC insulation

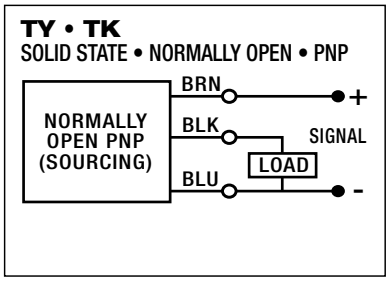
⚠ **WARNING: Do not exceed power rating (Watt = Voltage x Amperage). Permanent damage to sensor will occur.

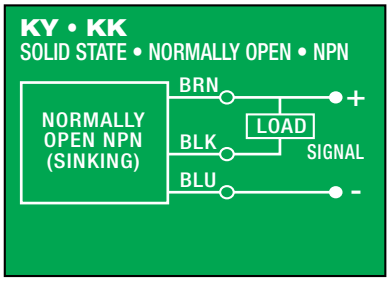
SWITCH INSTALLATION

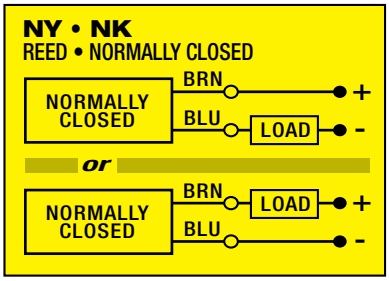
Place switch bracket onto any one of the four tie rods that run the length of the extruded tube. Insert the switch with set screw and the word "Tolomatic" facing up and slide into the mating slot on the bracket. Position the bracket with the switch to the exact location desired, with the bracket tight 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.

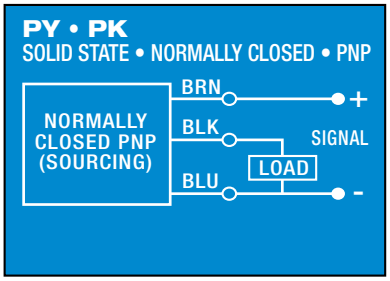
WIRING DIAGRAMS

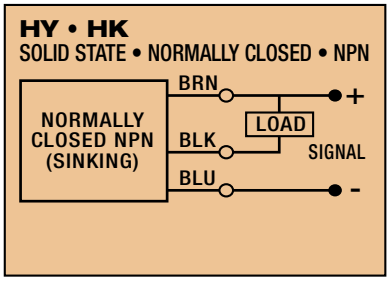


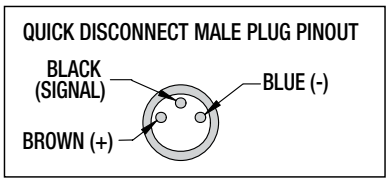


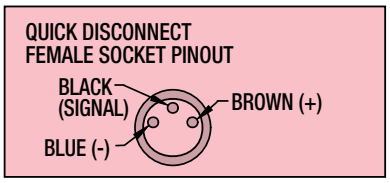






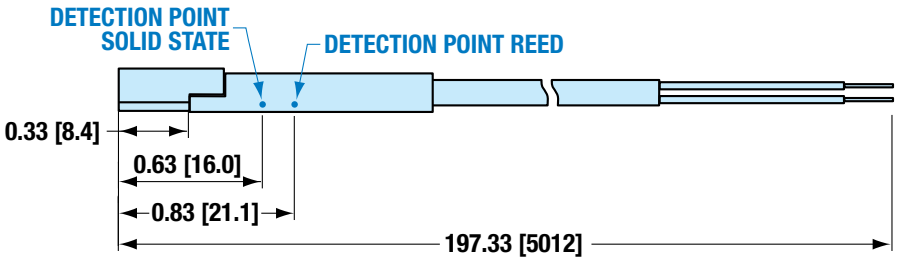




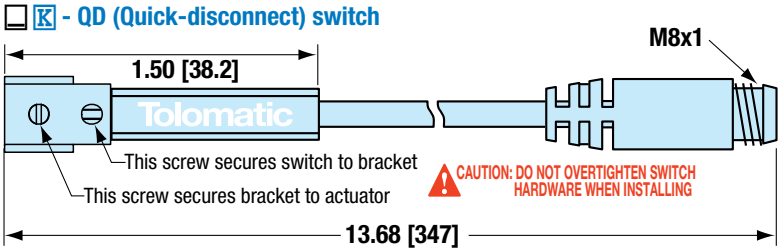


SWITCH DIMENSIONS

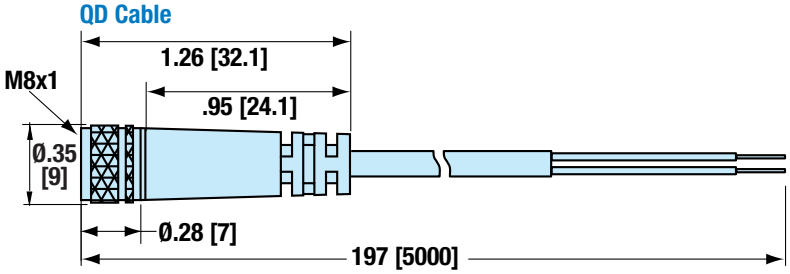
☐ Y - direct connect



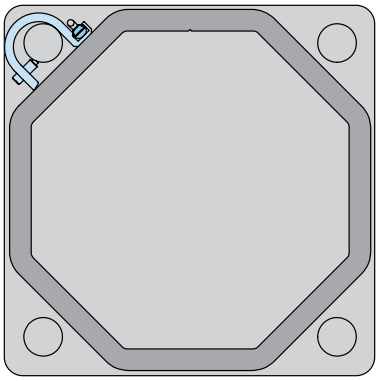
☐ K - QD (Quick-disconnect) switch



QD Cable



SWITCH MOUNTING



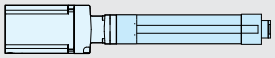
The switch bracket and switch does not extend beyond the profile of the RSX heads.

APPLICATION DATA WORKSHEET

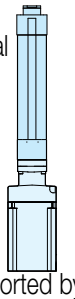
Fill in known data. Not all information is required for all applications

ORIENTATION

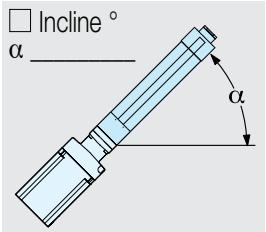
☐ RSX ☐ Horizontal



☐ Vertical



☐ Incline °
α _____



☐ 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	RETRACT
LOAD _____	**LOAD** _____
☐ lb. (U.S. Standard) ☐ kg. (Metric)	☐ lb. (U.S. Standard) ☐ kg. (Metric)
FORCE _____	**FORCE** _____
☐ lbf. (U.S. Standard) ☐ N (Metric)	☐ lbf. (U.S. Standard) ☐ N (Metric)

STROKE LENGTH _____

☐ inch (US Standard) ☐ millimeters (Metric)

PRECISION

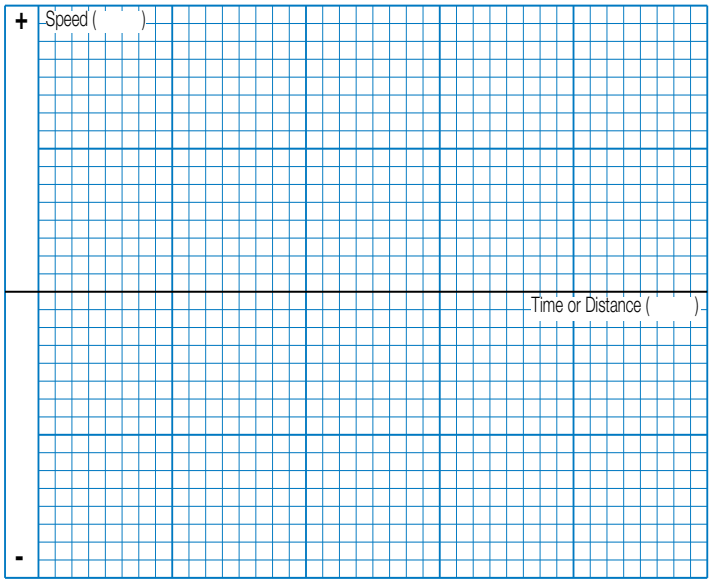
Repeatability _____
☐ inch ☐ millimeters

OPERATING ENVIRONMENT

Temperature, Contamination, Water, etc.

_____
_____
_____

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.

_____
_____
_____

STOP **USE THE TOLOMATIC SIZING AND SELECTION SOFTWARE AVAILABLE ON-LINE AT 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**

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 thrust in each of its segments.

2 SELECT ACTUATOR SIZE AND SCREW TYPE

Based on the required velocities and thrust select an actuator size and type and lead of screw drive.

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 thrust 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

When a roller screw is selected, calculate the application's required peak thrust and peak velocity and compare to the graphs. The selection must satisfy the application's peak requirements.

6 COMPARE APPLICATION'S CONTINUOUS OPERATION PARAMETERS TO CONTINUOUS OPERATION CAPACITY (CONTINUOUS DUTY REGION) OF SELECTED ACTUATOR

When a roller screw is selected, calculate the application's continuous operation thrust and velocity and compare to the graph. The selection must satisfy the application's peak requirements.

7 CALCULATE LUBRICATION INTERVAL

Calculate the recommended lubrication interval.
See page RSX_7 for complete lubrication information.

8 TEMPERATURE CONSIDERATIONS

If the application's ambient temperature lies outside of the allowed range -40° to +70°C (-40° to +158°F), contact the factory. Note that in aggressive applications where roller screw is used, outside temperature of the actuator's body can approach 82°C (180°F), and adequate clearance to avoid overheating of other system components should be allowed.

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 AND A CONTROLLER

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. Select a controller.

11 SELECT A MOTOR-ACTUATOR CONFIGURATION AND SENSORS IF REQUIRED

Select an inline or a reverse-parallel motor configuration. Select mounting and rod end options. Select position sensors (if required). 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 ROD END OPTIONS AND MOUNTING OPTIONS

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

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

RSX Extreme Force, Hydraulic Class Electric Actuator

Ordering

ACTUATOR

RSX 096 RN12 SM4500 RP1 HT1

OPTIONS

FFG CLV XR10 KK2 YM_____

MODEL & MOUNTING

RSX	Rod-Style Screw-Drive Actuator,

SIZE

080, 096

NUT/SCREW

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

STROKE LENGTH

SM____ Enter desired stroke length in millimeters

SIZE	MIN. STROKE mm	MIN. STROKE *in*	MAX. STROKE mm	MAX. STROKE *in*
080	75	*2.95*	1500	*59.06*
096	75	*2.95*	1500	*59.06*

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

TRUNNION MOUNT

TRR Trunnion mount

NOTE: Trunnion mount is not available for field retrofit, contact Tolomatic for details

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 all codes listed are compatible with all options. Contact Tolomatic with any questions.

ROD END

Externally threaded rod end is standard

CLV	Clevis Rod End
SR1	Imperial Thread

ROD EXTENSION

XR____ Enter desired rod extension in millimeters

For vertical applications only.

NOTE: The XR extension + stroke should not exceed the max. stroke of the specified actuator. (See MAX. STROKE table) Consult Tolomatic for extensions greater than the max. stroke length.

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	RK		
		Closed	no	NY		
			yes	NK		
SOLID STATE	PNP	Open	no	TY		
			yes	TK		
	NPN	Open	no	KY		
			yes	KK		
	PNP	Closed	no	PY		
			yes	PK		
	NPN	Closed	no	HY		
			yes	HK		

YOUR MOTOR HERE

YM_____ Motor mount for non-Tolomatic motor. www.tolomatic.com

Contact Tolomatic for white paint option lead time and application review.

The Tolomatic Difference Expect More From the Industry Leader:

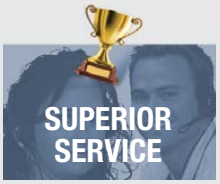
Tolomatic designs and builds the best standard products, modified products & unique custom products for your challenging applications.

The fastest delivery of catalog products... Electric products are built-to-order in 15 or 20 days; Pneumatic & Power Transmission products in 5 days.

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

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

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



Our people make the difference! Expect prompt, courteous replies to all of your application and product questions.

Also Consider These Other Tolomatic Products:

Electric Products

Rod & Guided Rod Style Actuators, High Thrust 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®; Disc Cone Clutch; Caliper Disc Brakes

"Foldout" Brochure #9900-9076

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