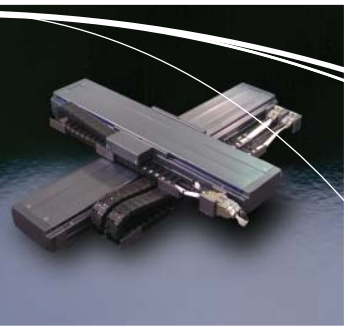
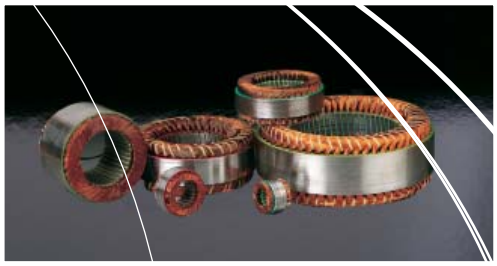
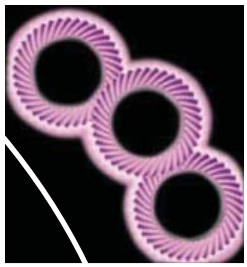
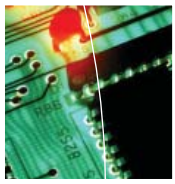
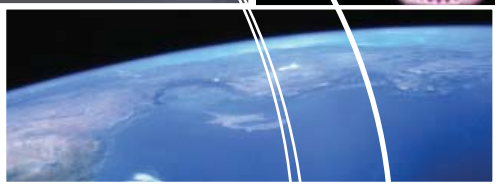
Parker

BAYSIDE®






PRECISION PRODUCTS

for the Motion Control Industry

Parker Hannifin Corporation

A Fortune 300 company with annual sales exceeding $9 billion and more than 400,000 customers in 46 countries, Parker Hannifin is the world's leading supplier of innovative motion control components and system solutions serving the industrial, mobile, and aerospace markets. We are the only manufacturer offering customers a choice of electromechanical, hydraulic, pneumatic, or computer-controlled motion systems.

Parker world headquarters in Cleveland

Total System Solutions

Parker's team of highly qualified application engineers, product development engineers, and system specialists can turn pneumatic, structural, and electromechanical products into an integrated system solution. Moreover, our Selectable Levels of Integration™ allows you to choose the appropriate system, subsystem, or component to meet your specific need.

Parker offers complete engineered systems.

First in Delivery, Distribution, and Support

In today's competitive, fast-moving economy, what good is an application that isn't ready on time? This is especially true when compressed design cycles make the quick delivery of critical components essential. With factories strategically located on five continents, Parker offers an unrivaled delivery record, getting solutions out our door and onto your floor faster than ever.

Parker also has the industry's largest global distribution network, with more than 8,600 distributors worldwide. Each of these locations maintains ample product inventory to keep your down-time to a minimum. And many distributors have in-house design capabilities to support your system and subsystem requirements.

Throughout the design process, Parker's factory-trained electro-mechanical engineers work hand in hand with you and day or night at 1-800-C-Parker. Our operators will connect you with a live, on-call representative who will identify replacement parts or services for all motion technologies.

Training

Parker's best-in-class technology training includes hands-on classes, Web-based instruction, and comprehensive texts for employees, distributors, and customers. Parker also provides computer-based training, PowerPoint presentations, exams, drafting and simulation software, and trainer stands.

parkermotion.com

Our award-winning Web site is your single source for

- Product information
- Downloadable catalogs
- Motion-sizing software
- 3D design files
- Training materials
- Product-configuration software
- RFQ capabilities

24/7 Emergency Breakdown Support

The Parker product information center is available any time of the day or night at 1-800-C-Parker. Our operators will connect you with a live, on-call representative who will identify replacement parts or services for all motion technologies.

A SOLUTION FOR EVERY AXIS

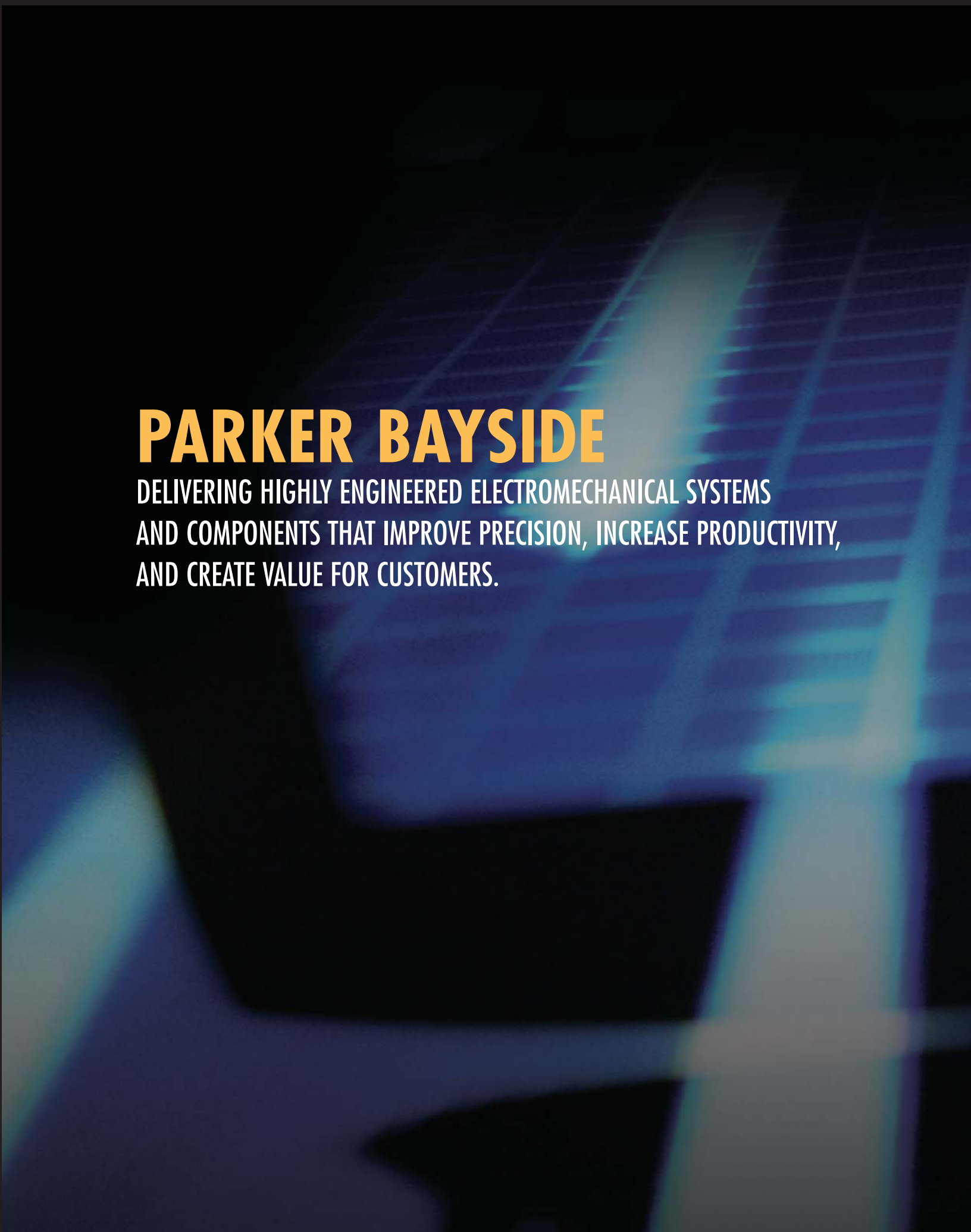
As someone looking for a motion control solution, you know there are countless manufacturers out there promising to solve your challenge. So what makes Parker Bayside so special? As part of Parker Hannifin's Electromechanical Automation Division, Parker Bayside is backed by the expertise, drive for innovation and high-quality products and systems of an $9 billion global presence in the motion control industry.

With a solution for every axis, Parker Bayside is a world-class manufacturer of electronic and mechanical motion control products, including linear and rotary positioning systems, servo motors and drives, gearheads and gearmotors. Our passion for excellence and focus on new technologies give you an unsurpassed level of commitment that means your automation objectives are solved quickly and efficiently. And to ensure your application is operating at 100%, we give you the support of our experienced team of technical professionals, 24/7.

Parker's Electromechanical Automation Division brings together leading brands in industrial and high-tech automation, including not only Bayside, but Acroloop, Compumotor, CTC, Custom Servo Motor and Trilogy. Designed for easy configuration to make a complete motion system — from miniature precision for life sciences to overhead gantries for the factory floor — these best-of-breed individual components are available separately, so you can build a motion system from the ground up, or as a complete motion system to make integration simple, fast and easy. For more details, please visit us at parkermotion.com.

Thank you for your interest in Parker Bayside. We look forward to putting you in motion!

Parker
BAYSIDE®



PARKER BAYSIDE

DELIVERING HIGHLY ENGINEERED ELECTROMECHANICAL SYSTEMS AND COMPONENTS THAT IMPROVE PRECISION, INCREASE PRODUCTIVITY, AND CREATE VALUE FOR CUSTOMERS.

Table of Contents

Linear, Vertical & Rotary Positioning Stages

Linear, Vertical & Rotary Stages

Product Series	Feature	Width (mm)	Travel (mm)	Length (mm)	Max. Load (kg)	Actuation	Accuracy	Repeatability
LM	Long Travel Precision	100 to 250 (3 sizes)	200 to 1,400	565 to 1,765	650	Ball Screw	±60µm to ±8µm	±15µm to ±5µm
	Long Travel Precision	100 to 250 (3 sizes)	200 to 2,000	503 to 2,388	650	Linear Motor	±20µm to ±3µm	±15µm to ±2µm
Micro	Low Profile High Precision	50 to 150 (4 sizes)	25 to 200	164 to 538	652	Ball or Lead Screw	±23µm to ±8µm	±10µm to ±5µm
Ultra	Side Driven Open or Solid Frame Ultra High Precision	200 to 600 (4 sizes)	100 to 500	256 to 768	2,187	Ball Screw, Lead Screw, or Linear Motor	±10µm to ±3µm ±10µm to ±1µm	±5µm to ±3µm ±5µm to ±0.5µm
Z Wedge[1]	True Vertical Motion	100 to 200 (3 sizes)	10 to 25	210 to 265	20	Ball Screw	±7µm to ±5µm	±2µm
ZP200	25 mm vertical Travel	200	25	200	75	Ball Screw		
Rotary	Rotary Motion Ultra Precision	100 to 200 (3 sizes)	360°	130 to 230	250	Direct Drive	±24 to ±12 arc sec	±8.2 to ±4.1 arc sec
	Rotary Motion Precision High Load, High Torque	100 to 300 (4 sizes)	360°	55 to 108	1000	Worm Gear	2 arc min	0.2 arc min
200 RT	Rotary Motion Precision Low Profile	100 to 300 (5 sizes)	360°	46 TO 76.2	90	Worm Drive	2 arc min	0.2 arc min

Crossed Roller & Ball Bearing Linear Slides

Product Series	Feature (mm)	Width (mm)	Travel (kg)	Max. Load	Material
SE	Extended Travel	50 to 150 (4 sizes)	25 to 400	980	Aluminum or Cast Iron
SP	Limited Travel	50 to 150 (4 sizes)	25 to 150	395	Aluminum or Cast Iron
SC & SK	Crank & Knob Lead Screw	50 to 150 (4 sizes)	25 to 100	395	Aluminum or Cast Iron
SW	Double "V" Low Profile	38 to 100 (3 sizes)	25 to 225	871	Aluminum only
3500	Miniature ball bearing	0.59 to 1.06 (inches) (4 sizes)	0.5 to 4 (inches)	30	Aluminum
3900 & 4000	Square profile	1.25 to 5 (inches) (8 sizes)	12.5 mm - 3	95	Aluminum
4900	Heavy duty	5 to 6 (inches) (3 sizes)	2 to 12 inches	140	Aluminum

Crossed Roller Bearing Sets

Product Series	Feature	Roller Diameter (mm)	Length (mm)	Maximum Load (kg)
RC	Crossed Roller	3 and 6	20 to 700	2,180

Manual Positioners

Product Series	Feature (mm)	Width (mm)	Travel (kg)	Max. Load	Material
Drive Mechanisms	Micrometers, digital	—	—	—	Aluminum
Subminiture Stage	Subminiature stages	11.2 mm	.125 to 0.5	12	Aluminum
3900 Drive	Square profile	1.25 to 5 (inches) (8 sizes)	12.5 mm -3	95	Aluminum
4000 Drive	Heavy duty slides	5 to 6 (2 sizes)	2 to 12 (inches)	140	Aluminum
2500	Tangent arm	1.75 & 2.62 (2 sizes)	360 with 10 degrees	10	Aluminum
10000/20000	low profile worm gear drive	4.75 inches	360 degrees	50	Aluminum
30000	Heavy load worm gear drives	5 to 10 (inches) (8 sizes)	360 degrees	200	Aluminum

Multi-Axis System 3U Integrated Chassis

Product Series	Number of Axes	Controller	Amplifier Type	Power/Axis	Input Voltage
3U	1 to 4	5 Brands	Linear & PWM	144 to 4,800 W	115 to 230 Vac

(1) Consult factory

Frameless Motors & Gearmotors

Servo Motors

Product Series	Frame Size	Windings (Vdc)	Length (mm)	Continuous Torque T_C (Nm)	Maximum Speed (RPM)	Feedback
Frameless	32 to 254 mm	12 to 600	20 to 100	0.044 to 58.0	30,000	N/A

Gearmotors

Product Series	Configuration	Frame Sizes	Cont. Torque (Nm)	Ratios	Backlash (arc minutes)	Gear Teeth	IP Rating	Windings	Feedback
GM	In-Line	60 to 142 mm NEMA 23 to 56	3 to 60	5, 7, 10 (3 ratios)	< 10	Helical Planetary	IP 65	160 Vdc 360 Vdc	Encoder Resolver
DX Servo Wheel	In-Line	152 & 203 mm Wheel	26 to 48	20 to 36 (4 ratios)	N/A	Planetary	N/A	24 Vdc 48 Vdc	Encoder
GM 50 Pancake Gearmotor	In-Line	120.65	2.0 to 19.8	10.51 42.47 100.65 152.51	< 30	Spur	IP65	12 VDC 24 vdc	Hall Sensor

Gearheads

Gearheads

Product Series	Gear Teeth	Configuration	Frame Sizes	Cont. Torque (Nm)	Ratios	Backlash (arc minutes)	IP Rating
PS	Helical Planetary	In-Line	60 to 300 mm (8 sizes)	5 to 4,181	3 to 100 (12 ratios)	< 3	IP 65
PX	Helical Planetary	In-Line	60 to 142 mm NEMA 23 to 56 (3 sizes)	18 to 158	3 to 100 (11 ratios)	< 8	IP 65
PV	Planetary	In-Line	40 to 90 mm (3 sizes)	3.5 to 71	3 to 100 (16 ratios)	<10	IP64
RS	Helical Planetary / Spiral Bevel	Right Angle	60 to 300 mm (7 sizes)	11 to 4,181	5 to 100 (9 ratios)	< 4	IP 65
RX	Helical Planetary / Spur Bevel	Right Angle	60 to 115 mm NEMA 23 to 42 (3 sizes)	7 to 45	5 to 100 (9 ratios)	< 14	IP 65
RT	Spiral Bevel / Helical	Right Angle Thru Bore	90 to 220 mm (5 sizes)	34 to 565	3 to 30 (5 ratios)	< 4	IP 65
RD	Spiral Bevel / Helical	Right Angle Double Shaft	90 to 220 mm (5 sizes)	23 to 565	1 to 30 (7 ratios)	< 4	IP 65
RB	Spiral Bevel	Right Angle	90 to 220 mm (5 sizes)	23 to 565	1 to 3 (3 ratios)	< 4	IP 65
NE	Spur	In-Line	NEMA 23 to 42 (3 sizes)	50 to 350	3 to 100 (9 ratios)	< 10	IP54
NR[1]	Bevel / Spur	Right Angle	NEMA 23 to 42 (3 sizes)	50 to 350	1 to 100 (10 ratios)	< 15	IP54

(1) Consult factory

Resources & Capabilities

● A Commitment to Excellence

Parker Bayside's Engineered Solutions Group is comprised of a uniquely qualified team of application, design and manufacturing engineers who are committed to provide Parker Bayside's customers with innovative, reliable and cost-effective positioning system solutions for their manufacturing processes.

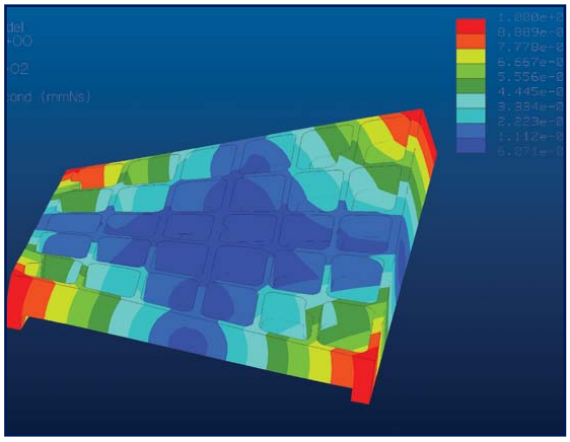
● Ideal Infrastructure

Parker Bayside's Engineered Solutions Group is supported by an effective, broad-based, corporate infrastructure. From one location, Parker Bayside designs and manufactures a wide range of motion control products, including linear positioning slides and stages, rails, motors, drives, controllers, gearheads and gearmotors. This capability provides an ideal infrastructure for cost-effective engineered solutions since they can be designed, built and integrated at one location into a single robust system.

Electronic Chassis

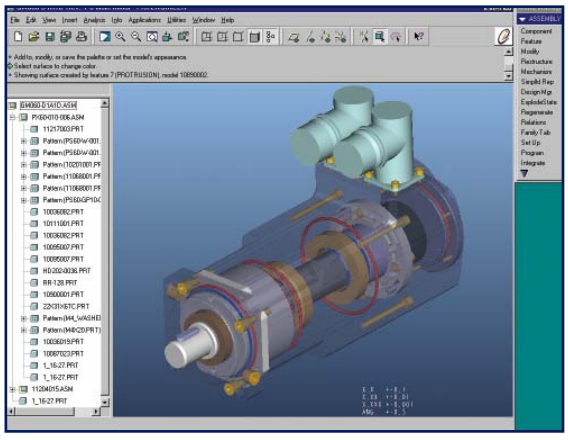
● Professional Capabilities

Parker Bayside's Systems Solution Group strives to become your dependable motion control positioning solution provider, and play a strategic role in achieving your new system development objectives. We follow your needs from the very early stages of conceptual ideas,



"FEA" Simulation

through a rigorous definition of system requirements, which in many cases we assist in developing. As partners, we may conduct various feasibility testing for verification of new ideas to meet challenging environmental conditions such as high vacuum, low magnetic field, tight space, high temperature and ground vibrations. These tests are conducted to assist us in providing you with our best possible recommended solution.



Pro / ENGINEER CAD Platform

● Strategic Partnership

Parker Bayside's Engineered Solutions Group has one main objective: to take your manufacturing process needs from concept to successful completion. Through an open channel of communication and joint planning, Parker Bayside's engineers will develop a cost-effective solution that meets or exceeds your expectations. Parker Bayside is looking forward to establishing a long-term strategic relationship with your company and project development team.

Parker Bayside's Six Step Project Process

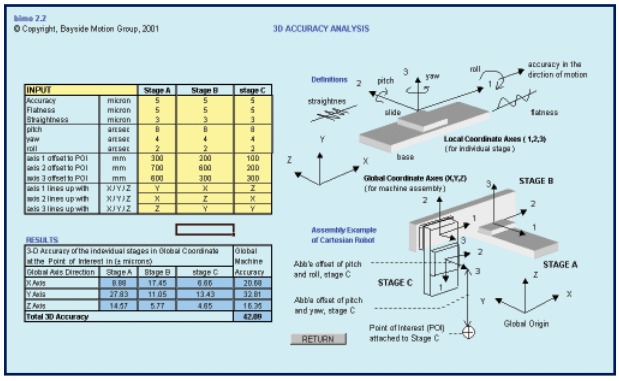
❶ Understanding the Need

Whether your project is related to building semiconductor wafer processing machines or high-precision general manufacturing equipment, Parker Bayside's first objective is to understand your engineering needs.

Our industry specialists review your positioning specifications for completeness, clarity, consistency and feasibility, as well as the value that each required specification has toward the desired manufacturing process.

❷ System Analysis

Once an engineered system and its requirements have been reviewed and defined, Parker Bayside's engineering team uses a proprietary software (BIMO) to gain a better qualitative understanding of the proposed system value as well as a quantitative understanding of optimal component sizing.



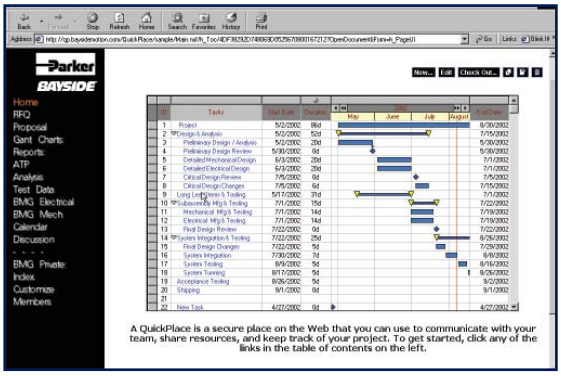
BIMO Analysis Tool

❸ Solution Proposal

Equipped with an in-depth understanding of the need and a proposed solution, our system application engineers prepare a detailed document that highlights the requirements, cost effectiveness of various solution options, recommended configuration, selected components, price quotation, and delivery schedule.

❹ Project Management

Each engineered system is assigned and led by a project manager who is responsible for ensuring that the project's process is begun and completed in a smooth, orderly and precise manner. To ensure accurate, up-to-date communication, the Project Manager utilizes a secured, web-based communication tool (QuickPlace) to keep all involved parties apprised of the project progress and details. The detail kept in the QuickPlace includes: Project Members, RFQ, Proposal, ATP, Gantt Charts, Tasks, Reports, System Analysis, Test results, Electrical Engineering, Mechanical Engineering and Discussion History.



View of QuickPlace

❺ Acceptance Test

The Acceptance Test Procedure (ATP) is a mutually agreed upon document, which outlines the procedures, tools and methods used to verify that all project performances meet desired specifications. The acceptance test procedure is prepared well in advance to allow for the customer representatives to review it prior to their presence in this stage of the project.

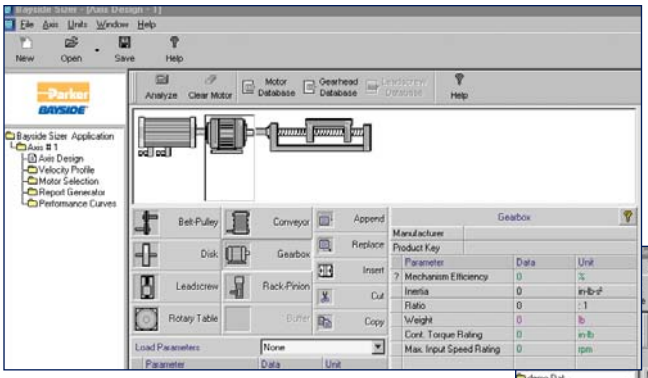
❻ After Sales Support

When the engineered system has been accepted by the customer, a Parker Bayside engineer is assigned to follow up the delivery at the customer's site. The engineer inspects the machine and powers it up. Training is also provided to the customer on site to assure proper readiness to start operation and maintain the machine.

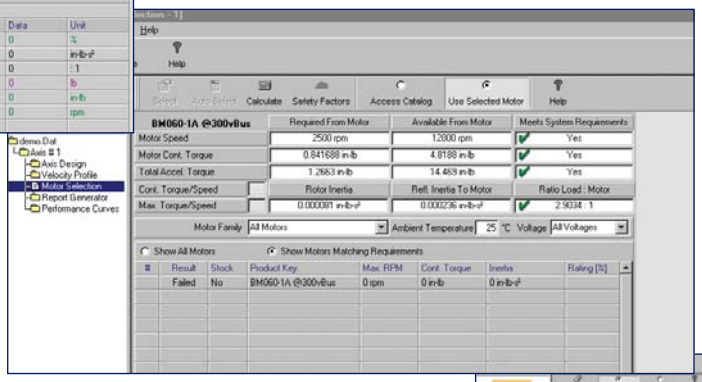
Throughout the life cycle of the machine, Parker Bayside continuously monitors the status of the project and provides quick support when needed.

Acceptance Testing

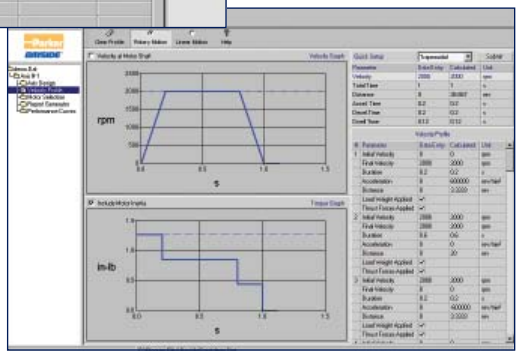
Motion Workbench



Axis Design
Selection of components and entry of parameters to build an axis. The selection component will appear on screen as a graphical symbol.



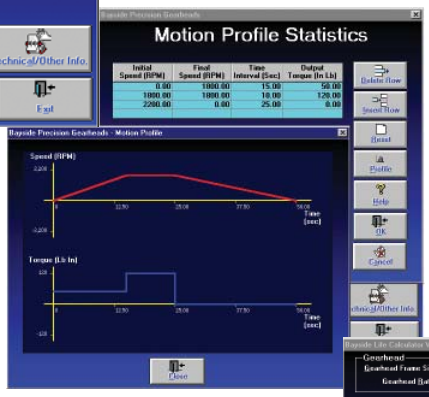
Motor Selection
Selects motor that meets system requirements and generates report with performance curve.



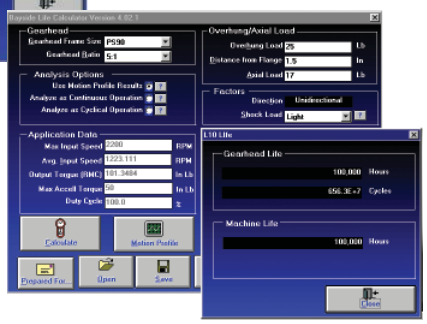
Velocity Profile
Entry of data for a specific velocity profile. As data is entered for accel, decel and dwell, the profile is graphically shown.

Life Estimator

Entry of application data for speed, torque, duty cycle loads and shock.



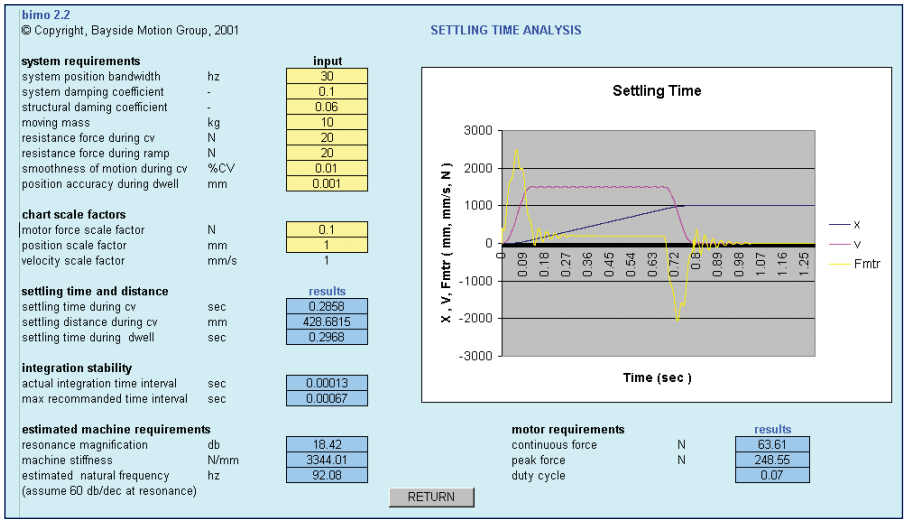
Profile - Entry of data for a specific velocity profile for each selections of accel, decel and dwell. It is also shown graphically.



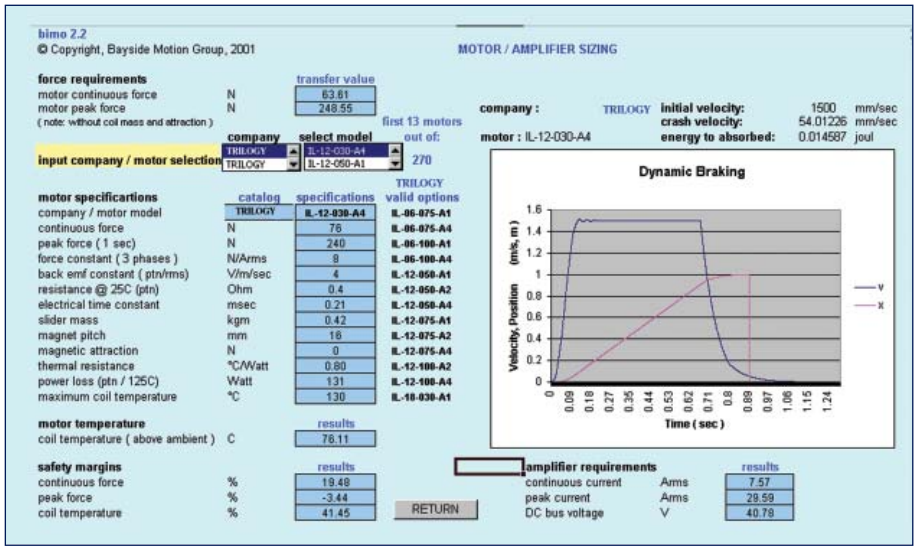
L10 Life - Creates detailed application report and gearhead life.

BIMO

(Parker Bayside Integrated Motion Optimizer)

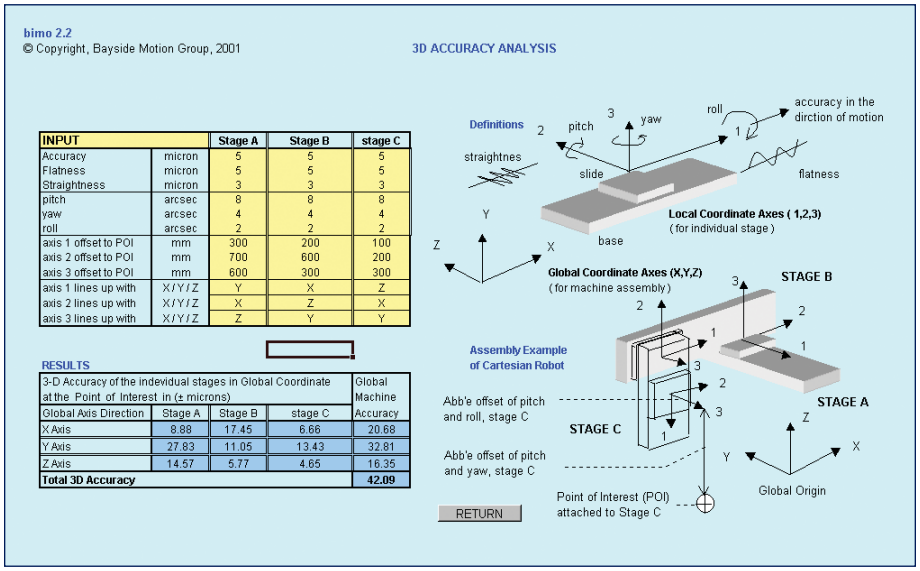


The dynamics and settling analysis assists in selecting the required motor forces needed to drive the stage in a motion profile, which is determined at the kinematic analysis phase.

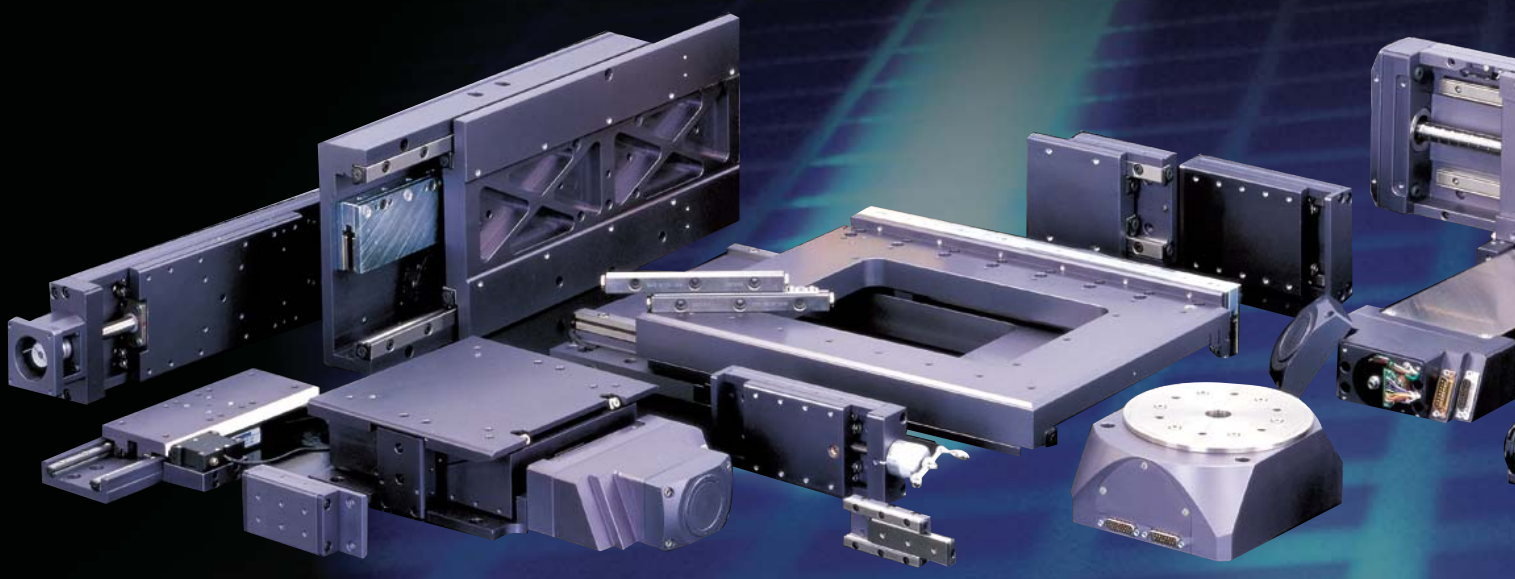


The linear motor and amplifier analysis selects the motor that meets the force requirements obtained from the dynamic analysis.

The 3-dimensional accuracy analysis determines the effects of sensor stages parameters, assembly configuration and Abbe offsets on the overall accuracy of the machine.



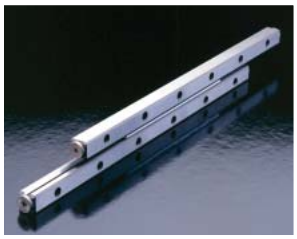
This software tools are made available as an aid to the selection of gearheads, motors and stages.
These values are merely an estimate and we cannot accept the responsibility for their interpretation.



POSITIONING STAGES AND SYSTEMS

DEVELOPING HIGHLY ENGINEERED LINEAR POSITIONING SYSTEMS THAT IMPROVE PRECISION, INCREASE PRODUCTIVITY AND CREATE VALUE FOR CUSTOMERS

Linear and Rotary Positioning Stages



Linear Positioning Stages

Vertical Positioning Stages

Rotary Stages

Manually Driven Slides & Stages

Engineered Systems

Positioning Stages: Application Solutions

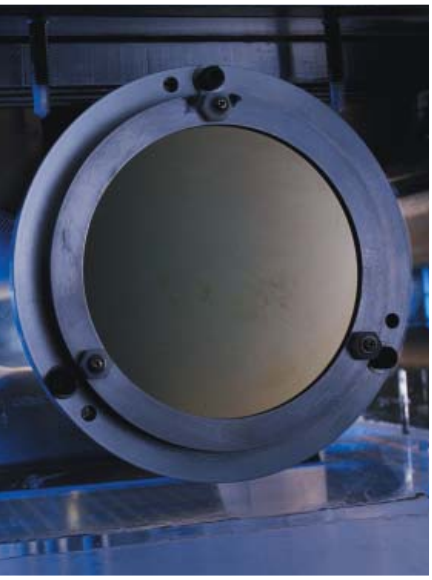
XYZ Systems for Thin Film Precision Inspection Equipment

APPLICATION CHALLENGE

The customer, ThermoNoran, manufactured precision thin film inspection equipment used for inspecting wafers in the semiconductor industry. They required an XYZ motion platform to inspect the thickness and identify any irregularities of the thin film substrates being placed on wafers. To stay at the forefront of their industry, they needed better constant velocity and higher throughput. In addition, they needed to process 300mm wafers in their 200mm footprint.

Smoothness and Constant Velocity for Scanning Axis.
The customer used lead screw stages with recirculating ball bearings for moving the scanning equipment. The stage they were using could not supply the required smoothness and constant velocity. The linear ball guides caused Z-axis jitter when operated at the required velocity and the lead screw limited the velocity capability.

Accuracy, Repeatability and Resolution of Overall System.
The customer required an accuracy and repeatability better than 2 microns and a resolution better than 4 microns from the XYZ motion system.



XYZ Systems for Automated Testing Equipment for MEMS

APPLICATION CHALLENGE

In the future, the telecommunications market is going to demand transmission rates in the magnitude of terabits per second. Fiber optics manufacturers need to move from first-generation switching, where the core processing is done electronically (O-E-O), to next-generation switches, where the light signal is redirected optically, greatly increasing transmission rates while eliminating expensive electronics. At the heart of these all-optical systems are Micro-Electro-Mechanical Systems (MEMS), which consist of a system of tilting mirror arrays.

A manufacturer of optical switches used in the fiber optics industry was looking for ways to automate their process of checking the position and control of the MEMS used in their switches. Currently the process is being performed manually, in what can best be described as a laboratory environment. In order to meet the future demand for this cutting-edge technology, the process needed to be automated in order to increase throughput. Some of the requirements required for a system would be:

1. Smooth motion 2. No servo dither at desired position 3. Sub-micron resolution
4. Small operating envelope

X-Y Scanning Application

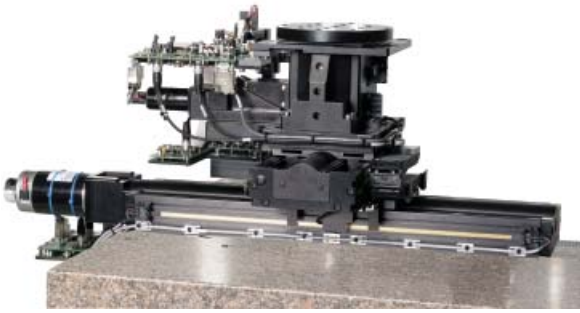
APPLICATION CHALLENGE

A customer was manufacturing an optical visual system that was to take dimensional measurements of a read-write head used in the semiconductor industry. The system was using step motors and controls to make small incremental movements, where an operator was to read the display and take measurements used to accept or reject the heads.

What was required of the positioning stage was 1 micron of accuracy over the full travel of the stage, and the ability to provide a resolution of 0.1 microns. The stage the customer was using was not able to provide the proper level of accuracy or provide the required resolution needed to make the incremental readings.

PARKER BAYSIDE SOLUTION

X Axis: (1) LM Positioning Stage with Ball Screw Drive and Integral Motor.
Y Axis: (1) High Accuracy Ultra Linear Motor Stage with Crossed Roller Bearings and Ironless Linear Motor.
Z Axis: (1) Z-Wedge Stage with a Ball Screw Drive and Integral Motor.



The LM Positioning Stage (X Axis) is used for stepping motion where its high dynamic stiffness improves the systems settling capability. It featured an integrated motor, built directly onto the ball screw shaft, eliminating compliance between the screw and motor.

The High Accuracy Linear Motor Stage (Y Axis) provided the extremely smooth, uniform motion required. The stage prevented Z Axis jitter, while supporting a high constant velocity and accurate straightness/flatness specifications. Constant velocity was tested at 0.03% uniformity.

The Z-Wedge Stage (also featuring an integrated theta) provided vertical motion (Z-Axis) and excellent position repeatability and stability in a compact package.

The integrated motors reduced overall system size while maximizing dynamic stiffness.

PARKER BAYSIDE SOLUTION

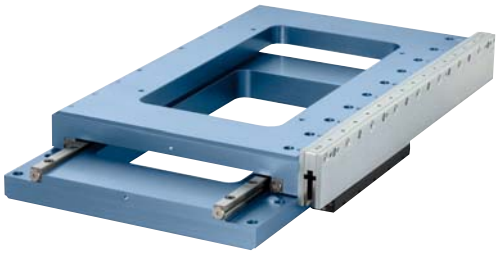
X and Y Axis Linear Motor Stages for Laser Scribing

Parker Bayside is designing custom stages for the Laser scribing for large format substrates. Meeting the high throughput motion demands requires the use of linear motors, precision recirculating linear bearings and a flexure that provide exceptional stiffness with least jitter during constant velocity. A precision enclosed linear encoder mounted down the center right beside the linear motor reduces the affect of angular errors and achieves the highest stiffness. The linear encoder resolution was resolved to 1um to achieve the customer's constant velocity specifications.

The technology built into Parker Bayside's custom stages mounted on a granite base combines the benefits of high resolution motion with ability to achieve high speeds, high accelerations and least jitter. The weldment base structure and granite isolation was designed so that it transmits no floor vibrations that will affect the process during motion. The bridge structure was designed for ease of adjustment in the field of the bridge orthogonality to travel direction.

PARKER BAYSIDE SOLUTION

(2) Ultra 300mm lead screw stages



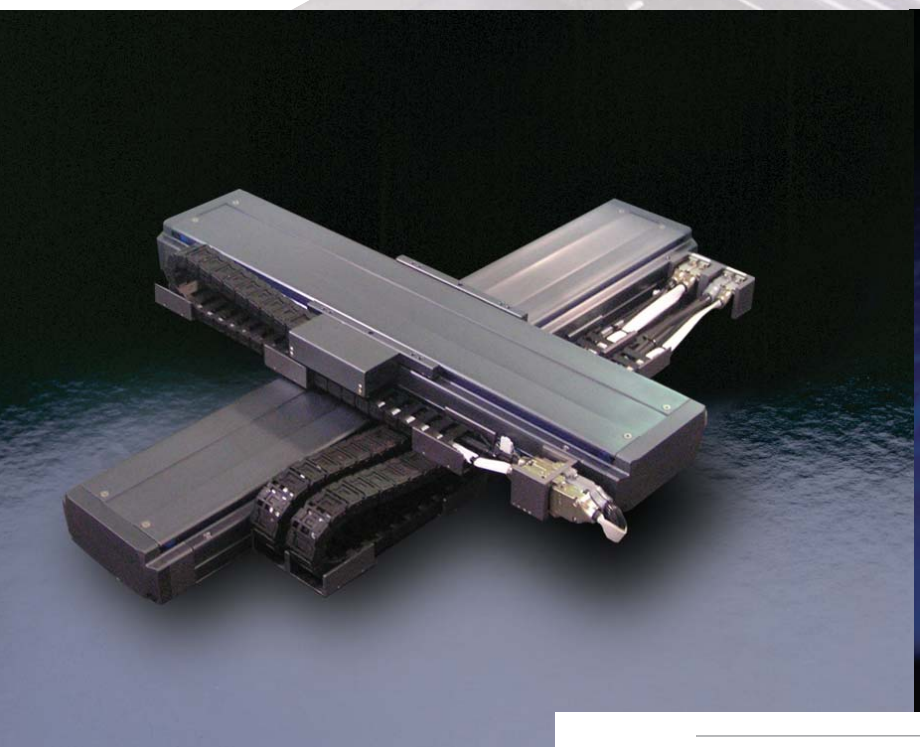
Two 300 mm Ultra lead screw stages were mounted in an X-Y configuration to provide the platform for the optical vision system. Non-contact optical encoders were used on the stage, which were certified to 1 micron total error and allowed for moves of 0.1 micron increments.

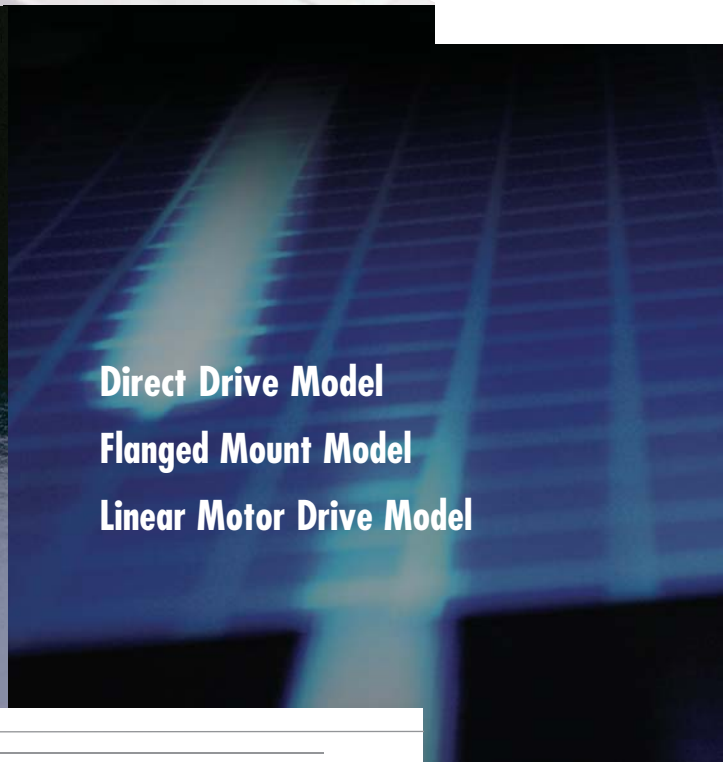
The Ultra stages feature crossed roller bearings, which provide repeatable, low-friction linear motion.

As opposed to a ball screw, where ball bearings are continuously coming in and out of pre-load, the advantage provided by the lead screw was smooth motion and high stiffness.

This solution can be used in test and measurement applications in the following industries:
1. Electronics 2. Medical 3. Semiconductor

LM Series: Linear Module

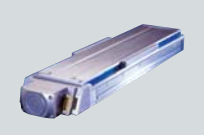




Direct Drive Model

Flanged Mount Model

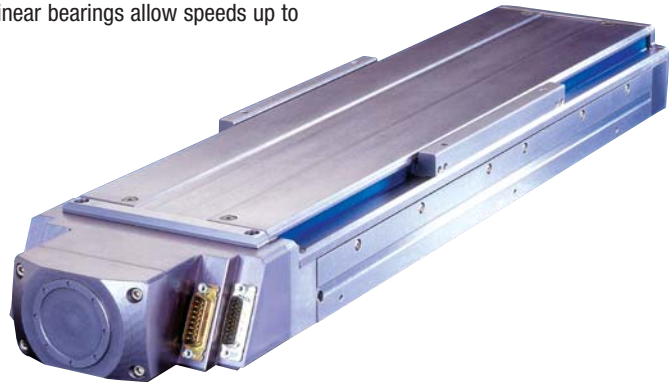
Linear Motor Drive Model



LM Series: Overview

LM Direct Drive Model

Features a revolutionary integral brushless DC motor and encoder design. This feature allows for a more compact overall package and improved system performance by eliminating backlash and wind-up. The high-performance ball screw and linear bearings allow speeds up to 1,300mm / sec.



- Integrated Brushless DC motor
- Rugged Compact Packaging
- Improved Dynamic Performance
- Pre-wired Linear or Rotary Encoders
- Pre-wired Limit Switches
- Complete Shielded Design
- All Elements Internally Located
- Lowest Profile in the Industry
- Integrated Brake

LM Flanged Mount Model

Ideal for easy mounting to any servo or step motor. For vertically mounted applications, we offer the option of a shaft brake mounted to the ball screw. Linear encoders are also available to increase positional accuracy and offer direct positional feedback regarding carriage location.

- Flange Face to Mount NEMA 23 & 34, size 60 & 90mm Motors
- Pre-wired Limit Switches
- Pre-wired Linear Encoders
- Complete Shielded Design
- Integrated Brake

LM Linear Motor Drive Model

Designed with an iron-based, brushless linear motor, the LM Linear Motor provides accelerations up to 4g's, with velocities to 3,000mm / sec. Recirculating linear guides provide exceptional load carrying capabilities. An integral, precision, non-contact linear encoder provides position feedback with high repeatability.

- Iron Core Linear Motor
- Peak Force 340 N for High Acceleration
- Pre-wired Integrated Cable Carrier
- Pre-wired Linear Encoder Internally Located
- Complete Shielded Design
- Pre-wired Limit Switches

High Speeds, Long Travels

All LM Stages feature a compact, low-profile, totally enclosed aluminum alloy construction for high strength in a lightweight package. The stages are rugged enough for the toughest packaging and automotive requirements, yet accurate enough for precise semiconductor, electronics assembly, and indexing applications. LM stages provide state-of-the-art performance and efficiency at an exceptional value.

A Stage and Motor all-in-one

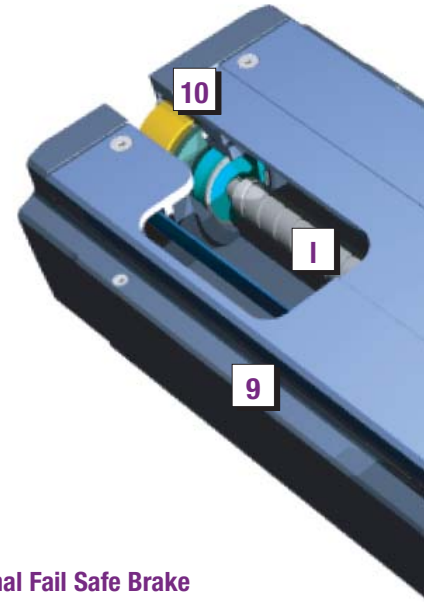
The **LM Direct Drive** is unique because the brushless servomotor is built directly onto the ball screw. This decreases overall length, while providing superior dynamic performance over conventional mounting methods. Eliminating the motor mounting and flexible coupling increases positioning accuracy and repeatability, providing greater reliability. A rotary encoder is also directly mounted to the ball screw, eliminating any build-up of errors.

When to Use:

- High speed
- Long travels
- Low profile
- Compact
- Precision
- Fast move and settle
- High-duty cycle

Applications:

- Material Handling
- Packaging
- Paper Converting
- Robotics
- Semiconductor



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Optional Fail Safe Brake
Integrated into stage, ideal for vertical applications

9

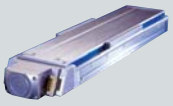
Low-Profile, Lightweight Aluminum Construction
fits into compact areas

LM Linear Motor

- With integrated brushless linear motor and linear encoder.

LM Flange Mount

- For externally mounted servo or stepper motors.



1

Precision Ball Screw
in 5, 10, and 16mm leads for high-speed operation

2

Completely Sealed Unit
with extruded covers and pulley driven seals protects against harsh IP30 environments

3

Recirculating Linear Guides
for long travel and high-load capacity

4

Optional Integrated Linear Encoder
for precision positioning

5

Pre-loaded Duplex Angular Contact Bearing
for ball screw support and high rotational speed

8

Sub D Connectors
for plug & play operation and easy hook up

7

Integrated High-Efficiency Brushless Servo Motor and Rotary Encoder
for high stiffness and precision positioning

6

Built-in End of Travel Limits and Home Sensor
for safety

Direct Drive Motor

Performance Specifications

Model No.	Travel		Maximum Velocity[1]		Maximum Load		Maximum Axial Load		Maximum Acceleration[1]	
	(mm)	(in)	(mm/sec)	(in/sec)	(kgf)	(lbf)	(kgf)	(lbf)	(m/sec^2)	(in/sec^2)
LM100D-0050	50	1.97	1,000	39	170	375	90	198	20	787
LM100D-0100	100	3.94	1,000	39	170	375	90	198	20	787
LM100D-0150	150	5.91	1,000	39	170	375	90	198	20	787
LM100D-0200	200	7.87	1,000	39	170	375	90	198	20	787
LM100D-0250	250	9.84	1,000	39	170	375	90	198	20	787
LM100D-0300	300	11.81	1,000	39	170	375	90	198	20	787
LM100D-0350	350	13.78	860	34	170	375	90	198	20	787
LM100D-0400	400	15.75	720	28	170	375	90	198	20	787
LM100D-0450	450	17.72	610	24	170	375	90	198	20	787
LM100D-0500	500	19.69	525	21	170	375	90	198	20	787
LM100D-0550	550	21.65	455	18	170	375	90	198	20	787
LM100D-0600	600	23.62	395	16	170	375	90	198	20	787

Accuracy Specifications

Model No.	Straightness/Flatness[2]		Accuracy[2, 3]		Repeatability[2]	
	(microns)	(in)	(microns)	(in)	(microns)	(in)
LM100D-0050	6	0.0002	12	0.0005	± 4	± 0.0002
LM100D-0100	8	0.0003	12	0.0005	± 4	± 0.0002
LM100D-0150	11	0.0004	14	0.0006	± 4	± 0.0002
LM100D-0200	14	0.0006	18	0.0007	± 4	± 0.0002
LM100D-0250	16	0.0006	22	0.0009	± 4	± 0.0002
LM100D-0300	18	0.0007	27	0.0011	± 4	± 0.0002
LM100D-0350	20	0.0008	30	0.0012	± 4	± 0.0002
LM100D-0400	22	0.0009	36	0.0014	± 4	± 0.0002
LM100D-0450	23	0.0009	40	0.0016	± 4	± 0.0002
LM100D-0500	25	0.0010	43	0.0017	± 4	± 0.0002
LM100D-0550	26	0.0010	47	0.0019	± 4	± 0.0002
LM100D-0600	29	0.0011	51	0.0020	± 4	± 0.0002

(1) Based on 10mm lead ball screw.
(2) Specifications are based on the stage mounted to a flat granite surface and measured at 25mm above the center of the stage.
(3) Higher precision available please consult factory.
Note: Cable Options - All LM D products are available with standard motor and encoder cables.

Inertia

Model No.	Screw Inertia	
	($gm\ cm\ sec^2$)	($oz\ in\ sec^2$)
LM100D-050	0.03600	0.00050
LM150D-100	0.04332	0.00060
LM100D-150	0.05064	0.00070
LM100D-200	0.05797	0.00080
LM100D-250	0.06529	0.00091
LM100D-300	0.07262	0.00101
LM100D-350	0.07994	0.00111
LM100D-400	0.08726	0.00121
LM100D-450	0.09459	0.00131
LM100D-500	0.10100	0.00140
LM100D-550	0.10926	0.00152
LM100D-600	0.11659	0.00162

Brake

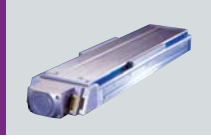
Fail Safe Brake:
24 Vdc, 0.2 amps

Motor Specifications

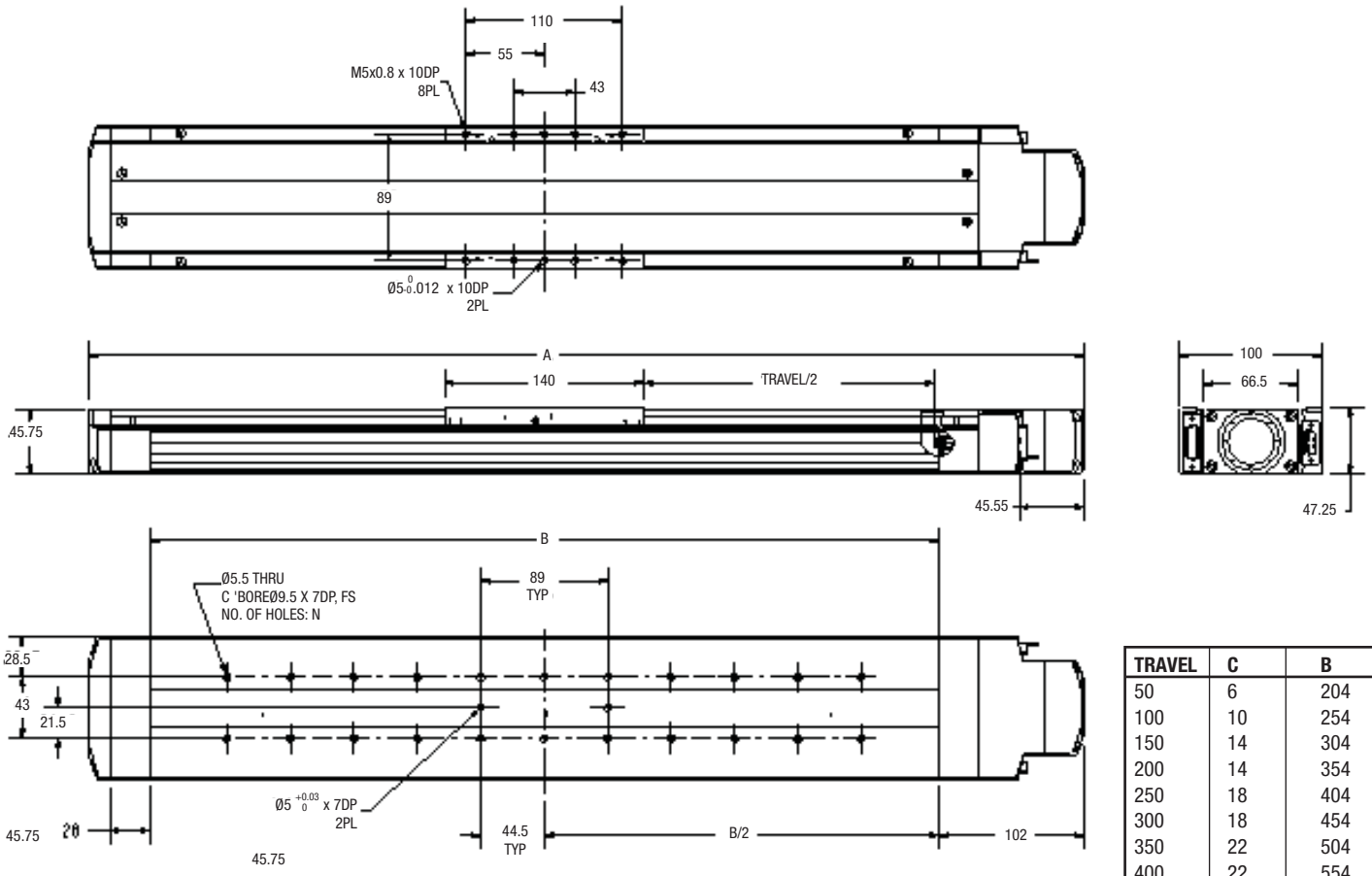
K032 Frameless Motor with: Voltage (bus)	160V	300V
K_E (V/kRPM)	11.47	23.15
K_T (Nm/amp)	0.11	0.221
(oz in/amp)	31.7	62.4
R_{L-L} (ohms)	16.5	66
L_{L-L} (mH)	8.11	33
Pole	4	4
Rotor Inertia	0.00871 gm cm sec^2 0.000121 oz in sec^2	

Rotary Encoder Specifications

Resolution:
2,000 Line
Electrical Input:
5 Vdc, 125mA maximum
Encoder Output:
Dual channel quadrature
Differential, TTL compatible
Frequency Response 125 Khz



Dimensions



TRAVEL	C	B	A
50	6	204	348
100	10	254	398
150	14	304	448
200	14	354	498
250	18	404	548
300	18	454	598
350	22	504	648
400	22	554	698
450	26	604	748
500	26	654	798
550	30	704	848
600	30	754	898

Model No.	Travel (mm)	Travel (in)	A Overall Length (mm)	A Overall Length (in)	B Base Length (mm)	B Base Length (in)	C # of Holes
LM100D-0050	50	1.97	348	13.70	204	8.03	6
LM100D-0100	100	3.94	398	15.67	254	10.00	10
LM100D-0150	150	5.91	448	17.64	304	11.97	14
LM100D-0200	200	7.87	498	19.61	354	13.94	14
LM100D-0250	250	9.84	548	21.57	404	15.91	18
LM100D-0300	300	11.81	598	23.54	454	17.87	18
LM100D-0350	350	13.78	648	25.51	504	19.84	22
LM100D-0400	400	15.75	698	27.48	554	21.81	22
LM100D-0450	450	17.72	748	29.45	604	23.78	26
LM100D-0500	500	19.69	798	31.42	654	25.75	26
LM100D-0550	550	21.65	848	33.39	704	27.72	30
LM100D-0600	600	23.62	898	35.35	754	29.69	30

Flanged Mount Motor

Performance Specifications

Model No.	Travel		Maximum Velocity[1]		Maximum Load		Maximum Axial Load		Maximum Acceleration[1]	
	(mm)	(in)	(mm/sec)	(in/sec)	(kgf)	(lbf)	(kgf)	(lbf)	(m/sec^2)	(in/sec^2)
LM100F-0050	50	1.97	1,000	39	170	375	90	198	20	787
LM100F-0100	100	3.94	1,000	39	170	375	90	198	20	787
LM100F-0150	150	5.91	1,000	39	170	375	90	198	20	787
LM100F-0200	200	7.87	1,000	39	170	375	90	198	20	787
LM100F-0250	250	9.84	1,000	39	170	375	90	198	20	787
LM100F-0300	300	11.81	1,000	39	170	375	90	198	20	787
LM100F-0350	350	13.78	860	34	170	375	90	198	20	787
LM100F-0400	400	15.75	720	28	170	375	90	198	20	787
LM100F-0450	450	17.72	610	24	170	375	90	198	20	787
LM100F-0500	500	19.69	525	21	170	375	90	198	20	787
LM100F-0550	550	21.65	455	18	170	375	90	198	20	787
LM100F-0600	600	23.62	395	16	170	375	90	198	20	787

Accuracy Specifications

Model No.	Straightness/Flatness[2]		Accuracy[2, 3]		Repeatability[2]	
	(microns)	(in)	(microns)	(in)	(microns)	(in)
LM100F-0050	6	0.0002	12	0.0005	± 4	± 0.0002
LM100F-0100	8	0.0003	12	0.0005	± 4	± 0.0002
LM100F-0150	11	0.0004	14	0.0006	± 4	± 0.0002
LM100F-0200	14	0.0006	18	0.0007	± 4	± 0.0002
LM100F-0250	16	0.0006	22	0.0009	± 4	± 0.0002
LM100F-0300	18	0.0007	27	0.0011	± 4	± 0.0002
LM100F-0350	20	0.0008	30	0.0012	± 4	± 0.0002
LM100F-0400	22	0.0009	36	0.0014	± 4	± 0.0002
LM100F-0450	23	0.0009	40	0.0016	± 4	± 0.0002
LM100F-0500	25	0.0010	43	0.0017	± 4	± 0.0002
LM100F-0550	26	0.0010	47	0.0019	± 4	± 0.0002
LM100F-0600	29	0.0011	51	0.0020	± 4	± 0.0002

(1) Based on 10mm lead ball screw.
(2) Specifications are based on the stage mounted to a flat granite surface and measured at 25mm above the center of the stage.
(3) Higher precision available please consult factory.

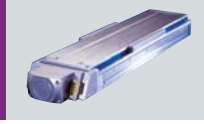
Note: Cable Options - All LM F products are available with standard motor and encoder cables.

Inertia

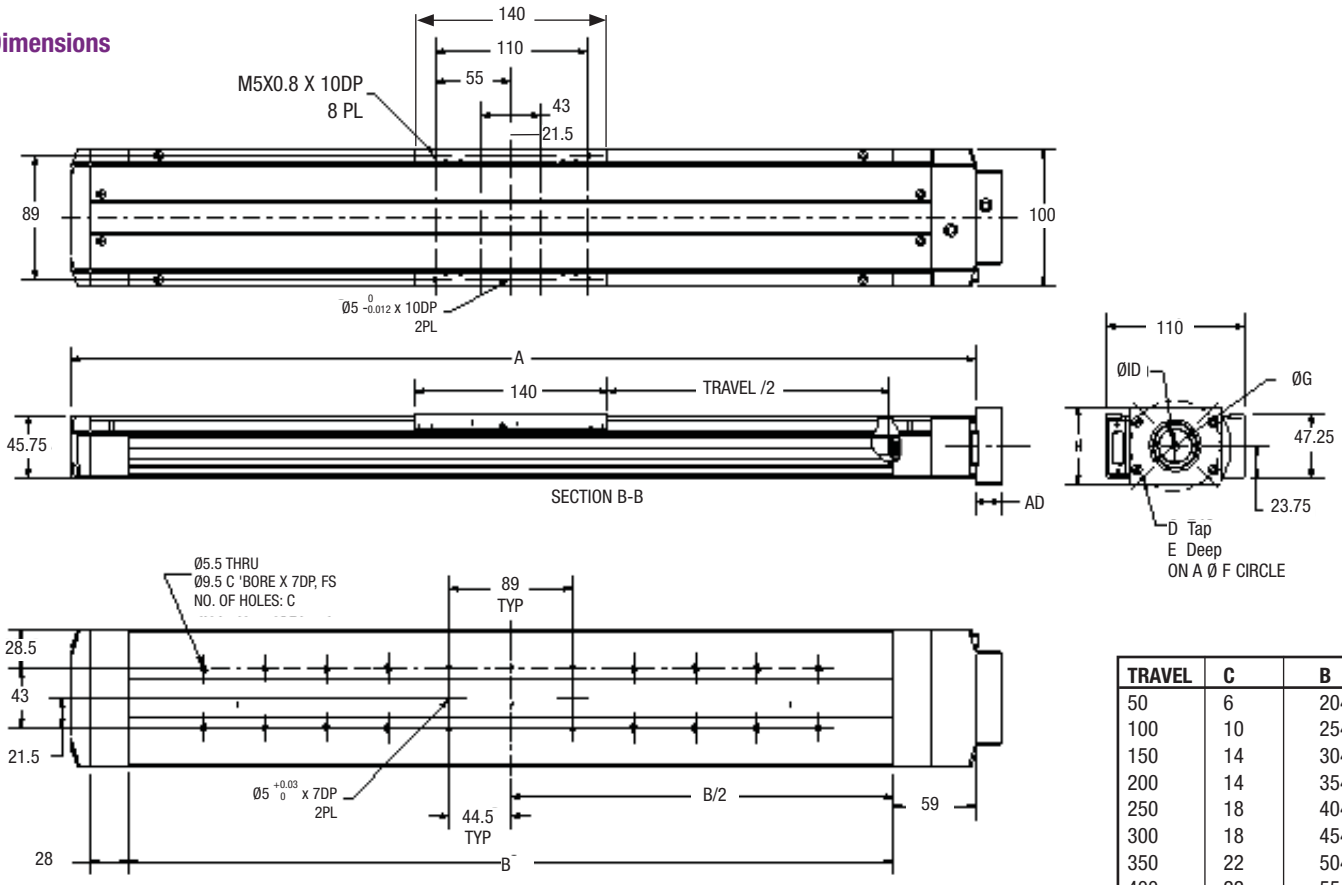
Model No.	Coupling Inertia		Screw Inertia	
	($gm\ cm\ sec^2$)	($oz\ in\ sec^2$)	($gm\ cm\ sec^2$)	($oz\ in\ sec^2$)
LM100F-0050	0.0255	0.000354	0.03506	0.00050
LM100F-0100	0.0255	0.000354	0.04238	0.00060
LM100F-0150	0.0255	0.000354	0.04970	0.00070
LM100F-0200	0.0255	0.000354	0.05703	0.00080
LM100F-0250	0.0255	0.000354	0.06444	0.00091
LM100F-0300	0.0255	0.000354	0.07168	0.00101
LM100F-0350	0.0255	0.000354	0.07900	0.00111
LM100F-0400	0.0255	0.000354	0.08632	0.00121
LM100F-0450	0.0255	0.000354	0.0.9365	0.00131
LM100F-0500	0.0255	0.000354	0.10100	0.00140
LM100F-0550	0.0255	0.000354	0.10832	0.0152
LM100F-0600	0.0255	0.000354	0.11565	0.00162

Brake

Fail Safe Brake:
24 Vdc, 0.2 amps



Dimensions



*AD DIMENSION DEPENDS ON MOTOR SELECTION

TRAVEL	C	B	A
50	6	204	305
100	10	254	355
150	14	304	405
200	14	354	455
250	18	404	505
300	18	454	555
350	22	504	605
400	22	554	655
450	26	604	705
500	26	654	755
550	30	704	805
600	30	754	855

Model No.	Travel (mm)	Travel (in)	A Overall Length (mm)	A Overall Length (in)	B Base Length (mm)	B Base Length (in)	C # of Holes
LM100F-0050	50	1.97	305	12.01	204	8.03	6
LM100F-0100	100	3.94	355	13.98	254	10.00	10
LM100F-0150	150	5.91	405	15.94	304	11.97	14
LM100F-0200	200	7.87	455	17.91	354	13.94	14
LM100F-0250	250	9.84	505	19.88	404	15.91	18
LM100F-0300	300	11.81	555	21.85	454	17.87	18
LM100F-0350	350	13.78	605	23.82	504	19.84	22
LM100F-0400	400	15.75	655	25.79	554	21.81	22
LM100F-0450	450	17.72	705	27.76	604	23.78	26
LM100F-0500	500	19.69	755	29.72	654	25.75	26
LM100F-0550	550	21.65	805	31.69	704	27.72	30
LM100F-0600	600	23.62	855	33.66	754	29.69	30

Coupling

Motor Mounting	Coupling I.D. (mm)	Coupling I.D. (in)
NEMA 23	6.35	0.25
NEMA 34	9.52	0.375
	12.7	0.5

Motor	D	E (mm)	E (in)	F (mm)	F (in)	G (mm)	G (in)	AD (mm)	AD (in)
NEMA 23	M4X0.7	8.5	0.335	66.675	2.625	38.1	1.5	19	0.748
NEMA 34	M5X0.8	10	0.394	98.425	3.875	73.025	2.875	25	0.984
BM60	M5x0.8	10	0.394	70	2.756	50	1.969	19	0.748
BM90	M6x1.0	12	0.472	100	3.937	80	3.15	25	0.984

Direct Drive Motor

Motor Specifications

K044 Frameless Motor with: Voltage	160V	300V
K_{EL-L} (V/kRPM)	23.5	46.9
K_{TL-L} (Nm/amp)	0.22	0.45
(oz in/amp)	31.7	62.4
R_{L-L} (ohms)	7.7	30.8
L_{L-L} (mH)	8	32
Pole	6	6
Rotor Inertia	0.044 gm cm sec^2	
	0.00061 oz in sec^2	

Rotary Encoder Specifications

Resolution:
2,000 Line

Electrical Input:
5 Vdc, 60 ma maximum

Encoder Output:
Dual channel quadrature
Differential, TTL compatible
Frequency Response 500 KHz

Brake

Fail Safe Brake:
24 Vdc, 0.2 amps

Brake Holding Force:

Lead (mm)	Force (kgf)	(lbf)
5	38	86
10	19	43
16	12	27

Inertia

Model No.	Screw Inertia (gm cm sec^2)	(oz in sec^2)
LM150D-200	0.2057	0.0029
LM150D-300	0.2582	0.0036
LM150D-400	0.3108	0.0043
LM150D-500	0.3634	0.0051
LM150D-600	0.4159	0.0058
LM150D-700	0.4685	0.0065
LM150D-800	0.5210	0.0072
LM150D-900	0.5736	0.0080
LM150D-1000	0.6261	0.0087
LM150D-1200	0.7312	0.0102
LM150D-1400	0.8363	0.0116

Performance Specifications

Model No.	Travel (mm)	Travel (in)	Maximum Velocity[1] (mm/sec)	Maximum Velocity[1] (in/sec)	Maximum Load (kgf)	Maximum Load (lbf)	Maximum Axial Load (kgf)	Maximum Axial Load (lbf)	Maximum Acceleration[1] (m/sec^2)	Maximum Acceleration[1] (in/sec^2)
LM150D-200	200	7.87	1,300	51	650	1,434	209	460	29	1,142
LM150D-300	300	11.81	1,300	51	650	1,433	209	460	29	1,142
LM150D-400	400	15.74	1,300	51	650	1,433	209	460	29	1,142
LM150D-500	500	19.69	1,190	46.9	650	1,433	209	460	29	1,142
LM150D-600	600	23.62	900	35.4	650	1,433	209	460	29	1,142
LM150D-700	700	27.56	700	27.6	650	1,433	209	460	29	1,142
LM150D-800	800	31.49	560	22.1	650	1,433	209	460	29	1,142
LM150D-900	900	35.43	460	18.1	650	1,433	209	460	29	1,142
LM150D-1000	1,000	39.37	385	15.2	650	1,433	209	460	29	1,142
LM150D-1200	1,200	47.24	280	11.5	650	1,433	209	460	29	1,142
LM150D-1400	1,400	55.12	215	8.5	650	1,433	209	460	29	1,142

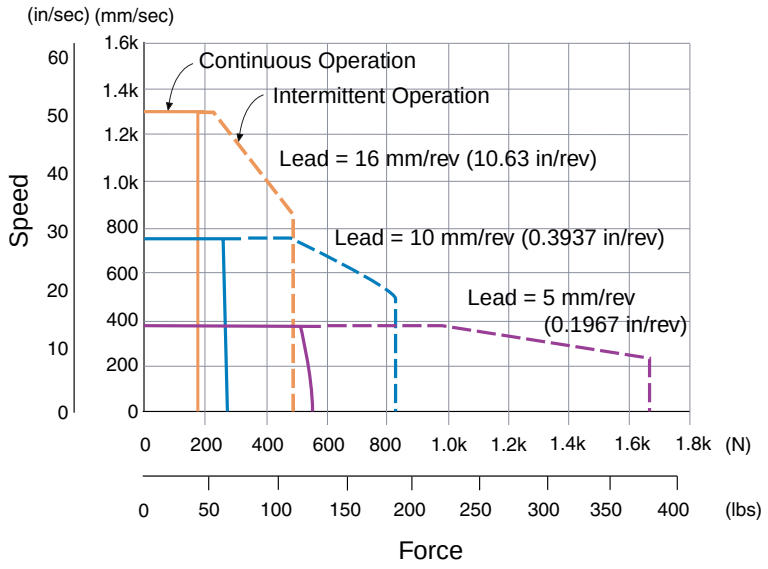
Accuracy Specifications

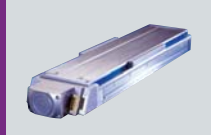
Model No.	Straightness/Flatness[2] (microns)	Straightness/Flatness[2] (in)	Accuracy[2, 3] (microns)	Accuracy[2, 3] (in)	Repeatability[2] (microns)	Repeatability[2] (in)
LM150D-200	15	0.0006	15	0.0006	± 5	± 0.0002
LM150D-300	18	0.0007	30	0.0012	± 5	± 0.0002
LM150D-400	22	0.0008	32	0.0013	± 5	± 0.0002
LM150D-500	25	0.0010	54	0.0021	± 5	± 0.0002
LM150D-600	27	0.0011	57	0.0022	± 5	± 0.0002
LM150D-700	30	0.0012	66	0.0026	± 5	± 0.0002
LM150D-800	32	0.0012	76	0.0030	± 5	± 0.0002
LM150D-900	34	0.0013	90	0.0035	± 5	± 0.0002
LM150D-1000	48	0.0019	100	0.0039	± 5	± 0.0002
LM150D-1200	72	0.0028	120	0.0047	± 5	± 0.0002
LM150D-1400	94	0.0037	140	0.0055	± 5	± 0.0002

(1) Based on 16mm lead ball screw.
(2) Specifications are based on the stage mounted to a flat granite surface and measured at 25mm above the center of the stage.
(3) Higher precision available please consult factory.
Note: Cable Options - All LM D products are available with standard motor and encoder cables.

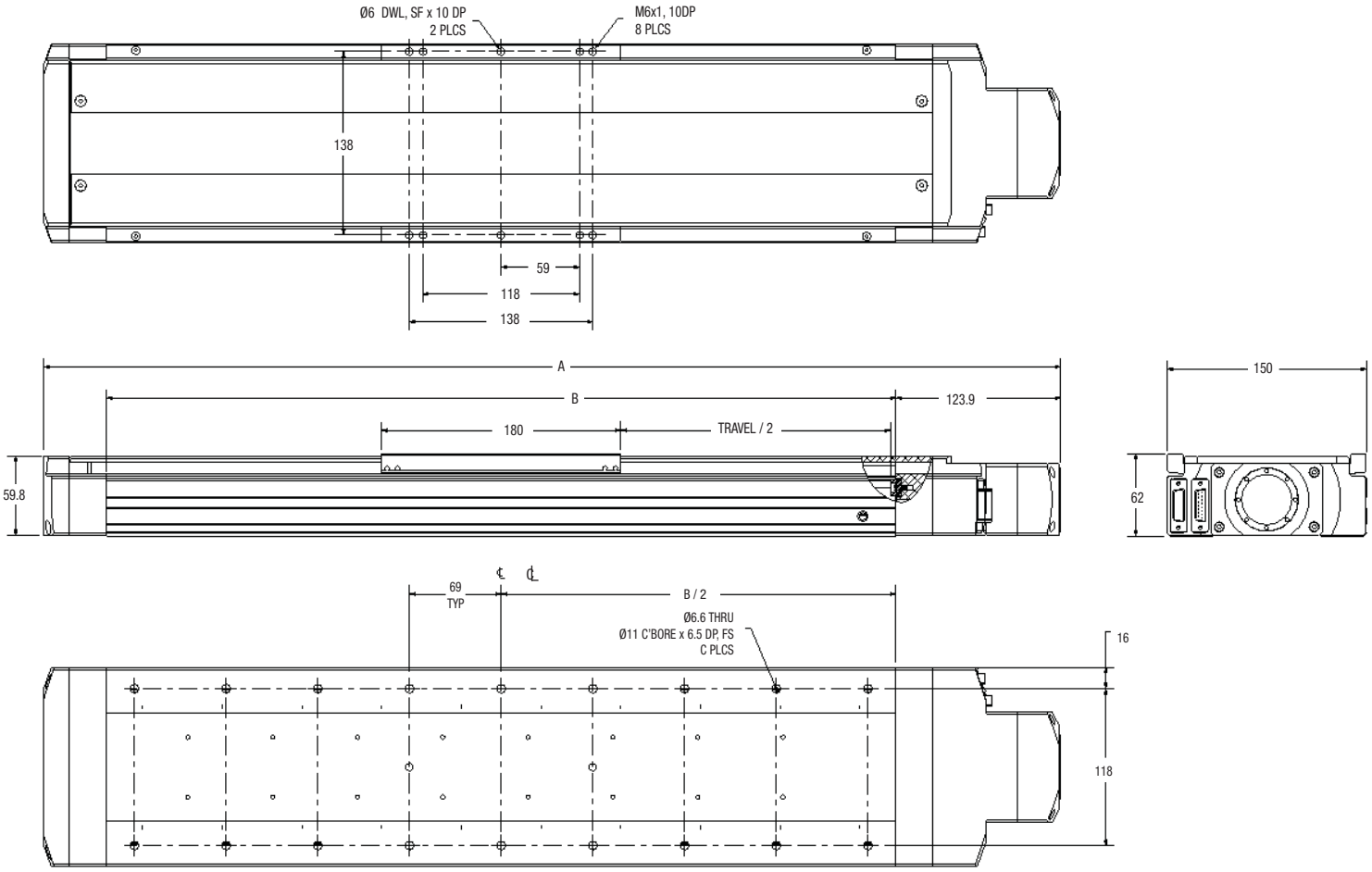
LM Direct Drive Speed vs. Force Analysis

(Maximum velocity may be limited by ball screw. See Performance Specifications above.)





Dimensions



Model No.	Travel		A Overall Length		B Base Length		C # of Holes	Stage Weight		Moving Slide Weight	
	(mm)	(in)	(mm)	(in)	(mm)	(in)		(kgf)	(lbf)	(kgf)	(lbf)
LM150D-200	200	7.87	565	22.24	394	15.51	10	7.85	17.3	1.92	4.24
LM150D-300	300	11.81	665	26.18	494	19.45	14	9.39	20.7	1.92	4.24
LM150D-400	400	15.75	765	30.11	594	23.39	18	10.88	24.0	1.92	4.24
LM150D-500	500	19.69	865	34.05	694	27.32	18	12.38	27.3	1.92	4.24
LM150D-600	600	23.62	965	37.99	794	31.26	22	13.92	30.7	1.92	4.24
LM150D-700	700	27.56	1,065	41.93	894	35.20	26	15.42	34.0	1.92	4.24
LM150D-800	800	31.50	1,165	45.86	994	39.13	26	16.92	37.3	1.92	4.24
LM150D-900	900	35.43	1,265	49.80	1,094	43.07	30	18.46	40.7	1.92	4.24
LM150D-1000	1,000	39.37	1,365	53.74	1,194	47.01	34	19.95	44.0	1.92	4.24
LM150D-1200	1,200	47.24	1,565	61.61	1,394	54.88	38	22.99	50.7	1.92	4.24
LM150D-1400	1,400	55.12	1,765	69.48	1,594	62.76	46	25.99	57.3	1.92	4.24

Flanged Mount Motor

Performance Specifications

Model No.	Travel		Maximum Velocity[1]		Maximum Load		Maximum Axial Load		Maximum Acceleration[1]	
	(mm)	(in)	(mm/sec)	(in/sec)	(kgf)	(lbf)	(kgf)	(lbf)	(m/sec^2)	(in/sec^2)
LM150F-200	200	7.87	1,300	51	650	1,434	209	460	29	1,142
LM150F-300	300	11.81	1,300	51	650	1,433	209	460	29	1,142
LM150F-400	400	15.74	1,300	51	650	1,433	209	460	29	1,142
LM150F-500	500	19.69	1,190	46.9	650	1,433	209	460	29	1,142
LM150F-600	600	23.62	900	35.4	650	1,433	209	460	29	1,142
LM150F-700	700	27.56	700	27.6	650	1,433	209	460	29	1,142
LM150F-800	800	31.49	560	22.1	650	1,433	209	460	29	1,142
LM150F-900	900	35.43	460	18.1	650	1,433	209	460	29	1,142
LM150F-1000	1,000	39.37	385	15.2	650	1,433	209	460	29	1,142
LM150F-1200	1,200	47.24	280	11.0	650	1,433	209	460	29	1,142
LM150F-1400	1,400	55.12	215	8.5	650	1,433	209	460	29	1,142

Accuracy Specifications

Model No.	Straightness/Flatness[2]		Accuracy[2, 3]		Repeatability[2]	
	(microns)	(in)	(microns)	(in)	(microns)	(in)
LM150F-200	15	0.0006	15	0.0006	± 5	± 0.0002
LM150F-300	18	0.0007	30	0.0012	± 5	± 0.0002
LM150F-400	22	0.0008	32	0.0013	± 5	± 0.0002
LM150F-500	25	0.0010	54	0.0021	± 5	± 0.0002
LM150F-600	27	0.0011	57	0.0022	± 5	± 0.0002
LM150F-700	30	0.0012	66	0.0026	± 5	± 0.0002
LM150F-800	32	0.0012	76	0.0030	± 5	± 0.0002
LM150F-900	34	0.0013	90	0.0035	± 5	± 0.0002
LM150F-1000	36	0.0014	100	0.0039	± 5	± 0.0002
LM150F-1200	39	0.0015	120	0.0047	± 5	± 0.0002
LM150F-1400	42	0.0017	140	0.0055	± 5	± 0.0002

(1) Based on 16mm lead ball screw.
(2) Specifications are based on the stage mounted to a flat granite surface and measured at 25mm above the center of the stage.
(3) Higher precision available please consult factory.
Note: Cable Options - All LM F products are available with standard motor and encoder cables.

Inertia

Model No.	Coupling Inertia		Screw Inertia	
	($gm\ cm\ sec^2$)	($oz\ in\ sec^2$)	($gm\ cm\ sec^2$)	($oz\ in\ sec^2$)
LM150F-200	0.0999	0.00139	0.1656	0.0023
LM150F-300	0.0999	0.00139	0.2159	0.0030
LM150F-400	0.0999	0.00139	0.2663	0.0037
LM150F-500	0.0999	0.00139	0.3239	0.0045
LM150F-600	0.0999	0.00139	0.3743	0.0052
LM150F-500	0.0999	0.00139	0.4247	0.0059
LM150F-800	0.0999	0.00139	0.4751	0.0066
LM150F-500	0.0999	0.00139	0.5327	0.0074
LM150F-1000	0.0999	0.00139	0.5830	0.0081
LM150F-1200	0.0999	0.00139	0.6910	0.0096
LM150F-1400	0.0999	0.00139	0.7918	0.0110

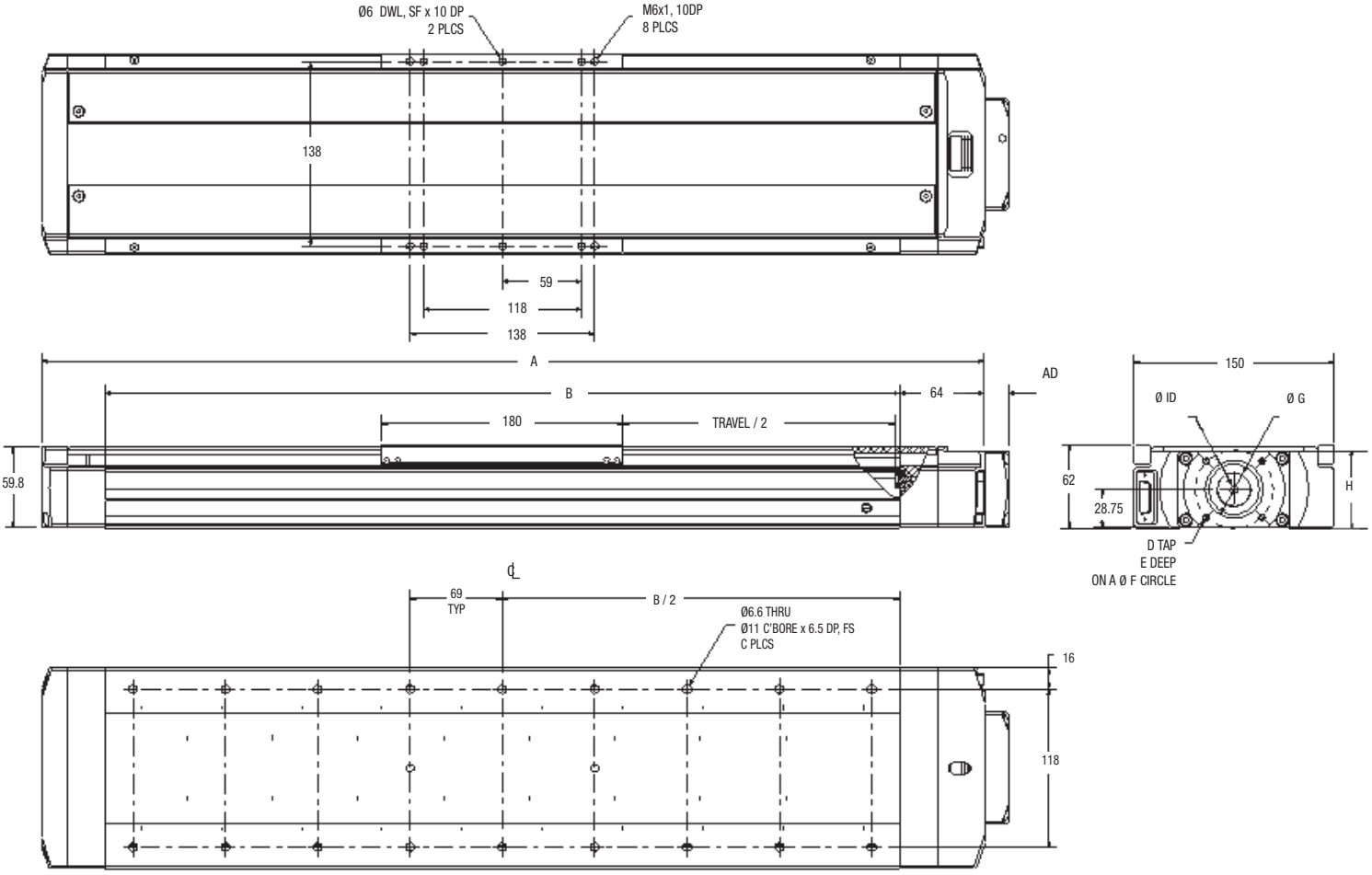
Brake

Fail Safe Brake:
24 Vdc, 0.2 amps

Brake Holding Force:

Lead	Force	
(mm)	(kgf)	(lbf)
5	38	86
10	19	43
16	12	27

Dimensions



Model No.	Travel		A Overall Length		B Base Length		C # of Holes	Stage Weight		Moving Slide Weight	
	(mm)	(in)	(mm)	(in)	(mm)	(in)		(kgf)	(lbf)	(kgf)	(lbf)
LM150F-200	200	7.87	505	19.88	394	15.51	10	7.57	16.7	1.92	4.24
LM150F-300	300	11.81	605	23.82	494	19.45	14	9.07	20.0	1.92	4.24
LM150F-400	400	15.75	705	27.76	594	23.39	18	10.57	23.3	1.92	4.24
LM150F-500	500	19.69	805	31.69	694	27.32	18	12.11	26.7	1.92	4.24
LM150F-600	600	23.62	905	35.63	794	31.26	22	13.61	30.0	1.92	4.24
LM150F-700	700	27.56	1,005	39.57	894	35.20	26	15.10	33.3	1.92	4.24
LM150F-800	800	31.50	1,105	43.50	994	39.13	26	16.64	36.7	1.92	4.24
LM150F-900	900	35.43	1,205	47.44	1,094	43.07	30	18.14	40.0	1.92	4.24
LM150F-1000	1,000	39.37	1,305	51.38	1,194	47.01	34	19.64	43.3	1.92	4.24
LM150F-1200	1,200	47.24	1,505	59.25	1,394	54.88	38	22.68	50.0	1.92	4.24
LM150F-1400	1,400	55.12	1,705	67.13	1,594	62.76	46	25.71	56.7	1.92	4.24

Coupling

Motor Mounting	Coupling I.D. (mm)	(in)
NEMA 23	6.35	0.25
	9.52	0.375
NEMA 34	9.52	0.375
	12.7	0.5

Motor	D	E (mm)	E (in)	F (mm)	F (in)	G (mm)	G (in)	H (mm)	H (in)	AD (mm)	AD (in)
NEMA 23	M4X 0.7	8.5	0.335	66.675	2.625	38.1	1.5	56.50	2.224	19	0.748
NEMA 34	M5X0.8	10	0.394	98.425	3.875	73.025	2.875	79.15	3.116	25	0.984
BM60	M5x0.8	10	0.394	70	2.756	50	1.969	60.00	2.362	19	0.748
BM90	M6x1.0	12	0.472	100	3.937	80	3.15	83.15	3.274	25	0.984

Performance Specifications

Model No.	Maximum Velocity (mm/sec)	Maximum Velocity (in/sec)	Maximum Acceleration[1] (m/sec^2)	Maximum Acceleration[1] (in/sec^2)	Maximum Load[2] (kgf)	Maximum Load[2] (lbf)
LM150L	**3,000**	118	**29**	1,142	**497**	1,096

Model No.	Continuous Force, Single Coil (N)	Continuous Force, Single Coil (lbf)	Continuous Force, Double Coil (N)	Continuous Force, Double Coil (lbf)	Peak Force, Single Coil (N)	Peak Force, Single Coil (lbf)	Peak Force, Double Coil (N)	Peak Force, Double Coil (lbf)
LM150L	**57**	12.8	**104**	23.4	**170**	38.2	**340**	76.4

Accuracy Specifications

Model No.	Straightness/Flatness [3] (microns)	Straightness/Flatness [3] (in)	Accuracy [3, 4] (microns)	Accuracy [3, 4] (in)	Repeatability [3, 4] (microns)	Repeatability [3, 4] (in)
LM150L-200	**15**	0.0006	**10**	0.0004	**± 2**	± 0.00008
LM150L-300	**18**	0.0007	**10**	0.0004	**± 2**	± 0.00008
LM150L-400	**22**	0.0009	**10**	0.0004	**± 2**	± 0.00008
LM150L-500	**25**	0.0010	**12**	0.0005	**± 2**	± 0.00008
LM150L-600	**27**	0.0011	**12**	0.0005	**± 2**	± 0.00008
LM150L-700	**30**	0.0012	**16**	0.0006	**± 2**	± 0.00008
LM150L-800	**32**	0.0012	**18**	0.0007	**± 2**	± 0.00008
LM150L-900	**34**	0.0013	**22**	0.0009	**± 2**	± 0.00008
LM150L-1000	**48**	0.0019	**34**	0.0013	**± 2**	± 0.00008
LM150L-1200	**72**	0.0028	**42**	0.0017	**± 2**	± 0.00008
LM150L-1400	**94**	0.0037	**54**	0.0021	**± 2**	± 0.00008
LM150L-1600	**112**	0.0044	**60**	0.0024	**± 2**	± 0.00008
LM150L-1800	**120**	0.0047	**76**	0.0030	**± 2**	± 0.00008
LM150L-2000	**130**	0.0051	**90**	0.0035	**± 2**	± 0.00008

Motor Specifications

Rated Performance		Units	Single Coil	Double Coil
Peak Force	F_p	**N** lbf	**170** 38	**340** 76
Continuous Force	F_c	**N** lbf	**57** 13	**104** 23
Peak Current	I_p	A_{rms}	13.7	13.7
Continuous Current @ t_{max}[1]	I_c A_{rms}	3.7	3.4	
Resistance @25°C ± 10%	R_m	ohms L-L	1.1	2.1
Inductance ± 20%	L	mH_{L-L}	3.0	6.1
Back EMF Constant @25°C ± 10%	K_E	**Vpeak/m/sec L-L** Vpeak/in/sec L-L	**12.6** 0.32	**25.2** 0.64
Max Continuous Dissipation	P_c	W	30	51
Force Constant @25°C ± 10%	K_F	**N/A_{rms}** lbf/A_{rms}	**15.4** 3.5	**30.9** 6.9
Motor Constant	Km	**N/ W** lb/ W	**$\sqrt{10.3}$** $\sqrt{2.3}$	**14.6** 3.3
Magent Pole Pitch (360 elec.deg.)	mm		32	32

(1) t_{max} = 130 ºC coil temperature

(1) Maximum Acceleration is dependent on load and friction. Motor peak force up to 340N (76.4 lbf)

(2) Maximum load is on a complete system basis. Bearing static / dynamic capacity is significantly higher.

(3) Specifications are based on the stage mounted to a flat granite surface and measured at 25mm above the center of the stage.

(4) Based on a closed loop system with a 1μm linear encoder, utilizing a 2 point slope correction

Note: Cable Options - All LM Linear Motor products are available with standard motor and encoder cables.

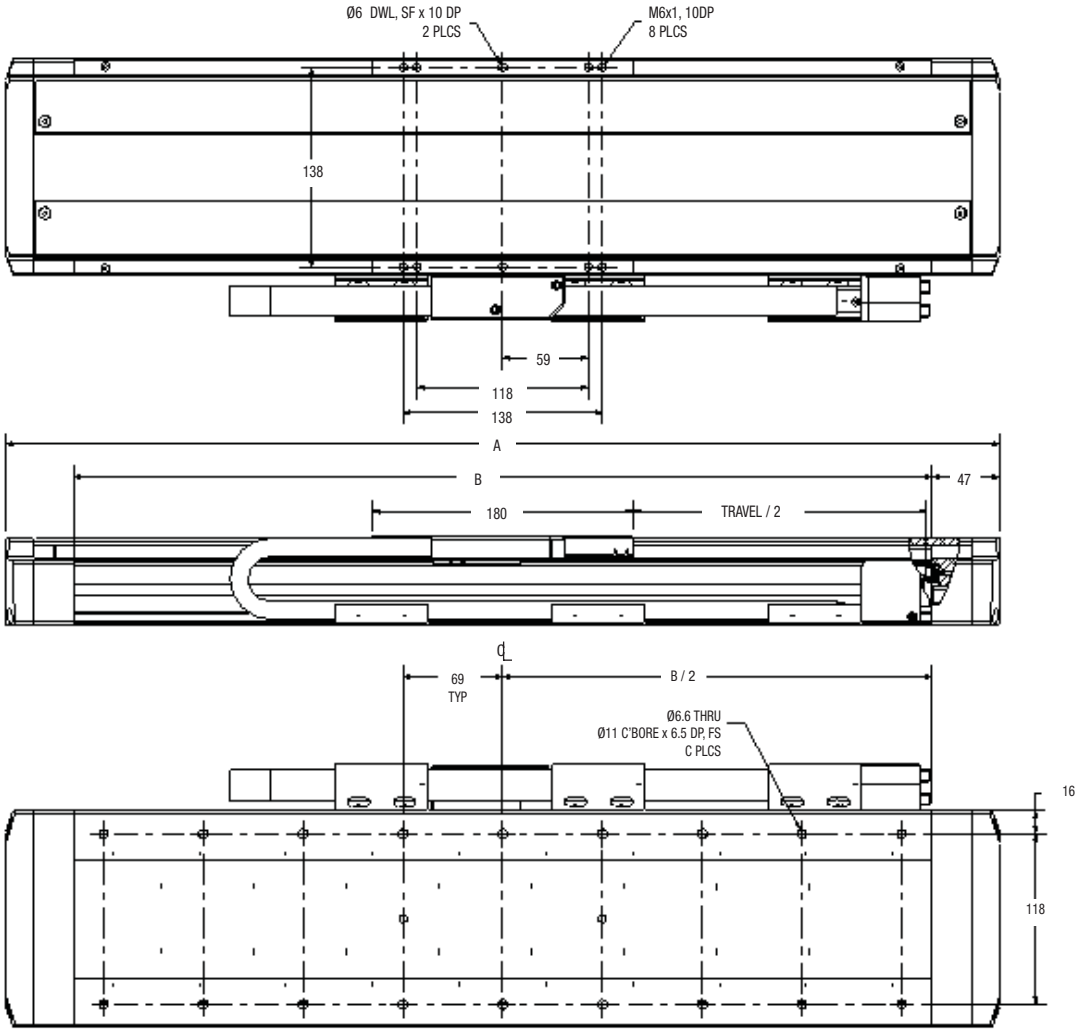
Linear Encoder Specifications

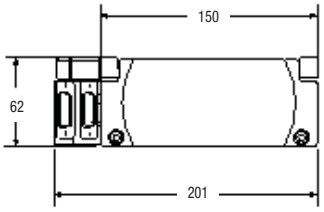
Resolution:
0.1μm, 0.5μm, 1.0μm, & 5.0μm

Electrical Input:
5 Vdc, 120 ma typical
5 Vdc, 250 ma for 0.1μm only

Encoder Output:
Dual channel quadrature
Differential, TTL compatible

Dimensions





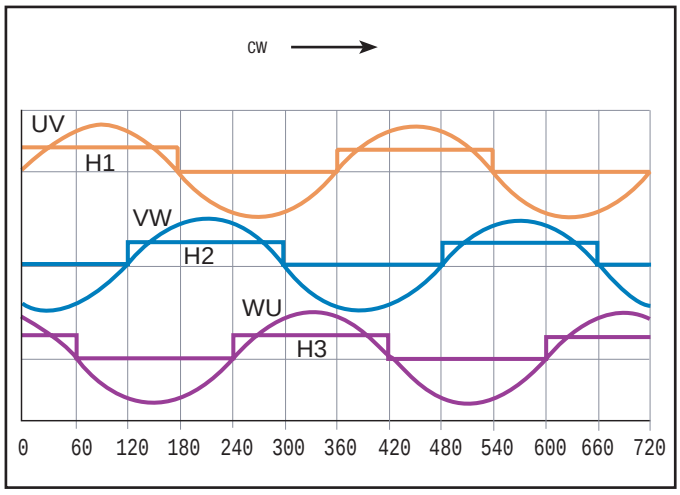
Model No.	Travel		A Overall Length				B Base Length				C # of Holes	
			Single Coil		Double Coil		Single Coil		Double Coil		Single Coil	Double Coil
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)		
LM150L-200	200	7.87	488	19.21	578	22.76	394	15.51	484	19.06	10	14
LM150L-300	300	11.81	588	23.15	678	26.69	494	19.45	584	22.99	14	18
LM150L-400	400	15.75	688	27.09	778	30.63	594	23.39	684	26.93	18	18
LM150L-500	500	19.69	788	31.02	878	34.57	694	27.32	784	30.87	18	22
LM150L-600	600	23.62	888	34.96	978	38.50	794	31.26	884	34.80	22	26
LM150L-700	700	27.56	988	38.90	1,078	42.44	894	35.20	984	38.74	26	26
LM150L-800	800	31.50	1,088	42.83	1,178	46.38	994	39.13	1,084	42.68	26	30
LM150L-900	900	35.43	1,188	46.77	1,278	50.31	1,094	43.07	1,184	46.61	30	34
LM150L-1000	1,000	39.37	1,288	50.71	1,378	54.25	1,194	47.01	1,284	50.55	34	38
LM150L-1200	1,200	47.24	1,488	58.58	1,578	62.13	1,394	54.88	1,484	58.43	38	42
LM150L-1400	1,400	55.12	1,688	66.46	1,778	70.00	1,594	62.76	1,684	66.30	46	50
LM150L-1600	1,600	62.99	1,888	74.33	1,978	77.87	1,794	70.63	1,884	74.17	50	54
LM150L-1800	1,800	70.87	2,088	82.20	2,178	85.75	1,994	78.50	2,084	82.05	58	58
LM150L-2000	2,000	78.74	2,288	90.08	2,378	93.62	2,194	86.38	2,284	89.92	62	66

Weights

Model No.	Stage Weight				Moving Slide Weight			
	Single Coil		Double Coil		Single Coil		Double Coil	
	(kgf)	(lbf)	(kgf)	(lbf)	(kgf)	(lbf)	(kgf)	(lbf)
LM150L-200	9.26	20.4	9.75	21.5	2.38	5.24	2.87	6.34
LM150L-300	10.07	22.2	10.56	23.3	2.38	5.24	2.87	6.34
LM150L-400	10.88	24	11.37	25.1	2.38	5.24	2.87	6.34
LM150L-500	11.7	25.8	12.19	26.9	2.38	5.24	2.87	6.34
LM150L-600	12.51	27.6	13.0	28.7	2.38	5.24	2.87	6.34
LM150L-700	13.32	29.4	13.81	30.5	2.38	5.24	2.87	6.34
LM150L-800	14.13	31.2	14.62	32.3	2.38	5.24	2.87	6.34
LM150L-900	14.94	32.9	15.43	34.0	2.38	5.24	2.87	6.34
LM150L-1000	15.75	34.7	16.24	35.8	2.38	5.24	2.87	6.34
LM150L-1200	17.37	38.3	17.86	39.4	2.38	5.24	2.87	6.34
LM150L-1400	18.99	41.9	19.48	43.0	2.38	5.24	2.87	6.34
LM150L-1600	20.61	45.5	21.1	46.6	2.38	5.24	2.87	6.34
LM150L-1800	22.24	49	22.73	50.1	2.38	5.24	2.87	6.34
LM150L-2000	23.86	52.6	24.35	53.7	2.38	5.24	2.87	6.34

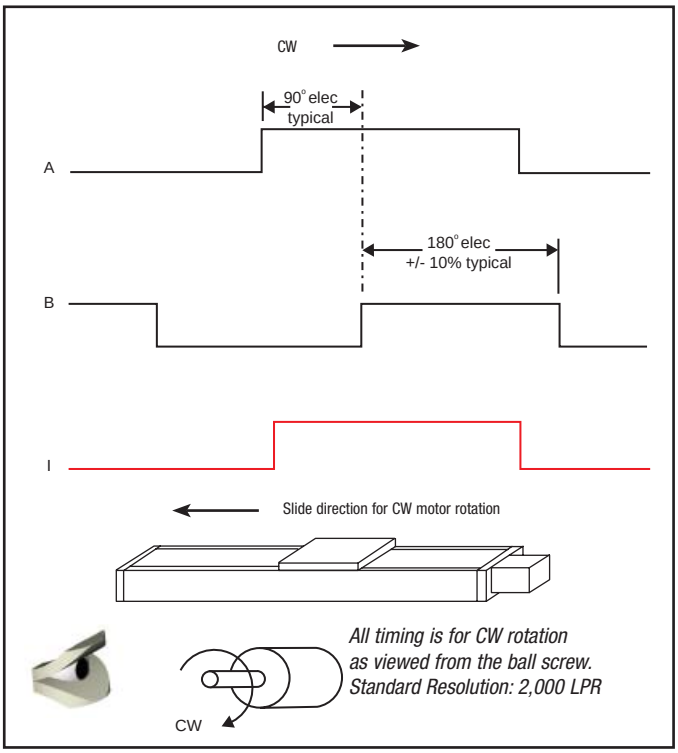
Motor Signal Timing

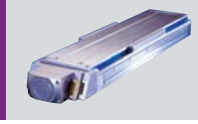
at motor connector direction same as encoder timing

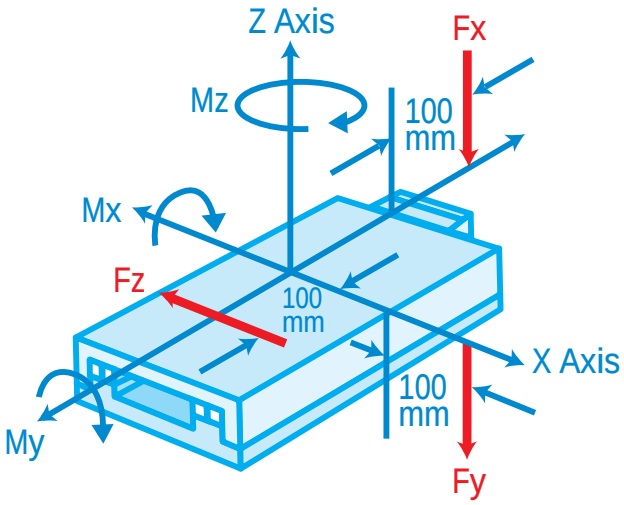


Note: also applies to linear motor stage direction as shown in encoder timing diagram

Encoder Timing







Fx is the load applied in the Z Axis direction, 100mm off end, causing Mx rotation around the X Axis.

Fy is the load applied in the Z Axis direction, 100mm off side, causing My rotation around the Y Axis.

Fz is the load applied around the Z Axis at a 100mm radius from the center, causing Mz rotation around the Z Axis.

Moment Loading

Model No.	F(Mx) (Load applied at 100mm off end)		F(My) (Load applied at 100mm off side)		F(Mz) (Load applied at 100mm off center)	
	(kg)	(lb)	**(kg)**	(lb)	**(kg)**	(lb)
LM150	**780**	1,720	**856**	1,888	**628**	1,385

Performance Specifications

Model No.	Travel		Maximum Velocity[1]		Maximum Load		Maximum Axial Load		Maximum Acceleration[1]	
	(mm)	(in)	(mm/sec)	(in/sec)	(kgf)	(lbf)	(kgf)	(lbf)	(m/sec^2)	(in/sec^2)
LM250D-200	200	7.87	1,300	51	1,600	3,500	500	1100	20	393
LM250D-300	300	11.81	1,300	51	1,600	3,500	500	1100	20	393
LM250D-400	400	15.74	1,300	51	1,600	3,500	500	1100	20	393
LM250D-500	500	19.69	1,300	51	1,600	3,500	500	1100	20	393
LM250D-600	600	23.62	1,200	47	1,600	3,500	500	1100	20	393
LM250D-700	700	27.56	1,200	47	1,600	3,500	500	1100	20	393
LM250D-800	800	31.49	1000	39	1,600	3,500	500	1100	20	393
LM250D-900	900	35.43	1000	39	1,600	3,500	500	1100	20	393
LM250D-1000	1,000	39.37	1000	39	1,600	3,500	500	1100	20	393
LM250D-1200	1,200	47.24	900	35	1,600	3,500	500	1100	20	393
LM250D-1400	1,400	55.12	725	28	1,600	3,500	500	1100	20	393

Accuracy Specifications

Model No.	Straightness/Flatness[2]		Accuracy[2, 3]		Repeatability[2]	
	(microns)	(in)	(microns)	(in)	(microns)	(in)
LM250D-200	15	0.0006	15	0.0006	± 5	± 0.0002
LM250D-300	18	0.0007	30	0.0012	± 5	± 0.0002
LM250D-400	22	0.0008	32	0.0013	± 5	± 0.0002
LM250D-500	25	0.0010	54	0.0021	± 5	± 0.0002
LM250D-600	27	0.0011	57	0.0022	± 5	± 0.0002
LM250D-700	30	0.0012	66	0.0026	± 5	± 0.0002
LM250D-800	32	0.0012	76	0.0030	± 5	± 0.0002
LM250D-900	34	0.0013	90	0.0035	± 5	± 0.0002
LM250D-1000	36	0.0014	100	0.0039	± 5	± 0.0002
LM250D-1200	39	0.0015	120	0.0047	± 5	± 0.0002
LM250D-1400	42	0.0017	140	0.0055	± 5	± 0.0002

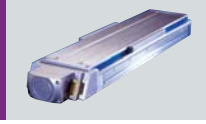
(1) Based on 32mm lead ball screw.
(2) Specifications are based on the stage mounted to a flat granite surface and measured at 25mm above the center of the stage with 2 point slope correction.
(3) Higher precision available, please consult factory.
Note: Cable Options - All LM D products are available with standard motor and encoder cables.

Inertia

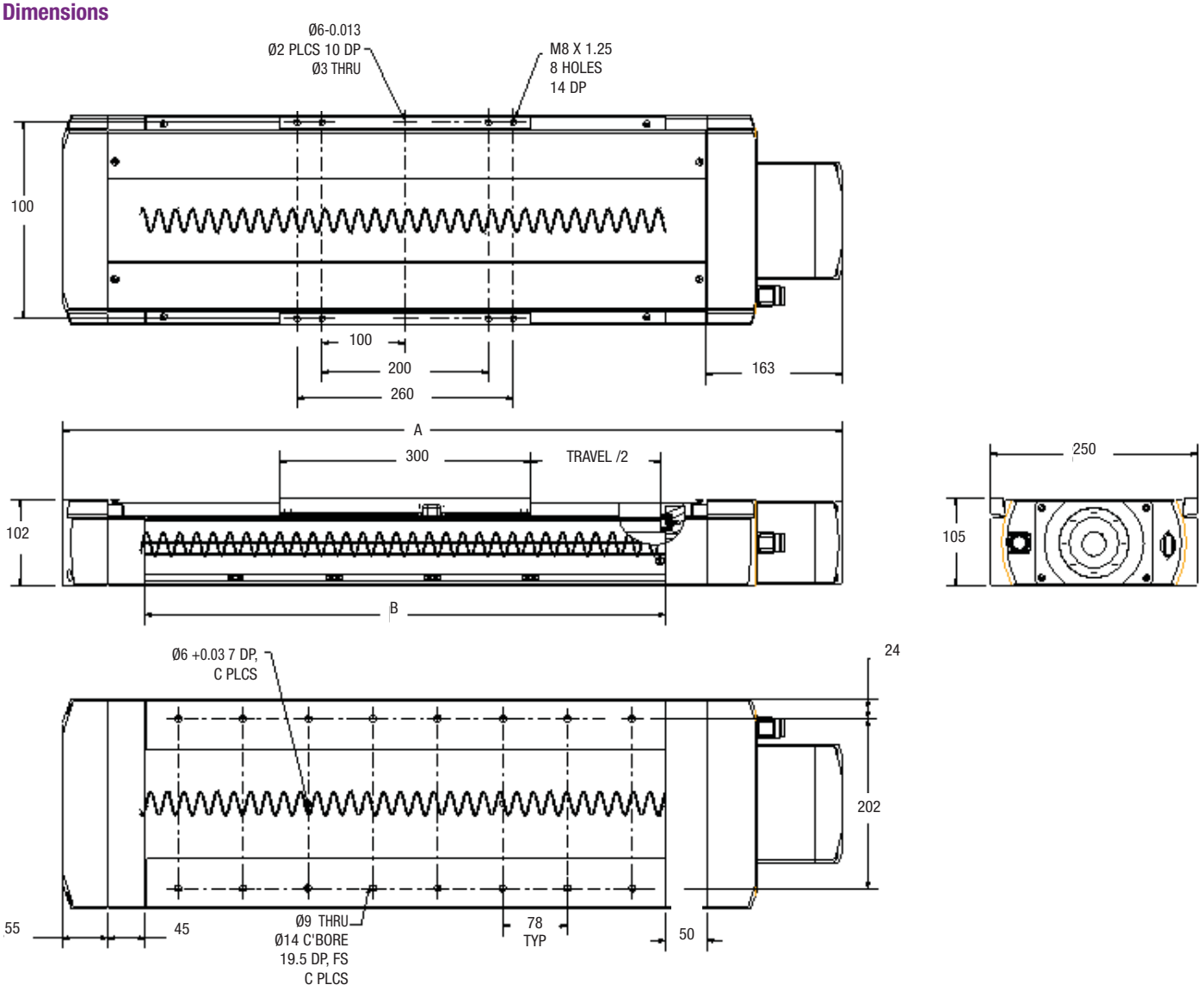
Model No.	Screw Inertia	
	($gm\ cm\ sec^2$)	($oz\ in\ sec^2$)
LM250D-200	4.68690	0.06504
LM250D-300	5.41445	0.07513
LM250D-400	6.14200	0.08523
LM250D-500	6.86956	0.09532
LM250D-600	7.59711	0.10542
LM250D-700	8.32466	0.11551
LM250D-800	9.05221	0.12561
LM250D-900	9.77977	0.13570
LM250D-1000	10.50732	0.14580
LM250D-1200	11.96243	0.16599
LM250D-1400	13.41753	0.18618

Brake

Fail Safe Brake:
24 Vdc, 0.72 amps



Dimensions



Model No.	Travel		A Overall Length		B Base Length		C # of Holes
	(mm)	(in)	(mm)	(in)	(mm)	(in)	
LM250D-200	200	7.87	838	32.99	525	20.67	12
LM250D-300	300	11.81	938	36.93	625	24.61	16
LM250D-400	400	15.74	1038	40.87	725	28.54	20
LM250D-500	500	19.69	1138	44.80	825	32.48	20
LM250D-600	600	23.62	1238	48.74	925	36.42	24
LM250D-700	700	27.56	1338	52.68	1025	40.35	24
LM250D-800	800	31.49	1438	56.61	1125	44.29	28
LM250D-900	900	35.43	1538	60.55	1225	48.23	32
LM250D-1000	1,000	39.37	1638	64.49	1325	52.17	32
LM250D-1200	1,200	47.24	1838	72.36	1525	60.04	40
LM250D-1400	1,400	55.12	2038	80.24	1725	67.91	44
LM250D-1600	1,600	62.99	2238	88.11	1925	75.79	48
LM250D-1800	1,800	70.87	2438	95.98	2125	83.66	52
LM250D-2000	2,000	78.74	2638	103.86	2325	91.54	60

Flanged Mount Motor

Performance Specifications

Model No.	Travel		Maximum Velocity[1]		Maximum Load		Maximum Axial Load		Maximum Acceleration[1]	
	(mm)	(in)	(mm/sec)	(in/sec)	(kgf)	(lbf)	(kgf)	(lbf)	(m/sec^2)	(in/sec^2)
LM250F-200	200	7.87	1,300	51	1,600	3,500	500	1100	20	393
LM250F-300	300	11.81	1,300	51	1,600	3,500	500	1100	20	393
LM250F-400	400	15.74	1,300	51	1,600	3,500	500	1100	20	393
LM250F-500	500	19.69	1,300	51	1,600	3,500	500	1100	20	393
LM250F-600	600	23.62	1,200	47	1,600	3,500	500	1100	20	393
LM250F-700	700	27.56	1,200	47	1,600	3,500	500	1100	20	393
LM250F-800	800	31.49	1000	39	1,600	3,500	500	1100	20	393
LM250F-900	900	35.43	1000	39	1,600	3,500	500	1100	20	393
LM250F-1000	1,000	39.37	1000	39	1,600	3,500	500	1100	20	393
LM250F-1200	1,200	47.24	900	35	1,600	3,500	500	1100	20	393
LM250F-1400	1,400	55.12	725	28	1,600	3,500	500	1100	20	393

Accuracy Specifications

Model No.	Straightness/Flatness[2]		Accuracy[2, 3]		Repeatability[2]	
	(microns)	(in)	(microns)	(in)	(microns)	(in)
LM250F-200	15	0.0006	15	0.0006	± 5	± 0.0002
LM250F-300	18	0.0007	30	0.0012	± 5	± 0.0002
LM250F-400	22	0.0008	32	0.0013	± 5	± 0.0002
LM250F-500	25	0.0010	54	0.0021	± 5	± 0.0002
LM250F-600	27	0.0011	57	0.0022	± 5	± 0.0002
LM250F-700	30	0.0012	66	0.0026	± 5	± 0.0002
LM250F-800	32	0.0012	76	0.0030	± 5	± 0.0002
LM250F-900	34	0.0013	90	0.0035	± 5	± 0.0002
LM250F-1000	36	0.0014	100	0.0039	± 5	± 0.0002
LM250F-1200	39	0.0015	120	0.0047	± 5	± 0.0002
LM250F-1400	42	0.0017	140	0.0055	± 5	± 0.0002

(1) Based on 32mm lead ball screw.
(2) Specifications are based on the stage mounted to a flat granite surface and measured at 25mm above the center of the stage with 2 point slope correction.
(3) Higher precision available please consult factory.
Note: Cable Options - All LM D products are available with standard motor and encoder cables.

Inertia

Model No.	Screw Inertia	
	($gm\ cm\ sec^2$)	($oz\ in\ sec^2$)
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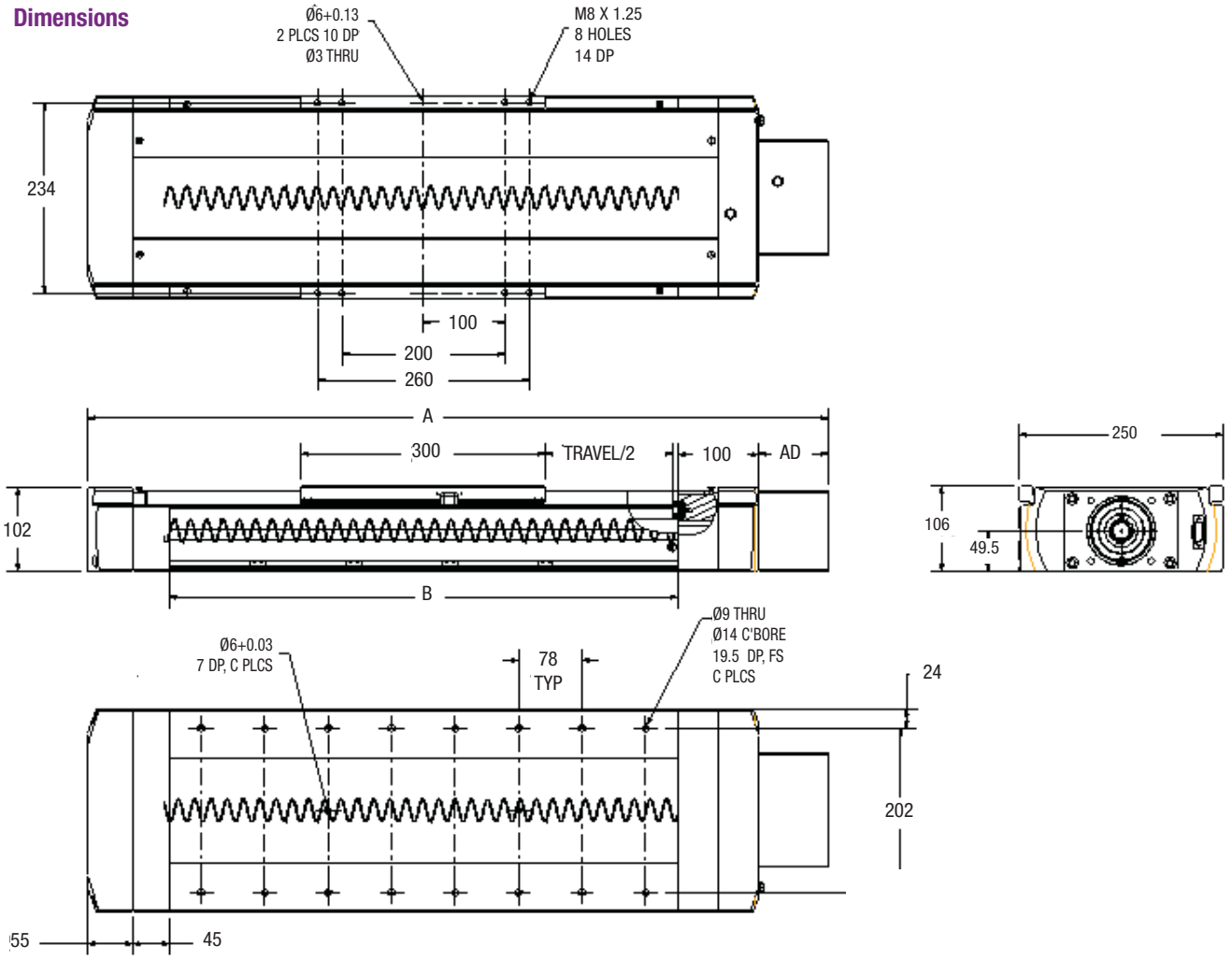
LM250F-400	6.14200	0.08523
LM250F-500	6.86956	0.09532
LM250F-600	7.59711	0.10542
LM250F-700	8.32466	0.11551
LM250F-800	9.05221	0.12561
LM250F-900	9.77977	0.13570
LM250F-1000	10.50732	0.14580
LM250F-1200	11.96243	0.16599
LM250F-1400	13.41753	0.18618

Brake

Fail Safe Brake:
24 Vdc, 0.72 amps

Dimensions



Model No.	Travel		A Overall Length		B Base Length		C # of Holes
	(mm)	(in)	(mm)	(in)	(mm)	(in)	
LM250F-200	200	7.87	725	28.54	525	20.67	12
LM250F-300	300	11.81	825	32.48	625	24.61	16
LM250F-400	400	15.75	925	36.42	725	28.54	20
LM250F-500	500	19.69	1025	40.35	825	32.48	20
LM250F-600	600	23.62	1125	44.29	925	36.42	24
LM250F-700	700	27.56	1225	48.23	1025	40.35	24
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LM250F-1400	1,400	55.12	1925	75.79	1725	67.91	44
LM250F-1600	1,600	62.99	2125	83.66	1925	75.79	48
LM250F-1800	1,800	70.87	2325	91.54	2125	83.66	52
LM250F-2000	2,000	78.74	2525	99.41	23.25	91.54	60

Performance Specifications

Model No.	Travel		Maximum Velocity[1]		Maximum Load		Maximum Axial Load		Maximum Acceleration[1]	
	(mm)	(in)	(mm/sec)	(in/sec)	(kgf)	(lbf)	(kgf)	(lbf)	(m/sec^2)	(in/sec^2)
LM250L-200	200	7.87	1,300	51	1,600	3,500	500	1100	20	393
LM250L-300	300	11.81	1,300	51	1,600	3,500	500	1100	20	393
LM250L-400	400	15.74	1,300	51	1,600	3,500	500	1100	20	393
LM250L-500	500	19.69	1,300	51	1,600	3,500	500	1100	20	393
LM250L-600	600	23.62	1,200	47	1,600	3,500	500	1100	20	393
LM250L-700	700	27.56	1,200	47	1,600	3,500	500	1100	20	393
LM250L-800	800	31.49	1000	39	1,600	3,500	500	1100	20	393
LM250L-900	900	35.43	1000	39	1,600	3,500	500	1100	20	393
LM250L-1000	1,000	39.37	1000	39	1,600	3,500	500	1100	20	393
LM250L-1200	1,200	47.24	900	35	1,600	3,500	500	1100	20	393
LM250L-1400	1,400	55.12	725	28	1,600	3,500	500	1100	20	393

Accuracy Specifications

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	(microns)	(in)	(microns)	(in)	(microns)	(in)
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LM250L-300	18	0.0007	30	0.0012	± 5	± 0.0002
LM250L-400	22	0.0008	32	0.0013	± 5	± 0.0002
LM250L-500	25	0.0010	54	0.0021	± 5	± 0.0002
LM250L-600	27	0.0011	57	0.0022	± 5	± 0.0002
LM250L-700	30	0.0012	66	0.0026	± 5	± 0.0002
LM250L-800	32	0.0012	76	0.0030	± 5	± 0.0002
LM250L-900	34	0.0013	90	0.0035	± 5	± 0.0002
LM250L-1000	36	0.0014	100	0.0039	± 5	± 0.0002
LM250L-1200	39	0.0015	120	0.0047	± 5	± 0.0002
LM250L-1400	42	0.0017	140	0.0055	± 5	± 0.0002

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(2) Specifications are based on the stage mounted to a flat granite surface and measured at 25mm above the center of the stage with 2 point slope correction.
(3) Higher precision available, please consult factory.
Note: Cable Options - All LM D products are available with standard motor and encoder cables.

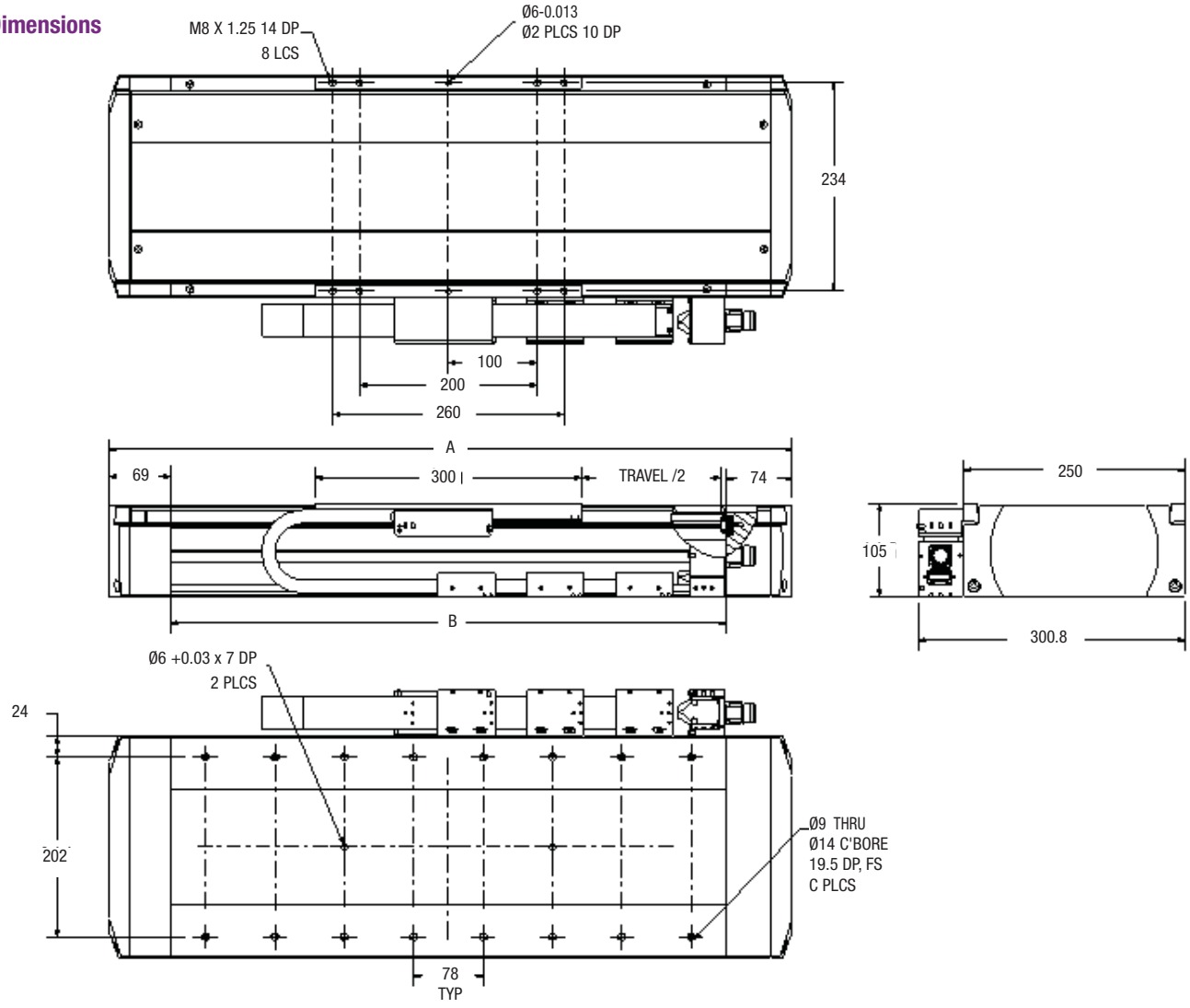
Inertia

Model No.	Screw Inertia	
	($gm\ cm\ sec^2$)	($oz\ in\ sec^2$)
LM250L-200	4.68690	0.06504
LM250L-300	5.41445	0.07513
LM250L-400	6.14200	0.08523
LM250L-500	6.86956	0.09532
LM250L-600	7.59711	0.10542
LM250L-700	8.32466	0.11551
LM250L-800	9.05221	0.12561
LM250L-900	9.77977	0.13570
LM250L-1000	10.50732	0.14580
LM250L-1200	11.96243	0.16599
LM250L-1400	13.41753	0.18618

Brake

Fail Safe Brake:
24 Vdc, 0.72 amps

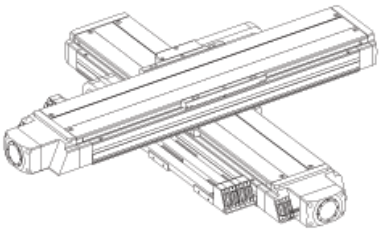
Dimensions



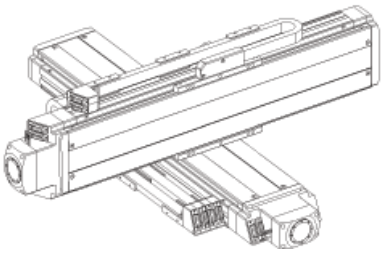
Model No.	Travel		A Overall Length				B Base Length				C # of Holes	
			Single Coil		Double Coil		Single Coil		Double Coil		Single Coil	Double Coil
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)		
LM250L-200	200	7.87	668	26.30	768	30.24	525	20.67	625	24.61	12	16
LM250L-300	300	11.81	768	30.24	868	34.17	625	24.61	725	28.54	16	20
LM250L-400	400	15.75	868	34.17	968	38.11	725	28.54	825	32.48	20	20
LM250L-500	500	19.69	968	38.11	1068	42.05	825	32.48	925	36.42	20	24
LM250L-600	600	23.62	1068	42.05	1168	45.98	925	36.42	1025	40.35	24	24
LM250L-700	700	27.56	1168	45.98	1,268	49.92	1025	40.35	1125	44.29	24	28
LM250L-800	800	31.50	1,268	49.92	1,368	53.86	1125	44.29	1,225	48.23	28	32
LM250L-900	900	35.43	1,368	53.86	1,468	57.80	1,225	48.23	1,325	52.17	32	32
LM250L-1000	1,000	39.37	1,468	57.80	1,568	61.73	1,325	52.17	1,425	56.10	32	36
LM250L-1200	1,200	47.24	1,668	65.67	1,768	69.61	1,525	60.04	1,625	63.98	40	40
LM250L-1400	1,400	55.12	1,868	73.54	1,968	77.48	1,725	67.91	1,825	71.85	44	48
LM250L-1600	1,600	62.99	2,068	81.42	2,168	85.35	1,925	75.79	2,025	79.72	48	52
LM250L-1800	1,800	70.87	2,268	89.29	2,368	93.23	2,125	83.66	2,225	87.60	52	56
LM250L-2000	2,000	78.74	2,468	97.17	2,568	101.10	2,325	91.54	2,425	95.47	60	60

Configuration & Options

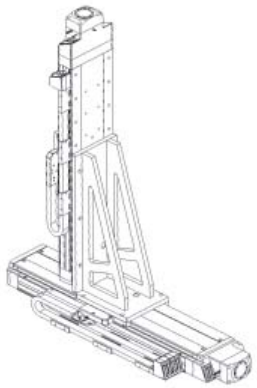
Suggested Orientations:



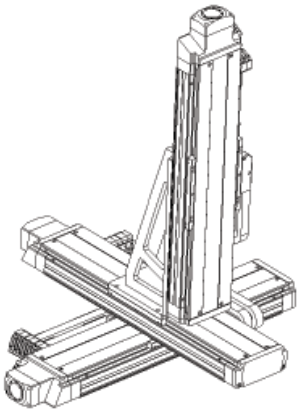
Option 1



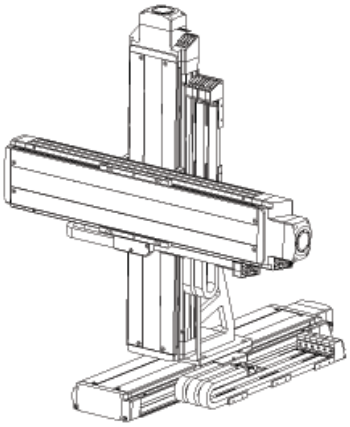
Option 2



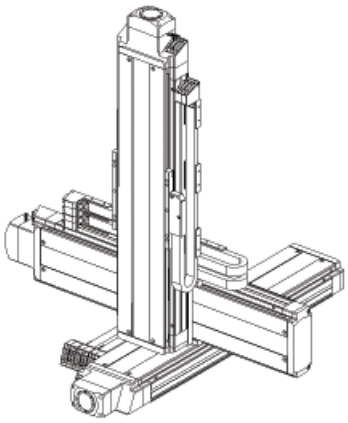
Option 3



Option 4



Option 5



Option 6

Options

Multi-Axis Configurations

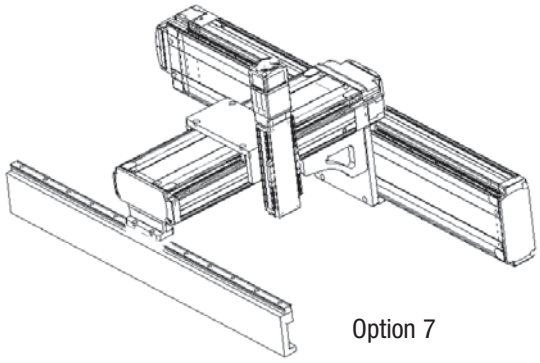
Various multi-axis configurations with brackets are available (see examples).

Calibration Option

Parker Bayside provides laser calibration to optimize your stage for the most demanding applications.

Cables

Power and sensor cables for the LM are available. Options include cables with connectors to Parker Bayside's i-Drive digital amplifier or with flying leads for hook up to any servo amplifier. Custom motor files can be supplied to drive the LM with non-Parker Bayside amplifiers.



Option 7

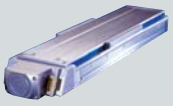
Mating Power Cable

Part Number	Length	Used With
10963204	3 meter	Flying Leads
10963205	8 meter	Flying Leads

Mating Sensor Cable

Part Number	Length	Used With
10963194	3 meter	Flying Leads
10963201	3 meter	i-Drive
10963202	8 meter	Flying Leads
10963203	8 meter	i-Drive
12602001[1]	—	i-Drive / Controller

(1) NOTE: When an external controller is used in a closed loop mode an additional sensor cable, part number 12602001, is required.



Catalog Configuration Numbering:

LM	150	D	-	0300	-	D	10	L	N	05	E	V	-	XXX
A	B	C		D		E	F	G	H	I	J	K		L

A Stage Series

LM	LM Series

B Metric Width of Stage

100	100 mm (4in)	(2)
150	150 mm (6in)	
250	250 mm (10in)	(1)

C Drive Type

D	Motor, Direct Drive	
F	Flange Mount	
L	Motor, Linear	(3)

D Travel

	Width		
	100 (mm)	150 (mm)	250 (mm)
0050	50	—	—
0100	100	—	—
0150	150	—	—
0200	200	200	200
0250	250	—	—
0300	300	300	300
0350	350	—	—
0400	400	400	400
0450	450	—	—
0500	500	500	500
0550	550	—	—
0600	600	600	600
0700	—	700	700
0800	—	800	800
0900	—	900	900
1000	—	1,000	1,000
1200	—	1,200	1,200
1400	—	1,400	1,400
1600	—	1,600 (6)	1,600 (6)
1800	—	1,800 (6)	1,800 (6)
2000	—	2,000 (6)	2,000 (6)

E Motor Type

D	Motor, Rotary Direct Drive (160V, 2,000 LPR)	
E	Motor, Rotary Direct Drive (300V, 2000 LPR)	
I	Motor, Linear, Ironcore	(3)
X	See how to order step 3	

F Drive Variations

Ball Screw Options		
05	5 mm Lead	(7)
10	10 mm Lead	(7)
16	16 mm Lead	(7)
Linear Motor Options		
03	Single Coil	(6)
06	Double Coil	(6)

G Home & Limit

N	None
L	NPN Normally Closed (+5~24Vdc, Sinking 20mA Max)

H Brake

B	Fail Safe Brake Option (7)
N	None

I Encoder, Linear

		Max Speed
00	None (7)	—
01	0.1 μm	0.7m/sec
05	0.5 μm	3 m/sec
10	1 μm	3 m/sec
50	5 μm	3 m/sec

J Protection

C	Extruded Cover (8)
E	Fully Enclosed (8)

K Environment

C	10,000 Class Cleanroom
S	Standard

L Special

XXX	Factory Issued

NOTES:

(1) 250 available 2nd Quarter 2003
(2) 100 available 3rd Quarter 2003
(3) Not available on LM100 models
(4) Only available for choice D in section C
(5) Only available for choice F in section C
(6) Only available for choice L in section C
(7) Not available for choice L in section C
(8) Not available for travels greater than 1200 mm

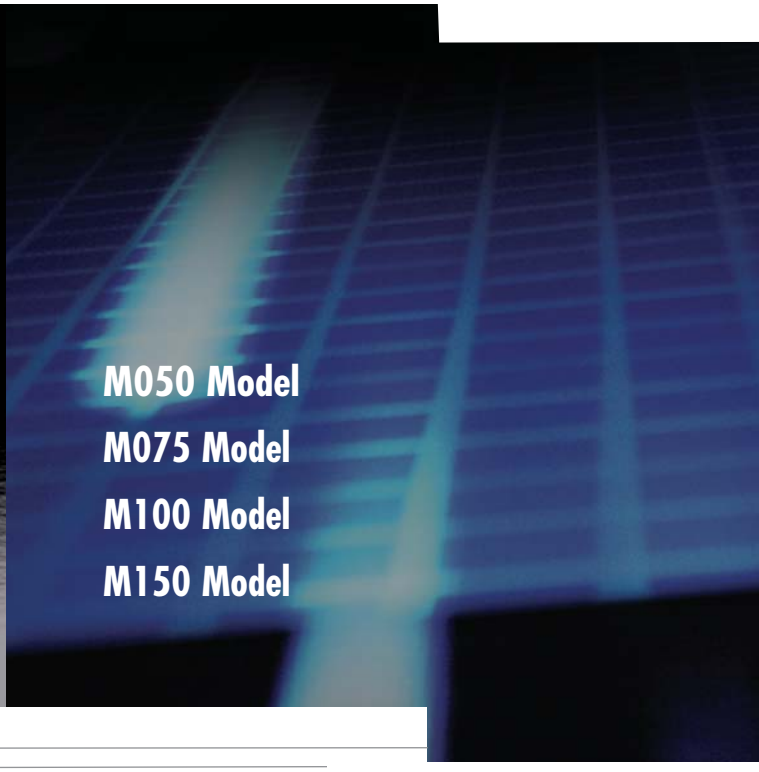
How to Order

1. Select options to create catalog configuration number: this is a reference number.
2. When placing an order, Parker Bayside will issue the unique part number for your configuration.
3. Specify motor, make and model for mounting kit.

LM Stages are supported by a worldwide network of offices and local distributors. Call 1-800-305-4555 for application engineering assistance or for the name of your local distributor. Information can also be obtained at **www.baysidemotion.com or www.parkermotion.com.**

Specifications are subject to change without notice.

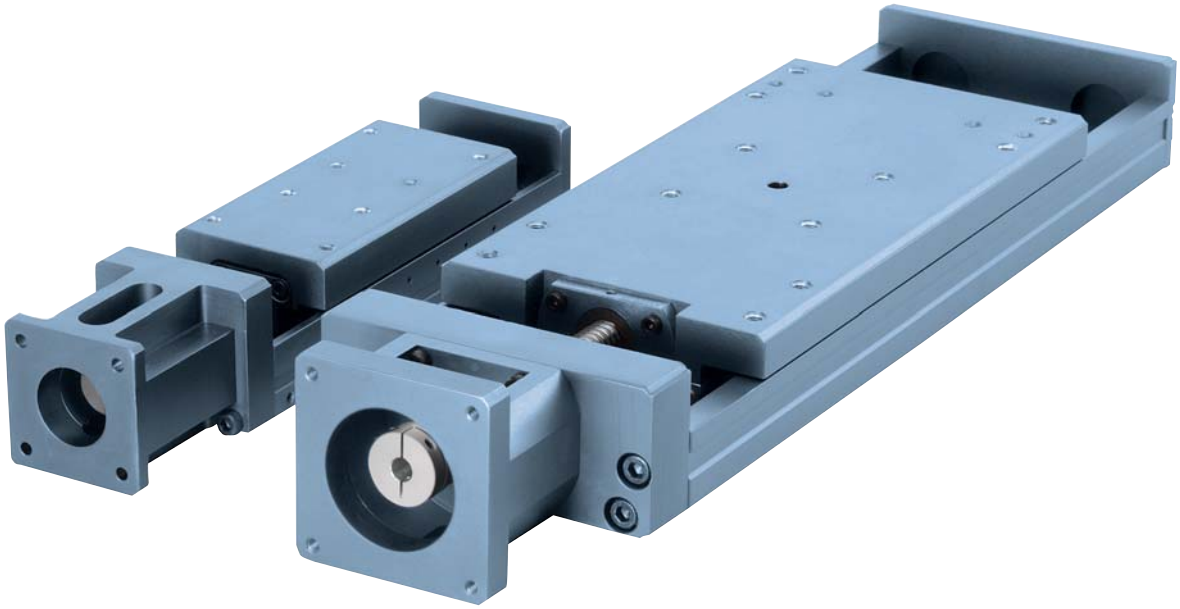
Micro Series: Crossed Roller Precision Stages



M050 Model
M075 Model
M100 Model
M150 Model

Micro Series: Overview

Micro positioning stages feature a low-profile design for space-sensitive applications and precision crossed roller bearings for high accuracies and exceptional repeatability. The stages come ready to mount to standard servomotors. Available in a variety of widths, travels, materials and ball screw or lead screw, Micro positioning stages offer system design flexibility, while providing superior performance.



M050
50mm wide
Maximum travel 100mm
Maximum load capacity 117kg
Standard NEMA 17 motor mounting and coupling

M075
75mm wide
Maximum travel 150mm
Maximum load capacity 339kg
Standard NEMA 17 motor mounting and coupling

M100
100mm wide
Maximum travel 150mm
Maximum load capacity 489kg
Standard NEMA 23 or mounting and coupling

M150
150mm wide
Maximum travel 200mm
Maximum load capacity 652kg
Standard NEMA 23 or mounting and coupling

High Precision Compact Design

Precision Drive Screws

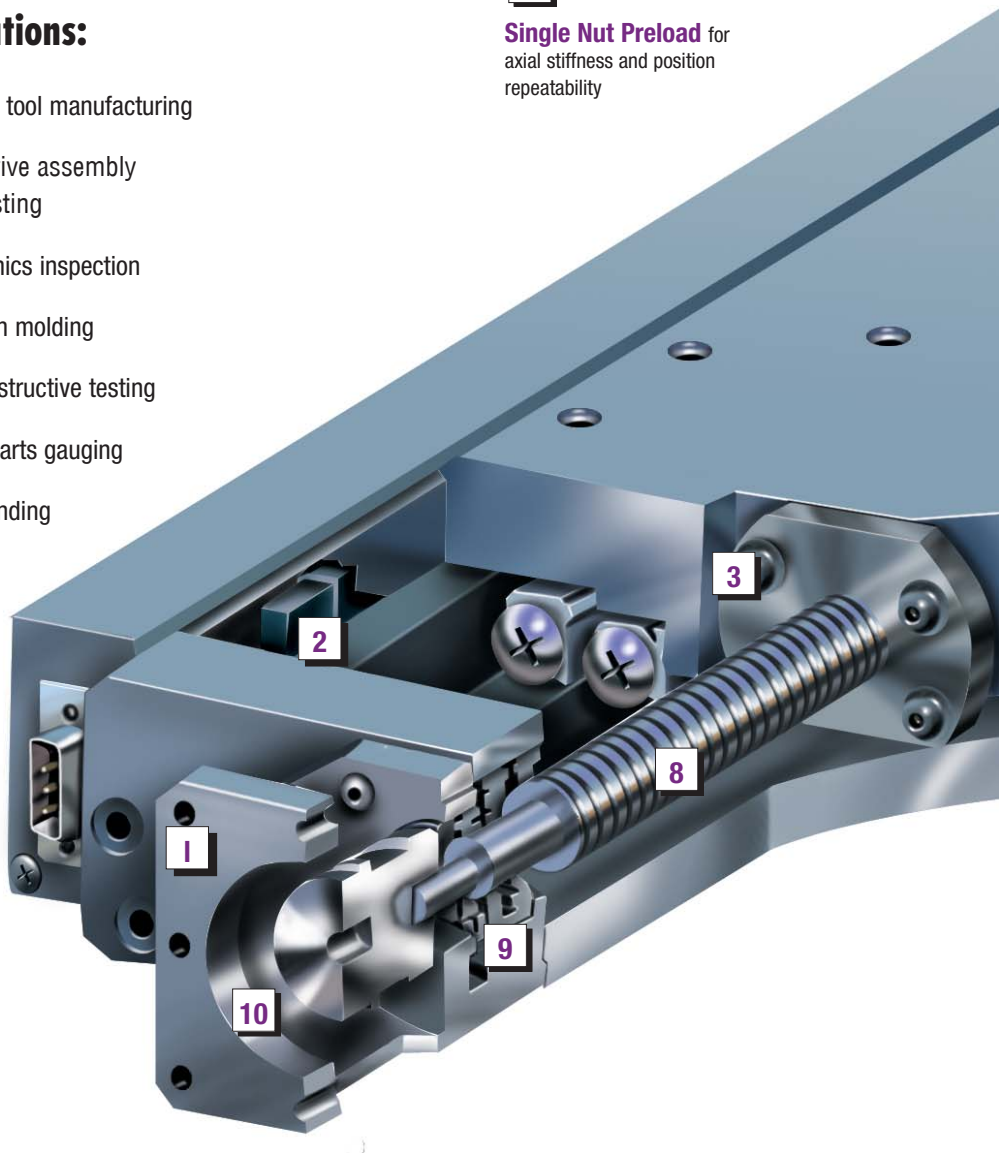
Micro Series Ball Screw-Stages use a C3 class precision ground ball screw. The ball nut is a single-piece construction that uses ball compression to eliminate axial play and establish a preload. The Micro Series ball screw provides for very high axial loads and high duty-cycle capability. Micro Series Lead Screw Stages use a precision ground "V" thread screw, using a self-adjusting nut with a multi-flexured, self-aligning housing. This reduces the effects of lead screw errors and allows for uniform torque and smooth motion. The Micro Series lead screw provides for constant velocity without vibration or ripple.

When to Use:

- High precision
- Compact design
- Constant velocity
- Short travel
- High axial load
- High-duty cycle
- Rugged for high vibration and temperature

Applications:

- Custom tool manufacturing
- Disk drive assembly and testing
- Electronics inspection
- Injection molding
- Non-destructive testing
- Small parts gauging
- Tool grinding



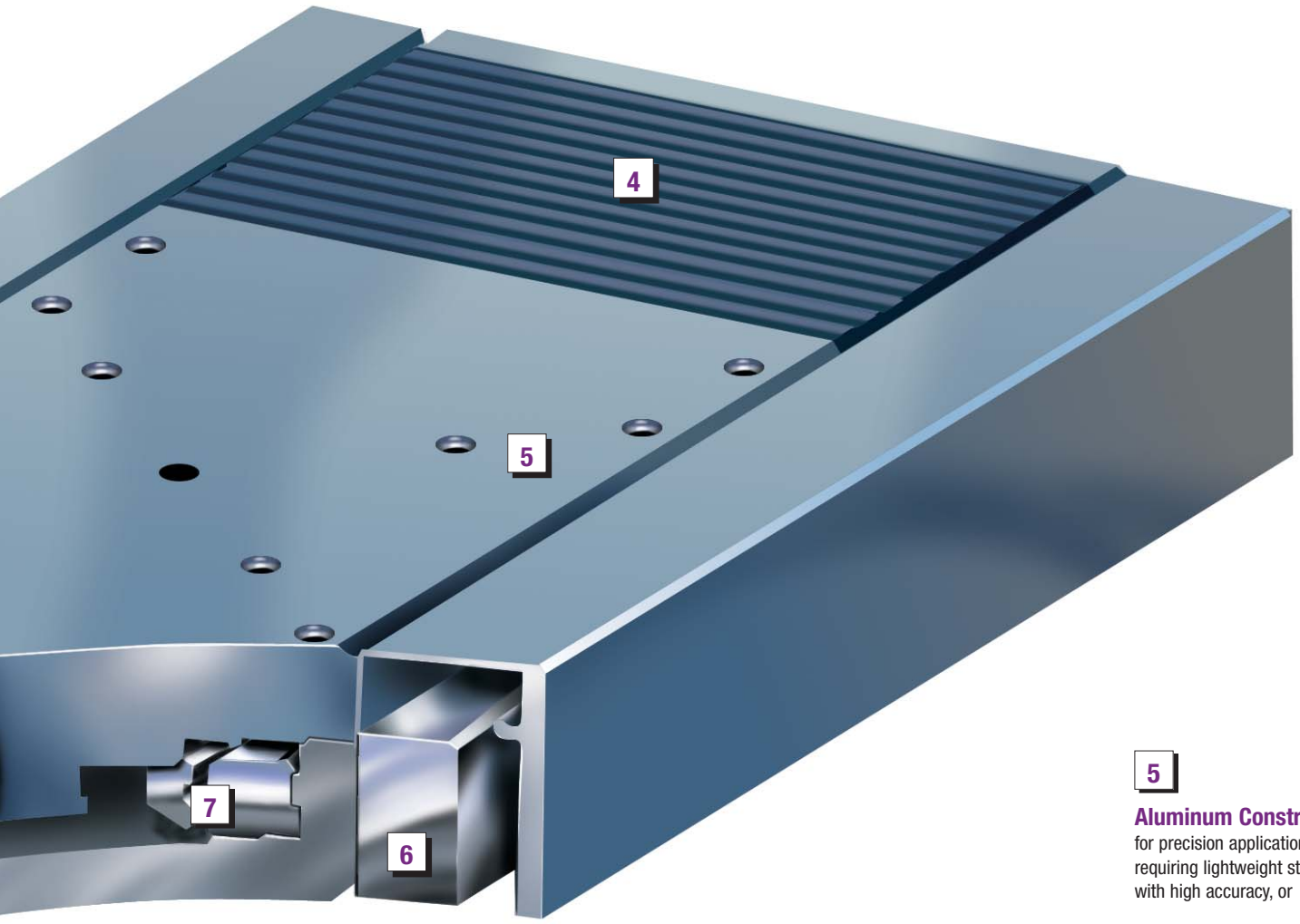
3
Single Nut Preload for axial stiffness and position repeatability

1
Ready To Mount for easy installation of any servo or step motor

2
Optional Home and Travel Limits for safety

10
Servo Flex Coupling for easy motor alignment without wind-up

9
ABEC 7 Preloaded Angular Contact Bearings for high loads and spindle stiffness



4

Optional Bellows Waycover for protection from dust and dirt

5

Aluminum Construction
for precision applications requiring lightweight staging with high accuracy, or

Cast Iron Construction
for rugged applications with high vibration or varying temperature environments

6

Optional Linear Encoder
for direct position feedback

8

C3 Class Precision Ground Ball Screw or Ground "V" Thread Screw
for high positioning accuracy

7

Precision Crossed Roller Bearings
for high loads, low friction and straight line accuracy

Crossed Roller Precision Stages

Performance Specifications

Model No.	Travel Range		Maximum Velocity				Maximum Load		Maximum Axial Load			
			Lead Screw[1]		Ball Screw[2]				Lead Screw		Ball Screw	
	(mm)	(in)	(mm / sec)	(in / sec)	(mm / sec)	(in / sec)	(kgf)	(lbf)	(kgf)	(lbf)	(kgf)	(lbf)
M050	25 to 100	0.98 to 3.93	12	0.5	—	—	117	260	2.3	5.2	—	—
M075	50 to 150	1.96 to 5.90	12	0.5	25	1	339	750	2.3	5.2	4.5	10.1
M100	25 to 150	0.98 to 5.90	75	3.0	150	6	489	1,080	4.5	10.1	31.7	71.3
M150	50 to 200	1.96 to 7.87	100	4.0	300	12	652	1,710	11.3	25.4	54.5	122.5

Accuracy Specifications[3]

Model No.	Straightness/Flatness		Pitch & Yaw		Accuracy[4]		Repeatability[4]	
	(microns/25mm)	(in / in)	(arc sec / 25mm)	(in / in)	(microns)	(in / in)	(microns)	(in)
M050	±2.50	±0.00010	±3.0	±0.00011	±6.0	±0.0002	±1	±0.00004
M075	±2.50	±0.00010	±3.0	±0.00011	±6.0	±0.0002	±1	±0.00004
M100	±2.50	±0.00010	±2.5	±0.00010	±6.5	±0.0001	±1	±0.00004
M150	±1.25	±0.00005	±2.0	±0.00007	±6.5	±0.0001	±2	±0.00008

Screw Inertia

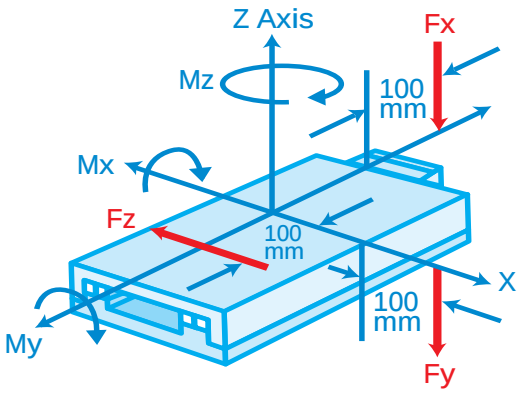
Model No.	Lead Screw		Ball Screw		Coupling Inertia		Moving Slide Weight			
							Aluminum		Cast Iron	
	(gm cm sec^2)	(oz in sec^2)	(gm cm sec^2)	(oz in sec^2)	(gm cm sec^2)	(oz in sec^2)	(kg)	(lb)	(kg)	(lb)
M050-025	0.00039	0.000006	—	—	0.0112	0.00016	0.39	0.86	1.1	2.42
M050-050	0.00065	0.000009	—	—	0.0112	0.00016	0.50	1.10	1.3	2.86
M050-100	0.00077	0.000011	—	—	0.0112	0.00016	0.77	1.70	2.0	4.40
M075-050	0.0033	0.000046	0.0049	0.00007	0.0112	0.00016	0.68	1.50	1.76	3.87
M075-100	0.0048	0.000067	0.0049	0.00007	0.0112	0.00016	1.04	2.29	2.70	5.94
M075-150	0.0066	0.000091	0.0073	0.0001	0.0112	0.00016	1.45	3.19	3.76	8.27
M100-025	0.0017	0.000023	0.0166	0.00023	0.0112	0.00016	0.95	2.09	2.46	5.41
M100-050	0.0021	0.000029	0.0196	0.00027	0.0112	0.00016	1.25	2.75	3.24	7.12
M100-075	0.0025	0.000034	0.0279	0.00039	0.0112	0.00016	1.50	3.30	3.89	8.55
M100-100	0.0025	0.000034	0.0279	0.00039	0.0112	0.00016	1.75	3.85	4.54	9.98
M100-150	0.0037	0.000052	0.0299	0.00042	0.0112	0.00016	2.00	4.40	5.19	11.41
M150-050	0.028	0.00039	0.095	0.0013	0.0112	0.00016	1.55	3.41	4.02	8.847
M150-100	0.032	0.00045	0.095	0.0013	0.0112	0.00016	1.55	3.41	4.02	8.84
M150-150	0.048	0.00067	0.135	0.0019	0.0112	0.00016	2.98	6.55	7.73	17.00
M150-200	0.080	0.00111	0.240	0.0033	0.0112	0.00016	2.98	6.55	7.73	17.00

(1) Based on 0.2in Lead Screw.

(2) Based on 10mm Ball Screw.

(3) Accuracy is based on stage mounted to a flat granite surface and measured at 25mm above the center of the stage.

(4) Accuracy and repeatability are based on open loop lead accuracy and can be enhanced with encoder feedback. Accuracy shown is over full range of travel.



Fx is the load applied in the Z Axis direction, 100mm off end, causing Mx rotation around the X Axis.

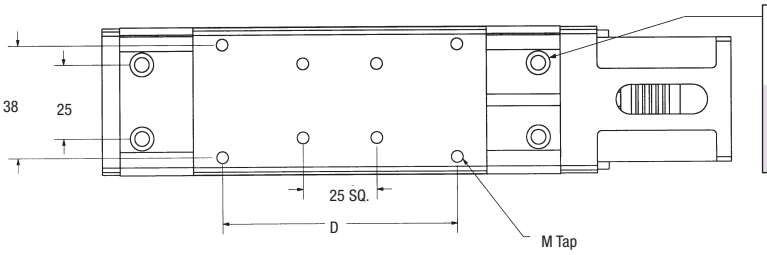
Fy is the load applied in the Z Axis direction, 100mm off side, causing My rotation around the Y Axis.

Fz is the load applied around the Z Axis at a 100mm radius from the center, causing Mz rotation around the Z Axis.

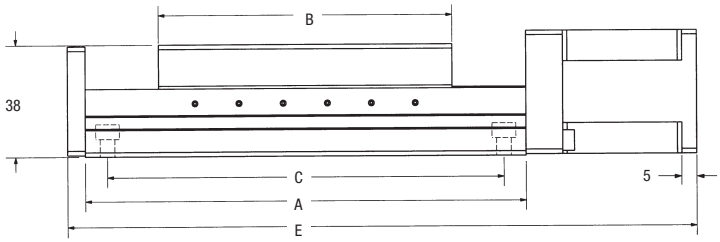
Moment Loading

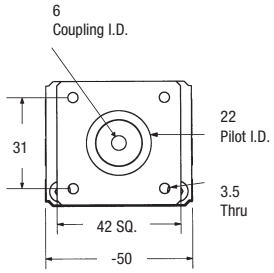
Model No.	F(Mx) (Load applied at 100mm off end)		F(My) (Load applied at 100mm off side)		F(Mz) (Load applied at 100mm off center)	
	(kg)	(lb)	**(kg)**	(lb)	**(kg)**	(lb)
M050-025	**4**	9	**3**	6	**1**	3
M050-050	**6**	13	**3**	8	**2**	4
M050-100	**9**	21	**4**	10	**2**	5
M075-050	**24**	52	**6**	36	**8**	18
M075-100	**32**	70	**19**	41	**9**	21
M075-150	**40**	89	**20**	45	**10**	22
M100-025	**42**	92	**23**	50	**11**	25
M100-050	**45**	100	**23**	51	**12**	26
M100-075	**51**	113	**24**	53	**12**	26
M100-100	**55**	121	**24**	53	**12**	27
M100-150	**65**	142	**25**	56	**13**	28
M150-050	**168**	369	**97**	213	**48**	107
M150-100	**132**	290	**77**	170	**39**	85
M150-150	**240**	528	**105**	231	**53**	116
M150-200	**204**	449	**90**	198	**45**	99

Dimensions



Model No.	H			
	Counterbore		Thru Hole	
	(mm)	(in)	(mm)	(in)
M050-025 M050-050 M050-100	8 x 5 dp	0.32 x 0.2 dp	5	0.2

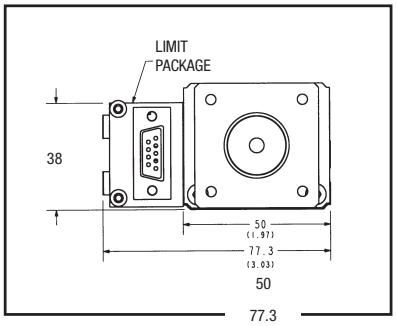




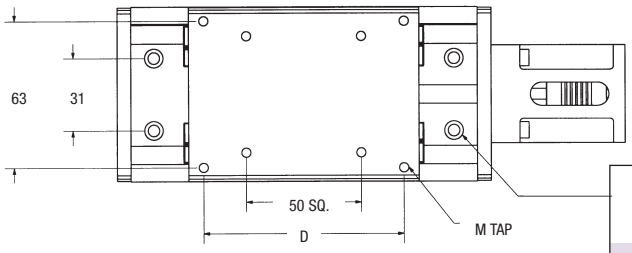
Model No.	Travel		A		B		C		D	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
M050-025	25	0.98	100	3.94	75	2.95	80	3.14	50	1.97
M050-050	50	1.97	150	5.91	100	3.94	135	5.31	80	3.15
M050-100	100	3.94	250	9.84	150	5.91	240	9.44	135	5.31

Model No.	E		M	Stage Weight		Maximum Load	
	(mm)	(in)	Tap	(kg)	(lb)	(kg)	(lb)
M050-025	164	6.45	M4x0.7	0.90	1.98	58	130
M050-050	214	8.42	M4x0.7	1.14	2.51	72	160
M050-100	314	12.36	M4x0.7	1.59	3.51	117	260

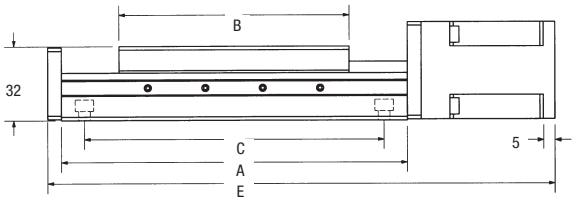
M050 Options

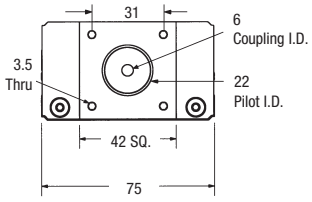


Dimensions



Model No.	H			
	Counterbore		Thru Hole	
	(mm)	(in)	(mm)	(in)
M075-050 M075-100 M075-150	8 x 5 dp	0.32 x 0.2 dp	5	0.2

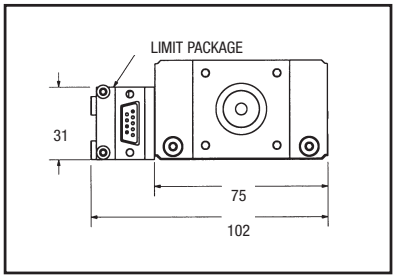




Model No.	Travel		A				B		C	
			Without Waycover		With Waycover					
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
M075-050	50	1.97	150	5.91	180	7.09	100	3.94	130	5.12
M075-100	100	3.94	250	9.84	300	11.81	150	5.91	225	8.86
M075-150	150	5.91	350	13.78	400	15.75	200	7.87	300	11.81

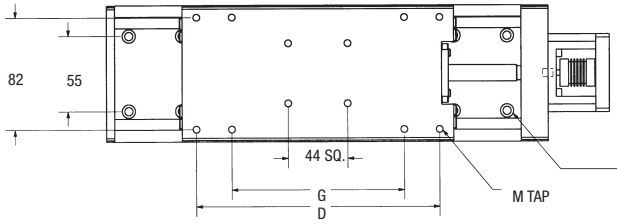
Model No.	D		E		M	Stage Weight		Maximum Load	
	(mm)	(in)	(mm)	(in)	Tap	(kg)	(lb)	(kg)	(lb)
M075-050	87	3.43	220	8.66	M4x.7	1.59	3.51	190	420
M075-100	138	5.43	320	12.60	M4x.7	2.05	4.52	258	570
M075-150	188	7.40	420	16.53	M4x.7	2.50	5.51	339	750

M075 Options

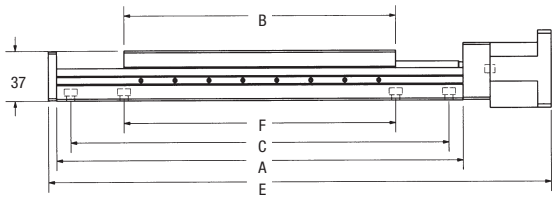


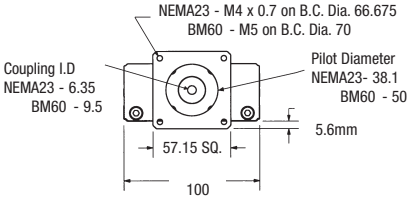
M100

Dimensions



Model No.	H			
	Counterbore		Thru Hole	
	(mm)	(in)	(mm)	(in)
M100-025 M100-050 M100-075 M100-100 M100-150	9.75 x 5 dp	0.38 x 0.2 dp	6	0.24

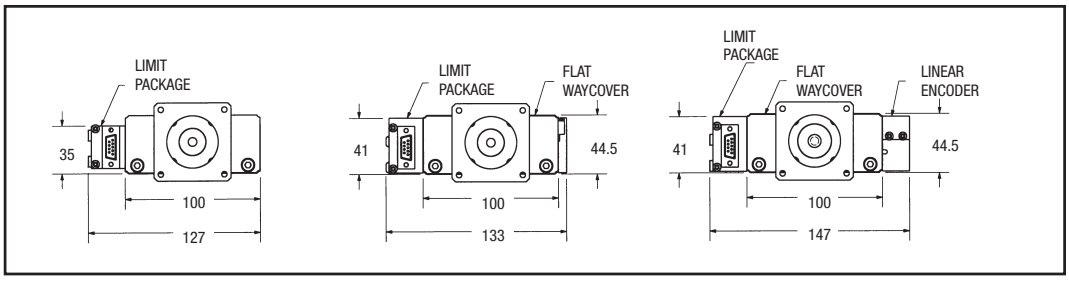




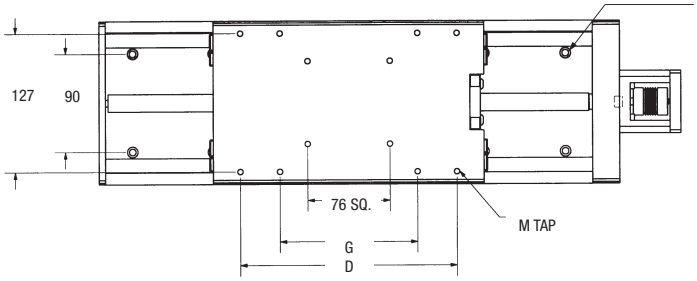
Model No.	Travel		A				B		C				D	
			Without Waycover		With Waycover				Without Waycover		With Waycover			
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
M100-025	25	0.98	150	5.91	175	6.89	125	4.92	127	4.99	127	4.99	—	—
M100-050	50	1.97	200	7.87	230	9.05	150	5.91	178	7.00	178	7.00	—	—
M100-075	75	2.95	250	9.84	280	11.02	175	6.89	229	9.01	229	9.01—	—	
M100-100	100	3.94	300	11.81	350	13.78	200	7.87	279	10.98	279	10.98	179	7.05
M100-150	150	5.91	400	15.75	450	17.72	250	9.84	381	14.99	431	16.97	229	9.02

Model No.	E		F				G		M	Stage Weight		Maximum Load	
			Without Waycover		With Waycover								
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	Tap	(kg)	(lb)	(kg)	(lb)
M100-025	221	8.7	—	—	—	—	100	3.94	M5x0.8	1.90	4.19	298	660
M100-050	266	10.5	—	—	—	—	127	4.99	M5x0.8	2.25	4.96	326	720
M100-075	321	12.6	179	7.05	179	7.05	150	5.91	M5x0.8	2.93	6.46	353	780
M100-100	371	14.6	200	7.87	200	7.87	127	4.99	M5x0.8	3.40	7.50	353	780
M100-150	471	18.4	330	12.99	370	14.57	127	4.99	M5x0.8	4.48	9.88	489	1080

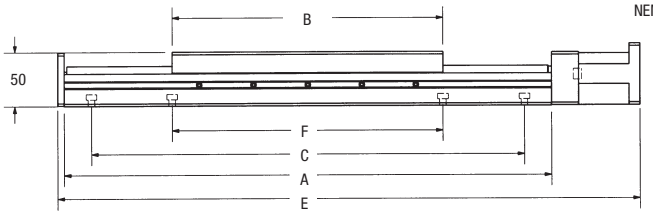
M100 Options

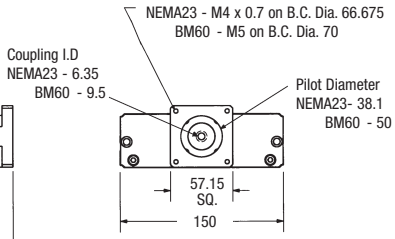


Dimensions



Model No.	H			
	Counterbore		Thru Hole	
	(mm)	(in)	(mm)	(in)
M150-050				
M150-100	9.75 x 5 dp	0.38 x 0.2 dp	6	0.24
M150-150				
M150-200				

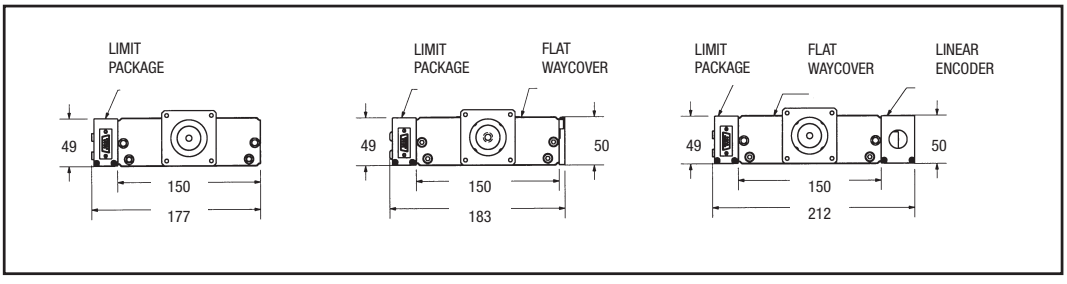




Model No.	Travel		A				B		C		D	
			Without Waycover		With Waycover							
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
M150-050	50	1.97	200	7.87	250	9.84	150	5.91	150	5.91	—	—
M150-100	100	3.94	250	9.84	300	11.81	150	5.91	200	7.87	—	—
M150-150	150	5.91	400	15.75	450	17.72	250	9.84	350	13.78	200	7.87
M150-200	200	7.87	450	17.72	500	19.68	250	9.84	400	15.75	200	7.87

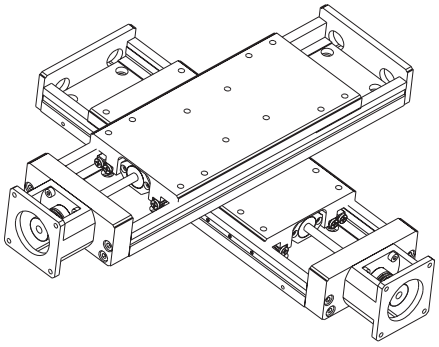
Model No.	E		F		G		M	Stage Weight		Maximum Load	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	Tap	(kg)	(lb)	(kg)	(lb)
M150-050	228	8.98	—	—	—	—	M5 x 0.8	4.00	8.82	407	900
M150-100	338	13.3	—	—	—	—	M5 x 0.8	5.00	11.03	570	1,260
M150-150	488	19.2	250	9.84	127	4.99	M5 x 0.8	7.90	17.42	652	1,440
M150-200	538	21.2	250	9.84	127	4.99	M5 x 0.8	8.99	19.82	774	1,710

M150 Options

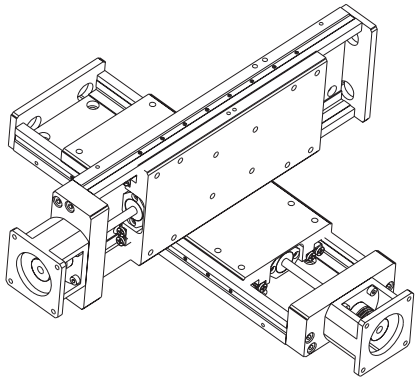


Configuration & Options

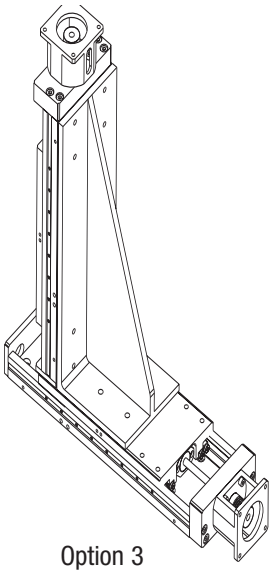
Suggested Orientations:



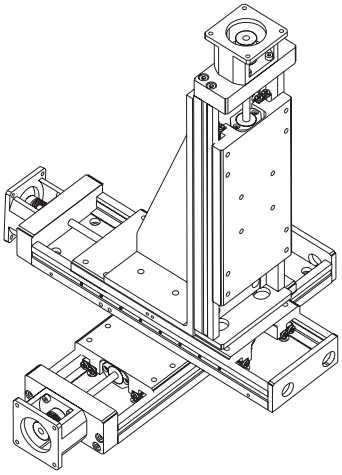
Option 1



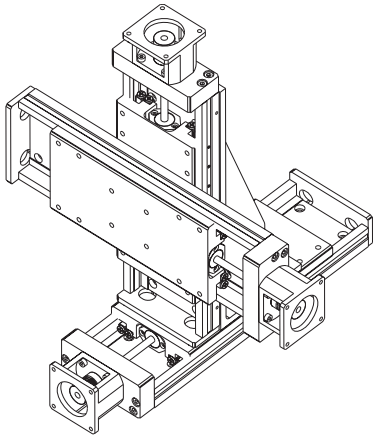
Option 2



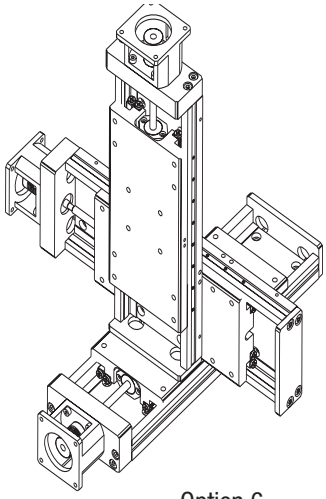
Option 3



Option 4



Option 5



Option 6

Options:

Multi-Axis Configurations
Various multi-axis configurations with brackets are available (see examples).

Calibration Option
Parker Bayside provides laser calibrated and / or matched roller options to optimize your stage for the most demanding applications.

P.A.C.T.
Prevents crossed roller bearing creep in vertical and / or high-speed applications.

Special Environment Option
Parker Bayside can prepare your stage for a variety of environments including:

- Vacuum
- Clean Room
- Radiation
- Food Grade

Special Lubricants
Dry lubricant suitable for environments that need a dry, permanent lubrication (e.g. vacuum-rated applications).

Order Numbering Example:

M	100	A	3	6	4	2	A	3
A	B	C	D	E	F	G	H	I

A — Stage Series

M	Micro Series

B — Metric Width og Stage

050	50 mm
075	75 mm
100	100 mm
150	150 mm

C — Material

A	Aluminum
C	Cast Iron

D — Travel

	Width			
	050 (mm)	075 (mm)	100 (mm)	150 (mm)
1	25	—	25	—
2	50	50	50	50
3	—	—	75	—
4	100	100	100	100
5	—	150	150	150
6	—	—	—	200

E — Drive Variations

	050	075	100	150
Lead Screw Options (Lead)				
1	0.025 in	0.025 in	—	—
2	—	—	0.1 in	0.1 in
3	—	—	0.2 in	0.2 in
4	1 mm	1 mm	1 mm	1 mm
Ball Screw Options (Lead)				
5	—	2.5 mm	—	—
6	—	—	10 mm	10 mm
7	—	—	2 mm	3 mm
8	—	—	—	5 mm

F — Limits & Bellows (1, 2)

1	None
2	None with Bellows
3	End of Travel
4	End of Travel with Bellows
5	End of Travel and Home
6	End of Travel and Home with Bellows

G — Linear Encoder (2)

	Width			
	050	075	100	150
1	None	None	None	None
2	—	—	0.1 µm	0.1 µm
3	—	0.5 µm	0.5 µm	0.5 µm

H — Motor Mounting

x	See how to order step 2

I — PACT / Environment

1	None (Standard)
2	Standard with PACT (1)
3	Clean Room (Anodized)(Class 10,000)
4	Clean Room (Anodized)(Class 10,000) w/ PACT (1)
5	Vacuum (No Finish)

NOTES:

(1) Not available on M050.

(2) End-of-Travel and Home Limits integral to linear encoder will be provided, when a linear encoder is selected.

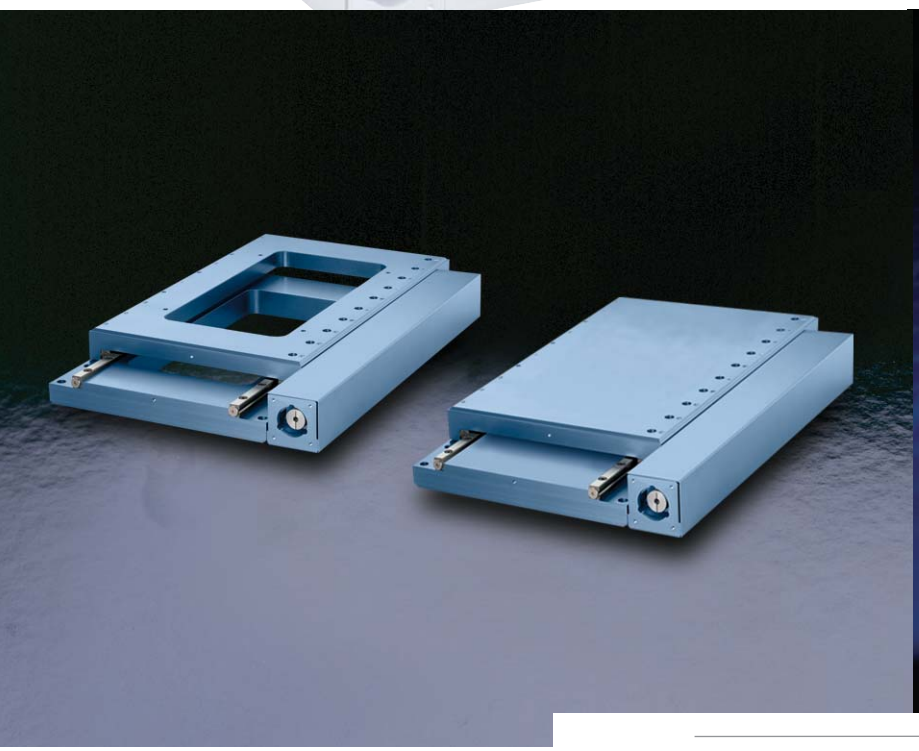
How to Order

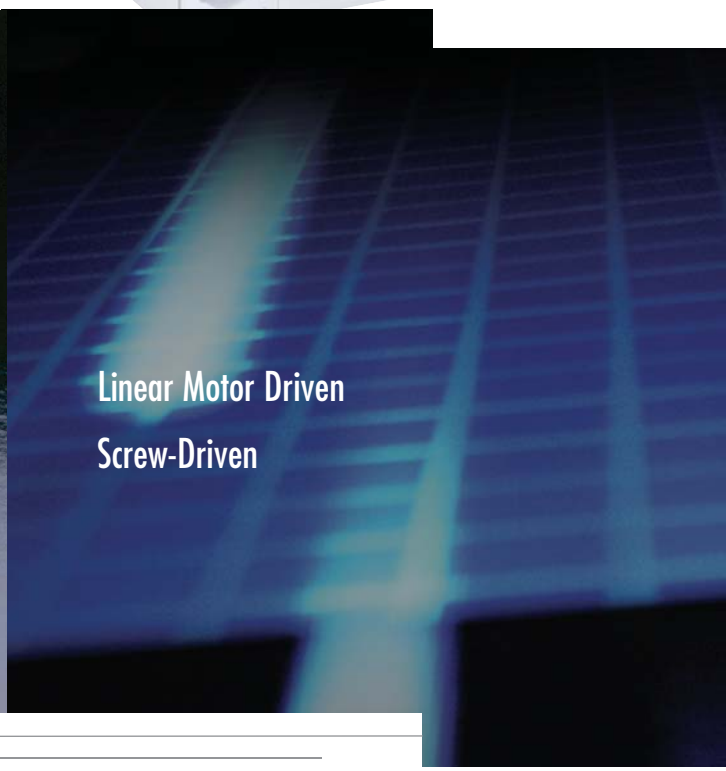
1. Pick features and options above.
2. Specify motor, make and model for mounting kit.

Micro positioning stages are supported by a worldwide network of offices and local distributors. Call **1-800-305-4555** for application engineering assistance or for the name of your local distributor. Information can also be obtained at **www.baysidemotion.com or www.parkermotion.com.**

Specifications are subject to change without notice.

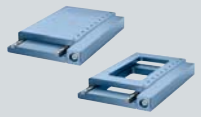
Ultra Series: Crossed Roller Ultra Precision Stages

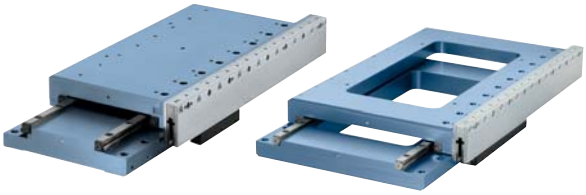


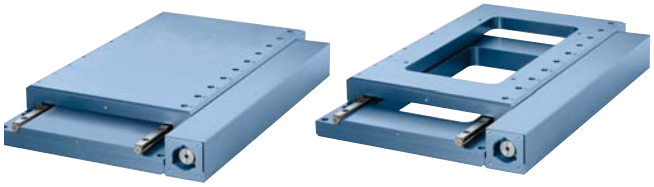


Linear Motor Driven

Screw-Driven







Linear Motor Ultra Stages utilize a non-contact optical linear encoder, integrated directly into the stage footprint. The encoder tape scale is mounted upside-down and referenced directly off the bearing surface, eliminating any Abbe error and protecting it from any debris. The encoder read head is mounted inside the stationary base, eliminating moving wires.

- Sub-micron accuracy
- 0.5 micron repeatability
- Travels from 100mm to 500mm
- Patented AutoFlex Preload
- Built-in encoder and limits
- Optional open frame construction

U200
Closed frame design
200mm wide
Maximum travel 400mm
Maximum load capacity 1,859kg
Maximum velocity to 1,500mm / sec

U300
Available in closed-and open-frame design
300mm wide
Maximum travel 500mm
Maximum load capacity 2187kg
Maximum velocity to 1,500mm/sec

U400
Available in closed and open frame design
400mm wide
Maximum travel 500mm
Maximum load capacity 2,187kg
Maximum velocity to 1,500mm / sec

U600
Available in open frame design
600mm wide
Maximum travel 500mm
Maximum load capacity 2 187kg
Maximum velocity to 1,500mm / sec

Screw-driven Ultra Stages are ideal for easy mounting to any servo or step motor. For increasing positional accuracy, optional linear encoders are offered.

- Variety of ball screw and lead screw pitches
- Travels from 100 to 500mm
- 2 micron repeatability
- Optional linear encoder for direct position feedback
- Optional open frame construction
- Available in closed and open frame design

U200
Available in closed frame design
200mm wide
Maximum travel 400mm
Maximum load capacity 1,859kg
NEMA 23 or 60mm BM Servo motor mounting

U300
Available in closed and open frame design
300mm wide
Maximum travel 500mm
Maximum load capacity 2,187kg
NEMA 23 or 60mm BM Servo motor mounting

U400
Available in closed and open frame design
400mm wide
Maximum travel 500mm
Maximum load capacity 2,187kg
NEMA 23 or 60mm BM Servo motor mounting

U600
Available in open frame design
600mm wide
Maximum travel 500mm
Maximum load capacity 2,187kg
NEMA 23 or 60mm BM Servo motor mounting

Ultra Precision

• Linear Motor Driven Ultra Stages

Linear Motor Ultra Stages can achieve sub-micron accuracy with position repeatability of + 1 encoder count. Featuring Parker Bayside's patented AutoFlex Preload, Linear Motor Ultra Stages provide exceptional smoothness of motion for constant velocity requirements in scanning applications. The AutoFlex preload provides a unique thermal compensation method, eliminating any effects of expansion/ contraction on bearing performance. The brushless linear motor is mounted inverted, with the ironless coil attached to the stationary base, eliminating moving wires.

• Screw-Driven Ultra Stages

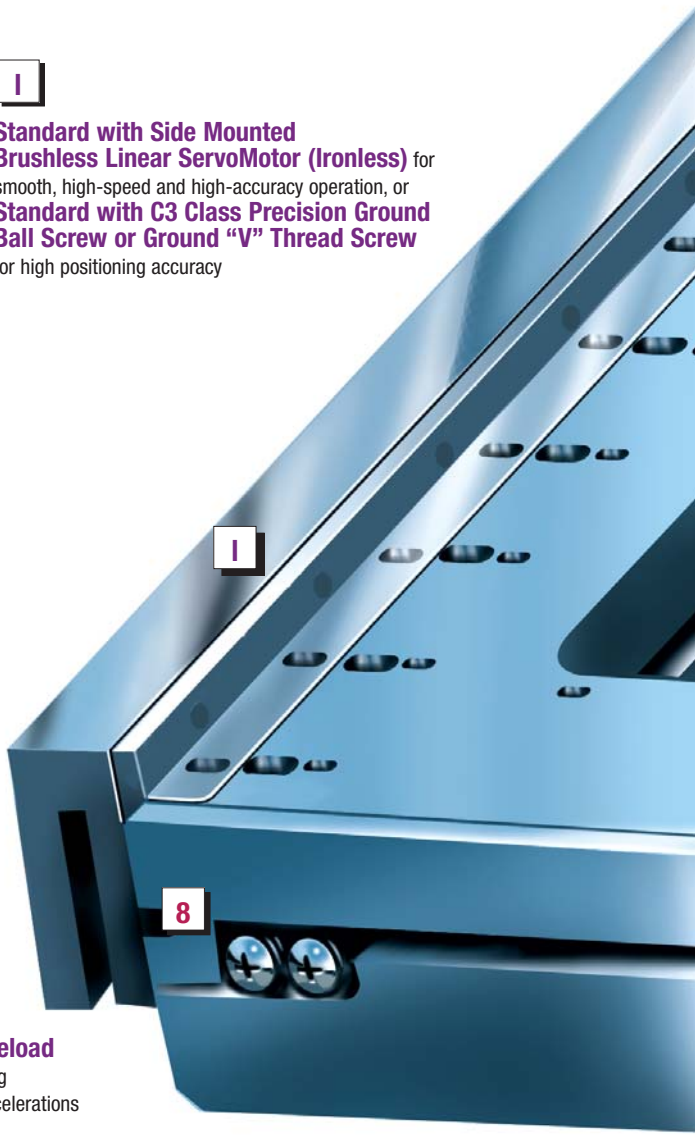
Traditional Ultra Stages are provided with either a ball screw or lead screw mounted alongside the stage. This stage configuration allows easy mounting of any step or servo motor with a flexible coupling. The ball screw version provides high speed and high force for dynamic move-and-settle applications. The lead screw version provides exceptional smoothness for slow-speed scanning. Both the lead screw and ball screw models are available with linear encoders, providing high positional accuracy and repeatability.

2

Optional Open Frame
for through-stage lighting or inspection

I

Standard with Side Mounted Brushless Linear ServoMotor (Ironless) for smooth, high-speed and high-accuracy operation, or
Standard with C3 Class Precision Ground Ball Screw or Ground "V" Thread Screw
for high positioning accuracy



8

Patented AutoFlex™ Preload
for optimum performance during thermal expansion and high accelerations

When to Use:

- High precision sub micron
- Precise repeatability
- Open or closed frame
- Thermal compensation
- Smooth motion

Applications:

- Electronics
- Semiconductor
- Automation
- Medical
- Flat panel

4

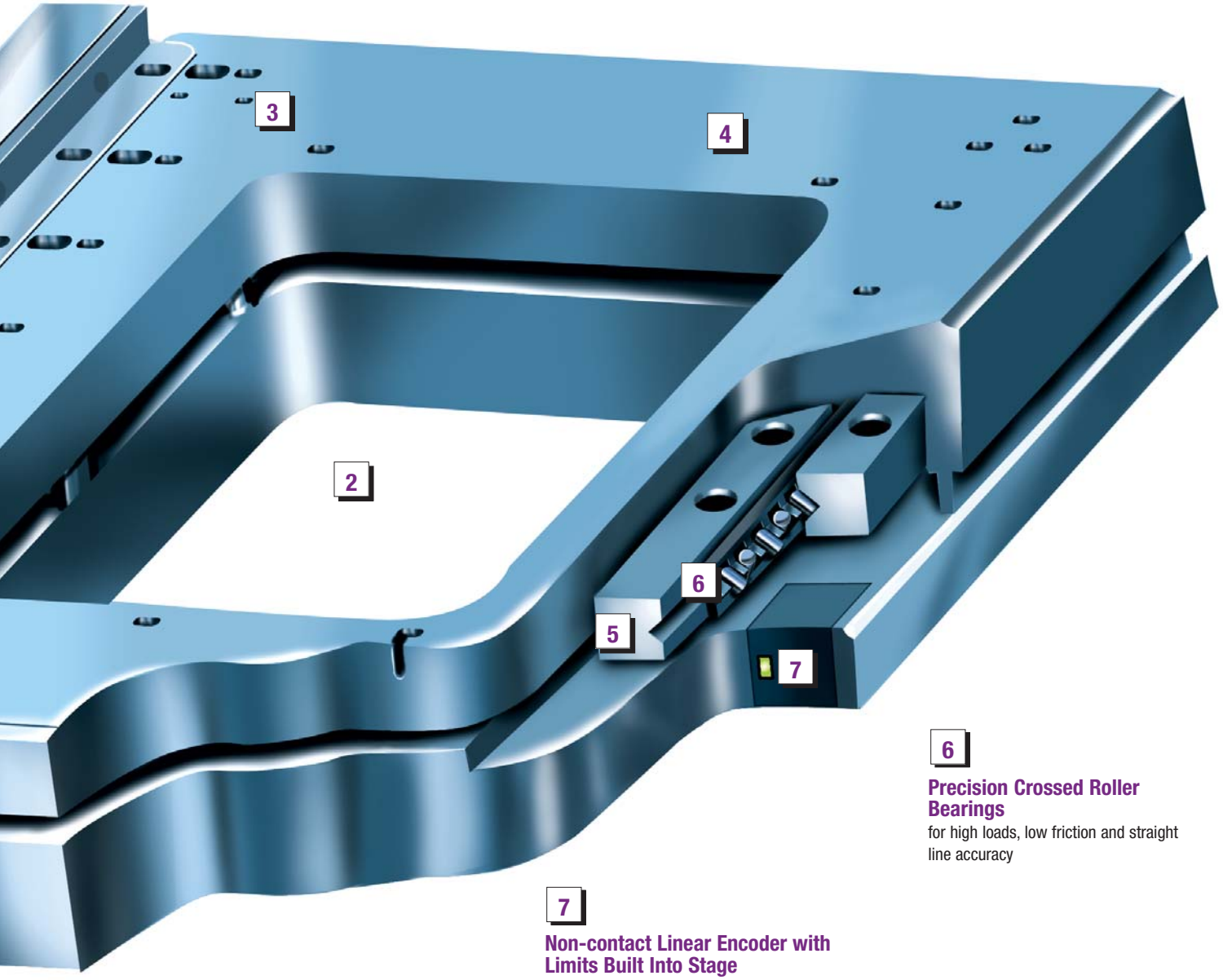
No Moving Wires
yields highest constant velocity and stage reliability

3

Rugged Aluminum Construction for high accuracy and stiffness

5

Optional Hollow Rollers for air bearing-type smoothness



6

Precision Crossed Roller Bearings
for high loads, low friction and straight line accuracy

7

Non-contact Linear Encoder with Limits Built Into Stage
for position feedback

Performance and Accuracy Specifications(1)

Model No.	Travel Range (mm)	Travel Range (in)	Maximum Velocity(1) (mm/sec)	Maximum Velocity(1) (in/sec)	Maximum Acceleration(1A) (g)
U200	**100 to 400**	3.94 to 15.75	**1,500**	59.1	2
U300	**200 to 500**	7.87 to 19.69	**1,500**	59.1	2
U400	**300 to 500**	11.81 to 19.69	**1,500**	59.1	2
U600	**500**	19.69	**1,500**	59.1	2

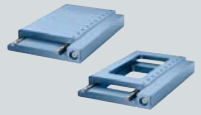
Model No.	Straightness / Flatness (microns/25mm)	Pitch & Yaw (arc sec/25mm)	Accuracy(2) (microns)	Repeatability(2) (microns)
U200	±1.25	±2.0	±2	± 0.5
U300	±1.25	±2.0	±2	± 0.5
U400	±1.25	±3.0	±2	± 0.5
U600	±1.25	±3.0	±2	± 0.5

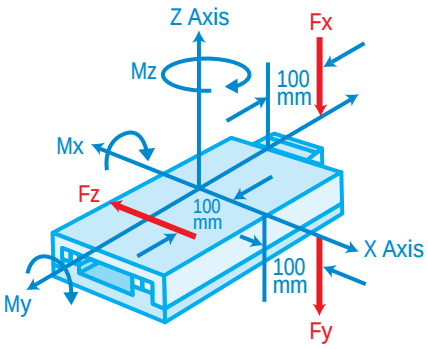
Linear Motor Specifications

All Linear Motor Ultra Series come with a brushless, ironless DC linear servomotor. The standard motors provided yield performance based on the moving mass and the customer load. For additional motor sizes to increase stage performance, please contact the factory.

Specification	Symbol	Unit	Motors for U200-100 U200-200 U200-300	Motors for U200-400 All U300 Series	Motors for All U400 Series All U600 Series
Peak Force	F_p	**N**	**120**	**240**	**400**
		lb	27.0	54.0	90
Continuous Force	F_c	**N**	**38**	**76**	**122**
		lb	9	17	28
Motor Constant	K_m	**N/$\sqrt{W}$**	**4.7**	**6.6**	**9.5**
		lb/$\sqrt{W}$	1.05	1.48	2.14
Max Continuous Dissipation	Pc	W	65	131	167
Peak Current	I_p	amps RMS	7.1	7.1	7.0
Continuous Current	I_c	amps RMS	2.3	2.3	2.1
Resistance	R_{L-L}	ohms	6.1	12.2	17.2
Inductance	L_{L-L}	mH	1.3	2.6	6.0
Back EMF Constant	**K_{EL-L}**	**Vpeak/mm/sec**	**13.7**	**27.5**	**46.5**
		Vpeak/in/sec	0.35	0.70	1.18
Force Constant	K_f	**N/amps**	**16.8**	**33.7**	**57**
		lb/Arms	3.8	7.6	12.8

(1) Maximum velocity is based on motor size and encoder resolution.
(1A) Maximum acceleration is load and motor size dependent. Actual acceleration may vary.
(2) Accuracy is based on a stage mounted to a flat granite surface and measured at 25mm above the center of the stage. Varies based on encoder length. Repeatability is based on encoder resolution selected and above specification is for 0.1µ resolution.





Fx is the load applied in the Z Axis direction, 100mm off end, causing Mx rotation around the X Axis.

Fy is the load applied in the Z Axis direction, 100mm off side, causing My rotation around the Y Axis.

Fz is the load applied around the Z Axis at a 100mm radius from the center, causing Mz rotation around the Z Axis.

Moment Loading(3)

Model No.	F(Mx) (Load applied at 100mm off end)		F(My) (Load applied at 100mm off side)		F(Mz) (Load applied at 100mm off center)	
	(kg)	(lb)	**(kg)**	(lb)	**(kg)**	(lb)
U200-100	**101**	222.67	**231**	509.27	**51**	112.44
U200-200	**108**	238.10	**313**	690.05	**54**	119.05
U200-300	**112**	246.92	**394**	868.62	**56**	123.46
U200-400	**115**	253.53	**476**	1049.40	**58**	127.87
U300-200	**108**	238.10	**398**	877.44	**54**	119.05
U300-300	**112**	246.92	**502**	1106.72	**56**	123.46
U300-400	**115**	253.53	**606**	1336.00	**58**	127.87
U300-500	**117**	257.94	**710**	1565.28	**59**	130.07
U400-300	**112**	246.92	**564**	1243.41	**56**	123.46
U400-400	**115**	253.53	**681**	1501.35	**58**	127.87
U400-500	**117**	257.94	**798**	1759.29	**59**	130.07
U600-500	**117**	257.94	**785**	1730.63	**59**	130.07

Linear Encoder Specifications

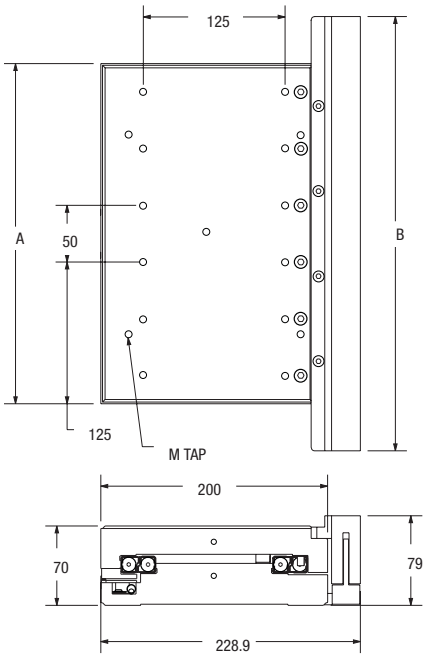
All Linear Motor Ultra Series are provided with a non-contact, optical linear encoder. Each encoder has two (2) magnetic travel limits and one (1) optical home reference built in. Available resolutions are: 0.1 micron, 0.5 micron, 1 micron, 5 microns.

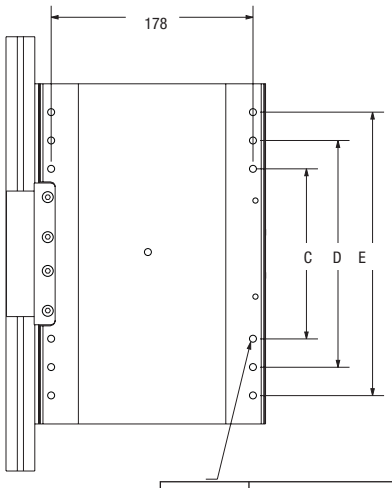
Encoder Power Supply	5 Vdc ± 5%
Operating Temperature	0 ^{o}C to 55 ^{o}C 32 ^{o}F to 131.0 ^{o}F
Output Signal (4)	Square wave differential line driver
Limit Signal	Magnetic, Normally Closed Sourcing
Home Signal	Optical Reference

(3) Maximum and moment loads are based on bearing capacity. Loading will effect acceleration and velocity capability. Specifications are subject to change without notice. Accuracy can be enhanced with mapping.
(4) Optional analog output head is available for use with external multipliers. Tape scale pitch is 20 microns. Please contact factory.

U200 Linear Motor Drive

Dimensions

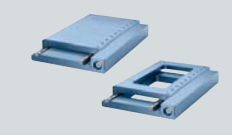




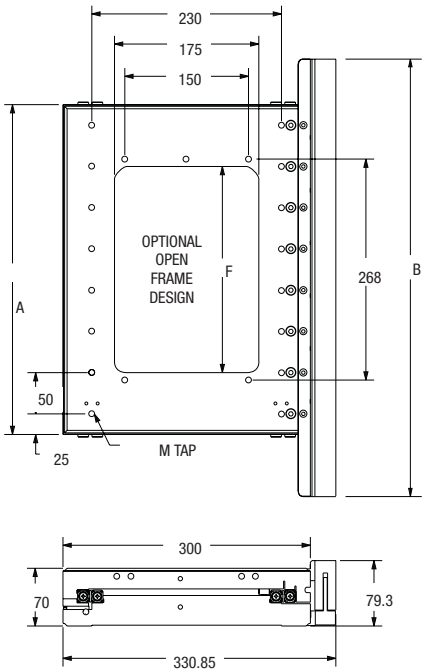
Model No.	H			
	Counterbore		Thru Hole	
	(mm)	(in)	(mm)	(in)
U200	**11x12 dp**	0.43x0.47	**7**	0.275

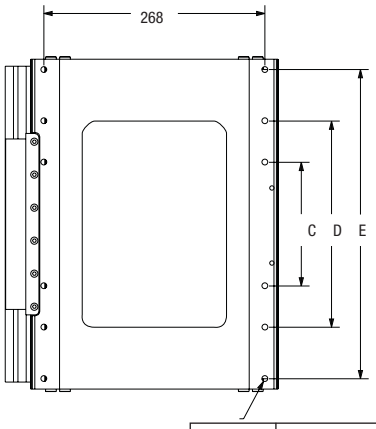
Model No.	Travel		A		B		C		D	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
U200-100	**100**	3.94	**200**	7.87	**256**	10.08	**150**	5.91	—	—
U200-200	**200**	7.87	**300**	11.81	**384**	15.12	**150**	5.91	—	—
U200-300	**300**	11.81	**400**	15.75	**448**	17.64	**150**	5.91	—	—
U200-400	**400**	15.75	**500**	19.69	**640**	25.20	**150**	5.91	**300**	11.81

Model No.	E		M	Load Capacity		Stage Weight		Moving Slide Weight	
	(mm)	(in)	Tap	(kg)	(lb)	(kg)	(lb)	(kg)	(lb)
U200-100	—	—	M6 x 1	**875**	1,929	**11.39**	25.11	**6.8**	14.99
U200-200	**275**	10.83	M6 x 1	**1,203**	2,652	**16.68**	36.77	**9.9**	21.83
U200-300	**375**	14.76	M6 x 1	**1,531**	3,375	**21.56**	47.53	**12.58**	27.73
U200-400	**475**	18.70	M6 x 1	**1,859**	4,098	**27.68**	61.02	**16.35**	36.05



Dimensions





Model No.	H			
	Counterbore		Thru Hole	
	(mm)	(in)	(mm)	(in)
U300	11x12 dp	0.43x0.47	7	0.275

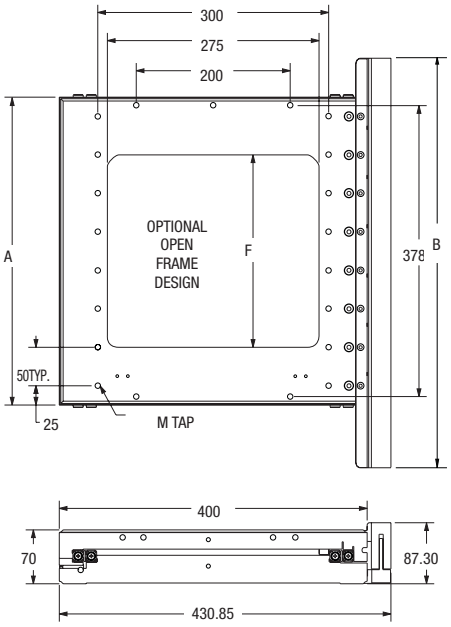
Model No.	Travel		A		B		C		D	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
U300-200	200	7.87	300	11.81	448	17.64	150	5.91	—	—
U300-300	300	11.81	400	15.75	576	22.68	150	5.91	200	7.87
U300-400	400	15.75	500	19.69	640	25.20	200	7.87	350	13.78
U300-500	500	19.69	600	23.62	768	30.24	200	7.87	400	15.75

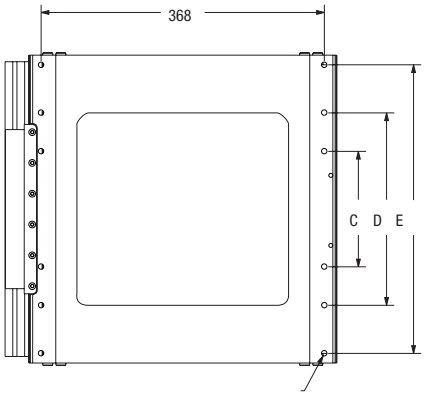
Model No.	E		F		M	Load Capacity	
	(mm)	(in)	(mm)	(in)	Tap	(kg)	(lb)
U300-200	275	10.83	150	5.91	M6 x 1	1,203	2,652
U300-300	375	14.76	250	9.84	M6 x 1	1,531	3,375
U300-400	475	18.70	350	13.78	M6 x 1	1,859	4,098
U300-500	575	22.64	450	17.72	M6 x 1	2,187	4,822

Model No.	Moving Slide Weight				Stage Weight			
	Open		Closed		Open		Closed	
	(kg)	(lb)	(kg)	(lb)	(kg)	(lb)	(kg)	(lb)
U300-200	8.62	19.00	12.75	28.11	13.31	29.34	22.93	50.55
U300-300	11.26	24.82	16.78	26.99	17.37	38.29	30.24	66.67
U300-400	13.19	29.58	20.07	44.25	20.74	45.72	36.79	81.11
U300-500	15.84	24.92	24.12	53.18	24.80	54.67	44.11	97.25

U400 Linear Motor Drive

Dimensions



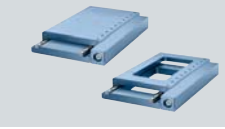


Model No.	H			
	Counterbore		Thru Hole	
	(mm)	(in)	(mm)	(in)
U400	11x12 dp	0.43x0.47	7	0.275

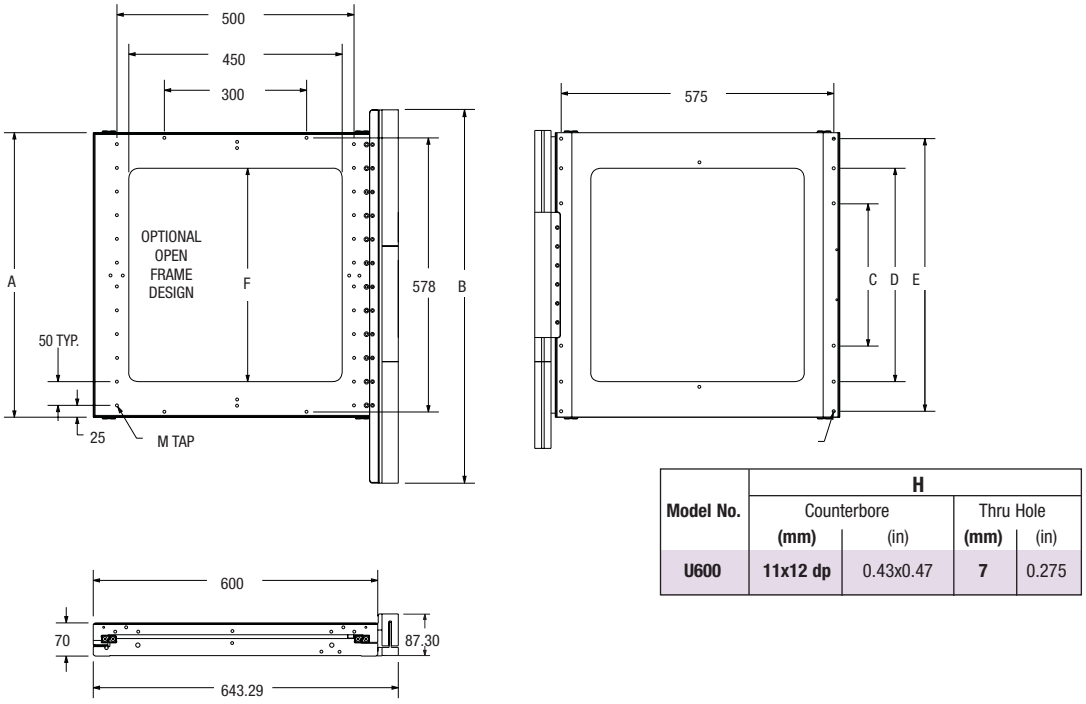
Model No.	Travel		A		B		C		D	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
U400-300	300	11.81	400	15.75	576	22.68	200	7.87	—	—
U400-400	400	15.75	500	19.69	640	25.20	200	7.87	350	13.78
U400-500	500	19.69	600	23.62	768	30.24	200	7.87	400	15.75

Model No.	E		F		M	Load Capacity	
	(mm)	(in)	(mm)	(in)	Tap	(kg)	(lb)
U400-300	375	14.76	250	9.84	M6 x 1	1,531	3,375
U400-400	475	18.70	350	13.78	M6 x 1	1,859	4,098
U400-500	575	22.64	450	17.72	M6 x 1	2,187	4,821

Model No.	Moving Slide Weight				Stage Weight			
	Open		Closed		Open		Closed	
	(kg)	(lb)	(kg)	(lb)	(kg)	(lb)	(kg)	(lb)
U400-300	12.88	28.40	20.12	44.36	20.76	45.77	38.00	83.77
U400-400	15.31	33.75	33.75	53.75	25.00	55.12	46.60	102.73
U400-500	18.36	40.48	40.48	64.44	30.05	66.25	56.25	124.01



Dimensions



Model No.	H			
	Counterbore		Thru Hole	
	(mm)	(in)	(mm)	(in)
U600	11x12 dp	0.43x0.47	7	0.275

Model No.	Travel		A		B		C		D	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
U600-500	500	19.69	600	23.62	768	30.24	300	11.81	450	17.72

Model No.	E		F		M	Load Capacity	
	(mm)	(in)	(mm)	(in)	Tap	(kg)	(lb)
U600-500	575	22.64	450	17.72	M6 x 1	2,187	4821

Model No.	Moving Slide Weight		Stage Weight	
	(kg)	(lb)	(kg)	(lb)
U600-500	22.19	48.92	38.63	85.16

Travel

Model No.	Travel Maximum Range (mm)	(in)
U200	100 to 400	3.94 to 15.75
U300	200 to 500	7.87 to 19.69
U400	300 to 500	11.81 to 19.69
U600	500	19.69

Velocity and Thrust

Model No.	Velocity				Maximum Thrust			
	Lead Screw [1]		Ball Screw[2]		Lead Screw		Ball Screw	
	(mm / sec)	(in / sec)	(mm / sec)	(in / sec)	(kgf)	(lbf)	(kgf)	(lbf)
U200	100	3.94	300	11.81	11.3	24.9	90	198.4
U300	100	3.94	300	11.81	11.3	24.9	90	198.4
U400	100	3.94	300	11.81	11.3	24.9	90	198.4
U600	100	3.94	300	11.81	11.3	24.9	90	198.4

Accuracy Specifications

Model No.	Straightness/ Flatness		Pitch & Yaw
	(microns / 25mm)	(in/in)	(arc sec / 25mm)
U200	±1.25	±0.00005	±2.0
U300	±1.25	±0.00005	±2.0
U400	±1.25	±0.00005	±3.0
U600	±1.25	±0.00005	±3.0

Model No.	Accuracy[3]		Repeatability[4]	
	(microns / 25mm)	(in)	(microns)	(in)
U200	±2.5	0.0001	±2.0	0.00008
U300	±2.5	0.0001	±2.0	0.00008
U400	±2.5	0.0001	±2.0	0.00008
U600	±2.5	0.0001	±2.0	0.00008

(1) Based on 0.2in Ball Screw.

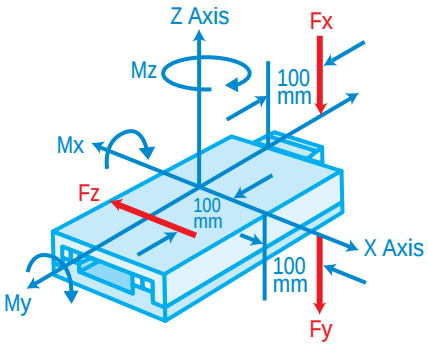
(2) Based on 10mm Lead Screw.

(3) Accuracy is based on a stage mounted to a flat granite surface and measured at 25mm above the center of the stage.

(4) Repeatability is based on encoder resolution selected and above specification is for 0.1µ resolution. Lead accuracy of ball screw (open loop without encoder) is ± 6 µm over travel range.

(5) Maximum and moment loads are based on bearing capacity. Loading will affect acceleration and velocity capability.

Specifications are subject to change without notice.



Fx is the load applied in the Z Axis direction, 100mm off end, causing Mx rotation around the X Axis.

Fy is the load applied in the Z Axis direction, 100mm off side, causing My rotation around the Y Axis.

Fz is the load applied around the Z Axis at a 100mm radius from the center, causing Mz rotation around the Z Axis.

Moment Loading[5]

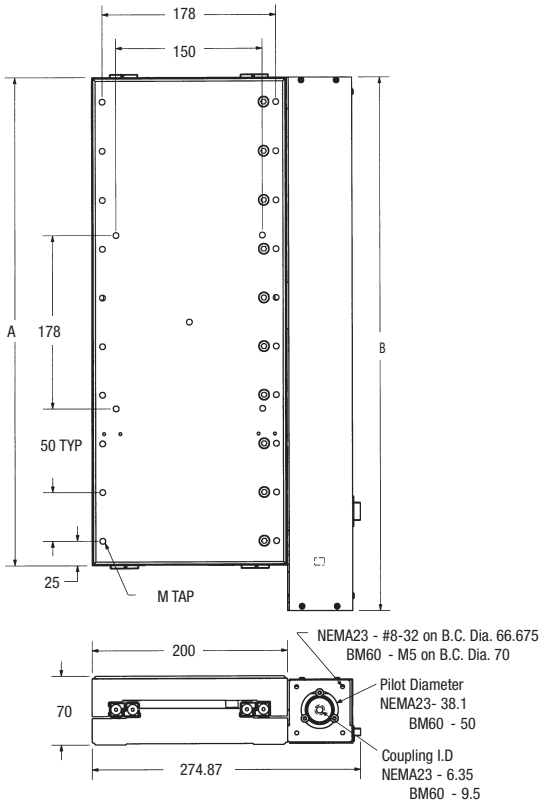
Model No.	F(Mx) (Load applied at 100mm off end)		F(My) (Load applied at 100mm off side)		F(Mz) (Load applied at 100mm off center)	
	(kg)	(lb)	**(kg)**	(lb)	**(kg)**	(lb)
U200-100	**101**	222.67	**231**	509.27	**51**	112.44
U200-200	**108**	238.10	**313**	690.05	**54**	119.05
U200-300	**112**	246.92	**394**	868.62	**56**	123.46
U200-400	**115**	253.53	**476**	1049.40	**58**	127.87
U300-200	**108**	238.10	**398**	877.44	**54**	119.05
U300-300	**112**	246.92	**502**	1106.72	**56**	123.46
U300-400	**115**	253.53	**606**	1336.00	**58**	127.87
U300-500	**117**	257.94	**710**	1565.28	**59**	130.07
U400-300	**112**	246.92	**564**	1243.41	**56**	123.46
U400-400	**115**	253.53	**681**	1501.35	**58**	127.87
U400-500	**117**	257.94	**798**	1759.29	**59**	130.07
U600-500	**117**	257.94	**785**	1730.63	**59**	130.07

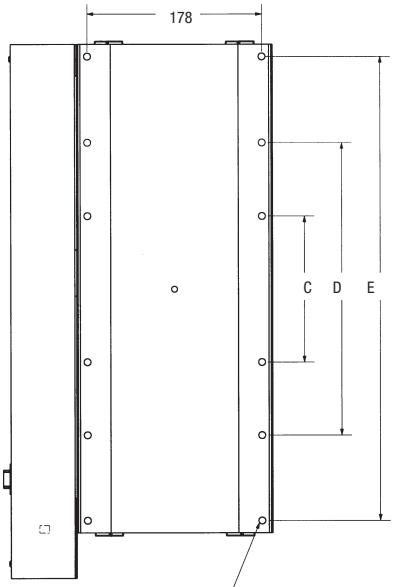
Screw Inertia

Model No.	Lead Screw		Ball Screw		Coupling Inertia		Moving Slide Weight Closed		Moving Slide Weight Open	
	(gm cm sec^2)	(oz in sec^2)	**(gm cm sec^2)**	(oz in sec^2)	**(gm cm sec^2)**	(oz in sec^2)	**(kg)**	(lb)	**(kg)**	(lb)
U200-100	**0.039**	0.00054	**0.104**	0.0015	**0.026**	0.00035	**4.26**	9.37	**—**	—
U200-200	**0.060**	0.00083	**0.157**	0.0022	**0.026**	0.00035	**6.16**	13.55	**—**	—
U200-300	**0.081**	0.00113	**0.209**	0.0029	**0.026**	0.00035	**8.11**	17.84	**—**	—
U200-400	**0.102**	0.00142	**0.262**	0.0036	**0.026**	0.00035	**10.09**	22.20	**—**	—
U300-200	**0.060**	0.00083	**0.157**	0.0022	**0.026**	0.00035	**8.4**	18.48	**4.27**	9.39
U300-300	**0.081**	0.00113	**0.209**	0.0029	**0.026**	0.00035	**11.11**	24.44	**5.29**	11.63
U300-400	**0.102**	0.00142	**0.261**	0.036	**0.026**	0.00035	**13.81**	30.38	**6.93**	15.25
U300-500	**0.123**	0.00171	**0.314**	0.0044	**0.026**	0.00035	**16.53**	36.36	**8.25**	18.15
U400-300	**0.081**	0.0011	**0.209**	0.0029	**0.026**	0.00035	**14.11**	31.04	**6.87**	15.11
U400-400	**0.102**	0.0014	**0.262**	0.0036	**0.026**	0.00035	**17.6**	38.72	**8.53**	18.76
U400-500	**0.123**	0.0017	**0.314**	0.0044	**0.026**	0.00035	**21.03**	46.27	**10.16**	22.35
U600-500	**0.123**	0.0017	**0.314**	0.0043	**0.026**	0.00035	**—**	—	**13.99**	30.77

U200 Screw-Driven

Dimensions



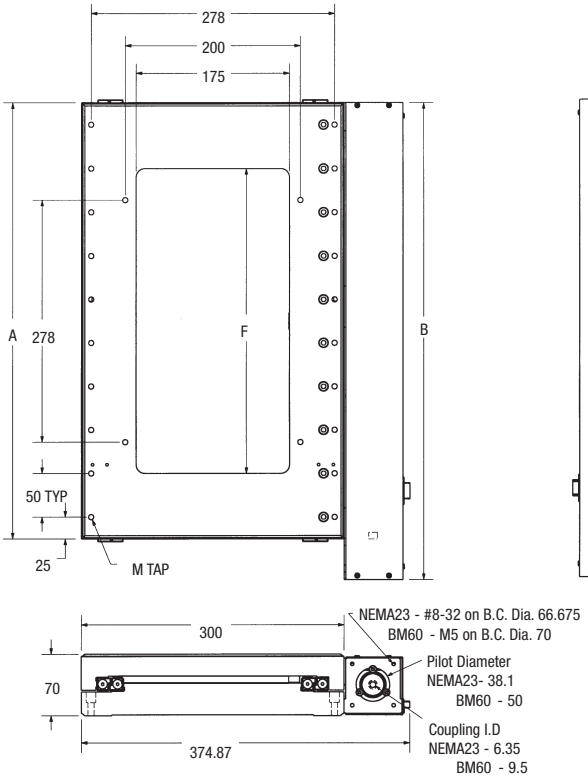


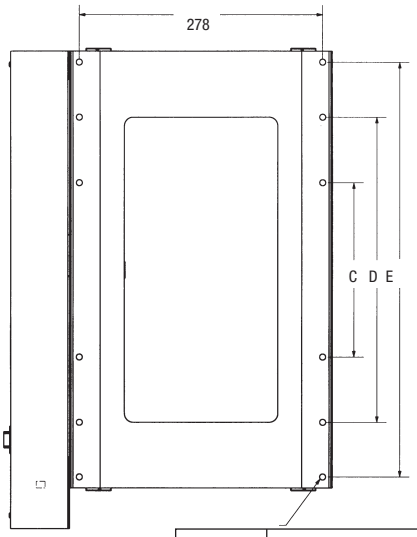
Model No.	H			
	Counterbore		Thru Hole	
	(mm)	(in)	**(mm)**	(in)
U200	**11x12 dp**	0.43x0.47	**7**	0.275

Model No.	Travel		A		B		C		D	
	(mm)	(in)	**(mm)**	(in)	**(mm)**	(in)	**(mm)**	(in)	**(mm)**	(in)
U200-100	**100**	3.94	**200**	7.87	**246**	9.7	**150**	5.9	—	—
U200-200	**200**	7.87	**300**	12.25	**346.5**	13.64	**150**	5.9	—	—
U200-300	**300**	11.81	**400**	15.75	**446.5**	17.59	**150**	5.9	—	—
U200-400	**400**	15.75	**500**	19.69	**546.5**	21.52	**150**	5.9	**300**	12.25

Model No.	E		M	Load Capacity		Stage Weight		Moving Slide Weight	
	(mm)	(in)	Tap	**(kg)**	(lb)	**(kg)**	(lb)	**(kg)**	(lb)
U200-100	—	—	M6 x 1	**875**	1,929	**9.48**	20.9	**4.26**	9.39
U200-200	**275**	10.83	M6 x 1	**1,203**	2,652	**13.72**	30.25	**6.16**	13.58
U200-300	**375**	14.76	M6 x 1	**1,531**	3,375	**18.02**	39.73	**8.11**	17.88
U200-400	**475**	18.7	M6 x 1	**1,859**	4,098	**22.35**	49.27	**10.09**	22.24

Dimensions





Model No.	H			
	Counterbore		Thru Hole	
	(mm)	(in)	(mm)	(in)
U300	11x12 dp	0.43x0.47	7	0.275

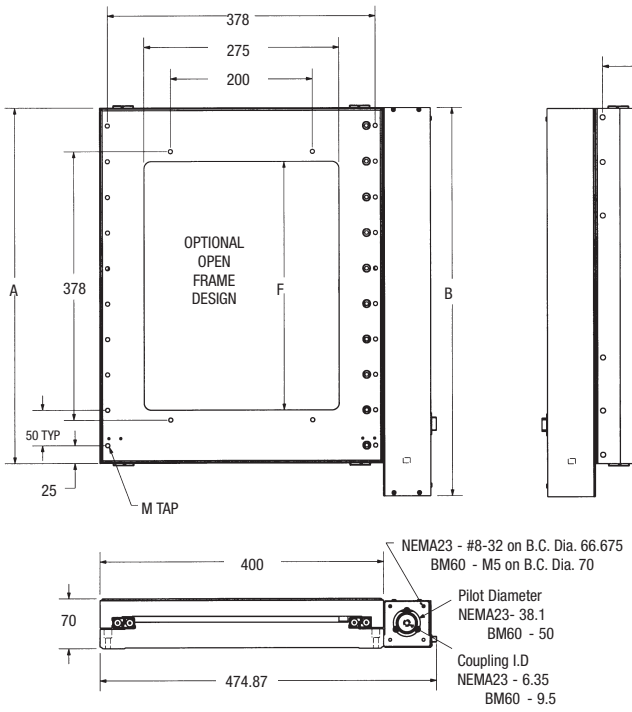
Model No.	Travel		A		B		C		D	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
U300-200	200	7.87	300	12.25	346.5	13.6	150	5.9	—	—
U300-300	300	12.25	400	15.75	446.5	17.6	150	5.9	200	7.87
U300-400	400	15.75	500	19.69	546.5	21.5	200	7.9	350	13.78
U300-500	500	19.69	600	23.62	646.5	25.5	200	7.9	400	15.75

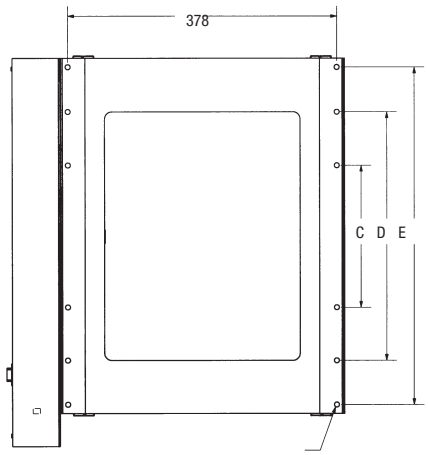
Model No.	E		F		M	Load Capacity	
	(mm)	(in)	(mm)	(in)	Tap	(kg)	(lb)
U300-200	275	10.83	150	5.9	M6 x 1	1,203	2,652
U300-300	375	14.76	250	9.84	M6 x 1	1,531	3,375
U300-400	475	18.7	350	13.78	M6 x 1	1,859	4,095
U300-500	575	22.64	450	17.72	M6 x 1	2,187	4,821

Model No.	Stage Weight				Moving Slide Weight			
	Open		Closed		Open		Closed	
	(kg)	(lb)	(kg)	(lb)	(kg)	(lb)	(kg)	(lb)
U300-200	9.59	21.1	19.21	42.35	4.27	9.41	8.4	18.5
U300-300	12.48	27.5	25.35	55.89	5.29	11.66	11.11	24.5
U300-400	15.41	33.9	31.46	69.36	6.93	15.28	13.81	30.4
U300-500	18.29	40.3	37.6	82.89	8.25	18.19	16.53	36.4

U400 Screw-Driven

Dimensions





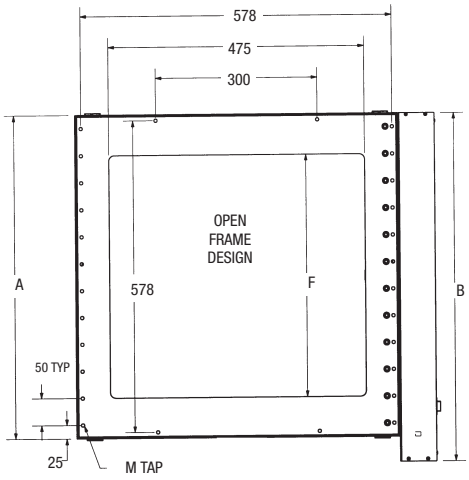
Model No.	H			
	Counterbore		Thru Hole	
	(mm)	(in)	(mm)	(in)
U400	11 x 12 dp	0.43 x 0.47 dp	7	0.275

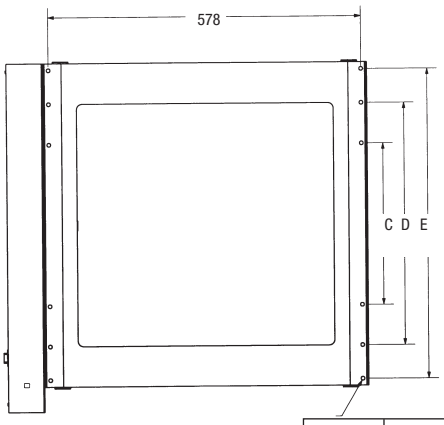
Model No.	Travel		A		B		C		D	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
U400-300	300	11.81	400	15.75	446.5	17.58	200	7.87	—	—
U400-400	400	15.75	500	19.69	546.5	21.52	200	7.87	350	13.78
U400-500	500	19.69	600	23.62	646.5	25.45	200	7.87	400	15.75

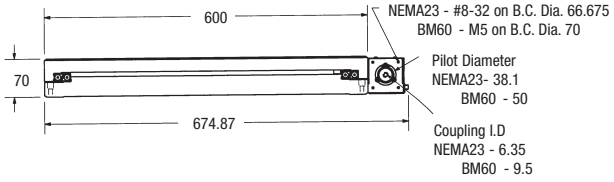
Model No.	E		F		M	Load Capacity	
	(mm)	(in)	(mm)	(in)	Tap	(kg)	(lb)
U400-300	375	14.76	250	9.84	M6 x 1	1,531	3,375
U400-400	475	18.70	350	13.78	M6 x 1	1,859	4,098
U400-500	575	22.64	450	17.72	M6 x 1	2,187	4,822

Model No.	Stage Weight				Moving Slide Weight			
	Open		Closed		Open		Closed	
	(kg)	(lb)	(kg)	(lb)	(kg)	(lb)	(kg)	(lb)
U400-300	15.28	33.69	32.52	71.69	6.87	15.15	14.11	31.11
U400-400	18.90	40.34	40.50	88.29	8.53	18.81	17.60	38.80
U400-500	22.68	50.00	48.88	107.76	10.16	22.40	21.03	46.36

Dimensions







Model No.	H			
	Counterbore		Thru Hole	
	(mm)	(in)	(mm)	(in)
U600	11 x 12 dp	0.43 x 0.47 dp	7	0.275

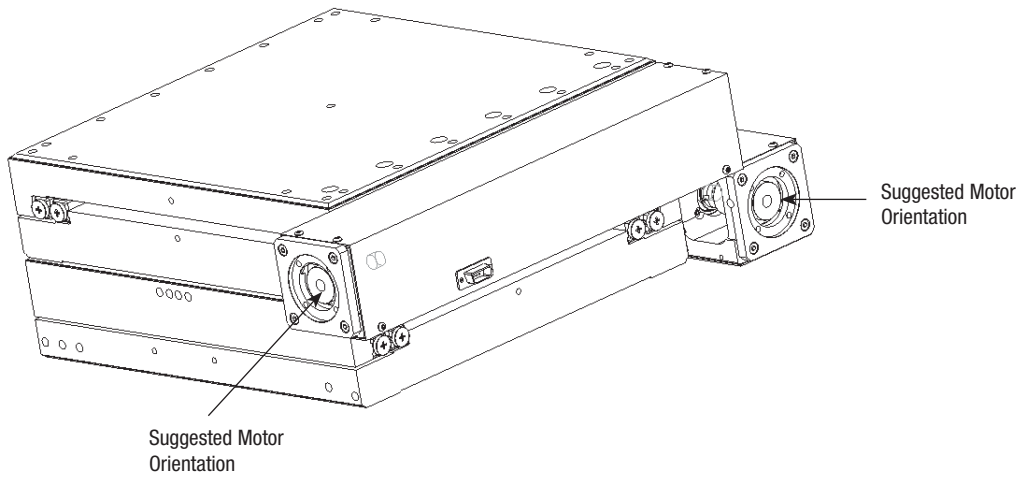
Model No.	Travel		A		B		C		D	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
U600-500	500	19.69	600	23.62	646.5	25.45	300	11.81	450	17.72

Model No.	E		F		M	Load Capacity	
	(mm)	(in)	(mm)	(in)	Tap	(kg)	(lb)
U600-500	575	22.64	450	17.72	M6 x 1	2,187	4,822

Model No.	Stage Weight		Moving Slide Weight	
	(kg)	(lb)	(kg)	(lb)
U600-500	31.41	69.25	13.99	30.84

Configuration & Options

Suggested Orientation:



Options:

Calibration Option
Parker Bayside provides laser-calibrated and / or matched roller options to optimize your stage for the most demanding applications.

P.A.C.T.
Prevents crossed roller bearing creep in vertical and/or high-speed applications.

Special Environment Option
Parker Bayside can prepare your stage for a variety of environments including:

- Vacuum
- Clean Room
- Radiation
- Food Grade

Special Lubricants
Dry lubricant suitable for environments that need a dry, permanent lubrication (e.g. vacuum rated applications).

Ordering Numbering Example:

U	300	X	3	2	1	3	1	1
A	B	C	D	E	F	G	H	I

A Stage Series

U	Ultra Series

B Metric Width of Stage

200	200 mm
300	300 mm
400	400 mm
600	600 mm

C Frame

	U200	U300	U400	U600
X	Closed	Closed	Closed	Closed
H	—	Open	Open	Open

D Travel

	U200	U300	U400	U600
1	100 mm	—	—	—
2	200 mm	200 mm	—	—
3	300 mm	300 mm	300 mm	—
4	400 mm	400 mm	400 mm	—
5	—	500 mm	500 mm	500 mm

E Drive Type

Lead Screw	Lead
1	0.1 in
2	0.2 in
3	1 mm
Ball Screw	
4	3 mm
5	5 mm
6	10 mm
Linear Motor	
7	Linear Motor Drive

F Limits (1)

1	None
2	End of Travel
3	End of Travel and Home

G Linear Encoder (1)

1	None
2	0.1 µm
3	0.5 µm
4	1.0 µm
5	5.0 µm

H Motor Mounting

X	See how to order step 2

I Roller Conf. / Environment

1	None (Standard)
2	PACT
3	Hollow Roller
4	Hollow Rollers with PACT
5	Clean Room (Class 10,000)
6	Clean Room (Class 10,000) with PACT
7	Clean Room (Class 10,000) Hollow Roller
8	Clean Room (Class 10,000) Hollow Roller with PACT
9	Vacuum (No Finish)
A	Vacuum (No Finish) Hollow Roller

NOTES:
(1) End-of-Travel and Home Limits integral to linear encoder will be provided, when a linear encoder is selected.

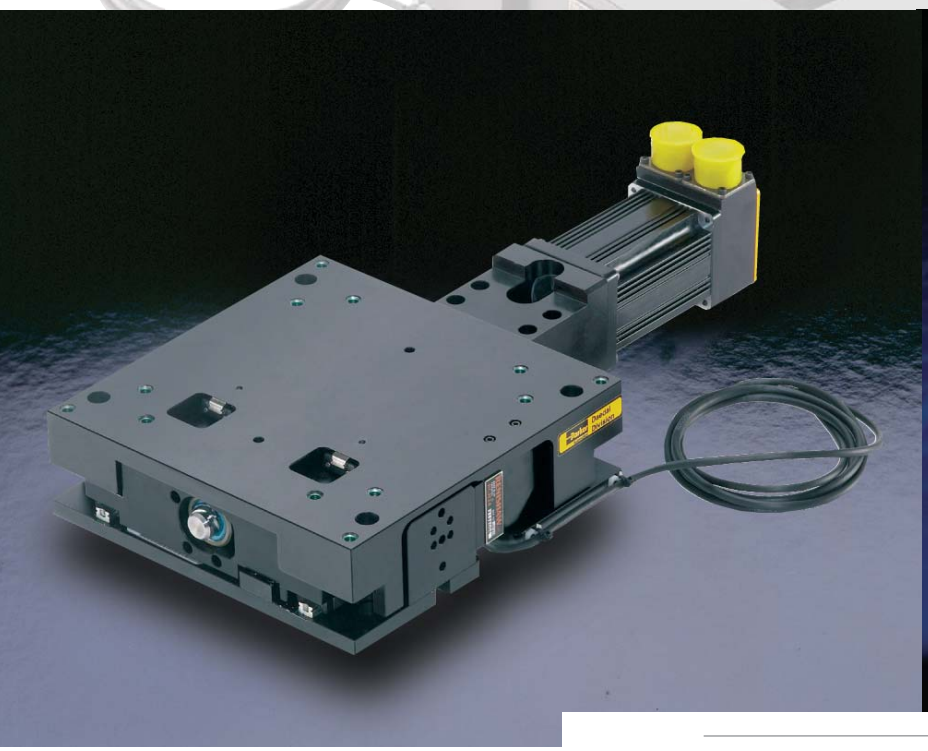
How to Order

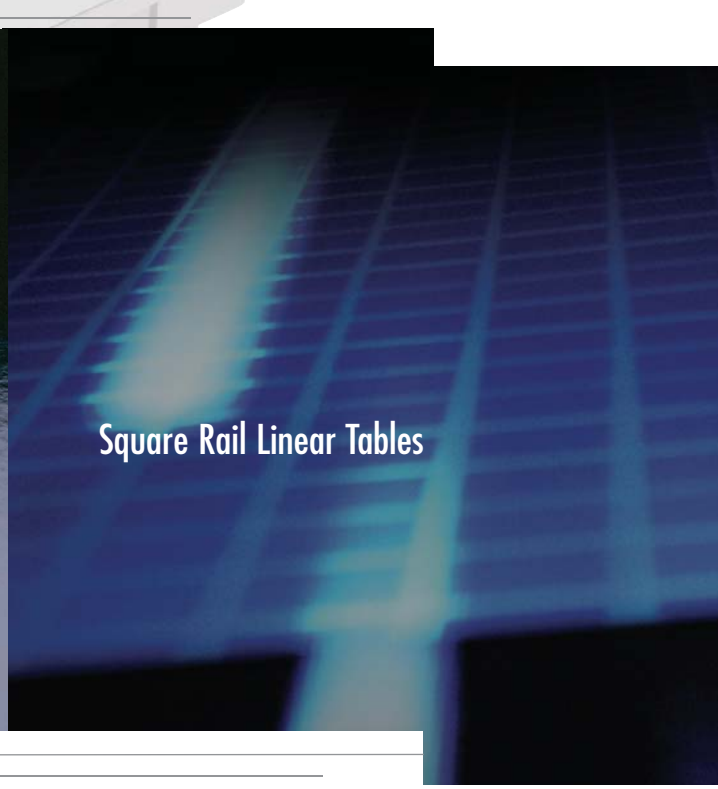
1. Pick features and options above.
2. Specify motor, make and model for mounting kit.

Ultra Stages are supported by a worldwide network of offices and local distributors.
Call **1-800-305-4555** for application engineering assistance or for the name of your local distributor.
Information can also be obtained at **www.baysidemotion.com or www.parkermotion.com**

Specifications are subject to change without notice.

ZP200 Series: Linear Table



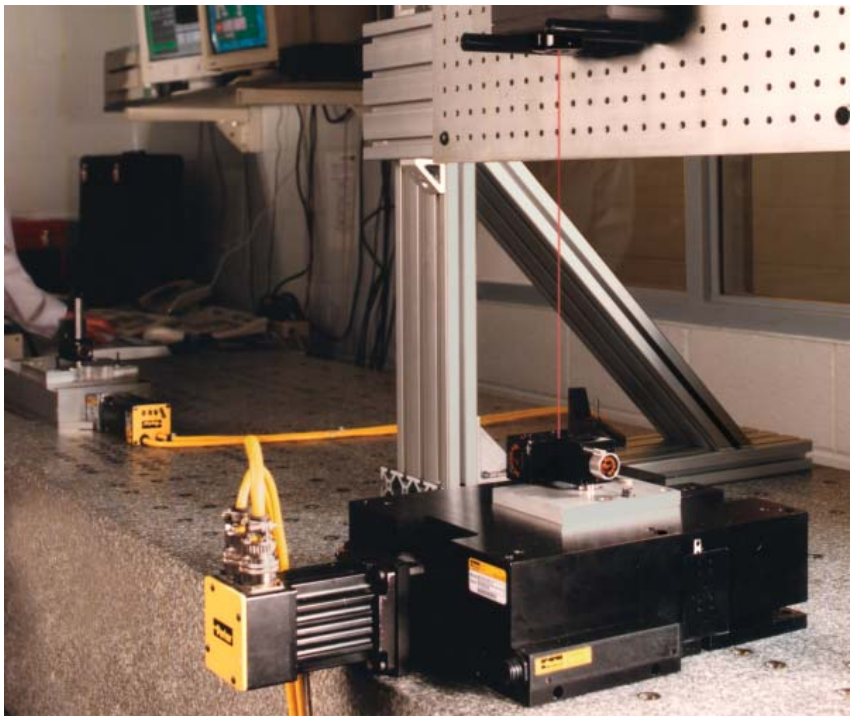


Square Rail Linear Tables

ZP200 Series: Overview

Features

- Precision platform for vertical (Z-axis) positioning
- Continuous duty - High dynamic performance
- Precision straightness (+/- 15 arc sec.) Throughout range of motion
- Precision ground ballscrew drive - 5, 10, or 20 mm lead
- Multi-axis compatibility with many linear motion products
- Laser tested and certified with calibrated lead laser



ZP200 utilized in a laser test set-up

Quality Design and Construction

The ZP200 Z axis lift table is a stable support platform which provides precise vertical translation and positioning, while maintaining X-Y integrity. Recirculating square rail bearings are incorporated into a unique variation of "wedge" mechanics to enable reliable high dynamic performance without the potential loss of travel encountered with crossed roller bearings. The ZP200 is compatible with many linear motion products for multi-axis systems, and it can be utilized as the system base axis or top axis to fit the motion requirements of the application. Standard mounting holes and dowel pin holes accommodate repeatable mounting.

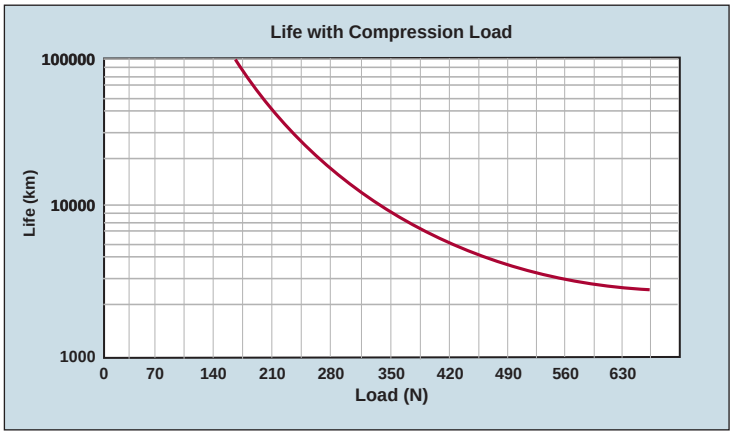
Options:

- Linear encoder option with selectable resolutions of 0.1, 0.5, 1.0 µm.
- Fail-safe brake (field installable - mounts directly to the ballscrew drive).
- Class 10 cleanroom preparation.
- Selectable motor mounting and couplings for SM16 or NEMA 23 servo or stepper motors.
- Easily adjusted travel "limit" and "home" sensors are provided in an enclosed sensor pack.

Specifications:

	Precision	Standard
Travel (Z-axis)	25 mm (limit to limit)	25 mm (limit to limit)
Positional Accuracy		
with no encoder [1,2,7] with linear encoder [3,6,7]	8 µm 8 µm	20 µm n/a
Positional Repeatability with no encoder [1,7] with 1.0 µm linear encoder [6,7] with 0.5 µm linear encoder [6,7] with 0.1 µm linear encoder [6,7]	 ± 3 µm +- 5 µm +- 4 µm +- 3 µm	 ± 10 µm n/a n/a n/a
Lift Lead Ratio[4] 5 mm lead ballscrew drive 10 mm lead ballscrew drive 20 mm lead ballscrew drive	 1.8199 mm/rev 3.6397 mm/rev 7.2794 mm/rev	
Lift Velocity 5 mm lead ballscrew drive 10 mm lead ballscrew drive 20 mm lead ballscrew drive	 110 mm/sec 220 mm/sec 440 mm/sec	
Load Capacity (normal)	15 kg (33 lb)	75 kg (165 lb)
Duty Cycle	100%	
Max Acceleration	7.2 m/sec^2	
Efficiency	90%	
Max Breakaway Torque[5]	0.15 Nm	
Max Running Torque[5]	0.13 Nm	
Linear Bearing – Coeff. Of Friction	0.01	
Ballscrew Diameter	16 mm	
Unit Weight	5.82 kg	
Top Plate Weight	2.25 kg	
Pitch [7,8]	+- 15 Arc Sec.	+- 45 Arc Sec.
Roll [7,8]	+- 15 Arc Sec.	+- 25 Arc Sec.
Input Inertia 5 mm lead ballscrew drive 10 mm lead ballscrew drive 20 mm lead ballscrew drive	 2.32x10^{-5} Kg-m^2 2.51x10^{-5} Kg-m^2 3.12x10^{-5} Kg-m^2	

1 Measured 38mm directly above the true center of the top mounting surface.
2 Measured using calibrated lead value (provided).
3 Slope correction value provided.
4 Lift per 1 motor shaft revolution. Lift lead listed is nominal. All units are provided with calibrated lead value.
5 Torque ratings are measured with unit unloaded, traveling upward.
6 Measured directly over encoder on outer edge.
7 Pitch and Roll Specifications are with no load, addition of load increases Pitch and Roll error by 10 Arc seconds per 5 Kg of load assuming the load CG is located in the center of the stage platform. Cantilevered loading increases these errors further.

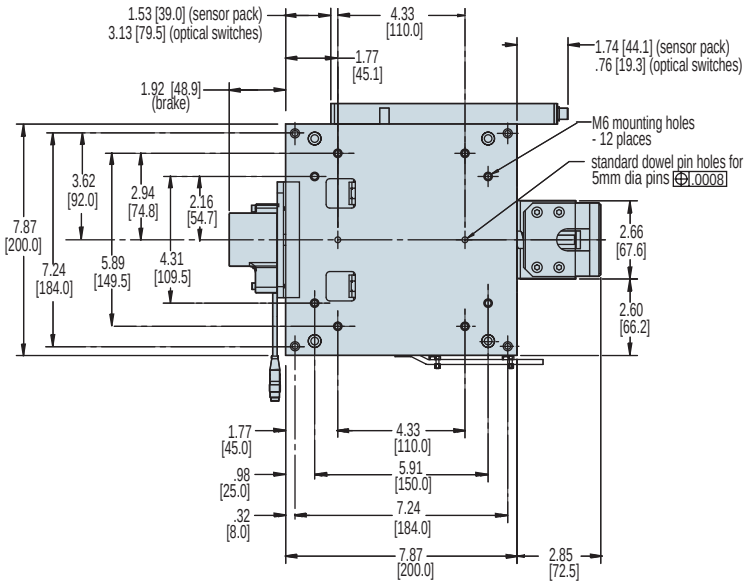


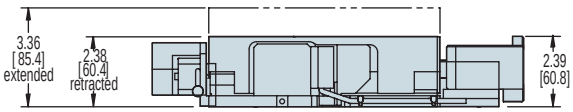
Table/Life Load Chart

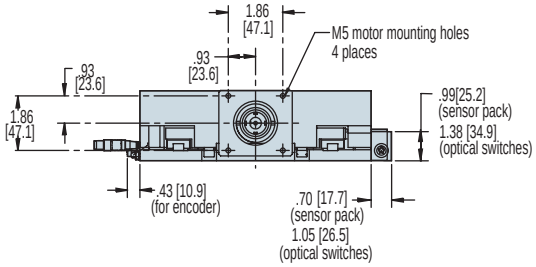
Compression (normal load)

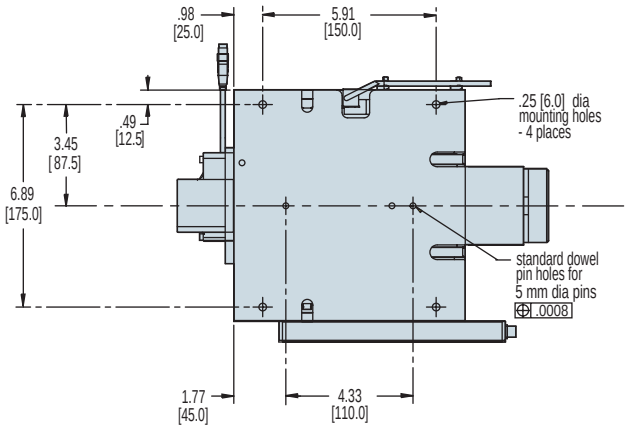
The graph provides a preliminary evaluation of the support bearing life/load characteristics. The curves show the life/load relationship when the applied load is centered on the carriage, normal (perpendicular) to the carriage mounting surface. For final evaluation of life vs load, including off center, tension, and side loads contact Parker Applications Engineering at 800-245-6903

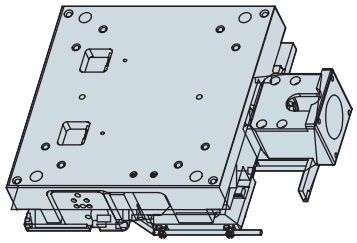
Dimensions inch (mm)



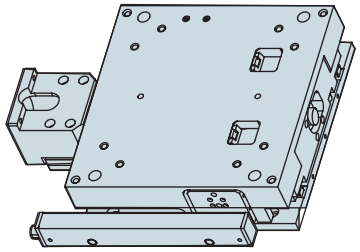








Encoder



Sensor Pack

2D & 3D CAD files — Download from parkermotion.com

100-9274-01 XR Adapter Plate

A multi-axis adapter plate is available to mount the ZP200 to an XR/LXR table or, mount an XR/LXR table to the ZP200. This plate is 9.53 mm thick and includes standard dowel pin holes for repeatable alignment.

	ZP200 as Base	ZP200 as Top Axis
404XR	Yes	n/a*
404LXR	Yes	n/a*
406XR	Yes	Yes
406LXR	Yes	Yes
206 Rotary	Yes	n/a*

*Not recommended - consult factory.

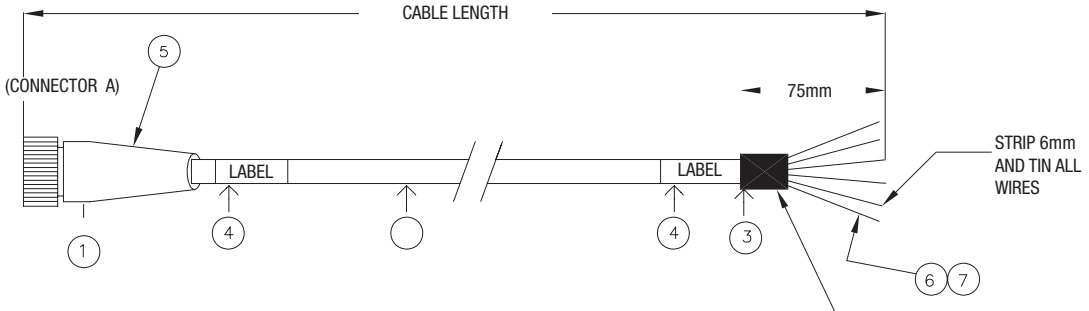
Limit & Home Sensors

Switch Type	Proximity			
Input Power	5-30VDC, 20mA			
Output	100mA (max)			
Repeatability	+/- 10 microns (unidirectional)			
Wire Color Code	3 Wire Sensor		4 Wire Sensor	
	(+) Supply	Brown	(+) Supply	Brown
	Output	Black	(N.O.) Normally Open Output	Black
	(-) Supply	Blue	(N.C.) Normally Closed Output	White
			(-) Supply	Blue
LED Color	Yellow			
Sensor Pack Switch Location	The L11-L14, H11-H14 Limit/Home options are enclosed in a sensor pack that is bolted to the side of the table. These sensors are adjustable along the length of the sensor pack. (Wire terminates in a 5-pin connector; extension cable included)			
N.O./N.C. Options	Normally Open (N.O.) switches are typically used as home sensors and are typically located between the limit sensors. Normally Closed (N.C.) switches are generally used as defense circuits to prevent damage to components caused by over-travel.			
Sinking/Sourcing Options	Sinking Switches (a.k.a. NPN): The output lead of this switch provides an electrical path to ground when activated. Sourcing Switches (a.k.a. PNP): The output lead of this switch provides a positive (+) voltage potential relative to ground. Note: refer to the controller's manual for input compatibility.			
Temperature Range[1]	+41° F to +158° F			
Vacuum Rating	1 x 10^{-3} Torr			

1. This range represents the maximum allowable temperature. Catalog specifications are guaranteed only at 20o C.

CAUTION: REVERSING SUPPLY POTENTIAL WILL DESTROY SENSOR
Brown: +5 to +30VDC Supply
Blue: Ground Supply
Black: Signal Output

Sensor Pack Cable Wiring Diagram



DAEDAL PART NO.	CABLE LENGTH
006-1742-01	3 METERS
006-1742-02	7.5 METERS

WIRE COLOR	FUNCTION	PIN#
RED	+5 to +24V DC	A
BLUE	LIMIT 1 (LXR -)	B
ORANGE	LIMIT 2 (LXR +)	C
GREEN	HOME	D
BLACK	GROUND	E
GREEN W/ YELLOW STRIPE	SHIELD	SHIELD CASE

NOTE: Limit 2 is the limit switch on the connector end of the sensor pack housing.

Order Example

Model Series	ZP200
Travel	
25 mm	T01
Mounting	
Metric	M
Grade	
Precision	P
Standard	S
Drive Screw	
5 mm lead	D2
10 mm lead	D3
20 mm lead	D4
Home Sensor	
No sensor	H1
N.C. current sinking - sensor pack	H11
N.O. current sinking - sensor pack	H12
N.C. current sourcing - sensor pack	H13
N.O. current sourcing - sensor pack	H14
Travel Limit Sensors	
No sensor	L1
N.C. current sinking - sensor pack	L11
N.O. current sinking - sensor pack	L12
N.C. current sourcing - sensor pack	L13
N.O. current sourcing - sensor pack	L14
Coupling	
No coupling	C1
0.25” bore Bellows	C3
0.38” bore Bellows	C5
9.0 mm (0.35”) bore Bellows	C23
Motor Mount	
No motor mounts	M1
SM16/BE16 motor	M2
NEMA 23 and SM23 motors	M3
BE23 motor mount	M61
Linear Encoder Option	
No encoder	E1
1.0 micron	E2
0.5 micron	E3
0.1 micron	E4
5.0 micron	E5
Sine/cosine encoder	E7
Brake option	
No brake	B1
Shaft brake	B2
Environmental	
Class 1000	R1
Class 10	R2
Place Holder	P1

Rotary Series: Direct Drive Precision Stages

Parker Bayside's Direct Drive Rotary Stages feature a robust construction and high performance in a compact package, providing smooth, near-frictionless motion with zero backlash.

Performance Specifications

Model No.	Axial Capacity		Perpendicular Capacity @ Radius	Continuous Output Torque		Peak Output Torque		Maximum Output Speed [1]
	(kgf)	(lb)		(Nm)	(in lb)	(Nm)	(in lb)	(RPM)
R100D	**75**	165.3	20kgf @ 50mm	**0.65**	5.75	**1.96**	17.34	700
R150D	**150**	330.6	75kgf @ 75mm	**4.00**	35.4	**12.00**	106.2	500
R200D	**250**	551.1	150kgf @ 100mm	**6.2**	54.80	**18.60**	164.40	300

Model No. @ øH	Radial Runout @ øk	Axial Runout of Rotation	Wobble @ Axis	Inertia		Stage Weight	
	(microns)	(microns)	(arc sec)	(gm cm sec^2)	(oz in sec^2)	(kg)	(lb)
R100D	20	18	60	**14.2**	0.197	**2.24**	4.85
R150D	26	23	45	**86.4**	1.200	**5.8**	12.79
R200D	36	30	30	**338.0**	4.695	**10.5**	23.15

Encoder Data

Model No.	R100D	R150D	R200D
Total Number of counts/rev [2]	473,600	629,760	944,000
Frequency at Max Speed [2] (MHz)	5.5	5.2	4.7
Resolution after x4 (arc sec)	2.73	2.05	1.3728
Repeatability after x4 (arc sec) [3]	± 8.4	± 6.15	± 4.1

(1) Maximum speed may be limited by input frequency response of controller or drive.
(2) Post quadrature (includes 10x interpolation and 4x of control).
(3) Typical system repeatability that can be achieved by a closed loop control system.

Motor Specifications

Model No.	Voltage Constant K_{EL-L} (V/kRPM)	Torque Constant K_{TL-L} (Nm/amp)	Torque Constant K_{TL-L} (in lb/amp)	Resistance R_{L-L} (ohms@ 25°C)	Inductance L_{L-L} (mH)	Thermal Resistance (°C/W)
R100D	75	**0.72**	6.37	59.9	50	2.0
R150D	210	**2**	17.7	11.4	14	2.0
R200D	325	**3.1**	27.4	10.4	21	2.0

Model No.	Rated Voltage (V)	Icont (amps)	Ipeak (amps)	Logic Voltage (V/amp)	Pole Count
R100D	300	0.9	2.72	5 V @ 170 ma	12
R150D	300	2.0	6.0	5 V @ 170 ma	20
R200D	300	2.0	6.0	5 V @ 170 ma	32

Direct Drive Precision Stages

High Performance in a Compact Package

Parker Bayside's Direct Drive Rotary Stage, featuring an integral brushless DC servomotor, has several distinct advantages over traditional worm gear-driven stages. The elimination of the worm gearing offers the ability to reduce wear with zero backlash while exhibiting near frictionless motion.

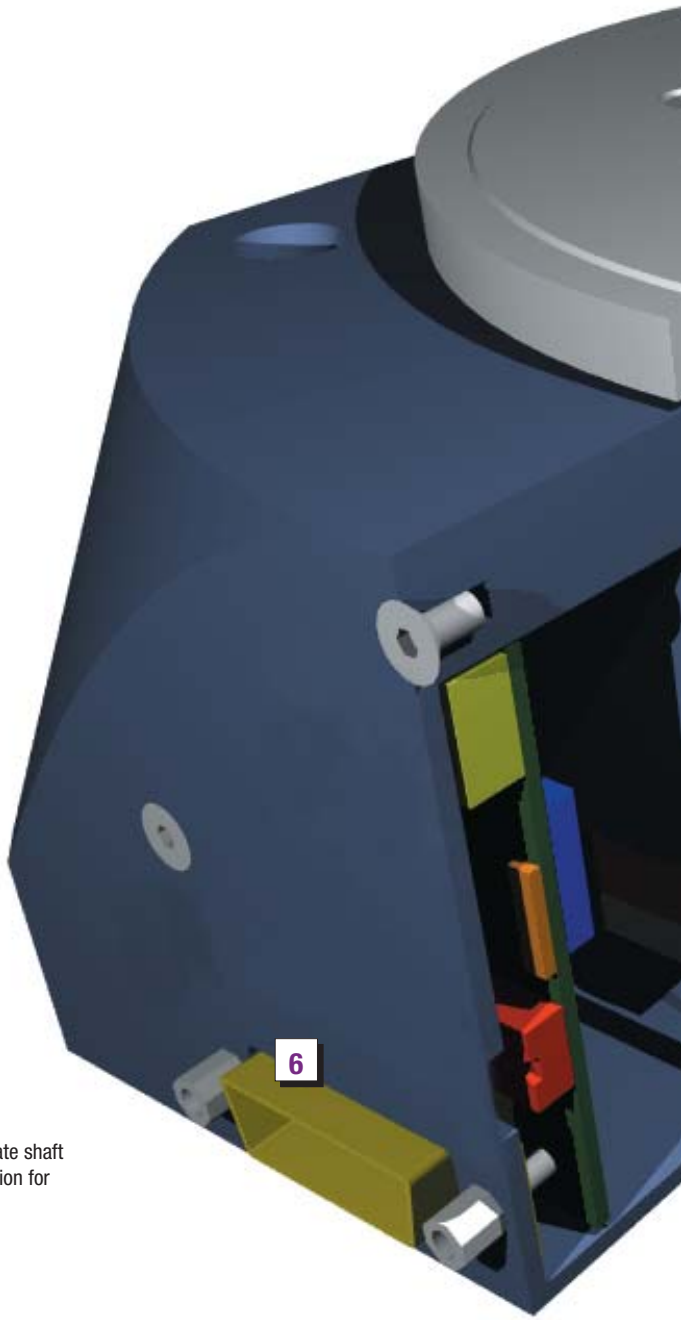
Its high positioning accuracy, solely based on the stage's encoder, provides repeatability within + 2 encoder counts, with resolutions ranging to 1.4 arc seconds. The RD Direct Drive features speeds up to 700 RPM with significant torque capability.

When to Use:

- Precision rotary motion
- ZERO backlash
- Compact
- Rugged

Applications:

- Electronic assembly
- Fiber Optics
- Medical
- Packaging
- Pharmaceutical
- Robotics
- Semiconductor

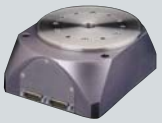


1

Robust bearing design
for high load capacity

2

Rotor / Shaft
motor rotor and top plate shaft as one piece construction for high stiffness

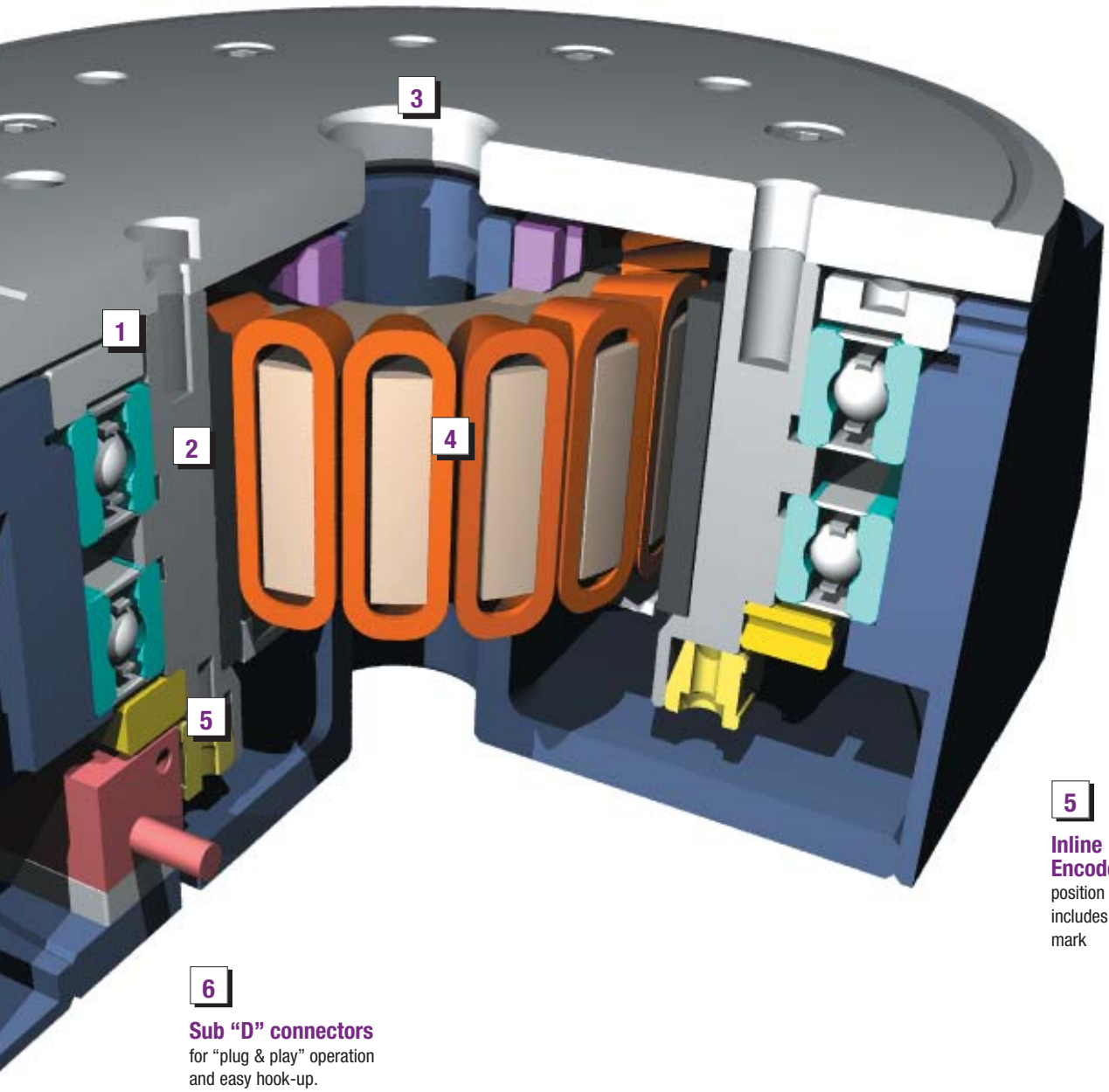


3

Stainless Steel Top Plate
precision ground for accurate mounting

4

Integrated Brushless Motor
unique design with high copper slot and rare earth magnet for maximum torque efficiency



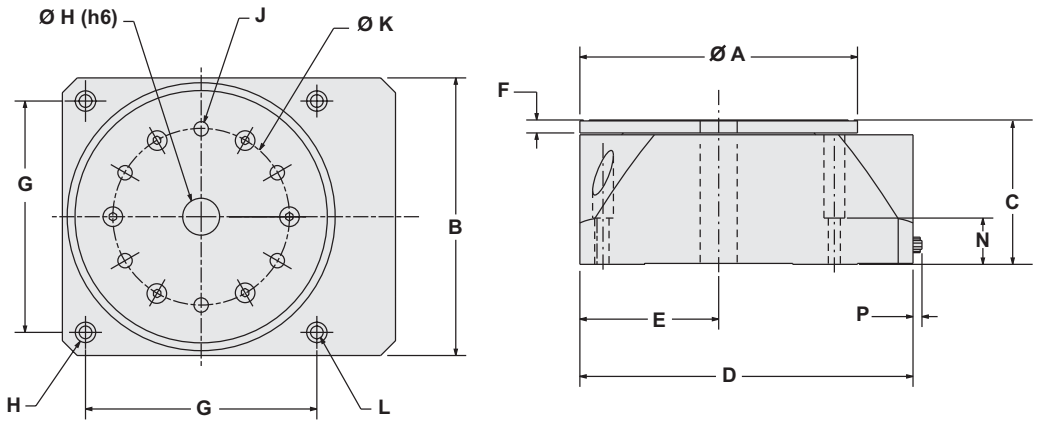
5

Inline Rotary Encoder for direct position feedback. Also includes once per rev index mark

6

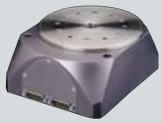
Sub "D" connectors
for "plug & play" operation and easy hook-up.

Dimensions



Model No.	A		B		C		D		E		F		G	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
R100D	100	3.94	100	3.94	75	2.95	130	5.12	50	1.96	5	0.196	85	3.34
R150D	150	5.9	150	5.9	78	3.07	180	7.08	75	2.95	7	0.275	125	4.92
R200D	200	7.87	200	7.87	100	3.94	230	9.05	100	3.94	10	0.393	160	6.29

Model No.	H		J	K		L		M		N		P	
	(mm)	(in)	Tap	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
R100D	20	0.787	M5	60	2.36	5.5	0.216	9.5	0.374	25	0.984	5	0.196
R150D	20	0.787	M6	95	3.74	6.5	0.255	11.2	0.440	25	0.984	5	0.196
R200D	30	1.18	M8	125	4.92	8.5	0.334	14.0	0.551	25	0.984	5	0.196



Order Numbering Example:

R	150	D
A	B	C

A — Stage Series

R	Direct Drive Rotary

B — Model

100	100 mm
150	150 mm
200	200 mm

C — Drive

D	Direct Drive

Cable Options:

Mating Power Cable

Part Number	Length	Used With
10963018-3000	3 meters	Flying Leads
10963018-8000	8 meters	Flying Leads

"Only for use with stage versions without LC display and programmable limits/outputs 5v requirement and Y-cable limits branch of previous cable type"

Mating Sensor Cable

Part Number	Length	Used With
10963241-3000	3 meters	Flying Leads

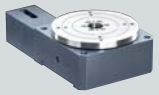
How to Order

Direct Drive Rotary Stages are supported by a worldwide network of offices and local distributors.
Call **1-800-305-4555** for application engineering assistance or for the name of your local distributor.
Information can also be obtained at **www.baysidemotion.com or www.parkermotion.com.**

Specifications are subject to change without notice.

Rotary Series: Worm Drive Precision Stages

Parker Bayside's Worm Drive Precision Stages feature a unique self-compensating preload to limit backlash, solid or though-bore construction, and built-in limit switches.



Performance Specifications

Model No.	Axial Capacity		Perpendicular Capacity @ 25mm		Perpendicular Capacity @ 150mm	
	(kg)	(lb)	(kgf)	(lb)	(kgf)	(lb)
R100M	100	220	22	48	7	15
R150M	400	880	88	194	33	73
R200M [4]	600	1,320	200	440	85	187
R300M	1,000	2,220	325	715	160	352

Model No.	Worm Gear Ratio	Gearing Backlash [1]	Peak Output Torque @100RPM Input		Peak Output Speed	Weight		Inertia	
		(arc sec)	(Nm)	(in lb)	(RPM)	(kgf)	(lbf)	(gm cm sec^2)	(oz in sec^2)
R100M	60:1	2	8	70.8	30	2.3	5.0	0.0057	0.0000784
R150M	72:1	2	25	221	30	6.0	13.0	0.055	0.00076
R200M [4]	72:1	2	55	487	30	15.0	33.0	0.148	0.00210
R300M	90:1	2	75	664	30	35.0	77.0	0.368	0.00516

Accuracy Specifications[2]

Model No.	Main Bearing Runout	Top to Base Parallelism	Position[3] Accuracy	Position[3] Repeatability	Input Torque Required	
	(microns)	(microns)	(arc min)	(arc sec)	(Nm)	(in oz)
R100M	±5	±12	2	12	0.07	20
R150M	±5	±12	2	12	0.14	20
R200M [4]	±7	±17	2	12	0.14	20
R300M	±10	±25	2	12	0.21	30

(1) Gearing backlash is uni-directional.

(2) Accuracy is based on stage mounted to a flat granite surface and measured at 25mm above the center of the stage.

(3) Accuracy and repeatability are based on open loop lead accuracy and can be enhanced with encoder feedback.

(4) See 200 RT Series page 90.

Worm Drive Precision Stages

The Rotary Stage Series offers an unparalleled combination of high accuracy and high-load capacity.

These rotary stages utilize a precision worm gear with the worm “flexed” against the gear to ensure a proper mesh. This feature provides high repeatability with very smooth operation.

Additionally, the rotary stages incorporate an oversized preloaded crossed roller bearing, offering exceptional stiffness and load capacity.

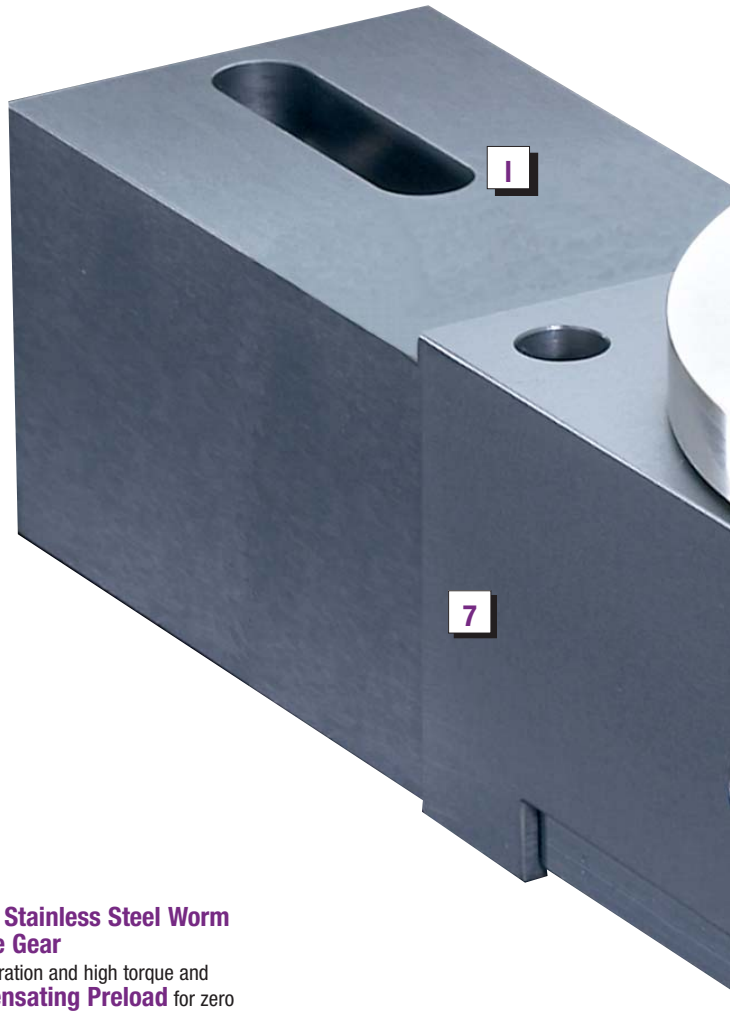
- Unique self-compensating preload to limit backlash
- Solid or thru bore construction
- Robust bearing design for high-load capacity
- Built-in limit switches
- Aluminum construction with stainless steel top plate

When to Use:

- High accuracy
- High loads
- Compact
- High stiffness

Applications:

- Electronic assembly
- Fiber Optics
- Medical
- Packaging
- Pharmaceutical
- Robotics
- Semiconductor

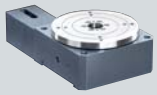


7

Heavy Duty Stainless Steel Worm with Bronze Gear
for smooth operation and high torque and **Self-Compensating Preload** for zero backlash

6

Completely Sealed and Lubricated
for long life even in harsh environments



1

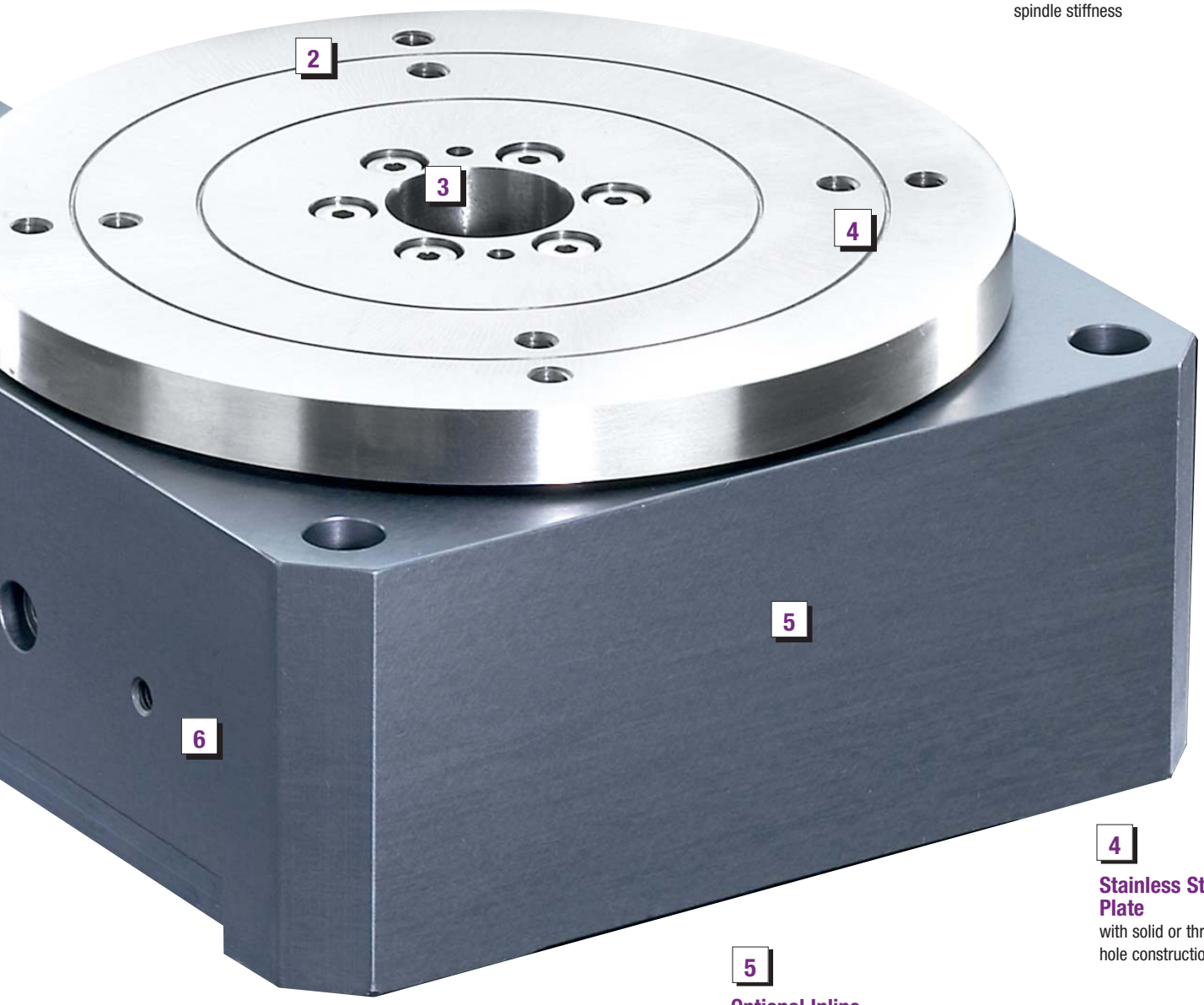
Motor Mounting and Coupling
for easy installation

2

Integral Limit Switches
mounted under top plate for safety

3

Preloaded Crossed Roller Bearings
for high loads and spindle stiffness



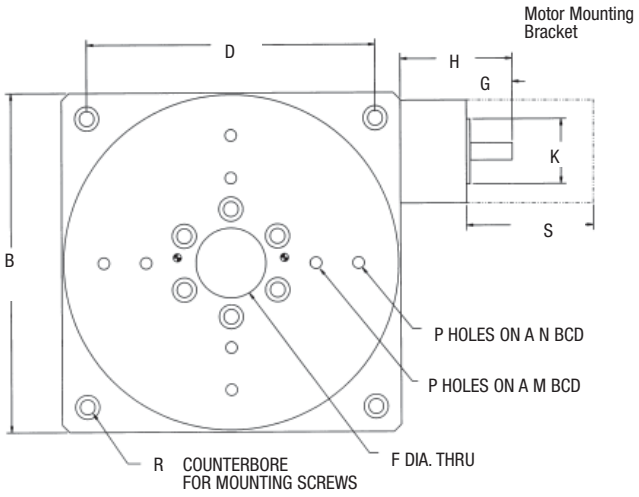
4

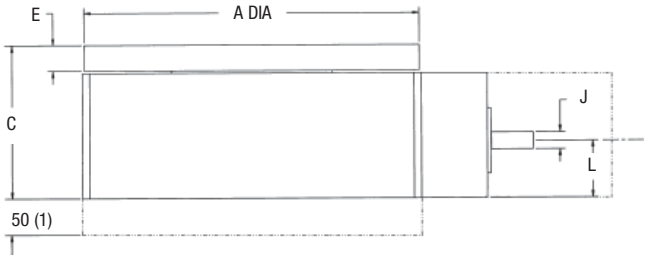
Stainless Steel Top Plate
with solid or through hole construction

5

Optional Inline Rotary Encoder
for direct position feedback

Dimensions



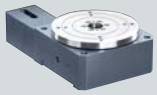


(1) This dimension is used when the in-line encoder option is selected.

Model No.	A		B		C		D		E	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
R100M	98.5	3.88	100	3.94	55	2.16	85	3.35	8	0.32
R150M	147.6	5.81	150	5.90	75	2.95	125	4.92	11	0.43
R200M	197.7	7.78	200	7.87	90	3.54	170	6.70	15	0.59
R300M	297.7	11.72	300	11.81	108	4.25	270	10.63	16	0.63

Model No.	F		G		H		J		K	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
R100M	12	0.47	15	0.59	45	1.77	5	0.197	18	0.709
R150M	25.5	1.00	27	1.06	66	2.60	10	0.394	38.1	1.50
R200M	38	1.50	27	1.06	66	2.60	10	0.394	38.1	1.50
R300M	51	2.00	39	1.53	113	4.45	12	0.472	73	2.875

Model No.	L		M		N		P	R	S		Stage Weight	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	Tap	C'Bore	(mm)	(in)	(kg)	(lb)
R100M	21	0.83	45	1.772	75	2.953	M5 x 0.8	M5	38.1	1.50	1.8	3.97
R150M	30.1	1.18	100	3.937	125	4.921	M6 x 1	M6	60.2	2.37	5	11
R200M	33.5	1.32	100	3.937	150	5.905	M8 x 1.25	M8	60.2	2.37	13	28.66
R300M	44.2	1.74	150	5.905	250	9.843	M8 x 1.25	M8	73.1	2.88	29	63.93



Order Numbering Example:

R	150	M	3	2	2	1	2
A	B	C	D	E	F	G	H

A — Stage Series

R	Worm Gear Rotary Series

B — Metric Square Width

100	100mm
150	150mm
200 [1]	200mm
300	300mm

C — Drive

M	Separate Motor

D — Gear Ratio

2	60:1 (R100)
3	72:1 (R150 and R200)
4	90:1 (R300)

(1) See page 90 for 200RT series and page 127 for manual driven rotary positioning stages

E — Motor Mounting

X	See how to order step 2

F — Limit Switches

1	None
2	End of Travel
3	End of Travel and Home

G — Encoder in line with top plate

1	None
3	2000 LPR

H — Environment

1	Standard
2	Clean Room

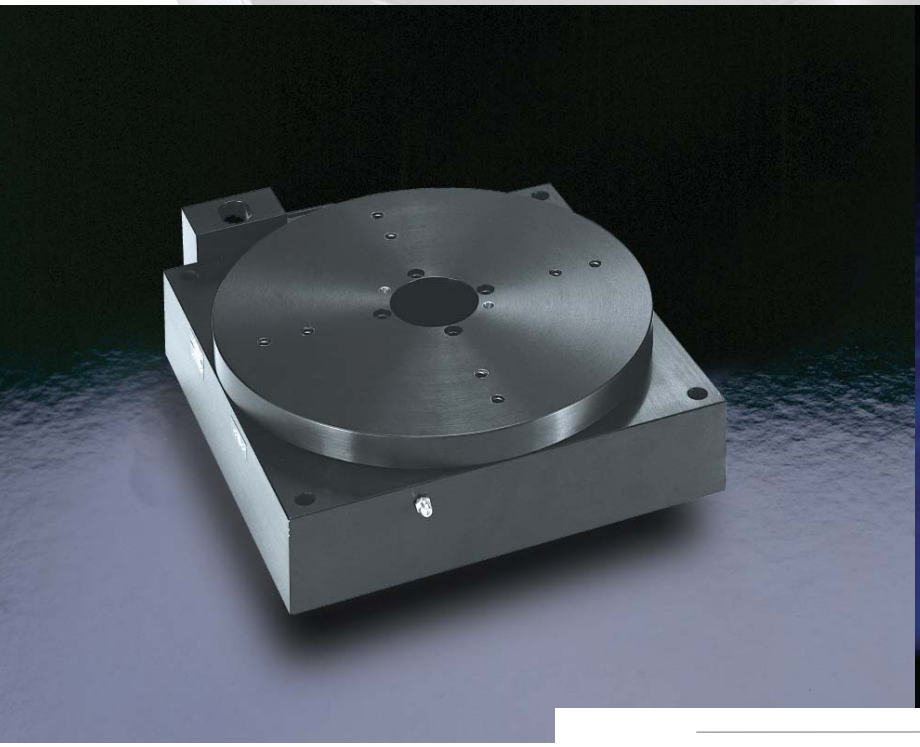
How to Order

1. Pick features and options above.
2. Specify motor, make and model for mounting kit.

Parker Bayside's Rotary Series is supported by a worldwide network of offices and local distributors. Call **1-800-305-4555** for application engineering assistance and the name of the local distributor or Parker Bayside office nearest you. Visit us online at **www.baysidemotion.com or www.parkermotion.com** for product information.

Specifications are subject to change without notice.

200 RT Series: Rotary Tables



- High repeatable indexing (12 arc sec.)
- Load capacities to 200 lbs
- 360 degrees travel
- Performance tested worm gear drive
- Selectable table sizes and drive ratio
- Dual race angular contact support bearing

200 RT Series: Overview

Quality Design and Construction

The 200RT Series Rotary Tables are designed for precise motor-driven rotary positioning and indexing. These tables are designed to function independently or in conjunction with linear tables used in high precision and precision automation applications. Their low-profile design minimizes stack height in multi-axis configurations and enables them to fit in many places where other motorized rotary devices cannot.

Models are available in 5, 6, 8, 10, or 12 inch diameters and are offered with four gear ratios making it convenient to match size, speed, and load requirements. They can be selected in either English or Metric mounting. They are found in virtually all industries where intermittent part indexing, part scanning, skew adjustment, or precise angular alignment is required.

At the heart of these tables is a rugged main support bearing which is comprised of two preloaded angular contact bearing races. It is designed for high load capacity and smooth, flat rotary motion. The drive is a precision worm gear assembly that is preloaded to remove backlash. The top and base are constructed of high quality aluminum with an attractive black anodized finish. The top and bottom mounting surfaces are precision ground to assure flatness.

200RT Series Characteristics

Common Characteristics	Units	Precision	Standard
Performance			
Positional Repeatability (unidirectional)	arc min	0.2	0.5
Duty Cycle	%	50	50
Table Runout (Max.)	in (µm)	±0.001 (±25)	±0.003 (±75)
Concentricity	in (µm)	±0.001 (±25)	±0.005 (±127)
Wobble	arc sec.	30	60
Input Velocity (Max.)	revs./sec.	15	15

Travel Dependent Characteristics

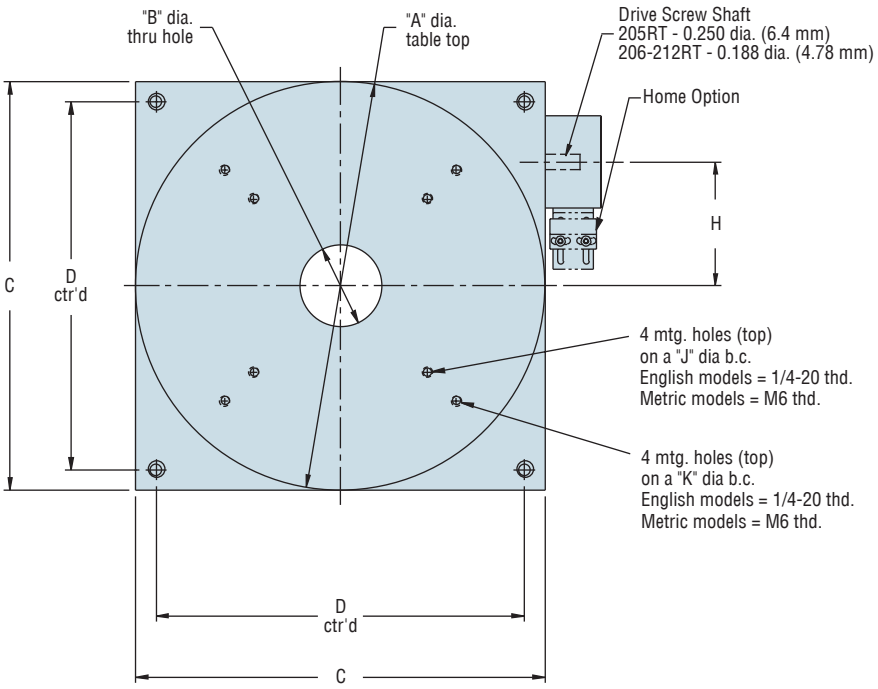
Table Diameter inches	Drive Ratio	Load Capacity lbs. (kgf)	Accuracy Prec. arc min	Accuracy Std. arc min	Output Torque in-lb (N-m)	Inertia 10^{-3} oz-in.-sec^2 (10^{-6} kg-m-sec^2)	Input Breakaway Torque (max) oz-in (N-m)	Running Torque (max) oz-in (N-m)	Weight Std. Top lb (kgf)	Weight Total lb (kgf)
5.0	180:1	25 (11)	3	10	25 (2.8)	0.14 (0.102)	22 (0.16)	20 (0.13)	0.67 (0.3)	6.0 (2.7)
5.0	90:1	25 (11)	3	10	25 (2.8)	0.15 (0.112)	22 (0.16)	20 (0.13)	0.67 (0.3)	6.0 (2.7)
5.0	36:1	70 (32)	5	12	25 (2.8)	0.24 (0.173)	22 (0.16)	20 (0.13)	0.67 (0.3)	6.0 (3.6)
6.0	180:1	150 (68)	3	10	40 (4.5)	0.16 (0.112)	22 (0.16)	20 (0.13)	0.91 (0.42)	8.0 (2.7)
6.0	90:1	150 (68)	3	10	40 (4.5)	0.20 (0.132)	22 (0.16)	20 (0.13)	0.91 (0.42)	8.0 (3.6)
6.0	45:1	150 (68)	5	12	40 (4.5)	0.29 (0.204)	22 (0.16)	20 (0.13)	0.91 (0.42)	8.0 (3.6)
8.0	180:1	150 (68)	3	10	40 (4.5)	0.24 (0.163)	28 (0.19)	25 (0.18)	2.23 (1.01)	15.0 (6.8)
8.0	90:1	150 (68)	3	10	40 (4.5)	0.66 (0.459)	28 (0.19)	25 (0.18)	2.23 (1.01)	15.0 (6.8)
8.0	36:1	150 (68)	5	12	40 (4.5)	0.90 (0.642)	28 (0.19)	25 (0.18)	2.30 (1.05)	15.0 (6.8)
10.0	180:1	200 (90)	3	10	190 (21.5)	0.74 (0.530)	33 (0.22)	30 (0.21)	5.26 (2.30)	29.0 (13.1)
10.0	90:1	200 (90)	3	10	190 (21.5)	1.02 (0.734)	33 (0.22)	30 (0.21)	5.26 (2.30)	29.0 (13.1)
10.0	45:1	200 (90)	5	12	190 (21.5)	2.13 (1.53)	33 (0.22)	30 (0.21)	5.26 (2.30)	29.0 (13.1)
12.0	180:1	200 (90)	3	10	190 (21.5)	0.99 (0.713)	33 (0.22)	30 (0.21)	7.67 (3.49)	32.0 (14.5)
12.0	90:1	200 (90)	3	10	190 (21.5)	1.59 (1.12)	33 (0.22)	30 (0.21)	7.67 (3.49)	32.0 (14.5)
12.0	45:1	200 (90)	5	12	190 (21.5)	3.83 (2.75)	33 (0.22)	30 (0.21)	7.67 (3.49)	32.0 (14.5)

NOTE: For moment load calculations, refer to the technical section of Parker's web site www.parkermotion.com

Rotary Encoder Option:

High resolution, high accuracy ring encoders can be mounted to the base of the rotary table. The encoder is coupled directly to the rotary table top, providing positional feedback with no drive train errors. 314,880 or 3,148,800 post quadrature counts per revolution are available, and an encoder housing is included to enclose and protect the encoder.

Dimensions inch (mm)



Options:

Motor Couplings
A wide range of coupling styles and bores are available to match motor requirements. Bellows-style couplings, offering the lowest windup are required for all precision grade tables, while the aluminum and stainless steel helix couplers offer good windup characteristics and high durability at a lower cost.

Motor Mounts
The motor mount is designed for an industry standard NEMA 23 motor flange and a maximum shaft length of 0.85".

Home Sensor
The Home sensor provides a fixed reference point to which the table can always return. This is a mechanical reed switch which is mounted the body of the rotary table and is activated by a magnet imbedded on the table top.

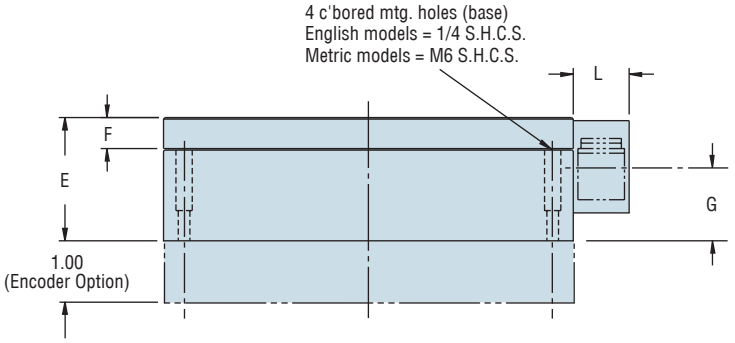
Rotary Encoders
High accuracy rotary encoders can be added for direct positional feedback of the table top position.

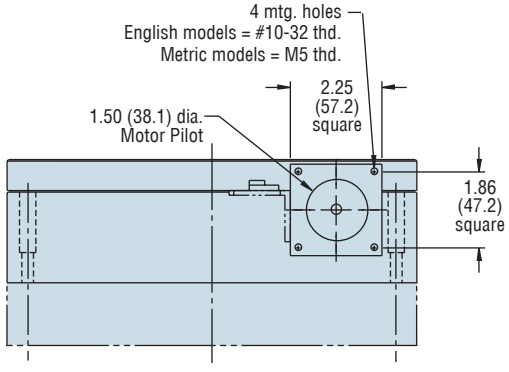
Seals
Custom designed sealed units are offered to prevent excessive wear or internal damage resulting from dust and contaminates.

Motors, Drives & Controls
Micro-step motors with drives are available for direct mounting to the rotary tables. Motion controllers can also be added to provide systems with seamless connectivity.

NOTE: Refer to www.parkermotion.com or contact a Parker applications engineer for additional detailed information pertaining to any of these options or accessories.

2D & 3D CAD files — Download from parkermotion.com





	A	B	C	D	E		F		G	H	J	K	L	M
					Std. (T2)	Option (T3)	Std. (T2)	Option (T3)						
English	5.0	1.0	5.0	4.0	1.8	2.42	0.38	1.00	1.11	1.66	3.0	4.0	1.38	0.188
	6.0	1.75	6.0	5.0	2.0	2.62	0.38	1.00	1.23	2.04	4.0	5.0	1.38	0.250
	8.0	1.75*	8.0	6.0	2.5	3.00	0.50	1.00	1.57	2.04	4.0	6.0	1.38	0.250
	10.0	2.0	10.0	9.0	3.0	3.25	0.75	1.00	1.81	3.03	6.0	8.0	1.38	0.250
	12.0	2.0	10.0	9.0	3.0	3.25	0.75	1.00	1.81	3.03	8.0	10.0	2.38	0.250
Metric	127.0	25.4	127.0	100	46.0	61.5	9.6	25.4	28.1	42.1	75	100	35	4.76
	152.4	44.5	152.4	125	50.8	66.5	9.6	25.4	31.4	51.8	100	125	35	6.35
	202.4	44.5*	203.2	175	63.5	76.2	12.7	25.4	39.8	51.8	100	150	35	6.35
	254.0	50.8	254.0	225	76.2	82.6	19.0	25.4	45.9	76.9	150	200	35	6.35
	304.8	50.8	254.0	225	76.2	82.6	19.0	25.4	45.9	76.9	200	250	60.4	6.35

*On the 8.0" (203,2) diameter table with 36:1 ratio, this dimension is 1.0" (25,4).

Order Example

2	08	01	RT	M	S	H1	C1	M1	E1	T1

Model Series

2

Table Diameter

5 in	127 mm	05
6 in	152.4 mm	06
8 in	202.4 mm	08
10 in	254 mm	10
12 in	304.8 mm	12

Gear Ratio

180:1 (Avail. on all dia.)	01
90:1 (Avail. on all dia.)	02
45:1 (Avail. on 6", 10" and 12" dia. only)	04
36:1 (Avail. on 5" and 8" dia. only)	05

Table Style — RT

Mounting

English	E
Metric	M

Grade

Standard Grade	S
Precision Grade	P

Home

No Home Switch	H1
Magnetic Home Switch	H2

Motor Coupling

No Coupling	C1	
0.25 in Bore, Helix, Aluminum	C2	
0.25 in Bore, Helix, Stainless Steel	C3	(Not Available on 205 Model)
0.25 in Bore, Bellows, required for precision grade	C4	
0.375 in Bore, Helix, Aluminum	C5	
0.375 in Bore, Helix, Stainless Steel	C6	(Not Available on 205 Model)
0.375 in Bore, Bellows, required for precision grade	C7	

Motor Mount

23 Frame Size	M1

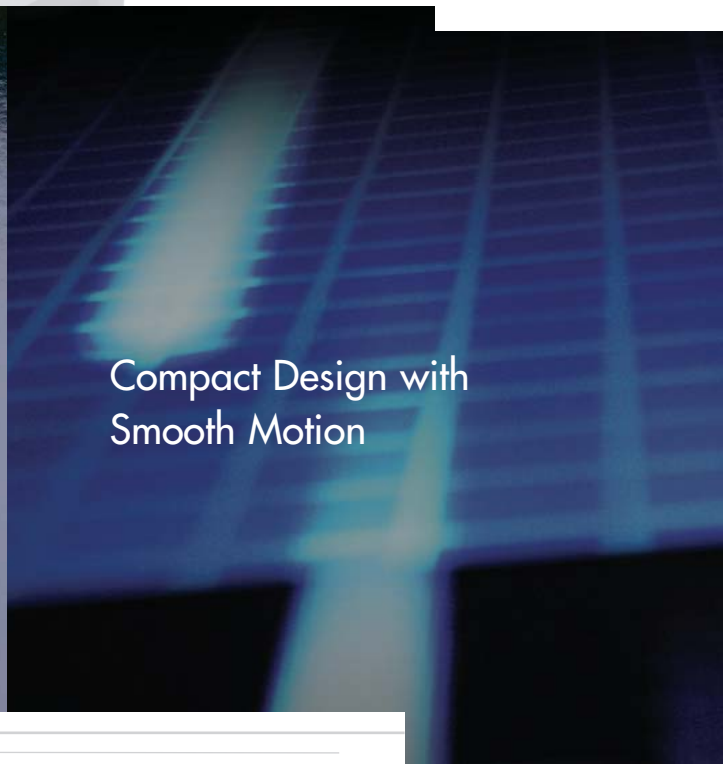
Encoder

No Encoder	E0
Ring Encoder - 314,880 post quad. counts/rev.	E8
Ring Encoder - 3,148,800 post quad. counts/rev.	E9

Table Top

No Top	T1
Standard Top	T2
Oversized Top (Raises height to clear NEMA 23 Motor)	T3

Crossed Roller & Ball Bearing Linear Slides: High Precision



Crossed Roller & Ball Bearing Linear Slides: Overview

- **0.00008 inch straightline accuracy–per inch of travel (0.00025 inches for miniatures)**
- **Nonrecirculating bearing style for smooth, low-friction motion**
- **Hardened and precision ground 440C stainless steel balls and rods**
- **Factory preloaded to precision specifications to eliminate any side play and provide a uniform coefficient of friction**

Parker linear slides are the ideal mechanisms for providing smooth, low-friction linear motion. These linear slides are mechanically simple motion devices comprised of two primary elements: a stationary base, and a moveable top carriage separated by a row of rolling element (non-sliding) bearings. The bearings, located on each side of the base, support the carriage and provide smooth, accurate, low-friction motion. Parker slides are offered with two types of linear bearings: ball bearing and cross roller bearing. The ball bearing offers smooth linear translation at the lowest cost. The cross roller bearing offers greater load carrying capability.

Because these bearing styles employ nonrecirculating rolling elements, there is virtually no mechanical vibration and a very low coefficient of friction. Since there is no sliding contact between the top and bottom members, Parker slides are much more reliable than dovetail slides. They eliminate the wear problems, lubrication requirements, and “stiction” (skipping and jumping caused by the increased force needed to initiate movement) normally associated with the higher-friction slides.

Each linear ball bearing is comprised of a row of hardened steel balls captured between four hardened and ground precision steel rods (two each on the base and top). These linear ball bearing assemblies are factory preloaded to eliminate side play and meet precision specifications.

Parker ball slides are offered in many different sizes and styles. Proper sizing and selection is based on travel, load, size, mounting requirements, and open aperture or solid top construction.

- **Higher normal load and moment load capacity**
- **Nonrecirculating bearing style for smooth motion**
- **0.00008 inch straightline accuracy (per inch of travel)**
- **Factory preload to eliminate any side play and provide a uniform coefficient of friction**

The cross roller slide has nearly twice the load capacity of a ball bearing slide of comparable size. It is similar to the ball bearing slide, having two nonrecirculating bearings to support and guide the moveable top carriage over the stationary base. The cross roller bearing, however, is comprised of two rows of cylindrical rollers instead of balls. Each roller is alternately crisscrossed (at 90°) with the next, and captured between “V” grooved bearing races– one located on the stationary base and one on the moving top carriage. Higher load capacity is achieved as a result of having a larger contact surface (line contact) than the ball bearing type (point contact).

Parker cross roller slides are constructed of corrosion-resistant black anodized aluminum and high carbon steel. These building materials provide optimized stiffness and thermal stability without excessive mass. Base and top mounting surfaces are precision ground to assure flatness and parallelism. Cross roller slides are preloaded during the manufacturing process to eliminate any side play and to provide a uniform coefficient of friction. A variety of modifications to standard models are available to meet custom requirements. Contact our application engineering department with your design specifications.

Crossed Roller Linear Slides

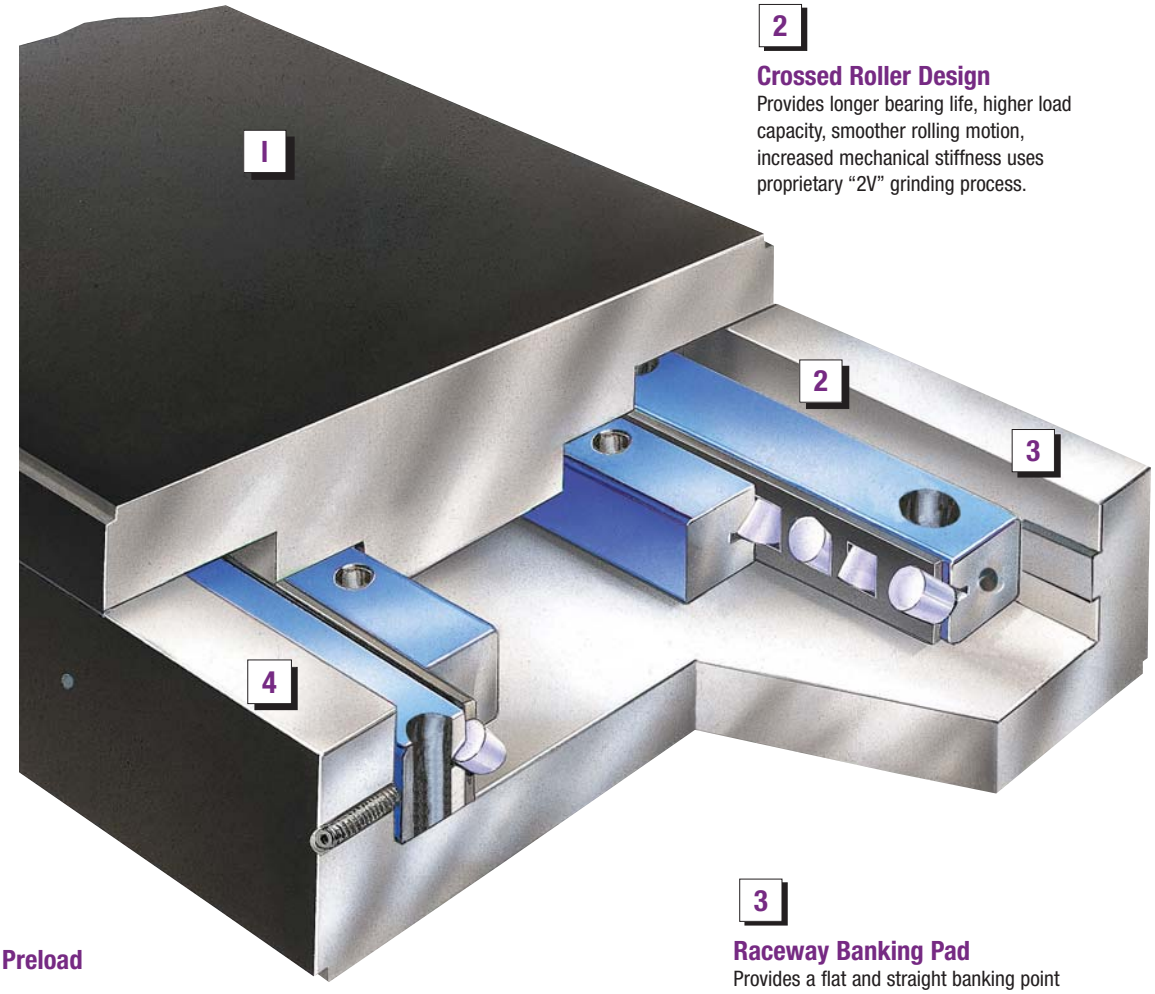
Crossed Roller Linear Slides are the ideal mechanisms for providing precise, low-friction linear motion. Two linear rows of bearings (one located on each side of the base), support the carriage and provide smooth, accurate, linear translation.

When to Use:

- Compact
- High precision
- Low coefficient of expansion
- High load capacity
- Smooth motion
- No bearing creep
- Short travel

Applications:

- Cleanroom
- Vacuum environment
- Electronic Assembly
- Fiber Optics
- Medical
- Pharmaceutical
- Semiconductor



1

Lightweight Aluminum Construction
Provides corrosion resistance, or
Cast Iron Construction
Provides low co-efficient of expansion

2

Crossed Roller Design
Provides longer bearing life, higher load capacity, smoother rolling motion, increased mechanical stiffness uses proprietary "2V" grinding process.

3

Raceway Banking Pad
Provides a flat and straight banking point

4

Patented Preload Screws

SE Series	Extended Travel Slides
Width: 50mm to 100mm	**Options**
Travel: 25mm to 400mm	- Clean Room and Vacuum Rated
Loads: Up to 980kg	- Modifications Available
	- Patented Anti-Creep Technology

SP Series	Limited Travel Slides
Width: 50mm to 100mm	**Options**
Travel: 25mm to 100mm	- Clean Room and Vacuum Rated
Loads: Up to 395kg	- Modifications Available
	- Patented Anti-Creep Technology

SC & SK Series	Crank & Knob Lead Screw Slides
Width: 50mm to 100mm	**Options**
Travel: 25mm to 100mm	- Clean Room and Vacuum Rated
Loads: Up to 395kg	- Modifications Available
	- Crank or Knob Drive Mechanism
	- Locking Mechanism
	- Patented Anti-Creep Technology

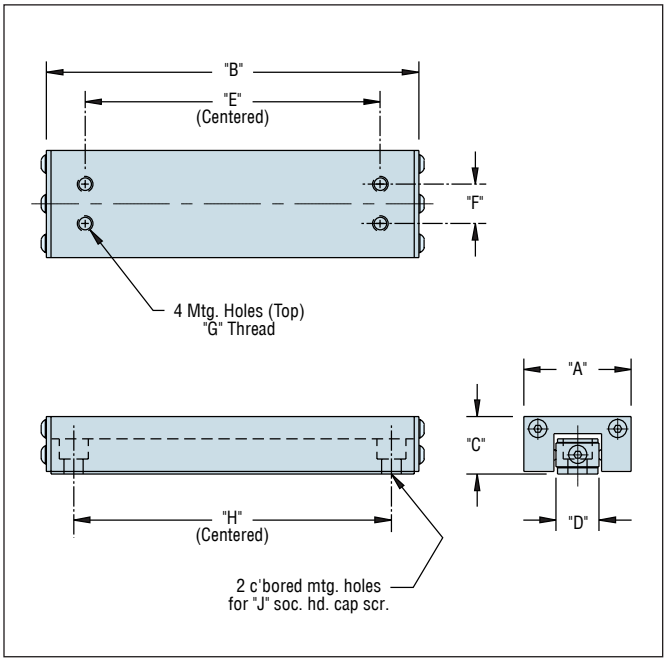
SW Series	Double “V” Low Profile Slides
Width: 38mm	**Options**
Travel: 25mm to 150mm	- Clean Room and Vacuum Rated
Loads: Up to 127kg	- Modifications Available
	- Patented Anti-Creep Technology

See parkermotion.com or baysidemotion.com for specifications.

3500 Series Miniature Ball Bearing Slides

These miniature slides are the smallest free-travel linear ball slides offered. They are used extensively in space restricted applications.

2D & 3D CAD files — Download from parkermotion.com



Specifications

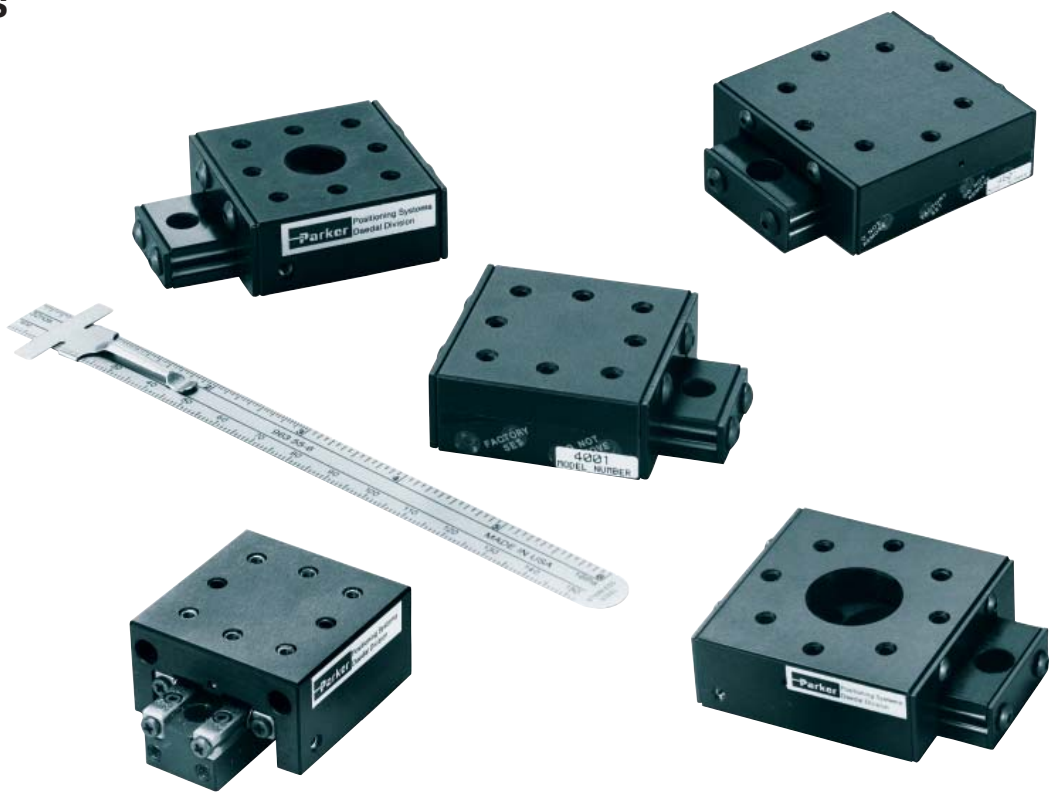
Straightline Accuracy: 0.00025 in/in

Model	Load Capacity* (lbs.) Travel (inches)	Normal	Inverted	Weight (lbs)	A	B	C	D	E (inches)	F	G	H	J
3505-05	0.5	4	2	0.03	.59	1.12	.32	.24	0.63	.22	#2-56	0.75	#2
3505-10	1.0	8	4	0.04	.59	2.12	.32	.24	1.63	.22	#2-56	1.38	#2
3505-20	2.0	12	6	0.06	.59	3.12	.32	.24	2.63	.22	#2-56	2.38	#2
3505-30	3.0	14	7	0.08	.59	4.12	.32	.24	3.63	.22	#2-56	3.38	#2
3507-05	0.5	8	4	0.04	.75	1.12	.40	.28	0.63	.38	#2-56	0.75	#2
3507-10	1.0	10	5	0.06	.75	2.12	.40	.28	1.63	.38	#2-56	1.38	#2
3507-20	2.0	12	6	0.08	.75	3.12	.40	.28	2.63	.38	#2-56	2.38	#2
3507-30	3.0	14	7	0.10	.75	4.12	.40	.28	3.63	.38	#2-56	3.38	#2
3510-05	0.5	10	5	0.10	1.00	1.68	.50	.36	1.25	.44	#6-32	1.25	#4
3510-10	1.0	12	6	0.12	1.00	2.68	.50	.36	2.25	.44	#6-32	2.25	#4
3510-20	2.0	15	7	0.14	1.00	3.68	.50	.36	3.25	.44	#6-32	3.25	#4
3511-07	0.75	15	8	0.08	1.06	1.68	.53	.42	1.25	.44	#6-32	1.13	#6
3511-15	1.5	18	9	0.14	1.06	2.68	.53	.42	2.25	.44	#6-32	2.13	#6
3511-20	2.0	20	10	0.20	1.06	3.68	.53	.42	3.25	.44	#6-32	3.13	#6
3511-30	3.0	25	13	0.26	1.06	4.56	.53	.42	4.00	.44	#6-32	3.25	#6
3511-40	4.0	30	15	0.32	1.06	6.00	.53	.42	5.50	.44	#6-32	4.00	#6

*For moment load ratings, refer to Parker's web site.

3900 and 4000 Series Square Profile Slides

These linear ball bearing and cross roller bearing slides are designed with a square face mounting surface and compatible mounting hole arrangements to facilitate easy “stacking” for multi-axis requirements. They are utilized as the primary element for Parker’s single-and multi-axis linear positioners.



Specifications

Straightline Accuracy: English 0.00008 in/in Metric 2 µm/25 mm

Ball Bearing	Model	Travel	Size-(Square)	Load Capacity Normal	Load Capacity Inverted	Aperture Diameter	Weight	Figure
English	3901	0.5 in	1.25 in	6 lb	3 lb	0.25 in	0.10 lb	A
	3905	0.5 in	1.25 in	6 lb	3 lb	none	0.10 lb	A
	4001	1.0 in	1.75 in	25 lb	13 lb	none	0.20 lb	B
	4005	1.0 in	1.75 in	25 lb	13 lb	0.50 in	0.20 lb	B
	4501	1.0 in	2.62 in	40 lb	20 lb	none	0.60 lb	C
	4505	1.0 in	2.62 in	40 lb	20 lb	1.00 in	0.50 lb	C
	4410	3.0 in	5.00 in	95 lb	48 lb	none	2.20 lb	D
	4450	3.0 in	5.00 in	95 lb	48 lb	2.00 in	1.70 lb	D
Metric	M3901	12.5 mm	31.8 mm	2.7 kg	1.4 kg	6.2 mm	0.05 kg	A
	M3905	12.5 mm	31.8 mm	2.7 kg	1.4 kg	none	0.05 kg	A
	M4001	25.0 mm	44.4 mm	11.0 kg	6.0 kg	none	0.09 kg	B
	M4005	25.0 mm	44.4 mm	11.0 kg	6.0 kg	12.7 mm	0.09 kg	B
	M4501	25.0 mm	66.5 mm	18.2 kg	9.1 kg	none	0.27 kg	C
	M4505	25.0 mm	66.5 mm	18.2 kg	9.1 kg	25.4 mm	0.23 kg	C
	M4410	75.0 mm	99.0 mm	43.2 kg	21.8 kg	none	1.00 kg	D
	M4450	75.0 mm	99.0 mm	43.2 kg	21.8 kg	50.8 mm	0.77 kg	D

Cross Roller Bearing	Model	Travel	Size-(Square)	Load Capacity Normal	Load Capacity Inverted	Aperture Diameter	Weight	Figure
English	CR4001	1.0 in	1.75 in	50 lb	25 lb	none	0.20 lb	B
	CR4501	1.0 in	2.62 in	88 lb	44 lb	none	0.80 lb	C
	CR4505	1.0 in	2.62 in	88 lb	44 lb	1.00 in	0.70 lb	C
	CR4410	3.0 in	5.00 in	120 lb	60 lb	none	2.20 lb	D
	CR4450	3.0 in	5.00 in	120 lb	60 lb	2.00 in	1.70 lb	D

3900 and 4000 Series Square Profile Slide Dimensions inches (mm)

Note: Values shown in parentheses are actual metric dimensions for metric models (not conversions).

2D & 3D CAD files — Download from parkermotion.com

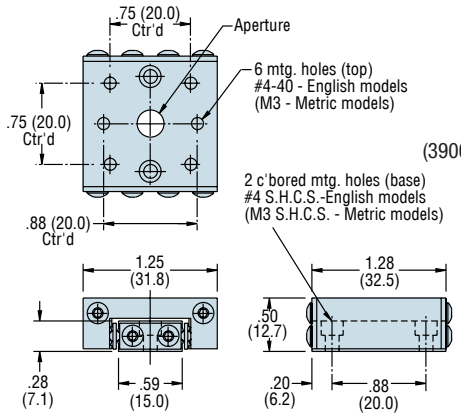


Figure A
(3900, M3900 series)

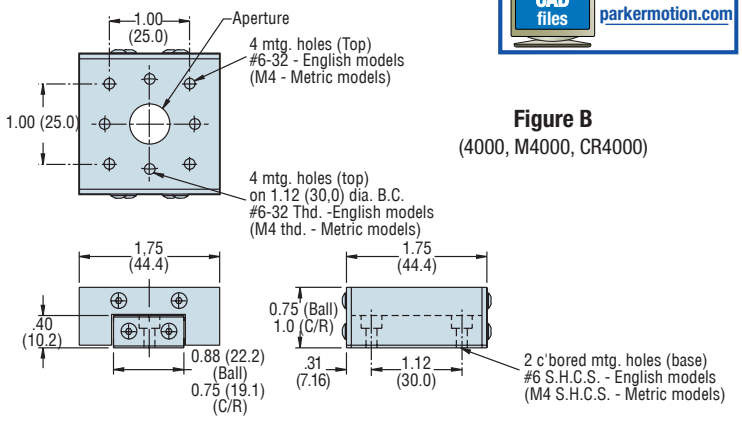


Figure B
(4000, M4000, CR4000)

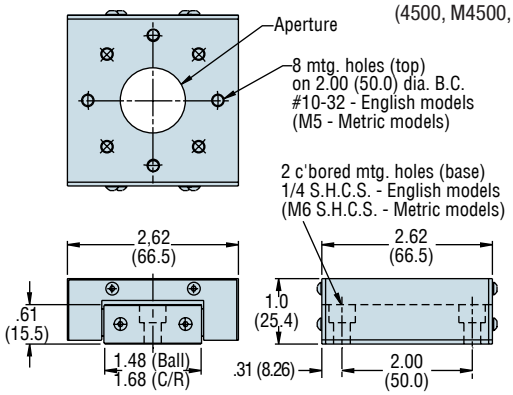


Figure C
(4500, M4500, CR4500)

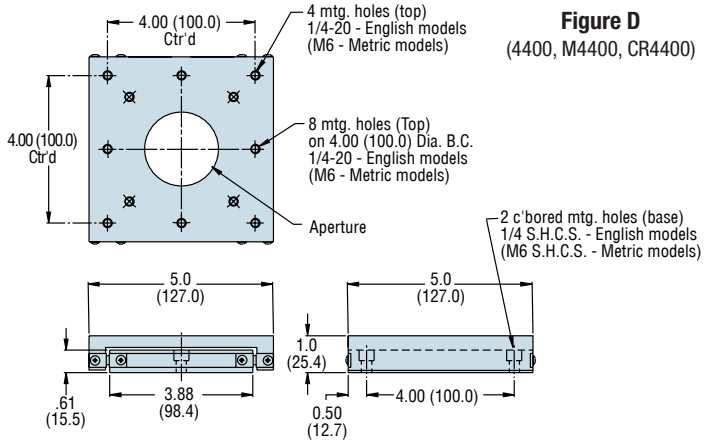
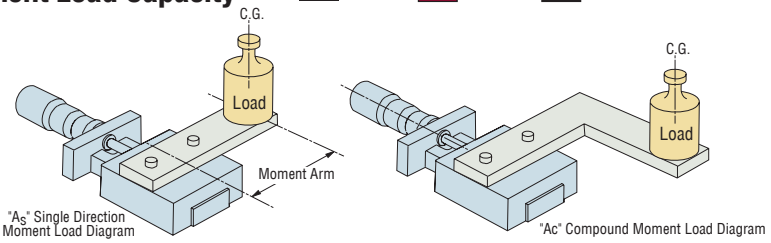
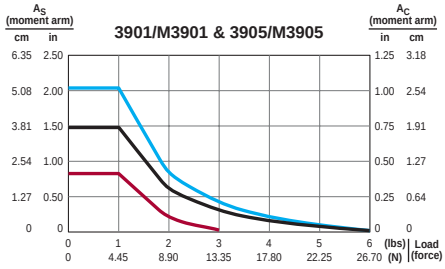


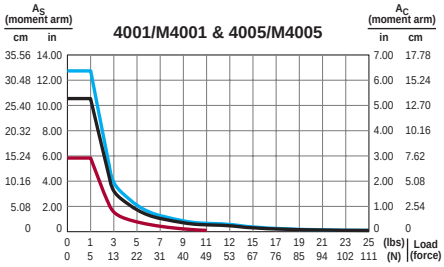
Figure D
(4400, M4400, CR4400)

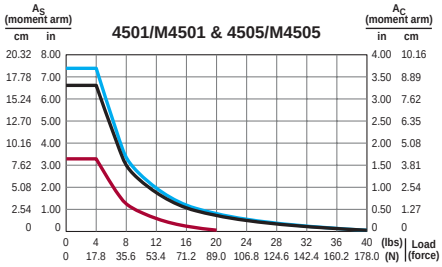
Moment Load Capacity

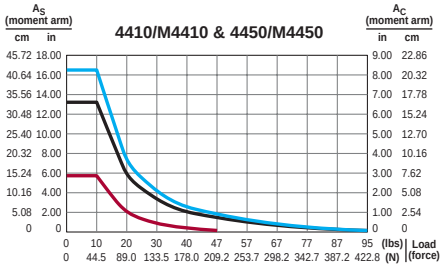
Yaw Pitch Roll

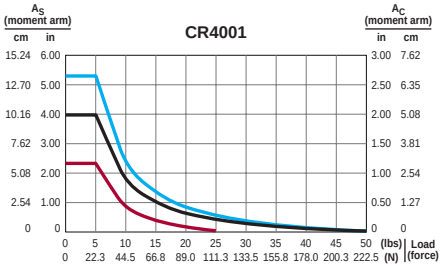


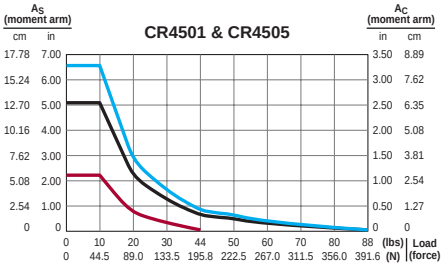


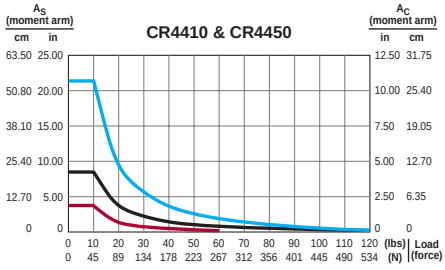












4000 Series Extended Travel Slides

These linear ball bearing and cross roller bearing slides have the same cross sectional sizes as the square profile slides, but offer longer travels and heavier load capacity.

Dimensions
inches (mm)

Figure A

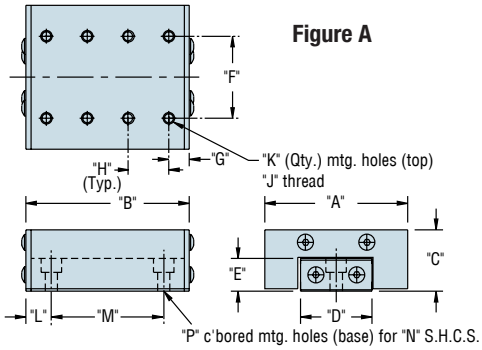
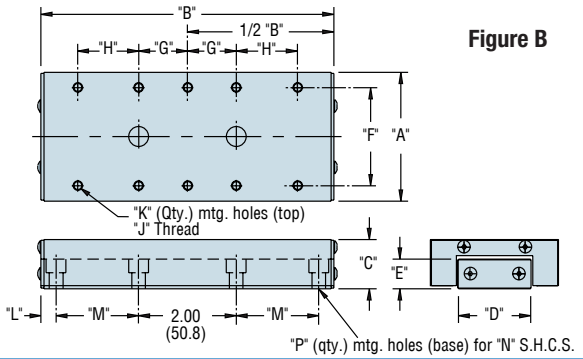


Figure B



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Specifications*

Straightline Accuracy: English 0.00008 in/in Metric 2 µm/25 mm

Ball Bearing			Load Capacity			Dimensions														
	Model	Travel	Normal	Inverted	Weight	Figure	A	B	C	D	E	F	G	H	J	K	L	M	N	P
		in	lb	lb	lb		units: inches													
English	4101	1.0	28	14	0.2	A	1.75	2.00	0.75	0.88	0.40	1.00	0.25	0.50	6-32	8	0.31	1.38	#6	2
	4201	2.0	40	20	0.4	A	1.75	3.00	0.75	0.88	0.40	1.00	0.25	0.50	6-32	12	0.31	2.38	#6	2
	4301	3.0	55	28	0.6	A	1.75	4.00	0.75	0.88	0.40	1.00	0.25	0.50	6-32	16	0.31	3.38	#6	2
	4601	2.0	64	32	0.9	B	2.62	4.00	1.00	1.48	0.61	2.00	0.50	—	10-32	6	0.31	0.69	.25	4
	4701	3.0	95	47	1.1	B	2.62	5.00	1.00	1.48	0.61	2.00	1.00	—	10-32	6	0.31	1.19	.25	4
	4801	4.0	122	61	1.4	B	2.62	6.00	1.00	1.48	0.61	2.00	0.50	1.00	10-32	10	0.31	1.69	.25	4
	4606	6.0	147	74	2.3	A	2.62	9.00	1.00	0.94	0.69	2.00	1.50	2.00	10-32	8	1.00	3.50	.25	3
	4609	9.0	184	92	3.1	A	2.62	12.00	1.00	0.94	0.69	2.00	1.00	2.00	10-32	12	1.00	5.00	.25	3
	4612	12.0	205	103	3.9	A	2.62	15.00	1.00	0.94	0.69	2.00	1.50	2.00	10-32	14	1.00	3.25	.25	5
	4615	15.0	225	113	4.7	A	2.62	18.00	1.00	0.94	0.69	2.00	1.00	2.00	10-32	18	1.00	4.00	.25	5
	4618	18.0	250	97	5.6	A	2.62	21.00	1.00	0.94	0.69	2.00	1.50	2.00	10-32	20	1.00	4.75	.25	5
	4621	21.0	272	136	6.5	A	2.62	24.00	1.00	0.94	0.69	2.00	1.00	2.00	10-32	24	1.00	5.50	.25	5
	4624	24.0	305	153	7.3	A	2.62	27.00	1.00	0.94	0.69	2.00	1.50	4.00	10-32	14	1.50	4.00	.25	7
	4627	27.0	330	165	8.2	A	2.62	30.00	1.00	0.94	0.69	2.00	1.00	4.00	10-32	16	1.50	4.50	.25	7
	4630	30.0	355	178	8.9	A	2.62	33.00	1.00	0.94	0.69	2.00	0.50	4.00	10-32	18	1.50	5.00	.25	7
Metric		mm	kg	kg	kg		units: millimeters													
	M4101	25.0	13	7	0.09	A	44.4	50.8	19.0	22.3	10.1	25.0	12.9	12.5	M4	6	7.8	35.0	M4	2
	M4201	50.0	18	9	0.18	A	44.4	76.2	19.0	22.3	10.1	25.0	13.1	12.5	M4	10	8.1	60.0	M4	2
	M4301	75.0	25	13	0.27	A	44.4	101.6	19.0	22.3	10.1	25.0	13.3	12.5	M4	14	8.3	85.0	M4	2
	M4601	50.0	29	15	0.41	B	66.5	101.6	25.4	37.6	15.5	50.0	12.5	—	M5	6	13.3	12.5	M6	4
	M4701	75.0	43	22	0.50	B	66.5	99.0	25.4	37.6	15.5	50.0	25.0	—	M5	6	13.5	25.0	M6	4
	M4801	100.0	55	28	0.64	B	66.5	152.4	25.4	37.6	15.5	50.0	12.5	25.0	M5	10	26.2	25.0	M6	4

Cross Roller Bearing			Load Capacity			Dimensions														
	Model	Travel	Normal	Inverted	Weight	Figure	A	B	C	D	E	F	G	H	J	K	L	M	N	P
		in	lb	lb	lb		units: inches													
English	CR4101	1.0	56	28	0.2	A	1.75	2.00	1.00	0.75	0.50	1.00	0.25	0.50	6-32	8	0.31	1.38	#6	2
	CR4201	2.0	60	30	0.4	A	1.75	3.00	1.00	0.75	0.50	1.00	0.25	0.50	6-32	8	0.31	2.38	#6	2
	CR4301	3.0	100	50	0.6	A	1.75	4.00	1.00	0.75	0.50	1.00	0.25	0.50	6-32	8	0.31	3.38	#6	2
	CR4601	2.0	100	64	0.9	B	2.62	4.00	1.00	1.68	0.61	2.00	0.50	—	10-32	6	0.31	0.69	.25	4
	CR4701	3.0	190	95	1.1	B	2.62	5.00	1.00	1.68	0.61	2.00	1.00	—	10-32	6	0.31	1.19	.25	4
	CR4801	4.0	244	122	1.4	B	2.62	6.00	1.00	1.68	0.61	2.00	0.50	1.00	10-32	10	0.31	1.69	.25	4

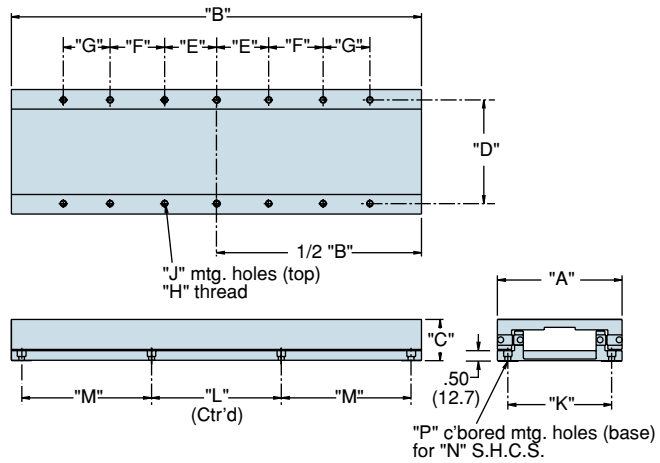
* For additional specifications, including moment loading capacities and other engineering references, please refer to product information on Parker's web site.

4900 Series Heavy Duty Slides

These linear slides are the larger, more rugged versions of Parker's nonrecirculating ball bearing and cross roller bearing slides. A wider footprint combined with larger bearing elements permit precise, effortless, linear translation of payloads as great as 280 pounds.

2D & 3D CAD files — Download from parkermotion.com

Dimensions inches (mm)†



† Note: Values shown in parentheses are actual metric dimensions for metric models (not conversions).

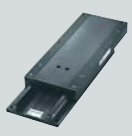
Specifications*

Straightline Accuracy: English 0.00008 in/in Metric 2 µm/25 mm

Ball Bearing	Model	Load Capacity Travel	Normal	Inverted	Weight	Dimensions A	B	C	D	E	F	G	H	J	K	L	M	N	P
		in	lb	lb	lb	units: inches													
English	4900-02	2.0	60	30	3.0	5.00	5.00	1.75	4.00	2.00	—	—	.25-20	6	4.00	4.00	—	.25	4
	4900-04	4.0	100	50	5.0	6.00	6.00	2.00	5.00	2.50	—	—	.25-20	6	5.00	5.00	—	.25	4
	4900-06	6.0	110	55	7.0	6.00	9.00	2.00	5.00	2.50	1.50	—	.25-20	10	5.00	5.00	1.50	.25	8
	4900-08	8.0	120	60	9.0	6.00	12.00	2.00	5.00	2.50	2.50	—	.25-20	10	5.00	5.00	3.00	.25	8
	4900-10	10.0	130	65	11.0	6.00	15.00	2.00	5.00	2.50	2.50	2.00	.25-20	14	5.00	6.00	4.00	.25	8
	4900-12	12.0	140	70	13.0	6.00	18.00	2.00	5.00	2.50	5.00	1.00	.25-20	14	5.00	7.00	5.00	.25	8
Metric		mm	kg	kg	kg	units: millimeters													
	M4900-02	50.0	27	13	1.4	99.0	99.0	44.5	100	50	—	—	M6	6	100	100	—	M6	4
	M4900-04	100.0	45	23	2.3	152.4	152.4	50.8	97	62.5	—	—	M6	6	97	97	—	M6	4
	M4900-06	150.0	50	25	3.0	152.4	228.6	50.8	97	62.5	37.5	—	M6	10	97	97	37.5	M6	8
	M4900-08	200.0	55	27	4.0	152.4	304.8	50.8	97	62.5	62.5	—	M6	10	97	97	75.0	M6	8
	M4900-10	250.0	59	28	5.0	152.4	381.0	50.8	97	62.5	62.5	50.0	M6	14	97	150	100.0	M6	8
	M4900-12	300.0	64	32	6.0	152.4	457.2	50.8	97	62.5	97.0	25.0	M6	14	97	175	97.0	M6	8

Cross Roller Bearing	Model	Load Capacity Travel	Normal	Inverted	Weight	Dimensions A	B	C	D	E	F	G	H	J	K	L	M	N	P
		in	lb	lb	lb	units: inches													
English	CR4900-04	4.0	200	100	5.0	6.00	6.00	2.00	5.00	2.50	—	—	.25-20	6	5.00	5.00	—	.25	4
	CR4900-06	6.0	220	110	7.5	6.00	9.00	2.00	5.00	2.50	1.50	—	.25-20	10	5.00	5.00	1.50	.25	8
	CR4900-08	8.0	240	120	9.0	6.00	12.00	2.00	5.00	2.50	2.50	—	.25-20	10	5.00	5.00	3.00	.25	8
	CR4900-10	10.0	260	130	11.0	6.00	15.00	2.00	5.00	2.50	2.50	2.00	.25-20	14	5.00	6.00	4.00	.25	8
	CR4900-12	12.0	280	140	13.0	6.00	18.00	2.00	5.00	2.50	5.00	1.00	.25-20	14	5.00	7.00	5.00	.25	8

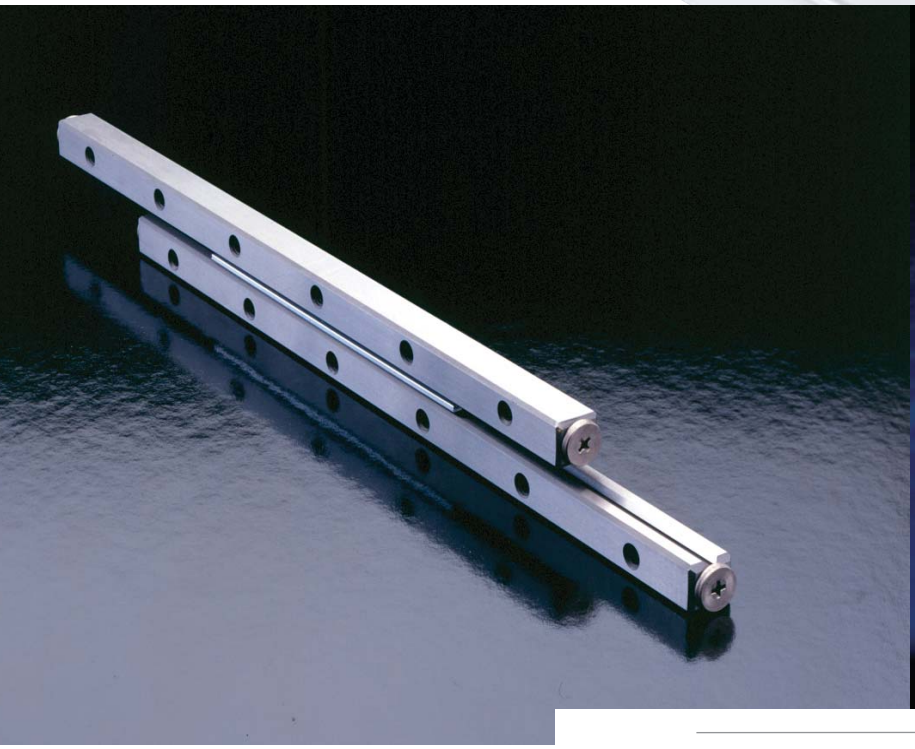
* For additional specifications, including moment loading capacities and other engineering references, please refer to product information on Parker's web site.

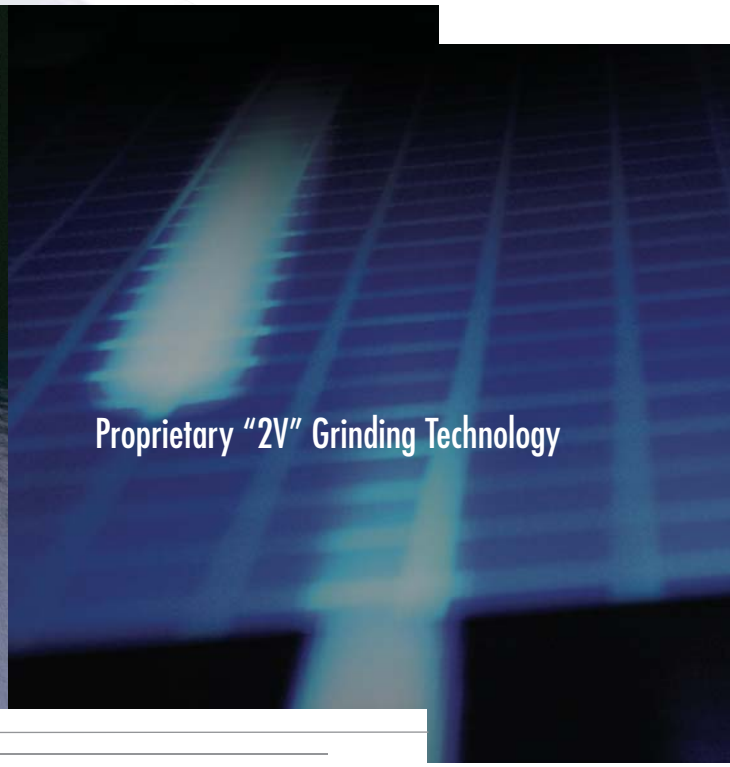


Linear Slide Selection Guide

Travel		Load Capacity		Width		Bearing	Model		Page
inches	mm	lbs	kg	in	mm	Type	English	Metric	Number
0.50	**12.7**	4	**2**	0.59	**15.0**	Ball	3505-05	—	96
0.50	**12.7**	6	**3**	1.25	**31.8**	Ball	3901	M3901	97
0.50	**12.7**	8	**4**	0.75	**19.1**	Ball	3507-05	—	96
0.50	**12.7**	10	**5**	1.00	**25.4**	Ball	3510-05	—	96
0.75	**19.1**	15	**7**	1.06	**26.9**	Ball	3511-07	—	96
1.00	**25.4**	8	**4**	0.59	**15.0**	Ball	3505-10	—	96
1.00	**25.4**	10	**5**	0.75	**19.1**	Ball	3507-10	—	96
1.00	**25.4**	12	**5**	1.00	**25.4**	Ball	3510-10	—	96
1.00	**25.4**	25	**11**	1.75	**44.5**	Ball	4001	M4001	97
1.00	**25.4**	28	**13**	1.75	**44.5**	Ball	4101	M4101	97
1.00	**25.4**	40	**18**	2.62	**66.5**	Ball	4501	M4501	97
1.00	**25.4**	50	**23**	1.75	**44.5**	Cross Roller	CR4001	—	97
1.00	**25.4**	56	**25**	1.75	**44.5**	Cross Roller	CR4101	—	97
1.00	**25.4**	88	**40**	2.62	**66.5**	Cross Roller	CR4500	—	97
1.50	**38.1**	18	**8**	1.06	**26.9**	Ball	3511-15	—	96
2.00	**50.8**	12	**5**	0.59	**15.0**	Ball	3505-20	—	96
2.00	**50.8**	12	**5**	0.75	**19.1**	Ball	3507-20	—	96
2.00	**50.8**	15	**7**	1.00	**25.4**	Ball	3510-20	—	96
2.00	**50.8**	20	**9**	1.06	**26.9**	Ball	3511-20	—	96
2.00	**50.8**	40	**18**	1.75	**44.5**	Ball	4201	M4201	99
2.00	**50.8**	60	**27**	1.75	**44.5**	Cross Roller	CR4201	—	99
2.00	**50.8**	60	**27**	5.00	**99.0**	Ball	4900-02	M4900-02	100
2.00	**50.8**	64	**29**	2.62	**66.5**	Ball	4601	M4601	99
2.00	**50.8**	100	**58**	2.62	**66.5**	Cross Roller	CR4601	—	99
3.00	**76.2**	14	**6**	0.59	**15.0**	Ball	3505-30	—	96
3.00	**76.2**	14	**6**	0.75	**19.1**	Ball	3507-30	—	96
3.00	**76.2**	25	**11**	1.06	**26.9**	Ball	3511-30	—	96
3.00	**76.2**	55	**25**	1.75	**44.5**	Ball	4301	M4301	99
3.00	**76.2**	95	**43**	2.62	**66.5**	Ball	4701	M4701	99
3.00	**76.2**	95	**43**	5.00	**99.0**	Ball	4400	M4400	97
3.00	**76.2**	100	**45**	1.75	**44.5**	Cross Roller	CR4301	—	99
3.00	**76.2**	120	**55**	5.00	**99.0**	Cross Roller	CR4400	—	97
3.00	**76.2**	190	**86**	2.62	**66.5**	Cross Roller	CR4701	—	99
4.00	**101.6**	30	**14**	1.06	**26.9**	Ball	3511-40	—	96
4.00	**101.6**	100	**45**	6.00	**152.4**	Ball	4900-04	M4900-04	100
4.00	**101.6**	122	**55**	2.62	**66.5**	Ball	4801	M4801	99
4.00	**101.6**	200	**91**	6.00	**152.4**	Cross Roller	CR4900-04	—	100
4.00	**101.6**	244	**111**	2.62	**66.5**	Cross Roller	CR4801	—	99
6.00	**152.4**	110	**50**	6.00	**152.4**	Ball	4900-06	M4900-06	100
6.00	**152.4**	147	**67**	2.62	**66.5**	Ball	4606	—	99
6.00	**152.4**	220	**100**	6.00	**152.4**	Cross Roller	CR4900-06	—	100
8.00	**203.2**	120	**55**	6.00	**152.4**	Ball	4900-08	M4900-08	100
8.00	**203.2**	240	**109**	6.00	**152.4**	Cross Roller	CR4900-08	—	100
9.00	**228.6**	184	**84**	2.62	**66.5**	Ball	4609	—	99
10.00	**254.0**	130	**59**	6.00	**152.4**	Ball	4900-10	M4900-10	100
10.00	**254.0**	260	**118**	6.00	**152.4**	Cross Roller	CR4900-10	—	100
12.00	**304.8**	140	**64**	6.00	**152.4**	Ball	4900-12	M4900-12	100
12.00	**304.8**	205	**93**	2.62	**66.5**	Ball	4612	—	99
12.00	**304.8**	280	**99**	6.00	**152.4**	Cross Roller	CR4900-12	—	100
15.00	**381.0**	225	**102**	2.62	**66.5**	Ball	4615	—	99
18.00	**457.2**	250	**114**	2.62	**66.5**	Ball	4618	—	99
21.00	**533.4**	272	**96**	2.62	**66.5**	Ball	4621	—	99
24.00	**609.6**	305	**139**	2.62	**66.5**	Ball	4624	—	99
27.00	**685.8**	330	**150**	2.62	**66.5**	Ball	4627	—	99
30.00	**762.0**	355	**161**	2.62	**66.5**	Ball	4630	—	99

Crossed Roller Bearings Series:

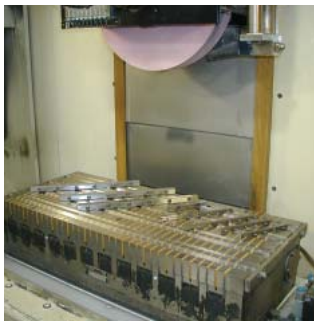




Crossed Roller Bearing Series: Overview

Proprietary "2V" Grinding Technology
Parker Bayside uses a proprietary "2V" grinding technology designed to achieve accuracy levels that are twice as high as the industry average. In the first step of the "2V" process, CNC grinders with specially developed wheel media grind the banking reference and mounting surfaces in the same sweep. In the second step, another CNC machine, with a different wheel media, grinds the V-shaped bearing surface in a soft force magnetic chuck and in strict reference to the banking surface. Pre-sized high-precision rollers and custom-designed roller retainer strips complete a bearing system unlike any other in the market.

Step 1 of "2V" grinding process



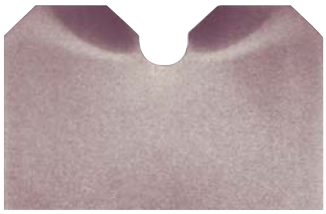
Step 2 of "2V" grinding process

When to Use:

- High Precision
- Short Travel up to 440mm
- High Carrying Load
- Zero Bearing Clearance
- Clearance

When to Use: Applications:

- Electronic Assembly
- Fiber Optics
- Medical
- Pharmaceutical
- Semiconductor

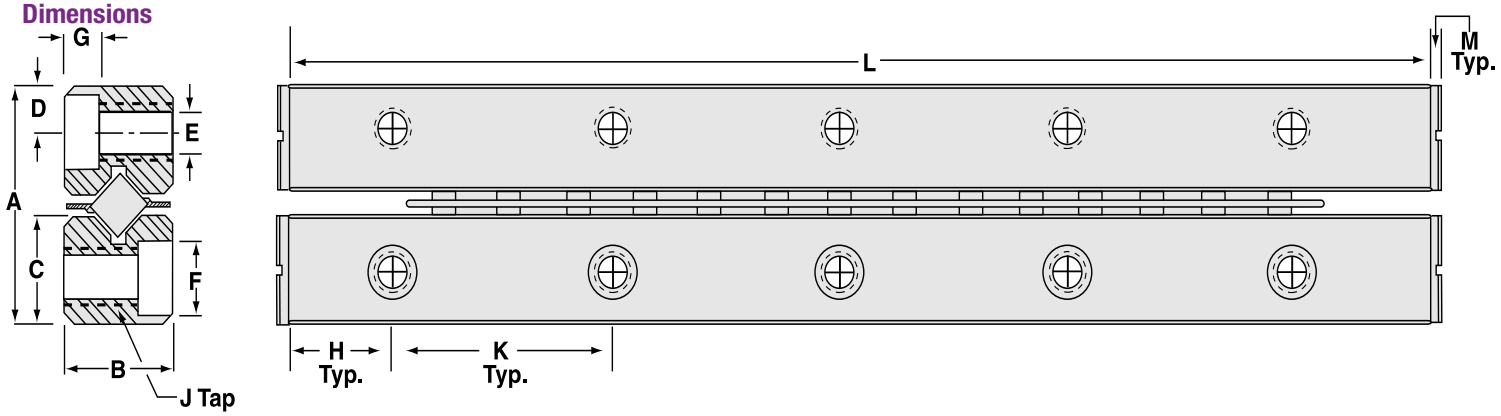


Cross sectional view of a Crossed Roller Rail showing hardness values

RC Series	Crossed Roller Bearings
Sizes	3mm and 6mm
Raceway Lengths	50mm to 700mm
Load Carrying Capacity	2,180kg (4,806 lb)

Rail Set

Dimensions



Part Number	Roller Diameter (mm)	Roller Diameter (in)	A (mm)	A (in)	B (mm)	B (in)	C (mm)	C (in)	D (mm)	D (in)	E (mm)	E (in)
RC3	3	0.12	18	0.71	8	0.31	8.3	0.33	3.5	0.14	3.3	0.13
RC6	6	0.23	31	1.22	15	0.59	14	0.551	6.0	0.26	5.3	0.21

Part Number	F (mm)	F (in)	G (mm)	G (in)	H (mm)	H (in)	J	K (mm)	K (in)	M (mm)	M (in)
RC3	6	0.24	3.1	0.22	12.5	0.49	M4	25	0.98	2	0.08
RC6	9.5	0.37	5.2	0.2	25	0.984	M6	50	1.97	3	0.12

Part Number	Travel (mm)	Travel (in)	L (mm)	L (in)	# Holes in Rail	# Rollers	Max. Load (kg)	Max. Load (lb)
RC3□ - 050□08	23.9	0.94	50	1.97	2	8	105	231
RC3□ - 075□12	33.9	1.33	75	2.95	3	12	158	348
RC3□- 100□17	33.8	1.33	100	3.94	4	17	210	463
RC3□- 97□22	33.8	1.33	97	4.92	5	22	290	640
RC3□ - 150□25	53.7	2.11	150	5.91	6	25	316	697
RC3□ - 175□30	53.7	2.11	175	6.89	7	30	395	870
RC3□ - 200□35	53.6	2.11	200	7.87	8	35	448	988
RC3□ - 225□37	83.6	3.29	200	7.87	9	37	474	1,044
RC3□ - 250□40	103.6	4.07	250	9.84	10	40	527	1,161
RC3□ - 275□45	103.5	4.07	275	10.83	11	45	580	1,278
RC3□ - 300□50	103.5	4.07	300	11.81	12	50	659	1,452
RC6□ - 100□75	44.1	1.74	100	3.94	2	7	325	717
RC6□ - 150□10	72.2	2.84	150	5.91	3	10	545	1,202
RC6□ - 200□13	100.3	3.95	200	7.87	4	13	655	1,444
RC6□ - 250□16	100.4	5.06	250	9.84	5	16	870	1,918
RC6□ - 300□19	156.5	6.16	300	11.81	6	19	980	2,160
RC6□ - 350□22	184.6	7.27	350	13.78	7	22	1,200	2,645
RC6□ - 400□25	212.7	8.37	400	15.75	8	25	1,310	2,888
RC6□ - 450□29	216.8	8.54	450	17.72	9	29	1,520	3,351
RC6□ - 500□33	220.9	8.69	500	19.69	10	33	1,740	3,836
RC6□ - 550□37	225	8.86	550	21.65	11	37	1,960	4,321
RC6□ - 600□41	229.2	9.02	600	23.62	12	41	2,180	4,806
RC6□ - 650□37	412.8	16.25	650	25.59	13	37	1,960	4,321
RC6□ - 700□40	440.8	17.35	700	27.56	14	40	2,180	4,806

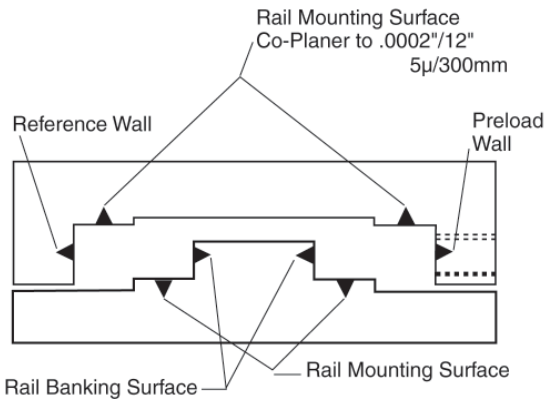
(1) Max. Load is based on a set of rails which consist of 4 rails and 2 retainers.
P.A.C.T. is a Patented Anti-Creep Technology that prevents roller migration in vertical and high-speed applications.
This option is available in bearing sizes of 3mm and 6mm. To order P.A.C.T. call out P/N PP-001 as a separate line item on your order.
□ See how to order for options.

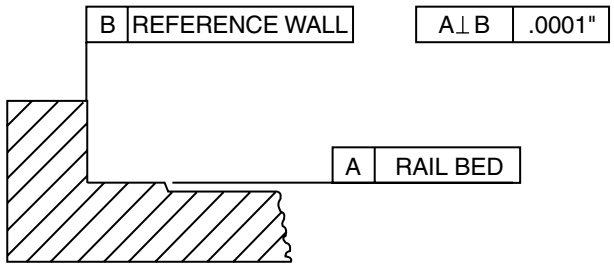
Crossed Roller Bearing Installation

Crossed Roller Bearings, when properly installed and preloaded, provide repeatable low-friction linear motion while eliminating side play. The opposed axes of the successive rollers create a line contact that allow crossed rollers to be mounted in any attitude. As compared to linear bearings using balls that have a point contact, crossed roller bearing line contacts have the ability to carry heavier loads (up to 10 times higher than ball bearings), obtain higher accuracy / repeatability and provide a smoother rolling motion approaching than that of an air bearing. The Crossed Roller Bearing line contact also eliminates the grooving or wearing problem associated with ball bearing point contact ensuring the integrity of your application over time. The following guidelines will help you install your bearing set.

Mounting Surface of Your Bearing Set

The most important issue in obtaining the highest accuracy and repeatability from your bearing set is the accuracy of its mounting surfaces. Special care should be taken to ensure the accuracy of parallelism and coparallelism of the mounting surfaces and their perpendicularity is to the highest tolerances. To obtain travel accuracy better than 1u / cm (0.0001" / ") your mounting surfaces should be equal or better than the following.

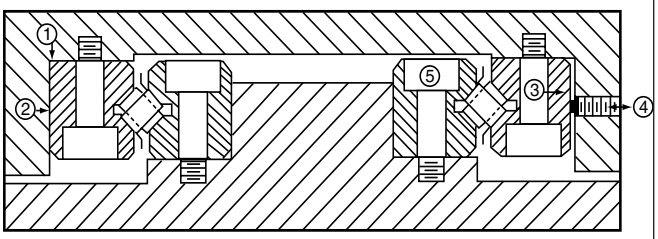




Preloading Bearings

Bearing preloading is a process of eliminating any side and vertical play while at the same time being careful not to create any friction in your bearing set. The most common method to load your bearings is by applying even amounts of force against an adjustable rail with a set screw in order to obtain a smooth rolling motion and mechanical stiffness. Special care should be taken to ensure that the preload is evenly distributed over the full length of the raceway. This can be accomplished by using a torque wrench or an experienced hand. Depending on the amount of stiffness needed for your application and the rigidity of your mounting structure, preloads can vary from 2% to 25% of the maximum load of the bearing. At right is a common preload method, if your application requires an alternative method contact the factory for application assistance.

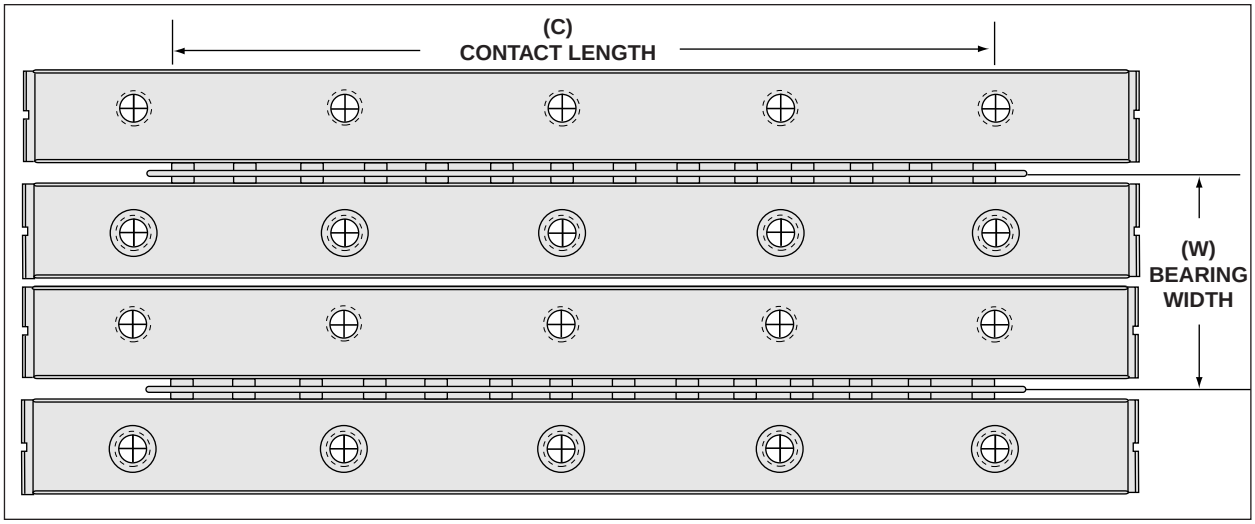
1. MOUNTING SURFACE
2. BANKING SURFACE
3.ADJUSTABLE RAIL
4. PRELOAD SCREW
5. MOUNTING SCREW



Installation Guide

Bearing Spacing

The spacing of your bearing set will have an effect on the stiffness and performance of your assembly. A general rule of thumb is to have the distance of the contact length of your bearings strip set relative to the distance between bearing. While this relationship can vary, ideal conditions should provide for a 1.5 contact length (C) to 1 bearing distance (W).



Lubrication

The low co-efficient of friction of crossed roller bearings (approx 0.003) means little lubrication is necessary for your bearing set. Lubrication is used more to protect against corrosion than wear. Often a single application of lubricant can last a lifetime. For applications that have special environmental considerations there are a number of alternative lubricants available. Contact the factory for special lubricant recommendations.

Component set part numbers include the following:

- **Crossed Roller** — Four rails, two roller strips and eight end screws.
- **Double “V” Crossed Roller** — Two rails, one double “V” rail, two roller strips and six end stops.

Order Numbering Example:

RC	3	T	200	A	35	1
A	B	C	D	E	F	G

A Bearing Series

RC	Crossed Roller

B Bearing Size (2)

3	3 mm
6	6 mm

C Bearing Material

T	Tool Steel
S	Stainless

D

Rail Length Bearing Size	
3mm	6mm
050	100
075	150
100	200
97	250
150	300
175	350
200	400
225	450
250	500
275	550
300	600
—	650
—	700

E Retainer Material (1)

A - Steel

F Roller Count

□□	Number of rollers

G Options

1	None
2	End Stops

NOTES:

(1) Contact factory for alternative retainers - Al, Brass and Plate
(2) Available 3 mm only
(3) Pact (anti-creep) per request

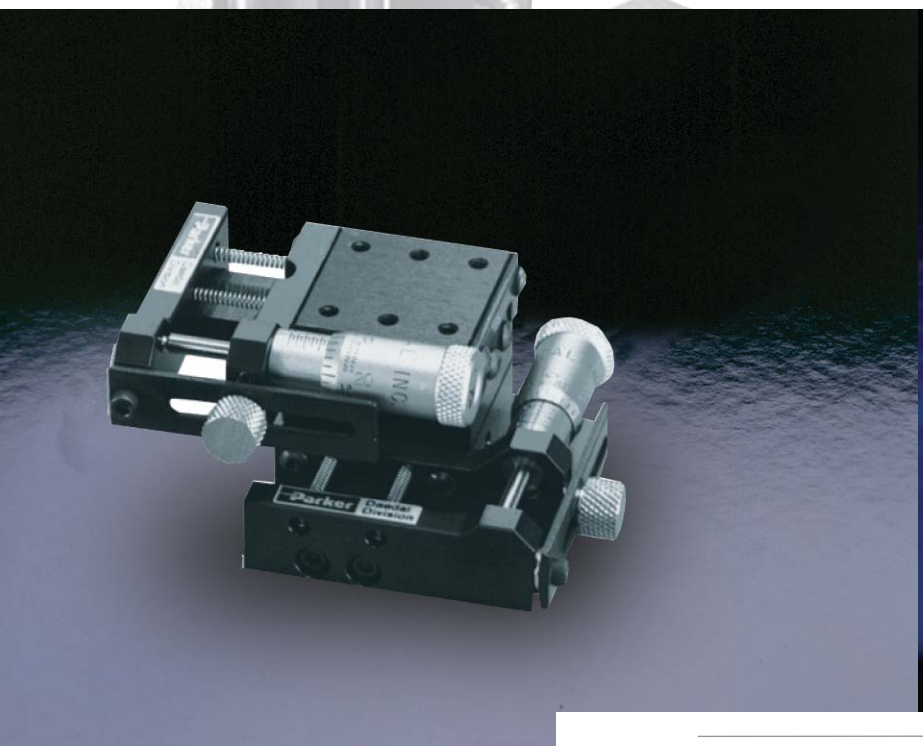
How to Order

Parker Bayside's Crossed Roller Series is supported by a worldwide network of offices and local distributors.
Call **1-800-305-4555** for application engineering assistance or for the name of your local distributor.
Information can also be obtained at **www.baysidemotion.com or www.parkermotion.com.**

Specifications are subject to change without notice.

Linear Positioning Stages:

Precision manual positioning with high resolution micrometers



- Precision Miniature Manual Positioners
- Digital or Standard Micrometers
- Multiaxis compatible
- Load Capacities over 200 lbs.

Linear Positioning Stages: Overview

Features

- **Aluminum top and base with precision ground mounting surfaces and black anodize protective finish**
- **Low friction linear adjustment with no backlash or sideplay**
- **Factory preloaded to provide dynamic stability and nimum runout**
- **Locking screw to positively lock stage without affecting position (standard on most models)**
- **Straightline accuracy of 0.00008 in/in of travel**
- **Selectable bearing systems: ball bearings for economy and cross roller bearings for greater load capacity**
- **Selectable drive mechanisms:**
  Micrometer (English or Metric)
  Fine screw (64 pitch)
  Differential screw
  Digital micrometers
- **Selectable drive locations: Center drive or Side drive (for space constraints)**

Parker precision linear stages provide controlled, precise point-to-point positioning along a linear axis. Stages are comprised of two basic components: a precision Parker linear slide (ball or cross roller), which serves as a linear bearing and guide, and a drive mechanism which accurately moves and positions the slide top along the linear axis.

Four types of drive mechanisms are available: a fine screw, a graduated micrometer, a digital micrometer, and a differential screw. The fine screw is used for fine resolution positioning.

A micrometer is used whenever a position readout is required. The differential screw is used for applications requiring extremely fine resolution positioning.

Positioning stages are available in a straight center-drive configuration or a side-drive configuration. They are offered in English or Metric versions.

Principles of Operation

The linear positioner operates in a simple manner: a drive screw is attached to the fixed slide base. The end of the drive screw rests against the end of the moveable top. There are two extended springs “pulling” the slide top toward the screw so that the top will always be held firmly against the screw end. When the screw is turned clockwise, it advances and pushes the slide top along the linear axis. When turned counterclockwise, the screw retracts and the slide top follows because of the spring pressure holding the top against the screw end. The result is a very smooth linear motion, accurately controlled by rotation of the drive mechanism.

Stage Series Selection Guide

Travel		Load Capacity		Width		Multi-Axis	Series		Page
inches	mm	lbs	kg	in	mm		English	Metric	Number
0.50	12.7	6	3	1.25	31.8	yes	3900	M3900	112
0.50	12.7	25	11	1.75	44.5	yes	4000	M4000	114
0.50	12.7	28	13	1.75	44.5	no	4100	M4100	114
0.50	12.7	40	18	1.75	44.5	no	4200	M4100	114
0.50	12.7	44	20	2.62	66.5	yes	4500	M4500	116
0.50	12.7	50	23	1.75	44.5	yes	CR4000	—	114
0.50	12.7	55	25	1.75	44.5	no	4300	M4300	114
0.50	12.7	56	25	1.75	44.5	no	CR4100	—	114
0.50	12.7	60	27	1.75	44.5	no	CR4200	—	114
0.50	12.7	64	29	2.62	66.5	yes	4600	M4600	122
0.50	12.7	88	40	2.62	66.5	yes	CR4500	—	116
0.50	12.7	95	43	2.62	66.5	yes	4700	M4700	122
0.50	12.7	100	45	1.75	44.5	no	CR4300	—	114
0.50	12.7	122	55	2.62	66.5	yes	4800	M4800	122
0.50	12.7	128	58	2.62	66.5	no	CR4600	—	122
0.50	12.7	190	86	2.62	66.5	no	CR4700	—	122
0.50	12.7	248	113	2.62	66.5	no	CR4800	—	122
1.00	25.4	25	11	1.75	44.5	yes	4000	M400	114
1.00	25.4	28	13	1.75	44.5	no	4100	M4100	114
1.00	25.4	40	18	1.75	44.5	no	4200	M4200	114
1.00	25.4	44	20	2.62	66.5	yes	4500	M4300	116
1.00	25.4	55	25	1.75	44.5	no	4300	—	114
1.00	25.4	56	25	1.75	44.5	no	CR4100	—	114
1.00	25.4	60	27	1.75	44.5	no	CR4200	—	114
1.00	25.4	64	29	2.62	66.5	yes	4600	M4600	122
1.00	25.4	88	40	2.62	66.5	yes	CR4500	—	116
1.00	25.4	95	43	2.62	66.5	yes	4700	M4700	122
1.00	25.4	95	43	5.00	127.0	yes	4400	M4400	114
1.00	25.4	100	45	1.75	44.5	no	CR4300	—	114
1.00	25.4	100	45	6.00	124.4	no	4900	M4900	124
1.00	25.4	120	55	5.00	127.0	yes	CR4400	—	114
1.00	25.4	122	55	2.62	66.5	yes	4800	M4800	122
1.00	25.4	128	58	2.62	66.5	no	CR4600	—	122
1.00	25.4	122	68	6.00	124.4	no	CR4900	—	124
1.00	25.4	190	86	2.62	66.5	no	CR4700	—	122
1.00	25.4	248	113	2.62	66.5	no	CR4800	—	122
2.00	50.8	95	43	5.00	127.0	yes	4400	M4400	114
2.00	50.8	100	45	6.00	124.4	no	4900	M4900	124
2.00	50.8	120	55	5.00	127.0	yes	CR4400	—	114
2.00	50.8	122	68	6.00	124.4	no	CR4900	—	124
4.00	101.6	100	45	6.00	124.4	no	4900	M4900	125
4.00	101.6	200	91	6.00	124.4	no	CR4900	—	125
6.00	124.4	110	50	6.00	124.4	no	4900	M4900	125
6.00	124.4	220	100	6.00	124.4	no	CR4900	—	125
8.00	203.2	120	55	6.00	124.4	no	4900	M4900	125
8.00	203.2	240	109	6.00	124.4	no	CR4900	—	125
10.00	254.0	130	59	6.00	124.4	no	4900	M4900	125
10.00	254.0	260	118	6.00	124.4	no	CR4900	—	125
12.00	304.8	112	64	6.00	124.4	no	4900	M4900	125
12.00	304.8	280	127	6.00	124.4	no	CR4900	—	125

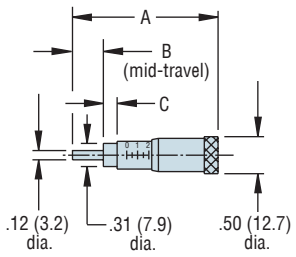
Drive Mechanisms

2D & 3D CAD files — Download from parkermotion.com

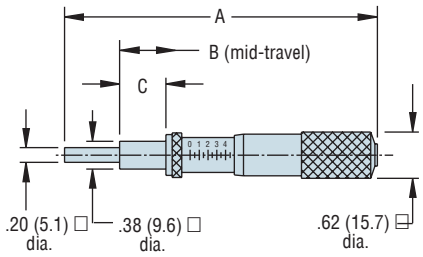
Parker positioning stages are offered with four types of drive mechanisms: graduated micrometer, digital micrometer, fine screw, and differential screw. These drives, shown here, are offered separately for use in any application requiring precisely controlled linear adjustment.

Graduated Micrometers

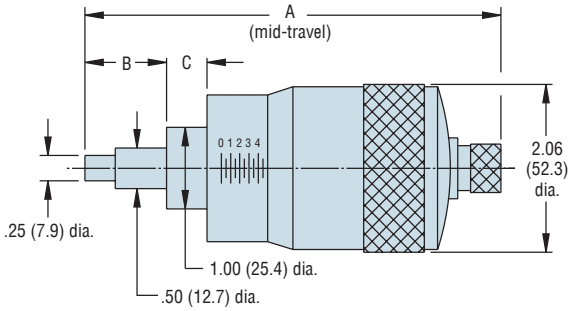
Model Number	Fig	Travel	Graduations	A	B	C
9511E	A	0.50 in	0.001 in	2.00 in	0.50 in	0.187 in
9511M	A	13 mm	0.01 mm	51 mm	13 mm	4.7 mm
9512E	B	0.50 in	0.001 in	2.61 in	0.05 in	0.375 in
9512M	B	13 mm	0.01 mm	66 mm	13 mm	9.5 mm
9524E	B	1.00 in	0.001 in	4.27 in	0.75 in	0.65 in
9524M	B	25 mm	0.01 mm	108 mm	19 mm	15.9 mm
9526E	B	2.00 in	0.001 in	6.18 in	1.25 in	0.625 in
9526M	B	50 mm	0.01 mm	129 mm	32 mm	15.9 mm
9531E	C	1.00 in	0.0001 in	5.12 in	0.88 in	0.55 in
9531M	C	25 mm	0.002 mm	130 mm	22 mm	14.2 mm
9532E	C	2.00 in	0.0001 in	7.13 in	1.46 in	0.55 in
9532M	C	50 mm	0.002 mm	130 mm	37 mm	14.2 mm



Mini-Micrometer
Figure A



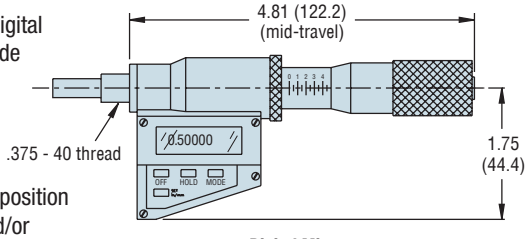
Standard Micrometer
Figure B



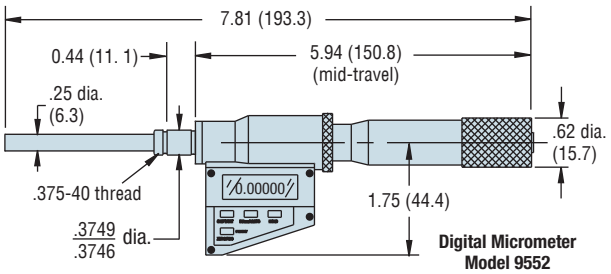
Large Thimble Micrometer
Figure C

These electronic digital micrometers provide an LCD readout to 0.00005 inch resolution.
Features:

- Zero set at any position
- Incremental and/or absolute positioning
- inch/mm setting



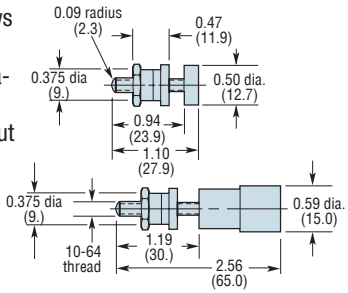
Digital Micrometer
Model 9551
1" Travel



Digital Micrometer
Model 9552
2" Travel

These steel adjustment screws feature a 64-pitch thread, making them ideal for applications where finer resolution is required, but positional readout is not.

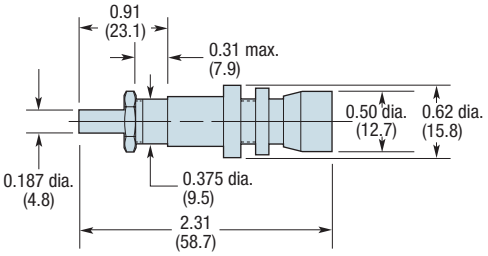
Model	Range
9570	0.75 in
9575	0.50 in



Fine Adjustment Screws
Models 9570, 9575

The 9560 differential screw offers two linear adjustment ranges in one unit: a coarse adjustment range of 0.31 in (8 mm) with a 48 pitch thread and a fine adjustment range of 0.078 in (2 mm) with a pitch equal to 336 threads per inch.

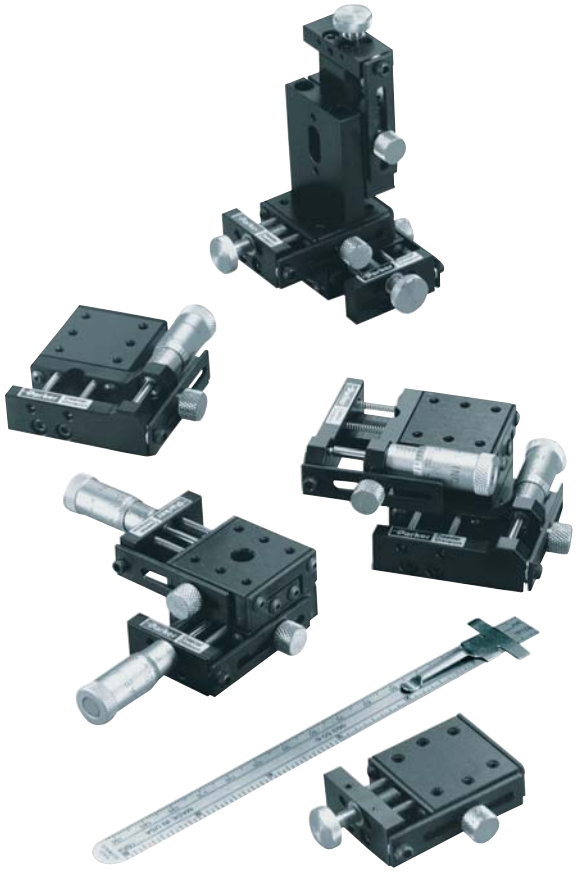
Model	Range
9560	0.75 in



Differential Screws
Models 9560

3900 Series (1.25 inches wide) Miniature Stages

The 3900 stages are ideal as single-or multi-axis units in space-restricted applications. These compact positioning stages feature a low-friction linear ball bearing system and two selectable drive mechanisms: a micrometer drive (English or Metric) offers fine adjustment with a graduated position readout; a 64-pitch fine screw drive offers increased sensitivity, for finer resolution control. A positive position lock, included as standard on all units, locks the stage carriage and prevents drift when the stage is idle.



Specifications	English	Metric
Travel - Maximum (selectable)	0.5 in	12.5 mm
Load Capacity:*		
Normal	6 lb – See table.	3 kg – See table.
Thrust T_a	10 lbs	4.5 kgs
T_b	3 lbs	1.4 kgs
Straightline Accuracy	0.00008 in (per inch of travel)	2 µm (per 25 mm travel)
Resolution/Graduations:		
English Micrometer	0.001 in	n/a
Metric Micrometer	n/a	0.01 mm
Fine Screw	64 pitch	0.4 mm

* Refer to linear slide component for moment load charts.

Selection Guide

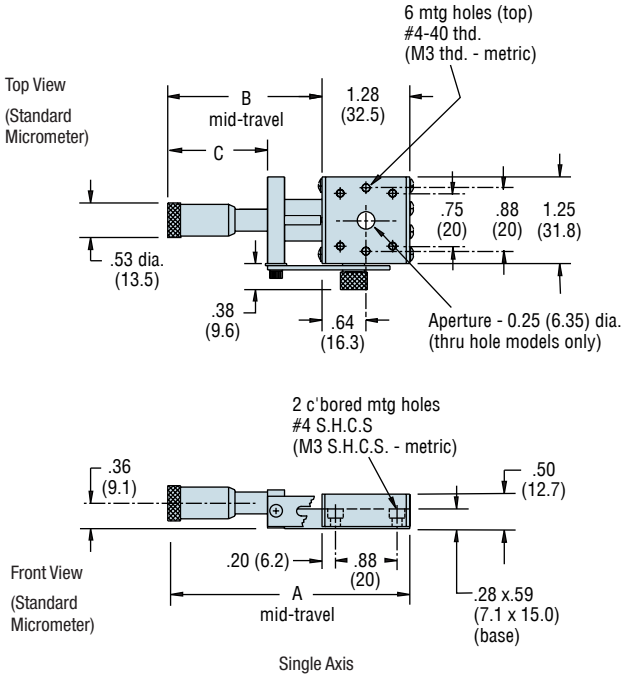
Description								Model Number*							
								Center Drive Models				Side Drive Models			
								Low Profile		Standard		Low Profile		Standard	
Type	Travel	Load Capacity	Drive Type (Normal)	Aperture	Linear Slide Number	Brg. Type	Unit Weight	1 Axis (X)	2 Axis (XY)	3 Axis (XYZ)	3 Axis (XYZ)	1 Axis (X)	2 Axis (XY)	3 Axis (XYZ)	3 Axis (XYZ)
English	0.50 in	6 lb	English Mic	no	3905	Ball	0.16 lb	3902	3922	3932	3942	3952	3972	3982	3992
English	0.50 in	6 lb	English Mic	yes	3901	Ball	0.16 lb	3906	3926	3936	3946	3956	3976	3986	3996
English	0.50 in	6 lb	Metric Mic	no	3905	Ball	0.16 lb	3902M	3922M	3932M	3942M	3952M	3972M	3982M	3992M
English	0.50 in	6 lb	Metric Mic	yes	3901	Ball	0.16 lb	3906M	3926M	3936M	3946M	3956M	3976M	3986M	3996M
English	0.50 in	6 lb	Fine Screw	no	3905	Ball	0.16 lb	3903	3923	3933	3943	—	—	—	—
English	0.50 in	6 lb	Fine Screw	yes	3901	Ball	0.16 lb	3907	3927	3937	3947	—	—	—	—
Metric	13 mm	3 kg	Metric Mic	no	M3905	Ball	0.078 kg	M3902M	M3922M	M3932M	M3942M	M3952M	M3972M	M3982M	M3992M
Metric	13 mm	3 kg	Metric Mic	yes	M3901	Ball	0.078 kg	M3906M	M3926M	M3936M	M3946M	M3956M	M3976M	M3986M	M3996M
Metric	13 mm	3 kg	Fine Screw	no	M3905	Ball	0.078 kg	M3903	M3923	M3933	M3943	—	—	—	—
Metric	13 mm	3 kg	Fine Screw	yes	M3901	Ball	0.078 kg	M3907	M3927	M3937	M3947	—	—	—	—

*Position lock is standard on all models.

Figure A Dimensions inches (mm)†

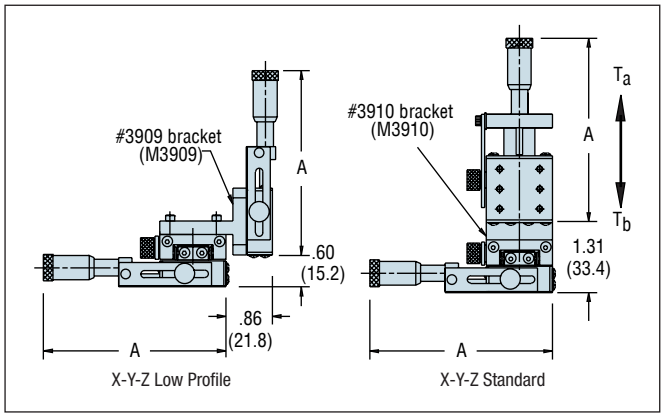
2D & 3D CAD files — Download from parkermotion.com

Center Drive



Single Axis

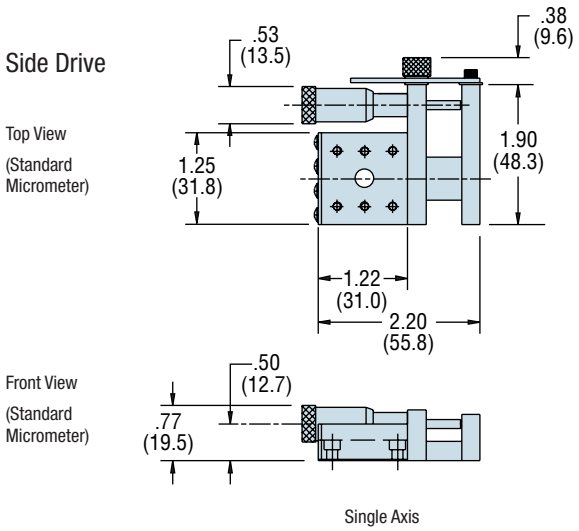
	English Mic. (in)	Metric Mic. (mm)	Fine Screw (in)
A	3.35	85.0	2.30
B	2.06	52.4	1.02
C	1.35	34.2	0.30



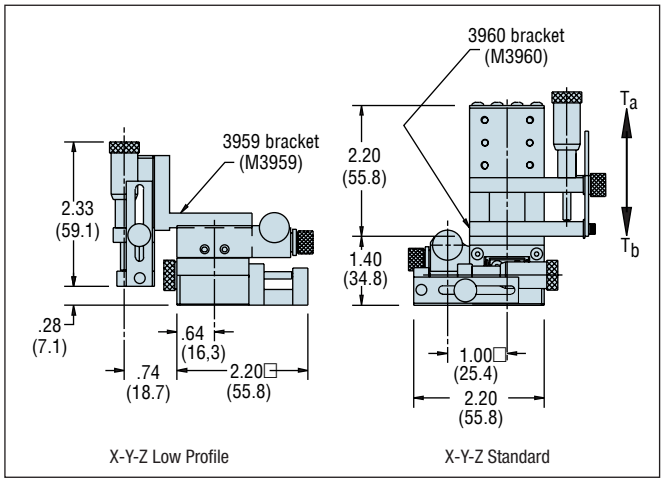
† Note: Values shown in parentheses are actual metric dimensions for metric models (not conversions).

Figure B – Dimensions inches (mm)†

Side Drive



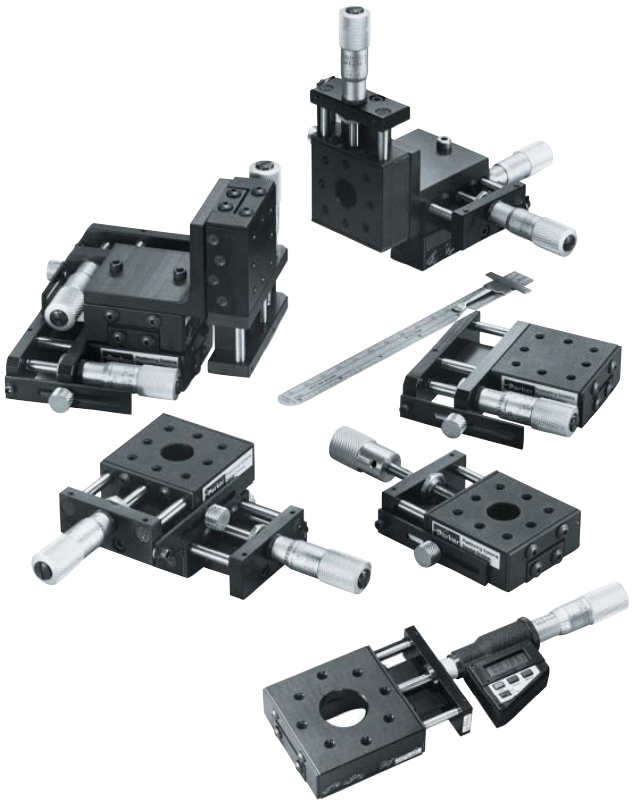
Single Axis



† Note: Values shown in parentheses are actual metric dimensions for metric models (not conversions).

4000 Series (1.75 inches wide) Square Face, Multi-Axis Stages

These positioning stages are larger, stronger, and offer more selectable features than the miniature stages. Their square geometry mounting surfaces permit easy “stacking” to form multi-axis units. Features include four drive mechanisms (micrometer, digital micro-meter, fine screw, and differential screw) and two bearing types (ball or cross roller).



Specifications	English	Metric
Travel - Maximum (selectable)	1.0 in	25 mm
Load Capacity:*		
Normal	50 lb – see table	11 kg – see table
Thrust T_a	10 lbs	4.5 kgs
T_b	5 lbs	2.3 kgs
Straightline Accuracy	0.00008 in (per inch of travel)	2 µm (per 25 mm travel)
Resolution/Graduations:		
English Micrometer	0.001 in	n/a
Metric Micrometer	n/a	0.01 mm
Digital Micrometer	0.00005 in	n/a
Fine Screw	64 pitch	n/a
Differential Screw:		
Coarse Adjustment	48 pitch	n/a
Fine Adjustment	336 pitch	n/a

* Refer to linear slide component for moment load charts.

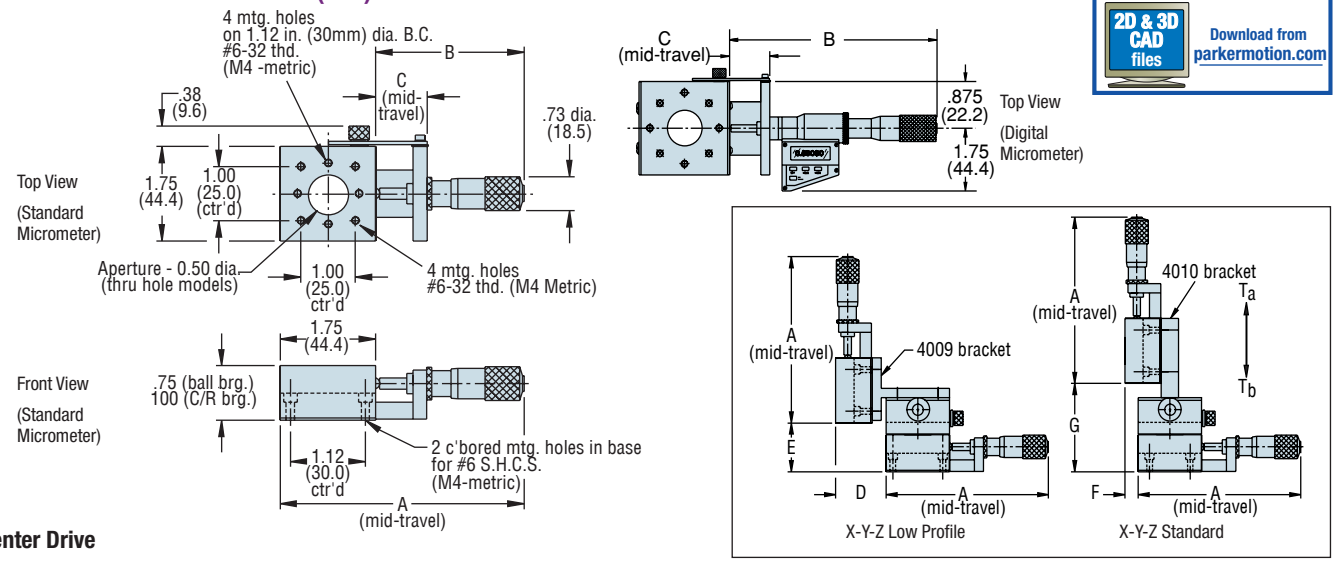
Selection Guide

Description								Model Number*							
								Center Drive Models				Side Drive Models			
										Low Profile	Standard			Low Profile	Standard
Type	Travel	Load Capacity	Drive Type (Normal)	Aperture	Linear Slide Number	Brg. Type	Unit Weight	1 Axis (X)	2 Axis (XY)	3 Axis (XYZ)	3 Axis (XYZ)	1 Axis (X)	2 Axis (XY)	3 Axis (XYZ)	3 Axis (XYZ)
English	0.30* in	25 lb	Diff. Screw	no	4001	Ball	0.5 lb	4002D	4022D	4032D	4042D	4052D	4072D	4082D	4092D
English	0.30* in	25 lb	Diff. Screw	yes	4005	Ball	0.5 lb	4006D	4026D	4036D	4046D	4056D	4076D	4086D	4096D
English	0.30* in	50 lb	Diff. Screw	no	CR4001	C/R	0.5 lb	CR4002D	CR4022D	CR4032D	CR4042D	CR4052D	CR4072D	CR4082D	CR4092D
English	0.50 in	25 lb	English Mic	no	4001	Ball	0.5 lb	4002	4022	4032	4042	4052	4072	4082	4092
English	0.50 in	25 lb	English Mic	yes	4005	Ball	0.5 lb	4006	4026	4036	4046	4056	4076	4086	4096
English	0.50 in	25 lb	Metric Mic	no	4001	Ball	0.5 lb	4002M	4022M	4032M	4042M	4052M	4072M	4082M	4092M
English	0.50 in	25 lb	Metric Mic	yes	4005	Ball	0.5 lb	4006M	4026M	4036M	4046M	4056M	4076M	4086M	4096M
English	0.50 in	50 lb	English Mic	no	CR4001	C/R	0.5 lb	CR4002	CR4022	CR4032	CR4042	CR4052	CR4072	CR4082	CR4092
English	0.50 in	50 lb	Metric Mic	no	CR4001	C/R	0.5 lb	CR4002M	CR4022M	CR4032M	CR4042M	CR4052M	CR4072M	CR4082M	CR4092M
English	0.75 in	25 lb	Fine Screw	no	4001	Ball	0.5 lb	4003	4023	4033	4043	4053	4073	4083	4093
English	0.75 in	25 lb	Fine Screw	yes	4005	Ball	0.5 lb	4007	4027	4037	4047	4057	4077	4087	4097
English	1.00 in	25 lb	English Mic	no	4001	Ball	0.5 lb	4004	4024	4034	4044	4054	4074	4084	4094
English	1.00 in	25 lb	Metric Mic	no	4001	Ball	0.5 lb	4004M	4024M	4034M	4044M	4054M	4074M	4084M	4094M
English	1.00 in	25 lb	Digital Mic	no	4001	Ball	1.0 lb	4004-DM	—	—	—	n/a	n/a	n/a	n/a
English	1.00 in	25 lb	Digital Mic	yes	4005	Ball	1.0 lb	4008-DM	—	—	—	n/a	n/a	n/a	n/a
English	1.00 in	50 lb	Digital Mic	no	CR4001	C/R	1.0 lb	CR4004-DM	—	—	—	n/a	n/a	n/a	n/a
Metric	13 mm	11 kg	Metric Mic	yes	M4001	Ball	0.23 kg	M4002M	M4022M	M4032M	M4042M	M4052M	M4072M	M4082M	M4092M
Metric	25 mm	11 kg	Digital Mic	yes	M4001	Ball	0.45 kg	M4004-DM	—	—	—	—	—	—	—
Metric	25 mm	11 kg	Metric Mic	yes	M4001	Ball	0.23 kg	M4004M	M4024M	M4034M	M4044M	M4054M	M4074M	M4084M	M4094M
Metric	13 mm	11 kg	Metric Mic	no	M4005	Ball	0.23 kg	M4006M	M4026M	M4036M	M4046M	M4056M	M4076	M4086M	M4096M
Metric	25 mm	11 kg	Digital Mic	no	M4005	Ball	0.45 kg	M4008-DM	—	—	—	n/a	n/a	n/a	n/a

* 0.3 in = coarse resolution range; 0.08 in = fine resolution range

*Position lock is standard on all models.

4000 Series Dimensions inches (mm)†



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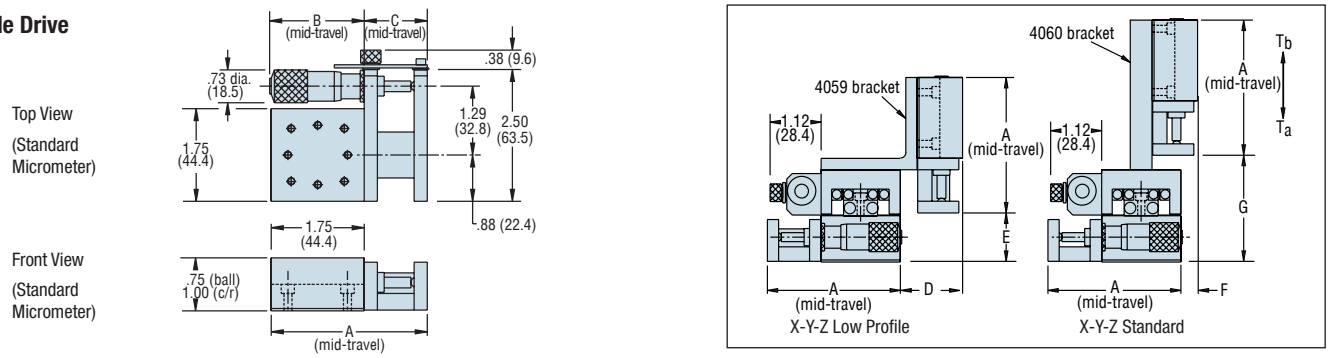
Center Drive

Side Drive



† Note: Values shown in parentheses are actual metric dimensions for metric models (not conversions).

Dimensions

Model Reference	Center Drive Models A	B	C	D	E	F	G		Side Drive Models A	B	C	D	E	F	G	Model Reference
4002D	4.12	2.37	0.88	1.12	0.9	0.12	1.88		2.87	1.44	1.19	1.12	0.68	0.12	1.88	4052D
4006D	4.12	2.37	0.88	1.12	0.9	0.12	1.88		2.87	1.44	1.19	1.12	0.68	0.12	1.88	4056D
CR4002D	4.12	2.37	0.88	1.36	1.30	0.36	2.37		2.87	1.73	1.19	1.38	0.94	0.38	2.38	CR4052D
4002	4.37	2.68	0.90	1.12	0.9	0.12	1.88		2.87	1.73	1.19	1.12	0.68	0.12	1.88	4052
4006	4.37	2.68	0.90	1.12	0.9	0.12	1.88		2.87	1.73	1.19	1.12	0.68	0.12	1.88	4056
4002M	4.37	2.68	0.90	1.12	0.9	0.12	1.88		2.87	1.73	1.19	1.12	0.68	0.12	1.88	4052M
4006M	4.37	2.68	0.90	1.12	0.9	0.12	1.88		2.87	1.73	1.19	1.12	0.68	0.12	1.88	4056M
CR4002	4.37	2.62	0.90	1.36	1.30	0.36	2.37		2.87	1.73	1.19	1.38	0.94	0.38	2.38	CR4052
CR4002M	4.37	2.62	0.90	1.36	1.30	0.36	2.37		2.87	1.73	1.19	1.38	0.94	0.38	2.38	CR4052M
4003	4.33	2.57	0.88	1.12	0.9	0.12	1.88		2.87	1.62	1.19	1.12	0.68	0.12	1.88	4053
4007	4.33	2.57	0.88	1.12	0.9	0.12	1.88		2.87	1.62	1.19	1.12	0.68	0.12	1.88	4057
4004	6.03	4.28	1.15	1.12	0.9	0.12	2.13		3.12	3.10	1.37	1.12	0.45	0.12	1.63	4054
4004M	6.03	4.28	1.15	1.12	0.9	0.12	2.13		3.12	3.10	1.37	1.12	0.45	0.12	1.63	4054M
4004-DM	7.74	5.99	1.18	—	—	—	—		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
4008-DM	7.74	5.99	1.18	—	—	—	—		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CR4004-DM	7.74	5.99	1.18	—	—	—	—	Inches	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
M4002M	111	68	23	28.5	22.6	3.1	47.8		72	44	30	33	15	3.0	47.8	M4052
M4004-DM	196.5	124.1	29.91	—	15.7	—	—		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
M4004M	125	109	29	28.5	22.6	3.1	54.1		115	79	36	28	11	3.0	47.8	M4054
M4006M	111	68	23	28.5	22.6	3.1	47.8		72	44	30	33	15	3.0	47.8	M4056
M4008-DM	196.5	124.1	29.91	—	15.7	—	—	Millimeters	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

4500 Series (2.62 inches wide) Square Face, Multi-Axis Stages

These positioning stages provide a larger mounting surface and greater load capacity than the 4000 Series stages. They are offered in a variety of selections, including English or Metric Style (size and mounting), two bearing types (ball or cross roller), and four drive mechanisms (micrometer, digital micrometer, fine screw, and differential screw). They can be ordered as single- or multi-axis units.

Specifications	English	Metric
Travel - Maximum (selectable)	1.0 in	25 mm
Load Capacity:*		
Normal	88 lb – See table.	20 kg – See table.
Thrust T_a	10 lbs	4.5 kgs
T_b	2 lbs	0.9 kgs
Straightline Accuracy	0.00008 in (per inch of travel)	2 µm (per 25 mm travel)
Resolution/Graduations:		
English Micrometer	0.001 in	n/a
Metric Micrometer	n/a	0.01 mm
Digital Micrometer	0.00005 in	0.001 mm
Fine Screw	64 pitch	n/a
Differential Screw:		
Coarse Adjustment	48 pitch	0.40 mm
Fine Adjustment	336 pitch	0.08 mm

* Refer to linear slide component for moment load charts.

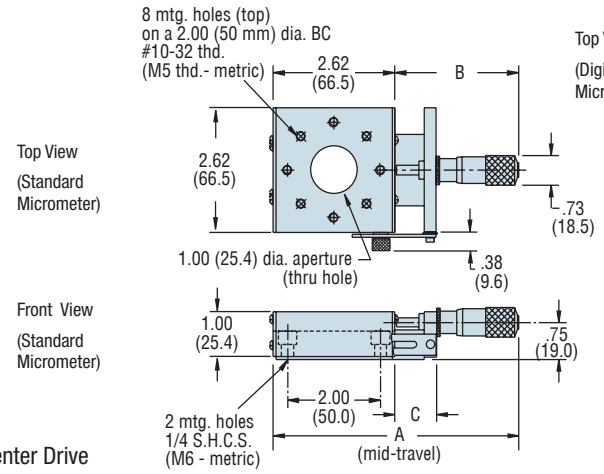
Selection Guide

Description									Model Number*							
							Unit Weight		Center Drive Models				Side Drive Models			
											Low Profile Standard				Low Profile Standard	
Type	Travel	Load Capacity	Drive Type (Normal)	Aperture	Slide Type	Linear Brg.	Center Drive	Side Drive	1 Axis (X)	2 Axis (XY)	3 Axis (XYZ)	3 Axis (XYZ)	1 Axis (X)	2 Axis (XY)	3 Axis (XYZ)	3 Axis (XYZ)
English	0.30*in	44 lb	Diff. Screw	no	4501	Ball	0.7 lb	0.9 lb	4502D	4522D	4532D	4542D	4552D	4572D	4582D	4592D
English	0.30*in	44 lb	Diff. Screw	yes	4505	Ball	0.7 lb	0.9 lb	4506D	4526D	4536D	4546D	4556D	4576D	4586D	4596D
English	0.30*in	88 lb	Diff. Screw	no	CR4501	C/R	0.9 lb	0.9 lb	CR4502D	CR4522D	CR4532D	CR4542D	CR4552D	CR4572D	CR4582M	CR4592D
English	0.50 in	44 lb	English Mic	no	4501	Ball	0.7 lb	0.9 lb	4502	4522	4532	4542	4552	4572	4582	4592
English	0.50 in	44 lb	English Mic	yes	4505	Ball	0.7 lb	0.9 lb	4506	4526	4536	4546	4556	4576	4586	4596
English	0.50 in	44 lb	Metric Mic	no	4501	Ball	0.7 lb	0.9 lb	4502M	4522M	4532M	4542M	4552M	4572M	4582M	4592M
English	0.50 in	44 lb	Metric Mic	yes	4505	Ball	0.7 lb	0.9 lb	4506M	4526M	4536M	4546M	4556M	4576M	4586M	4596M
English	0.50 in	88 lb	English Mic	no	CR4501	C/R	0.9 lb	1.0 lb	CR4502	CR4522	CR4532	CR4542	CR4552	CR4572	CR4582	CR4592
English	0.50 in	88 lb	English Mic	yes	CR4505	C/R	0.9 lb	1.0 lb	CR4506	CR4526	CR4536	CR4546	CR4556	CR4576	CR4586	CR4596
English	0.50 in	88 lb	Metric Mic	no	CR4501	C/R	0.9 lb	1.0 lb	CR4502M	CR4522M	CR4532M	CR4542M	CR4552M	CR4572M	CR4582M	CR4592M
English	0.50 in	88 lb	Metric Mic	yes	CR4505	C/R	0.9 lb	1.0 lb	CR4506M	CR4526M	CR4536M	CR4546M	CR4556M	CR4576M	CR4586M	CR4596M
English	0.75 in	44 lb	Fine Screw	no	4501	Ball	0.7 lb	0.9 lb	4503	4523	4533	4543	4553	4573	4583	4593
English	0.75 in	44 lb	Fine Screw	yes	4505	Ball	0.7 lb	0.9 lb	4507	4527	4537	4547	4557	4577	4587	4597
English	1.00 in	44 lb	English Mic	no	4501	Ball	0.7 lb	0.9 lb	4504	4524	4534	4544	4554	4574	4584	4594
English	1.00 in	44 lb	Metric Mic	no	4501	Ball	0.7 lb	0.9 lb	4504M	4524M	4534M	4544M	4554M	4574M	4584M	4594M
English	1.00 in	44 lb	Digital Mic	no	4501	Ball	1.6 lb	n/a	4504-DM	—	—	—	n/a	n/a	n/a	n/a
English	1.00 in	44 lb	Digital Mic	yes	4505	Ball	1.5 lb	n/a	4508-DM	—	—	—	n/a	n/a	n/a	n/a
English	1.00 in	88 lb	English Mic	no	CR4501	C/R	0.9 lb	1.0 lb	CR4504	CR4524	CR4534	CR4544	CR4554	CR4574	CR4584	CR4594
English	1.00 in	88 lb	Metric Mic	no	CR4501	C/R	0.9 lb	1.0 lb	CR4504M	CR4524M	CR4534M	CR4544M	CR4554M	CR4574M	CR4584M	CR4594M
Metric	13 mm	20 kg	Metric Mic	no	M4501	Ball	0.33 kg	0.42 kg	M4502M	M4522M	M4532M	M4542M	M4552M	M4572M	M4582M	M4592M
Metric	25 mm	20 kg	Digital Mic	no	M4501	Ball	0.63 kg	n/a	M4504-DM	—	—	—	—	—	—	—
Metric	25 mm	20 kg	Metric Mic	no	M4501	Ball	0.33 kg	0.42 kg	M4504M	M4524M	M4534M	M4544M	M4554M	M4574M	M4584M	M4594M
Metric	13 mm	20 kg	Metric Mic	yes	M4505	Ball	0.33 kg	0.42 kg	M4506M	M4526M	M4536M	M4546M	M4556M	M4576M	M4586M	M4596M
Metric	25 mm	20 kg	Digital Mic	yes	M4505	Ball	0.63 kg	n/a	M4508-DM	—	—	—	n/a	n/a	n/a	n/a

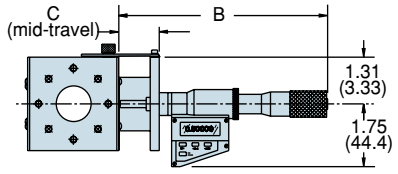
* 0.3 in= coarse resolution range; 0.08 in= fine resolution range

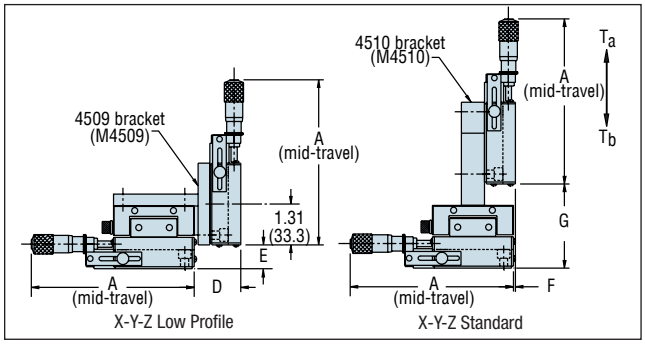
*Position lock is standard on all models.

4500 Series Dimensions inches (mm)†

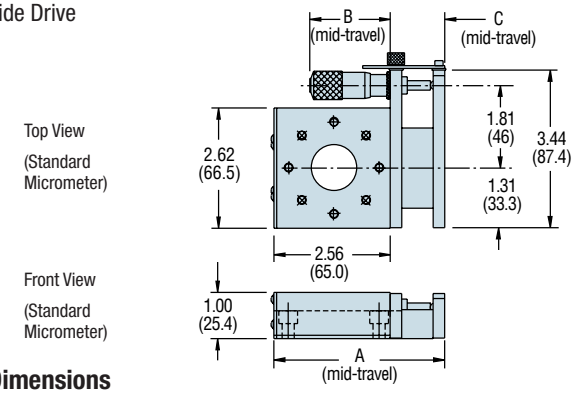


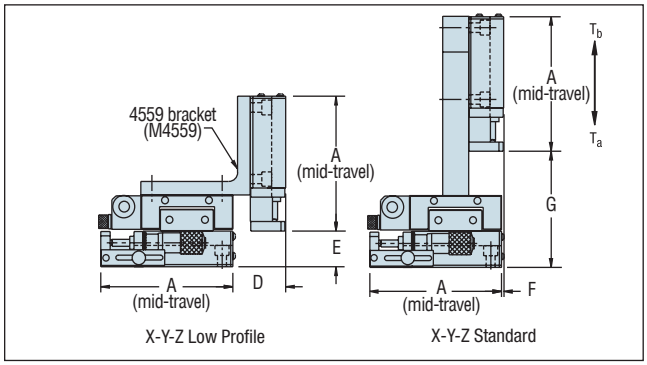
Center Drive





Side Drive





† Note: Values shown in parentheses are actual metric dimensions for metric models (not conversions).

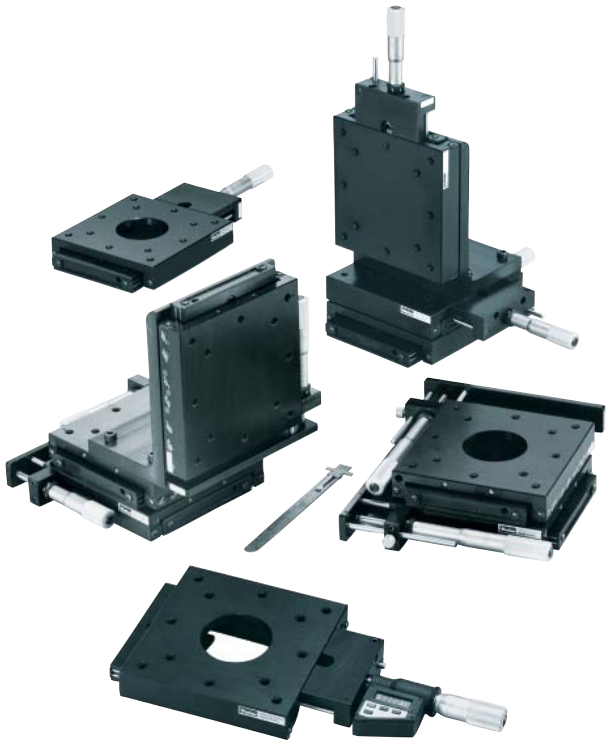
Dimensions

Model Reference	Center Drive Models A	B	C	D	E	F	G		Side Drive Models A	B	C	D	E	F	G	Model Reference
4502D	5.00	2.37	0.9	1.50	1.12	.06	2.70		3.75	1.44	1.19	1.50	1.00	.06	3.25	4552D
4506D	5.00	2.37	0.9	1.50	1.12	.06	2.70		3.75	1.44	1.19	1.50	1.00	.06	3.25	4556D
CR4502D	5.00	2.37	0.9	1.50	1.12	.06	2.70		3.75	1.44	1.19	1.50	0.94	.06	3.17	CR4552D
4502	5.25	2.62	0.9	1.50	1.12	.06	2.70		3.75	1.73	1.19	1.50	1.00	.06	3.25	4552
4506	5.25	2.62	0.9	1.50	1.12	.06	2.70		3.75	1.73	1.19	1.50	1.00	.06	3.25	4556
4502M	5.25	2.62	0.9	1.50	1.12	.06	2.70		3.75	1.73	1.19	1.50	1.00	.06	3.25	4552M
4506M	5.25	2.62	0.9	1.50	1.12	.06	2.70		3.75	1.73	1.19	1.50	1.00	.06	3.25	4556M
CR4502	5.25	2.62	0.9	1.50	1.12	.06	2.70		3.75	1.73	1.19	1.50	0.94	.06	3.17	CR4552
CR4506	5.25	2.62	0.9	1.50	1.12	.06	2.70		3.75	1.73	1.19	1.50	0.94	.06	3.17	CR4556
CR4502M	5.25	2.62	0.9	1.50	1.12	.06	2.70		3.75	1.73	1.19	1.50	0.94	.06	3.17	CR4552M
CR4506M	5.25	2.62	0.9	1.50	1.12	.06	2.70		3.75	1.73	1.19	1.50	0.94	.06	3.17	CR4556M
4503	5.12	2.50	0.9	1.50	1.12	.06	2.70		3.75	1.44	1.19	1.50	1.00	.06	3.25	4553
4507	5.12	2.50	0.9	1.50	1.12	.06	2.70		3.75	1.44	1.19	1.50	1.00	.06	3.25	4557
4504	6.90	4.28	1.18	1.50	1.12	.06	2.70		4.03	3.10	1.47	1.50	1.00	.06	2.12	4554
4504M	6.90	4.28	1.18	1.50	1.12	.06	2.70		4.03	3.01	1.47	1.50	1.00	.06	2.12	4554M
4504-DM	8.62	6.00	1.18	—	—	—	—		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
4508-DM	8.62	6.00	1.18	—	—	—	—		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CR4504	6.90	4.28	1.18	1.50	1.12	.06	2.70		4.03	3.10	1.47	1.50	1.00	.06	2.12	CR4554
CR4504M	6.90	4.28	1.18	1.50	1.12	.06	2.70		4.03	3.01	1.47	1.50	1.00	.06	2.12	CR4554M
M4502M	133	67	23	38.1	28.4	1.5	68.6		95	44	30	38.1	25.4	1.5	82.6	M4552M
M4504-DM	219	124	30	—	—	—	—		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
M4504M	175	109	30	38.1	28.4	1.5	68.6		102	79	37	38.1	25.4	1.5	82.6	M4554M
M4506M	133	67	23	38.1	28.4	1.5	68.6		95	44	30	38.1	25.4	1.5	82.6	M4556M
M4508-DM	219	124	30	—	—	—	—		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Inches / Millimeters

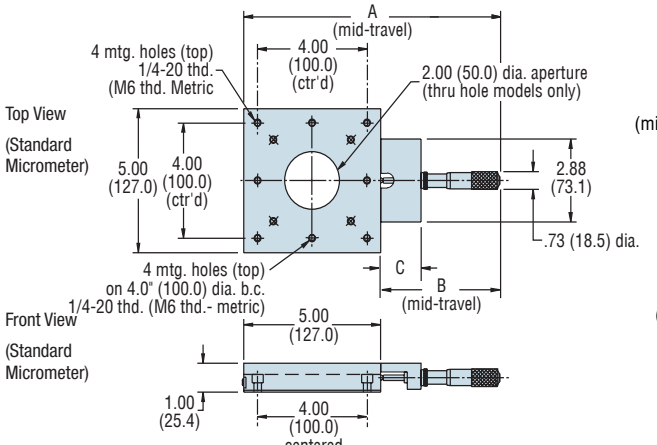
4400 Series (5.0 inches wide) Square Face, Multi-Axis Stages

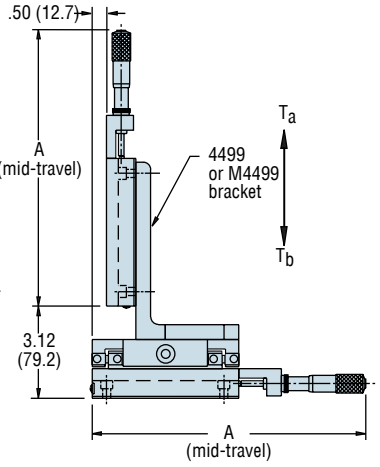
The 4400 positioning stage provides a large five-inch-square mounting surface on a relatively low profile (1.0 inch) and can be selected with or without a two-inch-diameter clear aperture. The 4400 series offers a variety of selections, including English or Metric Style (size and mounting), two bearing types (ball or cross roller), and three drive mechanisms (English micrometer, Metric micrometer or digital micrometer). Position locks are also available as a separate option when ordering. Three-axes units can precisely lift payloads weighing up to thirty pounds.



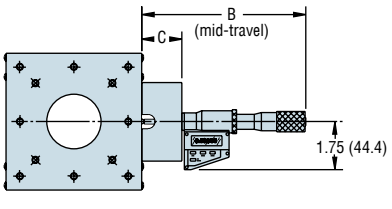
Specifications	English	Metric
Travel - Maximum (selectable)	2.0 in	50 mm
Load Capacity:*		
Normal	95 lb – See table.	43 kg – See table.
Thrust T_a	2.5 lbs	1.1 kgs
T_b	30 lbs	13.5 kgs
Straightline Accuracy	0.00008 in (per inch of travel)	2 µm (per 25 mm travel)
Resolution/Graduations:		
English Micrometer	0.001 in	n/a
Metric Micrometer	n/a	0.01 mm
Digital Micrometer	0.00005 in	0.001 mm

* Refer to linear slide component for moment load charts.





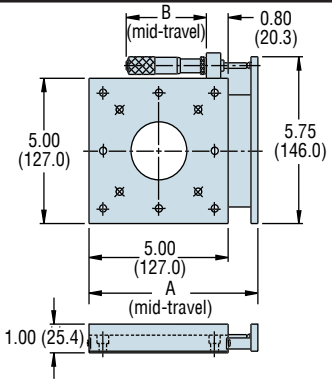
3 Axis X-Y-Z

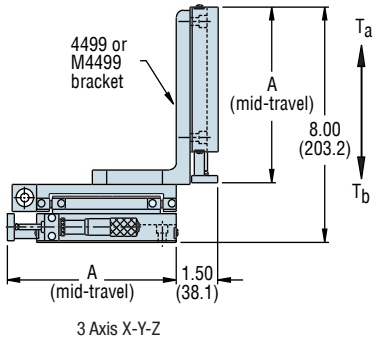


Top View
(Digital Micrometer)

Center Drive inches (mm)†

Side Drive inches (mm)†





3 Axis X-Y-Z

† Note: Values shown in parentheses are actual metric dimensions for metric models (not conversions).

4400 Series Model Selection Guide

Description								Center Drive Models						Side Drive Models				
								Model Number			Dimensions			Model Number			Dimensions	
Type	Travel	Load Capacity	Mic Type	Aperture	Slide (Ref.)	Brg. Type	Unit Wt.	1 Axis (X)	2 Axis (XY)	3 Axis (XYZ)	A	B	C	1 Axis (X)	2 Axis (XY)	3 Axis (XYZ)	A	B
English	1.0 in	95 lb	English Mic	no	4410	Ball	2.7 lb	4411	4421	4431	9.28	4.28	1.47	4416	4426	4436	6.0	2.88
English	1.0 in	95 lb	English Mic	yes	4450	Ball	2.7 lb	4451	4461	4471	9.28	4.28	1.47	4456	4466	4476	6.0	2.88
English	1.0 in	95 lb	Metric Mic	no	4410	Ball	2.7 lb	4413	4423	4433	9.28	4.28	1.47	4418	4428	4438	6.0	2.88
English	1.0 in	95 lb	Metric Mic	yes	4450	Ball	2.7 lb	4453	4463	4473	9.28	4.28	1.47	4458	4468	4478	6.0	2.88
English	1.0 in	95 lb	Digital Mic	no	4410	Ball	3.1 lb	4410-DM	—	—	11.28	6.28	1.47	—	—	—	—	—
English	1.0 in	95 lb	Digital Mic	yes	4450	Ball	3.1 lb	4450-DM	—	—	11.28	6.28	1.47	—	—	—	—	—
English	1.0 in	120 lb	English Mic	no	CR4410	C/R	2.7 lb	CR4411	CR4421	CR4431	9.28	4.28	1.47	CR4416	CR4426	CR4436	6.0	2.88
English	1.0 in	120 lb	English Mic	yes	CR4450	C/R	2.7 lb	CR4451	CR4461	CR4471	9.28	4.28	1.47	CR4456	CR4466	CR4476	6.0	2.88
English	1.0 in	120 lb	Metric Mic	no	CR4410	C/R	2.7 lb	CR4413	CR4423	CR4433	9.28	4.28	1.47	CR4418	CR4428	CR4438	6.0	2.88
English	1.0 in	120 lb	Metric Mic	yes	CR4450	C/R	2.7 lb	CR4453	CR4463	CR4473	9.28	4.28	1.47	CR4458	CR4468	CR4478	6.0	2.88
English	1.0 in	120 lb	Digital Mic	no	CR4410	C/R	3.1 lb	CR4411-DM	—	—	11.28	6.28	1.47	—	—	—	—	—
English	1.0 in	120 lb	Digital Mic	yes	CR4450	C/R	3.1 lb	CR4451-DM	—	—	11.28	6.28	1.47	—	—	—	—	—
English	2.0 in	95 lb	English Mic	no	4410	Ball	2.7 lb	4412	4422	4432	11.28	6.28	2.00	4417	4427	4437	6.5	4.38
English	2.0 in	95 lb	English Mic	yes	4450	Ball	2.7 lb	4452	4462	4472	11.28	6.28	2.00	4457	4467	4477	6.5	4.38
English	2.0 in	95 lb	Metric Mic	no	4410	Ball	2.7 lb	4414	4424	4434	11.28	6.28	2.00	4419	4429	4439	6.5	4.38
English	2.0 in	95 lb	Metric Mic	yes	4450	Ball	2.7 lb	4454	4464	4474	11.28	6.28	2.00	4459	4469	4479	6.5	4.38
English	2.0 in	95 lb	Digital Mic	no	4410	Ball	3.1 lb	4412-DM	—	—	12.81	7.81	2.00	—	—	—	—	—
English	2.0 in	95 lb	Digital Mic	yes	4450	Ball	3.1 lb	4452-DM	—	—	12.81	7.81	2.00	—	—	—	—	—
English	2.0 in	120 lb	English Mic	no	CR4410	C/R	2.7 lb	CR4412	CR4422	CR4432	11.28	6.28	2.00	CR4417	CR4427	CR4437	6.5	4.38
English	2.0 in	120 lb	English Mic	yes	CR4450	C/R	2.7 lb	CR4452	CR4462	CR4472	11.28	6.28	2.00	CR4457	CR4467	CR4477	6.5	4.38
English	2.0 in	120 lb	Metric Mic	no	CR4410	C/R	2.7 lb	CR4414	CR4424	CR4434	11.28	6.28	2.00	CR4419	CR4429	CR4439	6.5	4.38
English	2.0 in	120 lb	Metric Mic	yes	CR4450	C/R	3.1 lb	CR4454	CR4464	CR4474	11.28	6.28	2.00	CR4459	CR4469	CR4479	6.5	4.38
English	2.0 in	120 lb	Digital Mic	no	CR4410	C/R	3.1 lb	CR4412-DM	—	—	12.81	7.81	2.00	—	—	—	—	—
English	2.0 in	120 lb	Digital Mic	yes	CR4450	C/R	3.1 lb	CR4452-DM	—	—	12.81	7.81	2.00	—	—	—	—	—
Metric	25 mm	43 kg	Metric Mic	no	4410	Ball	1.2 kg	M4413	M4423	M4433	236	109	38	M4418	M4428	M4438	124	73
Metric	25 mm	43 kg	Metric Mic	yes	4450	Ball	1.2 kg	M4453	M4463	M4473	236	109	38	M4458	M4468	M4478	124	73
Metric	50 mm	43 kg	Metric Mic	no	4410	Ball	1.2 kg	M4414	M4424	M4434	286	131	50	M4419	M4429	M4439	165	111
Metric	50 mm	43 kg	Metric Mic	yes	4450	Ball	1.2 kg	M4454	M4464	M4474	286	131	50	M4459	M4469	M4479	165	111
Metric	25 mm	43 kg	Digital Mic	no	4410	Ball	1.4 kg	M4410-DM	—	—	286	131	50	—	—	—	—	—
Metric	25 mm	43 kg	Digital Mic	yes	4450	Ball	1.4 kg	M4450-DM	—	—	286	131	50	—	—	—	—	—
Metric	50 mm	43 kg	Digital Mic	no	4410	Ball	1.4 kg	M4412-DM	—	—	—	—	—	—	—	—	—	—
Metric	50 mm	43 kg	Digital Mic	yes	4450	Ball	1.4 kg	M4452-DM	—	—	—	—	—	—	—	—	—	—

NOTE: For the optional position lock, add "-L" to the desired part number when ordering.
Available on all models except the digital micrometer (-DM).

4100, 4200, 4300 Series (1.75 inches wide) Extended Length Stages

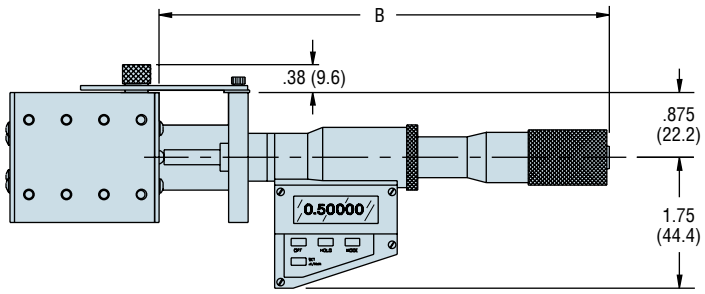
These positioning stages are longer versions of the 4000 series square faced linear positioners. Their extended length permit more rolling elements in the bearing system which provides increased load capacity with the same cross section. Like the 4000 series, they offer three drive mechanisms (micrometer, digital micrometer, and fine screw) and two bearing types (ball or cross roller).

Specifications	English	Metric
Travel - Maximum (selectable)	1.0 in	25 mm
Load Capacity:*		
Normal	100 lb – See table.	25 kg – See table.
Thrust T_a	10 lbs	4.5 kgs
T_b	3 lbs	1.4 kgs
Straightline Accuracy	0.00008 in (per inch of travel)	2 µm (per 25 mm travel)
Resolution/Graduations:		
English Micrometer	0.001 in	n/a
Metric Micrometer	n/a	0.01 mm
Digital Micrometer	0.00005 in	0.001 mm
Fine Screw	64 pitch	n/a mm

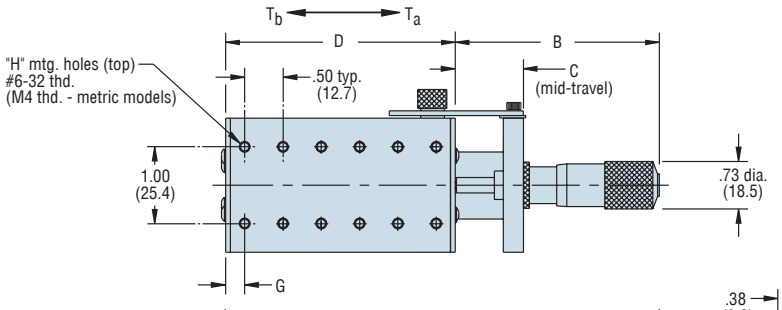
* Refer to linear slide component for moment load charts.

Dimensions inches (mm)†

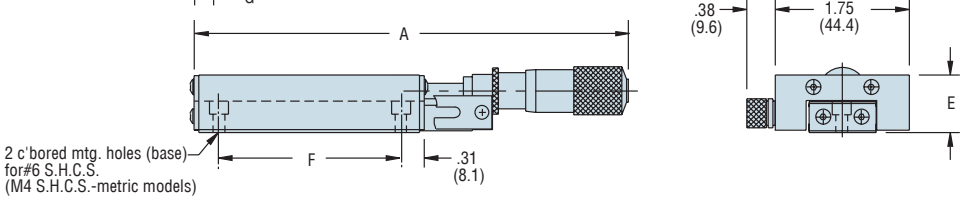
Top View
Digital
Micrometer



Top View
(Standard
Micrometer)



Front View
(Standard
Micrometer)



† Note: Values shown in parentheses are actual metric dimensions for metric models (not conversions).

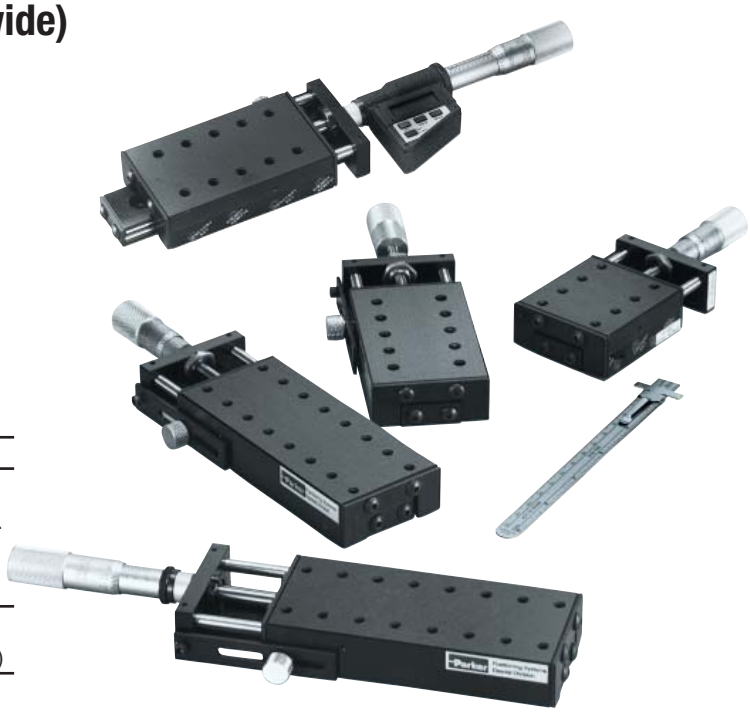
Model Selection Guide

Description								Dimensions								
Type	Travel	Load Capacity	Drive Type	Linear Slide Number	Bearing Type	Unit Weight	Model Number*	A	B	C	D	E	F	G	H	
English	0.50 in	28 lb	English Mic	4101	Ball	0.5 lb	4102	4.62	2.62	0.93	2.0	0.75	1.38	0.25	8	Inches
English	0.50 in	28 lb	Metric Mic	4101	Ball	0.5 lb	4102M	4.62	2.62	0.93	2.0	0.75	1.38	0.25	8	
English	0.50 in	40 lb	English Mic	4201	Ball	0.6 lb	4202	5.62	2.62	0.93	3.0	0.75	2.38	0.25	12	
English	0.50 in	40 lb	Metric Mic	4201	Ball	0.6 lb	4202M	5.62	2.62	0.93	3.0	0.75	2.38	0.25	12	
English	0.50 in	55 lb	English Mic	4301	Ball	0.8 lb	4302	6.62	2.62	0.93	4.0	0.75	3.38	0.25	16	
English	0.50 in	55 lb	Metric Mic	4301	Ball	0.8 lb	4302M	6.62	2.62	0.93	4.0	0.75	3.38	0.25	16	
English	0.50 in	56 lb	English Mic	CR4101	C/R	0.5 lb	CR4102	4.62	2.62	0.93	2.0	1.00	1.38	0.25	8	
English	0.50 in	56 lb	Metric Mic	CR4101	C/R	0.5 lb	CR4102M	4.62	2.62	0.93	2.0	1.00	1.38	0.25	8	
English	0.50 in	60 lb	English Mic	CR4201	C/R	0.8 lb	CR4202	5.62	2.62	0.93	3.0	1.00	2.38	0.25	12	
English	0.50 in	60 lb	Metric Mic	CR4201	C/R	0.8 lb	CR4202M	5.62	2.62	0.93	3.0	1.00	2.38	0.25	12	
English	0.50 in	100 lb	English Mic	CR4301	C/R	1.0 lb	CR4302	6.62	2.62	0.93	4.0	1.00	3.38	0.25	16	
English	0.50 in	100 lb	Metric Mic	CR4301	C/R	1.0 lb	CR4302M	6.62	2.62	0.93	4.0	1.00	3.38	0.25	16	
English	0.75 in	28 lb	Fine Screw	4101	Ball	0.5 lb	4103	4.50	2.50	0.88	2.0	0.75	1.38	0.25	8	
English	0.75 in	40 lb	Fine Screw	4201	Ball	0.6 lb	4203	5.50	2.50	0.88	3.0	0.75	2.38	0.25	12	
English	0.75 in	55 lb	Fine Screw	4301	Ball	0.8 lb	4303	6.50	2.50	0.88	4.0	0.75	3.38	0.25	16	
English	0.75 in	56 lb	Fine Screw	CR4101	C/R	0.5 lb	CR4103	4.50	2.50	0.88	2.0	1.00	1.38	0.25	8	
English	0.75 in	60 lb	Fine Screw	CR4201	C/R	0.8 lb	CR4203	5.50	2.50	0.88	3.0	1.00	2.38	0.25	12	
English	0.75 in	100 lb	Fine Screw	CR4301	C/R	1.0 lb	CR4303	6.50	2.50	0.88	4.0	1.00	3.38	0.25	16	
English	1.00 in	28 lb	English Mic	4101	Ball	0.5 lb	4104	6.28	4.28	1.18	2.0	0.75	1.38	0.25	8	
English	1.00 in	28 lb	Metric Mic	4101	Ball	0.5 lb	4104M	6.28	4.28	1.18	2.0	0.75	1.38	0.25	8	
English	1.00 in	28 lb	Digital Mic	4101	Ball	0.9 lb	4104-DM	8.0	6.0	1.18	2.0	0.75	1.38	0.25	8	
English	1.00 in	40 lb	English Mic	4201	Ball	0.6 lb	4204	7.28	4.28	1.18	3.0	0.75	2.38	0.25	12	
English	1.00 in	40 lb	Metric Mic	4201	Ball	0.6 lb	4204M	7.28	4.28	1.18	3.0	0.75	2.38	0.25	12	
English	1.00 in	40 lb	Digital Mic	4201	Ball	1.0 lb	4204-DM	9.0	6.0	1.18	3.0	0.75	2.38	0.25	12	
English	1.00 in	55 lb	English Mic	4301	Ball	0.8 lb	4304	8.28	4.28	1.18	4.0	0.75	3.38	0.25	16	
English	1.00 in	55 lb	Metric Mic	4301	Ball	0.8 lb	4304M	8.28	4.28	1.18	4.0	0.75	3.38	0.25	16	
English	1.00 in	55 lb	Digital Mic	4301	Ball	1.3 lb	4304-DM	10.0	6.0	1.18	4.0	0.75	3.38	0.25	16	
English	1.00 in	56 lb	English Mic	CR4101	C/R	0.5 lb	CR4104	6.28	4.28	1.18	2.0	1.0	1.38	0.25	8	
English	1.00 in	56 lb	Metric Mic	CR4101	C/R	0.5 lb	CR4104M	6.28	4.28	1.18	2.0	1.0	1.38	0.25	8	
English	1.00 in	56 lb	Digital Mic	CR4101	C/R	1.0 lb	CR4104-DM	8.0	6.0	1.18	2.0	1.0	1.38	0.25	8	
English	1.00 in	60 lb	English Mic	CR4201	C/R	0.8 lb	CR4204	7.28	4.28	1.18	3.0	1.0	2.38	0.25	12	
English	1.00 in	60 lb	Metric Mic	CR4201	C/R	0.8 lb	CR4204M	7.28	4.28	1.18	3.0	1.0	2.38	0.25	12	
English	1.00 in	60 lb	Digital Mic	CR4201	C/R	1.1 lb	CR4204-DM	9.0	6.0	1.18	3.0	1.0	2.38	0.25	12	
English	1.00 in	100 lb	English Mic	CR4301	C/R	1.0 lb	CR4304	8.28	4.28	1.18	4.0	1.0	3.38	0.25	16	
English	1.00 in	100 lb	Metric Mic	CR4301	C/R	1.0 lb	CR4304M	8.28	4.28	1.18	4.0	1.0	3.38	0.25	16	
English	1.00 in	100 lb	Digital Mic	CR4301	C/R	1.3 lb	CR4304-DM	10.0	6.0	1.18	4.0	1.0	3.38	0.25	16	
Metric	13 mm	13 kg	Metric Mic	M4101	Ball	0.2 kg	M4102M	117.3	66.5	23.6	50.8	19.0	35.0	12.9	6	Millimeters
Metric	13 mm	18 kg	Metric Mic	M4201	Ball	0.3 kg	M4202M	114.7	66.5	23.6	76.2	19.0	60.0	13.1	10	
Metric	13 mm	25 kg	Metric Mic	M4301	Ball	0.4 kg	M4302M	168.1	66.5	23.6	101.6	19.0	85.0	13.3	14	
Metric	25 mm	13 kg	Metric Mic	M4101	Ball	0.2 kg	M4104M	131.5	108.7	29.9	50.8	19.0	35.0	12.9	6	
Metric	25 mm	13 kg	Digital Mic	M4101	Ball	0.4 kg	M4104-DM	202.9	124.1	29.9	50.8	19.0	35.0	12.9	6	
Metric	25 mm	18 kg	Metric Mic	M4201	Ball	0.3 kg	M4204M	184.9	108.7	29.9	76.2	19.0	60.0	13.1	10	
Metric	25 mm	18 kg	Digital Mic	M4201	Ball	0.5 kg	M4204-DM	228.3	124.1	29.9	76.2	19.0	60.0	13.1	10	
Metric	25 mm	25 kg	Metric Mic	M4301	Ball	0.4 kg	M4304M	210.3	108.7	29.9	101.6	19.0	85.0	13.3	14	
Metric	25 mm	25 kg	Digital Mic	M4301	Ball	0.6 kg	M4304-DM	253.7	124.1	29.9	101.6	19.0	85.0	13.3	14	

***Position lock is standard on all models.**

4600, 4700, 4800 Series (2.62 inches wide) Extended Length Stages

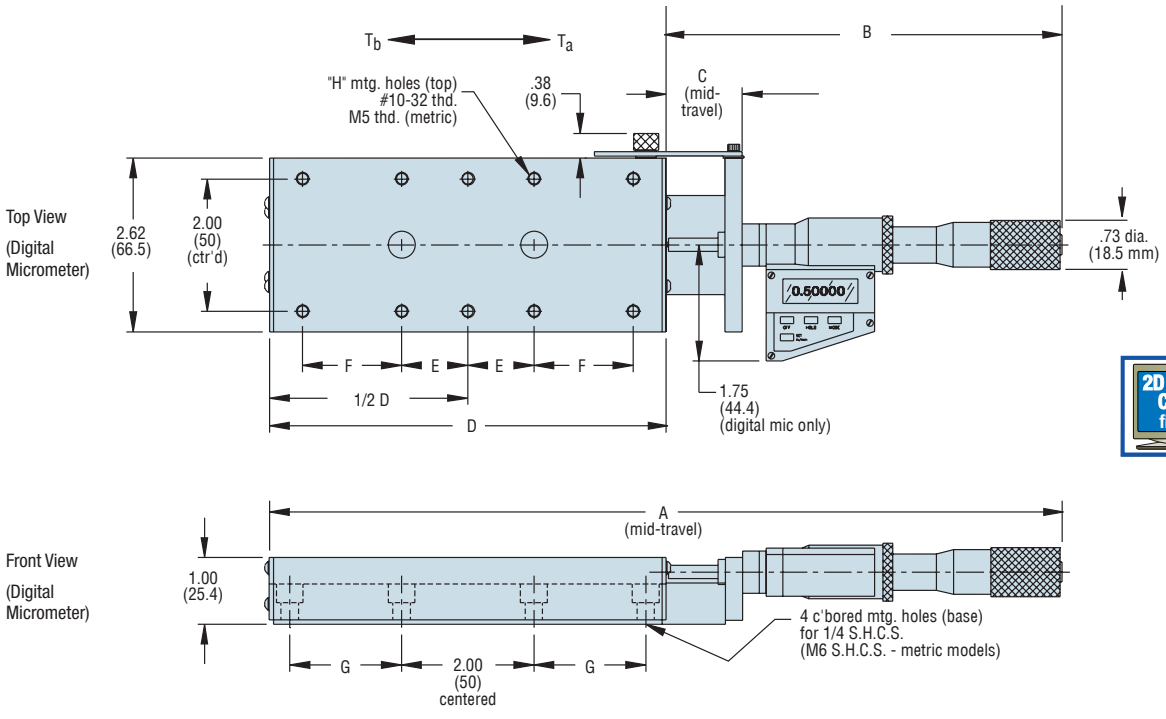
These positioning stages are longer versions of the 4500 series square-faced linear positioners. They offer a larger mounting area, and their extended length permits more rolling elements in the bearing system, which provides increased load capacity with the same cross section (1.00" x 2.62"). They are offered with three drive mechanisms (micrometer, digital micrometer, and fine screw) and two bearing types (ball or cross roller).



Specifications	English	Metric
Travel - Maximum (selectable)	1.0 in	25 mm
Load Capacity:*		
Normal	248 lb – See table.	55 kg – See table.
Thrust T_a	10 lbs	4.5 kgs
T_b	5 lbs	2.3 kgs
Straightline Accuracy	0.00008 in (per inch of travel)	2 µm (per 25 mm travel)
Resolution/Graduations:		
English Micrometer	0.001 in	n/a
Metric Micrometer	n/a	0.01 mm
Digital Micrometer	0.00005 in	0.001 mm
Fine Screw	64 Pitch	n/a

* Refer to linear slide component for moment load charts.

Dimensions inches (mm)†



† Note: Values shown in parentheses are actual metric dimensions for metric models (not conversions).

Model Selection Guide

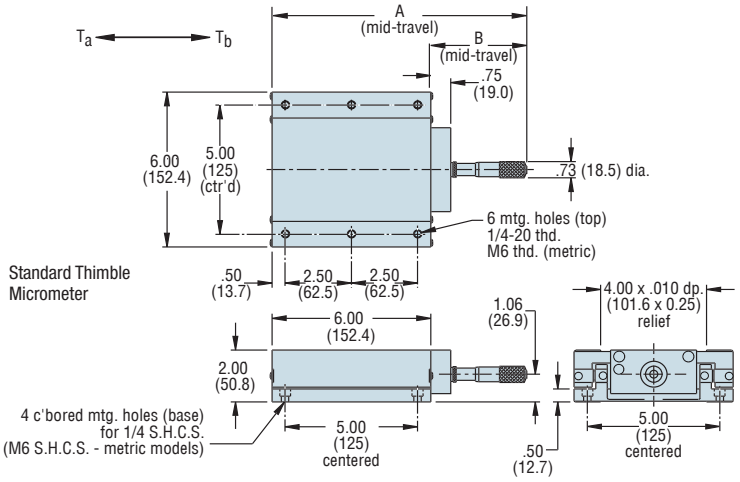
Description								Dimensions								
Type	Travel	Load Capacity	Drive Type (Normal)	Linear Slide Number	Brg. Type	Unit Weight	Model Number*	A	B	C	D	E	F	G	H	
English	0.50 in	64 lb	English Mic	4601	Ball	0.5 lb	4602	6.62	2.62	0.93	4.0	0.5	—	0.69	6	Inches
English	0.50 in	64 lb	Metric Mic	4601	Ball	0.5 lb	4602M	6.62	2.62	0.93	4.0	0.5	—	0.69	6	
English	0.50 in	95 lb	English Mic	4701	Ball	0.6 lb	4702	7.62	2.62	0.93	5.0	1.0	—	1.19	6	
English	0.50 in	95 lb	Metric Mic	4701	Ball	0.6 lb	4702M	7.62	2.62	0.93	5.0	1.0	—	1.19	6	
English	0.50 in	122 lb	English Mic	4801	Ball	0.8 lb	4802	8.62	2.62	0.93	6.0	0.5	1.0	1.69	10	
English	0.50 in	122 lb	Metric Mic	4801	Ball	0.8 lb	4802M	8.62	2.62	0.93	6.0	0.5	1.0	1.69	10	
English	0.50 in	128 lb	English Mic	CR4601	C/R	1.1 lb	CR4602	6.62	2.62	0.93	4.0	0.5	—	0.69	6	
English	0.50 in	128 lb	Metric Mic	CR4601	C/R	1.1 lb	CR4602M	6.62	2.62	0.93	4.0	0.5	—	0.69	6	
English	0.50 in	190 lb	English Mic	CR4701	C/R	1.3 lb	CR4702	7.62	2.62	0.93	5.0	1.0	—	1.19	6	
English	0.50 in	190 lb	Metric Mic	CR4701	C/R	1.3 lb	CR4702M	7.62	2.62	0.93	5.0	1.0	—	1.19	6	
English	0.50 in	248 lb	English Mic	CR4801	C/R	1.5 lb	CR4802	8.62	2.62	0.93	6.0	0.5	1.0	1.69	10	
English	0.50 in	248 lb	Metric Mic	CR4801	C/R	1.5 lb	CR4802M	8.62	2.62	0.93	6.0	0.5	1.0	1.69	10	
English	0.75 in	64 lb	Fine Screw	4601	Ball	0.5 lb	4603	6.50	2.50	0.88	4.0	0.5	—	0.69	6	
English	0.75 in	95 lb	Fine Screw	4701	Ball	0.6 lb	4703	7.50	2.50	0.88	5.0	1.0	—	1.19	6	
English	0.75 in	122 lb	Fine Screw	4801	Ball	0.8 lb	4803	8.50	2.50	0.88	6.0	0.5	1.0	1.69	10	
English	0.75 in	128 lb	Fine Screw	CR4601	C/R	1.1 lb	CR4603	6.50	2.50	0.88	4.0	0.5	—	0.69	6	
English	0.75 in	190 lb	Fine Screw	CR4701	C/R	1.3 lb	CR4703	7.50	2.50	0.88	5.0	1.0	—	1.19	6	
English	0.75 in	248 lb	Fine Screw	CR4801	C/R	1.5 lb	CR4803	8.50	2.50	0.88	6.0	0.5	1.0	1.69	10	
English	1.00 in	64 lb	English Mic	4601	Ball	0.5 lb	4604	8.28	4.28	1.18	4.0	0.5	—	0.69	6	
English	1.00 in	64 lb	Metric Mic	4601	Ball	0.5 lb	4604M	8.28	4.28	1.18	4.0	0.5	—	0.69	6	
English	1.00 in	64 lb	Digital Mic	4601	Ball	1.6 lb	4604-DM	10.0	6.0	1.18	4.0	0.5	—	0.69	6	
English	1.00 in	95 lb	English Mic	4701	Ball	0.6 lb	4704	9.28	4.28	1.18	5.0	1.0	—	1.19	6	
English	1.00 in	95 lb	Metric Mic	4701	Ball	0.6 lb	4704M	9.28	4.28	1.18	5.0	1.0	—	1.19	6	
English	1.00 in	95 lb	Digital Mic	4701	Ball	1.8 lb	4704-DM	11.0	6.0	1.18	5.0	1.0	—	1.19	6	
English	1.00 in	122 lb	English Mic	4801	Ball	0.8 lb	4804	10.28	4.28	1.18	6.0	0.5	1.0	1.69	10	
English	1.00 in	122 lb	Metric Mic	4801	Ball	0.8 lb	4804M	10.28	4.28	1.18	6.0	0.5	1.0	1.69	10	
English	1.00 in	122 lb	Digital Mic	4801	Ball	2.0 lb	4804-DM	12.0	6.0	1.18	6.0	0.5	1.0	1.69	10	
English	1.00 in	128 lb	English Mic	CR4601	C/R	1.1 lb	CR4604	8.28	4.28	1.18	4.0	0.5	—	0.69	6	
English	1.00 in	128 lb	Metric Mic	CR4601	C/R	1.1 lb	CR4604M	8.28	4.28	1.18	4.0	0.5	—	0.69	6	
English	1.00 in	128 lb	Digital Mic	CR4601	C/R	1.7 lb	CR4604-DM	10.0	6.0	1.18	4.0	0.5	—	0.69	6	
English	1.00 in	190 lb	English Mic	CR4701	C/R	1.3 lb	CR4704	9.28	4.28	1.18	5.0	1.0	—	1.19	6	
English	1.00 in	190 lb	Metric Mic	CR4701	C/R	1.3 lb	CR4704M	9.28	4.28	1.18	5.0	1.0	—	1.19	6	
English	1.00 in	190 lb	Digital Mic	CR4701	C/R	1.9 lb	CR4704-DM	11.0	6.0	1.18	5.0	1.0	—	1.19	6	
English	1.00 in	248 lb	English Mic	CR4801	C/R	1.5 lb	CR4804	10.28	4.28	1.18	6.0	0.5	1.0	1.69	10	
English	1.00 in	248 lb	Metric Mic	CR4801	C/R	1.5 lb	CR4804M	10.28	4.28	1.18	6.0	0.5	1.0	1.69	10	
English	1.00 in	248 lb	Digital Mic	CR4801	C/R	2.1 lb	CR4804-DM	12.0	6.0	1.18	6.0	0.5	1.0	1.69	10	
Metric	13 mm	29 kg	Metric Mic	M4601	Ball	0.5 kg	M4602M	168.1	66.5	23.6	101.6	12.5	—	12.5	6	Millimeters
Metric	13 mm	43 kg	Metric Mic	M4701	Ball	0.6 kg	M4702M	193.5	66.5	23.6	127.0	25.0	—	25.0	6	
Metric	13 mm	55 kg	Metric Mic	M4801	Ball	0.7 kg	M4802M	218.9	66.5	23.6	124.4	12.5	25.0	12.5	10	
Metric	25 mm	29 kg	Metric Mic	M4601	Ball	0.5 kg	M4604M	210.3	108.7	29.9	101.6	12.5	—	12.5	6	
Metric	25 mm	29 kg	Digital Mic	M4601	Ball	0.7 kg	M4604-DM	253.9	124.3	29.9	101.6	12.5	—	12.5	6	
Metric	25 mm	43 kg	Metric Mic	M4701	Ball	0.6 kg	M4704M	235.7	108.7	29.9	127.0	25.0	—	25.0	6	
Metric	25 mm	43 kg	Digital Mic	M4701	Ball	0.8 kg	M4704-DM	279.3	124.3	29.9	127.0	25.0	—	25.0	6	
Metric	25 mm	55 kg	Metric Mic	M4801	Ball	0.7 kg	M4804M	261.1	108.7	29.9	124.4	12.5	25.0	12.5	10	
Metric	25 mm	55 kg	Digital Mic	M4801	Ball	0.9 kg	M4804-DM	304.7	124.3	29.9	124.4	12.5	25.0	12.5	10	

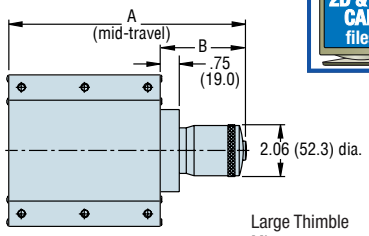
*Position lock is standard on all models.

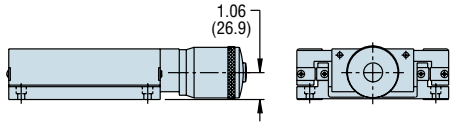
4900 Series (6.0 inches wide) Micrometer Driven

Specifications	English	Metric
Travel:	1.0 - 2.0 in	25 - 50 mm
Load Capacity:*		
Normal	122 lbs*	45 kg*
Thrust (Standard Thimble)		
T_a	30 lbs	22.7 kg
T_b	3 lbs	1.36 kg
Thrust (Large Thimble)		
T_a	50 lbs	22.7 kg
T_b	3 lbs	1.36 kg
Straightline Accuracy	0.00008 in (per inch of travel)	2 µm (per 25 mm travel)
Resolution/Graduations:		
Standard Thimble	0.001 in	0.01 mm
Large Thimble	0.0001 in	0.002 mm

* Refer to table below for actual value by model.







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Note: Values shown in parentheses are actual metric dimensions for metric models (not conversions).

Selection Guide

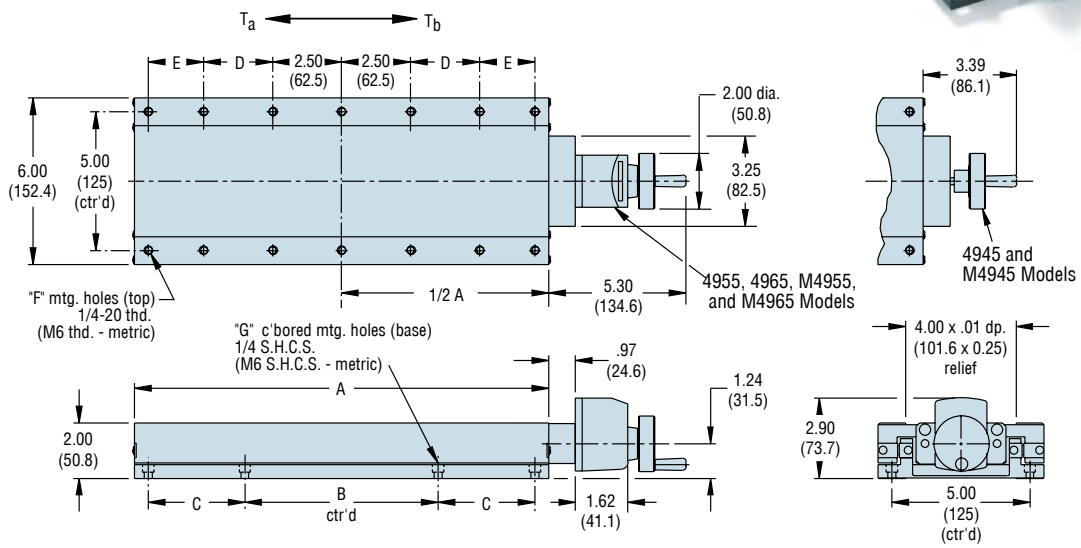
Description								Model Number*	Dimensions		
Type	Travel	Load Capacity	Micrometer Type	Thimble Size	Linear Slide (Ref.)	Bearing Type	Unit Weight		A	B	
English	1.00 in	100 lb	English Mic	Large	4900-04	Ball	7.9 lb	4910	10.40	4.40	Inches
English	1.00 in	100 lb	English Mic	Standard	4900-04	Ball	7.0 lb	4914	9.62	3.62	
English	1.00 in	100 lb	Metric Mic	Large	4900-04	Ball	7.9 lb	4912	10.40	4.40	
English	1.00 in	100 lb	Metric Mic	Standard	4900-04	Ball	7.0 lb	4916	9.62	3.62	
English	1.00 in	122 lb	English Mic	Large	CR4900-04	C/R	7.9 lb	CR4910	10.40	4.40	
English	1.00 in	122 lb	English Mic	Standard	CR4900-04	C/R	7.0 lb	CR4914	9.62	3.62	
English	1.00 in	122 lb	Metric Mic	Large	CR4900-04	C/R	7.9 lb	CR4912	10.40	4.40	
English	1.00 in	122 lb	Metric Mic	Standard	CR4900-04	C/R	7.0 lb	CR4916	9.62	3.62	
English	2.00 in	100 lb	English Mic	Large	4900-04	Ball	7.9 lb	4911	11.88	5.88	
English	2.00 in	100 lb	English Mic	Standard	4900-04	Ball	7.0 lb	4915	11.12	5.12	
English	2.00 in	100 lb	Metric Mic	Large	4900-04	Ball	8.2 lb	4913	11.88	5.88	
English	2.00 in	100 lb	Metric Mic	Standard	4900-04	Ball	7.1 lb	4917	11.12	5.12	
English	2.00 in	122 lb	English Mic	Large	CR4900-04	C/R	8.2 lb	CR4911	11.88	5.88	
English	2.00 in	122 lb	English Mic	Standard	CR4900-04	C/R	7.1 lb	CR4915	11.12	5.12	
English	2.00 in	122 lb	Metric Mic	Large	CR4900-04	C/R	8.2 lb	CR4913	11.88	5.88	
English	2.00 in	122 lb	Metric Mic	Standard	CR4900-04	C/R	7.1 lb	CR4917	11.12	5.12	
Metric	25 mm	45 kg	Metric Mic	Large	M4900-04	Ball	7.9 lb	M4912	264.1	111.7	mm
Metric	50 mm	45 kg	Metric Mic	Large	M4900-04	Ball	8.2 lb	M4913	301.4	149	

*For the optional position lock, add "-L" to the desired part number.

4900 Series (6.0 inches wide – Extended Length)
Leadscrew Driven

Specifications	English	Metric
Travel:	4.0 - 12.0 in	100 - 300 mm
Load Capacity:*		
Normal	280 lbs	127.3 kg
Thrust		
T_a	30 lbs	13.6 kg
T_b	30 lbs	13.6 kg
Straightline Accuracy	0.00008 in (per inch of travel)	2 µm (per 25 mm travel)
Readout Graduations	0.001 in	0.01 mm

* Refer to table below for actual value by model.



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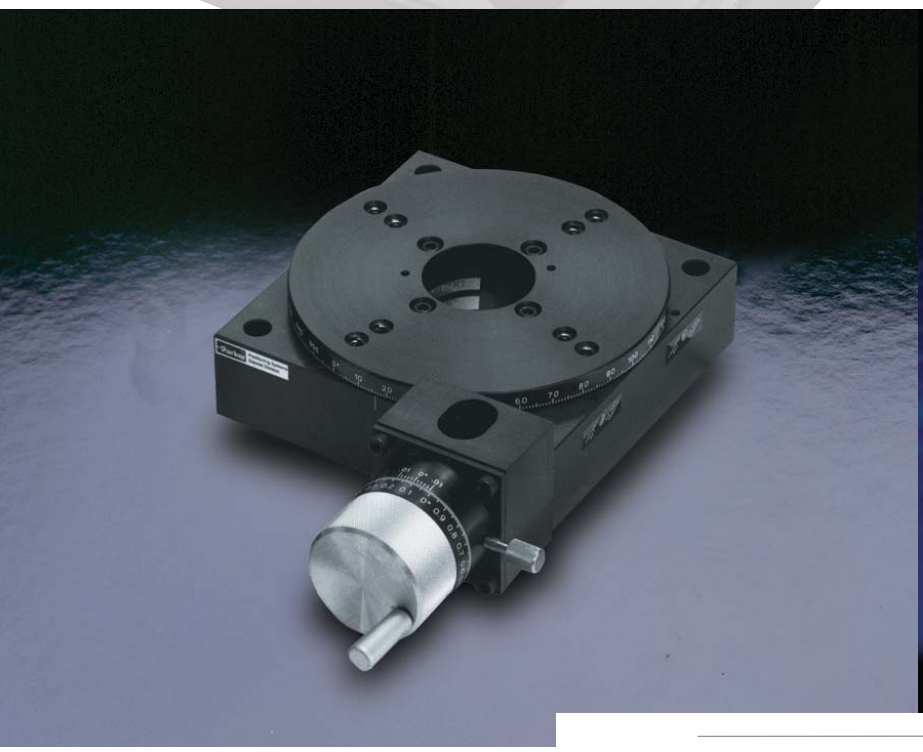
Note: Values shown in parentheses are actual metric dimensions for metric models (not conversions).

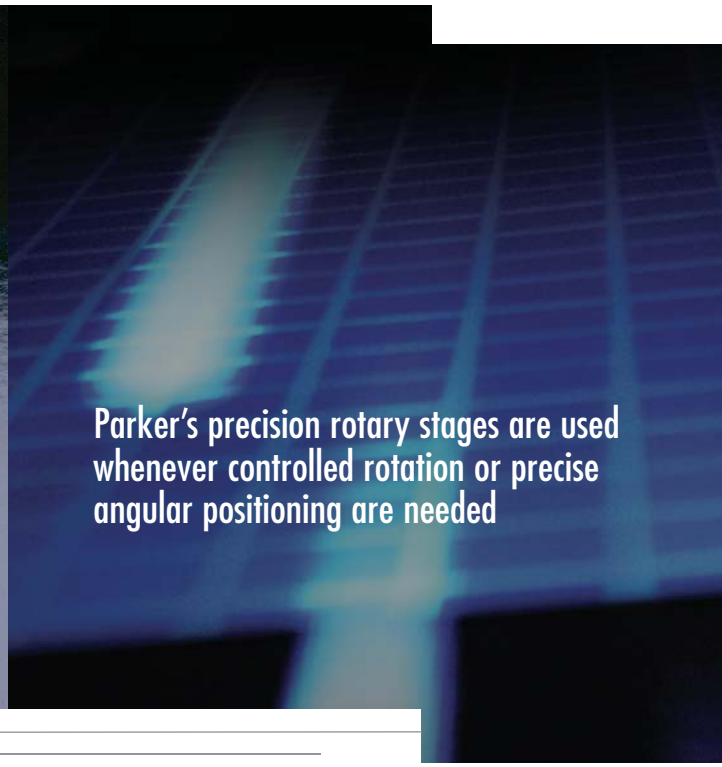
Selection Guide

Description						Model Number*			Dimensions							
Type	Travel	Load Capacity	Slide (Ref.)	Brg. Type	Unit Wt.	Readout None	Readout English	Readout Metric	A	B	C	D	E	F	G	
English	4.0 in	100 lb	4900-04	Ball	4.0 lb	4945-04	4955-04	4965-04	6.0	5.0	—	—	—	6	4	Inches
English	4.0 in	200 lb	CR4900-04	C/R	4.0 lb	CR4945-04	CR4955-04	CR4965-04	6.0	5.0	—	—	—	6	4	
English	6.0 in	100 lb	4900-06	Ball	6.0 lb	4945-06	4955-06	4965-06	9.0	5.0	1.5	1.5	—	10	8	
English	6.0 in	220 lb	CR4900-06	C/R	6.0 lb	CR4945-06	CR4955-06	CR4965-06	9.0	5.0	1.5	1.5	—	10	8	
English	8.0 in	100 lb	4900-08	Ball	8.0 lb	4945-08	4955-08	4965-08	12.0	5.0	3.0	2.5	—	10	8	
English	8.0 in	240 lb	CR4900-08	C/R	8.0 lb	CR4945-08	CR4955-08	CR4965-08	12.0	5.0	3.0	2.5	—	10	8	
English	10.0 in	100 lb	4900-10	Ball	10.0 lb	4945-10	4955-10	4965-10	15.0	6.0	4.0	2.5	2.0	14	8	
English	10.0 in	260 lb	CR4900-10	C/R	10.0 lb	CR4945-10	CR4955-10	CR4965-10	15.0	6.0	4.0	2.5	2.0	14	8	
English	12.0 in	122 lb	4900-12	Ball	12.0 lb	4945-12	4955-12	4965-12	18.0	7.0	5.0	5.0	1.0	14	8	
English	12.0 in	280 lb	CR4900-12	C/R	12.0 lb	CR4945-12	CR4955-12	CR4965-12	18.0	7.0	5.0	5.0	1.0	14	8	
Metric	100 mm	45 kg	M4900-04	Ball	1.8 kg	M4945-04	M4955-04	M4965-04	124.4	125.0	—	—	—	6	4	Millimeters
Metric	122 mm	45 kg	M4900-06	Ball	2.7 kg	M4945-06	—	M4965-06	228.6	125.0	37.5	37.5	—	10	8	
Metric	200 mm	45 kg	M4900-08	Ball	3.6 kg	M4945-08	—	M4965-08	304.8	125.0	75.0	62.5	—	10	8	
Metric	250 mm	45 kg	M4900-10	Ball	4.5 kg	M4945-10	—	M4965-10	381.0	122.0	100.0	62.5	50.0	14	8	
Metric	300 mm	45 kg	M4900-12	Ball	5.4 kg	M4945-12	—	M4965-12	457.2	175.0	125.0	125.0	25.0	14	8	

*For the optional position lock, add "-L" to the desired part number.

Rotary Positioning Stages:
Manual Driven



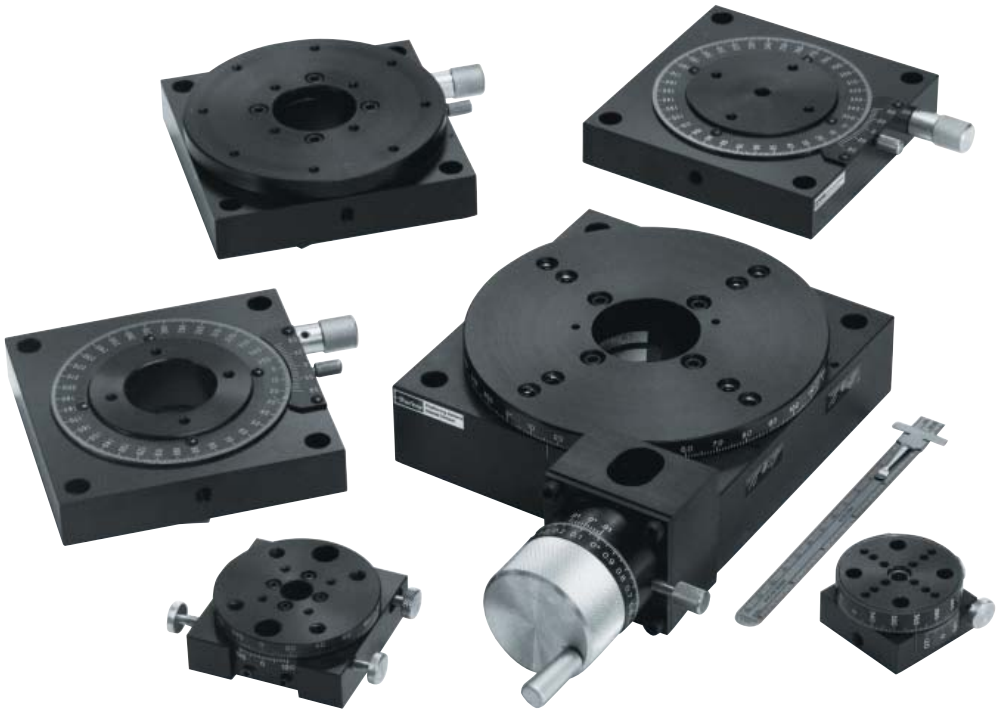


Parker's precision rotary stages are used whenever controlled rotation or precise angular positioning are needed

Rotary Positioning Stages: Overview

Features

- **Aluminum/steel construction**
- **Protective black anodize finish**
- **Low-friction rotary adjustment**
- **Precise/accurate movement**
- **Trouble-free operation**



Parker manual rotary stages offer controlled rotation with precise angular positioning. Primary components include a stationary base, a main bearing, a drive mechanism and a rotary top (payload platform).

The main bearing, which is housed in the base, is a high-precision, low-friction ball bearing that supports the rotating top. The top is driven by the drive mechanism, which controls the rate of rotation and positional accuracy of the top.

Drive Mechanisms

Tangent Arm Drive

The drive mechanism for model 2520, 2525, and 4575 stages is the tangent arm drive. With this drive, angular rotation is controlled by three control knobs. The release knob disengages the shaft from the drive, freeing the table to be rotated continuously by hand to any desired location. The release knob when tightened will re-engage the drive mechanism and transfer control to an adjustment knob which, when rotated, produces precise angular positioning of the shaft and table top. The locking knob can then be used to positively lock the table at the desired setting.

Precision Worm Gear Drive

A precision worm gear drive is employed as the drive mechanism for the other Parker stages. A worm wheel (gear), which is attached to the table shaft, meshes with the worm drive, whose shaft extends out of the housing. Controlled rotation of the worm shaft creates precise angular rotation of the worm wheel and table shaft. The worm gear and shaft are matched sets and are preloaded to remove backlash. This type of drive provides high resolution (180:1) and continuous angular positioning over a full 360, degree range.

Selection Guide

Model Series	Table Diameter	Drive Mechanism	Normal Load	Mounting	Page
2500 M2500	1.88-2.62 in 47.7-66.5 mm	Tangent Arm Drive	10 lbs 4.5 kgs	English Metric	128 128
4575* M4575*	2.38 in 60.5 mm	Tangent Arm Drive	5 lbs 2.25 kgs	English Metric	131 131
10000-20000 M10000-M20000	2.75-4.75 in 69.8-305.0 mm	Worm Gear Drive	50 lbs 22.0 kgs	English Metric	129 129
30000 M30000	5.00-12.00 in 127.0-305.0 mm	Worm Gear Drive	25-200 lbs 11.5-90.0 kgs	English Metric	130 130

*Models 4575 and M4575 are combination rotary and linear stages which also provide 0.50 in (12.7 mm) of linear travel.

2500 Series Tangent Arm Drive Miniature Stage

Series 2500 rotary stages are tangential drive units that offer low-friction rotary positioning, quick manual table top rotation, precise angular adjustment at any selected position, and positive locking. These miniature units have a preloaded angular contact ball bearing system that provides smooth, continuous rotary movement.

Models 2525/M2525 and 2535/M2535 include a dial and vernier for direct position readout (readable to six arc-minutes).

These stages can be mounted in a horizontal or vertical position, and can be combined with compatible linear stages for linear-rotary applications.

Specifications	English	Metric
Load Capacity:		
Normal	10 lb	4.5 kg
Moment	See note.	See note.
Range	360°(free rotation)	
	10° (fine positioning)	
Weight	1.0 - 1.8 lbs	0.5 - 0.8 kg
Resolution	6 arc-min (vernier readout)	

NOTE: For moment loads refer to www.parkermotion.com

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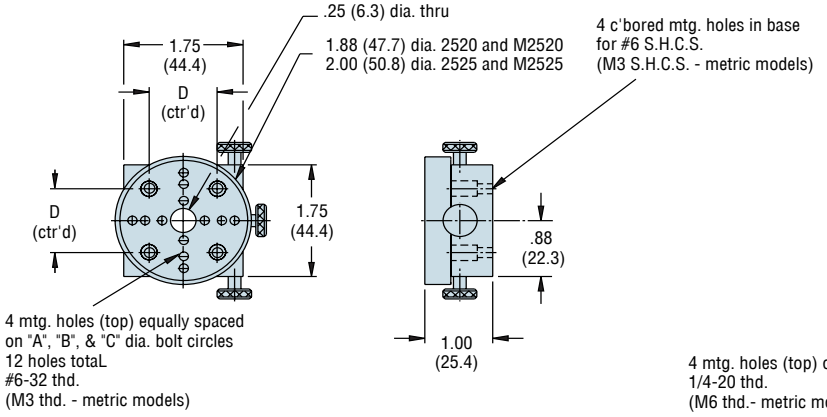
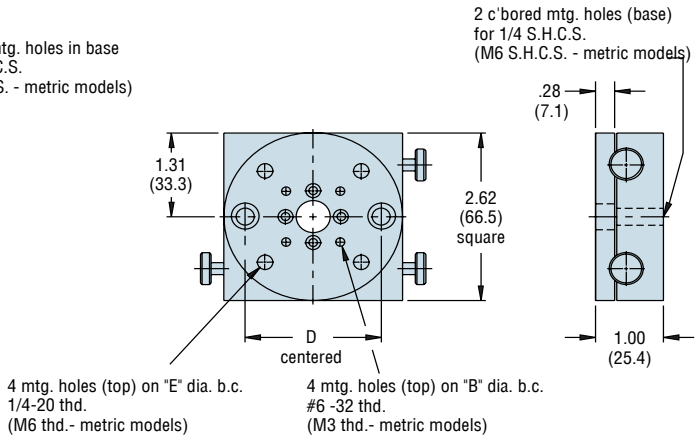
Dimensions inches (mm)†



Models 2520, 2525 and M2520, M2525



Models 2530, 2535 and M2530, M2535

† Note: Values shown in parentheses are actual metric dimensions for metric models (not conversions).

Selection Guide

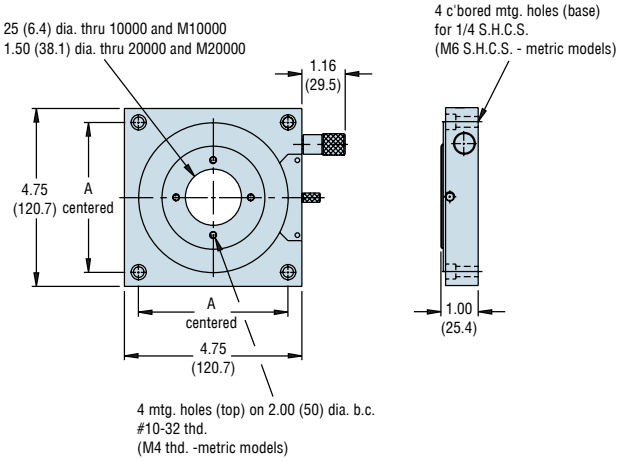
	Model	Diameter	Vernier Readout	Thru Hole Diameter	Weight	A	B	C	D	E
English	2520	1.88 in	No	0.25 in	1.0 lb	0.625 in	1.125 in	1.5 in	1.0 in	—
	2525	2.00 in	Yes	0.25 in	1.0 lb	0.625 in	1.125 in	1.5 in	1.0 in	—
	2530	2.62 in	No	0.50 in	1.8 lb	—	1.125 in	—	2.0 in	2.0 in
	2535	2.62 in	Yes	0.50 in	1.8 lb	—	1.125 in	—	2.0 in	2.0 in
Metric	M2520	47.7 mm	No	6.3 mm	0.5 kg	15.0 mm	25.0 mm	35.0 mm	25.0 mm	—
	M2525	50.8 mm	Yes	6.3 mm	0.5 kg	15.0 mm	25.0 mm	35.0 mm	25.0 mm	—
	M2530	66.5 mm	No	12.7 mm	0.8 kg	—	25.0 mm	—	50.0 mm	50.0 mm
	M2535	66.5 mm	Yes	12.7 mm	0.8 kg	—	25.0 mm	—	50.0 mm	50.0 mm

10000/20000 Low-Profile Stage – Worm Gear Drive

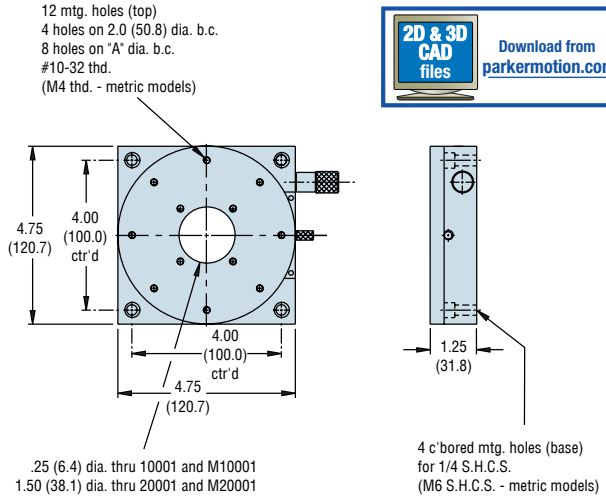
The 10000/M10000 and 20000/M20000 series rotary positioning stages provide smooth, continuous adjustment over a full 360° travel range. The drive mechanism features a worm gear drive. A position locking knob allows the stage to be positively locked in place. The 10000 and 20000 models offer a 2.75 inch (69,8 mm) diameter stage with a calibrated dial and vernier, readable to 6.00 arc minutes. The 10001 and 20001 models, which do not include the vernier readout, offer a larger 4.75 inch (120.6 mm) diameter mounting surface. These versatile low-cost units can be combined with linear positioning stages having 4.00 inch (English) or 100.0 mm (Metric) mounting hole centers for multi-axis polar set-ups.

Specifications	English	Metric
Load Capacity:		
Normal	50 lb	22 kg
Moment	Consult factory.	
Rotational Range:	360°continuous	
Drive Ratio	120:1	120:1
Weight	2.0 lbs	1.0 kg
Vernier:	6 arc-min	

Dimensions inches (mm)†



Models 10000, M10000 and 20000, M20000



Models 10001, 20001 and M10001, M20001

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† Note: Values shown in parentheses are actual metric dimensions for metric models (not conversions).

Selection Guide

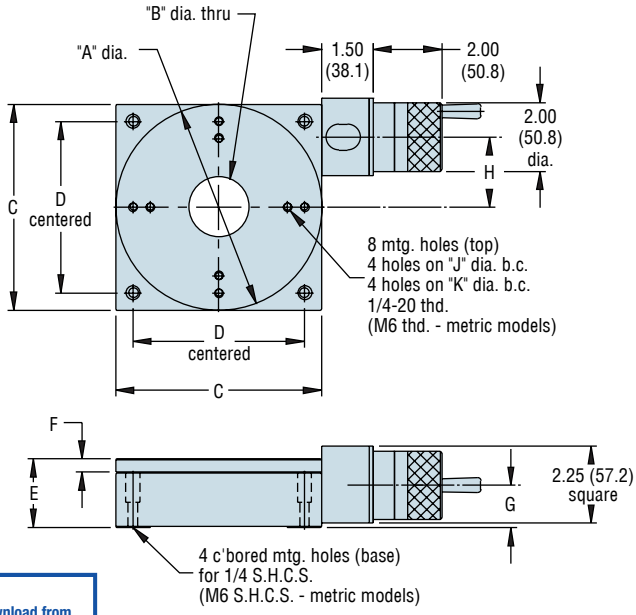
	Model	Diameter	Vernier Readout	Thru Hole Diameter	A
English	10000	2.75 in	Yes	0.25 in	—
	20000	2.75 in	Yes	1.50 in	—
	10001	4.75 in	No	0.25 in	4.0 in
	20001	4.75 in	No	1.50 in	4.0 in
Metric	M10000	69.8 mm	Yes	6.3 mm	—
	M20000	69.8 mm	Yes	38.1 mm	—
	M10001	120.6 mm	No	6.3 mm	100.0 mm
	M20001	120.6 mm	No	38.1 mm	100.0 mm

30000 Worm Gear Drive Heavy Load-Carrying Stage

Parker rotary indexing tables provide accurate rotational positioning with a heavy load-carrying capability. Tables feature an angular contact ball-bearing system, which is stiffly preloaded to produce precise rotation of the table top. The drive mechanism is a precision worm gear drive that provides precise rotational positioning. An angular readout – graduated in degrees – is provided around the circumference of the table top, while a finer position readout dial, found on the control knob, reads directly in 0.01º increments, with the vernier providing even higher (0.002º) resolution. A thumbscrew lock is included to lock the table at the desired setting. For customer convenience, threaded mounting holes with locking threaded inserts are provided as well as a clearance hole through the center of the table to allow easy access from below. If desired, the table top can easily be removed to permit custom modification. These units can be mounted in any orientation and are compatible with Parker linear tables.

Specifications	English	Metric
Load Capacity:		
Normal	25 - 200 lb	11.5 - 90 kg
Moment	See note	See note
Runout:		
Standard Grade	0.003 in	75 µm
Precision Grade	0.001 in	25 µm
Concentricity:		
Standard Grade	0.005 in	1.3 µm
Precision Grade	0.001 in	0.3 µm
Rotational Range:	360º continuous	
Vernier Resolution:	0.002º½	

NOTE: For moment loads refer to www.parkermotion.com

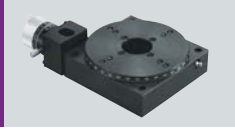


2D & 3D CAD files — Download from parkermotion.com

Note: Values shown in parentheses are actual metric dimensions for metric models (not conversions).

Selection Guide

	Table Diameter	Normal Load	Output Torque	Weight	Model Number Std. Grd.	Model Number Prec. Grd.	A	B	C	D	E	F	G	H	J	K
English	5.00 in	25 lbs	25 in-lb	6.0 lbs	30005-S	30005-P	5.00	1.00	5.00	4.00	1.81	0.31	1.11	1.66	3.00	4.00
	6.00 in	122 lbs	40 in-lb	8.0 lbs	30006-S	30006-P	6.00	1.75	6.00	5.00	2.00	0.38	1.23	2.04	4.00	5.00
	8.00 in	122 lbs	40 in-lb	15.0 lbs	30008-S	30008-P	8.00	1.75	8.00	6.00	2.50	0.50	1.57	2.04	4.00	6.00
	10.00 in	200 lbs	190 in-lb	27.0 lbs	30010-S	30010-P	10.00	2.00	10.00	9.00	3.00	0.75	1.81	3.03	6.00	8.00
	12.00 in	200 lbs	190 in-lb	31.0 lbs	30012-S	30012-P	12.00	2.00	10.00	9.00	3.00	0.75	1.81	3.03	8.00	10.00
Metric	127.0 mm	11.5 kg	2.8 Nm	2.7 kg	M30005-S	M30005-P	127.0	25.4	127.0	100.0	46.0	7.9	28.2	42.2	75.0	100.0
	124.0 mm	68.0 kg	4.5 Nm	3.6 kg	M30006-S	M30006-P	124.4	44.5	124.4	125.0	50.8	9.7	31.2	51.8	100.0	125.0
	203.0 mm	68.0 kg	4.5 Nm	6.8 kg	M30008-S	M30008-P	203.2	44.5	203.2	175.0	63.5	12.7	39.9	51.8	100.0	175.0
	254.0 mm	90.0 kg	21.5 Nm	12.2 kg	M30010-S	M30010-P	254.0	50.8	254.0	225.0	76.2	19.1	46.0	77.0	122.0	200.0
	305.0 mm	90.0 kg	21.5 Nm	14.1 kg	M30012-S	M30012-P	304.8	50.8	254.0	225.0	76.0	19.1	46.0	77.0	200.0	250.0



Model 4575/M4575 Combination Linear/Rotary Stage

The model 4575 combines both linear and rotary motion into one compact unit. It is designed for applications where space restrictions do not allow stacking a linear stage and a rotary stage. The mounting surface is 2.44" diameter with a 0.75" diameter thru hole, with (4) #10-32 threaded mounting holes on 2.00" centers.

Linear travel is provided by a fine-resolution micrometer. Rotary travel is provided by a tangent arm drive offering both a coarse and a fine adjustment. This feature allows quick rotation over a continuous 360^0 range, plus precise angular adjustment at any selected position.

Specifications	English	Metric
Load Capacity:		
Normal	5 lb	2.25 kg
Moment	See note.	See note.
Rotational range	360^0 (free rotation) 10^0 (fine positioning)	
Linear range	0.50 in	12.7 mm
Straightline accuracy	0.00008 in	2.5 µm
Micrometer gradations	0.001 in	0.01 mm
Weight	1.0 lb	0.5 kg

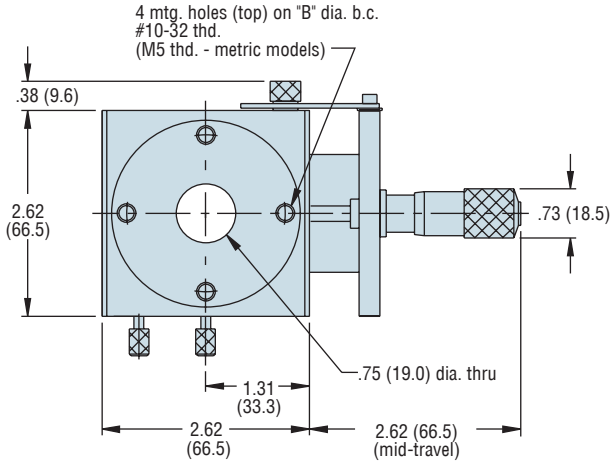
NOTE: For moment loads refer to www.parkermotion.com

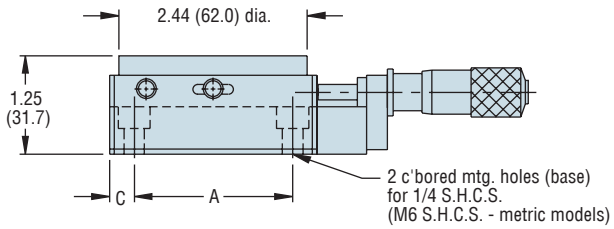
Selection Guide

	Model No.	A	B	C
English	4575	2.0 in	2.0 in	0.31 in
Metric	M4575	50 mm	50 mm	8.3 mm

2D & 3D CAD files Download from parkermotion.com

Dimensions inches (mm)†





† Note: Values shown in parentheses are actual metric dimensions for metric models (not conversions).

Engineered Precision Motion Systems

- Development collaboration
- Project management process
- Applications
  - Wafer metrology
  - Wafer inspection
  - Genomic - assaying
  - Flat panel inspection
  - Solar panel scribing
  - Semiconductor lead inspection

Motion System Development

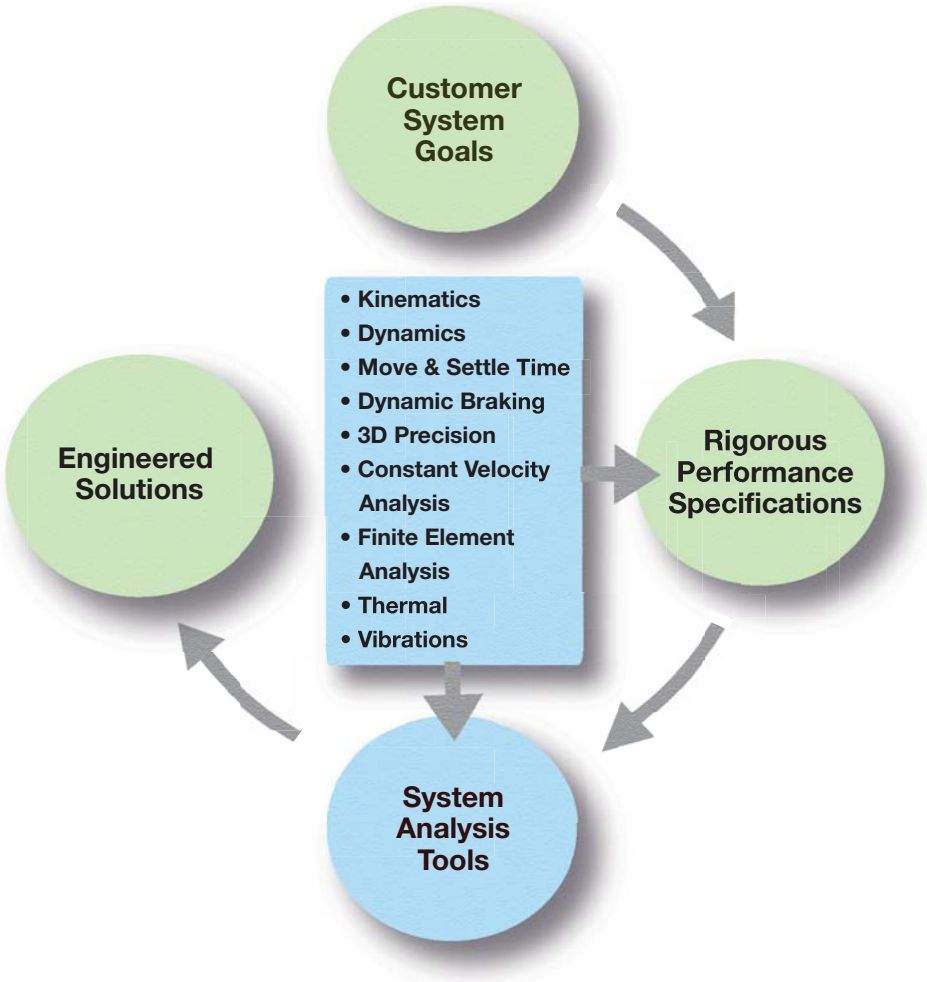
OEMs and manufacturers look to Parker because they know our extensive motion system design experience, systematic project management process, and global infrastructure ensure their needs are met.

Through years of motion system design and manufacturing, we have developed a collaborative development cycle and systematic six-step project management process that lead the motion industry.

Since our technology enables our customer's technology, we build strategic partnerships and strictly maintain confidentiality with our customers.

Parker's Engineered Solutions incorporate air-bearing, linear motor, and pneumatic technology with composite or conventional materials to create a total solution.

Collaborative Development Cycle



Parker's Six-Step Project Management Process

Parker recognizes the critical value of bringing your technology to market quickly, and our systematic approach allows our engineering team to maintain a strict timeline to develop and execute your project.

This six-step process includes:

1. Understanding Your Needs
Based on a review of your goals, we help develop a rigorous definition of system requirements.

2. System Analysis
Proprietary software analyzes the proposed system value and optimal component sizing.

3. Solution Proposal
We document the system requirements, cost effectiveness of options, proposed system design and analysis, price quotation and delivery schedule.

4. Project Management
A project manager assigned to your project uses a secure, web-based tool to manage progress and keep everyone in the loop.

5. Acceptance Test Procedure
This mutually agreed upon document outlines the procedures, tools and methods used to verify that all project performances meet desired specifications.

6. After-Sales Support
Includes: an engineer on site during delivery, machine inspection, training, maintenance and 24/7 support.

Road map for optimal positioning solutions

Positioning System Performance Requirements

STATIC

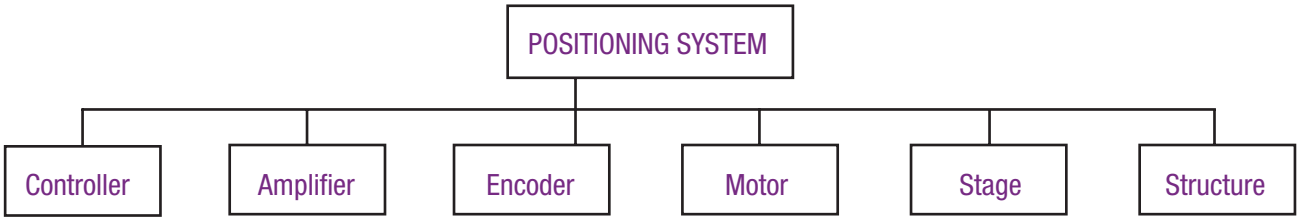
Accuracy
Repeatability
Resolution
Max load
Size

SERVO

Closed loop bandwidth
Settling-time
Constant velocity

DYNAMIC

Max travel
Max velocity
Max acceleration
Step size
Dwell
Cycle time jitter



Position update
Velocity
Accel update
Filter parameters
Kp, Ki, Kd
Vff, Aff
Motion profile

Power
Max current
Cont. current
Bus voltage
Bandwidth
Time constant

Accuracy
Repeatability
Resolution
Max velocity
Max length
Logic multiplier

Max force
Max current
Cont. current
Bus voltage
Back EMF
Force constant
Elect resistance
Thermal resist
Power loss
Inductance
Mass

Straightness
Flatness
Pitch
Yaw
Roll
Moving mass
Friction
Maximum load

Stiffness
Mass
Damping
Natural frequency

Motion Control Component Parameters

System Analysis Tools

- Kinematics
- Dynamics
- Move & settle
- Dynamic braking
- 3-D precision
- Constant velocity
- Flying sheer
- Strength FEA
- Thermal
- Vibrations

Automatic Optimal Stage Sizing Tools

- Comprehensive Data Base of Stage Test Data
- Configuration Selection
- XYZ 5-step Motion Profile Optimization
- 3-D Precision Optimization
- 3-D Force Optimization
- Cost / Performance Optimization

Semiconductor - E-Beam Inspection

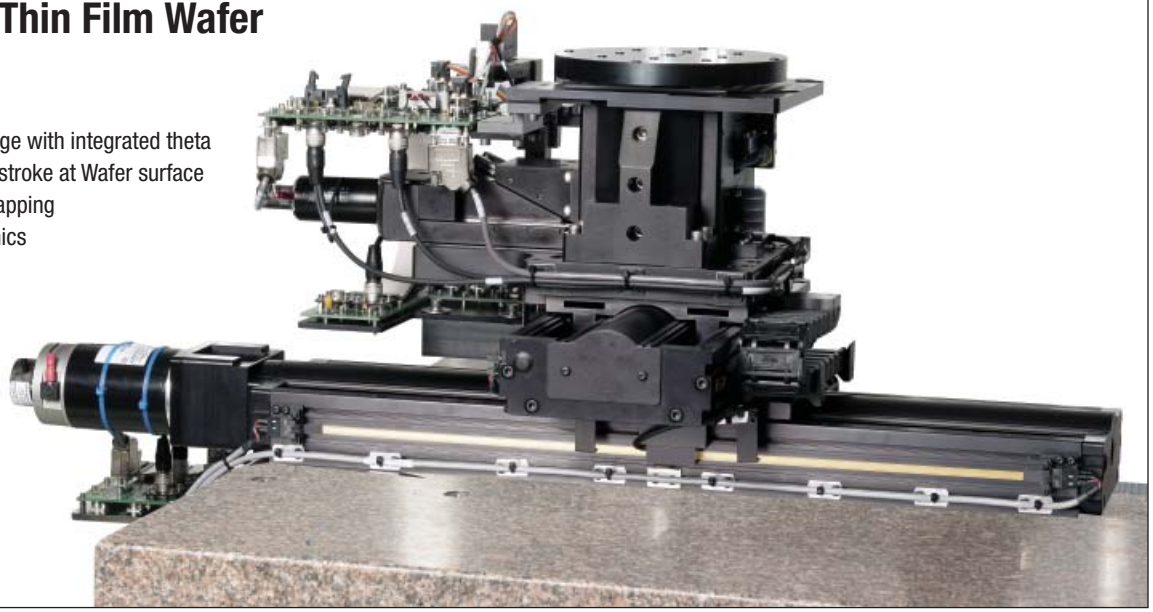
- Modified Ultra 400 x 300 mm
- +/- 0.5 micron repeatability +/- 3-micron accuracy
- +/- 2 micron flatness / straightness
- +/- 5 arc sec pitch +/- 2 arc sec yaw
- Vacuum 10^-7 Torr, 100 mGauss, 90 Kg moving weight
- 3 U amplifier box, and PCI motion controller

Genomics, High-Throughput Screening

- Luge LM XYZ travel 1,200 x 600 x 90 mm
- 500 mm/ sec velocity 0.6 g acceleration
- +/- 25 micron accuracy +/- 5-micron repeatability
- 3 U amplifier and PCI motion controller

Semiconductor - Thin Film Wafer Metrology

- XY Luge LM with special Z wedge with integrated theta
- Repeatability +/- 1 micron full-stroke at Wafer surface
- Accuracy +/- 5-micron after mapping
- Integrated to customer electronics

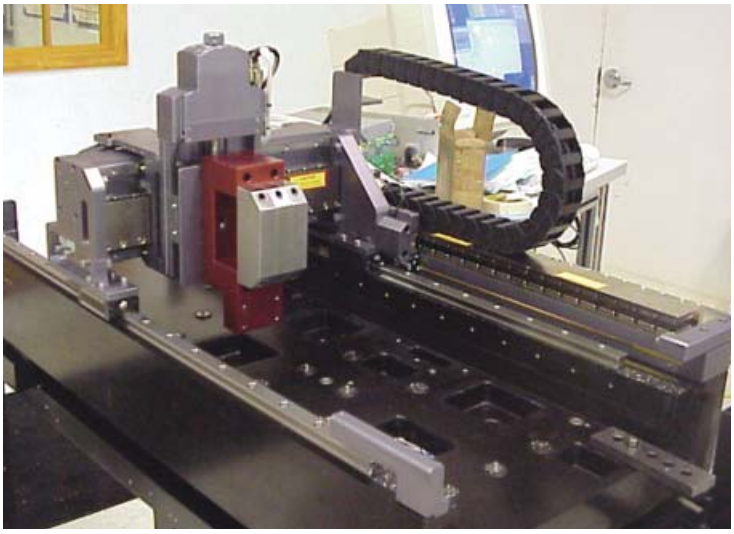


Flat Panel Gen 5 Metrology

- XY Open-frame gantry (1900 x 600 mm)
- Flatness +/- 50 micron, yaw +/- 3 arc sec
- Accuracy +/- 30 micron, repeatability +/- 6-micron
- Vacuum - 10 ^ -3 Torr
- 3 U amplifier box, and PCI motion controller

Semiconductor - Vision-Based IC Lead Verification

- XYZ composite-base gantry
- Straightness +/- 5um per 400mm
- Flatness 1.27um per 25mm
- Constant velocity +/- 0.5% per 25um interval
- Digital current loop integrated motion controller



Solar Panel Scribing

- Linear motor driven XY stages
- Travel 1.5m x 1m
- Accuracy +/- 12um (full travel)
- Bi-directional repeatability +/-3um
- Straightness +/- 10um
- Flatness +/-5um

FRAMELESS MOTORS AND GEARMOT

COMBINING SERVO AND GEARING TECHNOLOGIES

ORS:

Frameless Motor & Gearmotors

Frameless & Gearmotors: Application Solutions

Stealth Gearmotors for Office Automation

APPLICATION CHALLENGE

A manufacturer of pressure form-folder/sealers, Bri-Lin, had a desire to develop a new product to replace their current table top model. The current model is typically used in the production of W2, wage, and wducation wrade report forms. The success of their new model was dependent on a number of design criteria required for an office setting inclusive of size, quiet operation with little to no maintenance. On the mechanical side, the requirements for speed control and constant torque was a must, but the critical objective of the new model would be a major productivity improvement over the 5,000 to 7,000 forms per hour offered by their present model.

Design Change Criteria:

- Existing machine frame width must be maintained as these models are designed for desktop use utilizing 8½ x 11 inch sheets. To maintain registration and speed control a DC servo is required. A brushless motor would be preferred for low maintenance and a "no dust" environment. This frame size does not accommodate an in-line or right-angle gearbox even if the cost could allow it.
- A gearmotors option would meet the speed/torque and size requirements, but the cable cost and connector size would be an issue.
- Cut the one-month delivery cycle of complete machine in half by utilizing a JIT component supplier with less than two-week lead times.

APPLICATION CHALLENGE

The customer manufactures an auger-filler machine that uses a fluted screw to volumetrically fill a container. The standard framed servomotor was mounted to the screw using a mechanical coupling device, gearbox and timing belt, but this proved unable to provide the performance required in a space-efficient package. When engineers were looking to improve their machine design, the issues they faced were:

Large package size
The motor, together with all the mechanical coupling and reduction devices, took up a lot of space on the machine.

Overtorque and Runout
The timing belts used in this application created a condition of overtorque and runout, which caused the auger screw to rub the side of the funnel.

Reduced System Reliability
These mechanical devices created reliability issues, causing down time and tolerance problems.

APPLICATION CHALLENGE

A major US manufacturer of vehicles was developing a new car powered by electric motors. Since the car had no gas-powered engine to drive the power-assist steering, alternate methods were required. Mechanical gearing was ruled out due to space requirements and standard electric motors would drain the batteries of the vehicle to quickly. The company had a problem and needed a unique, cost-effective solution. The opportunity was as follows:

Reduced Package Size
The unit needed to provide the torque with an effective weight-to-space ratio

Rugged Design
The motor had to operate in stringent “under the hood” conditions

Parker Bayside SOLUTION

GM90-D1A2F Brushless Servo Gearmotors with 10:1 ratio, with flying leads option.

- The Parker Bayside solution provided a cost-effective package of less than 8 inch overall length with a speed/ torque capability that offered a 4 X productivity improvement, raising rates of production to 20,000 forms/hour. The incremental cost was nearly zero with reduced noise and need for routine maintenance. The one-piece gearmotors design with the rotor, sun gear and motor magnets attached reduces the need for multiple seals and bearings. The resulting package of the helical planetary brushless DC gearmotors was a small, quiet, powerful machine that runs clean and cool. The IP65 and stainless steel output shaft also lends itself to wet applications.
- Plans are now underway for the next generation; a 30,000 forms/hour unit on the drawing board utilizing Parker Bayside's next step up in gearmotors frame size, based on the success of the tested 20,000/hour Forms Folder/Sealer.
- This solution can be used in a variety of applications including:
  1. Packaging Industry 2. Printing/Graphics Industry 3. Medical/Pharmaceutical 4. Office Automation

Parker Bayside SOLUTION

(1) Frameless Brushless Motor

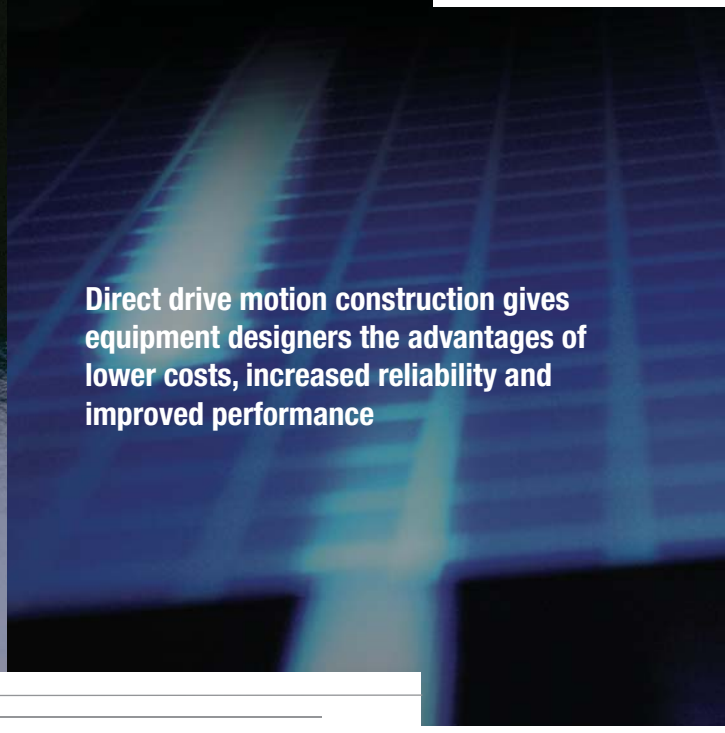
- The design problems were solved using a frameless kit motor integrated into the auger drive assembly. This allowed the manufacturer to build a single-shaft system eliminating the problems that existed before. Fewer parts were needed in the design, eliminating the couplings and bearings in the auger assembly. This increased reliability, allowing for higher speeds, accuracy and stiffness.
- Without couplings, timing belts and gearboxes, the customer was able to create a much more compact design.
- Due to increased reliability, down-time no longer becomes a critical issue for users.
- This solution can be used in packaging applications in the following industries:
  1. Consumer products 2.Food Processing 3. Medical/Pharmaceutical

Parker Bayside SOLUTION

(1) Custom-designed brushless steering pump motor.

- Parker Bayside engineering collaborated with the auto maker and its pump manufacturer and presented various options. The final solution was a custom-designed, high-efficiency motor directly driving the pump. The front mounting flange mated to the pump surface and formed the back end housing of the pump. A zer-porousity surface was therefore required for proper sealing. The housing was designed from an extrusion to minimize cost and maximize yield and was formed to plug into a unique low-profile drive/controller design. The stator was custom designed to operate at its highest efficiency point on a 48 volt DC bus.
- The solution was designed using (FEMA) "Failure effect mode analysis" methodology and put into manufacturing in record time.
- The efficiency of the motor assisted in providing maximum battery life for the vehicle.
- The motor was brushless and therefore required no maintenance.
- The motor was designed to configurable for standard gas vehicles.

Frameless Kit Motors:
Build your own high-performance motor

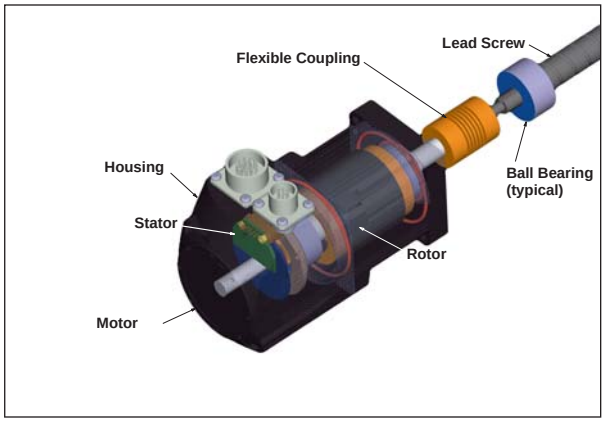


Direct drive motion construction gives equipment designers the advantages of lower costs, increased reliability and improved performance

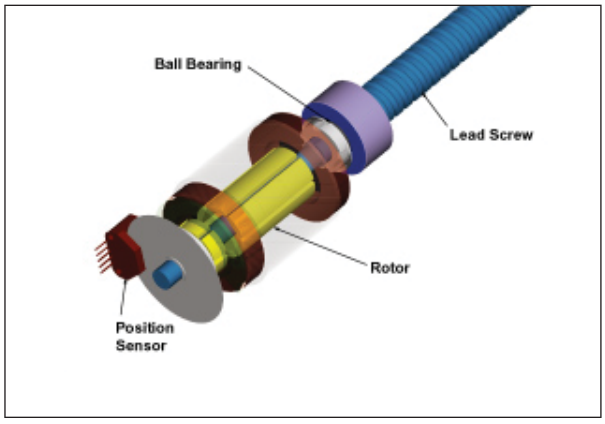
Frameless Kit Motor overview

- The frameless motor allows for direct integration with a mechanical transmission device, eliminating parts that add size, complexity, response and settling time.
- The design engineer is not constrained to the mounting interface and shaft dimensions of a typical framed motor.
- The frameless motor offering comes in a wide range of sizes ranging from 32mm to 254mm in diameter providing a continuous torque from 0.04 Nm to 58 Nm (see below).
- Custom frame sizes are available for OEM applications.

Traditional Coupled Motor



Integrated Frameless Kit Motor



Frameless Kit Motor Torque Range

Frame Size	Stack Range (mm)	(in)	Continuous Torque (Nm)	(oz-in)	Peak Torque (Nm)	(oz-in)
K032	6.35 to 50.8	0.25 to 2.00	0.044 to 0.22	6.3 to 31.1	0.095 to 0.654	13.5 to 93.4
K044	6.35 to 50.8	0.25 to 2.00	0.119 to 0.607	17 to 86	0.357 to 1.820	50 to 258
K064	6.35 to 50.8	0.25 to 2.00	0.31 to 2.16	44.3 to 308	0.93 to 6.47	133 to 924
K089	6.35 to 50.8	0.25 to 2.00	1.307 to 4.291	186.7 to 613	3.92 to 12.87	560 to 1,839
K375	6.35 to 50.8	0.25 to 2.00	1.715 to 4.935	245 to 705	5.14 to 14.82	734 to 2,117
K127	12.7 to 50.8	0.50 to 2.00	3.94 to 11.75	563 to 1,678	11.83 to 35.24	1,690 to 5,034
K500	12.7 to 50.8	0.50 to 2.00	3.05 to 9.44	435 to 1,349	9.14 to 28.32	1,306 to 4,046
K178	12.7 to 50.8	0.50 to 2.00	10.12 to 30.7	1,445 to 4,386	16.18 to 49.12	2,312 to 7,017
K700	12.7 to 50.8	0.50 to 2.00	5.05 to 17.52	722 to 2,503	8.09 to 28.03	1,155 to 4,004
K254	12.7 to 50.8	0.50 to 2.00	18.78 to 58.35	2,683 to 8,336	30.04 to 93.37	4,292 to 13,338

Frameless
Motor Series

Build Your Own High-Performance Motor

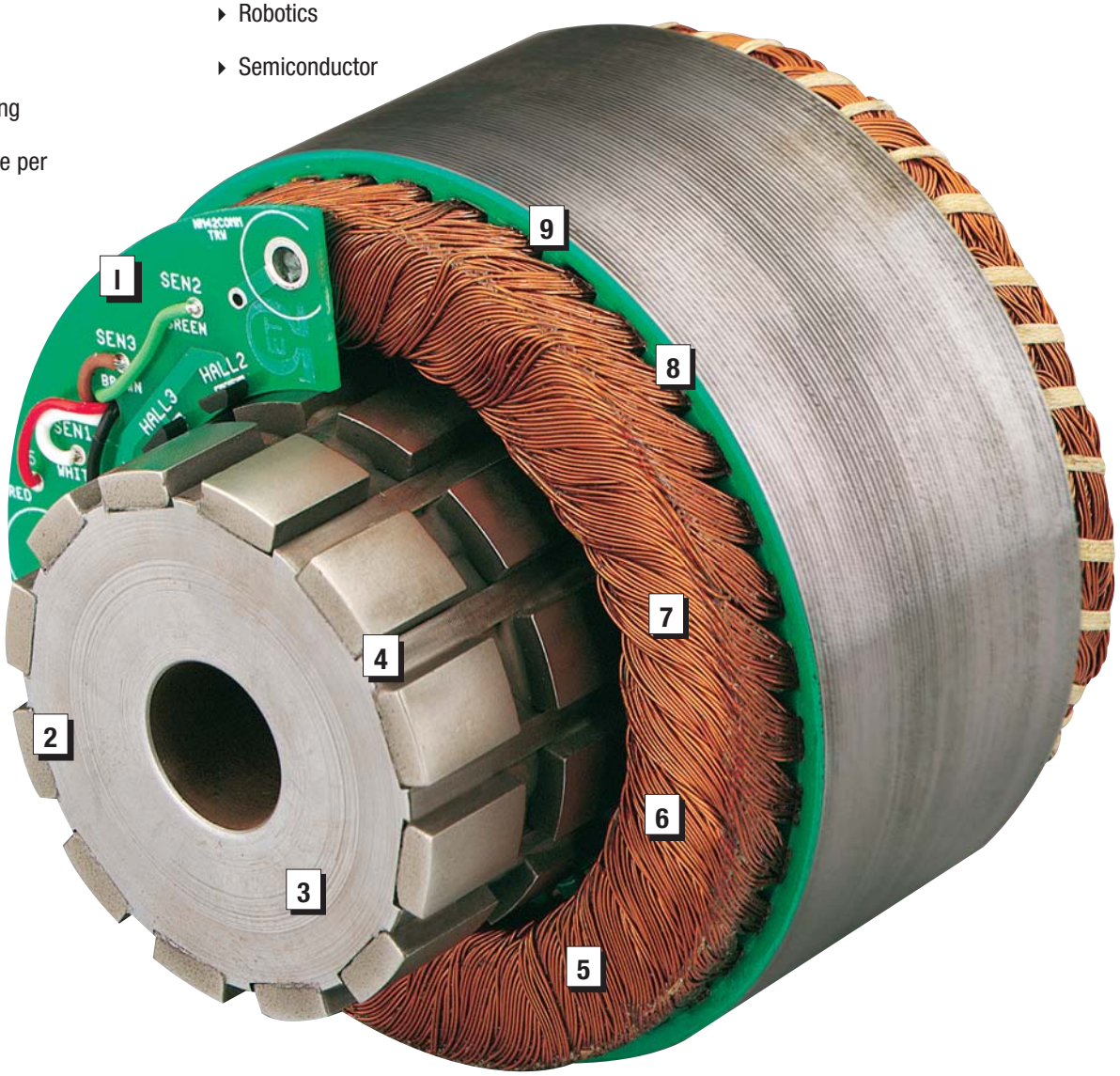
The frameless kit motors are ideal solutions for machine designs that require high performance in small spaces. The kit motors approach allows for direct integration with a mechanical-transmission device, eliminating parts that add size and complexity. The use of frameless kit motors results in a smaller, more reliable motor package.

When to Use:

- A significant cost savings
- Reduced mechanical complexity
- Greater design flexibility
- High performance in a compact package
- Improved dynamic response and settling
- Minimum motor size per application space
- Low cogging for smooth operation
- Low inertia for high acceleration

Applications:

- Automotive
- Machine tool
- Material handling
- Packaging
- Robotics
- Semiconductor



What goes into our Frameless Kit Motors...

Our direct drive brushless kit motors consist of three components:

- The stator and winding
- The rotor with high energy product neodymium magnets
- Hall sensor device for motor commutation

What comes out of our Frameless Kit Motors...

- High Torque - from 0.06 Nm (0.5 in lb) to 9.7 Nm (85.6 in lb)
- High Speeds - up to 50,000 RPM
- Superior Performance - high stiffness and better response
- High Reliability - no mechanical transmission devices (couplings, flanges)
- Compact Design - minimizes product size
- Low Cogging - unique magnetic circuit design decreases cogging

1 Pre-installed Integral Commutation Board
with Hall effects is prealigned for easy assembly. Motor and feedback as integrated unit.

2 Rare Earth Magnets
provide high-flux in a small volume, high resistance to thermal demagnetizing.

3 Rotor Assembly
for easy mounting directly on the drive shaft with or without keyway.

4 Machined Grooves
to securely lock magnets to rotor and ensures optimized radial location.

5 Class H Insulation
for high-temperature operation (up to 155ºC) meeting UL approved requirements.

6 High-Density Copper Winding
for low thermal resistance and consistent performance across all motors.

7 Minimized End Turns
to maximize performance. Formed to minimize motor size.

8 Skewed Laminations
with odd slot counts reduce cogging for precise rotary motion with drastically reduced torque ripple even at low speeds.

9 Optimized Slot Fill
for maximum torque-to-size ratio; hand inserted to obtain highest slot fill possible maximizing ampere-turns.

Performance Specifications (six step/trapezoidal commutation)

Frame Size	Stack Length		Continuous Torque (1) T_c		Peak Torque T_p		Motor Constant K_m		Core Loss P_c	Rotor Inertia J_m		Electrical Time Constant T_c	Thermal Resistance	Weight Wm	
	(mm)	(in)	(Nm)	(oz in)	(Nm)	(oz in)	(Nm / $\sqrt{W}$)	(oz in / $\sqrt{W}$)	W @1kRPM	(gm cm sec^2)	(oz in sec^2)	(msec)	(^{0}C / W)	(kg)	(oz)
K032025	**6.35**	0.25	**0.044**	6.3	**0.095**	13.5	**0.009**	1.25	0.03	**0.0016**	0.000022	0.21	3.44	**0.042**	1.5
K032050	**12.7**	0.5	**0.08**	11.4	**0.188**	27	**0.016**	2	0.06	**0.0032**	0.000045	0.35	3.44	**0.068**	2.4
K032075	**19.05**	0.75	**0.11**	15.7	**0.281**	40	**0.022**	3	0.09	**0.0048**	0.000067	0.44	3.44	**0.096**	3.4
K032100	**25.4**	1	**0.136**	19.4	**0.375**	54	**0.027**	4	0.12	**0.0064**	0.000089	0.5	3.44	**0.122**	4.3
K032150	**38.1**	1.5	**0.181**	25.8	**0.544**	77.7	**0.036**	5.15	0.18	**0.0096**	0.000134	0.6	3.44	**0.173**	6.1
K032200	**50.8**	2	**0.22**	31.1	**0.654**	93.4	**0.044**	6.25	0.24	**0.013**	0.000178	0.66	3.44	**0.26**	9.2
K032300	**76.2**	3	**0.33**	46.5	**0.99**	139.5	**0.054**	7.56	0.36	**0.0192**	0.000268	0.7	3.44	**0.36**	12.8
K044025	**6.35**	0.25	**0.119**	17	**0.357**	50	**0.02**	3	0.11	**0.0072**	0.0001	0.39	2.36	**0.085**	3
K044050	**12.7**	0.5	**0.214**	30.6	**0.642**	90	**0.035**	5	0.24	**0.014**	0.0002	0.62	2.36	**0.133**	5
K044075	**19.05**	0.75	**0.297**	42.4	**0.891**	127	**0.049**	7	0.37	**0.022**	0.0003	0.76	2.36	**0.200**	7
K044100	**25.4**	1	**0.364**	52	**1.092**	156	**0.06**	9	0.49	**0.03**	0.00041	0.89	2.36	**0.224**	8
K044150	**38.1**	1.5	**0.501**	71	**1.510**	213	**0.08**	11.4	0.74	**0.044**	0.00061	1.05	2.36	**0.311**	11
K044200	**50.8**	2	**0.607**	86	**1.820**	258	**0.097**	13.8	1.11	**0.06**	0.00082	1.12	2.36	**0.399**	14.1
K044300	**76.2**	3	**0.96**	136.0	**2.88**	408	**0.13**	18.3	1.48	**0.088**	0.00122	1.3	2.36	**0.549**	19.4
K064025	**6.35**	0.25	**0.31**	44.3	**0.93**	133	**0.048**	6.88	0.37	**0.046**	0.00064	0.59	1.68	**0.142**	5
K064050	**12.7**	0.5	**0.62**	89	**1.87**	267	**0.087**	12.48	0.78	**0.092**	0.00128	0.98	1.68	**0.286**	10.1
K064075	**19.05**	0.75	**0.85**	121.7	**2.56**	365	**0.122**	17.44	1.19	**0.138**	0.00192	1.26	1.68	**0.427**	15.1
K064100	**25.4**	1	**1.08**	154	**3.23**	462	**0.15**	21.44	1.6	**0.184**	0.00256	1.47	1.68	**0.572**	20.2
K064150	**38.1**	1.5	**1.46**	209	**4.39**	627	**0.204**	29.12	2.37	**0.276**	0.00384	1.77	1.68	**0.846**	30.2
K064200	**50.8**	2	**2.16**	308	**6.47**	924	**0.244**	34.88	3.23	**0.369**	0.00512	1.97	1.68	**1.129**	40.3
K064300	**76.2**	3	**2.91**	410	**8.73**	1,230	**0.33**	46.6	4.74	**0.552**	0.00768	2.6	1.68	**1.701**	60.5
K089050	**12.7**	0.5	**1.307**	186.7	**3.92**	560	**0.164**	23.36	2.14	**0.38**	0.00528	1.26	1.02	**0.498**	17.6
K089075	**19.05**	0.75	**1.96**	280	**5.88**	840	**0.235**	33.6	3.35	**0.576**	0.008	1.64	1.02	**0.747**	26.4
K089100	**25.4**	1	**2.618**	374	**7.84**	1,120	**0.283**	40.64	4.42	**0.792**	0.0011	1.92	1.02	**0.996**	35.2
K089150	**38.1**	1.5	**3.92**	560	**11.76**	1,680	**0.381**	54.4	6.7	**1.15**	0.016	2.33	1.02	**1.494**	52.8
K089200	**50.8**	2	**4.291**	613	**12.87**	1,839	**0.466**	66.56	8.95	**1.51**	0.021	2.6	1.02	**1.992**	70.4
K089300	**76.2**	3	**7.13**	1,004	**21.4**	3,012	**0.631**	88.9	13.4	**2.30**	0.032	2.9	1.02	**3.00**	105.6

(1) = Housed in a motor frame.
Typically an aluminum cylinder with 6.35mm (0.250in) thick walls,
K032, K044 and K064 mounted to a 152mm x 152mm x 12.5 mm (6in x 6in x 0.5in) aluminum plate
K089 mounted to a 203mm x 203mm x 12.5mm (8in x 8in x 0.5in) aluminum plate

Pole Count
K032 is 4
K044 is 6
K064 is 8
K089 is 12

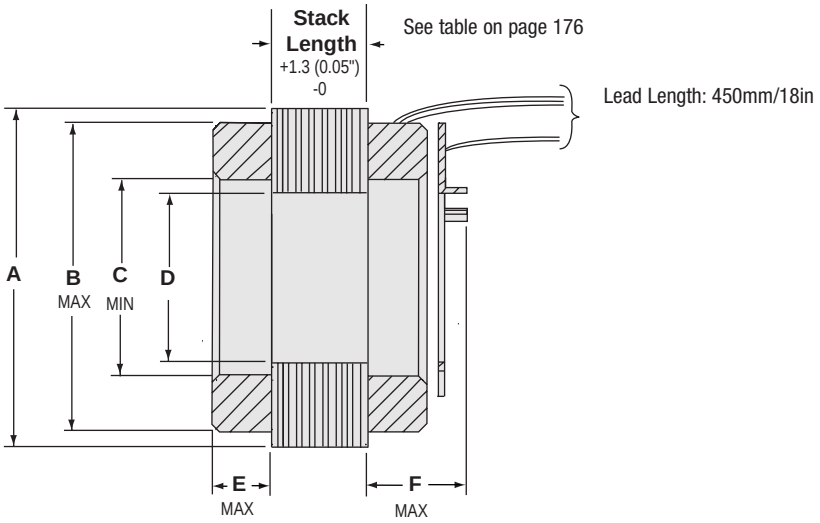
Frame Size	Stack Length		Continuous Torque (1) T_c		Peak Torque T_p		Motor Constant K_m		Core Loss P_c	Rotor Inertia J_m		Electrical Time Constant T_c	Thermal Resistance	Weight Wm	
	(mm)	(in)	(Nm)	(oz in)	(Nm)	(oz in)	(Nm / $\sqrt{W}$)	(oz in / $\sqrt{W}$)	W@1kRPM	(gm cm sec^2)	(oz in sec^2)	(msec)	(^{0}C / W)	(kg)	(oz)
K375050	**12.7**	0.5	**1.715**	245	**5.14**	734	**0.153**	21.8	1.2	**0.324**	0.0045	1.45	1.02	**0.611**	21.6
K375075	**19.05**	0.75	**2.401**	343	**7.19**	1,027	**0.213**	30.4	1.8	**0.497**	0.0069	1.9	1.02	**0.917**	32.4
K375100	**25.4**	1	**3.003**	429	**9**	1,286	**0.267**	38.1	2.4	**0.655**	0.0091	2.24	1.02	**1.095**	38.7
K375150	**38.1**	1.5	**4.025**	575	**12.6**	1,723	**0.357**	51	3.6	**1.01**	0.014	2.68	1.02	**1.554**	54.9
K375200	**50.8**	2	**4.935**	705	**14.82**	2,117	**0.438**	62.6	4.8	**1.30**	0.018	3.03	1.02	**2.02**	71.1
K375300	**76.2**	3	**6.69**	942	**20.1**	2,826	**0.592**	83.4	7.2	**2.02**	0.028	3.5	1.02	**2.94**	103.5
K127050	**12.7**	0.5	**3.94**	563	**11.83**	1,690	**0.29**	41.4	4.7	**1.15**	0.016	2.38	0.7	**1.087**	38.4
K127100	**25.4**	1	**6.98**	997	**21.04**	3,006	**0.513**	73.3	9.6	**2.38**	0.033	3.7	0.7	**1.766**	62.4
K127150	**38.1**	1.5	**9.56**	1,365	**28.66**	4,094	**0.702**	100.3	14.5	**3.53**	0.049	4.6	0.7	**2.355**	83.2
K127200	**50.8**	2	**11.75**	1,678	**35.24**	5,034	**0.864**	123.4	19.4	**4.75**	0.066	5.23	0.7	**2.99**	105.6
K127300	**76.2**	3	**16.1**	2,263	**48.3**	6,789	**1.18**	166.1	29.0	**7.06**	0.098	6.1	0.7	**3.65**	147.2
K500050	**12.7**	0.5	**3.05**	435	**9.14**	1,306	**0.224**	32	1.6	**1.15**	0.016	2.6	0.7	**1.087**	38.4
K500100	**25.4**	1	**5.49**	784	**16.46**	2,352	**0.403**	57.6	3	**2.30**	0.032	4.5	0.7	**1.766**	62.4
K500150	**38.1**	1.5	**7.92**	1,131	**23.76**	3,394	**0.582**	83.2	4.8	**3.46**	0.048	6	0.7	**2.355**	83.2
K500200	**50.8**	2	**9.44**	1,349	**28.32**	4,046	**0.694**	99.2	6.4	**4.61**	0.064	6.4	0.7	**2.988**	105.6
K500300	**76.2**	3	**15.4**	2,170	**46.2**	6,510	**1.13**	159.3	8.6	**6.92**	0.096	8.0	0.7	**4.18**	147.2
K178050	**12.7**	0.5	**10.12**	1,445	**16.18**	2,312	**0.627**	89.6	9.1	**4.75**	0.066	4.16	0.5	**2.4**	84.8
K178100	**25.4**	1	**18.06**	2,580	**28.89**	4,127	**1.12**	160	18.7	**9.36**	0.13	6.54	0.5	**3.71**	131.2
K178150	**38.1**	1.5	**24.75**	3,535	**39.59**	5,655	**1.534**	219	14.4	**14.4**	0.2	8.15	0.5	**4.98**	176
K178200	**50.8**	2	**30.7**	4,386	**49.12**	7,017	**1.904**	272	18.7	**18.7**	0.26	9.31	0.5	**6.34**	224
K178300	**76.2**	3	**43.1**	6,078	**69.0**	9,724	**2.68**	377	28.8	**28.8**	0.4	12.2	0.5	**8.90**	313.6
K700050	**12.7**	0.5	**5.05**	722	8.09	1,155	**0.314**	44.8	7.70	**7.7**	0.107	2.9	0.4	**2.4**	84.8
K700100	**25.4**	1	**9.57**	1,367	15.32	2,188	**0.594**	84.8	15.4	**15.4**	0.214	5	0.4	**3.71**	131.2
K700150	**38.1**	1.5	**13.55**	1,935	21.67	3,096	0.84	120	23.2	**23.2**	0.322	6.8	0.4	**4.98**	176
K700200	**50.8**	2	**17.52**	2,503	28.03	4,004	**1.086**	155.2	30.9	**31**	0.429	8.5	0.4	**6.34**	224
K700300	**76.2**	3	**27.5**	3,876	44.0	6,200	**1.53**	215	46.4	**46.4**	0.644	10.7	0.4	**8.91**	313.6
K254050	**12.7**	0.5	**18.78**	2,683	30.04	4,292	**1.043**	149	17.9	**17.9**	0.248	6.05	0.4	**4.48**	158.4
K254100	**25.4**	1	**33.92**	4,846	54.27	7,753	**1.883**	269	35.5	**35.5**	0.493	9.63	0.4	**6.79**	240
K254150	**38.1**	1.5	**46.84**	6,692	74.95	10,707	**2.597**	371	53.1	**53.1**	0.738	12.5	0.4	**9.056**	320
K254200	**50.8**	2	**58.35**	8,336	93.37	13,338	**3.234**	462	71.0	**71**	0.986	14.7	0.4	**11.32**	400
K254300	**76.2**	3	**80.9**	11,400	129.4	18,240	**4.49**	632	106.2	**106**	1.478	18.0	0.4	**15.9**	560

(1) = Housed in a motor frame. Typically an aluminum cylinder with 6.35mm (0.250in) thick walls,
K375, K127 and K500 mounted to a 305mm x 305mm x 12.5mm (12in x 12in x 0.5in) aluminum plate.
K178, K700 and K254 mounted to a 406mm x 406mm x 12.5mm (16in x 16in x 0.5in) aluminum plate.

Pole Count:
K127 & K375 are 12
K700 & K500 are 8
K178 & K254 are 18

K032 to K0254 Motors

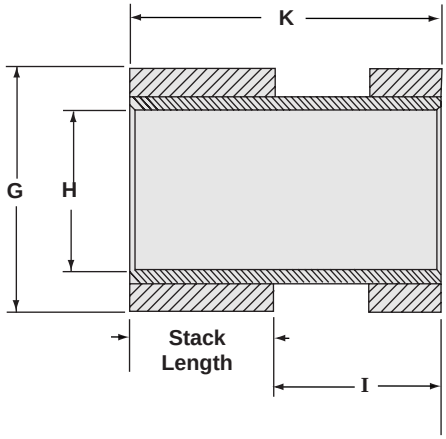
Dimensions



Stator Outline

Frame Size	A O.D. (mm)	A O.D. (in)	B End Turns O.D. (mm)	B End Turns O.D. (in)	C End Turns I.D. (mm)	C End Turns I.D. (in)	D I.D. (mm)	D I.D. (in)	E End Turns Length (mm)	E End Turns Length (in)	F Commutation Length (mm)	F Commutation Length (in)
K032	**31.78**	1.251	**27.94**	1.1	**16.51**	0.65	**15.06**	0.593	**6.4**	0.25	**14.5**	0.57
	31.75	1.25					**14.8**	0.583				
K044	**44.48**	1.751	**40.64**	1.6	**26.16**	1.03	**22.35**	0.88	**7.9**	0.31	**16.5**	0.65
	44.42	1.749					**22.09**	0.87				
K064	**63.52**	2.501	**60.7**	2.39	**38.1**	1.5	**35.18**	1.385	**9.65**	0.38	**17.5**	0.69
	63.47	2.499					**34.92**	1.375				
K089	**88.92**	3.501	**85.8**	3.38	**54.6**	2.15	**53.47**	2.105	**9.91**	0.39	**17.5**	0.69
	88.87	3.499					**53.21**	2.095				
K375	**95.28**	3.751	**88.9**	3.5	**53.32**	2.06	**50.93**	2.005	**12.7**	0.5	**19.5**	0.77
	95.22	3.749					**50.67**	1.995				
K127	**127.02**	5.001	**122.17**	4.81	**74.17**	2.92	**72.49**	2.854	**12.7**	0.5	**19.5**	0.77
	126.97	4.999					**72.23**	2.844				
K500	**127.05**	5.002	**115.32**	4.54	**70.6**	2.78	**68.2**	2.685	**20.5**	0.81	**30.5**	1.2
	126.95	4.998					**67.94**	2.675				
K178	**177.88**	7.003	**172.72**	6.8	**111.51**	4.39	**110.64**	4.355	**20.3**	0.8	*	
	177.72	6.997					**110.38**	4.345				
K700	**177.88**	7.003	**158.24**	6.23	**117.6**	4.63	**115.19**	4.535	**18.8**	0.74	*	
	177.72	6.997					**114.93**	4.525				
K254	**254.07**	10.003	**253.26**	9.971	**165.1**	6.5	**157.61**	6.205	**19.6**	0.77	*	
	253.92	9.997					**157.35**	6.195				

*integral commutation not available



Rotor Outline

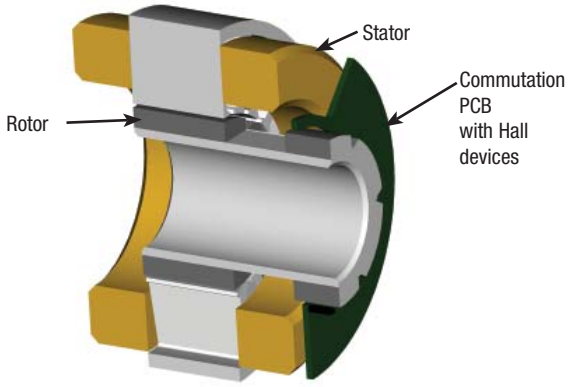


Figure 1.3
Kit Main Components

Frame Size	G Rotor O.D. (mm)	G Rotor O.D. (in)	H Rotor I.D. (mm)	H Rotor I.D. (in)	I Commutation Magnet Length (mm)	I Commutation Magnet Length (in)	K Rotor Length
K032	**13.94**	0.549	**7.62**	0.3	**13.21**	0.52	without Commutation:
	13.89	0.547	**7.59**	0.299			K = Stack Length + **0.76mm** (0.030in)
K044	**21.23**	0.836	**13.97**	0.55	**14.73**	0.58	
	21.18	0.834	**13.94**	0.549			with Commutation:
K064	**34.04**	1.34	**23.52**	0.926	**16.51**	0.65	K = Stack Length + **I + 0.76mm** (0.030in)
	33.98	1.338	**23.49**	0.925			
K089	**51.84**	2.041	**40.64**	1.6	**16.71**	0.66	
	51.79	2.039	**40.61**	1.599			
K375	**49.28**	1.94	**38.1**	1.5	**19.56**	0.77	
	49.15	1.935	**38.07**	1.499			
K127	**71.15**	2.801	**58.42**	2.3	**19.56**	0.77	
	71.09	2.799	**58.39**	2.299			
K500	**66.54**	2.62	**50.83**	2.001	**28.52**	1.12	
	66.5	2.618	**50.8**	2			
K178	**109.2**	4.292	**95.76**	3.77	*		
	108.9	4.29	**95.73**	3.769			
K700	**113.54**	4.47	**95.25**	3.75	*		
	113.49	4.468	**95**	3.74			
K254	**156.16**	6.148	**140.46**	5.53	*		
	156.11	6.146	**140.44**	5.529			

*integral commutation not available

Winding Selection

The selection of a particular frame size and winding for an application is dependent on:

Volume (diameter and length) requirement
Power (torque and speed) requirement
Voltage and current available or required

The first two items are dependent on the load and performance specifications of the application. They result in the selection of a particular frame size (032 through 254) and stack length.

The winding to be used will then be determined by voltage and current available or required.

Voltage: The bus voltage and maximum speed will approximately determine the required voltage constant (K_E).

Current: The maximum load and acceleration will determine the amount of current required, determined by the torque constant (K_T) associated with the selected voltage constant.

Example: Assume a requirement of 1,000 RPM at 50 oz in

If a motor with a particular winding having K_E = 18.24 V/1,000 RPM and K_T = 24.62 oz in/amp is chosen, it will now require a voltage (BEMF) of 18 volts and current of 2 amp.

NOTE: K_E and K_T are directly proportional to each other. Increasing K_E will also increase K_T; Decreasing K_E will also decrease K_T.

The result is that as the voltage requirement changes, the current requirement changes inversely.

Parker Bayside has a range of **27** windings available for each frame size and stack length, providing for virtually any practical combination of voltage and current required for your application.

The following pages show just a small representative sample of speed/torque curves for each of the 10 frame sizes available.

For the 044, 064, 089 and 127 frame sizes, the speed/torque curves are for stators that are used in the standard BM / GM motor products.

They make a good starting point for determining your specific application requirements and working with Parker Bayside application engineers to choose the proper motor size and power.

The following table lists the range of K_E and K_T available for each of the 10 frame sizes.

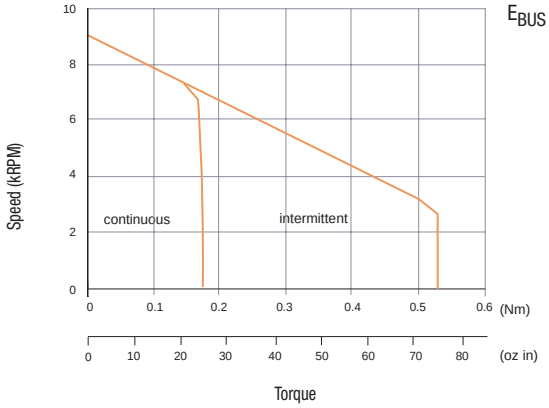
Detailed information for all these windings can be found on the web site: **www.baysidemotion.com or www.parkermotion.com**

Frame	Stack Range		K_E Range		K_T Range	
Size	(mm)	(in)	(V/1,000 RPM)	(V/rad/sec)	(Nm/amp)	(oz in/amp)
K032	**6.35 to 50.8**	0.25 to 2.00	**0.14 to 65.52**	0.0013 to 0.625	**0.0013 to 0.625**	0.18 to 88.45
K044	**6.35 to 50.8**	0.25 to 2.00	**0.28 to 126.3**	0.0027 to 1.2	**0.0027 to 1.2**	0.38 to 170.6
K064	**6.35 to 50.8**	0.25 to 2.00	**0.66 to 291.8**	0.0063 to 2.78	**0.0063 to 2.78**	0.89 to 394
K089	**6.35 to 50.8**	0.25 to 2.00	**1.35 to 605**	0.013 to 5.77	**0.013 to 5.77**	1.83 to 817
K375	**6.35 to 50.8**	0.25 to 2.00	**1.27 to 566**	0.012 to 5.40	**0.012 to 5.40**	1.71 to 765
K127	**12.7 to 50.8**	0.50 to 2.00	**3.73 to 827**	0.036 to 7.88	**0.036 to 7.88**	5.04 to 1116
K500	**12.7 to 50.8**	0.50 to 2.00	**3.38 to 714**	0.032 to 6.81	**0.032 to 6.81**	4.56 to 964
K178	**12.7 to 50.8**	0.50 to 2.00	**8.26 to 1716**	0.079 to 16.4	**0.079 to 16.4**	11.18 to 2,323
K700	**12.7 to 50.8**	0.50 to 2.00	**4.14 to 872**	0.039 to 8.31	**0.039 to 8.31**	5.59 to 1,177
K254	**12.7 to 50.8**	0.50 to 2.00	**11.44 to 2,537**	0.109 to 24.2	**0.109 to 24.2**	15.5 to 3,425

NOTE: Longer stacks and special windings are available. Call **1-800-305-4555**

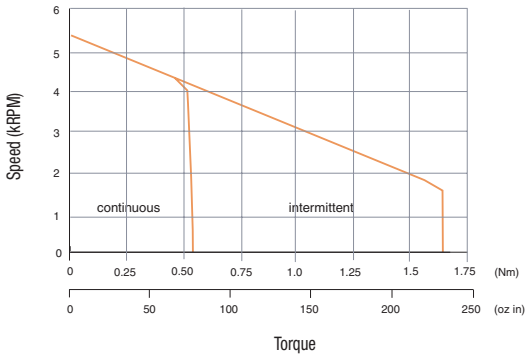
K032150-7Y

K_T = **0.051 Nm / amp** (7.19 oz-in / amp) R_{T-T} = 2.05 Ω I_{cont} = 3.6 amp
K_E = **0.051 v / rad / sec** (5.32 V / kRPM) L_{T-T} = 1.16 mH I_{peak} = 10.8 amp
E_{BUS} = 48 Vdc



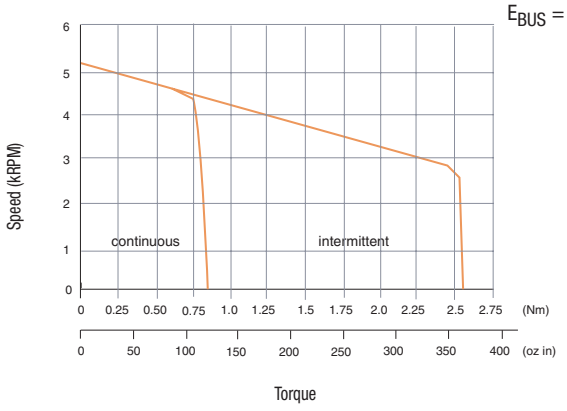
K044150-FY

K_T = **0.28 Nm / amp** (39.6 oz-in / amp) R_{T-T} = 11.8 Ω I_{cont} = 2 amp
K_E = **0.28 v / rad / sec** (29.3 V / kRPM) L_{T-T} = 12.5 mH I_{peak} = 6 amp
E_{BUS} = 160 Vdc



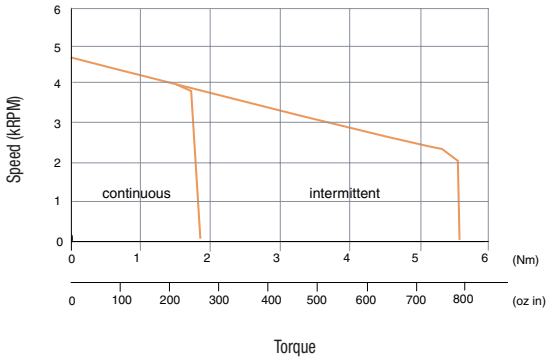
K044300-8Y

K_T = **0.28 Nm / amp** (39.6 oz-in / amp) R_{T-T} = 4.8 Ω I_{cont} = 3 amp
K_E = **0.28 v / rad / sec** (29.3 V / kRPM) L_{T-T} = 6.2 mH I_{peak} = 9 amp
E_{BUS} = 160 Vdc



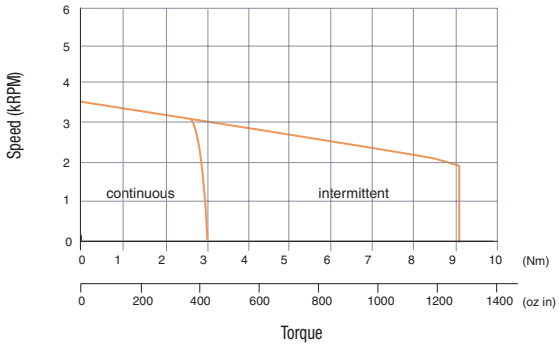
K064150-8Y

K_T = **0.33 Nm / amp** (46.1 oz-in / amp) R_{T-T} = 2.5 Ω I_{cont} = 6 amp
K_E = **0.33 v / rad / sec** (34.1 V / kRPM) L_{T-T} = 4.5 mH I_{peak} = 18 amp
E_{BUS} = 160 Vdc



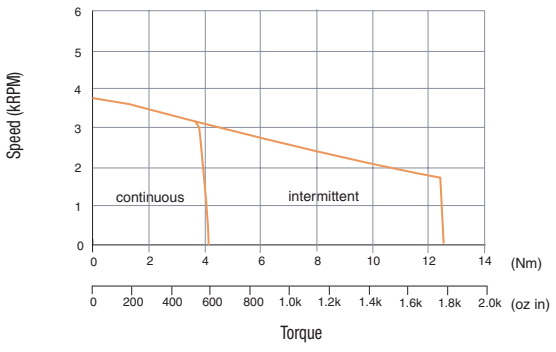
K064300-6Y

K_T = **0.42 Nm / amp** (59.9 oz-in / amp) R_{T-T} = 1.6 Ω I_{cont} = 7 amp
K_E = **0.42 v / rad / sec** (44.3 V / kRPM) L_{T-T} = 3.8 mH I_{peak} = 21 amp
E_{BUS} = 160 Vdc



K375150-6Y

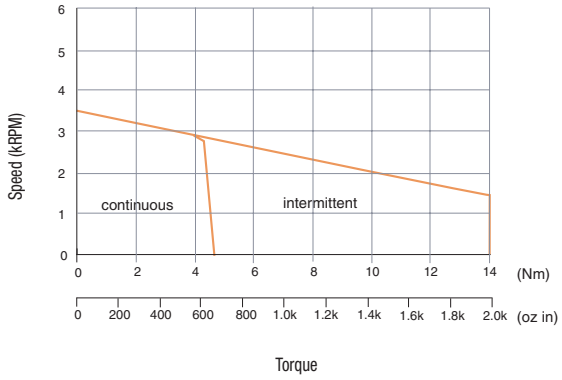
K_T = **0.41 Nm / amp** (57.92 oz-in / amp) R_{T-T} = 1.21 Ω I_{cont} = 10 amp
K_E = **0.41 v / rad / sec** (47.82 V / kRPM) L_{T-T} = 3.45 mH I_{peak} = 30 amp
E_{BUS} = 160 Vdc



Speed/Torque Curves

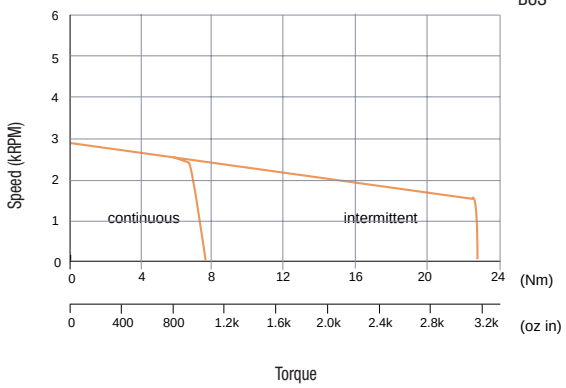
K089150-6Y

K_T = **0.43 Nm / amp** (61.6 oz-in / amp) R_{T-T} = 1.2 Ω I_{cont} = 11 amp
K_E = **0.43 v / rad / sec** (45.6 V / kRPM) L_{T-T} = 2.9 mH I_{peak} = 33 amp
E_{BUS} = 160 Vdc



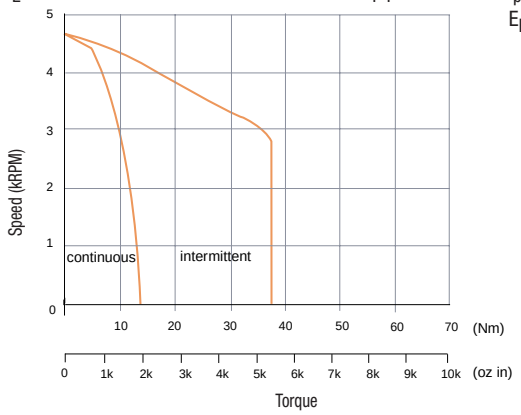
K089300-4Y

K_T = **0.54 Nm / amp** (75.8 oz-in / amp) R_{T-T} = 0.73 Ω I_{cont} = 15 amp
K_E = **0.54 v / rad / sec** (56.1 V / kRPM) L_{T-T} = 2.2 mH I_{peak} = 45 amp
E_{BUS} = 160 Vdc



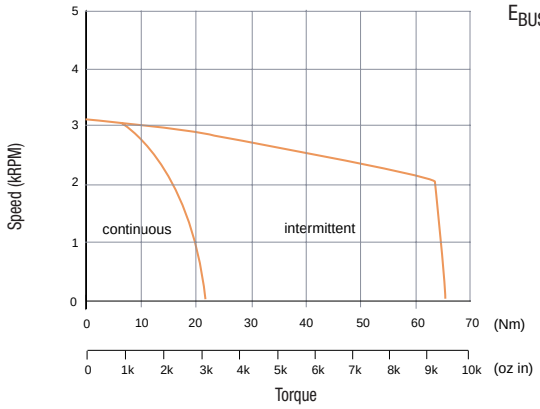
K127250-4Y

K_T = **0.61 Nm / amp** (86.9 oz-in / amp) R_{T-T} = 0.35 Ω I_{cont} = 20 amp
K_E = **0.61 v / rad / sec** (64.2 V / kRPM) L_{T-T} = 2.1 mH I_{peak} = 60 amp
E_{BUS} = 300 Vdc



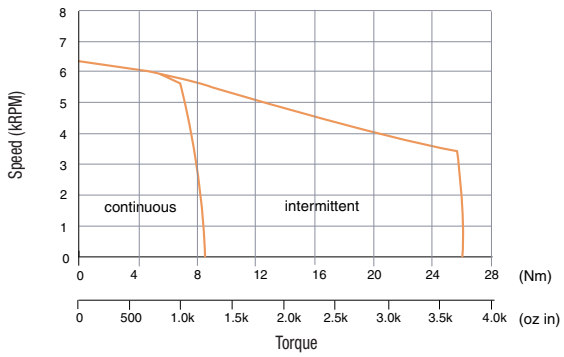
K127500-3Y

K_T = **0.92 Nm / amp** (130.4 oz-in / amp) R_{T-T} = 0.34 Ω I_{cont} = 24 amp
K_E = **0.92 v / rad / sec** (96.4 V / kRPM) L_{T-T} = 2.3 mH I_{peak} = 72 amp
E_{BUS} = 300 Vdc



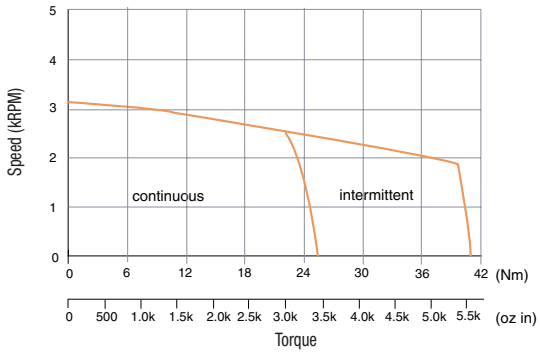
K500150-5Y

K_T = **0.45 Nm / amp** (63.78 oz-in / amp) R_{T-T} = 0.49 Ω I_{cont} = 18 amp
K_E = **0.45 v / rad / sec** (47.19 V / kRPM) L_{T-T} = 2.72 mH I_{peak} = 53 amp
E_{BUS} = 300 Vdc



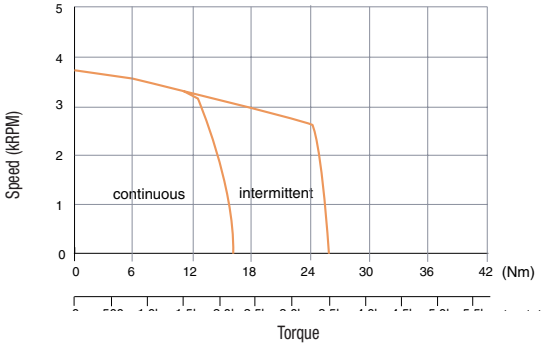
K178150-5Y

K_T = **0.93 Nm / amp** (130.5 oz-in / amp) R_{T-T} = 0.37 Ω I_{cont} = 27 amp
K_E = **0.93 v / rad / sec** (96.2 V / kRPM) L_{T-T} = 2.95 mH I_{peak} = 43 amp
E_{BUS} = 300 Vdc



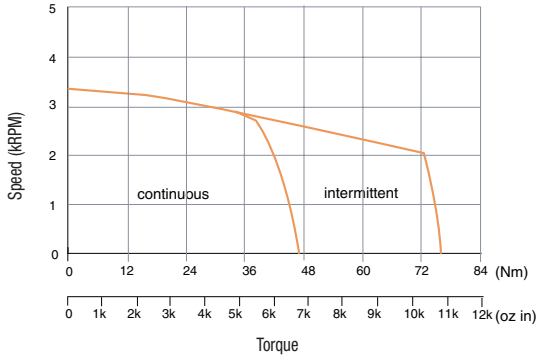
K700150-7Y

K_T = **0.78 Nm / amp** (110.35 oz-in / amp) R_{T-T} = 0.84 Ω I_{cont} = 18 amp
K_E = **0.78 v / rad / sec** (81.71 V / kRPM) L_{T-T} = 5.79 mH I_{peak} = 28 amp
E_{BUS} = 300 Vdc



K254150-5Y

K_T = **1.42 Nm / amp** (199.7 oz-in / amp) R_{T-T} = 0.78 Ω I_{cont} = 34 amp
K_E = **1.42 v / rad / sec** (147.6 V / kRPM) L_{T-T} = 3.6 mH I_{peak} = 54 amp
E_{BUS} = 300 Vdc



MOUNTING FRAMELESS MOTOR INTO ASSEMBLY

This section outlines a number of methods that can be used to mount the stator and rotor assemblies in the product.

Which method to be used will largely depend on the product design, performance requirements (torque, velocity, temperature, etc.) and the manufacturing capabilities of the user.

Dimensioned drawings for all the kits are shown in the catalog pages.

STATOR

The stator will be typically be mounted into a cylindrically shaped hole in the product (see Figure 9). It is recommended that a banking step be incorporated at the bottom of the hole to assure accurate and repeatable location of the stator.

Alternately, a non-ferrous "plug" could be used to provide a banking surface, which can be removed once the stator is fixed in place.

Figure 9 shows two methods for holding the stator in position; either with adhesive for a permanent assembly or with set screws for a removable assembly.

In designing the housing, be sure to provide a means for the stator lead wires (three) and the commutation Hall sensor PCB wires (five) to extend outside of the housing without interfering with the rotor / shaft assembly.

For volume production, a jig should be fabricated that will assure that the stator is located in the same position for each assembly. The yellow dot on the stator provides an index point for accomplishing this. This will eliminate the need to perform mechanical commutation alignment at final assembly.

Rotor

Except for the smaller motors (K032 and K044), the ID of the rotor will usually be larger than the shaft diameter.

An adapter sleeve will be required to allow mounting of the rotor to the shaft (see Figure 9).

The rotor / sleeve assembly must be positioned on the shaft such that the magnets are located in line with the stator assembly laminations. If the version in which the commutation PCB assembly is bonded to the end turns is being used, the commutation magnets must be located in proper proximity to the Hall sensors on the PCB. Figure 9 shows two methods for holding the rotor / sleeve on the shaft, either with adhesive or by using a spring pin and retaining ring.

When using the adhesive method, a shoulder should be provided on the shaft to properly locate the rotor/sleeve assembly.
When using the spring pin/retaining ring method, a slot must be provided in the sleeve that will engage the spring pin in the shaft, thus properly locating the rotor / sleeve assembly. During assembly, be sure that the pin and slot are fully engaged.

Note: The following adhesives are recommended for rotor and stator assembly (see Figure 9)

Loctite #325
Activator $7074
Loctite #609

Assembly

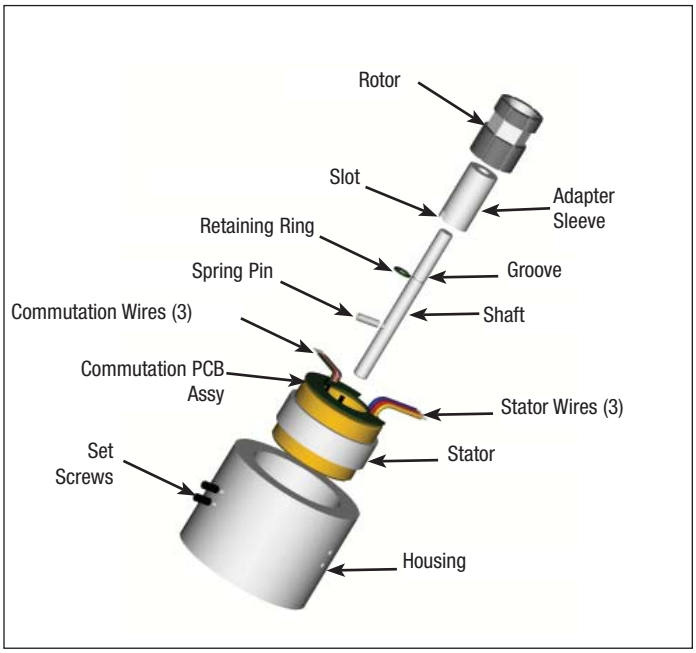
Stator Assembly:
Assemble stator in housing or sleeve (aluminum recommended) with the following locational clearances:

- Diameter to 127mm (5in) 0.025mm (0.001in) to 0.127mm (0.005in) diametrical clearance.
- Diameter over 127mm (5in) 0.05mm (0.002in) to 0.254mm (0.010in) diametrical clearance.

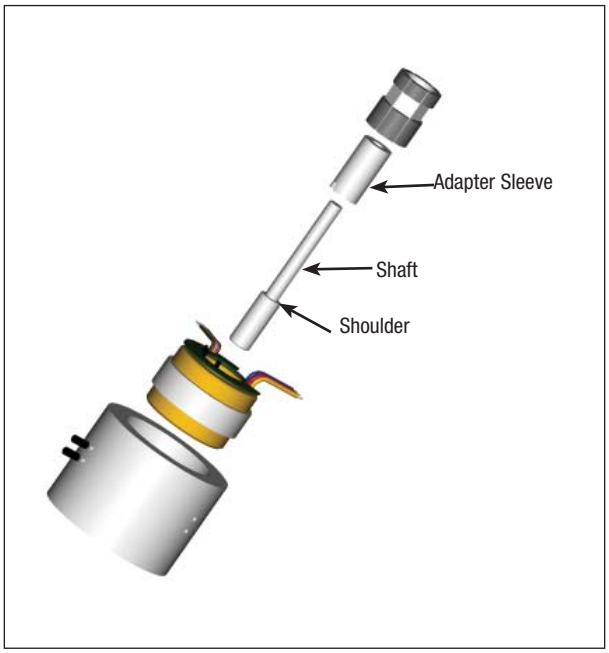
Do not force stator in position. This may damage or deform stator.

Permanent Assembly:
Secure stator with adhesive, Loctite #325 with activator #7074 or equivalent

Removable Assembly:
Secure with cup point screws or setscrews thru housing into stator steel laminations only. Use a minimum of three (3) screws equally spaced about stator O.D. Tighten evenly. Do not over torque screws. This may damage or deform stator.



Spring Pin / Retaining Ring Method



Shoulder / Adhesive Method

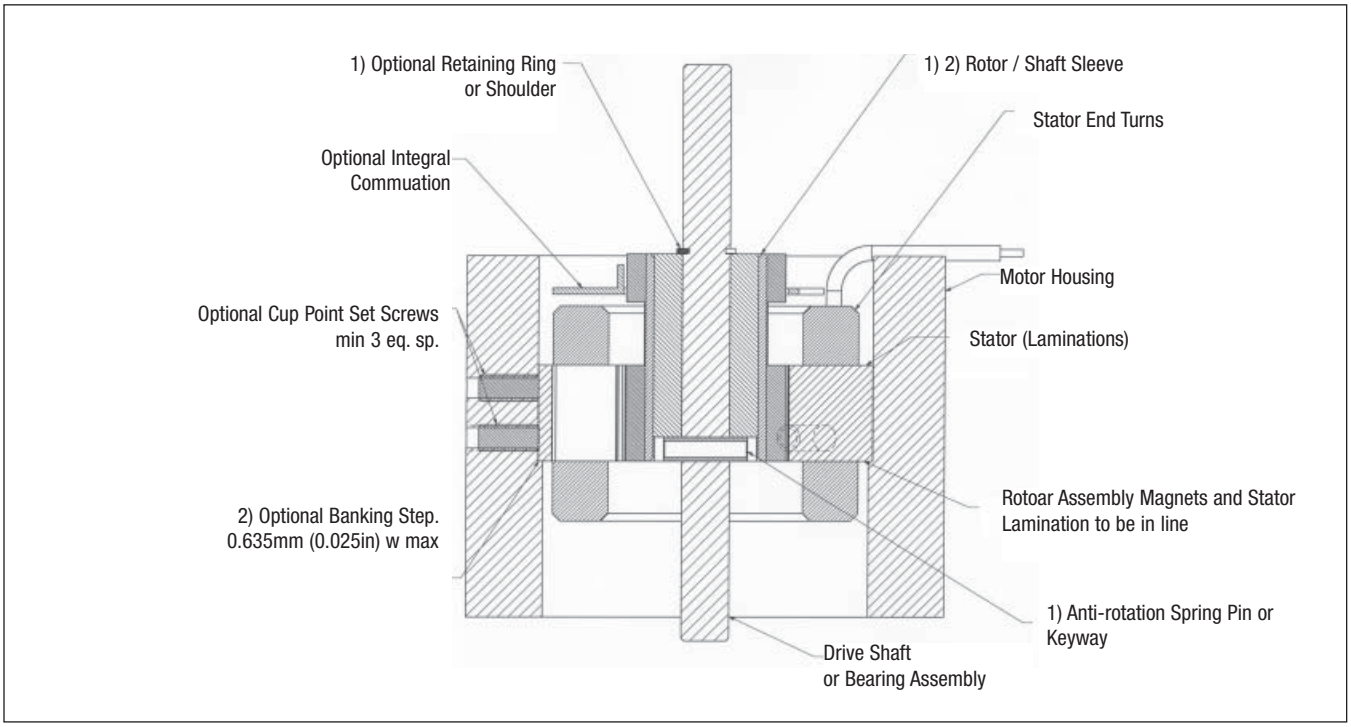


Figure 9

Rotor Assembly:
Assemble rotor to shaft with a locational clearance fit of 0.013mm (0.0005in) to 0.038mm (0.0015in) diametrical clearance.

Shoulder / Adhesive Method:
Fabricate shaft with shoulder. Secure rotor assembly and sleeve with adhesive. Loctite#609 or equivalent.

Spring Pin / Retaining Ring Method:
Fabricate a sleeve (steel or aluminum) with anti rotation spring pin groove. Fabricate shaft to accept retaining ring and spring pin. Permanently bond to rotor assembly.

Final Assembly:
Rotor magnets to be in line with stator laminations and concentric to stator lamination I.D. within 0.127mm (0.005in) MAX.

Caution:
Rotor assembly magnets are powerful and fragile!
Do not place near magnetically sensitive material
Do not place near other ferromagnetic materials such as iron, steel and nickel alloys. Strong uncontrolled attraction may damage magnets on contact.

Improper assembly of rotor into stator can cause serious injury and or damage to equipment.

When assembling the rotor into the stator, high radial forces will be experienced, which can cause the magnets to "crash" into the stator and be damaged and / or cause bodily injury!

The following precautions should be taken:

- Wrap the rotor with a thin (0.005in thick) Mylar sleeve which will fill the air gap between the rotor and stator during assembly and can be easily removed when assembly is complete.
- Support the rotor and stator assemblies in a fixturing arrangement which will prevent radial motion while the two assemblies are being mated.

Example:
1. Hold the rotor / shaft / product assembly in a machine tool vise on the base of an arbor press.
2. Fasten the stator assembly to the vertical moving member of the arbor press, away from the stator.
3. Slowly lower the stator assembly around the rotor / shaft / product assembly.
4. Tighten all fasteners to complete assembly.
5. Remove Mylar shim and check for rotational clearance.

How to Order

Order Numbering Example: **K 0 4 4 1 0 0 – E Y 2 XXX**

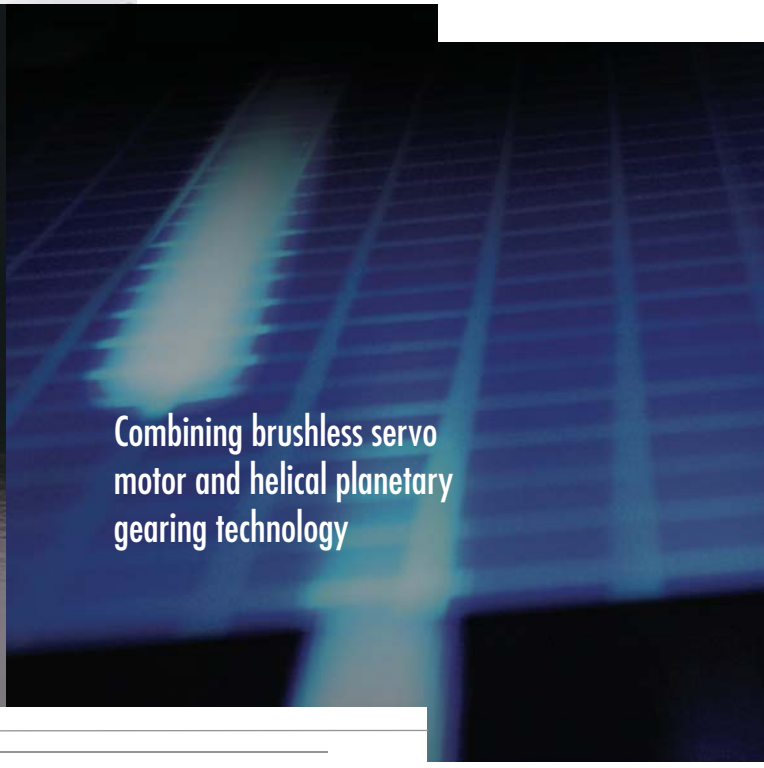
MODEL	STACK LENGTH	WINDING(1)	CONNECTION (2)	COMMUTATION
032	025 (0.25")	1	Y=Wye	1 = Without
044	050 (0.50")	2	D=Delta	2 = With Integral
064	075 (0.75")	3		
089	100 (1.00")	4		
375	150 (1.50")	5		
127	200 (2.00")	6		
500		7		
178		8		
700		9		
254		E		
		F		
		G		
		H		
		J		
		K		
		L		

(1) Consult Parker Bayside (1-800-305-4555 or www.baysidemotion.com or www.parkermotion.com) for specific winding designations.
(2) Consult factory for special options

Parker Bayside Kit Motors are supported by a worldwide network of offices and local distributors.
Call 1-800-305-4555 for application engineering assistance or for the name of your local distributor.
Information can also be obtained at **www.baysidemotion.com or www.parkermotion.com.**

Specifications are subject to change without notice.

Stealth® GM Gearmotor Series:
An Integrated Solution



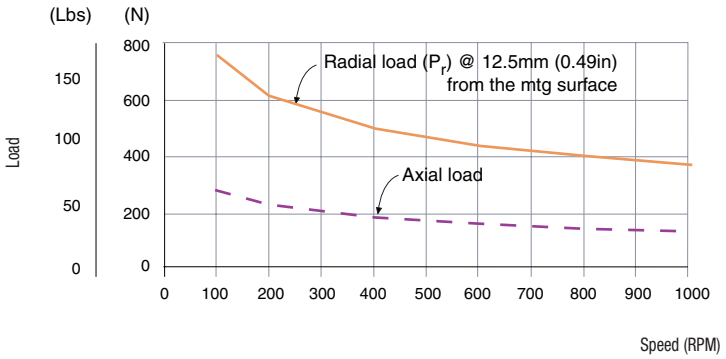
Combining brushless servo motor and helical planetary gearing technology

4 Frame Sizes	
GM60	GM23
GM90	GM34
GM115	GM42
GM142	GM56

Ratios	
5:1	25:1
7:1	30:1
10:1	50.1
20:1	100:1

Stealth® GM Gearmotors Series:
Output Shaft Load Rating

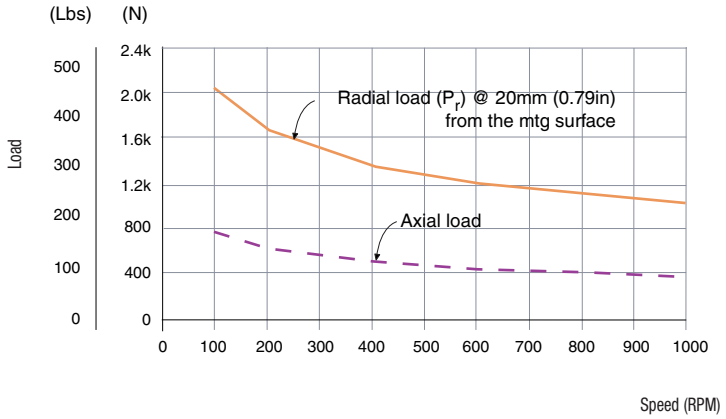
GM60/GM23



Formulas to calculate radial load (P_{rx}) at any distance "X" from the gearhead mounting surface.

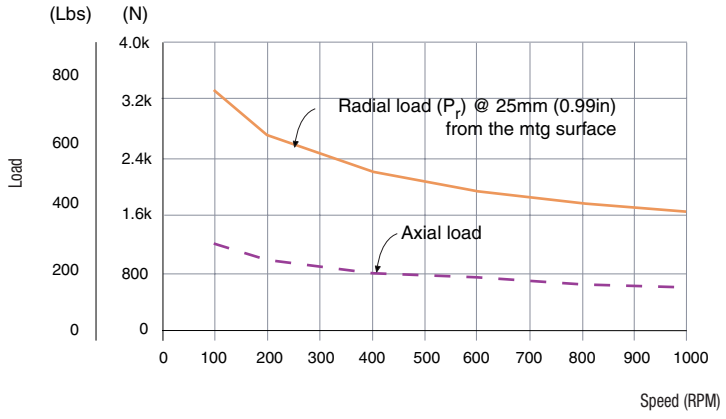
$P_{rx} = (P_r)(\mathbf{54mm}) / (\mathbf{41mm} + X)$
$P_{rx} = (P_r)(2.13in) / (1.61in + X)$

GM90/GM34



$P_{rx} = (P_r)(\mathbf{73mm}) / (\mathbf{52mm} + X)$
$P_{rx} = (P_r)(2.87in) / (2.05in + X)$

GM115/GM42



$P_{rx} = (P_r)(\mathbf{89mm}) / (\mathbf{63mm} + X)$
$P_{rx} = (P_r)(3.5in) / (2.48in + X)$

An Integrated Step Forward

Parker Bayside's Stealth® Gearmotors represent the first time a brushless servo motor and a helical planetary gearhead have been integrated into a single product. Previously, engineers needing a gear drive with servo motor were forced to purchase the gearhead and motor separately. Parker Bayside manufactures precision gearheads and gearmotors under one roof.

Stealth® Gearmotors combine both mechanical and electronic parts into a compact, powerful package. The motor magnets are attached directly to the input gearshaft, eliminating the extra couplings, shafts and bearings required when the two components are separate. Eliminating these extra parts means that Stealth gearmotors are more reliable, have higher performance and cost less than traditional motor/gearhead assemblies.

When to Use:

- High torque in compact package
- Reduce mechanical complexity
- Cost reduction

Applications:

- Automotive
- Machine tool
- Material handling
- Medical
- Packaging
- Paper converting
- Robotics
- Semiconductor

1 **Large Output Bearings**
for high radial loads

2 **IP65 Protection**
with Viton seals, DIN-type connectors, O-rings and an anodized aluminum alloy housing for use in harsh environments

3 **High-Density Copper Windings and Rare-Earth Magnets**
provides maximum torque and efficiency

4 **Skewed Laminations with Odd Slot Counts**
reduce cogging

5 **Duplex Angular Contact Bearing**
for optimum motor assembly stiffness

6 **Modular Encoders, Resolvers and Brakes**
offered standard without increasing package size

7 **Two Winding Options, Single or Double Stack Motors and Multiple Gear Ratios**
for a wide range of torques and speeds

8 **Single-Piece Construction**
of rotor and sun gear guarantees alignment for smooth operation

9 **Motor, Gearhead and Encoder**
in one compact package eliminates extra parts, improving reliability and performance

10 **Stealth® Helical Planetary Output**
provides high torques, low backlash and quiet, reliable performance

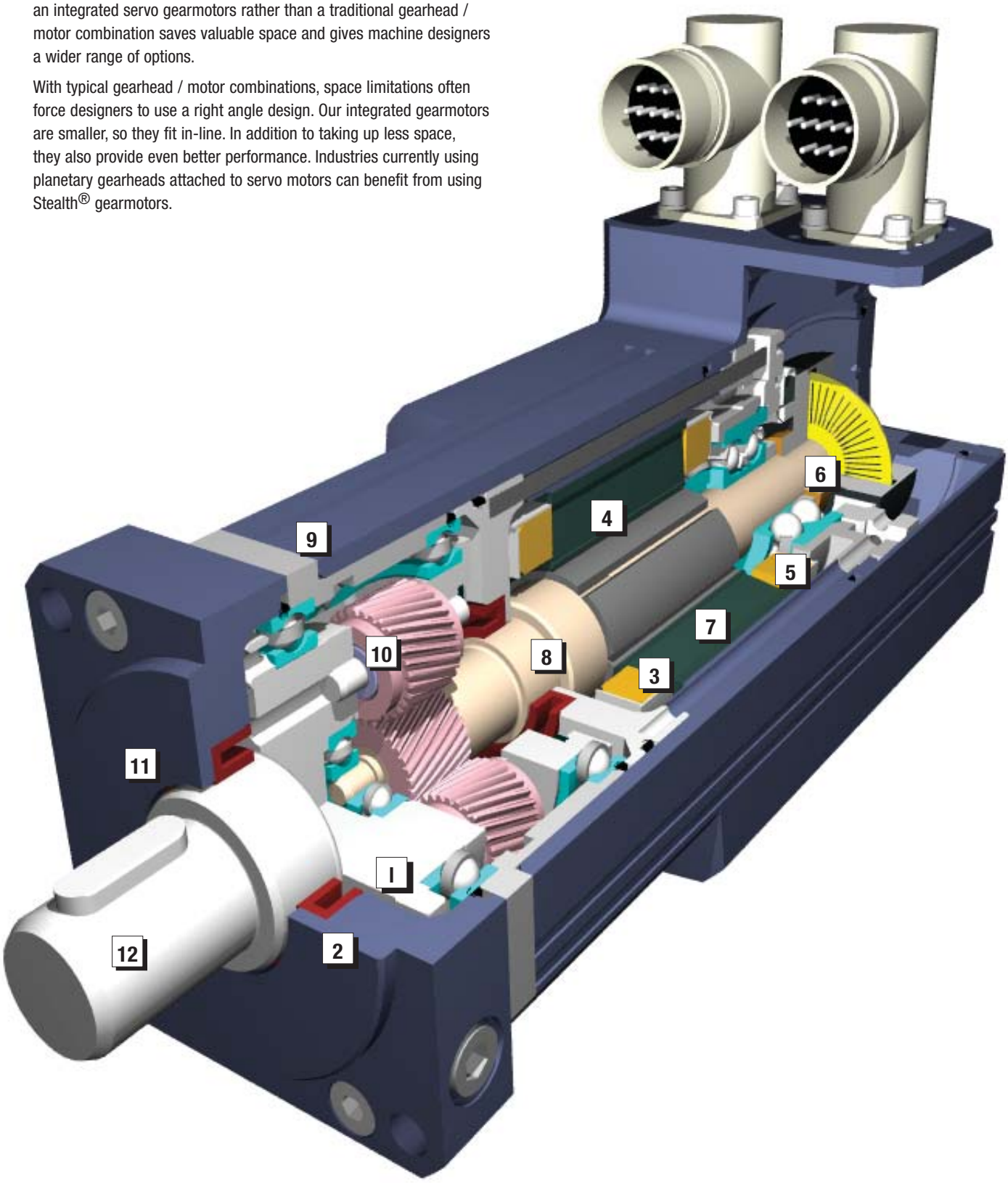
11 **Innovative Thermal Design**
runs 20% cooler than a separate motor/gearhead assembly

12 **Stainless Steel Output Shaft**
won't rust in corrosive environments

Motor and Gearhead All In One

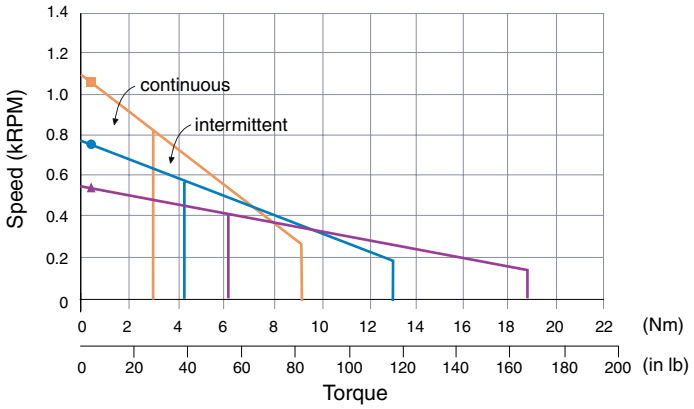
Stealth® gearmotors fit in-line for maximum design flexibility. Using an integrated servo gearmotors rather than a traditional gearhead / motor combination saves valuable space and gives machine designers a wider range of options.

With typical gearhead / motor combinations, space limitations often force designers to use a right angle design. Our integrated gearmotors are smaller, so they fit in-line. In addition to taking up less space, they also provide even better performance. Industries currently using planetary gearheads attached to servo motors can benefit from using Stealth® gearmotors.

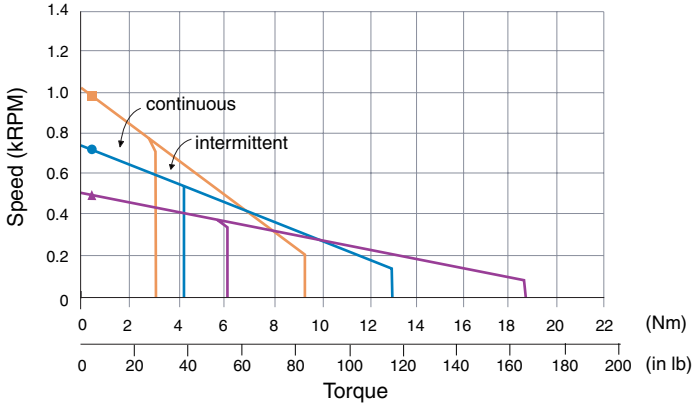


GM60/GM23 Speed / Torque Curves

Single Stack - 160 volt

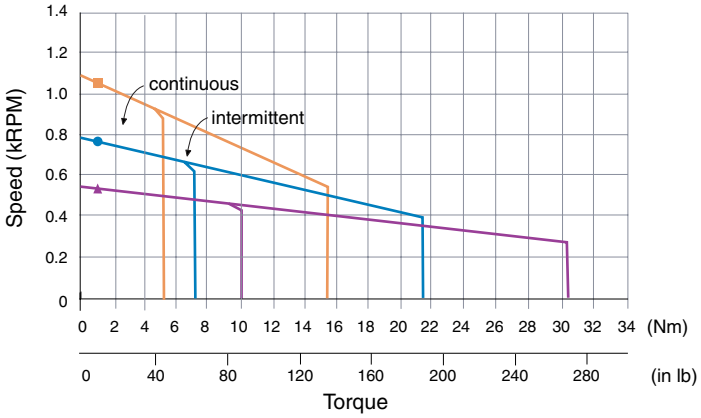


Single Stack - 300 volt

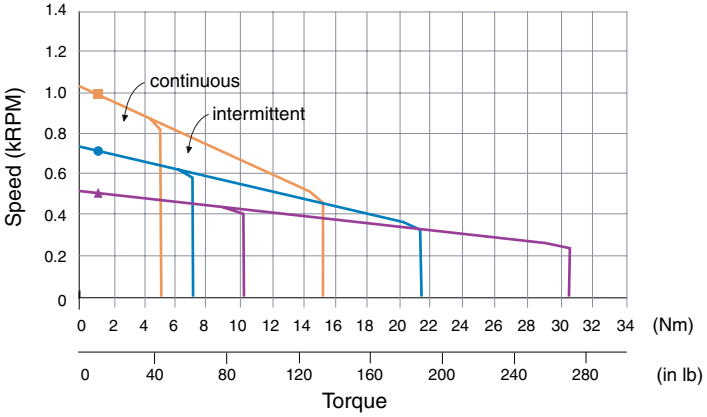


5:1 7:1 10:1

Double Stack - 160 volt



Double Stack - 300 volt



Performance Specifications (six step/trapezoidal commutation)

Mechanical Specifications

Frame Size	Stack Length	Weight without Brake		Maximum Radial Load		Torsional Stiffness		Standard Backlash	Low Backlash
		(kg)	(lb)	(N)	(lb)	(Nm/arc min)	(in lb/arc min)	(arc min)	(arc min)
GM060	Single	**2.1**	4.7	**1,300**	292	**6**	53	15	10
GM060	Double	**2.8**	6.2	**1,300**	292	**6**	53	15	10

* Measured at 2% of rated torque

Single Stack Specifications

Frame Size	Ratio	Max. Speed[1] T_C	Cont. Stall Torque [1] T_P		Peak Torque[1] D:300 Vdc		Winding C:160 Vdc K_{EL-L}	Voltage Constant[1][3] K_{TL-L}	Torque Constant[1][3] L_{L-L}		Induct R_{L-L}	Cold Resistance I_C	Cont. Current I_P	Peak Current	Inertia [2]	
		(RPM)	(Nm)	(in lb)	(Nm)	(in lb)		(V/kRPM)	(Nm/amp)	(in lb/amp)	(mH)	(ohms)	(amps)	(amps)	(gm cm sec^2)	(lb in sec^2)
GM060	5:1	1,100	**3.1**	27.5	**9.3**	82.5	C	146.5	**1.40**	12.5	12.5	11.8	2	7	**0.23**	0.00019
GM060	5:1	1,000	**3.1**	27.5	**9.3**	82.5	D	296.5	**2.85**	25.0	51.2	48.3	1	3	**0.23**	0.00019
GM060	7:1	780	**4.3**	38.5	**13.0**	115.5	C	205.1	**1.96**	17.5	12.5	11.8	2	7	**0.19**	0.00016
GM060	7:1	720	**4.3**	38.5	**13.0**	115.5	D	415.1	**3.99**	35.0	51.2	48.3	1	3	**0.19**	0.00016
GM060	10:1	540	**6.2**	55.0	**18.6**	165.0	C	293.0	**2.80**	25.0	12.5	11.8	2	7	**0.19**	0.00016
GM060	10:1	500	**6.2**	55.0	**18.6**	165.0	D	593.0	**5.70**	50.0	51.2	48.3	1	3	**0.19**	0.00016

Double Stack Specifications

Frame Size	Ratio	Max. Speed[1] T_C	Cont. Stall Torque [1] T_P		Peak Torque[1] D:300 Vdc		Winding C:160 Vdc K_{EL-L}	Voltage Constant[1][3] K_{TL-L}	Torque Constant[1][3] L_{L-L}		Induct R_{L-L}	Cold Resistance I_C	Cont. Current I_P	Peak Current	Inertia [2]	
		(RPM)	(Nm)	(in lb)	(Nm)	(in lb)		(V/kRPM)	(Nm/amp)	(in lb/amp)	(mH)	(ohms)	(amps)	(amps)	(gm cm sec^2)	(lb in sec^2)
GM060	5:1	1,100	**5.1**	45.0	**15.2**	135.0	C	146.5	1.40	12.5	6.2	4.8	4	11	**0.29**	0.00025
GM060	5:1	1,000	**5.1**	45.0	**15.2**	135.0	D	293.0	2.80	25.0	25	19	2	5	**0.29**	0.00025
GM060	7:1	780	**7.1**	63.0	**21.3**	189.0	C	205.6	1.96	17.5	6.2	4.8	4	11	**0.25**	0.00022
GM060	7:1	720	**7.1**	63.0	**21.3**	189.0	D	410.2	3.92	35.0	25	19	2	5	**0.25**	0.00022
GM060	10:1	540	**10.1**	90.0	**30.4**	270.0	C	293.0	2.80	25.0	6.2	4.8	4	11	**0.25**	0.00022
GM060	10:1	500	**10.1**	90.0	**30.4**	270.0	D	586.0	5.60	50.0	25	19	2	5	**0.25**	0.00022

Note: Pole Count for GM060 is 6

Thermal Resistance for GM060 is 1.5 ^{o}C/W

Stator winding thermal resistance (winding to ambient) is for the unit, mounted to a 254mm x 254mm x 12.7mm (10in x 10in x 0.5in) aluminum plate.

(1) These specifications refer to the output of the GM assembly.
When programming a digital amplifier for use with a GM assembly, these specifications must be adjusted by the ratio to create actual motor performance

(2) Inertia = Motor Rotor + Gear Selection. External Inertia must be divided by the square of the ratio.

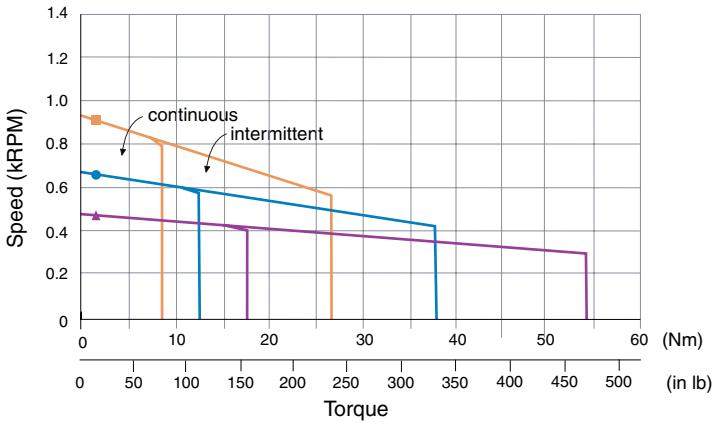
(3) Peak of sine wave

Specification are subject to change without notice

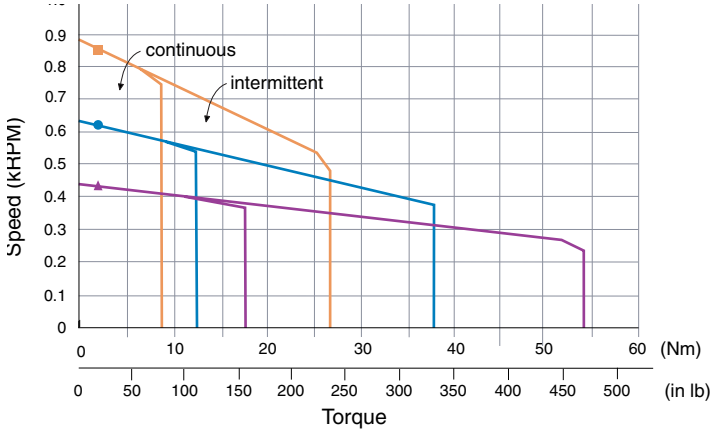
Stealth GM
Gearmotors Series

GM90/GM34 Speed / Torque Curves

Single Stack - 160 volt

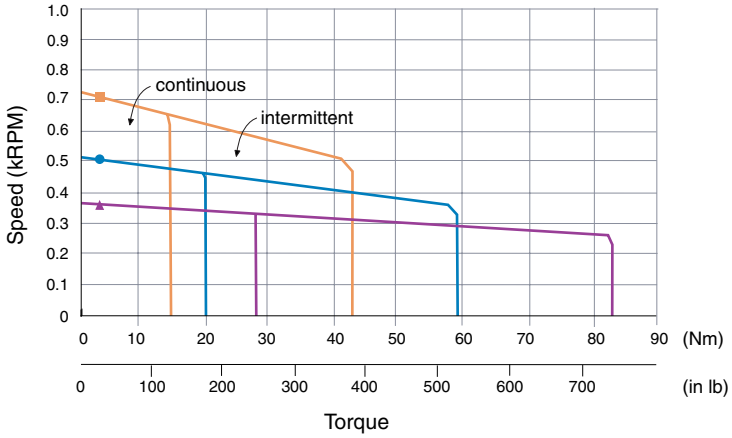


Single Stack - 300 volt

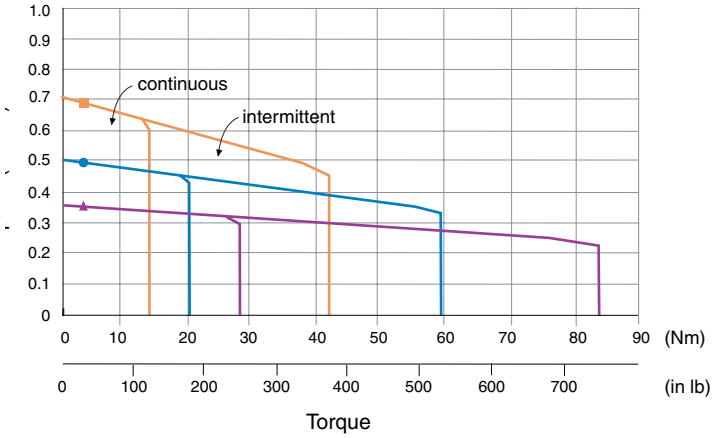


5:1 7:1 10:1

Double Stack - 160 volt



Double Stack - 300 volt



Performance Specifications (six step/trapezoidal commutation)

Mechanical Specifications

Frame Size	Stack Length	Weight without Brake		Maximum Radial Load		Torsional Stiffness		Standard Backlash	Low Backlash
		(kg)	(lb)	(N)	(lb)	(Nm/arc min)	(in lb/arc min)	(arc min)	(arc min)
GM090	Single	**6.0**	13.2	**2,600**	584	**11**	87	15	10
GM090	Double	**7.4**	16.3	**2,600**	584	**11**	87	15	10

* Measured at 2% of rated torque

Single Stack Specifications

Frame Size	Ratio	Max. Speed[1] T_C	Cont. Stall Torque[1] T_P		Peak Torque[1] D:300 Vdc		Winding C:160 Vdc K_{EL-L}	Voltage Constant[1][3] K_{TL-L}	Torque Constant[1][3] L_{L-L}		Induct R_{L-L}	Cold Resistance I_C	Cont. Current I_P	Peak Current	Inertia[2]	
		(RPM)	(Nm)	(in lb)	(Nm)	(in lb)		(V/kRPM)	(Nm/amp)	(in lb/amp)	(mH)	(ohms)	(amps)	(amps)	(gm cm sec^2)	(lb in sec^2)
GM090	5:1	900	**8.7**	77.0	**26.0**	231.0	C	170.5	**1.65**	14.5	4.5	2.5	5	16	**1.16**	0.00100
GM090	5:1	870	**8.7**	77.0	**26.0**	231.0	D	341.0	**3.25**	29.0	18.1	10.1	3	8	**1.16**	0.00100
GM090	7:1	670	**12.0**	107.0	**36.1**	321.0	C	238.7	**2.31**	20.3	4.5	2.5	5	16	**0.94**	0.00081
GM090	7:1	620	**12.0**	107.0	**36.1**	321.0	D	477.9	**4.55**	40.6	18.1	10.1	3	8	**0.94**	0.00081
GM090	10:1	450	**17.2**	153.0	**51.7**	459.0	C	341.0	**3.30**	29.0	4.5	2.5	5	16	**0.94**	0.00081
GM090	10:1	430	**17.2**	153.0	**51.7**	459.0	D	682.0	**6.50**	58.0	18.1	10.1	3	8	**0.94**	0.00081

Double Stack Specifications

Frame Size	Ratio	Max. Speed[1] T_C	Cont. Stall Torque[1] T_P		Peak Torque[1] D:300 Vdc		Winding C:160 Vdc K_{EL-L}	Voltage Constant[1][3] K_{TL-L}	Torque Constant[1][3] L_{L-L}		Induct R_{L-L}	Cold Resistance I_C	Cont. Current I_P	Peak Current	Inertia[2]	
		(RPM)	(Nm)	(in lb)	(Nm)	(in lb)		(V/kRPM)	(Nm/amp)	(in lb/amp)	(mH)	(ohms)	(amps)	(amps)	(gm cm sec^2)	(lb in sec^2)
GM090	5:1	720	**14.0**	124.0	**41.9**	372.0	C	221.5	**2.10**	18.5	3.8	1.6	7	20	**1.31**	0.00113
GM090	5:1	700	**14.0**	124.0	**41.9**	372.0	D	426.0	**4.05**	36.0	14.1	6.3	3	10	**1.31**	0.00113
GM090	7:1	500	**19.5**	173.0	**58.4**	519.0	C	310.1	**2.94**	25.9	3.8	1.6	7	20	**1.10**	0.00094
GM090	7:1	500	**19.5**	173.0	**58.4**	519.0	D	596.4	**5.67**	50.4	14.1	6.3	3	10	**1.10**	0.00094
GM090	10:1	360	**27.8**	247.0	**83.4**	741.0	C	443.0	**4.20**	37.0	3.8	1.6	7	20	**1.10**	0.00094
GM090	10:1	350	**27.8**	247.0	**83.4**	741.0	D	852.0	**8.10**	72.0	14.1	6.3	3	10	**1.10**	0.00094

Note: Pole Count for GM090 is 8

Thermal Resistance for GM090 is 1.2 ^{0}C/W

Stator winding thermal resistance (winding to ambient) is for the unit, mounted to a 254mm x 254mm x 12.7mm (10in x 10in x 0.5in) aluminum plate.

(1) These specifications refer to the output of the GM assembly.
When programming a digital amplifier for use with a GM assembly, these specifications must be adjusted by the ratio to create actual motor performance

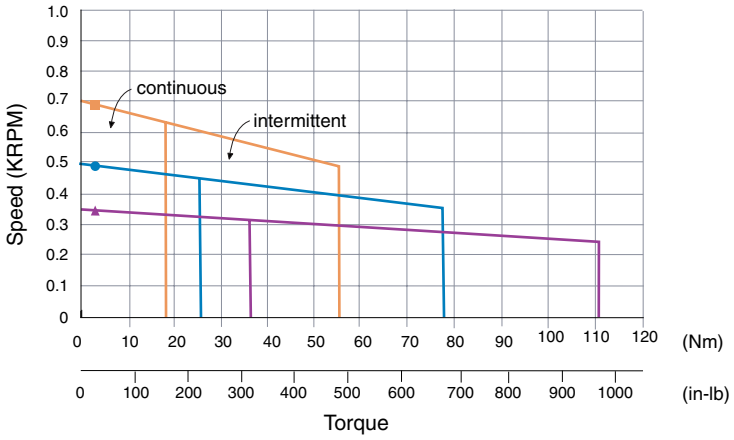
(2) Inertia = Motor Rotor + Gear Selection. External Inertia must be divided by the square of the ratio.

(3) Peak of sine wave

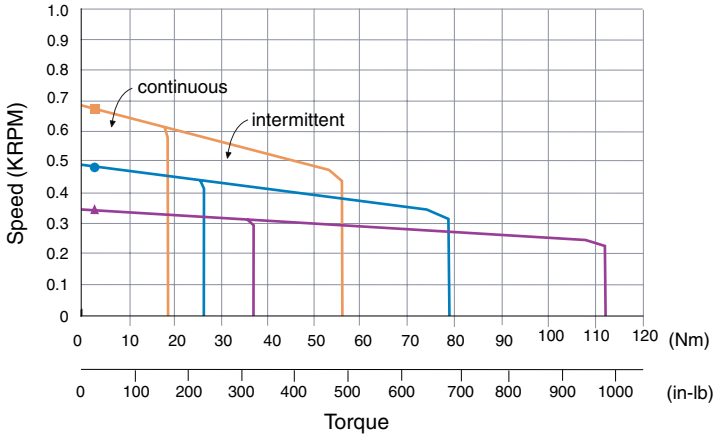
Specification are subject to change without notice

GM115/GM42 Speed / Torque Curves

Single Stack - 160 volt

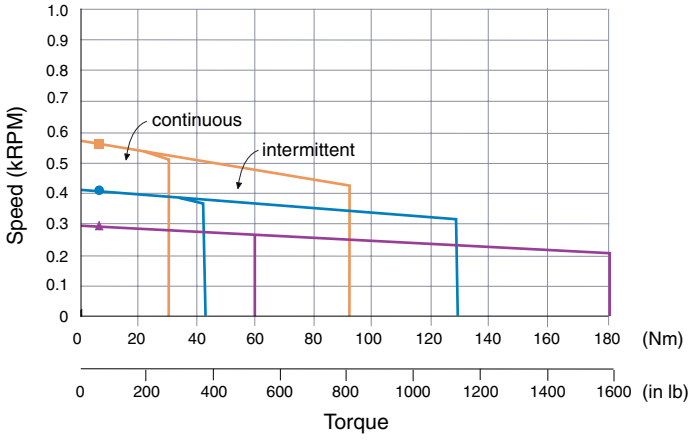


Single Stack - 300 volt

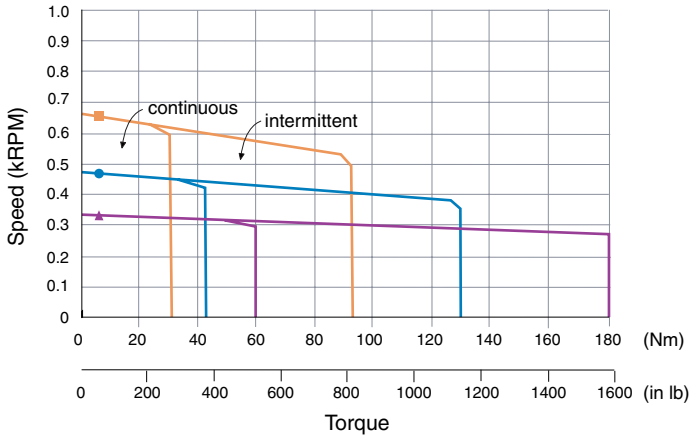


5:1 7:1 10:1

Double Stack - 160 volt



Double Stack - 300 volt



Performance Specifications (six step / trapezoidal commutation)

Mechanical Specifications

Frame Size	Stack Length	Weight without Brake		Maximum Radial Load		Torsional Stiffness		Standard Backlash	Low Backlash
		(kg)	(lb)	(N)	(lb)	(Nm/arc min)	(in lb/arc min)	(arc min)	(arc min)
GM115	Single	**8.4**	18.5	**3,900**	876	**20**	177	15	10
GM115	Double	**10.6**	23.4	**3,900**	876	**20**	177	15	10

* Measured at 2% of rated torque

Single Stack Specifications

Frame Size	Ratio	Max. Speed(1) T_C	Cont. Stall Torque (1) T_P		Peak Torque(1) D:300 Vdc		Winding C:160 Vdc K_{EL-L}	Voltage Constant(1)(3) K_{TL-L}	Torque Constant(1)(3) L_{L-L}		Induct R_{L-L}	Cold Resistance I_C	Cont. Current I_P	Peak Current	Inertia (2)	
		(RPM)	(Nm)	(in lb)	(Nm)	(in lb)		(V/kRPM)	(Nm/amp)	(in lb/amp)	(mH)	(ohms)	(amps)	(amps)	(gm cm sec^2)	(lb in sec^2)
GM115	5:1	700	**18.2**	162	**54.7**	486	C	228.0	**2.15**	19.5	2.9	1.2	8	25	**4.33**	0.00375
GM115	5:1	680	**18.2**	162	**54.7**	486	D	438.0	**4.15**	37.0	10.7	4.7	4	13	**4.33**	0.00375
GM115	7:1	500	**25.4**	227	**76.6**	681	C	319.2	**3.01**	27.3	2.9	1.2	8	25	**3.54**	0.00306
GM115	7:1	480	**25.4**	227	**76.6**	681	D	613.2	**5.81**	51.8	10.7	4.7	4	13	**3.54**	0.00306
GM115	10:1	350	**36.5**	324	**109.4**	972	C	456.0	**4.30**	39.0	2.9	1.2	8	25	**3.54**	0.00306
GM115	10:1	340	**36.5**	324	**109.4**	972	D	876.0	**8.30**	74.0	10.7	4.7	4	13	**3.54**	0.00306

Double Stack Specifications

Frame Size	Ratio	Max. Speed(1) T_C	Cont. Stall Torque (1) T_P		Peak Torque(1) D:300 Vdc		Winding C:160 Vdc K_{EL-L}	Voltage Constant(1)(3) K_{TL-L}	Torque Constant(1)(3) L_{L-L}		Induct R_{L-L}	Cold Resistance I_C	Cont. Current I_P	Peak Current	Inertia (2)	
		(RPM)	(Nm)	(in lb)	(Nm)	(in lb)		(V/kRPM)	(Nm/amp)	(in lb/amp)	(mH)	(ohms)	(amps)	(amps)	(gm cm sec^2)	(lb in sec^2)
GM115	5:1	570	**30.1**	267	**90.2**	801	C	280.5	**2.70**	23.5	2.2	0.73	11	34	**6.28**	0.00544
GM115	5:1	650	**30.1**	267	**90.2**	801	D	455.5	**4.35**	38.5	5.8	1.9	7	21	**6.28**	0.0054
GM115	7:1	400	**42.0**	373	**125.9**	1,119	C	392.7	**3.78**	32.9	2.2	0.73	11	34	**5.50**	0.00475
GM115	7:1	470	**42.0**	373	**125.9**	1,119	D	637.7	**6.09**	53.9	5.8	1.9	7	21	**5.50**	0.00475
GM115	10:1	280	**60.0**	533	**179.9**	1,599	C	561.0	**5.40**	47.0	2.2	0.73	11	34	**5.50**	0.00475
GM115	10:1	320	**60.0**	533	**179.9**	1,599	D	911.0	**8.70**	77.0	5.8	1.9	7	21	**5.50**	0.00475

Note: Pole Count for GM115 is 12

Thermal Resistance for GM115 is 0.95 ^{0}C/W

Stator winding thermal resistance (winding to ambient) is for the unit, mounted to a 254mm x 254mm x 12.7mm (10in x 10in x 0.5in) aluminum plate.

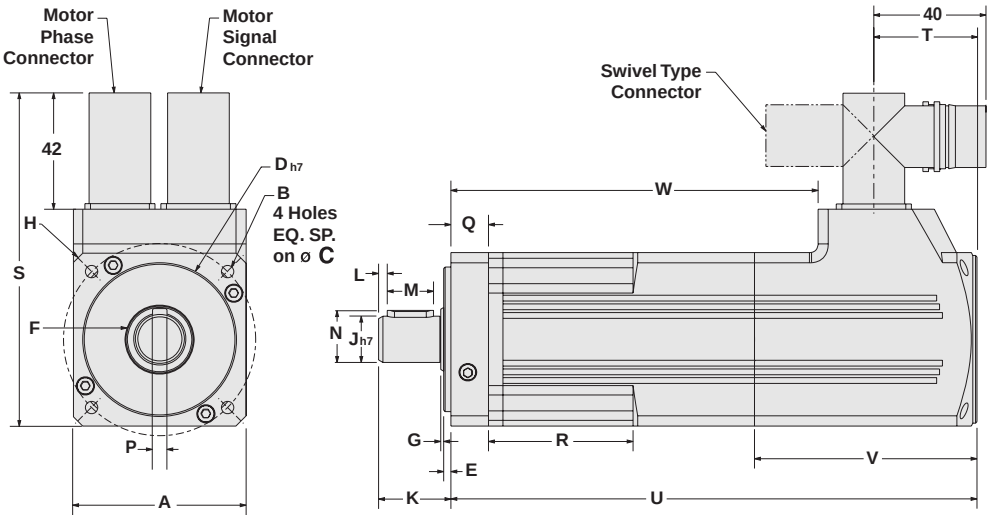
(1) These specifications refer to the output of the GM assembly.
When programming a digital amplifier for use with a GM assembly, these specifications must be adjusted by the ratio to create actual motor performance

(2) Inertia = Motor Rotor + Gear Selection. External Inertia must be divided by the square of the ratio.

(3) Peak of sine wave

Specification are subject to change without notice

Dimensions



METRIC SIZES

Frame Size	A Square Flange		B Bolt Hole		C Bolt Circle Diameter		D Pilot Diameter		E Pilot Thick.		F Shoulder Diameter		G Shoulder Height		H Housing Diameter		J Shaft Diameter	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
GM060	**60**	2.36	**5.5**	0.22	**70**	2.756	**50**	1.969	**2.5**	0.1	**23**	0.91	**1.0**	0.04	**80**	3.15	**16**	0.63
GM090	**90**	3.54	**6.5**	0.26	**100**	3.94	**80**	3.15	**3.0**	0.12	**36**	1.42	**1.0**	0.04	**116**	4.57	**20**	0.79
GM115	**115**	4.53	**8.5**	0.33	**130**	5.12	**110**	4.33	**3.5**	0.14	**36**	1.42	**1.5**	0.6	**152**	5.95	**24**	0.94

Frame Size	K Shaft Length		L Dist From Shaft End		M Keyway Length		N Keyway Height		P Keyway Width		Q Flange Thick		R Recess Length		S Height		T Connector Location	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
GM060	**25.0**	0.98	**3**	0.118	**16**	0.630	**18.0**	0.709	**5**	0.20	**13**	0.51	**50.0**	1.969	**117**	4.60	**37**	1.457
GM090	**40.0**	1.57	**5**	0.20	**28**	1.10	**22.5**	0.886	**6**	0.24	**17**	0.67	**54.5**	2.15	**147**	5.79	**39**	1.535
GM115	**50.0**	1.97	**7**	0.28	**32**	1.26	**27.0**	1.063	**8**	0.32	**20**	0.79	**55.5**	2.18	**175**	6.89	**46**	1.811

NEMA SIZES

Frame Size	B Bolt Hole		C Bolt Circle		D Pilot Diameter		J Output Shaft Diameter		K Output Shaft Length		M Keyway Length		N Keyway Height		P Keyway Width	
	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)
GM023	**0.195**	5.0	**2.625**	66.7	**1.500**	38.1	**0.375**	9.5	**1.000**	25.4	**0.750** flat	19.1 flat	**0.015** flat	0.4 flat	—	—
GM034	**0.218**	5.5	**3.875**	98.4	**2.875**	73.0	**0.500**	12.7	**1.250**	31.8	**1.063**	27.0	**0.072**	1.8	**0.125**	3.2
GM042	**0.281**	7.1	**4.950**	125.7	**2.187**	55.5	**0.625**	15.9	**1.500**	38.1	**1.130**	28.7	**0.108**	2.7	**0.188**	4.8

Options	Single Stack U Length (mm)	Single Stack U Length (in)	Single Stack V Rear Cover Length (mm)	Single Stack V Rear Cover Length (in)	Single Stack W Flange Offset (mm)	Single Stack W Flange Offset (in)	Double Stack U Length (mm)	Double Stack U Length (in)	Double Stack V Rear Cover Length (mm)	Double Stack V Rear Cover Length (in)	Double Stack W Flange Offset (mm)	Double Stack W Flange Offset (in)
GM060 Single Stack – Encoder or Resolver	**178**	7.01	**70**	2.76	**121**	4.76	219.2	8.63	70	2.76	162.2	6.39
GM060 Single Stack – Encoder or Resolver and Brake	**203**	7.99	**95**	3.74	**143**	5.63	244.2	9.61	95	3.74	184.2	7.25
GM060 Double Stack – Encoder or Resolver	**216**	8.5	**70**	2.76	**159**	6.26	257.2	10.13	70	2.76	200.2	7.88
GM060 Double Stack – Encoder or Resolver and Brake	**241**	9.46	**95**	3.74	**181**	7.12	282.2	11.11	95	3.74	222.2	8.75
GM090 Single Stack – Encoder or Resolver	**202.3**	7.96	**83**	3.27	**143.3**	5.64	259.3	10.21	83	3.27	200.3	7.89
GM090 Single Stack – Encoder or Resolver and Brake	**230.3**	9.07	**111**	4.37	**171**	6.73	287.3	11.31	111	4.37	228	8.98
GM090 Double Stack – Encoder or Resolver	**240.4**	9.46	**83**	3.27	**181.4**	7.14	297.4	11.71	83	3.27	238.4	9.39
GM090 Double Stack – Encoder or Resolver and Brake	**268.4**	10.57	**111**	4.37	**209.1**	8.23	325.4	12.81	111	4.37	266.1	10.48
GM115 Single Stack – Encoder or Resolver	**207.2**	8.16	**70**	2.76	**147.3**	5.8	276.2	10.87	70	2.76	216.3	8.52
GM115 Single Stack – Encoder or Resolver and Brake	**240.2**	9.46	**103**	4.06	**170.3**	6.7	309.2	12.17	103	4.06	239.3	10.02
GM115 Double Stack – Encoder or Resolver	**245.3**	9.66	**70**	2.76	**185.4**	7.3	314.3	12.37	70	2.76	254.4	2.14
GM115 Double Stack – Encoder or Resolver and Brake	**278.3**	10.96	**103**	4.06	**208.4**	8.2	347.3	13.67	103	4.06	277.4	10.92

Encoder Specifications (All GM Frame Sizes)

Resolution	2,000 LPR (8,000 LPR)
Electrical Input:	5 Vdc, 125 ma maximum (plus interface loads)
Encoder Output:	A, B, I, $\overline{A}$, $\overline{B}$, $\overline{I}$
	Differential, TTL compatible
	Frequency Response 500 Khz

Resolver Specification (All Frame Sizes)

Frequency	Hz	5,000
Input Voltage	Vrms	4.0
Input Current	ma max.	23
Input Power	Watts nom.	0.045
Transformation Ratio	± 10%	0.50
Output voltage	Vrms	2.0
Sensitivity	mv / Deg	35

Brake Specification

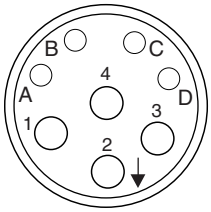
Frame Size	Static Holding Torque (Nm)	Static Holding Torque (in lb)	Voltage (V)	Current (amps)	Resistance (ohms)	Inertia (gm cm sec^2)	Inertia (oz in sec^2)
GM060	**0.33**	3.0	24 Vdc	0.19	131	**4.32 x 10^{-8}**	6.0 x 10^{-10}
GM090	**5.64**	50	24 Vdc	0.30	65	**4.32 x 10^{-8}**	6.0 x 10^{-10}
GM115	**5.64**	50	24 Vdc	0.30	65	**2.5 x 10^{-7}**	3.5 x 10^{-9}

Specification are subject to change without notice

Motor Connections & Cables

DIN Motor Power Connection

Pin Number	Function
1	U
4	V
3	W
2	Chassis Gnd.
A	Thermistor +
B	Thermistor -
C	Brake +
D	Brake -
–	Shield



Power

Motor Power Mating Connector

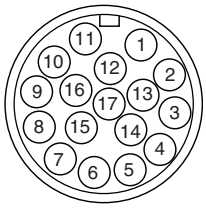
Manufacturer	Part Number	Description
Hypertac	LPNA08BFRKB170	Body
	020.232.2000	4 Pins Female 18-26 AWG
	020.090.1020	4 Pins Female 16-20 AWG

Motor Power Cable

Part Number	Length	Used With
10963093-3000	3 meter	Flying Leads
10963093-8000	8 meter	Flying Leads

DIN Sensor Connector Details

Pin Number	Function		Mating Cable
	Encoder	Resolver	i-Drive Conn. Pin Number
1	A +	S1 (SIN+)	1
2	B +	S4 (COS+)	2
7	+5V	R2 (Ref+)	7
8	Shield	Shield	8
9	A -	S3 (SIN-)	9
10	B -	S2 (COS-)	10
15	Gnd	R1 (REF-)	15
12	Spare	Spare	—
5	I +	—	5
13	I -	—	13
3	Hall 1 (S1)	—	—
11	Hall 2 (S2)	—	—
4	Hall 3 (S3)	—	—
16	Thermistor +	Thermistor +	—
17	Thermistor -	Thermistor -	—
6 & 14	No Connection		



Sensor

Motor Sensor Mating Connector

Manufacturer	Part Number	Description
Hypertac	SPNA17HFRON	Body
	020.256.1020	17 Pins Female

Mating Sensor Cable

Part Number	Length	Used With
10963123-3000	3 meter	Flying Leads
10963123-8000	8 meter	Flying Leads

Flying Leads from out of the Motor (All GM Frame Sizes)

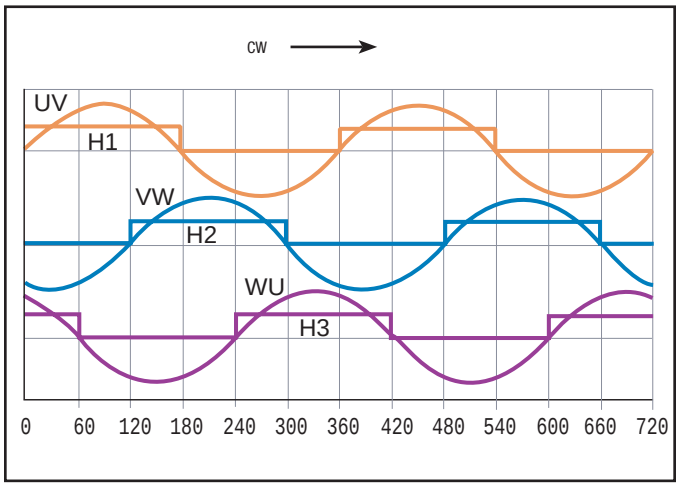
Power

Function	Color Code
U	Red
V	Black
W	White
Ground	Green

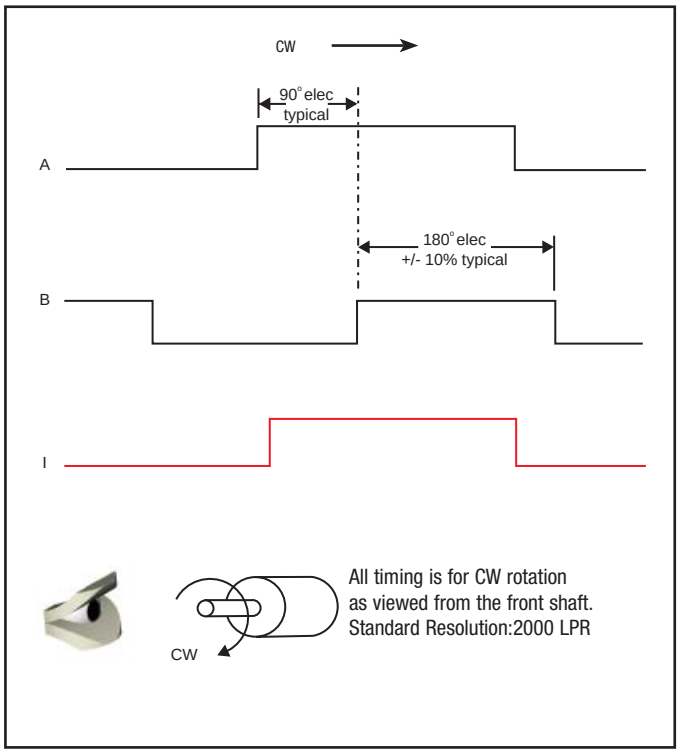
Encoder

Function	Color Code
A-	White
A+	Brown
B-	Green
B+	Blue
I-	Yellow
I+	Orange
S2	Violet
S1	White / Brown
S3	White / Orange
+5V	Red
GND	Black
T1	White / Red
T2	White / Black

Motor Signal Timing (C/D winding)
at motor connector



Encoder Timing



How to Order

Order Numbering Example: G M 0 6 0 – B 1 C 1 D

Gearmotors are supported by a worldwide network of offices and local distributors. Call **1-800-305-4555** for application engineering assistance or for the name of your local distributor. Information can also be obtained at **www.baysidemotion.com or www.parkermotiom.com**

FRAME SIZE

Metric	NEMA
060	023
090	034
115	042

RATIO

B = 5:1
C = 7:1
D = 10:1
E = 15:1
F = 20:1
G = 25:1
H = 30:1
J = 50:1
K = 70:1
L = 100:1

STACK LENGTH

1 = Single
2 = Double

WINDING

C = 160Vdc
D = 300Vdc

OPTIONS

1 = 2000 Line (1) Encoder
2 = 2000 Line (1) Encoder, Brake
3 = Resolver
4 = Resolver, Brake

(1) Includes commutation signals

CONNECTOR

B = MIL Connector
D = DIN Connector
F = Flying Leads (450mm/18in)
P = Parker standard Din Connector

Specifications are subject to change without notice.

Servo Wheel Series:

Compact Wheel Drives for Electric Vehicles

Combining servo motor, gearing and wheel design makes system integration easy.

Servo Wheel Series: Design Features

The Servo Wheel™ combines a brushless DC motor with planetary gears in a lightweight, aluminum housing to provide a compact solution for vehicle control. The Power Wheel's unique design makes system integration easy. You no longer have to purchase the motor, gearhead, wheel, electronics and bracket from different sources. Parker Bayside does all of the work for you. From component sourcing to actual assembly, Parker Bayside engineers designed the Power Wheel with your application in mind.
All you have to do is bolt it up and go!

Single-Piece Construction Motor Shaft

The first stage's planetary section sun gear is integrated into the single-piece construction motor shaft, to provide higher reliability in a compact package.

Planetary Gears

The planetary input stage provides a first pass reduction that is capable of carrying high torques with high input speeds in a small package.

Integrated Output Stage

The second stage planetary's unique design uses two planets for higher efficiency. Built entirely into the wheel, it utilizes an otherwise wasted area to provide a compact, space-saving package. Two large diameter bearings support the weight, protecting the gears from shock loading and dramatically increasing the radial load carrying capacity of the wheels.

Compact Wheel Drives for Electric Vehicles

Parker Baysides NEW Servo Wheel™ Drive System features state-of-the-art technology to provide motion for small, battery-powered, electric vehicles, including:

- **Automated Cleaning Equipment**
- **Healthcare Equipment**
- **Robotic/Material Handling Equipment**
- **AGV's**

Parker Bayside's Servo Wheel features:

BRUSHLESS DC MOTOR AMPLIFIERS designed for common motion profiles in battery powered vehicles to provide:

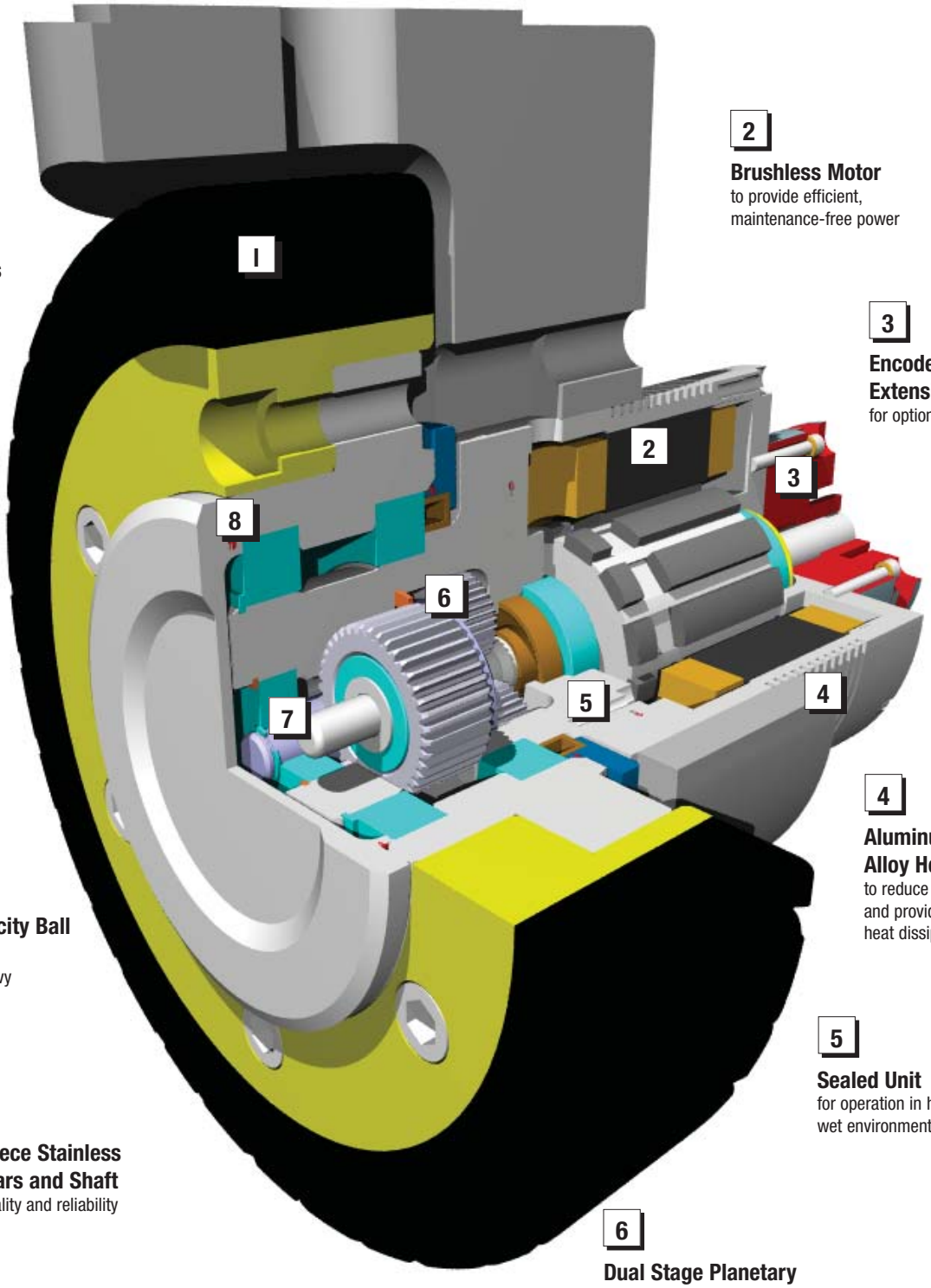
- 12, 24, 36 and 48 volt operation
- Current and temperature feedback control for safe, reliable operation
- Multiple input architectures for easy communication with higher-level controllers and navigation systems

PERMANENT MAGNET BRUSHLESS MOTORS to provide:

- High efficiency for longer run times between battery charges
- Greater power to size ratio for a compact package
- Integral hall sensors for motor TRAP commutation
- Long life and maintenance free-operation
- High input speeds in excess of 10,000 RPM
- No internal sparking – safe in explosive environments
- Low EMI, eliminating the need for heavy shielding

PLANETARY GEARS to provide high torque-carrying capability in a small package. The gears are built into the hub of the wheel, making the package compact and lightweight. This design also increases the radial load-carrying and shock loading capacity of the entire system.

Polyurethane tires are ideal for applications in hospitals, schools, and airports – any place requiring non-marking materials. This material is also ideal for high load carrying applications like material handling.



1
Polyurethane Antistatic Tires

2
Brushless Motor
to provide efficient, maintenance-free power

3
Encoder/Brake Extension
for optional ad-ons

4
Aluminum Alloy Housing
to reduce weight and provide optimum heat dissipation

5
Sealed Unit
for operation in hostile or wet environments

6
Dual Stage Planetary Gear Design
to deliver high torque and high efficiency in a compact package

7
Single Piece Stainless Steel Gears and Shaft
for high quality and reliability

8
High Load Capacity Ball Bearings
to accommodate heavy vehicle loads

Performance Specifications

Tire Diameter				152mm (6in)				203mm (8in)			
Speed Code / Gear Ratio				20	25	30	36	20	25	30	36
Motor Code	Power Cont. (W)										
1	400	Max Speed	Km/hr	5.5	4.4	3.6	3.0	7.3	5.8	4.9	4.0
			MPH	3.4	2.7	2.3	1.9	4.5	3.6	3.0	2.5
		Peak Torque	Nm	62	78	93	112	62	78	93	112
			in lb	551	689	827	992	551	689	827	992
		Continuous Torque	Nm	21	26	31	37	21	26	31	37
			in lb	184	230	276	331	184	230	276	331
2	450	Max Speed	Km/hr	4.61	3.69	3.08	2.56	6.16	4.93	4.11	3.42
			MPH	2.86	2.29	1.91	1.59	3.83	3.06	2.55	2.13
		Peak Torque	Nm	83	104	125	149	83	104	125	149
			in lb	735	919	1,103	1,323	735	919	1,103	1,323
		Continuous Torque	Nm	28	35	42	50	28	35	42	50
			in lb	245	306	368	441	245	306	368	441
3	1000	Max Speed	Km/hr	4.58	3.67	3.06	3.40	6.12	4.90	4.08	3.40
			MPH	2.85	2.28	1.90	2.11	3.80	3.04	2.53	2.11
		Peak Torque	Nm	197	247	296	355	1.97	247	296	355
			in lb	1,748	2,184	2,621	3,146	1,748	2,184	2,621	3,145
		Continuous Torque	Nm	66	82	99	118	66	82	99	118
			in lb	583	728	874	1,049	583	728	874	1,049
ALL TIRES		Load Capacity	kg	454				454			
			lb	1,000				1,000			

Antistatic Tires

Code		
	R	Polyurethane Black Smooth
	S	Polyurethane Black x Thread

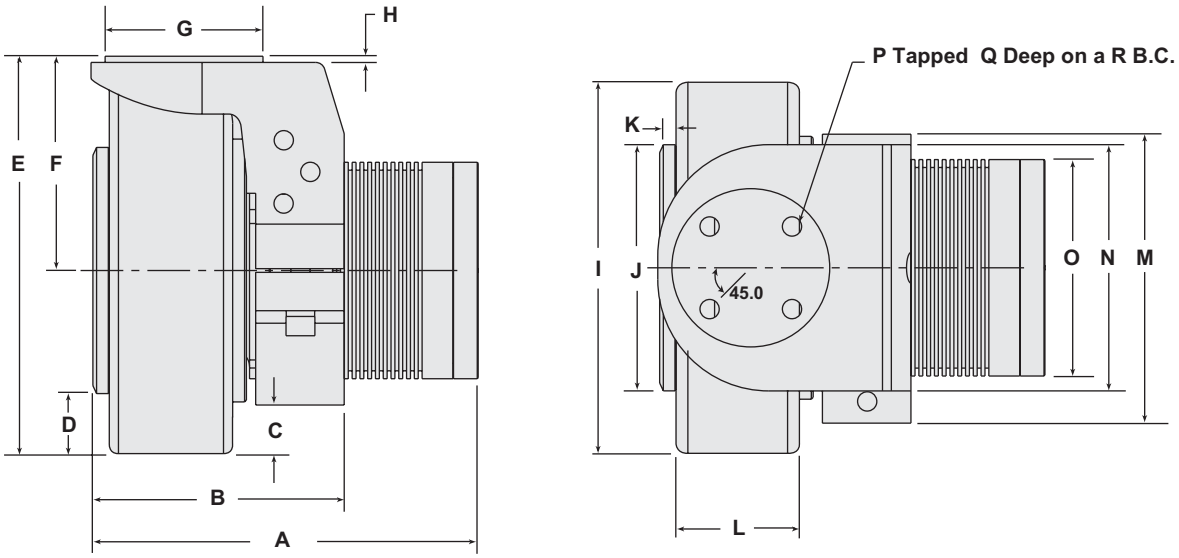
Operating Voltages

Code	K
Volts	24

Brake

Code	0	None
	3	50 in-lb

Dimensions



Model Number	Motor Power	A* without Brake		B		C		D		E		F	
		(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
	150	158.75	6.25	104.1	4.1	20.3	0.8	25.4	1.0	165.1	6.5	87.9	3.46
DX6	300	175.26	6.90	104.1	4.1	20.3	0.8	25.4	1.0	165.1	6.5	87.9	3.46
	746	191.77	7.55	104.1	4.1	20.3	0.8	25.4	1.0	165.1	6.5	87.9	3.46
	150	158.75	6.25	104.1	4.1	45.7	1.8	50.8	2.0	218.4	8.6	116.8	4.60
DX8	300	175.26	6.90	104.1	4.1	45.7	1.8	50.8	2.0	218.4	8.6	116.8	4.60
	746	191.77	7.55	104.1	4.1	45.7	1.8	50.8	2.0	218.4	8.6	116.8	4.60

Model Number	Motor Power	G		H		I		J		K		L	
		(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
	150	65.0	2.559	2.54	0.1	152.4	6.0	101.1	3.98	6.86	0.27	50.8	2.0
DX6	300	65.0	2.559	2.54	0.1	152.4	6.0	101.1	3.98	6.86	0.27	50.8	2.0
	746	65.0	2.559	2.54	0.1	152.4	6.0	101.1	3.98	6.86	0.27	50.8	2.0
	150	65.0	2.559	2.54	0.1	203.2	8.0	101.1	3.98	6.86	0.27	50.8	2.0
DX8	300	65.0	2.559	2.54	0.1	203.2	8.0	101.1	3.98	6.86	0.27	50.8	2.0
	746	65.0	2.559	2.54	0.1	203.2	8.0	101.1	3.98	6.86	0.27	50.8	2.0

Model Number	Motor Power	M		N		O		P		Q		R	
		(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)
	150	118.6	4.67	101.1	3.98	88.9	3.5	7.94	5.16	25.4	1.0	47.98	1.889
DX6	300	118.6	4.67	101.1	3.98	88.9	3.5	7.94	5.16	25.4	1.0	47.98	1.889
	746	118.6	4.67	101.1	3.98	100	3.94	7.94	5.16	25.4	1.0	47.98	1.889
	150	118.6	4.67	101.1	3.98	88.9	3.5	7.94	5.16	25.4	1.0	47.98	1.889
DX8	300	118.6	4.67	101.1	3.98	88.9	3.5	7.94	5.16	25.4	1.0	47.98	1.889
	746	118.6	4.67	101.1	3.98	100	3.94	7.94	5.16	25.4	1.0	47.98	1.889

* Consult factory for increased length with encoder and on brake option.

5 Step Procedure

1 Motor Code Selection

Based on the application requirement, select the appropriate motor power from the second column in the "Performance Specifications" table. The number to the left of it in the first column is the motor code.

2 Speed Code Selection

Find the intersection of the column with the selected tire diameter and the row with the motor code to give you the available speed ranges. From the four given speeds (in mph), select the one that meets your application needs. Proceed to the top of that column to find the speed code just under the tire diameter you have selected in step 1.

3 Voltage Code Selection

From the "Operating Voltages" table, select the correct voltage code based on the power supply available for the application.

4 Tire Composition Code Selection

Servo Wheels™ are available for a wide variety of applications. Some require a smooth ride or high load carrying capacity, or a combination of both. From the tire composition table, select the appropriate material for your application. The letter in the first column is the tire composition code.

5 Compose part number based on the codes selected

How to Order

Order Numbering Example: **D X A – R M V T B**

TIRE DIAMETER	RATIO	MOTOR SIZE	VOLTAGE	TIRE MATERIAL*	BRAKE/ENCODER** SIZE
A = 6 in.	1 = 20	1 = 400V	K = 24V	S = Polyurethane antistatic black x tread	0 = No Brake
B = 8 in.	2 = 24	2 = 450V		R = Polyurethane antistatic black	3 = 50 in-lb
	3 = 30	3 = 1000V			
	4 = 36				

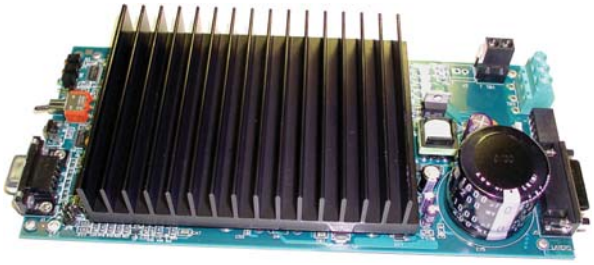
* Other tire compositions availble upon requests.
** Consult factory for encoder options.

Call **1-800-305-4555** for application engineering assistance or for the name of your local distributor.

WHEEL DRIVE SERIES 55 DIGITAL SERVO AMPLIFIER
High Current Control

FEATURES

- High-performance DSP-based servo controls motor force or torque. Control of velocity or position using the motor's Hall of encoder signals is an option.
- Controls brush-type, brushless-trapezoidal and brushless-sinusoidal motors.
- User inputs motor parameters, voltage, peak and continuous current limit into Windows-based setup software. Setup software automatically downloads the algorithm for a 2kHz current loop bandwidth via RS-232 communications.
- Proprietary PWM software controlled switching scheme yields ultra-low ripple at low current levels, zero crossover distortion, and minimizes EMI in noise sensitive applications
- Differential amplifiers accept a single +/- 10V analog current command for trapezoidal brushless and brush type motors.
- Optional inputs allow digital commands through the RS-232 or Serial Peripheral Interface.
- 3 Output current ranges and scale factors available.
- Optically isolated digital inputs for Enable/Reset, Brake, and +_ Travel Limits.
- Motor current monitor output, and optically isolated digital outputs provide controller fault indication. Configurator program provides drive status and fault history via RS-232 link.
- Fault protection makes this drive virtually indestructible.
- Operates from one low-cost 24 - 48 VDC unregulated power supply or battery.



PRODUCT DESCRIPTION

This digital servo amplifier provides DSP-based digital closed-loop, four-quadrant PWM control of force or torque of permanent magnet, linear or rotary, brush or brushless DC motors. Our PWM current control algorithm, current sensing method, and advanced switching scheme yields performance comparable to a linear servo amplifier.

This digital drive will reduce expensive motor drive stocking requirements because it will control brush-type, brushless-trapezoidal and brushless-sinusoidal motors.

Setup is easy. The operating configuration – motor type, motor parameters, operating voltage, peak and continuous current limits and system parameters for velocity or position control are all input by the user to a PC-based setup program that automatically downloads the information, with the computed algorithm, into the flash memory of the drive via an RS-232 port. The drive can be reconfigured at any time by running the setup-program.

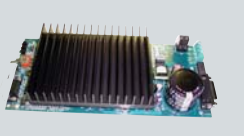
Specifications

BMG	P/N 11564028	11564030
INPUT POWER BUS	24 to 48 VDC	24 to 48 VDC
CONT. OUTPUT POWER (Max.)	450 watts [1]	1350 watts [1]
CONT. OUTPUT CURRENT	10 amps [1]	30 amps [1]
PEAK OUTPUT CURRENT	20 amps [1] (1 sec typ.)	60 amps [1]
SCALE FACTOR (A / V)	2	6
VOLTAGE @ CONT. OUTPUT CURRENT	Input Bus Voltage - [3] Volts Typical	Input Bus Voltage -[3] Volts Typical
Max HEAT SINK TEMPERATURE	Disables if > 70 °C	Disables if > 70 °C
Current LOOP BANDWIDTH	2 kHZ Typical	2 kHZ Typical
SWITCHING FREQUENCY	40kHZ	40kHZ
MINIMUM LOAD INDUCTANCE	100 UH	100 UH
WEIGHT	25 OZ	25 OZ

OPERATING CONTROL SIGNALS and INDICATORS

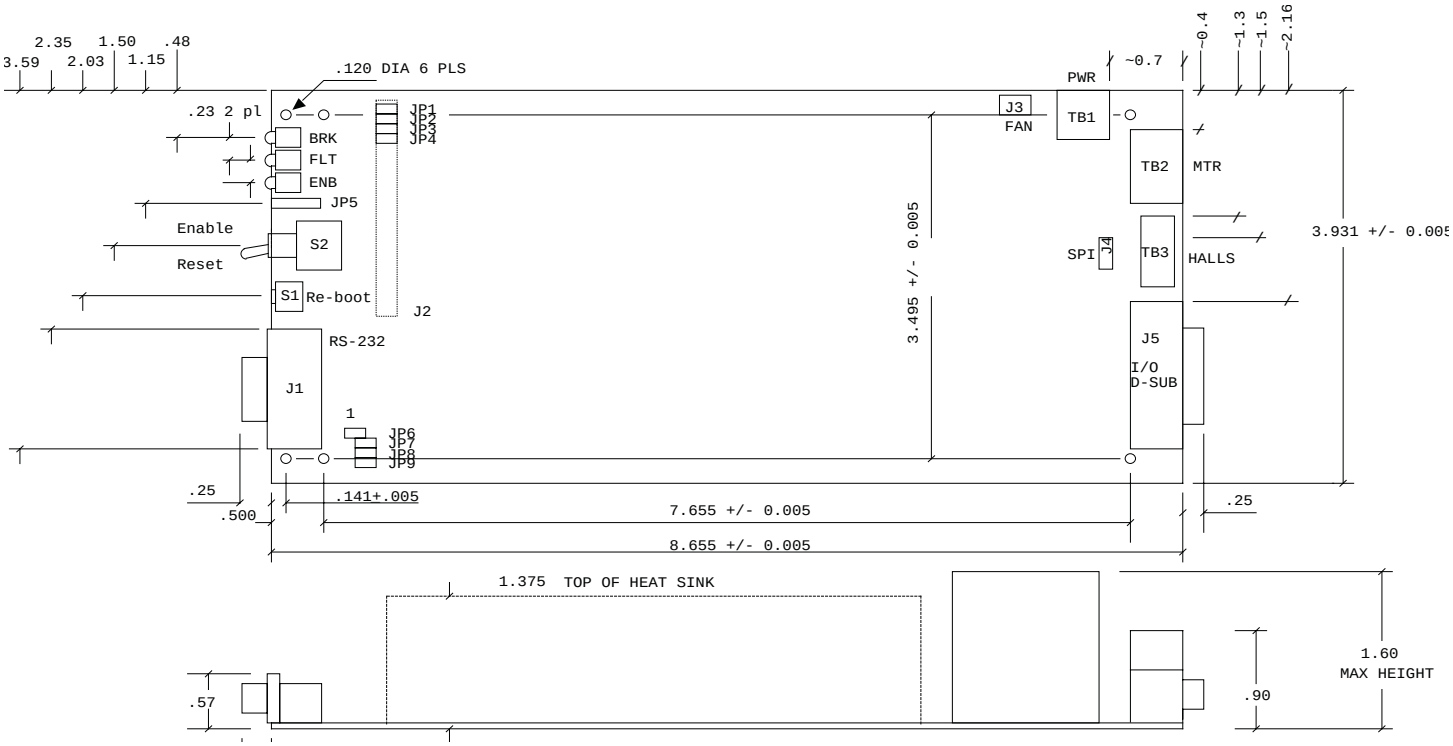
Input analog control signal	+_ 10 Volts
Digital Input Commands	Rs-232, SPI
Peak Current limit	Software adjustable
Continuous Current limit	Software adjustable
Drive Enable/Reset	5V logic, optically isolated
(+) Travel Limit	5V logic, optically isolated
(-) Travel Limit	5V logic, optically isolated
Brake	5V logic, optically isolated
Fault and/or Brake status	5V logic, optically isolated
Drive Enabled indicator	Green LED
Brake indicator	Red LED
Fault indicator	Red LED
Digital Hall Effect Sensors	3 channels,+5 Volts,Gnd

NOTES: 1. Depends on ambient operating temperature and heat sink.
For the >10 amperes continuous output, we recommend forced convection cooling with a minimum airflow of 100 CFM. Consult factory for assistance.



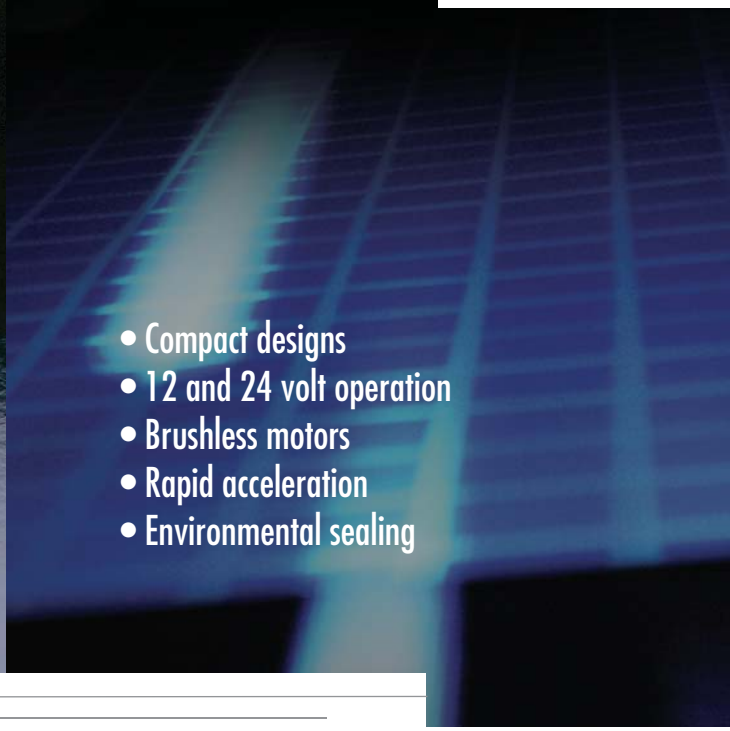
Digital Servo Amplifier

Mounting Dimensions



Pancake Gearmotor:

Compact Brushless DC Gearmotor



- Compact designs
- 12 and 24 volt operation
- Brushless motors
- Rapid acceleration
- Environmental sealing

Pancake Gearmotor Series: Design Features

The Pancake Gearmotor combines a brushless DC motor with precision gearing in a lightweight, aluminum housing to provide a compact solution. This unique design makes system integration easy. You no longer have to purchase the motor, gearhead, and electronics bracket from different sources.

Parker Bayside does all of the work for you. From component sourcing to actual assembly, Parker Bayside engineers designed the Pancake Gearmotor with your application in mind.

Single Integrated Package

- Environmentally sealed
- Available with brake and encoder add-ons
- Rugged aluminum alloy housing
- Durable anodized finish
- Customized mounting to fit any application

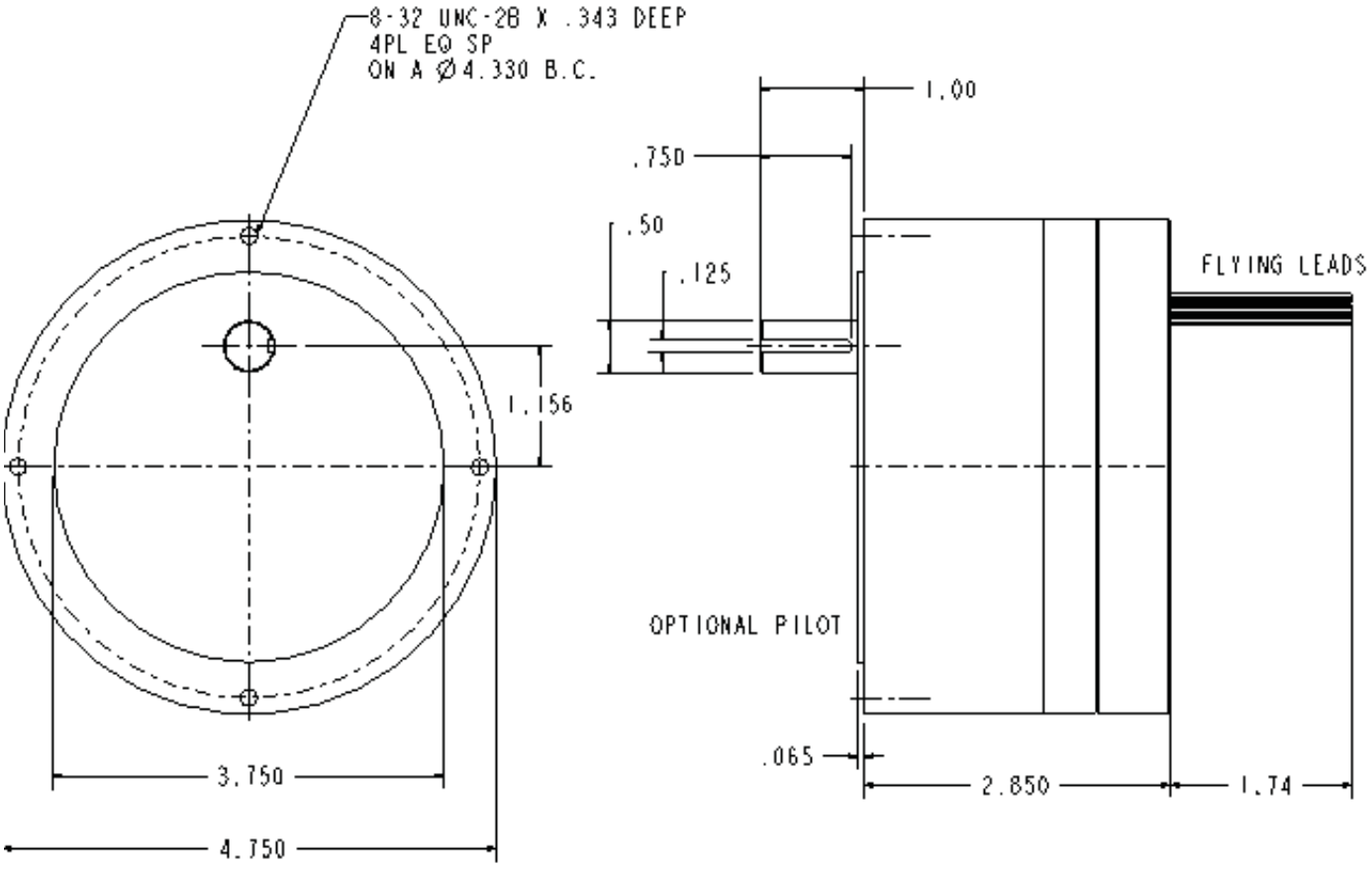
Brushless DC Motor

- Maintenance-free brushless design
- Low EMI
- Greater power-to-size factor than brush DC motors
- Built-in position and velocity sensing

Compact Gear Reduction

- Wide range of gear ratios
- Ideal for low-speed applications
- Precision ball bearings throughout
- Reduces load inertia for maximum performance

Dimensions



Flying leads

Color Coding	
Black	GND
Red	Vref
Green	Sensor C
Blue	Sensor B
Yellow	Sensor A
White	Phase C
Brown	Phase A
Orange	Phase B

Mechanical Specifications

Model	Weight (kg) / (lb)	Radial Load (N) / (lb)	Axial Load (N) / (lb)	Backlash (arc min)
GM50	2.3 / 5	223 / 50	45 / 10	30

Performance Specifications

Model	Ratio	Max Speed) (RPM	Torque (Nm)/(in-lbs)	Voltage (volts DC)	Current (amps)
GM50-152	152.51:1	27	19.8/175	12/24	4.6/2.3
GM50-100	100.65:1	40	18.1/160	12/24	6.4/3.2
GM50-043	42.47:1	93	7.9/70	12/24	6.4/3.2
GM50-011	10.51:1	364	2.0/18	12/24	6.3/3.2

How to Order

Order Numbering Example: **G M 5 0 – 0 1 0 XXX**

RATIO
010 = 10.51:1
042 = 42.47:1
100 = 100.65:1
152 = 152.51:1

SPECIAL

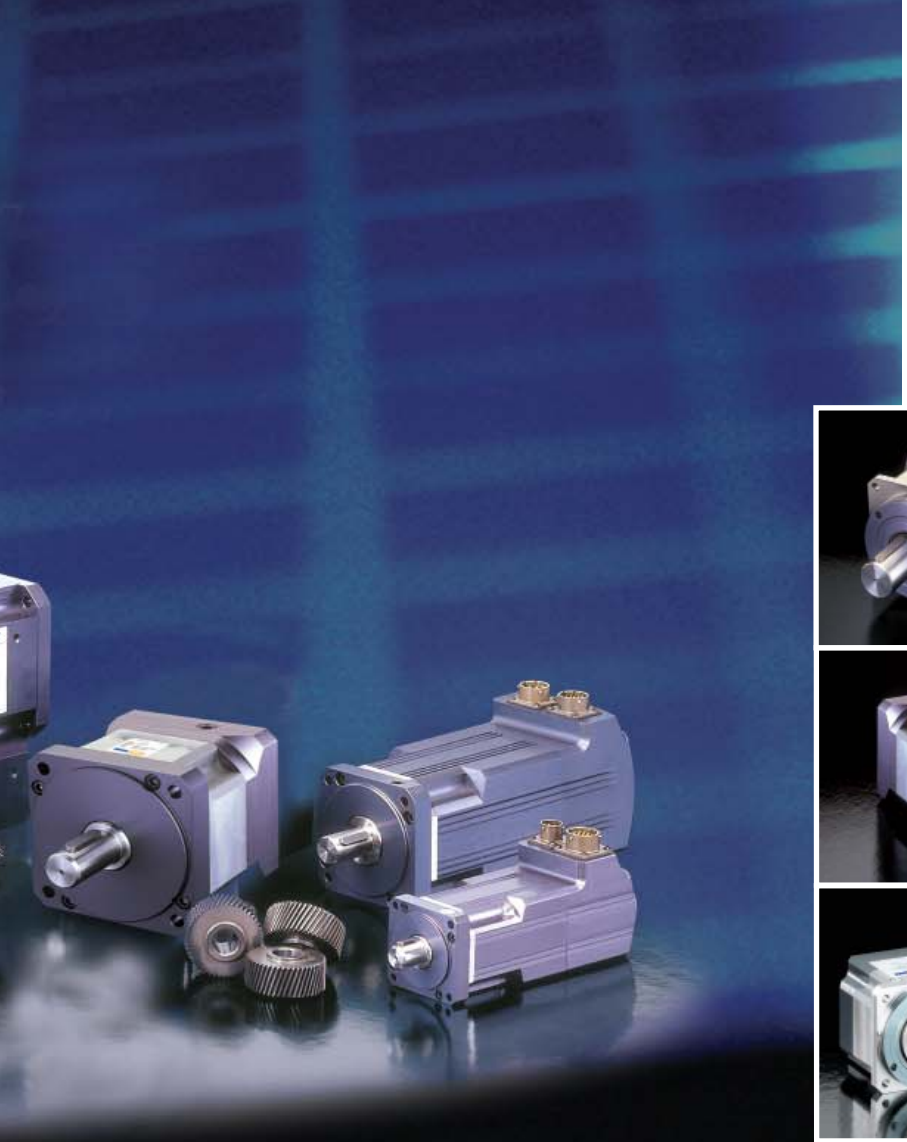
Factory Issued

Call **1-800-305-4555** for application engineering assistance or for the name of your local distributor.

Specifications are subject to change without notice.

GEARHEADS:

STEALTH PLANETARY AND NEMA SPUR



Gearheads

Gearheads: Application Solutions

Stealth Gearmotors for Factory Automation

APPLICATION CHALLENGE

The customer manufactures machines for gluing, fill, sealing and diverting of food containers for the food-processing industry. The motor and gearhead needed to be mounted above the food plane. Certain modifications had to be made to the gearhead to make it safe in this environment, as well as making the gearhead able to withstand frequent washdowns.

Design Considerations

- Gearhead Lubrication – must be USDA food grade approved in case of incidental contact to food.
- Gearhead Sealing – to prevent any leaking as well as prevent any ingress of the fluid during washdown.
- Gearhead Finish – special FDA-approved finish must be used, making it very durable and resistant to chipping, oxidizing or rusting.
- Gearhead Output Shaft – stainless steel to prevent any rust from developing and contaminating the processing food.

Stealth Gearheads on a Bottling Application

APPLICATION CHALLENGE

The manufacturer of high-speed milling machines used in the aerospace industry. These milling machines are becoming more commonplace in the aerospace and automotive industries because it allows large structural components to be machined from one piece, where before they were assembled from many smaller subcomponents. In high-speed milling, spindle heads are operating at speeds ranging from 18,000 to 40,000 RPM, so that the cutting is above the resonant frequency of the machine. Because of this, many characteristics become more critical than in standard machines. The extremely large size of the spindle head also posed problems for the customer in trying to keep it accurately positioned during the milling stage.

Low Stiffness

The spindle head was moved rotationally by 2 bull gears, driving a large ring gear. Because of the system characteristics, it was difficult to keep the spindle head absolutely stiff during the milling process. The problems associated with low stiffness are:

1. Poor surface finish 2. Accuracy errors 3. Excessive tool chatter 4. Reduced tool life

Stealth Gearheads on High-Speed Milling Machines

APPLICATION CHALLENGE

The manufacturer of high-performance plastic extrusion equipment. They needed a drop-in replacement gearhead for an existing worm gearbox used with their motor without having to alter the design of their machine. The gearhead/motor combination is being used to drive the machine's rollers. It controls the speed at which the plastic is extruded into high-quality plastic sheets. The smoothness of the rollers is critical to the quality of the plastic sheets being produced.

- **High Transmission Error and Velocity Ripple**
  The customer used worm gearheads to control the rollers. Worm gears exhibit a sliding action of involute gears instead of a rolling action, contributing to the lack of smoothness of the machine rollers. Due to the high transmission error and velocity ripple from the worm drive, the rollers operated at differing speeds. This produced small lines and imperfections on the plastic sheets, rendering it unusable.
- **High Wear and Low Efficiency**
  The high level of rubbing (sliding action) between the worm and wheel teeth in the worm gearhead caused a high gear-tooth-wear rate and a lower efficiency (70%) than other major gear types.

Parker Bayside SOLUTION

PS115-010-F01 Stealth PS planetary gearhread with standard food grade option. The F01 designation provides the gearhead with standard modifications: special lubrication, viton seals, special finish and a stainless steel output shaft.

Since this food grade modification is a standard option, delivery is only one week over the standard (typically one week) gearhead lead time.

Note: Similar standard modifications exist for vacuum, clean room, high temperature and radiation.

Parker Bayside SOLUTION

(1) Stealth PS Gearhead and (1) Stealth RT MultiDrive (throughbore) Gearhead

- The above Stealth gearhead products were used in combination to provide the required 120:1 ratio. The result was high-quality plastics sheets that exceeded the customer's specifications.
- The Stealth's all-helical planetary design **(HeliCrown Gear Tooth)** features extremely high gear tooth accuracy, minimizing transmission error and velocity ripple. The Helicrown design features extremely high efficiency (98%) while minimizing tooth wear by providing a pure rolling action. Parker Bayside's Plasma Nitriding heat-treating process further heightens the gear tooth's wear resistance.
- The Stealth MultiDrive gearhead features a space-saving thru-bore (hollow shaft) option, eliminating compliance that occurs when coupling a gearhead shaft to the rollers being driven.
- This solution can be used for a variety of applications, including:
  1. Packaging 2. Food 3. Semiconductor 4. Automotive 5. Medical

Parker Bayside SOLUTION

(2) Stealth PS142 Helical Planetary Gearheads

- The above Stealth gearheads were used in tandem to create a stiff platform for the spindle machine head. One gearhead, acting as the master, and the other as the slave, were attached to the bull gears to simultaneously turn the ring gear that positioned the machine head. While the master gearhead moved the ring, the slave was taking up the backlash. In this way, the precision gears allowed for the spindle to be moved accurately, while the two gearhead combination maintained maximum system stiffness.
- Parker Bayside's Stealth PS gearhead features an all-helical planetary gear design. Helical gears have a much higher tooth-contact ratio and greater face width than straight-spur gears, providing higher loads, smoother tooth engagement and quieter operation. The Stealth's HeliCrown Gear Tooth design provides extremely high gear tooth accuracy, while minimizing tooth wear. Parker Bayside's Plasma Nitriding heat-treating process further heightens the gear tooth's wear resistance.
- This solution can be used in the aerospace and automotive industries.

Stealth® PS Advanced Series:

The Ultimate in Gearhead Performance

Stealth Advanced PS is Parker Bayside's highest-performance servo gearhead. Available in 8 frame sizes and 12 gear ratios, you are guaranteed to find a Stealth PS to fit your high-performance servo applications.

7 Frame Sizes	
PS60	PS180
PS90	PS220
PS115	PS300
PS142	

Ratios *	
3:1	25:1
4:1	30:1
5:1	40:1
7:1	50:1
10:1	70:1
15:1	100:1
20:1	* For PS300 see Note (4)

Stealth® PS Advanced Series

Performance Specifications

	Units	Ratio	Frame Size						
			PS60	PS90	PS115	PS142	PS180	PS220	PS300
Nominal Output Torque, $T_{nom\ r}$	**Nm**	3-10	**25**	**74**	**170**	**294**	**735**	**1,413**	**3,616**
	in lb		220	650	1,500	2,600	6,500	12,500	32,000
	Nm	15-50	**34**	**107**	**226**	**396**	**1,017**	**1,808**	**4,520**
	in lb		300	950	2,000	3,500	9,000	16,000	40,000
	Nm	70-100	**28**	**90**	**203**	**339**	**893**	**1,582**	**4,181**
	in lb		250	800	1,800	3,000	7,900	14,000	37,000
Maximum Acceleration Output Torque, $T_{acc\ r}$	**Nm**	3-10, 70-100	**34**	**105**	**232**	**367**	**972**	**1,763**	**4,825**
	in lb		300	930	2,050	3,250	8,600	15,600	42,700
	Nm	15-50	**42**	**130**	**283**	**452**	**1,198**	**2,011**	**5,492**
	in lb		370	1,150	2,500	4,000	10,600	17,800	48,600
Emergency(1) Stop Output Torque, $T_{em\ r}$	**Nm**	3-10, 70-100	**78**	**243**	**537**	**853**	**2,237**	**4,068**	**11,119**
	in lb		690	2,150	4,750	7,550	19,800	36,000	98,400
	Nm	15-50	**96**	**299**	**655**	**1,040**	**2,757**	**4,520**	**12,656**
	in lb		850	2,650	5,800	9,200	24,400	40,000	112,000
Nominal Input Speed, $N_{nom\ r}$	RPM	3-5	3,200	2,800	2,400	2,000	1,600	1,200	1,000
	RPM	7-10	3,700	3,300	2,900	2,500	2,000	1,500	1,250
	RPM	15-50	4,200	3,800	3,400	3,000	2,400	1,800	1,500
	RPM	70-100	4,700	4,300	3,900	3,500	2,800	2,100	1,750
Max. Input Speed, N_{maxr}	RPM	3-100	6,000	5,300	4,500	3,800	3,000	2,300	1,900
Standard Backlash (2)	arc min	3-10	6	6	4	4	4	4	4
	arc min	15-100	8	8	6	6	6	6	6
Low Backlash (2)	arc min	3-10	4	4	3	3	3	3	3
	arc min	15-100	6	6	5	5	5	5	5
Efficiency at Nominal Torque	%	3-10	97	97	97	97	97	97	97
	%	15-100	94	94	94	94	94	94	94
Noise Level(3) at:									
3,000 RPM	dB	3-100	62	62	62	64	—	—	—
2,000 RPM	dB	3-100	—	—	—	—	66	68	70
Torsional Stiffness	**Nm / arc min**	3-100	**3**	**12**	**23**	**44**	**110**	**210**	**360**
	in lb / arc min		26	106	204	389	973	1,858	3,185
Maximum Weight	**kg**	3-10	**1.3**	**3**	**7**	**14**	**26**	**49**	**103**
	lb		2.8	7	15	30	57	108	228
	kg	15-100	**1.7**	**5**	**10**	**20**	**35**	**71**	**149**
	lb		3.7	10	22	43	77	157	330
Maximum Allowable Case Temperature	°C	3-100	← 100 →						
			For applications requiring lower case temperature, consult factory						

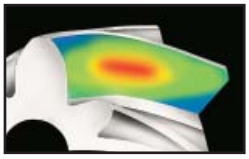
(1) Maximum of 1,000 stops
(2) Measured at 2% of rated torque
(3) Measured at 1 meter
(4) PS300 is available in Ratios of: 4, 5, 7, 10, 20, 50, 70 & 100:1

Specification are subject to change without notice

Get the Helical Advantage!

Stealth® Advanced in the PS / RS Models incorporates the latest enhancement in gearhead technology:

- Latest technology in seals…reduce heat and wear
- Oil lubrication…reduces, friction and operating temperature
- Front output seal cover…captures and protects output seal



Helical Planetary Design - Helical gears have more tooth contact and greater face width than spur gears. This results in higher loads, smoother tooth engagement, quieter operation and lower backlash.

HeliCrown® - Parker Bayside developed the HeliCrown gear tooth to further optimize Stealth's® performance. Since most vibration occurs at the entry and exit points of a gear tooth, HeliCrown eliminates metal only in these areas, without sacrificing gear strength, producing a quieter and stronger gear.

Plasma Nitriding - Parker Bayside's in-house Plasma Nitriding process results in an ideal gear tooth. The surface is very hard (65 Rc) and the core is strong, but flexible (36 Rc). The result is a wear-resistant gear tooth that can withstand heavy shock, ensuring high accuracy for the life of the gearhead.

ServoMount® - Parker Bayside's patented ServoMount design features a balanced input gear supported by a floating bearing. This unique design compensates for motor shaft runout and misalignment, ensuring TRUE alignment of the input sun gear with the planetary section and allowing input speeds up to 6,000 RPM. ServoMount ensures error-free installation to any motor, in a matter of minutes.

Stealth's® superior design and construction deliver "The Helical Advantage":

- Strong…30% More Torque
- Fast…6,000 RPM Input Speeds
- Accurate…Less Than 3 Arc minutes Backlash
- Quiet…Less Than 68dB Noise

Plus... Over 97% Efficiency

11

Front Output Seal Cover
Completely captures and protects output seal and allows in-field seal replacement.

10

Output Wave Seal Technology
Creates a hydrodynamic film between seal and shaft and reducing heat and wear.

9

Magnetic Oil Fill Drain Plug
The magnetic plug attracts normal wear particles keeping them away from the gear mesh.

For Applications Requiring Lower dB, Consult Factory

1

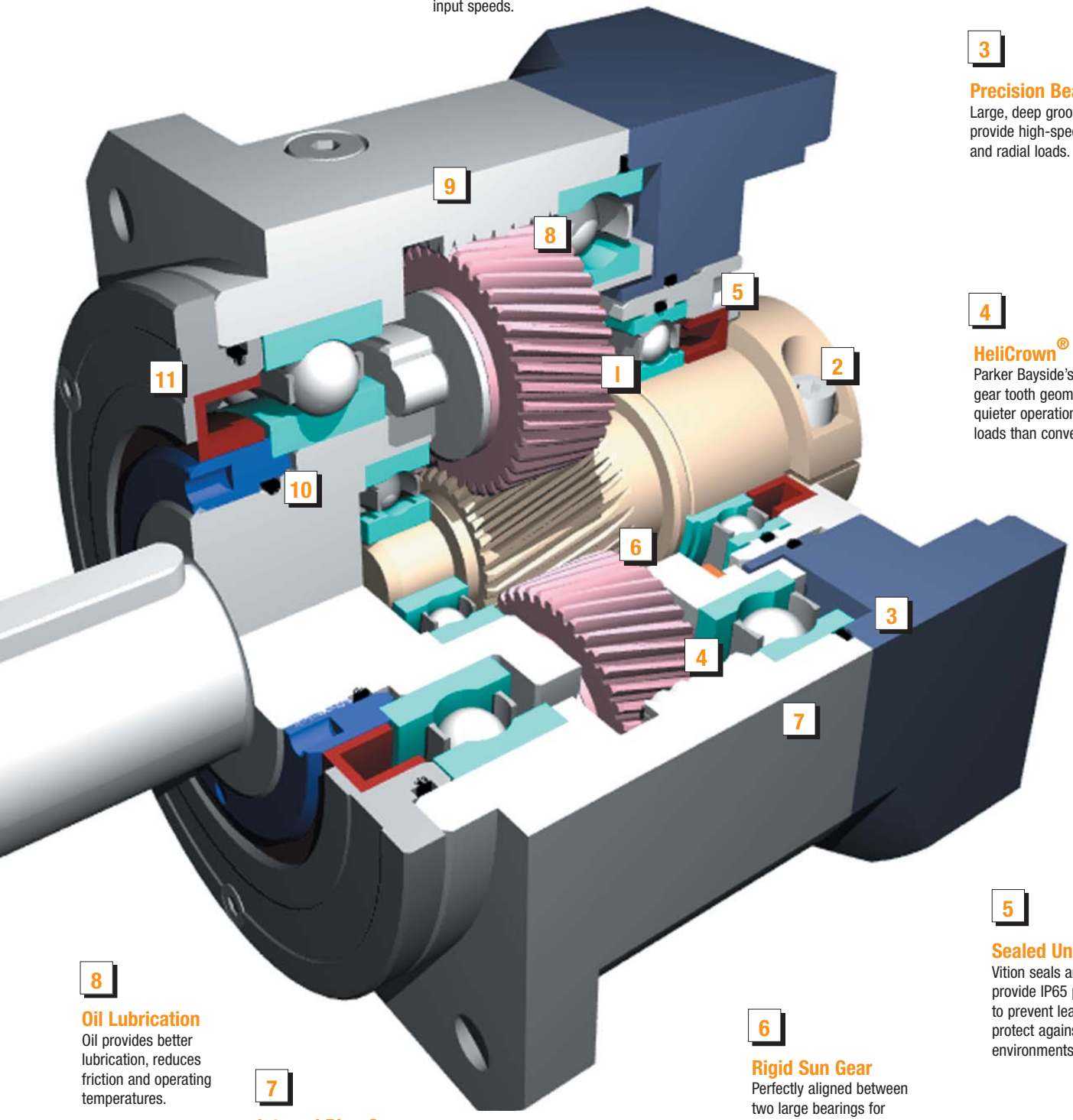
Helical Planetary

Provides smooth, quiet operation, high torque and high accuracy.

2

ServoMount®

Patented motor-mounting design ensures error-free installation and the balanced pinion allows higher input speeds.



3

Precision Bearings

Large, deep groove bearings provide high-speed capacity and radial loads.

4

HeliCrown®

Parker Bayside's proprietary gear tooth geometry ensures quieter operation and higher loads than conventional gears.

5

Sealed Unit

Vition seals and O-Rings provide IP65 protection to prevent leaks and protect against harsh environments.

6

Rigid Sun Gear

Perfectly aligned between two large bearings for maximum stiffness and strength.

7

Integral Ring Gear

Cutting the ring gear directly into the housing allows for larger bearing and planet gears, delivering maximum power and stiffness in a minimum package.

8

Oil Lubrication

Oil provides better lubrication, reduces friction and operating temperatures.

Moment of Inertia

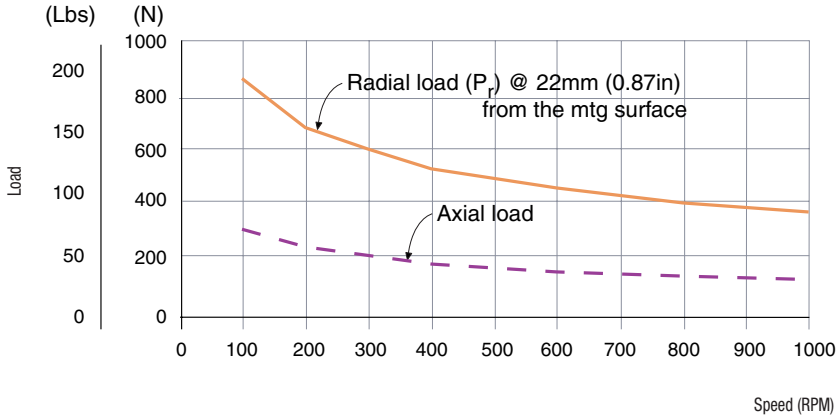
Specifications:	Units	Ratio	Frame Size						
			PS60	PS90	PS115	PS142	PS180	PS220	PS300
Small Motor Shaft Diameter Range	**mm**	3-100	**6-12.7**	**6-16**	**9-19**	**12.7-24**	**15.9-35**	**24-48**	**28-65**
	in		0.236-0.500	0.236-0.630	0.354-0.748	0.500-0.944	0.626-1.378	0.945-1.89	1.10-2.56
	gm cm sec²	3	**0.176**	**0.784**	**2.34**	**7.81**	**28.6**	—	—
	oz in sec²		0.002	0.011	0.033	0.109	0.397	—	—
	gm cm sec²	4,5	**0.101**	**0.486**	**1.87**	**4.92**	**17.6**	**62.6**	**284**
	oz in sec²		0.001	0.007	0.026	0.068	0.244	0.869	3.95
	gm cm sec²	7,10	**0.063**	**0.298**	**0.960**	**2.68**	**9.24**	**34.3**	**136**
	oz in sec²		0.001	0.004	0.013	0.037	0.128	0.476	1.88
	gm cm sec²	15	**0.092**	**0.420**	**1.60**	**4.17**	**15.8**	**51.0**	—
	oz in sec²		0.001	0.006	0.022	0.058	0.219	0.708	—
	gm cm sec²	16,20,25	**0.098**	**0.444**	**1.73**	**4.50**	**16.7**	**53.3**	**219**
	oz in sec²		0.001	0.006	0.024	0.063	0.232	0.741	3.05
	gm cm sec²	30-100	**0.054**	**0.247**	**0.760**	**2.18**	**7.450**	**27.1**	**93.9**
	oz in sec²		0.001	0.003	0.011	0.030	0.104	0.377	1.30
Large Motor Shaft Diameter Range	**mm**	3-100	**16-19**	**19-24**	**24-35**	**35-42**	**48-55**	—	
	in		0.500-0.630	0.630-0.748	0.748-0.944	0.944-1.38	1.38-1.65	1.89-2.17	—
	gm cm sec²	3	**0.253**	**1.07**	**3.25**	**10.6**	**37.8**	**111**	—
	oz in sec²		0.004	0.015	0.045	0.148	0.526	1.54	—
	gm cm sec²	4,5	**0.185**	**0.745**	**2.70**	**7.51**	**25.6**	**72.4**	—
	oz in sec²		0.003	0.010	0.038	0.104	0.356	1.01	—
	gm cm sec²	7,10	**0.143**	**0.566**	**1.70**	**5.01**	**15.8**	**44.1**	—
	oz in sec²		0.002	0.008	0.024	0.070	0.219	0.613	—
	gm cm sec²	15	**0.176**	**0.685**	**2.43**	**6.76**	**23.8**	**60.8**	—
	oz in sec²		0.002	0.010	0.034	0.094	0.331	0.845	—
	gm cm sec²	16,20,25	**0.182**	**0.715**	**2.56**	**7.09**	**24.7**	**62.9**	—
	oz in sec²		0.003	0.010	0.036	0.099	0.344	0.874	—
	gm cm sec²	30-100	**0.134**	**0.507**	**1.50**	**4.50**	**14.0**	**37.0**	—
	oz in sec²		0.002	0.007	0.021	0.063	0.195	0.513	—

Note: All Moment of Inertia values are as reflected at the input shaft of the gearhead.

Specification are subject to change without notice

Formulas to calculate radial load (P_{rx}) at any distance "X" from the gearhead mounting surface.

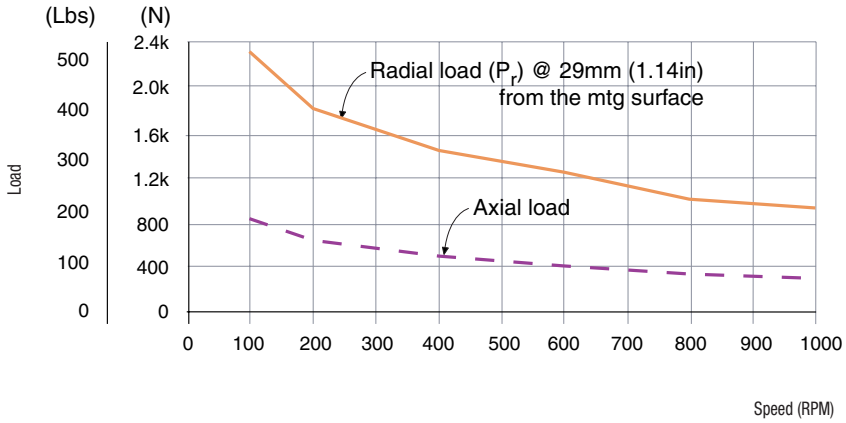
PS60



$P_{rx} = (P_r)(\mathbf{57mm}) / (\mathbf{35mm} + X)$

$P_{rx} = (P_r)(2.24in) / (1.38in + X)$

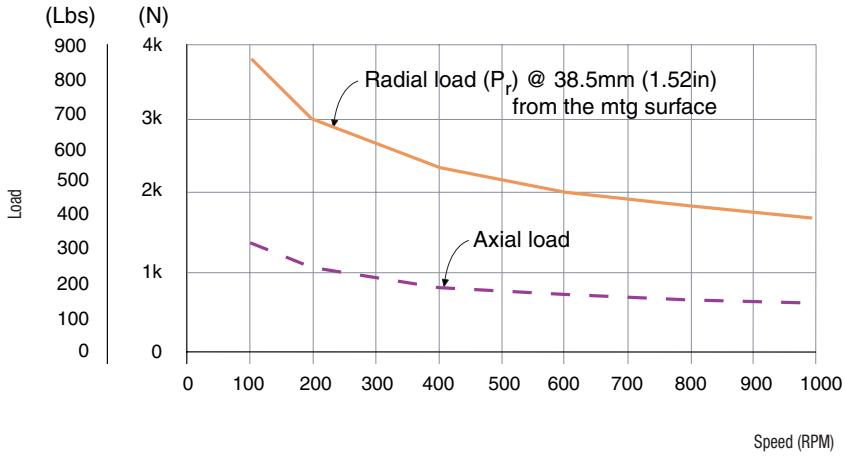
PS90



$P_{rx} = (P_r)(\mathbf{74mm}) / (\mathbf{45mm} + X)$

$P_{rx} = (P_r)(2.91in) / (1.77in + X)$

PS115

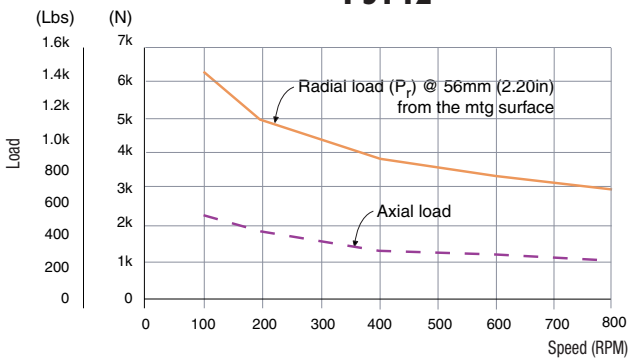


$P_{rx} = (P_r)(\mathbf{95mm}) / (\mathbf{57mm} + X)$

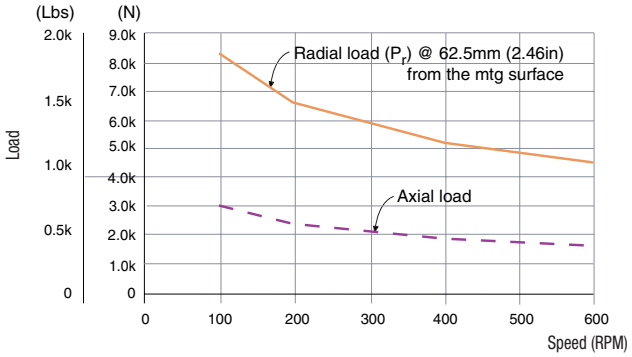
$P_{rx} = (P_r)(3.74in) / (2.24in + X)$

Output Shaft Load Rating

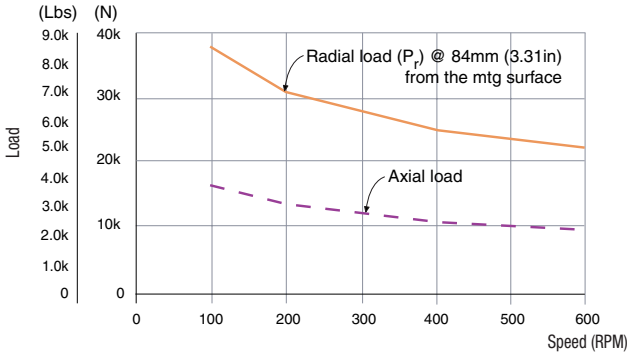
PS142



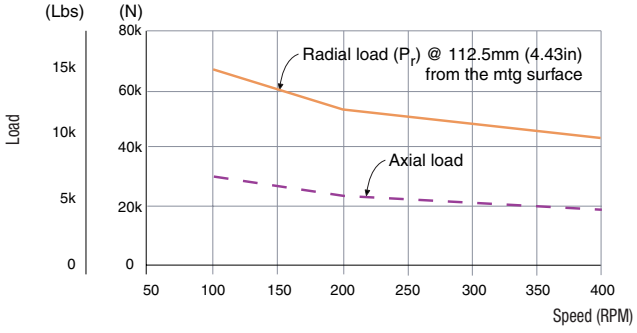
PS180



PS220



PS300



Formulas to calculate radial load (P_{rx}) at any distance "X" from the gearhead mounting surface.

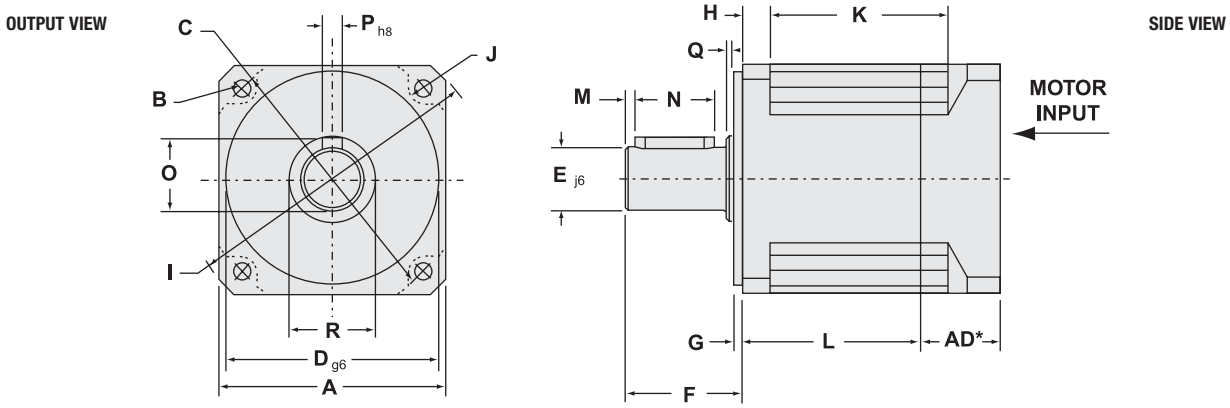
$P_{rx} = (P_r)(\mathbf{127mm}) / (\mathbf{71mm} + X)$
$P_{rx} = (P_r)(5in) / (2.79in + X)$

$P_{rx} = (P_r)(\mathbf{138mm}) / (\mathbf{76mm} + X)$
$P_{rx} = (P_r)(5.43in) / (2.99in + X)$

$P_{rx} = (P_r)(\mathbf{190mm}) / (\mathbf{106mm} + X)$
$P_{rx} = (P_r)(7.48in) / (4.17in + X)$

$Prx = (Pr)(\mathbf{268mm}) / (\mathbf{156mm} + X)$
$Prx = (Pr)(10.55in) / (6.14in + X)$

Dimensions



Frame Size	A Square Flange (mm)	A (in)	B Bolt Hole (mm)	B (in)	C Bolt Circle (mm)	C (in)	D Pilot Diameter (mm)	D (in)	E Output Shaft Diameter (mm)	E (in)	F Output Shaft Length (mm)	F (in)	G Pilot Thickness (mm)	G (in)	H Flange Thickness (mm)	H (in)	I Housing Diameter (mm)	I (in)	J Housing Recess (mm)	J (in)
PS60	60	2.362	5.5	0.217	70	2.756	50	1.969	16	0.630	37	1.457	8	0.315	8	0.315	80	3.150	5	0.197
PS90	90	3.543	6.5	0.256	100	3.937	80	3.150	22	0.866	48	1.890	11	0.433	10	0.394	116	4.567	6.5	0.256
PS115	115	4.528	8.5	0.335	130	5.118	110	4.331	32	1.260	65	2.559	13	0.512	14	0.551	152	5.984	7.5	0.295
PS142	142	5.591	11	0.433	165	6.496	130	5.118	40	1.575	97	3.819	15	0.591	15	0.591	185	7.283	10	0.394
PS180	182	7.165	13	0.512	215	8.465	160	6.299	55	2.165	105	4.134	20	0.787	16	0.630	240	9.449	16	0.630
PS220	220	8.661	17	0.669	250	9.843	180	7.087	75	2.953	138	5.433	30	1.181	22	0.866	290	11.417	16	0.630
PS300	305	12.008	21	0.827	350	13.780	250	9.843	100	3.937	190	7.480	35	1.378	26	1.024	400	15.748	18	0.709

Frame Size	K1 Recess Length (For Ratio ≤ 10:1) (mm)	K1 (in)	K2 Recess Length (For Ratio > 10:1) (mm)	K2 (in)	L1 Length (For Ratio ≤ 10:1) (mm)	L1 (in)	L2 Length (For Ratio > 10:1) (mm)	L2 (in)	M Dist. From Shaft End (mm)	M (in)	N Keyway Length (mm)	N (in)	O Key Height (mm)	O (in)	P Keyway Width (mm)	P (in)	Q Shoulder Height (mm)	Q (in)	R Shoulder Diameter (mm)	R (in)
PS60	37	1.457	67	2.638	36.7	1.445	66.7	2.626	2	0.079	25	0.984	18	0.709	5	0.197	0.5	0.020	22	0.866
PS90	48	1.890	88	3.465	49.5	1.949	89	3.504	3	0.118	32	1.260	24.5	0.965	6	0.236	0.5	0.020	35	1.378
PS115	62	2.441	110	4.331	61.7	2.429	109.5	4.311	5	0.197	40	1.575	35	1.378	10	0.394	1	0.039	45	1.772
PS142	82	3.228	143	5.630	76.5	3.012	138	5.433	5	0.197	63	2.480	43	1.693	12	0.472	3	0.118	55	2.165
PS180	88	3.465	158	6.220	83.5	3.287	153.5	6.043	6	0.236	70	2.756	59	2.323	16	0.630	3	0.118	70	2.756
PS220	116	4.567	218	8.583	108	4.252	210.5	8.287	6	0.236	90	3.543	79.5	3.130	20	0.787	3	0.118	95	3.740
PS300	160	6.299	332	13.071	158	6.220	292	11.496	7	0.276	140	5.512	106	4.173	28	1.102	3	0.118	140	5.512

*AD=Adapter Length. Adapter will vary, depending on motor.
Consult Internet (www.baysidemotion.com or www.parkermotion.com) for details or call Parker Bayside.

How to Order

P	S	1	4	2	-	0	0	3	-	X	X	X	L	H

1. Pick frame size and ratio.
2. Pick backlash and orientation.
3. Specify motor, make and model for mounting kit.

FRAME SIZE
60, 90, 115, 142, 180, 220, 300***

RATIO
003, 004, 005, 007, 010, 015, 020, 025, 030, 040, 050, 070, 100

SPECIAL
(Factory Issued)

BACKLASH
L = Low
S = Standard

ORIENTATION
H = Horizontal orientation
U = Output shaft pointing up
D = Output shaft pointing down

(For other orientations consult the factory)

PS Gearheads are supported by a worldwide network of offices and local distributors. Call **1-800-305-4555** for application engineering assistance or for the name of your local distributor. Information can also be obtained at **www.baysidemotion.com or www.parkermotion.com**

*** PS300 is available in Ratios of: 4, 5, 7, 10, 20, 50, 70 & 100:1

Specifications are subject to change without notice.

Stealth® PX Series:
Best Technology . . Best Value

Stealth PX incorporates Parker Bayside's helical planetary technology in a lower-cost package. Available in NEMA and metric frame sizes, Stealth PX delivers high torque and quiet, smooth operation for less-demanding servo applications.

4 Frame Sizes	
PX60	PX23
PX90	PX34
PX115	PX42
PX142	PX56

Ratios		
3:1	10:1	30:1
4:1	15:1	50:1
5:1	20:1	70:1
7:1	25:1	100:1

Performance Specifications

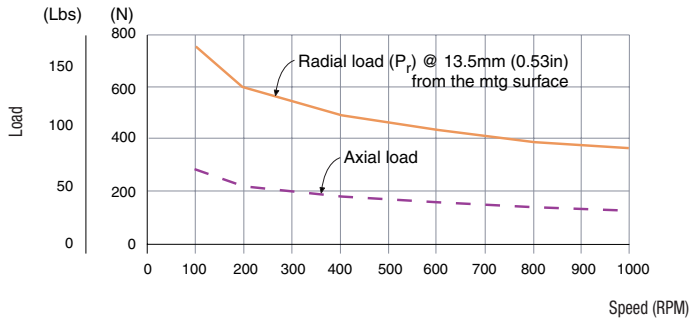
	Units	Ratio	Frame Size			
			PX60/PX23	PX90/PX34	PX115/PX42	PX142/56
Nominal Output Torque, $T_{nom\ r}$	**Nm**	3-5	**18**	**45**	**124**	**226**
	in lb		160	400	1,100	1,994
	Nm	7-15	**22**	**57**	**147**	**231**
	in lb		190	500	1,300	2,038
	Nm	20-50	**28**	**74**	**181**	**278**
	in lb		250	650	1,600	2,453
	Nm	70-100	**23**	**57**	**158**	**261**
	in lb		200	500	1,400	2,038
Max. Acceleration Output Torque, $T_{acc\ r}$	**Nm**	3-15, 70-100	**26**	**71**	**175**	**282**
	in lb		230	630	1,550	2,488
	Nm	20-50	**32**	**86**	**215**	**347**
	in lb		280	760	1,900	3,062
Emergency[1] Stop Output Torque, $T_{em\ r}$	**Nm**	3-15, 70-100	**60**	**164**	**407**	**656**
	in lb		530	1,450	3,600	5,789
	Nm	20-50	**74**	**198**	**497**	**800**
	in lb		650	1,750	4,400	7,055
Nominal Input Speed, $N_{nom\ r}$	RPM	3-5	3,200	2,800	2,400	2,000
	RPM	7-15	3,700	3,300	2,900	2,500
	RPM	20-50	4,200	3,800	3,400	3,000
	RPM	70-100	4,700	4,300	3,900	3,500
Maximum Input Speed, N_{maxr}	RPM	3-100	6,000	5,300	4,500	3,800
Standard Backlash [2]	arc min	3-10	10	9	8	8
	arc min	15-100	12	11	10	10
Low Backlash [2]	arc min	3-10	8	7	6	6
	arc min	15-100	10	9	8	8
Efficiency at Nominal Torque	%	3-10	96	96	96	96
	%	15-100	93	93	93	93
Noise Level[3] at: 3,000 RPM	dB	3-100	64	64	64	66
Torsional Stiffness	**Nm / arc min**	3-100	**3**	**10**	**20**	**39**
	in lb / arc min		22	88	177	345
Maximum Weight	**kg**	3-10	**1**	**3**	**7**	**14**
	lb		3	7	15	30
	kg	15-100	**2**	**5**	**10**	**20**
	lb		4	10	21	43
Max. Allowable Case Temperature	^0C	3-100	←	100	→	

			Frame Size			
Specifications:	**Units**	**Ratio**	**PX60/PX23**	**PX90/PX34**	**PX115/PX42**	**PX142/56**
Moment of Inertia[4]	**gm cm sec²**	3	**0.212**	**0.918**	**2.53**	**8.826**
	oz in sec²		0.003	0.013	0.035	0.124
	gm cm sec²	4,5	**0.134**	**0.590**	**1.92**	**4.514**
	oz in sec²		0.002	0.008	0.027	0.063
	gm cm sec²	7,10	**0.092**	**0.372**	**1.12**	**3.326**
	oz in sec²		0.001	0.005	0.016	0.047
	gm cm sec²	15	**0.122**	**0.524**	**1.64**	**4.849**
	oz in sec²		0.002	0.007	0.023	0.068
	gm cm sec²	20,25	**0.128**	**0.548**	**1.78**	**5.179**
	oz in sec²		0.002	0.008	0.025	0.073
	gm cm sec²	30-100	**0.083**	**0.322**	**0.924**	**2.840**
	oz in sec²		0.001	0.004	0.013	0.040

(1) Maximum of 1,000 stops
(2) Measured at 2% of rated torque.
(3) Measured at 1 meter
Specification are subject to change without notice
(4) All Moment of Inertia values are as reflected at the input shaft of the gearhead.

Output Shaft Load Rating

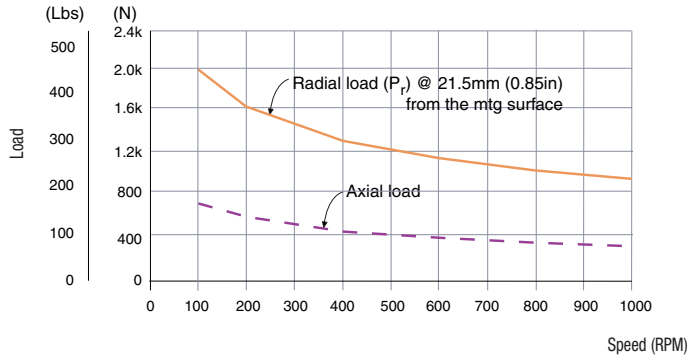
PX60 / PX23



Formulas to calculate radial load (P_{rx}) at any distance "X" from the gearhead mounting surface.

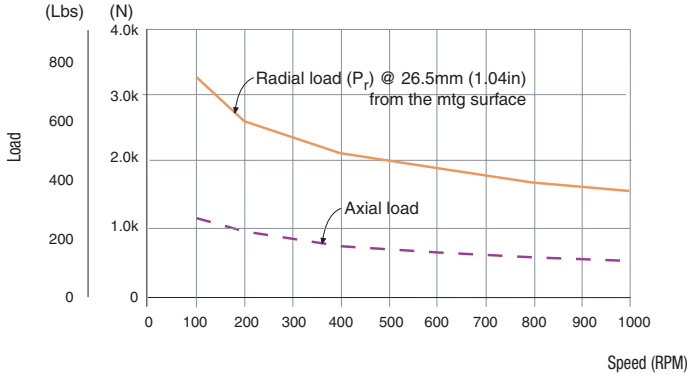
$P_{rx} = (P_r)(\mathbf{54mm}) / (\mathbf{41mm} + X)$
$P_{rx} = (P_r)(2.13in) / (1.61in + X)$

PX90 / PX34



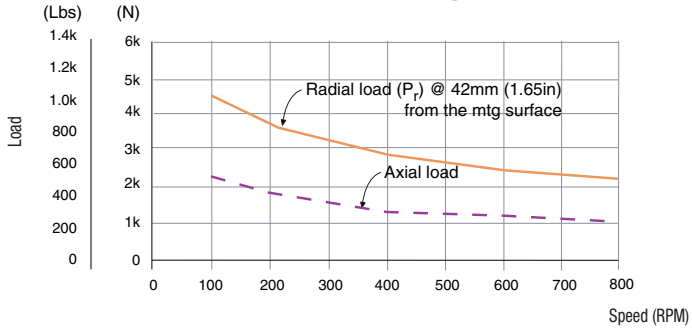
$P_{rx} = (P_r)(\mathbf{73mm}) / (\mathbf{52mm} + X)$
$P_{rx} = (P_r)(2.87in) / (2.05in + X)$

PX115 / PX42



$P_{rx} = (P_r)(\mathbf{89mm}) / (\mathbf{63mm} + X)$
$P_{rx} = (P_r)(3.5in) / (2.48in + X)$

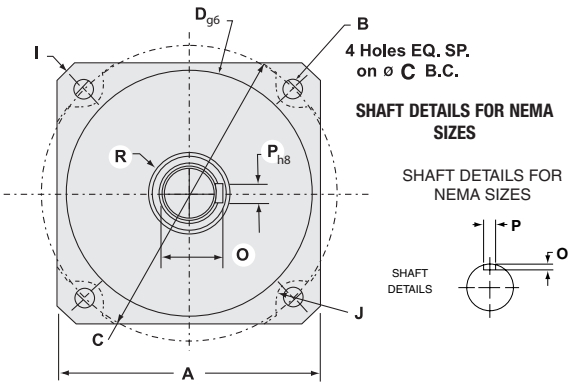
PX142 / PX56



$P_{rx} = (P_r)(\mathbf{121mm}) / (\mathbf{65mm} + X)$
$P_{rx} = (P_r)(4.76in) / (2.56in + X)$

Dimensions

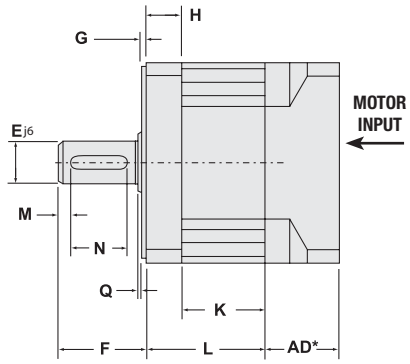
OUTPUT VIEW



SHAFT DETAILS FOR NEMA SIZES

SHAFT DETAILS FOR NEMA SIZES

SIDE VIEW



METRIC SIZES

Frame Size	A Square Flange (mm)	A (in)	B Bolt Hole (mm)	B (in)	C Bolt Circle (mm)	C (in)	D Pilot Diameter (mm)	D (in)	E Output Shaft Diameter (mm)	E (in)	F Output Shaft Length (mm)	F (in)	G Pilot Thickness (mm)	G (in)	H Flange Thickness (mm)	H (in)	I Housing Diameter (mm)	I (in)	J Housing Recess (mm)	J (in)
PX60	60	2.362	5.5	0.217	70	2.756	50	1.969	16	0.630	25	0.984	2.5	0.098	13	0.512	80	3.150	5.5	0.217
PX90	90	3.543	6.5	0.256	100	3.937	80	3.150	20	0.787	40	1.575	3	0.118	17	0.669	116	4.567	6.5	0.256
PX115	115	4.528	8.5	0.335	130	5.118	110	4.331	24	0.945	50	1.969	3.5	0.138	20	0.787	152	5.984	7.5	0.295
PX142	142	5.591	11.0	0.433	165	6.496	130	5.118	40	1.575	80	3.150	3.5	0.138	25	0.984	194	7.637	10.0	0.394

Frame Size	K1 Recess Length (For Ratio ≤ 10:1) (mm)	K1 (in)	K2 Recess Length (For Ratio > 10:1) (mm)	K2 (in)	L1 Length (For Ratio ≤ 10:1) (mm)	L1 (in)	L2 Length (For Ratio > 10:1) (mm)	L2 (in)	M Dist. From Shaft End (mm)	M (in)	N Keyway Length (mm)	N (in)	O Key Height (mm)	O (in)	P Keyway Width (mm)	P (in)	Q Shoulder Height (mm)	Q (in)	R Shoulder Diameter (mm)	R (in)
PX60	30	1.181	60	2.362	43	1.693	73	2.874	3	0.118	16	0.630	18	0.709	5	0.197	1	0.039	22	0.866
PX90	39.5	1.555	79	3.110	56.5	2.224	96	3.780	5	0.197	28	1.102	22.5	0.886	6	0.236	1	0.039	35	1.378
PX115	47.8	1.882	95.6	3.764	67.8	2.669	115.6	4.551	7	0.276	32	1.260	27	1.063	8	0.315	1.5	0.059	35	1.378
PX142	61.5	2.421	123.0	4.843	86.5	3.406	148.0	5.827	8	0.315	63	2.480	43.0	1.693	12	0.472	1.5	0.059	46	1.811

*AD=Adapter Length. Adapter will vary, depending on motor. Consult Internet (www.baysidemotion.com or www.parkermotion.com) for details or call Parker Bayside.

NEMA SIZES

Frame Size	B Bolt Hole (in)	B (mm)	C Bolt Circle (in)	C (mm)	D Pilot Diameter (in)	D (mm)	E Output Shaft Diameter (in)	E (mm)	F Output Shaft Length (in)	F (mm)	N Keyway Length (in)	N (mm)	O Keyway Depth (in)	O (mm)	P Keyway Width (in)	P (mm)
PX23	0.195	4.953	2.625	66.675	1.5	38.100	0.375	9.525	1	25.400	0.75 flat	19.050 flat	0.015 flat	0.381 flat	—	—
PX34	0.217	5.512	3.875	98.425	2.875	73.025	0.5	12.700	1.25	31.750	1.063	27.000	0.072	1.829	0.125	3.175
PX42	0.281	7.137	4.95	125.730	2.187	55.550	0.625	15.875	1.5	38.100	1.142	29.007	0.094	2.388	0.188	4.775
PX56	0.398	10.109	7.000	177.8	4.500	114.300	1.000	25.400	2.000	50.800	1.625	41.275	0.142	3.607	0.250	6.350

NOTE: NEMA sizes have 20% lower torque/stiffness ratings due to smaller output shaft diameter.

How to Order

Order Numbering Example: P X 1 1 5 - 0 1 0 - X X X L B

1. Pick frame size and ratio.
2. Pick options.
3. Specify motor make and model for mounting kit.

FRAME SIZE

(Metric Sizes)	(NEMA Sizes)
60	23
90	34
115	42
142	56

RATIO: 003, 004, 005, 007, 010, 015, 020, 025, 030, 050, 070, 100

SPECIAL (Factory Issued)

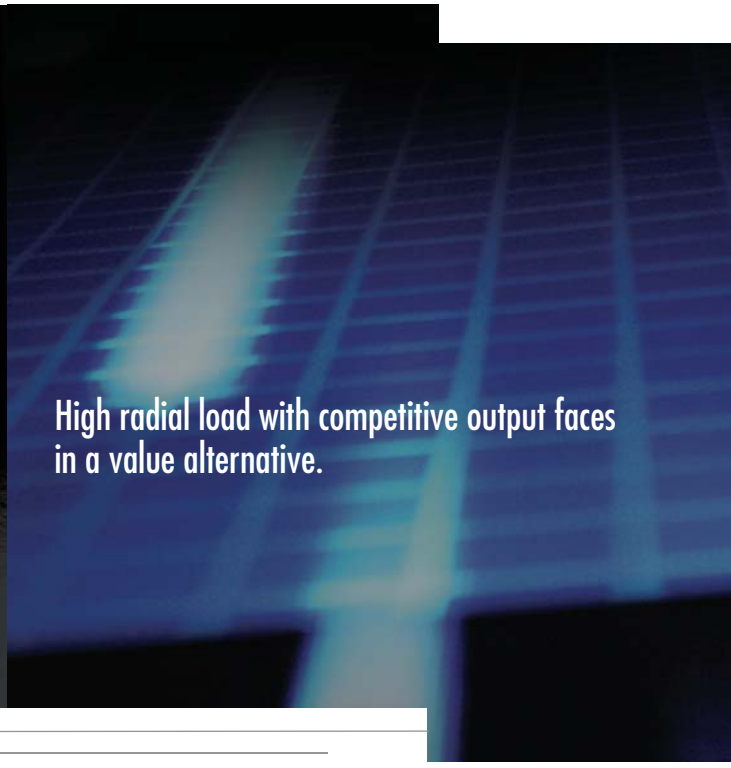
OPTIONAL: LOW BACKLASH

PX Gearheads are supported by a worldwide network of offices and local distributors. Call **1-800-305-4555** for application engineering assistance or for the name of your local distributor. Information can also be obtained at **www.baysidemotion.com or www.parkermotion.com**

Specifications are subject to change without notice.

PV Series Gearhead

Power & Versatility in a Value Alternative



100:1 Ratios *		
3:1	12:1	30:1
4:1	15:1	35:1
5:1	16:1	40:1
7:1	20:1	50:1
10:1	25:1	70:1

3 Frame Sizes	
PV40	PV17
PV60	PV23
PV90	PV34

Right Angle coming soon - Spring 2007. Consult factory.

The PV Series planetary gearhead combines power and versatility in an economical package. It comes in a wide range of options including dimensional output face crossovers to the Parker Bayside PX, Alpha LP, Neugart PLE, Stober PE and standard NEMA gearheads.

The PV Series is available in metric or NEMA frame sizes ranging from 40mm, 60mm and 90mm. NEMA sizes are NEMA 17, NEMA 23 and NEMA 34. Ratios are available from 3:1 to 100:1. Whether you're an OEM or an end user searching for competitive alternatives, the PV offers a superior solution. Manufactured in the USA, Parker Bayside's PV Series gearheads are manufactured in the USA."

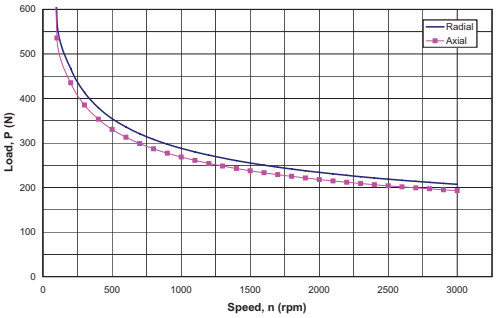
PV Series, Specifications

Parameter	Units	Ratio	PV40	PV60	PV90
Nominal Output Torque, Tnom r	Nm (in-lb)	3 4 5 7 10 12 15 16 20 25 30 35 40 50 70 100	 5.9 (52.215) 6.2 (54.87) 5.5 (48.675) 3.5 (30.975) 6.5 (57.525) 6.5 (57.525) 6.7 (59.295) 6.7 (59.295) 6.5 (57.525) 6.7 (59.295) 5.5 (48.675) 3.5 (30.975)	12 (106.2) 18.9 (167.265) 19.6 (173.46) 16.7 (147.795) 10.6 (93.81) 18.2 (161.07) 19.4 (171.69) 21.5 (190.255) 20.0 (177) 22.5 (199.125) 21.5 (190.275) 20 (177) 16.7 (147.795) 10.6 (93.81)	35 (309.75) 56 (495.6) 58 (513.3) 52 (460.2) 33 (292.05) 54 (477.9) 58 (513.3) 67 (592.95) 63 (557.55) 71 (628.35) 67 (592.95) 63 (557.55) 52 (460.2) 33 (292.05)
Max. Acceleration Output Torque,Tacc r [1]	Nm (in-lb)	3 4,5,12,15 7,70 10,100 16,20,25,28, 30,35,40,50	 11.8 (104.43) 11(97.35) 7 (61.95) 13 (115.05)	24 (212.4) 36.4 (322.14) 33.4 (295.59) 21.2 (187.62) 40 (354)	70 (619.5) 108 (955.8) 104 (920.4) 66 (584.1) 126 (1115.1)
Emergency Stop Output Torque,Tem r [2]	Nm (in-lb)	3,4,5,12,15,16, 20,25,30,35,40, 50 7,70 10,100	16 (141.6 13.7 (121.245) 9.2 (81.42)	55 (486.75) 44 (389.4) 39 (345.15)	170 (1504.5) 137 (1212.45) 122 (1079.7)
Nominal Input Speed, Nnom r	RPM	All Ratios	4500	4000	3500
Maximum Input Speed, Nmax r	RPM	All Ratios	8000	6000	6000
Lifetime	h	All Ratios	20,000		
Standard Backlash[3]	arc-min	≤ 10:1 > 1-:1	< 15 < 18	< 12 < 16	< 10 < 14
Efficiency at Nominal Torque	%	≤ 10:1 > 10:1	96 94	96 94	96 94
Noise Level at 3000 RPM[4]	dB(A)	All Ratios	60	65	65
Case Temperature	Degree C	All Ratios	Maximum Allowable -20 to 100		
Lubrication		All Ratios	Lifetime lubrication		
Mounting Position		All Ratios	Any		
Direction of Rotation		All Ratios	Same as input		
Degree of Protection		All Ratios	IP 64		
Maximum Weight	kg (lbs)	≤ 10:1 > 10:1	0.6 (1.2) 0.9 (2.0)	1.1 (2.5) 1.6 (3.5)	3.2 (7.0) 4.3 (9.5)

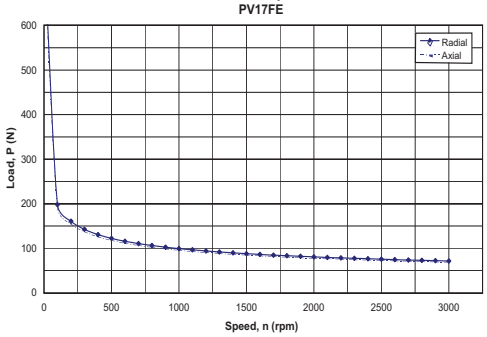
1) tacc+tdec=.2(tacc+tcont+tdec) Tcont=.25Tacc
2) Maximum of 1000 stops.
3) Measured at 2% of rated torque.
4) Measure at 1m.
r = rated values

Output shaft load rating

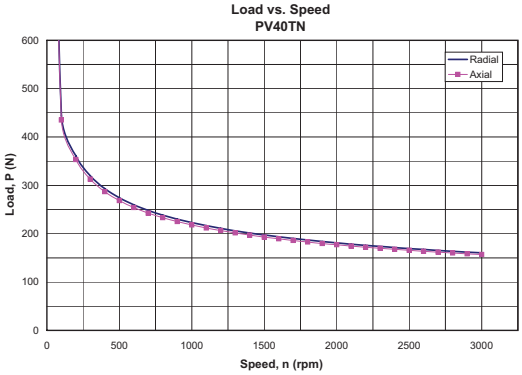
Load vs. Speed
PV40FB



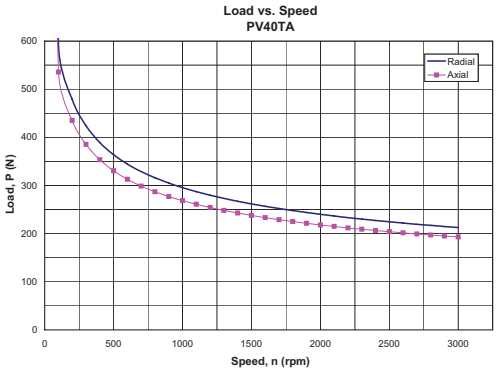
Load vs. Speed
PV17FE



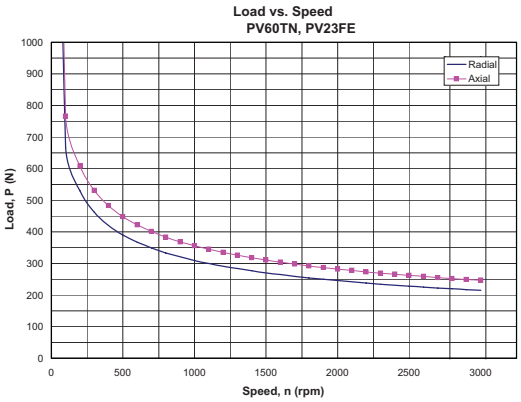
Load vs. Speed
PV40TN



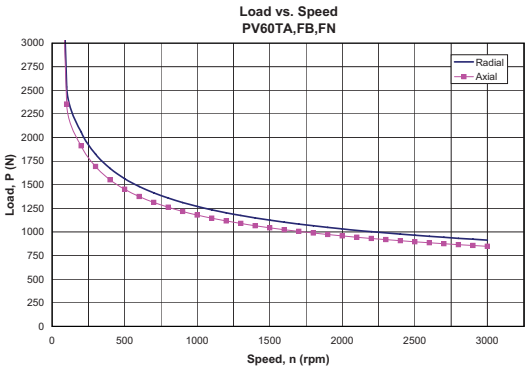
Load vs. Speed
PV40TA



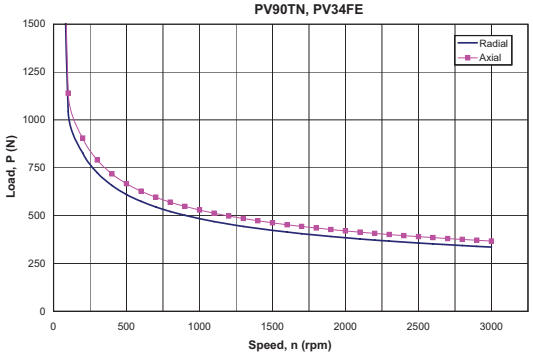
Load vs. Speed
PV60TN, PV23FE



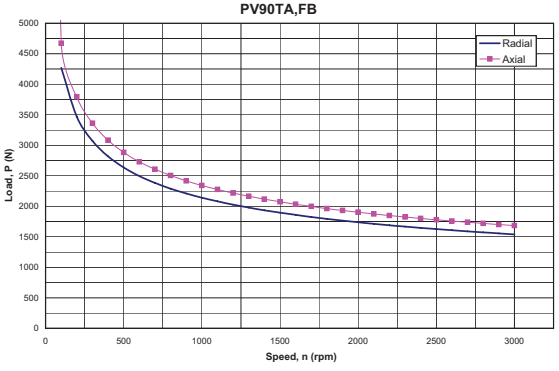
Load vs. Speed
PV60TA,FB,FN



Load vs. Speed
PV90TN, PV34FE



Load vs. Speed
PV90TA,FB



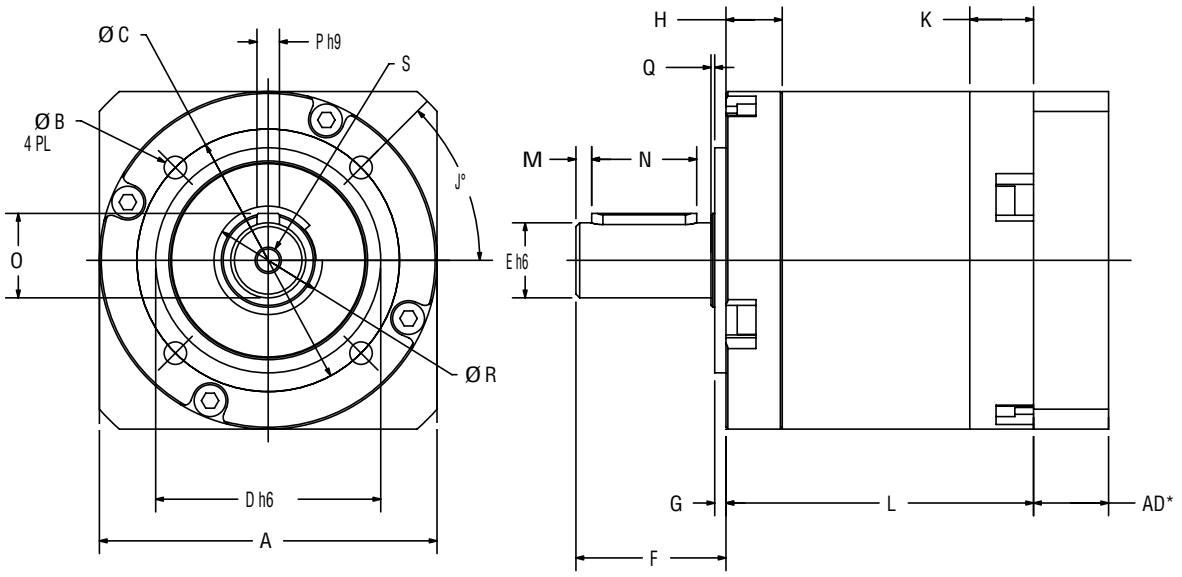
1) Maximum axial load, Fa.
2) Maximum radial load applied to the center of the shaft, Fr.
3) Radial load curves can be used to combine (radial + axial) load if Fa/Fr < .22.
4) If Fa/Fr > .22 consult factory.

PV Series, Inertia Table

Units	Ratio	PV40	PV60	PV90
kg cm²	3	----	0.1400	0.7400
in lb sec²		----	0.000124	0.000655
kg cm²	4	0.0200	0.1000	0.5000
in lb sec²		0.000018	0.000089	0.000443
kg cm²	5	0.0180	0.0840	0.3900
in lb sec²		0.000016	0.000074	0.000345
kg cm²	7	0.0160	0.0750	0.3400
in lb sec²		0.000014	0.000066	0.000301
kg cm²	10	0.0160	0.0070	0.3000
in lb sec²		0.000014	0.000006	0.000266
kg cm²	12	----	0.0970	0.4900
in lb sec²		----	0.000086	0.000434
kg cm²	15	----	0.0830	0.3900
in lb sec²		----	0.000073	0.000345
kg cm²	16	0.0190	----	----
in lb sec²		0.000017	----	----
kg cm²	20	0.0170	0.0830	0.3900
in lb sec²		0.000015	0.000073	0.000345
kg cm²	25	0.0170	0.0830	0.3900
in lb sec²		0.000015	0.000073	0.000345
kg cm²	28	0.0160	----	----
in lb sec²		0.000014	----	----
kg cm²	30	----	0.0700	0.3000
in lb sec²		----	0.000062	0.000266
kg cm²	35	0.0160	----	----
in lb sec²		0.000014	----	----
kg cm²	40	0.0160	0.0700	0.3000
in lb sec²		0.000014	0.000062	0.000266
kg cm²	50	0.0160	0.0700	0.3000
in lb sec²		0.000014	0.000062	0.000266
kg cm²	70	0.0160	0.0700	0.3000
in lb sec²		0.000014	0.000062	0.000266
kg cm²	100	0.0160	0.0700	0.3000
in lb sec²		0.000014	0.000062	0.000266

(1) Note: All moments of inertia values are as reflected at the input shaft of the gearhead

Dimensions

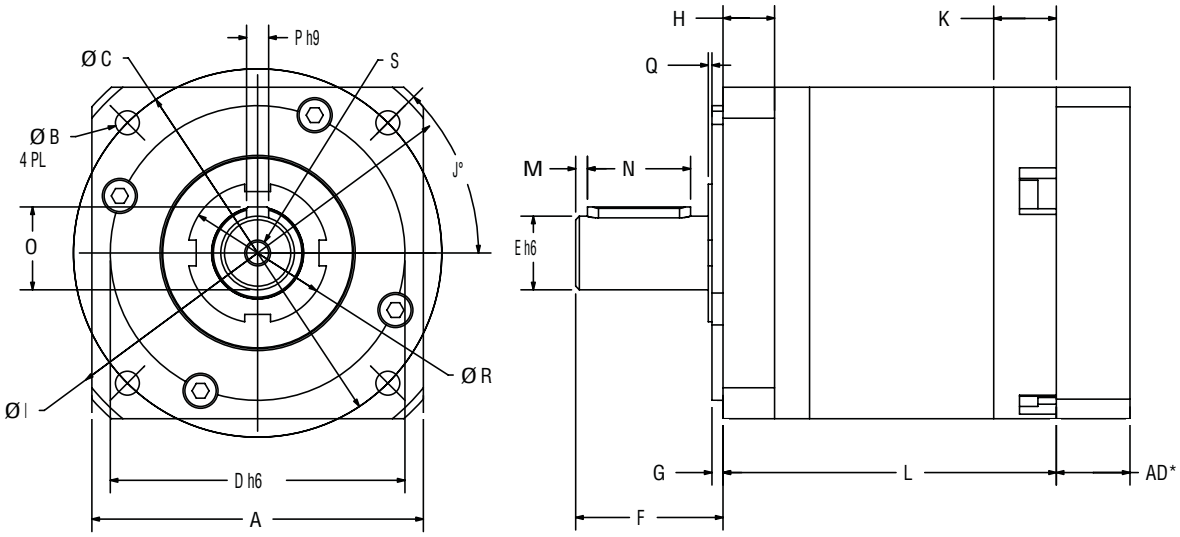


PV Tapped Face Dimensions Units: mm (in)

	A Body Diameter		B Tap x Depth		C Bolt Circle		D Pilot Diameter		E Output Shaft Diameter		F Output Shaft Length		G Pilot Thickness		H Flange Thickness		I Housing Diameter		J Lead Angle
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(deg)
PV40-TN	43	1.693	M4x7		34	1.339	26	1.024	10	0.394	26	1.024	1.5	0.059	10	0.394	---		45
PV40-TA	50	1.969	M4X10		44	1.732	35	1.378	12	0.472	25	0.984	3	0.118	10	0.394	---		90
PV60-TN	62	2.441	M5x10		52	2.047	40	1.575	14	0.551	35	1.378	2.5	0.098	12	0.472	---		45
PV60-TA	70	2.756	M5x10		62	2.362	52	2.047	16	0.630	36	1.417	5	0.197	16	0.630	---		90
PV90-TN	90	3.543	M6x11		70	2.756	60	2.362	20	0.787	40	1.575	3	0.118	15	0.591	---		45
PV90-TA	90	3.543	M6x12		80	3.150	68	2.677	22	0.866	46	1.811	5	0.197	18.5	0.728	---		90

	K Rear Thickness		L1 Length (Ratio <10:1)		L2 Length (Ratio >10:1)		M Dist. From Shaft End		N Keyway Length		O Key Height		P Keyway Width		Q Shoulder Height		R Shoulder Height		S Tap x Depth
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	
PV40-TN	11	0.433	48.5	1.909	63	2.480	3.1	0.122	16	0.630	10.2	0.402	3	0.118	0.6	0.024	11.633	0.458	M3X6
PV40-TA	11	0.433	48.5	1.909	63	2.480	1.3	0.051	16	0.630	13.5	0.531	4	0.157	3.5	0.138	17.831	0.702	M4x8
PV60-TN	16	0.630	63	2.480	83	3.268	2.71	0.107	25	0.984	16	0.630	5	0.197	2.5	0.098	19.939	0.785	M5x12
PV60-TA	16	0.630	67	2.638	87	3.425	2.21	0.087	25	0.984	18	0.709	5	0.197	3	0.118	28	1.102	M5x12
PV90-TN	17	.670	82	3.228	105.5	4.154	4.197	0.165	28	1.102	22.5	0.886	6	0.236	1	0.039	25	0.984	M6x12
PV90-TA	17	.670	85.5	3.366	109	4.291	3.197	0.126	28	1.102	24.5	0.965	6	0.236	5	0.197	38	1.496	M8x13

*AD = Adapter length. See how to order page for mounting kit adapter lengths.



PV Flange Face Dimensions Units: mm (in)

	A Square Flange		B Bolt Hole		C Bolt Circle		D Pilot Diameter		E Output Shaft Diameter		F Output Shaft Length		G Pilot Thickness		H Flange Thickness		I Housing Diameter		J Lead Angle
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(deg)
PV40-FB	43	1.693	3.4	0.134	50	1.969	35	1.378	13	0.512	26	1.024	3	0.118	10	0.394	56	2.205	45
PV17-FE	43	1.693	3.5	0.138	43.8	1.724	22	0.866	6.35	0.250	25	0.984	1.5	0.059	6	0.236	55	2.165	45
PV60-FB	62	2.441	5.5	0.217	70	2.756	50	1.969	16	0.630	25	0.984	2.5	0.098	10.3	0.406	80	3.150	45
PV23-FE	62	2.441	4.95	0.195	66.675	2.625	38.1	1.500	9.525	0.375	25.4	1.000	2.5	0.098	9.5	0.374	80	3.150	45
PV60-FN	62	2.441	5.5	0.217	70	2.756	50	1.969	14	0.551	25	0.984	2.5	0.098	10.3	0.406	80	3.150	45
PV90-FB	90	3.543	6.5	0.256	100	3.937	80	3.150	20	0.787	40	1.575	3	0.118	14	0.551	116	4.567	45
PV34-FE	90	3.543	5.52	0.217	98.43	3.875	73.025	2.875	12.7	0.500	31.75	1.250	3	0.118	15	0.591	116	4.567	45

	K Rear Thickness		L1 Length (Ratio < 10:1)		L2 Length (Ratio >10:1)		M Dist. From Shaft End		N Keyway Length		O Key Height		P Keyway Width		Q Shoulder Height		R Shoulder Diameter		S Tap x Depth
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	
PV40-FB	11	0.433	48.5	1.909	63	2.480	2.1	0.083	16	0.630	15	0.591	5	0.197	2	0.079	17.831	0.702	M4x8
PV17-FE	11	0.433	48.5	1.909	63	2.480	---	---	---	---	---	---	---	---	2.3	0.091	11.633	0.458	---
PV60-FB	16	0.630	71.5	2.815	91.5	3.602	3.2	0.126	16	0.630	18	0.709	5	0.197	1	0.039	28	1.102	M5x12
PV23-FE	16	0.630	60.5	2.382	80.5	3.169	---	---	19	0.748	9.444	0.372	Flat	---	1	0.039	19.939	0.785	M5x12
PV60-FN	16	0.630	71.5	2.815	91.5	3.602	3.2	0.126	16	0.630	16	0.630	5	0.197	1	0.039	28	1.102	M5x12
PV90-FB	17	.670	90.5	3.563	114	4.488	3.197	0.126	28	1.102	22.5	0.886	6	0.236	1	0.039	38	1.496	M6x12
PV34-FE	17	.670	82	3.228	105.5	4.154	---	---	27	1.063	14.247	0.561	3.175	0.125	1	0.039	25	0.984	M6x12

*AD = Adapter length. See how to order page for mounting kit adapter lengths.

PV Completes The Parker Bayside Gear Family

The Parker Bayside gearhead family offers choices to customers in almost every possible feature and specification. The depth of the Parker Bayside gearhead family is unmatched with frame sizes from 40mm (1.57”) up to 300mm (11.8”), ratios from 3:1 to 100:1, environmental options, backlash availability from 3 arc minutes to 18 arc minutes and a multitude of output face and mounting options that can fit any application.

Helical planetary technology is superb for low-backlash, high-stiffness and high-accuracy requirements, making the Parker Bayside Stealth line of helical planetary gearheads ideal for these high-and medium-level performance applications. The introduction of the PV Series gearhead completes the Parker Bayside gear family by offering a standard-grade gearhead with the highest radial load capacity available today in a cost-effective solution. Whether you need high-, medium- or standard-grade performance, Parker Bayside can match the need.

All Parker Bayside gearheads are proudly manufactured in the USA in our state-of-the-art facility which, displays the best use of Lean manufacturing practices. For more information go to parkermotion.com or baysidemotion.com

Order Numbering Example:

PV	60	F	N	-	003
A	B	C	D		E

A — Product

PV	Power Versatility

B — Frame Size[1]

40	40mm
17	NEMA 17
60	60mm
23	NEMA 23
90	90mm
34	NEMA 34

C — Front Face

F	Flange (Square) Face
T	Round (Tapped) Face

D — Output Face Dimensions

A	Alpha / Stober [2]
N	Neugart[3]
B	Parker Bayside (Same as PX)[2]
E	NEMA (English)[2,4]

E — Ratio

40/17 frame options = 004, 005, 007, 010, 016, 020, 035, 040, 050, 070, 100

60/23 and 90/40 frame options = 003, 004, 005, 007, 009, 010, 012, 015, 016, 020, 025, 028, 030, 040, 050, 070, 100

Mounting Kit

MV	60	XXX
A	B	C

FRAME SIZE	MOTOR SHAFT LENGTHS MM (IN)	GEARHEAD ADAPTER LENGTHS MM (IN)
PV40/PV17	12 thru 20 (0.472 thru 0.787)	13.7 (0.539)
	20.1 thru 25.4 (0.791 thru 1.000)	19 (0.748)
PV60/PV23	16 thru 25.4 (0.630 thru 1.000)	16.5 (0.65)
	25.4 thru 31.8 (1.004 thru 1.252)	22.5 (0.886)
PV90/PV34	20 thru 31.8 (0.787 thru 1.252)	20 (0.787)
	31.9 thru 40 (1.256 thru 1.575)	28.5 (1.122)

Note:
Adapter lengths may vary based on make and model of motor.

A — Product

MV	PV mounting kit

B — Frame Size[1]

40	40mm/NEMA 17
60	60mm/NEMA 23
90	90mm/NEMA 34

C — Factory assigned

XXX	**Consult factory for part number**

Notes:
(1) NEMA sizes only available with front face option 'F'
(2) Output face dimensions
Option 'A' only available with front face option 'T'
Option 'B' and 'E' only available with front face option 'F'
(3) For PV90FN use PV90FB
(4) Only available for NEMA 17, 23 and 34

Stealth® RS Advanced Series:
Compact, Right-Angle Servo Gearhead

Stealth® RS delivers "The Helical Advantage" in a compact, right-angle package. With 7 frame sizes and 9 gear ratios to choose from, you're guaranteed to find a Stealth® RS to fit your high performance servo applications.

7 Frame Sizes	
RS60	RS180
RS90	RS220
RS115	RS300
RS142	

Ratios*	
5:1	30:1
10:1	40:1
15:1	50:1
20:1	100:1
25:1	* For RS300 see Note (5)

Performance Specifications

	Units	Ratio	Frame Size RS60	RS90	RS115	RS142	RS180	RS220	RS300
Nominal Output Torque, $T_{nom\ r}$	**Nm**	5	**11**	**28**	**75**	**141**	**316**	**678**	**2,203**
	in lb		95	250	660	1,250	2,800	6,000	19,500
	Nm	10	**21**	**55**	**147**	**271**	**621**	**1,299**	**2,712**
	in lb		190	490	1,300	2,400	5,500	11,500	24,000
	Nm	15-25	**33**	**85**	**215**	**395**	**938**	**1,808**	**4,181**
	in lb		290	750	1,900	3,500	8,300	16,000	37,000
	Nm	30-100	**28**	**85**	**192**	**316**	**836**	**1,469**	**4,181**
	in lb		250	750	1,700	2,800	7,400	13,000	37,000
Max. Acceleration Output Torque, $T_{acc\ r}$	**Nm**	5	**13**	**33**	**88**	**166**	**373**	**802**	**2,644**
	in lb		115	295	780	1,470	3,300	7,100	23,400
	Nm	10	**26**	**66**	**169**	**333**	**734**	**1,582**	**3,277**
	in lb		230	580	1,500	2,950	6,500	14,000	29,000
	Nm	15-100	**37**	**101**	**260**	**452**	**1,096**	**2,000**	**5,311**
	in lb		330	890	2,300	4,000	9,700	17,700	47,000
Emergency(1) Stop Output Torque, $T_{em\ r}$	**Nm**	5	**31**	**77**	**203**	**384**	**870**	**1,853**	**6,102**
	in lb		270	680	1,800	3,400	7,700	16,400	54,000
	Nm	10	**60**	**153**	**395**	**768**	**1,695**	**3,684**	**7,684**
	in lb		530	1,350	3,500	6,800	15,000	32,600	68,000
	Nm	15-100	**87**	**232**	**599**	**1,040**	**2,520**	**4,588**	**12,316**
	in-lb		770	2,050	5,300	9,200	22,300	40,600	109,000
Nominal Input Speed, $N_{nom\ r}$	RPM	5,10	3,200	2,800	2,400	2,000	1,600	1,200	1,000
	RPM	15-40	3,700	3,300	2,900	2,500	2,000	1,500	1,250
	RPM	50-100	4,200	3,800	3,400	3,000	2,400	1,800	1,500
Maximum Input Speed, $N_{max\ r}$	RPM	5-100	6,000	5,300	4,500	3,800	3,000	2,300	1,900
Standard Backlash (2)	arc min	5,10	14	12	12	10	10	10	10
	arc min	15-100	12	10	10	8	8	8	8
Low Backlash (2)	arc min	5,10	10	8	8	6	6	6	6
	arc min	15-100	8	6	6	4	4	4	4
Efficiency at Nominal Torque	%		94	94	94	94	94	94	94
Noise Level(3) at:									
3,000 RPM	dB	5-100	70	70	70	—	—	—	—
2,000 RPM	dB		—	—	—	72	72	—	—
1,500 RPM	dB		—	—	—	—	—	72	72
Torsional Stiffness	**Nm / arc min**	5-100	**3**	**10**	**19**	**35**	**90**	**170**	**290**
	in lb / arc min		22	84	164	310	800	1,500	2,560
Maximum Weight	**kg**	5-100	**2**	**6**	**11**	**24**	**43**	**80**	**120**
	lb		4	13	25	52	94	177	265
Max. Allowable Case Temp.	^{0}C	5-100	← 100 →						

Specifications:	Units	Ratio	Frame Size RS60	RS90	RS115	RS142	RS180	RS220	RS300
Moment of Inertia(4)	**g cm sec^2**	5	**0.197**	**0.745**	**2.68**	**8.94**	**26.5**	**82.2**	**378**
	oz-in-sec^2		0.003	0.010	0.037	0.124	0.368	1.14	5.26
	g cm sec^2	10	**0.095**	**0.489**	**1.67**	**5.87**	**16.7**	**50.4**	**238**
	oz-in-sec^2		0.001	0.007	0.023	0.082	0.232	0.700	3.31
	g cm sec^2	15,30	**0.092**	**0.453**	**1.58**	**5.60**	**15.2**	**47.4**	**158**
	oz-in-sec^2		0.001	0.006	0.022	0.078	0.211	0.658	2.19
	g cm sec^2	20,25,40	**0.083**	**0.358**	**1.13**	**4.17**	**10.7**	**34.3**	**116**
	oz-in-sec^2		0.001	0.005	0.016	0.058	0.149	0.476	1.61
	g cm sec^2	50,100	**0.072**	**0.238**	**0.685**	**2.26**	**6.70**	**21.2**	**95.4**
	oz-in-sec^2		0.001	0.003	0.010	0.031	0.093	0.294	1.32

(1) Maximum of 1,000 stops
(2) Measured at 2% of rated torque
(3) Measured at 1 meter

(4) All Moment of Inertia values are as reflected at the input shaft of the gearhead.

(5) RS300 is available in Ratios of: 4, 6, 10, 15, 20, 24, 30 & 50:1

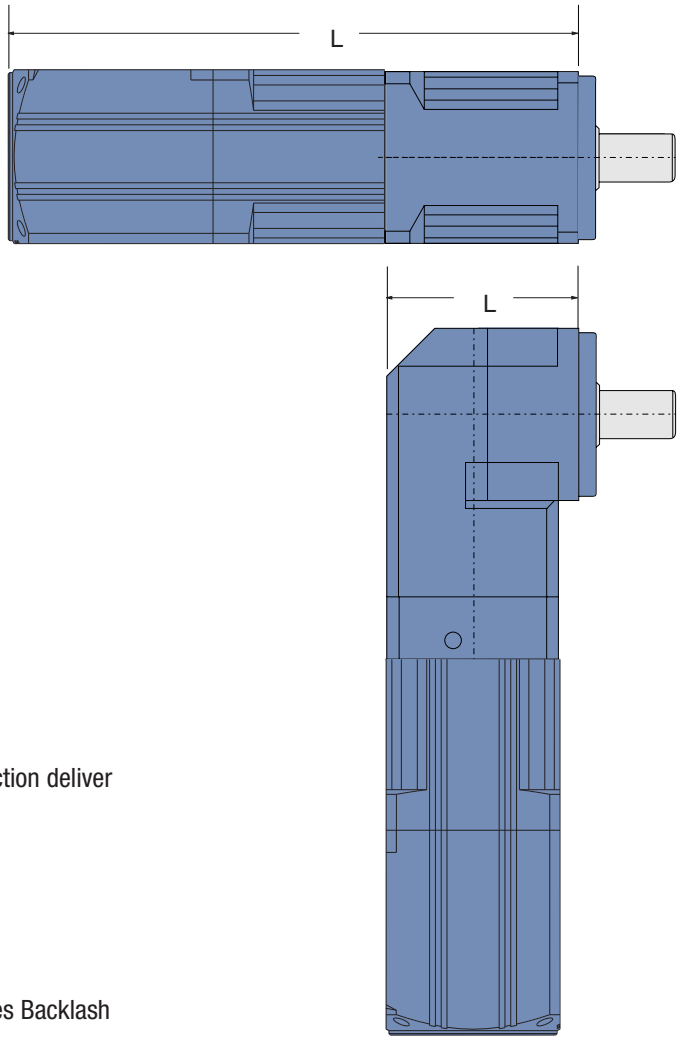
Specification are subject to change without notice

Space Tight? Turn Right

Stealth® Advanced in the PS / RS Models incorporates the latest enhancements in gearhead technology:

- Latest technology in seals…reduce heat and wear
- Oil lubrication…reduces, friction and operating temperature
- Front output seal cover…captures and protects output seal

For space constrained-applications Parker Bayside's Right-Angle gearheads can offer a two times space savings when compared to in-line products.



IN-LINE MOUNTING

RIGHT-ANGLE MOUNTING

Stealth's superior design and construction deliver "The Helical Advantage":

- Strong…30% More Torque
- Quiet…Less Than 70dB Noise
- Fast…6,000 RPM Input Speeds
- Accurate…Less Than 4 Arc minutes Backlash

Plus... Over 94% Efficiency

1

Stealth Planetary Output
Stealth RS is built into the gearhead to deliver “The Helical Advantage” at the load-carrying output section.

2

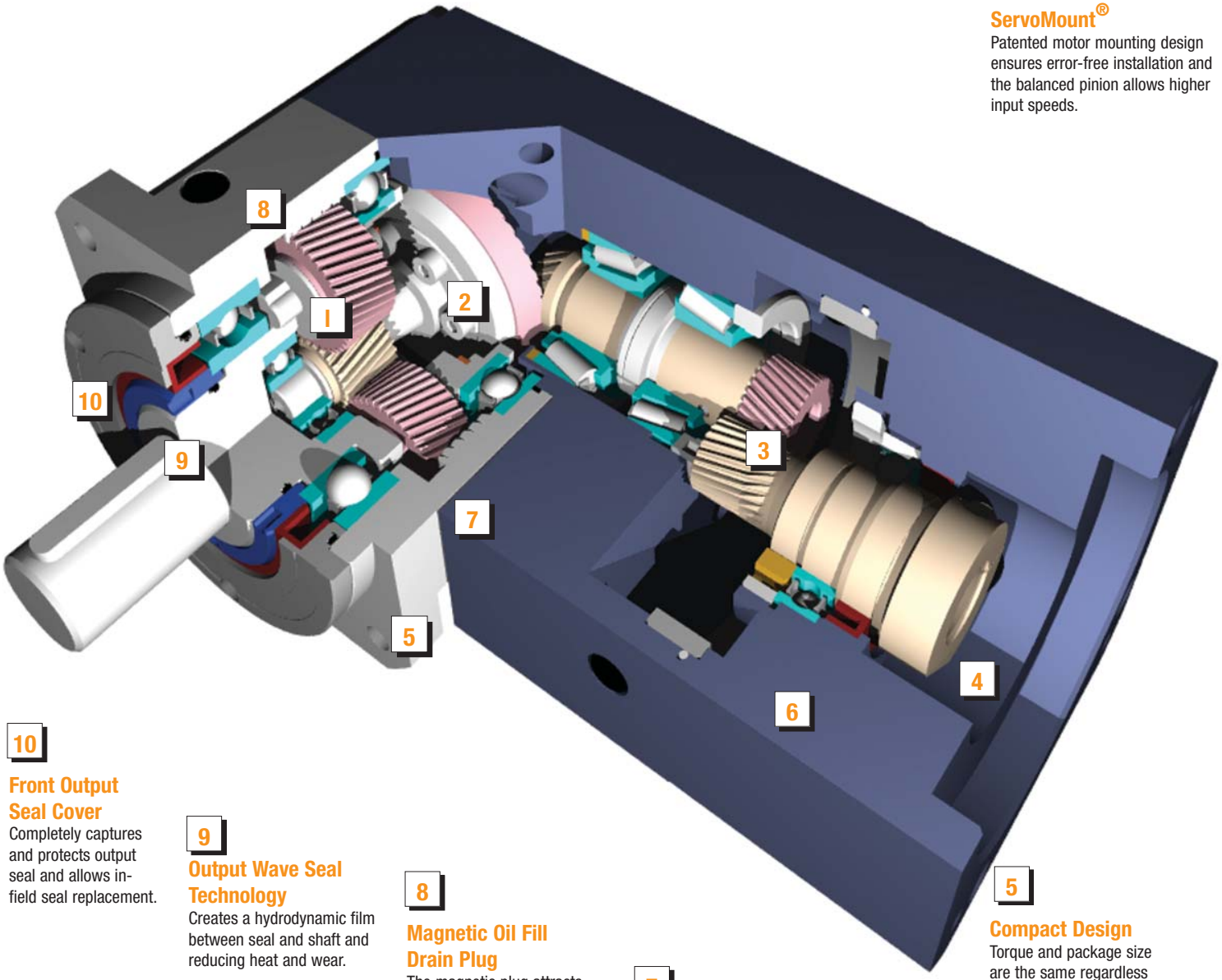
Spiral Bevel Gears
Deliver high efficiency and high torque in a compact, right angle package.

3

High Speed Input
Helical Stealth gearing provides high input speeds with quiet operation. Input cavity surrounds the gears for constant lubrication in any orientation.

4

ServoMount®
Patented motor mounting design ensures error-free installation and the balanced pinion allows higher input speeds.



10

Front Output Seal Cover
Completely captures and protects output seal and allows in-field seal replacement.

9

Output Wave Seal Technology
Creates a hydrodynamic film between seal and shaft and reducing heat and wear.

8

Magnetic Oil Fill Drain Plug
The magnetic plug attracts normal wear particles keeping them away from the gear mesh.

7

Oil Lubrication
Oil provides better lubrication, reduces friction and operating temperatures.

6

Sealed Unit
Viton seals and O-Rings provide IP65 protection to prevent leaks and protect against harsh environments.

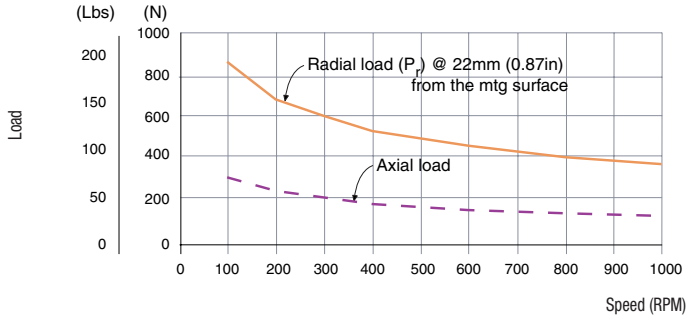
5

Compact Design
Torque and package size are the same regardless of ratio.

Output Shaft Load Rating

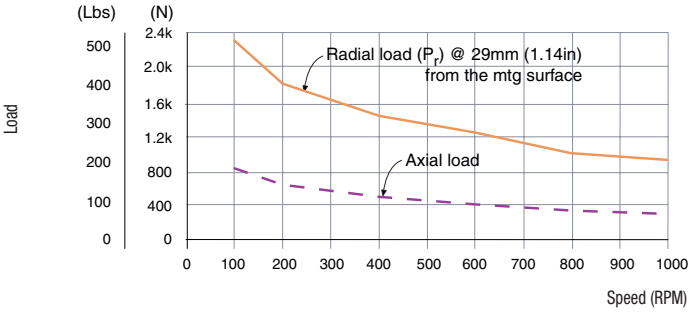
Formulas to calculate radial load (P_{rx}) at any distance "X" from the gearhead mounting surface.

RS60



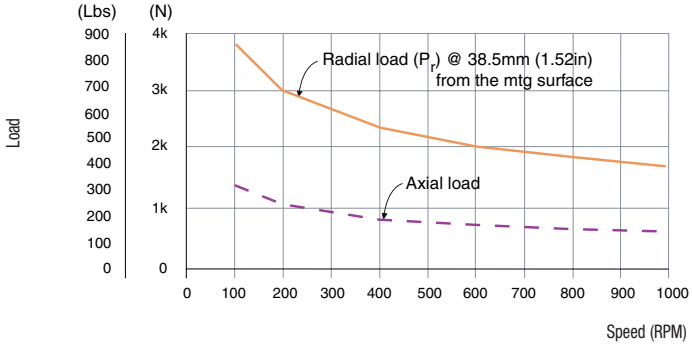
$P_{rx} = (P_r)(\mathbf{57mm}) / (\mathbf{35mm} + X)$
$P_{rx} = (P_r)(2.24in) / (1.38in + X)$

RS90



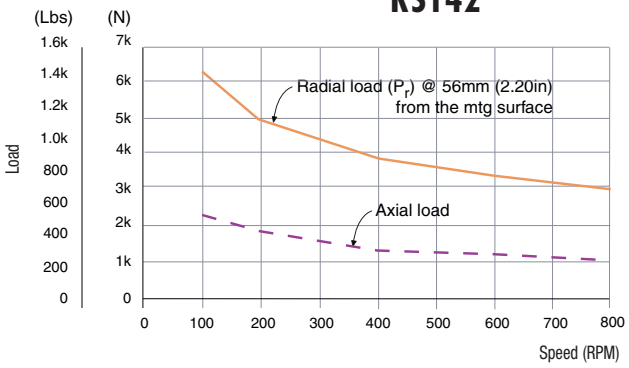
$P_{rx} = (P_r)(\mathbf{74mm}) / (\mathbf{45mm} + X)$
$P_{rx} = (P_r)(2.91in) / (1.77in + X)$

RS115

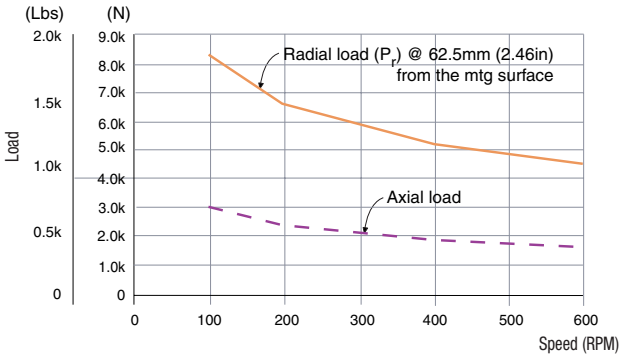


$P_{rx} = (P_r)(\mathbf{95mm}) / (\mathbf{57mm} + X)$
$P_{rx} = (P_r)(3.74in) / (2.24in + X)$

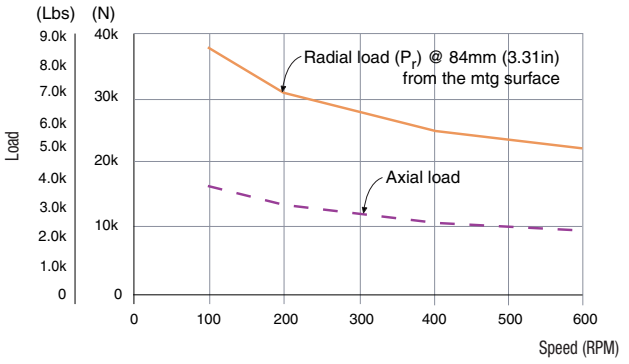
RS142



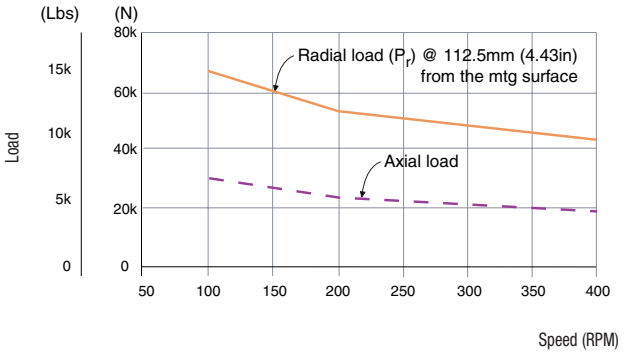
RS180



RS220



RS300



Formulas to calculate radial load (P_{rx}) at any distance "X" from the gearhead mounting surface.

$P_{rx} = (P_r)(\mathbf{127mm}) / (\mathbf{71mm} + X)$
$P_{rx} = (P_r)(5in) / (2.79in + X)$

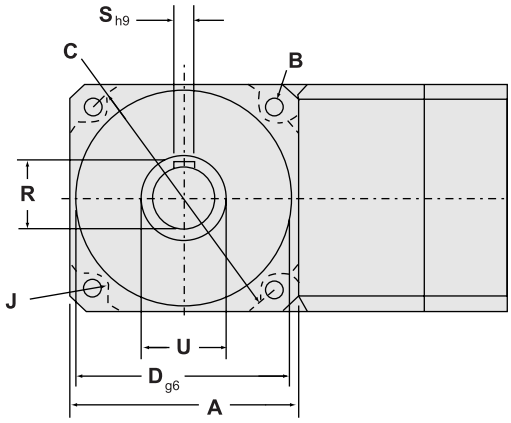
$P_{rx} = (P_r)(\mathbf{138mm}) / (\mathbf{76mm} + X)$
$P_{rx} = (P_r)(5.43in) / (2.99in + X)$

$P_{rx} = (P_r)(\mathbf{190mm}) / (\mathbf{106mm} + X)$
$P_{rx} = (P_r)(7.48in) / (4.17in + X)$

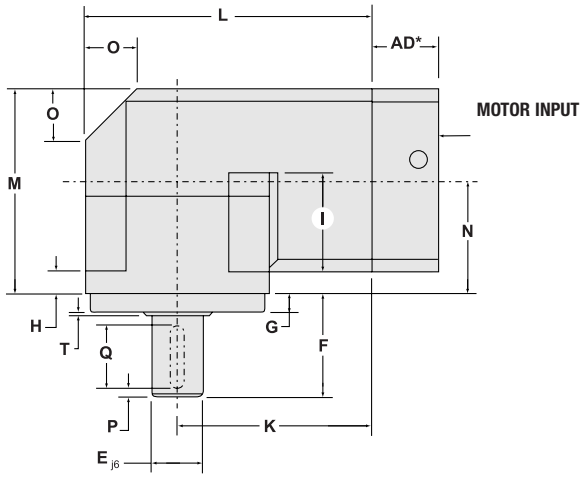
$Prx = (Pr)(\mathbf{268mm}) / (\mathbf{156mm} + X)$
$Prx = (Pr)(10.55in) / (6.14in + X)$

Dimensions

OUTPUT VIEW



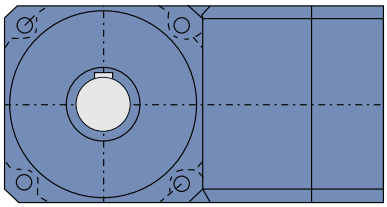
SIDE VIEW



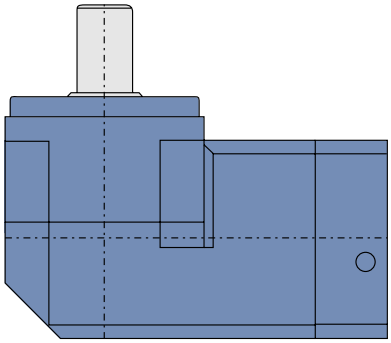
Frame Size	A Square Flange (mm)	A (in)	B Bolt Hole (mm)	B (in)	C Bolt Circle (mm)	C (in)	D Pilot Diameter (mm)	D (in)	E Output Shaft Diameter (mm)	E (in)	F Output Shaft Length (mm)	F (in)	G Pilot Thickness (mm)	G (in)	H Flange Thickness (mm)	H (in)	I Recess Length (mm)	I (in)	J Housing Recess (mm)	J (in)
RS60	**60**	2.362	**5.5**	0.217	**70**	2.756	**50**	1.969	**16**	0.630	**37**	1.457	**8**	0.315	**8**	0.315	**36**	1.417	**5**	0.197
RS90	**90**	3.543	**6.5**	0.256	**100**	3.937	**80**	3.150	**22**	0.866	**48**	1.890	**11**	0.433	**10**	0.394	**51.5**	2.028	**6.5**	0.256
RS115	**115**	4.528	**8.5**	0.335	**130**	5.118	**110**	4.331	**32**	1.260	**65**	2.559	**13**	0.512	**14**	0.472	**63**	2.480	**7.5**	0.295
RS142	**142**	5.591	**11**	0.433	**165**	6.496	**130**	5.118	**40**	1.575	**97**	3.819	**15**	0.591	**15**	0.591	**81.5**	3.209	**10**	0.394
RS180	**182**	7.165	**13**	0.512	**215**	8.465	**160**	6.299	**55**	2.165	**105**	4.134	**20**	0.787	**16**	0.630	**97.5**	3.839	**16**	0.630
RS220	**220**	8.661	**17**	0.669	**250**	9.843	**180**	7.087	**75**	2.953	**138**	5.433	**30**	1.181	**22**	0.866	**101**	3.976	**16**	0.630
RS300	**305**	12.008	**21**	0.827	**350**	13.780	**250**	9.843	**100**	3.937	**190**	7.480	**35**	1.378	**26**	1.024	**172**	6.772	**18**	0.709

Frame Size	K Dist. to Output Centerline (mm)	K (in)	L Housing Length (mm)	L (in)	M Housing Width (mm)	M (in)	N Dist. to Input Centerline (mm)	N (in)	O Taper Dist. (mm)	O (in)	P Dist. From Shaft End (mm)	P (in)	Q Keyway Length (mm)	Q (in)	R Key Height (mm)	R (in)	S Keyway Width (mm)	S (in)	T Shoulder Height (mm)	T (in)	U Shoulder Diameter (mm)	U (in)
RS60	**66**	2.598	**96**	3.780	**73**	2.874	**43**	1.693	**14**	0.551	**2**	0.079	**25**	0.984	**18**	0.709	**5**	0.197	**0.5**	0.020	**22**	0.866
RS90	**103**	4.055	**148**	5.827	**103**	4.055	**58**	2.283	**25**	0.984	**3**	0.118	**32**	1.260	**24.5**	0.965	**6**	0.236	**0.5**	0.020	**35**	1.378
RS115	**122.5**	4.823	**180**	7.087	**129**	5.079	**71.5**	2.815	**32**	1.260	**5**	0.197	**40**	1.575	**35**	1.378	**10**	0.394	**1**	0.039	**45**	1.772
RS142	**159**	6.260	**230**	9.055	**162**	6.378	**91**	3.583	**40**	1.575	**5**	0.197	**63**	2.480	**43**	1.693	**12**	0.472	**3**	0.118	**55**	2.165
RS180	**172**	6.772	**263**	10.354	**197**	7.756	**106**	4.173	**55**	2.165	**6**	0.236	**70**	2.756	**59**	2.323	**16**	0.630	**3**	0.118	**70**	2.756
RS220	**230**	9.055	**340**	13.386	**245**	9.646	**135**	5.315	**60**	2.362	**6**	0.236	**90**	3.543	**79.5**	3.130	**20**	0.787	**3**	0.118	**95**	3.740
RS300	**327.5**	12.894	**480**	18.898	**350**	13.780	**197.5**	7.776	**80**	3.150	**7**	0.276	**140**	5.512	**106**	4.173	**28**	1.102	**3**	0.118	**140**	5.512

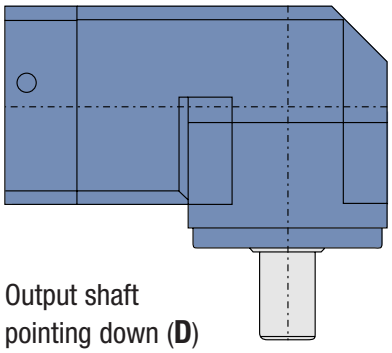
*AD=Adapter Length. Adapter will vary, depending on motor. Consult Internet (www.baysidemotion.com or www.parkermotion.com) for details or call Parker Bayside.



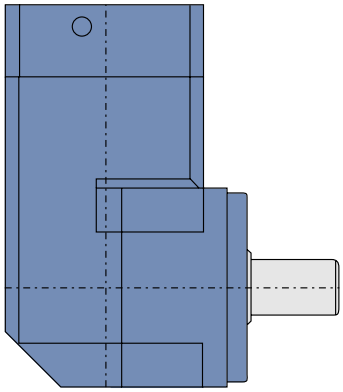
Horizontal orientation (**H**)



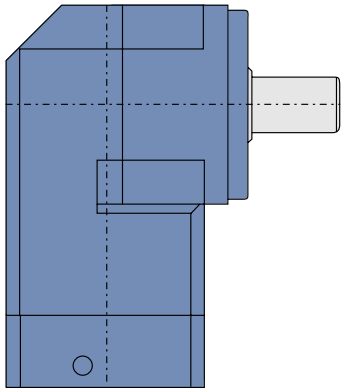
Output shaft pointing up (**U**)



Output shaft pointing down (**D**)



RS input facing up (**E**)



RS input facing down (**F**)

How to Order

Order Numbering Example: R S 1 8 0 - 0 1 0 - X X X L H

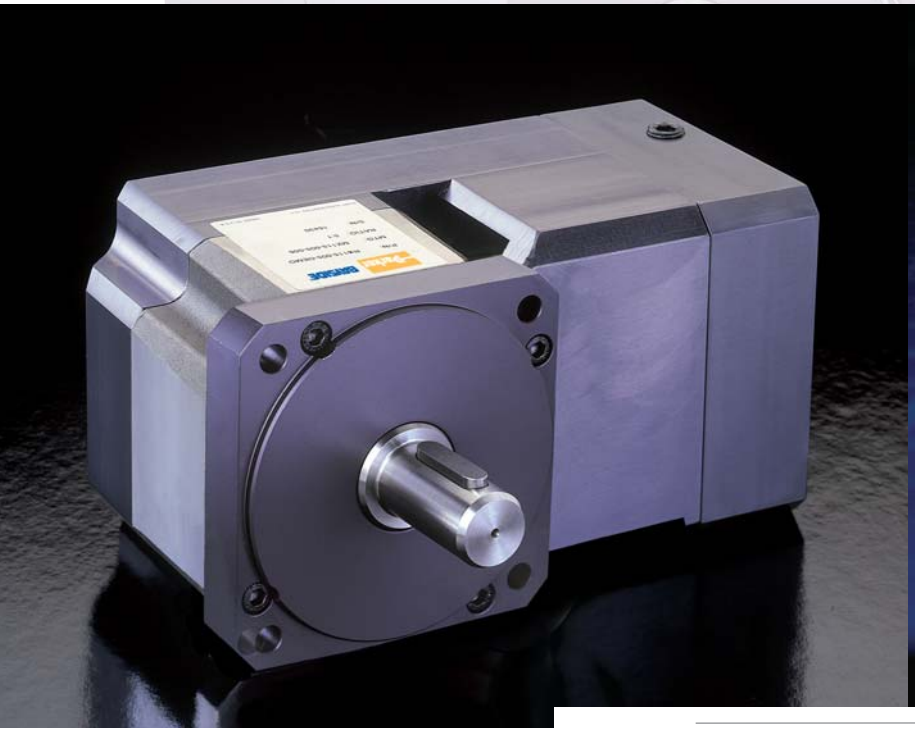
1. Pick frame size and ratio.
2. Pick backlash and orientation.
3. Specify motor make and model for mounting kit.

FRAME SIZE	RATIO		SPECIAL	BACKLASH	ORIENTATION
60	005	030	(Factory	L = Low backlash	H = Horizontal orientation
90	010	040	Issued)	S = Standard backlash	U = Output shaft pointing up
115	015	050			D = Output shaft pointing down
142	020	100			E = RS input facing up
180	025				F = RS input facing down
220					(For other orientations consult the factory)
300					

RS Gearheads are supported by a worldwide network of offices and local distributors. Call **1-800-305-4555** for application engineering assistance or for the name of your local distributor. Information can also be obtained at **www.baysidemotion.com or www.parkermotion.com.**

Specifications are subject to change without notice.

Stealth® RX Series: Best Technology



Stealth RX incorporates Parker Bayside's helical planetary technology in a lower-cost package. Stealth RX delivers high torque and quiet, smooth operation for less-demanding servo applications.

6 Frame Sizes	
RX60	RX23
RX90	RX34
RX115	RX42

Ratios		
5:1	20:1	40:1
10:1	25:1	50:1
15:1	30:1	100:1

Performance Specifications

	Units	Ratio	Frame Size RX60	RX90	RX115
Nominal Output Torque, $T_{nom\ r}$	**Nm**	5	**7**	**17**	**45**
	in lb		58	149	484
	Nm	10	**13**	**33**	**88**
	in lb		112	292	484
	Nm	15-25	**20**	**51**	**129**
	in lb		175	451	1,238
	Nm	30-100	**17**	**51**	**115**
	in lb		149	451	1,323
Max. Acceleration Output Torque, $T_{acc\ r}$	**Nm**	5	**8**	**20**	**53**
	in lb		69	175	587
	Nm	10	**16**	**40**	**101**
	in lb		138	350	1,140
	Nm	15-100	**22**	**61**	**156**
	in lb		196	536	1,748
Emergency(1) Stop Output Torque, $T_{em\ r}$	**Nm**	5	**19**	**46**	**122**
	in lb		165	409	1,362
	Nm	10	**46**	**92**	**237**
	in lb		409	812	2,653
	Nm	15-100	**67**	**139**	**359**
	in lb		594	1,232	4,022
Nominal Input Speed, $N_{nom\ r}$	RPM	5, 10	3,200	2,800	2,400
	RPM	15-40	3,700	3,300	2,900
	RPM	50-100	4,200	3,800	3,400
Maximum Input Speed, N_{maxr}	RPM	5-100	6,000	5,300	4,500
Standard Backlash (2)	arc min	5, 10	20	18	18
	arc min	15-100	20	18	16
Low Backlash (2)	arc min	5, 10	18	16	16
	arc min	15-100	16	14	12
Efficiency at Nominal Torque	%	5-100	94	94	94
Noise Level(3) at: 3,000 RPM	dB	5-100	70	70	70
Torsional Stiffness	**Nm / arc min**	5-100	**2.5**	**9.5**	**18.5**
	in lb / arc min		22	84	164
Maximum Weight	**kg**	5-100	**2.01**	**5.74**	**11.35**
	lb		4.42	12.65	25
Max. Allowable Case Temperature	^0C	5-100	← 100 →		

Specifications:	Units	Ratio	Frame Size RX60	RX90	RX115
Moment of Inertia(4)	**gm cm sec²**	5	**0.1970**	**0.7450**	**2.6820**
	oz in sec²		0.0030	0.0100	0.0373
	gm cm sec²	10	**0.0950**	**0.4890**	**1.6688**
	oz in sec²		0.0013	0.0068	0.0232
	gm cm sec²	15, 30	**0.0920**	**0.4530**	**1.5794**
	oz in sec²		0.0013	0.0063	0.0219
	gm cm sec²	20-40	**0.0830**	**0.3576**	**1.1324**
	oz in sec²		0.0012	0.0050	0.0157
	gm cm sec²	50-100	**0.0720**	**0.2384**	**0.6854**
	oz in sec²		0.0010	0.0033	0.0095

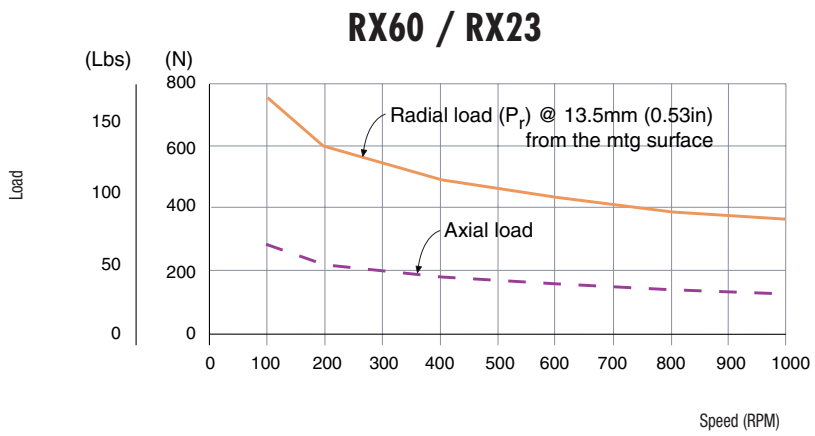
(1) Maximum of 1,000 stops
(2) Measured at 2% of rated torque
(3) Measured at 1 meter
(4) All Moment of Inertia values are as reflected at the input shaft of the gearhead.

Specification are subject to change without notice

Output Shaft Load Rating

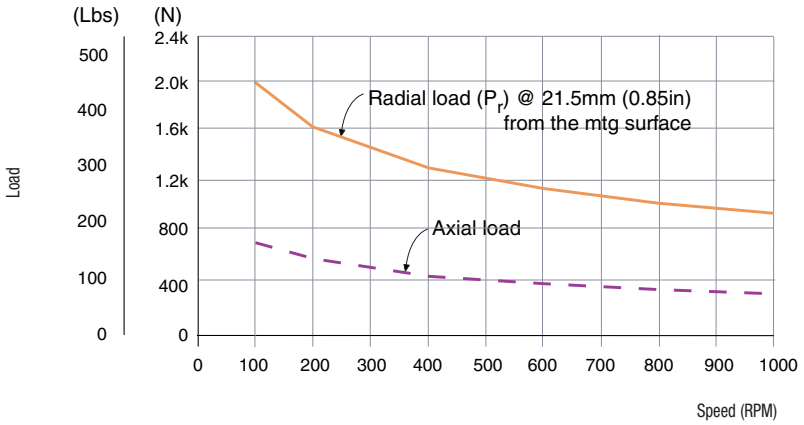
Formulas to calculate radial load (P_{rx}) at any distance "X" from the gearhead mounting surface.

RX60 / RX23



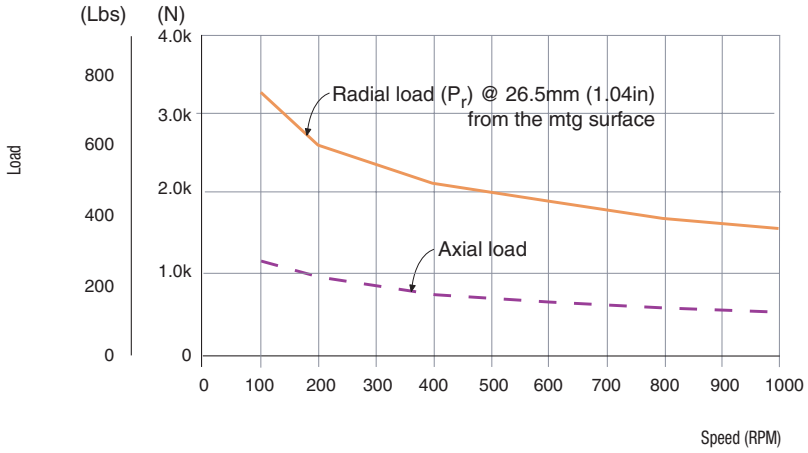
$P_{rx} = (P_r)(\mathbf{54mm}) / (\mathbf{41mm} + X)$
$P_{rx} = (P_r)(2.13in) / (1.61in + X)$

RX90 / RX34



$P_{rx} = (P_r)(\mathbf{73mm}) / (\mathbf{52mm} + X)$
$P_{rx} = (P_r)(2.87in) / (2.05in + X)$

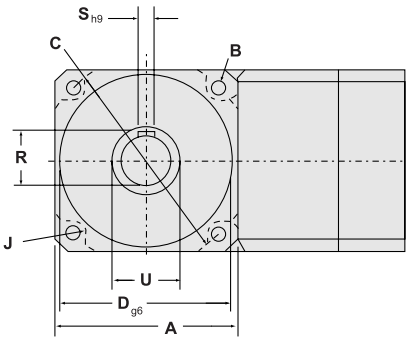
RX115 / RX42



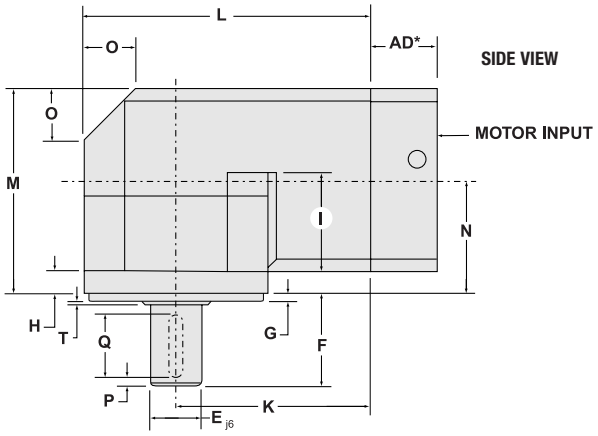
$P_{rx} = (P_r)(\mathbf{89mm}) / (\mathbf{63mm} + X)$
$P_{rx} = (P_r)(3.5in) / (2.48in + X)$

Dimensions

OUTPUT VIEW



SIDE VIEW



METRIC SIZES

Frame Size	A Square Flange (mm)	A (in)	B Bolt Hole (mm)	B (in)	C Bolt Circle (mm)	C (in)	D Pilot Diameter (mm)	D (in)	E Output Shaft Diameter (mm)	E (in)	F Output Shaft Length (mm)	F (in)	G Pilot Thickness (mm)	G (in)	H Flange Thickness (mm)	H (in)	I Recess Length (mm)	I (in)	J Housing Recess (mm)	J (in)
RX60	**60**	2.362	**5.5**	0.217	**70**	2.756	**50**	1.969	**16**	0.630	**25**	0.984	**2.5**	0.098	**13**	0.512	**36**	1.417	**5**	0.197
RX90	**90**	3.543	**6.5**	0.256	**100**	3.937	**80**	3.150	**20**	0.787	**40**	1.575	**3**	0.118	**17**	0.669	**51.5**	2.028	**6.5**	0.256
RX115	**115**	4.528	**8.5**	0.335	**130**	5.118	**110**	4.331	**24**	0.945	**50**	1.969	**3.5**	0.138	**20**	0.787	**63**	2.480	**7.5**	0.295

Frame Size	K Dist. to Output Centerline (mm)	K (in)	L Housing Length (mm)	L (in)	M Housing Width (mm)	M (in)	N Dist. to Input Centerline (mm)	N (in)	O Taper Dist. (mm)	O (in)	P Dist. From Shaft End (mm)	P (in)	Q Keyway Length (mm)	Q (in)	R Key Height (mm)	R (in)	S Keyway Width (mm)	S (in)	T Shoulder Height (mm)	T (in)	U Shoulder Diameter (mm)	U (in)
RX60	**66**	2.598	**96**	3.780	**79.3**	3.122	**43**	1.693	**14**	0.551	**3**	0.197	**16**	0.630	**18**	0.709	**5**	0.197	**0.5**	0.020	**22**	0.866
RX90	**103**	4.055	**148**	5.827	**110**	4.330	**58**	2.283	**25**	0.984	**5**	0.238	**28**	1.102	**24.5**	0.965	**6**	0.236	**0.5**	0.020	**35**	1.378
RX115	**122.5**	4.823	**180**	7.087	**186**	7.323	**77.6**	3.055	**32**	1.260	**7**	0.315	**32**	1.260	**27**	1.063	**8**	0.315	**1**	0.039	**45**	1.772

*AD=Adapter Length. Adapter will vary, depending on motor. Consult Internet (www.baysidemotion.com or www.parkermotion.com) for details or call Parker Bayside.

NEMA SIZES

Frame Size	B Bolt Hole (in)	B (mm)	C Bolt Circle (in)	C (mm)	D Pilot Diameter (in)	D (mm)	E Output Shaft Diameter (in)	E (mm)	F Output Shaft Length (in)	F (mm)	Q Keyway Length (in)	Q (mm)	R Keyway Depth (in)	R (mm)	S Keyway Width (in)	S (mm)
RX23	**0.195**	4.953	**2.625**	66.675	**1.5**	38.100	**0.375**	9.525	**1**	25.400	**0.75 flat**	19.050 flat	**0.015 flat**	0.381 flat	—	—
RX34	**0.217**	5.512	**3.875**	98.425	**2.875**	73.025	**0.5**	12.700	**1.25**	31.750	**1.063**	27.000	**0.072**	1.829	**0.125**	3.175
RX42	**0.281**	7.137	**4.95**	125.730	**2.187**	55.550	**0.625**	15.875	**1.5**	38.100	**1.142**	29.007	**0.094**	2.388	**0.188**	4.775

NOTE: NEMA sizes have 20% lower torque/stiffness ratings due to smaller output shaft diameter.

How to Order

Order Numbering Example: R X 1 1 5 - 0 1 0 - X X X L B

1. Pick frame size and ratio.
2. .Pick options.
3. Specify motor, make and model for mounting kit.

FRAME SIZE

(Metric Sizes)	(NEMA Sizes)
60	23
90	34
115	42

RATIO: 005 010 015 020 025 030 040 050 100

SPECIAL: (Factory Issued)

OPTIONAL: LOW BACKLASH

RX gearheads are supported by a worldwide network of offices and local distributors. Call **1-800-305-4555** for application engineering assistance or for the name of your local distributor. Information can also be obtained at **www.baysidemotion.com or www.parkermotion.com**

Specifications are subject to change without notice.

Stealth® MultiDrive Series:
The Flexible Right Angle

Stealth® MultiDrive (MD) offers three different output options for true flexibility. MultiDrive models include low-ratio, dual-shaft and hollow-shaft options in a compact, right angle package. With 5 frame sizes and multiple ratios to choose from, you are guaranteed to find a Stealth® MultiDrive to fit your servo motor application.

Stealth® MultiDrive Series: Overview

MultiDrive™ features Stealth® helical gearing for high torque, high accuracy and quiet operation in a compact, right-angle package.

- **Low Backlash**
  Standard as low as 8 arc minutes and 4 arc minutes optional
- **Space Saving**
  compact, right-angle design saves space in many applications
- **Smooth, Quiet Operation and Long Life**
  hardened, precision spiral bevel gears ensure quiet operation
- **Quick, Error-Free Mounting**
  to any servo or stepper motor using Parker Bayside's patented ServoMount® design
- **Sealed Unit…**
  seals and o-rings provide IP65 protection to prevent leaks and to protect against harsh environments

RT Model Hollow Shaft

5 Frame Sizes
RT90
RT115
RT142
RT180
RT220

Ratios
3:1
9:1
15:1
21:1
30:1

RB Model Low Ratio

5 Frame Sizes
RB90
RB115
RB142
RB180
RB220

Ratios
1:1
2:1
3:1

RD Dual Shaft Model

5 Frame Sizes
RD90
RD115
RD142
RD180
RD220

Ratios	
1:1	15:1
2:1	21:1
3:1	30:1
9:1	

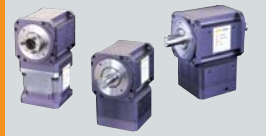
Performance Specifications

	Units	Ratio	Frame Size (RT, RD, RB) R_90	R_115	R_142	R_180	R_220
Nominal Output Torque, $T_{nom\ r}$	**Nm**	1	**23**	**45**	**113**	**192**	**508**
	in lb		200	400	1,000	1,700	4,500
	Nm	2-30	**34**	**90**	**136**	**260**	**565**
	in lb		300	800	1,200	2,300	5,000
Max. Acceleration Output Torque, $T_{acc\ r}$	**Nm**	1	**28**	**56**	**141**	**240**	**636**
	in lb		250	500	1,250	2,125	5,625
	Nm	2-30	**42**	**113**	**169**	**324**	**636**
	in lb		375	1,000	1,500	2,875	5,625
Emergency(1) Stop Output Torque, $T_{em\ r}$	**Nm**	1	**45**	**90**	**226**	**384**	**1,017**
	in lb		400	800	2,000	3,400	9,000
	Nm	2-30	**68**	**181**	**271**	**520**	**1,130**
	in lb		600	1,600	2,400	4,600	10,000
Nominal Input Speed, $N_{nom\ r}$	RPM	1,2,3	3,000	2,600	2,200	1,800	1,400
	RPM	9,15,21,30	3,800	3,400	3,000	2,400	1,800
Max. Input Speed, N_{maxr}	RPM	1,2,3	4,000	3,500	2,900	2,500	1,600
	RPM	9,15,21,30	5,300	4,500	3,800	3,000	2,300
Standard Backlash	arc min	1,2,3	10	9	9	8	8
	arc min	9,15,21,30	12	11	11	10	10
Low Backlash	arc min	1,2,3	6	5	5	4	4
	arc min	9,15,21,30	8	7	7	6	6
Efficiency at Nominal Torque	%	1,2,3	95	95	95	95	95
	%	9,15,21,30	92	92	92	92	92
Noise Level(2) at:							
2,500 RPM	dB	All	70	70	70	—	—
1,500 RPM	dB		—	—	—	72	72
Torsional Stiffness	**Nm / arc min**	All	**3**	**6**	**16**	**43**	**90**
	in lb / arc min		28	56	140	380	800
Maximum Weight	**kg**	All	**7**	**13**	**25**	**54**	**114**
	lb		16	28	56	120	250
Maximum Allowable Case Temperature	^{o}C	All	← 100 →				

Specifications:	Units	Ratio	Frame Size (RT, RD, RB) R_90	R_115	R_142	R_180	R_220
Moment of Inertia(3)	**gm cm sec²**	1	**3.28**	**11.0**	**38.7**	**101**	**444**
	oz in sec²		0.046	0.153	0.538	1.41	6.17
	gm cm sec²	2	**4.17**	**11.3**	**32.8**	**95.4**	**274**
	oz in sec²		0.058	0.157	0.455	1.32	3.81
	gm cm sec²	3	**2.68**	**7.75**	**22.3**	**65.6**	**191**
	oz in sec²		0.037	0.108	0.311	0.911	2.65
	gm cm sec²	9	**1.07**	**3.28**	**10.4**	**35.8**	**119**
	oz in sec²		0.015	0.046	0.145	0.497	1.66
	gm cm sec²	15 - 30	**0.566**	**2.09**	**5.36**	**17.9**	**62.6**
	oz in sec²		0.008	0.029	0.075	0.248	0.869

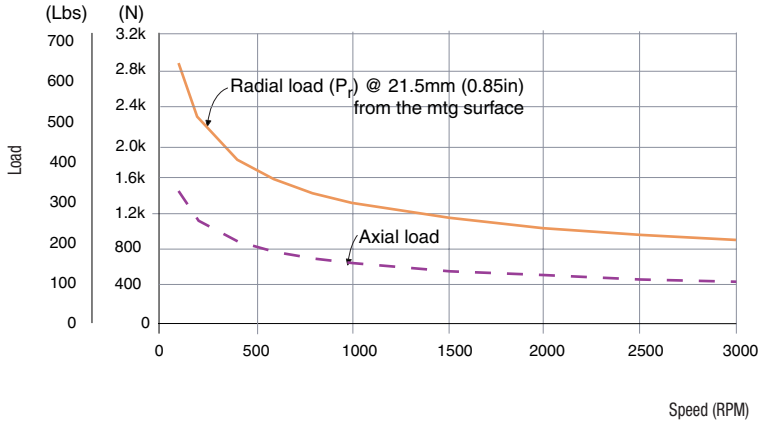
(1) Maximum of 1,000 stops
(2) Measured at 1 meter
(3) All Moment of Inertia values are as reflected at the input shaft of the gearhead.

Specification are subject to change without notice



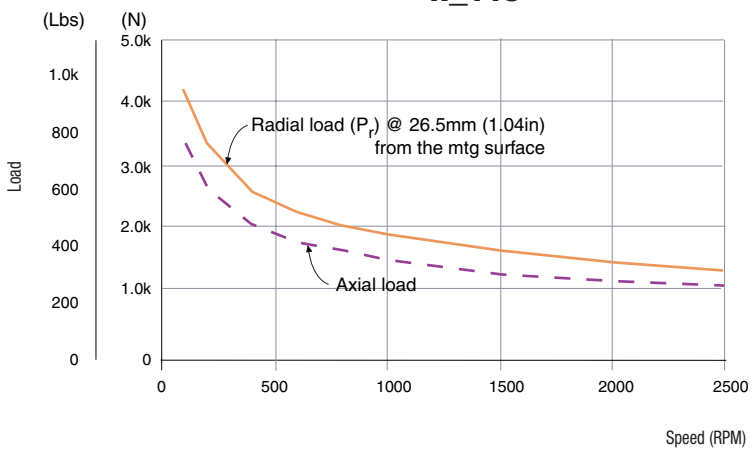
Formulas to calculate radial load (P_{rx}) at any distance "X" from the gearhead mounting surface.

R_90



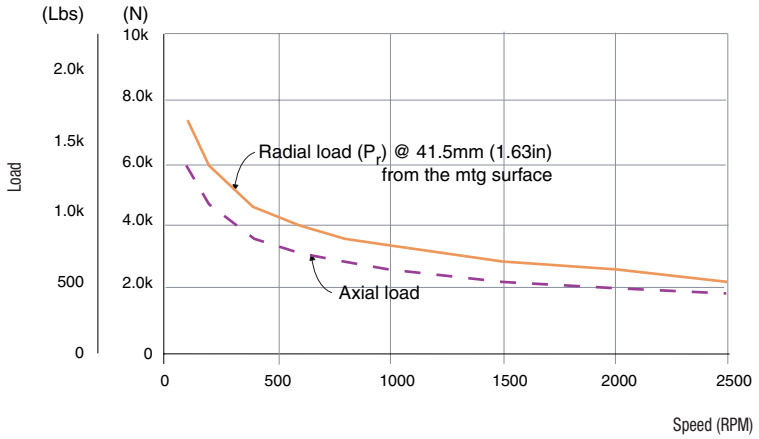
$P_{rx} = (P_r)(\mathbf{121mm}) / (\mathbf{100mm} + X)$
$P_{rx} = (P_r)(4.76in) / (3.94in + X)$

R_115



$P_{rx} = (P_r)(\mathbf{151mm}) / (\mathbf{125mm} + X)$
$P_{rx} = (P_r)(5.94in) / (4.92in + X)$

R_142

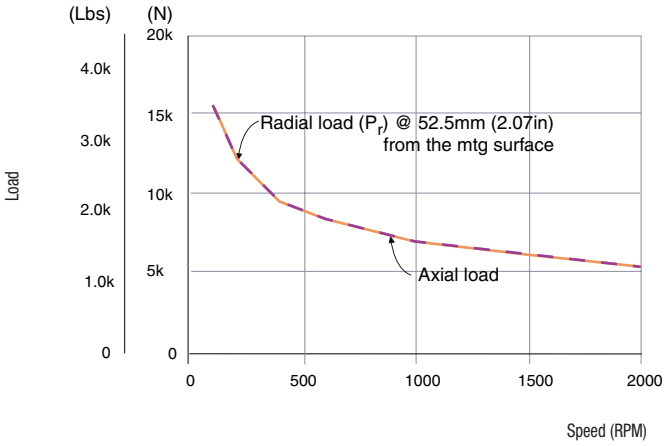


$P_{rx} = (P_r)(\mathbf{201mm}) / (\mathbf{160mm} + X)$
$P_{rx} = (P_r)(7.91in) / (6.30in + X)$

Output Shaft Load Rating

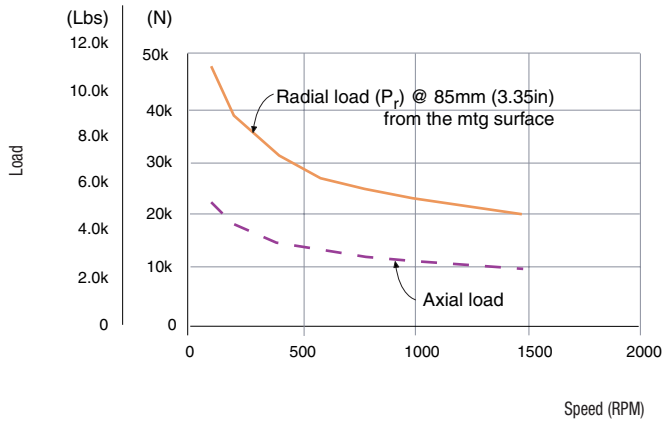
Formulas to calculate radial load (P_{rx}) at any distance "X" from the gearhead mounting surface.

R_180



$P_{rx} = (P_r)(\mathbf{260mm}) / (\mathbf{208mm} + X)$
$P_{rx} = (P_r)(10.24in) / (8.19in + X)$

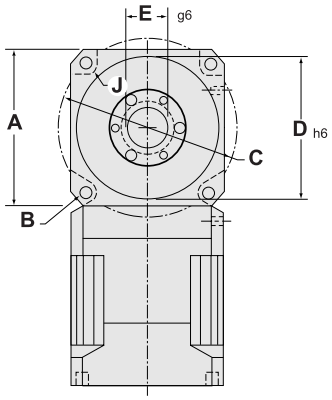
R_220



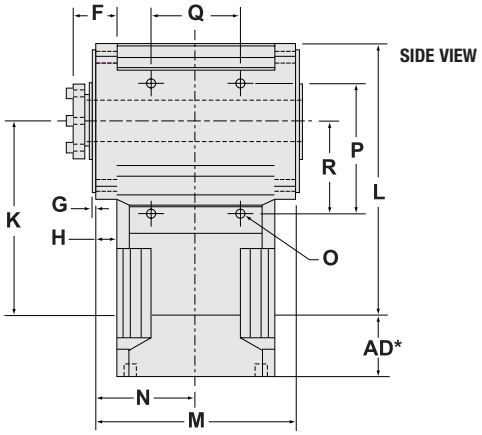
$P_{rx} = (P_r)(\mathbf{352mm}) / (\mathbf{267mm} + X)$
$P_{rx} = (P)(13.86in) / (10.5in + X)$

Dimensions

OUTPUT VIEW



SIDE VIEW



Frame Size	A Square Flange (mm)	(in)	B Bolt Hole (mm)	(in)	C Bolt Circle (mm)	(in)	D Pilot Diameter (mm)	(in)	E Thru Bore Diameter** (mm)	(in)	F Taper Bushing Extension (mm)	(in)	G Pilot Thickness (mm)	(in)	H Flange Thickness (mm)	(in)
RT90	**90**	3.543	**6.5**	0.256	**100**	3.937	**80**	3.150	**22**	0.866	**26.5**	1.043	**3**	0.118	**12**	0.472
RT115	**115**	4.528	**8.5**	0.335	**130**	5.118	**110**	4.331	**30**	1.181	**31**	1.220	**3.5**	0.138	**14**	0.551
RT142	**142**	5.591	**11**	0.433	**165**	6.496	**130**	5.118	**38**	1.496	**43**	1.693	**3.5**	0.138	**20**	0.787
RT180	**182**	7.165	**13**	0.512	**215**	8.465	**160**	6.299	**48**	1.890	**54.2**	2.134	**10**	0.394	**25**	0.984
RT220	**220**	8.661	**17**	0.669	**250**	9.843	**180**	7.087	**60**	2.362	**74.1**	2.917	**15**	0.591	**35**	1.378

Frame Size	J Housing Recess (mm)	(in)	K Dist. to Output Centerline (For ratio = 3:1) (mm)	(in)	K2 Dist. to Output Centerline (For ratio > 3:1) (mm)	(in)	L1 Housing Length (For ratio = 3:1) (mm)	(in)	L2 Housing Length (For ratio > 3:1) (mm)	(in)	M Housing Width (mm)	(in)	N Dist. to Input Centerline (mm)	(in)
RT90	**6.6**	0.260	**95**	3.740	**117**	4.606	**140**	5.512	**162**	6.378	**114**	4.488	**57**	2.244
RT115	**7.9**	0.311	**116**	4.567	**144.2**	5.677	**173.5**	6.831	**201.7**	7.941	**143**	5.630	**71.5**	2.815
RT142	**10.5**	0.413	**134**	5.276	**179**	7.047	**205**	8.071	**250**	9.843	**182**	7.165	**91**	3.583
RT180	**10**	0.394	**169**	6.654	**209.1**	8.228	**260**	10.236	**300.1**	11.815	**232**	9.134	**116**	4.567
RT220	**16**	0.630	**206**	8.110	**266**	10.472	**316**	12.441	**376**	14.803	**290**	11.417	**145**	5.709

Both output flanges have identical dimensions.
*AD=Adapter Length. Adapter will vary, depending on motor. Consult Internet (www.baysidemotion.com or www.parkermotion.com) for details or call Parker Bayside.
**Maximum bushing bore diameter. Actual through bore of output shaft is larger. For additional bore diameter, contact Parker Bayside's Application Engineers for information.

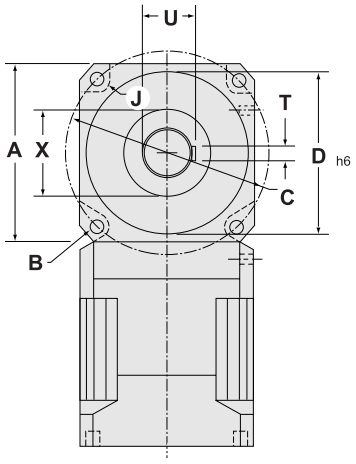
Foot Mounting Holes Location (RT, RD, RB)

Frame Size	O Thread Size x Depth	P (mm)	(in)	Q (mm)	(in)	R (mm)	(in)
R__90	M4x6	**80**	3.150	**60**	2.362	**60**	2.362
R__115	M6x9	**100**	3.937	**70**	2.756	**75**	2.953
R__142	M8x12	**120**	4.724	**80**	3.150	**85**	3.346
R__180	M10x15	**160**	6.299	**100**	3.937	**110**	4.331
R__220	M12x20	**195**	7.677	**130**	5.118	**136**	5.354

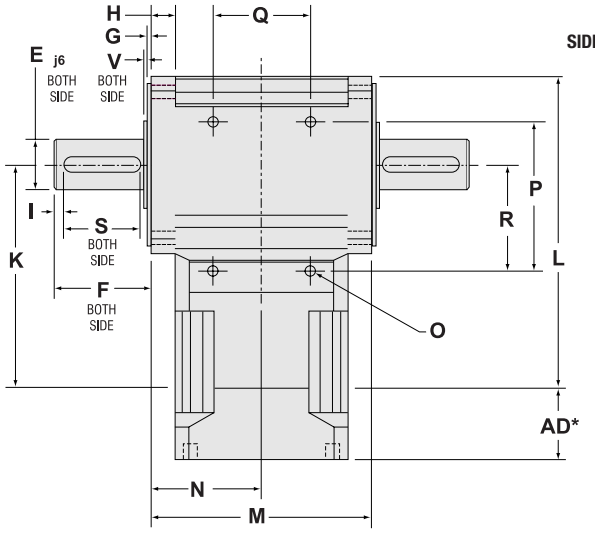
RD Dual Shaft

Dimensions

OUTPUT VIEW



SIDE VIEW



Frame Size	A Square Flange (mm)	(in)	B Bolt Hole (mm)	(in)	C Bolt Circle (mm)	(in)	D Pilot Diameter (mm)	(in)	E Output Shaft Diameter (mm)	(in)	F Output Shaft Length (mm)	(in)	G Pilot Thickness (mm)	(in)	H Flange Thickness (mm)	(in)	I Dist. From Shaft End (mm)	(in)	J Housing Recess (mm)	(in)
RD90	**90**	3.543	**6.5**	0.256	**100**	3.937	**80**	3.150	**20**	0.787	**40**	1.575	**3**	0.118	**12**	0.472	**5**	0.197	**6.6**	0.260
RD115	**115**	4.528	**8.5**	0.335	**130**	5.118	**110**	4.331	**24**	0.945	**50**	1.969	**3.5**	0.138	**14**	0.551	**7**	0.276	**7.9**	0.311
RD142	**142**	5.591	**11**	0.433	**165**	6.496	**130**	5.118	**40**	1.575	**80**	3.150	**3.5**	0.138	**20**	0.787	**8**	0.315	**10.5**	0.413
RD180	**182**	7.165	**13**	0.512	**215**	8.465	**160**	6.299	**50**	1.969	**95**	3.740	**10**	0.394	**25**	0.984	**6**	0.236	**10**	0.394
RD220	**220**	8.661	**17**	0.669	**250**	9.843	**180**	7.087	**75**	2.953	**155**	6.102	**15**	0.591	**35**	1.378	**8**	0.315	**16**	0.630

Frame Size	K1 Dist. to Output Centerline (For ratio <= 3:1) (mm)	(in)	K2 Dist. to Output Centerline (For ratio > 3:1) (mm)	(in)	L1 Housing Length (For ratio <= 3:1) (mm)	(in)	L2 Housing Length (For ratio > 3:1) (mm)	(in)	M Housing Width (mm)	(in)	N Dist. to Input Centerline (mm)	(in)	S Keyway Length (mm)	(in)	T Keyway Thickness (mm)	(in)	U Keyway Height (mm)	(in)	V Shoulder Height (mm)	(in)	X Shoulder Diameter (mm)	(in)
RD90	**95**	3.740	**117**	4.606	**140**	5.512	**162**	6.378	**114**	4.488	**57**	2.244	**28**	1.102	**6**	0.236	**22.5**	0.886	**2.5**	0.098	45	1.575
RD115	**116**	4.567	**144.2**	5.677	**173.5**	6.831	**201.7**	7.941	**143**	5.630	**71.5**	2.815	**32**	1.260	**8**	0.315	**27**	1.063	**2.5**	0.098	**50**	1.969
RD142	**134**	5.276	**179**	7.047	**205**	8.071	**250**	9.843	**182**	7.165	**91**	3.583	**63**	2.480	**12**	0.472	**43**	1.693	**2.5**	0.098	**50**	1.969
RD180	**169**	6.654	**209.1**	8.232	**260**	10.236	**300.1**	11.815	**232**	9.134	**116**	4.567	**70**	2.756	**14**	0.551	**53.5**	2.106	**2.5**	0.098	**55**	2.165
RD220	**206**	8.110	**266**	10.472	**316**	12.441	**376**	14.803	**290**	11.417	**145**	5.709	**100**	3.937	**20**	0.787	**79.5**	3.130	**2.5**	0.098	**100**	3.937

Both output flanges have identical dimensions. Contact Parker Bayside's Application Engineers for information.
*AD=Adapter Length. Adapter will vary, depending on motor. Consult Internet (www.baysidemotion.com or www.parkermotion.com) for details or call Parker Bayside.

Encoder Mounting Option	Dimensions For All Frame Sizes (mm)	(in)
Shaft Diameter	**9.525**	0.375
Shaft Length	**19.050**	0.750
Bolt Circle	**74.981**	2.952
Tapped Holes	**M4x6** (Min. Depth)	
Encoder (Not Supplied)	**DRC C25, BEI E25, RENCO C2520**	

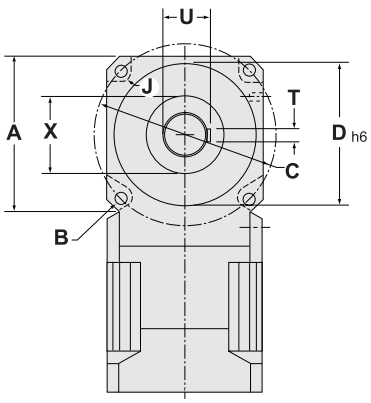
An additional flange is required on the gearhead for encoder mounting.
It will increase the thickness of one output flange by 10mm.

Foot Mounting Holes Location (RT, RD, RB)

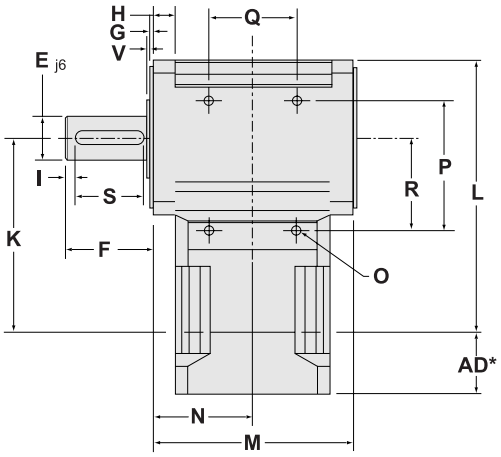
Frame Size	O Thread Size x Depth	P (mm)	(in)	Q (mm)	(in)	R (mm)	(in)
R__90	M4x6	**80**	3.150	**60**	2.362	**60**	2.362
R__115	M6x9	**100**	3.937	**70**	2.756	**75**	2.953
R__142	M8x12	**120**	4.724	**80**	3.150	**85**	3.346
R__180	M10x15	**160**	6.299	**100**	3.937	**110**	4.331
R__220	M12x20	**195**	7.677	**130**	5.118	**136**	5.354

Dimensions

OUTPUT VIEW



SIDE VIEW



Frame Size	A Square Flange (mm)	A (in)	B Bolt Hole (mm)	B (in)	C Bolt Circle (mm)	C (in)	D Pilot Diameter (mm)	D (in)	E Output Shaft Diameter (mm)	E (in)	F Output Shaft Length (mm)	F (in)	G Pilot Thickness (mm)	G (in)	H Flange Thickness (mm)	H (in)	I Dist. From Shaft End (mm)	I (in)	J Housing Recess (mm)	J (in)
RB90	**90**	3.543	**6.5**	0.256	**100**	3.937	**80**	3.150	**20**	0.787	**40**	1.575	**3**	0.118	**12**	0.472	**5**	0.197	**6.6**	0.260
RB115	**115**	4.528	**8.5**	0.335	**130**	5.118	**110**	4.331	**24**	0.945	**50**	1.969	**3.5**	0.138	**14**	0.551	**7**	0.276	**7.9**	0.311
RB142	**142**	5.591	**11**	0.433	**165**	6.496	**130**	5.118	**40**	1.575	**80**	3.150	**3.5**	0.138	**20**	0.787	**8**	0.315	**10.5**	0.413
RB180	**182**	7.165	**13**	0.512	**215**	8.465	**160**	6.299	**50**	1.969	**95**	3.740	**10**	0.394	**25**	0.984	**6**	0.236	**10.0**	0.394
RB220	**220**	8.661	**17**	0.669	**250**	9.843	**180**	7.087	**75**	2.953	**155**	6.102	**15**	0.591	**35**	1.378	**8**	0.315	**16.0**	0.630

Frame Size	K Dist. to Output Centerline (mm)	K (in)	L Housing Length (mm)	L (in)	M Housing Width (mm)	M (in)	N Dist. to Input Centerline (mm)	N (in)	S Keyway Length (mm)	S (in)	T Keyway Thickness (mm)	T (in)	U Keyway Height (mm)	U (in)	V Shoulder Height (mm)	V (in)	X Shoulder Diameter (mm)	X (in)
RB90	**95**	3.740	**140.6**	5.512	**114**	4.488	**57**	2.244	**28**	1.102	**6**	0.236	**22.5**	0.886	**2.5**	0.098	45	1.575
RB115	**116**	4.567	**173.5**	6.831	**143**	5.630	**71.5**	2.815	**32**	1.260	**8**	0.315	**27**	1.063	**2.5**	0.098	**50**	1.969
RB142	**134**	5.276	**205**	8.071	**182**	7.165	**91**	3.583	**63**	2.480	**12**	0.472	**43**	1.693	**2.5**	0.098	**50**	1.969
RB180	**169**	6.654	**260**	10.236	**232**	9.134	**116**	4.567	**70**	2.756	**14**	0.551	**53.5**	2.106	**2.5**	0.098	**55**	2.165
RB220	**206**	8.110	**316**	12.441	**290**	11.417	**145**	5.709	**100**	3.937	**20**	0.787	**79.5**	3.130	**2.5**	0.098	**100**	3.937

Both output flanges have identical dimensions.
*AD=Adapter Length. Adapter will vary, depending on motor. Consult Internet (www.baysidemotion.com or www.parkermotion.com) for details or call Parker Bayside.
*Additional hollow shaft bore diameters are available. Contact Parker Bayside's Application Engineers for information.

How to Order

Order Numbering Example: R D 1 4 2 E 0 1 0 - X X X L B

1. Pick frame size and ratio.
2. Pick options.
3. Specify motor, make and model for mounting kit.

MODEL
RB= Low Ratio
RD= Dual-Shaft
RT= Hollow Shaft

FRAME SIZE
090
115
142
180
220

OPTIONAL ENCODER MOUNT
RD Only

RATIOS

RB	RD	RT
001	001	-
002	002	-
003	003	003
-	009	009
-	015	015
-	021	021
-	030	030

SPECIAL
(Factory Issued)

OPTIONAL LOW BACKLASH

MultiDrive Gearheads are supported by a worldwide network of offices and local distributors. Call **1-800-305-4555** for application engineering assistance or for the name of your local distributor. Information can also be obtained at **www.baysidemotion.com** or **www.parkermotion.com**

Specifications are subject to change without notice.

NE Nema Series:
Lightweight, Compact and Low Friction

Parker Bayside's NEMA gearheads feature a high-efficiency spur-gear design, in a light, compact package. Designed to mount directly to the face of NEMA face stepper and servo motors, NEMA gearheads are ideal for applications requiring smooth operation and low starting torque. Ratios from 3:1 to 100:1 are available in NEMA 23, 34 and 42 frame sizes.

3 Frame Sizes
NE23
NE34
NE42

Ratios	
3:1	20:1
5:1	30:1
8:1	50:1
10:1	100:1
15:1	

Performance Specifications

	Units	Ratio	Frame Size NE23	NE34	NE42
Nominal Output Torque, $T_{nom\ r}$	**in-lb**	3	**16**	**64**	**123**
	Nm		2	7	14
	in lb	5	**27**	**107**	**205**
	Nm		3	12	23
	in lb	8-10	**40**	**142**	**250**
	Nm		5	16	28
	in lb	15	**46**	**170**	**300**
	Nm		5	19	34
	in lb	20-100	**50**	**180**	**350**
	Nm		6	20	40
Max. Acceleration Output Torque, $T_{acc\ r}$	**in lb**	3	**24**	**95**	**185**
	Nm		3	11	21
	in lb	5	**40**	**160**	**307**
	Nm		5	18	35
	in lb	8-10	**60**	**210**	**375**
	Nm		7	24	42
	in lb	15	**70**	**255**	**450**
	Nm		8	29	51
	in lb	20-100	**75**	**270**	**525**
	Nm		9	31	59
Nominal Input Speed, $N_{nom\ r}$	RPM	All	4,000	4,000	4,000
Max. Input Speed, N_{maxr}	RPM	All	5,500	5,000	4,500
Standard Backlash (1)	arc min	3, 5, 8, 10	30	25	25
	arc min	15-100	20	20	20
Low Backlash (1)	arc min	3, 5, 8, 10	15	15	15
	arc min	15-100	10	10	10
Efficiency at Nominal Torque	%	All	98%	98%	98%
Moment of Inertia	**oz in sec^2**	All	**0.00007**	**0.0005**	**0.004**
	gm cm sec^2		0.0051	0.0408	0.306
Maximum Weight	**lb**	All	**1.0**	**3.0**	**6.0**
	kg		0.5	1.4	3.0
Radial Load (2)	**lb**	All	**20**	**80**	**200**
	N		90	350	890
Axial Load	**lb**	All	**10**	**30**	**60**
	N		45	135	265

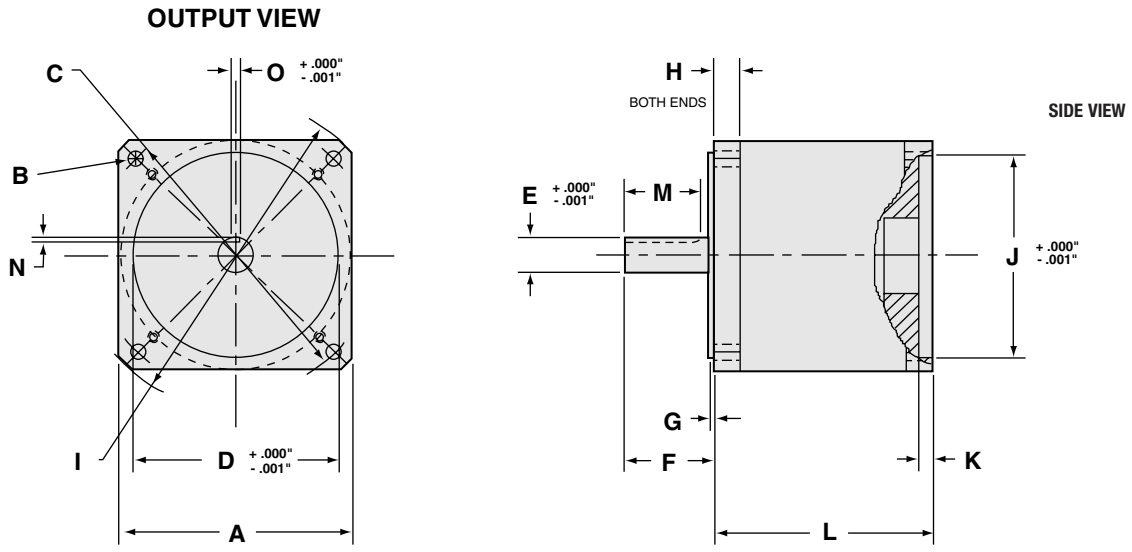
(1) Measured at 2% of rated torque

(2) Radial Loads are measured at 12.7mm (0.5in) from the gearhead mounting surface. These ratings are based on gearhead making more than one revolution on output shaft.

Specification are subject to change without notice

Dimensions

OUTPUT VIEW

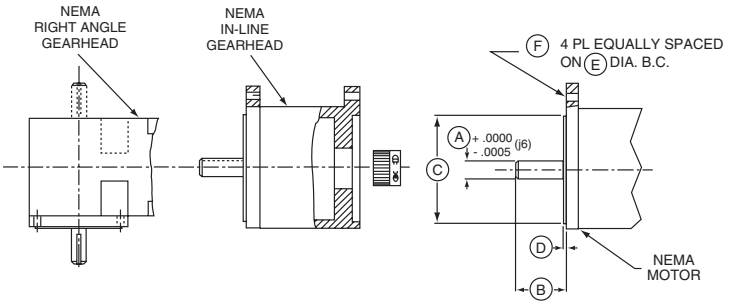


Frame Size	A Square Flange (in)	A (mm)	B Bolt Hole (in)	B (mm)	C Bolt Circle (in)	C (mm)	D Pilot Diameter (in)	D (mm)	E Output Shaft Diameter (in)	E (mm)	F Output Shaft Length (in)	F (mm)	G Pilot Thickness (in)	G (mm)	H Flange Thickness (in)	H (mm)
NE 23	**2.27**	58	**0.195**	5.0	**2.625**	66.7	**1.500**	38.1	**0.375**	9.5	**1.00**	25.4	**0.062**	1.6	**0.19**	5
NE 34	**3.25**	83	**0.218**	5.5	**3.875**	98.4	**2.875**	73.0	**0.500**	12.7	**1.25**	31.8	**0.067**	1.7	**0.38**	10
NE 42	**4.20**	107	**0.281**	7.1	**4.950**	125.7	**2.187**	55.5	**0.625**	15.9	**1.50**	38.1	**0.093**	2.4	**0.50**	13

Frame Size	I Housing Diameter (in)	I (mm)	J Input Pilot Diameter (in)	J (mm)	K Input Pilot Depth (in)	K (mm)	L Housing Length (in)	L (mm)	M Keyway Length (in)	M (mm)	N Keyway Depth (in)	N (mm)	O Keyway Width (in)	O (mm)
NE 23	**3.00**	76	**1.501**	38.13	**0.125**	3.2	**2.30**	58	**0.75 flat**	19 flat	**0.015 flat**	0.4 flat	**—**	—
NE 34	**4.38**	111	**2.876**	73.05	**0.200**	5.1	**3.00**	76	**1.06**	27	**0.072**	1.8	**0.124**	3.15
NE 42	**5.63**	143	**2.188**	55.58	**0.187**	4.7	**3.75**	95	**1.13**	29	**0.108**	2.7	**0.187**	4.75

MOUNTING TO NEMA-FRAMED MOTORS: DIRECT MOUNT

Gearheads attach directly to motors with NEMA mounting dimensions (see table). Parker Bayside's clamp-on-pinion and mounting hardware are included with gearheads, so your motor can be up and running in a matter of minutes.



NEMA DIMENSIONS

	Dimension	Motor Mounting Dimensions					
		NE23		NE34		NE42	
		in	(mm)	in	(mm)	in	(mm)
A	Motor Shaft Diameter	0.250	(6.4)	.375/.500	(9.5/12.7)	0.625	(15.9)
B	Motor Shaft Length	0.810	(20.6)	1.250	(31.8)	1.380	(35.1)
C	Pilot Diameter	1.500	(38.1)	2.875	(73.0)	2.186	(55.5)
D	Pilot Length	0.063	(1.6)	0.063	(1.6)	0.093	(2.4)
E	Mounting Bolt Circle	2.625	(66.7)	3.875	(98.4)	4.950	(125.7)
F	Bolt Hole Size	0.195	(5.0)	0.218	(5.5)	0.281	(7.1)

All dimensions are in inches (millimeters).

MOUNTING TO NON-NEMA FRAMED MOTORS: ADAPTER MOUNT

For motors with non-NEMA dimensions, Parker Bayside supplies a mounting kit including a clamp-on-pinion, adapter plate and all necessary hardware. When ordering, simply provide the part number or outline drawing of your motor, and the gearhead will be shipped ready to mount.

How to Order

Order Numbering Example: N E 3 4 - 0 1 0 - X X X L B

FRAME SIZE
23
34
42

RATIO
003 020
005 030
008 050
010 100
015
(all ratios are exact)

SPECIAL
(Factory Issued)

OPTIONAL
LOW BACKLASH

1. Pick frame size and ratio.
2. Pick options.
3. Specify motor, make and model for mounting kit.

NEMA gearheads are supported by a worldwide network of offices and local distributors. Call **1-800-305-4555** for application engineering assistance or for the name of your local distributor. Information can also be obtained at **www.baysidemotion.com** or **www.parkermotion.com**

Specifications are subject to change without notice.

Specials are Standard at Parker Bayside

Parker Bayside has geared our design and manufacturing capabilities to make custom or modified gearheads quickly and inexpensively.

"Standard" specials include many of the products shown on this page. In addition, we have designed hundreds of gearheads for a wide variety of applications, including military, aerospace, food processing, paper mills and other specialized applications. Or, if you simply need a smaller shaft or a different gear ratio, we can accommodate modifications quickly and easily.

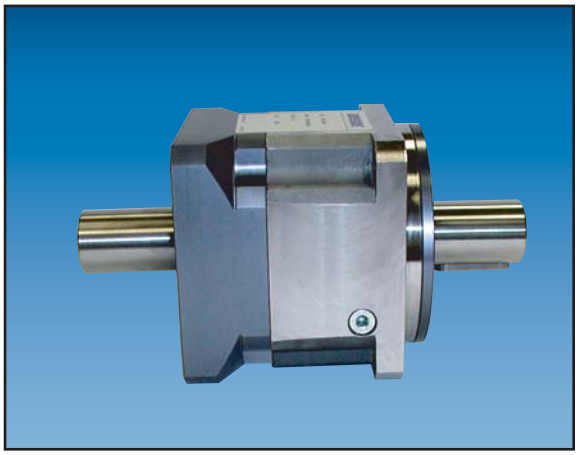
Linear Slide

Gearheads ready to mount to linear slides.
Most belt driven linear slides need a gearhead to reduce inertia. Parker Bayside has pre-engineered in-line and right-angle gearheads to mount directly to most popular linear slides, eliminating the need for couplings or adapters. Standard gearheads are available for the following linear slides: (partial list)

- Parker Daedal
- THK
- Hauser
- IKO
- Bishop Wiscarver
- INA
- NSK
- Star Linear
- Item Products
- Tol-o-Matic
- Warner Rapidtrak
- Warner Tollo

Input Shaft / Speed Reducer

Increased design flexibility.
Stealth gearheads are available with an input-shaft option. The input-shaft option allows more design flexibility, as options like brakes, encoders, or safety couplings can be used between the motor and the gearhead. Also, non-standard or oversized motors can be easily attached to a Stealth gearhead via an input shaft. Standard input shaft options are available for each model and frame size.



Stainless Steel Gearmotor

Washdown motors for harsh conditions.
Parker's high-performance washdown series servo motors were co-designed with engineers from the world's largest food-processing plants to guarantee the right solution for the most demanding applications. Ideal for above-food-line applications, our IP67-rated stainless steel brushless servo motors feature a non-corrosive housing for extremely long life, field-serviceable seals for easy maintainability, multiple ratios, a paint-free exterior, a shaft PTFE seal, conduit fittings, a 316 SST single-piece housing and high-density copper-fill and rare-earth magnets.

Military Spec Gearheads

Mil-spec quality at commercial prices.
Parker Bayside has extensive experience in military and aerospace applications. The Stealth Bomber, M1 Tank and the Space Shuttle all use Parker Bayside gearheads. Parker Bayside's quality system has been approved by NASA and the US Government to MIL-I-45208A. In today's world of tight military budgets, Parker Bayside can give you a mil-spec gearhead at commercial pricing.

Special Environment

Put a Parker Bayside gearhead anywhere!
Parker Bayside can supply gearheads to operate in the harshest environments:

Vacuum - Available as a standard option to 10^{-7} Torr vacuum ratings.

Clean Room - Special gearheads for Class 100 clean room applications.

High Temperature - Special lubricants and seals for temperatures up to 250° Celsius.

Radiation - Gearheads customized to operate within radioactive environments.

Food Grade - Gearheads customized to operate within food-handling environments.

Parker Bayside Gearhead Selection

Selecting a gearhead for a particular application involves the consideration of a number of interrelated parameters. These are:

- Speed
- Continuous torque
- Repetitive peak torque or acceleration torque
- Emergency stop torque
- Duty cycle
- Ambient temperature
- Radial and axial shaft load

Parker Bayside has prepared the following procedure that will provide a straightforward method for selecting a gearhead that will provide an L-10 life of 10,000 hours.

In this procedure, two rating factors must be used, which derate the gearhead to compensate for thermal and application related torque effects.

- **K_T** - The Torque Thermal Factor

This factor derates the transmitted torque to prevent case temperature from exceeding 100 degrees C.
The Thermal Factors given in the table are for ambient temperature 25 degrees C, medium-size indoor space, with the gearheads mounted to a metal base with a surface area more than 3 times larger than the gearhead surface area.

TORQUE THERMAL FACTOR, K_T

		Output Speed, (RPM)									
Frame Size	**Ratio**	**100**	**200**	**400**	**600**	**800**	**1,000**	**1,500**	**2,000**	**2,500**	**3,000**
PV40		1	1	1	1	1	1	—	—	—	—
PS, PX, PV, RS60		1	1	1	1	1	1	—	—	—	—
PS, PX, PV, RS90		1	1	1	1	1	1.2	—	—	—	—
PS, PX, RS115		1	1	1	1	1.2	1.5	—	—	—	—
PS, RS142		1	1	1	1.3	1.7	—	—	—	—	—
PS, RS180	1 stage (1)	1	1	1.5	2.3	—	—	—	—	—	—
	2 stage (2)	1.1	1.5	—	—	—	—	—	—	—	—
PS, RS220	1 stage (1)	1	1.2	2.1	3.2	—	—	—	—	—	—
	2 stage (2)	1.3	2.5	—	—	—	—	—	—	—	—
PS ,RS300	1 stage (1)	1	1.5	3.1	—	—	—	—	—	—	—
	2 stage (2)	1.9	—	—	—	—	—	—	—	—	—
R_90	1	1	1	1	1	1	1	1	1	1.25	1.5
	2-30	1	1	1	1	1	1	1.1	—	—	—
R_115	1	1	1	1	1	1	1	1	1.3	1.7	—
	2-30	1	1	1	1	1	1.3	2	—	—	—
R_142	1	1	1	1	1	1	1.3	2	2.7	3.4	—
	2-30	1	1	1	1	1.3	1.6	—	—	—	—
R_180	1	1	1	1	1	1.3	1.7	2.5	3.4	—	—
	2-30	1	1	1	1.4	1.8	2.3	—	—	—	—
R_220	1	1	1	1.2	1.8	2.4	3.0	4.5	—	—	—
	2-30	1	1	1.3	2.0	2.6	—	—	—	—	—

(1) Data given for PS 3:1 to 10:1 and all RS ratios (2) Data given for PS ratios above 10:1

- **K_S** - The Shock Factor

This factor is used to derate the transmitted torque for applications where the application is not well defined, has random duty cycles or experiences varying peak torques subjecting the gear teeth to torques above the estimated torques.

A K_S has been defined for four general application categories, as shown below, and is independent of gearhead size. If your application does not fit into one of these categories, contact Parker Bayside to discuss your requirements.

	Load Type	**Application**	**K_S**
Known Load Data		All Industries	1.00
	Light	Textiles, liquid mixers, can filling, food, conveyors, plastics, fans	1.25
Unknown Load Data	Moderate	Paper mills, rubber industry, sugar industry, metal mills, lumber, robotics	1.50

9 Step Procedure

1 Load Parameters

Evaluate the following requirements of the load:

Load inertia
Acceleration time (t_{acc})
Continuous run time (t_{cont})
Deceleration time (t_{dec})
Dwell time (t_{dwell})
Maximum continuous speed (N_{cont})

From these, calculate:

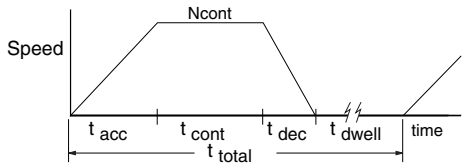
Acceleration torque (T_{acc})
Continuous run torque (T_{cont})
Deceleration torque (T_{dec})
Dwell torque (T_{dwell})*

*Although not used in the following torque calculations, torque requirements during dwell (zero speed) must be considered when selecting gearhead size.

2 Duty Cycle

Determine if the application is to be considered as **intermittent** or **continuous** by calculating the duty cycle as follows:

$$\text{Duty Cycle} = \frac{(t_{acc} + t_{cont} + t_{dec})}{t_{total}} \times 100$$

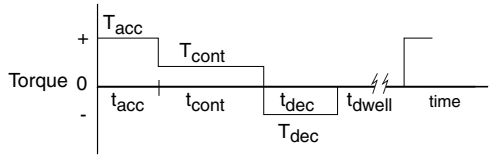


If the duty cycle is< 60%, and $(t_{acc} + t_{cont} + t_{dec})$ is less than 20 minutes, the motion is considered to be **intermittent**.

If the duty cycle is ≥ 60%, or $(t_{acc} + t_{cont} + t_{dec})$ is greater than 20 minutes, the motion is considered to essentially be **continuous**.

3 Calculate the Root Mean Cube Output Torque, T_{mean}.

$$T_{mean} = \sqrt[3]{\frac{\left[\frac{(T_{acc}^3)(N_{cont})(t_{acc})}{2} + (T_{cont}^3)(N_{cont})(t_{cont}) + \frac{(T_{dec}^3)(t\ dec)}{2}\right]}{\left[\frac{(N_{cont})(t_{acc})}{2} + (N_{cont})(t\ cont) + \frac{(N_{cont})(t\ dec)}{2}\right]}}$$



4 Select a gearhead type; PS, PX, RS, Multi-drive, NE or NR (Match gearhead frame size to motor frame size)

5 Review the catalogue listings and determine the gearhead size (40 thru 300) which can meet the following criteria:

$T_{mean} \leq T_{nomr}$
T_{acc} and $T_{dec} \leq T_{accr}$

6 Determine the maximum rated input speed (N_{maxr}) for the selected gearhead.

7 Using $N_{cont.}$ and N_{maxr} from step 6, determine the maximum allowable ratio as:

$$\text{Max ratio} = \frac{N_{maxr}}{N_{cont.}}$$

8 Select an actual ratio from the catalogue listing and calculate the mean input speed, N_{meani} and the maximum input speed, N_{maxi}, as follows:

$$N_{meani} = \left(\frac{\frac{(N_{cont})(t\ acc)}{2} + (N\ cont)(t\ cont) + \frac{(N\ cont)(t\ dec)}{2}}{t\ acc + t\ cont + t\ dec} \right) (\text{RATIO})$$

$$N_{maxi} = (N_{cont})(\text{RATIO})$$

Note: Reflected inertia requirement may determine the actual ratio, as long as it does not exceed the maximum value calculated in STEP 7.

9

	CONTINUOUS MOTION	INTERMITTENT MOTION
Select factor	K_T and K_S	K_S
Calculate	$(T_{mean})(K_T)(K_S)$	$(T_{mean})(K_S)$
Determine that	$T_{nomr} > \mathbf{(T_{mean})(K_T)(K_S)}$	$T_{nomr} > \mathbf{(T_{mean})(K_S)}$

- Compare the required accelerate and decelerate torques, T_{acc} / T_{dec}, to the rated accelerate torque, T_{accr} .

T_{accr} must be greater than the larger of T_{acc} or T_{dec}.

- Check the Emergency Stop Torque rating.
- Compare N_{meani} with the nominal rated speed, N_{nomr}.

N_{nomr} must be greater than N_{meani}

- Compare the maximum input speed N_{maxi} with the maximum input speed rating, N_{maxr}.

N_{maxr} must be greater than N_{maxi}

- Verify radial and axial shaft load.
- If any of these comparisons are not met, then:
  - Choose a larger gearhead
  - Reevaluate the ratio
  - Reevaluate the torque
  - Reevaluate the speed
  - Reevaluate the duty cycle
  - Reevaluate shaft load

SELECTION PROCESS IS COMPLETE!

This gearhead selection is made available as an aid to selection of Parker Bayside Gearheads.
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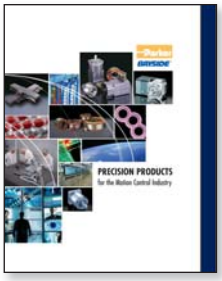

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