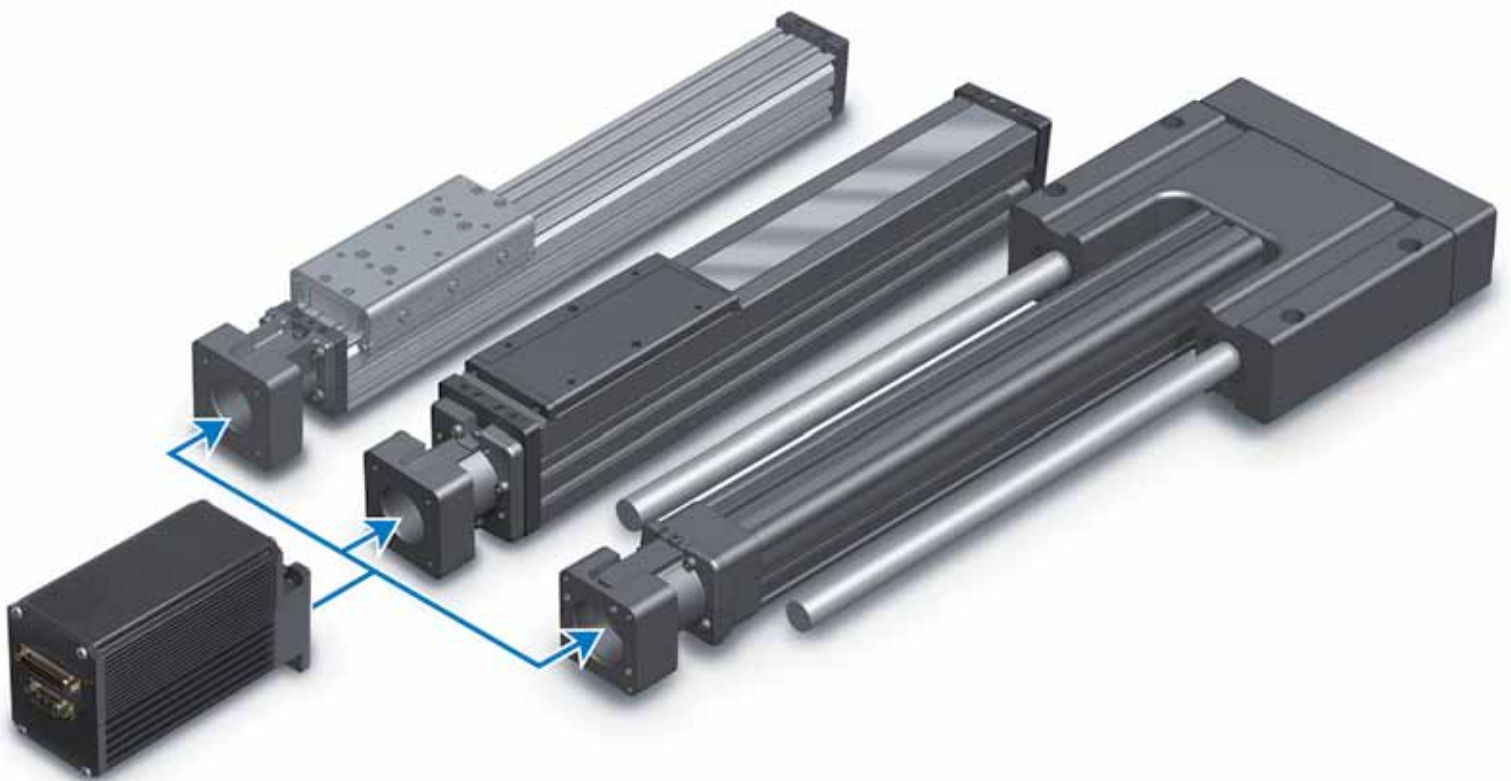


# SmartActuator Series

## ICM Plus

INTEGRATED CONTROL MOTOR

**ENDURANCE TECHNOLOGY<sup>SM</sup>**



# What is a **SmartActuator**?

The SmartActuator is a controller, drive and motor integrated with an actuator for an all-in-one solution. Tolomatic has over 50 years of experience manufacturing rodless and rod-style electric and pneumatic actuators. The SmartActuator puts this experience and the intelligence of powerful digital drive technology into one actuator. The result: reliable, affordable power that is remarkably easy-to-use.

## About the **ICM Plus**

The ICM Plus creates an all-in-one (control, drive, motor, actuator) affordable solution mounted to your choice of Tolomatic electric rodless or rod-style. The ICM Plus is designed for industrial applications, by combining a flexible integrated digital drive with the power of a servo motor.

### Capabilities

- Indexer programming
- Infinite positioning
- Stand-alone operation
- Mid-stroke positioning with sensors
- Stepper mode (pulse/direction)
- Analog position mode
- 100% duty cycle for continuous operation
- 24 Vdc opto-isolated I / O, NPN or PNP
  - 8 Inputs
  - 2 Outputs
- IP65 option - For protection against water and dust ingress



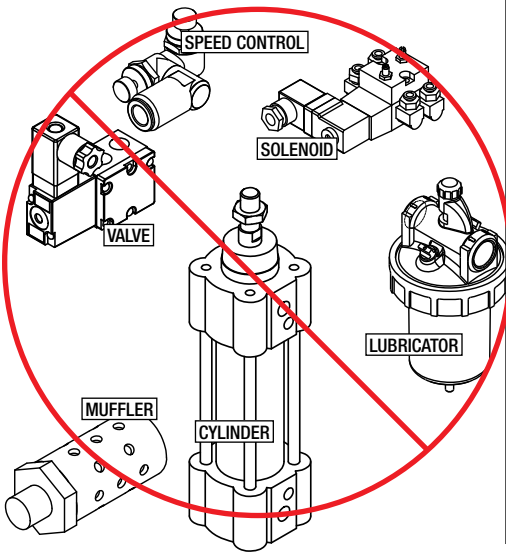
## The **ICM Plus** means flexibility

Screw-drive or belt-drive; rod style or rodless; inline or reverse-parallel; the ICM Plus expands your options to include nearly the entire line of Tolomatic electric actuators.

# Choose the **Smart**Actuator for these advantages:

## vs PNEUMATIC / HYDRAULIC CYLINDERS

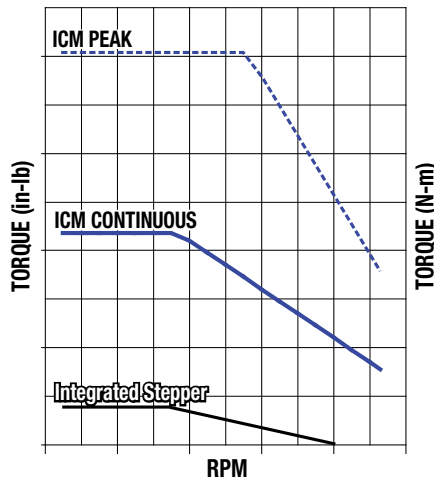
- More cost effective to operate
  - Less power consumption
- No costly and messy leaks
- Fewer, cleaner components
  - Eliminates valves, hoses, condensers, mufflers, filters, lubricators, compressors
- Precise control of position, speed, acceleration and force
- Quiet operation
- Accurately positions load at multiple and repeatable locations
- Ability to synchronize motion with other machine operations



## vs INTEGRATED STEPPER ACTUATOR

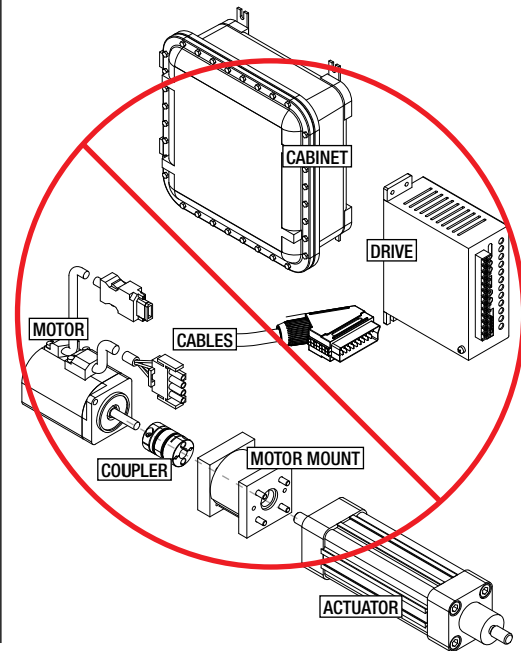
- True closed loop control ensures position is actually met
- Servo motors supply 100% duty cycle vs. stepper motors which typically supply less than 50% duty cycle
- Expanded speed/torque capability

**SPEED vs THRUST**  
ICM Motor & Integrated Stepper Motor



## vs TRADITIONAL ELECTRIC SYSTEMS

- Fewer components to purchase and assemble
  - Eliminates separate actuator, motor, drive, cables, coupler and motor mount
- Eliminates need for additional cabinet space: smaller footprint
- Approximately 1/2 the cost of traditional electric actuator systems

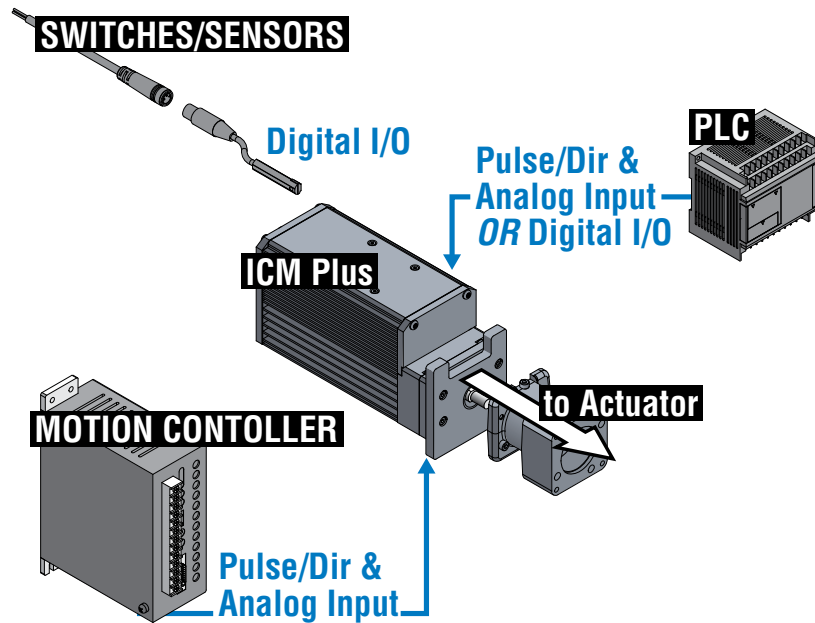


### CONTENTS

What is the SmartActuator?.....2	Modes of Operation .....4	ICM Specifications & Performance..... 6
ICM Plus Introduction .....2	Flexible Operation .....4	ICM Dimensions.....7
Smart Actuator Advantages .....3	ICM Plus Features.....5	Ordering.....8

# ICM Plus Modes of Operation

(choose one)



## Powerful Software - Intuitive Interface

The software interface is divided into three main sections:
 

- Input / Output**: Shows a table of I/O line states with inputs 1-16 and outputs 1-8, each with a status indicator (Lo, Hi, X).
- Control Panel**: A dashboard with various status indicators (Motor, Encoder, etc.) and control buttons like "Enable", "Get Description", "Stop", "Clear Status", "Start", "Reset", "Pause", and "Use".
- Indexer Programming**: A window for creating and editing motion sequences. It lists 24 sequences and shows a list of steps for a selected sequence, such as "1. Home", "2. Wait For Delay Time", "3. Home", "4. Wait For Position", "5. Set Output", "6. Wait Move Done", "7. Home", and "8. Conditional Jump".
- Oscilloscope**: A real-time waveform display showing digital signals over time, with a time axis from 0.0 to 0.1 seconds.

## Flexible Operation

**Stand-alone mode:** PLCs or switches/sensors can send commands to the actuator via digital I/O to invoke indexer program for motion or other logic events.

**Communication mode:** PLC or PC sends position commands or register changes over RS-232.

**Stepper mode:** PLC or motion controller sends pulse/direction commands to actuator initiating motion.

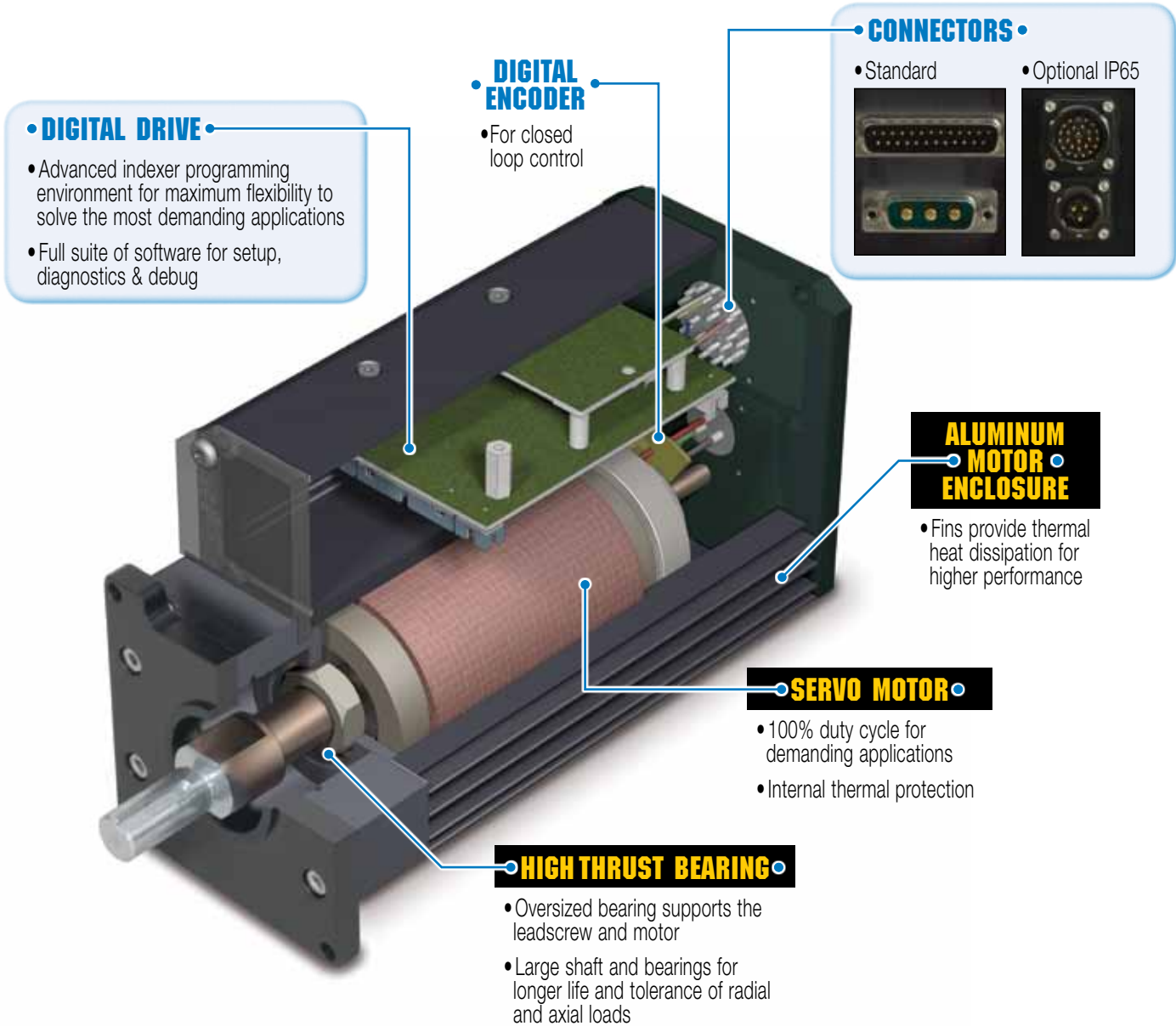
**Analog position mode:** PLC or motion controller sends 0 - 10 VDC analog signal to actuator which equates into an actual position (contact factory for Analog Torque Mode).

# SmartActuator ICM Plus

## INTEGRATED CONTROL MOTOR

**ENDURANCE TECHNOLOGY<sup>SM</sup>**

Endurance Technology features are designed for maximum durability to provide extended service life. This endurance technology symbol indicates our durability design features.



### OPTIONS

**BRAKE**



For vertical applications and energy savings when ICM is not in use

**IP65**



For protection against water and dust ingress

**CABLES**



- Signal Cable (5m, IP40 or IP65)
- Power Cable (5m, IP40 or IP65)



## MECHANICAL SPECIFICATIONS

	Unit	ICM
<b>Peak Torque</b>	in-lb	17
	<i>N-m</i>	<i>1.92</i>
<b>Cont. Torque</b>	in-lb	8.0
	<i>N-m</i>	<i>0.9</i>
<b>Base Weight</b>	lb	6.50
	<i>kg</i>	<i>2.95</i>
<b>Min temp</b>	deg F	50
	<i>deg C</i>	<i>10</i>
<b>Max temp</b>	deg F	122
	<i>deg C</i>	<i>50</i>
NOTE: Performance de-rating will be necessary at ambient temperatures greater than 25 deg. C (77 deg F)		
<b>IP rating</b>	std	40
<b>IP rating</b>	option	65
RoHS Compliant Components Approval Pending		

## POWER SUPPLY

### POWER SUPPLY SIZING GUIDELINES

The ICM Plus is intended to run off an isolated DC power source. The power supply that is required will depend on the application. A 48V supply will allow the actuator to operate at maximum speed. A 24V supply will result in half the rated velocity. Input current will depend on the actuator power needed in the application. If operating more than one actuator on the same power supply add the required power supply rating for each actuator. Call Tolomatic for help in determining power supply for your application.

ICM (Required Power - Watts)

SPEED (RPM)	TORQUE (in-lb)							
	2	4	6	8	10	12	14	16
200	28	44	65	91	121	156	196	240
400	38	60	87	119	155	197	243	293
600	48	76	109	147	190	238	290	347
800	59	93	132	176	225	279	338	402
1000	70	110	154	205	260	321	387	458
1200	81	127	177	234	295	363	435	514
1400	93	144	200	263	331	405	485	571
1600	105	161	224	292	367	448	535	628
1800	117	179	247	322	403	491	585	686
2000	129	197	271	352	440	535	636	745
2200	142	215	295	382	477	579		
2400	155	233	319	413	514			
2600	168	252	344	444				
2800	182	271	369					
	<i>0.23</i>	<i>0.45</i>	<i>0.68</i>	<i>0.90</i>	<i>1.13</i>	<i>1.36</i>	<i>1.58</i>	<i>1.81</i>
	<b>TORQUE (N-m)</b>							

Use this table to help determine the proper power source rating for an application. NOTE: green numbers indicate power supply required in Watts for the given speed and thrust indicated at outside margins.

### SYSTEM POWER OVERLOADING CONSIDERATIONS

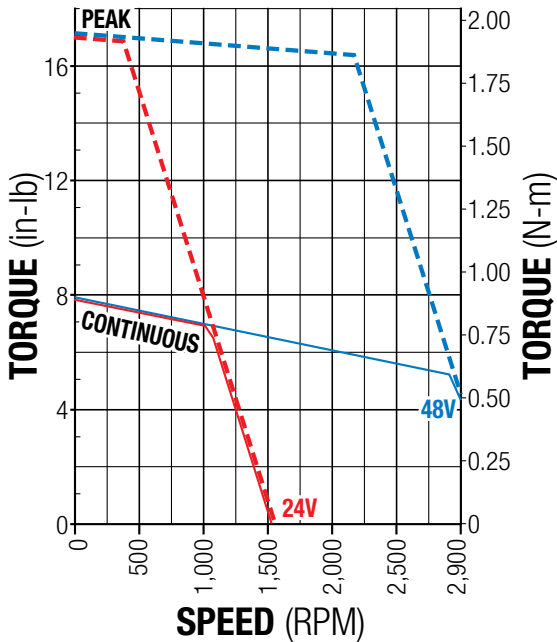
For applications with large load requirements, care should be taken to prevent the system from generating adverse amounts of power, resulting in overloading and possible failure of the actuator.

Vertical applications or applications with large inertia loads may cause regenerative energy to be created. If regenerative energy becomes an issue a shunt regulator will be needed to dissipate excess energy.

Use the Tolomatic Shunt Regulator (part #2180-9811) for preventing over-voltage conditions. Screw terminals are marked with "+" and "-" which should be connected to the power bus.



**MOTOR SPEED vs TORQUE**



**BRAKE CONSIDERATIONS**

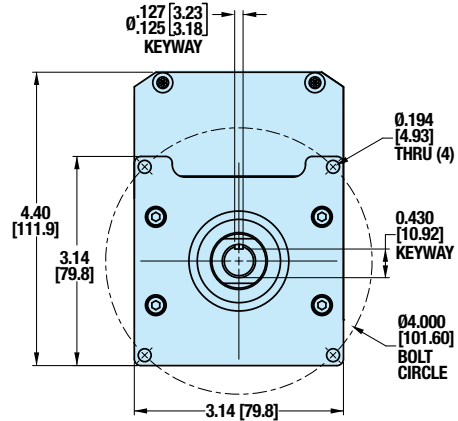
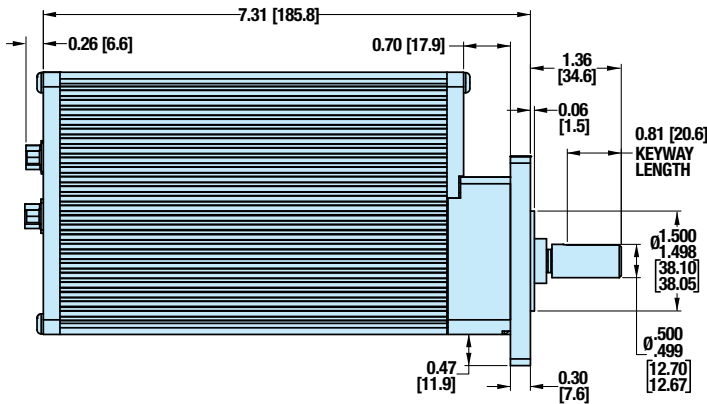
An unpowered ICM will require a brake to maintain its position if an external torque is applied.

A brake can be used with the ICM motor to keep the actuator from backdriving, typically in vertical applications. A brake may be used for safety reasons or for energy savings allowing the actuator to hold position when unpowered.

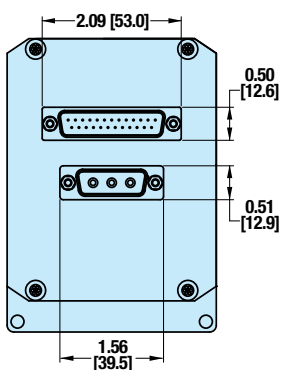
NOTE: The optional Spring-Applied/Electronically-Released Brake requires 24V power. It has a input current rating of 0.414 Amps.

**Test conditions:** Motor operated at rated temperature mounted to an aluminum heatsink. Aluminum heatsink: 11" x 11" x 1/2"

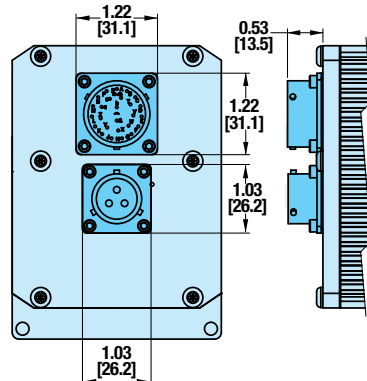
**DIMENSIONS**



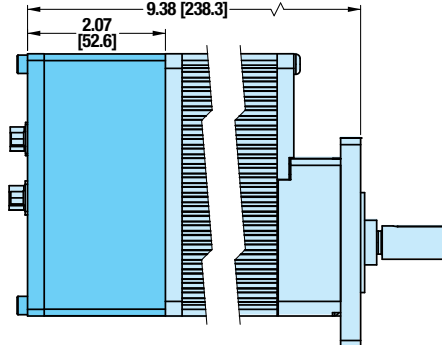
**STANDARD CONNECTORS**



**IP65 CONNECTORS**



**BRAKE OPTION LENGTH**



## ORDERING

MODEL OPTIONS

**AM** **T1** **30** **01** **CPS**



**ADD MOTOR**  
**AM** Add Motor (at the end of actuator configuration string)

**ICM MOTOR**  
**T1** ICM Plus Servo Motor

**BRAKE**  
**30** Motor without brake  
**31** Motor WITH brake

**IP65 OPTION**  
**01** with standard connectors  
**02** WITH IP65 connectors

**CABLES**  
**CPS** Standard Cables, Power and Signal  
**CIP** IP65 Cables, Power and Signal

### OPTIONS

Description	Part Number	Cable Length
<b>CABLES: ICM Plus</b>		
Signal Cable: IP40	3604-1640	5m
Signal Cable: IP65	3604-1648	5m
Power Cable: IP40	3604-1641	5m
Power Cable: IP65	3604-1649	5m

Description	Part Number
<b>MISCELLANEOUS: ICM Plus</b>	
Shunt Regulator	2180-9811

**⚠** Not all codes listed are compatible with all options.

Call Tolomatic 1-800-328-2174 to determine available options and accessories based on your application requirements.





# 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

Tolomatic continues to offer the fastest delivery of standard catalog products. 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.



## ONLINE SIZING & SELECTION SOFTWARE

Online sizing that is easy to use, accurate and always up-to-date. Input your application data and the software will determine a Tolomatic electric actuator to meet your requirements.



## 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

### 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

### POWER-TRANSMISSION PRODUCTS



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

"FOLDOUT" BROCHURE #9900-9076  
PRODUCTS BROCHURE #9900-4029



3800 County Road 116 • Hamel, MN 55340 U.S.A.  
Phone: (763) 478-8000 • Fax: (763) 478-8080

Toll-Free: **1-800-328-2174**

Email: [help@tolomatic.com](mailto:help@tolomatic.com) • <http://www.tolomatic.com>

All brand and product names are trademarks or registered trademarks of their respective owners. Information in this document is believed accurate at time of printing. However, Tolomatic assumes no responsibility for its use or for any errors that may appear in this document. Tolomatic reserves the right to change the design or operation of the equipment described herein and any associated motion products without notice. Information in this document is subject to change without notice.

Visit [www.tolomatic.com](http://www.tolomatic.com) for the most up-to-date technical information

