ERD ELECTRIC ROD-STYLE ACTUATOR

LINEAR SOLUTIONS MADE EASY

USDA AGRICULTURAL MARKETING

Accepted Equipment
The ERD is an economical rod-style electric actuator designed as an alternative to pneumatic cylinders, a cost effective actuator for general automation and an option for automating manual processes. In addition, the ERD is available with all stainless steel and IP69k options which makes it the ideal hygienic actuator for the food & beverage processing environment.

TOLOMATIC’S ELECTRIC ROD-STYLE ACTUATORS

<table>
<thead>
<tr>
<th>ERD</th>
<th>RSA</th>
<th>RSX</th>
<th>GSA</th>
<th>IMA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rod-Style Actuator</td>
<td>Rod-Style Actuator</td>
<td>Rod-Style Actuator</td>
<td>Guided Rod-Style Actuator</td>
</tr>
<tr>
<td>Thrust up to:</td>
<td>35 kN (7,868 lbf)</td>
<td>58 kN (13,039 lbf)</td>
<td>133.5 kN (30,000 lbf)</td>
<td>4.23 kN (950 lbf)</td>
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<tr>
<td>Speed up to:</td>
<td>1473 mm/sec (58 in/sec)</td>
<td>3,124 mm/sec (123 in/sec)</td>
<td>760 mm/sec (29.9 in/sec)</td>
<td>3,124 mm/sec (123 in/sec)</td>
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<tr>
<td>Stroke Length up to:</td>
<td>1219 mm (48 in)</td>
<td>1,524 mm (60 in)</td>
<td>1500 mm (59 in)</td>
<td>914 mm (36 in)</td>
</tr>
<tr>
<td>Screw/Nut Type</td>
<td>Solid, Ball &amp; Roller</td>
<td>Solid, Ball &amp; Roller</td>
<td>Roller</td>
<td>Solid &amp; Ball</td>
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</tbody>
</table>

For complete information see www.tolomatic.com or 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)
ERD – Applications

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

Optional all stainless-steel design for washdown environments

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The ERD is an economical rod-style electric actuator designed as an alternative to pneumatic cylinders and an option for automating manual processes. The ERD is compatible with many NEMA & metric mount stepper and servo motors to create a flexible, powerful electric actuator solution. Built-to-order in stroke lengths up to 1.219 m (48").
MAXIMUM DURABILITY

**MOTOR ORIENTATION & MOTOR CHOICES**

- **LMI** – INLINE
  
  Inline option directly couples the driving shaft and is typically a one-piece housing construction for optimum alignment and support of the motor.

- **RP** – REVERSE PARALLEL
  
  Reverse-parallel option minimizes the overall length and offers a belt reduction drive with a 1:1 or 2:1 ratio.

**OPTIONS**

- **TRR** – TRUNNION MOUNT
  For applications that require pivoting, 300 series stainless steel construction. Available on all sizes.

- **PCD** – REAR CLEVIS MOUNT
  For applications that require rear pivot. Available for 15, 20, 22, 25, 30 sizes with RP mounting only.

- **FM2** – FOOT MOUNT*
  For applications that require bottom mounting, 300 series stainless steel construction. Available on all sizes.

- **FFG** – FRONT FLANGE MOUNT*
  For front mounting applications, 300 series stainless steel construction. Available on all sizes.

- **SWITCHES**
  Choose from: Reed, Solid State PNP or NPN, all available in normally open. Available on all sizes.

- **ARI** – INTERNAL ANTI-ROTATE
  When anti-rotation is required. For 15, 20, 22, 25, 30 sizes.

- **IP67 & IP69K RATINGS**
  An IP67 upgrade (static rating) for protection against water and dust ingress. IP69k also protects from high pressure wash-down (see page ERD_34 for ordering details).

- **SS1** – STAINLESS STEEL
  Same ERD actuator made of all 300 series stainless steel for corrosion resistance. For 06, 10, 15, 20, 22, 25, 30 sizes.

- **SS2** – STAINLESS STEEL
  SS1 option plus IP67 or IP69k and protective motor enclosure (see page ERD_6). Available on 10, 15, 20 sizes.

- **GD2** – GUIDE
  For applications that require anti-rotation, or guidance and load bearing. Made of lightweight aluminum. Available on 06, 10, 15, 20 sizes.

*NOTE: Foot Mount, Front Flange Mount and Switches are shipped together with the actuator but are not installed by Tolomatic.
The all 300 series stainless-steel ERD for 10, 15 & 20 sizes incorporates hygienic design principles and includes a protective enclosure for Tolomatic stepper/servo motors. (10 size: stepper motor only) The SS2 has an IP69k rating (static). The SS2 is built-to-order in stroke lengths up to 0.6 m (24”).

**FLEXIBLE CONNECTION**
- Choice of cord grips (PVDF) or industry standard conduit threads

**SMOOTH EXTERIOR**
- This primary design decision eases cleanup and helps to prevent bacterial growth

**IP69K RATED**
- To withstand high-pressure wash-down
- Clean-in-place compatible

**MOTOR PROTECTION**
- Motor enclosure made of stainless steel designed to protect motor with IP69k rating (static)
ERD22, 25 & ERD30 STANDARD
ALL 300 SERIES STAINLESS STEEL, IP69K

The all 300 series stainless-steel ERD incorporates hygienic design principles and has an IP69k rating (static). Available in 22, 25 & 30 sizes, the ERD is built-to-order in stroke lengths up to 1.219 m (48") with force up to 35 kN (7,868 lbf).

- **BREATHER / PURGE PORT**
  - Helps prevent contaminants from entering into actuator

- **WELDED SEAMS**
  - Leaving no gaps which eases cleanup and helps to prevent bacterial growth

- **USDA SCRAPER**
  - Available with USDA certified option HYGI1

- **HYGI1 Option: USDA approved hygienic design**
  [NSF/ANIS3-A 14159-1-2010]
  (see #2190-4003 for usage details)

- **DURABLE SEALS**
  - Polyurethane for IP69k ingress protection and resistance to caustic wash-down

- **STAINLESS STEEL FASTENERS**
  - Standard metric threads
  - Hex fasteners for sturdy construction without potential particle collection areas

- **STANDARD METRIC THREADS**
  - 06, 10, 15, 20 male threads; 22, 25, 30 female threads

- **GREASE PORT**
  - Screw re-lubrication system provides extended screw life
  - Convenient lubrication without disassembly

- **USDA SCRAPER**
  - Available with USDA certified option HYGI1

- **THREADED ROD END**
  - Compatible with many commercially available metric rod end accessories
  - Standard metric threads

- **ALL 300 SERIES STAINLESS STEEL CONSTRUCTION**
  - 300 series stainless steel for corrosion resistance
  - Simplifies and lowers cost of machine design by eliminating the need for protective guards around standard actuators
**ERD – Electric Rod-Style Actuator**

**SIZE: ALL**

**SPECIFICATIONS (US conventional measurement)**

<table>
<thead>
<tr>
<th>ERD SIZE</th>
<th>MAXIMUM STROKE</th>
<th>SCREW CODE</th>
<th>LEAD</th>
<th>LEAD ACCURACY</th>
<th>BACKLASH</th>
<th>MAXIMUM THRUST</th>
<th>DYNAMIC LOAD RATING</th>
<th>INERTIA</th>
<th>WEIGHT</th>
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<td>in/ft</td>
<td>in</td>
<td>lbf</td>
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<td>0.4402</td>
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<td>450</td>
<td>0.0173</td>
<td>0.4402</td>
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<td>0.0685</td>
<td>0.4102</td>
<td>0.0263</td>
<td>7.575</td>
</tr>
</tbody>
</table>

**SIDE LOAD CONSIDERATIONS**

The standard ERD rod-style actuator is not meant to be used in applications where side loading occurs. If side loading exists in the application consider the GD2 guided option.

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.

*Longer stroke length modification available upon request.*

**Temperature range**

40° to 130° F
(4.4° to 54.4° C)

**IP rating**

40 (static) standard for 06, 10, 15, 20 sizes
69k (static) standard for 22, 25, 30 sizes
## ERD – Electric Rod-Style Actuator

### SPECIFICATIONS (metric measurement)

<table>
<thead>
<tr>
<th>ERD SIZE</th>
<th>MAXIMUM STRIKE</th>
<th>SCREW CODE</th>
<th>LEAD</th>
<th>LEAD ACCURACY</th>
<th>BACKLASH</th>
<th>MAXIMUM THRUST</th>
<th>DYNAMIC LOAD RATING</th>
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<th>WEIGHT</th>
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<td></td>
<td>mm</td>
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<td>mm/6000</td>
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</table>

**What is an IP Rating?**

The IP Code (or Ingress Protection Rating) consists of the letters IP followed by two digits and an optional letter. As defined in international standard IEC 60529, it classifies the degrees of protection provided against the intrusion of solid objects (including body parts like hands and fingers), dust, accidental contact, and water in electrical enclosures.

The IP69K test specifies a spray nozzle that is fed with 80°C water at 8–10 MPa (80–100 bar) and a flow rate of 14–16 L/min. The nozzle is held 10–5 cm from the tested device at angles of 0°, 30°, 60°, and 90° for 30 s each. The test device sits on a turntable that rotates once every 12 s (6 rpm).

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<th>SOLIDS, FIRST DIGIT:</th>
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<tr>
<td>2</td>
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<table>
<thead>
<tr>
<th>LIQUIDS, SECOND DIGIT (static rating)</th>
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<tr>
<td>2</td>
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**What Does IP69K Mean?**

German standard DIN 40050-9 extends the IEC 60529 rating system described above with an IP69K rating for high-pressure, high-temperature wash-down applications. Such enclosures must not only be dust tight (IP6X), but also able to withstand high-pressure and steam cleaning.

The first digit indicates the level of protection that the enclosure provides against access to hazardous parts (e.g., electrical conductors, moving parts) and the ingress of solid foreign objects.

The second digit indicates the level of protection that the enclosure provides against harmful ingress of water.
PV LIMITS: Any material which carries a sliding load is limited by heat buildup. The factors that affect heat generation rate in an application are the pressure on the nut in pounds per square inch and the surface velocity in feet per minute. The product of these factors provides a measure of the severity of an application.

\[ P \times V \leq 0.1 \]

\[ \text{(Pressure Velocity of Acme Nut)} \]
The underlying formula that defines this value is:

\[ L_{10} = \left( \frac{C}{P_e} \right)^3 \cdot L \]

where:
- \( C \) = Dynamic load rating (lbf) or (N)
- \( P_e \) = Equivalent load (lbf) or (N)
- \( L \) = Screw lead (in/rev) (mm/rev)

\( L_{10} \) Travel life in millions of units (in or mm),

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.

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

where:
- \( P_e \) = Equivalent load (lbf) or (N)
- \( P_n \) = Each increment at different load (lbf) or (N)
- \( L \) = Total distance traveled per cycle (extend + retract stroke)
- \( L_1, L_2, L_3, \ldots, L_n \) = Each increment of stroke at different load (in) or (mm)
PV LIMITS: Any material which carries a sliding load is limited by heat buildup. The factors that affect heat generation rate in an application are the pressure on the nut in pounds per square inch and the surface velocity in feet per minute. The product of these factors provides a measure of the severity of an application.

\[
P \times V \leq 0.1
\]

(Pressure Velocity of Acme Nut)

Size it. Tolomatic.com for fast, accurate actuator selection

ERD – Electric Rod-Style Actuator

ERD15 PERFORMANCE

CRITICAL SPEED CAPACITY

PV LIMITS (ACME NUTS)

SIZING

ACTUATOR

ERD_12 1-800-328-2174
NOTE: The $L_{10}$ expected life of a ball screw linear actuator is expressed as the linear travel distance that 90% of properly maintained ball 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:

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

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

- $C$ = Dynamic load rating (lbf) or (N)
- $P_e$ = Equivalent load (lbf) or (N)

If load is constant across all movements then:

$$L = \text{actual load} = \text{equivalent load}$$

$$L = \text{Screw lead (in/rev) (mm/rev)}$$

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.

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

Where:

- $P_e$ = Equivalent load (lbf) or (N)
- $P_i$ = Each increment at different load (lbf) or (N)
- $L$ = Total distance traveled per cycle (extend + retract stroke)
  $$L = L_1 + L_2 + L_3 + \ldots + L_n$$
- $L_i$ = Each increment of stroke at different load (in) or (mm)
**CRITICAL SPEED CAPACITY**

![Graph showing critical speed capacity with stroke (mm) vs. speed (in/sec) and stroke (in) vs. speed (in/sec).]

**MAXIMUM THRUST vs STROKE**

![Graph showing maximum thrust vs stroke with stroke (mm) and stroke (in).]

**PV LIMITS (BRONZE NUT)**

![Graph showing PV limits with speed (mm/sec) vs. speed (in/sec).]

**SCREW LIFE**

![Graph showing screw life with thrust (N) vs. life (million in).]

**NOTE:** See L<sub>10</sub> expected life calculation on page ERD_13.
ERD – Electric Rod-Style Actuator

SIZE: ERD22

CRITICAL SPEED CAPACITY

PERFORMANCE

MAXIMUM THRUST vs STROKE

SCREW LIFE

NOTE: See L10 expected life calculation on page ERD_13
ERD – Electric Rod-Style Actuator

SIZE: ERD30

CRITICAL SPEED CAPACITY

MAXIMUM THRUST vs STROKE

SCREW LIFE

NOTE: See L10 expected life calculation on page ERD_13
**PERFORMANCE**

**SIZE:** 22, 25, 30

**RE-LUBRICATION RECOMMENDATION:**

**ERD22, ERD25, ERD30:** ERD 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. For many general purpose applications, Tolomatic ball screw actuators are typically considered lubricated for life unless otherwise specified, such as those actuator models outfitted with a re-lubrication feature. For roller screw or ball screw actuators outfitted with a re-lubrication feature, 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 zerk located on the rod end.

<table>
<thead>
<tr>
<th>ERD22</th>
<th>ERD25</th>
<th>ERD30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qty.</td>
<td>2.5g + (0.010 x § mm)</td>
<td>4.8g + (0.010 x § mm)</td>
</tr>
<tr>
<td>Qty.</td>
<td>0.09oz + (0.009 x § in)</td>
<td>0.17oz + (0.009 x § in)</td>
</tr>
</tbody>
</table>

$§ = Stroke length (mm or in)

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

---

**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.

---

**OPTION:** GD2 – GUIDED ERD

**LOAD VS EXTENDED LENGTH**

06, 10, 15

15, 20

---

ERD_18 1-800-328-2174
OPTION: GD2 – GUIDED ERD

**BENDING MOMENTS**

<table>
<thead>
<tr>
<th>Xs – STROKE LENGTH (mm.)</th>
<th>06</th>
<th>10</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 lbs (0 kg)</td>
<td>0.4</td>
<td>0.6</td>
<td>1.0</td>
</tr>
<tr>
<td>4 lbs (1.8 kg)</td>
<td>0.2</td>
<td>0.3</td>
<td>0.5</td>
</tr>
<tr>
<td>8 lbs (3.6 kg)</td>
<td>0.1</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>12 lbs (5.4 kg)</td>
<td>0.0</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>16 lbs (7.3 kg)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**GUIDE ROD DEFLECTION**

<table>
<thead>
<tr>
<th>Xs – STROKE LENGTH (mm.)</th>
<th>06</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 lbs (0 kg)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>4 lbs (1.8 kg)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>8 lbs (3.6 kg)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>12 lbs (5.4 kg)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>16 lbs (7.3 kg)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**NOTE:** Deflection is measured at the tooling plate. Excessive deflection may impact actuator life. Contact Tolomatic for assistance.

Contact Tolomatic for assistance: sizeit.tolomatic.com

Contact Tolomatic for assistance: 800-441-7393

For fast, accurate actuator selection: www.tolomatic.com

ERD – Electric Rod-Style Actuator

PERFORMANCE

DEFLECTION (in)

0.050
0.100
0.200
0.250

Xs – STROKE LENGTH (mm.)

51
3 lbs (1.4 kg)
6 lbs (2.7 kg)
9 lbs (4.1 kg)
12 lbs (5.4 kg)

ERD – Electric Rod-Style Actuator

www.tolomatic.com ERD_19
ERD – Electric Rod-Style Actuator

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

SIZE: 06, 10, 15, 20

ACTUATOR

ERD – Electric Rod-Style Actuator

DIMENSIONS

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

ERD06 ERD10 ERD15 ERD20

Dimensions in millimeters

Dimensions in inches

** This dimension is determined
day choice.

** Note: If ordering as a replace-
ment actuator for use with rod end
options, order Code RA1 to receive
M10x1.25 rod end thread on the ERD15
Note: If ordering as a replacement actua-
for use with rod end options, order
Code RA1 to receive M16x1.5 rod end
thread on the ERD20
ERD – Electric Rod-Style Actuator

SIZE: 06, 10, 15, 20

3D CAD available at www.tolomatic.com

Always use configurated CAD solid model to determine critical dimensions

IP67 - IP69K OPTION DIMENSIONS

IP67 OPTION

<table>
<thead>
<tr>
<th>ERD06</th>
<th>ERD10</th>
<th>ERD15</th>
<th>ERD20</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>116.6</td>
<td>121.8</td>
<td>152.4*</td>
</tr>
<tr>
<td>G</td>
<td>44.30</td>
<td>44.17</td>
<td>53.0</td>
</tr>
<tr>
<td>I</td>
<td>Surface for mounting options</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IP69K OPTION

<table>
<thead>
<tr>
<th>ERD06</th>
<th>ERD10</th>
<th>ERD15</th>
<th>ERD20</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>NA</td>
<td>128.1</td>
<td>164.8</td>
</tr>
<tr>
<td>G</td>
<td>NA</td>
<td>50.52</td>
<td>65.7</td>
</tr>
<tr>
<td>I</td>
<td>Surface for mounting options</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dimensions in millimeters

* Dimension shown is with Tolomatic AMS1xx motor hardware YMH option will determine this dimension.

IP67 (static rating) option replaces the Jam Nut (II in table for standard ERD actuator)

IP67 OPTION

<table>
<thead>
<tr>
<th>ERD06</th>
<th>ERD10</th>
<th>ERD15</th>
<th>ERD20</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>4.59</td>
<td>4.79</td>
<td>6.00*</td>
</tr>
<tr>
<td>G</td>
<td>1.744</td>
<td>1.739</td>
<td>2.09</td>
</tr>
<tr>
<td>I</td>
<td>Surface for mounting options</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IP69K OPTION

<table>
<thead>
<tr>
<th>ERD06</th>
<th>ERD10</th>
<th>ERD15</th>
<th>ERD20</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>NA</td>
<td>5.04</td>
<td>6.49</td>
</tr>
<tr>
<td>G</td>
<td>NA</td>
<td>1.989</td>
<td>2.59</td>
</tr>
<tr>
<td>I</td>
<td>Surface for mounting options</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dimensions in inches

FFG - FRONT FLANGE

<table>
<thead>
<tr>
<th>ERD06</th>
<th>ERD10</th>
<th>ERD15</th>
<th>ERD20</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>44.45</td>
<td>57.15</td>
<td>63.50</td>
</tr>
<tr>
<td>B</td>
<td>25.40</td>
<td>34.93</td>
<td>44.45</td>
</tr>
<tr>
<td>C</td>
<td>12.70</td>
<td>22.33</td>
<td>31.75</td>
</tr>
<tr>
<td>D</td>
<td>31.75</td>
<td>44.45</td>
<td>50.80</td>
</tr>
<tr>
<td>E</td>
<td>03.91</td>
<td>04.93</td>
<td>05.61</td>
</tr>
<tr>
<td>F</td>
<td>18.00</td>
<td>28.00</td>
<td>40.00</td>
</tr>
<tr>
<td>G</td>
<td>4.93</td>
<td>4.93</td>
<td>4.93</td>
</tr>
<tr>
<td>H</td>
<td>6.00</td>
<td>6.00</td>
<td>8.00</td>
</tr>
</tbody>
</table>

Dimensions in millimeters

<table>
<thead>
<tr>
<th>ERD06</th>
<th>ERD10</th>
<th>ERD15</th>
<th>ERD20</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.750</td>
<td>2.250</td>
<td>2.500</td>
</tr>
<tr>
<td>B</td>
<td>1.000</td>
<td>1.375</td>
<td>1.750</td>
</tr>
<tr>
<td>C</td>
<td>0.500</td>
<td>0.875</td>
<td>1.250</td>
</tr>
<tr>
<td>D</td>
<td>1.250</td>
<td>1.750</td>
<td>2.000</td>
</tr>
<tr>
<td>E</td>
<td>0.154</td>
<td>0.194</td>
<td>0.221</td>
</tr>
<tr>
<td>F</td>
<td>0.709</td>
<td>1.102</td>
<td>1.575</td>
</tr>
<tr>
<td>G</td>
<td>0.194</td>
<td>0.194</td>
<td>0.194</td>
</tr>
<tr>
<td>H</td>
<td>0.236</td>
<td>0.236</td>
<td>0.315</td>
</tr>
</tbody>
</table>

Dimensions in inches
ERD – Electric Rod-Style Actuator

**SIZE:** 06, 10, 15, 20

**SRE SPHERICAL ROD END**

Allows for slight misalignment between the load and the actuator (radial and angular). Uses an industry-standard bearing.

<table>
<thead>
<tr>
<th>Size</th>
<th>A Ø</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F Ø</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>22.3</td>
<td>36.0</td>
<td>12.0</td>
<td>8.8</td>
<td>10°</td>
<td>8.0</td>
<td>M8x1.25</td>
<td>17.0</td>
</tr>
<tr>
<td>15</td>
<td>28.0</td>
<td>43.0</td>
<td>14.0</td>
<td>10.5</td>
<td>10°</td>
<td>10.0</td>
<td>M10x1.25</td>
<td>20.0</td>
</tr>
<tr>
<td>20</td>
<td>42.0</td>
<td>64.0</td>
<td>21.0</td>
<td>15.0</td>
<td>10°</td>
<td>16.0</td>
<td>M16x1.5</td>
<td>28.0</td>
</tr>
</tbody>
</table>

Dimensions in millimeters

**CLV CLEVIS ROD END**

Used with the externally threaded rod end when the actuator has to compensate for misalignment or pivot about an axis.

* Note: ERD15 rod end options use M10 X 1.25 thread, not the standard M12 X 1.75 rod end thread. When ordering an attachment with the actuator the actuator will come with M10x1.25 thread.

* Note: ERD20 rod end options use M16 X 1.5 thread, not the standard M16 X 2.0 rod end thread. When ordering an attachment with the actuator the actuator will come with M16x1.5 thread.

<table>
<thead>
<tr>
<th>Size</th>
<th>A Ø</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F Ø</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>6.0</td>
<td>6.0</td>
<td>12.0</td>
<td>12.0</td>
<td>9.5</td>
<td>24.0</td>
<td>M6x1.0</td>
</tr>
<tr>
<td>10</td>
<td>8.0</td>
<td>8.0</td>
<td>16.0</td>
<td>16.0</td>
<td>10.0</td>
<td>32.0</td>
<td>M8x1.25</td>
</tr>
<tr>
<td>15</td>
<td>10.0</td>
<td>10.0</td>
<td>20.0</td>
<td>20.0</td>
<td>12.0</td>
<td>40.0</td>
<td>M10x1.25</td>
</tr>
<tr>
<td>20</td>
<td>16.0</td>
<td>16.0</td>
<td>32.0</td>
<td>32.0</td>
<td>19.0</td>
<td>64.0</td>
<td>M16x1.5</td>
</tr>
</tbody>
</table>

Dimensions in millimeters

**ALC ALIGNMENT COUPLER**

Used in combination with the externally threaded rod end to provide smooth motion and extends actuator life by preventing binding caused by angular or axial misalignment. Not available for use with clevis or trunnion mounts, as they must be rigidly mounted.

<table>
<thead>
<tr>
<th>Size</th>
<th>A Ø</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>6.0</td>
<td>M10x1.25</td>
<td>20.0</td>
<td>73.0</td>
<td>30.0</td>
<td>32.0</td>
</tr>
<tr>
<td>20</td>
<td>8.0</td>
<td>M16x1.5</td>
<td>32.0</td>
<td>108.0</td>
<td>41.0</td>
<td>45.0</td>
</tr>
</tbody>
</table>

Dimensions in millimeters

Note: ERD15 rod end options use M10 X 1.25 thread, not the standard M12 X 1.75 rod end thread. When ordering an attachment with the actuator the actuator will come with M10x1.25 thread.

Note: ERD20 rod end options use M16 X 1.5 thread, not the standard M16 X 2.0 rod end thread. When ordering an attachment with the actuator the actuator will come with M16x1.5 thread.

3D CAD available at www.tolomatic.com

Always use configurated CAD solid model to determine critical dimensions.

[Notes:](#)
ERD – Electric Rod-Style Actuator

SIZE: 06, 10, 15, 20

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

DIMENSIONS

FM2 - FOOT MOUNT

Dimensions in millimeters

Dimensions in inches

www.tolomatic.com
**ERD – Electric Rod-Style Actuator**

**DIMENSIONS**

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

**SS2 – STAINLESS-STEEL BODY WITH PROTECTIVE MOTOR COVER AND IP69K UPGRADE**

![Diagram of SS2 actuator]

<table>
<thead>
<tr>
<th>Code</th>
<th>Encoder Code</th>
<th>Available cable exit options</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS21</td>
<td>G1,E1</td>
<td>no cord grips 1/2&quot; NPT tapped hole</td>
</tr>
<tr>
<td>SS22</td>
<td>G1,E1</td>
<td>no cord grips M20 x 1.5 tapped hole</td>
</tr>
<tr>
<td>SS23</td>
<td>G1</td>
<td>1 cord grip (motor, no encoder)</td>
</tr>
<tr>
<td></td>
<td>E1</td>
<td>2 cord grips (motor, with encoder)</td>
</tr>
</tbody>
</table>

*Unit ships standard with hex bolts in these tapped holes

**NOTE:** IP67 is a static rating

**Dimensions in millimeters**

<table>
<thead>
<tr>
<th>Code</th>
<th>ERD10</th>
<th>ERD15</th>
<th>ERD20</th>
<th>BNM20</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>204.0</td>
<td>282.70</td>
<td>311.4</td>
<td>339.98</td>
</tr>
<tr>
<td>B</td>
<td>26.42</td>
<td>41.61</td>
<td>52.10</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>24.00</td>
<td>24.00</td>
<td>24.00</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>65.10</td>
<td>89.00</td>
<td>89.00</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>4.39</td>
<td>5.27</td>
<td>5.27</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>100.99</td>
<td>134.98</td>
<td>171.64</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>113.56</td>
<td>143.76</td>
<td>164.80</td>
<td>193.37</td>
</tr>
<tr>
<td>H</td>
<td>44.17</td>
<td>53.04</td>
<td>72.48</td>
<td></td>
</tr>
<tr>
<td>J*</td>
<td>M6 x 1.0</td>
<td>M6 x 1.0</td>
<td>M6 x 1.0</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>13.00</td>
<td>13.00</td>
<td>23.37</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td>Surface for mounting options</td>
</tr>
</tbody>
</table>

**Dimensions in inches**

<table>
<thead>
<tr>
<th>Code</th>
<th>ERD10</th>
<th>ERD15</th>
<th>ERD20</th>
<th>BNM20</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>8.03</td>
<td>11.130</td>
<td>12.26</td>
<td>13.385</td>
</tr>
<tr>
<td>B</td>
<td>1.040</td>
<td>1.638</td>
<td>2.051</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>0.945</td>
<td>0.945</td>
<td>0.945</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>2.563</td>
<td>3.504</td>
<td>3.504</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>0.173</td>
<td>0.207</td>
<td>0.207</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>3.976</td>
<td>5.314</td>
<td>6.738</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>4.471</td>
<td>5.660</td>
<td>6.488</td>
<td>7.613</td>
</tr>
<tr>
<td>H</td>
<td>1.739</td>
<td>2.088</td>
<td>2.853</td>
<td></td>
</tr>
<tr>
<td>J*</td>
<td>M6 x 1.0</td>
<td>M6 x 1.0</td>
<td>M6 x 1.0</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>0.512</td>
<td>0.512</td>
<td>0.920</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td>Surface for mounting options</td>
</tr>
</tbody>
</table>

SS2 is not available for the 06, 22, 25, 30 size
**ERD – Electric Rod-Style Actuator**

**DIMENSIONS**

3D CAD available at www.tolomatic.com

Always use configurated CAD solid model to determine critical dimensions

**GD2 – GUIDED ERD**

**GUIDED ERD WITH IP67 OPTION**

ERD STROKE IS REDUCED BY DIMENSION “V”

<table>
<thead>
<tr>
<th>Dimensions in millimeters</th>
<th>ERD06</th>
<th>ERD10</th>
<th>ERD15</th>
<th>ERD20</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERD06</td>
<td>76.20</td>
<td>88.90</td>
<td>114.30</td>
<td>149.86</td>
</tr>
<tr>
<td>ERD10</td>
<td>41.28</td>
<td>50.80</td>
<td>63.50</td>
<td>82.55</td>
</tr>
<tr>
<td>ERD15</td>
<td>28.58</td>
<td>31.75</td>
<td>47.63</td>
<td>63.50</td>
</tr>
<tr>
<td>ERD20</td>
<td>25.40</td>
<td>25.40</td>
<td>25.40</td>
<td>50.8</td>
</tr>
<tr>
<td>E0</td>
<td>9.7</td>
<td>5.63</td>
<td>7.14</td>
<td>8.74</td>
</tr>
<tr>
<td>F0</td>
<td>6.35</td>
<td>9.53</td>
<td>12.70</td>
<td>19.05</td>
</tr>
<tr>
<td>G0</td>
<td>28.58</td>
<td>40.13</td>
<td>56.39</td>
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</tr>
<tr>
<td>H0</td>
<td>57.15</td>
<td>69.85</td>
<td>88.90</td>
<td>117.48</td>
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<tr>
<td>J0</td>
<td>25.40</td>
<td>25.40</td>
<td>25.40</td>
<td>38.10</td>
</tr>
<tr>
<td>K0</td>
<td>99.31</td>
<td>107.80</td>
<td>137.87</td>
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<tr>
<td>L0</td>
<td>50.80</td>
<td>50.80</td>
<td>63.50</td>
<td>127.00</td>
</tr>
<tr>
<td>M0</td>
<td>12.70</td>
<td>15.88</td>
<td>22.23</td>
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<tr>
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<td>60.96</td>
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<tr>
<td>P0</td>
<td>25.40</td>
<td>38.10</td>
<td>50.80</td>
<td>58.42</td>
</tr>
<tr>
<td>R0</td>
<td>15.88</td>
<td>25.40</td>
<td>38.10</td>
<td></td>
</tr>
<tr>
<td>S0</td>
<td>M4 x 0.7</td>
<td>M5 x 0.8</td>
<td>M6 x 1.0</td>
<td>M8 x 1.25</td>
</tr>
<tr>
<td>T0</td>
<td>66.68</td>
<td>76.20</td>
<td>101.60</td>
<td>127.00</td>
</tr>
<tr>
<td>U0</td>
<td>25.40</td>
<td>34.93</td>
<td>44.45</td>
<td>57.15</td>
</tr>
<tr>
<td>V0</td>
<td>18.19</td>
<td>14.91</td>
<td>14.86</td>
<td>30.47</td>
</tr>
</tbody>
</table>

**Dimensions in inches**

<table>
<thead>
<tr>
<th>Dimensions in inches</th>
<th>ERD06</th>
<th>ERD10</th>
<th>ERD15</th>
<th>ERD20</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERD06</td>
<td>3.000</td>
<td>3.500</td>
<td>4.500</td>
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<tr>
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<td>2.000</td>
<td>2.500</td>
<td>3.250</td>
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<tr>
<td>ERD15</td>
<td>1.125</td>
<td>1.250</td>
<td>1.875</td>
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<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>2.00</td>
</tr>
<tr>
<td>E0</td>
<td>0.194</td>
<td>0.221</td>
<td>0.261</td>
<td>0.344</td>
</tr>
<tr>
<td>F0</td>
<td>0.250</td>
<td>0.375</td>
<td>0.500</td>
<td>0.750</td>
</tr>
<tr>
<td>G0</td>
<td>1.125</td>
<td>1.580</td>
<td>2.220</td>
<td></td>
</tr>
<tr>
<td>H0</td>
<td>2.250</td>
<td>2.750</td>
<td>3.500</td>
<td>4.625</td>
</tr>
<tr>
<td>J0</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.500</td>
</tr>
<tr>
<td>K0</td>
<td>3.910</td>
<td>4.244</td>
<td>5.428</td>
<td></td>
</tr>
<tr>
<td>L0</td>
<td>2.000</td>
<td>2.000</td>
<td>2.500</td>
<td>5.000</td>
</tr>
<tr>
<td>M0</td>
<td>0.500</td>
<td>0.625</td>
<td>0.875</td>
<td>1.00</td>
</tr>
<tr>
<td>N0</td>
<td>1.125</td>
<td>1.580</td>
<td>2.220</td>
<td>2.400</td>
</tr>
<tr>
<td>P0</td>
<td>1.000</td>
<td>1.500</td>
<td>2.000</td>
<td>2.300</td>
</tr>
<tr>
<td>R0</td>
<td>0.625</td>
<td>1.000</td>
<td>1.500</td>
<td>1.500</td>
</tr>
<tr>
<td>S0</td>
<td>M4 x 0.7</td>
<td>M5 x 0.8</td>
<td>M6 x 1.0</td>
<td>M8 x 1.25</td>
</tr>
<tr>
<td>T0</td>
<td>2.625</td>
<td>3.000</td>
<td>4.000</td>
<td>5.000</td>
</tr>
<tr>
<td>U0</td>
<td>1.000</td>
<td>1.375</td>
<td>1.750</td>
<td>2.250</td>
</tr>
<tr>
<td>V0</td>
<td>0.716</td>
<td>0.587</td>
<td>0.585</td>
<td>1.200</td>
</tr>
</tbody>
</table>

*This dimension is determined by motor choice.*
ERD – Electric Rod-Style Actuator

SIZE: 22, 25, 30

3D CAD available at www.tolomatic.com

Always use configurated CAD solid model to determine critical dimensions

There are tables and diagrams illustrating the dimensions of ERD actuators in both millimeters and inches. The tables show the dimensions for ERD22, ERD25, and ERD30 models.

For example, in millimeters:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Ø D</th>
<th>Ø E</th>
<th>Ø F</th>
<th>G</th>
<th>Ø H</th>
<th>J</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>187.33</td>
<td>42.88</td>
<td>17.8</td>
<td>27.99</td>
<td>74.9</td>
<td>56.9</td>
<td>M6 x 1.0 - 6H</td>
<td>12.0</td>
<td>45.49</td>
<td>M12 x 1.25</td>
</tr>
<tr>
<td>243.74</td>
<td>54.66</td>
<td>23.9</td>
<td>35.00</td>
<td>113.0</td>
<td>88.9</td>
<td>M8 x 1.25 - 6H</td>
<td>16.0</td>
<td>76.20</td>
<td>M20 x 1.5</td>
</tr>
<tr>
<td>243.74</td>
<td>54.66</td>
<td>23.9</td>
<td>54.99</td>
<td>113.0</td>
<td>88.9</td>
<td>M8 x 1.25 - 6H</td>
<td>16.0</td>
<td>76.20</td>
<td>M27 x 2.0</td>
</tr>
</tbody>
</table>

Dimensions in millimeters

<table>
<thead>
<tr>
<th>L</th>
<th>M</th>
<th>N</th>
<th>P</th>
<th>R</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.2</td>
<td>69.9</td>
<td>98.6</td>
<td>7.1</td>
<td>50.8</td>
<td>76.2</td>
</tr>
<tr>
<td>15.7</td>
<td>120.7</td>
<td>158.8</td>
<td>10.7</td>
<td>84.3</td>
<td>138.2</td>
</tr>
<tr>
<td>15.7</td>
<td>120.7</td>
<td>158.8</td>
<td>10.7</td>
<td>84.3</td>
<td>138.2</td>
</tr>
</tbody>
</table>

Dimensions in millimeters

In inches:

<table>
<thead>
<tr>
<th>L</th>
<th>M</th>
<th>N</th>
<th>P</th>
<th>R</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.40</td>
<td>2.75</td>
<td>3.88</td>
<td>0.28</td>
<td>2.00</td>
<td>3.00</td>
</tr>
<tr>
<td>0.62</td>
<td>4.75</td>
<td>6.25</td>
<td>0.42</td>
<td>3.32</td>
<td>5.44</td>
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<td>0.62</td>
<td>4.75</td>
<td>6.25</td>
<td>0.42</td>
<td>3.32</td>
<td>5.44</td>
</tr>
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</table>

Dimensions in inches
ERD – Electric Rod-Style Actuator

**FM2 OPTION**

![FM2 Option Diagram]

<table>
<thead>
<tr>
<th></th>
<th>T</th>
<th>U</th>
<th>V</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERD22</td>
<td>88.9</td>
<td>145.0</td>
<td>7.11</td>
<td>44.5</td>
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<tr>
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<td>194.3</td>
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<td>69.9</td>
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<tr>
<td>ERD30</td>
<td>120.7</td>
<td>194.3</td>
<td>11.99</td>
<td>69.9</td>
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</table>

Dimensions in millimeters

**TRR OPTION**

![TRR Option Diagram]

<table>
<thead>
<tr>
<th></th>
<th>X</th>
<th>Y</th>
<th>Z</th>
<th>AA</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERD22</td>
<td>109.68</td>
<td>77.67</td>
<td>16.00</td>
<td>15.95</td>
</tr>
<tr>
<td>ERD25</td>
<td>168.66</td>
<td>114.81</td>
<td>25.39</td>
<td>25.36</td>
</tr>
<tr>
<td>ERD30</td>
<td>168.66</td>
<td>114.81</td>
<td>25.39</td>
<td>25.36</td>
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</table>

Dimensions in millimeters

**HYG1 OPTION**

![HYG1 Option Diagram]

<table>
<thead>
<tr>
<th></th>
<th>BB</th>
<th>CC</th>
<th>DD</th>
<th>EE</th>
<th>FF</th>
<th>GG</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERD22</td>
<td>41.4</td>
<td>27.9</td>
<td>12.7</td>
<td>50.8</td>
<td>56.9</td>
<td>79.2</td>
</tr>
<tr>
<td>ERD25</td>
<td>51.6</td>
<td>38.1</td>
<td>23.9</td>
<td>57.2</td>
<td>82.6</td>
<td>98.6</td>
</tr>
<tr>
<td>ERD30</td>
<td>51.6</td>
<td>38.1</td>
<td>23.9</td>
<td>57.2</td>
<td>82.6</td>
<td>98.6</td>
</tr>
</tbody>
</table>

Dimensions in millimeters

**Dimensions**

Always use configurated CAD solid model to determine critical dimensions

3D CAD available at [www.tolomatic.com](http://www.tolomatic.com)

ERD - 22, 25, 30

Dimensions in inches
ERD – Electric Rod-Style Actuator

SIZE: 06, 10, 15

ALTERNATIVE MOTOR DIMENSIONS

The ERD 06, 10 & 15 sizes are designed to accommodate NEMA standard stepper and servo motors.

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)

This ERD actuator is compatible with the following motor manufacturers:

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

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.

<table>
<thead>
<tr>
<th>MOTOR SHAFT LENGTH</th>
<th>ERD06</th>
<th>ERD10</th>
<th>ERD15</th>
<th>ERD06</th>
<th>ERD10</th>
<th>ERD15</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN. A</td>
<td>12.7</td>
<td>12.7</td>
<td>12.7</td>
<td>0.50</td>
<td>0.50</td>
<td>0.50</td>
</tr>
<tr>
<td>MAX. B</td>
<td>27.94</td>
<td>27.94</td>
<td>31.75</td>
<td>1.100</td>
<td>1.100</td>
<td>1.250</td>
</tr>
<tr>
<td>DIAMETER C</td>
<td>5.00</td>
<td>5.00</td>
<td>6.35</td>
<td>0.197</td>
<td>0.197</td>
<td>0.250</td>
</tr>
<tr>
<td>CIRCLE Ø C</td>
<td>33.69</td>
<td>43.82</td>
<td>66.68</td>
<td>1.287</td>
<td>1.725</td>
<td>2.625</td>
</tr>
<tr>
<td>SPACING D</td>
<td>23.11</td>
<td>30.99</td>
<td>47.14</td>
<td>0.910</td>
<td>1.220</td>
<td>1.856</td>
</tr>
<tr>
<td>DIAMETER MAX. E</td>
<td>24.90</td>
<td>24.90</td>
<td>39.37</td>
<td>0.980</td>
<td>0.980</td>
<td>1.550</td>
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<tr>
<td>HEIGHT MAX. F</td>
<td>2.29</td>
<td>3.30</td>
<td>3.30</td>
<td>0.090</td>
<td>0.130</td>
<td>0.130</td>
</tr>
</tbody>
</table>

Dimensions in millimeters

Dimensions in inches

MOTOR CHOICES - YOUR MOTOR HERE

SELECT A COMPLETE SYSTEM FROM TOLOMATIC OR ADD ANY MOTION SYSTEM TO OUR ACTUATORS

"YOUR MOTOR HERE" MADE-TO-ORDER MOTOR MOUNTS, 15 DAYS.

- Select a high-performance Tolomatic electric actuator and we’ll provide a motor-specific interface for your motor. With our online database, you can select from over 60 motor manufacturers and hundreds of models.

Visit www.tolomatic.com/ymh to find your motor/actuator match!

Your Motor Here

Configure an actuator and a complete motion control system today using Tolomatic’s easy-to-use on-line sizing & selection

Available FREE at www.tolomatic.com

The ERD 15, 20, 22, 25 & 30 sizes utilize Tolomatic’s YMH (Your Motor Here) program. See www.tolomatic.com/ymh or consult Tolomatic sales at 1-800-328-2174 for details.
ERD actuators have 6 switch options: 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, IP67 rated and are RoHS compliant. Switches feature bright red or green LED signal indicators.

<table>
<thead>
<tr>
<th>Switch Type</th>
<th>Order Code</th>
<th>Lead</th>
<th>Switching Logic</th>
<th>Power LED</th>
<th>Signal LED</th>
<th>Operating Voltage</th>
<th><strong>Power Rating (Watts)</strong></th>
<th>Switching Current (mA max.)</th>
<th>Leakage Current (mA max.)</th>
<th>Voltage Drop (V max.)</th>
<th>Temp. Range</th>
<th>Shock / Vibration (G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>REED</td>
<td>R R</td>
<td>5m</td>
<td>SPST Normally Open</td>
<td>— Red</td>
<td>—</td>
<td>5 - 240 AC/DC</td>
<td><strong>10.0</strong></td>
<td>100mA</td>
<td>—</td>
<td>3.0 V max.</td>
<td>14 to 158°F</td>
<td>30 G / 9 G</td>
</tr>
<tr>
<td>REED</td>
<td>R K</td>
<td>QD*</td>
<td>Normally Open</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>SOLID STATE</td>
<td>T Y</td>
<td>5m</td>
<td>PNP (Sourcing) Normally Open</td>
<td>— Green</td>
<td>—</td>
<td>5 - 30 VDC</td>
<td><strong>3.0</strong></td>
<td>200mA</td>
<td>8 mA at 24V</td>
<td>1.0 V max.</td>
<td>-10 to 70°C</td>
<td>50 G / 9 G</td>
</tr>
<tr>
<td>SOLID STATE</td>
<td>T K</td>
<td>QD*</td>
<td>Normally Open</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>SOLID STATE</td>
<td>R Y</td>
<td>5m</td>
<td>NPN (Sinking) Normally Open</td>
<td>— Red</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>SOLID STATE</td>
<td>R R</td>
<td>QD*</td>
<td>Normally Open</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

*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 - 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.
**SWITCHES**

**WIRING DIAGRAMS**

- **REED • NORMALLY OPEN**
  - RY & RK
  - NORMALLY OPEN
  - BRN BLU LOAD
  - or
  - NORMALLY OPEN
  - BRN BLU LOAD

- **SOLID STATE • NORMALLY OPEN • PNP**
  - TY & TK
  - NORMALLY OPEN PNP (SOURCING)
  - BRN BLK BLU SIGNAL
  - LOAD

- **SOLID STATE • NORMALLY OPEN • NPN**
  - KY & KK
  - NORMALLY OPEN NPN (SINKING)
  - BRN BLK BLU SIGNAL
  - LOAD

**SWITCH DIMENSIONS**

- **TY** - direct connect
  - 0.276 [7.00]
  - 0.291 [7.40]
  - DETECTION POINT, SOLID STATE
  - DETECTION POINT, REED

- **K** - QD (Quick-disconnect) switch
  - 6 [150]

- **QD Cable**
  - MBx1
  - 1.26 [32.1]
  - 0.95 [24.1]
  - 0.35 [9]
  - 0.57 [14.5]

**SWITCH CLAMP**

- 0.53 [13.4]
- 0.46 [11.8]
**APPLICATION DATA WORKSHEET**

**ORIENTATION**

- Horizontal
- Vertical
- Incline
- Inline
- Reverse Parallel

- Load supported by actuator
- Load supported by other mechanism

**MOVE PROFILE**

**EXTEND**

Move Distance

- inch
- millimeters

Move Time

Max. Speed

- in/sec
- mm/sec

Dwell Time After Move

**RETRACT**

Move Distance

- inch
- millimeters

Move Time

Max. Speed

- in/sec
- mm/sec

Dwell Time After Move

**STROKE LENGTH**

- inch
- millimeters

**PRECISION**

- 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.

**LOAD**

- lb.
- kg.

**FORCE**

- lbf.
- N

**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
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 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.

6 VERIFY PV VALUE (IF ACME)
Verify that the PV value does not exceed the PV value for the size of the screw selected.

7 CALCULATE LIFE (IF BALL SCREW)
Determine the practical load of the system to calculate the L10 estimated life.

8 DETERMINE IF LOAD GUIDANCE IS NEEDED
If application requires carrying a load, anti-rotate, a tooling plate or there is risk of side loading the rod, choose the guided option. Available sizes: 06, 10, 15, 20

9 DETERMINE IF INGRESS PROTECTION AGAINST DUST AND WATER IS NEEDED.
If actuator is in contact with dust particulate, water or wash-down environment choose the IP67 or IP69k option. Available sizes: 06, 10, 15, 20; Available sizes: [15 & 20 with SS2], 22, 25, 30

10 DETERMINE IF ENVIRONMENT IS CORROSIVE OR WASH DOWN
If corrosion resistance is required for 06-20 sizes, choose from two options of stainless steel components

- (SS1) ERD with all stainless steel components
- (SS2) ERD with all stainless steel components and protective motor enclosure.

For 22, 25 & 30 sizes choose (IP69k)

11 SELECT MOUNTING AND SENSOR CHOICES
Mounting options include: TRR 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.

12 SELECT ACTUATOR CONTROL SOLUTION
Add an extremely easy to use drive and motor combination to power the actuator.
**ERD ACTUATOR REPLACEMENT KITS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>ERD SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>06</td>
</tr>
<tr>
<td>FFG</td>
<td>Front Flange Mount Kit</td>
<td>2190-1025</td>
</tr>
<tr>
<td>FM2</td>
<td>Foot Mount Kit</td>
<td>2190-9001</td>
</tr>
<tr>
<td>TRR</td>
<td>Trunnion Mount</td>
<td>1820-1003 (order 2)</td>
</tr>
<tr>
<td>IP67</td>
<td>4 IP67 Kit</td>
<td>2190-9201</td>
</tr>
<tr>
<td>IP69K</td>
<td>4 IP69K Kit</td>
<td>–</td>
</tr>
<tr>
<td>GD2</td>
<td>Guide Kit</td>
<td>Order via configurator code: GD2ERD_ _ SM _ _ _ _</td>
</tr>
</tbody>
</table>

1 REPLACEMENT ONLY: If ERD15 unit was built with SS2 option, foot mount kit 2192-9203 is required.
2 REPLACEMENT ONLY: If ERD20 unit was built with RP SS1 option, foot mount kit 2193-9209 is required.
3 REPLACEMENT ONLY: Trunnion mount option not available with SS2 option
4 REPLACEMENT ONLY: If used on an actuator that was not originally built with the IP67 option the thrust rod will retract below the Cap/Seal and may damage the seal

**ERD ACTUATOR SIZING**

**SERVICE PARTS ORDERING**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>ERD SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>RA1</td>
<td>If replacing an actuator with CLV, SRE or ALC rod end option and want to use existing rod end, add RA1 to the end of the ordering code for thread compatibility. Do not reorder the rod end option.</td>
<td></td>
</tr>
</tbody>
</table>

**ERD SWITCHES**

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

**EXAMPLE:**

```
SWERD15KK
```

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.
**ERD – Electric Rod-Style Actuator**

### ORDERING

**ERD 15**

SN – ORDERING CODE

**SN02**

**SM152.4**

**SM152.4**

**LMI**

**ST1**

- **MODEL**
  - ERD Rod-Style Actuator

- **SIZE**
  - 06, 10, 15, 20, 22, 25, 30

### NUT/SCREW COMBINATIONS

<table>
<thead>
<tr>
<th>Size</th>
<th>Code</th>
<th>Turns/in (TPI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>SN</td>
<td>02, 04, 16</td>
</tr>
<tr>
<td>10</td>
<td>SN</td>
<td>01, 02, 05</td>
</tr>
<tr>
<td>15</td>
<td>BNM</td>
<td>05 mm lead</td>
</tr>
<tr>
<td>20</td>
<td>BN</td>
<td>05, 10 mm lead</td>
</tr>
<tr>
<td>22</td>
<td>BN</td>
<td>05, 10 mm lead</td>
</tr>
<tr>
<td>25</td>
<td>BN</td>
<td>05, 10 mm lead</td>
</tr>
<tr>
<td>30</td>
<td>BN</td>
<td>05, 10 mm lead</td>
</tr>
</tbody>
</table>

### STROKE LENGTH

**SM...** 
Enter desired stroke length in millimeters (25.4mm = 1 inch)

<table>
<thead>
<tr>
<th>Size</th>
<th>Code</th>
<th>Stroke Length</th>
<th>MM</th>
<th>In</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>203.2</td>
<td>02, 04, 16</td>
<td>203</td>
<td>8</td>
</tr>
<tr>
<td>10</td>
<td>254.0</td>
<td>01, 02, 05</td>
<td>254</td>
<td>10</td>
</tr>
<tr>
<td>15</td>
<td>609.6</td>
<td>05 mm lead</td>
<td>609</td>
<td>24</td>
</tr>
<tr>
<td>20</td>
<td>1000.0</td>
<td>05, 10 mm lead</td>
<td>100</td>
<td>39.4</td>
</tr>
<tr>
<td>22</td>
<td>1219.2</td>
<td>05, 10 mm lead</td>
<td>122</td>
<td>48</td>
</tr>
<tr>
<td>25</td>
<td>1219.2</td>
<td>05, 10 mm lead</td>
<td>122</td>
<td>48</td>
</tr>
<tr>
<td>30</td>
<td>1219.2</td>
<td>05, 10 mm lead</td>
<td>122</td>
<td>48</td>
</tr>
</tbody>
</table>

Contact Tolomatic with requests for longer strokes.

### MOTOR MOUNTING

- **LMI** In-line motor mount
- **RP1** 1:1 ratio, Reverse Parallel motor mount
- **RP2** 2:1 ratio, Reverse Parallel motor mount

\*RP is not available for the 06 & 10 size

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

### ACTUATOR MOUNTING

- **FFG** Front Flange Mount
- **TRM** Trunnion Mounting, Rear (metric)
- **TRR** Trunnion Mounting, Rear (US standard)
- **FM2** Foot Mount
- **PCD1** Rear Clevis Mounting inch/Imperial pin size
- **PCD2** Rear Clevis Mounting metric pin size

**NOTE:** Foot Mount and Front Flange Mount are shipped together with the actuator but are not installed by Tolomatic.

\$ RP motor mount ONLY: 15, 20, 22, 25, 30 sizes

### ENVIRONMENTAL PROTECTION

- **SS1** Stainless steel actuator
- **SS2** Stainless steel actuator with protective motor enclosure
- **SS21** NPT 1/2” conduit thread
- **SS22** M20x1.5 conduit thread
- **SS23** Cord grip(s), 1 or 2 grips

### ROD END

- **CLV** Clevis Rod End
- **SRE** Spherical Rod End
- **ALC** Alignment Coupler Rod End

**NOTE:** Rod End options above are not available for all ERD sizes. Stainless steel available for the above rod ends in limited sizes. Contact Tolomatic

For replacement actuator compatible with existing rod end options see RA1 code on pg. 34

### SWITCHES**

**TYPE**

- **REED**
  - **ST1**
  - **YM**

**LOGIC**

- **NORMALLY**
  - Open
  - Closed

**QUANTITY**

- **LENGTH**
  - 5 m (16.4 feet)

**IP RATING CHOICES**

- **IP40**
- **IP67**
- **IP69K**

**IP RATING AVAILABLE**

- **SIZE**
  - 06
  - 10
  - 15
  - 20
  - 22
  - 25
  - 30

**NOTE:** Switches are shipped together with the actuator but are not installed by Tolomatic.

### YOUR MOTOR HERE

**YM...** Motor mount for non-Tolomatic motor.

**AM...** Tolomatic motor: contact factory

### STEPPER & BRUSHLESS SERVO MOTORS

- **Motors**
- **Drives**
- **Gearboxes**

### CONFIGURE ACTUATOR SIZING

Available FREE at www.tolomatic.com
The Tolomatic Difference  Expect More From the Industry Leader:

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

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

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.

SUPERIOR SERVICE
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