

ERD ELECTRIC ROD-STYLE ACTUATOR

ENDURANCE TECHNOLOGYSM

PATENT PENDING



LINEAR SOLUTIONS MADE EASY

ERD Electric Rod-Style Actuator






WHAT IS THE ERD?

The ERD is an economical rod-style electric actuator designed as an alternate to non-repairable pneumatic cylinders and an option for automating manual processes. The ERD is compatible with many NEMA standard stepper and servo motors to create a flexible, powerful electric actuator solution.



TOLOMATIC'S ELECTRIC ROD-STYLE ACTUATORS

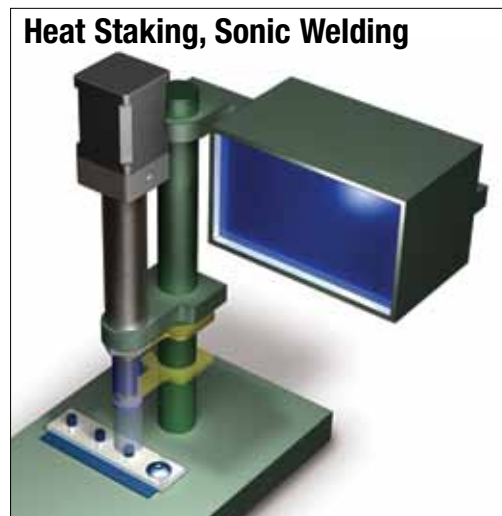
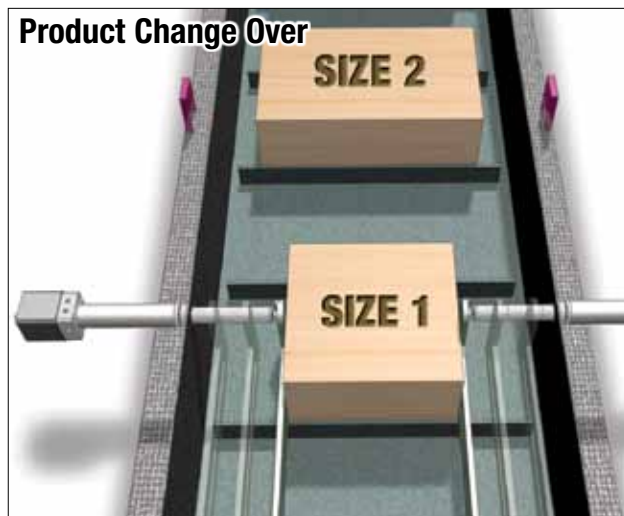
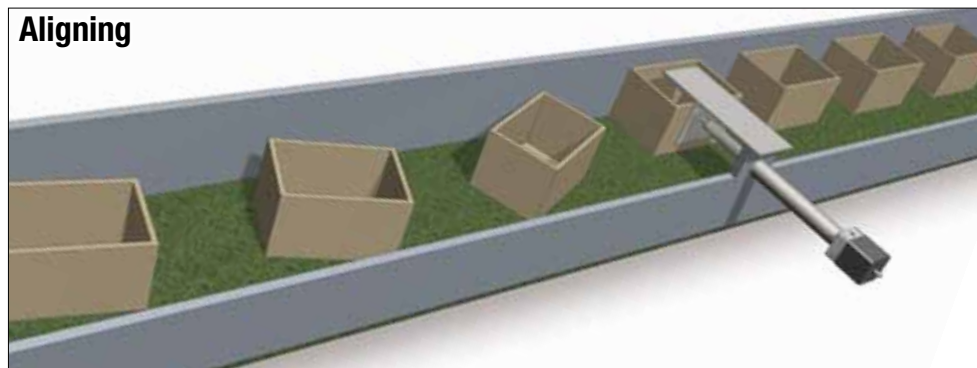
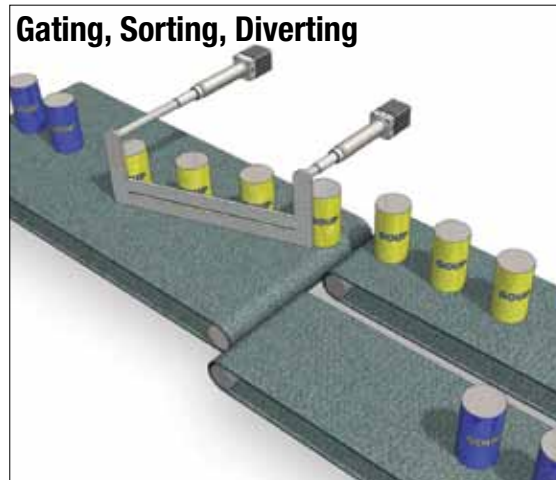
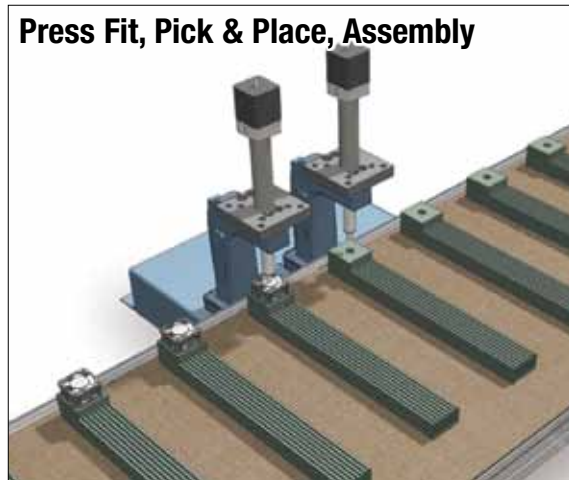


	ERD	ICR SmartActuator™	RSA	GSA	IMA
					
	Rod-Style Actuator	Integrated Control Rod-Style Actuator	Rod-Style Actuator	Guided Rod-Style Actuator	Integrated Motor Rod-Style Actuator
Thrust up to:	75 lbf [334 N]	720 lbf [3202.7 N]	7,000 lbf [31,138 N]	2,700 lbf [12,010 N]	3,300 lbf [14,679 N]
Speed up to:	40 in/sec [1016 mm/sec]	25 in/sec [635 mm/sec]	123 in/sec [3,124 mm/sec]	123 in/sec [3,124 mm/sec]	23 in/sec [584 mm/sec]
Stroke Length up to:	12 in [305 mm]	24 in [609 mm]	60 in [1,524 mm]	36 in [914 mm]	18 in [457 mm]
Screw/Nut Type	Solid	Ball	Solid, Ball & Roller	Solid & Ball	Ball & Roller
<i>For complete information see www.tolomatic.com or literature number:</i>					
Literature Number:	2190-4000	2100-4000	3600-4609	3600-4609	2700-4000

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

ERD Electric Rod-Style Actuator

Applications



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Other Applications:

- Aligning
 - Animation
 - Assembly
 - Automatic tool changers
 - Automotive
 - Converting
 - Conveyors
 - Diverting
 - Fillers
- Formers
 - Gating
 - Heat staking
 - Laser positioning
 - Material handling systems
 - Medical equipment
 - Motion simulators
 - Open/close doors
 - Packaging equipment
- Parts clamping
 - Patient lifts
 - Pick & place
 - Plate positioning change
 - Press fit
 - Product changeover
 - Product test simulations
 - Robot manipulator arms
 - Sonic welding
- Sorting
 - Table positioning
 - Tension control
 - Test stands
 - Volumetric pumps
 - Web guidance
 - Wire winding

ERD ELECTRIC ROD-STYLE ACTUATOR

ENDURANCE TECHNOLOGYSM

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

**5 DAYS
BUILT-TO-ORDER**

PATENT PENDING

• SCREW / NUT TECHNOLOGY •

- Solid nut of engineered resins offers quiet performance at low cost



• THREADED NOSE MOUNT WITH JAM NUT

- Metric threads
- Convenient mounting for many applications



• MALE THREADED ROD END

- Standard metric threads
- Compatible with many commercially available metric rod end accessories



• NOSE BEARING

- Engineered resins for smooth operation
- Provides critical support of thrust rod

• STAINLESS STEEL THRUST TUBE


- Stainless steel thrust tube provides high rigidity and corrosion resistance

STAINLESS STEEL MAIN TUBE

- Stainless steel main tube provides high rigidity and corrosion resistance

NEMA MOTOR MOUNT

- ERD06: NEMA11
- ERD10: NEMA17
- ERD15: NEMA23

 Limitations to motor shaft size apply (see page 9)

OVERSIZED MAIN BEARING

- Oversized for long life
- Accommodates high thrust load

INTERNAL MAGNET

- This standard feature accommodates reed and solid state switches anywhere on the main tube

LEAD SCREW

- High performance steel, proven through years of use in Tolomatic actuators
- Three leads available in each size to maximize thrust or speed

OPTIONS



• TRUNNION MOUNT*

For applications that require pivoting
**Install by Tolomatic*



• FOOT MOUNT

Convenient, flexible mounting option



• FRONT FLANGE MOUNT

Convenient mounting option



• SWITCHES

Choose from: Reed, Solid State PNP or NPN, all available in normally open



NOTE: All* options are shipped together with the actuator but are not installed by Tolomatic. (*Trunnion Mount installed by Tolomatic)

ERD Electric Rod-Style Actuator

SIZE: ALL

SPECIFICATIONS

SPECIFICATIONS (US standard measurement)

ERD SIZE	SCREW DIA. in	MAXIMUM STROKE* in	SCREW CODE	LEAD in/rev	LEAD ACCURACY in/ft	MAXIMUM THRUST* lbf	INERTIA		WEIGHT	
							Base	Per Inch	Base	Per Inch
							lb-in ²	lb-in ²	lb	lb
06	0.250	8	SN02	0.500	0.005	20	0.0018	0.0001	0.263	0.035
			SN04	0.250						
			SN16	0.063						
10	0.375	10	SN01	1.000	0.007	40	0.0022	0.0006	0.411	0.069
			SN02	0.500						
			SN05	0.200						
15	0.500	12	SN01	1.000	0.006	75	0.0104	0.0017	1.079	0.126
			SN02	0.500	0.005					
			SN05	0.200	0.006					

SPECIFICATIONS (metric measurement)

ERD SIZE	SCREW DIA. mm	MAXIMUM STROKE* mm	SCREW CODE	LEAD mm/rev	LEAD ACCURACY mm/300mm	MAXIMUM THRUST* N	INERTIA		WEIGHT	
							Base	Per Inch	Base	Per Inch
							kg-m ² x 10 ⁻⁶	kg-m ² x 10 ⁻⁶	kg	kg
06	6.35	203.2	SN02	12.7	0.13	89	0.53	0.03	0.119	0.016
			SN04	6.35						
			SN16	1.60						
10	9.53	254.0	SN01	25.4	0.18	188	0.64	0.18	0.186	0.031
			SN02	12.7						
			SN05	5.08						
15	12.70	304.8	SN01	25.4	0.15	334	3.04	0.50	0.489	0.057
			SN02	12.7	0.13					
			SN05	5.08	0.15					

Temperature range	40° to 130° F (4.4° to 54.4° C)
IP rating	40 (static)

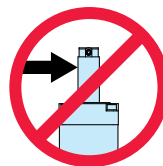
***Longer stroke length modification available upon request,**

SIDE LOAD CONSIDERATIONS

The ERD rod-style actuator is not meant to be used in applications where side loading occurs.

Loads must be guided and supported. Loads should be aligned with the line of motion of the thrust rod.

Side loading will affect the life of the actuator.

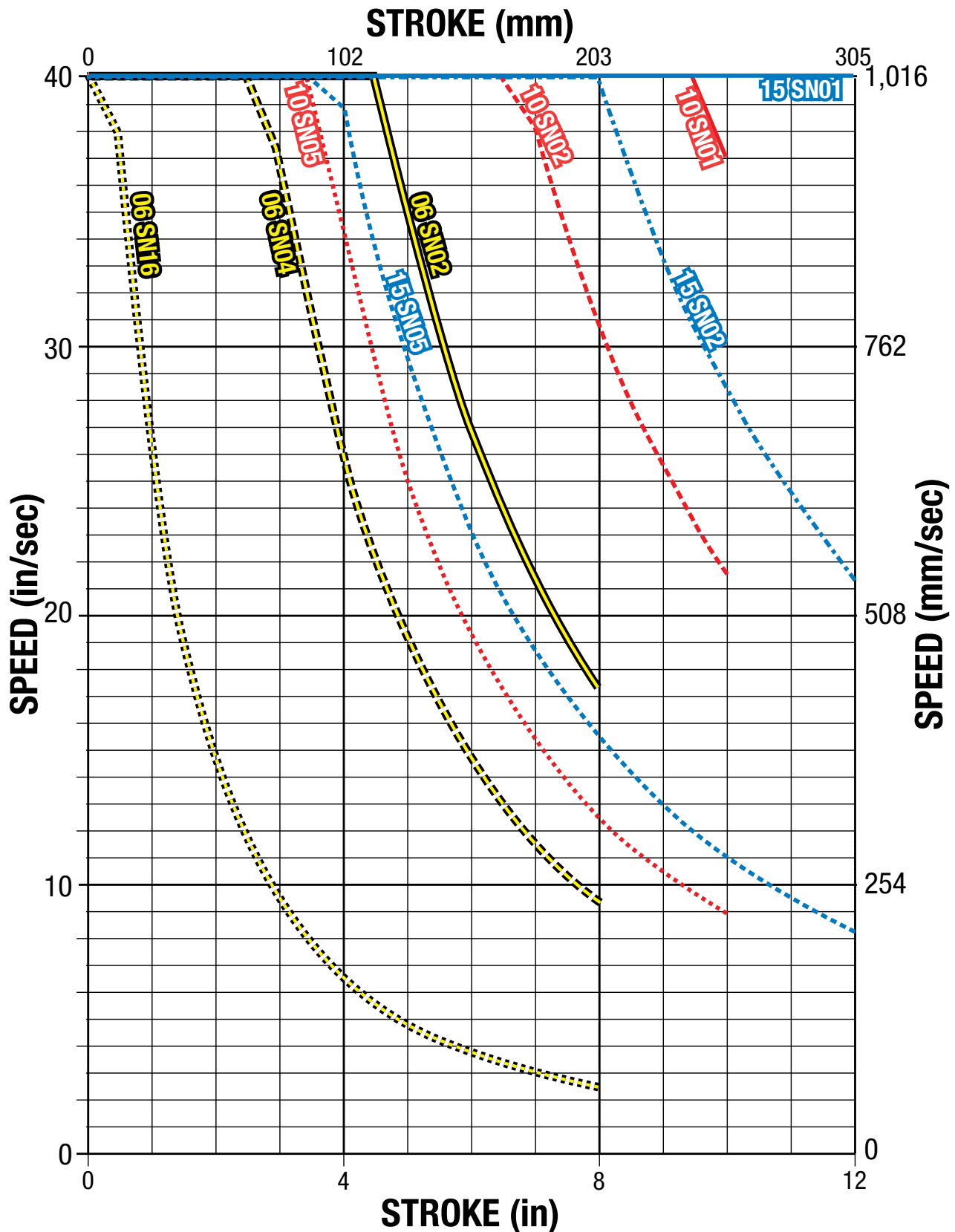


ERD Electric Rod-Style Actuator

SIZE: ALL

PERFORMANCE

ACME SCREW/NUT CRITICAL SPEED CAPACITIES

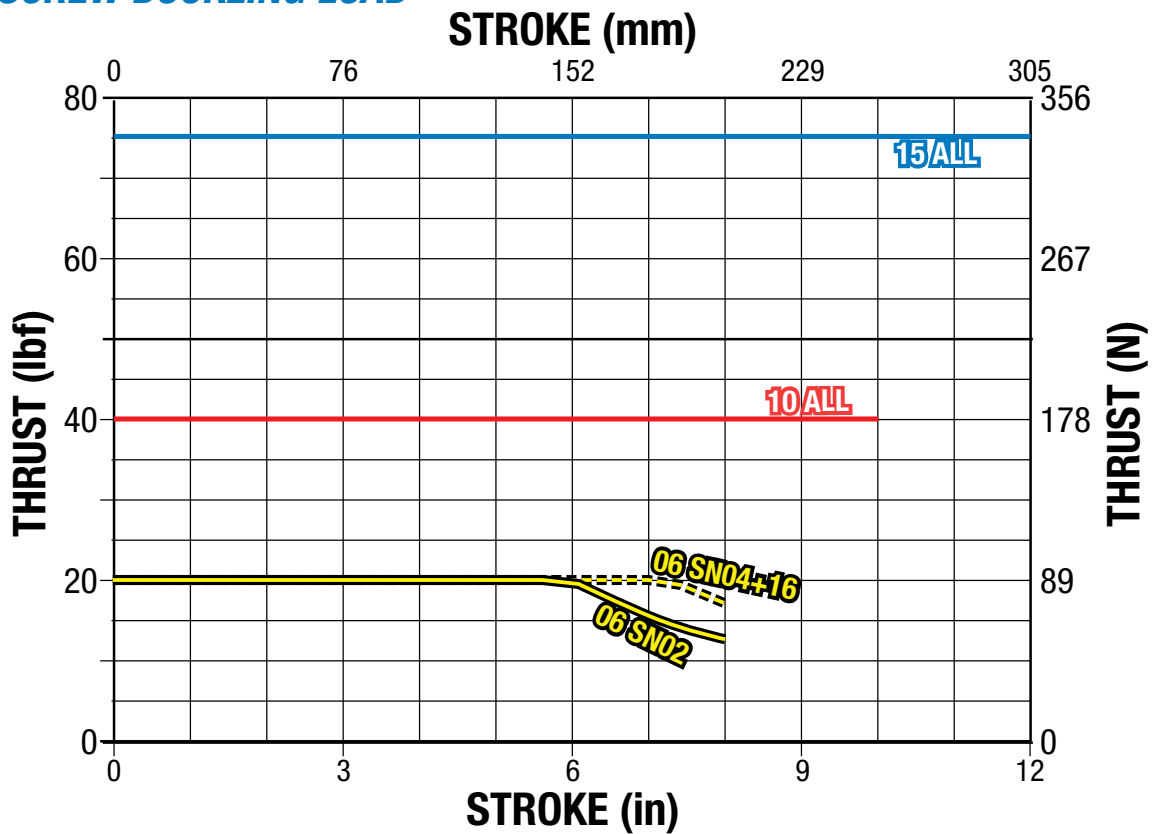


ERD Electric Rod-Style Actuator

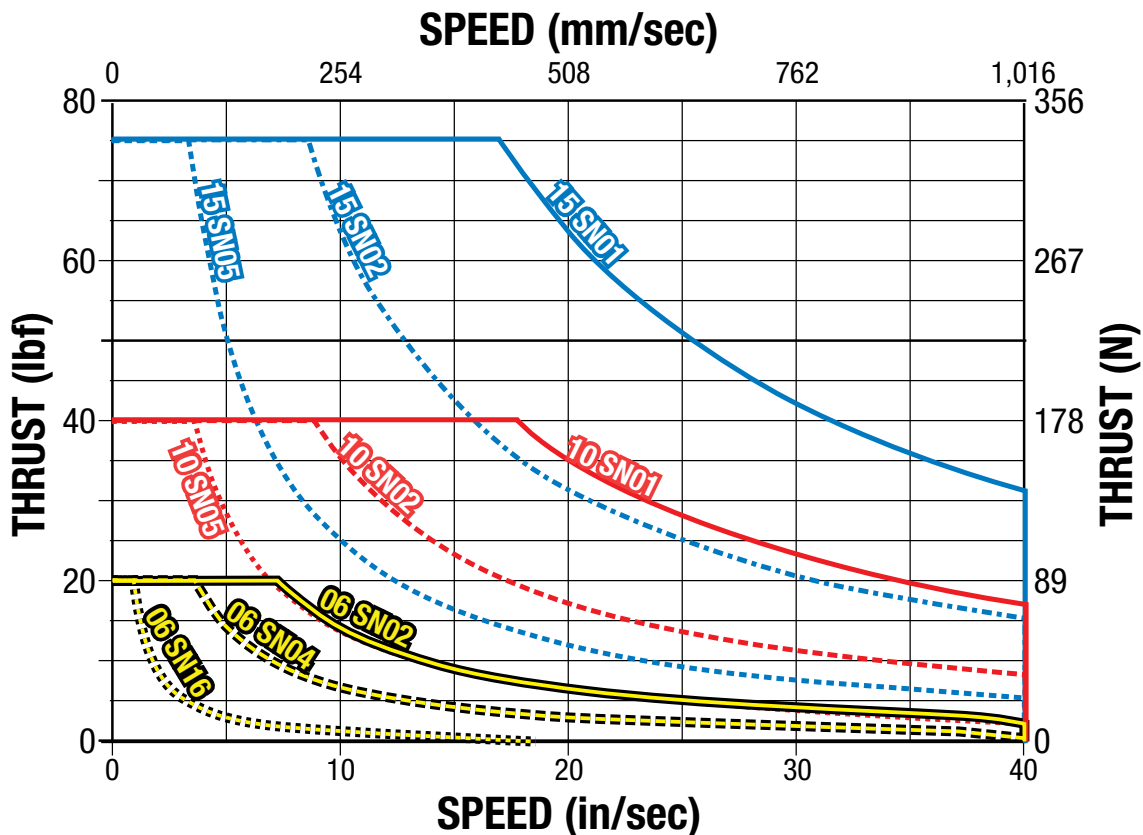
SIZE: ALL

PERFORMANCE

SCREW BUCKLING LOAD



PV LIMITS (Pressure Velocity of Acme Nut)

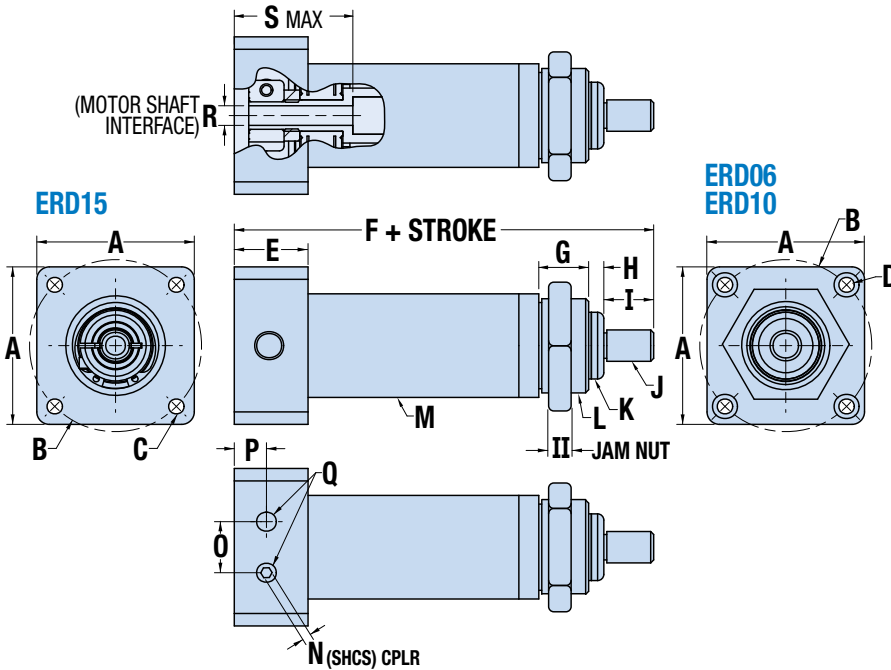


ERD Electric Rod-Style Actuator

SIZE: **ALL**

DIMENSIONS  3D CAD available at www.tolomatic.com

ACTUATOR



		ERD06	ERD10	ERD15
A	in	1.125	1.580	2.220
	mm	28.58	40.13	56.39
B	in	Ø1.287	Ø1.725	Ø2.625
	mm	Ø32.69	Ø43.82	Ø66.68
C	in	-	-	-
	mm	-	-	M4 x 0.8


		ERD06	ERD10	ERD15
D	in	0.136	0.154	-
	mm	Ø3.45	Ø3.91	-
E	in	1.400	0.740	0.850
	mm	35.56	18.80	21.59
F	in	3.88	4.20	5.40
	mm	98.5	102.3	137.2

		ERD06	ERD10	ERD15	
G	in	0.500	0.500	0.600	
	mm	12.70	12.70	15.24	
H	in	0.153	0.153	0.153	
	mm	3.89	3.89	3.89	
I	in	0.375	0.500	0.750	
	mm	9.53	12.70	19.05	
J	in	-	-	-	
	mm	M6 x 1.0	M8 x 1.25	M12 x 1.75	
K	in	Ø.443	Ø.669	Ø1.041	
	mm	Ø11.25	Ø17.00	Ø26.40	
L	in	-	-	-	
	mm	M16 x 1.5	M24 x 1.5	M34 x 1.5	
II	in	0.236	0.236	0.315	
	mm	6.00	6.00	8.00	
M	in	0.669	Ø1.040	Ø1.638	
	mm	Ø17.00	Ø26.42	Ø41.61	
N	in	0.098	0.098	0.098	
	mm	2.50	2.50	2.50	
O	in	0.512	0.512	0.512	
	mm	13.00	13.00	13.00	
P	in	0.264	0.323	0.298	
	mm	6.71	8.20	7.57	
Q	in	(2) M4 x 0.7 ±.10	(2) M6 x 1.0 ±.31	(2) M6 x 1.0 ±.50	
	mm	(2) M4 x 0.7 ±2.5	(2) M6 x 1.0 ±7.9	(2) M6 x 1.0 ±12.7	
		in	Ø.197	Ø.197	0.250
		mm	Ø5.00	Ø5.00	Ø6.35
S	in	1.100	1.100	1.250	
	mm	27.94	27.94	31.75	

MOTOR DIMENSIONS


The ERD actuator is designed to accommodate NEMA standard stepper and servo motors.

ACTUATOR	SIZE
ERD06	NEMA11
ERD10	NEMA17
ERD15	NEMA23

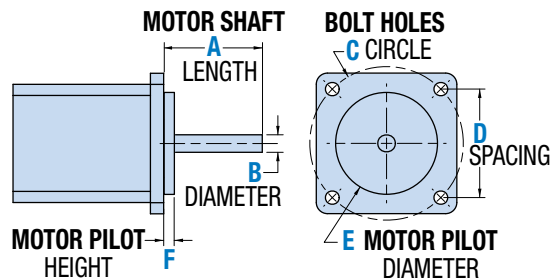
The only limiting factors are the motor shaft diameter and length. NEMA standard motors from the companies in the table at right have been found to be compatible with the ERD actuator.  *NOT a complete listing

ERD Compatible Motor Suppliers*

Anaheim Automation
Animatics
Applied Motion Products
Automation Direct
Cool Muscle
Electrocraft
Fastech
IMS / Scheider Electric
JVL
LIN Engineering
Nippon Pulse Motor
Omega
Oriental Motor
Parker
Sanyo Denki

 When any motor has been selected for use with the ERD actuator it is important to confirm the motor is compatible with the dimensions in the table below.

			ERD06	ERD10	ERD15
MOTOR SHAFT	LENGTH	MIN.	in 0.50	0.50	0.50
		mm 12.7	12.7	12.7	
	MAX.	in 1.100	1.100	1.250	
		mm 27.94	27.94	31.75	
DIAMETER	B	in 0.197	0.197	0.250	
	mm 5.00	5.00	6.35		
BOLT HOLE	CIRCLE	C	in 1.287	1.725	2.625
	mm 33.69	43.82	66.68		
SPACING	D	in 0.910	1.220	1.856	
	mm 23.11	30.99	47.14		
MOTOR PILOT	DIAMETER MAX.	E	in 0.980	0.980	1.550
		mm 24.90	24.90	39.37	
	HEIGHT MAX.	F	in 0.090	0.130	0.130
mm 2.29	3.30	3.30			

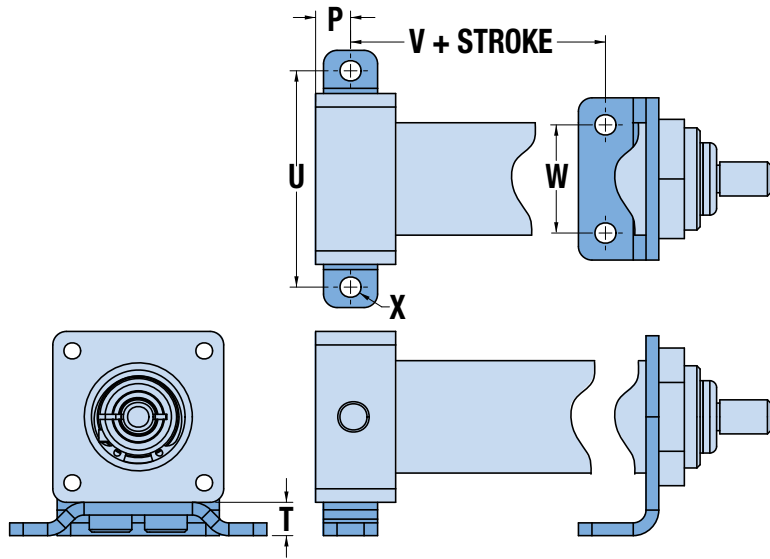


ERD Electric Rod-Style Actuator-Options

SIZE: ALL

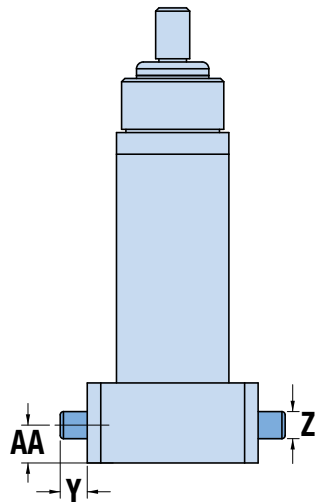
DIMENSIONS  3D CAD available at www.tolomatic.com

FOOT MOUNT

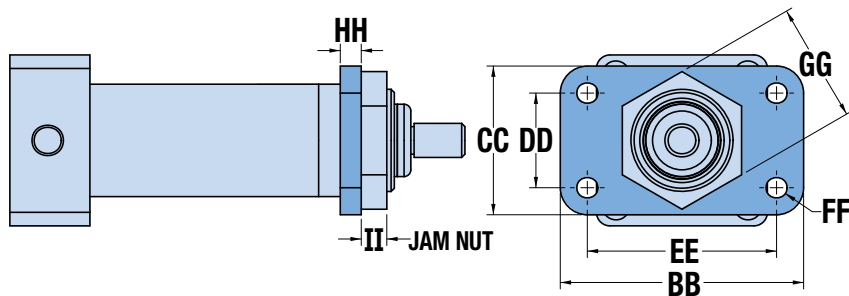


		ERD06	ERD10	ERD15
T	in	0.259	0.308	0.406
	mm	6.58	7.82	10.31
U	in	1.750	2.00	2.600
	mm	44.45	50.80	66.04
V	in	2.270	2.357	3.165
	mm	57.66	59.87	80.39
W	in	0.625	1.00	1.250
	mm	15.88	25.4	31.75
X	in	0.154	0.194	0.221
	mm	03.91	04.93	05.61
Y	in	0.250	0.250	0.430
	mm	6.35	6.35	10.92
Z	in	0.1878 /	0.2503 /	0.3753 /
		0.1876	0.2501	0.3751
	mm	04.770 /	06.358 /	09.533 /
		04.765	06.353	09.528
AA	in	1.221	0.350	0.425
	mm	31.01	8.89	10.80
BB	in	1.750	2.250	2.500
	mm	44.45	57.15	63.50
CC	in	1.000	1.375	1.750
	mm	25.40	34.93	44.45
DD	in	0.500	0.875	1.250
	mm	12.70	22.23	31.75
EE	in	1.250	1.750	2.000
	mm	31.75	44.45	50.80
FF	in	0.154	0.194	0.221
	mm	03.91	04.93	05.61
GG	in	0.709	1.102	1.575
	mm	18.00	28.00	40.00
HH	in	0.194	0.194	0.194
	mm	4.93	4.93	4.93
II	in	0.236	0.236	0.315
	mm	6.00	6.00	8.00

TRUNNION MOUNT



FRONT FLANGE



ERD Electric Rod-Style Actuator

SIZE: **ALL**

SWITCHES



ERD actuators offer a wide range of sensing choices. There are 6 switch choices: reed, solid state PNP (sourcing) or solid state NPN (sinking); normally open; with flying leads or quick-disconnect.

Commonly used for end-of-stroke positioning, these switches allow clamp-on installation anywhere along the entire actuator length. The internal magnet, located on the thrust tube, 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 green LED signal indicators.



	Order Code	Part Number	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	R Y	2190-9082	5m	SPST Normally Open	—	Red	5 - 240 AC/DC	**10.0	100mA	—	3.0 V max.	—	14 to 158°F	30 G / 9 G
	R K	2190-9083	QD*											
SOLID STATE	T Y	2190-9088	5m	PNP (Sourcing) Normally Open	—	Green	5 - 30 VDC	**3.0	200mA	8 mA @ 24V	1.0 V max.	0.01 mA max.	[-10 to 70°C]	50 G / 9 G
	T K	2190-9089	QD*											
	K Y	2190-9090	5m	NPN (Sinking) Normally Open	—	Red								
	K K	2190-9091	QD*											

*QD = Quick-disconnect Enclosure classification IEC 529 IP67 (NEMA 4)

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.

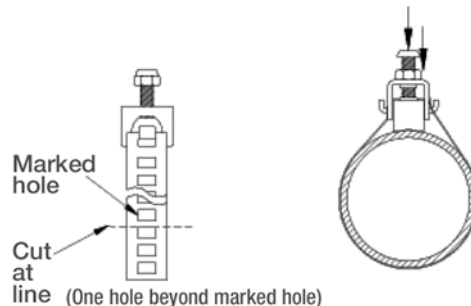
SWITCH INSTALLATION - FIELD REPLACEMENT INSTRUCTIONS



STEP 1:
Loosen screw and nut.



STEP 2:
Place sensor and wrap the band around the ERD cylinder. Position the hook with the nearest hole on the band and mark the hole with a permanent marker.



STEP 3:
Remove mounting assembly. Cut the band at the nearest edge of the next hole. (The one that's furthest away from the mounting head.)



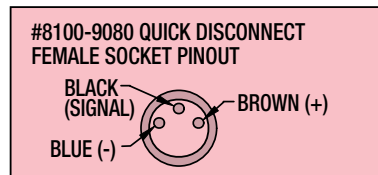
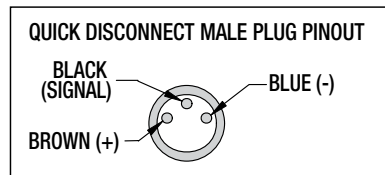
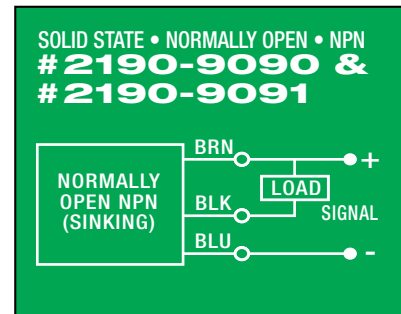
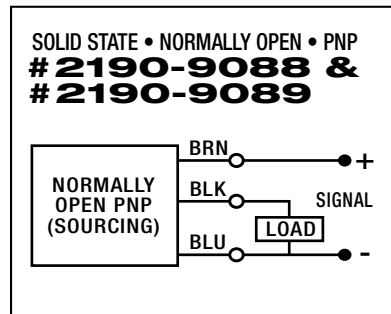
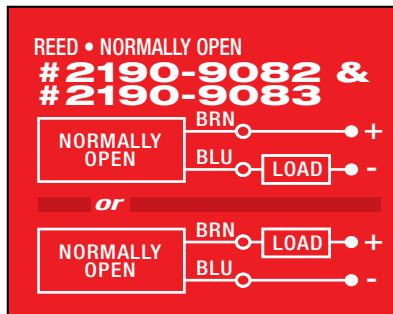
STEP 4:
Replace the sensor and mounting assembly. Wrap the band and put the chosen hole on the hook. Position the switch and tighten. Tighten nut for steadying.

ERD Electric Rod-Style Actuator

SIZE: ALL

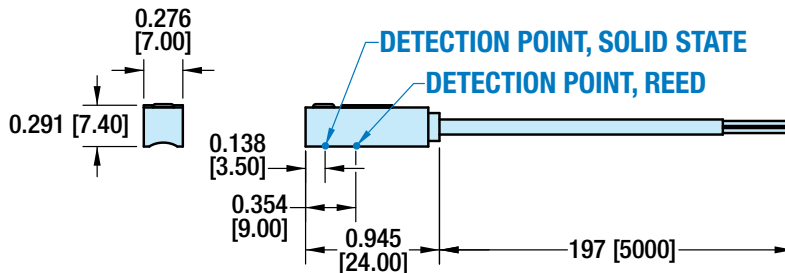
SWITCHES

WIRING DIAGRAMS

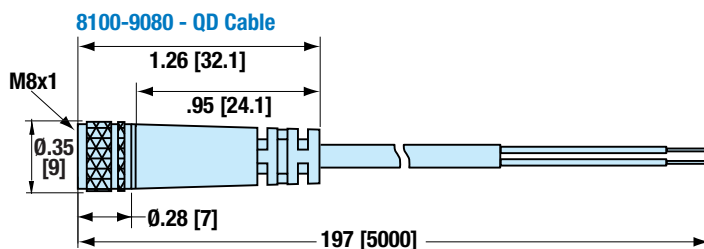
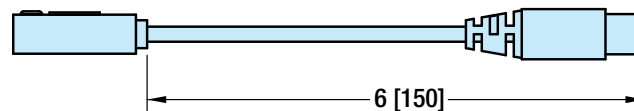


SWITCH DIMENSIONS

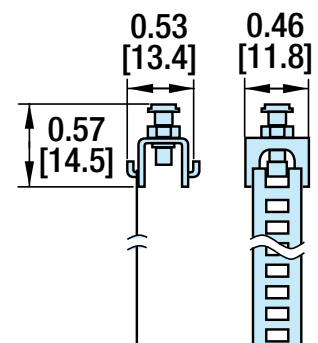
Y - direct connect



K - QD (Quick-disconnect) switch



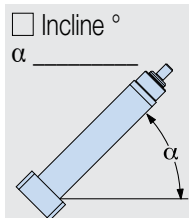
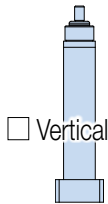
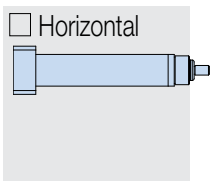
SWITCH CLAMP
 2190-1079



APPLICATION DATA WORKSHEET

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

ORIENTATION



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)

FORCE

lb. (U.S. Standard) kg. (Metric)

RETRACT

LOAD

lb. (U.S. Standard) kg. (Metric)

FORCE

lb. (U.S. Standard) kg. (Metric)

STROKE LENGTH

inch (US Standard)

millimeters (Metric)

PRECISION

Repeatability _____

inch

millimeters

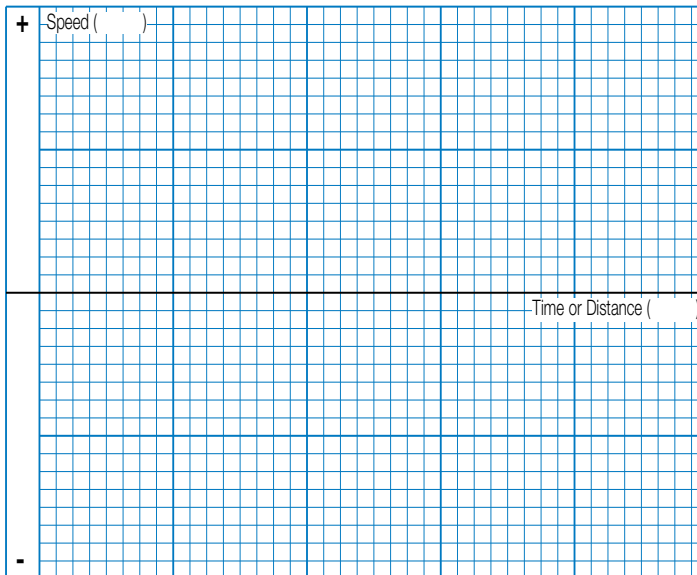
OPERATING ENVIRONMENT

Temperature, Contamination, Water, etc.

FREE - Windows® compatible software, download at www.tolomatic.com

Or Call 1-800-328-2174 for Excellent Customer Service & Technical Support

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 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

ERD Electric Rod-Style Actuator



Selection Guidelines

1 ESTABLISH MOTION PROFILE

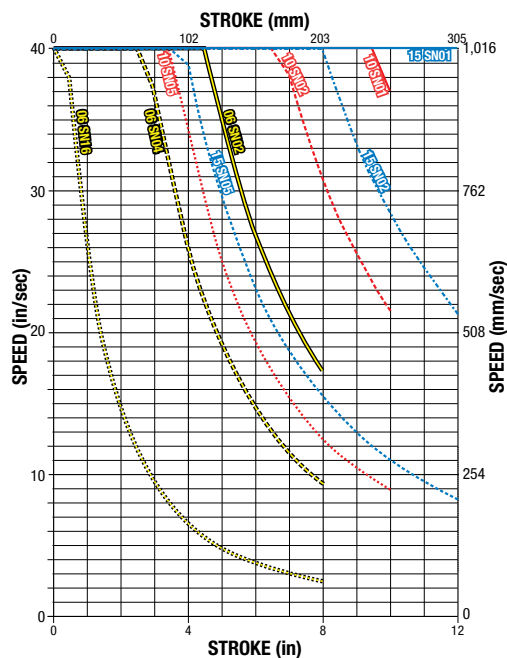
Using the application stroke length, desired cycle time, loads and forces, establish the motion profile details including linear velocity and thrust in each of its segments.

2 SELECT ACTUATOR SIZE AND SCREW TYPE

Based on the required velocities and thrust select a size and screw type and lead of the ERD actuator.

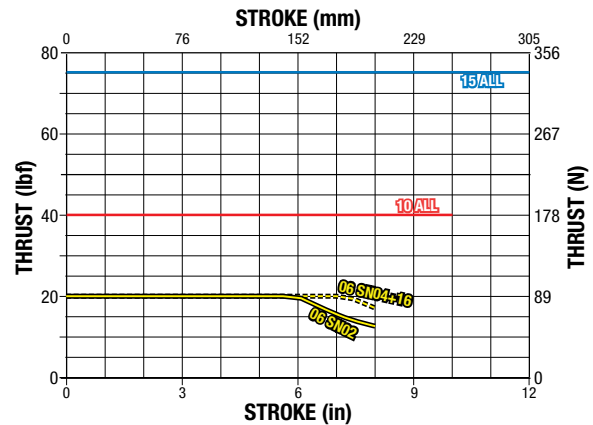
3 VERIFY CRITICAL SPEED OF THE SCREW

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



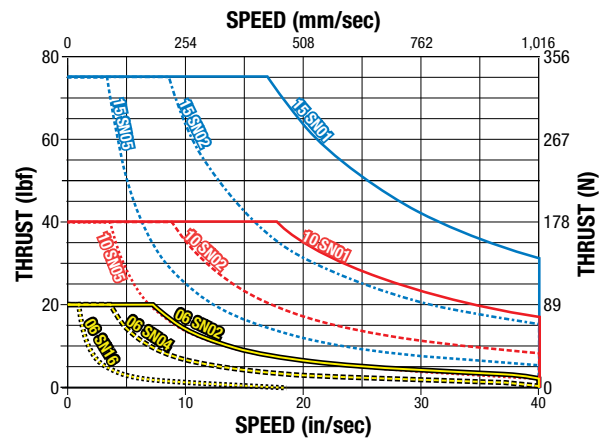
4 VERIFY AXIAL BUCKLING STRENGTH OF THE SCREW

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



5 VERIFY PV VALUE

Verify that the PV value does not exceed the PV value for the size of the screw selected.



6 ESTABLISH TOTAL TORQUE REQUIREMENTS

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

7 SELECT MOUNTING AND SENSOR CHOICES

Mounting options include: TRN trunnion mount, FFG front flange mount, FM2 foot mount. 6 sensor choices include: reed, solid state PNP or NPN, all in normally open, with flying leads or quick-disconnect couplers.

ERD Electric Rod-Style Actuator

ORDERING

ERD 10 SN02 SM152.4 LMI FFG KK2

MODEL	
ERD	Rod-Style Actuator

SIZE		
06	10	15

NUT/SCREW COMBINATIONS		
SIZE	CODE	TURNS/in (TPI)
06	SN	02, 04, 16
10	SN	01, 02, 05
15	SN	01, 02, 05

STROKE LENGTH		
SM _ _	Enter desired stroke length in millimeters (25.4mm = 1 inch)	
MAXIMUM STROKE		
	ERD	
SIZE	mm	in
06	203.2	8
10	254.0	10
15	304.8	12

Contact Tolomatic with requests for longer strokes

MOTOR MOUNTING	
LMI	In-line motor mount

ACTUATOR MOUNTING	
<i>For all motor mounts:</i>	
FFG	Front Flange Mount
TRR*	Trunnion Mounting, Rear
FM2	Foot Mount
<i>*Installed by Tolomatic</i>	

SWITCHES						
TYPE	LOGIC	NORMALLY	QUICK-DISCONNECT	CODE	QUANTITY	LEAD LENGTH
REED	SPST	Open	No	RY	After code enter quantity desired	5 m (16.4 feet) 6 in (152mm) to QD connector w/ 5m lead
			Yes	RK		
SOLID STATE	PNP	Open	No	TY		
			Yes	TK		
	NPN	Open	No	KY		
			Yes	KK		

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

NOTE: All* options are shipped together with the actuator but are not installed by Tolomatic. (*Trunnion Mount installed by Tolomatic)

SERVICE PARTS ORDERING

ERD ACTUATOR MOUNTING REPLACEMENT KITS

Code	Description	ERD SIZE		
		06	10	15
<i>For all motor mounts</i>				
FFG	Front Flange Mount Kit	2190-1025	2191-1025	2192-1025
FM2	Foot Mount Kit	2190-9001	2191-9001	2192-9001
TRR	Trunnion Mount Kit	1820-1003 (order 2)	0610-1044 (order 2)	6000-1785 (order 2)

ERD SWITCHES

To order switch kits use configuration code for switch preceded by SW and actuator code.

EXAMPLE: **SWERD15KK3**

KIT ACTUATOR SIZE SWITCH CODE QUANTITY

Code	**Switch ONLY Part No.	Lead	Normally	Sensor Type
R Y	2190-9082	5m (197 in)	Open	Reed
R K	2190-9083*	Quick-disconnect		
T Y	2190-9088	5m (197 in)	Open	Solid State PNP
T K	2190-9089*	Quick-disconnect		
K Y	2190-9090	5m (197 in)	Open	Solid State NPN
K K	2190-9091*	Quick-disconnect		

The example is for 3 Solid State NPN, Normally Open Switches with Quick-disconnect couplers. Each switch is complete with Bracket, Set Screw, Switch and mating QD cable.

**Also order clamp assembly #2190-1079

*Also order mating QD cable #8100-9080

To order switch ONLY see part number in table

THE TOLOMATIC DIFFERENCE

What you expect from the industry leader:



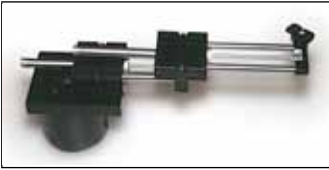
EXCELLENT CUSTOMER SERVICE & TECHNICAL SUPPORT

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



INDUSTRY LEADING DELIVERIES

Standard catalog products are built to order and ready-to-ship in 5 days or less. Modified and custom products ship weeks ahead of the competition.



INNOVATIVE PRODUCTS

From standard catalog products... to modified products... to completely unique custom products, Tolomatic designs and builds the best solutions for your challenging applications.



SIZING & SELECTION SOFTWARE

Windows® compatible, downloadable from our website – FREE – the best tool of its kind on the market! Product selection has never been easier.



3D MODELS & 2D DRAWINGS AVAILABLE ON THE WEB

Easy to access CAD files are available in many popular formats.

ALSO CONSIDER THESE OTHER TOLOMATIC PRODUCTS:

PNEUMATIC PRODUCTS



RODLESS CYLINDERS: Band Cylinders, Cable Cylinders, MAGNETICALLY COUPLED CYLINDERS/SLIDES; GUIDED ROD CYLINDER SLIDES

"FOLDOUT" BROCHURE #9900-9075 PRODUCTS BROCHURE #9900-4028 www.tolomatic.com/pneumatic

ELECTRIC PRODUCTS



ROD & GUIDED ROD STYLE ACTUATORS, HIGH THRUST ACTUATORS, SCREW & BELT DRIVE RODLESS ACTUATORS, MOTORS, DRIVES AND CONTROLLERS

"FOLDOUT" BROCHURE #9900-9074 PRODUCTS BROCHURE #9900-4016 www.tolomatic.com/electric

POWER TRANSMISSION PRODUCTS



GEARBOXES: Float-A-Shaft®, Slide-Rite®; DISC CONE CLUTCH; CALIPER DISC BRAKES

"FOLDOUT" BROCHURE #9900-9076 PRODUCTS BROCHURE #9900-4029 www.tolomatic.com/pt



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