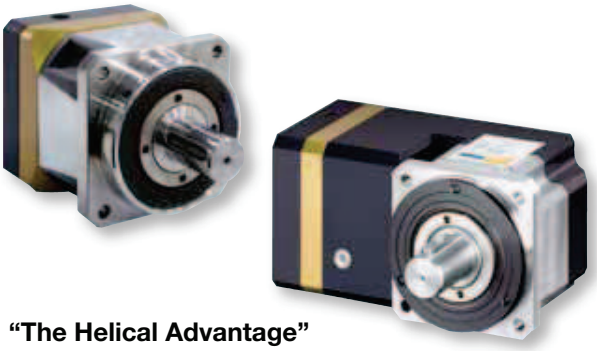
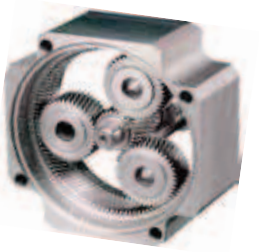
Helical Planetary Gearhead Features

Parker planetary gearheads incorporate the latest technology enhancements...

- **Latest technology in seals to reduce heat and wear**
- **Oil lubrication reduces friction and operating temperature, increasing gear life**

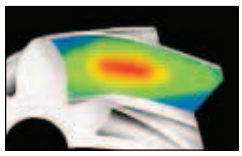


Helical Planetary Design



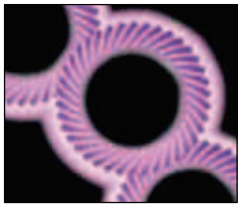
Helical gears have more tooth contact and greater face width than spur gears. This results in higher loads, smoother tooth engagement, quieter operation and lower backlash.

HeliCrown®



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

Plasma Nitriding



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

ServoMount®

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

"The Helical Advantage"

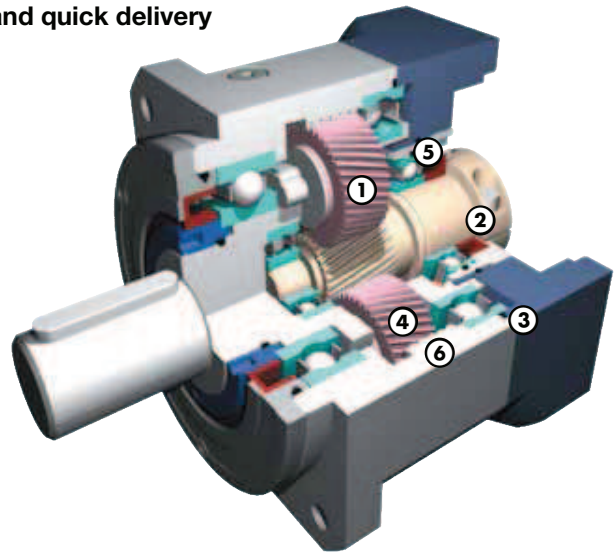
Parker planetary gearheads are a superior design with construction integrity to deliver power, speed and accuracy – quietly and efficiently.

Power...	30% more torque than comparably sized gearheads
Speed...	up to 6,000 RPM input speeds
Accuracy...	Less than 3 arc-minutes backlash
Quiet...	Less than 68 dB noise
Efficiency...	Over 97% efficiency

Parker Stealth® planetary gearhead features

Features unique to Generation II Stealth® gearheads

- **Widely spaced angular contact bearings provide higher radial load capacity**
- **Full compliment of needle bearings for increased service life**
- **Universal mounting kits offer easier mounting and quick delivery**



Common features for all Generation I & II Stealth® gearheads

① **Helical Planetary** – Provides smooth, quiet operation, high torque and high accuracy.

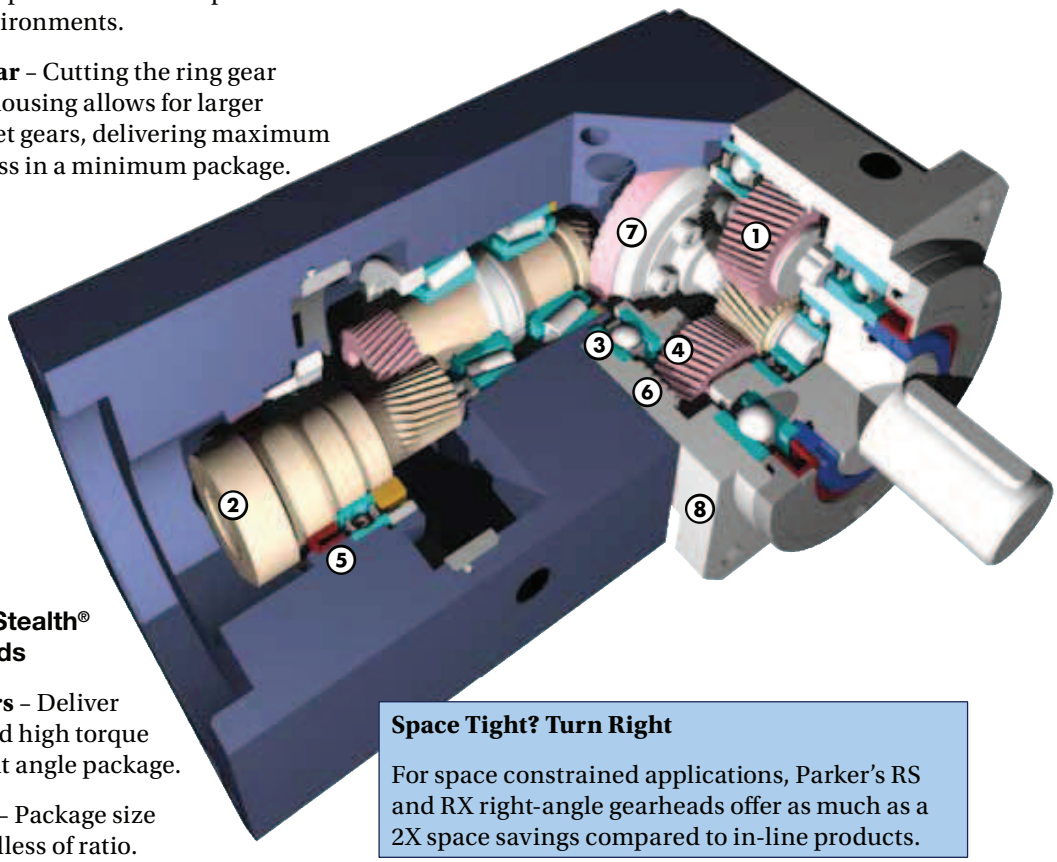
② **ServoMount®** – Motor-mounting design ensures error-free installation and the balanced pinion allows higher input speeds.

③ **Precision Bearings** – Provide high speed and high radial and axial load capacity.

④ **HeliCrown®** – Parker's proprietary gear tooth geometry ensures quieter operation and higher loads than conventional gears.

⑤ **Sealed Unit** – Vition seals and O-Rings provide IP65 protection to prevent leaks and protect against harsh environments.

⑥ **Integral Ring Gear** – Cutting the ring gear directly into the housing allows for larger bearing and planet gears, delivering maximum power and stiffness in a minimum package.



Features unique to Stealth® right-angle gearheads

⑦ **Spiral Bevel Gears** – Deliver high efficiency and high torque in a compact, right angle package.

⑧ **Compact Design** – Package size is the same regardless of ratio.

Space Tight? Turn Right

For space constrained applications, Parker's RS and RX right-angle gearheads offer as much as a 2X space savings compared to in-line products.

Generation II Stealth® Series

PS Generation II Performance Specifications

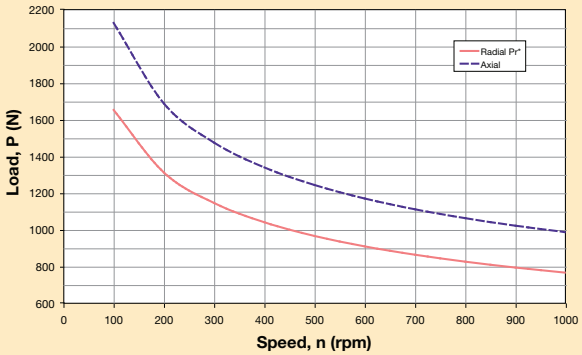
Parameter	Units	Ratio	PS60 Gen II	PS90 Gen II	PS115 Gen II	PS142 Gen II
Nominal Output Torque [1] **$T_{nom\ r}$**	Nm (in-lb)	3,15,30	27 (239)	76 (673)	172 (1522)	300 (2656)
		4,5,7,20,25,40,50,70	37 (327)	110 (974)	230 (2036)	430 (3807)
		10,100	32 (283)	93 (823)	205 (1814)	310 (2745)
Maximum Acceleration Output Torque [2] **$T_{acc\ r}$**	Nm (in-lb)	3,15,30	34 (300)	105 (930)	225 (1990)	450 (3984)
		4,5,7,20,25,40,50,70	48 (425)	123 (1090)	285 (2525)	645 (5711)
		10,100	37 (325)	112 (990)	240 (2125)	465 (4117)
Emergency Stop Output Torque [3] **$T_{em\ r}$**	Nm (in-lb)	3,15,30	80 (710)	260 (2300)	600 (5310)	1100 (9739)
		4,5,7,20,25,40,50,70	70 (620)	230 (2035)	500 (4425)	970 (8588)
		10,100	60 (530)	200 (1770)	430 (3805)	830 (7349)
Nominal Input Speed $N_{nom\ r}$	RPM	3	3000	2500	2000	1500
		4,5	3500	3000	2500	2000
		7,10,15	4000	3500	3000	2500
		20,25,30	4500	4000	3500	3000
		40,50	4800	4400	3800	3200
		70,100	5200	4800	4200	3600
Maximum Input Speed $N_{max\ r}$ [4]	RPM	3 – 100	6000	5500	4500	4000
Maximum Radial Load Pr_{max} [5, 7]	N (lbs)		1650 (370)	4800 (1080)	7500 (1685)	10,000 (2247)
Maximum Axial Load Pa_{max} [6]	N (lbs)		2100 (475)	3600 (810)	6800 (1530)	8800 (1976)
Service Life	h		20,000			
Standard Backlash [8]	arc-min	3 – 10	<6	<6	<4	<4
		15 – 100	<8	<8	<6	<6
Low Backlash [8]	arc-min	3 – 10	<4	<4	<3	<3
		15 – 100	<6	<6	<5	<5
Efficiency at Nominal Torque	%	3 – 10	97	97	97	97
		15 – 100	94	94	94	94
Noise Level at 3000 RPM [9]	db	3 – 100	<62	<62	<65	<66
Torsional Stiffness	Nm/arc-min (in-lb/arc-min)	3 – 100	3 (27)	12 (105)	27 (240)	50 (438)
Maximum Allowable Case Temperature	° C	3 – 100	-20 to 90			
Lubrication		3 – 100	Per Maintenance Schedule			
Mounting Position		3 – 100	Any			
Direction of Rotation		3 – 100	Same as Input			
Degree of Protection			IP65			
Maximum Weight	kg (lbs)	3 – 10	1.3 (2.9)	3.0 (6.6)	7.0 (15.4)	14.0 (30.0)
		15 – 100	1.7 (3.7)	5.0 (11.0)	10.0 (22.0)	20.0 (43.0)

1) At nominal speed Nnom r.
2) Parker MotionSizer sizing software available for free download at parkermotion.com.
3) Maximum of 1000 stops.
4) For intermittent operation.
5) Max radial load applied to the center of the shaft at 100 rpm.
6) Max axial load at 100 rpm.
7) For combined radial and axial load consult factory.
8) Measured at 2% of rated torque.
9) Measure at 1m.

PS Generation II Output Shaft Load Rating

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

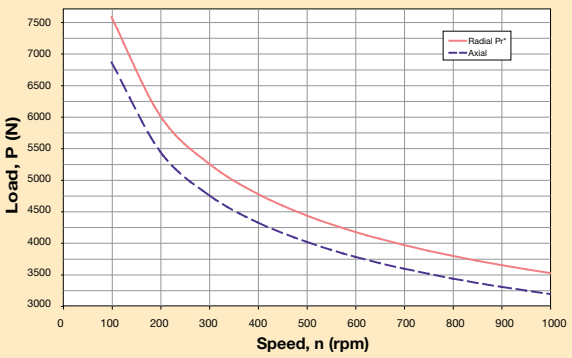
PS60



Prx = Pr * 75 mm / (49 + X)

Prx = Pr * 2.95 in / (1.93 in + X)

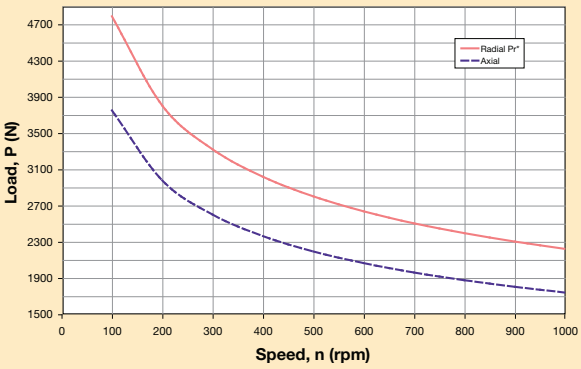
PS115



Prx = Pr * 124 mm / (81 + X)

Prx = Pr * 4.88 in / (3.19 in + X)

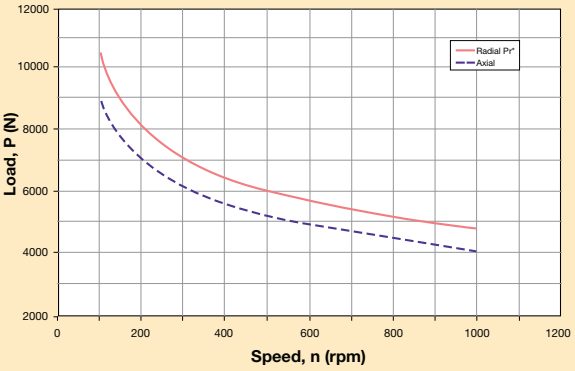
PS90



Prx = Pr * 96 mm / (62 + X)

Prx = Pr * 3.78 in / (2.44 in + X)

PS142



Prx = Pr * 156 mm / (93 + X)

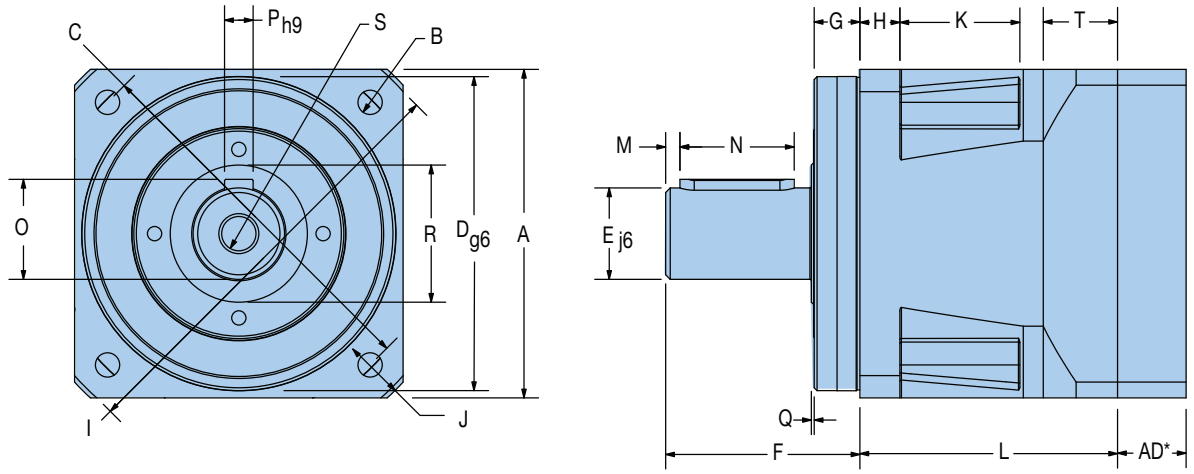
Prx = Pr * 6.14 in / (3.66 in + X)

* Radial load applied to center of the shaft.

Generation II Stealth® Series

PS Generation II Dimensions

Free 3D Solid Models and drawings available at parkermotion.com



Metric Frame Sizes

Frame Size	A		B		C		D		E		F		G	
	Square Flange		Bolt Hole		Bolt Circle		Pilot Diameter		Output Shaft Diameter		Output Shaft Length		Pilot Thickness	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
PS60	62	2.441	5.5	0.217	70	2.756	50	1.969	16	0.630	40	1.575	11	0.433
PS90	90	3.543	6.5	0.256	100	3.937	80	3.150	22	0.866	52	2.047	15	0.591
PS115	115	4.528	8.5	0.335	130	5.118	110	4.331	32	1.260	68	2.677	16	0.630
PS142	142	5.591	11.0	0.433	165	6.496	130	5.118	40	1.575	102	4.016	20	0.787

Frame Size	H		I		J		K		L1		L2		M	
	Flange Thickness		Housing Diameter		Housing Recess		Recess Length		Length (3–10 Ratios)		Length (15–100 Ratios)		Distance from Shaft End	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
PS60	8	0.315	80	3.150	5	0.197	24	0.945	59.8	2.354	94.8	3.732	2	0.079
PS90	10	0.394	116	4.567	6.5	0.256	33	1.299	69.5	2.736	113	4.449	3	0.118
PS115	14	0.551	152	5.984	7.5	0.295	42	1.654	90.2	3.551	143.4	5.646	5	0.197
PS142	15	0.591	185	7.283	10.0	0.394	45	1.772	103.7	4.083	170.7	6.720	5	0.197

Frame Size	N		O		P		Q		R		S	T	
	Keyway Length		Key Height		Keyway Width		Shoulder Height		Shoulder Diameter		Tap & Depth (end of shaft)	Rear Housing Thickness	
	mm	in	mm	in	mm	in	mm	in	mm	in		mm	in
PS60	25	0.984	18	0.709	5	0.197	1	0.039	22	0.866	M5x8	20.3	0.799
PS90	32	1.260	24.5	0.965	6	0.236	1	0.039	35	1.378	M8x16	20	0.787
PS115	40	1.575	35	1.378	10	0.394	1.5	0.059	50	1.969	M12x25	26	1.024
PS142	63	2.480	43	1.693	12	0.472	2.5	0.098	78	3.071	M16x32	31	1.220

PS Generation II Universal Mounting Kit*

Adapter Length "AD" Dimension

Frame Size	Motor Shaft Length		Gearhead Adapter Length	
	mm	in	mm	in
60	16 – 35 35.1 – 41	0.630 – 1.378 1.382 – 1.614	16.5 22.5	0.65 0.886
90	20 – 40 40.1 – 48	0.787 – 1.575 1.579 – 1.890	20 28.5	0.787 1.122
115	22 – 50 50.1 – 61	0.866 – 1.969 1.972 – 2.402	24 35	0.945 1.378
142	26 – 62 62.1 – 82	1.023 – 2.441 2.445 – 3.228	30 50	1.181 1.969

* Know your motor and need our mounting kit part number? See page 29 or use our Motor Mounting Search Tool on our website at: www.parkermotion.com

PS Generation II Inertia

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

Ratio	Units*	PS60	PS90	PS115	PS142
3	kg-cm²	0.2500	0.9700	3.4000	14.8000
	in-lb-sec²	0.000221	0.000858	0.003009	0.013098
4	kg-cm²	0.1700	0.6700	2.2000	9.8000
	in-lb-sec²	0.000150	0.000593	0.001947	0.008673
5	kg-cm²	0.1500	0.5100	1.7000	7.0000
	in-lb-sec²	0.000133	0.000451	0.001505	0.006195
7	kg-cm²	0.1400	0.4100	1.3000	5.3000
	in-lb-sec²	0.000124	0.000363	0.001151	0.004691
10	kg-cm²	0.1400	0.3700	1.1000	4.4000
	in-lb-sec²	0.000124	0.000327	0.000974	0.003894
15	kg-cm²	0.1500	0.5200	0.1700	6.4000
	in-lb-sec²	0.150000	0.000460	0.000150	0.005664
20	kg-cm²	0.1500	0.5100	1.7000	6.4000
	in-lb-sec²	0.000133	0.000451	0.001505	0.005664
25	kg-cm²	0.1500	0.5100	1.7000	6.4000
	in-lb-sec²	0.000133	0.000451	0.001505	0.005664
30, 40, 50, 70, 100	kg-cm²	0.1300	0.3700	1.1000	4.2000
	in-lb-sec²	0.000115	0.000327	0.000974	0.003717

* Note: 1 kg-cm² = 0.000885 in-lb-sec²

Generation II Stealth® Series

Generation II Stealth® How to Order

Choose gearhead series, frame size, ratio, backlash and specify motor, make and model for mounting kit from the charts below and on the following page.

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.

Gearhead Ordering Information

	①	②		③		④		⑤	⑥
Order Example:	PS	60	-	003	-	XXX	-	S	2

① Series	② Frame Size	③ Ratio	④ Special Options*	⑤ Backlash	⑥ GEN 2 Identifier
PS	60, 90, 115, 142	003, 004, 005, 007, 010, 015, 020, 025, 030, 040, 050, 070, 100	XXX = Factory issued	S = Standard L = Low	2
PX	60, 90, 115, 23, 34, 42	003, 004, 005, 007, 010, 015, 020, 025, 030, 040, 050, 070, 100	XXX = Factory issued T01 = Flange Mount		
RS	60, 90, 115, 142	005, 010, 015, 020, 025, 030, 040, 050, 100	XXX = Factory issued		
RX	60, 90, 115, 23, 34, 42	005, 010, 015, 020, 025, 030, 040, 050, 100	XXX = Factory issued (Contact factory for Flange Mount Option)		

* Standard special options include: F01 Food Grade, W01 Washdown, G01 Genl Spacer Plate, L02 No lubricant (standard is oil filled), V01 Vacuum, C01 CleanRoom Class 10,000. Leave blank if no special option required.

Motor Mounting How to Order

Know your motor and need our mounting kit part number? Use the charts below or use our Motor Mounting Search Tool on our website at:

www.parkermotion.com

	⑦		⑧
Order Example:	MU	60 -	XXX

	⑦	⑧
Universal Mounting*	**Frame Size ****	**Mounting Kit Suffix Number**
MU	60, 90, 115	See Motor Mounting Selection Tool on our website at: www.parkermotion.com

* Common to PS, PX, RS and RX Series Gearheads
**PX/RX23 use MU60, PX/RX34 use MU90, PX/RX42 use MU115

Universal Mounting Kit Adapter Length "AD" Dimension

	Motor Shaft Length		Gearhead Adapter Length	
Frame Size	**mm**	**in**	**mm**	**in**
60	16 – 35 35.1 – 41	0.630 – 1.378 1.382 – 1.614	16.5 22.5	0.65 0.886
90	20 – 40 40.1 – 48	0.787 – 1.575 1.579 – 1.890	20 28.5	0.787 1.122
115	22 – 50 50.1 – 61	0.866 – 1.969 1.972 – 2.402	24 35	0.945 1.378
142	26 – 62 46 – 82	1.023 – 2.44 1.811 – 3.23	30 50	1.181 1.969

Recommended Parker Motor and Mounting Kit

	Recommended Servo Motor			Recommended Stepper Motor		
Frame Size	**Motor**	**Mounting Kit**	**AD Dimension**	**Motor**	**Mounting Kit**	**AD Dimension**
60 or 23	BE23 SM23	MU60-033	16.5 mm	LV23 HV23	MU60-005	16.5 mm
90 or 34	MPP092 BE34	MU90-092 MU90-005	20 mm	LV34 HV34	MU90-005	20 mm
115 or 42	MPP100 MPP115	MU-115-039 MU115-010	24 mm			
142	MPP115 MPP142	MU142-010 Mu142-146	30 mm			

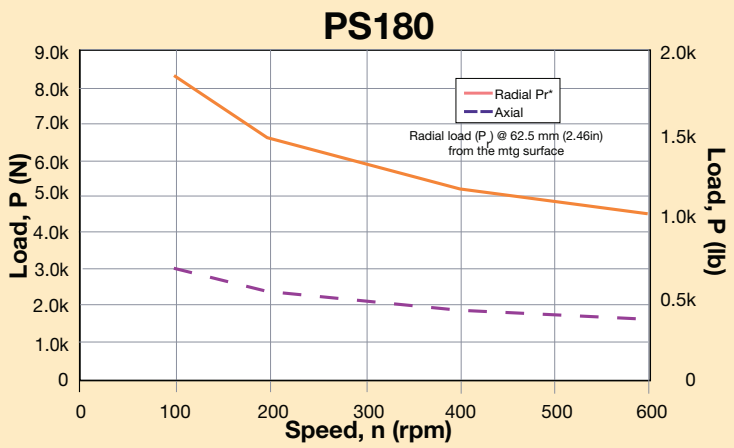
Generation I Stealth® Series

PS Performance Specifications

Parameter	Units	Ratio	PS180		PS220	
Nominal Output Torque $T_{nom\ r}$	Nm (in-lb)	3,4,5,7,10	735	(6500)	1413	(12,500)
		15,20,25, 30,40,50	1017	(9000)	1808	(16,000)
		70,100	893	(7900)	1582	(14,000)
Maximum Acceleration Output Torque [1] $T_{acc\ r}$	Nm (in-lb)	3,4,5,7,10 70,100	972	(8600)	1763	(15,600)
		15,20,25, 30,40,50	1198	(10,600)	2011	(17,800)
Emergency Stop Output Torque [2] $T_{em\ r}$	Nm (in-lb)	3,4,5,7,10 70,100	2237	(19,800)	4068	(36,000)
		15,20,25, 30,40,50	2757	(24,400)	4520	(40,000)
Nominal Input Speed $N_{nom\ r}$	RPM	3,4,5	1600		1200	
		7,10	2000		1500	
		15,20,25, 30,40,50	2400		1800	
		70,100	2800		2100	
Maximum Input Speed $N_{max\ r}$	RPM	3 – 100	3000		2300	
Standard Backlash [3]	arc-min	3 – 10	4		4	
		15 – 100	6		6	
Low Backlash [3]	arc-min	3 – 10	3		3	
		15 – 100	5		5	
Efficiency at Nominal Torque	%	3 – 10	97		97	
		15 – 100	94		94	
Noise Level at: **2000 RPM [4]** **3000 RPM [4]**	db	3 – 100	66 —		68 —	
Torsional Stiffness	Nm/arc-min (in-lb/arc-min)	3 – 100	110	(973)	210	(1,858)
Maximum Allowable Case Temperature	° C	3 – 100	-20 to 90			
Degree of Protection			IP65			
Maximum Weight	kg (lbs)	3 – 10	26	(57)	49	(108)
		15 – 100	35	(77)	71	(157)

1) Parker MotionSizer sizing software available for free download at parkermotion.com.
2) Maximum of 1,000 stops
3) Measured at 2% of rated torque
4) Measured at 1 meter

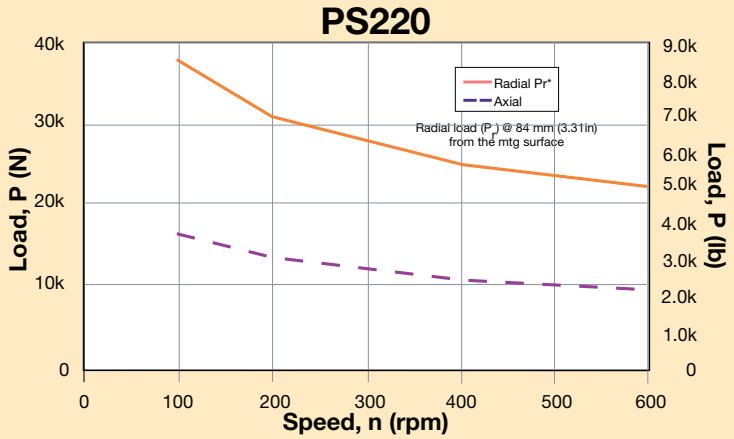
PS Output Shaft Load Rating



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

Prx = Pr * 138 mm / (76 + X)

Prx = Pr * 5.43 in / (2.99 in + X)



Prx = Pr * 190 mm / (106 + X)

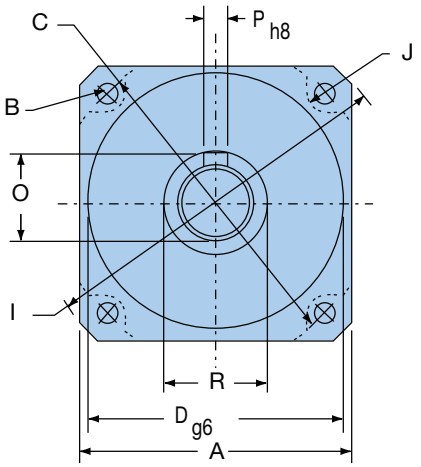
Prx = Pr * 7.48 in / (4.17 in + X)

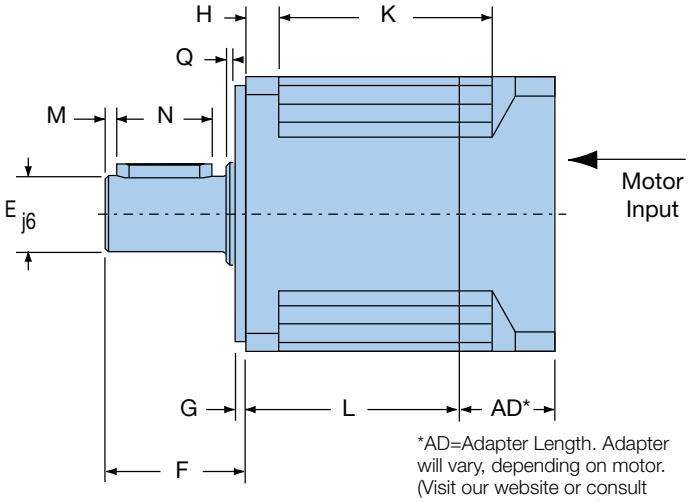
* Radial load applied to center of the shaft.

Generation I Stealth® Series

PS Dimensions

Free 3D Solid Models and drawings available at parkermotion.com





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

Metric Frame Sizes

Frame Size	A Square Flange		B Bolt Hole		C Bolt Circle		D Pilot Diameter		E Output Shaft Diameter		F Output Shaft Length		G Pilot Thickness		H Flange Thickness		I Housing Diameter		J Housing Recess	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
PS180	182	7.165	13	0.512	215	8.465	160	6.299	55	2.165	105	4.134	20	0.787	16	0.630	240	9.449	16	0.630
PS220	220	8.661	17	0.669	250	9.843	180	7.087	75	2.953	138	5.433	30	1.181	22	0.866	290	11.417	16	0.630

Frame Size	K1 Recess Length (for ratios 3-10)		K2 Recess Length (for ratios 15-100)		L1 Length (for ratios 3-10)		L2 Length (for ratios 15-100)		M Distance from Shaft End		N Keyway Length		O Key Height		P Keyway Width		Q Shoulder Height		R Shoulder Diameter	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
PS180	88	3.465	158	6.220	83.5	3.287	153.5	6.043	6	0.236	70	2.756	59	2.323	16	0.630	3	0.118	70	2.756
PS220	116	4.567	218	8.583	108	4.252	210.5	8.287	6	0.236	90	3.543	79.5	3.130	20	0.787	3	0.118	95	3.740

PS Inertia

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

	Ratio	Units	Frame Size	
			PS180	PS220
Small Motor Shaft Diameter Range	3 to 100	mm	15.9-35	24-48
		in	0.626-1.378	0.945-1.89
	3	gm-cm-sec^2	28.6	—
		oz-in-sec^2	0.397	—
	4, 5	gm-cm-sec^2	17.6	62.6
		oz-in-sec^2	0.244	0.869
	7, 10	gm-cm-sec^2	9.24	34.3
		oz-in-sec^2	0.128	0.476
	15	gm-cm-sec^2	15.8	51.0
		oz-in-sec^2	0.219	0.708
	20, 25	gm-cm-sec^2	16.7	53.3
		oz-in-sec^2	0.232	0.741
	30, 40, 50, 70, 100	gm-cm-sec^2	7.450	27.1
		oz-in-sec^2	0.104	0.377

	Ratio	Units	Frame Size	
			PS180	PS220
Large Motor Shaft Diameter Range	3 to 100	mm	35-42	48-55
		in	1.38-1.65	1.89-2.17
	3	gm-cm-sec^2	37.8	111
		oz-in-sec^2	0.526	1.54
	4, 5	gm-cm-sec^2	25.6	72.4
		oz-in-sec^2	0.356	1.01
	7, 10	gm-cm-sec^2	15.8	44.1
		oz-in-sec^2	0.219	0.613
	15	gm-cm-sec^2	23.8	60.8
		oz-in-sec^2	0.331	0.845
	20, 25	gm-cm-sec^2	24.7	62.9
		oz-in-sec^2	0.344	0.874
	30, 40, 50, 70, 100	gm-cm-sec^2	14.0	37.0
		oz-in-sec^2	0.195	0.513