

# RS RACK & PINION ACTUATOR

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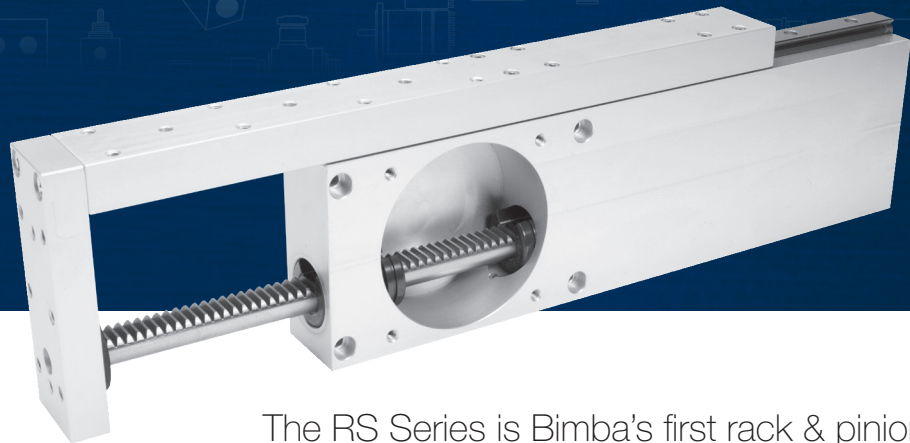








## RS RACK & PINION ELECTRIC ACTUATOR

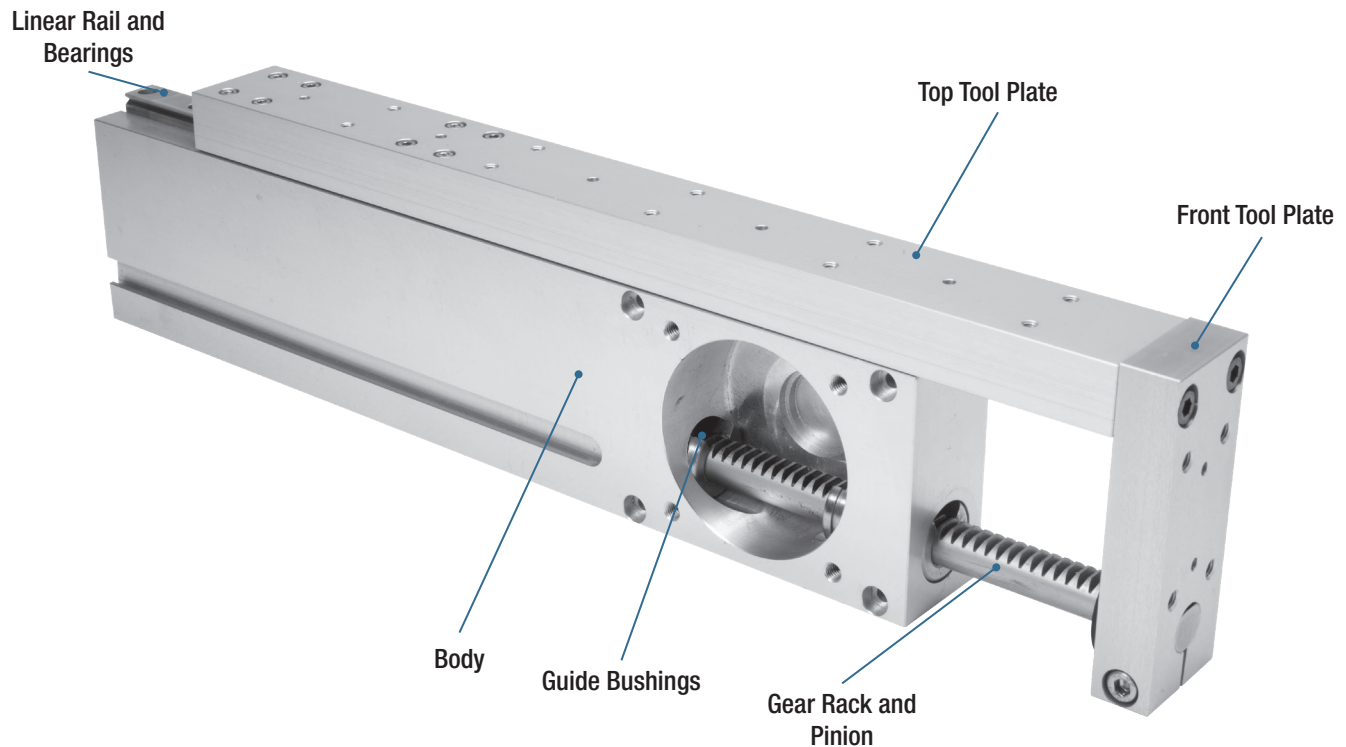


The RS Series is Bimba's first rack & pinion style electric actuator that features a square linear rail bearing assembly. The internal self-lube square ball rail bearing provides smooth motion and maximum moment loading capacity in all mounting directions, and ensures long reliable performance throughout its lifetime.

A smooth ball rail guide offers efficient and effortless motion in both horizontal and vertical orientations in a sleek, cost effective body style even when subjected to significant side loads. Vertical applications in which the load must be contained or held firmly due to a loss of power become possible with available options including a pneumatically actuated gear holding brake.



# PRODUCT FEATURES



Rack and pinion electric actuators offer numerous advantages not found in other electric actuator technologies. Paramount among them is the high thrust force and speed per unit size in a robust, cost effective package due to an inherent square rail linear bearing.

## FEATURES AND BENEFITS

### Linear Ball Rail System:

- High force
- Long life
- Self-lubricating
- High moment loading

### Many Options:

- Optional pneumatically actuated brake
- Optional limit switches
- Special coating for harsh environments

### Drive Options:

- NEMA 23 or 34 ready
- Integrated gear reducer available
- Motor mounts to fit your motor or gear reducer



A rack & pinion is a type of linear actuator made from a pair of gears which convert rotational motion into linear motion. A circular gear called the “pinion” engages teeth on a linear “gear” bar called the “rack”. Rotational motion applied to the pinion from a motor causes the rack to move relative to the pinion, thereby translating the rotational motion of the pinion into linear motion.

While it may be used in a single-axis motion application, the robust design of this rack & pinion actuator makes it an ideal actuator for use in the Z-axis of a dual actuator or gantry system. Transition plates are available to couple a Bimba rod, rodless, or rack & pinion actuator to an RS actuator, which means solving motion applications in two dimensions is an easy task.

## MATERIALS OF CONSTRUCTION

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<b>Body Material:</b>	Aluminum
<b>Tool Plates:</b>	Aluminum
<b>Rack &amp; Pinion:</b>	Armoloy®-coated Steel



## APPLICATION IDEAS

- Pick & Place
- Sorting
- Loading
- Stacking
- Insertion
- Clamping
- Parts Transfer
- Labeling
- Machine Tool
- Conveyor

## TARGET APPLICATIONS

The RS Series is intended for medium-duty industrial applications that require flexible motion with ample moment loading capacity. The RS Series excels in and is often used with multi-axis applications as the “Z-axis” member; multi-axis systems can take advantage of the relatively lightweight yet robust performance of the RS. The light weight adds value by providing a significant thrust force with speeds approaching a belt actuator using a smaller motor. When thrust and speed are the primary characteristics required in your linear motion application, and extreme precision is a secondary characteristic, the RS Series can often be the best motion solution.

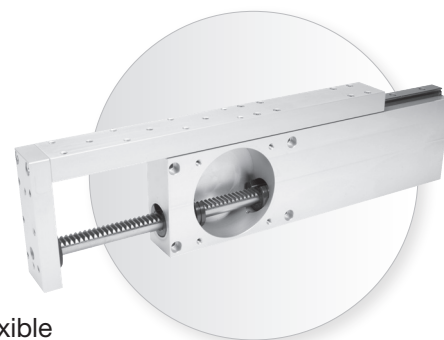
For applications that call for an alternative to a traditional pneumatic application, one that offers a more adaptable solution for your motion needs, Bimba rack & pinion electric actuators provide the interchangeable solution that adapts with your business in an easy-to-use, long-lasting, and tough electric actuator that exceeds the competition.

## MOUNTING & DRIVE OPTIONS

While the RS Series comes ready for direct mounting of NEMA-sized motors, Bimba offers a number of additional motor mounts to choose from so you can mount the motor of your choice. With many Bimba NEMA standard size stepper and servo motors to choose from, configuring a RS electric actuator that best meets the needs of even your most demanding application has never been easier.

## ADVANTAGES

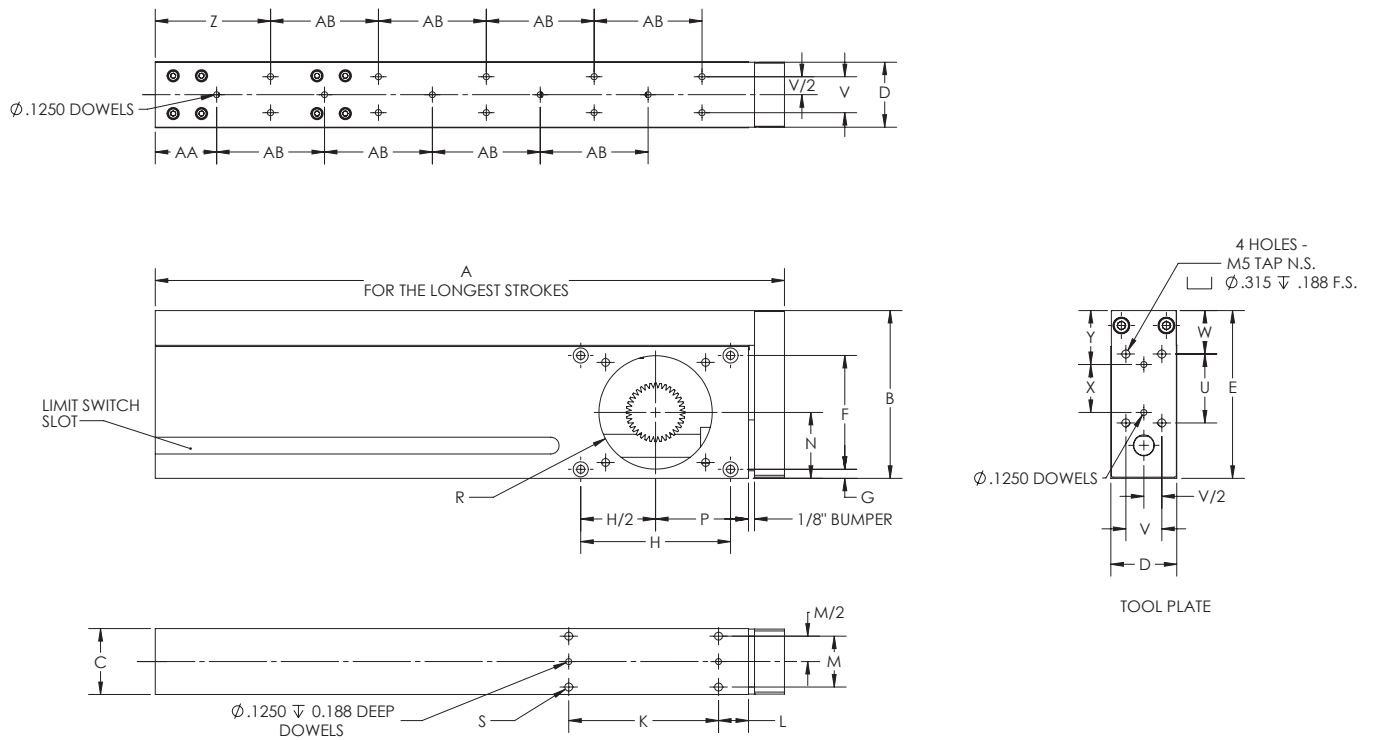
FEATURE	ADVANTAGE	BENEFIT
Slim construction	Light; requires minimal space	Mounted in many applications with limited real estate
Rack and pinion	Speed	Maximize through-put
Square linear bearing	Robust	Carry high loads and moment capacities
Pneumatic gear rack brake	Suspends linear loads	Prevents crashing and damage
High thrust force	Robust	Maximize thrust force per size





## DIMENSIONS

Key specification information for RS Series actuators is given below. For additional specification information, contact Bimba Customer Service at [cs@bimba.com](mailto:cs@bimba.com), or 800.44.BIMBA (800.442.4622).



DIMENSIONS																	
SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T
RS9	10.43	2.94	1.13	1.12	2.92	1.06	1.00	2.66	0.50	2.66	0.28	0.84	1.14	1.61	1.50	M4	2.63
RS12	13.25	3.38	1.38	1.36	3.35	2.38	0.19	3.13	0.62	2.88	0.63	1.06	1.38	1.94	2.37	M5	2.95
RS15	17.00	4.28	1.50	1.48	4.25	2.75	0.38	4.75	0.63	3.75	0.63	1.00	1.75	2.50	3.17	M5	3.94

DIMENSIONS								
SIZE	U	V	W	X	Y	Z	AA	AB
RS9	1.38	0.75	0.77	1.00	0.96	2.13	1.00	2.25
RS12	1.44	0.75	0.91	1.00	1.13	2.41	1.28	1.25
RS15	2.50	1.00	1.00	2.50	1.13	2.63	3.63	2.00

ACTUATOR	GEAR PINION DIAMETER	LOAD RATINGS N (lbs)
RS9	1.00"	222 (50)
RS12	1.00"	334 (75)
RS15	1.25"	556 (125)

# HOW TO ACCESSORIZE

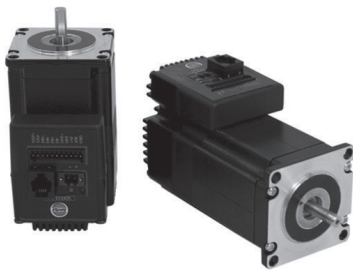
## MOTORS AND DRIVES

Bimba motors are available to use as the rotary drive mechanism of the RS Series. With a complete array of stepper and servo motors available in stock, Bimba has a motor\*-drive solution that meets many demanding applications.

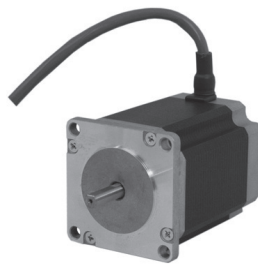
Configuring your motor and creating your first motion profile program is easier than ever with Bimba's intuitive and icon based IQ® suite of motion software. With our complete software suite available for free download from the Bimba website, there is no additional cost to your motion project. All Bimba stepper and servo programming software uses the same IQ® programming software, greatly reducing the learning curve. Existing programs can be easily shared or adapted among the two motor technologies.

**See the Motors and Drives section for Bimba's wide selection of available motors and motor drives.**

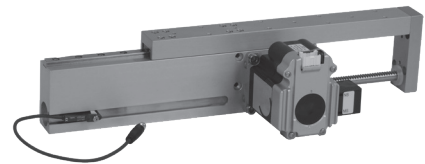
*\*Contact Bimba's Customer Service team for help in crossing your motor to a Bimba motor.*



INTELLIMOTOR®  
ITM-23Q-2-EIP-E-M12



AC STEPPER MOTOR  
MTR-AC23T-753-S



RS12 WITH SERVO MOTOR

## LIMIT SWITCHES

PART NUMBERS	SWITCH TYPE	OPERATION
SW-PNO	PNP	Normally Open
SW-PNC	PNP	Normally Closed
SW-NNO	NPN	Normally Open
SW-NNC	NPN	Normally Closed

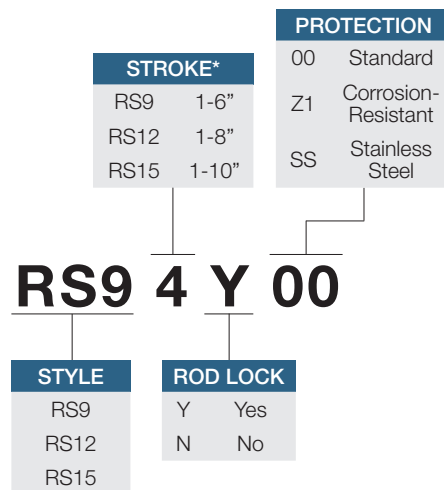
*Specifications: 24VDC, 200ma*



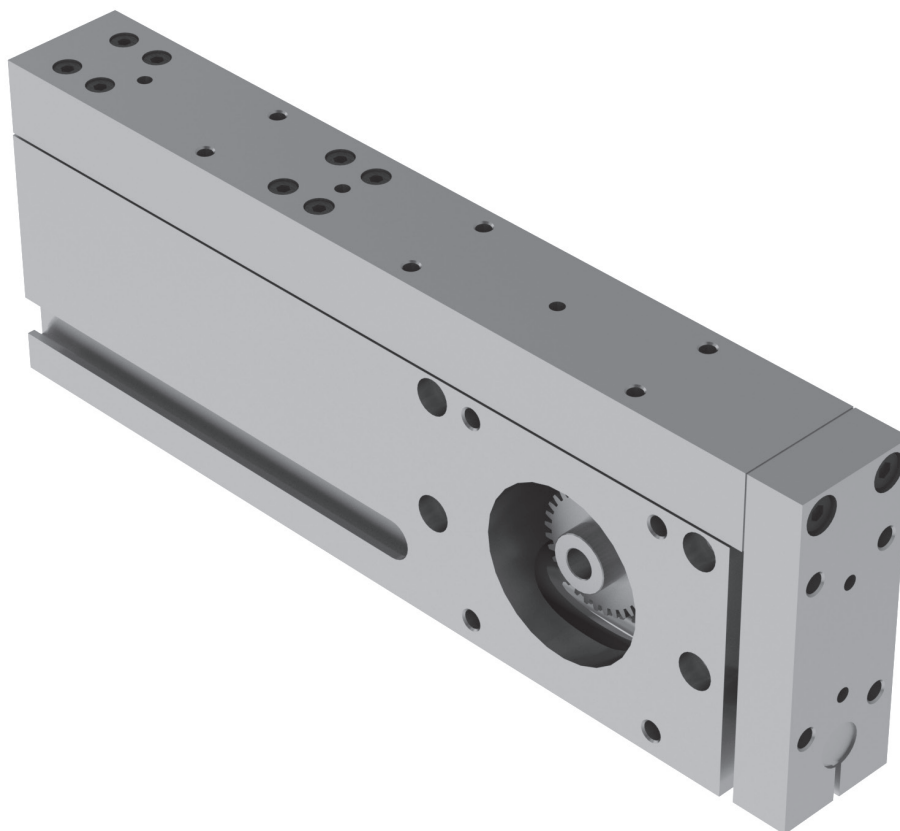
# HOW TO ORDER

The model numbers of RS Series rack & pinion actuators consist of an alphanumeric cluster designating product type, size, stroke length, drive type, pitch, and shaft diameter that together make up the complete part number to use in ordering. Use the ordering information below to build a valid part number.

An example of a basic RS9 unit with 4" stroke, rod lock, and standard protection is shown below.



\* Determined in 1/4" increments



NOTE: If a motor or gearbox adapter is required, please refer to the Adapters section of the Accessories chapter in this catalog.

# HOW TO REPAIR

Bimba RS Series rack & pinion actuators are repairable. A list of the individual components is given below that together make up the RS Series actuator.

Please use the linear actuator serial number located at the drive end for all inquiries, along with the original purchase order number (if available). Describe the part required along with part number below. Contact Bimba Customer Service at 800-442-4622 (800-44-BIMBA) or e-mail [cs@bimba.com](mailto:cs@bimba.com).

## RS9

QUANTITY	PART NO.	PART DESCRIPTION
1	RS9-32-03	Housing
1	RS9-32-04	Front Tool plate
1	RS9-32-05-C	Side Tool plate
2	RS9-32-13	Bushing
1	RS9-32-08	Pinion Stock
1	RS9-32-09	Linear Rail
2	RS9-32-10	Linear Bearing
1	RS9-32-11	Stop Collar
1	THC-RP-5	Gear Rack
2	RS9-32-12	Bumper

## RS12

QUANTITY	PART NO.	PART DESCRIPTION
1	RS12-24-03	Housing
1	RS12-24-04	Front Tool plate
1	RS12-24-05-C	Side Tool plate
2	RS12-24-13	Bushing
1	RS12-24-08	Pinion
1	RS12-24-09	Linear Rail
2	RS12-24-10	Linear Bearing
1	RS15-20-20	Stop
1	RP-24-XX	Gear Rack
1	RS12-24-12	Rubber Stop

## RS15

QUANTITY	PART NO.	PART DESCRIPTION
1	RS15-20-03	Housing
1	RS15-20-04	Front Tool plate
1	RS15-20-05-C	Side Tool plate
4	RS15-20-13	Bushing
1	RS15-20-08	Pinion
1	MS15-P05	Linear Rail
2	MS15-P06	Linear Bearing
1	RS15-20-20	Stop
1	RP-20-48	Gear Rack
1	RS15-20-12	Rubber Stop
1	RS15-20-21	Stop Collar



## SWITCHES

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Switches add versatility to your electric motion application. They can be used to provide end of stroke limits, count strokes, or communicate positioning to an outside source. Switches can provide safety to applications as well, preventing undesirable situations like runaways to prevent damage.

To learn more about Bimba's available switch selection, refer to the Switches section in this catalog.

## PROTECTION

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Bimba offers several protection options for our actuators. Our primary options are Armoloy® and stainless steel. **Armoloy®** offers additional protection against moisture and dirt. It is used to coat the steel linear rail and bearings in a Bimba actuator. Armoloy® coating can also be applied to the aluminum extrusion upon request. **Stainless steel** works in conjunction with Armoloy® coatings, providing additional protection to the end caps and carriage.

Additional coatings are available upon request.

## MOTOR MOUNTING

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Motor mounts allow you to mount any motor to any actuator (within the actuator's rating). They give end users the ability to use Bimba electric actuators with the motor of their choosing. Careful considerations regarding torque limitations must be made when mounting a motor the actuator is not rated for.

To request custom motor mounting options, please supply Bimba with the following information: shaft diameter, shaft length, pilot diameter, pilot depth, bolt circle, and hole size.

## CUSTOMER-REQUESTED HOLES AND DOWEL PINS

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Bimba can provide custom holes and dowel pins to accommodate the customer's specific tooling and mounting holes.

For further customization, contact the factory.



# NOTES