



▶ PERFORMANCE: PER SERIES

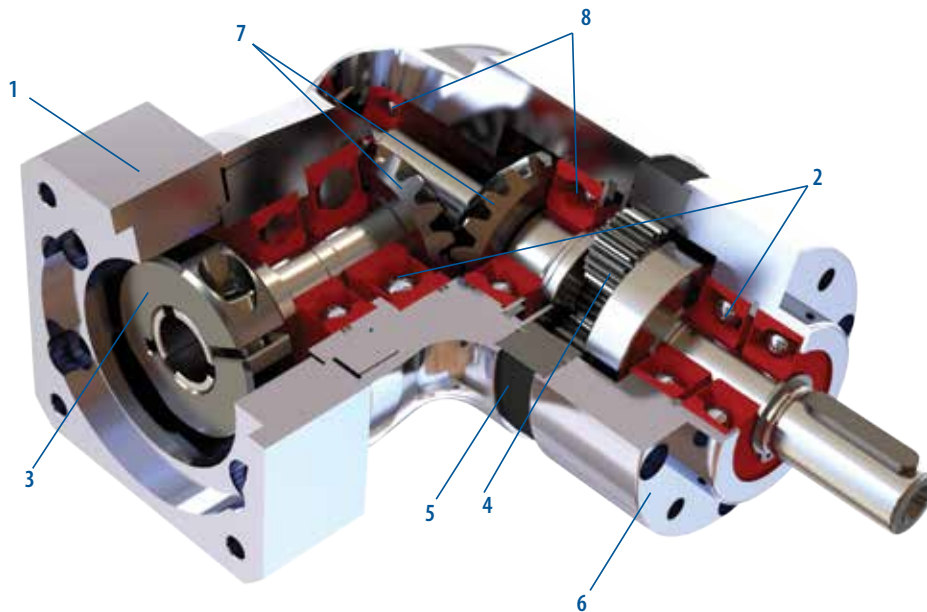
GAM can.

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 PER series is a great gearbox value for servo, stepper, and other motion control applications. It offers the best quality available for the price point. Offering the advantages of the popular EPL in a right angle configuration, the PER series is a reliable alternative when radial or axial loadings are minimized.

PER Series offers:

- PER-W with a metric output
- PER-N with a NEMA output
- Ratios from 3:1 to 1000:1
- Ready to mount to your motor



1. Adapter Plate
(Customized adapter plates for quick and easy motor mounting)

2. Deep Groove Ball Bearings
(dual ball bearings)

3. Input Clamping Element

4. Planet Gears
(precision ground gears)

5. Ring Gear
(Ring gear incorporated into housing)

6. Output face

7. Precision ground spiral bevel gears

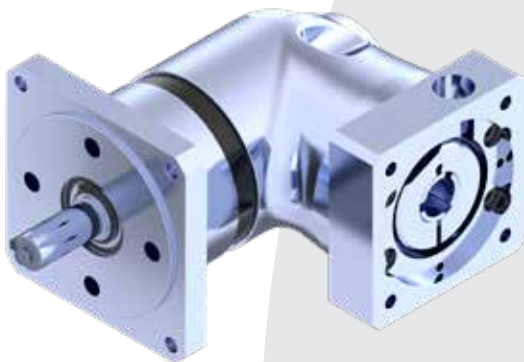
8. Bevel gear supported at both ends
(input to planetary)



PER-W

PER-W

- GAM Metric output face
- Frame sizes from 50 mm to 118 mm



PER-N (NEMA)

PER-N

- NEMA output face
- Frame sizes from NEMA 17 to 42

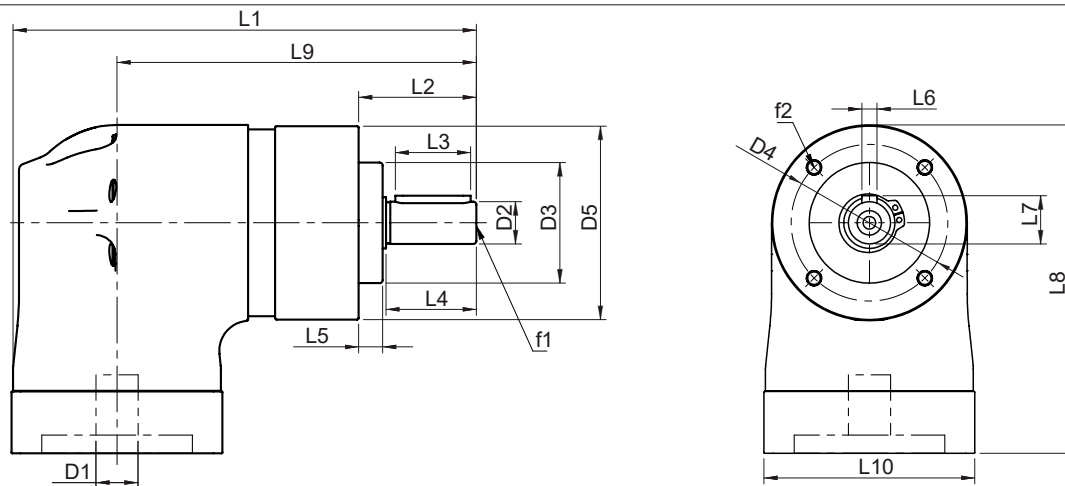


▶ PER-W SERIES - (METRIC)



PER-W Series		64	84	118	
Stock Ratios		5, 10, 50			
All Ratios Available		1-Stage Planetary: 3, 4, 5, 7, 10 2-Stage Planetary: 12, 16, 20, 25, 35, 40, 50, 70, 100 3-Stage Planetary: 120, 160, 200, 250, 350, 490, 700, 1000			
Nominal Output Torque (T_{2n})	Nm (lb-in)	3:1	16 (142)	33 (292)	82 (726)
		4, 5, 7:1	22 (195)	45 (398)	101 (894)
		10, 100, 1000:1	14 (124)	34 (301)	90 (797)
		all other ratios	30 (266)	71 (628)	149 (1319)
Max Acceleration Output Torque (T_{2B})	Nm (lb-in)	3:1	30 (266)	57 (504)	148 (1310)
		4, 5, 7:1	37 (327)	84 (743)	168 (1487)
		10, 100, 1000:1	21 (186)	65 (575)	155 (1372)
		all other ratios	37 (327)	89 (788)	181 (1602)
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)
		all other ratios	84 (743)	216 (1912)	480 (4248)
Nominal Speed (n_{1n})	RPM	-	3300	2900	2400
Max Speed (n_{1max})		-	6000	6000	5000
Standard Output Backlash (j)	arcmin	3:1 - 10:1	<12	<12	<10
		12:1 - 100:1	<14	<14	<12
		120:1 - 1000:1	<15	<15	<12
Allowable Radial Load (F_{rad}) ¹⁾	N (lbs)	-	560 (126)	1300 (293)	2500 (563)
Allowable Axial Load (F_{axial})	N (lbs)	-	500 (113)	1000 (225)	1500 (338)
Torsional Stiffness (C_{21})	Nm/arcmin (lb-in/arcmin)	10, 100, 1000	2.8 (25)	5.4 (48)	10 (89)
		7, 70, 700	3.2 (28)	6.8 (60)	16 (142)
		all other ratios	3.9 (35)	9.1 (81)	19 (168)
Weight (m)	kg (lbs)	1-stage	3.0 (6.6)	5.6 (12)	15 (33)
		2-stage	3.3 (7.3)	6.4 (14)	17 (37)
		3-stage	3.6 (7.9)	7.2 (16)	19 (42)
Noise Level (L_{pA})	dB(A)	-	< 75	< 78	< 78
Mass Moment of Inertia (J_1)	kg cm ² (lb-in ²)	3:1	0.95 (0.32)	5.4 (1.8)	22 (7.5)
		4:1, 12:1, 16:1	0.88 (0.30)	5.1 (1.7)	20 (6.8)
		5:1, 20:1, 25:1	0.86 (0.29)	5.1 (1.7)	20 (6.8)
		7:1, 35:1	0.85 (0.29)	5.0 (1.7)	19 (6.5)
		10:1, 40:1 - 100:1	0.84 (0.29)	4.9 (1.7)	19 (6.5)
		120:1 - 1000:1	0.84 (0.29)	4.9 (1.7)	19 (6.5)
Efficiency at Load	1-stage: 92% 2-stage: 90% 3-stage: 88%				
Service Life	>20,000				
Lubrication	Mineral Grease EPO				
Protection Rating	IP 64				
Operating Temperature Range	-20°C to 90°C				

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



PER-W 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	(0.630)	24	(0.945)	32	(1.260)
D2 k6	output shaft diameter	14	(0.551)	20	(0.787)	25	(0.984)
D3 h7	pilot diameter	40	(1.575)	55	(2.165)	80	(3.150)
D4	bolt circle	52	(2.047)	70	(2.756)	100	(3.937)
D5	housing diameter	64	(2.520)	84	(3.307)	118	(4.646)
f1	shaft thread	M5x12		M6x16		M10x22	
f2	mounting holes	M5x12		M6x14		M8x18	
L1 (1-stage)**	gearbox length	154	(6.063)	217.5	(8.563)	276.5	(10.886)
L1 (2-stage)**		176	(6.929)	250.5	(9.862)	316.5	(12.461)
L1 (3-stage)**		198	(7.795)	283.5	(11.161)	357.5	(14.075)
L2	shaft length	39	(1.535)	54	(2.126)	61	(2.402)
L3	key length	25	(0.984)	36	(1.417)	45	(1.772)
L4	usable shaft length	30	(1.181)	45	(1.772)	50	(1.969)
L5	pilot height	8	(0.315)	8	(0.315)	10	(0.394)
L6	key width	5	(0.197)	6	(0.236)	8	(0.315)
L7	key height	16	(0.630)	22.5	(0.886)	28	(1.102)
L8**	gearbox height	108.6	(4.276)	153	(6.024)	183.5	(7.224)
L9 (1-stage)	length to input centerline	119.3	(4.697)	171	(6.732)	216.5	(8.524)
L9 (2-stage)		141.3	(5.563)	204	(8.031)	256.5	(10.098)
L9 (3-stage)		163.3	(6.429)	237	(9.331)	297.5	(11.713)
L10	adapter size	70	(2.756)	90	(3.543)	120	(4.724)

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

TYPE CODES FOR PER-W SERIES (METRIC)

Example: PER - W - 084 - 005 G - M0000 - H0000 - C00000

Gearbox Series

PER w/ Metric Output

Gearbox Style

W = 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

Configuration Code

Assigned by GAM

Output Code

Assigned by GAM

Motor Code

Assigned by GAM

Options Available for This Product

G = Key on output shaft per DIN6885

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

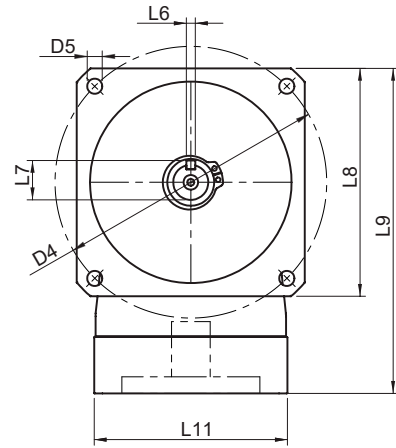
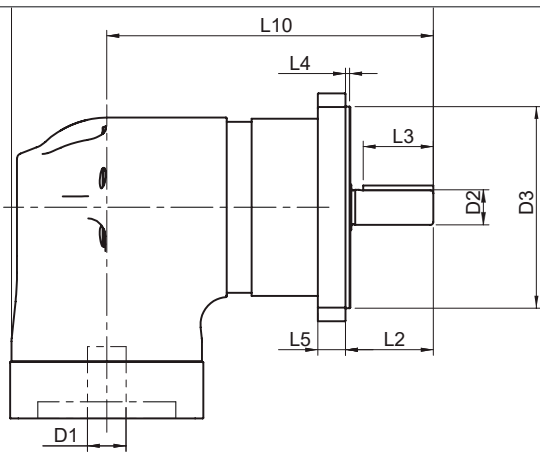


▶ PER-N SERIES - (NEMA)



PER-N Series		34		42	
Stock Ratios		5, 10, 50			
All Ratios Available		1-Stage Planetary: 3, 4, 5, 7, 10 2-Stage Planetary: 12, 16, 20, 25, 35, 40, 50, 70, 100 3-Stage Planetary: 120, 160, 200, 250, 350, 490, 700, 1000			
Nominal Output Torque (T_{2n})	Nm (lb-in)	3:1	16 (142)	33 (292)	
		4, 5, 7:1	22 (195)	45 (398)	
		10, 100, 1000:1	14 (124)	34 (301)	
		all other ratios	30 (266)	71 (628)	
Max Accel. Torque (T_{2B})	Nm (lb-in)	3:1	30 (266)	57 (504)	
		4, 5, 7:1	37 (327)	84 (743)	
		10, 100, 1000:1	21 (186)	65 (575)	
		all other ratios	37 (327)	89 (788)	
Emergency Output Torque (T_{2not})	Nm (lb-in)	3:1	72 (637)	160 (1416)	
		4, 5, 7:1	84 (743)	216 (1912)	
		10, 100, 1000:1	62 (549)	160 (1416)	
		all other ratios	84 (743)	216 (1912)	
Nominal Speed (n_{1n})	RPM	-	3300	2900	
Max Input Speed (n_{1max})		-	6000	6000	
Standard Output Backlash (j)	arcmin	3:1 - 10:1	< 12	< 12	
		12:1 - 100:1	< 14	< 14	
		120:1 - 1000:1	< 15	< 15	
Allowable Radial Load (F_{rad}) ¹⁾	N (lbs)	-	476 (107)	1105 (249)	
Allowable Axial Load (F_{axial})	N (lbs)	-	425 (96)	850 (191)	
Torsional Stiffness (C_{t21})	Nm/arcmin (lb-in/arcmin)	10, 100, 1000	2.8 (25)	5.4 (48)	
		7, 70, 700	3.2 (28)	6.8 (60)	
		all other ratios	3.9 (35)	9.1 (81)	
Weight (m)	kg (lbs)	1-stage	3.0 (6.6)	5.6 (12)	
		2-stage	3.3 (7.3)	6.4 (14)	
		3-stage	3.6 (7.9)	7.2 (16)	
Noise Level (L_{pk})	dB(A)	-	< 75	< 78	
Mass Moment of Inertia (J_1)	kg cm ² (lb-in ²)	3:1	0.95 (0.32)	5.4 (1.8)	
		4:1, 12:1, 16:1	0.88 (0.30)	5.1 (1.7)	
		5:1, 20:1, 25:1	0.86 (0.29)	5.1 (1.7)	
		7:1, 35:1	0.85 (0.29)	5.0 (1.7)	
		10:1, 40:1 - 100:1	0.84 (0.29)	4.9 (1.7)	
		120:1 - 1000:1	0.84 (0.29)	4.9 (1.7)	
Efficiency at Load	1-stage: 92% 2-stage: 90% 3-stage: 88%				
Service Life	>20,000				
Lubrication	Mineral Grease EPO				
Protection Rating	IP 64				
Operating Temperature Range	-20°C to 90°C				

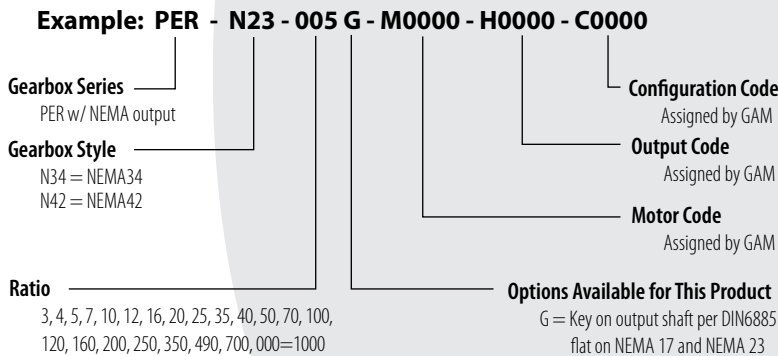
1) Load applied at center of output shaft @100 RPM



PER-N Series		34		42	
		mm	(in)	mm	(in)
D1 ^{max standard*}	motor shaft diameter	14	(0.551)	19	(0.748)
D1 ^{max available*}	motor shaft diameter	16	(0.630)	24	(0.945)
D2 k6	output shaft diameter	12.70	(0.500)	19.05	(0.750)
D3 h7	pilot diameter	73.03	(2.875)	55.55	(2.187)
D4	bolt circle	98.43	(3.875)	125.72	(4.950)
D5	mounting holes	5.5	(0.217)	7.1	(0.280)
L1 (1-stage)**	gearbox length	153	(6.024)	203	(7.992)
L1 (2-stage)**		175	(6.890)	236	(9.291)
L1 (3-stage)**		197	(7.756)	268	(10.551)
L2	shaft length	31.80	(1.252)	31.80	(1.252)
L3	key length	27	(1.063)	29	(1.142)
L4	pilot height	1.7	(0.067)	2.4	(0.094)
L5	flange thickness	10	(0.394)	13	(0.512)
L6	key width	3.18	(0.125)	4.76	(0.187)
L7	key height / flat height	14.30	(0.563)	18.26	(0.719)
L8	output flange size	82.55	(3.250)	106.68	(4.200)
L9 ²⁾	gearbox height	117.8	(4.638)	164.3	(6.469)
L10 (1-stage)	length to input centerline	118.3	(4.657)	156.2	(6.150)
L10 (2-stage)		140.3	(5.524)	189.2	(7.449)
L10 (3-stage)		162.3	(6.390)	221.2	(8.709)
L11	adapter size	70	(2.756)	90	(3.543)

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

TYPE CODES FOR PER-N SERIES (NEMA)



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