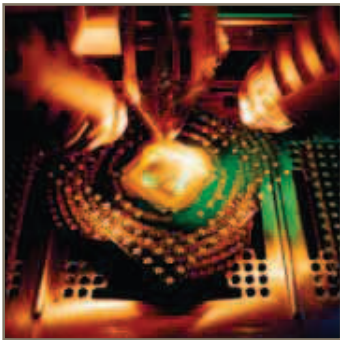
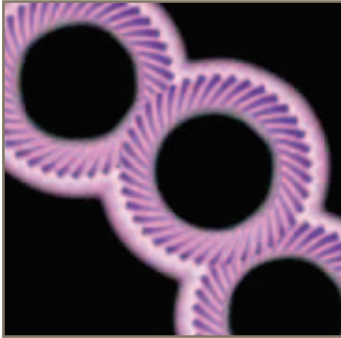




aerospace  
climate control  
electromechanical  
filtration  
fluid & gas handling  
hydraulics  
pneumatics  
process control  
sealing & shielding



# Gearheads and Gearmotors



ENGINEERING YOUR SUCCESS.

# Parker Hannifin Corporation

A Fortune 300 company with annual sales exceeding \$10 billion and more than 400,000 customers in 43 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.

## 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

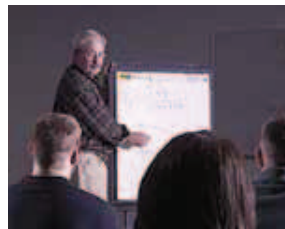
In today's competitive, fast-moving economy, what good is an application that isn't ready on time? This is especially true when compressed design cycles make the quick delivery of critical components essential. With factories strategically located on five continents, Parker offers an unrivaled delivery 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 downtime 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 electromechanical 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.



Parker world headquarters in Cleveland



## 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**
- **Videos and application stories**



## 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.

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- In-line and Right Angle

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### Visit our Website

Complete up-to-date technical assistance can be found on our web at [www.parkermotion.com](http://www.parkermotion.com). This includes all the latest information on current products, new product introductions, local assistance and support, plus a comprehensive “Engineering Reference Library” including: complete product catalog data, product selection Wizards, performance charts and graphs, engineering data and calculations, CAD drawings, local service and support directory, on-line purchasing, application stories and videos.



## Welcome!

Thank you for your interest in the products offered by the Parker Hannifin Electromechanical Automation Division. This catalog presents Parker's electromechanical solutions for high-precision and high-speed automation. Our gearheads, motors, and integrated products are recognized around the world for their functionality, performance, and reliability.

Bayside pioneered the market for precision servo gearheads many years ago. Parker continues this tradition in quality and design with innovations like our Stealth Generation II Helical Planetary Gearhead, enhanced to provide superior performance for the most demanding applications. Our PV Series planetary gearhead combines power and versatility in an economical package. Our line of Frameless Motors, Servo Wheels, and other integrated products provide an ideal solution for machine designs that require high performance in small spaces.

As you read through this catalog, you will discover that Parker offers the widest variety of electromechanical solutions that are delivered in the shortest amount of time. Still, many customers require special solutions to satisfy unique or special requirements. Parker has been providing custom engineered solutions for over 30 years to satisfy those requirements. If your application cannot be fulfilled by the complement of products found in this catalog, please contact an authorized Parker Automation Technology Center or a factory applications engineer.

Parker is proud to present these high precision products to you. We invite you to discover the advantages that can be realized by relying on Parker for products and systems which represent the very best value in the electromechanical marketplace.

Sincerely,

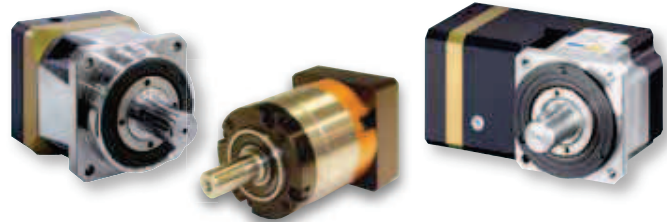


Ken Sweet  
General Manager

# Product Overview

## Planetary Gearheads

Our new Generation II Stealth® Series provides higher radial load, increased service life and ease of mounting than comparably sized planetary gearheads. The Stealth Generation II Helical Planetary Gearheads incorporate design enhancements to provide superior performance for the most demanding high performance applications. For larger frame sizes, Parker offers Generation I Stealth® Series gearheads in 142 to

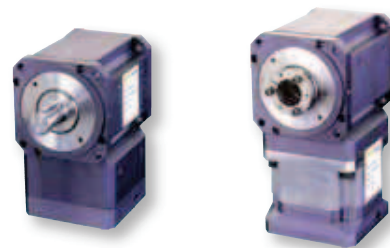


220 mm and NEMA 56 frame sizes. For standard precision applications, the PV Series gearhead combines power and versatility in an economical package available in a wide range of options.

Product Series	Gear Geometry	Performance	Configuration	Frame Size	Nominal Continuous Torque	Radial Load	Backlash arc-min	Page	
					Nm (in-lb)	N (lbs)			
Generation II Stealth®	PS	Helical Planetary	High Precision	In-Line	60 – 115 mm	27 – 230 (240 – 2047)	1650 – 7500 (370 – 1683)	8 – <3	12
	PX	Helical Planetary	Mid Precision	In-Line	60 – 115 mm NEMA 23 – 42	20 – 160 (178 – 1424)	1550 – 6800 (348 – 1526)	10 – <6	16
	RS	Helical Planetary/ Spiral Bevel	High Precision	Right Angle	60 – 115 mm	13 – 220 (115 – 1958)	1650 – 7500 (370 – 1683)	14 – <6	20
	RX	Helical Planetary/ Right Angle	Mid Precision	Right Angle	60 – 115 mm NEMA 23 – 42	10 – 136 (89 – 1210)	1550 – 6800 (348 – 1526)	20 – <12	24
Generation I Stealth®	PS	Helical Planetary	High Precision	In-Line	180 – 220 mm	294 – 1808 (2616 – 16,091)	7900 – 58,000 (1775 – 13,020)	8 – <3	30
	PX	Helical Planetary	Mid Precision	In-Line	142 mm NEMA 56	220 – 278 (1958 – 2474)	6000 (1347)	10 – <8	34
	RS	Helical Planetary/ Spiral Bevel	High Precision	Right Angle	180 – 220 mm	141 – 1808 (1255 – 16,091)	7900 – 58,000 (1775 – 13,020)	10 – <4	36
PV	Planetary	Standard	In-Line	40 – 115 mm NEMA 17 – 42	3.5 – 148 (31 – 1317)	190 – 10,555 (43 – 2370)	15 – <12	40	

## MultiDrive Gearheads

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.



Product Series	Gear Geometry	Performance	Configuration	Frame Size	Continuous Torque	Radial Load	Backlash arc-min	Page
					Nm (in-lb)	N (lbs)		
RT	Helical	High Precision	Right Angle Hollow Shaft	90 – 220 mm	23 – 565 (204 – 5178)	2800 – 7500 (692 – 1685)	<14 – <6	50
RD	Helical	High Precision	Right Angle Double Shaft	90 – 220 mm	30 – 150 (266 – 1328)	2800 – 7500 (692 – 1685)	<14 – <6	50
RB	Helical	High Precision	Right Angle Low Ratio	90 – 220 mm	35 – 190 (266 – 1682)	2800 – 7500 (692 – 1685)	<14 – <6	50

## NEMA Gearheads

NEMA gearheads feature a high-efficiency spur gear design, in a light, compact package, and are ideal for applications requiring smooth operation and low starting torque. Ratios from 3:1 to 100:1 are available.



Product Series	Gear Geometry	Performance	Configuration	Frame Size	Continuous Torque	Radial Load	Backlash arc-min	Page
					Nm (in-lb)	N		
<b>NE</b>	Spur Gear	Economy	In-Line	NEMA 23 – 42	6 – 40 (50 – 350)	90 – 890 (20 – 200)	10 – 30	58

## Integral Solution Gearmotors

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.



Product Series	Gear Geometry	Performance	Configuration	Frame Size	Continuous Torque	Feedback	Backlash	Page
					Nm (in-lb)	Encoder/Resolver	arc-min	
<b>GM</b>	Helical Planetary	Mid-Precision	In-Line	60 – 142 mm NEMA 23 – 56	3 – 60	Encoder/Resolver	< 10	Consult Factory
<b>DX</b>	Planetary	Mid-Precision	In-Line	6 and 8 inch dia. Wheel Drive	26 – 48	Encoder	—	62

# Application Examples

## Plastic Bottle Extrusion

The manufacturer of high-performance plastic extrusion equipment 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, controlling 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.



### Application Challenges:

#### *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 SOLUTION:

Stealth PS Gearhead and RT MultiDrive (hollow shaft) Gearhead 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 (95%) while minimizing gear tooth wear by providing a pure rolling action. Parker's Plasma Nitriding heat-treating process further heightens the gear tooth's wear resistance.

The MultiDrive gearhead features a space-saving 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 packaging, food, semiconductor, automotive and medical.

## Food/Packaging Automation

A manufacturer of machines for gluing, fill, sealing and diverting food containers for the food-processing industry had a



requirement for the motor and gearhead to be mounted above the food plane. Certain modifications were also needed for the gearhead to make it safe for the food environment, and capable to withstand frequent washdowns.

- **Output Shaft – stainless steel prevents any rust from developing and contaminating the processing food.**

### Parker SOLUTION:

*Stealth PS planetary gearhead with standard F01 food grade special option*



Stealth PS planetary gearhead with standard food grade option provides the gearhead with standard modifications including 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 gearhead lead time. (Note: Similar standard modifications exist for vacuum, clean room, high temperature and radiation.)

### Gearhead Design Considerations:

- **Lubrication – must be USDA food grade approved in case of incidental contact to food**
- **Sealing – must prevent any leaking as well as prevent any ingress of the fluid during washdown**
- **Finish – special FDA-approved finish must be used making it very durable and resistant to chipping, oxidizing or rusting**

# High-Speed Milling

High-speed milling machines are commonplace in industries such as aerospace and automotive because they allow large structural components to be machined from one piece rather than assembled from



many smaller subcomponents. For a customer that manufactures high-speed milling machines, 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 with their standard machines. The extremely large size of the spindle head also posed problems for the manufacturer in trying to keep it accurately positioned during the milling stage.

## Application Challenge:

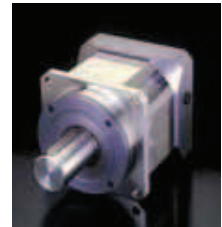
### *Low Stiffness*

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:

- **Poor surface finish**
- **Accuracy errors**
- **Excessive tool chatter**
- **Reduced tool life**

## Parker SOLUTION:

Two Stealth® PS Helical Planetary 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'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 also be used in the aerospace and automotive industries.

# Stealth® MultiDrive Gearheads

Stealth® MultiDrive Series:

The Flexible Right Angle Gearhead Solution



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. MultiDrive gearheads features Stealth helical gearing for high torque, high accuracy and quiet operation. With five frame sizes and multiple ratios to choose from, you are sure to find a Stealth MultiDrive to fit your servo motor application.

- **Space Saving: Compact, right-angle design saves space in many applications**
- **Low Backlash: Standard as low as 8 arc-minutes and 4 arc-minutes optional**
- **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's ServoMount® design**
- **Sealed Unit: Seals and O-rings provide IP65 protection to prevent leaks and to protect against harsh environments**

## MultiDrive RT, RD and RB Series Precision Gearheads

Product Series	Configuration	Ratios	Gear Geometry	Performance	Frame Size (mm)	Continuous Torque Nm (in-lb)	Radial Load N (lbs)	Backlash arc-min
RT	Right Angle Hollow Shaft	3, 9, 15, 21 and 30:1	Helical	High Precision	90 – 220	23 – 565 (204 – 5178)	2800 – 7500 (692 – 1685)	<14 to <6
RD	Right Angle Double Shaft	1, 2, 3, 9, 15, 21 and 30:1	Helical	High Precision	90 – 220	30 – 150 (266 – 1328)	2800 – 7500 (692 – 1685)	<14 to <6
RB	Right Angle Low Ratio	1, 2 and 3:1	Helical	High Precision	90 – 220	35 – 190 (266 – 1682)	2800 – 7500 (692 – 1685)	<14 to <6



## Performance Specifications

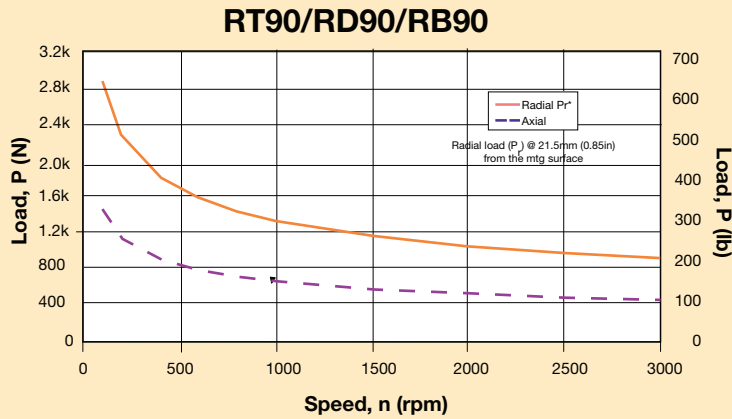
		Frame Size (RT, RD, RB)					
		Ratio	R_90	R_115	R_142	R_180	R_220
<b>Nominal Output Torque</b> $T_{nom r}$	Nm (in-lb)	1	23 (200)	45 (400)	113 (1000)	192 (1700)	508 (4500)
		2,3,9,15,21,30	34 (300)	90 (800)	136 (1200)	260 (2300)	565 (5000)
<b>Max. Acceleration Output Torque</b> $T_{acc r}$	Nm (in-lb)	1	28 (250)	56 (500)	141 (1250)	240 (2125)	636 (5625)
		2,3,9,15,21,30	42 (375)	113 (1000)	169 (1500)	324 (2875)	636 (5625)
<b>Emergency <sup>(1)</sup> Stop Output Torque</b> $T_{em r}$	Nm (in-lb)	1	45 (400)	90 (800)	226 (2000)	384 (3400)	1017 (9000)
		2,3,9,15,21,30	68 (600)	181 (1600)	271 (2400)	520 (4600)	1130 (10,000)
<b>Nominal Input Speed, <math>N_{nom r}</math></b>	RPM	1,2,3	3000	2600	2200	1800	1400
		9,15,21,30	3800	3400	3000	2400	1800
<b>Max. Input Speed, <math>N_{max r}</math></b>	RPM	1,2,3	4000	3500	2900	2500	1600
		9,15,21,30	5300	4500	3800	3000	2300
<b>Standard Backlash</b>	arc-min	1,2,3	10	9	9	8	8
		9,15,21,30	12	11	11	10	10
<b>Low Backlash</b>	arc-min	1,2,3	6	5	5	4	4
		9,15,21,30	8	7	7	6	6
<b>Efficiency at Nominal Torque</b>	%	1,2,3	95	95	95	95	95
		9,15,21,30	92	92	92	92	92
<b>Noise Level <sup>(2)</sup> at:</b> <b>2,500 RPM</b> <b>1,500 RPM</b>	dB	All	70	70	70	—	—
			—	—	—	72	72
<b>Torsional Stiffness</b>	Nm/arc-min (in-lb/arc-min)	All	3 (28)	6 (56)	16 (140)	43 (380)	90 (800)
<b>Maximum Weight</b>	kg (lb)	All	7 (16)	13 (28)	25 (56)	54 (120)	114 (250)
<b>Maximum Allowable Case Temperature</b>	°C	All			100		

(1) Maximum of 1,000 stops

(2) Measured at 1 meter

# Stealth® MultiDrive Gearheads

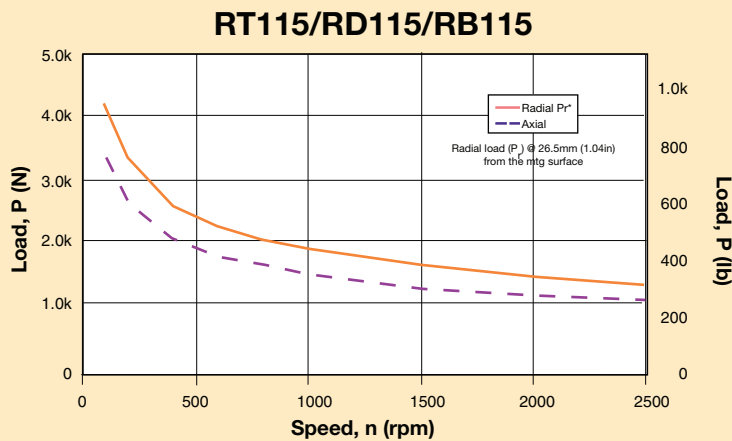
## MultiDrive RT/RD/RB Output Shaft Load Rating



Formulas to calculate radial load (Prx) at any distance "X" from the gearhead mounting surface:

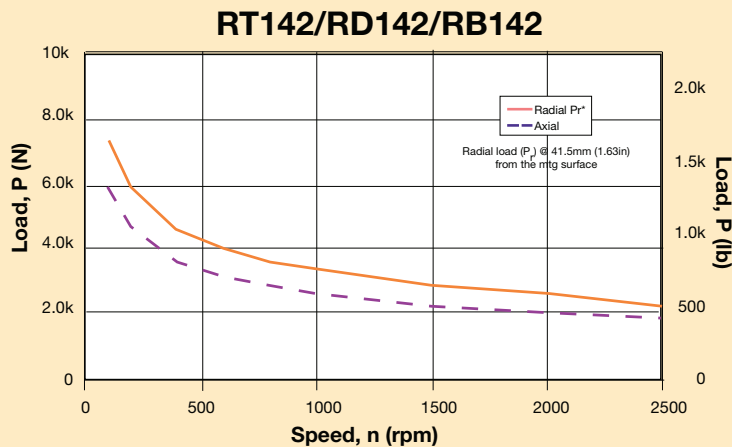
$$Prx = Pr * 121 \text{ mm} / (100 \text{ mm} + X)$$

$$Prx = Pr * 4.76 \text{ in} / (3.94 \text{ in} + X)$$



$$Prx = Pr * 151 \text{ mm} / (125 + X)$$

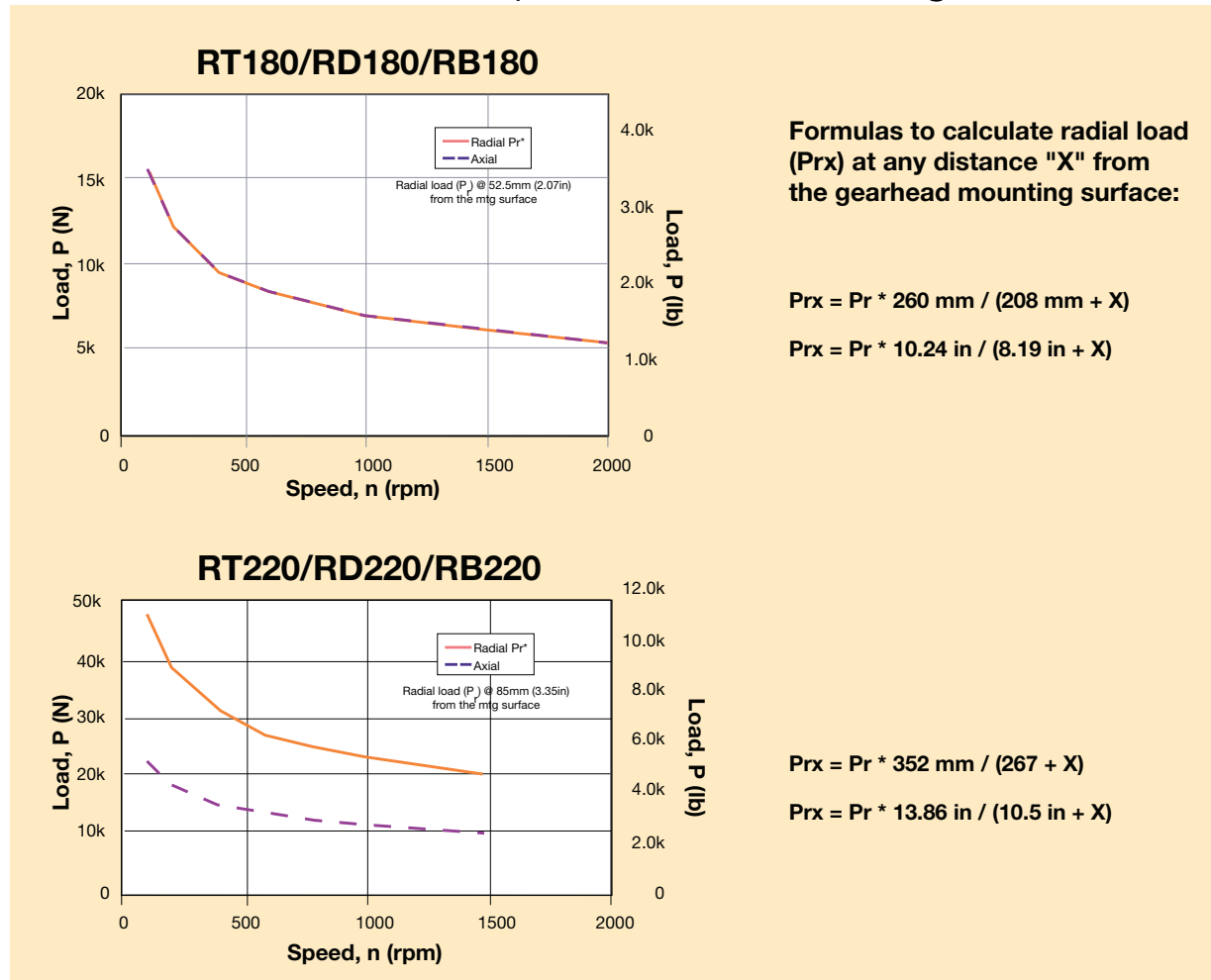
$$Prx = Pr * 5.94 \text{ in} / (4.92 \text{ in} + X)$$



$$Prx = Pr * 201 \text{ mm} / (160 + X)$$

$$Prx = Pr * 7.91 \text{ in} / (6.30 \text{ in} + X)$$

## MultiDrive RT/RD/RB Output Shaft Load Rating



### Inertia

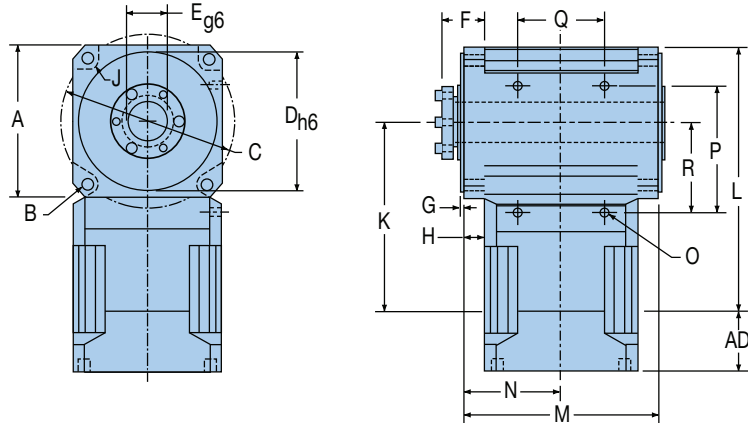
All moment of inertia values are as reflected at the input of the gearhead

		Frame Size (RT, RD, RB)				
Ratio	Units	R_90	R_115	R_142	R_180	R_220
1	gm-cm-sec <sup>2</sup>	3.28	11.0	38.7	101	444
	oz-in-sec <sup>2</sup>	0.046	0.153	0.538	1.41	6.17
2	gm-cm-sec <sup>2</sup>	4.17	11.3	32.8	95.4	274
	oz-in-sec <sup>2</sup>	0.058	0.157	0.455	1.32	3.81
3	gm-cm-sec <sup>2</sup>	2.68	7.75	22.3	65.6	191
	oz-in-sec <sup>2</sup>	0.037	0.108	0.311	0.911	2.65
9	gm-cm-sec <sup>2</sup>	1.07	3.28	10.4	35.8	119
	oz-in-sec <sup>2</sup>	0.015	0.046	0.145	0.497	1.66
15, 21, 30	gm-cm-sec <sup>2</sup>	0.566	2.09	5.36	17.9	62.6
	oz-in-sec <sup>2</sup>	0.008	0.029	0.075	0.248	0.869

# Stealth® MultiDrive Gearheads

## Dimensions – RT Hollow Shaft

Free 3D Solid Models and drawings available at [parkermotion.com](http://parkermotion.com)



\*AD=Adapter Length. Adapter will vary, depending on motor. (Visit our website or consult the factory for details.)

Frame Size	A		B		C		D		E		F		G		H	
	Square Flange		Bolt Hole		Bolt Circle		Pilot Diameter		- Bore Diameter *		Taper Bushing Extension		Pilot Thickness		Flange Thickness	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	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		K1		K2		L1		L2		M		N	
	Housing Recess		Distance to Output Centerline (For ratio = 3:1)		Distance to Output Centerline (For ratio > 3:1)		Housing Length (For ratio = 3:1)		Housing Length (For ratio > 3:1)		Housing Width		Distance to Input Centerline	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	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.

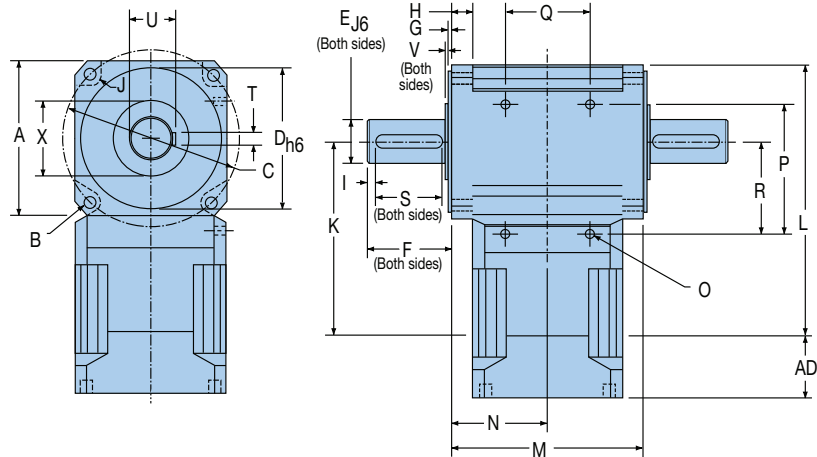
\*Maximum bushing bore diameter. Actual through bore of output shaft is larger. For additional bore diameter, contact Parker's Application Engineers for information.

### Foot Mounting Holes Location

Frame Size	Thread Size x Depth	O		P		Q		R	
		mm	in	mm	in	mm	in	mm	in
RT90	M4x6	80	3.150	60	2.362	60	2.362		
RT115	M6x9	100	3.937	70	2.756	75	2.953		
RT142	M8x12	120	4.724	80	3.150	85	3.346		
RT180	M10x15	160	6.299	100	3.937	110	4.331		
RT220	M12x20	195	7.677	130	5.118	136	5.354		

# Dimensions – RD Dual Shaft

Free 3D Solid Models and drawings available at [parkermotion.com](http://parkermotion.com)



\*AD=Adapter Length. Adapter will vary, depending on motor. (Visit our website or consult the factory for details.)

Frame Size	A		B		C		D		E		F		G		H		I		J	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
RT90	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
RT115	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
RT142	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	10.50	0.413
RT180	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
RT220	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		K2		L1		L2		M		N		S		T		U		V		X	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
RT90	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
RT115	116	4.567	144.2	5.677	173.5	6.831	201.7	7.941	143	5.630	71.52	2.815	32	1.260	8	0.315	27	1.063	2.5	0.098	50	1.969
RT142	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
RT180	169	6.654	209.1	8.228	260	10.236	300.111	11.815	232	9.134	116	4.567	70	2.756	14	0.551	53.52	2.106	2.5	0.098	55	2.165
RT220	206	8.110	266	10.472	316	12.441	376	14.803	290	11.417	145	5.709	100	3.937	20	0.787	79.53	3.130	2.5	0.098	100	3.937

Both output flanges have identical dimensions.

## Foot Mounting Holes Location

Frame Size	Thread Size x Depth	P		Q		R	
		mm	in	mm	in	mm	in
RT90	M4x6	80	3.150	60	2.362	60	2.362
RT115	M6x9	100	3.937	70	2.756	75	2.953
RT142	M8x12	120	4.724	80	3.150	85	3.346
RT180	M10x15	160	6.299	100	3.937	110	4.331
RT220	M12x20	195	7.677	130	5.118	136	5.354

## Encoder Mounting Option

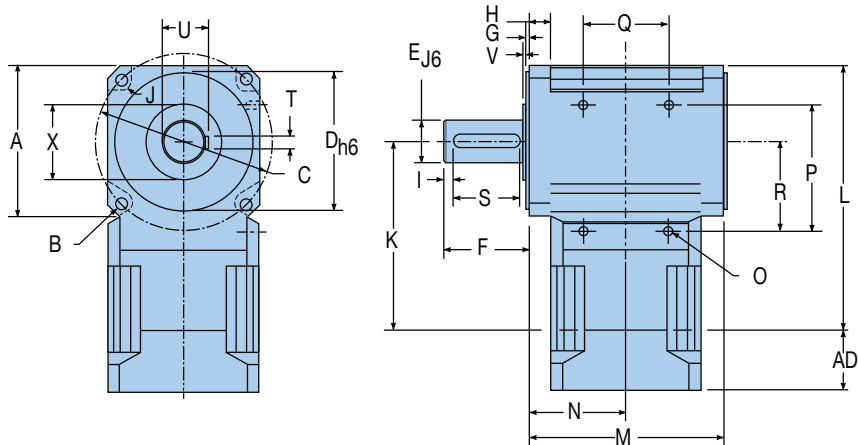
	Dimensions For All Frame Sizes – mm (in)
Shaft Diameter	9.525 (0.375)
Shaft Length	19.050 (0.750)
Bolt Circle	74.981 (2.952)
Tapped Holes	M4x6 (Min. Depth)
Encoder (Not Supplied)	DRC C25, BEI E25, RENCO C2520

An additional flange is required on the gearhead for encoder mounting. it will increase the thickness of one output flange by 10mm.

# Stealth® MultiDrive Gearheads

## Dimensions – RB Low Ratio

Free 3D Solid Models and drawings available at [parkermotion.com](http://parkermotion.com)



\*AD=Adapter Length. Adapter will vary, depending on motor. (Visit our website or consult the factory for details.)

Frame Size	A		C		E		F		G		H		I		J	
	Square Flange		Bolt Circle		Output Shaft Diameter		Output Shaft Length		Pilot Thickness		Flange Thickness		Distance from Shaft End		Housing Recess	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
RT90	90	3.543	100	3.937	20	0.787	40	1.575	3	0.118	12	0.472	5	0.197	6.6	0.260
RT115	115	4.528	130	5.118	24	0.945	50	1.969	3.5	0.138	14	0.551	7	0.276	7.9	0.311
RT142	142	5.591	165	6.496	40	1.575	80	3.150	3.5	0.138	20	0.787	8	0.315	10.5	0.413
RT180	182	7.165	215	8.465	50	1.969	95	3.740	10	0.394	25	0.984	6	0.236	10	0.394
RT220	220	8.661	250	9.843	75	2.953	155	6.102	15	0.591	35	1.378	8	0.315	16	0.630

Frame Size	K		L		M		N		S		T		U		V		X	
	Distance to Output Centerline		Housing Length		Housing Width		Distance to Input Centerline		Keyway Length		Keyway Thickness		Keyway Height		Shoulder Height		Shoulder Diameter	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
RT90	95	3.740	140	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
RT115	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
RT142	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
RT180	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
RT220	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.

### Foot Mounting Holes Location

Frame Size	Thread Size x Depth	O		P		Q		R	
		mm	in	mm	in	mm	in	mm	in
		RT90	M4x6	80	3.150	60	2.362	60	2.362
RT115	M6x9	100	3.937	70	2.756	75	2.953		
RT142	M8x12	120	4.724	80	3.150	85	3.346		
RT180	M10x15	160	6.299	100	3.937	110	4.331		
RT220	M12x20	195	7.677	130	5.118	136	5.354		

# Stealth® MultiDrive How to Order

Choose gearhead series, frame size, ratio, backlash and orientation from the chart below.

## Gearhead Ordering Information

Order Example:		①	②	③	④	⑤	⑥
		RD	142	E	003	-	XXX LB
Series	Frame Size (mm)	Encoder	Ratio	Special	Backlash		
RB Low Ratio	090	—	001, 002, 003				
	115						
	142						
	180						
	220						
RD Dual Shaft	090	E	001, 002, 003, 009, 015, 021, 030	Factory Assigned (Only if needed)	Blank = Standard LB = Low		
	115						
	142						
	180						
	220						
RT Hollow Shaft	090	—	003, 009, 015, 021, 030				
	115						
	142						
	180						
	220						

## Mounting Kit Ordering Information

For 1:1, 2:1 and 3:1 ratios, mounting kit is: MD (frame size)-ratio-xxx. For example MD90-001  
 For 9:1 or higher, , mounting kit is: MT (frame size)-ratio-xxx. For example MD90-021

Parker MotionSizer sizing software available for free download at: [www.parkermotion.com](http://www.parkermotion.com)

## Recommended Parker Motor and Mounting Kit

Frame Size	Ratio	Recommended Servo Motor			Recommended Stepper Motor		
		Motor	Mounting Kit	AD Dimension	Motor	Mounting Kit	AD Dimension
90	1:1, 2:1, 3:1	BE34 MPP092	MD90-209 MD90-016	24.5 mm	LV34 HV34	MD90-209	24.5 mm
	9:1 or Higher	BE34 MPP092	MT90-005 MT90-051	35.3 mm 44 mm	LV34 HV34	MT90-005	35.3 mm
115	1:1, 2:1, 3:1	MPP092 MPP115	MD115-017 MD115-010	26.5 mm 34.4 mm			
	9:1 or Higher	MPP092 MPP115	MT115-045 MT115-010	43.2 mm 51 mm			
142	1:1, 2:1, 3:1	MPP115 MPP142	MD142-010 MD142-013	40.8 mm 36 mm			
	9:1 or Higher	MPP115 MPP142	MT142-010 MT142-146	58 mm 75 mm			
180	1:1, 2:1, 3:1	MPP142 MPP190	MD180-123 MD180-125	36.4 mm 48 mm			
	9:1 or Higher	MPP142 MPP190	MT180-131 MT180-096	67.5 mm 109 mm			
220	1:1, 2:1, 3:1	MPP190 MPP220	MD220- MD-220	Consult Factory			
	9:1 or Higher	MPP190 MPP220	MT220-021 MT220-022	104 mm 138 mm			

### Sizing/Selection Design Assistance

To properly size and select a gearhead for a specific application requires consideration of several interrelated parameters including: speed, continuous torque, repetitive peak torque or acceleration torque, emergency stop torque, duty cycle, ambient temperature and radial and axial shaft load.

The 9 step procedure on pages 72-73 provides a straightforward method of selecting the correct gearhead for your application.