



## ▶ HIGH PERFORMANCE: FP SERIES

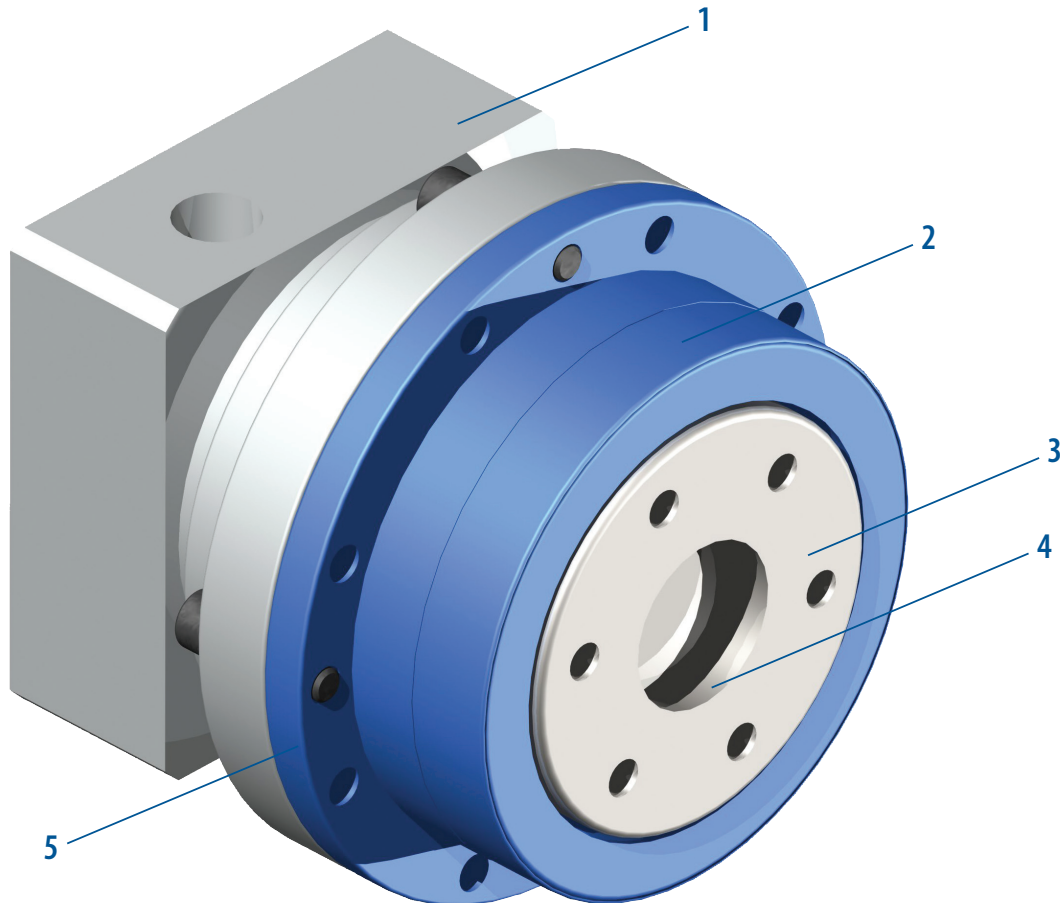
### GAM can.

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)

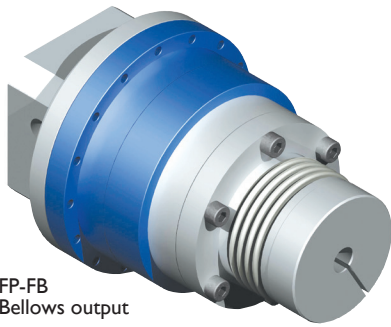
4. Flange Pilot  
(Centering pilot for machine elements)

5. Mounting Flange  
(Allows for compact machine mounting)

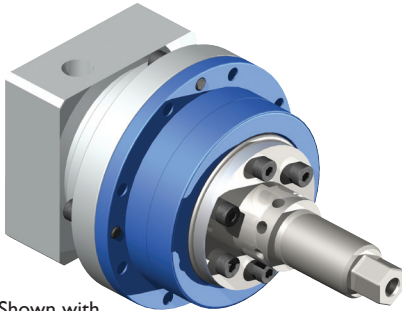
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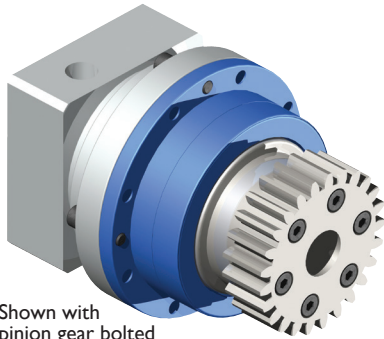
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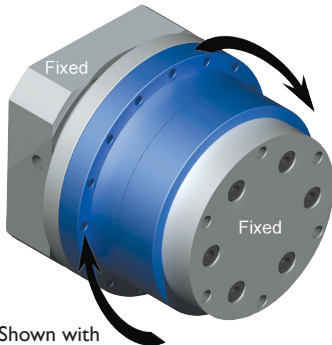
FP-FB  
Bellows output



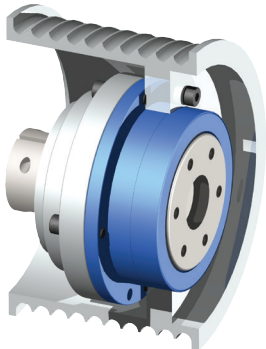
Shown with  
custom shaft easily  
bolted to gearbox.



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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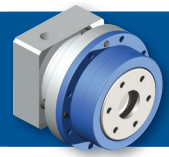
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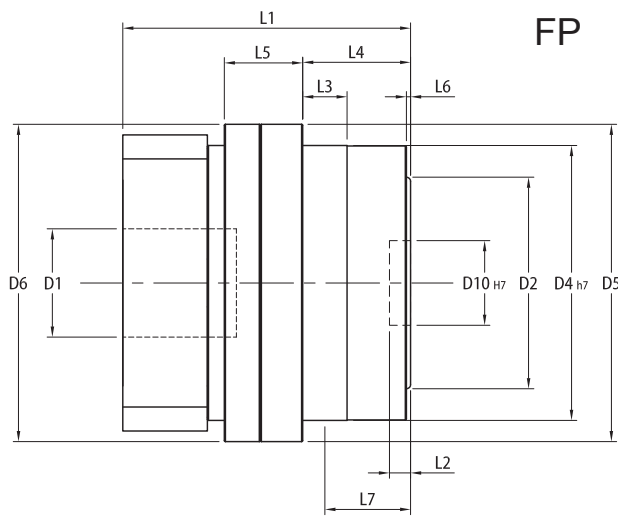
# ▶ FP SERIES - FP



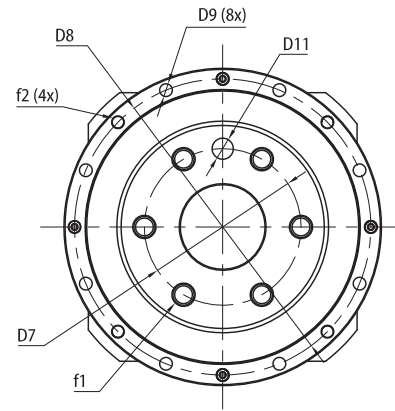
FP-F/P Series*			50		70		90		120					
Stock Ratios*			5, 10											
All Ratios Available*			4, 5, 7, 10, 16, 20, 21, 25, 28, 31, 35, 43, 49, 61, 91 (91:1 ratio not available in size 50)											
Nominal Output Torque (T <sub>2n</sub> )	Nm (lb-in)	4:1, 5:1, 7:1	6.5 (58)		26 (230)		54 (478)		120 (1062)					
		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 <sub>2B</sub> )	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 <sub>2not</sub> )	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 <sub>1n</sub> )	RPM	-	3000		3000		3000		2500					
Max Speed (n <sub>1max</sub> )		-	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 <sub>rad</sub> )	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 <sub>axial</sub> )	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 <sub>T</sub> )**	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 <sub>PA</sub> )	dB	-	< 64		< 66		< 68		< 70					
Mass Moment of Inertia (J <sub>1</sub> )	kg cm <sup>2</sup>	all ratios	1 Stage	0.06	0.06	1 Stage	0.32	0.06	1 Stage	1.4	0.31	1 Stage	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													

\* 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**

4, 5, 7, 10, 16, 20, 21, 25, 28, 31, 35, 43, 49, 61, 91

(91:1 not available for size 50)

Ratio for FP-P is (n-1)

**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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