

IMA

INTEGRATED MOTOR ROD-STYLE ACTUATOR

● **ENDURANCE TECHNOLOGY** ●SM

Patent Pending



LINEAR SOLUTIONS MADE EASY

The longest lasting, high-force integrated actuator on the market!

The IMA is a compact, durable, high force rod-style actuator. The IMA integrates a servo motor into a ball or roller screw-driven actuator to provide efficient high force in a compact lightweight design envelope. Our patent-pending design allows for easy re-lubrication without disassembly for extremely long service life.

Tolomatic has over 50 years of experience manufacturing rodless and rod-style electric and pneumatic actuators. The IMA combines this experience and the power of servo motor technology into one actuator.

The result: reliable, affordable power in a compact package.

The IMA's unique integrated design

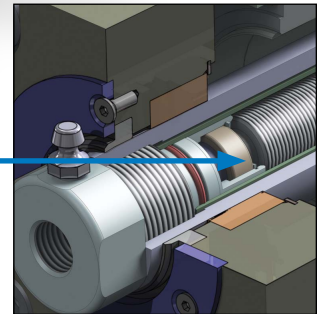
Features:

- Compact, lightweight design
- Long life
- High force
- High positional accuracy
- High efficiency
- Proven performance
- Ratings for extreme environments
- Compatibility
- Low inertia

Eliminates:

- Couplers
- Adapters
- Belts
- Gears
- Unneeded assembly labor
- Forced air or water cooling
- Hydraulic systems
- Pneumatic systems
- Need for multiple vendors

**PATENT
PENDING
SCREW
LUBRICATION
SYSTEM**



TOLOMATIC'S ELECTRIC ROD-STYLE ACTUATORS



ENDURANCE TECHNOLOGY®

	IMA	ERD	ICR SmartActuator®	RSA	GSA
					
	Integrated Motor Rod-Style Actuator	Rod-Style Actuator	Integrated Control Rod-Style Actuator	Rod-Style Actuator	Guided Rod-Style Actuator
Thrust up to:	6,875 lbf [30,594 N]	500 lbf [2224 N]	720 lbf [3202.7 N]	7,000 lbf [31,138 N]	2,700 lbf [12,010 N]
Speed up to:	23 in/sec [584 mm/sec]	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]
Stroke Length up to:	18 in [457 mm]	24 in [609 mm]	24 in [609 mm]	60 in [1,524 mm]	36 in [914 mm]
Screw/Nut Type	Ball & Roller	Solid & Ball	Ball	Solid, Ball & Roller	Solid & Ball
<i>For complete information see www.tolomatic.com or literature number:</i>					
Literature Number:	2700-4000	2190-4000	2100-4000	3600-4609	3600-4609

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

IMA - Integrated Motor Actuator

IMA Applications

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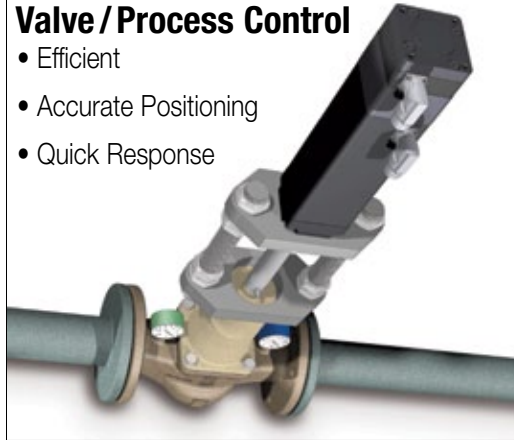
Press Fitting System

- High Force
- Long Life



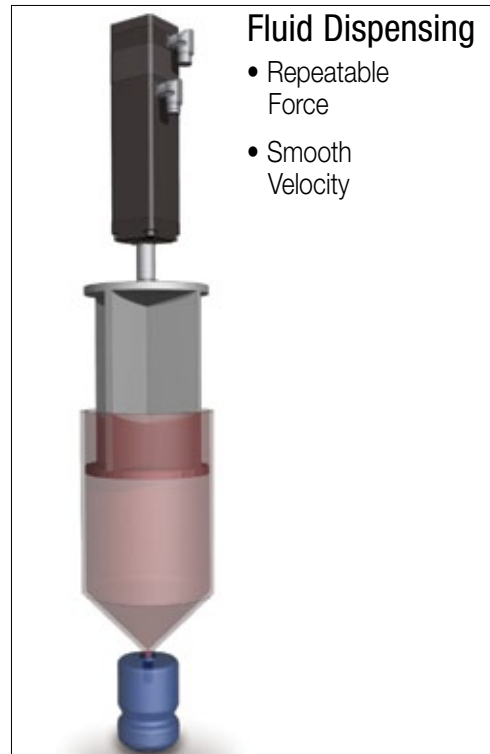
Valve / Process Control

- Efficient
- Accurate Positioning
- Quick Response



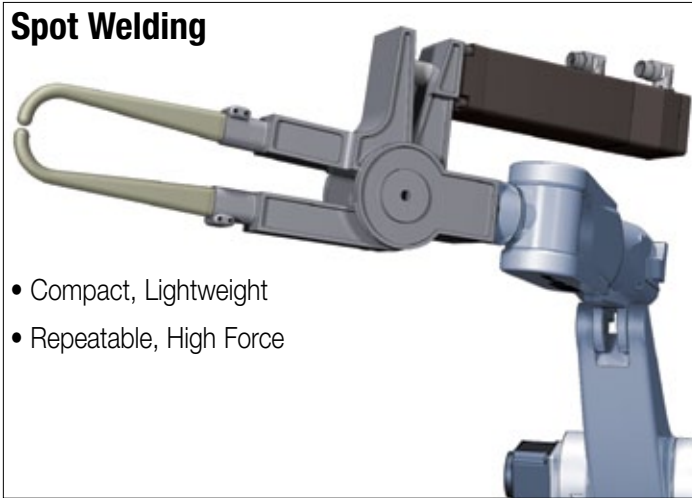
Fluid Dispensing

- Repeatable Force
- Smooth Velocity



Spot Welding

- Compact, Lightweight
- Repeatable, High Force



More Applications:

- | | | | |
|--|---|---|--|
| <ul style="list-style-type: none">• Aerospace• Animation• Assembly• Automated assembly• Automatic tool changers• Automotive• Clamping• Converting• Conveyors• Cycle testing• Fillers | <ul style="list-style-type: none">• Formers• Hydraulic replacement• Laser positioning• Machine tools• Material handling systems• Medical equipment• Military• Molding• Motion simulators• Open/close doors• Packaging equipment | <ul style="list-style-type: none">• Parts clamping• Patient lifts• Pick & place• Pneumatic replacement• Precision grinders• Product test simulations• Riveting / fastening / joining• Robot manipulator arms• Sawmill equipment | <ul style="list-style-type: none">• Semiconductor• Stamping• Table positioning• Tension control• Test stands• Tube bending• Volumetric pumps• Water jet control• Wave generation• Web guidance• Welding• Wire winding |
|--|---|---|--|

IMA INTEGRATED MOTOR ACTUATOR

ENDURANCE TECHNOLOGYSM

The IMA is a compact, durable, high force rod-style actuator. The IMA integrates a servo motor into a ball or roller screw-driven actuator to provide efficient high force in a compact lightweight design envelope. Our patent-pending design allows for easy re-lubrication without disassembly for extremely long service life. Built-to-order in stroke lengths up to 18 inches with your choice of screw technology.

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

HIGH POSITIONAL ACCURACY

SCREW ACCURACY			
Roller Nut	± 0.0004"/ft.	± 0.0102mm/300mm	
Ball Nut	± 0.002"/ft.	± 0.051mm/300mm	

INTERNAL BUMPERS

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

REPLACEABLE ROD WIPER

- Prevents contaminants from entering the actuator for extended life

GREASE PORT

- Patent pending screw relubrication system provides extended screw service life
- Convenient lubrication without disassembly (IMA22 is lubed for life and does not include grease port)

INTEGRAL MOUNTING

- Four metric threaded holes on front face are available for direct mounting or addition of customized options

THREADED ROD END

- Zinc plated alloy steel construction for corrosion resistance
- Provides a common interface to multiple rod end options

THRUST TUBE

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

MULTIPLE SCREW TECHNOLOGIES

YOU CAN CHOOSE:

- Ball nuts offer efficiency at a cost effective price
- Roller nuts provide the highest thrust and life ratings available



SMOOTH BODY DESIGN

- Eliminates potential contaminant collection points

CONNECTORS

YOU CAN CHOOSE FROM:

- Connector choice and wiring emulates popular motor manufacturers for compatibility:
 - Tolomatic Standard
 - Bosch Rexroth MSK Series
 - Emerson FM & NT Series
 - Lenze MCA Series
 - more to come...

- STAGGERED CONNECTORS for convenient installation

- 270° Rotatable & Box mount options available

HIGH RESOLUTION FEEDBACK

YOU CAN CHOOSE:

- Digital encoder
- Multi-turn absolute encoder
- Resolver

HIGH THRUST BEARING

- Provides complete support of screw and protects the feedback device from linear forces

MULTIPLE MOTOR WINDINGS

YOU CAN CHOOSE:

- 230V or 460V rated windings potted directly into actuator housing
- Skewed motor windings provide minimal torque ripple for smooth linear motion
- Integral thermal switch for over temperature protection
- 1 stack motor (MV21-230V & MV41-460V) available for the IMA33, allows strokes between 3 and 6" providing the thrust needed for many applications in a more compact, lighter weight package

OPTIONS

MOUNTING

- Front Face - Standard
- Side Mounting Holes, 2 sides & bottom (no photo)
- Mounting Plates
- Rear Clevis
- Front Flange
- Trunnion, Rear or Front

ROD END

- Internal Thread - Standard
- External Threads
- Clevis
- Spherical Eye
- Alignment Coupler

BRAKE

- 24V Spring held / electronically released

CABLES

- Signal Cable (6m)
- Power Cable (6m)

ARO

- Anti-Rotate

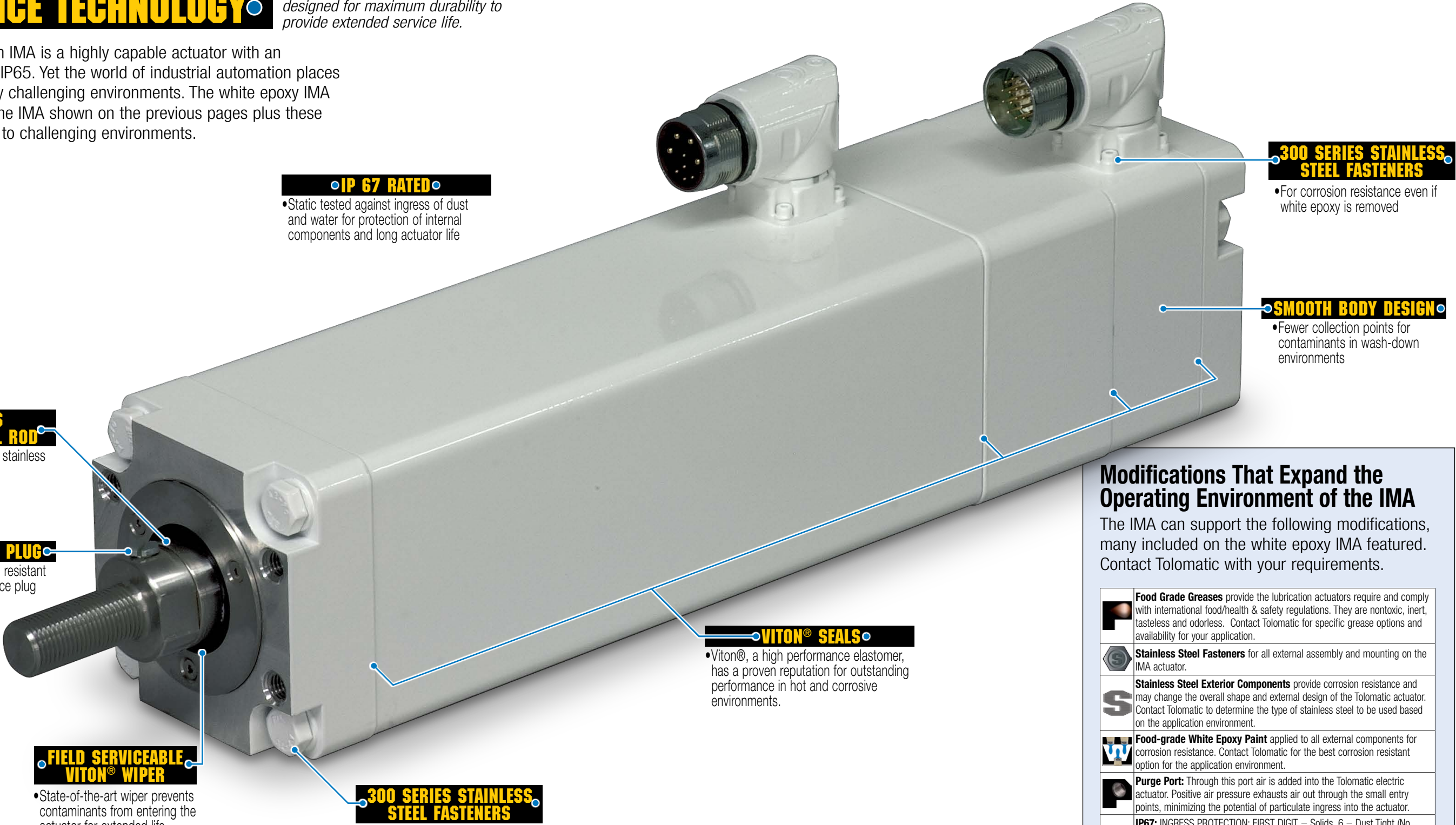
IP67 • For protection against water and dust ingress

FOOD GRADE IMA

ENDURANCE TECHNOLOGYSM

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

The standard production IMA is a highly capable actuator with an environmental rating of IP65. Yet the world of industrial automation places actuators in increasingly challenging environments. The white epoxy IMA has all the features of the IMA shown on the previous pages plus these features that are suited to challenging environments.



IP 67 RATED

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

300 SERIES STAINLESS STEEL FASTENERS

- For corrosion resistance even if white epoxy is removed

SMOOTH BODY DESIGN

- Fewer collection points for contaminants in wash-down environments

300 SERIES STAINLESS STEEL ROD

- Corrosion resistant 316 stainless steel rod

GREASE ZERK OR PLUG

- Both made with corrosion resistant 316 stainless steel. Replace plug with zerk to lubricate

FIELD SERVICEABLE VITON® WIPER

- State-of-the-art wiper prevents contaminants from entering the actuator for extended life

300 SERIES STAINLESS STEEL FASTENERS

- For corrosion resistance even if white epoxy is removed
- Hex bolts for fewer collection points for contaminants in wash-down environments

VITON® SEALS

- Viton®, a high performance elastomer, has a proven reputation for outstanding performance in hot and corrosive environments.

Modifications That Expand the Operating Environment of the IMA

The IMA can support the following modifications, many included on the white epoxy IMA featured. Contact Tolomatic with your requirements.

	Food Grade Greases provide the lubrication actuators require and comply with international food/health & safety regulations. They are nontoxic, inert, tasteless and odorless. Contact Tolomatic for specific grease options and availability for your application.
	Stainless Steel Fasteners for all external assembly and mounting on the IMA actuator.
	Stainless Steel Exterior Components provide corrosion resistance and may change the overall shape and external design of the Tolomatic actuator. Contact Tolomatic to determine the type of stainless steel to be used based on the application environment.
	Food-grade White Epoxy Paint applied to all external components for corrosion resistance. Contact Tolomatic for the best corrosion resistant option for the application environment.
	Purge Port: Through this port air is added into the Tolomatic electric actuator. Positive air pressure exhausts air out through the small entry points, minimizing the potential of particulate ingress into the actuator.
	IP67: INGRESS PROTECTION: FIRST DIGIT = Solids, 6 = Dust Tight (No ingress of dust; complete protection against contact) SECOND DIGIT = Liquids, 7 = Immersion up to 1 m (Ingress of water in harmful quantity shall not be possible when the enclosure is immersed in water under defined conditions of pressure and time up to 1 m of submersion).
	IP69K: INGRESS PROTECTION: 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.[4] Such enclosures must not only be dust tight (IP6X), but also able to withstand high-pressure and steam cleaning.

OPTIONS MOUNTING

•Front Face - Standard

•Side Mounting Holes, 2 sides & bottom (no photo)

•Rear Clevis

•Front Flange

•Trunnion, Rear or Front

IMA - Integrated Motor Actuator

Performance & Mechanical Specifications:

SERIES		IMA22 (1 Stack, MV21/41)	IMA22 (3 Stack, MV23/43)	IMA33 (1 Stack, MV21/41)				IMA33 (3 Stack, MV23/43)				IMA44				IMA55			
FACE SIZE	in	2.5		3.3								4.4				5.6			
	mm	63.5		83								110				142			
STROKE	in	3.0 to 12.0	6.0 to 12.0	3.0 to 18.0				6.0 to 18.0				6.0 to 18.0							
	mm	76.2 to 304.8	152.4 to 304.8	76.2 to 457.2				152.4 to 457.2				152.4 to 457.2							
NUT/SCREW		BN05	BN05	BN05	BN10	RN05	RN10	BN05	BN10	RN05	RN10	BN05	BN10	RN05	RN10	BN05	BN10	RN05	RN10
SCREW LEAD	in	0.197	0.197	0.197	0.394	0.197	0.394	0.197	0.394	0.197	0.394	0.197	0.394	0.197	0.394	0.197	0.394	0.197	0.394
	mm	5	5	5	10	5	10	5	10	5	10	5	10	5	10	5	10	5	10
DYNAMIC LOAD RATING (1 mil revs)	lbf	1,012	1,012	1,709	1,214	7,872	6,805	1,709	1,214	7,872	6,805	3,395	3,372	10,683	9,210	6,714	7,476	15,176	11,750
	N	4,502	4,502	7,602	5,400	35,017	30,270	7,602	5,400	35,017	30,270	15,100	15,000	47,521	40,968	29,865	33,255	67,533	52,288
SCREW LEAD ACCURACY	in/ft	0.002	0.002	0.002		0.0004		0.002		0.0004		0.002		0.0004		0.002		0.004	
	mm/300	0.051	0.051	0.051		0.0102		0.051		0.0102		0.051		0.0102		0.051		0.102	
BACKLASH	in	0.004	0.004	0.004	0.004	0.0012	0.0012	0.004	0.004	0.0012	0.0012	0.005	0.005	0.0012	0.0012	0.005	0.005	0.0012	0.0012
	mm	0.1	0.1	0.1	0.1	0.03	0.03	0.1	0.1	0.03	0.03	0.13	0.13	0.03	0.03	0.13	0.13	0.03	0.03
CONT. THRUST	lbf	200	325	365	183	350	175	900	450	850	425	1,750	875	1,650	825	2,950	1,475	2,750	1,375
	N	890	1,446	1,624	814	1,557	778	4,003	2,002	3,781	1,891	7,784	3,892	7,340	3,670	13,128	6,564	12,238	6,119
PEAK THRUST	lbf	325	325	1,000	549	1,050	525	1,000	900	1,700	850	2,000	1,750	3,300	1,650	3,000	2,950	6,875	2,750
	N	1,446	1,446	4,448	2,442	4,671	2,335	4,448	4,003	7,562	3,781	8,896	7,784	14,679	7,340	13,350	13,128	30,594	12,238
MAX. VELOCITY	in/sec	12	12	12	24	12	24	11.5	23	11.5	23	11.5	23	11.5	23	7.9	15.7	7.9	15.7
	mm/sec	305	305	305	610	305	610	292	584	292	584	292	584	292	584	201	399	201	399
**BASE WEIGHT	lb	5.3	6.4	11.4				14.1				28.6				54.5			
	kg	2.4	2.9	5.2				6.4				13				24.8			
WEIGHT PER UNIT OF STROKE	lb/in	0.2428		0.6603								1.1035				2.1115			
	kg/mm	0.0073		0.0118								0.0197				0.03771			
**BASE INERTIA	lb-in ²	0.3004	0.5004	0.9305	0.9349	0.9310	0.9370	1.6485	1.6530	1.6508	1.6567	3.3107	3.3205	3.2851	3.2969	25.711	25.745	25.532	25.570
	kg-cm ²	0.8790	1.4642	2.7216	2.7346	2.7231	2.7406	4.8220	4.8349	4.8284	4.8459	9.6838	9.7126	9.6090	9.6434	75.2409	75.3404	74.681	74.793
INERTIA PER UNIT OF STROKE	lb-in ² /in	0.0012	0.0012	0.0027	0.0031	0.0036	0.0041	0.0027	0.0031	0.0036	0.0041	0.0181	0.0187	0.0098	0.0106	0.153	0.154	0.111	0.112
	kg-cm ² /mm	0.0035	0.0035	0.0003	0.0004	0.0004	0.0005	0.0003	0.0004	0.0004	0.0005	0.0021	0.0022	0.0011	0.0012	0.0176	0.0177	0.323	0.328
BREAKAWAY TORQUE	in-lb	3.0	3.0	4.8	4.8	5.3	5.3	4.8	4.8	5.3	5.3	5.6	5.6	6.2	6.2	9.4	9.4	10.3	10.3
	N-m	0.34	0.34	0.54	0.54	0.60	0.60	0.54	0.54	0.60	0.60	0.63	0.63	0.70	0.70	1.06	1.06	1.16	1.16
BACK DRIVE FORCE*	lbf	49	49	78	39	78	39	78	39	78	39	91	46	91	46	153	77	152	76
	N	218	218	347	173	347	173	347	173	347	173	405	205	405	205	681	343	676	338
TEMP RANGE	°F	50 to 122																	
	°C	10 to 50																	
IP RATING	Standard IP65, Optional IP67 (Static)																		
REL. HUMIDITY (NON-CONDENSING)	5 to 90%																		
SHOCK	20g peak, 6 msec duration																		
VIBRATION	2.5g 30....2,000 Hz																		

*In vertical applications an unpowered IMA will require a brake to maintain position if the load on the actuator exceeds this value

**Value given is for a zero stroke actuator



Performance data was validated using an aluminum face mount plate: IMA22/33 (8.25" x 7.0" x 0.7"); IMA44 (9.0" x 9.0" x 0.7"); IMA55 (9.0" x 9.0" x 1.0")

IMA - Integrated Motor Actuator

Motor Specifications:

SERIES		IMA22				IMA33				IMA44		IMA55	
WINDING/MOTOR VOLTAGE		MV21	MV41	MV23	MV43	MV21	MV41	MV23	MV43	MV23	MV43	MV23	MV43
TORQUE CONSTANT (K_t)	in-lb/A Peak	3.3	6.6	4.3	8.2	5.4	10.7	5.5	10.7	5.4	10.6	6.7	13.4
	N-m/A Peak	0.37	0.74	0.49	0.93	0.61	1.21	0.62	1.21	0.61	1.20	0.76	1.51
VOLTAGE CONSTANT (K_e)	V/Krpm Peak	30	59	37	70	81	160	79.8	154	78.1	153.1	100	201
CONTINUOUS STALL TORQUE	in-lb	7.5		13.3		16		39	38	74	75	112	112
	N-m	0.85		1.50		1.8		4.4	4.3	8.4	8.5	12.7	12.7
CONTINUOUS STALL CURRENT	Arms	1.6	0.8	2.2	1.15	2.1	1.1	5	2.5	9.7	5	11.8	5.9
PEAK TORQUE	in-lb	15.0		26.6		32		78	76	148	150	280	280
	N-m	1.69		3.0		3.6		8.8	8.6	16.7	16.9	25.3	25.3
PEAK CURRENT	Arms	3.2	1.4	4.4	2.3	6.3	3.3	10	5	19.4	10	29.5	14.8
RESISTANCE	Ohms	18.1	72.4	7.1	28.3	10	40.1	2.07	8.3	0.58	2.32	0.57	2.93
INDUCTANCE	mH	10.7	42	4.5	18	13.6	54.1	3.8	15	2.75	11.5	1.4	5.8
NO. OF POLES		8											
BUS VOLTAGE	Vrms	230	460	230	460	230	460	230	460	230	460	230	460
SPEED @ RATED V	RPM	3,650						3,500				2,400	

RoHS Compliant Components;  IMA33 & IMA55 Approved • IMA22 & IMA44 Approval Pending

 Performance data was validated using an aluminum face mount plate: IMA22/33 (8.25" x 7.0" x 0.7"); IMA44 (9.0" x 9.0" x 0.7"); IMA55 (9.0" x 9.0" x 1.0")

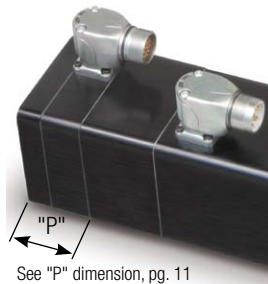
BRAKE CONSIDERATIONS

An unpowered IMA will require a brake to maintain its position if the force on the actuator exceeds Back Drive Force listed in the table on page IMA_6.

A brake can be used with the actuator to keep it from back-driving, typically in vertical applications. A brake may be used for safety reasons or for energy savings allowing the actuator to hold position when unpowered. See page IMA_19 for ordering information.

NOTE: The optional Spring-Applied / Electronically-Released Brake requires 24V power. Input current rating:

IMA22 - 0.35 Amps;
IMA33 - 0.43 Amps;
IMA44 - 0.67 Amps;
IMA55 - 0.66 Amps.



Brake Specifications:

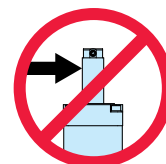
SERIES		IMA22	IMA33	IMA44	IMA55
ROTOR INERTIA	oz-in ²	0.052	0.112	0.656	0.587
	gm-cm ²	19	73	239	214
CURRENT	Amp	0.35	0.43	0.67	0.66
HOLDING TORQUE	in-lb	14	35	89	145
	N-m	1.6	4.0	9.0	16.4
ENGAGE TIME	mSec	75	40	25	15
DISENGAGE TIME	mSec	20	50	35	25
VOLTAGE	Vdc	24			

SIDE LOAD CONSIDERATIONS

The IMA integrated motor actuator is not meant to be used in applications where side loading occurs.

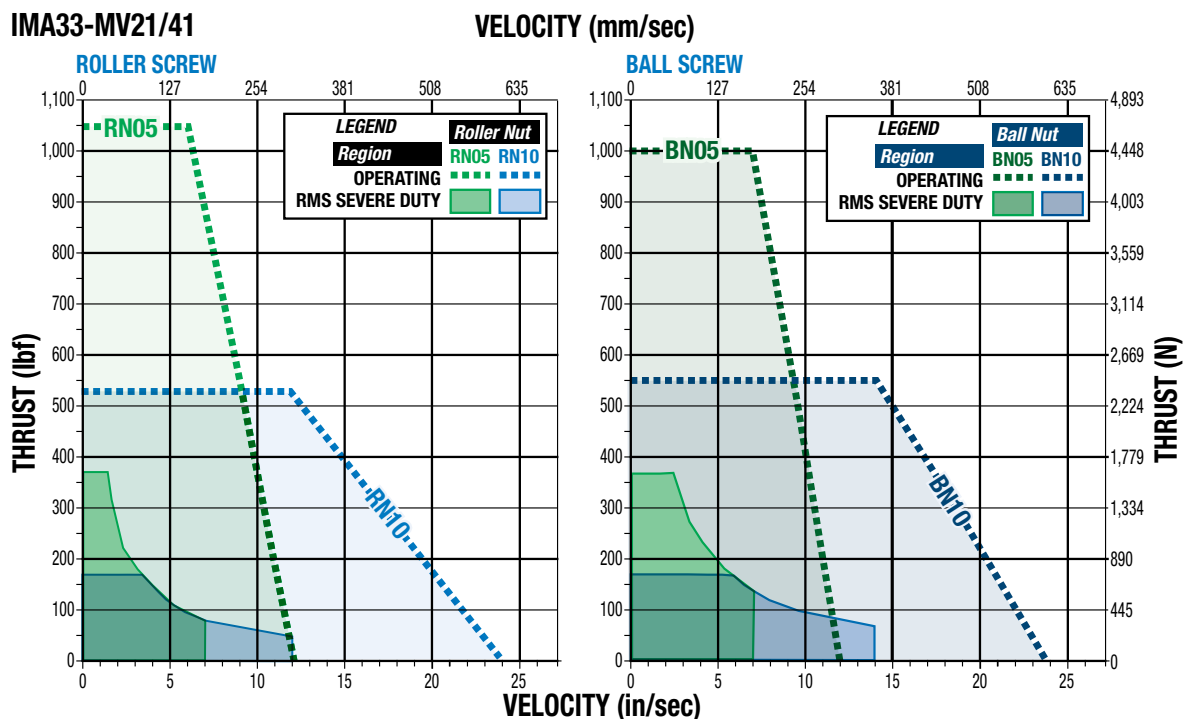
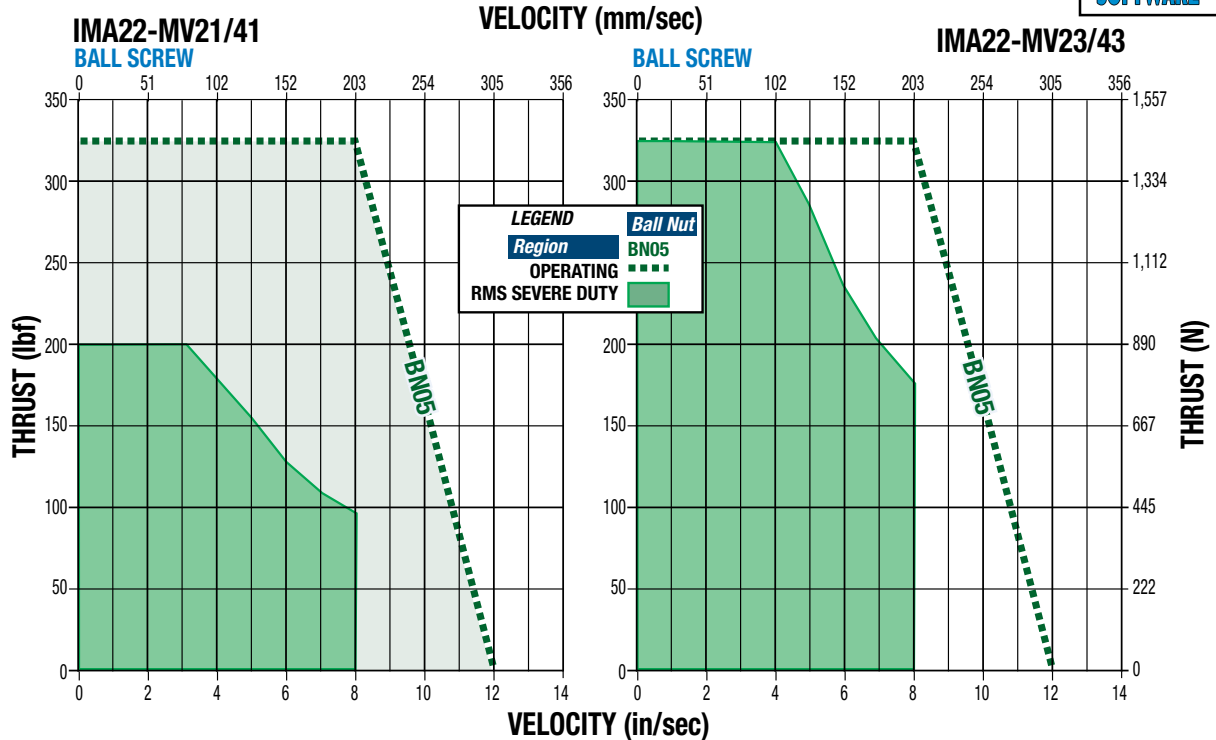
Loads must be guided and supported. Loads should be aligned with the line of motion of the thrust rod.

Side loading will affect the life of the actuator.



IMA - Integrated Motor Actuator

SPEED vs THRUST



OPERATING REGION is the maximum performance capabilities of the actuator system. Higher peak thrusts are achievable by servo motor actuator systems, so please consult Tolomatic before exceeding catalog rating.

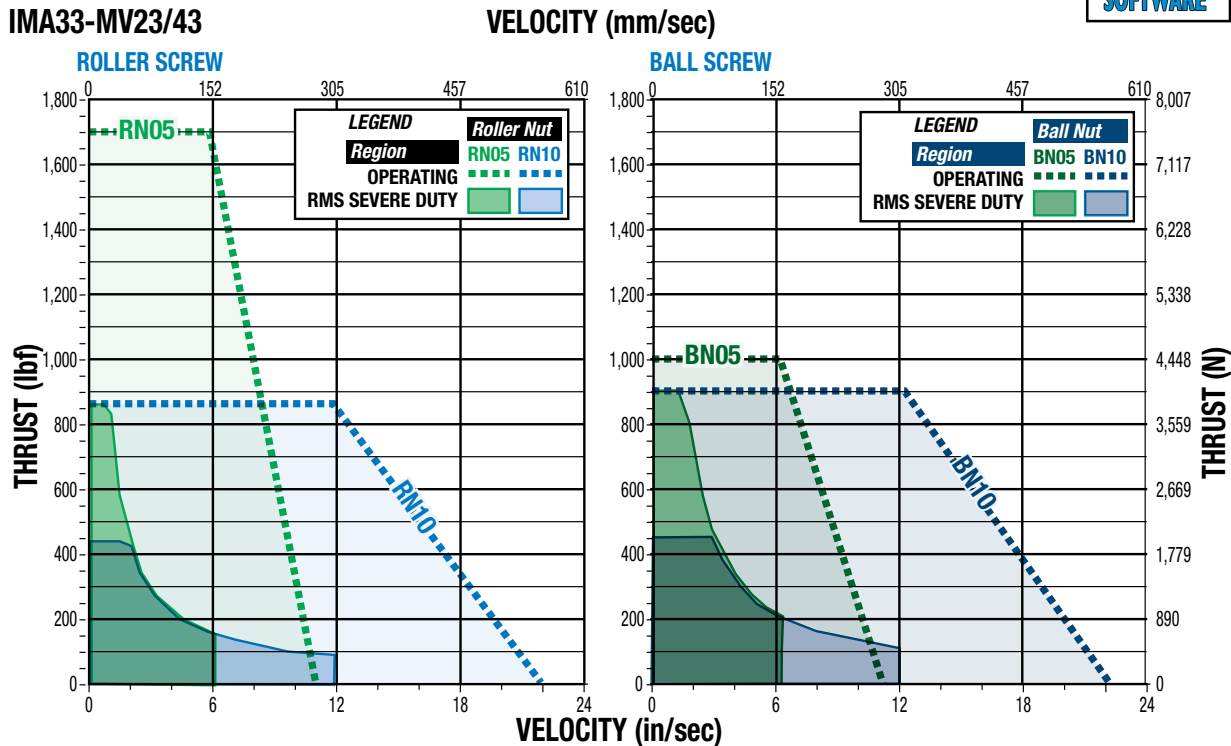
SEVERE DUTY REGION is defined as the RMS thrust and velocity limit that is derived from the thermal limits of the actuator system to achieve the dynamic load rating of the screw. (Example: Extend and retract under force 100% of the time with no dwells.)

IMA - Integrated Motor Actuator

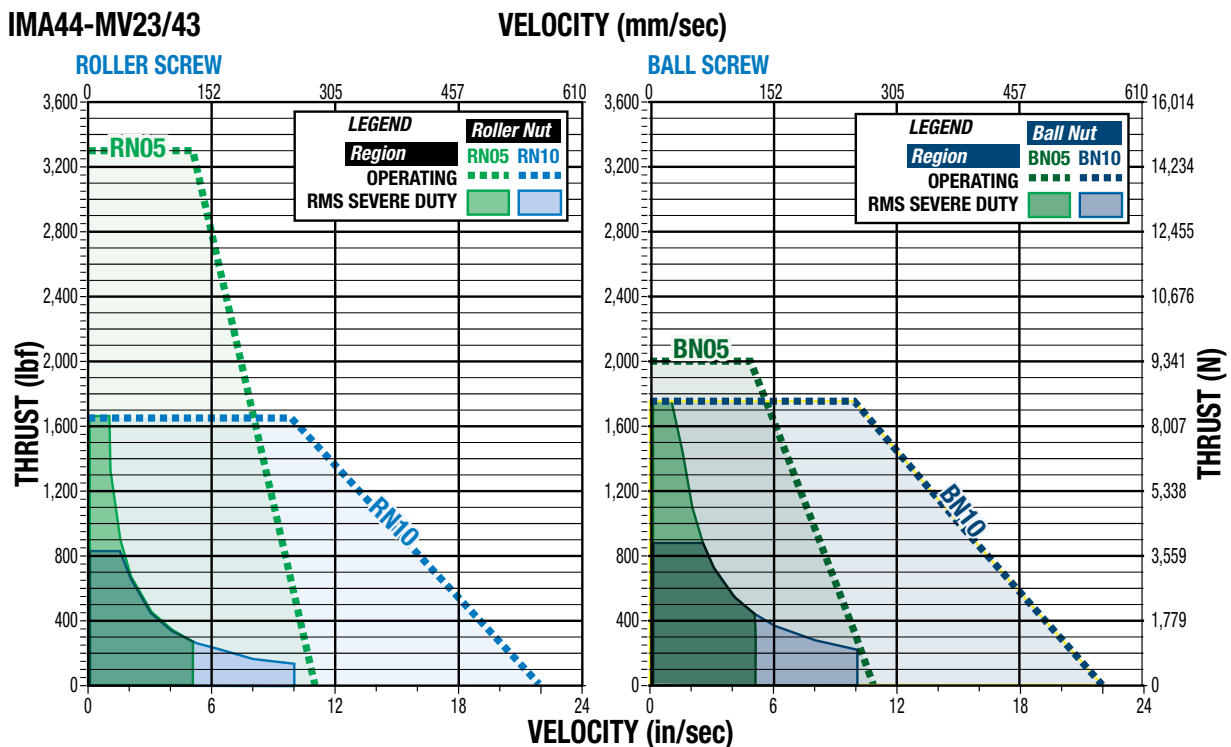


SPEED vs THRUST

IMA33-MV23/43



IMA44-MV23/43



OPERATING REGION is the maximum performance capabilities of the actuator system. Higher peak thrusts are achievable by servo motor actuator systems, so please consult Tolomatic before exceeding catalog rating.

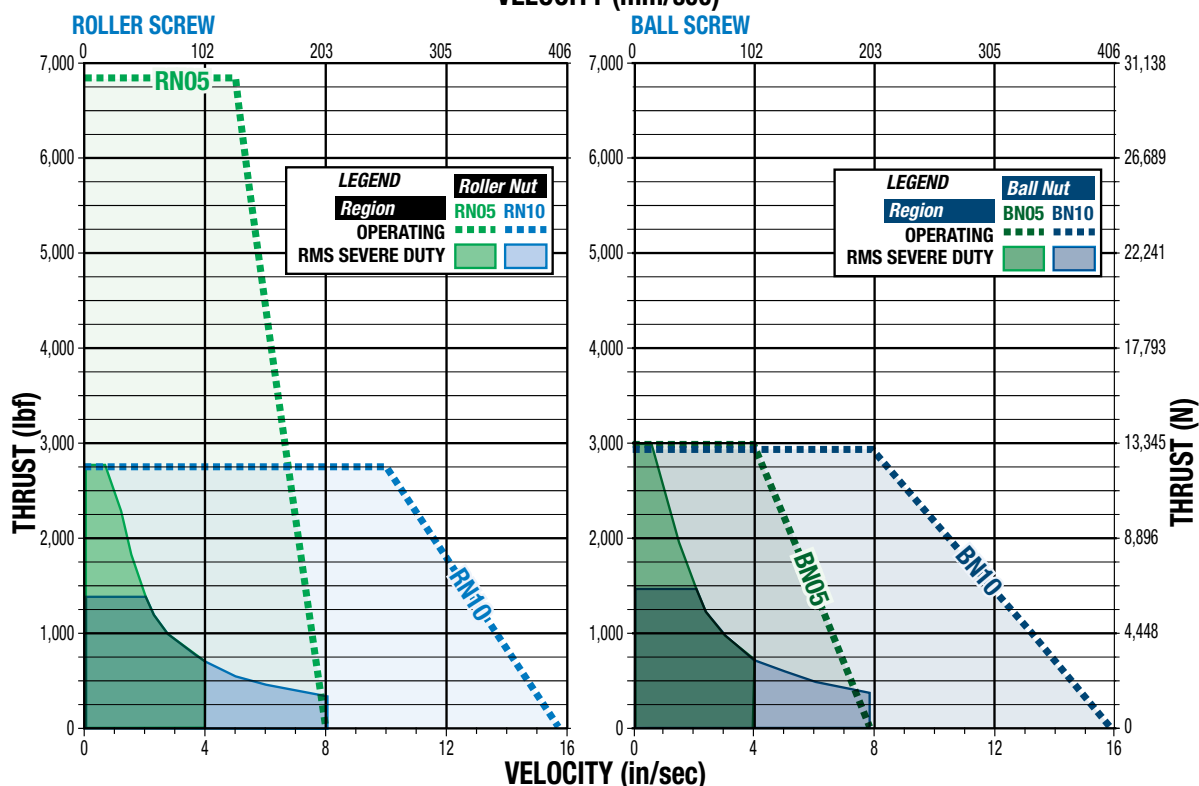
SEVERE DUTY REGION is defined as the RMS thrust and velocity limit that is derived from the thermal limits of the actuator system to achieve the dynamic load rating of the screw. (Example: Extend and retract under force 100% of the time with no dwells.)

IMA - Integrated Motor Actuator



SPEED vs THRUST

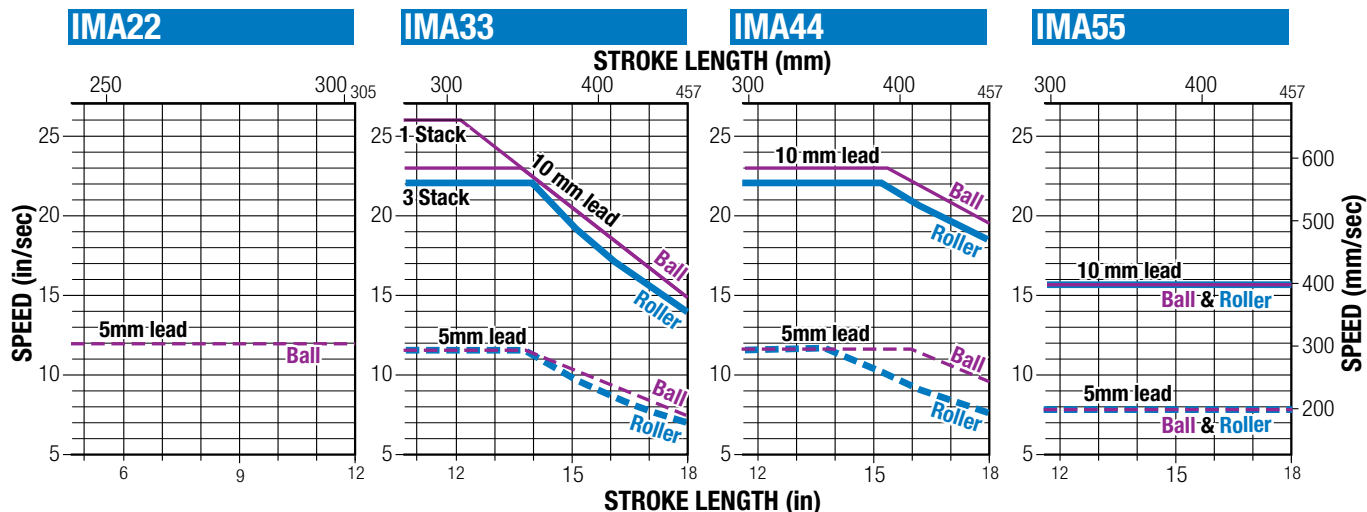
IMA55-MV23/43



OPERATING REGION is the maximum performance capabilities of the actuator system. Higher peak thrusts are achievable by servo motor actuator systems, so please consult Tolomatic before exceeding catalog rating.

SEVERE DUTY REGION is defined as the RMS thrust and velocity limit that is derived from the thermal limits of the actuator system to achieve the dynamic load rating of the screw. (Example: Extend and retract under force 100% of the time with no dwells.)

CRITICAL SPEED

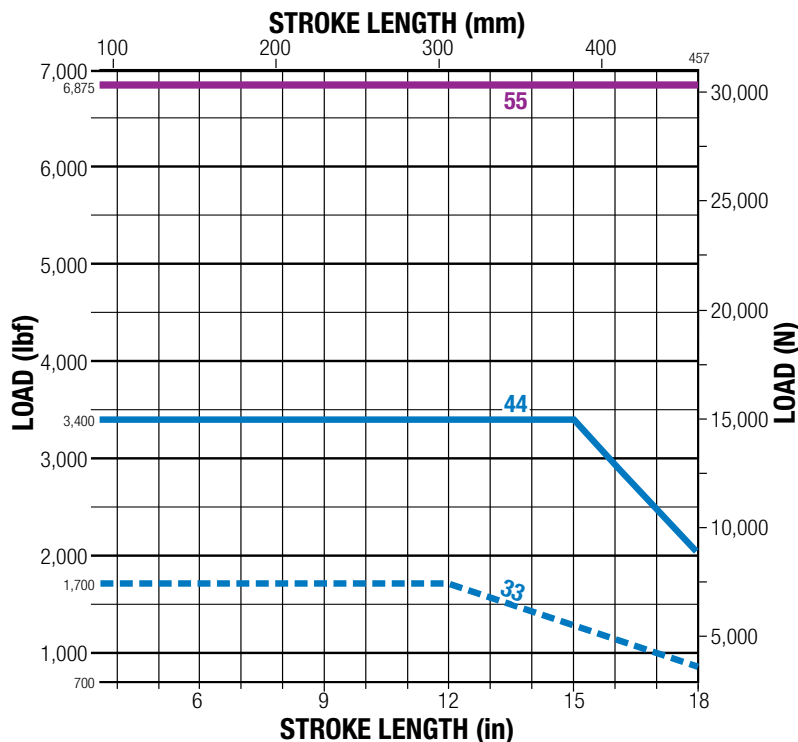


All curves represent properly lubricated and maintained actuators.

IMA - Integrated Motor Actuator



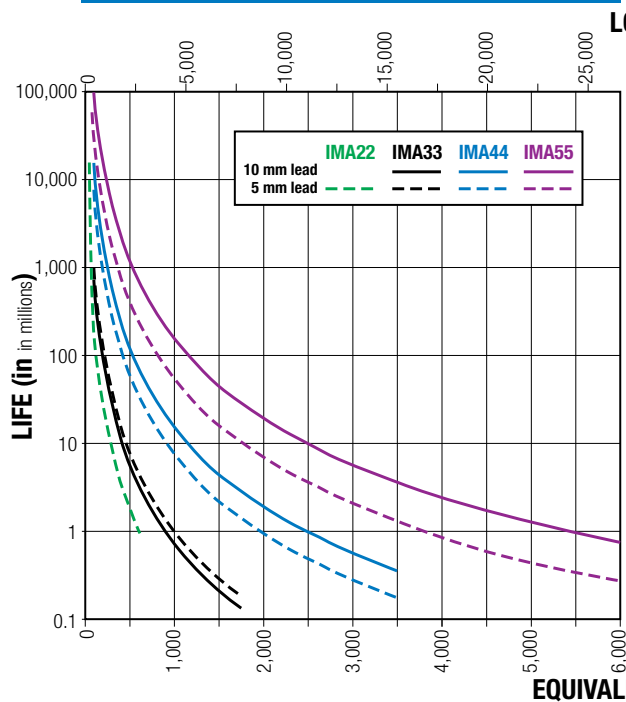
ROLLER SCREW BUCKLING LOAD



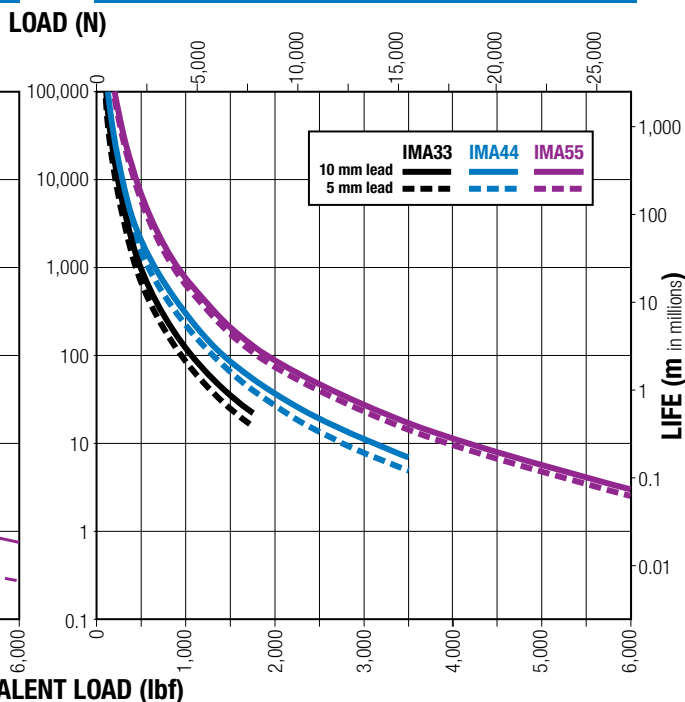
All curves represent properly lubricated and maintained actuators.

LIFE

BALL SCREW



ROLLER SCREW



NOTE: The L_{10} expected life of a ball and roller screw linear actuator is expressed as the linear travel distance that 90% of properly maintained ball and roller screws 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:

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

Travel life in millions of inches, where:

C = Dynamic load rating (lbf)

F = Equivalent load (lbf)

ℓ = Screw lead (in/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.

$$P_e = \sqrt[3]{\frac{\% (P_1)^3 + \% (P_2)^3 + \% (P_3)^3 + \% (P_n)^3}{100}}$$

Where:

P_e = Equivalent load (lbs)

P_n = Each increment at different load (lbs)

$\%_n$ = Percentage of stroke at load increment

IMA - Integrated Motor Actuator

CALCULATING RMS THRUST AND VELOCITY FOR SEVERE DUTY

Servo motor actuator systems have two speed / thrust curves: one for severe duty (continuous) and another for operating region (intermittent or peak). The root mean square (RMS) thrust & velocity is based on the application duty cycle and must fall within the severe duty region of the actuator system. The application maximum thrust & velocity must fall within the operating region of the actuator system. Higher peak thrusts are achievable by the actuator system, so please consult Tolomatic before exceeding catalog ratings. Use the following formulas when calculating the RMS thrust & velocity. When selecting a servo motor actuator system, it is recommended to add a margin of safety of 15% to the thrust and velocity required to move the load.

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

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

Where:

T_{RMS} = RMS Thrust

V_{RMS} = RMS Velocity

T_i = Thrust during interval i

V_i = Velocity during interval i

t_i = Time interval i

CALCULATING LUBRICATION INTERVAL

IMA actuators require periodic re-lubrication to maintain optimal performance. Below are formulas to help determine lubrication interval. See IMA User Guide (#2700-4001) for formula definitions, complete instructions and examples.

BALL SCREW

STEP 1: $P_{IMA} = V_{RMS} \times T_{RMS} \times 0.113 \text{ (watts)}$

STEP 2: Select the appropriate actuator power level

P_c	33	44	55
P_c	105	185	240

STEP 3: $K_p = \frac{P_c}{P_{IMA}}$

STEP 4: $t_l = 1000 \text{ (hours)} = K_p < 1$
 $t_l = 9000 \text{ (hours)} = K_p > 1$

- Re-lubricate with Mobilith SHC220 Grease #2744-1016 (Quantity: IMA33: 3.0 g; IMA44: 5.0 g; IMA55: 7.0 g) into the grease zerk located on the rod end.
- IMA22 ballscrew does not require re-lubrication

ROLLER SCREW

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

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

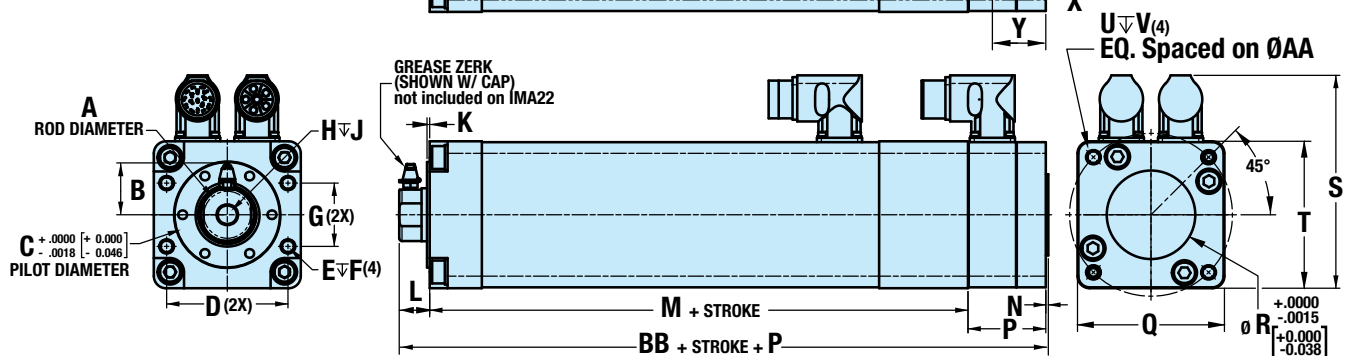
	33RN05	33RN10	44RN05	44RN10	55RN05	55RN10
K_{Co}	0.24	0.44	0.26	0.40	0.31	0.84

STEP 3: $t_L = t_{BL} \times K_T \text{ (hours)}$

- Re-lubricate with Tolomatic Grease #2744-9099 (Quantity: IMA33: 3.0 g; IMA44: 5.0 g; IMA55: 7.0 g) into the grease zerk located on the rod end.

IMA - Integrated Motor Actuator

Dimensions: **All Sizes**



	IMA22	IMA33	IMA44	IMA55
A	0.999	1.186	1.499	2.249
mm	25.38	30.13	38.08	57.13
B	—	1.11	1.27	1.65
mm	—	28.3	32.3	41.9
C	1.8898	2.3622	2.8346	3.937
mm	48.000	60.000	72.000	100.000
D	2.126	2.717	3.346	4.331
mm	54.00	69.00	85.00	100.00
E	—	—	—	—
mm	M6 x 1.0	M8 x 1.25	M8 x 1.25	M12 x 1.75
F	0.52	0.57	0.68	0.89
mm	13.2	14.5	17.1	22.5
G	0.787	1.417	2.165	2.559
mm	20.00	36.00	55.00	65.00
H	—	—	—	—
mm	M8 x 1.25	M12 x 1.25	M20 x 1.5	M27 x 2.0
J	0.65	0.88	1.02	1.50
mm	16.5	22.2	25.9	38.1
K	0.06	0.06	0.06	0.06
mm	1.5	1.5	1.5	1.5
L	0.68	0.68	0.66	0.95
mm	17.3	17.3	16.8	24.1
M	4.32	6.05	7.88	10.48
mm	109.8	153.7	200.0	266.2
N	0.06	0.06	0.06	0.06
mm	1.5	1.5	1.5	1.5
P1	1.62	1.74	1.74	1.90
mm	41.2	44.2	44.2	48.2
P2	3.41	3.18	3.15	3.81
mm	86.7	80.8	80.0	96.8
P3	—	1.98	1.98	2.14
mm	—	50.3	50.3	54.3
P4	—	3.68	3.50	3.81
mm	—	93.5	89.0	96.8
P5	1.62	1.74	1.74	2.36
mm	41.2	44.2	44.2	59.9

	IMA22	IMA33	IMA44	IMA55
P6	3.41	3.18	3.15	3.81
mm	86.7	80.8	80.0	96.8
P7	2.31	2.33	2.33	2.66
mm	58.7	59.2	59.2	67.5
P8	3.79	3.96	3.90	4.39
mm	96.3	100.6	99.1	111.5
Q	2.50	3.29	4.35	5.66
mm	63.5	83.6	110.5	143.6
R	1.5748	1.9685	2.9528	3.937
mm	40.000	50.000	75.000	100.000
S1	4.02	4.81	5.87	7.16
mm	102.0	122.2	149.0	181.9
S2	4.02	4.81	5.87	7.16
mm	102.0	122.2	149.0	181.9
S3	4.02	4.81	5.87	7.16
mm	102.0	122.2	149.0	181.9
S4	4.02	4.81	5.87	7.16
mm	102.0	122.2	149.0	181.9
S5	—	4.47	5.53	6.82
mm	—	113.5	140.4	173.3
T	2.50	3.29	4.35	5.66
mm	63.5	83.6	110.5	143.6
U	—	—	—	—
mm	M6 x 1.0	M8 x 1.25	M8 x 1.25	M12 x 1.75
V	0.53	0.65	0.65	0.80
mm	13.5	16.5	16.5	20.5
W	0.38	0.66	0.88	0.88
mm	9.5	16.8	22.2	22.2
X	0.38	0.66	0.88	0.88
mm	9.5	16.8	22.2	22.2
Y	1.08	1.20	1.20	1.35
mm	27.3	30.4	30.4	34.4
Z	2.39	2.88	3.07	3.42
mm	60.6	73.1	77.9	86.9
AA	2.756	3.622	5.000	6.102
mm	70.00	92.00	127.00	155.00
BB	5.06	6.79	8.6	11.49
mm	128.6	172.5	218.3	291.8

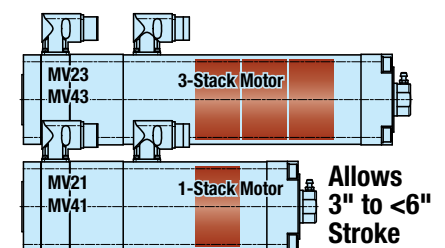
KEY FEATURES: 1-STACK & 3-STACK MOTORS

IMA22

SERIES	MV21/41	MV23/43
STROKE	in	3.0 to 12.0
	mm	76.2 to 304.8
PEAK THRUST	lbf	up to 325
	N	up to 1,446

IMA33

SERIES	MV21/41	MV23/43
STROKE	in	3.0 to 18.0
	mm	76.2 to 457.2
PEAK THRUST	lbf	up to 1,050
	N	up to 4,673



Allows
3" to <6"
Stroke

P1 = Digital Encoder
P2 = Digital Encoder with Brake
P3 = Digital Encoder (Emerson NT)
P4 = Digital Encoder with Brake (Emerson NT)
P5 = Resolver

P6 = Resolver with Brake
P7 = Absolute Encoder
P8 = Absolute Encoder w/ Brake
S1 = Tolomatic Standard
S2 = Bosch MSK Motor Series

S3 = Emerson FM Series
S4 = Lenze MCS Motor Series
S5 = Emerson NT Series*
*Uses Box Mount Connectors (IP67 not available)
*Not available as standard on IMA22

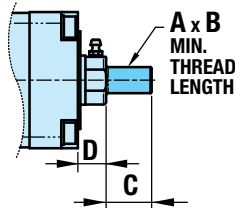
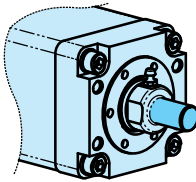
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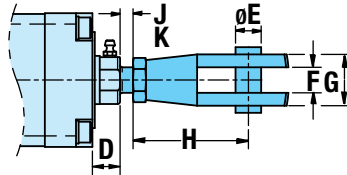
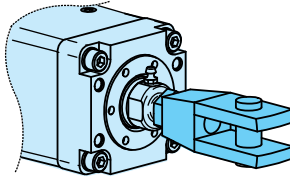


Dimensions: Rod End Options

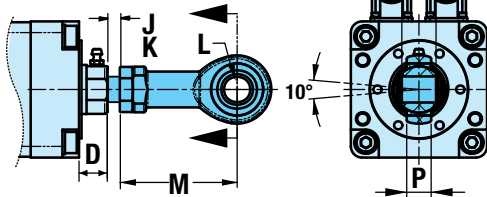
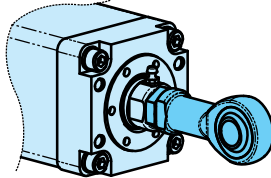
EXTERNAL THREADED ROD END (MET)



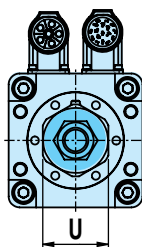
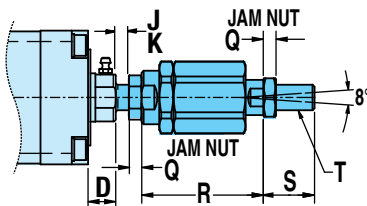
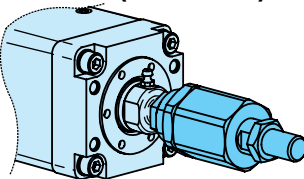
CLEVIS ROD END (RCL)



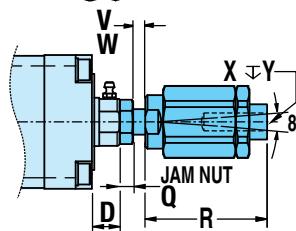
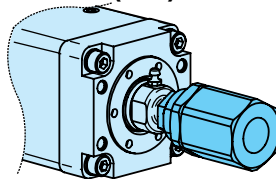
SPHERICAL ROD EYE (SRE)



ALIGNMENT COUPLER (ALC + MET)



ALIGNMENT COUPLER FEMALE (ALC)



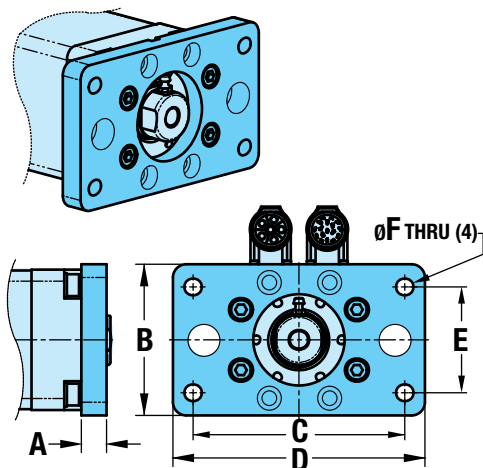
	IMA22	IMA33	IMA44	IMA55
A	—	—	—	—
mm	M10 x 1.25	M16 x 1.5	M20 x 1.5	M27 x 2.0
B	0.87	1.35	1.63	1.80
mm	22.1	34.3	41.4	38.1
C	0.97	1.47	1.75	2.00
mm	24.6	37.3	44.5	50.8
D	0.68	0.68	0.66	0.95
mm	17.3	17.3	16.8	24.1
E	0.394	0.630	0.787	1.181
mm	10.00	16.00	20.00	30.00
F	0.39	0.63	0.79	1.18
mm	10.0	16.0	20.0	30.0
G	0.79	1.26	1.57	2.17
mm	20.0	32.0	40.0	55.0
H	1.77	2.83	3.54	4.86
mm	45.0	72.0	90.0	123.5
J	0.36	0.52	0.56	0.40
mm	9.1	13.2	14.2	10.1
K	0.10	0.12	0.12	0.20
mm	2.5	3.0	3.0	5.1
L	0.394	0.630	0.787	1.181
mm	10.00	16.00	20.00	30.00
M	1.89	2.84	3.43	4.86
mm	48.0	72.0	87.0	123.5
N	0.55	0.83	0.98	1.46
mm	14.0	21.0	25.0	37.0
P	0.49	0.59	0.71	0.94
mm	12.5	15.0	18.0	25.0
Q	0.20	0.32	0.39	0.53
mm	5.0	8.0	10.0	13.5
R		2.99	3.23	3.66
mm		76.0	82.0	93.0
S		1.26	1.57	2.16
mm		32.0	40.0	54.0
T	—	—	—	—
mm	M10 x 1.25	M16 x 1.5	M20 x 1.5	M27 x 2.0
U	1.18	1.61	1.65	2.17
mm	30.0	41.0	42.0	55.0
V	—	—	0.43	0.43
mm	—	—	11.0	11.0
W	—	—	0.16	0.09
mm	—	—	4.1	2.4
X	—	—	—	—
mm	—	—	M20 x 1.5	M27 x 1.75
Y	—	—	1.65	2.13
mm	—	—	42.0	54.0

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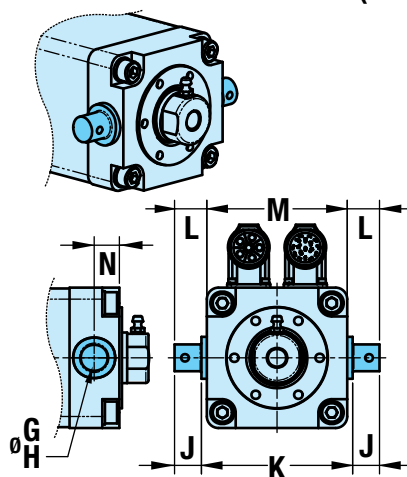


Dimensions: Mounting Options

FRONT FLANGE MOUNT (FFG)

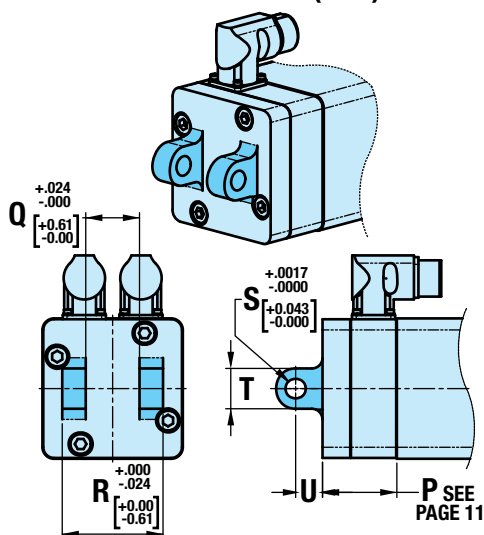


FRONT TRUNNION MOUNT (TRF)



	IMA22	IMA33	IMA44	IMA55
A	0.44	0.59	0.63	0.70
mm	11.2	15.0	16.0	17.0
B	2.65	3.43	4.35	5.91
mm	67.3	87.0	110.5	150.0
C	3.937	4.961	5.906	9.055
mm	100.00	126.00	150.00	130.00
D	4.62	5.91	6.69	10.24
mm	117.3	150.0	170.0	260.0
E	1.969	2.480	2.953	4.528
mm	50.00	63.00	75.00	115.00
F	0.34	0.48	0.58	0.66
mm	8.7	12.3	14.7	16.7
G	0.472	0.629	0.787	0.984
mm	12.0	15.98	19.99	24.99
H	0.471	0.628	0.786	0.983
mm	12.0	15.95	19.96	24.97
J	0.34	0.63	0.79	0.98
mm	8.6	16.0	20.1	24.9
K	2.68	3.54	4.84	6.30
mm	68.0	90.0	123.0	160.0
L	0.43	0.76	1.04	1.30
mm	10.9	19.2	26.3	33.1
M	2.50	3.29	4.35	5.66
mm	63.5	83.6	110.5	143.6
N	0.59	0.59	0.83	1.10
mm	15.0	15.0	21.0	28.0

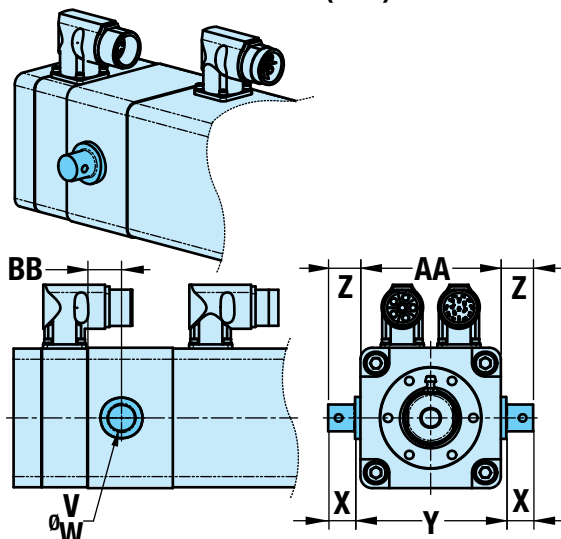
REAR CLEVIS MOUNT (PCD)



	IMA22	IMA33	IMA44	IMA55
Q	1.0236 ¹	1.2598	1.9685	2.3622
mm	26.000 ¹	32.000	50.000	60.000
R	1.7717 ²	2.3622	3.5433	4.3307 ⁴
mm	45.000 ²	60.000	90.000	110.000 ⁴
S	0.3937 ³	0.4724	0.6299	0.7874 ⁵
mm	10.000 ³	12.000	16.000	20.000 ⁵
T	0.787	0.945	1.417	1.575
mm	20.00	24.00	36.00	40.00
U	0.512	0.630	0.866	1.063
mm	13.00	16.00	22.00	27.00
V	0.472	0.629	0.787	0.984
mm	11.99	15.98	19.99	24.99
W	0.471	0.628	0.786	0.983
mm	11.96	15.95	19.96	24.97
X	0.34	0.63	0.79	0.98
mm	8.6	16.0	20.1	24.9
Y	2.68	3.54	4.84	6.30
mm	68.0	90.0	123.0	160.0
Z	0.43	0.76	1.04	1.30
mm	10.9	19.2	26.3	33.1
AA	2.50	3.29	4.35	5.66
mm	63.5	83.6	110.5	143.6
BB	0.59	0.79	0.98	1.26
mm	15.0	20.0	25.0	32.0

1	+0.0205"/-0.0000"
2	+0.0000"/-0.0244"
3	+0.0014"/-0.0000"
4	+0.0000"/-0.0343"
5	+0.0020"/-0.0000"

REAR TRUNNION MOUNT (TRR)



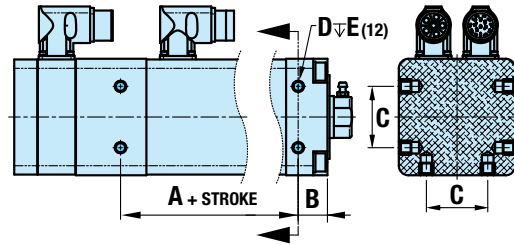
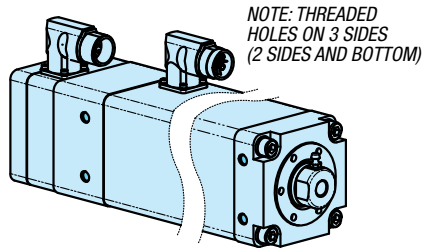
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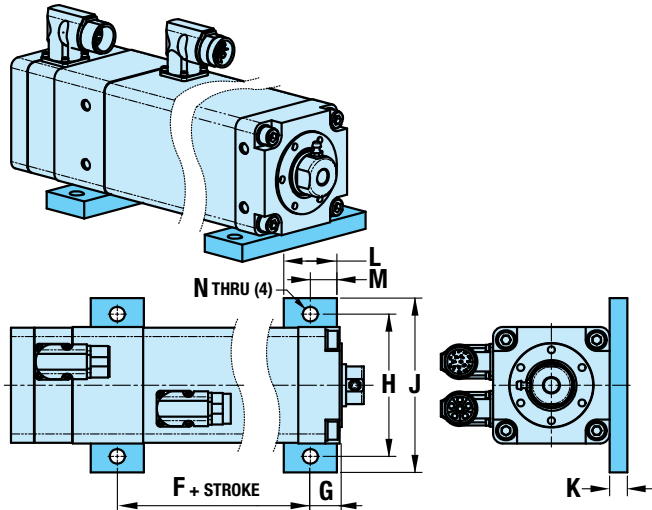


Dimensions: Options

SIDE MOUNTING (MST)

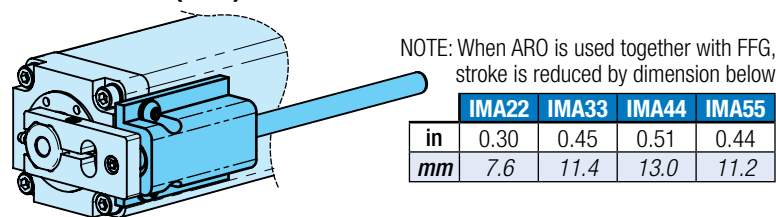


MOUNTING PLATES (MP2)



	IMA22	IMA33	IMA44	IMA55
A	2.67	3.97	5.63	7.53
mm	67.8	100.7	143.0	191.2
B	0.79	0.83	0.98	1.18
mm	20.0	21.0	25.0	30.0
C	1.339	1.732	1.969	3.346
mm	34.00	44.00	50.00	85.00
D	—	—	—	—
mm	M6 X 1.0	M8 x 1.25	M8 x 1.25	M12 x 1.75
E	0.52	0.57	0.68	0.89
mm	13.1	14.5	17.1	22.5
F	2.67	3.97	5.63	7.53
mm	67.8	100.7	143.0	191.2
G	0.79	0.83	0.98	1.18
mm	20.0	21.0	25.0	30.0
H	3.150	4.016	5.118	6.693
mm	80.00	102.00	130.00	170.00
J	3.94	4.92	6.10	7.87
mm	100.0	125.0	155.0	200.0
K	0.43	0.50	0.50	0.79
mm	11.0	12.7	12.7	20.0
L	1.18	1.50	1.50	1.97
mm	30.0	38.1	38.1	50.0
M	0.59	0.75	0.75	0.98
mm	15.0	19.1	19.1	25.0
N	0.34	0.42	0.42	0.59
mm	8.7	10.7	10.7	15.1

ANTI ROTATE (ARO)



	IMA22	IMA33	IMA44	IMA55
in	0.30	0.45	0.51	0.44
mm	7.6	11.4	13.0	11.2

	IMA22	IMA33	IMA44	IMA55
P	0.50	0.63	0.78	1.25
mm	12.7	15.9	19.8	31.8
Q	1.71	2.24	2.78	3.74
mm	43.3	57.0	70.5	95.1
R	2.02	2.75	3.28	4.32
mm	51.2	69.7	83.2	109.7
S	1.37	1.50	1.81	2.69
mm	34.8	38.1	45.9	68.2
T	1.82	2.47	2.47	4.20
mm	46.2	62.7	62.7	106.7
U	3.19	4.14	4.27	5.60
mm	81.0	105.2	108.5	142.5
V	0.38	0.50	0.50	0.75
mm	9.5	12.7	12.7	19.1
W	2.56	3.50	3.66	4.55
mm	65.0	89.0	93.0	115.6
X	0.63	0.63	0.61	0.90
mm	16.1	16.1	15.5	22.8
Y	2.16	2.85	3.38	4.66
mm	54.9	72.3	85.7	118.3

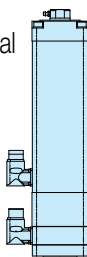
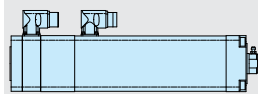
APPLICATION DATA WORKSHEET

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

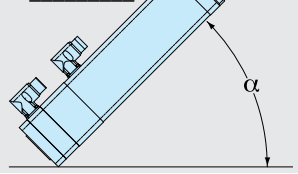
ORIENTATION

☐ Horizontal

☐ Vertical



☐ Incline °
 α



☐ Load supported by actuator OR ☐ Load supported by other mechanism

SIZING SOFTWARE

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

MOVE PROFILE

EXTEND

Move Distance _____

☐ inch ☐ millimeters

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

STROKE LENGTH

order in
mm ONLY

☐ millimeters (S M)
(Metric)

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

EXTEND

LOAD

☐ lb. ☐ kg.
(U.S. Standard) (Metric)

FORCE

☐ lb. ☐ kg.
(U.S. Standard) (Metric)

RETRACT

LOAD

☐ lb. ☐ kg.
(U.S. Standard) (Metric)

FORCE

☐ lb. ☐ kg.
(U.S. Standard) (Metric)

PRECISION

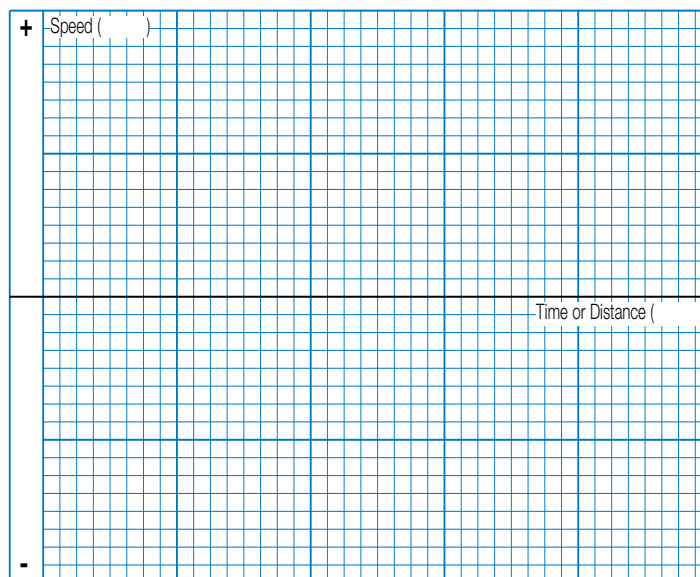
Repeatability _____

☐ inch ☐ millimeters

OPERATING ENVIRONMENT

Temperature, Contamination, Water, etc.

MOTION PROFILE



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

CONTACT INFORMATION

Name, Phone, Email
Co. Name, Etc.



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

IMA - Integrated Motor Actuator

Selection Guidelines



1 ESTABLISH MOTION PROFILE

Using the application stroke length, desired cycle time and loads establish the motion profile details.

2 COMPARE OPERATING (PEAK) THRUST AND SPEED TO OPERATING REGION

Calculate the application required operating (peak) thrust and speed and compare to graphs on pages IMA_8-9. The calculated thrust and speed must fall within the operating region of the actuator.

3 COMPARE SEVERE DUTY (CONTINUOUS) THRUST AND SPEED TO SEVERE DUTY REGION

Calculate the RMS thrust and speed required and compare to graphs on pages IMA_8-9. The calculated thrust and speed must fall within the severe duty region. See complete instructions on IMA_page 9 for help calculating continuous force.

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

4 CONSIDER SCREW/NUT CHOICES

Choose roller nuts for its longer life (see Life graph on page IMA_10) and higher peak loads (see graphs on pages IMA_8 & 9). Ball nuts are cost competitive and more efficient (see table on page IMA_8).

SCREW ACCURACY

Roller Nut	± 0.0004"/ft.	± 0.0102mm/300mm
Ball Nut	± 0.002"/ft.	± 0.051mm/300mm

5 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.

6 VERIFY AXIAL BUCKLING STRENGTH OF THE SCREW (ROLLER SCREW)

Verify that the peak thrust does not exceed the critical buckling force for the size of the screw selected (see graph on page IMA_10).

7 MOTOR WINDINGS & VOLTAGES

Choose motor windings optimized for 230 Vac and 460 Vac voltage busses. The 1 stack motor (MV21-230V & MV41-460V), available for the IMA22/33, allows strokes between 3 and 6" providing the thrust needed for many applications in a more compact, lighter weight package

8 CALCULATE LUBRICATION INTERVAL

See page IMA_9 for an overview and IMA Users Guide (#2700-4001) for complete instructions to calculate lubrication interval.

9 TEMPERATURE

The IMA is intended to operate in an environment with an ambient temperature between 50-122°F, (10-50°C). Performance should be de-rated if the ambient temperature is above 77°F (25°C). Contact the factory if the ambient tem-

perature does not fit within this range. NOTE: Temperature of the actuator's body can approach 180°F (82°C) in aggressive applications. Adequate clearance to ensure actuator's ambient conditions do not rise drastically should be allowed.

10 BRAKE CONSIDERATIONS

An unpowered IMA will require a brake to maintain its position if the force on the actuator exceeds Back Drive Force listed in the table on page IMA_6.

A brake can be used with the actuator to keep it 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. See page IMA_20 for ordering information.

NOTE: The optional Spring-Applied / Electronically-Released Brake requires 24V power. Input current rating: IMA22 - 0.35 Amps; IMA33 - 0.43 Amps; IMA44 - 0.67 Amps; IMA55 - 0.66 Amps.

11 CHOOSE MOTOR CONNECTORS & FEEDBACK DEVICE

Connector choice and wiring emulates popular motor manufacturers for compatibility.

Current connector choices include:

- Bosch Rexroth MSK Series
- Emerson FM & NT Series
- Lenze MCA Series

Current feedback choices include:

- Digital Encoder
- Absolute Encoder
- Resolver

Contact Tolomatic for additional motor connectors, feedback combinations and motor files for third party drives.

12 CONSIDER MOUNTING & ROD END OPTIONS

Examine mounting options dimensional drawings on page IMA_11-16. Standard mounting on the IMA are 4 tapped holes on the front rod end face of the actuator. The Side Mount option (MST) includes 12 tapped holes, 4 on each side and 4 on the bottom of the actuator. Other fixed mounting options are the Front Flange Mount (FFG) and Mounting Plates (MP2). Pivoting mount options are Front Trunnion (TRF), Rear Trunnion (TRR) and Rear Clevis Mount (PCD).

Rod End Options include: External Threaded Rod End (MET), Clevis Rod End (RCL), Spherical Rod Eye (SRE) and Alignment Coupler (ALC).

NOTE: Regardless of the mounting option chosen, care must be taken to ensure that the load is guided and in-line with the thrust rod's line of motion. Misalignment of the thrust rod's line of motion will cause degradation in the actuator's expected life.

13 CONSIDER ENVIRONMENTAL RATING AND ANTI-ROTATE OPTIONS

The environmental rating for a standard IMA is IP65, choose IP67 for protection against water and dust ingress. Choose the Anti-Rotate Option (ARO) if required. Call Tolomatic at 1-800-328-2174 for help in determining the best actuator for your application.

IMA - Integrated Motor Actuator

Replacement Option Parts Ordering

PART NO.	DESCRIPTION
2722-9014	Spherical Rod Eye Kit, IMA22
2733-9014	Spherical Rod Eye Kit, IMA33
2744-9014	Spherical Rod Eye Kit, IMA44
2755-9014	Spherical Rod Eye Kit, IMA55
2722-9015	Clevis Rod End Kit, IMA22
2733-9015	Clevis Rod End Kit, IMA33
2744-9015	Clevis Rod End Kit, IMA44
2755-9015	Clevis Rod End Kit, IMA55
2124-1070	Alignment Coupler Kit, IMA22
2132-1060	Alignment Coupler Kit, IMA33
2150-1060	Alignment Coupler Kit, IMA44
2164-1060	Alignment Coupler Kit, IMA55
2722-9010	Mounting Plate Kit, IMA22
2733-9010	Mounting Plate Kit, IMA33
2744-9010	Mounting Plate Kit, IMA44
2755-9010	Mounting Plate Kit, IMA55
2722-9018	Front Flange Mount Kit, IMA22
2733-9018	Front Flange Mount Kit, IMA33
2744-9018	Front Flange Mount Kit, IMA44
2755-9018	Front Flange Mount Kit, IMA55
2722-2045	Rear Clevis Mount, IMA22
2733-1045	Rear Clevis Mount, IMA33
2744-1045	Rear Clevis Mount, IMA44
2755-1045	Rear Clevis Mount, IMA55
2722-9075	Anti Rotate, Bearing Assy, IMA22
2733-9075	Anti Rotate, Bearing Assy, IMA33 & 44
2755-9075	Anti Rotate, Bearing Assy, IMA55
2722-9074	Anti Rotate, Shaft Clamp Assy, IMA22
2722-2211	Anti Rotate, Shaft, IMA22 - Indicate Stroke

PART NO.	DESCRIPTION
2733-9074	Anti Rotate, Shaft Clamp Assy, IMA33
2733-1211	Anti Rotate, Shaft, IMA33 - Indicate Stroke
2744-9074	Anti Rotate, Shaft Clamp Assy, IMA44
2744-1211	Anti Rotate, Shaft, IMA44 - Indicate Stroke
2755-9074	Anti Rotate, Shaft Clamp Assy, IMA55
2755-1211	Anti Rotate, Shaft, IMA55 - Indicate Stroke
2733-1221	Motor Power Cable, NO Brake, 460 Vac, MV4
2733-1222	Motor Power Cable, w/ Brake, 460 Vac, MV4
2744-1221	Motor Power Cable, NO Brake, 230 Vac, MV2
2744-1222	Motor Power Cable, w/ Brake, 230 Vac, MV2
2733-1223	Feedback Cable, 12 pin (Resolver & Stegmann), flying leads
2733-1224	Feedback Cable, 17 pin (Digital Encoder), flying leads
2733-1266	Feedback Cable, 12 pin (Stegmann), DB15 Connector for Allen Bradley, Kinetix/Ultra
2733-1267	Feedback Cable, 12 pin (Resolver), DB15 Connector for Allen Bradley, Kinetix/Ultra
2733-1265	Feedback Cable, 17 pin (Digital Encoder), DB15 Connector for Allen Bradley, Kinetix/Ultra
2744-1016	Mobilith SHC220 Grease (Ball nut/screw)
2744-9099	Grease (Roller nut/screw)
2552-1132	Wiper, IMA22
2115-1030	Wiper, IMA33
2744-1003	Wiper, IMA44
2140-1030	Wiper, IMA55
2744-1213	Zerk Cap
2744-9092	Kit, Zerk with Cap
2744-1214	Grease Ftg. Plug

All parts are listed for REPLACEMENT ONLY. If not ordered on original unit the IMA may require additional tapped holes or replacement rod end. Contact Tolomatic.

IMA - Integrated Motor Actuator

Ordering

MODEL SELECTION (MUST BE IN THIS ORDER)

IMA 44 BN05 SM304-8 MV23 DT1D1N

OPTIONS (IN ANY ORDER)

ALC MP2 IP67 CR6

MODEL

IMA Integrated Motor Actuator

SIZE

22 22 Series Actuator
33 33 Series Actuator
44 44 Series Actuator
55 55 Series Actuator

NUT / SCREW

BN05 Ball Nut, 5 mm lead
BN10 Ball Nut, 10 mm lead
*RN05 Roller Nut, 5 mm lead
*RN10 Roller Nut, 10 mm lead

*For IMA55:  Extended Catalog product, lead time may vary from standard 5 day delivery, contact Tolomatic
*For IMA22: not available at this time

STROKE LENGTH

SM _ _ _ _ Stroke, (76.2 to 457.2) enter stroke length in millimeters

NOTE: Maximum stroke for IMA22 is 12" (304.8mm)

MOTOR VOLTAGE

MV21* 230 Vac, Motor Voltage, 1 Stack Winding
MV41* 460 Vac, Motor Voltage, 1 Stack Winding
MV23 230 Vac, Motor Voltage, 3 Stack Winding
MV43 460 Vac, Motor Voltage, 3 Stack Winding

 *NOTE: 22/33 size actuators only

MOTOR CONNECTORS

DT1 Tolomatic Standard Motor
DB1 Bosch Rexroth MSK Motor
DE1 Emerson FM Motor series
DE2** Emerson NT Motor series
DL1 Lenze MCS Motor series

**NOTE: IP67 is not available with DE2 (Emerson NT connectors)
Not available standard on IMA22

 Some feedback devices are not compatible with some connectors
Contact Tolomatic for complete motor connector & feedback combination information

FEEDBACK DEVICE

A1 Stegmann Hiperface® Multi-turn ABS MT
D1 Digital Quadrature 2000 Line Encoder
R1 Resolver, BRX

BRAKE OPTION

N NO Brake
B Brake

ROD END OPTIONS

— Standard, female, internally threaded rod end
MET Male Externally Threaded Rod End
SRE Spherical Eye Rod End
RCL Clevis Rod End
ALC Alignment Coupler
 NOTE: ALC (Alignment Coupler) requires ARO (Anti-Rotate) for proper operation

MOUNTING OPTIONS

— Standard Face Mount
MP2 Mounting Plates - 2 req.
FFG Front Flange Mount
TRF Trunnion Mount, Front
TRR Trunnion Mount, Rear
PCD Clevis Mount, Rear
MST Side Mount (tapped holes on 3 sides)

OTHER OPTIONS

IP67 Ingress Protection Rating
ARO Anti Rotate

CABLES

CR6 Tolomatic standard 6m flying lead cables, power and feedback
CA6 Allen Bradley 6m flying lead cables, power and DB15 feedback cable

For custom cable lengths please contact Tolomatic. Lead times will vary.

 NOTE: only use these cable options with DT1 motor connector, use cables from drive manufacturer for all others.

 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:



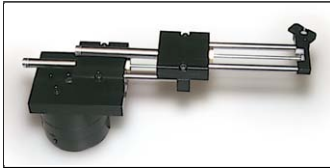
EXCELLENT CUSTOMER SERVICE & TECHNICAL SUPPORT

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



INDUSTRY LEADING DELIVERIES

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

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 • <http://www.tolomatic.com>

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