Rotary and Lift Positioning

Delivering precise positioning for rotary or vertical motion, products in this section have been designed for high performance and flexibility of use. They are designed to function independently or in conjunction with linear stages. Accurate and robust, these components integrate with other Parker motion control elements, streamlining the machine design process.

- Multiple drive train options available
- Profile stages as small as 80 mm in diameter
- Speed up to 600 rpm
- Repeatability to +/- 1 arc-sec
- Easily mountable to other Parker Stages to form multi-axis systems

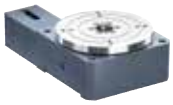
mPR Miniature Precision Rotary Stage

Self-contained stage includes direct drive motor, high resolution feedback, and high precision rotary bearing. Easily mounted to existing Parker product lines.
Page 472.

PM-DD Powerful Direct Drive Motors

Ideal for applications that require attaching a load directly to the motor, the PMDD offers robust power and smooth motion with no backlash.
Page 487.

RM Series Worm Drive Rotary Tables



The RM Series offers an unparalleled combination of smooth operation plus high accuracy and high-load capacity.
Page 496.

200RT Series Rotary Tables

Low profile and light weight make these ideal indexing units for multi-axis combinations with high-precision linear tables.
Page 501.

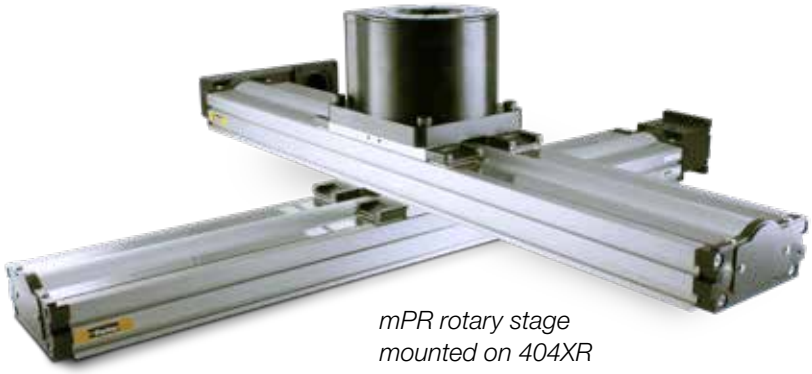
ZP200 Vertical Lift “Wedge” Stages

Support platform providing precise vertical translation and positioning while maintaining X-Y integrity.
Page 507.

The mPR Series

Miniature High Precision Rotary Stage

- Compact size
- Self-contained stage includes direct drive motor, high resolution feedback, and high precision rotary bearing
- Easily mounted to existing Parker mSR, MX, and XR product lines
- Very high precision rotary motion

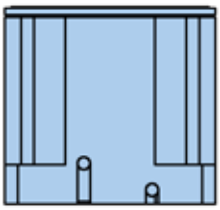


mPR rotary stage mounted on 404XR multi-axis system.

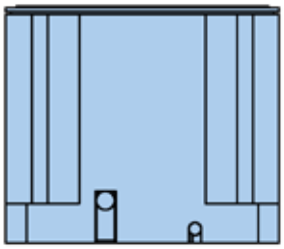
Typical Enhancements

- **Hall effect sensors for commutation**
- **Direct mounting pattern for mSR, MX, and XR products**
- **3 meter length high-flex cables**
- **Integrated servo motor**
- **Ample through hole**
- **Clean room option available**
- **3 digital encoder resolution options, plus a 1 Vp-p analog option**
- **CE and RoHS compliant as standard**

	mPR Series
Maximum Diameter (mm)	104
Maximum Payload (N)	117
Maximum Velocity (rpm)	600



mPR80



mPR100

The Miniature Precision Rotary (mPR) stage is designed to meet the needs of OEMs and machine builders seeking very high precision in a compact direct drive product.

Two form factors of 80mm and 104mm diameter mount easily on top of small linear motion axes for building complete multi-axis motion systems.

The mPR is lightweight without sacrificing precision and stiffness and delivers excellent torque density.

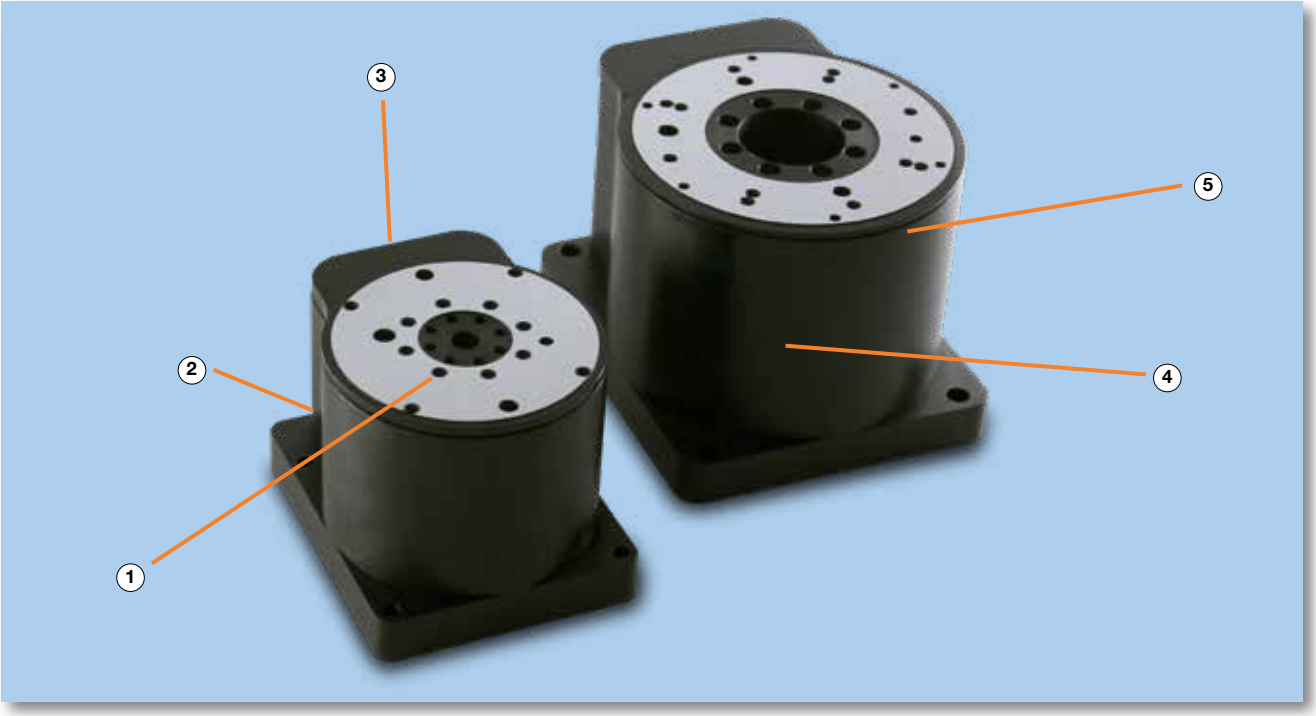
High angular resolution and precision angular repeatability, combined with high precision runout values, make the mPR a high performer in the field of precision rotary motion control.

The mPR is driven with a direct drive, 3 phase AC servo motor which is integrated directly to the products Aluminum base. The direct drive eliminates mechanical compliance which might exist from gearing or screw driven devices.

As a result the mPR delivers excellent angular dynamic response, and high precision rotary positioning. The combination of all of these features make the mPR the ideal stage for applications in laser processing, electronics manufacturing, semiconductor inspection, and high precision metrology.

For examples of multi-axis systems, visit **www.parker.com/emn/mPR.**

mPR Design Advantages



1 Tapped Holes and Dowel Pinning
The mPR has tapped holes in both the top and base for ease of mounting and dowel pins to ensure repeatable mounting when mounting additional tooling to the stage.

2 High Flex Cabling
The mPR uses high flex cabling as standard to ensure maximum life of the stage regardless of whether it's integrated into a multi or single axis system.

3 Integrated, Optical Linear Encoder
The mPR provides maximum versatility with three different optical digital encoder resolutions and an analog sine/cosine option. Easily change resolutions with an external interface, instead of changing the entire head.

4 Frameless Kit Motor Direct Drive
The frameless kit motor is directly integrated with the drive train to deliver reliable performance in small spaces.

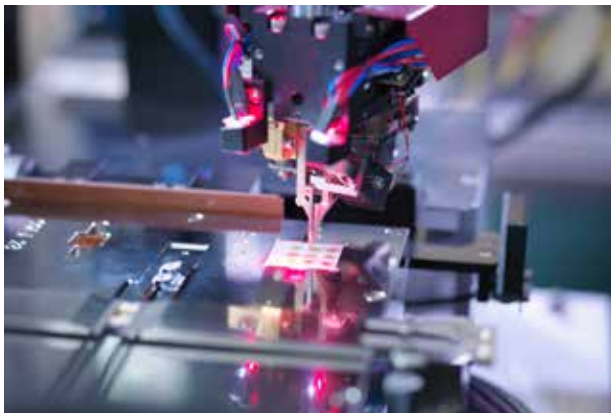
5 High Precision Crossed Roller Bearings
High performance precision-grade bearings have up to five times the life expectancy of typical ball bearings. These bearings are lubricated for the life of the product to reduce maintenance.

Standard Features

Travel	360 Degree Continuous
Motor	Frameless Direct Drive Motor (will hall Effect Device)
Feedback	Non-Contact Optical Encoder
Scale	20um Pitch Stainless Steel Ring
Resolution	1Vp-p Analog Output (see specifications) Digital Output Options (see specifications)
Sensors	Integrated Home Mark (Encoder Channel C)
Runout	Axial: < 6um available (see specifications) Radial: < 6um available (see specifications)
Bearings	High Precision Crossed Roller Bearings
Encoder Cable	High Flex, 10M Cycle, 3m length
Motor / Hall Cable	Integrated with Motor
Structure	Anodized Aluminum 6064-T6
Environment	Standard Optional: Clean Room
Temperature	0–50 degrees Celsius
Humidity	10–80% Non-Condensing

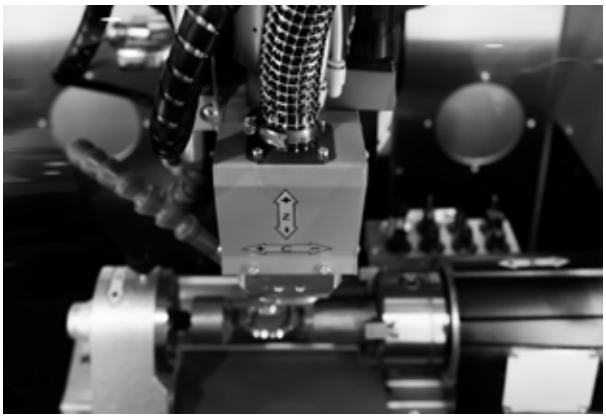
6 Clean Room Tested
Limited contact surfaces within the product make the mPR ideal for clean room applications. Higher clean room versions are available for order as custom. Contact the Parker applications engineering department for more details at 1.800.358.9070.

Application Solutions: Rotary Driven Automation Tables



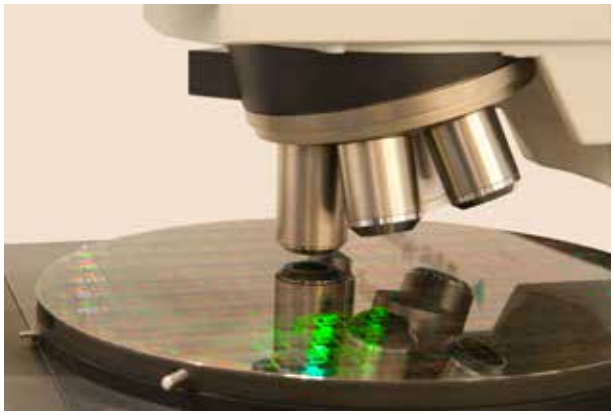
Electronics Manufacturing

The mPR is an ideal theta axis for electronics manufacturing given its combination of tight geometric performance, precision and speed. The combination of precision cross roller bearing, high resolution feedback device, and high performance servo drive make the mPR extremely responsive for high speed pick and place of miniature components for electronics manufacturing. In addition to its geometric and dynamic performance, the mPR is also very robust, as it is designed for 100% duty cycle, and lubricated for the life of the product, requiring no preventative maintenance.



Laser Machining and Laser Processing

The mPR is an excellent rotary axis for laser machining and laser processing applications given its spectacular bearing performance and smooth motion. Regardless if cutting, marking, etching or welding the mPR is an ideal rotary stage for laser processing equipment given the tight integration of slotless rotary servo motor, high resolution feedback and high precision rotary bearing. The combination of all these key design elements in the mPR will make all features in the work piece smooth and precisely positioned.



Semiconductor Manufacturing, Handling, and Metrology

The mPR in combination with other Parker precision linear axes (XR, mSR, and MX) make ideal building blocks for applications in semiconductor manufacturing, handling, and metrology. The precision and clean operation make the mPR ideal for applications for skew adjustment of the wafer. Direct mounting to the XR, mSR and MX is also very advantageous when making XY-theta systems.

Precision Metrology

The mPR makes for a spectacular rotary axis for automated metrology equipment. Smooth precise angular motion, and limited runout errors make the mPR an ideal rotary stage for optical metrology equipment measuring miniature parts or features. The compact size and ease of integration make the mPR an ideal rotary compliment to multi axis metrology systems.

SPECIFICATIONS
mPR80
(80 mm diameter profile)

The mPR80 is a miniature precision rotary stage that has been engineered to deliver a combination of modularity, flexibility, and performance in an extremely compact package.

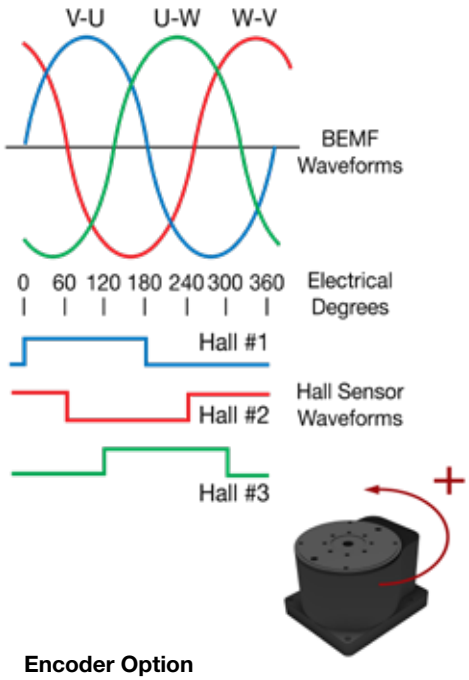
mPR mounted atop an mSR XY system.

Stage Information

Stage Mass	kg	1.45
Max Load (Axial)	kg	4.0
Max Load (Radial)	kg	4.0
Moving Mass	kg	0.54
Rotating Moment of Inertia	kg*mm^2	320

Motor Information

Stall Current	Arms	1.6
Peak Current	Arms	5.04
Voltage Constant	Vrms/krpm	13.86
Torque Constant	Nm/Arms	0.229
Resistance	Ohms	6.5
Inductance	mH	5.5
Stall Torque Continuous	Nm	0.36
Peak Torque	Nm	0.9
Max Bus Voltage	Vdc	340
Max Winding Temperature	Degree C	125
Winding Thermal Resistance	Deg C / watt	2.36
Magnet Pitch	Deg	120
Motor Thermal Time Constant	minutes	11
Motor Cable Diameter	mm	4.7
Encoder Diameter	mm	4.5
Cable Length	m	3



		Encoder Option			
Encoder Dependent Specifications		**E1**	**E2**	**E3**	**SC**
Travel	Degrees	360	360	360	360
Home Position Location	+/- Degrees	1	1	1	1
Encoder lines Per Revolution	lines / rev	11,840	11,840	11,840	11,840
Encoder Resolution	Arc-Sec	5.47	0.547	0.0547	Analog Sine/Cos
Bi-directional Repeatability	+/- Arc-Sec	11	2.5	1.25	*
Axial Runout	µm	6	6	6	6
Radial Runout	µm	6	6	6	6
Wobble	Arc-Sec	15	15	15	15
Max Velocity	RPM	600	100	10	600

* SC encoder resolution is dependent upon drive input resolution.

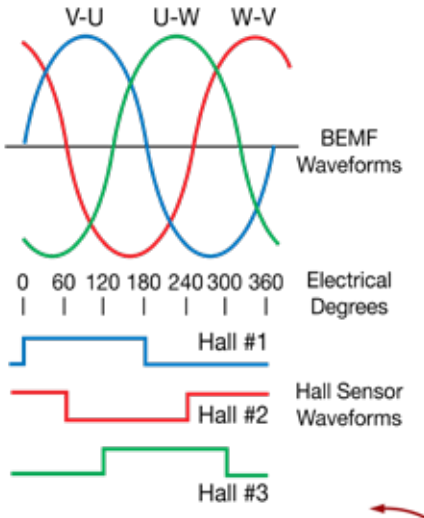
mPR100
(104 mm diameter profile)

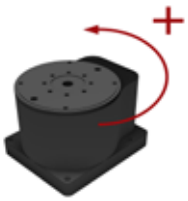
The mPR100 is a self-contained precision rotary stage, including a direct drive motor, feedback device, and precision rotary bearings.


mPR mounted atop a single axis XR.

Stage Information		
Stage Mass	kg	2.9
Max Load (Axial)	kg	12.0
Max Load (Radial)	kg	12.0
Moving Mass	kg	1.0
Rotating Moment of Inertia	kg*mm^2	1000

Motor Information		
Stall Current	Arms	3.79
Peak Current	Arms	11.95
Voltage Constant	Vrms/krpm	41.28
Torque Constant	Nm/Arms	0.68
Resistance	Ohms	3.9
Inductance	mH	8.9
Stall Torque Continuous	Nm	2.0
Peak Torque	Nm	6.2
Max Bus Voltage	Vdc	340
Max Winding Temperature	Degree C	125
Winding Thermal Resistance	Deg C / watt	1.02
Magnet Pitch	Deg	60
Motor Thermal Time Constant	minutes	28
Motor Cable Diameter	mm	7.5
Encoder Cable Diamter	mm	4.5
Cable Length	m	3





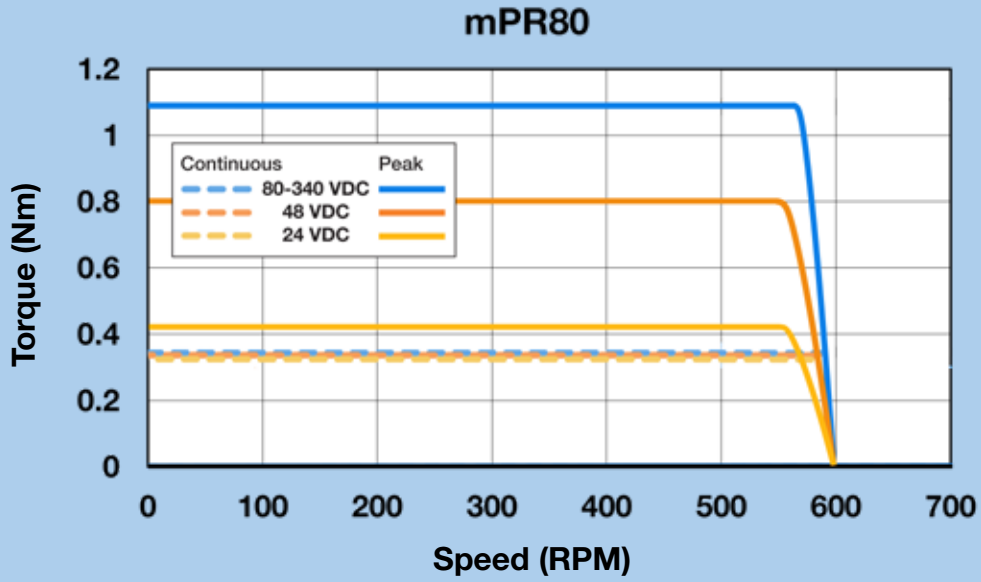
Encoder Dependent Specifications		Encoder Interpolator E1	E2	E3	SC
Travel	Degrees	360	360	360	360
Home Position Location	+/- Degrees	1	1	1	1
Encoder lines Per Revolution	lines / rev	15,744	15,744	15,744	15,744
Encoder Resolution	Arc-Sec	4.116	0.4116	0.0412	Analog Sine/Cos
Bi-directional Repeatability	+/- Arc-Sec	10	2	1	*
Axial Runout	µm	6	6	6	6
Radial Runout	µm	6	6	6	6
Wobble	Arc-Sec	12.5	12.5	12.5	12.5
Max Velocity	RPM	600	95	9.5	600

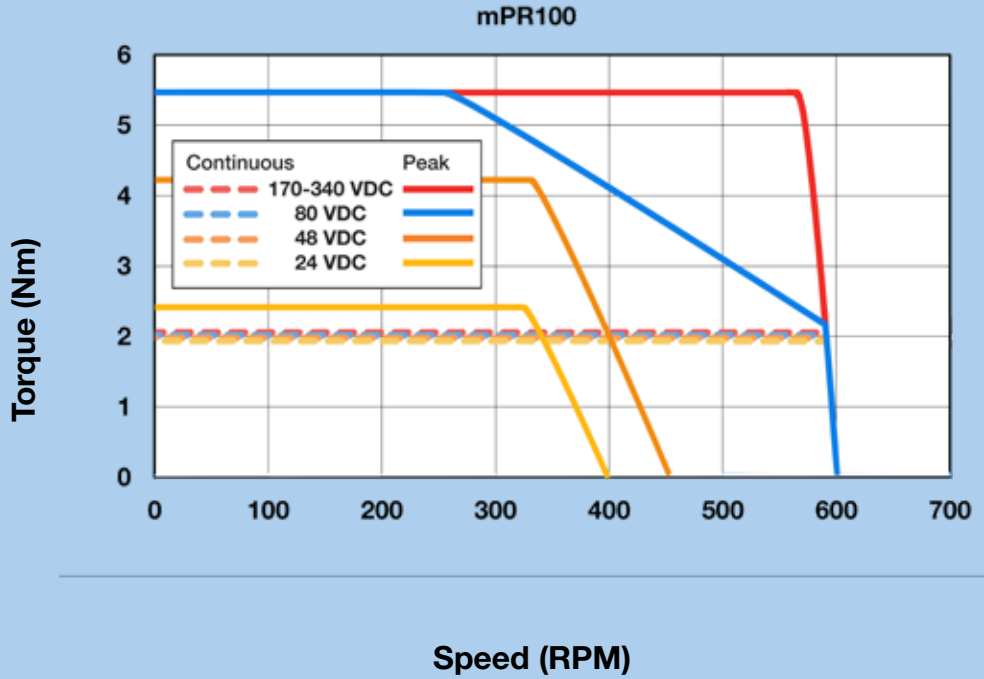
* SC encoder resolution is dependent upon drive input resolution.

Speed-Torque Performance

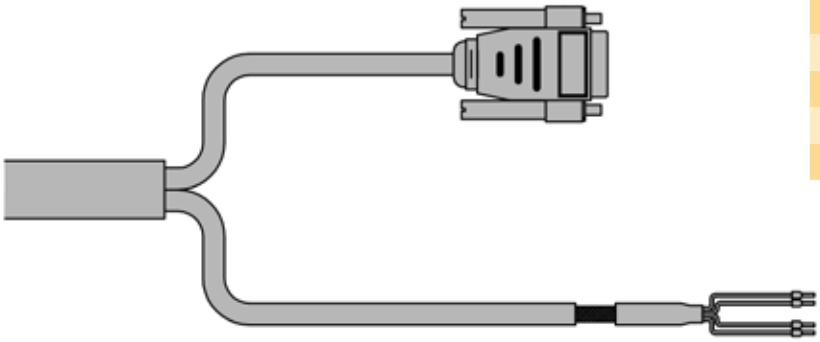
Parker MotionSizer sizing software available for free download at www.parker.com/emn.

Below are speed-torque performance curves at a variety of different bus voltages supplied to the mPR. To achieve full speed-torque performance of the motor, a bus voltage of 170–340 volts is required. ***Note: Speed is limited by encoder resolution. See specifications sheet for limits.***





Motor Hall and Power Cable Information



Male 9 Pin D-Sub

Color	Function	Pin Number
Black	Hall Power	5
White	Hall Ground	6
Yellow	H1	7
Blue	H2	8
Green	H3	9

Motor Leads

Color	Function
Red	U
Brown	V
Orange	W
Green/Yellow	Ground

Stage Wiring Encoder Information

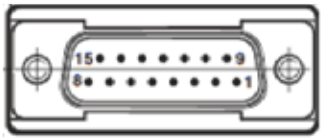
Optical Encoder (E1, E2, E3 Option)

Function	Signal	Pin #
Power	5 Volts DC	8
	Ground	2, 9
Incremental Signals	A+	14
	A-	6
	B+	13
	B-	5
Reference Mark	Z+	12
	Z-	4
Limits*	Not connected	10, 11
Setup	(Used in installation)	1
Error Output	NPN	3

Sine Cosine Encoder (SC Option)

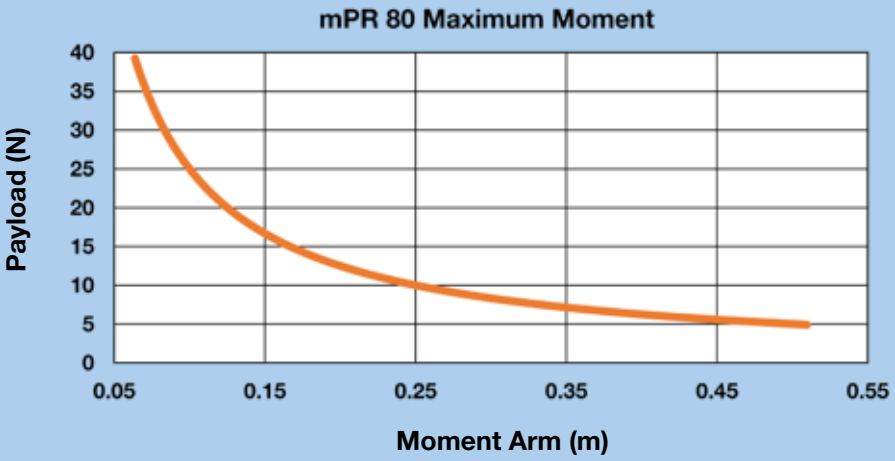
Function	Signal	Pin #
Power	5 Volts DC	4, 5
	0 Volts DC	12, 13
Incremental Signals	Cosine +	9
	Cosine -	1
	Sine +	10
	Sine -	2
Reference Mark	Z+	3
	Z-	11
Limits*	Not connected	7, 8
Setup	(Used in installation)	6
Remote Calibration	NPN	14

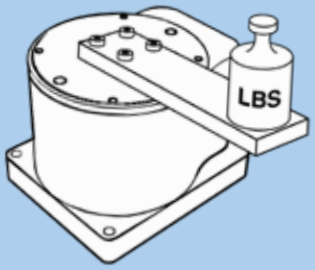
*** The mPR is not equipped with limit sensors. However, the unit's encoder system can be equipped with limit sensors "integral" to the scale. Consult the factory for more information.**

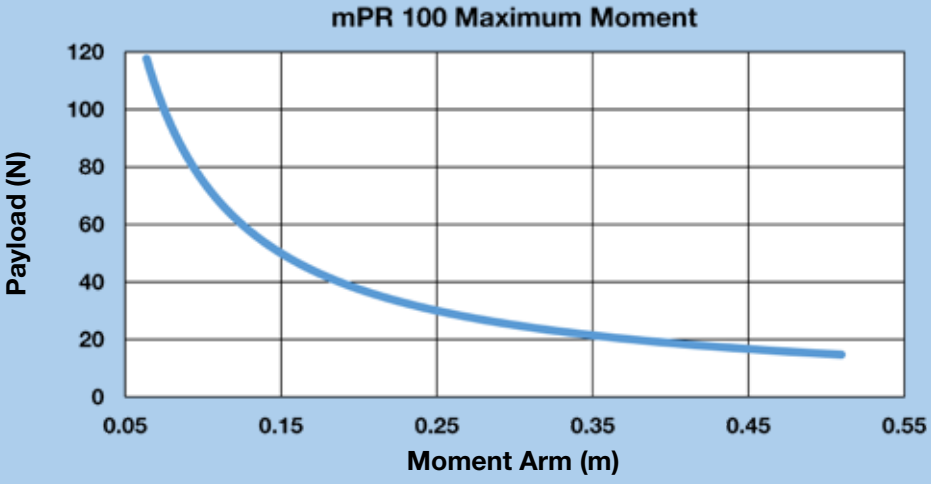


Moment Loading

Below are two plots indicating the maximum allowable moment arms at a given payload to ensure product life of 1 billion revolutions.



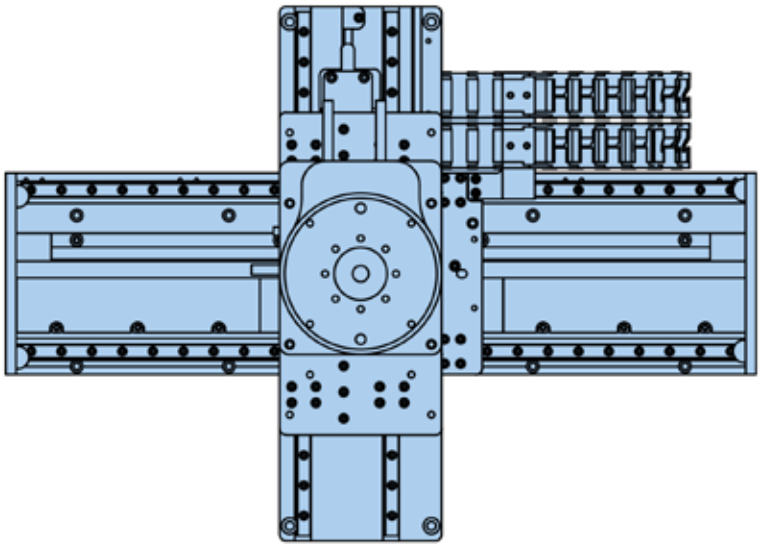




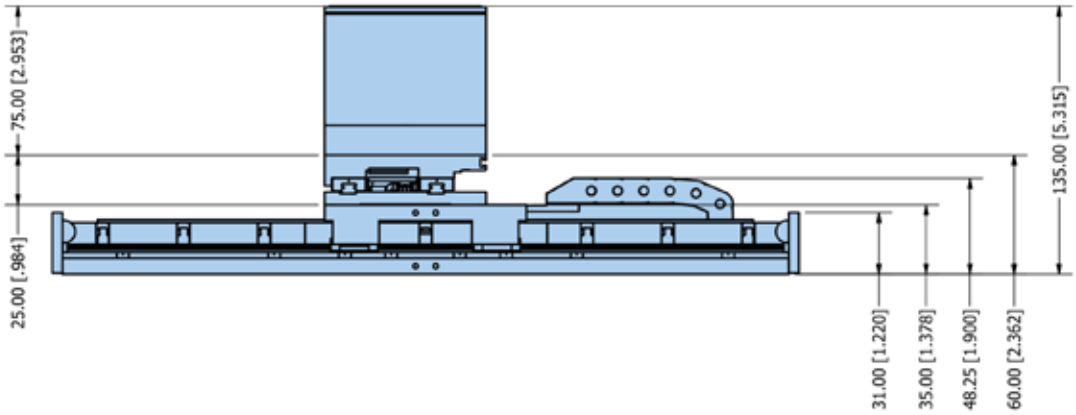
CONFIGURATIONS

mPR80 Multi-Axis Cartesian Robot Configurations

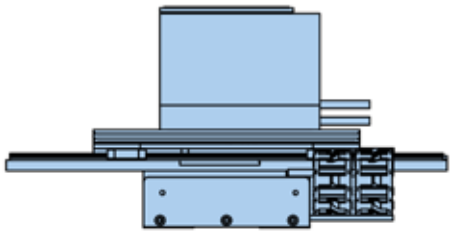
Top



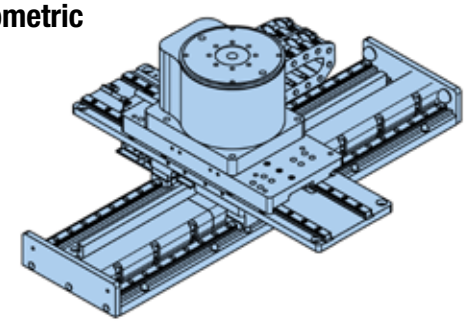
Side



Front

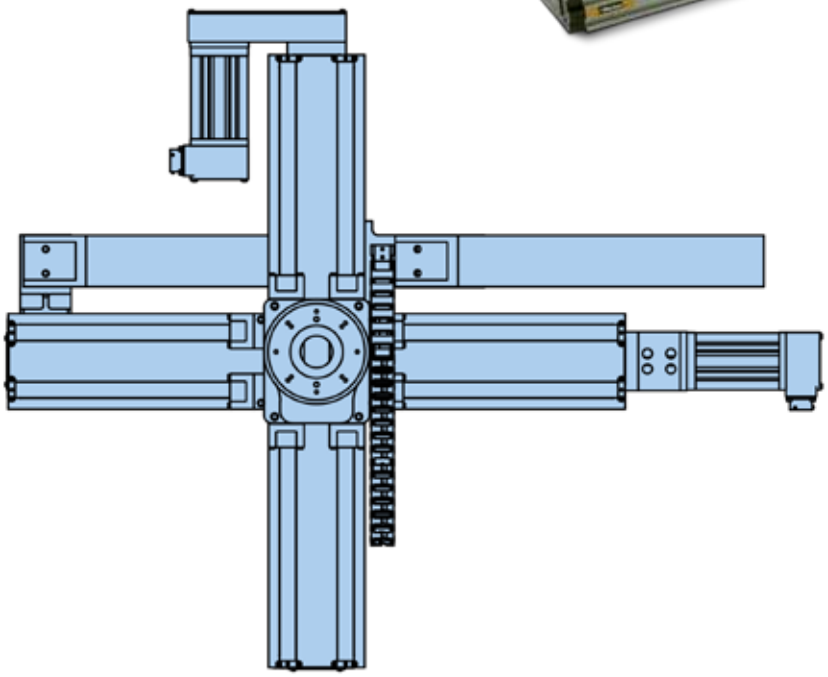


Isometric

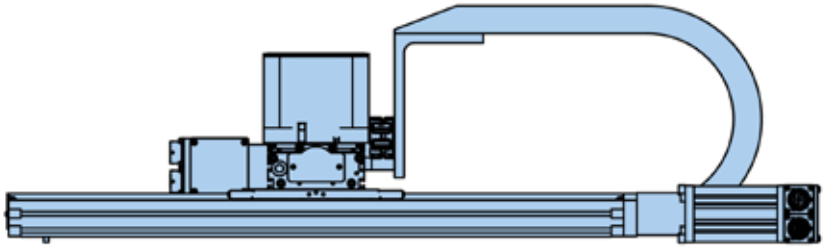


mPR100 Multi-Axis Cartesian Robot Configurations

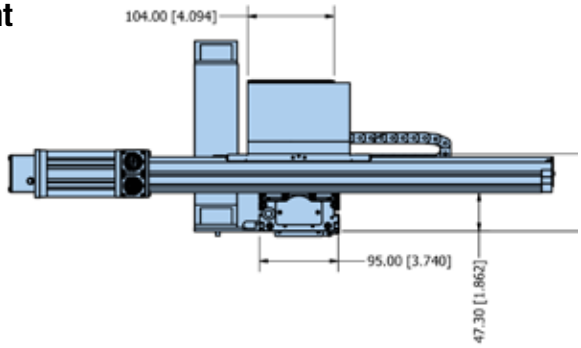
Top



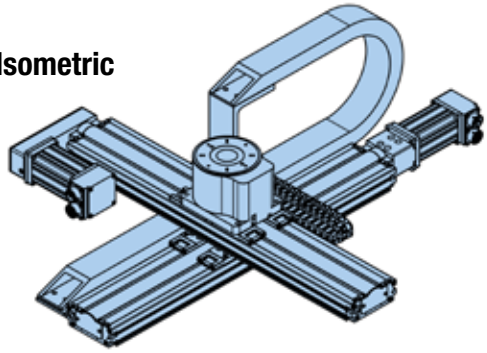
Side



Front



Isometric



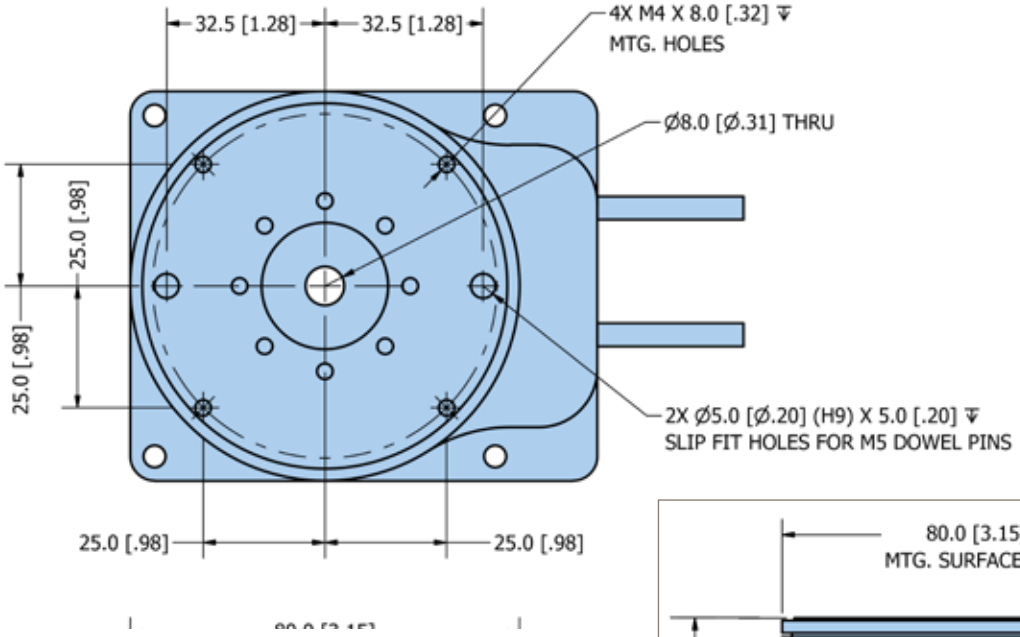
DIMENSIONS

mPR80 Dimensions

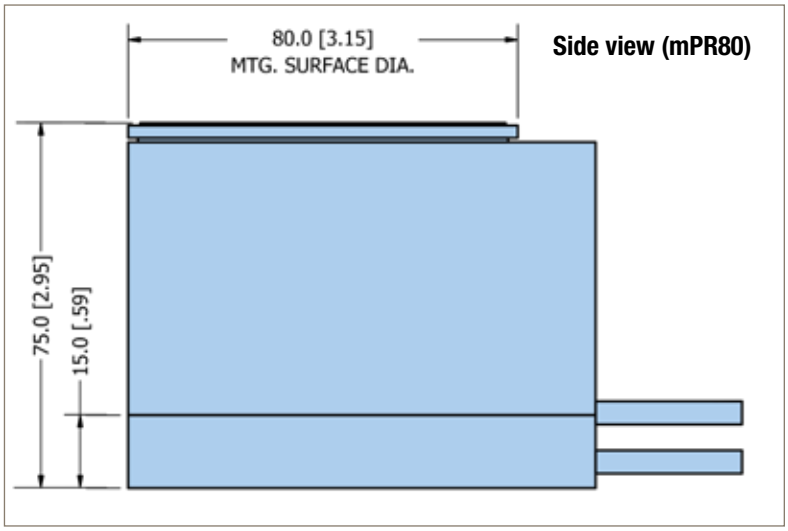
Download 2D & 3D files from www.parker.com/emn/mPR

Dimensions (mm)

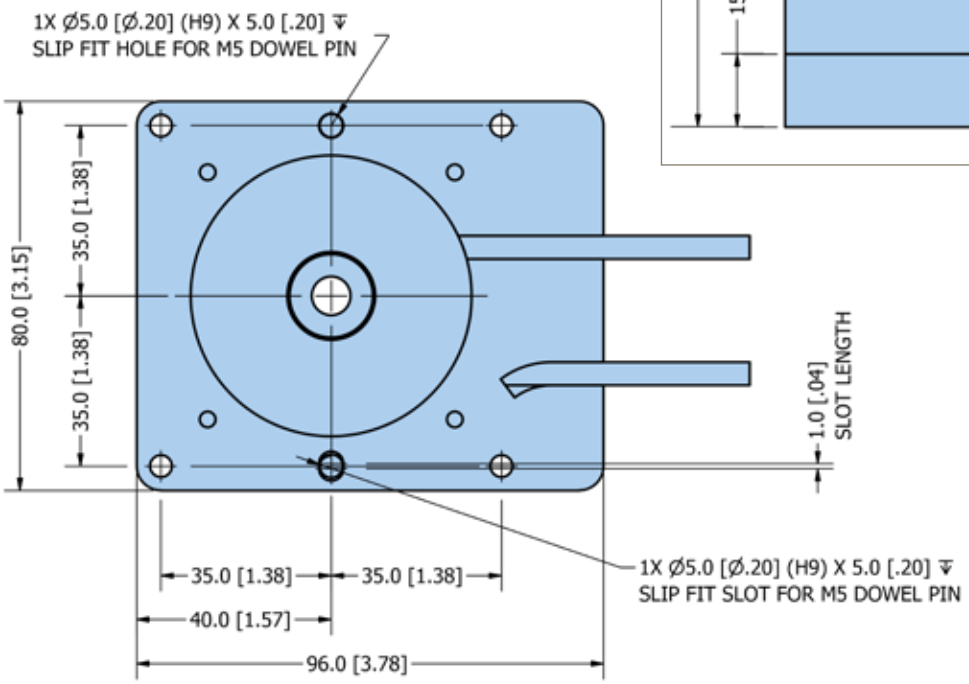
Top view (mPR80)



Side view (mPR80)

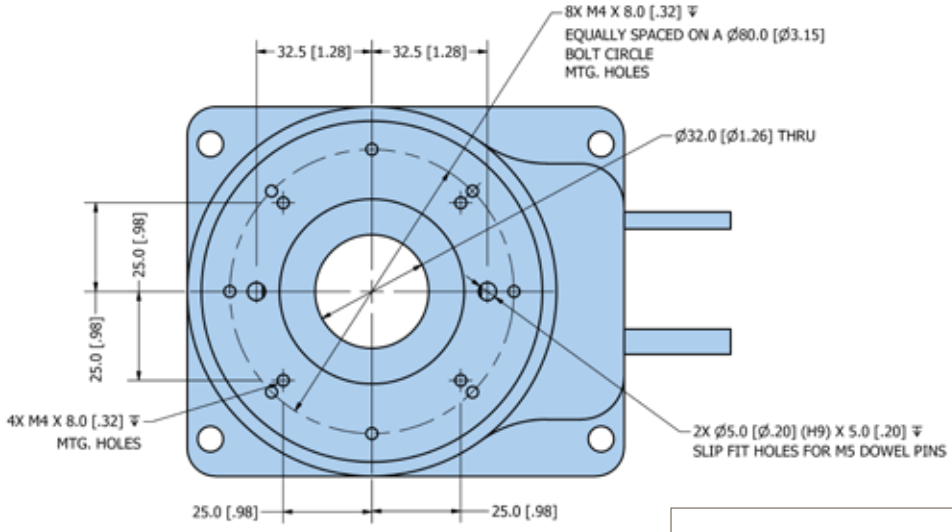


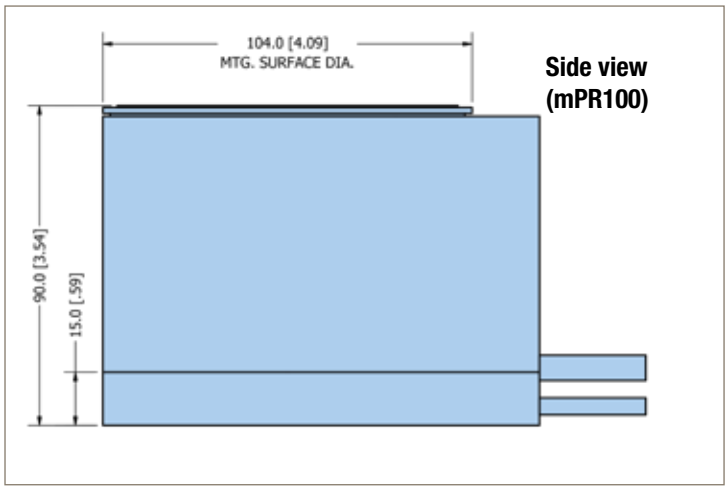
Bottom view (mPR80)



mPR100 Dimensions

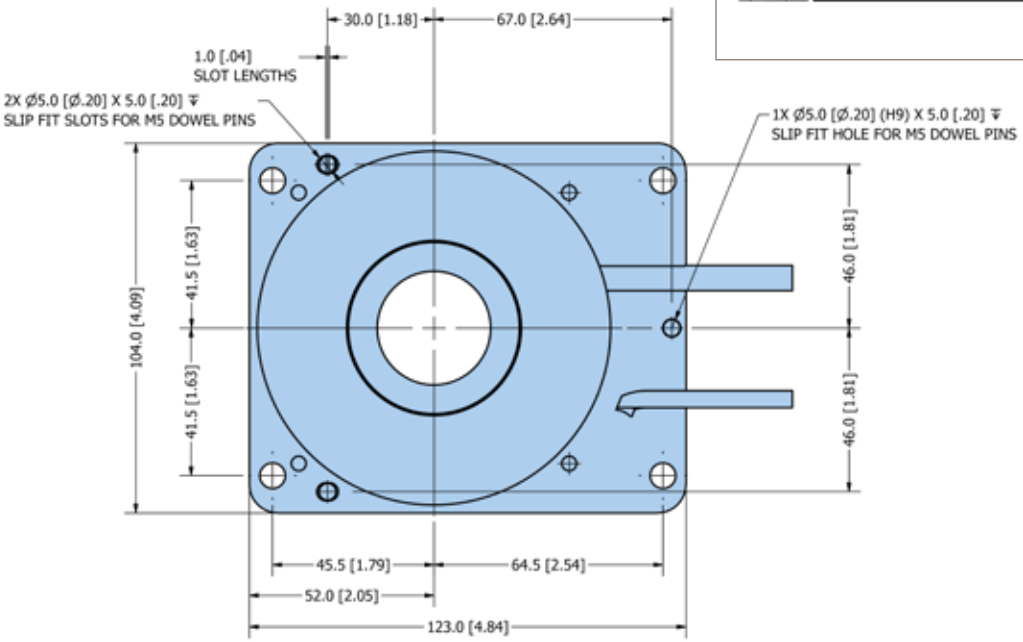
Top view (mPR100)



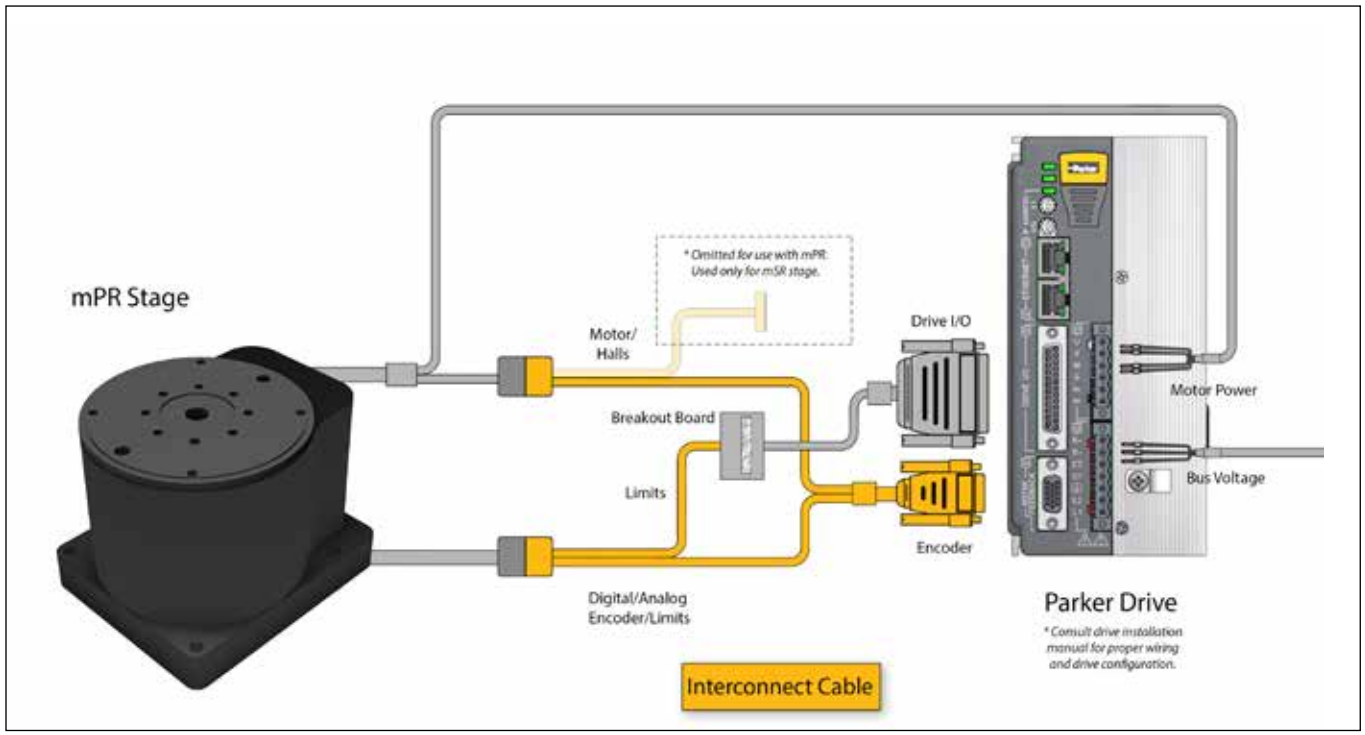


Side view (mPR100)

Bottom view (mPR100)



OPTIONS & ACCESSORIES



Parker Drives and Cable Accessory Part Numbers

Encoder Type	Drive	Cable Interconnect Part Number
Digital	IPA	006-2690-01
Analog	IPA	006-2692-01
Digital	P Series	006-2691-01
Digital/Analog	Motor Power and Hall Flying Lead	006-2678-01
Digital	Digital Encoder Flying Lead	006-2679-01
Analog	Analog Encoder Flying Lead	006-2680-01

ORDERING INFORMATION
mPR Series

Fill in an order code from each of the numbered fields to create a complete model order code.

	①	②	③	④	⑤	⑥	⑦	⑧
Order Example:	mPR	080	D	A	E2	H	3	N

① Series

mPR	

② Size

080	80mm
100	104mm

③ Drive

D	Direct

④ Motor Option

A	Standard Option

⑤ Encoder Resolution

	mPR80	**mPR100**
E1	5.47 Arc-Sec	4.116 Arc-Sec
E2	0.547 Arc-Sec	0.4116 Arc-Sec
E3	0.0547 Arc-Sec	0.0412 Arc-Sec
SC	Analog Sine/Cosine	Analog Sine/Cosine

⑥ Home

H	H

⑦ Cable Option

3	3 meter high-flex

⑧ Clean Room Option

N	Standard Class 1000
*	Consult factory for higher cleanroom options

mPR Drive Solutions

Drive/Control Solutions

The Intelligent Parker Amplifier, or IPA, is a versatile servo drive/controller based on the ACR control platform.

The IPA provides a dual port Ethernet interface which gives the machine builder the flexibility needed to create cost effective motion control solutions.

The IPA operates as a fully programmable stand-alone motion controller with on-board I/O and virtual axis capability or can be integrated into a PLC or PC-based machine control solution.

Software tools are included to optimize motion performance and efficiently monitor and manage the application.

EtherNet/IP gives IPA users a popular connectivity option to PLCs for easy integration of servo motion in larger machine control application. The IPA is an EtherNet/IP adapter device supporting both I/O and Explicit Messaging. Add-On Instructions are available for seamless integration with Logix controllers.

Drive Solutions

P Series Drive

P Series - DC version

The P-Series drives operate with a variety of machine control architectures, and offer sophisticated servo functionality. Accurate and easy to use inertia detection leads to fast set-up of tuning parameters and minimal settling time.

Advanced filtering and vibration suppression features can be used to increase throughput and improve positioning performance.

For high speed, real-time network applications, the P-Series is available with, EtherCAT, the fastest growing, most flexible industrial Ethernet protocol. Ideal for use with the Parker Automation Controller, the P-Series also follows the open standards for EtherCAT.

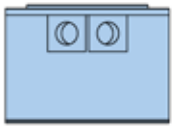
The Pulse version can be configured for step and direction control input and includes analog inputs for torque or velocity control. Select Indexer mode to create up to 64 position table entries triggered via inputs or over a RS422 interface.

The PM-DD Series

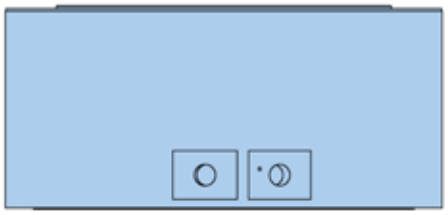
Powerful Direct Drive Rotary Motors

- Robust power and smooth motion with no backlash
- Ideal for applications that require attaching a load directly to the motor
- Compact and accurate with high torque density
- Easily configured with multiple control options
- Very high precision rotary motion

- **Easy configuration**
- **Multiple control options**
- **Predefined Profile mode provides ideal indexing features for your machine**
- **EtherCAT gives high speed communication for multi-axis solutions**



PM-DDB06B



PM-DDFA6G

** Several other sizes available. Bracket shown is only available with home switch option.*

	PM-DD Series
Maximum Diameter (mm)	360
Maximum Payload (N)	15,000
Maximum Velocity (rpm)	500

P Series direct-drive rotary motors are high performance integrated positioning systems. The combination of high torque, zero backlash, and precision bearing structure results in fast settling time and outstanding accuracy.

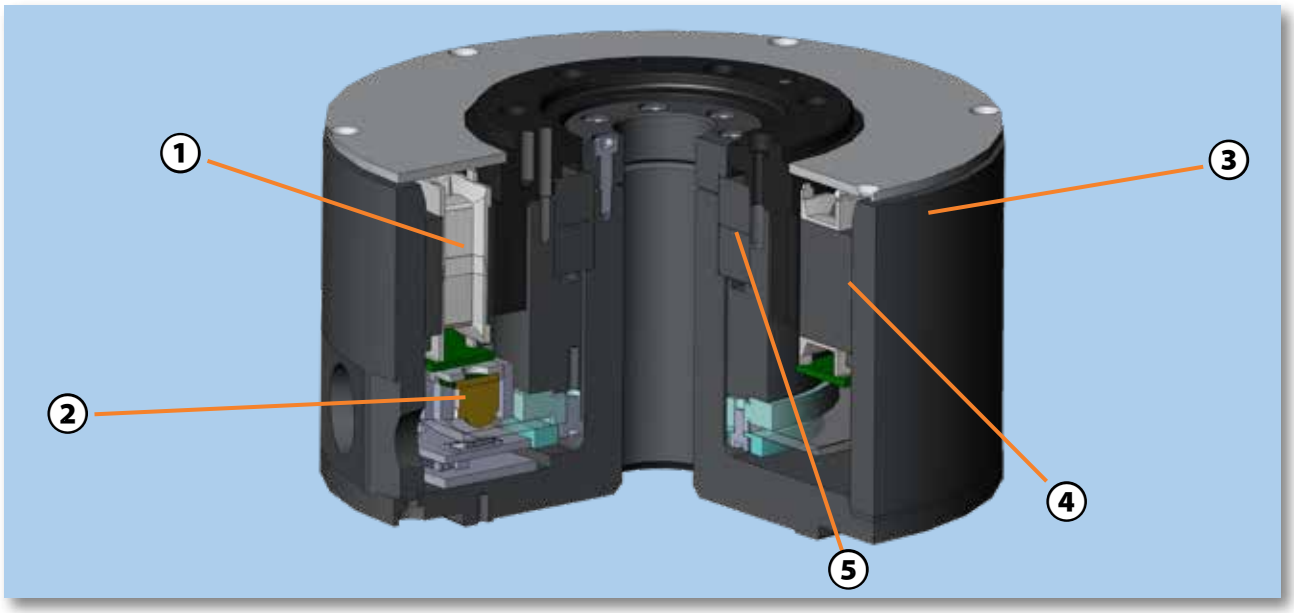
The PM-DD servo motor is designed to provide high torque and high accuracy. Tapped mounting holes and a hollow through bore allow this robust motor to be used in a variety of applications that require the load to be attached directly to the motor.

By eliminating the use of couplings or belts, the load can be driven in a smooth, nearly frictionless motion with no backlash.

PM-DD motors are a perfect match with the P Series Servo Drives. The absolute encoders in the motor populate motor nameplate data back to the drives for simplified commissioning. Accurate and easy to use inertia detection leads to fast set-up of tuning parameters and minimal settling time. Once the motor is connected to a P series drive, it will automatically recognize the motor.

The pulse version of the drive can be configured for step and direction control input and includes analog inputs for torque or velocity control. Select indexer mode to create up to 64 position table entries triggered via inputs or over a RS422 interface.

For high speed, real-time network applications, the P-Series is available with EtherCAT, the fastest growing, most flexible industrial Ethernet protocol. Ideal for use with the Parker Automation Controller, the P-Series also follows the open standards for EtherCAT.



1 Winding
Optimized winding structure provides high performance in a compact package.

2 Encoder
For accurate control, the PM-DD is equipped with 20 bit absolute feedback with BISS-C communication as standard. This allows accuracy of +/- 30 arc-sec. with repeatability of +/- 1.3 arc-sec.

3 Frame
The PM-DD is made in five frame sizes: 135mm, 175mm, 230mm, 290mm, and 360mm. 13 models provide power options that can meet a wide variety of application requirements.

- **Rated speed: 200 RPM/150 RPM**
- **Rated torque: 3 Nm to 160 Nm**

4 Magnet
High torque density by using highest class rated Neodymium permanent magnet.

5 Bearing
Improved bearing design yields low vibration and outstanding mechanical accuracy. Load carrying capabilities extend to 15,000N.

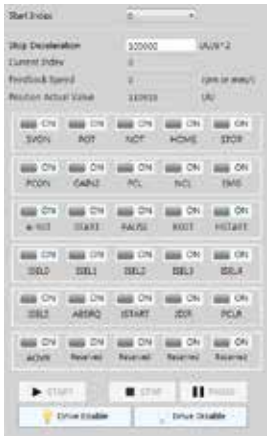
SERVO DRIVE

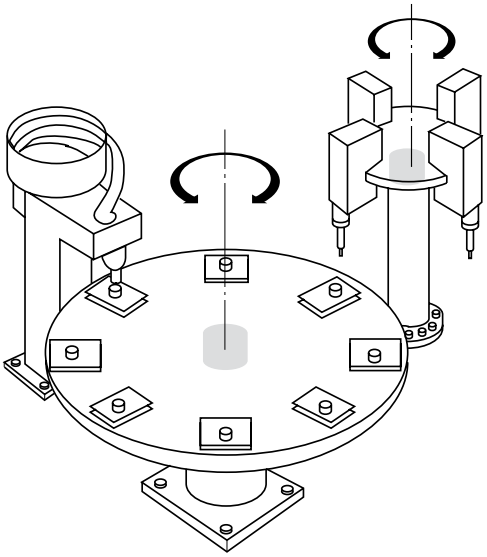
Ideal direct drive solution for P series drive

- **100~400W : PD-04P & 04C**
- **400~1kW : PD-10P & 10C**
- **1kW~3.5kW : PD-35P & 35C**

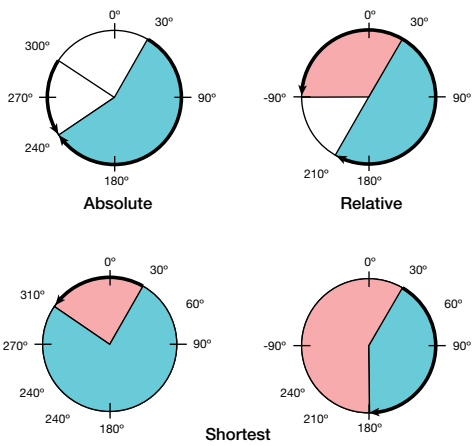
Pre-Defined Profile Function with Parker Drives

- **Available in 64 profiles**





- **Rotary Absolute/Relative/ Shortest move**



SPECIFICATIONS

PM-DD Series

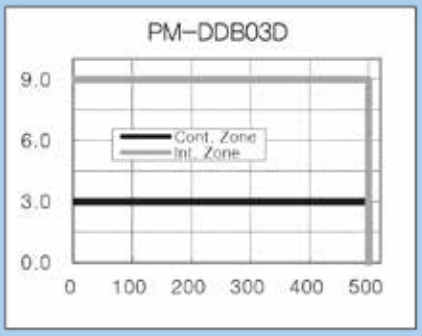
With 5 frame sizes (13 models)available, the PM-DD Series can provide peak torques up to 480 Nm and load carrying capabilities up to 15,000 N.

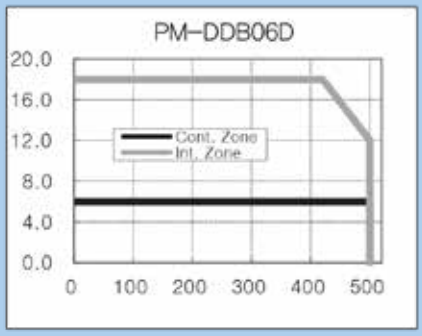
		PM-DDB□□D□H			PM-DDC□□D□H			PM-DDD□□D□H			PM-DDE□□D□H		PM-DDF□□G□H	
		03	06	09	06	12	18	12	22	34	40	60	A1	A6
P series Drive		PD-04	PD-04	PD-04	PD-04	PD-04	PD-04	PD-04	PD-10	PD-10	PD-10	PD-35	PD-35	PD-35
Diameter	mm	ø135			ø175			ø230			ø290		ø360	
Rated Power	W	63	126	188	126	251	377	251	461	712	838	1,257	1,728	2,513
Rated Torque	N-m	3	6	9	6	12	18	12	22	34	40	60	110	160
Peak Torque	N-m	9	18	27	18	36	54	36	66	102	120	180	330	480
Rated Current	Arms	1.12	1.46	2.63	1.48	2.41	3	2.58	3.33	5.72	5.3	8.33	9.48	14.6
Peak Current	Arms	3.36	4.38	7.89	4.44	7.23	9	7.74	9.99	17.16	15.9	24.99	28.44	43.8
Rated Velocity	rpm	200			200			200			200		150	
Max Velocity	rpm	500	500	500	500	500	400	500	400	400	300	300	250	250
Torque Constant	N-m/ Arms	2.76	4.25	3.57	4.18	5.13	6.12	4.8	6.81	6.13	7.77	7.42	11.95	11.29
Moment of Inertia	kg -$m^2 \times 10^{-4}$	5.74	8.67	11.5	27.32	38.9	50.48	54.14	68.15	82.16	311.55	371.71	1410.2	1763.4
Power Rate	kW/s	15.68	42.35	70.43	13.18	52.71	118.59	26.6	71.02	140.7	51.36	96.68	85.9	145.4
Angular Acceleration	rad/s^2	191.2	141.6	127.7	455.03	323.9	280.3	450.9	309.6	241.5	778.35	619.1	1281.13	1101.4
Accuracy for ABS Position	arc-sec	±30												
Accuracy for Repeatability	arc-sec	±1.3												
Axial run-out	mm	0.015												
Radial run-out	mm	0.03												
Allowable thrust load	N	1500			3300			4000			11000		15000	
Allowable moment load	N-m	40			70			93			250		350	
Encoder		20-bit single turn serial encoder (BiSS-C / Absolute)												
Weight (Approx.)	kg	6.3	7.2	9.2	8.7	10.6	12.6	17.3	19.6	21.9	28.2	35	54	70.3

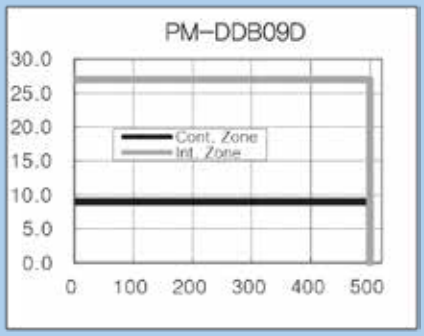
Working Environment	Ambient Temperature	Operating: 32–104°F (0–40°C) Storage: -4–140°F (-20–60°C)
	Ambient Humidity	20–80% RH (avoid dew/condensation)
	Atmosphere	Avoid direct sunlight. No corrosive gas, inflammable gas, oil mist, or dust.

Speed-Torque Performance

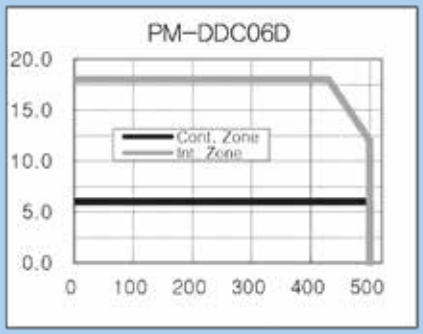
Size B

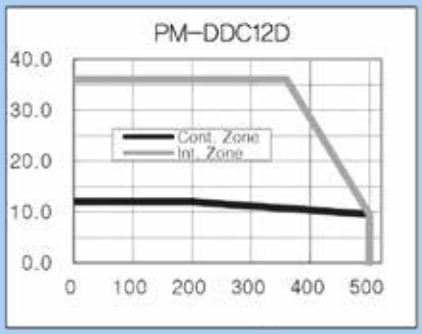


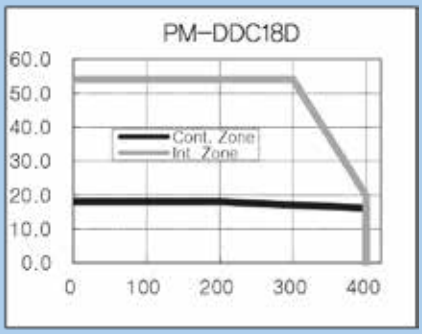




Size C

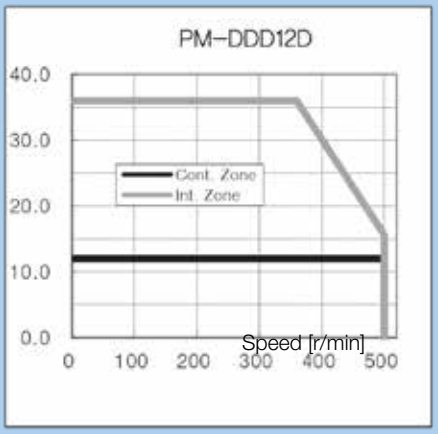




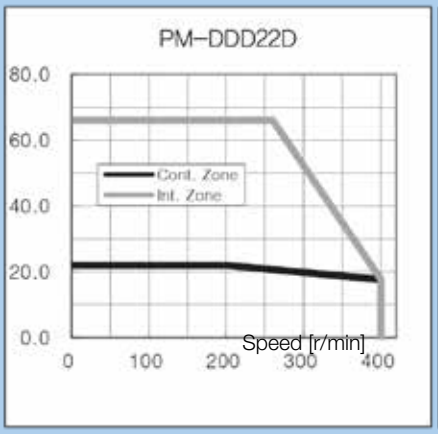


Size D

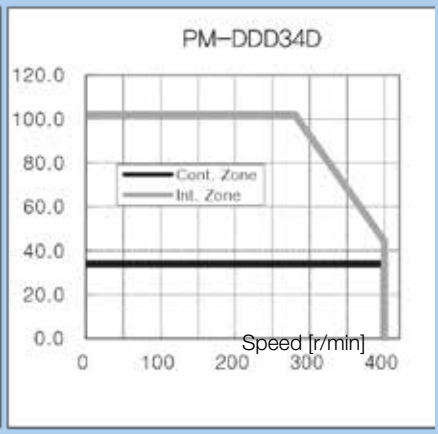
Torque [Nm]



Torque [Nm]

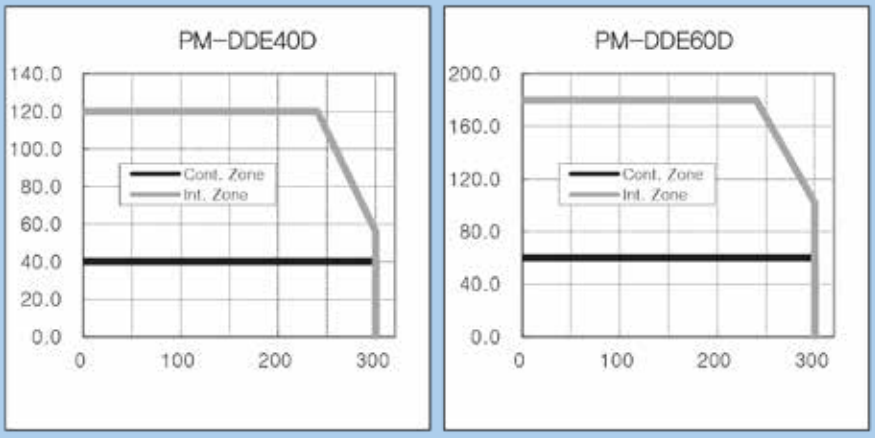


Torque [Nm]

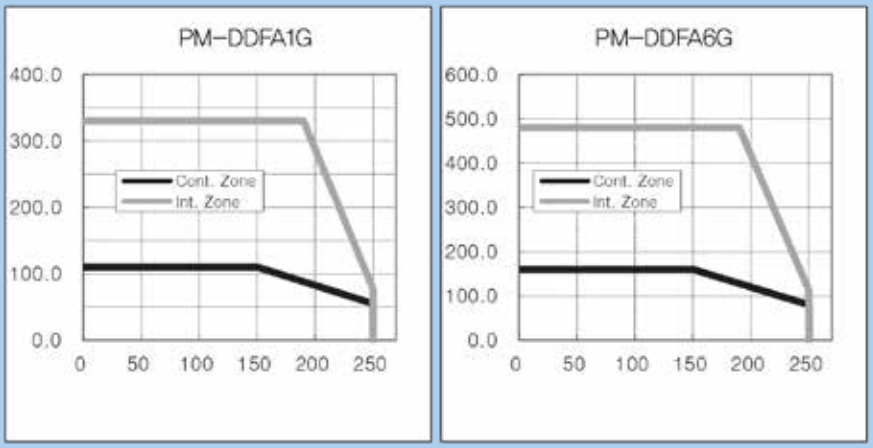


Speed-Torque Performance

Size E

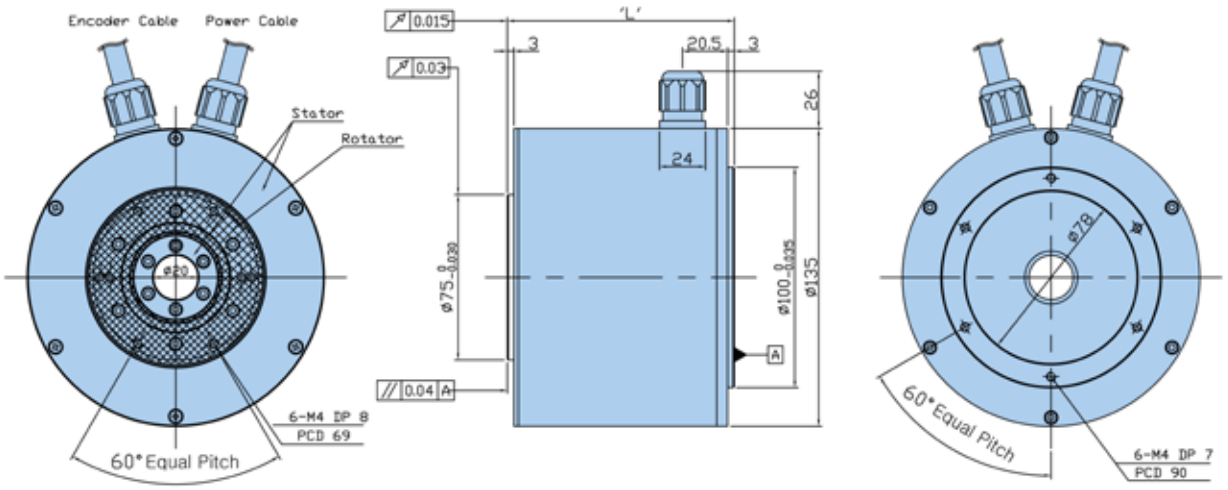


Size F



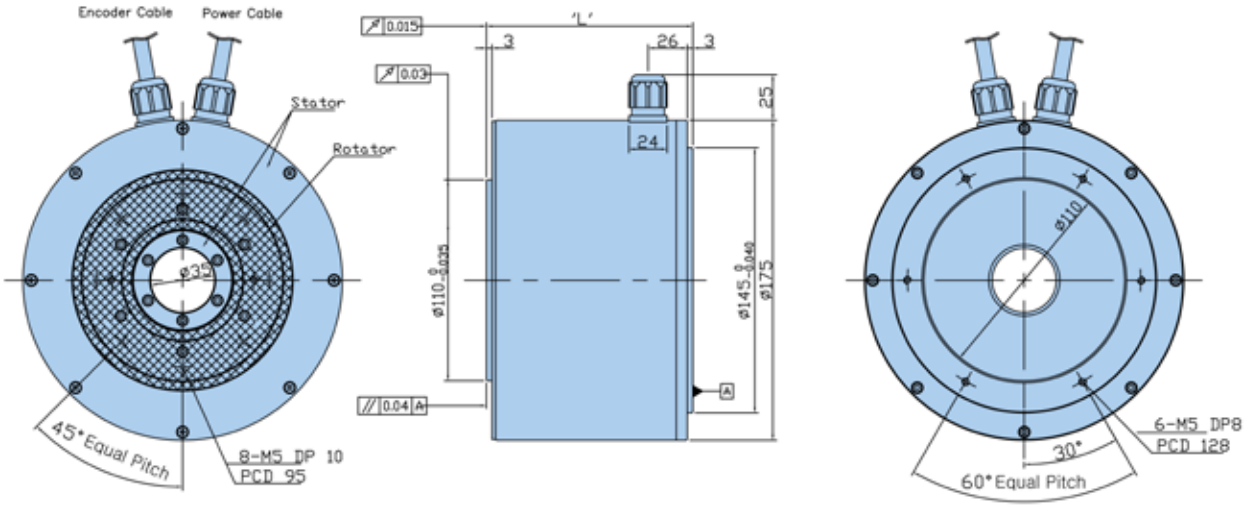
DIMENSIONS

PM-DD Series



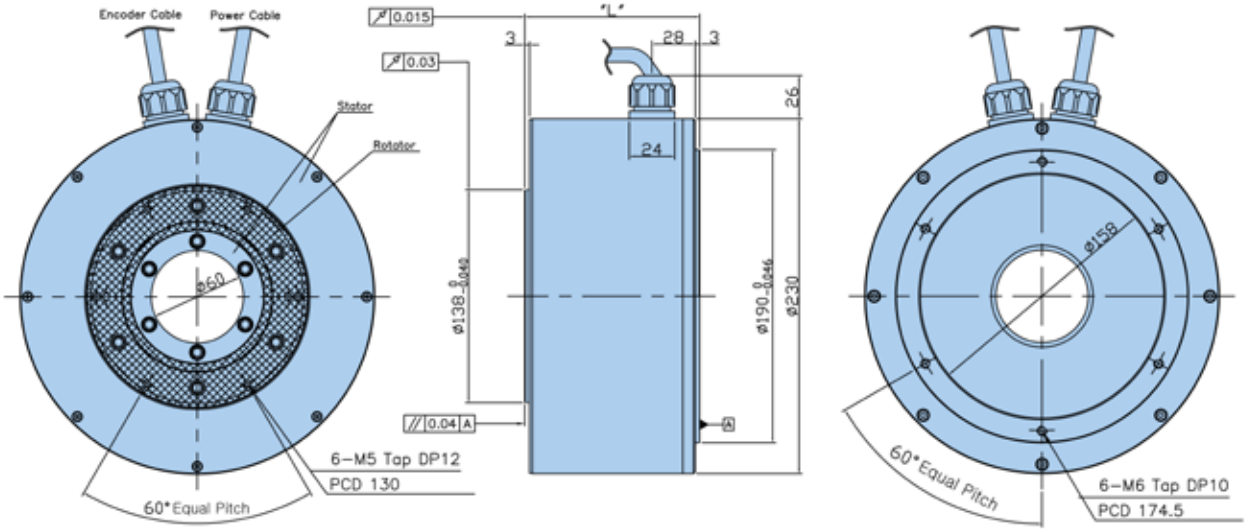
Size B

Motor	Length (mm) 'L'	Weight (Kg)
PM-DDB03D	78	6.3
PM-DDB06D	100	7.2
PM-DDB09D	124	9.2



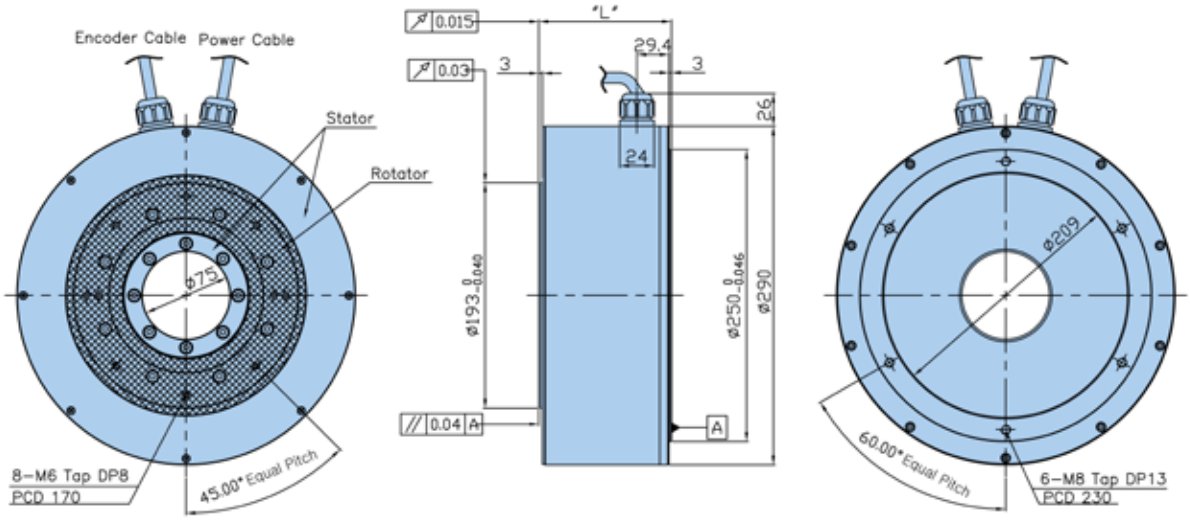
Size C

Motor	Length (mm) 'L'	Weight (Kg)
PM-DDC06D	77	8.7
PM-DDC12D	95	10.6
PM-DDC18D	113	12.6



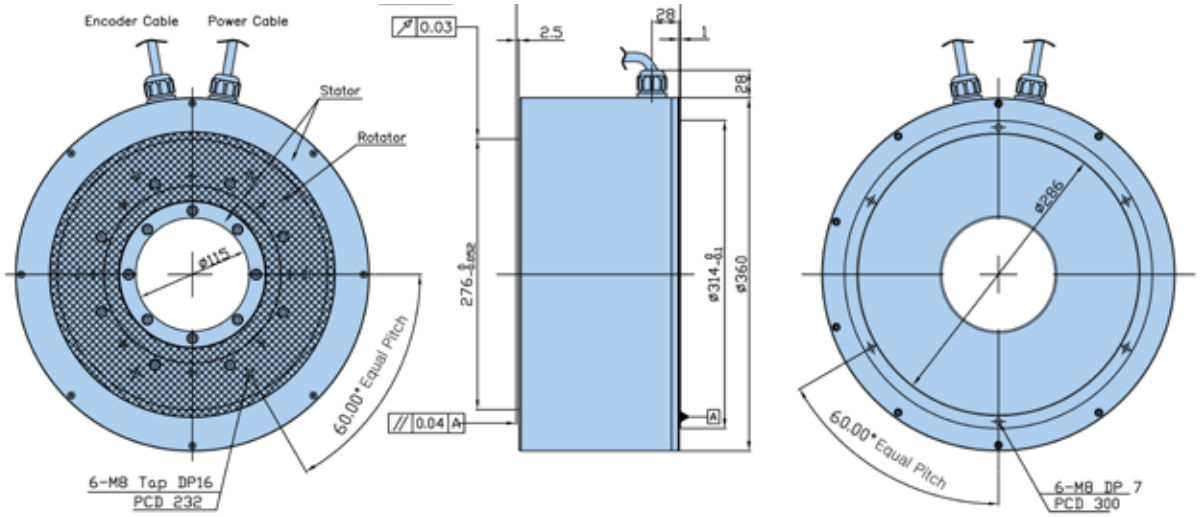
Size D

Motor	Length (mm) 'L'	Weight (Kg)
PM-DDD12D	82.5	17.3
PM-DDD22D	100.5	19.6
PM-DDD34D	118.5	21.9



Size E

Motor	Length (mm) 'L'	Weight (Kg)
PM-DDE40D	95.4	28.2
PM-DDE60D	113.4	35



Size B

Product	Length (mm) 'L'	Weight (Kg)
PM-DDFA1G	131	54
PM-DDFA6G	167	70.3

ORDERING INFORMATION
PM-DD Series

Fill in an order code from each of the numbered fields to create a complete model order code.

	①	②	③	④	⑤	⑥	⑦
MOTOR Order Example:	PM-DD	B	60	A	NO	H	

① **Series**
- **DD** DD Motor

② **Size**
- **B** External Diameter 135mm
- **C** External Diameter 175mm
- **D** External Diameter 230mm
- **E** External Diameter 290mm
- **F** External Diameter 360mm

③ **Torque**
- **03** 3Nm
- **06** 6Nm
- **09** 9Nm
- **60** 60Nm
- **A6** 160Nm

④ **Rated Speed**
- **A** 300rpm
- **D** 200rpm (Standard, ø135~ø290 : 200rpm)
- **G** 150rpm (Standard, ø360 : 150rpm)
- **M** 100rpm

⑤ **Encoder**
- **NO** 135 | 175 | 230 | 290 | 360
  20Bit (Single turn ABS, Biss-C communication)

⑥ **Shaft Type**
- **H** Standard hollow shaft

⑦ **Voltage**
  200V DD Motor (no entry needed)

	①	②	③	④
CABLE Order Example:	APCS	E	03	ZS

① **Cable Type**
- **APCS** APCS

② **Cable**
- **E** Encoder Feedback
- **PN** Motor Power

③ **Length**
- **03** 3m
- **05** 5m
- **10** 10m
- **20** 20m

④ **Rated Speed**
- **ZS** Standard Feedback Cable
  Standard Power Cable (PM-DDF series)
- **YS** Standard Power Cable(PM-DDB~E series)

RM Series Worm Drive Precision Stages

Precision for High Load Applications

- 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

Applications

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

When to Use

- High accuracy
- High loads
- Compact
- High stiffness

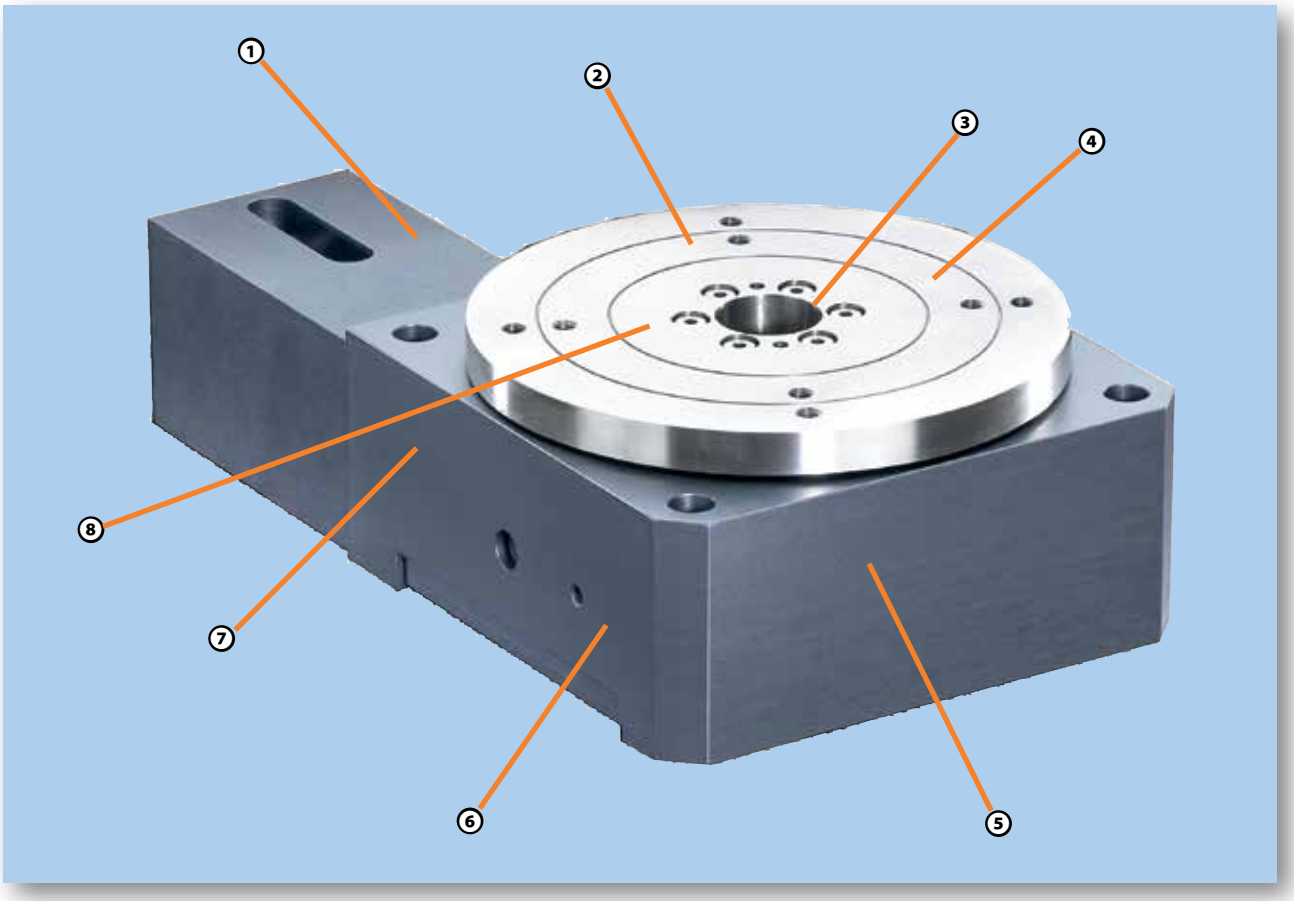
RM100 RM150 RM200 RM300

**Bracket shown is only available with home switch option.*

	RM Series
Maximum Diameter (mm)	297
Maximum Payload (N)	4,511
Maximum Velocity (rpm)	30

The RM 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 cross roller bearing, offering exceptional stiffness and load capacity.



1. **Motor Mounting and Coupling**
for easy installation

2. **Integral Limit Switches**
mounted under top plate for safety

3. **Preloaded Cross 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

6. **Completely Sealed and Lubricated**
for long life even in harsh environments

7. **Heavy Duty Stainless Steel Worm with Bronze Gear**
for smooth operation and high torque

8. **Self-Compensating Preload**
for zero backlash

SPECIFICATIONS

RM Series Worm Drive Precision Stages

The Rotary Stage Series is ideal for traditional industrial applications which require high load and thrust capacities while achieving precision motion.

Performance Specifications

	Axial Capacity		Perpendicular Capacity @ 25 mm		@150 mm	
Model No.	(kg)	(lb)	(kgf)	(lb)	(kgf)	(lb)
R100M	100	220	22	48	7	15
R150M	400	880	88	194	33	73
R200M	600	1320	200	440	85	187
R300M	1000	2220	325	715	160	352

	Worm	Unidirectional Repeatability (1)	Peak Output Torque @100 RPM Input		Peak Output Speed	Weight		Inertia	
Model No.	Gear Ratio	(arc-min)	(Nm)	(in-lb)	(RPM)	(kgf)	(lbf)	gm-cm sec²	oz-in sec²
R100M	60:1	0.2	8	70.8	30	2.3	5.0	0.0057	0.0000784
R150M	72:1	0.2	25	221	30	6.0	13.0	0.055	0.00076
R200M	72:1	0.2	55	487	30	15.0	33.0	0.148	0.00210
R300M	90:1	0.2	75	664	30	35.0	77.0	0.368	0.00516

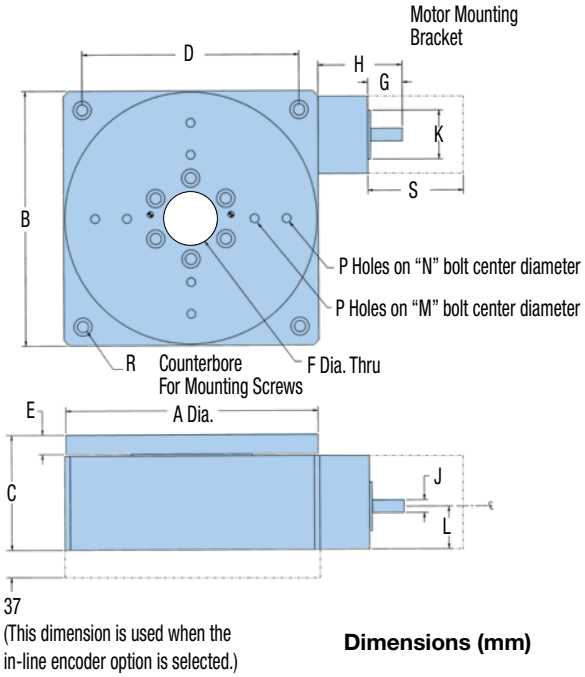
Accuracy Specifications (1)

	Main Bearing Runout	Wobble	Positional Accuracy (1)	Bidirectional Repeatability (1)	Maximum Running Torque (Unloaded at 2 rps)	
	(microns)	(arc-min)	(arc-min)	(arc-min)	(Nm)	(oz-in)
R100M	±15	±0.5	5	0.5	0.141	20
R150M	±20	±0.5	3	0.5	0.177	25
R200M	±25	±0.5	3	0.5	0.212	30
R300M	±30	±0.5	3	0.5	0.247	35

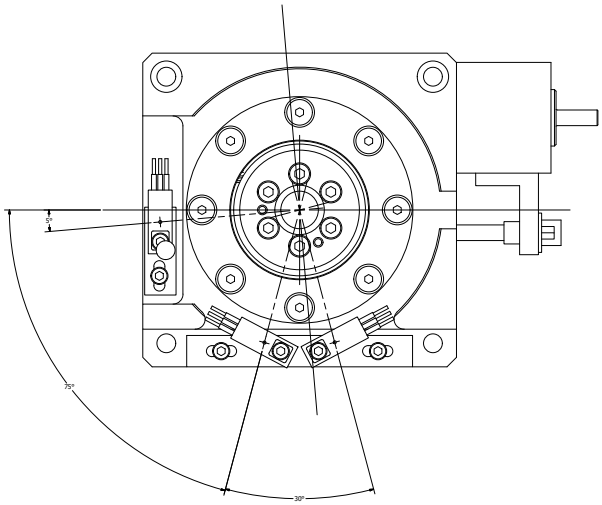
(1) Accuracy and repeatability are based on stage mounted to a flat granite surface and measured at 25 mm above the center of the stage.

DIMENSIONS

RM Series Dimensions



Dimensions (mm)



RM Series Sensor Locations

	A		B		C		D		E	
Model No.	**(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

	F		G		H		J		K	
Model No.	**(mm)**	**(in)**	**(mm)**	**(in)**	**(mm)**	**(in)**	**(mm)**	**(in)**	**(mm)**	**(in)**
R100M	12.700	0.50	15	0.59	45	1.77	5	0.197	18	0.709
R150M	26.187	1.03	27	1.06	66	2.60	10	0.394	38.1	1.50
R200M	41.280	1.63	27	1.06	66	2.60	10	0.394	38.1	1.50
R300M	55.575	2.19	39	1.53	113	4.45	12	0.472	73	2.875

	L		M		N		P	R	Stage Weight	
Model No.	**(mm)**	**(in)**	**(mm)**	**(in)**	**(mm)**	**(in)**	**Tap**	**CBore**	**(kg)**	**(lb)**
R100M	21	0.83	45	1.772	75	2.953	M5 x 0.8	M5	1.8	3.97
R150M	30.1	1.18	100	3.937	125	4.921	M6 x 1	M6	5	11
R200M	33.5	1.32	100	3.937	150	5.905	M8 x 1.25	M8	13	28.66
R300M	44.3	1.74	150	5.905	250	9.843	M8 x 1.25	M8	29	63.93

ORDERING INFORMATION

RM Series Worm Drive Precision Stages

Fill in an order code from each of the numbered fields to create a complete model order code.

	①	②	③	④	⑤	⑥	⑦	⑧
Order Example:	R	150M	7	MP2	C04	L1H1	E0	R1

① Series

R	Worm Gear Rotary Series

② Metric Square Width

100M	100 mm
150M	150 mm
200M	200 mm
300M	300 mm

③ Gear Ratio

6	60:1 (R100)
7	72:1 (R150 and R200)
9	90:1 (R300)

④ Motor Mounting

M00	No motor block included
M16	Motor block for Parker BE16(1,2,3 stack)
M22	Motor block for Parker LV/HV23, SM23(1,2,3)
M23	Motor block for Parker BE23(1,2,3 stack)
M34	Motor block for Parker BE34 motors
MP1	Including motor and mount with BE163CJ-NPSN
MP2	Including motor and mount with BE233FJ-NSPN
MP3	Including motor and mount with HV233-02-10

⑤ Coupling Code

C00	No coupling included
C01	0.1875 inch coupling included
C02	5 mm coupling included
C03	0.250 inch coupling included (for BE16,LV/HV23)
C04	0.375 inch coupling included (for BE23/SM23(1,2,3)
C05	8 mm coupling included
C06	9 mm coupling included
C07	11 mm coupling included
C08	0.500 inch coupling included (for BE34 motors)
C09	14 mm coupling included
C10	16 mm coupling included

⑥ Limits Switches

L0H0	No Home or Limit Sensors included
L0H1	1 normally open NPN home sensor included
L1H0	2 normally closed NPN limit sensors included
L1H1	1 home and 2 limit sensors included

⑦ Encoder in Line with Top Plate

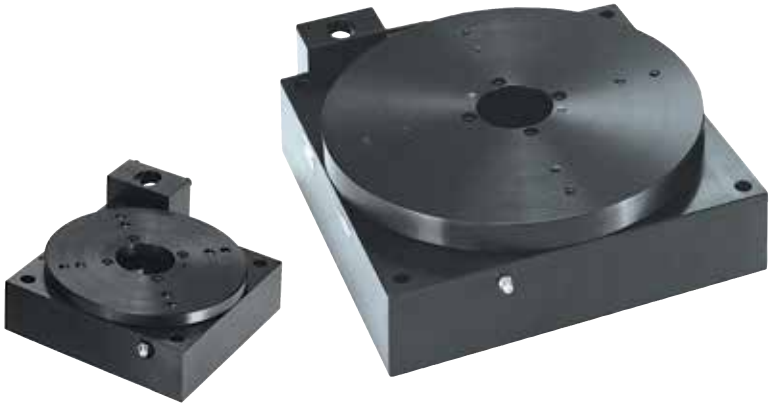
E0	No encoder included
E1	2000 line in-line rotary encoder included

⑧ Environment

R1	Standard environmental protection
R2	Cleanroom preparation included to class XX(TBD)

200RT Series Rotary Tables
Precise Rotary Positioning and Indexing

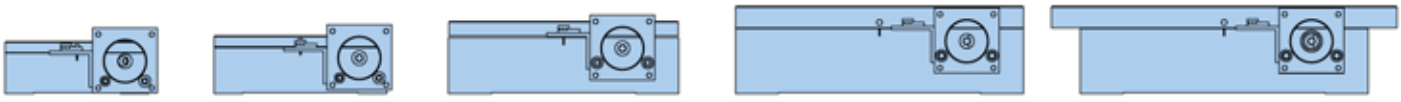
- **Highly repeatable indexing (12 arc-sec)**
- **Load capacities to 200 lbs**
- **360 degrees continuous travel**
- **Performance tested worm gear drive**
- **Selectable table sizes and drive ratio**
- **Dual race angular contact support bearing**
- **Quality design and construction**



	200RT
Maximum Diameter (mm)	304
Maximum Payload (N)	889
Maximum Input Velocity (rpm)	900

Options

- **Motor couplings in a wide range of coupling styles and bores**
- **Motor mounts**
- **Home sensor for fixed reference point**
- **High resolution, high accuracy rotary encoders**
- **Custom designed sealed units**
- **Motors, drives & controls available for complete system solutions**



205RT **206RT** **208RT** **210RT** **212RT**

**Bracket shown is only available with home switch option.*

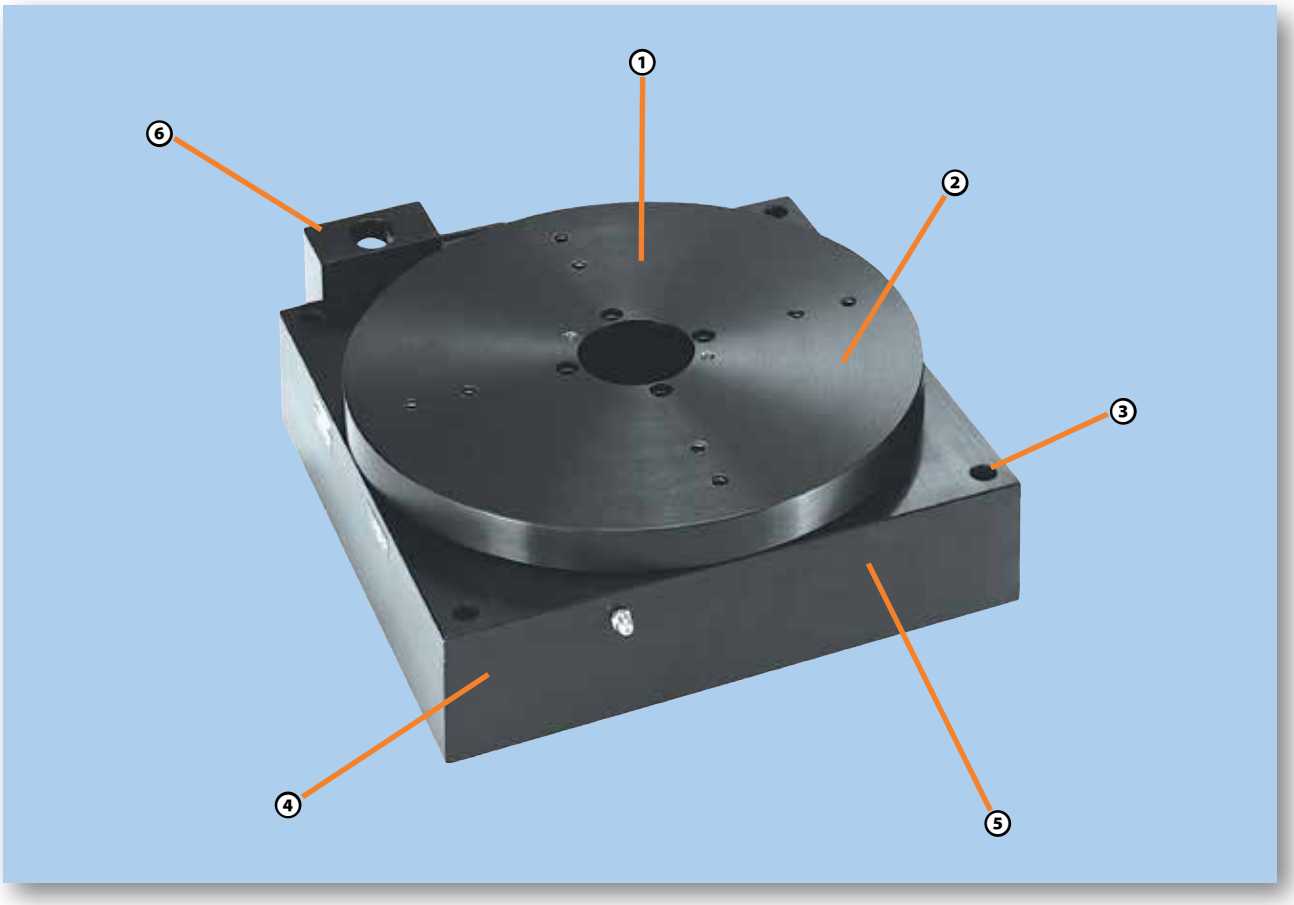
The 200RT Series Rotary Tables are designed for precise motor-driven rotary positioning and indexing. These tables are designed to function independently or in conjunction with linear tables used in the high-precision and precision automation applications.

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 which 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.



① **Multiple sizes**
Models are available in five diameter sizes and are offered with four gear ratios

② **Load capacities**
to 200 pounds

③ **Available with English or Metric Mounting**

④ **Low profile design**
minimizes stack height in multi-axis configurations

⑤ **High resolution, high accuracy rotary encoders**
can be added for direct positional feedback of the table top position.

⑥ **Custom designed sealed units**
are offered to prevent excessive wear or internal damage resulting from dust and contaminants

SPECIFICATIONS

The various table sizes of the 200RT Series makes it convenient to match size, speed, and load requirements for any application.

200RT Common Characteristics

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

* Runout refers to the vertical deviation of the table top while rotating.

** Concentricity refers to the horizontal deviation of the table top while rotating.

*** Maximum output velocity is dependent on the drive ratio selected.

Travel Dependent Characteristics

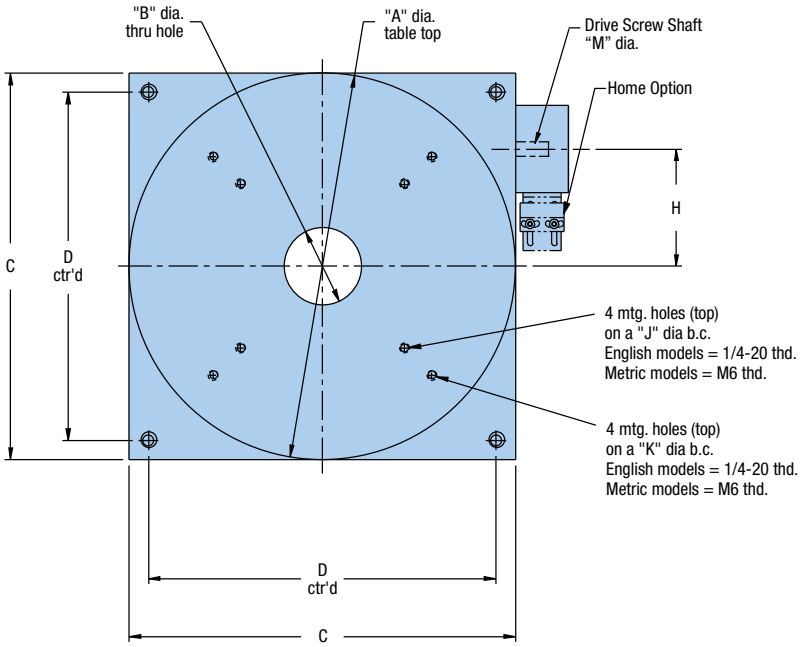
			Accuracy arc-min						Weight lb (kgf)	
Table Diameter inches	**Drive Ratio**	**Load Capacity lbs (kgf)***	**Precision**	**Standard**	**Output Torque in-lb (N-m)**	**Inertia 10^{-3}-oz.-in-sec^2 (10^{-6} kg-m-sec^2)**	**Input Breakaway Torque (max.) oz.-in (N-m)**	**Running Torque (max) oz-in (N-m)**	**Standard Top**	**Total**
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	25 (11)	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	120 (13.6)	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	120 (13.6)	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	120 (13.6)	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	120 (13.6)	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	120 (13.6)	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	120 (13.6)	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 (14.5)

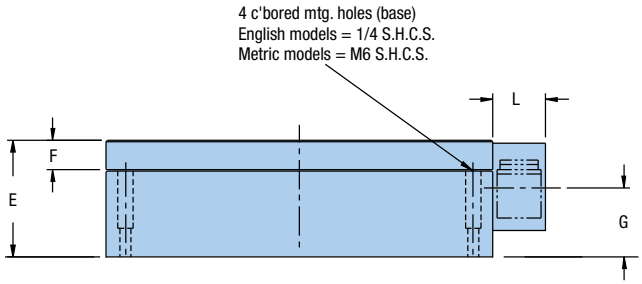
* Load centered on table. If offset, see charts for moment capacity.

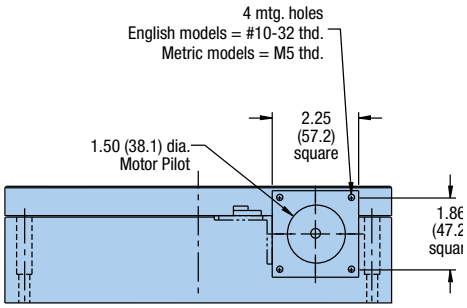
DIMENSIONS

Download 2D & 3D files from www.parker.com/emn/RTSeries

Dimensions - inches (mm)







English Units

A	B	C	D	E Standard (T2)	E Option (T3)	F Standard (T2)	F Option (T3)	G	H	J	K	L	M
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	0.25
8.0	1.75*	8.0	6.0	2.5	3.12	0.50	1.00	1.57	2.04	4.0	6.0	1.38	0.25
10.0	2.0	10.0	9.0	3.0	3.62	0.75	1.00	1.81	3.03	6.0	8.0	1.38	0.25
12.0	2.0	10.0	9.0	3.0	3.62	0.75	1.00	1.81	3.03	8.0	10.0	2.38	0.25

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

Metric Units

A	B	C	D	E Standard (T2)	E Option (T3)	F Standard (T2)	F Option (T3)	G	H	J	K	L	M
127.0	25.4	127.0	100	46.0	61.5	9.6	25.0	28.1	42.1	75	100	35	4.76
152.4	44.5	152.4	125	50.8	66.5	9.6	25.0	31.4	51.8	100	125	35	6.35
203.2	44.5*	203.2	175	63.5	79.2	12.7	25.0	39.8	51.8	100	150	35	6.35
254.0	50.8	254.0	225	76.2	91.9	19.0	25.0	45.9	76.9	150	200	35	6.35
304.8	50.8	254.0	225	76.2	91.9	19.0	25.0	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).

OPTIONS & ACCESSORIES

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 embedded on the table top.

Rotary Encoders

High resolution, high accuracy rotary encoders can be added for direct positional feedback of the table top position.

Rotary encoders can be mounted directly to the base of the rotary table. The encoder input shaft is then coupled directly to the rotary table top, supplying positional feedback of the table top, with no drive train errors. They can be supplied with or without a base housing which encloses and protects the encoder.

Seals

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

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.

Rotary inspection stand

ORDERING INFORMATION

200RT Rotary Tables

Fill in an order code from each of the numbered fields to create a complete model order code.

	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
Order Example:	2	08	01	RT	M	S	H1	C1	M1	E0	T1

① Series
2

② Table Diameter
05	5 in, 125 mm
06	6 in, 150 mm
08	8 in, 200 mm
10	10 in, 250 mm
12	12 in, 300 mm

③ Gear Ratio
01	180:1, Available on all dia.
02	90:1, Available on all dia.
04	45:1, Available on 6”, 10” and 12” dia. only
05	36:1, Available on 5” and 8” dia. only

④ Table Style
RT

⑤ Mounting
E	English
M	Metric (800CT only)

⑥ Grade
S	Standard
P	Precision

⑦ Home
H1	No home switches
H2	Magnetic home switches

⑧ Motor Coupling
C1	No coupling
C2	0.25 in bore, helix, aluminum
C3	0.25 in bore, helix, stainless steel (not available on 205 model)
C4	0.25 in bore, bellows, required for precision grade
C6	0.375 in bore, helix, stainless steel (not available on 205 model)
C7	0.375 in bore, bellows, required for precision grade

⑨ Motor Mount
M1	23 frame size

⑩ Encoder
E0	No encoder
E8	Ring encoder – 314,880 post quad. counts/rev

⑪ Table Top
T1	No top
T2	Standard top
T3	Oversized top (raises height to clear NEMA 23 motor)

Free sizing and selection support from Virtual Engineer at parker.com/VirtualEngineer

Virtual Engineer

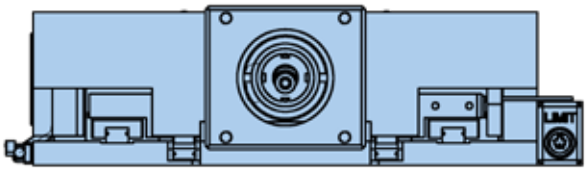
ZP200 Series Vertical Lift "Wedge" Table

Precise Vertical Translation, Small Form Factor

- **Precision platform for vertical (Z-axis) positioning**
- **Continuous duty - High dynamic performance**
- **Precision straightness (±5 arc-sec) throughout range of motion**
- **Precision ground ballscrew drive - 5, 10, or 20 mm lead**
- **Multi-axis compatibility with XR and LXR tables**
- **Laser tested and certified with calibrated lead value**
- **Quality design and construction**

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**



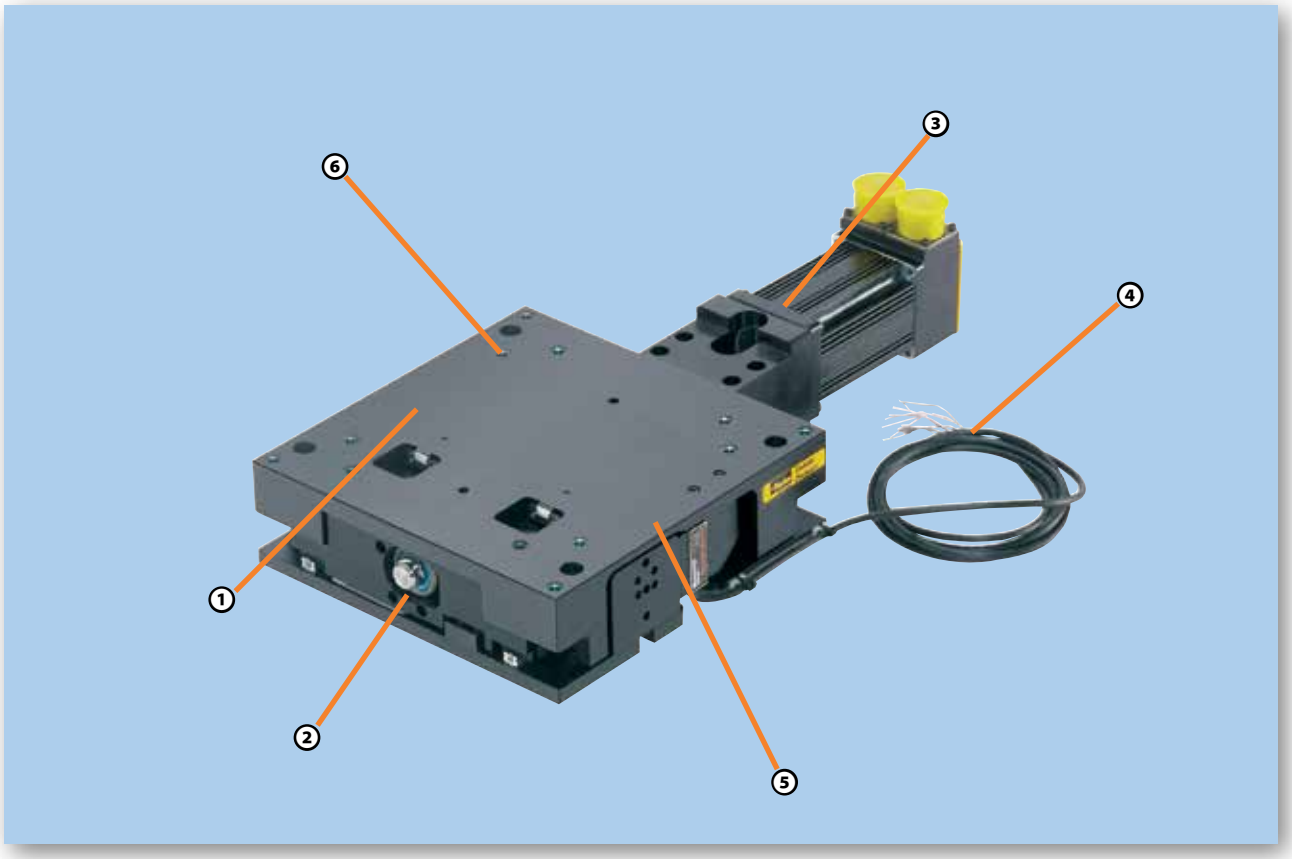
ZP200

	ZP200 Series
Maximum Travel (mm)	25
Maximum Payload (N)	735
Maximum Acceleration (m/sec²)	7.2

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 cross roller bearings.

The ZP200 is compatible with XR and LXR tables 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.



① **Up to 25 mm Vertical Travel**
with positional accuracy down to 8 microns

② **Three leadscrew options**
of 5, 10 and 20 mm to provide to best solution for your applications

③ **Selectable motor mounting and couplings**
for SM16 or NEMA 23 servo or stepper motors

④ **Linear Encoder option**
with selectable resolutions of 0.1, 0.5, 1.0 µm

⑤ **Compatible with XR and LXR tables**
for multi-axis systems, and it can be utilized as the system base axis or top axis to fit motion requirements

⑥ **Standard mounting holes and dowel pin holes**
accommodate repeatable mounting

ZP200 utilized in a laser test set-up

SPECIFICATIONS

The rugged bearing design of the ZP200 Series provides platform stiffness and stability while the precision ground ball-screw drive assures positional accuracy and worry-free operation.

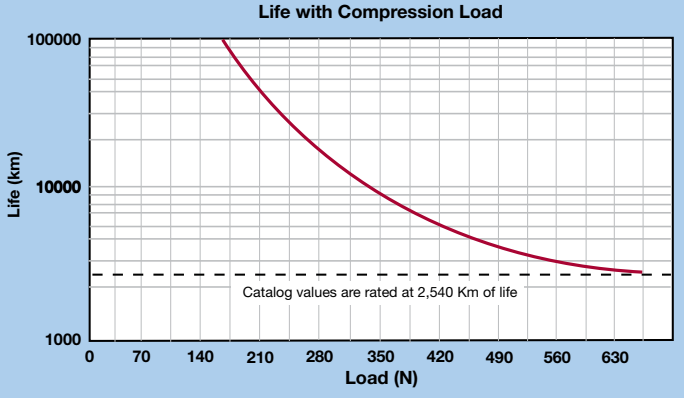
ZP200 Specifications

	Precision	Standard
Travel (Z-axis)	25 mm (limit to limit)	25 mm (limit to limit)
Positional Accuracy		
with no encoder [1,2,7]	8 µm	20 µm
with linear encoder [3,6,7]	8 µm	—
Positional Repeatability		
with no encoder [1,7]	± 3 µm	± 10 µm
with 1.0 µm linear encoder [6,7]	± 5 µm	—
with 0.5 µm linear encoder [6,7]	± 4 µm	—
with 0.1 µm linear encoder [6,7]	± 3 µm	—
Lift Lead Ratio [4]		
5 mm lead ballscrew drive	1.8199 mm/rev	
10 mm lead ballscrew drive	3.6397 mm/rev	
20 mm lead ballscrew drive	7.2794 mm/rev	
Lift Velocity		
5 mm lead ballscrew drive	110 mm/sec	
10 mm lead ballscrew drive	220 mm/sec	
20 mm lead ballscrew drive	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 – Coefficient Of Friction	0.01	
Ballscrew Diameter	16 mm	
Unit Weight	5.82 kg	
Top Plate Weight	2.25 kg	
Pitch [7]	± 15 Arc-sec	± 45 Arc-sec
Roll [7]	± 15 Arc-sec	± 25 Arc-sec
Input Inertia		
5 mm lead ballscrew drive	2.32 x 10^{-5} Kg-m^2	
10 mm lead ballscrew drive	2.51 x 10^{-5} Kg-m^2	
20 mm lead ballscrew drive	3.12 x 10^{-5} Kg-m^2	

1) Measured 38 mm 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 measured with <1kg load. Addition of load increases pitch and roll error by 10 arc-sec per 5 kg of load assuming the load center of gravity is located at the center of the stage platform. Cantilevered loading increases these errors more.

Table Life/Compression (Normal) Load

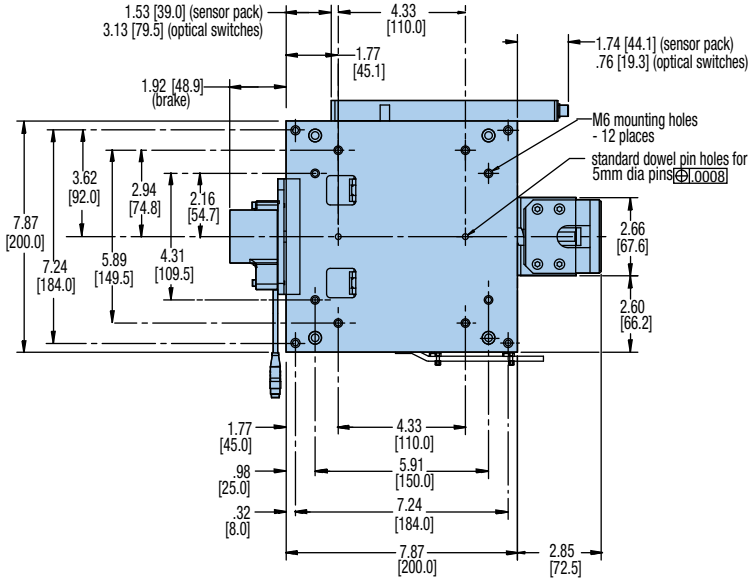
The graph provides a preliminary evaluation of the support bearing life/load characteristics. The curves show the life/load relationship when the applied load is centered on the carriage, normal (perpendicular) to the carriage mounting surface. For final evaluation of life vs load, including off center,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

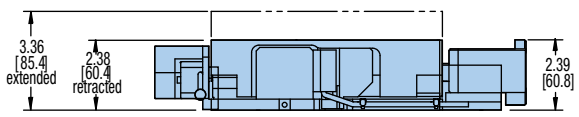


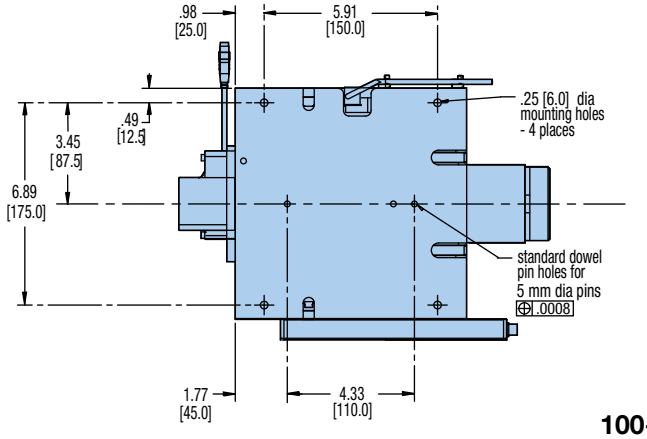
DIMENSIONS

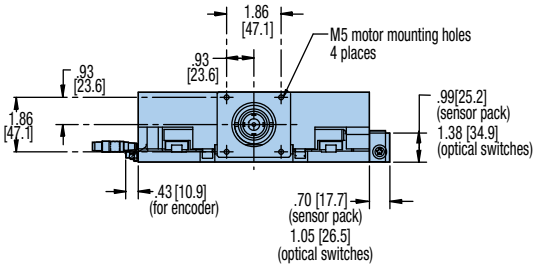
Download 2D & 3D files from www.parker.com/emn/ZP200

Dimensions - inches (mm)









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	—*
404LXR	Yes	—*
406XR	Yes	Yes
406LXR	Yes	Yes
206 Rotary	Yes	—*

*Not recommended - consult factory.

ORDERING INFORMATION

ZP200 Series

Fill in an order code from each of the numbered fields to create a complete model order code.

	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
Order Example:	ZP200	T01	M	S	D2	H12	L12	C3	M3	E3	B2	R1	P1

① **Series**
ZP200

② **Travel**
T01 25 mm

③ **Mounting**
M Metric

④ **Grade**
P Precision
S Standard

⑤ **Drive Screw**
D2 5 mm lead
D3 10 mm lead
D4 20 mm lead

⑥ **Home Sensor**
H1 No sensor
H11 N.C. current sinking, sensor pack
H12 N.O. current sinking, sensor pack
H13 N.C. current sourcing, sensor pack
H14 N.O. current sourcing, sensor pack

⑦ **Travel Limit Sensors**
L1 No sensor
L11 N.C. current sinking, sensor pack
L12 N.O. current sinking, sensor pack
L13 N.C. current sourcing, sensor pack
L14 N.O. current sourcing, sensor pack

⑧ **Coupling**
C1 No coupling
C3 0.25” bore bellows
C5 0.38” bore bellows
C23 9.0 mm (0.35”) bore bellows

⑨ **Motor Mount**
M1 No motor mounts
M2 SM16/BE16 motor
M3 NEMA 23 and SM23 motors
M61 BE23 motor mount

⑩ **Linear Encoder Option**
E1 No encoder
E2 1.0 micron
E3 0.5 micron
E4 0.1 micron
E5 5.0 micron
E7 Sine/cosine encoder

⑪ **Brake Option**
B1 No brake
B2 Shaft brake

⑫ **Environmental**
R1 Class 1000
R2 Class 10

⑬ **P1** Place holder