

PV Series Gearheads

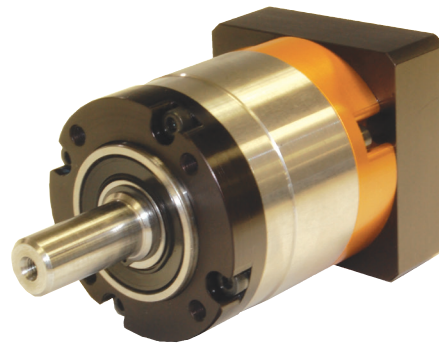
PV Series: Value Alternative Precision Planetary Gearheads

PV = Power + Versatility

The PV Series planetary gearhead combines power and versatility in an economical package. It comes in a wide range of options, including dimensional output face crossovers to the Parker PX, Alpha LP, Neugart PLE, Stober PE and standard NEMA gearheads.

The PV Series is available in metric or NEMA frame sizes: 40, 60, 90 and 115 mm, and NEMA sizes 17, 23, 34 and 42. Ratios are available from 3:1 to 100:1.

Whether you're an OEM or an end user searching for competitive alternatives, the PV offers a superior solution. Parker's PV Series gearheads are made in the USA.

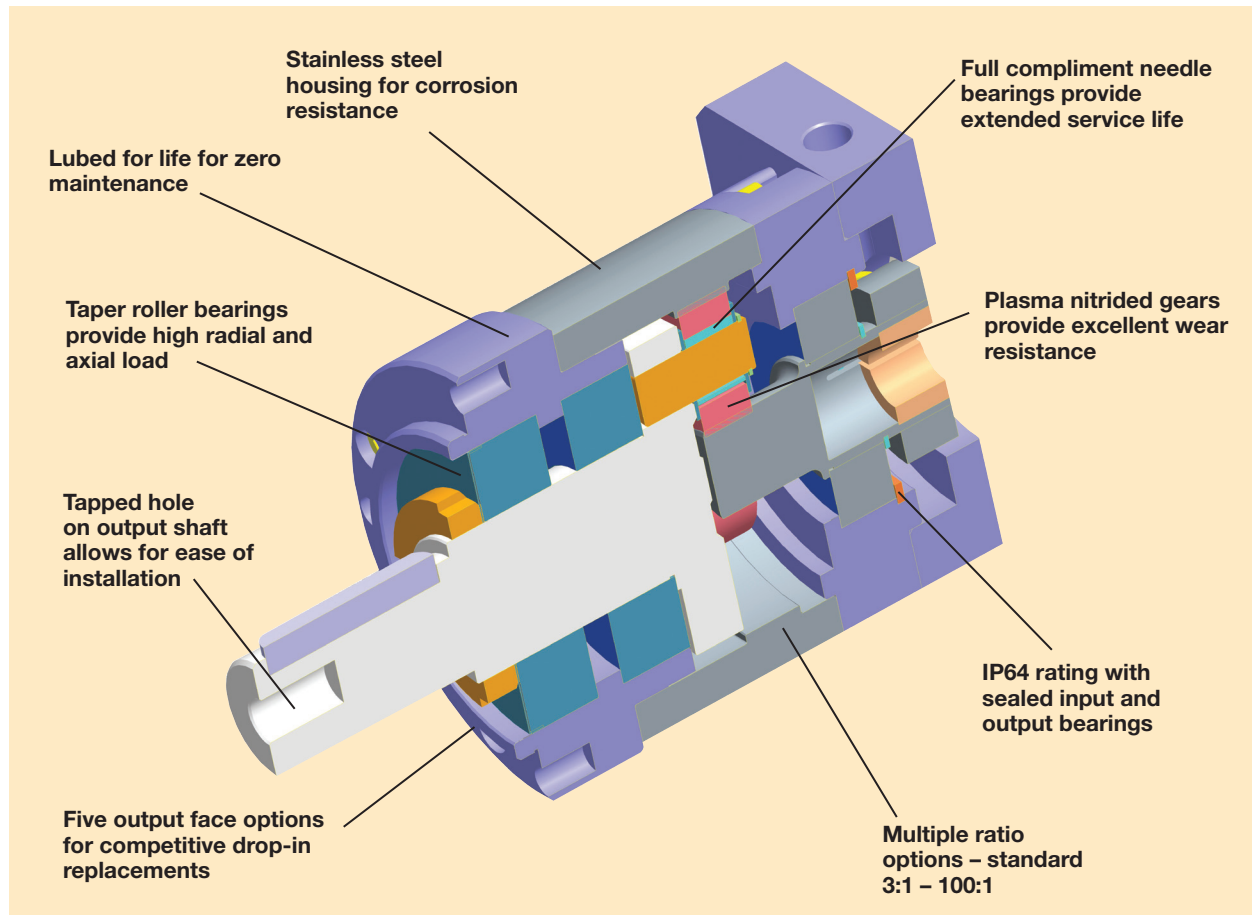


- **Higher radial load capacity:** Taper roller output bearings
- **Competitive Alternatives:** Five Drop-In Output Face Options
- **Universal mounting kits:** Quicker deliveries and easier mounting
- **Higher gear wear resistance:** Plasma Nitriding heat treating

PV Series Precision Gearheads

Product Series	Gear Geometry	Configuration	Frame Size (mm)	Nominal Continuous Torque (Nm)	Radial Load (N)	Backlash arc-min	IP Rating
PV40/17	Planetary	In-Line	40 (NEMA 17)	3.5 – 6.7	190 – 590	<15	IP64
PV60/23	Planetary	In-Line	60 (NEMA 23)	10.2 – 22.5	665 – 2535	<12	IP64
PV90/34	Planetary	In-Line	90 (NEMA 34)	33 – 71	1040 – 4270	<10	IP64
PV115/42	Planetary	In-Line	115 (NEMA 42)	67 – 144	1235 – 10,550	<8	IP64

PV Series Gearhead Features and Benefits



PV Series Gearheads

Performance Specifications

Parameter	Units	Ratio	PV40/PV17		PV60/PV23		PV90/PV34		PV115/PV42	
Nominal Output Torque T _{nom r}	Nm (in-lb)	3	–	–	12.0	(106.200)	35	(309.75)	74	(654.90)
		4	5.9	(52.215)	18.9	(167.265)	56	(495.60)	111	(982.30)
		5	6.2	(54.870)	19.6	(173.460)	58	(513.30)	115	(1017.70)
		7	5.5	(48.675)	16.7	(147.795)	52	(460.20)	104	(920.40)
		10	3.5	(30.975)	10.6	(93.810)	33	(292.05)	67	(592.95)
		12	–	–	18.2	(161.070)	54	(477.90)	112	(991.20)
		15	–	–	19.4	(171.690)	58	(513.30)	120	(1062.00)
		16	6.5	(57.525)	–	–	–	–	–	–
		20	6.5	(57.525)	21.5	(190.275)	67	(592.95)	136	(1203.60)
		25	6.7	(59.295)	20.0	(177.000)	63	(557.55)	126	(1115.10)
		30	–	–	22.5	(199.275)	71	(628.35)	144	(1274.40)
		35	6.7	(59.295)	–	–	–	–	–	–
		40	6.5	(57.525)	21.5	(190.275)	67	(592.95)	136	(1203.60)
		50	6.7	(59.295)	20.0	(177.000)	63	(557.55)	126	(1115.10)
		70	5.5	(48.675)	16.7	(147.795)	52	(460.20)	104	(920.40)
		100	3.5	(30.975)	10.6	(93.810)	33	(292.05)	67	(592.95)
Maximum Acceleration Output Torque ¹⁾ T _{acc r}	Nm (in-lb)	3	–	–	24.0	(212.400)	70	(619.50)	148	(1309.80)
		4,5,12,15	11.8	(104.430)	36.4	(322.140)	108	(955.80)	222	(1964.70)
		7,70	11.0	(97.350)	33.4	(295.590)	104	(920.40)	208	(1840.80)
		10,100	7.0	(61.950)	21.2	(187.620)	66	(584.10)	134	(1185.90)
		16,20,25,30,35,40,50	13.0	(115.050)	40.0	(354.000)	126	(1115.10)	252	(2230.20)
Emergency Stop Output Torque ²⁾ T _{em r}	Nm (in-lb)	3,4,5,12,15,16,20,25,30,35,40,50	16.0	(141.600)	55.0	(486.750)	170	(1504.50)	350	(3097.50)
		7, 70	13.7	(121.245)	44.0	(389.400)	137	(1212.45)	290	(2466.50)
		10, 100	9.2	(81.420)	39.0	(345.150)	122	(1079.70)	255	(2256.75)
Nominal Input Speed N _{nom r}	RPM	3 – 100	4500		4000		3500		3000	
Maximum Input Speed N _{max r}	RPM	3 – 100	8000		6000		6000		5000	
Service Life	h	3 – 100	20,000							
Standard Backlash ³⁾	arc-min	3 – 10	<15		<12		<10		<8	
		15 – 100	<18		<16		<14		<12	
Efficiency at Nominal Torque	%	3 – 10	96							
		15 – 100	94							
Noise Level at 3000 RPM ⁴⁾	db	3 – 100	<60		<65		<65		<70	
Maximum Allowable Case Temperature	° C	3 – 100	-20 to 100							
Lubrication		3 – 100	Lifetime lubrication							
Mounting Position		3 – 100	Any							
Direction of Rotation		3 – 100	Same as Input							
Degree of Protection		3 – 100	IP64							
Maximum Weight	kg (lbs)	3 – 10	0.6	(1.2)	1.2	(2.5)	3.2	(7.0)	6.8	(13.5)
		15 – 100	0.9	(2.0)	1.6	(3.5)	4.3	(9.5)	9.7	(19.3)

1) Parker MotionSizer sizing software available for free download at parkermotion.com. $t_{acc} + t_{dec} = 0.2 (t_{acc} + t_{cont} + t_{dec})$ $T_{cont} = 0.25 T_{acc}$

2) Maximum of 1000 stops.

3) Measured at 2% of rated torque.

4) Measure at 1m.

Inertia

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

Ratio	Units*	PV40/PV17	PV60/PV23	PV90/PV34	PV115/PV42
3	kg-cm ²	–	0.1400	0.7400	1.9700
	in-lb-sec ²	–	0.000124	0.000655	0.001743
4	kg-cm ²	0.0200	0.1000	0.5000	1.3400
	in-lb-sec ²	0.000018	0.000089	0.000443	0.001186
5	kg-cm ²	0.0180	0.0840	0.3900	1.1300
	in-lb-sec ²	0.000016	0.000074	0.000345	0.001000
7	kg-cm ²	0.0160	0.0750	0.3400	0.9300
	in-lb-sec ²	0.000014	0.000066	0.000301	0.000823
10	kg-cm ²	0.0160	0.0700	0.3000	0.8500
	in-lb-sec ²	0.000014	0.000062	0.000266	0.000752
12	kg-cm ²	–	0.0970	0.4900	1.2300
	in-lb-sec ²	–	0.000086	0.000434	0.001089
15	kg-cm ²	–	0.0830	0.3900	1.0400
	in-lb-sec ²	–	0.000073	0.000345	0.000920
16	kg-cm ²	0.0190	–	–	–
	in-lb-sec ²	0.000017	–	–	–
20	kg-cm ²	0.0170	0.0830	0.3900	1.0400
	in-lb-sec ²	0.000015	0.000073	0.000345	0.000920
25	kg-cm ²	0.0170	0.0830	0.3900	1.0400
	in-lb-sec ²	0.000015	0.000073	0.000345	0.000920
30	kg-cm ²	–	0.0700	0.3000	0.8400
	in-lb-sec ²	–	0.000062	0.000266	0.000743
35	kg-cm ²	0.0160	–	–	–
	in-lb-sec ²	0.000014	–	–	–
40, 50, 70, 100	kg-cm ²	0.0160	0.0700	0.3000	0.8400
	in-lb-sec ²	0.000014	0.000062	0.000266	0.000743

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

Maximum Output Shaft Load Rating

See load rating charts on pages 42-43

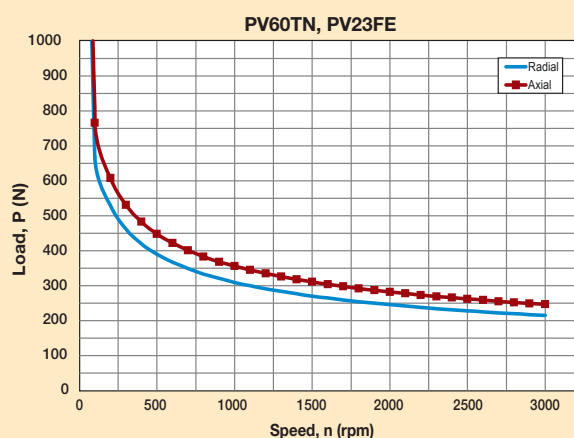
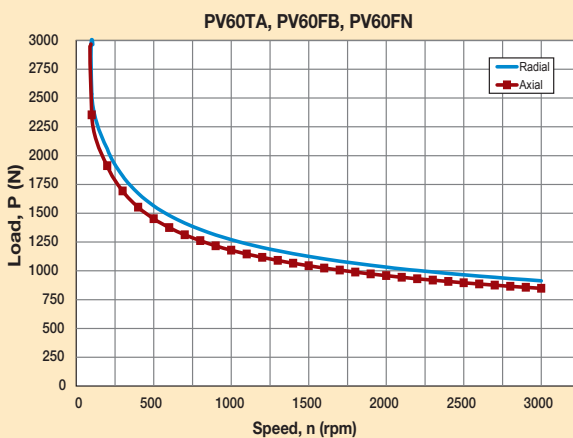
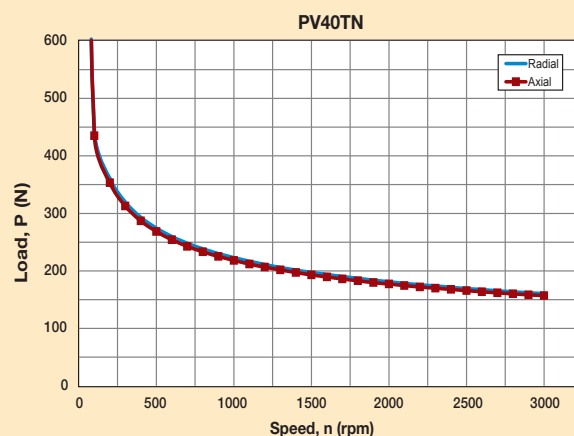
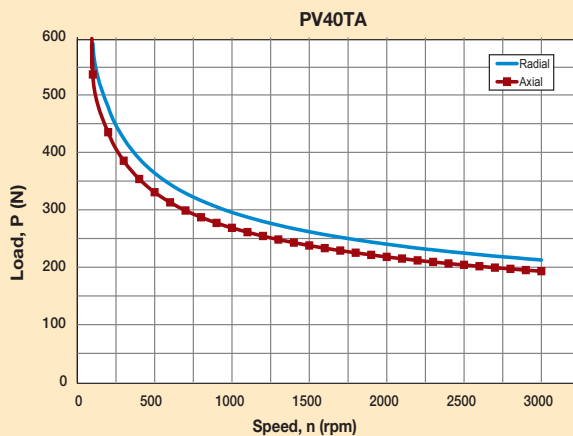
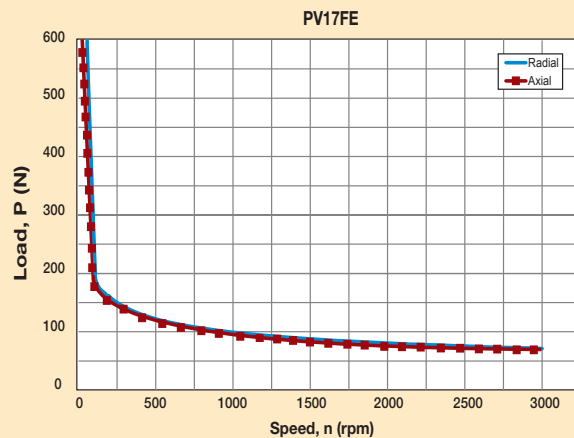
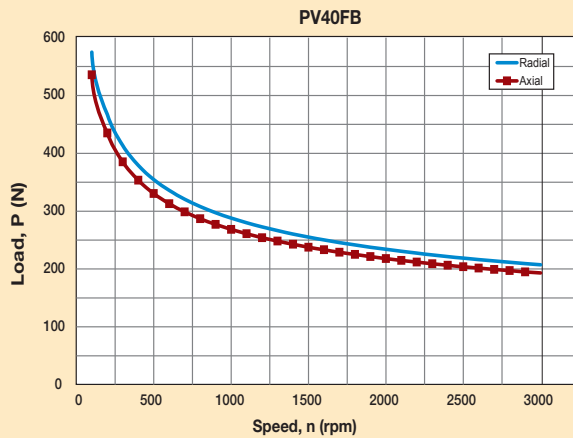
	Output Face Option*	PV40/PV17	PV60/PV23	PV90/PV34	PV115/PV42
Maximum Radial Load Pr, N ** (3-100 ratios)	FE	200	665	1040	1235
	TN	440	665	1040	2100
	FB, FN, TA	590	2535	4270	8550
Maximum Axial Load Pr, N ** (3-100 ratios)	FE	190	765	1140	1300
	TN	430	765	1140	2380
	FB, FN, TA	530	2350	4670	10550

* See How to Order page 46, items 3 & 4 for front face/output face code definitions.

** @100 rpm, radial load applied at center of shaft

PV Series Gearheads

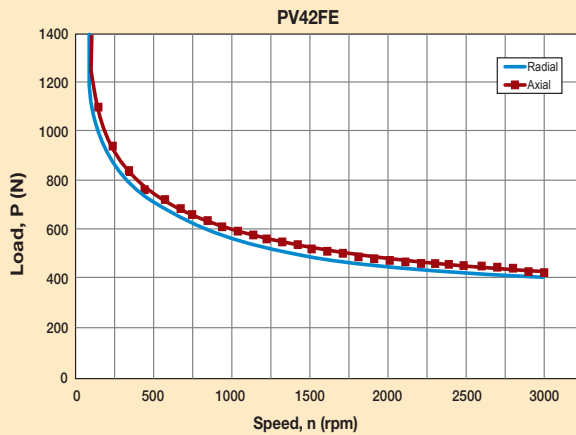
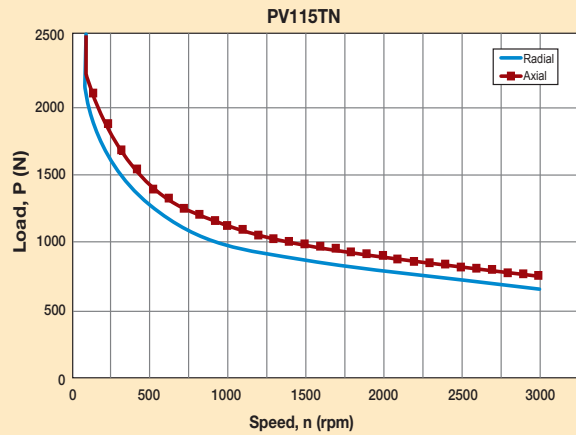
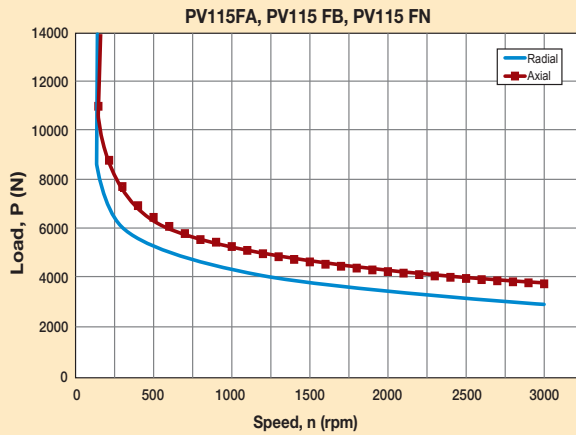
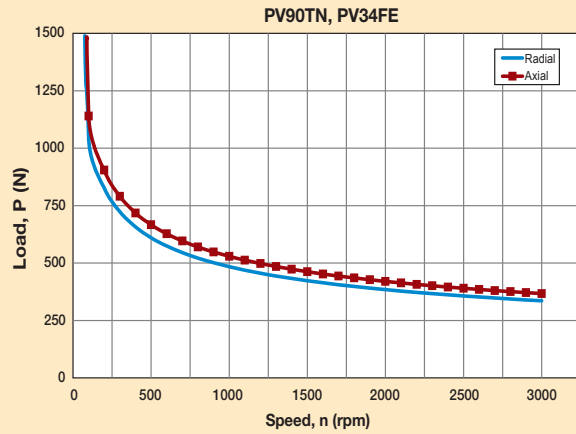
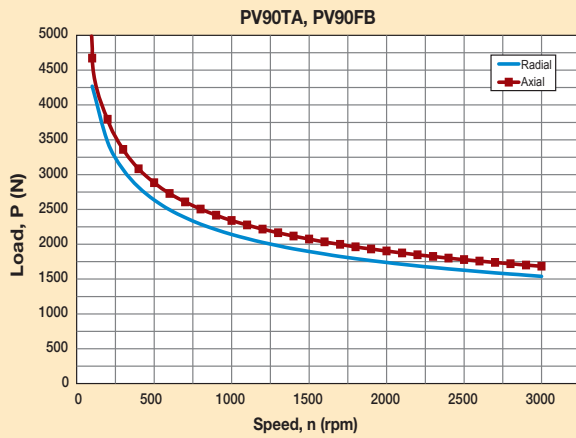
Output Shaft Load Ratings – PV40/PV17 & PV60/PV23



See How to Order page 46, items 3 & 4 for front face/output face code definitions.

- 1) Maximum axial load, F_a .
- 2) Maximum radial load applied to the center of the shaft, F_r .
- 3) Radial load curves can be used to combine (radial + axial) load if $F_a/F_r < 0.22$.
- 4) If $F_a/F_r > 0.22$ consult factory.

Output Shaft Load Ratings – PV90/PV34 & PV115/PV42



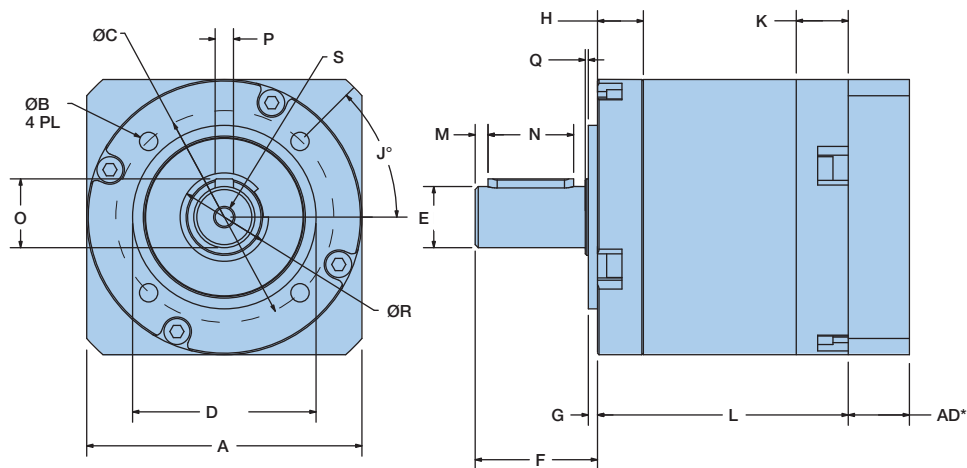
See How to Order page 46, items 3 & 4 for front face/output face code definitions.

- 1) Maximum axial load, F_a .
- 2) Maximum radial load applied to the center of the shaft, F_r .
- 3) Radial load curves can be used to combine (radial + axial) load if $F_a/F_r < 0.22$.
- 4) If $F_a/F_r > 0.22$ consult factory.

PV Series Gearheads

Dimensions – Tapped Face (TA & TN)

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



*AD = Adapter length. See how to order page for mounting kit adapter lengths.

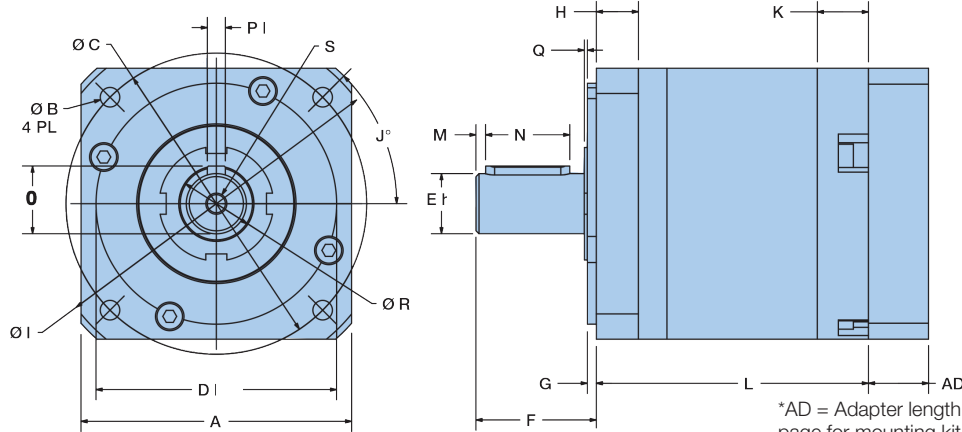
Metric Frame Sizes

Frame Size	A		B		C		D		E		F		G		H		J		K	
	Body Diameter		Tap x Depth		Bolt Circle		Pilot Diameter		Output Shaft Diameter		Output Shaft Length		Pilot Thickness		Flange Thickness		Lead Angle		Rear Thickness	
	mm	in			mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	°		mm	in
PV40TN	43	1.693	M4x7		34	1.339	26	1.024	10	0.394	26	1.024	1.5	0.059	10	0.394	45		11	0.433
PV40TA	50	1.969	M4x10		44	1.732	35	1.378	12	0.472	25	0.984	3	0.118	10	0.394	90		11	0.433
PV60TN	62	2.441	M5x10		52	2.047	40	1.575	14	0.551	35	1.378	2.5	0.098	12	0.472	45		16	0.630
PV60TA	70	2.756	M5x10		62	2.362	52	2.047	16	0.630	36	1.417	5	0.197	16	0.630	90		16	0.630
PV90TN	90	3.543	M6x11		70	2.756	60	2.362	20	0.787	40	1.575	3	0.118	15	0.591	45		17	0.670
PV90TA	90	3.543	M6x12		80	3.150	68	2.677	22	0.866	46	1.811	5	0.197	18.5	0.728	90		17	0.670
PV115TN	115	4.528	M10x16		100	3.937	80	3.150	25	0.984	55	2.165	4	0.157	20	0.787	45		23	0.906
PV115TA	120	4.724	M8x20		108	4.252	90	3.543	32	1.260	70	2.756	6	0.236	28	1.102	90		23	0.906

Frame Size	L1		L2		M		N		O		P		Q		R		S	
	Length (3 – 10 Ratios)		Length (12 – 100 Ratios)		Distance from Shaft End		Keyway Length		Key Height		Keyway Width		Shoulder Height		Shoulder Diameter		Tap & Depth (end of shaft)	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in		
PV40TN	48.5	1.909	63	2.480	3.1	0.122	16	0.630	10.2	0.402	3	0.118	0.6	0.024	11.633	0.458	M3X6	
PV40TA	48.5	1.909	63	2.480	1.3	0.051	16	0.630	13.5	0.531	4	0.157	3.5	0.138	17.831	0.702	M4x8	
PV60TN	63	2.480	83	3.268	2.71	0.107	25	0.984	16		5	0.197	2.5	0.098	19.939	0.785	M5x12	
PV60TA	67	2.638	87	3.425	2.21	0.087	25	0.984	18	0.709	5	0.197	3	0.118	28	1.102	M5x12	
PV90TN	82	3.228	105.5	4.154	4.197	0.165	28	1.102	22.5	0.886	6	0.236	1	0.039	25	0.984	M6x12	
PV90TA	85.5	3.366	109	4.291	3.197	0.126	28	1.102	24.5	0.965	6	0.236	5	0.197	38	1.496	M8x13	
PV115TN	102	4.016	136	5.354	5.2	0.205	40	1.575	28	1.102	8	0.315	1	0.039	35	1.378	M10x20	
PV115TA	110	4.331	144	5.669	4	0.157	50	1.969	35	1.378	10	0.394	1.8	0.071	40	1.575	M12x22	

Dimensions – Flange Face (FB, FE & FN)

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



*AD = Adapter length. See how to order page for mounting kit adapter lengths.

Metric & NEMA Frame Sizes

Frame Size		A		B		C		D		E		F		G		H		I		J
		Body Diameter		Bolt Hole		Bolt Circle		Pilot Diameter		Output Shaft Diameter		Output Shaft Length		Pilot Thickness		Flange Thickness		Housing Diameter		Lead Angle
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	°
Metric	PV40FB	43	1.693	3.4	0.134	50	1.969	35	1.378	13	0.512	26	1.024	3	0.118	10	0.394	56	2.205	45
	PV60FB	62	2.441	5.5	0.217	70	2.756	50	1.969	16	0.630	25	0.984	2.5	0.098	10.3	0.406	80	3.150	45
	PV60FN	62	2.441	5.5	0.217	70	2.756	50	1.969	14	0.551	25	0.984	2.5	0.098	10.3	0.406	80	3.150	45
	PV90FB	90	3.543	6.5	0.256	100	3.937	80	3.150	20	0.787	40	1.575	3	0.118	14	0.551	116	4.567	45
	PV115FB	115	4.528	8.5	0.335	130	5.118	110	4.331	24	0.945	50	1.969	3.5	0.138	18	0.709	152	5.984	45
	PV115FN	115	4.528	8.5	0.335	130	5.118	110	4.331	25	0.984	55	2.165	3.5	0.138	18	0.709	152	5.984	45

NEMA		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	°
	PV17FE	1.693	43	0.138	3.5	1.724	43.8	0.866	22	0.250	6.35	0.984	25	0.059	1.5	0.236	6	2.165	55	45
	PV23FE	2.441	62	0.195	4.95	2.625	66.675	1.500	38.1	0.375	9.525	1.000	25.4	0.062	1.6	0.449	11.4	3.150	80	45
	PV34FE	3.543	90	0.217	5.52	3.875	98.43	2.875	73.025	0.500	12.7	1.250	31.75	0.065	1.65	0.591	15	4.567	116	45
	PV42FE	4.528	115	0.281	7.14	4.949	125.7	2.187	55.55	0.625	15.875	1.500	38.1	0.094	2.4	0.787	20	5.984	152	45

Frame Size		K		L1		L2		M		N		O		P		Q		R		S
		Rear Thickness		Length (3 – 10 Ratios)		Length (12 – 100 Ratios)		Distance from Shaft End		Keyway Length		Key Height		Keyway Width		Shoulder Height		Shoulder Diameter		Tap & Depth
		mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	
Metric	PV40FB	11	0.433	48.5	1.909	63	2.480	2.1	0.083	16	0.630	15	0.591	5	0.197	2	0.079	17.831	0.702	M4x8
	PV60FB	16	0.630	71.5	2.815	91.5	3.602	3.2	0.126	16	0.630	18	0.709	5	0.197	1	0.039	28	1.102	M5x12
	PV90FB	17	0.670	90.5	3.563	119	4.685	3.197	0.126	28	1.102	22.5	0.886	6	0.236	1	0.039	38	1.496	M6x12
	PV115FB	23	0.906	114.5	4.508	148.5	5.846	4.2	0.165	40	1.575	27	1.063	8	0.315	1.5	0.059	40	1.575	M10x22
	PV115FN	23	0.906	114.5	4.508	148.5	5.846	4.2	0.165	40	1.575	27	1.063	8	0.315	1.5	0.059	40	1.575	M10x22

NEMA		in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	
	PV17FE	0.433	11	1.909	48.5	2.480	63	–	–	–	–	–	–	–	–	0.091	2.3	0.458	11.633	–
	PV23FE	0.630	16	2.382	60.5	3.169	80.5	–	–	0.748	19	0.36	9.144	Flat		0.039	1	0.785	19.939	M5x12
	PV34FE	0.670	17	3.32	84.35	4.154	105.5	–	–	1.063	27	0.553	14.045	0.125	3.175	0.039	1	0.984	25	M6x12
	PV42FE	0.906	23	4.016	102	5.354	136	0.016	0.4	1.120	28.45	0.705	17.91	0.188	4.775	–	–	–	–	M6x20

PV Series Gearheads

How to Order

Use the tables below to configure your PV gearhead and motor mounting kit part number.

	①	②	③	④	⑤
Order Example:	PV	40	T	N	- 004

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 60-61 provides a straightforward method of selecting the correct gearhead for your application.

①	②		③		④		⑤	
Series	Frame Size		Front Face		Output Face Compatible		Ratio	
PV Power Versatility Series	40	40 mm	T	Tapped (round)	A N	Alpha/Stober Neugart	004	4:1
			F	Flanged (square)	B	Parker Bayside (PX)	005	5:1
	17	NEMA 17	F	Flanged (square)	E	NEMA (English)	007	7:1
							010	10:1
							016	16:1
							020	20:1
							025	25:1
							035	35:1
							040	40:1
							050	50:1
							070	70:1
							100	100:1
	60	60 mm	T	Tapped (round)	A N	Alpha/Stober Neugart	003	3:1
			F	Flanged (square)	B N	Parker Bayside (PX) Neugart	004	4:1
	23	NEMA 23	F	Flanged (square)	E	NEMA (English)	005	5:1
							007	7:1
	90	90 mm	T	Tapped (round)	A N	Alpha/Stober Neugart	010	10:1
							012	12:1
			F	Flanged (square)	B	Parker Bayside (PX)	015	15:1
							020	20:1
	34	NEMA 34	F	Flanged (square)	E	NEMA (English)	025	25:1
							030	30:1
	115	115 mm	T	Tapped (round)	A N	Alpha/Stober Neugart	040	40:1
							050	50:1
			F	Flanged (square)	B	Parker Bayside (PX)	070	70:1
							100	100:1
	42	NEMA 42	F	Flanged (square)	E	NEMA (English)		

Mounting Kit Ordering Information

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

	⑥	⑦	⑧
Order Example:	MV	60	XXX

⑥	⑦	⑧
Series	Frame Size	Factory Assigned
MV (Mounting kit for PV)	40 60 90 115	40 or 17 60 or 23 90 or 34 115 or 42
		XXX See Motor Mounting Search Tool on parkermotion.com or consult factory for part number

Mounting Kit Adapter Length*

Frame Size	Motor Shaft Length		“AD”	
	mm	(in)	mm	(in)
40/17	12 – 20 20.1 – 25.4	(0.472 – 0.787) (0.791 – 1.000)	13.7 19.0	(0.539) (0.748)
60/23	16 – 25.4 25.4 – 31.8	(0.630 – 1.000) (1.004 – 1.252)	16.5 22.5	(0.650) (0.886)
90/34	20 – 31.8 31.9 – 40	(0.787 – 1.252) (1.256 – 1.575)	20.0 28.5	(0.787) (1.122)
115/42	22 – 40 40.1 – 51	(0.866 – 1.575) (1.579 – 2.008)	24.0 35.0	(0.945) (1.378)

* Adapter length may vary depending on motor make and model.

Recommended Parker Motor and Mounting Kit*

Frame Size	Recommended Servo Motor			Recommended Stepper Motor		
	Motor	Mounting Kit	AD Dimension	Motor	Mounting Kit	AD Dimension
40 or 17	BE16 SM16	MV40-005	19 mm	LV17 HV17	MV40-003	19 mm
60 or 23	BE23 SM23	MV60-001 MV60-005	22.5 mm 16.5 mm	LV23 HV23	MV60-002	16.5 mm
90 or 34	BE34 MPP092	MV90-005 MV90-002	20 mm 28.5 mm	LV34 HV34	MV90-005	20 mm
115 or 42	MPP100 MPP115	MV115-039 MV115-010	24 mm 35 mm			

*Parker MotionSizer sizing software available for free download at: www.parkermotion.com