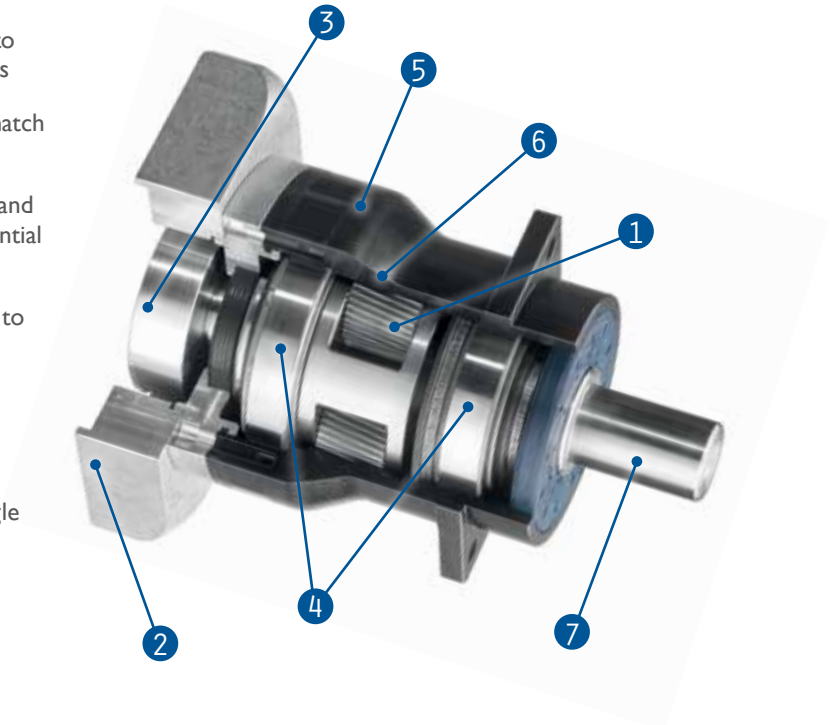




## ▶ HIGHEST PERFORMANCE: SPH SERIES

The SPH series features helical gearing which brings a whole new level of power and precision to GAM's already extensive portfolio of gear reducer technology. With special attention paid to every aspect during development, the SPH gracefully combines design and engineering, to deliver our best inline planetary gear reducer yet. For dynamic and demanding servo applications where performance is critical, the SPH is highly powerful and efficient, yet smooth and quiet.

- 1. Helical Gears** Precision cut and ground to quietly deliver higher torques and accuracies
- 2. Adapter Flange** Custom machined to match any motor for easy installation
- 3. Input Clamping Element** Low inertia and balanced for high speeds with a single tangential screw ensures a secure motor connection
- 4. Bearings** Optimized taper roller bearings to accommodate high radial and axial loads
- 5. Housing** Sleek and contoured steel housing with black oxide treatment for maximum durability
- 6. Ring Gear** Machined directly into the single piece housing for maximum stiffness
- 7. Output Shaft** Offered smooth or keyed and can be easily shortened if required

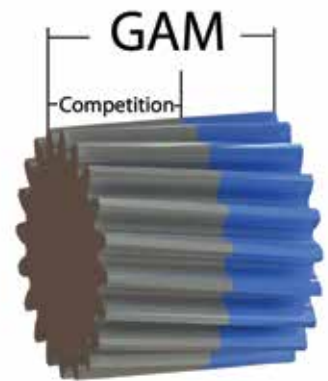


### Helical gears make the difference

The helical gear profile is cut at an angle that allows for gradual tooth engagement allowing for smooth, accurate, and quiet transmission. GAM's SPH gears are cut at the optimal helix angle to minimize resultant axial forces and they have a larger tooth width to maximize torque carrying capacity compared to the competition.

### It all starts with the gears

The SPH's helical gears are produced to an extremely high level of quality and ground for further precision. With state of the art testing and measuring instruments and qualified personnel, we assure that the SPH will meet and exceed your requirements. With the SPH, every detail counts.



### The SPH is GAM's highest performing inline gear reducer

Designed for **dynamic**  
& **cyclic** applications

Can be optimized for **high speed**  
and **continuous** applications

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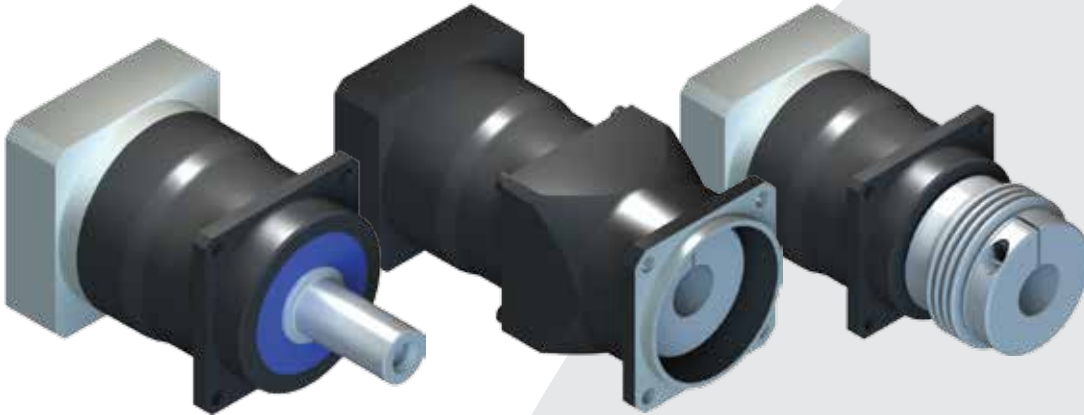
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## Available configurations for simple and compact machine integration



### SPH-W

Shaft output design for mounting to pulleys and rack and pinion systems. Available with a smooth or keyed output shaft.

### SPH-K

Features a bellows or a zero backlash elastomer-spider coupling on the output for maximum stiffness and the best results in highly dynamic applications. An output housing comes standard with custom housings available.

### SPH-F

Same benefits as the SPH-K models without the housing on the output. Plug the gearbox directly into your machine and achieve a more compact design.

## When your application is demanding...demand GAM's SPH

	LOW	HIGH	SUPERIOR	WHY GAM SPH?
<b>Flexibility</b>	Competition A		<b>SPH</b>	Configured to meet the application, not the other way around!
	Competition B			
<b>Modifications &amp; Customizations</b>	Competition A		<b>SPH</b>	Flexible manufacturing and experienced engineering
	Competition B			
<b>Performance</b>			<b>SPH</b>	95 years of gear manufacturing experience
			Competition A	
			Competition B	
<b>Quality</b>			<b>SPH</b>	State of the art testing and measuring machines. ISO 9001 Certified
			Competition A	
			Competition B	



### The following methods are applied:

- CNC coordinate measurement method
- CNC gear measurement method
- Mechanical measurement test
- Surface testing
- Thickness measurement
- Magnetic particle inspection
- Hardness testing
- Grinding burn inspection

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# HIGHEST PERFORMANCE: SPH SERIES - SPH-W

SPH-W		50	60	75	100	140	180				
All Ratios Available		1 Stage: 3, 4, 5, 7, 10									
		2 Stage: 12, 15, 16, 20, 25, 28, 30, 35, 40, 50, 70, 100									
Nominal Output Torque ( $T_{2n}$ )	Nm (lb-in)	3:1-5:1	20 (177)	60 (531)	100 (885)	250 (2213)	450 (3983)	900 (7966)			
		7:1	18 (159)	40 (354)	80 (708)	180 (1593)	420 (3717)	800 (7081)			
		10:1	15 (133)	30 (266)	65 (575)	110 (974)	240 (2124)	450 (3983)			
		12:1-40:1	13 (115)	60 (531)	100 (885)	250 (2213)	450 (3983)	900 (7966)			
		50:1	13 (115)	40 (354)	80 (708)	250 (2213)	450 (3983)	900 (7966)			
		70:1	10 (89)	40 (354)	80 (708)	180 (1593)	420 (3717)	800 (7081)			
100:1	7 (62)	30 (266)	65 (575)	110 (974)	240 (2124)	450 (3983)					
Max Acceleration Output Torque ( $T_{2B}$ )	Nm (lb-in)	1.5 x Nominal ( $T_{2n}$ )									
Emergency Output Torque ( $T_{2not}$ )	Nm (lb-in)	3.5 x Nominal ( $T_{2n}$ )									
Nominal Input Speed ( $n_{1n}$ )	RPM	-	4500	4500	4500	4000	3800	2000			
Max Input Speed ( $n_{1max}$ )		-	6000								
Standard Output Backlash (j)	arcmin	1-stage	<4	<4	<4	<4	<4	<4			
		2-stage	<6	<6	<6	<6	<6	<6			
Reduced Output Backlash (j)	arcmin	1-stage	<3	<2	<2	<2	<2	<2			
		2-stage	<5	<4	<4	<4	<4	<4			
Allowable Radial Load ( $F_{rad1}$ )	N (lbf)	-	700 (157)	3,500 (787)	4,500 (1012)	8,000 (1798)	12,000 (2698)	20,000 (4496)			
Allowable Axial Load ( $F_{axial}$ )	N (lbf)	-	600 (135)	1,600 (360)	2,400 (540)	2,400 (540)	6,000 (1349)	10,000 (2248)			
Torsional Stiffness ( $C_{t21}$ )	Nm/arcmin (lb-in/arcmin)	1-stage	2.0 (18)	4.0 (35)	12 (106)	32 (283)	54 (478)	168 (1487)			
		2-stage	2.0 (18)	4.0 (35)	12 (106)	32 (283)	54 (478)	168 (1487)			
Mass Moment of Inertia ( $J_1$ )	kg-cm <sup>2</sup> (lb-in <sup>2</sup> )	3:1	0.13 (0.044)	0.42 (0.144)	1.26 (0.431)	4.00 (1.367)	12.90 (4.408)	62.30 (21.29)			
		4:1	0.08 (0.027)	0.29 (0.099)	0.95 (0.325)	2.90 (0.991)	8.45 (2.888)	38.90 (13.29)			
		5:1	0.06 (0.021)	0.22 (0.075)	0.79 (0.270)	2.20 (0.752)	6.20 (2.119)	25.90 (8.850)			
		7:1	0.05 (0.017)	0.17 (0.058)	0.68 (0.232)	1.81 (0.619)	4.66 (1.592)	18.40 (6.288)			
		10:1	0.04 (0.014)	0.15 (0.051)	0.62 (0.212)	1.60 (0.547)	3.86 (1.319)	13.60 (4.647)			
		12-16:1	0.08 (0.027)	0.18 (0.062)	0.62 (0.212)	1.46 (0.499)	3.40 (1.162)	12.90 (4.408)			
		20-25:1	0.06 (0.021)	0.14 (0.048)	0.53 (0.181)	1.20 (0.410)	2.45 (0.837)	8.69 (2.970)			
		28-40:1	0.05 (0.017)	0.13 (0.044)	0.50 (0.171)	1.10 (0.376)	2.10 (0.718)	6.99 (2.389)			
		50-100:1	0.04 (0.014)	0.12 (0.041)	0.46 (0.157)	0.99 (0.338)	1.73 (0.591)	5.39 (1.842)			
Weight (m)	kg (lbs)	1-stage	1.1 (2.4)	(2.2) (4.9)	3.6 (7.9)	7.3 (16)	17.4 (38)	38 (84)			
		2-stage	1.8 (4.0)	(2.9) (6.4)	4.9 (11)	9.1 (20)	23.3 (51)	48 (106)			
Noise Level ( $L_{pk}$ )	dB(A)	1-stage	<60	<60	<63	<64	<65	<65			
		2-stage	<60	<60	<61	<62	<63	<64			
Efficiency at Load	1-stage: 98% 2-stage: 96%										
Service Life	>20,000 hours										
Lubrication	Lifetime lubrication with synthetic oil										
Protection Rating	IP64 (IP65/IP66 available on request)										
Operating Temperature Range	-25°C to +80°C (short term: 100°C)										

1) Load applied at center of output shaft @ 100 RPM

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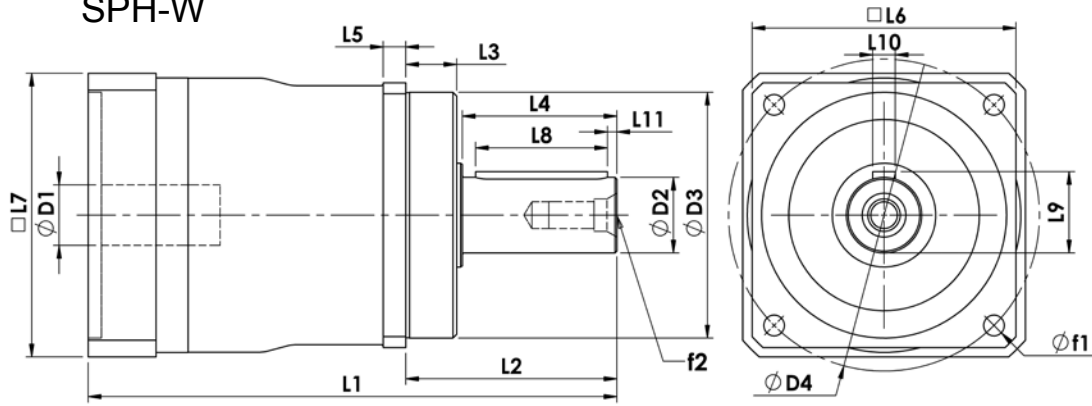
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# SPH-W



SPH-W		50		60		75		100		140		180	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)
D1 <sub>max</sub> Standard	Motor Shaft Diameter	11	(0.433)	14	(0.551)	19	(0.748)	24	(0.945)	32	(1.260)	38	(1.496)
D1 <sub>max</sub> Available <sup>1</sup>		11	(0.433)	19	(0.748)	24	(0.945)	32	(1.260)	38	(1.496)	48	(1.890)
D1 <sub>max</sub> 2-stage		11	(0.433)	14	(0.551)	19	(0.748)	24	(0.945)	32	(1.260)	38	(1.496)
D2 k6	Output Shaft Diameter	14	(0.551)	16	(0.630)	22	(0.866)	32	(1.260)	40	(1.575)	55	(2.165)
D3 g6	Pilot Diameter	45	(1.772)	60	(2.362)	70	(2.756)	90	(3.543)	130	(5.118)	160	(6.299)
D4	Output Bolt Circle	63	(2.480)	68	(2.677)	85	(3.346)	120	(4.724)	165	(6.496)	215	(8.465)
f1	Mounting Holes	5.5	(0.217)	6	(0.236)	6.6	(0.260)	9	(0.354)	11	(0.433)	13	(0.512)
f2	Shaft End Thread	M5		M5		M8		M8		M16		M20	
L1 <sup>2</sup>	Overall Gearbox Length	125	(4.921)	150	(5.906)	165	(6.496)	220	(8.661)	280	(11.024)	330	(12.992)
L1 <sub>2-stage</sub> <sup>2</sup>		165	(6.496)	190	(7.480)	210	(8.268)	270	(10.630)	345	(13.583)	420	(16.535)
L2	Shaft Length	38	(1.496)	48	(1.890)	56	(2.205)	88	(3.465)	112	(4.409)	112	(4.409)
L3	Pilot Height	12	(0.472)	18	(0.709)	18	(0.709)	28	(1.102)	27	(1.063)	27	(1.063)
L4	Usable Shaft Length	24	(0.945)	28	(1.102)	36	(1.417)	58	(2.283)	82	(3.228)	82	(3.228)
L5	Flange Thickness	6	(0.236)	6	(0.236)	7	(0.276)	10	(0.394)	12	(0.472)	18	(0.709)
L6	Output Square	55	(2.165)	61	(2.402)	75	(2.953)	100	(3.937)	140	(5.512)	180	(7.087)
L7 <sup>2</sup>	Input Square	65	(2.559)	75	(2.953)	90	(3.543)	120	(4.724)	150	(5.906)	210	(8.268)
L8	Key Length	20	(0.787)	25	(0.984)	32	(1.260)	50	(1.969)	70	(2.756)	70	(2.756)
L9	Key Height	16	(0.630)	18	(0.709)	24.5	(0.965)	35	(1.378)	43	(1.693)	59	(2.323)
L10	Key Width	5	(0.197)	5	(0.197)	6	(0.236)	10	(0.394)	12	(0.472)	16	(0.630)
L11	Key End	2	(0.079)	1.5	(0.059)	2	(0.079)	4	(0.157)	5	(0.197)	6	(0.236)

1) For larger motor shaft diameters, please contact GAM.

2) Depending on the motor, value can vary.

## TYPE CODES FOR SPL SERIES (SPH-W)

**Example: SPH - W - 075 - 005 G - [115 - A01] - S111**

**Gearbox Series**

SPL Series

**Gearbox Style**

W = Output Shaft

**Gearbox Size**

050, 060, 075, 100, 140, 180

**Ratio**

3, 4, 5, 7, 10, 12, 15, 16, 20, 25, 28, 30, 35, 40, 50, 70, 100

**Special Options**

Assigned by GAM

**Motor Mount Kit**

Assigned by GAM

**Options Available for This Product**

G = Key on output shaft per DIN6885

C = Reduced backlash and key on output shaft

H = Smooth output shaft

A = Reduced backlash and smooth shaft

Tolerance (mm)		
Size	k6	g6
Over 6	+0.010	-0.005
Thru 10	+0.001	-0.014
Over 10	+0.012	-0.006
Thru 18	+0.001	-0.017
Over 18	+0.015	-0.007
Thru 30	+0.002	-0.020
Over 30	+0.018	-0.009
Thru 50	+0.002	-0.025
Over 50	+0.021	-0.010
Thru 80	+0.002	-0.029
Over 80	+0.025	-0.012
Thru 120	+0.003	-0.034
Over 120	+0.028	-0.014
Thru 180	+0.003	-0.037

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# HIGHEST PERFORMANCE: SPH SERIES - SPH-K

SPH-K		50	60	75	100	140	180	
All Ratios Available		1 Stage: 3, 4, 5, 7, 10						
		2 Stage: 12, 15, 16, 20, 25, 28, 30, 35, 40, 50, 70, 100						
Nominal Output Torque (T <sub>2n</sub> )	Nm (lb-in)	3:1-5:1	20 (177)	60 <sub>1</sub> (531)	100 (885)	250 (2213)	450 (3983)	900 (7966)
		7:1	18 (159)	40 (354)	80 (708)	180 (1593)	420 (3717)	800 (7081)
		10:1	15 (133)	30 (266)	65 (575)	110 (974)	240 (2124)	450 (3983)
		12:1-40:1	13 (115)	60 <sub>1</sub> (531)	100 (885)	250 (2213)	450 (3983)	900 (7966)
		50:1	13 (115)	40 (354)	80 (708)	250 (2213)	450 (3983)	900 (7966)
		70:1	10 (89)	40 (354)	80 (708)	180 (1593)	420 (3717)	800 (7081)
100:1	7 (62)	30 (266)	65 (575)	110 (974)	240 (2124)	450 (3983)		
Max Acceleration Output Torque (T <sub>2B</sub> )	Nm (lb-in)	1.5 x Nominal (T <sub>2n</sub> )						
Emergency Output Torque (T <sub>2not</sub> )	Nm (lb-in)	3.5 x Nominal (T <sub>2n</sub> )						
Nominal Input Speed (n <sub>in</sub> )	RPM	-	4500	4500	4500	4000	3800	2000
Max Input Speed (n <sub>1max</sub> )		-	6000					
Standard Output Backlash (j)	arcmin	1-stage	<4	<4	<4	<4	<4	<4
		2-stage	<6	<6	<6	<6	<6	<6
Reduced Output Backlash (j)	arcmin	1-stage	<3	<2	<2	<2	<2	<2
		2-stage	<5	<4	<4	<4	<4	<4
Torsional Stiffness (C <sub>t21</sub> ) With Bellows Coupling	Nm/arcmin (lb-in/arcmin)	1-stage	1.3 (11)	2.8 (25)	7.5 (66)	20 (175)	36 (317)	96 (851)
		2-stage	1.3 (11)	2.8 (25)	7.5 (66)	20 (175)	36 (317)	96 (851)
Torsional Stiffness (C <sub>t21</sub> ) With Elastomer Coupling	Nm/arcmin (lb-in/arcmin)	1-stage	0.3 (3)	0.5 (4)	1.0 (9)	3 (23)	5 (46)	11 (99)
		2-stage	0.3 (3)	0.5 (4)	1.0 (9)	3 (23)	5 (46)	11 (99)
Mass Moment of Inertia (J <sub>1</sub> ) With Bellows Coupling	kg-cm <sup>2</sup> (lb-in <sup>2</sup> )	3:1	0.18 (0.061)	0.62 (0.212)	1.65 (0.563)	6.89 (2.354)	18.90 (6.458)	89.86 (30.705)
		4:1	0.11 (0.037)	0.40 (0.138)	1.17 (0.399)	4.53 (1.546)	11.83 (4.041)	54.40 (18.589)
		5:1	0.08 (0.027)	0.29 (0.100)	0.93 (0.318)	3.24 (1.107)	8.36 (2.857)	35.82 (12.240)
		7:1	0.06 (0.020)	0.21 (0.071)	0.75 (0.257)	2.34 (0.800)	5.76 (1.969)	23.46 (8.017)
		10:1	0.04 (0.015)	0.17 (0.057)	0.66 (0.224)	1.86 (0.636)	4.40 (1.504)	16.08 (5.495)
		12-16:1	0.08 (0.028)	0.19 (0.064)	0.63 (0.217)	1.56 (0.534)	3.61 (1.234)	13.87 (4.739)
		20-25:1	0.06 (0.021)	0.14 (0.049)	0.54 (0.183)	1.24 (0.424)	2.54 (0.867)	9.09 (3.105)
		28-40:1	0.05 (0.017)	0.13 (0.045)	0.50 (0.172)	1.12 (0.383)	2.14 (0.733)	7.19 (2.458)
Mass Moment of Inertia (J <sub>1</sub> ) With Elastomer Coupling	kg-cm <sup>2</sup> (lb-in <sup>2</sup> )	3:1	0.16 (0.056)	0.52 (0.178)	1.68 (0.575)	5.11 (1.747)	15.34 (5.243)	68.08 (23.26)
		4:1	0.10 (0.034)	0.35 (0.118)	1.19 (0.406)	3.53 (1.205)	9.83 (3.357)	42.15 (14.403)
		5:1	0.07 (0.025)	0.26 (0.087)	0.94 (0.322)	2.60 (0.888)	7.08 (2.419)	27.98 (9.56)
		7:1	0.06 (0.019)	0.19 (0.064)	0.76 (0.259)	2.01 (0.688)	5.11 (1.746)	19.46 (6.650)
		10:1	0.04 (0.015)	0.16 (0.054)	0.66 (0.225)	1.70 (0.581)	4.08 (1.394)	14.12 (4.825)
		12-16:1	0.08 (0.028)	0.18 (0.063)	0.63 (0.217)	1.50 (0.512)	3.49 (1.191)	13.10 (4.478)
		20-25:1	0.06 (0.021)	0.14 (0.048)	0.54 (0.183)	1.22 (0.416)	2.49 (0.849)	8.77 (2.998)
		28-40:1	0.05 (0.017)	0.13 (0.045)	0.50 (0.172)	1.11 (0.379)	2.12 (0.724)	7.03 (2.403)
Weight (m) With Bellows Coupling	kg (lbs)	1-stage	1.6 (3.5)	3.0 (6.5)	4.5 (10)	11 (24)	23 (50)	52 (115)
		2-stage	2.3 (5.0)	3.7 (8.0)	5.8 (12.8)	13 (28)	29 (63)	62 (137)
Weight (m) With Elastomer Coupling	kg (lbs)	1-stage	1.5 (3.2)	2.7 (5.9)	4.5 (10)	9.3 (21)	21 (46)	46 (102)
		2-stage	2.2 (4.8)	3.4 (7.4)	5.8 (12.9)	11 (25)	27 (59)	56 (124)
Noise Level (L <sub>pa</sub> )	dB(A)	1-stage	<60	<60	<63	<64	<65	<65
		2-stage	<60	<60	<61	<62	<63	<64
Efficiency at Load	1-stage: 98% 2-stage: 96%							
Service Life	>20,000 hours							
Lubrication	Lifetime lubrication with synthetic oil							
Protection Rating	IP64 (IP65/IP66 available on request)							
Operating Temperature Range	-25°C to +80°C (short term: 100°C)							

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11 Limited to 40 Nm (354 lb-in) for SPH-F and SPH-K. For higher torques, please contact GAM.

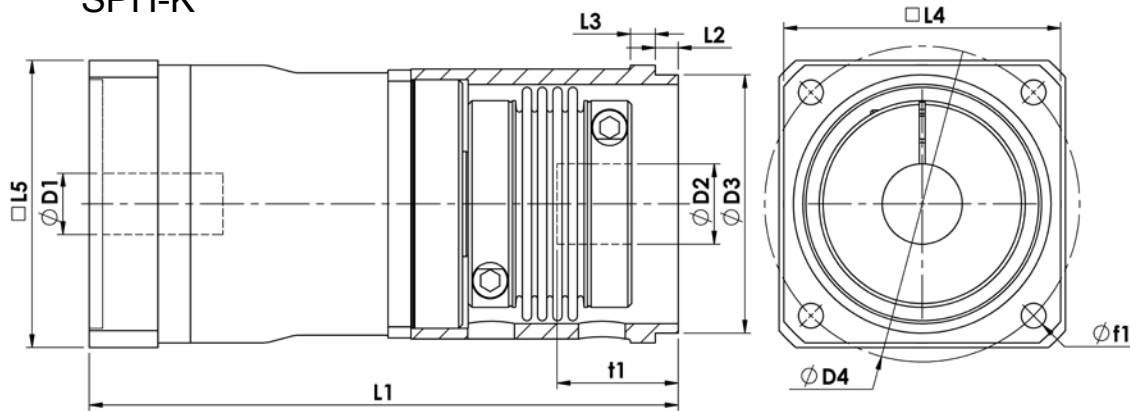
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# SPH-K



SPH-K		50		60		75		100		140		180	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)
D1 <sub>max</sub> Standard	Motor Shaft Diameter	11	(0.433)	14	(0.551)	19	(0.748)	24	(0.945)	32	(1.260)	38	(1.496)
D1 <sub>max</sub> Available <sup>1</sup>		11	(0.433)	19	(0.748)	24	(0.945)	32	(1.260)	38	(1.496)	48	(1.890)
D1 <sub>max</sub> 2-stage		11	(0.433)	14	(0.551)	19	(0.748)	24	(0.945)	32	(1.260)	38	(1.496)
D2 <sub>FB min</sub>	Minimum Output Bore	10	(0.394)	12	(0.472)	22	(0.866)	22	(0.866)	42	(1.654)	50	(1.969)
D2 <sub>FE min</sub>		12	(0.472)	18	(0.709)	22	(0.866)	35	(1.378)	38	(1.496)	48	(1.890)
D2 <sub>FB max</sub>	Maximum Output Bore	20	(0.787)	28	(1.102)	38	(1.496)	50	(1.969)	64	(2.520)	90	(3.543)
D2 <sub>FE max</sub>		19	(0.748)	26	(1.024)	33	(1.299)	42	(1.654)	56	(2.205)	70	(2.756)
D3 g6	Pilot Diameter	55	(2.165)	70	(2.756)	85	(3.346)	115	(4.528)	135	(5.315)	180	(7.087)
D4	Output Bolt Circle	70	(2.756)	85	(3.346)	105	(4.134)	140	(5.512)	165	(6.496)	215	(8.465)
f1	Mounting Holes	5.5	(0.217)	6.6	(0.260)	9	(0.354)	11	(0.433)	13	(0.512)	17	(0.669)
L1 <sup>2</sup>	Overall Gearbox Length	155	(6.102)	189	(7.441)	214	(8.425)	262	(10.315)	308	(12.126)	386	(15.197)
L1 <sub>2-stage</sub> <sup>2</sup>		195	(7.677)	229	(9.016)	259	(10.197)	312	(12.283)	373	(14.685)	476	(18.740)
L2	Pilot Height	6	(0.236)	6	(0.236)	8	(0.315)	10	(0.394)	12	(0.472)	15	(0.591)
L3	Flange Thickness	6	(0.236)	7	(0.276)	9	(0.354)	11	(0.433)	13	(0.512)	15	(0.591)
L4	Output Square	60	(2.362)	70	(2.756)	95	(3.740)	120	(4.724)	145	(5.709)	190	(7.480)
L5 <sup>2</sup>	Input Square	65	(2.559)	75	(2.953)	90	(3.543)	120	(4.724)	150	(5.906)	210	(8.268)
t1 <sub>FB min</sub>	Minimum Shaft Engagement	24	(0.945)	27	(1.063)	39.5	(1.555)	44	(1.732)	49	(1.929)	65.5	(2.579)
t1 <sub>FE min</sub>		21	(0.827)	29	(1.142)	38.5	(1.516)	45	(1.772)	49	(1.929)	70	(2.756)
t1 <sub>FB max</sub>	Maximum Shaft Engagement	41	(1.614)	51	(2.008)	62	(2.441)	74	(2.913)	86	(3.386)	105	(4.134)
t1 <sub>FE max</sub>		27.5	(1.083)	36.5	(1.437)	46	(1.811)	55	(2.165)	60	(2.362)	83	(3.268)

1) For larger motor shaft diameters, please contact GAM.

2) Depending on the motor, value can vary.

## TYPE CODES FOR SPH-K SERIES

**Example: SPH - KE - 060 - 005 G - [115 - 201] - S111**

**Gearbox Series**

SPH Series

**Gearbox Style**

KB = Bellows coupling output  
KE = Elastomer coupling output

**Gearbox Size**

050, 060, 075, 100, 140, 180

**Ratio**

3, 4, 5, 7, 10, 12, 15, 16, 20, 25, 28, 30,  
35, 40, 50, 70, 100

**Special Options**

Assigned by GAM

**Motor Mount Kit**

Assigned by GAM

**Options Available for This Product**

G = Standard backlash and keyway  
in output coupling  
C = Reduced backlash and keyway  
in output coupling  
H = Standard backlash and no keyway  
in output coupling  
A = Reduced backlash and no keyway  
in output coupling

Tolerance (mm)		
Size	k6	g6
Over 6	+0.010	-0.005
Thru 10	+0.001	-0.014
Over 10	+0.012	-0.006
Thru 18	+0.001	-0.017
Over 18	+0.015	-0.007
Thru 30	+0.002	-0.020
Over 30	+0.018	-0.009
Thru 50	+0.002	-0.025
Over 50	+0.021	-0.010
Thru 80	+0.002	-0.029
Over 80	+0.025	-0.012
Thru 120	+0.003	-0.034
Over 120	+0.028	-0.014
Thru 180	+0.003	-0.037

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# HIGHEST PERFORMANCE: SPH SERIES - SPH-F

SPH-F		50	60	75	100	140	180	
All Ratios Available		1 Stage: 3, 4, 5, 7, 10						
		2 Stage: 12, 15, 16, 20, 25, 28, 30, 35, 40, 50, 70, 100						
Nominal Output Torque ( $T_{2n}$ )	Nm (lb-in)	3:1-5:1	20 (177)	60 <sub>1</sub> (531)	100 (885)	250 (2213)	450 (3983)	900 (7966)
		7:1	18 (159)	40 (354)	80 (708)	180 (1593)	420 (3717)	800 (7081)
		10:1	15 (133)	30 (266)	65 (575)	110 (974)	240 (2124)	450 (3983)
		12:1-40:1	13 (115)	60 <sub>1</sub> (531)	100 (885)	250 (2213)	450 (3983)	900 (7966)
		50:1	13 (115)	40 (354)	80 (708)	250 (2213)	450 (3983)	900 (7966)
		70:1	10 (89)	40 (354)	80 (708)	180 (1593)	420 (3717)	800 (7081)
100:1	7 (62)	30 (266)	65 (575)	110 (974)	240 (2124)	450 (3983)		
Max Acceleration Output Torque ( $T_{2a}$ )	Nm (lb-in)	1.5 x Nominal ( $T_{2n}$ )						
Emergency Output Torque ( $T_{2not}$ )	Nm (lb-in)	3.5 x Nominal ( $T_{2n}$ )						
Nominal Input Speed ( $n_{1n}$ )	RPM	-	4500	4500	4500	4000	3800	2000
Max Input Speed ( $n_{1max}$ )		-	6000					
Standard Output Backlash (j)	arcmin	1-stage	<4	<4	<4	<4	<4	<4
		2-stage	<6	<6	<6	<6	<6	<6
Reduced Output Backlash (j)	arcmin	1-stage	<3	<2	<2	<2	<2	<2
		2-stage	<5	<4	<4	<4	<4	<4
Torsional Stiffness ( $C_{t21}$ ) With Bellows Coupling	Nm/arcmin (lb-in/arcmin)	1-stage	1.3 (11)	2.8 (25)	7.5 (66)	20 (175)	36 (317)	96 (851)
		2-stage	1.3 (11)	2.8 (25)	7.5 (66)	20 (175)	36 (317)	96 (851)
Torsional Stiffness ( $C_{t21}$ ) With Elastomer Coupling	Nm/arcmin (lb-in/arcmin)	1-stage	0.3 (3)	0.5 (4)	1.0 (9)	3 (23)	5 (46)	11 (99)
		2-stage	0.3 (3)	0.5 (4)	1.0 (9)	3 (23)	5 (46)	11 (99)
Mass Moment of Inertia ( $J_1$ ) With Bellows Coupling	kg-cm <sup>2</sup> (lb-in <sup>2</sup> )	3:1	0.18 (0.061)	0.62 (0.212)	1.65 (0.563)	6.89 (2.354)	18.90 (6.458)	89.86 (30.71)
		4:1	0.11 (0.037)	0.40 (0.138)	1.17 (0.399)	4.53 (1.546)	11.83 (4.041)	54.40 (18.59)
		5:1	0.08 (0.027)	0.29 (0.100)	0.93 (0.318)	3.24 (1.107)	8.36 (2.857)	35.82 (12.240)
		7:1	0.06 (0.020)	0.21 (0.071)	0.75 (0.257)	2.34 (0.800)	5.76 (1.969)	23.46 (8.017)
		10:1	0.04 (0.015)	0.17 (0.057)	0.66 (0.224)	1.86 (0.636)	4.40 (1.504)	16.08 (5.495)
		12-16:1	0.08 (0.028)	0.19 (0.064)	0.63 (0.217)	1.56 (0.534)	3.61 (1.234)	13.87 (4.739)
		20-25:1	0.06 (0.021)	0.14 (0.049)	0.54 (0.183)	1.24 (0.424)	2.54 (0.867)	9.09 (3.105)
		28-40:1	0.05 (0.017)	0.13 (0.045)	0.50 (0.172)	1.12 (0.383)	2.14 (0.733)	7.19 (2.458)
Mass Moment of Inertia ( $J_1$ ) With Elastomer Coupling	kg-cm <sup>2</sup> (lb-in <sup>2</sup> )	3:1	0.16 (0.056)	0.52 (0.178)	1.68 (0.575)	5.11 (1.747)	15.34 (5.243)	68.08 (23.26)
		4:1	0.10 (0.034)	0.35 (0.118)	1.19 (0.406)	3.53 (1.205)	9.83 (3.357)	42.15 (14.403)
		5:1	0.07 (0.025)	0.26 (0.087)	0.94 (0.322)	2.60 (0.888)	7.08 (2.419)	27.98 (9.56)
		7:1	0.06 (0.019)	0.19 (0.064)	0.76 (0.259)	2.01 (0.688)	5.11 (1.746)	19.46 (6.650)
		10:1	0.04 (0.015)	0.16 (0.054)	0.66 (0.225)	1.70 (0.581)	4.08 (1.394)	14.12 (4.83)
		12-16:1	0.08 (0.028)	0.18 (0.063)	0.63 (0.217)	1.50 (0.512)	3.49 (1.191)	13.10 (4.478)
		20-25:1	0.06 (0.021)	0.14 (0.048)	0.54 (0.183)	1.22 (0.416)	2.49 (0.849)	8.77 (3.00)
		28-40:1	0.05 (0.017)	0.13 (0.045)	0.50 (0.172)	1.11 (0.379)	2.12 (0.724)	7.03 (2.403)
Weight (m) With Bellows Coupling	kg (lbs)	1-stage	1.3 (2.9)	2.7 (6.0)	4.1 (9)	9.7 (21)	21 (46)	47 (103)
		2-stage	2.0 (4.5)	3.4 (7.5)	5.4 (11.9)	12 (25)	27 (59)	57 (125)
Weight (m) With Elastomer Coupling	kg (lbs)	1-stage	1.2 (2.7)	2.4 (5.3)	4.1 (9)	8.2 (18)	19 (42)	41 (89)
		2-stage	1.9 (4.2)	3.1 (6.9)	5.4 (11.9)	10 (22)	25 (55)	51 (111)
Noise Level ( $L_{pa}$ )	dB(A)	1-stage	<60	<60	<63	<64	<65	<65
		2-stage	<60	<60	<61	<62	<63	<64
Efficiency at Load	1-stage: 98% 2-stage: 96%							
Service Life	>20,000 hours							
Lubrication	Lifetime lubrication with synthetic oil							
Protection Rating	IP64 (IP65/IP66 available on request)							
Operating Temperature Range	-25°C to +80°C (short term: 100°C)							

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 Operating Temperature Range

1. Limited to 40 Nm (354 lb-in) for SPH-F and SPH-K. For higher torques, please contact GAM.

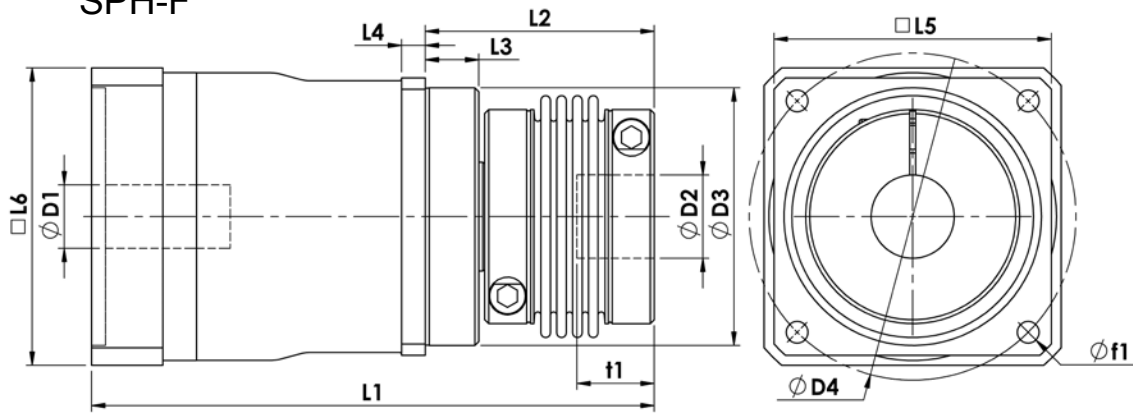
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# SPH-F

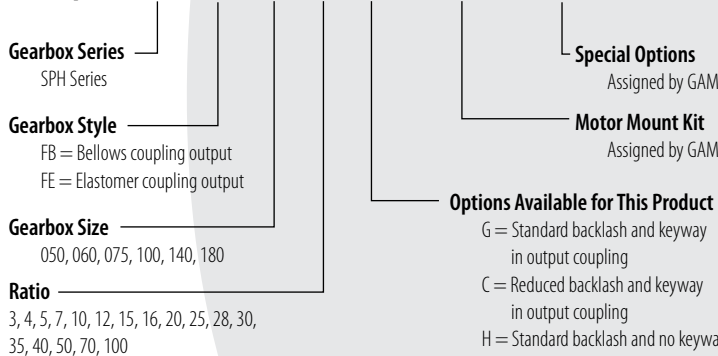


SPH-F		50		60		75		100		140		180	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)
D1 <sub>max</sub> Standard	Motor Shaft Diameter	11	(0.433)	14	(0.551)	19	(0.748)	24	(0.945)	32	(1.260)	38	(1.496)
D1 <sub>max</sub> Available <sup>1</sup>		11	(0.433)	19	(0.748)	24	(0.945)	32	(1.260)	38	(1.496)	48	(1.890)
D1 <sub>max</sub> 2-stage		11	(0.433)	14	(0.551)	19	(0.748)	24	(0.945)	32	(1.260)	38	(1.496)
D2 <sub>FB min</sub>	Minimum Output Bore	10	(0.394)	12	(0.472)	22	(0.866)	22	(0.866)	42	(1.654)	50	(1.969)
D2 <sub>FE min</sub>		12	(0.472)	18	(0.709)	22	(0.866)	35	(1.378)	38	(1.496)	48	(1.890)
D2 <sub>FB max</sub>	Maximum Output Bore	20	(0.787)	28	(1.102)	38	(1.496)	50	(1.969)	64	(2.520)	90	(3.543)
D2 <sub>FE max</sub>		19	(0.748)	26	(1.024)	33	(1.299)	42	(1.654)	56	(2.205)	70	(2.756)
D3 g6	Pilot Diameter	45	(1.772)	60	(2.362)	70	(2.756)	90	(3.543)	130	(5.118)	160	(6.299)
D4	Output Bolt Circle	63	(2.480)	68	(2.677)	85	(3.346)	120	(4.724)	165	(6.496)	215	(8.465)
f1	Mounting Holes	5.5	(0.217)	6	(0.236)	6.6	(0.260)	9	(0.354)	11	(0.433)	13	(0.512)
L1FB <sup>2</sup>	Overall Gearbox Length	144	(5.669)	177	(6.969)	197	(7.756)	244	(9.606)	283	(11.142)	356	(14.016)
L1FE <sup>2</sup>		151	(5.945)	180	(7.087)	202	(7.953)	248	(9.764)	292	(11.496)	354	(13.937)
L1FB <sub>2-stage</sub> <sup>2</sup>		184	(7.244)	217	(8.543)	242	(9.528)	294	(11.575)	348	(13.701)	446	(17.559)
L1FE <sub>2-stage</sub> <sup>2</sup>		191	(7.520)	220	(8.661)	247	(9.724)	298	(11.732)	357	(14.055)	444	(17.480)
L2FB	Coupling Length	57	(2.244)	75	(2.953)	88	(3.465)	112	(4.409)	115	(4.528)	138	(5.433)
L2FE		64	(2.520)	78	(3.071)	93	(3.661)	116	(4.567)	124	(4.882)	136	(5.354)
L3	Pilot Height	12	(0.472)	18	(0.709)	18	(0.709)	28	(1.102)	27	(1.063)	27	(1.063)
L4	Flange Thickness	6	(0.236)	6	(0.236)	7	(0.276)	10	(0.394)	12	(0.472)	18	(0.709)
L5	Output Square	55	(2.165)	61	(2.402)	75	(2.953)	100	(3.937)	140	(5.512)	180	(7.087)
L6 <sup>2</sup>	Input Square	65	(2.559)	75	(2.953)	90	(3.543)	120	(4.724)	150	(5.906)	210	(8.268)
t1 <sub>FB min</sub>	Minimum Shaft Engagement	13	(0.512)	16	(0.630)	22	(0.866)	26	(1.024)	24	(0.945)	35.5	(1.398)
t1 <sub>FE min</sub>		17	(0.669)	20	(0.787)	26.5	(1.043)	31	(1.220)	33	(1.299)	38	(1.496)
t1 <sub>FB max</sub>	Maximum Shaft Engagement	30	(1.181)	39	(1.535)	45	(1.772)	56	(2.205)	61	(2.402)	75.5	(2.972)
t1 <sub>FE max</sub>		23.5	(0.925)	27.5	(1.083)	34.5	(1.358)	41	(1.614)	44	(1.732)	51	(2.008)

- 1) For larger motor shaft diameters, please contact GAM.
- 2) Depending on the motor, value can vary.

## TYPE CODES FOR SPH-F SERIES

**Example: SPH - FE - 060 - 005 G - [115 - 201] - S111**



Size	Tolerance (mm)	
	k6	g6
Over 6	+0.010	-0.005
Thru 10	+0.001	-0.014
Over 10	+0.012	-0.006
Thru 18	+0.001	-0.017
Over 18	+0.015	-0.007
Thru 30	+0.002	-0.020
Over 30	+0.018	-0.009
Thru 50	+0.002	-0.025
Over 50	+0.021	-0.010
Thru 80	+0.002	-0.029
Over 80	+0.025	-0.012
Thru 120	+0.003	-0.034
Over 120	+0.028	-0.014
Thru 180	+0.003	-0.037





# ▶ HIGHEST PERFORMANCE: SPL SERIES

### GAM can.

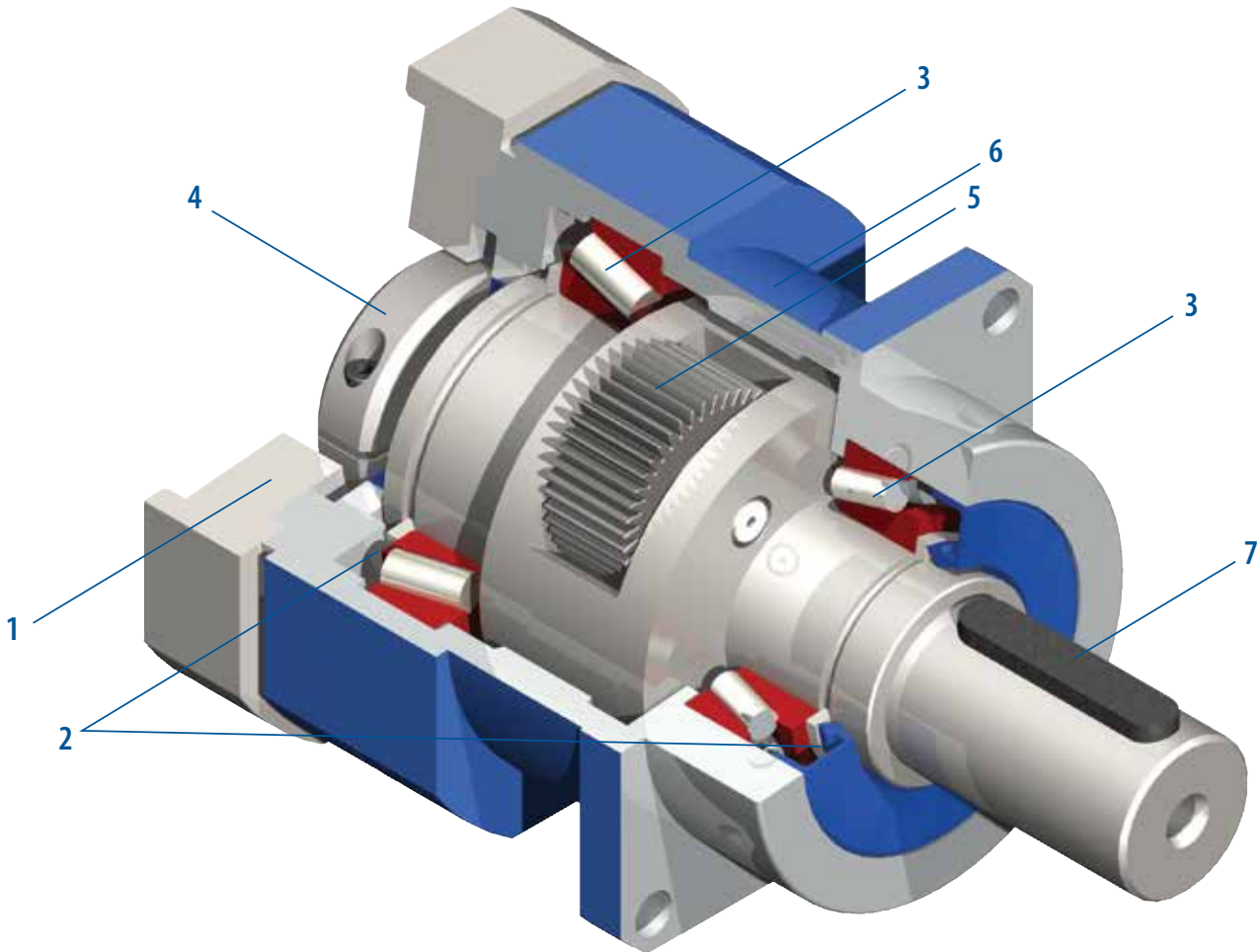
If you don't see exactly what you need, let us know. We can modify the SPL Series gearboxes to meet your needs. Page 4 provides a list of commonly requested modifications to give you a feel for our capabilities.

The SPL is the next generation of our I.M.P.A.C.T.<sup>®</sup> series. It has been designed with the latest servo motors and your most demanding motion control applications in mind. The SPL can handle oversized motor shafts, higher input speeds, and high torques. Now the SPL has been expanded to incorporate our unique Integrated Modular Planetary and Coupling Technology (I.M.P.A.C.T.<sup>®</sup>). Our planetary and coupling package increases system stiffness and reduces the overall costs of conventional packages.

The SPL gearbox performance and quality, along with GAM's manufacturing flexibility and overall service, will provide you with the best solution on the market!

### Benefits of the SPL Series include:

- Precision gears equal low backlash with quiet operation
- Long wear life: 30,000 hours
- Lubricated for life
- Ready for motor mounting
- Output dimensions match those of many conventional planetary gearboxes on the market
- Ratios from 3:1 to 100:1
- Frame sizes from 60 mm to 180 mm



1. Adapter Flange  
(Customized adapter flanges for quick and easy motor mounting)
2. Viton<sup>®</sup> Seals  
(Protective seals to isolate the gearbox)
3. Bearings  
(Tapered roller bearings accommodate high overhung loads)

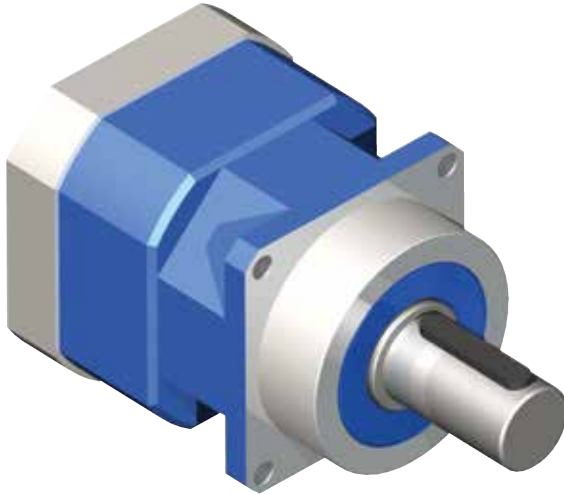
4. Input Clamping Element
5. Planet Gears  
(Extra large face width gears pack a high level of torque in a small gearbox frame)
6. Gear Housing  
(Ring gear incorporated into housing)
7. Keyway  
(Available with keyway on output shaft)

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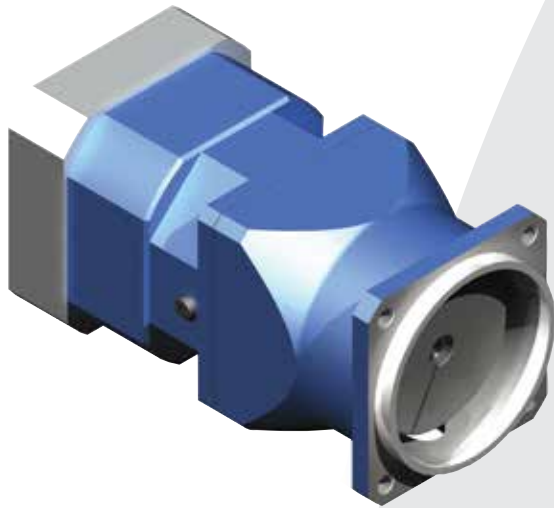
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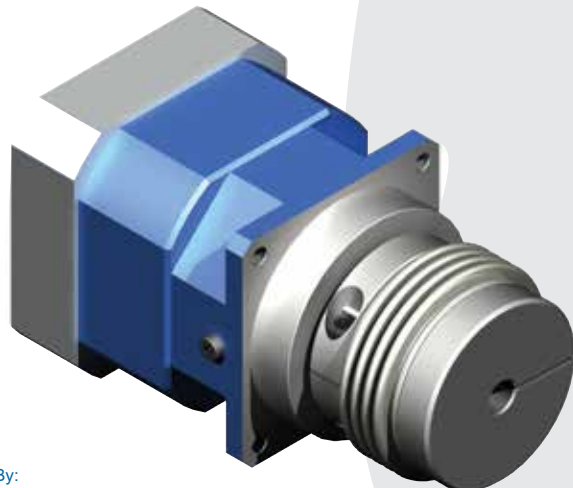
#### SPL-W

- Shaft output design for mounting to pulleys and rack and pinion systems
- Ratios from 3:1 to 100:1
- Frame sizes from 60 mm to 180 mm (larger sizes available by request)



#### SPL-K

- SPL-KB features a bellows coupling on the output
- Innovative bellow coupling on the output provides for maximum stiffness and best results in high dynamic applications
- Also available with a zero backlash elastomer-spider style coupling (SPL-KE) on the output
- Ratios from 3:1 to 100:1
- Frame sizes from 60 mm to 180 mm
- Output lantern comes standard with the SPL-K
- Custom lanterns available



#### SPL-F

- Same benefits as the SPL-K models without the bell housing on the output. Plug the gearbox into your machine and achieve a more compact design
- Ratios from 3:1 to 100:1
- Frame sizes from 60 mm to 180 mm

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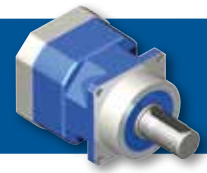
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# SPL SERIES - SPL-W



SPL - W			60	75	100	140	180	
Stock Ratios			5,10					
All Ratios Available			1 Stage: 3, 4, 5, 7, 10 2 Stage: 12, 16, 20, 25, 35, 40, 50, 70, 100					
Nominal Output Torque ( $T_{2n}$ )	Nm (lb-in)	3:1	26 (230)	39 (345)	110 (974)	210 (1859)	600 (5310)	
		4, 5, 7:1	32 (283)	65 (575)	150 (1328)	340 (3009)	600 (5310)	
		10:1	24 (212)	40 (354)	115 (1018)	210 (1859)	600 (5310)	
		2-Stage (except 100:1)	38 (336)	85 (752)	180 (1593)	400 (3540)	600 (5310)	
		100:1	28 (248)	48 (425)	130 (1151)	250 (2213)	600 (5310)	
Max Acceleration Output Torque ( $T_{2B}$ )	Nm (lb-in)	3:1	36 (319)	80 (708)	180 (1593)	380 (3363)	1200 (10620)	
		4, 5, 7:1	50 (443)	120 (1062)	250 (2213)	540 (4779)	1300 (11505)	
		10:1	36 (319)	94 (832)	200 (1770)	440 (3894)	1200 (10620)	
		2-Stage (except 100:1)	54 (478)	125 (1106)	260 (2301)	550 (4868)	1300 (11505)	
		100:1	38 (336)	94 (832)	200 (1770)	440 (3894)	1200 (10620)	
Emergency Output Torque ( $T_{2not}$ )	Nm (lb-in)	3:1	100 (885)	200 (1770)	500 (4425)	1000 (8850)	1850 (16373)	
		4, 5, 7:1	120 (1062)	240 (2124)	600 (5310)	1260 (11151)	2450 (21683)	
		10:1	90 (797)	200 (1770)	500 (4425)	1000 (8850)	2800 (24780)	
		2-Stage (except 100:1)	120 (1062)	240 (2124)	600 (5310)	1260 (11151)	2450 (21683)	
		100:1	90 (797)	200 (1770)	500 (4425)	1000 (8850)	2800 (24780)	
Nominal Speed ( $n_{1n}$ )	RPM	-	4500	4500	4000	3800	2000	
Max Speed ( $n_{1max}$ )		-	6500	6000	6000	5500	3500	
Standard Output Backlash (j)	arcmin	1-stage	< 6	< 5	< 5	< 5	< 4	
		2-stage	< 7	< 6	< 6	< 6	< 6	
Reduced Output Backlash (j)	arcmin	1-stage	< 4	< 3	< 3	< 3	< 2	
		2-stage	< 5	< 4	< 4	< 4	< 4	
Allowable Radial Load ( $F_{rad}$ ) <sup>(1)</sup>	N (lbs)	-	3000 (675)	4200 (945)	6300 (1418)	11000 (2475)	13000 (2925)	
Allowable Axial Load ( $F_{axial}$ )	N (lbs)	-	2400 (540)	3800 (855)	5600 (1260)	10600 (2385)	13500 (3038)	
Torsional Stiffness ( $C_{221}$ )	Nm/arcmin (lb-in/arcmin)	1-stage	5 (44)	13 (115)	40 (354)	56 (496)	130 (1151)	
		2-stage	5 (44)	13 (115)	40 (354)	56 (496)	130 (1151)	
Weight (m)	kg (lbs)	1-stage	2.6 (5.7)	3.7 (8.2)	7.2 (15.9)	19.3 (42.6)	32 (71)	
		2-stage	3.3 (7.3)	4.2 (9.3)	9.5 (20.9)	23.3 (51.4)	36.6 (81)	
Noise Level ( $L_{PA}$ )	dB(A)		< 64	< 65	< 67	< 67	< 70	
Mass Moment of Inertia ( $J_1$ )	kg cm <sup>2</sup> (lb-in <sup>2</sup> )	3:1	0.43 (0.168)	1.15 (0.450)	6.05 (2.368)	14.25 (5.578)	53 (20.75)	
		4:1	0.33 (0.129)	0.92 (0.360)	4.05 (1.585)	9.31 (3.644)	39 (15.27)	
		5:1	0.27 (0.106)	0.81 (0.317)	3.17 (1.241)	6.91 (2.705)	34 (13.31)	
		7:1	0.23 (0.090)	0.72 (0.282)	2.44 (0.955)	4.91 (1.922)	31 (12.14)	
		10:1	0.2 (0.078)	0.67 (0.262)	2.08 (0.814)	3.89 (1.523)	29 (11.35)	
Efficiency at Load			1-stage: 96% 2-stage: 94%					
Service Life			> 30,000 hours					
Lubrication			Lifetime lubrication with synthetic oil					
Protection Rating			IP65					
Operating Temperature Range			-20°C to 90°C					

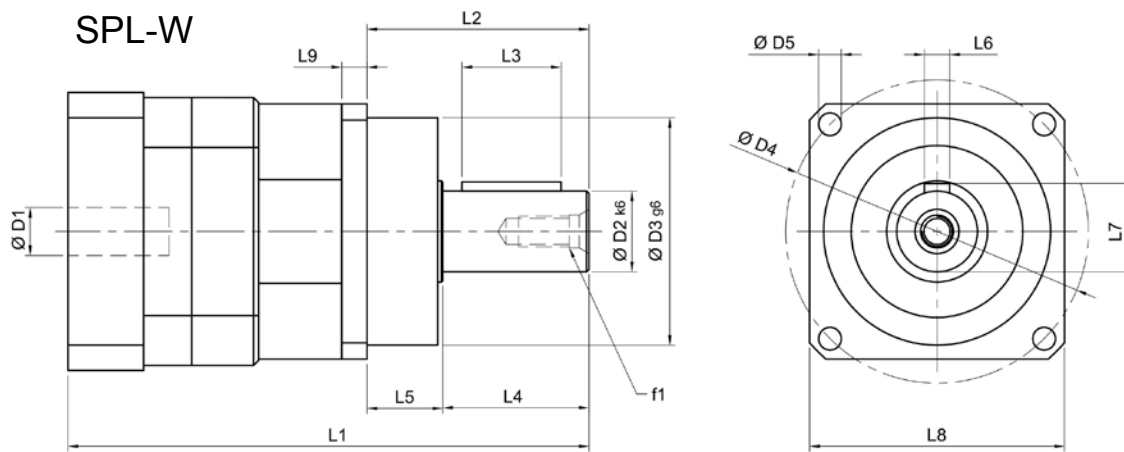
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# SPL-W



SPL-W		60		75		100		140		180	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)
D1 max standard	motor shaft diameter	14	(0.551)	19	(0.748)	24	(0.945)	32	(1.260)	54	(2.126)
D1 max available*	motor shaft diameter	19	(0.748)	24	(0.945)	32	(1.26)	38	(1.496)	54	(2.126)
D1 max 2-stage	motor shaft diameter	14	(0.551)	19	(0.748)	24	(0.945)	34	(1.339)	38	(1.496)
D2 k6	output shaft diameter	16	(0.63)	22	(0.866)	32	(1.26)	40	(1.575)	55	(2.165)
D3 g6	pilot diameter	60	(2.362)	70	(2.756)	90	(3.543)	130	(5.118)	160	(6.299)
D4	bolt circle	68	(2.677)	85	(3.346)	120	(4.724)	165	(6.496)	215	(8.465)
f1	shaft thread	M5 x 12		M8 x 19		M12 x 26		M16 x 36		M20 x 42	
D5	mounting holes ø	ø5.5		ø6.6		ø9		ø11		ø13	
L1 1-STAGE**	gearbox total length	151 (5.945)		174.5 (6.87)		226.5 (8.917)		292 (11.496)		312 (12.283)	
L1 2-STAGE**		178 (7.008)		201 (7.913)		251 (9.882)		342 (13.465)		334 (13.15)	
L2	shaft length	48 (1.89)		56 (2.205)		88 (3.465)		112 (4.409)		100 (3.937)	
L3	key length	25 (0.984)		32 (1.26)		50 (1.969)		70 (2.756)		63 (2.756)	
L4	usable shaft length	28 (1.102)		36 (1.417)		58 (2.283)		82 (3.228)		82 (3.228)	
L5	pilot height	20 (0.787)		20 (0.787)		30 (1.181)		30 (1.181)		14 (0.551)	
L6	key width	5 (0.197)		6 (0.236)		10 (0.394)		12 (0.472)		16 (0.630)	
L7	key height	18 (0.709)		24.5 (0.965)		35 (1.378)		43 (1.693)		60 (2.362)	
L8	output square	65 (2.559)		76 (2.992)		101 (3.976)		141 (5.551)		180 (7.087)	
L9	flange thickness	6 (0.236)		7 (0.276)		10 (0.394)		12 (0.472)		14 (0.551)	

\* for larger motor shaft diameters, please contact GAM \*\* depending on the motor, value can vary

## TYPE CODES FOR SPL SERIES (SPL-W)

**Example: SPL - W - 075 - 005 G - [115 - A01] - S111**

**Gearbox Series**

SPL Series

**Gearbox Style**

W = Output Shaft

**Gearbox Size**

060, 075, 100, 140, 180

**Ratio**

3, 4, 5, 7, 10, 12, 16, 20, 25, 35, 40, 50, 70, 100

**Special Options**

Assigned by GAM

**Motor Mount Kit**

Assigned by GAM

**Options Available for This Product**

G = Key on output shaft per DIN6885

C = Reduced backlash and key on output shaft

H = Smooth output shaft

A = Reduced backlash and smooth shaft

### Tolerances (mm)

Size	k6	g6
Over 6	+0.010	-0.005
Thru 10	+0.001	-0.014
Over 10	+0.012	-0.006
Thru 18	+0.001	-0.017
Over 18	+0.015	-0.007
Thru 30	+0.002	-0.020
Over 30	+0.018	-0.009
Thru 50	+0.002	-0.025
Over 50	+0.021	-0.010
Thru 80	+0.002	-0.029
Over 80	+0.025	-0.012
Thru 120	+0.003	-0.034
Over 120	+0.028	-0.014
Thru 180	+0.003	-0.037

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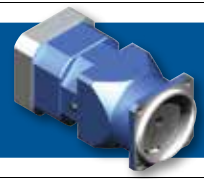
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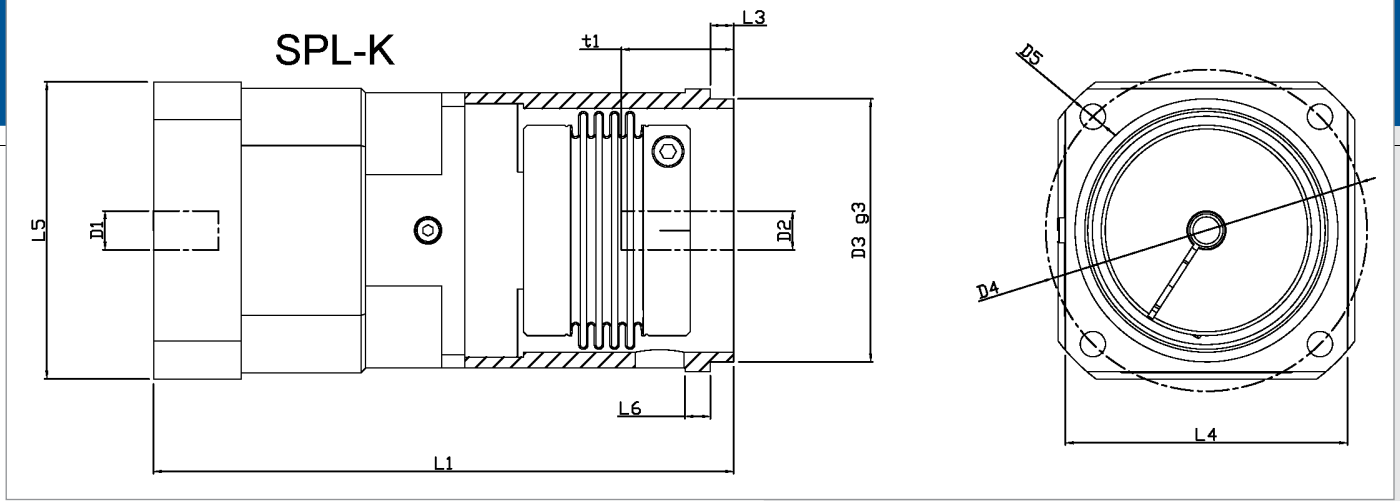
# SPL SERIES - SPL-K



SPL-K		60	75	100	140	180	
Stock Ratios		5,10					
All Ratios Available		1 Stage: 3, 4, 5, 7, 10 2 Stage: 12, 16, 20, 25, 35, 40, 50, 70, 100					
Nominal Output Torque ( $T_{2n}$ )	Nm (lb-in)	3:1	26 (230)	39 (345)	110 (974)	210 (1859)	600 (5310)
		4, 5, 7:1	32 (283)	65 (575)	150 (1328)	340 (3009)	600 (5310)
		10:1	24 (212)	40 (354)	115 (1018)	210 (1859)	600 (5310)
		2-Stage (except 100:1)	38 (336)	85 (752)	180 (1593)	400 (3540)	600 (5310)
		100:1	28 (248)	48 (425)	130 (1151)	250 (2213)	600 (5310)
Max Acceleration Output Torque ( $T_{2a}$ )	Nm (lb-in)	3:1	36 (319)	80 (708)	180 (1593)	380 (3363)	1200 (10620)
		4, 5, 7:1	50 (443)	120 (1062)	250 (2213)	540 (4779)	1300 (11505)
		10:1	36 (319)	94 (832)	200 (1770)	440 (3894)	1200 (10620)
		2-Stage (except 100:1)	54 (478)	125 (1106)	260 (2301)	550 (4868)	1300 (11505)
		100:1	38 (336)	94 (832)	200 (1770)	440 (3894)	1200 (10620)
Emergency Output Torque ( $T_{2not}$ )	Nm (lb-in)	3:1	100 (885)	200 (1770)	500 (4425)	1000 (8850)	1850 (16373)
		4, 5, 7:1	120 (1062)	240 (2124)	600 (5310)	1260 (11151)	2450 (21683)
		10:1	90 (797)	200 (1770)	500 (4425)	1000 (8850)	2800 (24780)
		2-Stage (except 100:1)	120 (1062)	240 (2124)	600 (5310)	1260 (11151)	2450 (21683)
		100:1	90 (797)	200 (1770)	500 (4425)	1000 (8850)	2800 (24780)
Nominal Speed ( $n_{1n}$ )	RPM	-	4500	4500	4000	3800	2000
Max Speed ( $n_{1max}$ )		-	6500	6000	6000	5500	3500
Standard Output Backlash (j)	arcmin	1-stage	< 6	< 5	< 5	< 5	< 4
		2-stage	< 7	< 6	< 6	< 6	< 6
Reduced Output Backlash (j)	arcmin	1-stage	< 4	< 3	< 3	< 3	< 2
		2-stage	< 5	< 4	< 4	< 4	< 4
Torsional Stiffness ( $C_{21}$ )	Nm/arcmin (lb-in/arcmin)	1-stage	3.21 (28.4)	7.88 (69.7)	22.61 (200.1)	36.64 (324.3)	36.6 (324.3)
		2-stage	3.21 (28.4)	7.88 (69.7)	22.61 (200.1)	36.64 (324.3)	36.6 (324.3)
Weight (m)	kg (lbs)	1-stage	3.35 (7.39)	4.61 (10.16)	9.82 (21.65)	24.55 (54.12)	38.4 (84.7)
		2-stage	4.05 (8.93)	5.11 (11.27)	12.12 (26.72)	28.55 (62.94)	43 (94.8)
Noise Level ( $L_{pa}$ )	dB(A)		< 64	< 65	< 67	< 67	< 70
Mass Moment of Inertia ( $J_1$ )	kg cm <sup>2</sup> (lb-in <sup>2</sup> )	3:1	0.65 (0.223)	2.82 (0.962)	10.11 (3.454)	21.31 (7.283)	53 (18.090)
		4:1	0.54 (0.185)	2.41 (0.822)	6.87 (2.346)	13.79 (4.711)	39 (13.310)
		5:1	0.49 (0.168)	2.23 (0.762)	5.41 (1.848)	10.2 (3.486)	39 (13.310)
		7:1	0.44 (0.150)	2.06 (0.704)	4.18 (1.428)	7.15 (2.444)	31 (10.580)
		10:1	0.42 (0.143)	1.98 (0.678)	3.55 (1.213)	5.59 (1.910)	31 (10.580)
Efficiency at Load		1-stage: 96% 2-stage: 94%					
Service Life		> 30,000 hours					
Lubrication		Lifetime lubrication with synthetic oil					
Protection Rating		IP65					
Operating Temperature Range		-20°C to 90°C					

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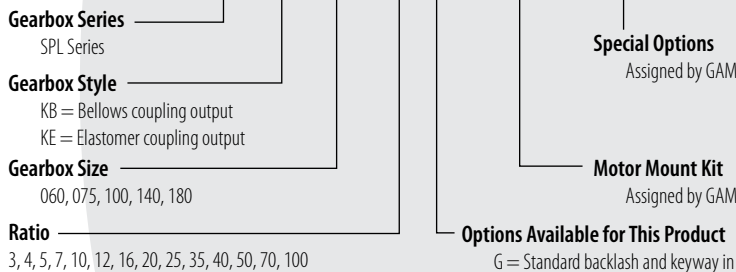


SPL-K		60		75		100		140		180	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)
D1 max standard	motor shaft diameter	14	(0.551)	19	(0.748)	24	(0.945)	32	(1.260)	54	(2.126)
D1 max available*	motor shaft diameter	19	(0.748)	24	(0.945)	32	(1.26)	38	(1.496)	54	(2.126)
D1 max 2-stage	motor shaft diameter	14	(0.551)	19	(0.748)	24	(0.945)	34	(1.339)	38	(1.496)
D2 <sub>max</sub> - KB	max output bore	28	(1.102)	38	(1.496)	50	(1.969)	64	(2.520)	85	(3.346)
D2 <sub>max</sub> - KE	max output bore	26	(1.024)	38	(1.496)	46	(1.811)	56	(2.205)	-	-
D3 <sub>g6</sub> - KB/E	pilot diameter	70	(2.756)	85	(3.346)	115	(4.528)	135	(5.315)	180	(7.087)
D4 <sub>KB/E</sub>	bolt circle	85	(3.346)	105	(4.134)	140	(5.512)	165	(6.496)	215	(8.465)
D5 <sub>KB/E</sub>	bolt hole	6.6	(0.26)	9	(0.354)	11	(0.433)	13	(0.512)	17	(0.669)
L1 <sub>1-stage</sub> KB/E**	gearbox total length	180	(7.087)	207	(8.150)	241.5	(9.508)	300	(11.811)	326	(12.835)
L1 <sub>2-stage</sub> KB/E**	gearbox total length	207	(8.150)	233.5	(9.193)	266	(10.472)	350	(13.780)	340	(13.386)
L3 <sub>KB/E</sub>	pilot height	6	(0.236)	8	(0.315)	10	(0.394)	12	(0.472)	15	(0.591)
L4 <sub>KB/E</sub>	output flange size	70	(2.756)	95	(3.74)	120	(4.724)	145	(5.709)	190	(7.48)
L5**	gearbox thickness	70	(2.756)	81	(3.189)	106	(4.173)	146	(5.748)	200	(7.874)
L6 <sub>KB/E</sub>	flange thickness	7	(0.276)	9	(0.354)	11	(0.433)	13	(0.512)	15	(0.591)
t1 <sub>min</sub> - KB	min shaft engagement	21	(0.827)	26	(1.024)	32	(1.260)	33	(1.300)	59	(2.323)
t1 <sub>max</sub> - KB	max shaft engagement	43	(1.693)	58.5	(2.3031)	60	(2.362)	68	(2.677)	88	(3.465)
t1 <sub>min</sub> - KE	min shaft engagement	22	(0.866)	28	(1.102)	34	(1.339)	36	(1.417)	-	-
t1 <sub>max</sub> - KE	max shaft engagement	31.5	(1.240)	38.5	(1.516)	45	(1.772)	48.5	(1.909)	-	-

\* for larger motor shaft diameters, please contact GAM \*\* depending on the motor, value can vary

### TYPE CODES FOR SPL-K SERIES

**Example: SPL - KE - 060 - 005 G - [115-201] - S111**



- Options Available for This Product**
- G = Standard backlash and keyway in output coupling
  - C = Reduced backlash and keyway in output coupling
  - H = Standard backlash and no keyway in output coupling
  - A = Reduced backlash and no keyway in output coupling

Tolerances (mm)		
Size	k6	g6
Over 6	+0.010	-0.005
Thru 10	+0.001	-0.014
Over 10	+0.012	-0.006
Thru 18	+0.001	-0.017
Over 18	+0.015	-0.007
Thru 30	+0.002	-0.020
Over 30	+0.018	-0.009
Thru 50	+0.002	-0.025
Over 50	+0.021	-0.010
Thru 80	+0.002	-0.029
Over 80	+0.025	-0.012
Thru 120	+0.003	-0.034
Over 120	+0.028	-0.014
Thru 180	+0.003	-0.037

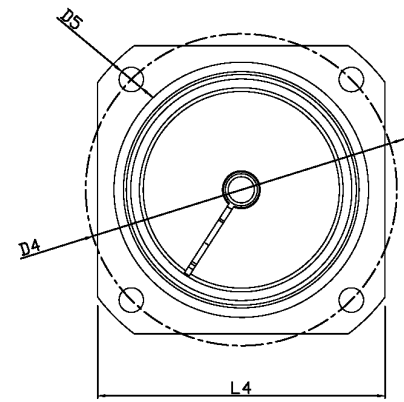
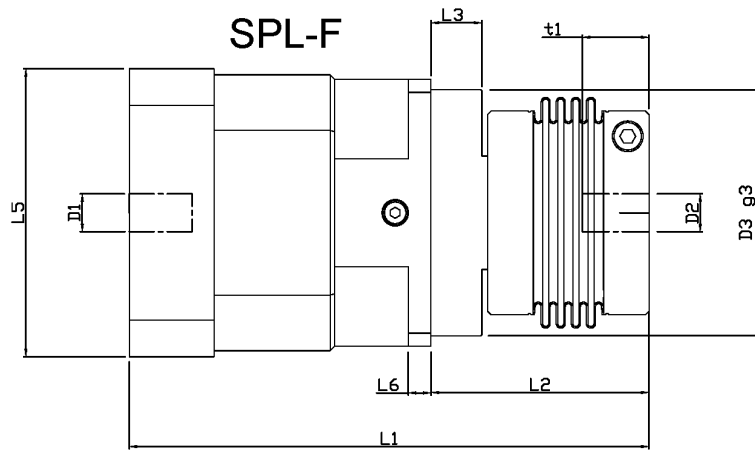


# SPL SERIES - SPL-F



SPL-F			60	75	100	140	180	
Stock Ratios			5,10					
All Ratios Available			1 Stage: 3, 4, 5, 7, 10 2 Stage: 12, 16, 20, 25, 35, 40, 50, 70, 100					
Nominal Output Torque ( $T_{2n}$ )	Nm (lb-in)	3:1	26 (230)	39 (345)	110 (974)	210 (1859)	600 (5310)	
		4, 5, 7:1	32 (283)	65 (575)	150 (1328)	340 (3009)	600 (5310)	
		10:1	24 (212)	40 (354)	115 (1018)	210 (1859)	600 (5310)	
		2-Stage (except 100:1)	38 (336)	85 (752)	180 (1593)	400 (3540)	600 (5310)	
		100:1	28 (248)	48 (425)	130 (1151)	250 (2213)	600 (5310)	
Max Acceleration Output Torque ( $T_{2a}$ )	Nm (lb-in)	3:1	36 (319)	80 (708)	180 (1593)	380 (3363)	1200 (10620)	
		4, 5, 7:1	50 (443)	120 (1062)	250 (2213)	540 (4779)	1300 (11505)	
		10:1	36 (319)	94 (832)	200 (1770)	440 (3894)	1200 (10620)	
		2-Stage (except 100:1)	54 (478)	125 (1106)	260 (2301)	550 (4868)	1300 (11505)	
		100:1	38 (336)	94 (832)	200 (1770)	440 (3894)	1200 (10620)	
Emergency Output Torque ( $T_{2em}$ )	Nm (lb-in)	3:1	100 (885)	200 (1770)	500 (4425)	1000 (8850)	1850 (16373)	
		4, 5, 7:1	120 (1062)	240 (2124)	600 (5310)	1260 (11151)	2450 (21683)	
		10:1	90 (797)	200 (1770)	500 (4425)	1000 (8850)	2800 (24780)	
		2-Stage (except 100:1)	120 (1062)	240 (2124)	600 (5310)	1260 (11151)	2450 (21683)	
		100:1	90 (797)	200 (1770)	500 (4425)	1000 (8850)	2800 (24780)	
Nominal Speed ( $n_{1n}$ )	RPM	-	4500	4500	4000	3800	2000	
Max Speed ( $n_{1max}$ )		-	6500	6000	6000	5500	3500	
Standard Output Backlash (j)	arcmin	1-stage	< 6	< 5	< 5	< 5	< 4	
		2-stage	< 7	< 6	< 6	< 6	< 6	
Reduced Output Backlash (j)	arcmin	1-stage	< 4	< 3	< 3	< 3	< 2	
		2-stage	< 5	< 4	< 4	< 4	< 4	
Torsional Stiffness ( $C_{21}$ )	Nm/arcmin (lb-in/arcmin)	1-stage	3.21 (28.4)	7.88 (69.7)	22.61 (200.1)	36.64 (324.3)	36.6 (324.3)	
		2-stage	3.21 (28.4)	7.88 (69.7)	22.61 (200.1)	36.64 (324.3)	36.6 (324.3)	
Weight (m)	kg (lbs)	1-stage	3.1 (6.8)	4.2 (9.3)	8.7 (19.2)	22.7 (50.1)	32.8 (72.3)	
		2-stage	3.8 (8.4)	4.7 (10.4)	11 (24.2)	26.7 (58.9)	37.4 (82.5)	
Noise Level ( $L_{pa}$ )	dB(A)		< 64	< 65	< 67	< 67	< 70	
Mass Moment of Inertia ( $J_1$ )	kg cm <sup>2</sup> (lb-in <sup>2</sup> )	3:1	0.65 (0.223)	2.82 (0.962)	10.11 (3.454)	21.31 (7.283)	53 (18.090)	
		4:1	0.54 (0.185)	2.41 (0.822)	6.87 (2.346)	13.79 (4.711)	39 (13.310)	
		5:1	0.49 (0.168)	2.23 (0.762)	5.41 (1.848)	10.2 (3.486)	39 (13.310)	
		7:1	0.44 (0.150)	2.06 (0.704)	4.18 (1.428)	7.15 (2.444)	31 (10.580)	
		10:1	0.42 (0.143)	1.98 (0.678)	3.55 (1.213)	5.59 (1.910)	31 (10.580)	
Efficiency at Load		1-stage: 96% 2-stage: 94%						
Service Life		> 30,000 hours						
Lubrication		Lifetime lubrication with synthetic oil						
Protection Rating		IP65						
Operating Temperature Range		-20°C to 90°C						

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SPL-F		60		75		100		140		180	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)
D1 max standard	motor shaft diameter	14	(0.551)	19	(0.748)	24	(0.945)	32	(1.260)	54	(2.126)
D1 max available*	motor shaft diameter	19	(0.748)	24	(0.945)	32	(1.26)	38	(1.496)	54	(2.126)
D1 max 2-stage	motor shaft diameter	14	(0.551)	19	(0.748)	24	(0.945)	34	(1.339)	38	(1.496)
D2 <sub>max</sub> - FB	max output bore	28	(1.102)	38	(1.496)	50	(1.969)	64	(2.520)	85	(3.346)
D2 <sub>max</sub> - FE	max output bore	26	(1.024)	38	(1.496)	46	(1.811)	56	(2.205)	-	-
D3 <sub>g6</sub> - FB/E	pilot diameter	60	(2.362)	70	(2.756)	90	(3.543)	130	(5.118)	160	(6.299)
D4 <sub>FB/E</sub>	bolt circle	68	(2.677)	85	(3.346)	120	(4.724)	165	(6.496)	215	(8.465)
D5 <sub>FB/E</sub>	bolt hole	ø5.5		ø6.6		ø9		ø11		ø13	
L1 <sub>1-stage</sub> - FB**	gearbox total length	169	(6.653)	196.5	(7.736)	223	(8.779)	280	(11.024)	304	(11.968)
L1 <sub>2-stage</sub> - FB**	gearbox total length	196	(7.716)	223	(8.779)	247.5	(9.744)	330	(12.992)	327	(12.874)
L1 <sub>1-stage</sub> - FE**	gearbox total length	171	(6.732)	196.5	(7.736)	226.5	(8.917)	290	(11.417)	-	-
L1 <sub>2-stage</sub> - FE**	gearbox total length	198	(7.795)	223	(8.779)	251	(9.882)	340	(13.386)	-	-
L2 <sub>FB</sub>	coupling length	76	(2.992)	83	(2.047)	105	(4.134)	117	(4.606)	112	(4.409)
L2 <sub>FE</sub>	coupling length	79	(3.110)	94	(3.700)	104	(4.094)	125	(4.921)	-	-
L3 <sub>FB/E</sub>	pilot height	20	(0.787)	20	(0.787)	30	(1.181)	30	(1.181)	14	(0.551)
L4 <sub>FB/E</sub>	output flange size	65	(2.559)	76	(2.992)	101	(3.976)	141	(5.551)	180	(7.087)
L5**	gearbox thickness	70	(2.756)	81	(3.189)	106	(4.173)	146	(5.748)	200	(7.874)
L6 <sub>FB/E</sub>	flange thickness	6	(0.236)	7	(0.276)	10	(0.394)	12	(0.472)	20	(0.787)
t1 <sub>min</sub> - FB	min shaft engagement	21	(0.827)	26	(1.024)	32	(1.260)	33	(1.300)	59	(2.323)
t1 <sub>max</sub> - FB	max shaft engagement	39	(1.535)	43	(1.693)	58	(2.165)	52	(2.047)	88	(3.465)
t1 <sub>min</sub> - FE	min shaft engagement	22	(0.866)	28	(1.102)	34	(1.339)	36	(1.417)	-	-
t1 <sub>max</sub> - FE	max shaft engagement	31.5	(1.240)	38.5	(1.516)	45	(1.772)	48.5	(1.909)	-	-

\* for larger motor shaft diameters, please contact GAM \*\* depending on the motor, value can vary

Size	Tolerances (mm)	
	k6	g6
Over 6	+0.010	-0.005
Thru 10	+0.001	-0.014
Over 10	+0.012	-0.006
Thru 18	+0.001	-0.017
Over 18	+0.015	-0.007
Thru 30	+0.002	-0.020
Over 30	+0.018	-0.009
Thru 50	+0.002	-0.025
Over 50	+0.021	-0.010
Thru 80	+0.002	-0.029
Over 80	+0.025	-0.012
Thru 120	+0.003	-0.034
Over 120	+0.028	-0.014
Thru 180	+0.003	-0.037

### TYPE CODES FOR SPL-F SERIES

**Example: SPL - FE - 060 - 005 G - [115-201] - S111**

**Gearbox Series**

SPL Series.

**Gearbox Style**

FB = Bellows coupling output  
FE = Elastomer coupling output

**Gearbox Size**

060, 075, 100, 140, 180

**Ratio**

3, 4, 5, 7, 10, 12, 16, 20, 25, 35, 40, 50, 70, 100

**Special Options**

Assigned by GAM

**Motor Mount Kit**

Assigned by GAM

**Options Available for This Product**

G = Standard backlash and keyway in output coupling

C = Reduced backlash and keyway in output coupling

H = Standard backlash and no keyway in output coupling

A = Reduced backlash and no keyway in output coupling

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## ▶ HIGH PERFORMANCE: EPL SERIES

### GAM can.

If you don't see exactly what you need, let us know. We can modify the EPL Series gearboxes to meet your needs. Page 4 provides a list of commonly requested modifications to give you a feel for our capabilities.

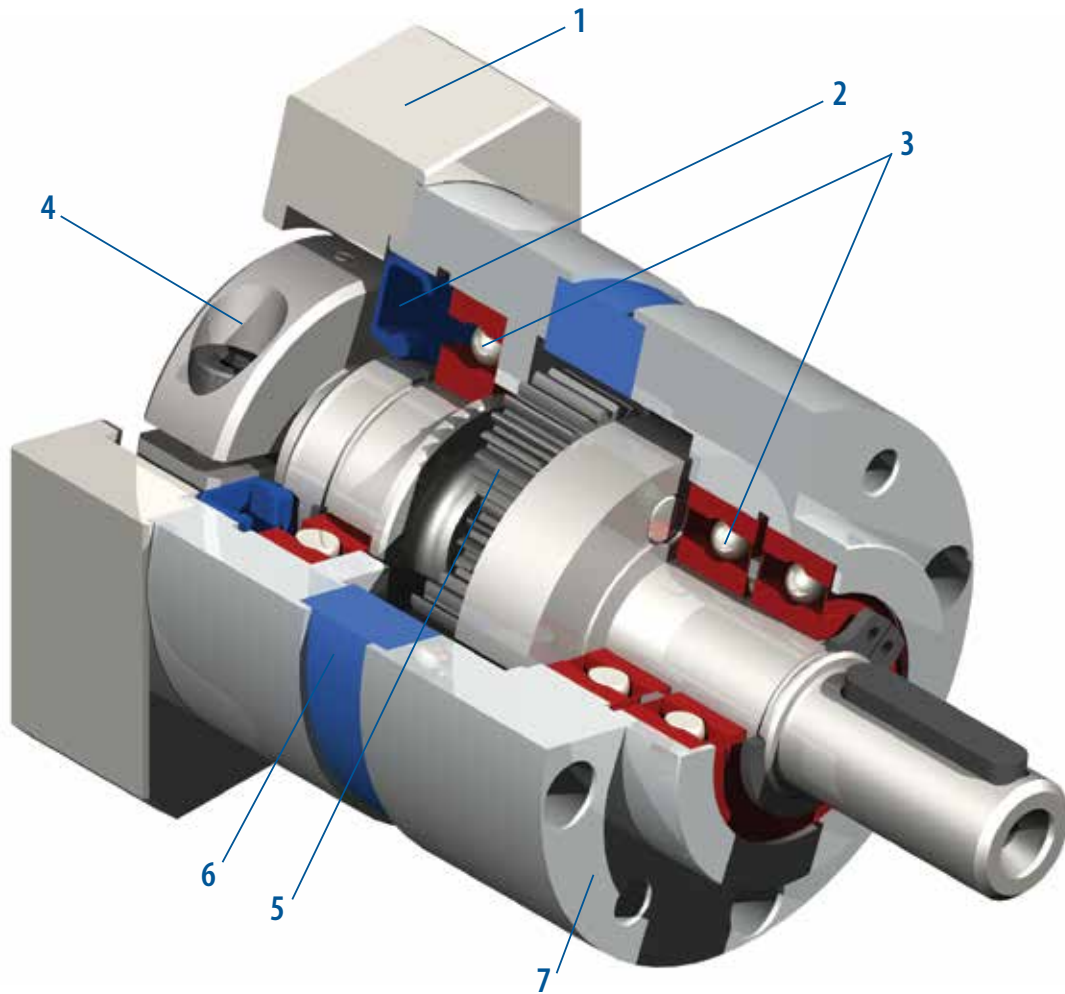
Our EPL Series is widely known as the best value on the market- tens of thousands of EPL's installed since 1998 in North America alone. That's because it offers the best quality available for the price point. We've added some features that make it unequalled in its class and ideal for most servo applications.

### EPL Series enhancements include:

- A 50 mm frame size in our standard shaft version (-W) that is a drop-in for many gearboxes
- NEMA output version with oversized english shaft for improved performance
- Option for larger motor shafts

### New output configurations include:

- EPL-A dimensions that drop in for popular planetary gearboxes on the market.
- EPL-F that features a flange output for a compact design and allows for easy connecting of mechanical elements such as pulleys and pinions.



#### 1. Adapter Plate

(Customized adapter plates for quick and easy motor mounting)

#### 3. Angular Contact Bearings

(for high radial and axial loading)

#### 6. Ring Gear

(Ring gear incorporated into housing)

#### 4. Input Clamping Element

#### 5. Planet Gears

(Precision honed gears)

#### 7. Output Face

2. Seals  
(Protective seals to isolate the gearbox)

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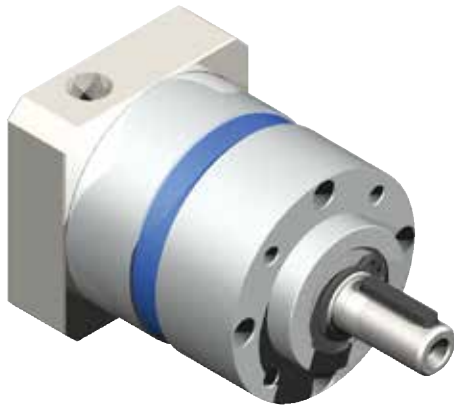
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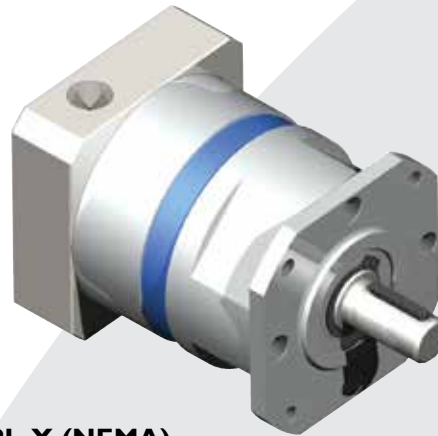
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# ▶ HIGH PERFORMANCE: EPL SERIES



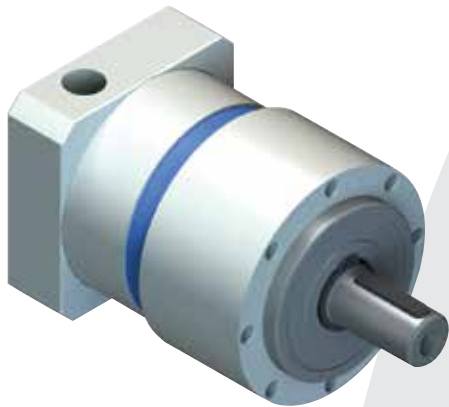
## EPL-W

- GAM Metric Output Face
- Heavy Duty Output Bearings
- Ratios 3:1 to 1000:1
- Frame sizes from 50 mm to 150 mm
- Ready to mount to your motor



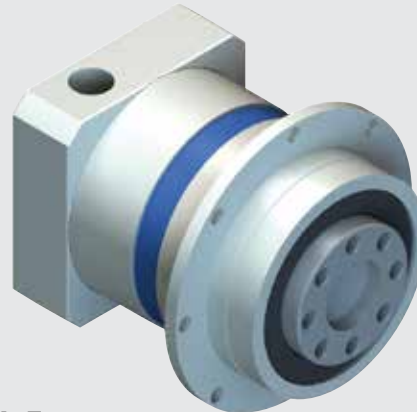
## EPL-X (NEMA)

- NEMA output face with oversized english shaft
- Ratios 3:1 to 1000:1
- Frame sizes from NEMA 17 to 56
- Ready to mount to your motor



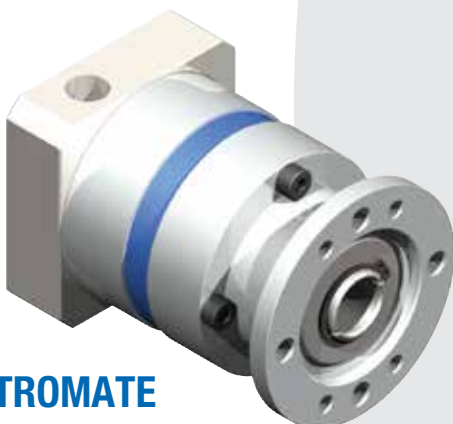
## EPL-A

- Metric output dimensions match many other popular inline planetary gear reducers on the market.
- Ratios 3:1 to 1000:1
- Frame sizes from 50mm to 155mm
- Ready to mount to your motor



## EPL-F

- Flange output
- Compact design
- Ratios 3:1 to 1000:1
- Ready to mount to your motor



## EPL-H Linear Mount

- Hollow output with zero backlash clamping ring
- A quick, simple, low cost solution used to mount onto any “off the shelf” linear belt or ball screw module.
- Ready to mount to your motor on the input
- Ready to mount to your module on the output
- For more information on Linear Mounts, refer to page 77.

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# EPL SERIES - EPL-W

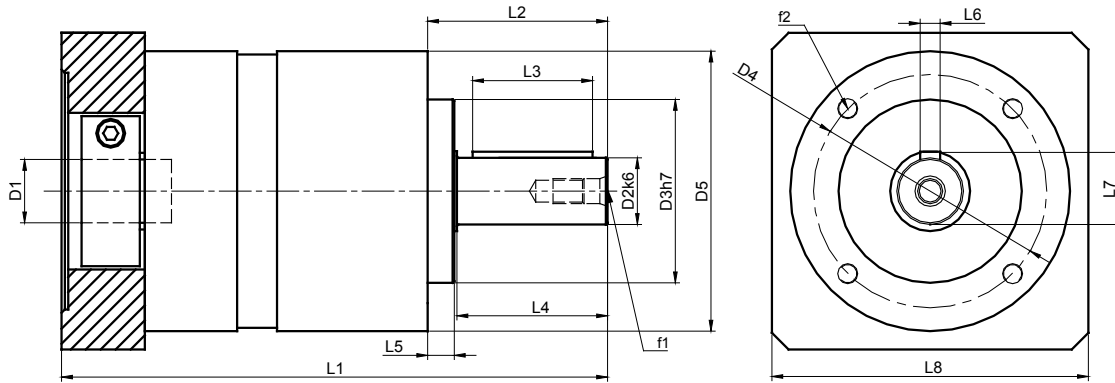


EPL Series		50		64		84		118		150			
Stock Ratios		3, 5, 7, 10, 25, 50, 100 (Standard Input)										N/A	
All Ratios Available		1-stage: 3, 4, 5, 7, 10 2-stage: 12, 16, 20, 25, 35, 40, 50, 70, 100 3-stage: 120, 160, 200, 250, 350, 490, 700, 1000 (Consult GAM for other ratios)											
Nominal Output Torque ( $T_{2n}$ )	Nm (lb-in)	3:1	5 (44)	20 (177)	40 (354)	100 (885)	230 (2036)						
		4, 5, 7:1	6.5 (58)	26 (230)	54 (478)	120 (1062)	310 (2744)						
		10, 100, 1000:1	5 (44)	16 (142)	40 (354)	105 (929)	180 (1593)						
		12:1	14 (124)	36 (319)	80 (708)	170 (1505)	272 (2407)						
		all other ratios	16 (142)	42 (372)	100 (885)	210 (1859)	340 (3009)						
Max Acceleration Output Torque ( $T_{2B}$ )	Nm (lb-in)	3:1	10 (89)	36 (319)	70 (620)	180 (1593)	360 (3186)						
		4, 5, 7:1	13 (115)	44 (389)	100 (885)	200 (1770)	460 (4071)						
		10, 100, 1000:1	10 (89)	24 (212)	75 (664)	180 (1593)	340 (3009)						
		12:1	17.5 (155)	45 (398)	100 (885)	215 (1903)	360 (3186)						
		all other ratios	20 (177)	52 (460)	125 (1106)	255 (2257)	460 (4071)						
Emergency Output Torque ( $T_{2not}$ )	Nm (lb-in)	3:1	20 (177)	72 (637)	160 (1416)	200 (1770)	860 (7612)						
		4, 5, 7:1	26 (230)	84 (743)	216 (1912)	480 (4248)	1000 (8851)						
		10, 100, 1000:1	20 (177)	62 (549)	160 (1416)	410 (3629)	800 (7081)						
		12:1	28 (248)	72 (637)	160 (1416)	400 (3540)	860 (7612)						
		all other ratios	32 (283)	84 (743)	216 (1912)	480 (4248)	1000 (8851)						
Nominal Speed ( $n_{1n}$ )	RPM	-	3500	3500	3000	2500	2500						
Max Speed ( $n_{1max}$ )	RPM	-	6000	6000	6000	5000	4500						
Standard Output Backlash (j)	arcmin	1-stage	<16	<10	<10	<8	<8						
		2-stage	<20	<14	<14	<12	<12						
		3-stage	-	<18	<18	<16	<16						
Allowable Radial Load ( $F_{rad}$ ) 1	N (lbs)	-	650 (146)	1900 (428)	2800 (630)	5000 (1125)	7500 (1688)						
Allowable Axial Load ( $F_{axial}$ )	N (lbs)	-	700 (158)	1500 (338)	2500 (563)	4500 (1013)	6000 (1350)						
Torsional Stiffness ( $C_{t21}$ )	Nm/arcmin (lb-in/arcmin)	10,100,1000	0.60 (5.3)	1.3 (11.5)	3.4 (30.1)	8.3 (73.5)	22 (194.7)						
		7,70,700	0.78 (6.9)	1.7 (15)	4.8 (42.5)	13.6 (120.4)	27 (239)						
		all other ratios	0.90 (8.0)	2.4 (21.2)	7.1 (62.8)	17.2 (152.2)	33 (292.1)						
Weight (m)	kg (lbs)	1-stage	0.4 (0.9)	1.0 (2.2)	2.3 (5.1)	5.8 (12.8)	10.0 (22.1)						
		2-stage	0.5 (1.1)	1.3 (2.9)	3.1 (6.8)	7.9 (17.4)	12.5 (27.6)						
		3-stage	-	1.6 (3.5)	3.9 (8.6)	10.0 (22.1)	15.0 (33.1)						
Noise Level ( $L_{pk}$ )	dB(A)	-	<64	<66	<68	<70	<72						
Mass Moment of Inertia ( $J_1$ )	kg cm <sup>2</sup> (lb-in <sup>2</sup> ) (lb-in <sup>2</sup> )	3:1	0.06 (0.021)	0.45 (0.154)	1.37 (0.468)	6.54 (2.235)	12.23 (4.179)						
		4:1, 12:1, 16:1	0.04 (0.014)	0.38 (0.130)	1.14 (0.390)	4.8 (1.640)	7.65 (2.614)						
		5:1, 20:1, 25:1	0.04 (0.014)	0.36 (0.123)	1.05 (0.359)	4.05 (1.384)	6.24 (2.132)						
		7:1, 35:1	0.04 (0.014)	0.35 (0.120)	0.97 (0.331)	3.4 (1.162)	4.7 (1.606)						
		10:1, 40:1 - 100:1	0.04 (0.014)	0.34 (0.116)	0.93 (0.318)	3.1 (1.059)	3.8 (1.299)						
		120:1 - 1000:1	(0.000)	0.34 (0.116)	0.93 (0.318)	3.12 (1.066)	3.9 (1.333)						
Efficiency at Load	1-stage: 94% 2-stage: 92% 3-stage: 90%												
Service Life	> 30,000 hours												
Lubrication	Mineral Grease EPO												
Protection Rating	IP 64												
Operating Temperature Range	-20°C to 90°C												

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1) Load applied at center of output shaft @ 100 RPM  
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# EPL-W



EPL-W Series		50		64		84		118		150	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)
D1 <sup>max standard*</sup>	motor shaft diameter	11	(0.433)	14	(0.551)	19	(0.748)	24	(0.945)	28	(1.102)
D1 <sup>max available*</sup>	motor shaft diameter	14	(0.551)	16	(0.63)	24	(0.945)	32	(1.26)	38	(1.496)
D2 <sup>k6</sup>	output shaft diameter	12	(0.472)	14	(0.551)	20	(0.787)	25	(0.984)	40	(1.575)
D3 <sup>h7</sup>	pilot diameter	35	(1.378)	40	(1.575)	55	(2.165)	80	(3.15)	110	(4.331)
D4	bolt circle	44	(1.732)	52	(2.047)	70	(2.756)	100	(3.937)	130	(5.118)
D5	housing diameter	50	(1.969)	64	(2.52)	84	(3.307)	118	(4.646)	150	(5.906)
f1	shaft thread	M4x8		M5x12		M6x16		M10x22		M10 x 22	
f2	mounting holes	M4x6		M5x12		M6x14		M8x18		M10x20	
L1 1-STAGE**	gearbox total length	93 (3.661)		117 (4.606)		162 (6.378)		199 (7.835)		265 (10.433)	
L1 2-STAGE**		109 (4.291)		139 (5.472)		195 (7.677)		239 (9.409)		305 (12.008)	
L1 3-STAGE**		-		161 (6.339)		228 (8.976)		280 (11.024)		346 (13.622)	
L2	shaft length	24.5	(0.965)	39	(1.535)	54	(2.126)	61	(2.402)	81	(3.189)
L3	key length	16	(0.63)	25	(0.984)	36	(1.417)	45	(1.772)	60	(2.362)
L4	usable shaft length	18	(0.709)	30	(1.181)	45	(1.772)	50	(1.969)	70	(2.756)
L5	pilot height	4	(0.157)	8	(0.315)	8	(0.315)	10	(0.394)	10	(0.394)
L6	key width	4	(0.157)	5	(0.197)	6	(0.236)	8	(0.315)	12	(0.472)
L7	key height	13.5	(0.531)	16	(0.63)	22.5	(0.886)	28	(1.102)	43	(1.693)
L8**	adapter size	50	(1.969)	70	(2.756)	90	(3.543)	120	(4.724)	150	(5.906)

\* for larger motor shaft diameters, please contact GAM \*\* depending on the motor, value can vary

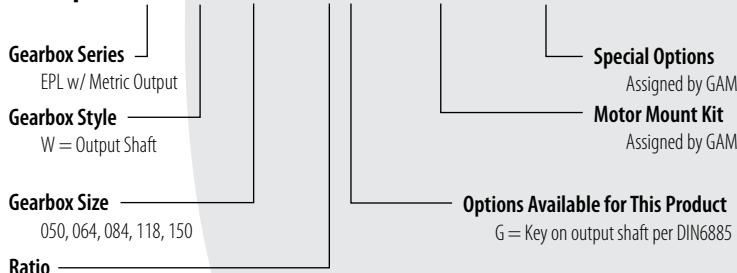


### Recommended Output Coupling (if necessary)

	metal bellows	KLC-25	KLC-50	KLC-125	KM-270	KM-400
elastomer	EKM-45	EKM-60	EKM-150	EKM-300	EKM-400	EKM-400

### TYPE CODES FOR EPL SERIES (EPL-W)

**Example: EPL - W - 084 - 005 G - [115 - A01] - S111**



Tolerances (mm)		
Size	k6	h7
Over 10	+0.012	0
Thru 18	+0.001	-0.018
Over 18	+0.015	0
Thru 30	+0.002	-0.021
Over 30	+0.018	0
Thru 50	+0.002	-0.025
Over 50	+0.021	0
Thru 80	+0.002	-0.030
Over 80	+0.025	0
Thru 120	+0.003	-0.035

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# EPL SERIES - EPL-X (NEMA)



NEMA-X Series		17	23	34	42	56	
Stock Ratios		N/A	3, 5, 7, 10, 25, 50, 100		N/A	N/A	
All Ratios Available		1-stage: 3, 4, 5, 7, 10 2-stage: 12, 16, 20, 25, 35, 40, 50, 70, 100 3-stage: 120, 160, 200, 250, 350, 490, 700, 1000					
Nominal Output Torque ( $T_{2n}$ )	Nm (lb-in)	3:1	5 (44)	20 (177)	40 (354)	100 (885)	100 (885)
		4, 5, 7:1	6.5 (58)	26 (230)	54 (478)	120 (1062)	120 (1062)
		10, 100, 1000:1	5 (44)	16 (142)	40 (354)	105 (929)	105 (929)
		12:1	14 (124)	36 (319)	80 (708)	170 (1505)	170 (1505)
		all other ratios	16 (142)	42 (372)	100 (885)	210 (1859)	210 (1859)
Max Accel. Torque ( $T_{2B}$ )	Nm (lb-in)	3:1	10 (89)	36 (319)	70 (620)	180 (1593)	180 (1593)
		4, 5, 7:1	13 (115)	44 (389)	100 (885)	200 (1770)	200 (1770)
		10, 100, 1000:1	10 (89)	24 (212)	75 (664)	180 (1593)	180 (1593)
		12:1	17.5 (155)	45 (398)	100 (885)	215 (1903)	215 (1903)
		all other ratios	20 (177)	52 (460)	125 (1106)	255 (2257)	255 (2257)
Emergency Output Torque ( $T_{2not}$ )	Nm (lb-in)	3:1	20 (177)	72 (637)	160 (1416)	200 (1770)	200 (1770)
		4, 5, 7:1	26 (230)	84 (743)	216 (1912)	480 (4248)	480 (4248)
		10, 100, 1000:1	20 (177)	62 (549)	160 (1416)	410 (3629)	410 (3629)
		12:1	28 (248)	72 (637)	160 (1416)	400 (3540)	400 (3540)
		all other ratios	32 (283)	84 (743)	216 (1912)	480 (4248)	480 (4248)
Nominal Speed ( $n_{1n}$ )	RPM	-	3500	3500	3000	2500	2500
Max Input Speed ( $n_{1max}$ )		6000	6000	6000	5000	5000	
Standard Output Backlash (j)	arcmin	1-stage	< 20	< 10	< 10	< 8	< 8
		2-stage	< 24	< 14	< 14	< 12	< 12
		3-stage	< 30	< 18	< 18	< 16	< 16
Allowable Radial Load ( $F_{rad}$ ) <sup>1)</sup>	N (lbs)	-	375 (84)	450 (101)	900 (203)	2175 (489)	2175 (489)
Allowable Axial Load ( $F_{axial}$ )	N (lbs)	-	300 (68)	420 (95)	650 (146)	1375 (309)	1375 (309)
Torsional Stiffness ( $C_{21}$ )	Nm/arcmin (lb-in/arcmin)	10,100,1000	Contact GAM	1.3 (11.5)	3.4 (30.1)	8.3 (73.5)	8.3 (73.5)
		7,70,700	Contact GAM	1.7 (15)	4.8 (42.5)	13.6 (120.4)	13.6 (120.4)
		all other ratios	Contact GAM	2.4 (21.2)	7.1 (62.8)	17.2 (152.2)	17.2 (152.2)
Weight (m)	kg (lbs)	1-stage	0.4 (0.88)	1.0 (2.2)	2.3 (5.1)	5.8 (12.8)	5.8 (12.8)
		2-stage	0.5 (1.1)	1.3 (2.9)	3.1 (6.8)	7.9 (17.4)	7.9 (17.4)
		3-stage	0.6 (1.32)	1.6 (3.5)	3.9 (8.6)	10.0 (22.1)	10.0 (22.1)
Noise Level ( $L_{pA}$ )	dB(A)	-	< 60	< 66	< 68	< 70	< 70
Mass Moment of Inertia ( $J_1$ )	kg cm <sup>2</sup> (lb-in <sup>2</sup> )	3:1	0.0144 (0.005)	0.45 (0.154)	1.37 (0.468)	6.54 (2.235)	6.54 (2.235)
		4:1, 12:1, 16:1	0.0096 (0.003)	0.38 (0.130)	1.14 (0.390)	4.8 (1.640)	4.8 (1.640)
		5:1, 20:1, 25:1	0.0096 (0.003)	0.36 (0.123)	1.05 (0.359)	4.05 (1.384)	4.05 (1.384)
		7:1, 35:1	0.0152 (0.005)	0.35 (0.120)	0.97 (0.331)	3.4 (1.162)	3.4 (1.162)
		10:1, 40:1 - 100:1	0.0078 (0.003)	0.34 (0.116)	0.93 (0.318)	3.1 (1.059)	3.1 (1.059)
		120:1 - 1000:1	0.0078 (0.003)	0.34 (0.116)	0.93 (0.318)	3.12 (1.066)	3.12 (1.066)
Efficiency at Load	1-stage: 94% 2-stage: 92% 3-stage: 90%						
Service Life	> 30,000 hours						
Lubrication	Mineral Grease EPO						
Protection Rating		IP 64					
Operating Temperature Range		-20°C to 90°C					

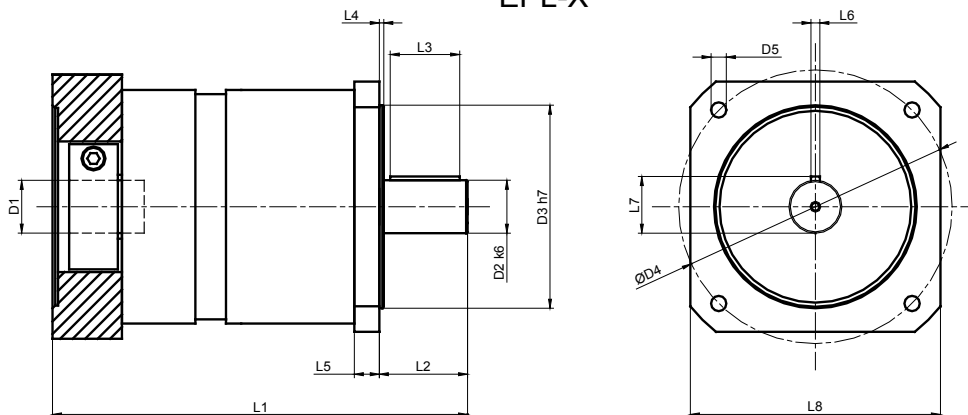
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# EPL-X



NEMA-X Series		17		23		34		42		56	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)
D1 <sub>max standard</sub> *	motor shaft diameter	11	(0.433)	14	(0.551)	19	(0.748)	24	(0.945)	24	(0.945)
D1 <sub>max available</sub> *	motor shaft diameter	-	(-)	16	(0.63)	24	(0.945)	32	(1.26)	32	(1.26)
D2 k6	output shaft diameter	9.525	(0.375)	12.7	(0.5)	19.050	(0.75)	25	(0.984)	25	(0.984)
D3 h7	pilot diameter	21.97	(0.865)	38.1	(1.5)	73	(2.874)	55.55	(2.187)	114.300	(4.50)
D4	bolt circle	43.8	(1.724)	66.7	(2.626)	98.400	(3.874)	125.7	(4.949)	177.800	(7.000)
D5	mounting holes	3.25	(0.128)	5	(0.197)	5.5	(0.217)	7.1	(0.28)	10.200	(0.402)
L1 1-STAGE**	gearbox total length	108	(4.252)	111	(4.37)	147	(5.787)	199	(7.835)	199	(7.835)
L1 2-STAGE**		124	(4.882)	133	(5.236)	180	(7.087)	239	(9.409)	239	(9.409)
L1 3-STAGE**		139.5	(5.492)	155	(6.102)	213	(8.386)	280	(11.024)	280	(11.024)
L2	shaft length	25.4	(1.000)	25.4	(1.000)	31.8	(1.252)	42	(1.654)	41	(1.614)
L3	key length	-	(-)	19.05	(0.75)	25.4	(1)	38	(1.496)	32	(1.26)
L4	pilot height	1.6	(0.063)	1.6	(0.063)	1.7	(0.067)	2.4	(0.094)	4	(0.157)
L5	flange thickness	4.9	(0.193)	5	(0.197)	10	(0.394)	19	(0.748)	20	(0.7874)
L6	key width	-	(-)	3.175	(0.125)	4.78	(0.188)	8	(0.315)	8	(0.315)
L7	key height / flat height	9.14	(0.36)	14.22	(0.56)	21.290	(0.838)	28	(1.102)	28	(1.102)
L8	flange size	40	(1.575)	65	(2.559)	90	(3.543)	120	(4.724)	145	(5.709)

\* for larger motor shaft diameters, please contact GAM \*\*depending on the motor, value can vary \*\*\* long motor shafts can be accommodated, but overall gearbox length will grow



### Recommended Output Coupling (if necessary)

	KLC-25	KLC-50	KLC-125	KM-270	KM-400
metal bellows					
elastomer	EKM-20	EKM-60	EKM-150	EKM-300	EKM-400

### TYPE CODES FOR EPL SERIES (EPL-X (NEMA))

**Example: EPL - X23 - 005 G - [115 - A01] - S111**

**Gearbox Series**  
EPL w/ NEMA output

**Gearbox Style**

- X17 = NEMA17
- X23 = NEMA23
- X34 = NEMA34
- X42 = NEMA42
- X56 = NEMA56

**Ratio**

- 3, 4, 5, 7, 10, 12, 16, 20, 25, 35, 40, 50, 70, 100,
- 120, 160, 200, 250, 350, 490, 700, 000=1000

**Special Options**

Assigned by GAM

**Motor Mount Kit**

Assigned by GAM

**Options Available for This Product**

G = Key on output shaft per DIN6885

### Tolerances (mm)

Size	k6	h7
Over 10	+0.012	0
Thru 18	+0.001	-0.018
Over 18	+0.015	0
Thru 30	+0.002	-0.021
Over 30	+0.018	0
Thru 50	+0.002	-0.025
Over 50	+0.021	0
Thru 80	+0.002	-0.030
Over 80	+0.025	0
Thru 120	+0.003	-0.035

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# EPL SERIES - EPL-A

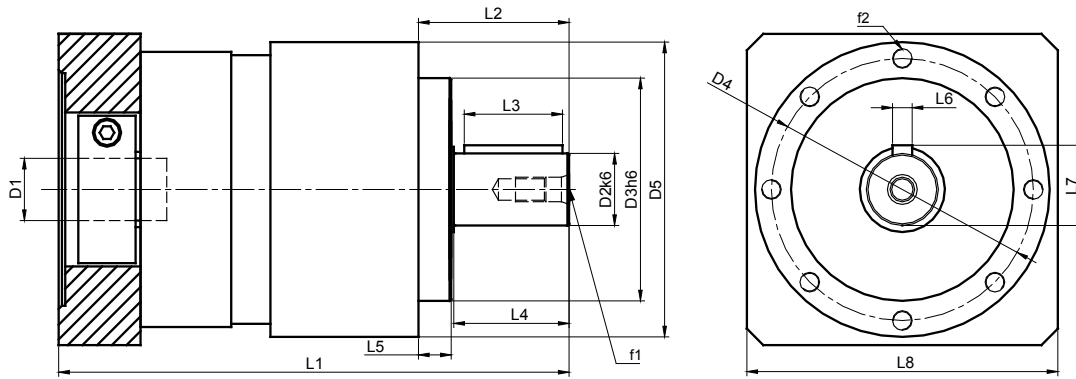


EPL-A Series		50		70		90		120		155	
All Ratios Available		1stage: 3, 4, 5, 7, 10 2stage: 12, 16, 20, 25, 35, 40, 50, 70, 100 3stage: 120, 160, 200, 250, 350, 490, 700, 1000 (Consult GAM for other ratios)									
Nominal Output Torque ( $T_{2n}$ )	Nm (lb-in)	3:1	5 (44)	20 (177)	40 (354)	100 (885)	230 (2036)				
		4, 5, 7:1	6.5 (58)	26 (230)	54 (478)	120 (1062)	310 (2744)				
		10, 100, 1000:1	5 (44)	16 (142)	40 (354)	105 (929)	180 (1593)				
		12:1	14 (124)	36 (319)	80 (708)	170 (1505)	272 (2407)				
		all other ratios	16 (142)	42 (372)	100 (885)	210 (1859)	340 (3009)				
Max Acceleration Output Torque ( $T_{2B}$ )	Nm (lb-in)	3:1	10 (89)	36 (319)	70 (620)	180 (1593)	360 (3186)				
		4, 5, 7:1	13 (115)	44 (389)	100 (885)	200 (1770)	460 (4071)				
		10, 100, 1000:1	10 (89)	24 (212)	75 (664)	180 (1593)	340 (3009)				
		12:1	17.5 (155)	45 (398)	100 (885)	215 (1903)	360 (3186)				
		all other ratios	20 (177)	52 (460)	125 (1106)	255 (2257)	460 (4071)				
Emergency Output Torque ( $T_{2not}$ )	Nm (lb-in)	3:1	20 (177)	72 (637)	160 (1416)	200 (1770)	860 (7612)				
		4, 5, 7:1	26 (230)	84 (743)	216 (1912)	480 (4248)	1000 (8851)				
		10, 100, 1000:1	20 (177)	62 (549)	160 (1416)	410 (3629)	800 (7081)				
		12:1	28 (248)	72 (637)	160 (1416)	400 (3540)	860 (7612)				
		all other ratios	32 (283)	84 (743)	216 (1912)	480 (4248)	1000 (8851)				
Nominal Speed ( $n_{1n}$ )	RPM	-	3500	3500	3000	2500	2500				
Max Speed ( $n_{1max}$ )	RPM	-	6000	6000	6000	5000	4500				
Standard Output Backlash (j)	arcmin	1stage	<16	<10	<10	<8	<8				
		2stage	<20	<14	<14	<12	<12				
		3stage	-	<18	<18	<16	<16				
Allowable Radial Load ( $F_{rad1}$ )	N (lbs)	-	650 (146)	1550 (348)	2400 (540)	4600 (1034)	7500 (1686)				
Allowable Axial Load ( $F_{axial}$ )	N (lbs)	-	700 (158)	1450 (326)	1900 (427)	4000 (899)	6000 (1349)				
Torsional Stiffness ( $C_{21}$ )	Nm/arcmin (lbin/arcmin)	10,100,1000	0.60 (5.3)	1.3 (11.5)	3.4 (30.1)	8.3 (73.5)	22 (194.7)				
		7,70,700	0.78 (6.9)	1.7 (15)	4.8 (42.5)	13.6 (120.4)	27 (239)				
		all other ratios	0.90 (8.0)	2.4 (21.2)	7.1 (62.8)	17.2 (152.2)	33 (292.1)				
Weight (m)	kg (lbs)	1stage	0.4 (0.9)	1 (2.2)	2.3 (5.1)	5.8 (12.8)	10 (22.1)				
		2stage	0.5 (1.1)	1.3 (2.9)	3.1 (6.8)	7.9 (17.4)	12.5 (27.6)				
		3stage	-	1.6 (3.5)	3.9 (8.6)	10.0 (22.1)	15 (33.1)				
Noise Level ( $L_{pk}$ )	dB(A)	-	<64	<66	<68	<70	<72				
Mass Moment of Inertia ( $J_1$ )	kg cm <sup>2</sup> (lb-in <sup>2</sup> )	3:1	0.06 (0.021)	0.45 (0.154)	1.37 (0.468)	6.54 (2.235)	12.23 (4.179)				
		4:1, 12:1, 16:1	0.04 (0.014)	0.38 (0.13)	1.14 (0.390)	4.8 (1.640)	7.65 (2.614)				
		5:1, 20:1, 25:1	0.04 (0.014)	0.36 (0.123)	1.05 (0.359)	4.05 (1.384)	6.24 (2.132)				
		7:1, 35:1	0.04 (0.014)	0.35 (0.12)	0.97 (0.331)	3.4 (1.162)	4.7 (1.606)				
		10:1, 40:1 - 100:1	0.04 (0.014)	0.34 (0.116)	0.93 (0.318)	3.1 (1.059)	3.8 (1.299)				
		120:1 - 1000:1	0 0	0.34 (0.116)	0.93 (0.318)	3.12 (1.066)	3.9 (1.333)				
Efficiency at Load	1stage: 94% 2stage: 92% 3stage: 90%										
Service Life	> 30,000 hours										
Lubrication	Mineral Grease EPO										
Protection Rating	IP 64										
Operating Temperature Range	-20°C to 90°C										

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# EPL-A



EPL-A Series		50		70		90		120		155	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)
D1 <sub>max standard</sub> *	motor shaft diameter	11	(0.433)	14	(0.551)	19	(0.748)	24	(0.945)	28	(1.102)
D1 <sub>max available</sub> *	motor shaft diameter	14	(0.551)	16	(0.630)	24	(0.945)	32	(1.260)	38	(1.496)
D2 k6	output shaft diameter	12	(0.472)	16	(0.630)	22	(0.866)	32	(1.260)	40	(1.575)
D3h6	pilot diameter	35	(1.378)	52	(2.047)	68	(2.677)	90	(3.543)	120	(4.724)
D4	Bolt Circle	44	(1.732)	62	(2.441)	80	(3.150)	108	(4.252)	140	(5.512)
D5	Housing Diameter	50	(1.968)	70	(2.756)	90	(3.543)	118	(4.646)	155	(6.102)
f1	Shaft Thread	M4x8		M5x17		M8x25		M12x37		M16x45	
f2	Mounting Holes	(8x) M4x6		(8x) M5x12		(8x) M6x14		(8x) M8x18		(8x) M10x24	
L1 1-STAGE**	gearbox total length	93	(3.661)	130	(5.118)	164	(6.457)	222	(8.740)	300	(11.811)
L1 2-STAGE**		109	(4.291)	152	(5.984)	196	(7.717)	263	(10.354)	341	(13.425)
L1 3-STAGE**		-	-	174	(6.850)	229	(9.016)	304	(11.968)	382	(15.039)
L2	Shaft length	24.5	(0.965)	36	(1.417)	46	(1.811)	70	(2.756)	94	(3.701)
L3	Key Length	16	(0.630)	25	(0.984)	30	(1.181)	50	(1.968)	70	(2.756)
L4	Useable Shaft Length	18	(0.709)	28	(1.102)	35	(1.378)	58	(2.283)	82	(3.228)
L5	Pilot Height	4	(0.157)	5.5	(0.217)	9	(0.354)	7	(0.276)	5.5	(0.217)
L6	Key Width	4	(0.157)	5	(0.197)	6	(0.236)	10	(0.394)	12	(0.472)
L7	Key Height	13.5	(0.531)	18	(0.709)	24.5	(0.965)	35	(1.378)	43	(1.693)
L8**	Adapter Size	50	(1.968)	70	(2.756)	90	(3.543)	120	(4.724)	150	(5.905)

\* for larger motor shaft diameters, please contact GAM    \*\*depending on the motor, value can vary    \*\*\* longer motor shafts can be accommodated, but overall gearbox length will grow



### Recommended Output Coupling (if necessary)

	KLC-25	KLC-50	KLC-125	KM-270	KM-400
metal bellows					
elastomer	EKM-20	EKM-60	EKM-150	EKM-300	EKM-400

### TYPE CODES FOR EPL SERIES (EPL-A)

**Example: EPL - A - 090 - 005 G - [115 - A01] - S111**

**Gearbox Series**

EPL w/ Popular Metric Output Dimensions

**Gearbox Style**

A= Output Shaft

**Gearbox Size**

050, 070, 090, 120, 155

**Special Options**

Assigned by GAM

**Motor Mount Kit**

Assigned by GAM

**Options Available for This Product**

G = Key on output shaft per DIN6885

### Tolerances (mm)

Size	k6	h6
Over 10	+0.012	0
Thru 18	+0.001	-0.011
Over 18	+0.015	0
Thru 30	+0.002	-0.013
Over 30	+0.018	0
Thru 50	+0.002	-0.016
Over 50	+0.021	0
Thru 80	+0.002	-0.019
Over 80	+0.025	0
Thru 120	+0.003	-0.022

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Ratio

Toll Free Phone (877) SERV098 3, 4, 5, 7, 10, 12, 16, 20, 25, 35, 40, 50, 70, 100,  
Toll Free Fax (877) SERV099 120, 160, 200, 250, 350, 490, 700, 000=1000

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# EPL SERIES - EPL-F

EPL-F Series			64	90	110
All Ratios Available			1-Stage: 3, 4, 5, 7, 10 2-Stage: 12, 16, 20, 25, 35, 40, 50, 70, 100 3-Stage: 120, 160, 200, 250, 350, 490, 700, 1000		
Nominal Output Torque ( $T_{2n}$ )	Nm (lb-in)	3:1	20 (177)	40 (354)	100 (885)
		4, 5, 7:1	26 (230)	54 (478)	120 (1062)
		10, 100, 1000:1	16 (142)	40 (354)	105 (929)
		12:1	36 (319)	80 (708)	170 (1505)
		all other ratios	42 (372)	100 (885)	210 (1859)
Max Acceleration Output Torque ( $T_{2B}$ )	Nm (lb-in)	3:1	36 (319)	70 (620)	180 (1593)
		4, 5, 7:1	44 (389)	100 (885)	200 (1770)
		10, 100, 1000:1	24 (212)	75 (664)	180 (1593)
		12:1	45 (398)	100 (885)	215 (1903)
		all other ratios	52 (460)	125 (1106)	255 (2257)
Emergency Output Torque ( $T_{2not}$ )	Nm (lb-in)	3:1	72 (637)	160 (1416)	200 (1770)
		4, 5, 7:1	84 (743)	216 (1912)	480 (4248)
		10, 100, 1000:1	62 (549)	160 (1416)	410 (3629)
		12:1	72 (637)	160 (1416)	400 (3540)
		all other ratios	84 (743)	216 (1912)	480 (4248)
Nominal Speed ( $n_{1n}$ )	RPM	-	3500	3000	2500
Max Speed ( $n_{1max}$ )	RPM	-	6000	6000	5000
Standard Output Backlash (j)	arcmin	1stage	< 10	< 10	< 8
		2stage	< 14	< 14	< 12
		3stage	< 18	< 18	< 16
Allowable Radial Load ( $F_{rad}$ ) 1	N (lbs)	-	1200 (270)	2000 (450)	2100 (472)
Allowable Axial Load ( $F_{axial}$ )	N (lbs)	-	800 (180)	1000 (225)	1400 (315)
Torsional Stiffness ( $C_{z1}$ )	Nm/arcmin (lbin/arc-min)	10,100,1000	1.3 (11.5)	3.4 (30.1)	8.3 (73.5)
		7,70,700	1.7 (15)	4.8 (42.5)	13.6 (120.4)
		all other ratios	2.4 (21.2)	7.1 (62.8)	17.2 (152.2)
Weight (m)	kg (lbs)	1stage	1 (2.2)	2.3 (5.1)	5.8 (12.8)
		2stage	1.3 (2.9)	3.1 (6.8)	7.9 (17.4)
		3stage	3.5 (3.9)	3.9 (8.6)	10.0 (22.1)
Noise Level ( $L_{pa}$ )	dB(A)	-	<66	<68	<70
Mass Moment of Inertia ( $J_1$ )	kg cm <sup>2</sup> (lb-in <sup>2</sup> )	3:1	0.61 (0.208)	1.79 (0.612)	8.53 (2.915)
		4:1, 12:1, 16:1	0.5 (0.171)	1.47 (0.502)	6.11 (2.088)
		5:1, 20:1, 25:1	0.48 (0.164)	1.23 (0.420)	4.87 (1.664)
		7:1, 35:1	0.39 (0.133)	1.14 (0.390)	3.71 (1.268)
		10:1, 40:1 - 100:1	0.38 (0.130)	1.1 (0.376)	3.38 (1.155)
		120:1 - 1000:1	0.38 (0.130)	1.1 (0.376)	3.39 (1.158)
Efficiency at Load	1stage: 94% 2stage: 92% 3stage: 90%				
Service Life	> 30,000 hours				
Lubrication	Mineral Grease EPO				
Protection Rating			IP 64		
Operating Temperature Range			-20°C to 90°C		

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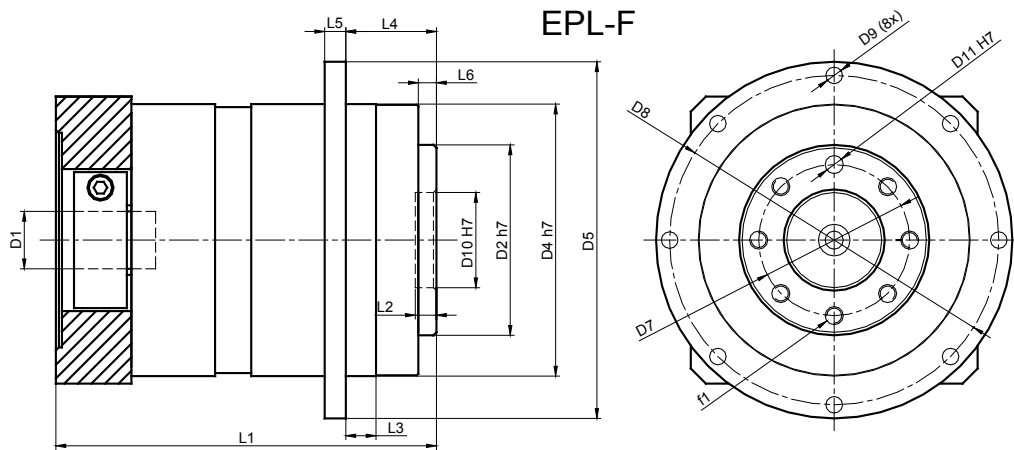
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Operating Temperature Range

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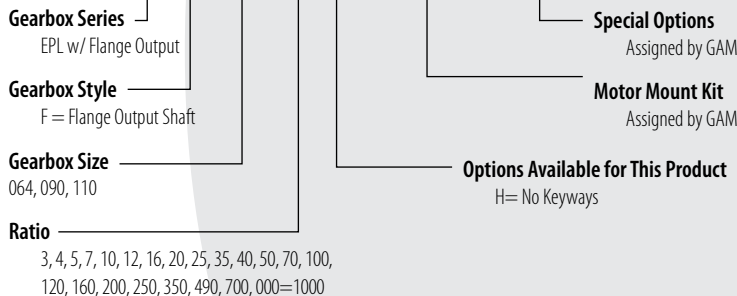


EPL-F Series		64		90		110	
		mm	(in)	mm	(in)	mm	(in)
D1 <sub>max standard</sub> *	motor shaft diameter	14	(0.551)	19	(0.748)	24	(0.945)
D1 <sub>max available</sub> *	motor shaft diameter	16	(0.630)	24	(0.945)	32	(1.260)
D2 h7	output flange diameter	40	(1.575)	63	(2.480)	80	(3.150)
D4 h7	pilot diameter	64	(2.520)	90	(3.543)	110	(4.331)
D5	flange diameter	86	(3.386)	118	(4.646)	145	(5.709)
D7	inner bolt circle	31.5	(1.240)	50	(1.968)	63	(2.480)
D8	outer bolt circle	79	(3.110)	109	(4.291)	135	(5.315)
D9	mounting hole diameter (8x)	4.5	(0.177)	5.5	(0.217)	5.5	(0.217)
D10 H7	flange pilot	20	(0.787)	31.5	(1.240)	40	(1.575)
D11 H7	dowel diameter	5	(0.197)	6	(0.236)	6	(0.236)
f1	flange tap	(7) M5x7		(7) M6x10		(7) M6x12	
L1 1-STAGE**	gearbox total length	93 (3.661)		126 (4.961)		150 (5.905)	
L1 2-STAGE**		113 (4.490)		158 (6.220)		190 (7.480)	
L1 3-STAGE**		129 (5.08)		191 (7.520)		231 (9.094)	
L2	flange pilot depth	4	(0.157)	6	(0.236)	6	(0.236)
L3	pilot height	7	(0.276)	10	(0.394)	10	(0.394)
L4	output length	19.5	(0.768)	30	(1.181)	29	(1.142)
L5	flange thickness	4	(0.157)	7	(0.276)	8	(0.315)
L6	output flange length	3	(0.118)	6	(0.236)	6	(0.236)

\* for larger motor shaft diameters, please contact GAM    \*\* depending on the motor, value can vary

### TYPE CODES FOR EPL SERIES (EPL-F)

**Example: EPL - F - 090 - 005 H - [115 - A01] - S111**



Size	Tolerances (mm)	
	h7	H7
Over 10	0	0.018
Thru 18	-0.018	0
Over 18	0	0.021
Thru 30	-0.021	0
Over 30	0	+0.025
Thru 50	-0.025	0
Over 50	0	+0.030
Thru 80	-0.030	0
Over 80	0	+0.035
Thru 120	-0.035	0

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# EPL SERIES: EPL-H



EPL Series		64	84	118	
Stock Ratios		3, 5, 7, 10, 25, 50, 100 (Standard Input)			
All Ratios Available		1-stage: 3, 4, 5, 7, 10			
		2-stage: 12, 16, 20, 25, 35, 40, 50, 70, 100			
		3-stage: 120, 160, 200, 250, 350, 490, 700, 1000			
Nominal Output Torque ( $T_{2n}$ )	Nm (lb-in)	3:1, 10:1, 100:1, 1000:1	14 (124)	40 (354)	100 (885)
		4:1, 5:1, 7:1	26 (230)	50 (443)	120 (1062)
		all other ratios	36 (319)	64 (566)	165 (1460)
Max Accel Output Torque ( $T_{2B}$ )	Nm (lb-in)	3:1, 10:1, 100:1, 1000:1	25 (221)	60 (531)	150 (1328)
		4:1, 5:1, 7:1	40 (354)	75 (664)	180 (1593)
		all other ratios	44 (389)	75 (664)	180 (1593)
Nominal Input Speed ( $n_{1n}$ )	RPM	-	3500	3000	2500
Max Input Speed ( $n_{1max}$ )	RPM	-	6000	6000	5000
Standard Output Backlash (j)	arcmin	3:1 - 10:1	< 10	< 10	< 8
		12:1 - 100:1	< 14	< 14	< 12
		120:1 - 1000:1	< 18	< 18	< 16
Weight (m)	kg (lb)	1-stage	1.0 (2.2)	2.3 (5.1)	5.8 (12.8)
		2-stage	1.3 (2.9)	3.1 (6.8)	7.9 (17.4)
		3-stage	1.6 (3.5)	3.9 (8.6)	10.0 (22.1)
Noise Level ( $L_{pA}$ )	dB (A)	-	< 66	< 68	< 70
Mass Moment of Inertia ( $J_1$ )	kg cm <sup>2</sup> (lb-in <sup>2</sup> )	3:1	0.45 (0.154)	1.37 (0.468)	6.54 (2.235)
		4:1, 12:1, 16:1	0.38 (0.130)	1.14 (0.390)	4.8 (1.640)
		5:1, 20:1, 25:1	0.36 (0.123)	1.05 (0.359)	4.05 (1.384)
		7:1, 35:1	0.35 (0.120)	0.97 (0.331)	3.4 (1.162)
		10:1, 40:1 - 100:1	0.34 (0.116)	0.93 (0.318)	3.1 (1.059)
		120:1 - 1000:1	0.34 (0.116)	0.93 (0.318)	3.12 (1.066)
Efficiency at Load		1-stage: 92% 2-stage: 90% 3-stage: 88%			
Service Life		> 20,000 hours			
Lubrication		Mineral Grease EPO			
Protection Rating		IP 64			
Operating Temperature Range		-20°C to 90°C			

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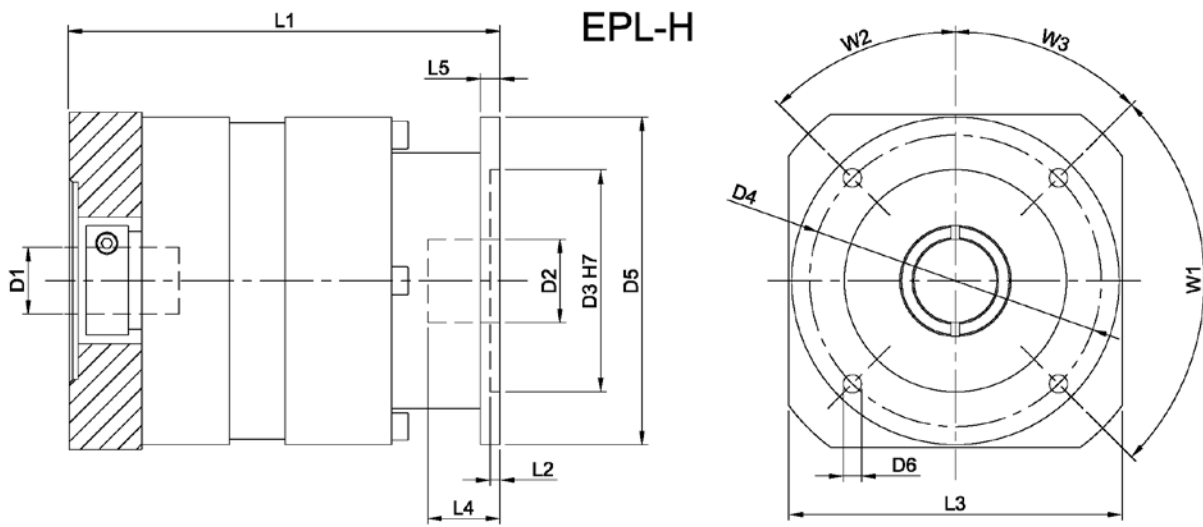


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EPL Series		64		84		118	
		mm	(in)	mm	(in)	mm	(in)
D1 max standard*	motor shaft diameter	14	(0.551)	19	(0.748)	24	(0.945)
D1 max available*	motor shaft diameter	16	(0.63)	24	(0.945)	32	(1.26)
D2 max	output shaft diameter	16	(0.63)	20	(0.787)	30	(1.181)
D3 H7	pilot diameter	44	(1.732)	60	(2.362)	80	(3.15)
D4	bolt circle	55.5	(2.185)	73	(2.874)	105	(4.134)
D5	flange diameter	70	(2.756)	84	(3.307)	118	(4.646)
D6	mounting holes	5.5	(0.217)	5.5	(0.217)	6.6	(0.26)
L1 1-STAGE**	gearbox total length	98.5	(3.878)	122	(4.803)	155.5	(6.122)
L1 2-STAGE**		120.5	(4.744)	155	(6.102)	196	(7.717)
L1 3-STAGE**		142.5	(5.61)	188	(7.402)	236.5	(9.311)
L2	pilot depth	3.5	(0.138)	3.5	(0.138)	3.5	(0.138)
L3	flange size	70	(2.756)	90	(3.543)	120	(4.724)
L4	allowable shaft depth	28	(1.102)	30	(1.181)	27	(1.063)
L5	flange thickness	6	(0.236)	6	(0.236)	10	(0.394)
W1	bolt hole spacing	125°		4x 90°		4x 90°	
W2	hole angle 1	27.5°		67.5°		67.5°	
W3	hole angle 2	27.5°		22.5°		22.5°	

\* for larger motor shaft diameters, please contact GAM \*\* depending on the motor, value can vary

### TYPE CODES FOR EPL SERIES (EPL-H)

**Example: EPL - H - 084 - 005 H - [115 - A01] - S111**

**Gearbox Series**

EPL w/ Linear Mount  
Output

**Gearbox Style**

H = Hollow Output Shaft

**Gearbox Size**

064, 084, 118

**Ratio**

3, 4, 5, 7, 10, 12, 16, 20, 25, 35, 40, 50, 70, 100,  
120, 160, 200, 250, 350, 490, 700, 000 = 1000

**Special Options**

Assigned by GAM

**Motor Mount Kit**

Assigned by GAM

**Options Available for This Product**

H = No Keyways

### Tolerances (mm)

Size	H7
Over 6	+0.015
Thru 10	0
Over 10	+0.018
Thru 18	0
Over 18	+0.021
Thru 30	0
Over 30	+0.025
Thru 50	0
Over 50	+0.030
Thru 80	0

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## ▶ HIGH PERFORMANCE: SSP SERIES

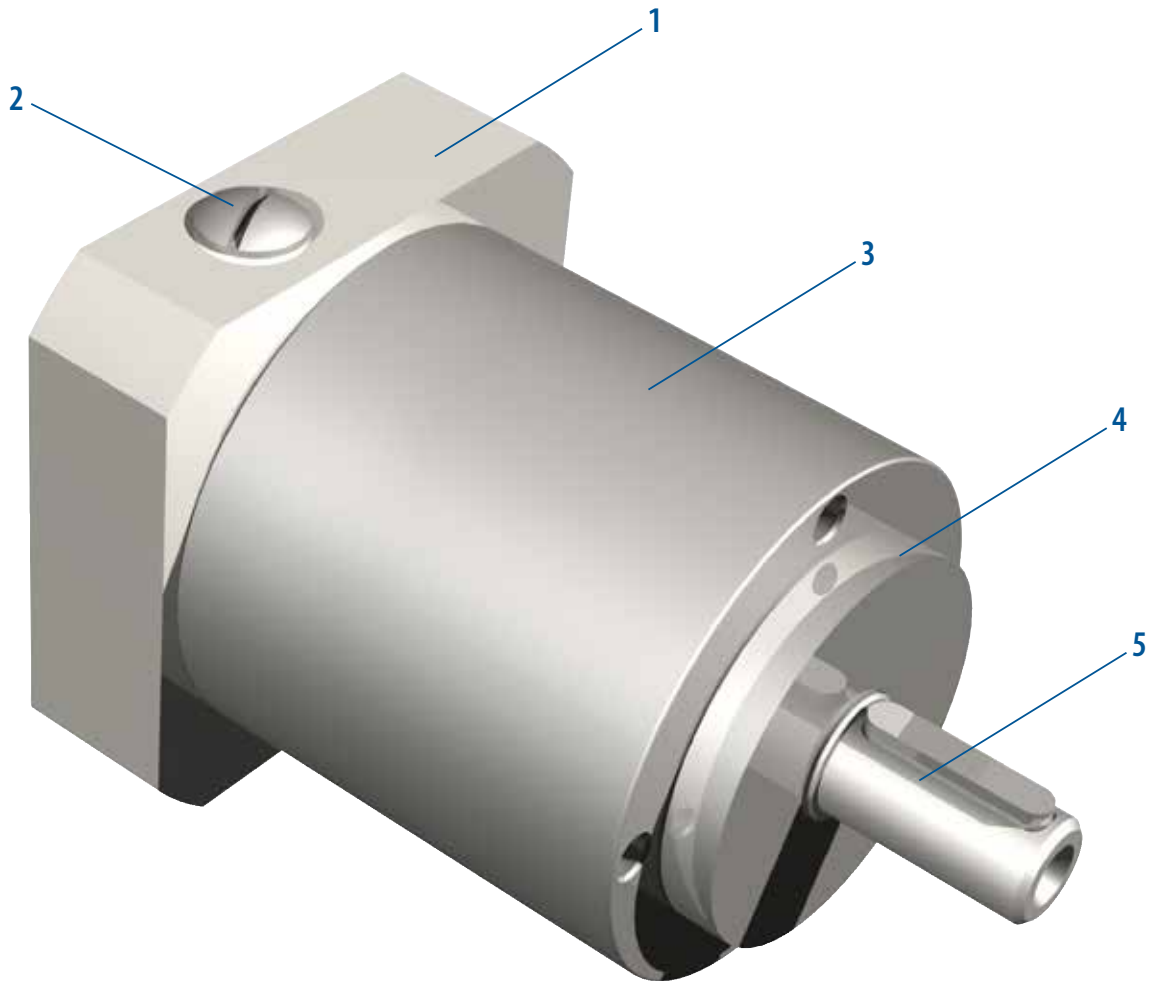
### GAM can.

If you don't see exactly what you need, let us know. We can modify the SSP Series gearboxes to meet your needs. Page 4 provides a list of commonly requested modifications to give you a feel for our capabilities.

Our Stainless Steel Planetary (SSP) Series is an innovative washdown servo gearbox solution designed for food, medical or sanitary applications. It is a precision planetary gearbox outwardly constructed of 300-series stainless steel. The motor adapter plate, housing and shaft are all stainless steel. Viton® seals, stainless steel hardware and sealed interfaces provide outstanding corrosion resistance in all types of wet and caustic washdown environments. Ideal for any light or demanding servo application where corrosion resistance is a requirement, the SSP Series offers economy, high precision, and long lasting performance.

### SSP Series benefits:

- All exposed surfaces stainless steel
- Frame sizes from 70 to 120 mm
- Ratios from 3:1 to 100:1



### Suitable for food or medical applications!

#### 1. Adapter Flange

(Stainless steel adapter for quick and easy motor mounting)

#### 2. Hole Plug

(Threaded stainless steel plug)

#### 3. Lubrication (internal)

(Standard with food grade grease)

#### 4. Seals (internal)

(Viton® seals keep contaminants out and lubricant in and achieves an IP66 rating)

#### 5. Shaft

(Stainless steel keyed output shaft)

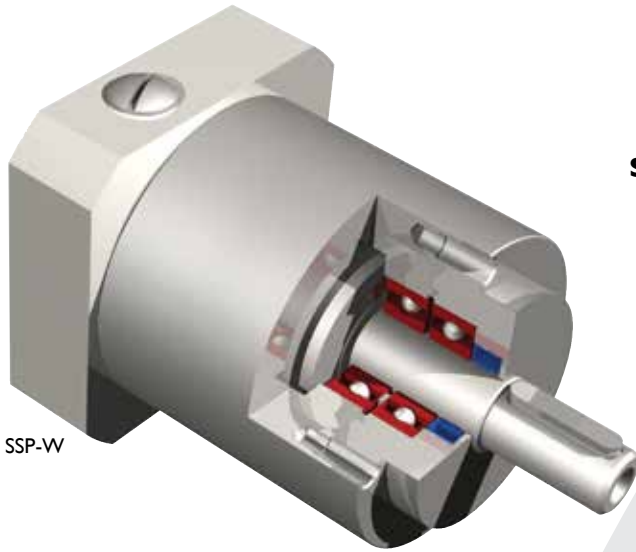
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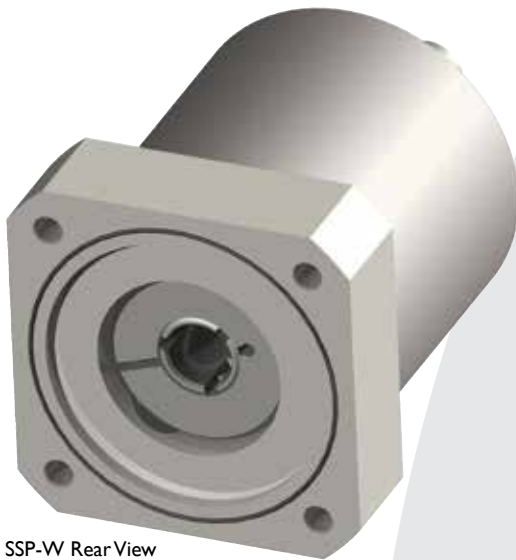
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SSP-W

### SSP-W

- Dual output bearings for high radial and axial loading
- Frame sizes from 70 mm to 120 mm
- Ratios from 3:1 to 100:1



SSP-W Rear View

### SSP-W

- Input clamping element for fast and easy mounting
- Optional input O-ring to keep contaminants out custom designed for your motor. (Special request at time of order)



SSP-W with Coupling

### SSP-W

- Optional stainless steel output coupling KG-VA for corrosion resistant connections to other shafts
- Contact GAM for more information on these couplings

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# ▶ SSP-SERIES - SSP



SSP Series		70	90	120	
Stock Ratios		5,10			
All Ratios Available		1-stage: 3, 4, 5, 7, 10 2-stage: 12, 16, 20, 25, 35, 40, 50, 70, 100 For other ratios, consult GAM			
Nominal Output Torque ( $T_{2n}$ )	Nm (lb-in)	3:1	20 (177)	40 (354)	100 (885)
		4, 5, 7:1	26 (230)	54 (478)	120 (1062)
		10, 100, 1000:1	16 (142)	40 (354)	105 (929)
		12:1	36 (319)	80 (708)	170 (1505)
		all other ratios	42 (372)	100 (885)	210 (1859)
Max Acceleration Output Torque ( $T_{2B}$ )	Nm (lb-in)	3:1	36 (319)	70 (620)	180 (1593)
		4, 5, 7:1	44 (389)	100 (885)	200 (1770)
		10, 100, 1000:1	24 (212)	75 (664)	180 (1593)
		12:1	45 (398)	100 (885)	215 (1903)
		all other ratios	52 (460)	125 (1106)	255 (2257)
Emergency Output Torque ( $T_{2not}$ )	Nm (lb-in)	3:1	72 (637)	160 (1416)	200 (1770)
		4, 5, 7:1	84 (743)	216 (1912)	480 (4248)
		10, 100, 1000:1	62 (549)	160 (1416)	410 (3629)
		12:1	72 (637)	160 (1416)	400 (3540)
		all other ratios	84 (743)	216 (1912)	480 (4248)
Nominal Input Speed ( $n_{1n}$ )	RPM	-	3500	3000	2500
Max Speed ( $n_{1max}$ )		-	6000	6000	5000
Standard Output Backlash (j)	arcmin	3:1 - 10:1	< 10	< 10	< 8
		12:1 - 100:1	< 14	< 14	< 12
Allowable Radial Load ( $F_{rad}$ ) <sup>1)</sup>	N (lbs)	-	910 (205)	1500 (338)	3000 (675)
Allowable Axial Load ( $F_{axial}$ )	N (lbs)	-	500 (113)	1000 (225)	1500 (338)
Torsional Stiffness ( $C_{t21}$ )	Nm/arcmin (lb-in/rcmin)	10:1, 100:1	1.3 (11.5)	3.4 (30.1)	8.3 (73.5)
		7:1, 70:1	1.7 (15)	4.8 (42.5)	13.6 (120.4)
		all other ratios	2.4 (21.2)	7.1 (62.8)	17.2 (152.2)
Weight (m)	kg (lbs)	1-stage	2 (4.4)	3.9 (8.6)	8.8 (19.4)
		2-stage	2.3 (5.1)	4.7 (10.4)	10.9 (24)
Noise Level ( $L_{pk}$ )	dB(A)	-	< 64	< 66	< 68
Mass Moment of Inertia ( $J_1$ )	kg cm <sup>2</sup> (lb-in <sup>2</sup> )	3:1	0.45 (0.154)	1.37 (0.468)	6.54 (2.235)
		4:1, 12:1, 16:1	0.38 (0.130)	1.14 (0.390)	4.8 (1.640)
		5:1, 20:1, 25:1	0.36 (0.123)	1.05 (0.359)	4.05 (1.384)
		7:1, 35:1	0.35 (0.120)	0.97 (0.331)	3.4 (1.162)
		10:1, 40:1 - 100:1	0.34 (0.116)	0.93 (0.318)	3.1 (1.059)
Efficiency at Load		1-stage: 94% 2-stage: 92%			
Service Life		> 30,000 hours			
Lubrication		Food Grade Grease: Note 1. Meets FDA 21 CFR 178.3570 requirements Note 2. USDA H1 authorized (authorized for use in federally inspected meat and poultry plants)			
Protection Rating		IP 66			
Operating Temperature Range		-20°C to 90°C			

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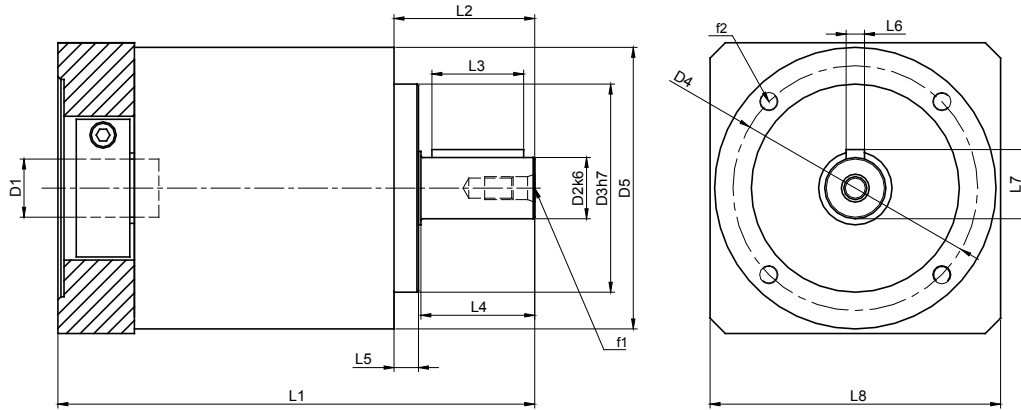
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# SSP-W



SSP Series		70		90		120	
		mm	(in)	mm	(in)	mm	(in)
D1 max standard	motor shaft diameter	14	(0.551)	19	(0.748)	24	(0.945)
D1 max available*	motor shaft diameter	16	(0.63)	24	(0.945)	32	(1.26)
D2 k6	output shaft diameter	16	(0.63)	22	(0.866)	32	(1.26)
D3 h7	pilot diameter	52	(2.047)	68	(2.677)	90	(3.543)
D4	bolt circle	62	(2.441)	80	(3.15)	108	(4.252)
D5	housing diameter	70	(2.756)	92	(3.622)	122	(4.803)
f1	shaft thread	M5x12		M6x16		M10x22	
f2	mounting holes	M6x12		M6x14		M8x18	
L1 1-STAGE***	gearbox total length	131 (5.157)		174 (6.85)		232 (9.134)	
L1 2-STAGE***		153 (6.024)		207 (8.15)		271 (10.669)	
L2	shaft length	36 (1.417)		46 (1.811)		70 (2.756)	
L3	key length	25 (0.984)		30 (1.181)		50 (1.969)	
L4	usable shaft length	28 (1.102)		36 (1.417)		58 (2.283)	
L5	pilot height	7 (0.276)		9 (0.354)		11 (0.433)	
L6	key width	5 (0.197)		6 (0.236)		8 (0.315)	
L7	key height	18 (0.709)		24.600 (0.969)		34.8 (1.37)	

\* for these larger motor shaft diameters, please contact GAM

\*\* depending on the motor, value can vary



### Recommended Output Coupling (if necessary)

all stainless bellows	KG-VA-80	KG-VA-220	KG-VA-350
-----------------------	----------	-----------	-----------

### TYPE CODES FOR SSP SERIES (SSP-W)

**Example: SSP - W - 090 - 005 G - [115 - A01] - S111**

**Gearbox Series**

Stainless Steel  
Planetary Series

**Gearbox Style**

W = Output Shaft

**Gearbox Size**

070, 090, 120

**Ratio**

3, 4, 5, 7, 10, 12, 16, 20, 25, 35, 40, 50, 70, 100

**Special Options**

Assigned by GAM

**Motor Mount Kit**

Assigned by GAM

**Options Available for This Product**

G = Key on output DIN688

### Tolerances (mm)

Size	k6	h7
Over 10	+0.012	0
Thru 18	+0.001	-0.018
Over 18	+0.015	0
Thru 30	+0.002	-0.021
Over 30	+0.018	0
Thru 50	+0.002	-0.025
Over 50	+0.021	0
Thru 80	+0.002	-0.030
Over 80	+0.025	0
Thru 120	+0.003	-0.035

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## ▶ HIGH PERFORMANCE: FP SERIES

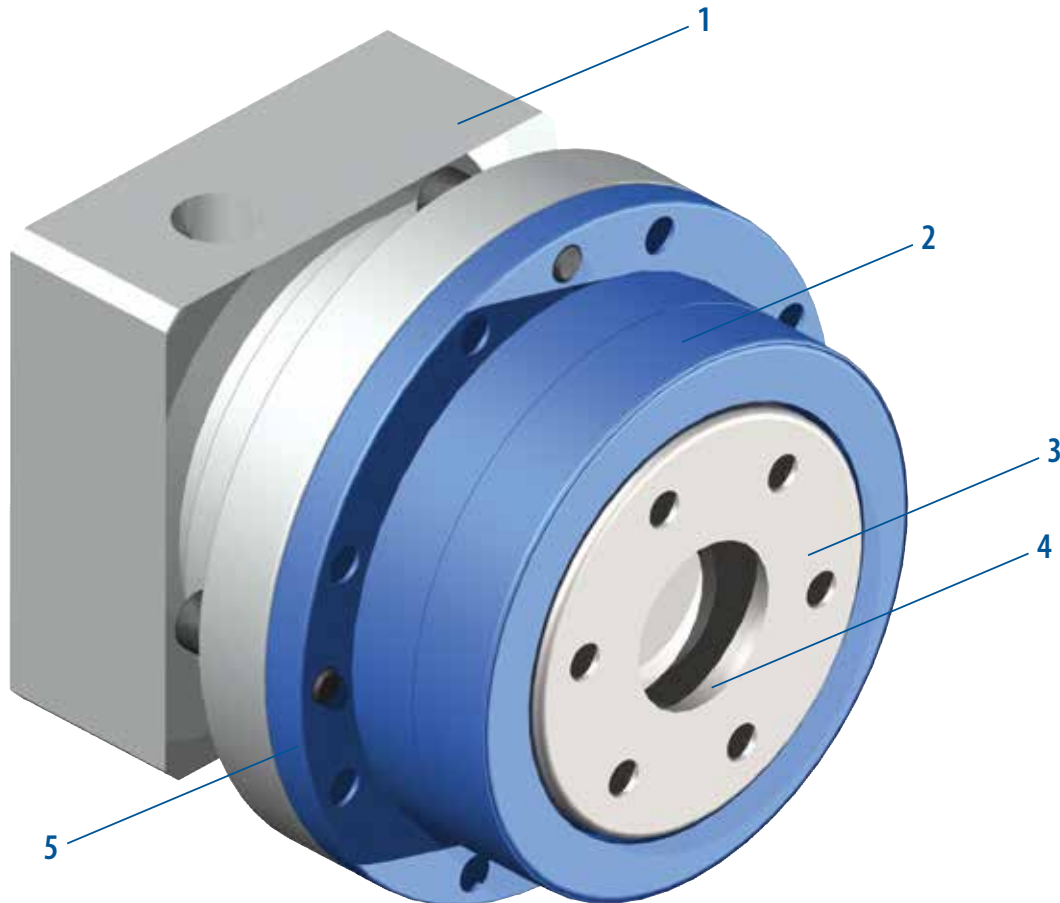
### GAM can.

If you don't see exactly what you need, let us know. We can modify the FP Series gearboxes to meet your needs. Page 4 provides a list of commonly requested modifications to give you a feel for our capabilities.

The FP Series is a “shaftless” planetary gearbox that offers advantages in space and performance. The output flange allows machine elements such as pinion gears, pulleys, rotary index tables, and transmission shafting to be easily connected directly to the output. The design also provides high torsional and tilting rigidity that improves machine performance.

### Features and Benefits of the FP Series include:

- Compact design
- High tilting rigidity for high overhung loads
- Best in class performance for accuracy due to
  - High torsional stiffness
  - Low backlash
- Lightweight
- Long design life of 20,000 hours
- Lubricated for life
- Ready for motor mounting
- Ratios 3:1 - 91:1
- Frame sizes from 50 mm to 120 mm



1. Adapter Flange  
(Customized adapter flanges for quick and easy motor mounting)

2. Output Bearing (internal)  
(Innovative bearing arrangement for high stiffness)

3. Output Flange  
(Easily mount components directly to flange)

4. Flange Pilot  
(Centering pilot for machine elements)

5. Mounting Flange  
(Allows for compact machine mounting)

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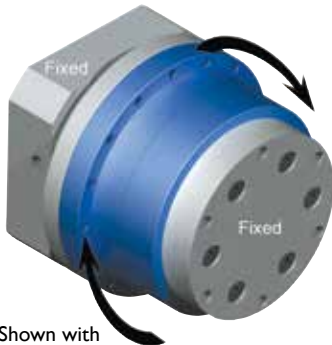
FP-FB  
Bellows output



Shown with  
custom shaft easily  
bolted to gearbox.



Shown with  
pinion gear bolted  
to the output face.



Shown with  
output face fastened to stationary  
element. Gearbox housing will rotate.



## FP-FB

- Integrated coupling on output for high torsional stiffness and a zero backlash connection while compensating for misalignment
- Available with flange mounted bellows or elastomer couplings

- Simplify machine system – GAM can provide custom shafts with standard FP gearboxes
- Shafts can be easily added and removed with a few bolts when changes are required

- A true zero backlash connection of the pinion to the gearbox.
- Ideal for compact, rigid systems

## FP-P

- Fixing output will allow rotation of housing
- A compact solution for space constraints

- Eliminate unnecessary components by fastening machine elements to the gearbox
- Gearbox housing rotates to directly drive a wheel or pulley

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# ▶ FP SERIES - FP



FP-F/P Series*			50		70		90		120		
Stock Ratios*			5, 10								
All Ratios Available*			4, 5, 7, 10, 16, 20, 21, 25, 28, 31, 35, 43, 49, 61, 91 (91:1 ratio not available in size 50)								
Nominal Output Torque ( $T_{2n}$ )	Nm (lb-in)	4:1, 5:1, 7:1	6.5	(58)	26	(230)	54	(478)	120	(1062)	
		10:1, 91:1	5	(44)	16	(142)	40	(354)	105	(929)	
		all other ratios	16	(142)	44	(389)	100	(885)	210	(1859)	
Max Acceleration Output Torque ( $T_{2B}$ )	Nm (lb-in)	4:1, 5:1, 7:1	13	(115)	36	(319)	100	(885)	200	(1770)	
		10:1, 91:1	9	(80)	24	(212)	75	(664)	180	(1593)	
		all other ratios	18	(159)	55	(487)	125	(1106)	255	(2257)	
Emergency Output Torque ( $T_{2not}$ )	Nm (lb-in)	4:1, 5:1, 7:1	26	(230)	84	(743)	216	(1912)	480	(4248)	
		10:1, 91:1	20	(177)	62	(549)	110	(974)	410	(3629)	
		all other ratios	26	(230)	84	(743)	216	(1912)	480	(4248)	
Nominal Speed ( $n_{1n}$ )	RPM	-	3000		3000		3000		2500		
Max Speed ( $n_{1max}$ )		-	6000		6000		5000		5000		
Standard Output Backlash ( $j$ )	arcmin	1 Stage	<12		<8		<8		<8		
		2 Stage	<15		<11		<11		<11		
Reduced Output Backlash ( $j$ )	arcmin	1 Stage	<8		<5		<5		<5		
		2 Stage	<12		<8		<8		<8		
Radial Load ( $F_{rad}$ )	N (lbs)	100rpm	1333	(300)	1932	(434)	3972	(893)	6541	(1470)	
		200rpm	1131	(254)	1389	(312)	2540	(571)	3955	(889)	
		300rpm	848	(191)	1050	(236)	1837	(413)	2696	(606)	
Axial Load ( $F_{axial}$ )	N (lbs)	100rpm	359	(81)	445	(100)	795	(179)	1175	(264)	
		200rpm	243	(55)	293	(66)	508	(114)	709	(159)	
		300rpm	186	(42)	219	(49)	368	(83)	483	(109)	
Tilting Rigidity <sup>1</sup>	Nm/arcmin (lb-in/arcmin)	-	11	(97)	19	(168)	51	(451)	127	(1124)	
Tilting Moment Load ( $M_T$ )**	Nm (lb-in)	100rpm	33	(292)	57	(505)	147	(1301)	296	(2620)	
		200rpm	28	(248)	41	(363)	94	(832)	179	(1584)	
		300rpm	21	(186)	31	(274)	68	(602)	122	(1080)	
Torsional Stiffness	Nm/arcmin (lb-in/arcmin)	4, 16, 20, 28	0.5	(4.4)	2.4	(21.12)	7.1	(62.48)	17.2	(151.36)	
		5, 21, 25, 35	0.5	(4.4)	2.4	(21.12)	7.1	(62.48)	17.2	(151.36)	
		7, 31, 43, 49, 61	0.4	(3.52)	2.2	(19.36)	6	(52.8)	14	(123.2)	
		10, 91	0.4	(3.52)	2	(17.6)	5	(44)	10	(88)	
Weight (m)	kg (lbs)	1 Stage	0.8	(2)	1.5	(3)	3.5	(8)	7.6	(17)	
		2 Stage	1	(2.2)	1.8	(4)	3.8	(8.4)	8.4	(18.5)	
Noise Level ( $L_{pA}$ )	dB	-	< 64		< 66		< 68		< 70		
Mass Moment of Inertia ( $J_1$ )	kg cm <sup>2</sup>	all ratios	1 Stage	0.06	0.06	0.32	0.06	1.4	0.31	2.97	1.36
			2 Stage								
Efficiency at Load	1 stage efficiency: 94%    2 stage efficiency: 92%										
Service Life	>20,000 hours										
Lubrication	Lifetime lubricant with grease										
Protection Rating	IP 65										
Operating Temperature Range	-10°C to 90°C										

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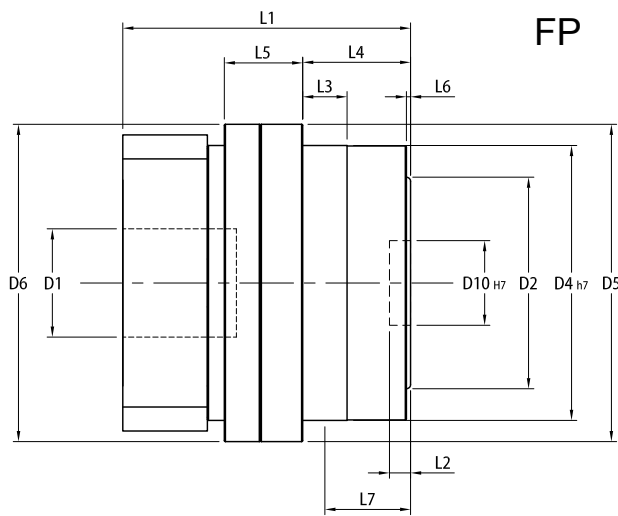


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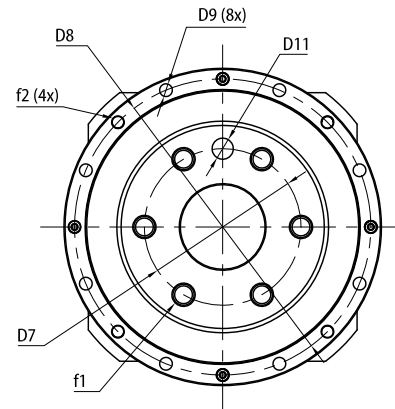
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\*Ratio for FP-P are (n-1)    \*\*Maximum value without axial load  
1) Radial load distance shown in dimension tables (L7)



FP



FP Series		50		70		90		120	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)
D1 <sub>max</sub>	motor shaft diameter	14	(0.551)	14	(0.551)	22	(0.866)	28	(1.102)
D1 <sub>max</sub> (2-Stage)	motor shaft diameter	14	(0.551)	14	(0.551)	19	(0.748)	22	(0.866)
D2	output flange diameter	42	(1.654)	55	(2.165)	75	(2.953)	105	(4.134)
D4 h7	pilot diameter	57	(2.244)	72	(2.835)	100	(3.937)	130	(5.118)
D5	flange diameter	69	(2.717)	84	(3.307)	118	(4.646)	150	(5.906)
D6	input housing diameter	56	(2.205)	72	(2.835)	100	(3.937)	130	(5.118)
D7	inner bolt circle	28	(1.102)	36	(1.417)	60	(2.362)	80	(3.150)
D8	outer bolt circle	63	(2.480)	78	(3.071)	109	(4.291)	140	(5.512)
D9	mounting holes	3.5	(0.138)	3.5	(0.138)	4.5	(0.177)	5.5	(0.217)
D10 H7	flange pilot	12	(0.472)	19	(0.748)	28	(1.102)	40	(1.575)
D11	dowel diameter x depth	4 x 4		5x5		6x6		8x8	
f1	flange through holes	6 x M4		6 x M5		6 x M6		6 x M8	
f2	threaded mounting holes	M3		M3		M4		M5	
L1** (1-Stage)	gearbox total length	69	(2.717)	83	(3.268)	107	(4.213)	134	(5.276)
L1** (2-Stage)	gearbox total length	100	(3.937)	95	(3.740)	120	(4.724)	147	(5.787)
L2	flange pilot depth	5	(0.197)	5	(0.197)	8	(0.315)	7	(0.276)
L3	pilot height	12	(0.472)	12	(0.472)	17	(0.669)	21	(0.827)
L4	output length	29	(1.142)	33	(1.299)	40.5	(1.594)	52.5	(2.067)
L5	flange length	15.5	(0.610)	20	(0.787)	28	(1.102)	37	(1.457)
L6	output flange height	3	(0.118)	3	(0.118)	3.5	(0.138)	3.5	(0.138)
L7	radial load distance	24.75	(0.974)	29.5	(1.161)	37	(1.457)	45.25	(1.781)

\* for larger motor shaft diameters, please contact GAM \*\* depending on the motor, value can vary

**TYPE CODES FOR FP SERIES (FP)**

**Example: FP - F - 070 - 005H - [115 - A01] - S111**

**Gearbox Series**

FP = Flange Planetary

**Gearbox Style**

F = Output Flange Rotates  
P = Gearbox Housing Rotates  
FB = Bellows Coupling Output

**Gearbox Size**

050, 070, 090, 120

**Ratio**

1.5, 7, 10, 15, 20, 21, 25, 28, 31, 35, 43, 49, 61, 91  
(91:1 not available for size 50)

**Special Options**

Assigned by GAM

**Motor Mount Kit**

Assigned by GAM

**Options Available for This Product**

H = standard backlash  
A = reduced backlash

**Tolerances (mm)**

Size	h7	H7
Over 10	0	+0.018
Thru 18	-0.018	0
Over 18	0	+0.021
Thru 30	-0.021	0
Over 30	0	+0.025
Thru 50	-0.025	0
Over 50	0	+0.030
Thru 80	-0.030	0
Over 80	0	+0.035
Thru 120	-0.035	0
Over 120	0	+0.040
Thru 180	-0.040	0

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## ▶ PERFORMANCE: PE SERIES

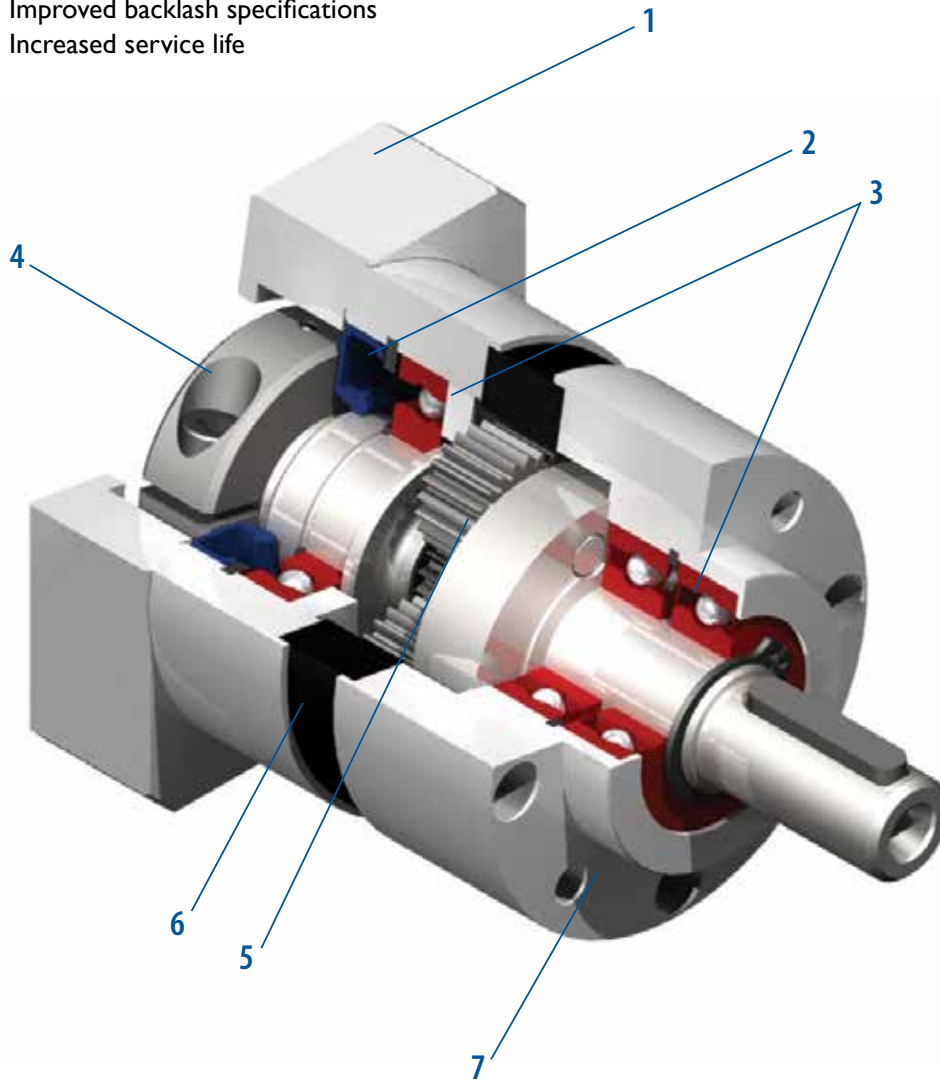
### GAM can.

If you don't see exactly what you need, let us know. We can modify the PE Series gearboxes to meet your needs. Page 4 provides a list of commonly requested modifications to give you a feel for our capabilities.

The GAM PE series is a great gearbox value for servo, stepper, and other motion control applications. It offers the best quality available for the price point. Based on the design of the popular EPL series, the PE series is a reliable alternative when radial or axial loadings are minimized.

### PE Series offers:

- Metric output (4 sizes)
- NEMA output (4 sizes)
- Wide range of ratios (3:1 to 1000:1)
- Available to purchase online!
- Improved backlash specifications
- Increased service life



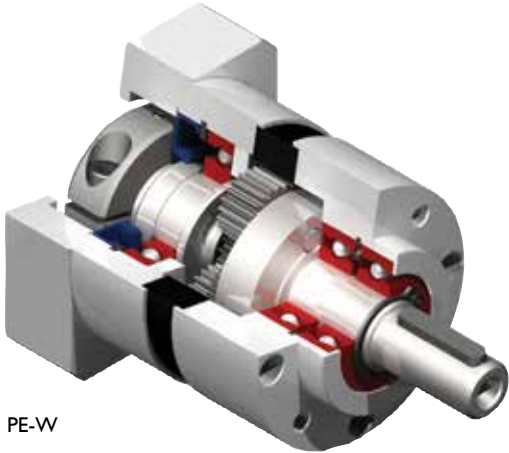
1. Adapter Plate  
(Customized adapter plates for quick and easy motor mounting)
2. Seals  
(Protective seals to isolate the gearbox)
3. Ball Bearings  
(Dual ball bearings)
4. Input Clamping Element
5. Planet Gears  
(Precision honed gears)
6. Ring Gear  
(Ring gear incorporated into housing)
7. Output Face

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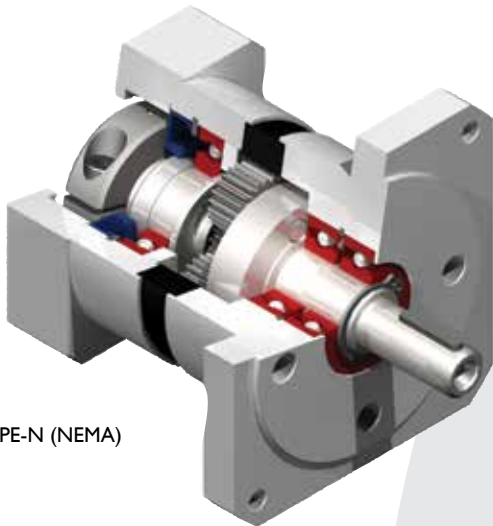
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PE-W

**PE-W**

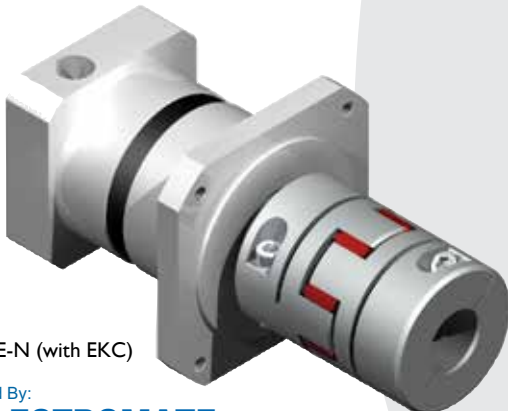
- Metric output face
- Ratios 3:1 to 1000:1
- Frame sizes from 50 mm to 118 mm
- Ready to mount to your motor



PE-N (NEMA)

**PE-N (NEMA)**

- NEMA output face
- Ratios 3:1 to 1000:1
- Frame sizes from NEMA 17 to 42
- Ready to mount to your motor



PE-N (with EKC)

**PE-N (shown with GAM's EKC elastomer coupling)**

- Use the PE Series gearbox with the EKC coupling for the most cost-effective solution!

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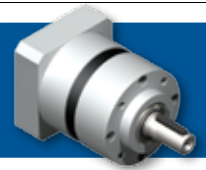
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# ▶ PE-W SERIES - (METRIC)



PE-W Series		50	64	84	118	
Stock Ratios		5, 10, 50				
All Ratios Available		1-stage: 3, 4, 5, 7, 10 2-stage: 12, 16, 20, 25, 35, 40, 50, 70, 100 3-stage: 120, 160, 200, 250, 350, 490, 700, 1000				
Nominal Output Torque ( $T_{2n}$ )	Nm (lb-in)	3:1	5 (44)	20 (177)	40 (354)	100 (885)
		4, 5, 7:1	6.5 (58)	26 (230)	54 (478)	120 (1062)
		10, 100, 1000:1	5 (44)	16 (142)	40 (354)	105 (929)
		12:1	14 (124)	36 (319)	80 (708)	170 (1505)
		all other ratios	16 (142)	42 (372)	100 (885)	210 (1859)
Max Acceleration Output Torque ( $T_{2B}$ )	Nm (lb-in)	3:1	10 (89)	36 (319)	70 (620)	180 (1593)
		4, 5, 7:1	13 (115)	44 (389)	100 (885)	200 (1770)
		10, 100, 1000:1	10 (89)	24 (212)	75 (664)	180 (1593)
		12:1	17.5 (155)	45 (398)	100 (885)	215 (1903)
		all other ratios	20 (177)	52 (460)	125 (1106)	255 (2257)
Emergency Output Torque ( $T_{2not}$ )	Nm (lb-in)	3:1	20 (177)	72 (637)	160 (1416)	200 (1770)
		4, 5, 7:1	26 (230)	84 (743)	216 (1912)	480 (4248)
		10, 100, 1000:1	20 (177)	62 (549)	160 (1416)	410 (3629)
		12:1	28 (248)	72 (637)	160 (1416)	400 (3540)
		all other ratios	32 (283)	84 (743)	216 (1912)	480 (4248)
Nominal Speed ( $n_{1n}$ )	RPM	-	3500	3500	3000	2500
Max Speed ( $n_{1max}$ )		-	6000	6000	6000	5000
Standard Output Backlash (j)	arcmin	3:1 - 10:1	<16	<10	<10	<8
		12:1 - 100:1	<20	<14	<14	<12
		120:1 - 1000:1	-	<18	<18	<16
Allowable Radial Load ( $F_{rad}$ ) <sup>1)</sup>	N (lbs)	-	425 (96)	560 (126)	1300 (293)	2500 (563)
Allowable Axial Load ( $F_{axial}$ )	N (lbs)	-	350 (79)	500 (113)	1000 (225)	1500 (338)
Torsional Stiffness ( $C_{t21}$ )	Nm/arcmin (lb-in/arcmin)	10, 100, 1000	0.60 (5.3)	1.3 (11.5)	3.4 (30.1)	8.3 (73.5)
		7, 70, 700	0.78 (6.9)	1.7 (15)	4.8 (42.5)	13.6 (120.4)
		all other ratios	0.9 (8.0)	2.4 (21.2)	7.1 (62.8)	17.2 (152.2)
Weight (m)	kg (lbs)	1-stage	0.4 (0.9)	1.0 (2.2)	2.3 (5.1)	5.8 (12.8)
		2-stage	0.5 (1.1)	1.3 (2.9)	3.1 (6.8)	7.9 (17.4)
		3-stage	- (-)	1.6 (3.5)	3.9 (8.6)	10.0 (22.1)
Noise Level ( $L_{pA}$ )	dB(A)	-	< 64	< 66	< 68	< 70
Mass Moment of Inertia ( $J_1$ )	kg cm <sup>2</sup> (lb-in <sup>2</sup> ) (lb-in <sup>2</sup> )	3:1	0.06 (0.021)	0.45 (0.154)	1.37 (0.468)	6.54 (2.235)
		4:1, 12:1, 16:1	0.04 (0.014)	0.38 (0.130)	1.14 (0.390)	4.8 (1.640)
		5:1, 20:1, 25:1	0.04 (0.014)	0.36 (0.123)	1.05 (0.359)	4.05 (1.384)
		7:1, 35:1	0.04 (0.014)	0.35 (0.120)	0.97 (0.331)	3.4 (1.162)
		10:1, 40:1 - 100:1	0.04 (0.014)	0.34 (0.116)	0.93 (0.318)	3.1 (1.059)
		120:1 - 1000:1	(0.000)	0.34 (0.116)	0.93 (0.318)	3.12 (1.066)
Efficiency at Load	1-stage: 94% 2-stage: 92% 3-stage: 90%					
Service Life	>20,000					
Lubrication	Mineral Grease EPO					
Protection Rating		IP 64				
Operating Temperature Range		-20°C to 90°C				

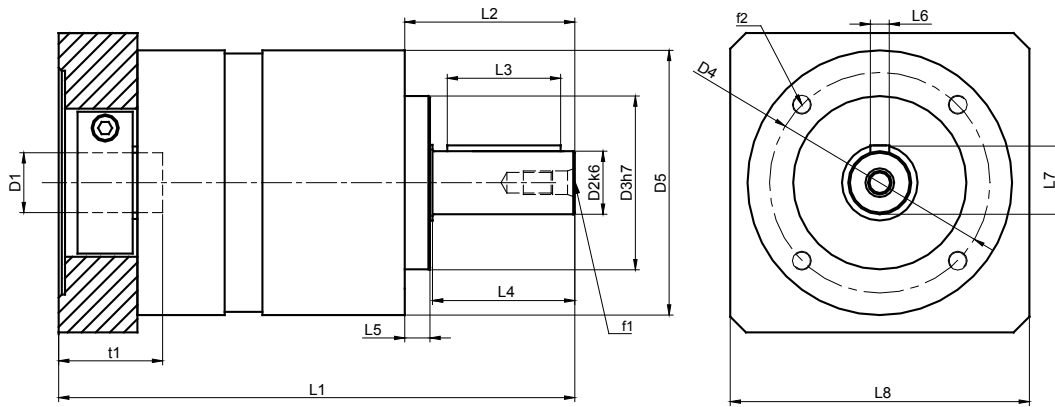
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 Operating Temperature Range

Toll Free Call Applied Torque of 1000g shaft @ 100 RPM

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# PE-W



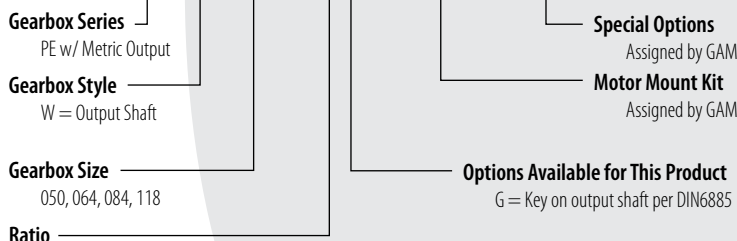
mm (in)		50	64	84	118
D1 <sub>max standard*</sub>	motor shaft diameter	11 (0.433)	14 (0.551)	19 (0.748)	24 (0.945)
D1 <sub>max available*</sub>	motor shaft diameter	14 (0.551)	16 (0.630)	24 (0.945)	32 (1.260)
D2 <sub>k6</sub>	output shaft diameter	12 (0.472)	14 (0.551)	20 (0.787)	25 (0.984)
D3 <sub>h7</sub>	pilot diameter	35 (1.378)	40 (1.575)	55 (2.165)	80 (3.15)
D4	bolt circle	44 (1.732)	52 (2.047)	70 (2.756)	100 (3.937)
D5	housing diameter	50 (1.969)	64 (2.52)	84 (3.307)	118 (4.646)
f1	shaft thread	M4x8	M5x12	M6x16	M10x22
f2	mounting holes	M4x6	M5x12	M6x14	M8x18
L1 1-STAGE**	gearbox total length	93 (3.661)	117 (4.606)	162 (6.378)	199 (7.835)
L1 2-STAGE**		108 (4.252)	139 (5.472)	195 (7.677)	239 (9.409)
L1 3-STAGE**		- (-)	161 (6.339)	228 (8.976)	280 (11.024)
L2	shaft length	24.5 (0.965)	39 (1.535)	54 (2.126)	61 (2.402)
L3	key length	16 (0.63)	25 (0.984)	36 (1.417)	45 (1.772)
L4	usable shaft length	18 (0.709)	30 (1.181)	45 (1.772)	50 (1.969)
L5	pilot height	4 (0.157)	8 (0.315)	8 (0.315)	10 (0.394)
L6	key width	4 (0.157)	5 (0.197)	6 (0.236)	8 (0.315)
L7	key height	13.5 (0.531)	16 (0.63)	22.5 (0.886)	28 (1.102)
L8**	adapter size	50 (1.969)	70 (2.756)	90 (3.543)	120 (4.724)
t1***	allowable shaft length	23 (0.87)	23 (0.906)	30 (1.181)	40 (1.575)

\* for larger motor shaft diameters, please contact GAM \*\* depending on the motor, value can vary \*\*\* long motor shafts can be accommodated, but overall gearbox length will grow  
 \*\*\*\*The PE-W-050 may have a blue ring gear

	Recommended Output Coupling (if necessary)			
	metal bellows	KLC-25	KLC-50	KLC-125
elastomer	EKC-25	EKC-35	EKC-80 or 110	EKM-300

## TYPE CODES FOR PE-W SERIES (METRIC)

**Example: PE - W - 084 - 005 G - [115 - A01] - S111**



Tolerances (mm)		
Size	k6	h7
Over 6	+0.010	0
Thru 10	+0.001	-0.015
Over 10	+0.012	0
Thru 18	+0.001	-0.018
Over 18	+0.015	0
Thru 30	+0.002	-0.021
Over 30	+0.018	0
Thru 50	+0.002	-0.025
Over 50	+0.021	0
Thru 80	+0.002	-0.030

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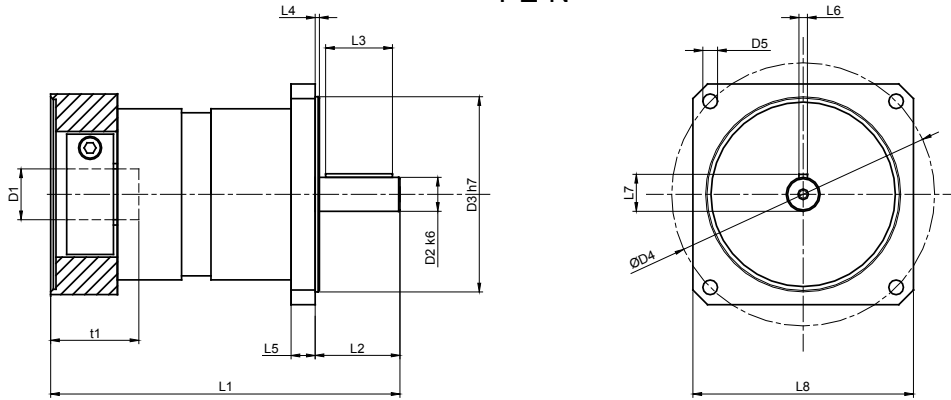


# ▶ PE-N SERIES - (NEMA)



PE-N Series		17	23	34	42	
Stock Ratios		5, 10, 50				
All Ratios Available		1-stage: 3, 4, 5, 7, 10 2-stage: 12, 16, 20, 25, 35, 40, 50, 70, 100 3-stage: 120, 160, 200, 250, 350, 490, 700, 1000				
Nominal Output Torque (T <sub>2n</sub> )	Nm (lb-in)	3:1	5 (44)	5 (44)	20 (177)	40 (354)
		4, 5, 7:1	6.5 (58)	6.5 (58)	26 (230)	54 (478)
		10, 100, 1000:1	5 (44)	5 (44)	16 (142)	40 (354)
		12:1	14 (124)	14 (124)	36 (319)	80 (708)
		all other ratios	16 (142)	16 (142)	42 (372)	100 (885)
Max Accel. Torque (T <sub>2B</sub> )	Nm (lb-in)	3:1	10 (89)	10 (89)	36 (319)	70 (620)
		4, 5, 7:1	13 (115)	13 (115)	44 (389)	100 (885)
		10, 100, 1000:1	10 (89)	10 (89)	24 (212)	75 (664)
		12:1	17.5 (155)	17.5 (155)	45 (398)	100 (885)
		all other ratios	20 (177)	20 (177)	52 (460)	125 (1106)
Emergency Output Torque (T <sub>2not</sub> )	Nm (lb-in)	3:1	20 (177)	20 (177)	72 (637)	160 (1416)
		4, 5, 7:1	26 (230)	26 (230)	84 (743)	216 (1912)
		10, 100, 1000:1	20 (177)	20 (177)	62 (549)	160 (1416)
		12:1	28 (248)	28 (248)	72 (637)	160 (1416)
		all other ratios	32 (283)	32 (283)	84 (743)	216 (1912)
Nominal Speed (n <sub>1n</sub> )	RPM	-	3500	3500	3500	3000
Max Input Speed (n <sub>1max</sub> )		-	6000	6000	6000	6000
Standard Output Backlash (j)	arcmin	3:1 - 10:1	<20	<16	< 10	< 10
		12:1 - 100:1	<24	<20	< 14	< 14
		120:1 - 1000:1	-	-	< 18	< 18
Allowable Radial Load (F <sub>rad</sub> ) <sup>1)</sup>	N (lbs)	-	361 (81)	361 (81)	476 (107)	1105 (249)
Allowable Axial Load (F <sub>axial</sub> )	N (lbs)	-	298 (67)	298 (67)	425 (96)	850 (191)
Torsional Stiffness (C <sub>t21</sub> )	Nm/arcmin (lb-in/arc-min)	10, 100, 1000	0.50 (4.4)	0.60 (5.3)	1.3 (11.5)	3.4 (30.1)
		7, 70, 700	0.65 (5.8)	0.78 (6.9)	1.7 (15)	4.8 (42.5)
		all other ratios	0.8 (7.5)	0.9 (8.0)	2.4 (21.2)	7.1 (62.8)
Weight (m)	kg (lbs)	1-stage	0.45 (1.0)	0.45 (1.0)	1.1 (2.4)	2.4 (5.3)
		2-stage	0.55 (1.2)	0.55 (1.2)	1.4 (3.1)	3.2 (7.1)
		3-stage	- (-)	- (-)	1.7 (3.7)	4.0 (8.8)
Noise Level (L <sub>PA</sub> )	dB(A)	-	<60	<64	< 66	< 68
Mass Moment of Inertia (J <sub>1</sub> )	kg cm <sup>2</sup> (lb-in <sup>2</sup> )	3:1	0.0144 (0.005)	0.06 (0.021)	0.45 (0.154)	1.37 (0.468)
		4:1, 12:1, 16:1	0.0096 (0.003)	0.04 (0.014)	0.38 (0.130)	1.14 (0.390)
		5:1, 20:1, 25:1	0.0096 (0.003)	0.04 (0.014)	0.36 (0.123)	1.05 (0.359)
		7:1, 35:1	0.0152 (0.005)	0.04 (0.014)	0.35 (0.120)	0.97 (0.331)
		10:1, 40:1 - 100:1	0.0078 (0.003)	0.04 (0.014)	0.34 (0.116)	0.93 (0.318)
		120:1 - 1000:1	- (-)	- (-)	0.34 (0.116)	0.93 (0.318)
Efficiency at Load	1-stage: 94% 2-stage: 92% 3-stage: 90%					
Service Life	>20,000					
Lubrication	Mineral Grease EPO					
Sold & Serviced By: Protection Rating	IP 64					
Operating Temperature Range	-20°C to 90°C					

# PE-N



PE-N Series		17		23		34		42	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)
D1 <sup>max standard*</sup>	motor shaft diameter	11	(0.433)	11	(0.433)	14	(0.551)	19	(0.748)
D1 <sup>max available*</sup>	motor shaft diameter	11	(0.433)	14	(0.551)	16	(0.630)	24	(0.945)
D2 <sup>k6</sup>	output shaft diameter	9.525	(0.375)	9.525	(0.375)	12.700	(0.500)	19.05	(0.750)
D3 <sup>h7</sup>	pilot diameter	21.97	(0.865)	38.100	(1.500)	73.025	(2.875)	55.55	(2.187)
D4	bolt circle	43.8	(1.725)	66.7	(2.625)	98.400	(3.875)	125.7	(4.95)
D5	mounting holes	3.25	(0.128)	5	(0.2)	5.5	(0.22)	7.1	(0.28)
L1 1-STAGE**	gearbox total length	108	(4.252)	102	(4.016)	125	(4.921)	162	(6.378)
L1 2-STAGE**		124	(4.882)	122.5	(4.823)	147	(5.787)	194.5	(7.657)
L1 3-STAGE**		-	(-)	-	(-)	169	(6.654)	227	(8.937)
L2	shaft length	25.4	(1.00)	25.4	(1.00)	31.8	(1.25)	31.8	(1.25)
L3	key length	-	(-)	-	(-)	27	(1.06)	29	(1.14)
L4	pilot height	1.6	(0.063)	1.6	(0.06)	1.7	(0.07)	2.4	(0.09)
L5	flange thickness	4.9	(0.193)	5	(0.2)	10	(0.39)	13	(0.51)
L6	key width	-	(-)	-	(-)	3.2	(0.13)	4.8	(0.19)
L7	key height / flat height	9.14	(0.36)	9.14	(0.36)	14.3	(0.56)	18.260	(0.72)
L8	output flange size	40	(1.575)	57.14	(2.25)	82.55	(3.25)	106.68	(4.20)
t1***	allowable motor shaft	25	(0.984)	23	(0.87)	32	(1.26)	40	(1.575)

\* for larger motor shaft diameters, please contact GAM \*\*depending on the motor, value can vary \*\*\* longer motor shafts can be accommodated, but overall gearbox length will grow



### Recommended Output Coupling (if necessary)

	metal bellows	KLC-25	KLC-25	KLC-50	KLC-125
	elastomer	EKC-25	EKC-25	EKC-80	EKC-110

### TYPE CODES FOR PE-N SERIES (NEMA)

**Example: PE - N23 - 005 G - [115 - A01] - S111**

**Gearbox Series**  
NPE w/ NEMA output

**Gearbox Style**

N17 = NEMA17  
N23 = NEMA23  
N34 = NEMA34  
N42 = NEMA42

**Ratio**

3, 4, 5, 7, 10, 12, 16, 20, 25, 35, 40, 50, 70, 100,  
20, 160, 200, 250, 350, 490, 700, 000=1000

**Special Options**

Assigned by GAM

**Motor Mount Kit**

Assigned by GAM

**Options Available for This Product**

G = Key on output shaft per DIN6885  
flat on NEMA 17 and NEMA 23

### Tolerances (mm)

Size	k6	h7
Over 6	+0.010	0
Thru 10	+0.001	-0.015
Over 10	+0.012	0
Thru 18	+0.001	-0.018
Over 18	+0.015	0
Thru 30	+0.002	-0.021
Over 30	+0.018	0
Thru 50	+0.002	-0.025
Over 50	+0.021	0
Thru 80	+0.002	-0.030

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