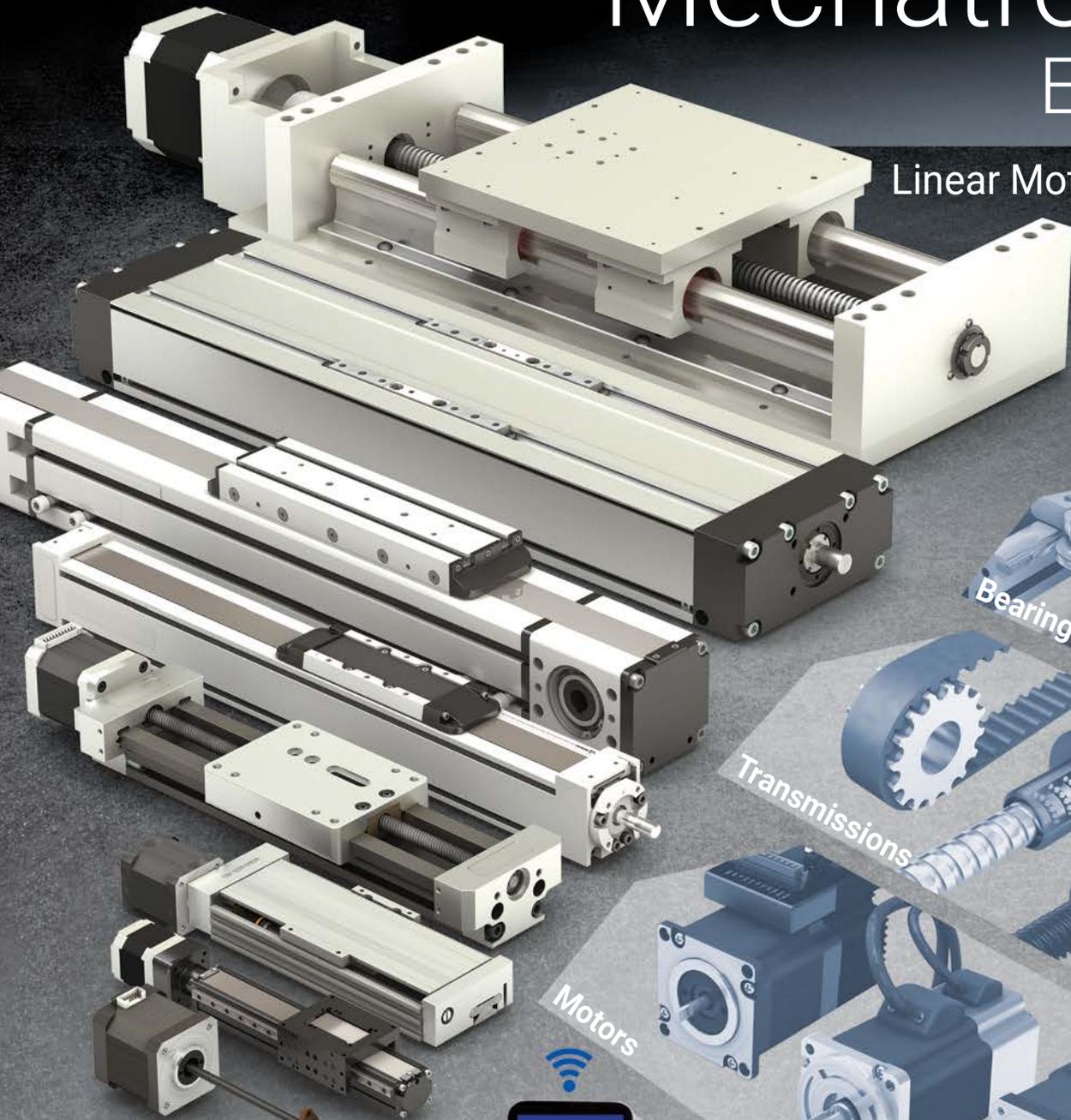




Mechatronics Enabled

Linear Motion Solutions



Bearings

Transmissions

Motors

IoT

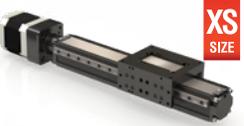


Current Status	
Time	02:17:43
Status	RUNNING
Quantity	12.324
Temperature	IP: 46.3
Power	Output: 14.2
<input type="button" value="PAUSE"/> <input type="button" value="RESUME"/>	



Configure Online at
pbclinear.com
 1-800-962-8979

Selection Chart

Linear Actuator Series	Product Style	Car & Rail Cross Section (H mm x W mm)	 MAX Horizontal Payload • N (lb.)	Maximum Stroke - mm (inches)											
				300 (12")	600 (24")	900 (36")	1200 (48")	1500 (59")	1800 (71")	2100 (83")	2400 (94")	2700 (106")	3000 (118")	3300 (130")	3600 (142")
 LSM Series (Lead screw motor)	N11-N23			LSM (Lead screw motor)											
															
 ML Series		MIN 32 X 32 MAX 58 X 40	MIN 178 (40) MAX 890 (200)	ML											
															
 Compact Series	Compact	55 X 23	240 (54) 2,500 (562)	Compact											
	Plus	55 X 23	5,350 (1,202)	Compact Plus											
 SIMO Series	Screw	MIN 73 X 24 MAX 100 X 40	880 (197)	SIMO											
	Belt	MIN 73 X 24 MAX 100 X 40	MIN 880 (197) MAX 1,600 (360)	Screw											
 PLA Series	055	55 X 68	980 (220)	SIMO											
				Belt											
 MTB Series	042-105	MIN 60 X 42 MAX 133 X 105	MIN 1,560 (351) MAX 7,500 (1,686)	PLA											
				MTB 042 055, 080, 105 6000 (236.22")											
 MUK Series	65 Single Car	145 X 65	8,500 (1,910)	MUK											
	65 Dual Car	145 X 65	11,200 (2,517)	Single and Dual Car											
 Simplicity Series	Simplicity 08-32	MIN 153 X 65 MAX 457 X 187	MIN 6,450 (1,450) MAX 83,400 (18,750)	Simplicity											
	Ball 08-32	MIN 153 X 65 MAX 457 X 187	MIN 2,028 (456) MAX 15,266 (3,432)												

300 (12") 600 (24") 900 (36") 1200 (48") 1500 (59") 1800 (71") 2100 (83") 2400 (94") 2700 (106") 3000 (118") 3300 (130") 3600 (142")

Carriage Options

Drive Options



GST (Plain)



CRT



PRT & Linear BRG



Lead Screw



Ball Screw



Belt

Carriage Options			Drive Options			
GST (Plain)	CRT	PRT & Linear BRG	Lead Screw	Ball Screw	Belt	
						Lead Screw Motor Series
						ML Series
						Compact Series
						SIMO Series
						PLA Series
						MTB Series
						MUK Series
						Simplicity Series

Actuator Technology Selection Options

Bearing Options:

Plain Bearing



- FrelonGOLD® self-lubricating and maintenance free bearing surfaces
- Smooth and quiet operation
- Vibration damping
- Shock resistant
- Applicable in contaminated environments

Cam Roller



- High speed
- Increased cantilevered loads
- Corrosion resistant stainless steel raceways
- Contamination resistance

Profile Rail



- High precision, rigidity, and speeds
- Increased stiffness and pre-loaded bearing performance
- Cantilevered loads support
- Low coefficient of friction

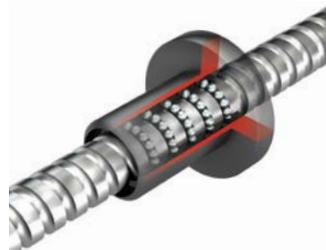
Transmission Options:

Lead Screw



- Precision
- Smooth and quiet operation
- Vibration damping
- Self-lubricating and maintenance free
- Standard fixed or anti-backlash nut options

Ball Screw



- High Loads
- Increased stiffness and pre-loaded bearing performance
- Cantilevered loads support
- Multiple accuracy classes available
- Rigid preloaded nut design

Belt Drive



- High speed
- Long stroke applications
- Protection against contamination
- Lubrication free and low maintenance cost

Motor Options:

Integrated Lead Screw Stepper



- Compact design
- Coupler not required
- Decreased costs

Servo & Step Servo



- High torque density
- Low rotor inertia
- High resolution
- IoT compatible

Integrated Stepper (Smart)



- Combined motor and drive
- Space saving design
- Reduced wiring
- IoT compatible

Motor Options Overview

Classic Stepper

Low cost and simple

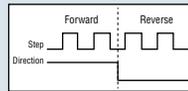
Motion Controller
Board level



or PLC



Motion Command



Amplifier

Chip (small motors)



or Box Style Amplifier



Motor



Feedback: None • **Network:** Defined by motion controller manufacturer

Integrated Motor Mounted Amplifier

Used when a large amplifier is needed and reduces wiring

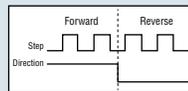
Motion Controller
Board level



or PLC



Motion Command



Amplifier

Motor



Feedback: None • **Network:** Defined by motion controller manufacturer

Integrated Smart Motor

Distributed control, reduced wiring, and simplified electrical panel; major industrial networks supported; supports recipe driven machine reconfiguration, and simplified commissioning and troubleshooting.

Motion Controller

Motion Command

Amplifier

Motor



Call factory for other requirements

Feedback: YES • 20000 line encoder • **Network:** YES • Options include:



Open Market Motor Flexibility

Used when manufacturer specific motors and control architectures are preferred and when special motor configurations are required.

Motion Controller

Customer Choice

Motion Command

Manufacturer Specific

Amplifier

Manufacturer Specific

Motor

Flexible: Stepper, Servo BLDC, or Gear Motors



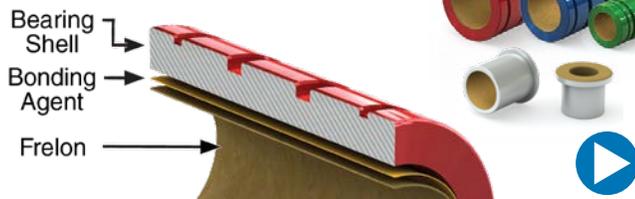
Feedback: Manufacturer specific • **Network:** Manufacturer specific

PBC Linear Core Competencies

Bonding polymer and fluoropolymer bearing material to metals

Developed and refined over the years, linear plain bearings excel where traditional ball bearings fail.

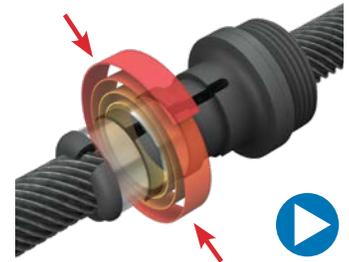
- No moving parts eliminates risk of catastrophic failure
- Temperature extremes (-400°F to +400°F)
- 20x shock loads of similar ball bearing
- Self-lubricated, no maintenance
- Both linear and rotary applications



Constant Force™ lead screw and thread rolling

Constant Force Technology is an intuitive leap forward in nut design for lead screw applications. The result is greater consistency in performance, life, and a greater resistance to backlash.

- Uniform pressure applied to nut for life
- Consistent precision at all stages of motion profile
- Optimized thread geometries
- Superior lead accuracy



Highly accurate length rails with SIMO® process

The Simultaneous Integral Milling Operation (SIMO) qualifies the rail to tolerances that have 6x less bow, 2x less twist, and 2x better flatness.

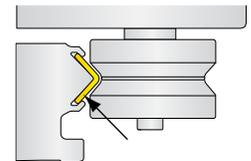
- Parallelism +/- 0.001"
- Straightness +/- 0.002"/ft
- Twist < 0.25 degree/ft
- 20 ft sections join-able to achieve greater lengths



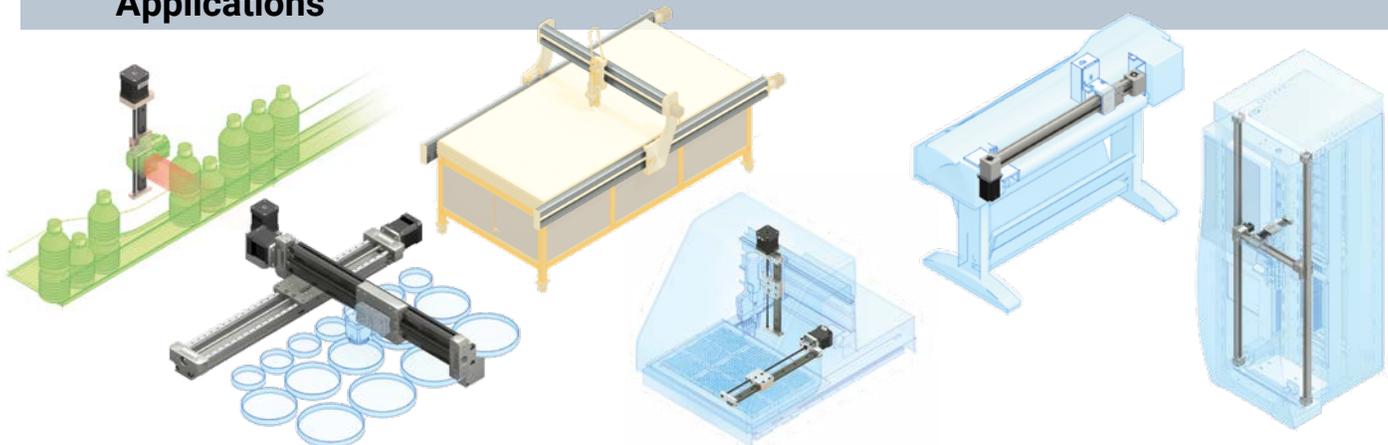
Joining aluminum and steel together for longer rails

IVT rails are produced by mechanically embedding R"C" 58-62 hardened 420 stainless steel angle races onto an anodized aluminum profile.

- Precise, durable, and lightweight
- Raceway to raceway +/- 0.001"
- Raceway to surface +/- 0.002"

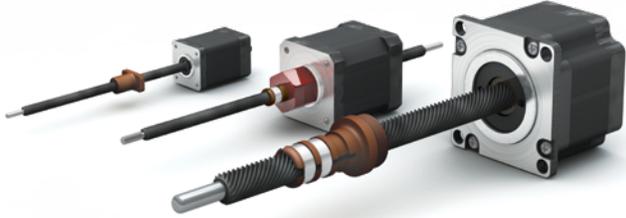


Applications



Actuators

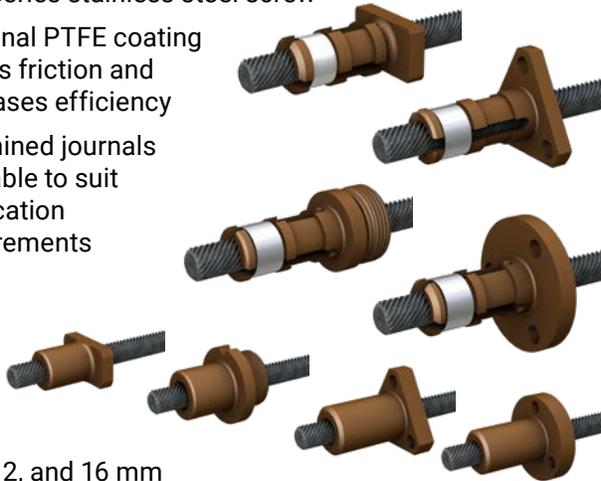
Lead Screw Motors and Hybrid Linear Actuators



The patent pending Constant Force Lead Screw applies uniform pressure to the nut at all stages of travel along our quality CNC rolled lead screws. World class NEMA motors combined with an integrated lead screw make for one of the most accurate lead screw assemblies on the market.

Key Features

- Superior Performance: 2-4x less backlash over the life of the device, as validated by leading lab automation customer testing
- Self-lubricating: All nut styles offered are self-lubricating for the life of the nut
- CNC Roll Threading: Allow for standard accuracies of 0.003"/ft. (2-3 times better than the competition). Precision lead accuracy of 0.001"/ft is available upon request
- 300 series stainless steel screw
- Optional PTFE coating lowers friction and increases efficiency
- Machined journals available to suit application requirements



6, 10, 12, and 16 mm diameters with 1–25 mm leads
 3/16", 1/4", 3/8", 7/16", 1/2", diameters with 0.05"–1" leads
 NEMA 08, 11, 14, 17, and 23 flange sized stepper motors

ML Series Actuators



Key Features

- Compact profile 28 x 32 mm for small-scale automation
- High speed precision, enhanced load capacities, and precise repeatability
- Linear guide supports available in single or dual rails
- Long travel lengths up to 650 mm



Linear Guide Support Rails

Single or double rails



ML Series			
Size	mm	32 x 28	
Base Weight (without motor)	Kg	0.06	
MAX Load	Fx ⁴	N	267
	Fy	N	107
	Fz	N	178
MAX Moments	Mx	Nm	1.4
	My	Nm	1.4
	Mz	Nm	1.42
MAX Stroke Length	mm	650	
MIN Stroke Length	mm	5	
Add for 100 mm of Stroke	Kg	0.15	
MAX Speed	m/s	1	
Moment of Inertia	Iy	cm ⁴	2.4
	Iz	cm ⁴	4.4

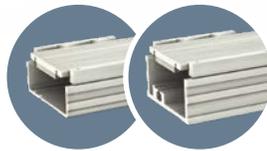
Actuators

Compact Series Actuators



Key Features

- Plain bearing or profile rail options
- 8 mm ball screw option
- 6 and 10 mm lead screw option
- Low and tall profile cover option
- Utilizes our self-lubricating and maintenance free Constant Force™ anti-backlash nut or standard fixed nut
- Integrated NEMA 17 or NEMA 23 motor or motor mount drive mechanism
- Manual hand knob or stub shafts available
- Ideal for medical & lab automation, automated delivery systems, robotic dispensing, and electronics manufacturing



Compact Series		GST-Plain Bearing	Profile Rail		
			Lead Screw	Lead Screw	Ball Screw
Size	mm	23 x 55	23 X 55	23 X 55	
MAX Load	Fx N	25	25	222	386
	Fy N	200	950	1,425	
	Fz N	200	950	1,425	
MAX Moments	Mx Nm	9	20.2	30.4	
	My Nm	9	13.1	29.8	
	Mz Nm	15.1	13.1	29.8	
MAX Stroke Length	mm	510	1,000	1,000	
MIN Stroke Length	mm	37	70	70	
Add for 100 mm of Stroke	Kg	0.059	6 mm/10 mm 0.12/0.16	0.14	
MAX Speed	m/s	0.83	1.25	0.40	

UG Series SIMO® Actuators

Lead Screw Driven



Key Features

- Versatile, Flexible, Affordable
- All critical edges machined concurrently in one pass
- Integrated or motor mount drive mechanism
- Built to either low profile or tall base rail
- Plain bearing or ball bearing options

Lead Screw Key Features

- 300 series stainless steel 10 mm diameter lead screw with PTFE coating and various lead options
- Utilizes our self-lubricating and maintenance free Constant Force anti-backlash nut or standard fixed nut
- Ideal for a broad range of applications such as kiosks, assembly, automation, medical, and laboratory

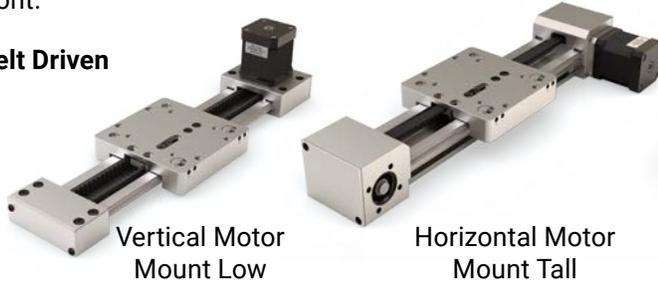
UG Series SIMO Lead Screw Driven				
		GST Plain Bearing Low/Tall		CRT V-Guide Low/Tall
Size	mm	73x24 / 73x40		73x24 / 73x40
Base Weight excluding motor	Kg	0.41/0.50		0.53/0.62
MAX Static Load	Fx ⁴ N	111.2		111.2
	Fy N	3,150		740
	Fz N	6,000/4,710		880
MAX Moments	Mx Nm	100		15
	My Nm	130		25
	Mz Nm	120		35
MAX Stroke Length	mm	1,400		1,400
MIN Stroke Length	mm	125		125
Add for 100 mm of Stroke	Kg	0.24		0.26
MAX Speed with lubrication	m/s	4.2		5.5
Moment of Inertia	Iy cm ⁴	48.9		102.6
	Iz cm ⁴	51.4		104.4

Actuators

UG Series SIMO® Actuators

Cont.

Belt Driven



Belt Driven Key Features

- Ideal for higher speed, high duty cycle applications
- Belt material is nylon covered, fiberglass reinforced, neoprene
- Temperature range of 0° C to +80° C (32° F to 176° F)
- Rounded GT®2 tooth design creates better engagement with the pulley for greater torque transfer, reduced vibration, and extended life

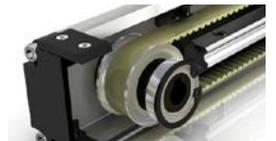


MTB Series Actuators



Key Features

- Long travel lengths
- High acceleration, speeds, and rigidity
- Fully enclosed aluminum housing
- Strong yet lightweight and corrosion-resistant
- Low friction, noise and vibration
- Anodized aluminum housing and carriage
- Steel reinforced belt capable of handling high loads
- Ball guided rail system
- Adjustable belt tension
- Multiple drive configurations

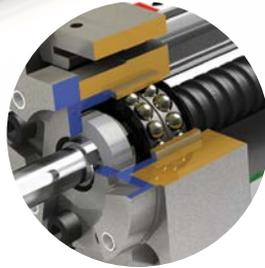


UG Series SIMO Belt Driven			
		Horizontal Motor Mount Tall	Vertical Motor Mount Low
Rail Style		GST/CRT	GST/CRT
Base Weight excluding motor	Kg	0.50/0.62	0.41/0.53
MAX Static Load	Fx ⁴ N	200	
	Fy N	3,150/740	
	Fz N	4,710/880	6,000/880
MAX Moments	Mx Nm	100/15	
	My Nm	130/25	
	Mz Nm	120/35	
MAX Stroke Length	mm	1,900	
MIN Stroke Length	mm	5	
Add for 100 mm of Stroke	Kg	0.18	0.11
MAX Speed with lubrication	m/s	4.2	5.5
Moment of Inertia	ly cm ⁴	48.9	102.6
	lz cm ⁴	51.4	104.4

MTB Series					
Size	mm	42 x 42	55 x 55	80 x 80	105 x 105
Base Weight	Kg	1.60	4.80	6.00	12.50
MAX Load	Fx ⁴ N	460	820	1,650	2,750
	Fy N	1,560	1,850	4,500	7,500
	Fz N	1,560	1,850	4,500	7,500
MAX Moments	Mx Nm	20	25	80	120
	My Nm	55	120	450	700
	Mz Nm	55	120	450	700
MAX Stroke Length	mm	2,000	6,000	6,000	6,000
MIN Stroke Length	mm	100	100	100	100
Add for 100 mm of Stroke	Kg	0.25	0.37	0.90	1.50
MAX Speed	m/s	3	3	3	3
Moment of Inertia	lx cm ⁴	12	36	183	440
	ly cm ⁴	15	45	226	535

Actuators

PLA Series Actuators

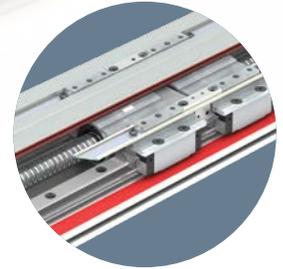


Key Features

- Enclosed aluminum housing with Integral-V™ hardened steel raceways
- High speed cam roller design is sealed against contamination
- T-slots for easy mounting
- Stainless steel seal strip magnetically sealed
- Many accessories such as sensors, mounting brackets, couplings, motor mounts, etc.

PLA Series			
Size	mm	55 x 55	
Base Weight (without motor)	Kg	1.636	
MAX Load	Fx ⁴	N	1,958
	Fy	N	285
	Fz	N	980
MAX Moments	Mx	Nm	12
	My	Nm	52
	Mz	Nm	52
MAX Stroke Length	mm	2,710	
MIN Stroke Length	mm	50	
Add for 100 mm of Stroke	Kg	0.379	
MAX Speed length dependent	m/s	0.8	
Moment of Inertia	Ix	cm ⁴	29
	Iy	cm ⁴	32

MUK Series Actuators



Key Features

- Incorporates two 20 mm recirculating ball profile rail guide ways
- Load capabilities up to 11,200 N
- Single or dual carriage options available
- Class 7 (52 µm/300 mm) travel accuracy ball screw is standard, consult factory for other options
- Compact aluminum profile incorporates t-slots for easy sensor mounting

MUK Series				
		Single Carriage	Dual Carriage	
Size	mm	145 x 65	145 x 65	
Base Weight	Kg	2.2	2.8	
Lead	mm	5	10	20
	Fx N	3,597	2,996	1,798
MAX Load	Fy N	8,500		11,200
	Fz N	8,500		11,200
	Mx Nm	550	950	
MAX Moments	My Nm	330	1,150	
	Mz Nm	330	1,150	
	MAX Stroke Length	mm	1,750*	1,750*
MIN Stroke Length	mm	125	125	
Add for 100 mm of Stroke	Kg	1.01	1.01	
MAX Speed length dependent	m/s	1	79	
Moment of Inertia	Ix cm ⁴	90	90	
	Iy cm ⁴	687	687	

* Contact factory for lengths between 750–1750 mm.
Consultations available for lengths longer than 1750 mm.

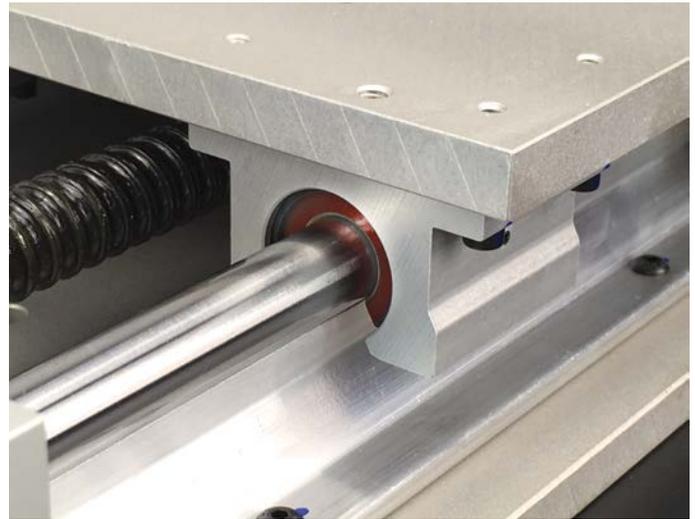
Note: The moments and loads above are maximum values. For further information, contact PBC Linear. Class 7 (52 µm/300 mm) travel accuracy ball screw is standard.

Linear Slides

Simplicity Linear Slides

Key Features

- Handles heavy loads in harsh, contaminated environments
- Low profile systems for applications with height constraints
- Rail shaft diameters from 12.7 mm (0.5 in) to 50.8 mm (2.0 in)
- Rail lengths to 2,440 mm (96 in)
- Carriage speeds up to 0.457 m/s (18 in/s)
- Normal carriage loads up to 83,000 N (18,750 lbf)
- Available with plain or ball bearings
- Ideal for harsh environments such as, machine tools, fiberglass manufacturing & processing plants, stone cutters & other quarry applications, auto manufacturing facilities, welding & assembly lines, foundries



RPS



1RPS



RS



2RPS



LRPS



2LRPS



SC2RPS



2HCR & 2HWL



2N42, 2N56,
2N143



2N23 & 2N34



Top 10 Benefits of Internet of Things Enabled Mechatronics



Integrating Internet Connected Smart Robot Modules

The top 10 advantages machine builders and users gain when combining enhanced mechanical components with advances in smart motor technology and control strategies include:

1. Lower Cost & Enhanced Functionality

Less wiring and connectors, fewer components and sensors, less labor invested, reduced time spent in setup and maintenance, and maximized operational uptime all add up to a cost savings.

2. Less Space

The driver, controller, and amplifier are built into the smart motor, eliminating extra panel space.

3. Simplified Wiring

Fewer sensors and I/O connections result in fewer input/output connections and less complicated wiring schemes.

4. Reduced Troubleshooting

Fewer components, less wire connections, and increased performance greatly reduce the occurrence of errors.

5. Streamlined Commissioning

Preprogrammed homing routines and distributed control reduces installation times and allows report progress via internet connectivity. It also allows an operator to make in-process adjustments at an individual axis without affecting the PLC or entire production line.

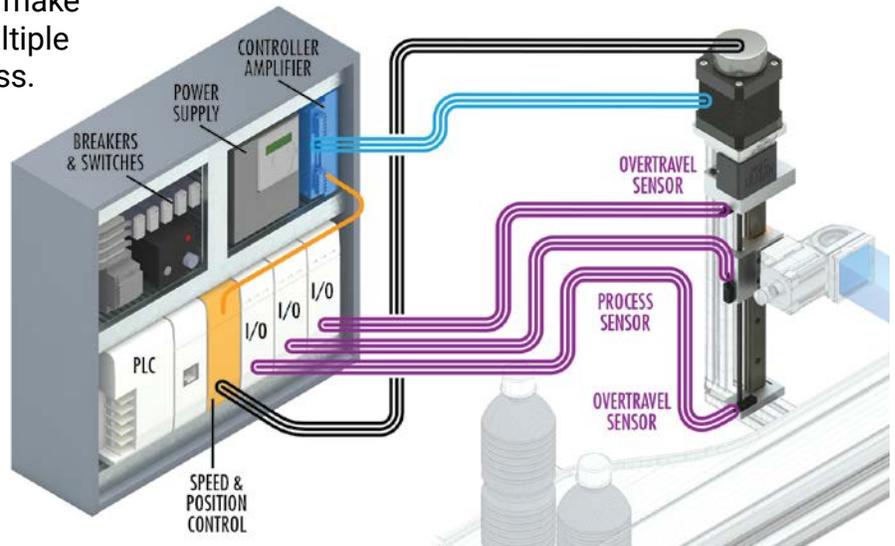


6. Modular Integration

Standardized smart robot modules make integration into multiple axes or multiple machines a natural and easy process.

7. Automated Adjustment

Automated adjustments increase manufacturing flexibility and speed. In addition, adaptive control is possible with conditions monitored and adjustments made locally, in real time, and right at the actuator level, without having to route instructions through the PLC.



8. Maximized Uptime

Real time monitoring of temperatures, friction, motor torque, and other performance related data can be routed to a mobile device allowing the human decision maker to proactively handle issues related to maximizing machine uptime.

9. Preventative Maintenance

Established time frames for periodic maintenance based on cycles, number of pieces run, or other dynamic conditions can be monitored and reported to any IoT connected device, such as a work station, tablet, or mobile phone, allowing teams to proactively keep equipment running at peak efficiency.



10. Increased Output

IoT connected motion systems drive greater flexibility, less downtime, increased performance, and greater bottom line output for manufacturers, assembly lines, packaging equipment, and production equipment.

The integration of IoT processes and equipment is shortening the design phase with cross discipline communication, design development, and project management tools. Procurement and build cycles are shortened due to the need for fewer components along with the use of online configuration and purchasing tools. With IoT connected programming and real time analytics, ease of use, maintenance, and overall life are increased for the user. All of these things combine adding to the bottom line, creating more opportunity and increasing financial returns.

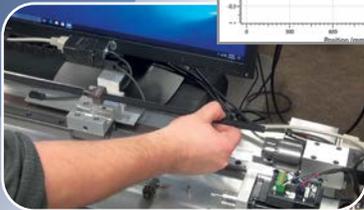
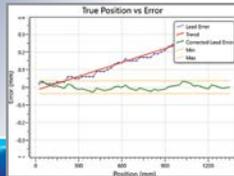
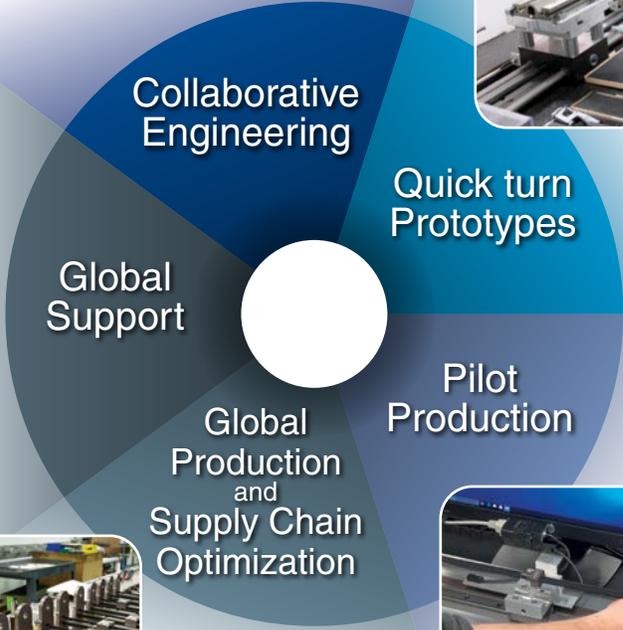
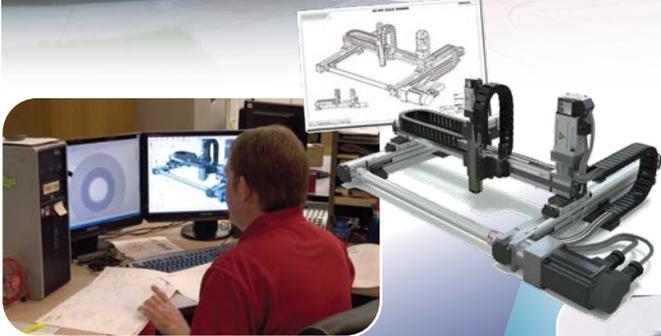


Who We Are...

An extension of your team, from concept through pilot.

PBC Linear maintains a commitment to bring improved linear motion solutions to market. Since 1983, its goal has been to provide innovative solutions through the development and manufacturing of linear motion components, mechanical sub-assemblies, and customized systems to meet customers' application and product needs and specifications.

Our diverse staff of engineers combines in-depth industry knowledge and decades of experience with a collaborative approach to meet the linear motion requirements of each application. With game-changing linear motion solutions, PBC Linear has a competitive advantage by streamlining assembly, improving application performance, and implementing innovative ideas that put customers on the path of success.



Core Competencies

- Full line of ground-breaking linear motion products that simplify application and reduce costs.
- 24/7 in-house manufacturing that guarantees quality control and quick, on-time delivery.
- A significant Patent Estate that includes:
 - Pillow block housing for a shaft-supporting bearing.
 - Linear rail system with preload adjustment.
 - Linear rail system with preload adjustment apparatus.
 - Magnetic thrust motor.
- 10 patents pending that include:
 - Integral-V™ linear guides.
 - MS ball-type manual and motor driven system.

Manufacturing Agility

Headquartered in a 200,000 square-foot facility in Roscoe, Illinois, USA, PBC Linear production is maximized to produce unmatched quality



and designed specifically for the most complex and meticulous applications resulting in ready to install solutions.

This allows PBC Linear to provide quiet, smooth, and reliable linear motion in a wide array of applications, ranging from very small pick-and-place assemblies and scanners used in lab automation, to heavy-duty lift systems used in industrial manufacturing.

New technologies such as kiosks and unattended retail systems, as well as printers, scanners, and etchers utilize components or complete systems from PBC Linear.

- 1983 Pacific Bearing Company is founded by CEO Robert Schroeder
- 1985 Mr. Bob Schroeder invents the first self-lubricating plain bearing 
- 1986 Simplicity product line expands to include pillow blocks, linear slides and shafting - 96
- 1997 PBC Headquarters relocated to 150,000 ft² facility in Roscoe, Illinois  Redi-Rail and Hevi-Rail products are launched
- 2000 Uni-Guide two piece modular guides is introduced to the market
- 2003 Mini-Rail® miniature linear guides released to market 
- 2006 V-Rail introduced
- 2007 MTB Actuators & Commercial Rail introduced
- 2008 PBC Lineartechnik GmbH established to meet the needs of the European market
Patent Pending Integral-V™ technology is introduced at the renowned Hannover Messe tradeshow in Germany
Pacific Bearing Co. d.b.a. PBC Linear to better represent their actuator offerings in the linear motion market
- 2009 ML - Miniature Linear Actuator Series offers new opportunities for lab automation, biotech and compact applications
- 2010 Low Profile Uni-Guide (UGA) is introduced, offering the same Uni-guide advantages, but in a compact 24 mm height profile
- 2011 Major manufacturing expansion of an additional FMS machine and a total of 130 pallets  PBC achieves AS9100C certification utilized by the aerospace and defense industries as well as ISO9001 certification
- 2012 PBC Linear introduces SIMO® Series Linear Motion Platform & Constant Force™ Tech
- 2013 PBC acquires LEE Controls LLC & introduces CS Compact Series actuators
- 2014 3D Platform is founded to provide large format 3D printers to the manufacturing market
- 2015 PBC + Moons' joint venture founded 
- 2017 PBC Linear introduces Lead Screw Assemblies
- 2019 PBC expands 66,000 ft² with new building at their main location & PBC LinearTechnik GmbH renamed to PBC Linear Europe GmbH



A Pacific Bearing Company

Engineering Your Linear Motion Solutions



Global Footprint



📍 PBC Linear Worldwide Headquarters

6402 E. Rockton Road, Roscoe, Illinois 61073 USA
Tel: +1.815.389.5600 • Toll-Free: +1.800.962.8979
Fax: +1.815.389.5790
sales@pbclinear.com • pbclinear.com

📍 PBC Linear Europe GmbH European Headquarters

Bonner Straße 363, 40589 Duesseldorf, Germany
Tel: +49 211 545590 20 • Fax: +49 211 545590 39
info@pbclinear.eu • pbclinear.eu

📍 PBC-MOONS China Headquarters

168 Mingjia Road, Minhang District, Shanghai 201107, P.R. China
Tel: +86 21 52634688 • Fax: +86 21 52634098
info@moons.com.cn • www.moons.com.cn

Range of Offerings



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UGA40, 9" Rail

Mini-Rail Linear Guide
MR15, 97 mm Rail

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PTFE Coated Leadscrew
Anti-Backlash Nut, 12 mm

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