

PRODUCT OVERVIEW

If you need high precision gear reducers at a reasonable cost and you value innovation and excellent service, take a close look at our product line. You'll find a wide range of products all created to minimize your design and installation time, minimize space requirements and maximize performance.

As you look through the pages that follow, you'll find in-line and right-angle gearboxes that offer varying degrees of precision—highest precision, high precision and precision. You'll also find that our precision gearbox matches the performance of most high precision competitive products... and that our highest precision gear reducers offer unmatched precision and performance.

HIGHEST PRECISION

JPG-W



In-line I.M.P.A.C.T.™ Series

Pages 2–7

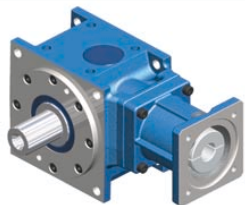
Planetary gearbox with input and output couplings
Ratios 3:1 to 100:1; frames sizes from 70 mm to 180 mm

JPG-W—Shaft output design for mounting to pulleys and rack and pinions systems

JPG-KE—Low backlash with elastomer spider output coupling for oscillation dampening

JPG-KB—Bellows output coupling for maximum stiffness

DS-W



Right-Angle Dyna Series

Pages 8–13

High-efficiency hypoid gearbox

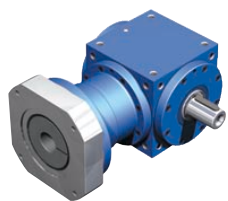
Ratios from 3:1 to 100:1; frames sizes from 55 mm to 190 mm; bellows coupling input; machined bell housing for mounting to servo motor

DS-W—Single output shaft configuration

DS-H—Hollow bore output configuration

DS-T—Dual output shaft configuration

HPS-W



Right-Angle High Power Series

Pages 14–17

High-torque, low-ratio spiral bevel gearbox.

Ratios 1:1 to 5:1; frame sizes from 75 mm to 280 mm

HPS-W—Single shaft, motor mount configuration

HPS-H—Hollow shaft, motor mount configuration

HPS-T—Dual shaft, motor mount configuration

In-line Economy Series

Pages 18–25

Low-cost planetary gearbox.

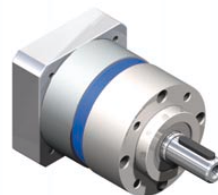
Ratios 3:1 to 1000:1; frame sizes from 40 mm to 150 mm and NEMA 17 to 56.

EPL-W—Metric output face

EPL-NEMA—NEMA output face

EPL-H Linear Mount—Hollow output, mounts to any off-the-shelf linear belt or ball screw module

EPL-W



Right-Angle Dyna-Lite Series

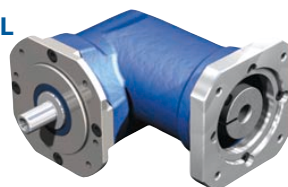
Pages 26–29

Low-cost, hypoid gearbox.

Ratios 3:1 to 100:1, frame sizes from NEMA 23 to NEMA 42.

DL—Low backlash, standard NEMA output face

DL



Right-Angle Bevel-Planetary Series

Pages 30–33

Low-cost right-angle gearbox.

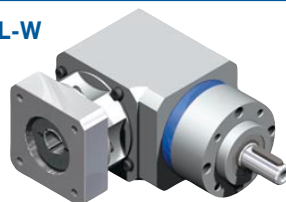
Ratios 25:1 to 1000:1, frame sizes from 64 mm to 118 mm and NEMA 23 to 42.

RPL-W—Metric output face

RPL-NEMA—NEMA output face

RPL-H—Hollow output, mounts to any linear belt or ball screw module

RPL-W



In-line Ultra Low-cost Planetary Series

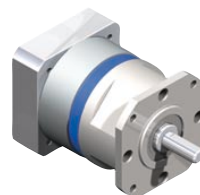
Pages 34–37

Low-cost planetary gearbox alternative to spur gearbox.

Ratios 5:1 to 100:1; frame sizes from NEMA 23 to NEMA 42.

UPL—Low backlash, fixed input for easy mounting to standard NEMA motors

UPL



Right-Angle Power-Lite Series

Pages 38–41

Low-cost, low ratio, spiral bevel gearbox.

Ratios 1:1 and 2:1; frame sizes from 60 mm to 110 mm; mounts directly to extruded linear building elements; with or without motor mount.

PL-W—Single output shaft configuration

PL-H—Hollow output shaft configuration

PL-T—Dual output shaft configuration

PL-H



Product Sizing

Pages 42–43

Ordering Information

Pages 44–47

Coupling Specifications

Pages 48–49

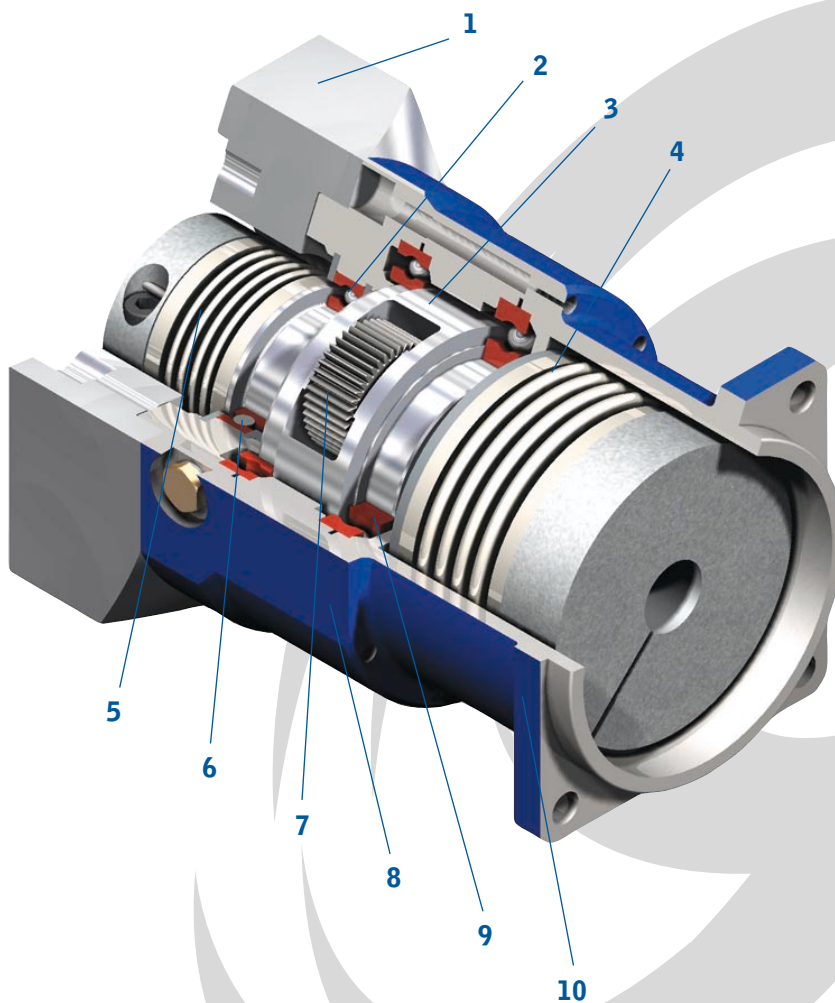


I.M.P.A.C.T.™

The I.M.P.A.C.T.™ (Integrated Modular Planetary and Coupling Technology) Series is our highest precision in-line planetary gearbox that is radically different from any product on the market today. Our high-performance bellows coupling is integrated into the input. This allows for axial growth of the motor shaft to prevent premature motor bearing failure. The I.M.P.A.C.T.™ Series also incorporates an integrated bellows or elastomer coupling on the output for a shorter overall package and higher system stiffness.

This unique package comes complete with a machined motor adapter plate for mounting to your specific servo motor. It also has a machined output housing for hassle-free installation. A shaft output version is also available.

- **Reduces design and installation times**
- **Shorter package for an increase in stiffness**
- **Potential of reduced cycles times, increase in position accuracy and reduced torsional wind-up**



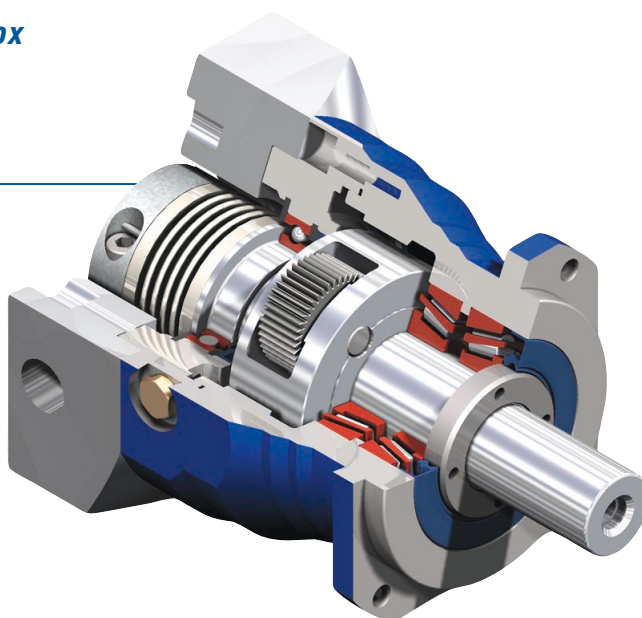
COMPONENT INDEX

- 1. Adapter Flange**
(Customized adapter flanges for quick and easy motor mounting)
- 2. Viton Seals**
(Protective viton seals to isolate the gearbox)
- 3. Planet Carrier**
- 4. Output Coupling**
(Pre-installed integrated Jakob coupling with patented easy clamp system)
- 5. Input Coupling**
(Pre-installed integrated Jakob coupling with patented easy clamp system)
- 6. Ball Bearing**
(Ball bearing to support the input coupling)
- 7. Planet Gears**
(High precision ground gears)
- 8. Gear Housing**
(Gear housing with incorporated ring gear)
- 9. Bearings**
(Tapered bearings on JPG-W for higher allowable shaft loads and ball bearings on JPG/KB and KE style)
- 10. Bell Housing**
(Bell housing to protect the output coupling)
Not included with JPG-W style.

Highest-Precision Planetary Gearbox with Input and Output Couplings

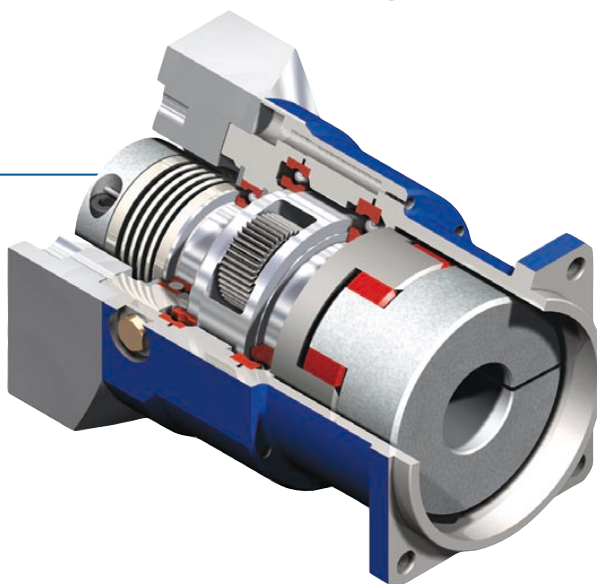
JPG-W

- Shaft output design for mounting to pulleys and rack and pinions systems
- Ratios from 3:1 to 100:1
- Frame sizes from 70 mm to 180 mm



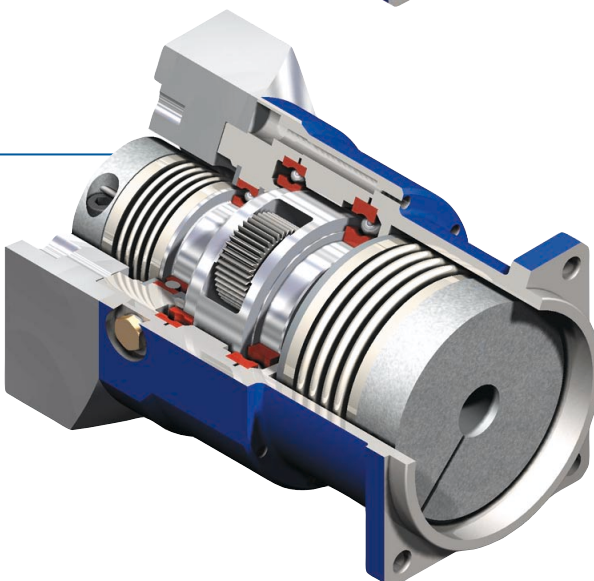
JPG-KE

- Low backlash with plug-in elastomer spider coupling on the output for oscillation dampening
- Ratios from 3:1 to 100:1
- Frame sizes from 70 mm to 180 mm

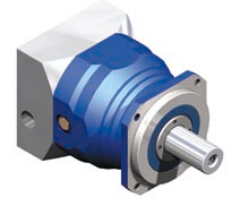


JPG-KB

- Innovative bellows coupling on the output provides for maximum stiffness and best results in high dynamic applications.
- Ratios from 3:1 to 100:1
- Frame sizes from 70 mm to 180 mm



JPG-W

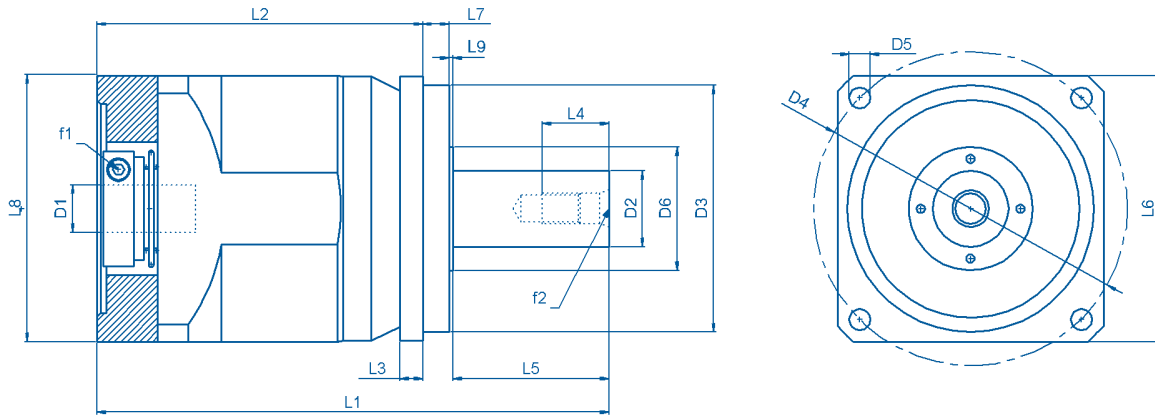


I.M.P.A.C.T.™

IMPACT Series W				50	90	200	400	600
Nominal Output Torque	T _{2n}	Nm (lb-in)	3:1	35 (310)	60 (531)	150 (1328)	240 (2124)	600 (5310)
			4:1, 16:1, 40	40 (354)	70 (620)	170 (1505)	300 (2655)	600 (5310)
			5:1, 7:1, 20:1, 28:1, 50:1, 70:1	50 (443)	90 (797)	200 (1770)	400 (3540)	600 (5310)
			10:1, 100:1	25 (221)	55 (487)	130 (1151)	240 (2124)	600 (5310)
Max Acceleration Output Torque	T _{2B}	Nm (lb-in)	3:1	50 (443)	110 (974)	250 (2213)	500 (4425)	1200 (10620)
			4:1, 16:1, 40	60 (531)	130 (1151)	300 (2655)	550 (4868)	1300 (11505)
			5:1, 7:1, 20:1, 28:1, 50:1, 70:1	70 (620)	150 (1325)	340 (3009)	600 (5310)	1300 (11505)
			10:1, 100:1	40 (354)	100 (885)	220 (1947)	450 (3983)	1200 (10620)
Emergency Output Torque	T _{2not}	Nm (lb-in)	3:1	110 (974)	160 (1416)	590 (5222)	850 (7523)	1850 (16373)
			4:1	150 (1328)	210 (1859)	750 (6638)	1150 (10178)	2450 (21683)
			all other ratios	170 (1505)	300 (2655)	750 (6638)	1300 (11505)	2800 (24780)
Nominal Input Speed	n _{1n}	RPM	3:1	2700	2400	2300	2000	1100
			4, 5, 7, 10:1	3200	2800	2500	2100	2000
			16, 20, 28:1	4000	3500	3000	2900	2500
			40, 50, 70:1	4400	3700	3400	2800	2700
			100:1	5000	4400	4100	3900	3200
Max Input Speed	n _{1max}	RPM	all ratios	6000	6000	4500	4000	3500
Standard Output Backlash	j	arcmin	1-stage	< 6	< 6	< 4	< 4	< 4
			2-stage	< 8	< 8	< 6	< 6	< 6
Reduced Output Backlash	j	arcmin	1-stage	< 4	< 4	< 2	< 2	< 2
			2-stage	< 6	< 6	< 4	< 4	< 4
Torsional Stiffness	C _{t21}	Nm/arcmin (lb-in/arcmin)	1-stage	4 (35)	9.5 (84)	23 (204)	46 (407)	130 (1151)
			2-stage	4.1 (36)	9.5 (84)	26 (230)	61 (540)	158 (1398)
Allowable Radial Load ¹⁾	F _{rad}	N (lb)		2800 (630)	4000 (900)	5900 (1328)	9100 (2048)	13000 (2925)
Allowable Axial Load	F _{axial}	N (lb)		2400 (540)	3300 (743)	5300 (1193)	9600 (2160)	13500 (3038)
Weight	m	kg (lbs)	1-stage	2.3 (5.1)	5 (11)	10.5 (23)	15.8 (35)	32 (71)
			2-stage	2.9 (6.4)	7 (15.4)	15.2 (34)	22.9 (50)	36.6 (81)
Noise Level		dB		< 68	< 68	< 70	< 70	< 70
Mass Moment of Inertia	J ₁	kg cm ² (lb-in ²)	3:1	0.47 (0.16)	0.85 (0.29)	4.1 (1.4)	10.2 (3.5)	53 (18.1)
			4:1, 5:1	0.38 (0.13)	0.55 (0.19)	2.7 (0.92)	6.1 (2.1)	39 (13.3)
			7:1, 10:1	0.32 (0.11)	0.4 (0.14)	2 (0.68)	4.1 (1.4)	31 (10.6)
			all other ratios	0.34 (0.12)	0.35 (0.12)	0.5 (0.17)	2.5 (0.85)	6 (2.05)
Ratios Available				1-stage: 3, 4, 5, 7, 10 2-stage: 16, 20, 28, 40, 50, 70 ,100				
Efficiency at Maximum Loading				1-stage: 96% 2-stage: 93%				
Service Life				>20,000 hours				
Lubrication				Synthetic Oil Viscosity ISO VG 220				
Protection Rating				IP 64				
Operating Temperature Range				-10°C to 90°C				

1) Measured at center of output shaft at 300 rpm. Bearing life calculations available upon request.

JPG-W

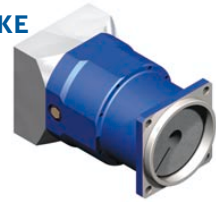


JPG-W		50		90		200		400		600	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)
D1_{max 1-stage}*	motor shaft diameter	19	(0.75)	24	(0.94)	34	(1.34)	38	(1.5)	54	(2.13)
D1_{max 2-stage}*	motor shaft diameter	19	(0.75)	24	(0.94)	24	(0.94)	34	(1.34)	38	(1.5)
D2_{k6}	output shaft diameter	20	(0.79)	25	(0.98)	32	(1.26)	40	(1.57)	55	(2.17)
D3_{g6}	pilot diameter	60	(2.36)	80	(3.15)	110	(4.33)	130	(5.12)	160	(6.3)
D4	bolt circle	75	(2.95)	100	(3.94)	130	(5.12)	165	(6.5)	215	(8.46)
D5	mounting holes	5.5	(0.22)	6.6	(0.26)	9	(0.35)	11	(0.43)	13	(0.51)
D6	shoulder diameter	35	(1.38)	40	(1.57)	55	(2.17)	65	(2.56)	85	(3.35)
L9	shoulder height	1	(0.04)	2	(0.08)	2	(0.08)	2	(0.08)	4	(0.16)
f1_{1-stage}	clamping bolt size	M5		M6		M8		M8		M12	
f1_{2-stage}	clamping bolt size	M5		M5		M6		M8		M8	
f2	shaft thread	M6		M8		M10		M16		M20	
L1_{1-stage}**	gearbox total length	165	(6.5)	183	(7.2)	234	(9.21)	272	(10.71)	312	(12.28)
L1_{2-stage}**	gearbox total length	192	(7.56)	208	(8.19)	260	(10.24)	311	(12.24)	334	(13.15)
L2_{1-stage}**	base gearbox length	125	(4.92)	137	(5.39)	164	(6.46)	176	(6.93)	212	(8.35)
L2_{2-stage}**	base gearbox length	152	(5.98)	162	(6.38)	190	(7.48)	215	(8.46)	234	(9.21)
L3	flange thickness	6	(0.24)	7	(0.28)	10	(0.39)	12	(0.47)	14	(0.55)
L4	thread depth	16	(0.63)	19	(0.75)	28	(1.1)	36	(1.42)	42	(1.65)
L5	shaft length	33	(1.3)	36	(1.42)	58	(2.28)	82	(3.23)	82	(3.23)
L6	output flange size	70	(2.76)	90	(3.54)	120	(4.72)	140	(5.51)	180	(7.09)
L7	pilot height	6	(0.24)	8	(0.31)	10	(0.39)	12	(0.47)	14	(0.55)
L8	gearbox thickness	70	(2.76)	100	(3.94)	130	(5.12)	150	(5.91)	200	(7.87)

* for larger motor shaft diameters, please contact GAM

** value can vary depending on the motor

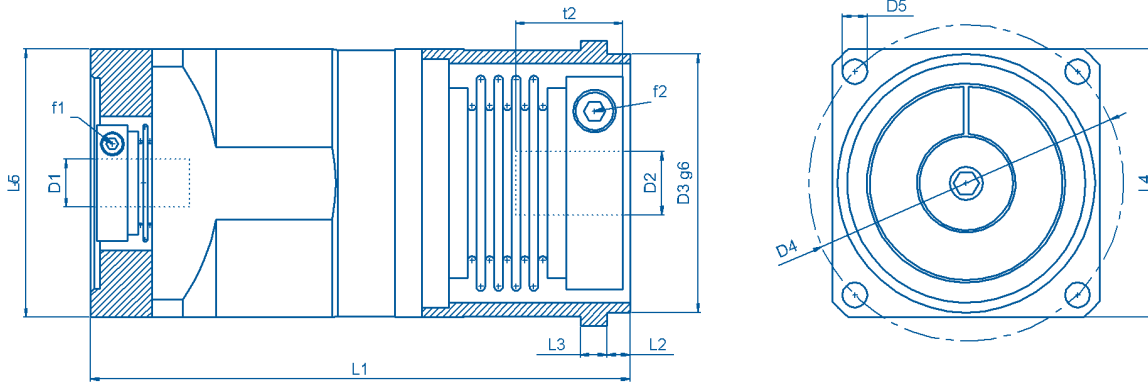




I.M.P.A.C.T.™

IMPACT Series (KB/KE)				50	90	200	400	600
Nominal Output Torque	T _{2n}	Nm (lb-in)	3:1	– (–)	60 (531)	150 (1328)	240 (2124)	600 (5310)
			4:1, 16:1, 40	40 (354)	70 (620)	170 (1505)	300 (2655)	600 (5310)
			5:1, 7:1, 20:1, 28:1, 50:1, 70:1	50 (443)	90 (797)	200 (1770)	400 (3540)	600 (5310)
			10:1, 100:1	25 (221)	55 (487)	130 (1151)	240 (2124)	600 (5310)
Max Acceleration Output Torque	T _{2B}	Nm (lb-in)	3:1	– (–)	110 (974)	250 (2213)	500 (4425)	1200 (10620)
			4:1, 16:1, 40	60 (531)	130 (1151)	300 (2655)	550 (4868)	1300 (11505)
			5:1, 7:1, 20:1, 28:1, 50:1, 70:1	70 (620)	150 (1328)	340 (3009)	600 (5310)	1300 (11505)
			10:1, 100:1	40 (354)	100 (885)	220 (1947)	450 (3983)	1200 (10620)
Emergency Output Torque	T _{2not}	Nm (lb-in)	3:1	– (–)	160 (1416)	500 (4425)	850 (7523)	1650 (14603)
			4:1	150 (1328)	210 (1859)	500 (4425)	900 (7965)	1650 (14603)
			all other ratios	170 (1505)	300 (2655)	500 (4425)	900 (7965)	1650 (14603)
			10:1, 100:1	100 (885)	250 (2213)	500 (4425)	900 (7965)	1650 (14603)
Nominal Input Speed	n _{1n}	RPM	3:1	–	2400	2300	2000	1100
			4, 5, 7, 10:1	3200	2800	2500	2100	2000
			16, 20, 28:1	4000	3500	3000	2900	2500
			40, 50, 70:1	4400	3700	3400	2800	2700
			100:1	5000	4400	4100	3900	3200
Max Input Speed	n _{1max}	RPM	all ratios	6000	6000	4500	4000	3500
Standard Output Backlash	j	arcmin	1-stage	< 6	< 6	< 4	< 4	< 4
			2-stage	< 8	< 8	< 6	< 6	< 6
Reduced Output Backlash	j	arcmin	1-stage	< 4	< 4	< 2	< 2	< 2
			2-stage	< 6	< 6	< 4	< 4	< 4
Torsional Stiffness - KB	C _{t21}	Nm/arcmin (lb-in/arcmin)	1-stage	3.8 (34)	9.5 (84)	28 (248)	48 (425)	105 (929)
			2-stage	4 (35)	11 (97)	34 (301)	66 (584)	118 (1044)
Torsional Stiffness - KE	C _{t21}	Nm/arcmin (lb-in/arcmin)	all ratios	0.8 (7)	1.4 (12)	5.4 (48)	6.8 (60)	– (–)
Weight	m	kg (lbs)	1-stage	2.6 (5.7)	5.7 (12.6)	11.8 (26)	13.8 (30)	38.4 (85)
			2-stage	3.6 (7.9)	7.7 (17)	16.5 (36)	20.9 (46)	43 (95)
Noise Level		dB		<68	<68	<70	<70	<70
Mass Moment of Inertia	J ₁	kg cm ² (lb-in ²)	3:1	– (–)	1.2 (0.41)	6 (2.05)	14.5 (4.9)	73 (24.9)
			4:1, 5:1	0.49 (0.17)	0.7 (0.24)	3.4 (1.16)	7.7 (2.6)	46 (15.7)
			7:1, 10:1	0.36 (0.12)	0.45 (0.15)	2.1 (0.72)	4.5 (1.5)	32 (10.9)
			all other ratios	0.3 (0.1)	0.35 (0.12)	0.45 (0.15)	2.2 (0.75)	5.2 (1.77)
Ratios Available			1-stage: 3, 4, 5, 7, 10, (3:1 not available in size 50) 2-stage: 16, 20, 28, 40, 50, 70, 100					
Efficiency at Maximum Loading			1-stage: 96% 2-stage: 93%					
Service Life			>20,000 hours					
Lubrication			Synthetic Oil Viscosity ISO VG 220					
Protection Rating			IP 64					
Operating Temperature Range			-10°C to 90°C					

JPG-KB/KE



JPG-KB/KE		50		90		200		400		600	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)
D1_{max} 1-stage *	motor shaft diameter	19	(0.75)	24	(0.94)	34	(1.34)	38	(1.50)	54	(2.13)
D1_{max} 2-stage *	motor shaft diameter	19	(0.75)	24	(0.94)	24	(0.94)	34	(1.34)	38	(1.50)
D2_{max} - KB	max output bore	30	(1.18)	38	(1.5)	56	(2.2)	75	(2.95)	85	(3.35)
D2_{max} - KE	max output bore	30	(1.18)	33	(1.3)	56	(2.2)	70	(2.76)	–	–
D3_{g6}	pilot diameter	70	(2.76)	85	(3.35)	115	(4.53)	135	(5.31)	180	(7.09)
D4	bolt circle	85	(3.35)	105	(4.13)	140	(5.51)	165	(6.5)	215	(8.46)
D5	bolt hole	6.6	(0.26)	9	(0.35)	11	(0.43)	13	(0.51)	17	(0.67)
f1_{1-stage}	clamping bolt size	M5		M6		M8		M8		M12	
f1_{2-stage}	clamping bolt size	M5		M5		M6		M8		M8	
f2_{KB}	clamping bolt size	M6		M8		M12		M12		M16	
f2_{KE}	clamping bolt size	M8 (M6)		M10 (M8)		M12		M14		–	
L1_{1-stage} **	gearbox total length	159	(6.26)	184	(7.24)	222	(8.74)	238	(9.37)	326	(12.83)
L1_{2-stage} **	gearbox total length	182	(7.17)	208	(8.19)	250	(9.84)	273	(10.75)	340	(13.39)
L2	pilot height	6	(0.24)	8	(0.31)	10	(0.39)	12	(0.47)	15	(0.59)
L3	flange thickness	7	(0.28)	9	(0.35)	11	(0.43)	13	(0.51)	15	(0.59)
L4	output flange size	70	(2.76)	95	(3.74)	120	(4.72)	145	(5.71)	190	(7.48)
L5	gearbox thickness	70	(2.76)	100	(3.94)	130	(5.12)	150	(5.91)	200	(7.87)
t2_{min} - KB	min shaft engagement	28	(1.1)	30	(1.18)	42	(1.65)	45	(1.77)	59	(2.32)
t2_{max} - KB	max shaft engagement	36	(1.42)	38	(1.5)	55	(2.17)	62	(2.44)	88	(3.46)
t2_{min} - KE	min shaft engagement	32	(1.26)	34	(1.34)	46	(1.81)	51	(2.01)	–	–
t2_{max} - KE	max shaft engagement	37	(1.46)	38	(1.5)	55	(2.17)	62	(2.44)	–	–

* for larger motor shaft diameters, please contact GAM

** value can vary depending on the motor



DYNA SERIES

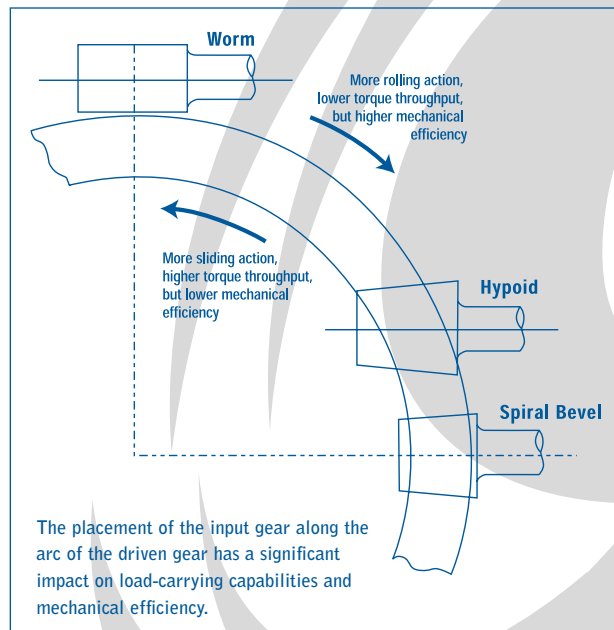
The Dyna Series is our highest precision right-angle gear reducer utilizing sophisticated hypoid gearing. The benefit of hypoid gearing is that it combines the space and configuration advantages of worm gearing with the high efficiencies of bevel gearing. The result is that the Dyna Series is able to achieve ratios up to 15:1 in a single stage and ratios up to 100:1 in 2 stages.

- **High efficiencies**
- **High allowable axial and radial loading**
- **Ultra low backlash**
- **Back drivable**
- **Multiple output shaft configurations and hollow output**

The Advantage of Hypoid Gearing

The GAM Hypoid offers significant advantages over other conventional right-angle gears.

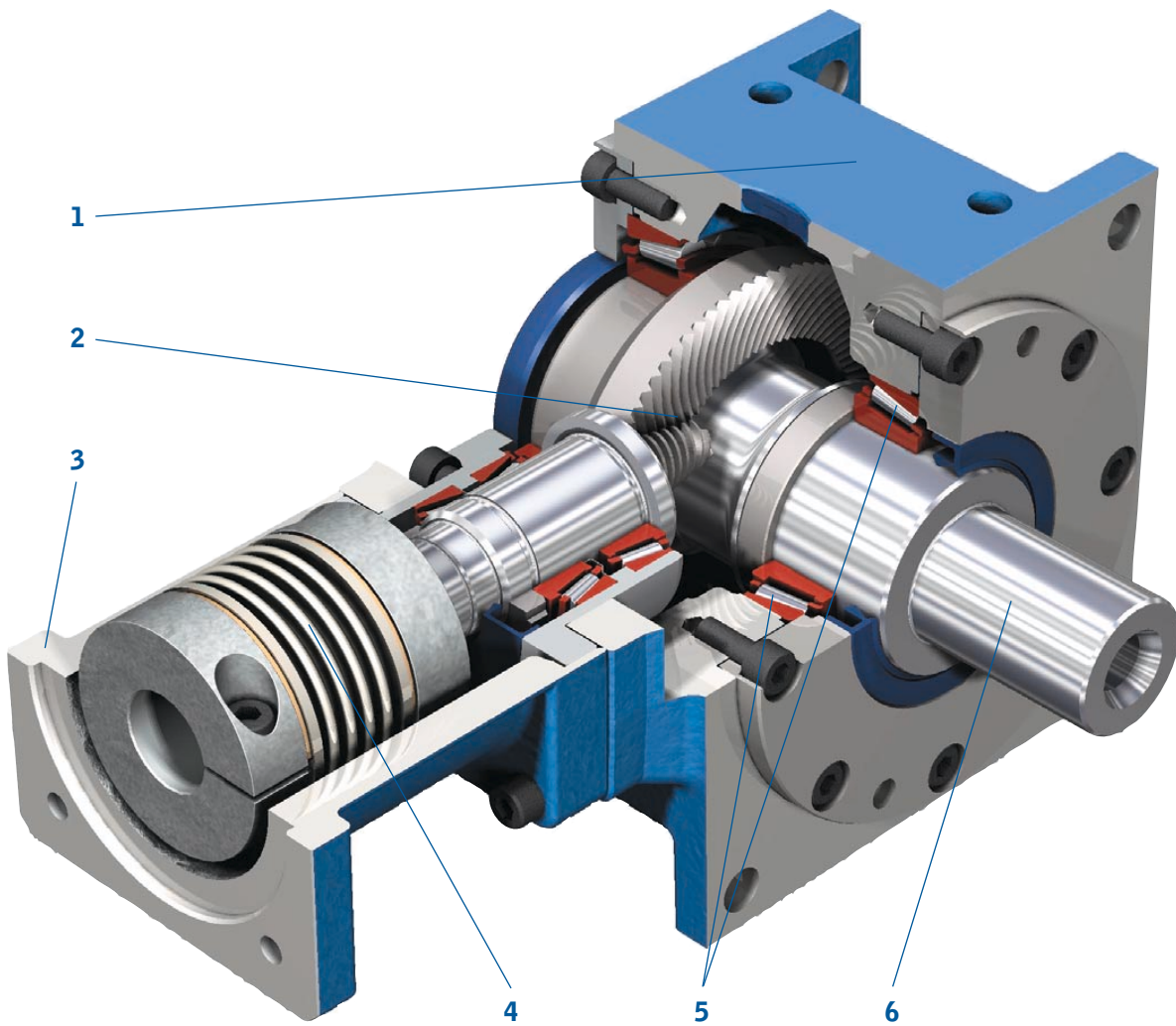
Conventional spiral bevel gearing, meshing in the position shown at the bottom of the drawing, has a purely rolling meshing action that is mechanically very efficient. Its drawback is that it offers the smallest total tooth contact area, so its torque throughput capacity is lower. Single-stage spiral bevel gearing is limited to about a 6:1 reduction ratio. It's easy to get higher ratios with multiple-stage configurations, but the additional gear stage lowers mechanical efficiency, increases backlash, consumes space and weight, and reduces reliability.



Conventional worm gearing, meshing in the position shown at the top of the drawing, has a very high total tooth contact area. While it offers high torque throughput and high ratio reduction, worm gearing has the lowest mechanical efficiency, due to the friction generated by its high component of sliding action. Worm gearing is also subject to the kind of wear that demands adjustment in order to maintain accuracy.

Hypoid gearing, meshing at the intermediate position, offers mostly rolling action with a small component of sliding action. It has a greater tooth contact area than bevel gearing, so its load carrying capability is greater. The GAM Hypoid offers further advantages by going up to a 15:1 gear ratio in a single stage with efficiencies between 93% and 96%, depending upon ratio throughout the speed range. Another important design criterion for precision servo applications is, of course, low backlash in the gearbox. The GAM Hypoid offers advantages in the area in two ways. First is the single-stage design, which eliminates the backlash from a second set of meshing gears. Second is accurate machining and assembly alignment; Dyna Series gearboxes are available in high-accuracy models that offer backlash of ≤ 2 arcminutes.

GAM Hypoid gearing is available in two product ranges, our highest precision Dyna Series, and high precision, Dyna-Lite Series.



COMPONENT INDEX

1. Aluminum Housing

(Aluminum housing significantly reduces the weight of the gearbox)

2. Hypoid Gearing

(Optimized gearing allows ratios up to 15:1 in a single stage; 100:1 in two stages)

3. Bell Housing

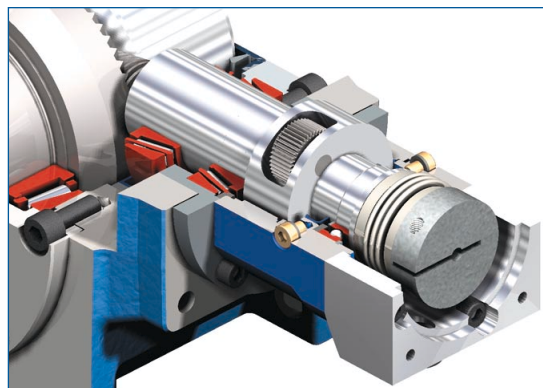
(Customized bell housing for quick and easy mounting to any motor)

4. Coupling

(Gearbox can be supplied with either a bellows or elastomer coupling)

5. Tapered Roller Bearings

(Roller bearings for high radial and axial loading)



Ratios above 15:1

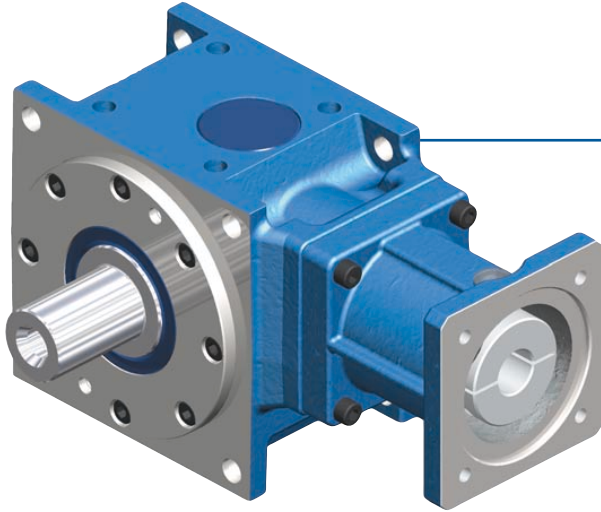
6. Output Shaft

(Gearbox can be supplied with one or two solid shafts or hollow shafts)



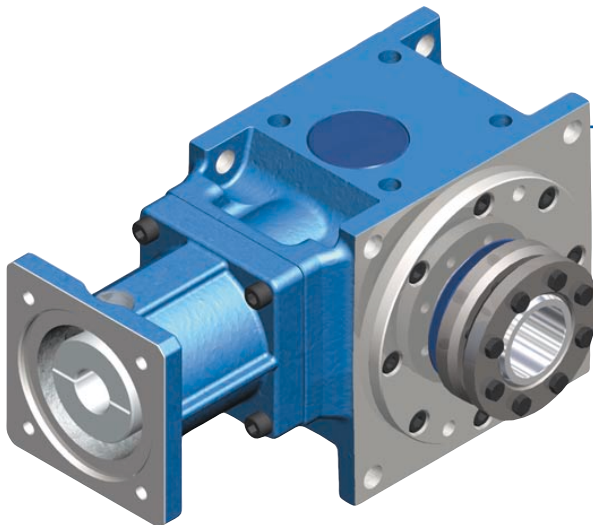
DYNA SERIES

Highest Precision Right-Angle Gear Reducer Utilizes Sophisticated Hypoid Gearing



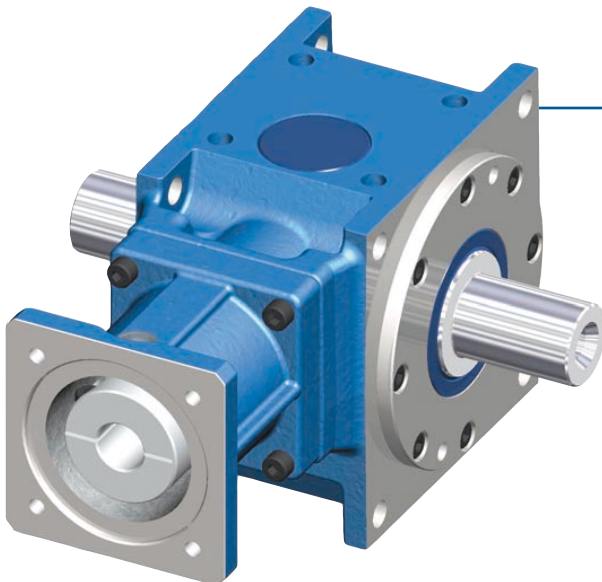
DS-W

- Single output shaft configuration with our high performance bellow coupling input and machined bell housing to mount to any servo motor
- Ratios from 3:1 to 100:1 (ratios larger than 15:1 will utilize planetary gearing for the first stage and hypoid gearing for the second stage)
- Frame sizes from 55 mm to 190 mm



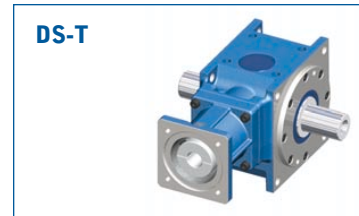
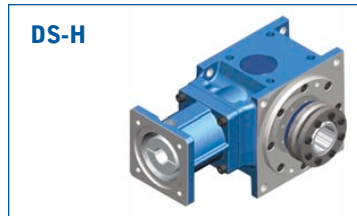
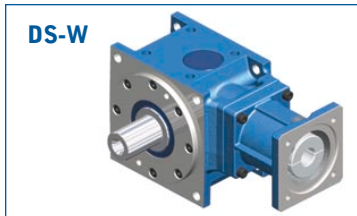
DS-H

- Hollow bore output configuration with our high performance bellow coupling input and machined bell housing to mount to any servo motor
- Ratios from 3:1 to 100:1 (ratios larger than 15:1 will utilize planetary gearing for the first stage and hypoid gearing for the second stage)
- Frame sizes from 55 mm to 190 mm



DS-T

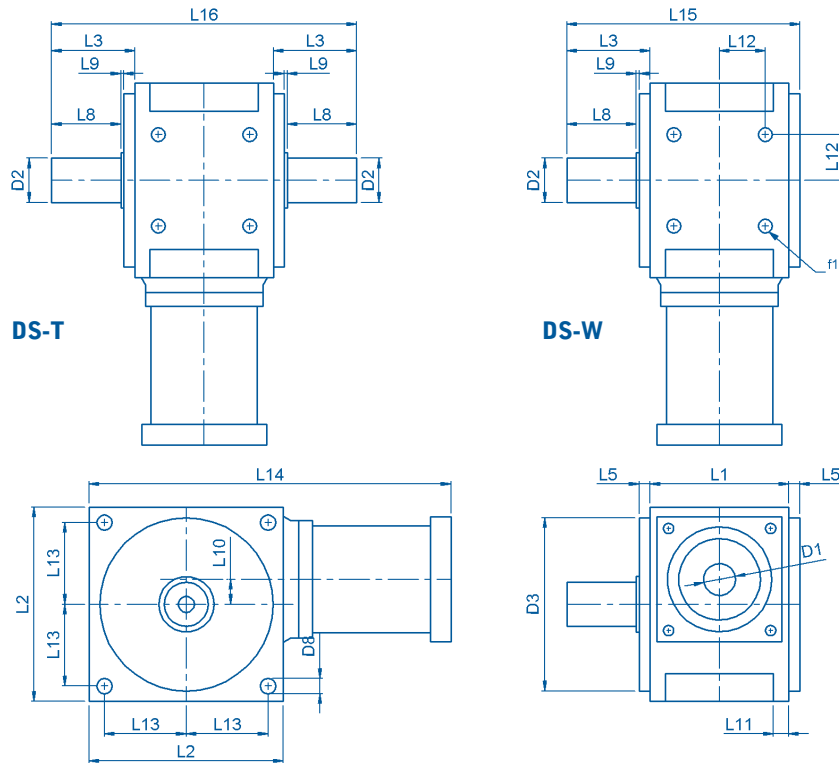
- Dual output shaft configuration with our high performance bellow coupling input and machined bell housing to mount to any servo motor
- Ratios from 3:1 to 100:1 (ratios larger than 15:1 will utilize planetary gearing for the first stage and hypoid gearing for the second stage)
- Frame sizes from 55 mm to 190 mm



DYNA Series				55	75	90	115	140	190
Nominal Ouput Torque	T _{2n}	Nm (lb-in)	12:1, 15:1	20 (177)	40 (354)	75 (664)	145 (1283)	410 (3629)	810 (7169)
			30:1	35 (310)	70 (620)	140 (1239)	260 (2301)	540 (4779)	1200 (10620)
			100:1	35 (310)	70 (620)	140 (1239)	260 (2301)	550 (4868)	1300 (11505)
			all other ratios	35 (310)	70 (620)	140 (1239)	260 (2301)	720 (6372)	1440 (12744)
Max Acceleration Output Torque	T _{2B}	Nm (lb-in)	12:1, 15:1	32 (283)	60 (531)	115 (1239)	220 (2301)	615 (4868)	1230 (11505)
			30:1	53 (469)	105 (929)	210 (1859)	390 (3452)	780 (6903)	1680 (14868)
			100:1	53 (469)	105 (929)	210 (1859)	390 (3452)	1000 (8850)	2160 (19116)
			all other ratios	53 (469)	105 (929)	210 (1859)	390 (3452)	1080 (9558)	2160 (19116)
Emergency Output Torque	T _{2not}	Nm (lb-in)	12:1, 15:1	50 (443)	100 (885)	190 (1859)	360 (3452)	1020 (8850)	2040 (19116)
			all other ratios	70 (620)	140 (1239)	280 (2478)	520 (4602)	1440 (12744)	2880 (25488)
Nominal Speed	n _{1n}	RPM	3:1 - 15:1	6000	6000	5000	4000	3000	2500
			30:1 - 100:1	3000	3000	3200	3200	2800	2500
Maximum Speed	n _{1max}	RPM	3:1 - 15:1	8000	8000	7000	6000	5000	4500
			30:1 - 100:1	6000	6000	6000	6000	6000	4500
Standard Backlash	j	arcmin	3:1 - 15:1	< 5	< 5	< 4	< 4	< 4	< 4
			30:1 - 100:1	< 7	< 7	< 6	< 6	< 6	< 6
Reduced Backlash	j	arcmin	3:1 - 15:1	< 3	< 3	< 2	< 2	< 2	< 2
			30:1 - 100:1	< 4	< 4	< 3	< 3	< 3	< 3
Allowable Radial Load ¹⁾	F _{rad}	N (lb)		3300 (743)	4900 (1103)	7200 (1620)	10000 (2250)	15000 (3375)	22500 (5063)
Torsional Stiffness	C _{t21}	Nm/arcmin (lb-in/arcmin)		3.5 (31)	7 (62)	17.5 (155)	39 (345)	103 (912)	210 (1859)
Allowable Axial Load	F _{axial}	N (lb)		1650 (371)	2450 (551)	3600 (810)	5000 (1125)	7500 (1688)	11250 (2531)
Weight	m	kg (lbs)	3:1 - 15:1	2.5 (5.5)	5 (11)	8.5 (19)	15 (33)	28 (62)	48 (106)
			30:1 - 100:1	3.5 (7.7)	6 (13.2)	9.9 (22)	16.4 (36)	30.2 (67)	52.5 (116)
Noise Level		dB		< 66	< 66	< 68	< 68	< 70	< 72
Mass Moment of Inertia	J ₁	kg cm ² (lb-in ²)	3:1, 4:1	.43 (0.15)	1.1 (0.38)	2.5 (0.85)	6.7 (2.3)	24 (8.2)	72 (24.6)
			5:1, 6:1	.24 (0.08)	0.63 (0.22)	1.4 (0.48)	3.8 (1.3)	13 (4.4)	37 (12.6)
			8:1 - 15:1	0.18 (0.06)	0.47 (0.16)	1.1 (0.38)	2.8 (1)	8.6 (2.9)	24 (8.2)
			30:1 - 100:1	0.16 (0.05)	0.18 (0.06)	0.41 (0.14)	0.49 (0.17)	0.97 (0.33)	3.78 (1.29)
Ratios Available			1-stage: 3, 4, 5, 6, 8, 10, 12, 15 2-stage: 30, 40, 50, 70, 100 3-stage: consult GAM						
Efficiency at Load			3:1 - 10:1 > 96% 12:1, 15:1 > 93% 30:1 - 100:1 > 92%						
Service Life			>30,000 hours						
Lubrication			Synthetic Oil: ISO VG 100						
Protection Rating			IP 64						
Operating Temperature Range			-10°C to 90°C						

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





mm (in)		55	75	90	115	140	190
D1 max 1-stage	input shaft diameter*	21 (0.83)	21 (0.83)	30 (1.18)	43 (1.69)	54 (2.13)	54 (2.13)
D1 max 2-stage		14 (0.55)	14 (0.55)	24 (0.94)	24 (0.94)	30 (1.18)	35 (1.38)
D2 _{k6}	output shaft diameter	20 (0.79)	24 (0.94)	32 (1.26)	40 (1.57)	55 (2.17)	70 (2.76)
D3 _{g6}	pilot diameter	89 (3.5)	105 (4.13)	125 (4.92)	150 (5.91)	195 (7.68)	250 (9.84)
D8	mounting hole diameter	6.6 (0.26)	9 (0.35)	11 (0.43)	14 (0.55)	17.5 (0.69)	17.5 (0.69)
f1	mounting hole thread	M6	M8	M10	M12	M16	M16
L1	housing width	60 (2.36)	80 (3.15)	100 (3.94)	120 (4.72)	146 (5.75)	196 (7.72)
L2	housing size	90 (3.54)	115 (4.53)	140 (5.51)	170 (6.69)	215 (8.46)	260 (10.24)
L3	output shaft length	50 (1.97)	50 (1.97)	60 (2.36)	70 (2.76)	102 (4.02)	122 (4.8)
L5	pilot height	13.5 (0.53)	8.5 (0.33)	8 (0.31)	8 (0.31)	10 (0.39)	10 (0.39)
L8	usable shaft length	35 (1.38)	40 (1.57)	50 (1.97)	60 (2.36)	90 (3.54)	110 (4.33)
L9	shoulder height	1.5 (0.06)	1.5 (0.06)	2 (0.08)	2 (0.08)	2 (0.08)	2 (0.08)
L10	hypoid offset	9 (0.35)	14 (0.55)	18 (0.71)	23 (0.91)	32 (1.26)	42 (1.65)
L11	flange thickness	8 (0.31)	10 (0.39)	11 (0.43)	13 (0.51)	15 (0.59)	17 (0.67)
L12	hole location	22 (0.87)	27 (1.06)	33 (1.3)	40 (1.57)	50 (1.97)	65 (2.56)
L13	hole location	39 (1.54)	49 (1.93)	59 (2.32)	72 (2.83)	91 (3.58)	112 (4.41)
L14 _{1-stage} ¹⁾	input length	175 (6.89)	225.5 (8.88)	261 (10.28)	305 (12.01)	367.5 (14.47)	465 (18.31)
L14 _{2-stage} ¹⁾		232.5 (9.15)	253 (9.96)	261.5 (10.3)	292.5 (11.52)	348 (13.7)	430 (16.93)
L15	gearbox width	123.5 (4.86)	138.5 (5.45)	168 (6.61)	198 (7.8)	258 (10.16)	328 (12.91)
L16	gearbox width	160 (6.3)	180 (7.09)	220 (8.66)	260 (10.24)	350 (13.78)	440 (17.32)

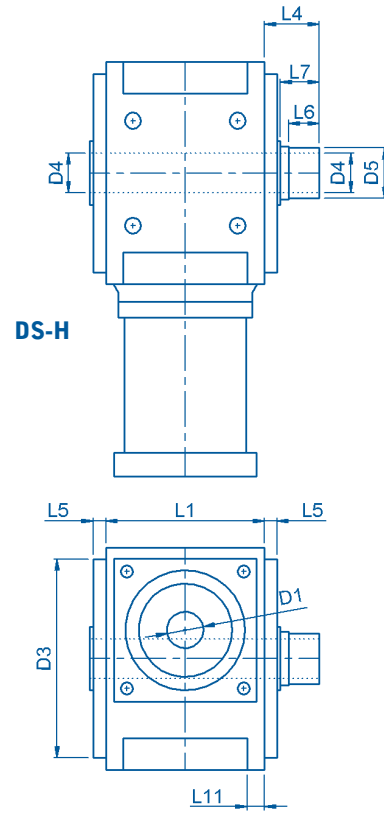
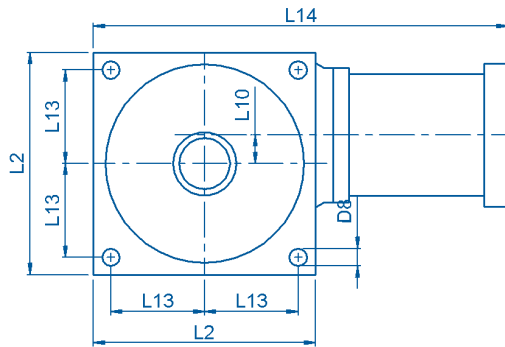
1) length may vary depending on motor

*for larger shaft diameters consult GAM



	Recommended Output Coupling (if necessary)					
metal bellows	KM-60	KM-170	KM-270	KM-400	KM-1300	KSD-2500
elastomer	EKM-60	EKM-150	EKM-300	EKM-500	–	–

Coupling specifications on pages 48-49..



mm (in)		55	75	90	115	140	190
D1 _{max 1-stage}	input shaft diameter*	21 (0.83)	21 (0.83)	30 (1.18)	43 (1.69)	54 (2.13)	54 (2.13)
D1 _{max 2-stage}		14 (0.55)	14 (0.55)	24 (0.94)	24 (0.94)	30 (1.18)	35 (1.38)
D3 _{g6}	pilot diameter	89 (3.5)	105 (4.13)	125 (4.92)	150 (5.91)	195 (7.68)	250 (9.84)
D4 _{h7 1)}	hollow bore	20 (0.79)	25 (0.98)	30 (1.18)	40 (1.57)	55 (2.17)	70 (2.76)
D5 _{f7}	hollow outer diameter	24 (0.94)	30 (1.18)	36 (1.42)	50 (1.97)	68 (2.68)	80 (3.15)
D8	mounting hole diameter	6.6 (0.26)	9 (0.35)	11 (0.43)	14 (0.55)	17.5 (0.69)	17.5 (0.69)
f1	mounting hole thread	M6	M8	M10	M12	M16	M16
L1	housing width	60 (2.36)	80 (3.15)	100 (3.94)	120 (4.72)	146 (5.75)	196 (7.72)
L2	housing size	90 (3.54)	115 (4.53)	140 (5.51)	170 (6.69)	215 (8.46)	260 (10.24)
L4	hollow hub length	73 (2.87)	81 (3.19)	95 (3.74)	109 (4.29)	129 (5.08)	161 (6.34)
L5	pilot height	13 (0.51)	8.5 (0.33)	8 (0.31)	8 (0.31)	10 (0.39)	10 (0.39)
L6	hub length	20 (0.79)	22 (0.87)	26 (1.02)	29 (1.14)	32 (1.26)	34 (1.34)
L7	shoulder + hub length	23 (0.91)	25 (0.98)	29 (1.14)	33 (1.3)	37 (1.46)	40 (1.57)
L10	hypoid offset	9 (0.35)	14 (0.55)	18 (0.71)	23 (0.91)	32 (1.26)	42 (1.65)
L11	flange thickness	8 (0.31)	10 (0.39)	11 (0.43)	13 (0.51)	15 (0.59)	17 (0.67)
L12	hole location	22 (0.87)	27 (1.06)	33 (1.3)	40 (1.57)	50 (1.97)	65 (2.56)
L13	hole location	39 (1.54)	49 (1.93)	59 (2.32)	72 (2.83)	91 (3.58)	112 (4.41)
L14 _{1-stage 2)}	input length	175 (6.89)	225.5 (8.88)	261 (10.28)	305 (12.01)	367.5 (14.47)	465 (18.31)
L14 _{2-stage 2)}		232.5 (9.15)	253 (9.96)	261.5 (10.3)	292.5 (11.52)	348 (13.7)	430 (16.93)

1) mating shaft should have h6 tolerance

2) length may vary depending on motor

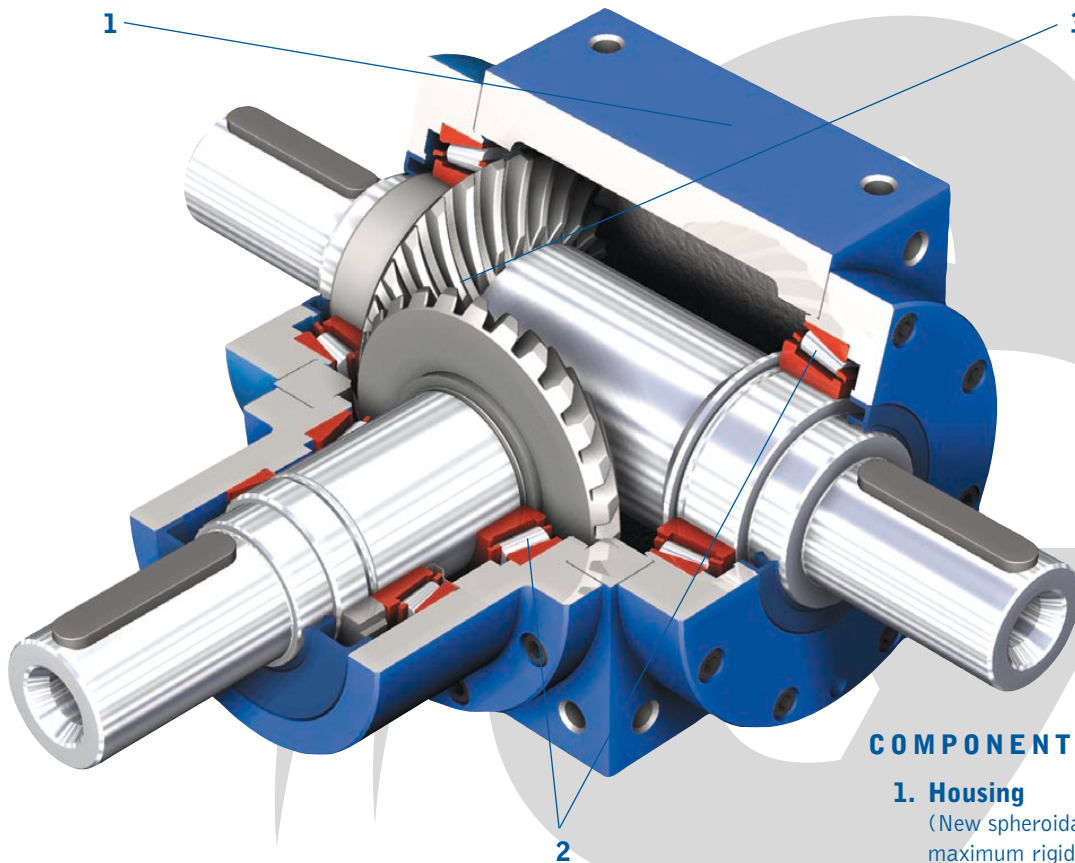
*for larger shaft diameters consult GAM



HIGH POWER SERIES

The High Power Series is our high-torque, low-ratio, multiple output shaft configuration right-angle gear reducer. The High Power Series maximizes torque and offers high efficiencies in a overall compact design. The gearing was specifically designed for applications in which efficient distribution of torque or heavy lifting is required. It is also ideal for servo applications where high input speeds and low-ratio right-angle gearing is required.

- **High torque in a compact package**
- **High allowable radial and axial loads on input and output shafts**
- **Lubricated for life**
- **Available with single, multiple shaft or hollow shaft configurations**
- **Available with or without motor mount for quick and easy mounting to any metric or NEMA motor**



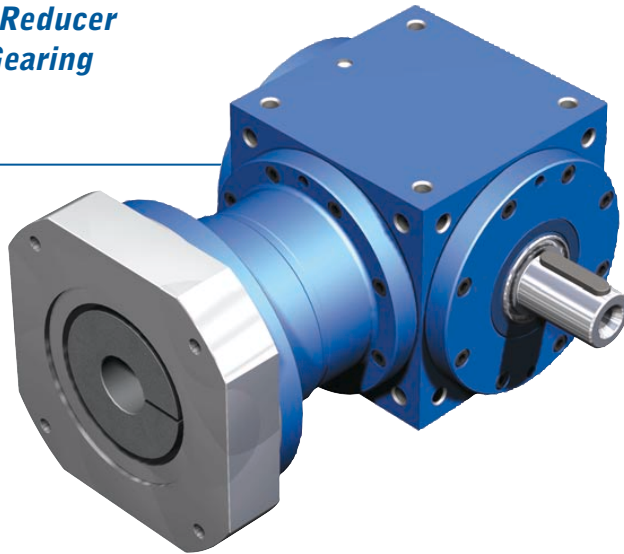
COMPONENT INDEX

- 1. Housing**
(New spheroidal graphite iron housing for maximum rigidity)
- 2. Bearings**
(Tapered roller bearings throughout the gearbox for high allowable shaft loads)
- 3. Spiral Bevel Gearing**
(Precision spiral bevel gears)

***Highest Precision Right-Angle Gear Reducer
Utilizes Sophisticated Spiral Bevel Gearing***

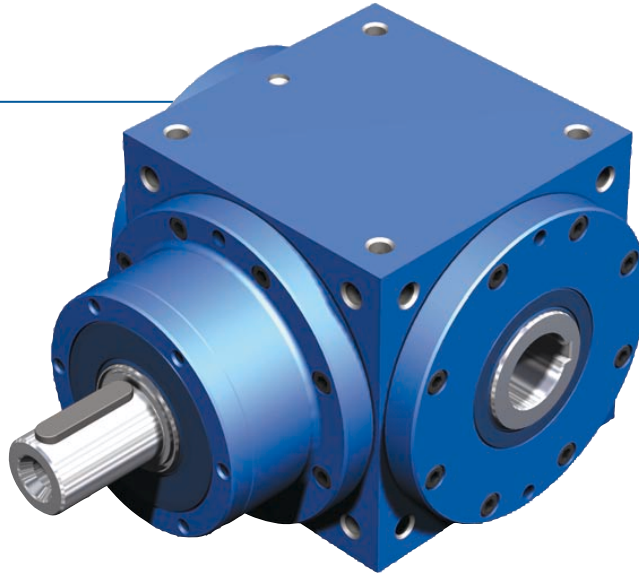
HPS-W

- Single shaft
- Shown with motor mount
(available without motor mount)
- Ratios from 1:1 to 5:1
- Frame sizes from 75 mm to 280 mm



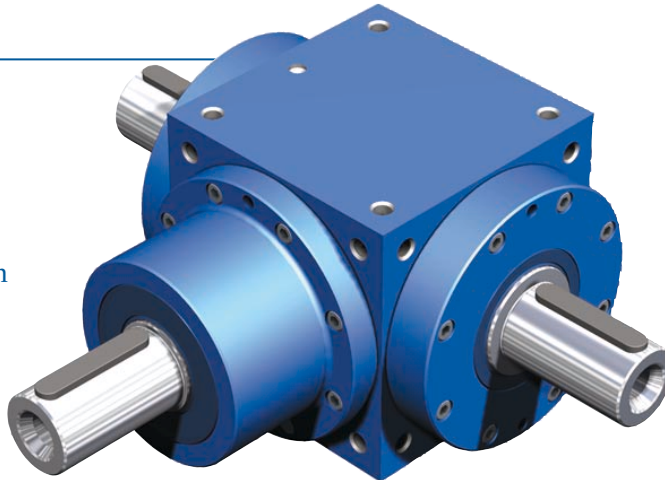
HPS-H

- Hollow shaft
- Shown without motor mount
(available with motor mount)
- Ratios from 1:1 to 5:1
- Frame sizes from 75 mm to 280 mm

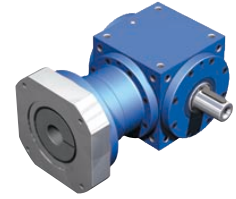


HPS-T

- Dual shaft
- Shown without motor mount
(available with motor mount)
- Ratios from 1:1 to 5:1
- Frame sizes from 75 mm to 280 mm



HPS-W



HIGH POWER SERIES

High Power Series				75	90	110	140	170	210	240	280
Thermal Limit	N	kW		5.5	7.4	10.8	16.1	23.4	28.6	45.3	60.3
Nominal Output Torque ¹⁾	T _{2n}	Nm (lb-in)	1:1 X	87 (770)	135 (1195)	290 (2567)	625 (5531)	1020 (9027)	2050 (18143)	3350 (29648)	5200 (46020)
			1:1	45 (398)	78 (690)	150 (1328)	360 (3186)	585 (5177)	13000 (115050)	2150 (19028)	3200 (28320)
			1.5:1	48 (425)	82 (726)	186 (1646)	411 (3637)	666 (5894)	1530 (13541)	2430 (21506)	3900 (34515)
			2:1	42 (372)	68 (602)	150 (1328)	330 (2921)	544 (4814)	1220 (10797)	2010 (17789)	3050 (26993)
			3:1	33 (292)	54 (478)	120 (1062)	270 (2390)	450 (3983)	1020 (9027)	1650 (14603)	2850 (25223)
			4:1, 5:1	25 (221)	40 (354)	85 (752)	196 (1735)	320 (2832)	740 (6549)	1210 (10709)	2000 (17700)
Maximum Output Torque	T _{2B}	Nm (lb-in)	1:1 X	131 (1159)	203 (1797)	435 (3850)	938 (8301)	1530 (13541)	3075 (27214)	5025 (44471)	7800 (69030)
			1:1	68 (602)	117 (1035)	225 (1991)	540 (4779)	878 (7770)	1950 (17258)	3225 (28541)	4800 (42480)
			1.5:1	72 (637)	123 (1089)	279 (2469)	617 (5460)	999 (8841)	2295 (20311)	3645 (32258)	5850 (51773)
			2:1	63 (558)	102 (903)	225 (1991)	495 (4381)	816 (7222)	1760 (15576)	3015 (26683)	4575 (40489)
			3:1	50 (443)	81 (717)	180 (1593)	405 (3584)	675 (5974)	1530 (13541)	2475 (21904)	4275 (37834)
			4:1, 5:1	38 (336)	60 (531)	128 (1133)	294 (2602)	480 (4248)	1110 (9824)	1815 (16063)	3000 (26550)
Maximum Speed	n _{1n}	RPM	1:1 X	3000	2500	2000	2000	1500	1200	1200	1000
			all other ratios	6500	5500	4500	3500	3000	2200	2000	1700
Standard Backlash	j	arcmin		< 15	< 14	< 13	< 13	< 12	< 12	< 12	< 11
Reduced Backlash	j	arcmin		< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Allowable Radial Load ²⁾	F _{rad}	N (lbs)	1:1 X	2000 (450)	2700 (608)	4500 (1013)	7500 (1688)	11000 (2475)	16000 (3600)	21000 (4725)	30000 (6750)
			all other ratios	1100 (248)	1600 (360)	2500 (563)	4500 (1013)	6000 (1350)	10500 (2363)	15000 (3375)	18000 (4050)
Allowable Axial Load	F _{axial}	N (lbs)	1:1 X	1000 (225)	1350 (304)	2250 (506)	3750 (844)	5500 (1238)	8000 (1800)	10500 (2363)	15000 (3375)
			all other ratios	550 (124)	800 (180)	1250 (281)	2250 (506)	3000 (675)	5250 (1181)	7500 (1688)	9000 (2025)
Weight ³⁾	m	kg (lbs)		4.5 (10)	8 (18)	13 (29)	22 (49)	38.5 (85)	71 (157)	103.5 (228)	155 (342)
Noise Level	L _{pa}	dB		70	74	76	77	78	80	82	83
Ratios Available				1, 1.5, 2, 3, 4, 5							
Efficiency at Load				>96*							
Service Life				> 15,000 hours							
Lubrication				Synthetic ISO VG 150							
Protection Rating				IP 64							
Maximum Temperature				100°C							

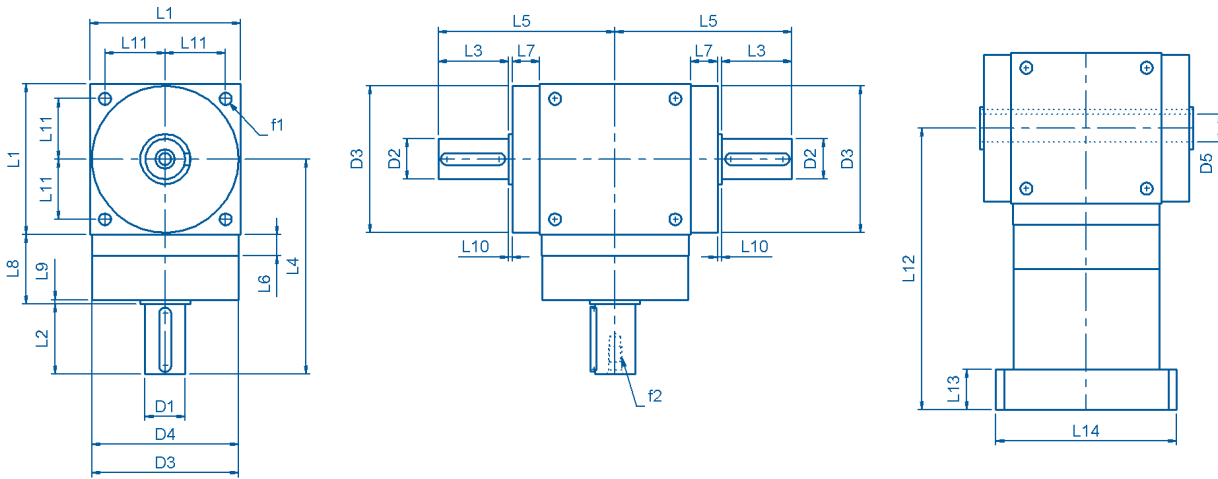
1) Nominal torque value calculated from fatigue life of gears. Verify the thermal limit.

Thermal limit > Output Torque(Nm) * Output Speed / 9549 or Output Torque(lb-in) * Output Speed / 84509

The thermal limit may be increased through the use of several options. Please consult GAM for more information.

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

3) Weights listed are without motor mount assembly.



mm (in)		75	90	110	140	170	210	240	280
D1 & D2 _{k6}	shaft diameter	16 (0.63)	18 (0.71)	22 (0.87)	32 (1.26)	40 (1.57)	50 (1.97)	55 (2.17)	60 (2.36)
	shaft key size	5 x 5 x 25	6 x 6 x 28	6 x 6 x 32	10 x 8 x 45	12 x 8 x 50	14 x 9 x 70	16 x 10 x 80	18 x 11 x 100
D1 & D2 _{k6} *	shaft diameter (HPX)	20 (0.79)	25 (0.98)	35 (1.38)	40 (1.57)	50 (1.97)	60 (2.36)	70 (2.76)	80 (3.15)
D3 _{h7}	pilot diameter	73 (2.87)	88 (3.46)	108 (4.25)	135 (5.31)	165 (6.5)	205 (8.07)	235 (9.25)	275 (10.83)
D4	housing diameter	72 (2.83)	86 (3.39)	106 (4.17)	104 (4.09)	128 (5.04)	160 (6.3)	180 (7.09)	200 (7.87)
D5 _{h7}	hollow diameter	14 (0.55)	18 (0.71)	22 (0.87)	32 (1.26)	40 (1.57)	50 (1.97)	55 (2.17)	60 (2.36)
	hollow key size	5 x 5	6 x 6	6 x 6	8 x 7	12 x 8	14 x 9	16 x 10	18 x 11
f1	mounting holes	M6	M6	M8	M10	M12	M16	M16	M16
f2	shaft thread	M5	M6	M8	M12	M16	M16	M20	M20
L1	housing size	75 (2.95)	90 (3.54)	110 (4.33)	140 (5.51)	170 (6.69)	210 (8.27)	240 (9.45)	280 (11.02)
L2	input shaft length	30 (1.18)	35 (1.38)	40 (1.57)	50 (1.97)	60 (2.36)	75 (2.95)	85 (3.35)	110 (4.33)
L3	output shaft length	30 (1.18)	35 (1.38)	40 (1.57)	50 (1.97)	60 (2.36)	75 (2.95)	85 (3.35)	110 (4.33)
L4	input length	120 (4.72)	135 (5.31)	155 (6.1)	180 (7.09)	215 (8.46)	265 (10.43)	300 (11.81)	360 (14.17)
L5	output length	84 (3.31)	97 (3.82)	112 (4.41)	167 (6.57)	162 (6.38)	202 (7.95)	231 (9.09)	276 (10.87)
L6	input pilot height	15 (0.59)	15 (0.59)	15 (0.59)	15 (0.59)	15 (0.59)	20 (0.79)	25 (0.98)	25 (0.98)
L7	output pilot height	14.5 (0.57)	15 (0.59)	15 (0.59)	15 (0.59)	15 (0.59)	20 (0.79)	25 (0.98)	25 (0.98)
L8	input housing length	52.5 (2.07)	55 (2.17)	60 (2.36)	60 (2.36)	70 (2.76)	85 (3.35)	95 (3.74)	110 (4.33)
L9	shoulder thickness	2 (0.08)	2 (0.08)	2 (0.08)	2 (0.08)	2 (0.08)	2 (0.08)	2 (0.08)	2 (0.08)
L10	shoulder thickness	2 (0.08)	2 (0.08)	2 (0.08)	2 (0.08)	2 (0.08)	2 (0.08)	2 (0.08)	2 (0.08)
L11	hole location	30 (1.18)	36 (1.42)	44 (1.73)	55 (2.17)	67 (2.64)	85 (3.35)	95 (3.74)	110 (4.33)
L12¹⁾	input mounting length	145 (5.71)	167 (6.57)	197 (7.76)	232 (9.13)	277 (10.91)	347 (13.66)	382 (15.04)	442 (17.4)
L13	adapter thickness	value depends on motor (consult GAM)							
L14	adapter size	value depends on motor (consult GAM)							

1) length may change depending on motor.

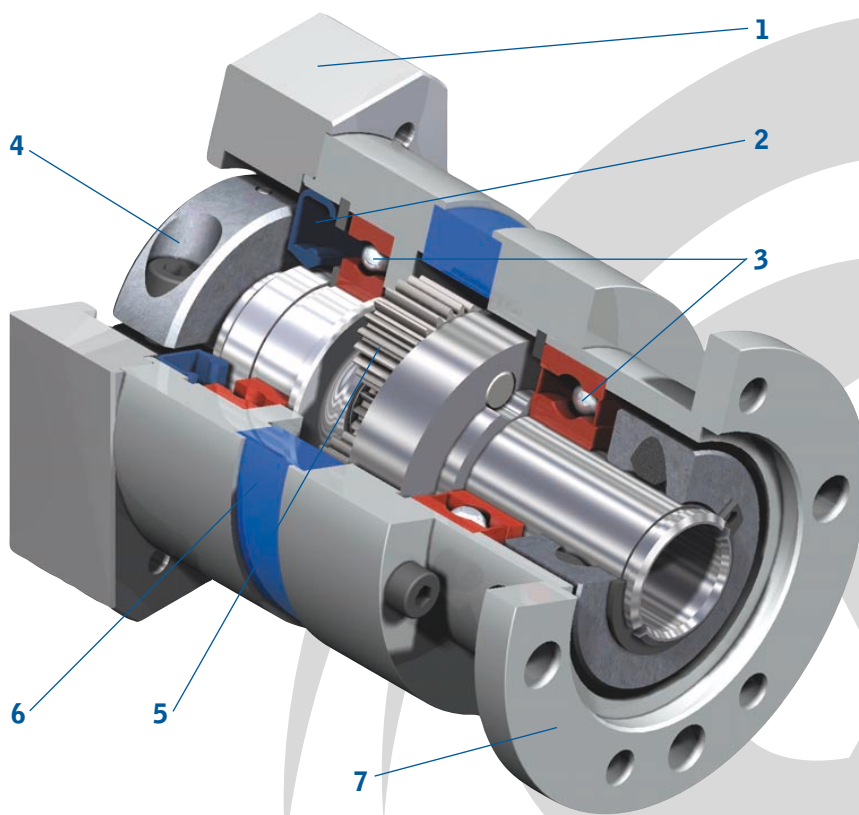
* HPX dimensions vary slightly from HPS. Consult GAM for other dimensions.



ECONOMY SERIES

Designed to maintain the high quality associated with GAM Gear products, the Economy Series was engineered to provide a high-quality, low-cost gearing solution for less demanding servo applications. The EPL Series consists of a variety of configurations to meet the requirements of many applications.

- **Low backlash**
- **Precision gears**
- **Lightweight**
- **Lubricated for life**
- **Fixed input with radial clamping ring makes for quick and easy mounting to metric or English motors**
- **Many customizations available**



COMPONENT INDEX

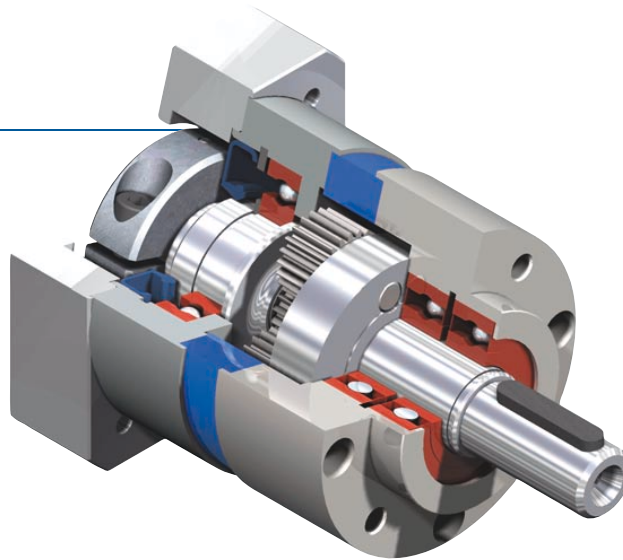
- 1. Adapter Plate**
(Customized adapter plates for quick and easy motor mounting)
- 2. Seals**
(Protective seals to isolate the gearbox)
- 3. Ball Bearings**
(Single ball bearing in the EPL-H-064; dual ball bearings in all other sizes and styles)
- 4. Input Clamping Element**
- 5. Planet Gears**
(Precision honed gears)
- 6. Ring Gear**
(Ring gear incorporated into housing)
- 7. Output Face**
(Ready to mount to belt or ball screw modules)

Linear Mount shown

Low Cost Planetary Gear Reducer

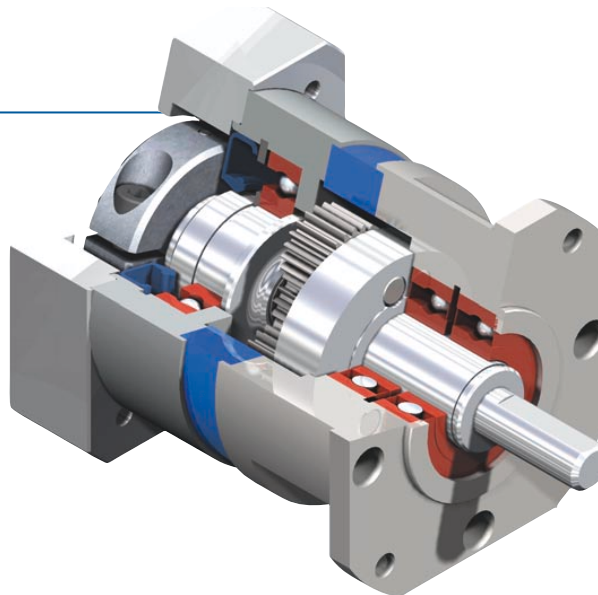
EPL-W

- Metric output face
- Ratios 3:1 to 1000:1
- Frame sizes from 40 mm to 150 mm



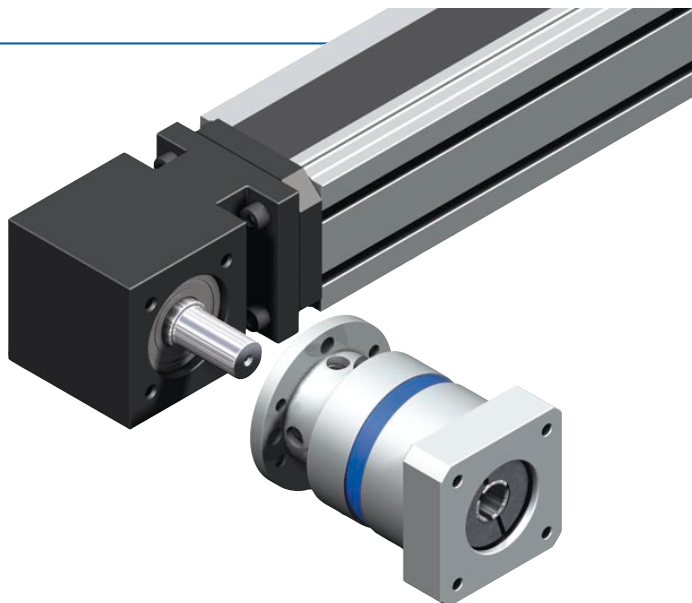
EPL-NEMA

- NEMA output face
- Ratios 3:1 to 1000:1
- Frame sizes from NEMA 17 to 56

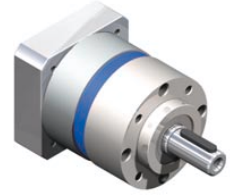


EPL-H Linear Mount

- 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.



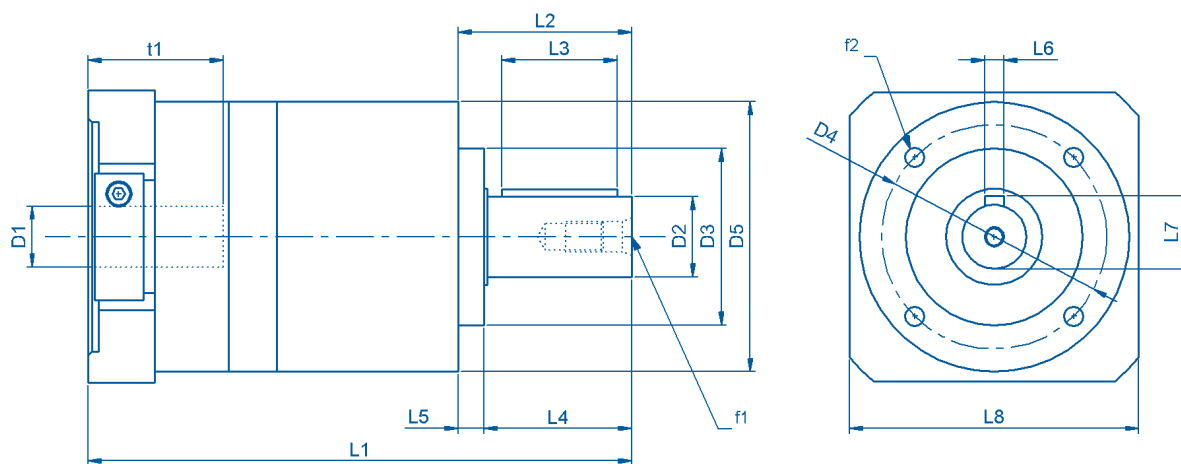
EPL-W



ECONOMY SERIES

EPL Series			40	64	84	118	150		
Nominal Ouput Torque	T _{2n}	Nm (lb-in)	3:1, 4:1 5:1, 7:1	6.5 (58)	3:1, 10:1, 100:1, 1000:1	14 (124)	40 (354)	100 (885)	165 (1460)
			9:1	3.5 (31)	4:1, 5:1, 7:1	26 (230)	50 (443)	120 (1062)	210 (1859)
			all other ratios	16 (142)	all other ratios	36 (319)	64 (566)	165 (1460)	300 (2655)
Max Acceleration Torque	T _{2B}	Nm (lb-in)	3:1, 4:1 5:1, 7:1	13 (115)	3:1, 10:1, 100:1, 1000:1	25 (221)	60 (531)	150 (1328)	310 (2744)
			9:1	8 (71)	4:1, 5:1, 7:1	40 (354)	80 (708)	180 (1593)	340 (3009)
			all other ratios	25 (221)	all other ratios	55 (487)	135 (1195)	255 (2257)	410 (3629)
Emergency Output Torque	T _{2not}	Nm (lb-in)	3:1, 4:1 5:1, 7:1	21 (186)	3:1, 10:1, 100:1, 1000:1	45 (398)	120 (1062)	300 (2655)	610 (5399)
			9:1	16 (142)	4:1, 5:1, 7:1	70 (620)	150 (1328)	360 (3186)	700 (6195)
			all other ratios	40 (354)	all other ratios	75 (664)	185 (1637)	480 (4248)	820 (7257)
Nominal Speed	n _{1n}	RPM	3500		3500	3000	3000	2500	
Max Input Speed	n _{1max}		6000		6000	6000	5000	4000	
Standard Backlash	j	arcmin	3:1 - 7:1	< 20	3:1 - 10:1	< 10	< 10	< 8	< 8
			9:1 - 49:1	< 25	12:1 - 100:1	< 15	< 14	< 12	< 12
			64:1 - 343:1	< 30	120:1 - 1000:1	< 20	< 18	< 16	< 16
Allowable Radial Load ¹⁾	F _{rad}	Nm (lbs)	425 (96)		1900 (428)	2800 (630)	5000 (1125)	7500 (1688)	
Allowable Axial Load	F _{axial}	Nm (lbs)	500 (113)		1500 (338)	2500 (563)	4500 (1013)	6000 (1350)	
Torsional Stiffness	C _{t21}	Nm/arcmin (lb-in/arcmin)			10:1, 100:1, 1000:1	1.3 (11.5)	3.4 (30.1)	8.3 (73.5)	22 (194.7)
					7:1, 49:1, 70:1, 490:1, 700:1	1.7 (15)	4.8 (42.5)	13.6 (120.4)	27 (239)
					all other ratios	2.4 (21.2)	7.1 (62.8)	17.2 (152.2)	33 (292.1)
Weight	m	kg (lbs)	1-stage	0.4 (0.88)	1-stage	1.0 (2.2)	2.3 (5.1)	5.8 (12.8)	10.0 (22.1)
			2-stage	0.5 (1.1)	2-stage	1.3 (2.9)	3.1 (6.8)	7.9 (17.4)	12.5 (27.6)
			3-stage	0.6 (1.32)	3-stage	1.6 (3.5)	3.9 (8.6)	10.0 (22.1)	15.0 (33.1)
Noise Level	L _{PA}	dB(A)	< 60		< 66	< 68	< 70	< 72	
Mass Moment of Inertia	J ₁	kg cm ² (lb-in ²)	3:1	0.0144 (0.0049)	3:1	0.176 (0.06)	0.542 (0.18)	2.54 (0.86)	2.54 (0.86)
			4:1, 5:1	0.0096 (0.0033)	4:1, 12:1, 16:1	0.173 (0.059)	0.473 (0.16)	1.86 (0.63)	1.86 (0.63)
			9:1	0.0152 (0.0052)	5:1, 7:1, 20:1, 25:1, 35:1	0.156 (0.053)	0.407 (0.14)	1.51 (0.51)	1.51 (0.51)
			all other ratios	0.0078 (0.0027)	all other ratios	0.137 (0.047)	0.328 (0.11)	1.07 (0.36)	1.07 (0.36)
Ratios Available			3, 4, 5, 7 9, 12, 16, 20, 25, 35, 49 64, 80, 100, 140, 175, 245, 343						
Efficiency at Load			1-stage: 90% 2-stage: 85% 3-stage: 80%						
Service Life			> 20,000 hours						
Lubrication			Mineral Grease EP0						
Protection Rating			IP 64						
Operating Temperature			-20°C to 90°C						

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



mm (in)		40	64	84	118	150
D1_{max}*	motor shaft diameter	9 (0.35)	14 (0.55)	19 (0.75)	24 (0.94)	28 (1.1)
D2_{k6}	output shaft diameter	10 (0.39)	14 (0.55)	20 (0.79)	25 (0.98)	40 (1.57)
D3_{h7}	pilot diameter	25 (0.98)	40 (1.57)	55 (2.17)	80 (3.15)	110 (4.33)
D4	bolt circle	33 (1.3)	52 (2.05)	70 (2.76)	100 (3.94)	130 (5.12)
D5	housing diameter	40 (1.57)	64 (2.52)	84 (3.31)	118 (4.65)	150 (5.91)
f1	shaft thread	M3x9	M5x12	M6x16	M10x22	—
f2	mounting holes	M4x6	M5x12	M6x14	M8x18	M10x22
L1_{1-stage}**	gearbox total length	98.5 (3.88)	117 (4.61)	162 (6.38)	199 (7.83)	265 (10.43)
L1_{2-stage}**		114 (4.49)	139 (5.47)	195 (7.68)	239 (9.41)	305 (12.01)
L1_{3-stage}**		129.5 (5.1)	161 (6.34)	228 (8.98)	280 (11.02)	346 (13.62)
L2	shaft length	29 (1.14)	39 (1.54)	54 (2.13)	61 (2.4)	81 (3.19)
L3	key length	20 (0.79)	25 (0.98)	36 (1.42)	45 (1.77)	60 (2.36)
L4	usable shaft length	23 (0.91)	30 (1.18)	45 (1.77)	50 (1.97)	70 (2.76)
L5	pilot height	5 (0.2)	8 (0.31)	8 (0.31)	10 (0.39)	10 (0.39)
L6	key width	3 (0.12)	5 (0.2)	6 (0.24)	8 (0.31)	10 (0.39)
L7	key height	11.2 (0.44)	16 (0.63)	22.5 (0.89)	28 (1.1)	43 (1.69)
L8**	adapter size	40 (1.57)	70 (2.76)	90 (3.54)	120 (4.72)	150 (5.91)
t1***	allowable motor shaft	25 (0.98)	23 (0.91)	30 (1.18)	40 (1.57)	40 (1.57)

* for larger motor shaft diameters, please contact GAM

** value can vary depending on the motor

*** long motor shafts can be accommodated, but overall gearbox length will grow

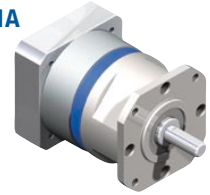


Recommended Output Coupling (if necessary)

metal bellows elastomer	KM-20 EKM-20	KM-60 EKM-60	KM-170 EKM-150	KM-270 EKM-300	KM-500 EKM-500
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Coupling specifications on pages 48-49.

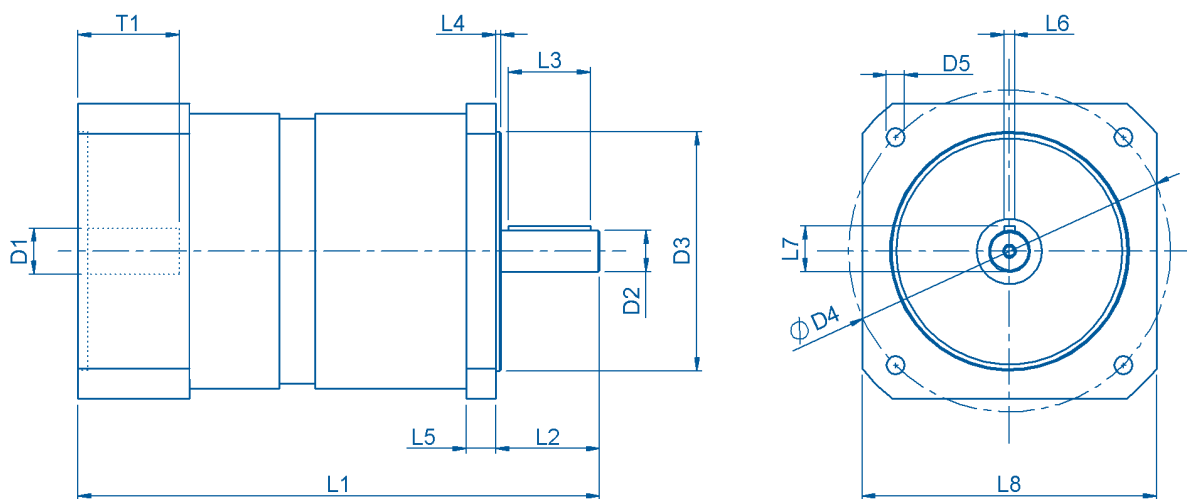




NEMA SERIES

NEMA Series			17		23		34	42	56
Nominal Ouput Torque	T _{2n}	Nm (lb-in)	3:1, 4:1 5:1, 7:1	6.5 (58)	3:1 18 (159)	40 (354)	100 (885)	100 (885)	
					4:1, 5:1, 7:1 18 (159)	54 (478)	120 (1062)	120 (1062)	
			9:1	3.5 (31)	10:1 14 (124)	40 (354)	104 (920)	104 (920)	
					100:1, 1000:1 16 (142)	60 (531)	120 (1062)	120 (1062)	
			all other ratios	16 (142)	all other ratios 18 (159)	60 (531)	120 (1062)	120 (1062)	
Max Acceleration Torque	T _{2B}	Nm (lb-in)	all other ratios	16 (142)	all ratios 18 (159)	60 (531)	120 (1062)	200 (1770)	
Nominal Speed	n _{1n}	RPM	3500		3500	3000	3000	3000	
Maximum Speed	n _{1max}		6000		6000	6000	5000	5000	
Standard Backlash	j	arcmin	3:1 - 7:1	< 20	3:1 - 10:1	< 10	< 10	< 8	< 8
			9:1 - 49:1	< 25	12:1 - 100:1	< 15	< 14	< 12	< 12
			64:1 - 343:1	< 30	120:1 - 1000:1	< 20	< 18	< 16	< 16
Allowable Radial Load ¹⁾	F _{rad}	N (lbs)	375 (84)		450 (101)	500 (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 _{t21}	Nm/arcmin (lb-in/arcmin)			10:1, 100:1, 1000:1	0.8 (7.1)	1.8 (15.9)	3.1 (27.4)	8.3 (73.5)
					7:1, 49:1, 70:1, 490:1, 700:1	1 (8.9)	2.6 (23)	5.1 (45.1)	15.2 (134.5)
					all other ratios	1.2 (10.6)	2.8 (24.8)	6.2 (54.9)	17.2 (152.2)
Weight	m	kg (lbs)	1-stage	0.4 (0.88)	1-stage	1.0 (2.2)	2.3 (5.1)	5.8 (12.8)	6.2 (13.7)
			2-stage	0.5 (1.1)	2-stage	1.3 (2.9)	3.1 (6.8)	7.9 (17.4)	8.3 (18.3)
			3-stage	0.6 (1.32)	3-stage	1.6 (3.5)	3.9 (8.6)	10.0 (22.1)	10.4 (22.9)
Noise Level	L _{PA}	dB(A)	< 60		< 66	< 68	< 70	< 72	
Mass Moment of Inertia at Input	J ₁	kg cm ² (lb-in ²)	3:1	0.0144 (0.0049)	3:1	0.176 (0.06)	0.542 (0.18)	2.54 (0.86)	2.56 (0.87)
			4:1, 5:1	0.0096 (0.0033)	4:1, 12:1, 16:1	0.173 (0.059)	0.473 (0.16)	1.86 (0.63)	1.88 (0.64)
			9:1	0.0152 (0.0052)	5:1, 7:1, 20:1, 25:1, 35:1	0.156 (0.053)	0.407 (0.14)	1.51 (0.51)	1.52 (0.52)
			all other ratios	0.0078 (0.0027)	all other ratios	0.137 (0.047)	0.328 (0.11)	1.07 (0.36)	1.07 (0.36)
Ratios Available			3, 4, 5, 7 9, 12, 16, 20, 25, 35, 49 64, 80, 100, 140, 175, 245, 343		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				
Efficiency at Load			1-stage: 90% 2-stage: 85% 3-stage: 80%						
Service Life			> 20,000 hours						
Lubrication			Mineral Grease EP0						
Protection Rating			IP 64						
Operating Temperature			-20°C to 90°C						

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



mm (in)		17	23	34	42	56
D1 _{max} *	motor shaft diameter	9 (0.35)	14 (0.55)	19 (0.75)	24 (0.94)	24 (0.94)
D2 _{k6}	output shaft diameter	6.35 (0.250)	9.525 (0.375)	12.7 (0.500)	15.875 (0.625)	19.05 (0.750)
D3 _{h7}	pilot diameter	21.97 (0.865)	38.1 (1.5)	73 (2.874)	55.55 (2.187)	114.3 (4.500)
D4	bolt circle	43.8 (1.72)	66.7 (2.63)	98.4 (3.87)	125.7 (4.95)	149.2 (5.875)
D5	mounting holes	3.25 (0.13)	5 (0.2)	5.5 (0.22)	7.1 (0.28)	3/8"-16UNC
L1 _{1-stage} **	gearbox total length	98.5 (3.88)	111 (4.37)	147 (5.79)	185 (7.28)	185 (7.28)
L1 _{2-stage} **		114 (4.49)	133 (5.24)	180 (7.09)	225.5 (8.88)	225.5 (8.88)
L1 _{3-stage} **		129.5 (5.1)	155 (6.1)	213 (8.39)	266 (10.47)	266 (10.47)
L2	shaft length	22.2 (0.87)	25.4 (1)	31.8 (1.25)	38.1 (1.5)	50 (1.97)
L3	key length	— (—)	— (—)	27 (1.06)	29 (1.14)	40 (1.57)
L4	pilot height	1.6 (0.06)	1.6 (0.06)	1.7 (0.07)	2.4 (0.09)	3 (0.12)
L5	flange thickness	6.8 (0.27)	5 (0.2)	10 (0.39)	13 (0.51)	31 (1.22)
L6	key width	— (—)	— (—)	3.2 (0.13)	4.8 (0.19)	4.763 (0.188)
L7	key height / flat height	— (—)	9.14 (0.36)	14.3 (0.56)	18.26 (0.72)	21.97 (0.86)
L8	flange size	40 (1.57)	65 (2.56)	90 (3.54)	120 (4.72)	127 (5.00)
t1 ***	allowable motor shaft	25 (0.98)	23 (0.91)	30 (1.18)	40 (1.57)	40 (1.57)

* for larger motor shaft diameters, please contact GAM

** value can vary depending on the motor

*** long motor shafts can be accommodated, but overall gearbox length will grow

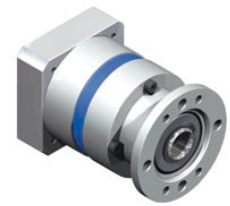


Recommended Output Coupling (if necessary)

metal bellows elastomer	KM-12 EKM-8	KM-20 EKM-30	KM-60 EKM-60	KM-170 EKM-150	KM-270 EKM-300
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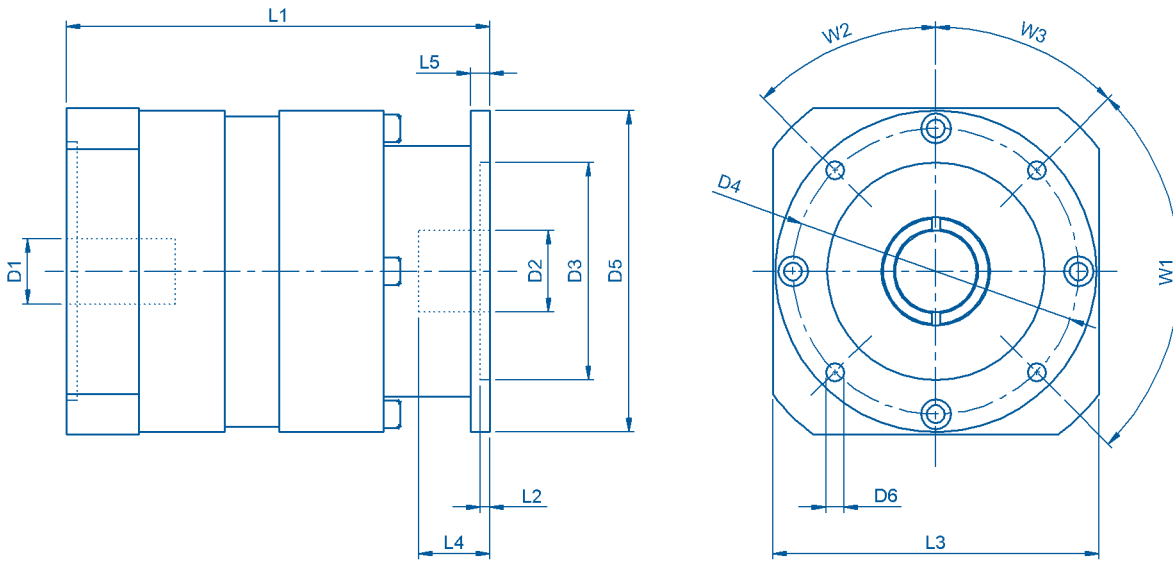
Coupling specifications on pages 48-49.





LINEAR MOUNT SERIES

Linear Mount Series			64	84	118	
Nominal Ouput 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 Acceleration 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 Speed	n _{1max}	RPM		3500	3000	3000
Maximum Speed	n _{1n}			6000	6000	5000
Standard Output Backlash	j	arcmin	3:1 - 10:1	< 10	< 10	< 8
			12:1 - 100:1	< 15	< 14	< 12
			120:1 - 1000:1	< 20	< 18	< 16
Weight	m	kg (lbs)	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)
Mass Moment of Inertia	J ₁	kg cm ² (lb-in ²)	i=3	0.176 (0.06)	0.542 (0.185)	2.54 (0.867)
			i=4	0.159 (0.054)	0.424 (0.145)	1.76 (0.601)
			i=5	0.15 (0.051)	0.379 (0.129)	1.48 (0.505)
			i=7,10	0.138 (0.047)	0.332 (0.113)	1.14 (0.389)
			i=12-35	0.156 (0.053)	0.407 (0.139)	1.51 (0.515)
			i=40-1000	0.136 (0.046)	0.327 (0.112)	1.07 (0.365)
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			
Efficiency at Load			1-stage: 90% 2-stage: 85% 3-stage: 80%			
Service Life			> 20,000 hours			
Lubrication			Mineral Grease EP0			
Protection Rating			IP 64			
Operating Temperature			-20°C to 90°C			



mm (in)		64	84	118
D1 _{max} *	motor shaft diameter	14 (0.55)	19 (0.75)	24 (0.94)
D2 _{max}	output shaft diameter	16 (0.63)	20 (0.79)	30 (1.18)
D3 _{h7}	pilot diameter	44 (1.73)	60 (2.36)	80 (3.15)
D4	bolt circle	55.5 (2.19)	73 (2.87)	105 (4.13)
D5	flange diameter	70 (2.76)	84 (3.31)	118 (4.65)
D6	mounting holes	5.5 (0.22)	5.5 (0.22)	6.6 (0.26)
L1 _{1-stage} **	gearbox total length	98.5 (3.88)	122 (4.8)	155.5 (6.12)
L1 _{2-stage} **		120.5 (4.74)	155 (6.1)	196 (7.72)
L1 _{3-stage} **		142.5 (5.61)	188 (7.4)	236.5 (9.31)
L2	pilot depth	3.5 (0.14)	3.5 (0.14)	3.5 (0.14)
L3	adapter size	70 (2.76)	90 (3.54)	120 (4.72)
L4	allowable shaft depth	28 (1.1)	23 (0.91)	26 (1.02)
L5	flange thickness	6 (0.24)	6 (0.24)	10 (0.39)
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

** value can vary depending on the motor



DYNA-LITE

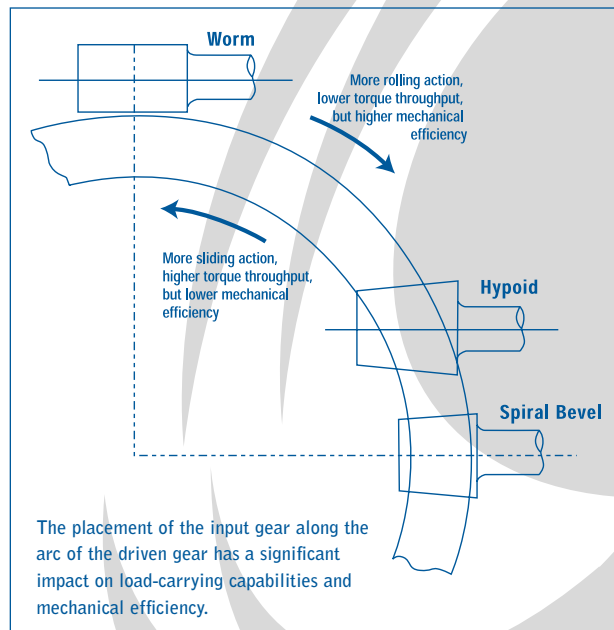
The Dyna-Lite uses a hypoid gear, similar to that found in our Dyna Series, to deliver a quality, compact, and efficient right angle gearbox. The Dyna-Lite was designed to give many of the advantages of our Dyna-Series, but at a cost savings for less demanding applications.

- **Low backlash**
- **Compact**
- **Efficient**
- **Lubricated for life**
- **Standard NEMA output face**
- **Quick and easy mounting to any metric or English motor**

The Advantage of Hypoid Gearing

The GAM Hypoid offers significant advantages over other conventional right angle gears.

Conventional spiral bevel gearing, meshing in the position shown at the bottom of the drawing, has a purely rolling meshing action that is mechanically very efficient. Its drawback is that it offers the smallest total tooth contact area, so its torque throughput capacity is lower. Single-stage spiral bevel gearing is limited to about a 6:1 reduction ratio. It's easy to get higher ratios with multiple-stage configurations, but the additional gear stage lowers mechanical efficiency, increases backlash, consumes space and weight, and reduces reliability.

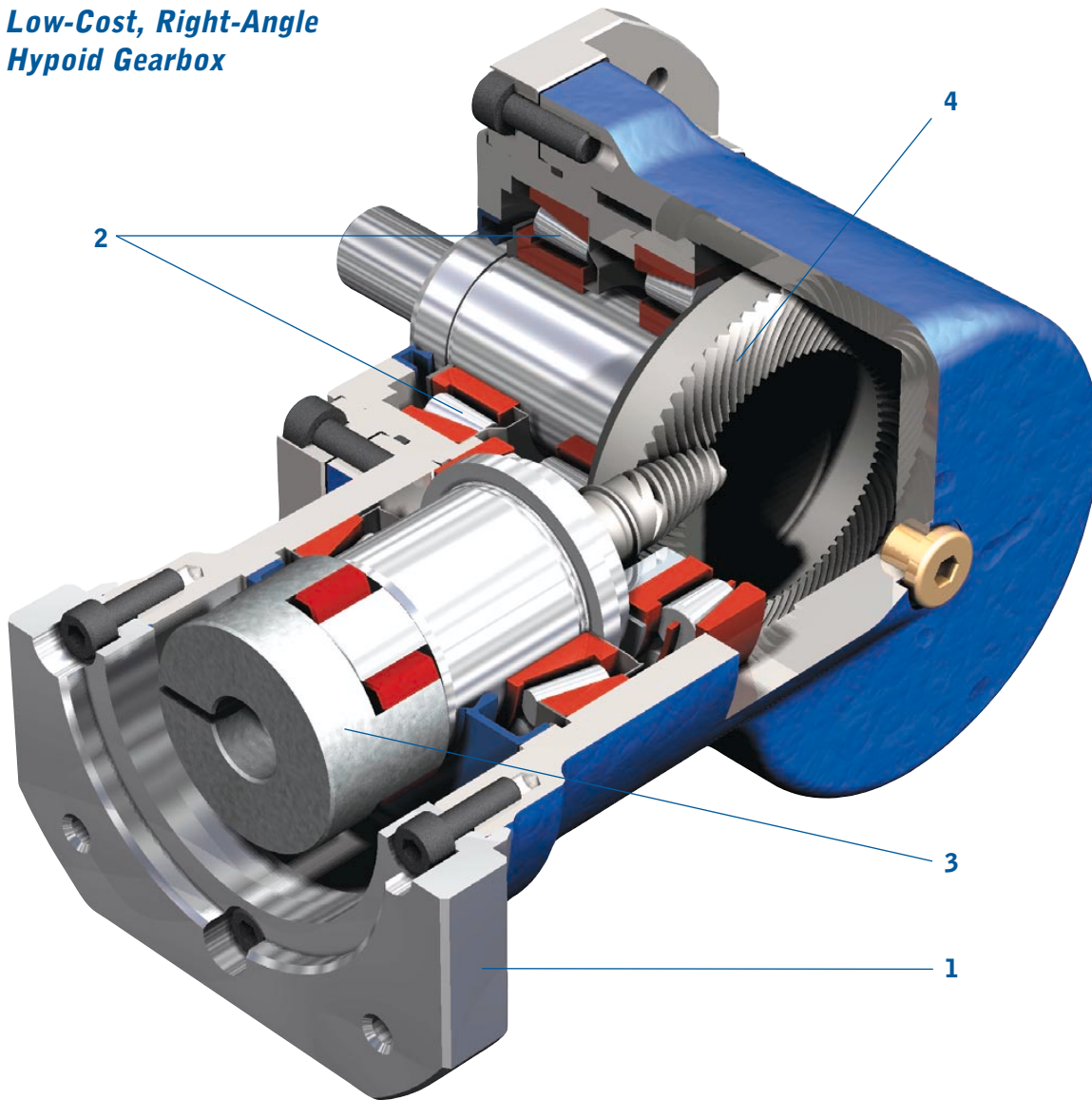


Conventional worm gearing, meshing in the position shown at the top of the drawing, has a very high total tooth contact area. While it offers high torque throughput and high ratio reduction, worm gearing has the lowest mechanical efficiency, due to the friction generated by its high component of sliding action. Worm gearing is also subject to the kind of wear that demands adjustment in order to maintain accuracy.

Hypoid gearing, meshing at the intermediate position, offers mostly rolling action with a small component of sliding action. It has a greater tooth contact area than bevel gearing, so its load carrying capability is greater. The GAM Hypoid offers further advantages by going up to a 15:1 gear ratio in a single stage with efficiencies between 93% and 96%, depending upon ratio throughout the speed range. Another important design criterion for precision servo applications is, of course, low backlash in the gearbox. The GAM Hypoid offers advantages in the area in two ways. First is the single-stage design, which eliminates the backlash from a second set of meshing gears. Second is accurate machining and assembly alignment; Dyna Series gearboxes are available in high-accuracy models that offer backlash of ≤ 2 arcminutes.

GAM Hypoid gearing is available in two product ranges, our highest precision Dyna Series, and high precision, Dyna-Lite Series.

Low-Cost, Right-Angle Hypoid Gearbox



COMPONENT INDEX

1. Adapter Plate

(Allows for quick and easy motor mounting)

2. Bearings

(Taper roller bearings allows high radial loading of output shaft)

3. Coupling

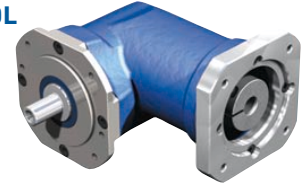
(Elastomer coupling for quick motor mounting)

4. Gears

(Precision hypoid gear ratios up to 10:1 in a single stage)



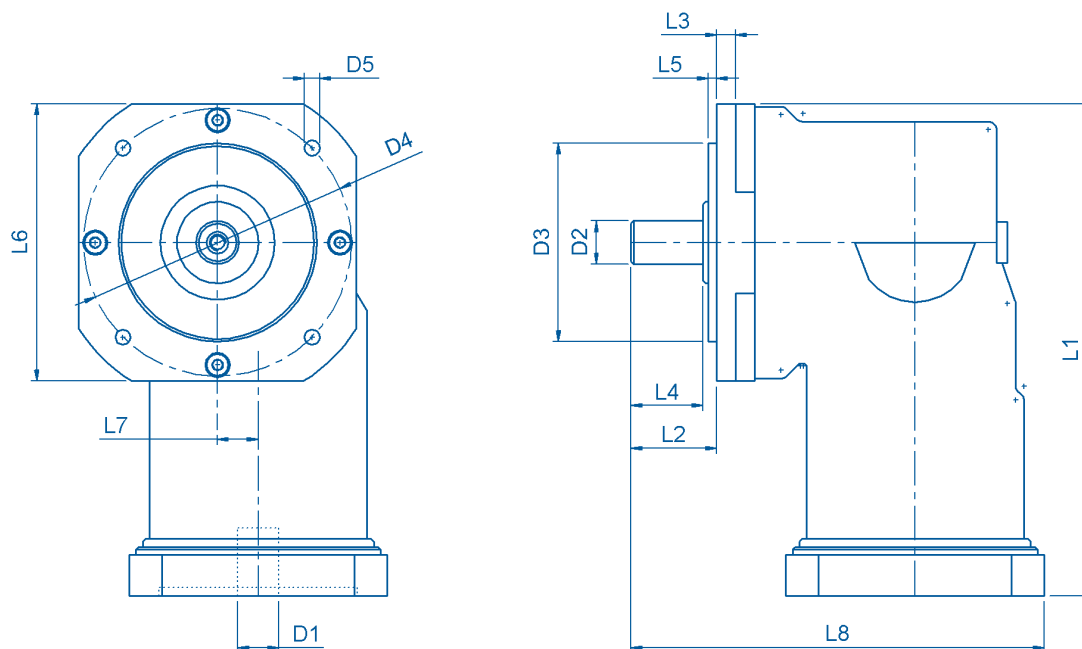
DL



DYNA-LITE SERIES

Dyna-Lite Series				23	34	42
Nominal Output Torque	T _{2n}	Nm (lb-in)		10 (89)	40 (354)	80 (708)
Maximum Acceleration Torque	T _{2B}	Nm (lb-in)		15 (133)	60 (531)	120 (1062)
E-Stop Torque	T _{2not}	Nm (lb-in)		20 (177)	80 (708)	160 (1416)
Nominal Speed	n _{1n}	RPM	1-stage	3000	3000	3000
			2-stage	3500	3000	2500
Maximum Speed	n _{1max}	RPM		6000	6000	5000
Standard Backlash	j	arcmin	1-stage	<15	<12	<10
			2-stage	<20	<15	<12
Allowable Radial Load ¹⁾	F _{rad}	N (lb-in)		1200 (270)	1500 (338)	1900 (428)
Allowable Axial Load	F _{axial}	N (lb-in)		600 (135)	750 (169)	950 (214)
Torsional Stiffness	C _{t21}	Nm/arcmin (lb-in/arcmin)		2.3 (20.4)	4.5 (39.8)	11.3 (100)
Weight	m	kg (lbs)	1-stage	3 (6.6)	5.1 (11.2)	15 (33.1)
			2-stage	4 (8.8)	7.4 (16.3)	22.9 (50.5)
Noise Level	L _{pa}	dB(A)		<=66	<=66	<=66
Mass Moment of Inertia at Input	J ₁	kg cm ² (lb-in ²)	3:1	0.8 (0.272)	1.99 (0.68)	4.9 (1.67)
			5:1	0.6 (0.204)	1.51 (0.51)	3.8 (1.29)
			10:1	0.55 (0.187)	1.38 (0.47)	3.4 (1.16)
			all other ratios	0.17 (0.058)	0.44 (0.15)	1.58 (0.54)
Ratios Available			1-stage: 3, 5, 10 2-stage: 25, 50, 100 for other ratios consult GAM			
Efficiency at Load			1-stage: 96% 2-stage: 93%			
Service Life			> 20,000 hours			
Lubrication			Synthetic Oil: ISO VG 100			
Protection Rating			IP 64			
Operating Temperature			-10°C to 100°C			

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



mm (in)		23	34	42
D1 max*	motor shaft diameter	15 (0.59)	19 (0.75)	26 (1.02)
D2 k6	output shaft diameter	12.7 (0.500)	15.875 (0.625)	19.05 (0.750)
D3 h7	pilot diameter	38.1 (1.500)	73.025 (2.875)	55.499 (2.185)
D4	bolt circle	66.68 (2.625)	98.43 (3.875)	125.73 (4.95)
D5	mounting holes	5.1 (0.201)	5.6 (0.22)	6.35 (0.25)
L1 1-stage**	gearbox length	115 (4.528)	181 (7.126)	230 (9.055)
L1 2-stage**		200.6 (7.898)	266.6 (10.496)	377 (14.843)
L2	shaft length	20.5 (0.807)	31.5 (1.24)	35 (1.378)
L3	flange thickness	6 (0.236)	6 (0.236)	8 (0.315)
L4	usable shaft length	16 (0.63)	26.5 (1.043)	30 (1.181)
L5	pilot height	2.6 (0.102)	3 (0.118)	3 (0.118)
L6	flange size	80 (3.15)	102 (4.016)	130 (5.118)
L7	gear offset	9 (0.354)	15 (0.591)	19 (0.748)
L8	gearbox width	97 (3.819)	154.5 (6.083)	165 (6.496)

* for larger motor shaft diameters, please contact GAM

** value can vary depending on the motor



Recommended Output Coupling (if necessary)

metal bellows elastomer	KM-20 EKM-15	KM-60 EKM-60	KM-170 EKM-150
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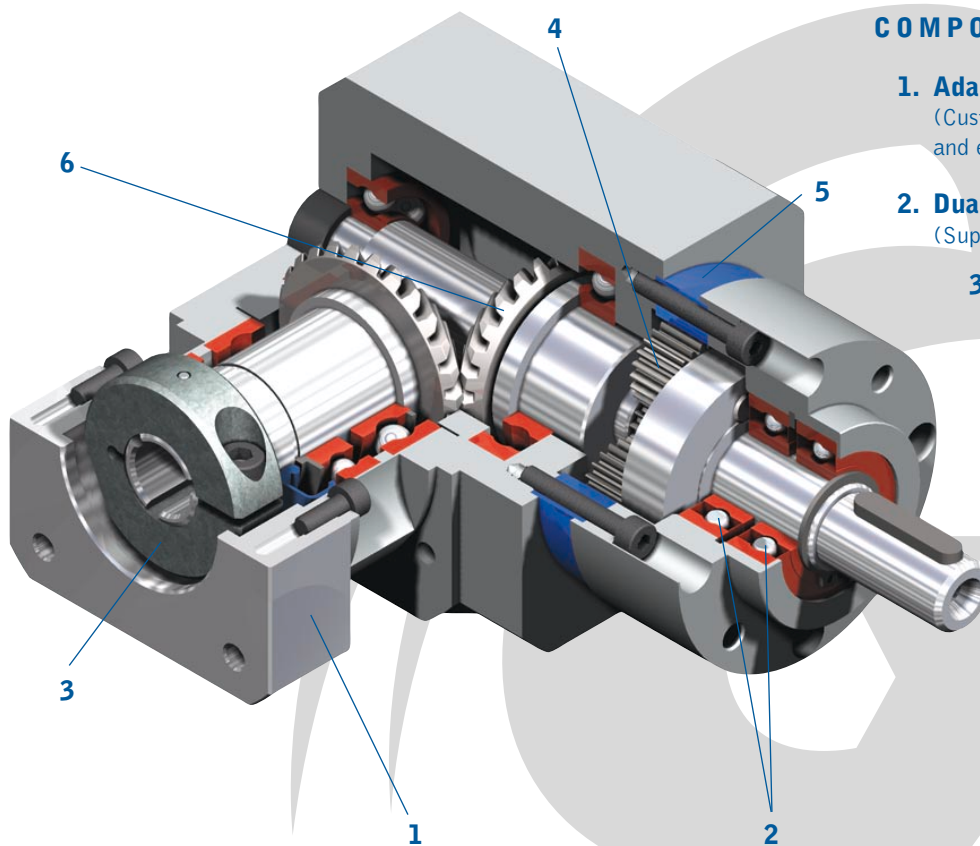
Coupling specifications on pages 48-49.



RIGHT-ANGLE BEVEL-PLANETARY—RPL SERIES

The RPL is the right-angle version of our Economy Series planetary gearbox line. In applications where space is limited, the RPL is a good choice. The RPL is available in a variety of output configurations to offer the maximum flexibility in your design.

- Precision honed gears
- Ring gear integrated into the housing
- Fixed input sun gear
- Ratios up to 1000:1
- Custom adapter plates mount to any servo motor
- Lubricated for the life of the product



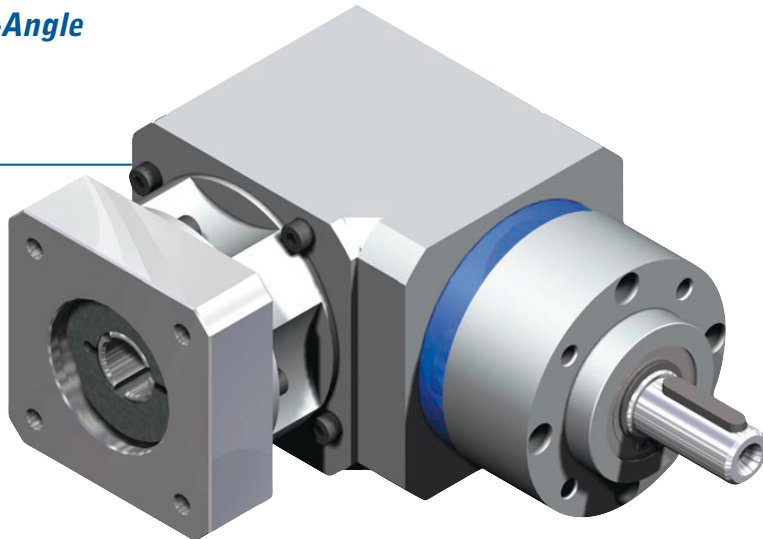
COMPONENT INDEX

- 1. Adapter Plate**
(Customized adapter plates for quick and easy motor mounting)
- 2. Dual Ball Bearings**
(Support high radial loading on output shaft)
- 3. Input Clamping Element**
- 4. Planet Gears**
(Precision honed planet gears)
- 5. Ring Gear**
- 6. Spiral Bevel Gear**

High-Quality, Low-Cost Right-Angle Bevel-Planetary Gearboxes

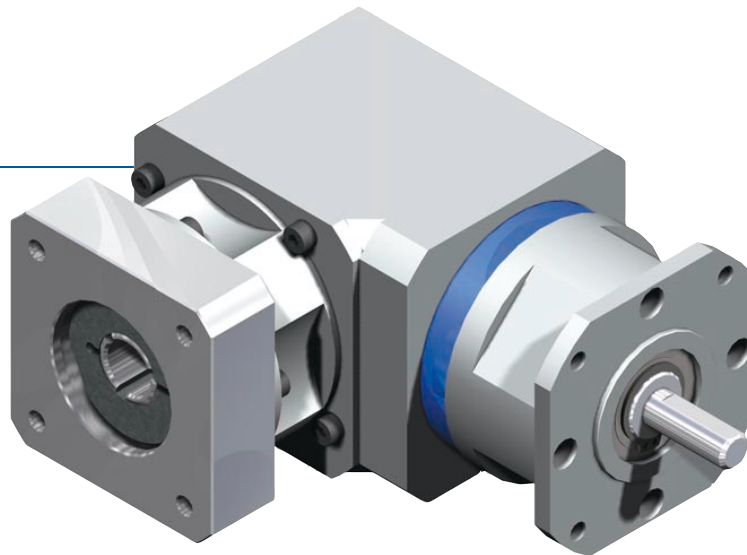
RPL-W

- Metric output face
- Ratio 12:1 to 1000:1
- Frame sizes from 64 mm to 118 mm



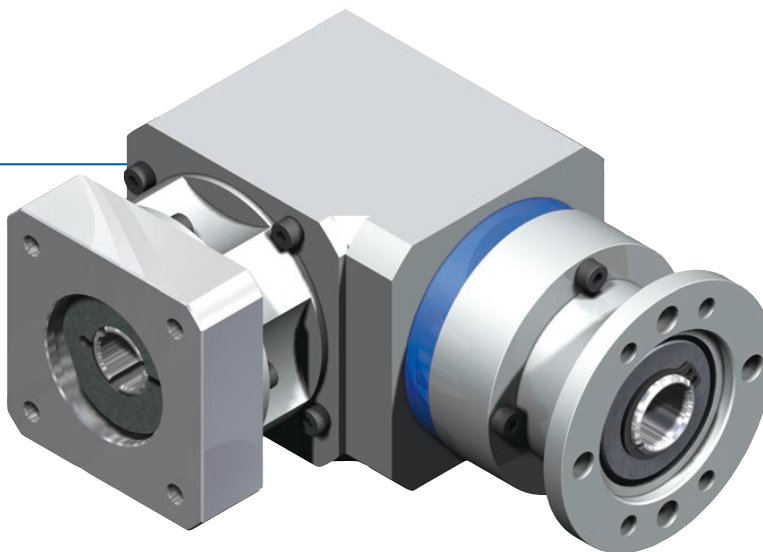
RPL-NEMA

- NEMA output face
- Ratios 12:1 to 1000:1
- Frame sizes from NEMA 23 to 42

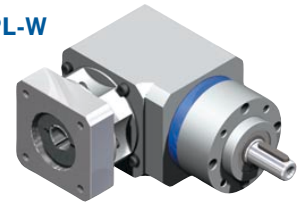


RPL-H

- 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



RPL-W

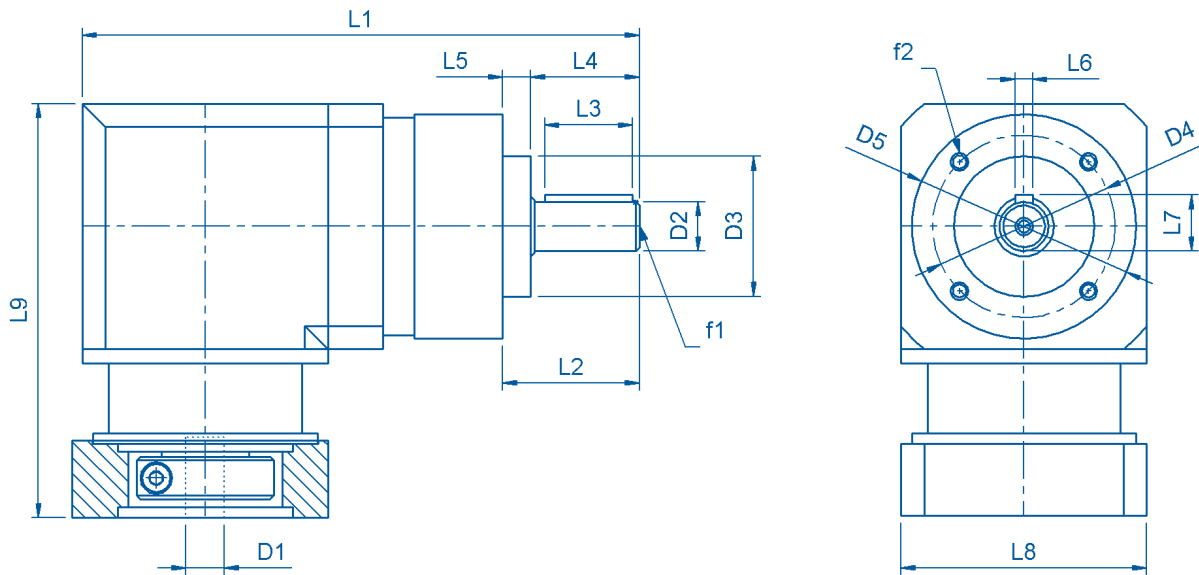


RPL SERIES

RPL Series			64	84	118	
Nominal Ouput Torque	T _{2n}	Nm (lb-in)	100:1, 1000:1	14 (124)	40 (354)	100 (885)
			all other ratios	36 (319)	64 (566)	165 (1460)
Max Acceleration Torque	T _{2B}	Nm (lb-in)	100:1, 1000:1	25 (221)	60 (531)	150 (1328)
			all other ratios	55 (487)	135 (1195)	255 (2257)
Nominal Speed	n _{1n}	RPM		3500	3000	3000
Maximum Speed	n _{1max}			5000	5000	4500
Standard Backlash	j	arcmin	25:1 - 100:1	< 15	< 14	< 12
			120:1 - 1000:1	< 20	< 18	< 16
Allowable Radial Load 1)	F _{rad}	N (lbs)		1900 (428)	2800 (630)	5000 (1125)
Allowable Axial Load	F _{axial}	N (lbs)		1500 (338)	2500 (563)	4500 (1013)
Torsional Stiffness	C _{t21}	Nm/arcmin (lb-in/arcmin)	100:1	1.3 (11.5)	3.4 (30.1)	8.3 (73.5)
			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)		2.8 (6.2)	6.6 (14.6)	16.1 (35.5)
Noise Level	L _{PA}	dB(A)		< 68	< 70	< 72
Mass Moment of Inertia	J ₁	kg cm ² (lb-in ²)	25:1	1.35 (0.46)	3.85 (1.31)	8.01 (2.72)
			all other ratios	1.31 (0.45)	3.75 (1.28)	7.94 (2.7)
Ratios Available			3-stage: 25, 40, 50, 70, 100 for other ratios consult GAM			
Efficiency at Load			> 85%			
Service Life			> 10,000 hours			
Lubrication			Mineral Grease EP0			
Protection Rating			IP 64			
Operating Temperature			-20°C to 90°C			

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

For NEMA or hollow output performance and dimensional data consult GAM.



mm (in)		64	84	118
D1 max	motor shaft diameter	14 (0.55)	19 (0.75)	24 (0.94)
D2 k6	output shaft diameter	14 (0.55)	20 (0.79)	25 (0.98)
D3 h7	pilot diameter	40 (1.57)	55 (2.17)	80 (3.15)
D4	bolt circle	52 (2.05)	70 (2.76)	100 (3.94)
D5	housing diameter	64 (2.52)	84 (3.31)	118 (4.65)
f1	shaft thread	M5x12	M6x16	M10x22
f2	mounting holes	M5x12	M6x14	M8x18
L1 3-stage	gearbox total length	183 (7.2)	252.5 (9.94)	323 (12.72)
L2	shaft length	39 (1.54)	54 (2.13)	61 (2.4)
L3	key length	25 (0.98)	36 (1.42)	45 (1.77)
L4	usable shaft length	30 (1.18)	45 (1.77)	50 (1.97)
L5	pilot height	8 (0.31)	8 (0.31)	10 (0.39)
L6	key width	5 (0.2)	6 (0.24)	8 (0.31)
L7	key height	16 (0.63)	22.5 (0.89)	28 (1.1)
L8*	adapter size	70 (2.76)	90 (3.54)	120 (4.72)
L9*	gearbox total width	114.5 (4.51)	147 (5.79)	188.5 (7.42)

* Value can vary depending on the motor

For NEMA or hollow output performance and dimensional data consult GAM.



Recommended Output Coupling (if necessary)			
metal bellows	KM-60	KM-170	KM-270
elastomer	EKM-60	EKM-150	EKM-300

Coupling specifications on pages 48-49.



ULTRA-LOW COST PLANETARY—UPL SERIES

The UPL is priced like a spur gearbox but has the performance of a planetary! This planetary gearbox conforms to the quality standards of a GAM product and is an alternative to low-cost spur gearboxes. The UPL is ideal for applications involving low-cost motors such as synchronous or stepper that have a standard NEMA output face.

- **Low cost**
- **Low backlash via precision gears**
- **Fixed input makes for quick and easy mounting to standard NEMA 23, 34, or 42 motors**

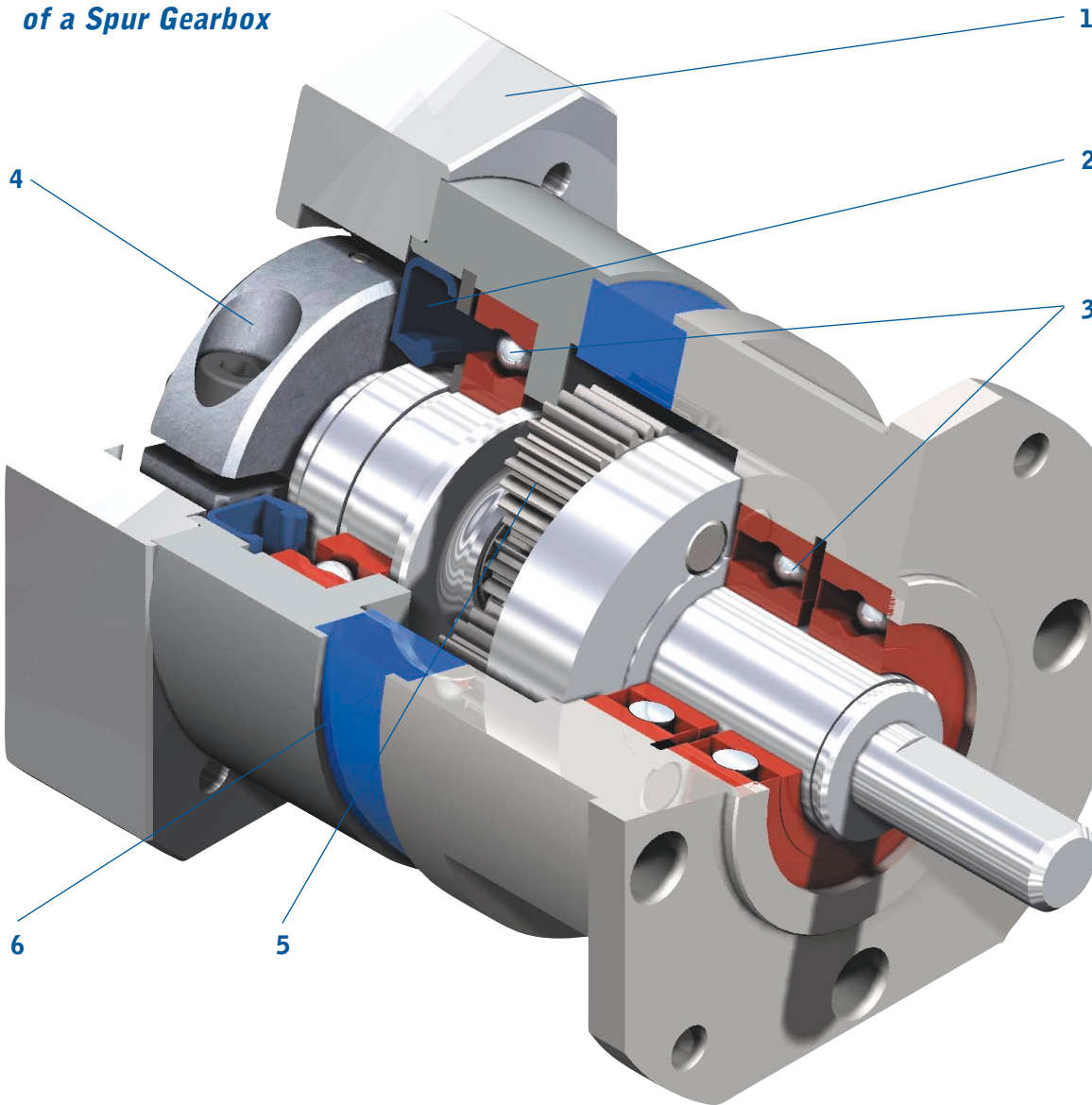
Ratios

5:1
10:1
25:1
50:1
100:1

Available Frame sizes

NEMA 23
NEMA 34
NEMA 42

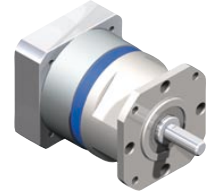
Performance of a Planetary at the Price of a Spur Gearbox



COMPONENT INDEX

- | | |
|---|--|
| <p>1. Motor Mount
(Gearbox ready to mount to standard NEMA 23, 34, 42 motors)</p> <p>2. Seals
(Protective seals to isolate the gearbox)</p> <p>3. Ball Bearings
(Ball bearings to support all elements of the gearbox)</p> | <p>4. Input Clamping Element</p> <p>5. Planet Gears
(Precision honed gears)</p> <p>6. Ring Gear
(Ring gear incorporated into housing)</p> |
|---|--|

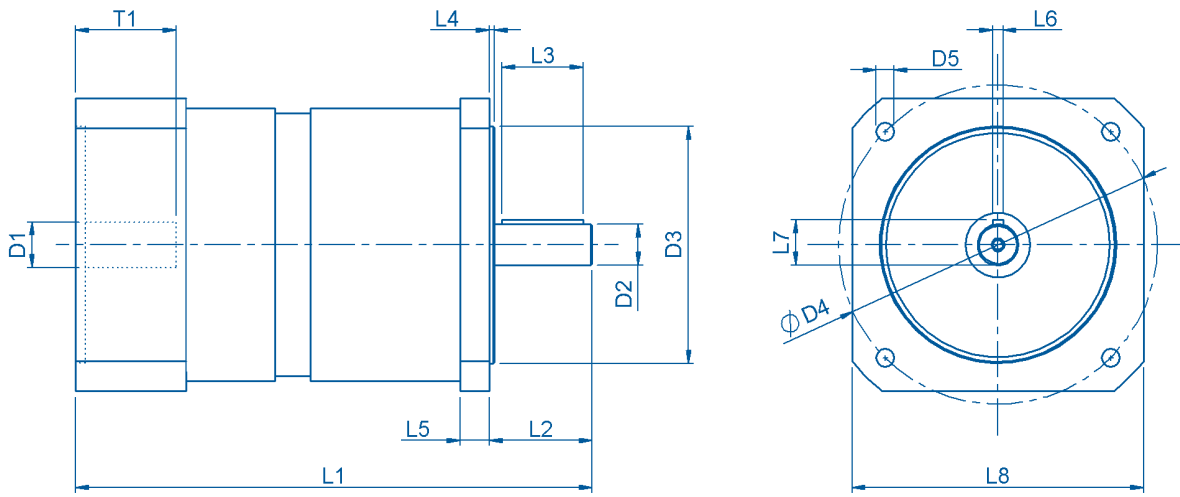




UPL SERIES

UPL Series			23	34	42
Nominal Output Torque	T_{2n}	Nm (lb-in)	5:1	18 (159)	54 (478)
			10:1	14 (124)	40 (354)
			25:1, 50:1, 100:1	18 (159)	60 (531)
Max Acceleration Torque	T_{2B}	Nm (lb-in)	all ratios	18 (159)	60 (531)
Nominal Speed	n_{1n}	RPM		3500	3000
Maximum Speed	n_{1max}			6000	5000
Standard Backlash	j	arcmin	5:1	< 15	< 15
			10:1	< 20	< 20
			25:1, 50:1, 100:1	< 25	< 25
Allowable Radial Load ¹⁾	F_{rad}	N (lbs)		450 (101)	1200 (270)
Allowable Axial Load	F_{axial}	N (lbs)		500 (113)	900 (203)
Torsional Stiffness	C_{t21}	Nm/arcmin (lb-in/arcmin)	5:1	1.2 (10.6)	3 (26.6)
			10:1	1 (8.9)	1.8 (15.9)
			25:1, 50:1	1.2 (10.6)	2.7 (23.9)
			100:1	0.8 (7.1)	1.8 (15.9)
Weight	m	kg (lbs)	5:1, 10:1	1.0 (2.2)	2.3 (5.1)
			25:1, 50:1, 100:1	1.3 (2.9)	3.1 (6.8)
Noise Level	L_{PA}	dB(A)		< 67	< 69
Mass Moment of Inertia	J_1	kg cm ² (lb-in ²)		0.1 (0.034)	0.29 (0.099)
Ratios Available			1-stage: 5, 10 2-stage: 25, 50, 100		
Efficiency at Load			1-stage: 90% 2-stage: 85%		
Service Life			> 10,000 hours		
Lubrication			Mineral Grease EP0		
Protection Rating			IP 64		
Operating Temperature			-20°C to 90°C		

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



mm (in)		23	34	42
D1	motor shaft diameter	9.525 / 6.35 (0.375 / 0.250)	12.7 / 9.525 (0.500 / 0.375)	19.05 / 15.875 (0.750 / 0.625)
D2 k6	output shaft diameter	9.525 (0.375)	12.7 (0.500)	15.875 (0.625)
D3 h7	pilot diameter	38.1 (1.500)	73.02 (2.875)	55.55 (2.187)
D4	bolt circle	66.7 (2.63)	98.4 (3.87)	125.7 (4.95)
D5	mounting holes	5 (0.2)	5.5 (0.22)	7.1 (0.28)
D6	motor pilot diameter	38.1 (1.500)	73.02 (2.875)	55.55 (2.187)
L1 1-STAGE	gearbox total length	106 (4.17)	147 (5.79)	185 (7.28)
L1 2-STAGE		128 (5.04)	180 (7.09)	225 (8.86)
L2	shaft length	25.4 (1.00)	31.8 (1.25)	38.1 (1.50)
L3	key length	— (—)	27 (1.06)	29 (1.14)
L4	pilot height	1.6 (0.06)	1.7 (0.07)	2.4 (0.09)
L5	flange thickness	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 (.36)	14.3 (0.56)	18.26 (0.72)
L8	flange size	65 (2.56)	90 (3.54)	120 (4.72)



Recommended Output Coupling (if necessary)

metal bellows	KM-20	KM-60	KM-170
elastomer	EKM-15	EKM-60	EKM-150

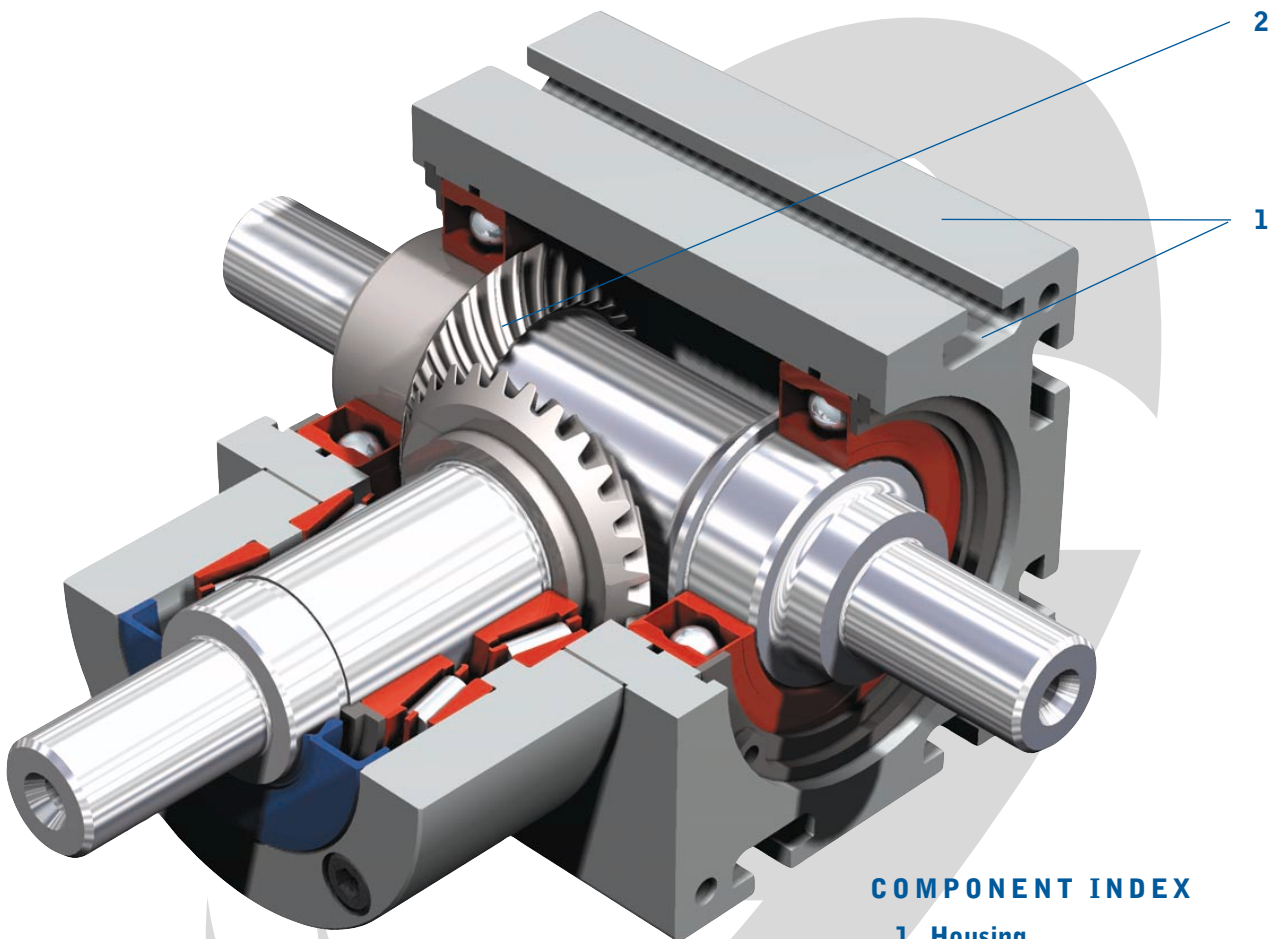
Coupling specifications on pages 48-49.



POWER-LITE SERIES

The Power Lite's innovative packaging and features allow flexibility beyond compare. The aluminum housing can be easily mounted directly to extruded linear building elements or by bolting into its face. Output configurations include single output shaft, dual output shaft, and a hollow shaft. Use the Power Lite where quality low-ratio, right-angle gearboxes are required.

- Mounts directly to extruded linear building elements
- Lightweight
- Precision gears
- Lubricated for life
- Available with motor mount for quick and easy mounting to any metric or English motor
- 4 frame sizes
- Ratios 1:1 and 2:1

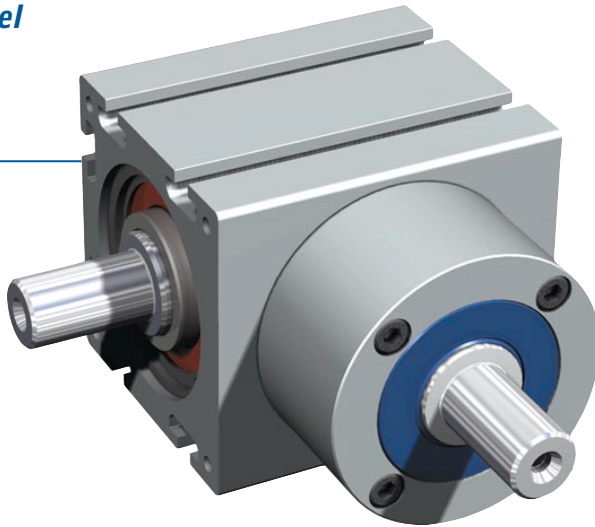


COMPONENT INDEX

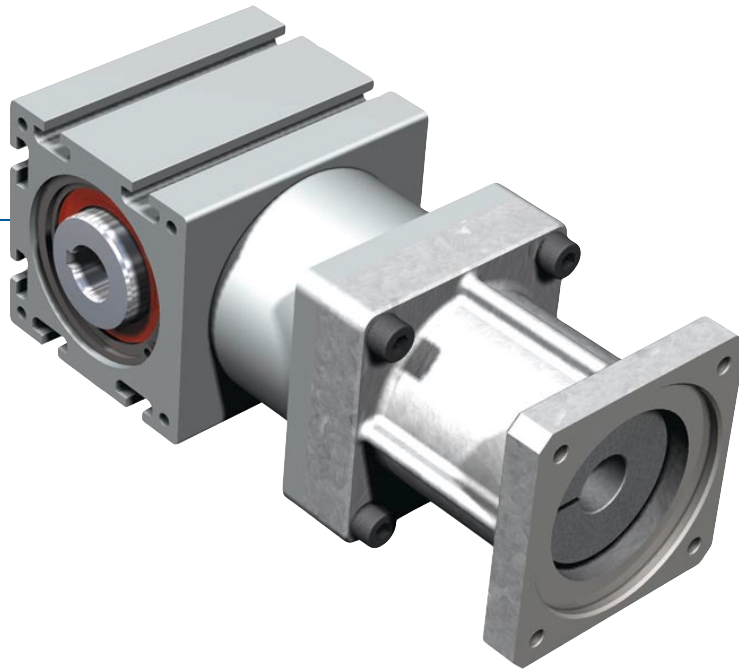
- 1. Housing**
(Light weight aluminum housing with integral T-slots)
- 2. Spiral Bevel Gearing**
(Precision spiral bevel gears)

Low-Cost, Right-Angle Spiral Bevel Gearbox**PL-W**

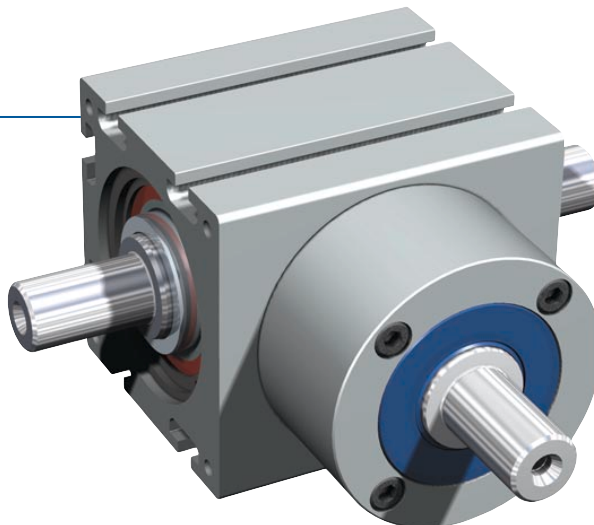
- Single output shaft
- Available with motor mount

**PL-H**

- Hollow output shaft
- Shown with motor mount
- Available with shaft input

**PL-T**

- Dual output shaft
- Available with motor mount



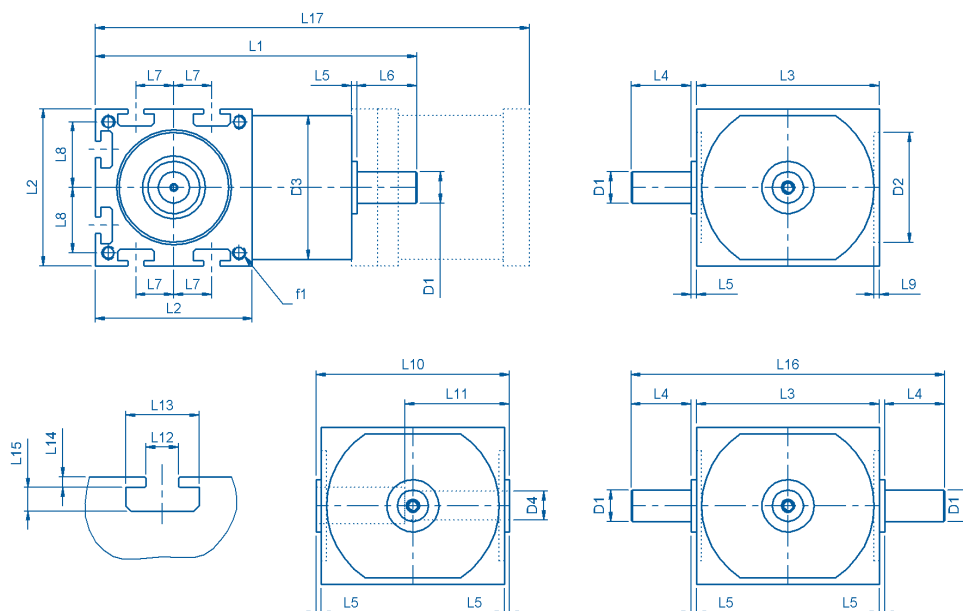
PL-H



POWER-LITE SERIES

Power-Lite Series			60	75	90	110	
Nominal Output Torque	T _{2n}	Nm (lb-in)	1:1	10 (89)	17 (150)	25 (221)	40 (354)
			2:1	11 (97)	20 (177)	40 (354)	80 (708)
Maximum Output Torque	T _{2B}	Nm (lb-in)		15 (133)	30 (266)	60 (531)	120 (1062)
Nominal Speed	n _{1n}	RPM		2250	2000	1750	1500
Maximum Speed	n _{1n}	RPM		3000	3000	3000	3000
Standard Backlash	j	arcmin		< 20	< 18	< 15	< 14
Allowable Radial Load ¹⁾	F _{rad}	N (lbs)		500 (113)	850 (191)	1400 (315)	2300 (518)
Allowable Axial Load	F _{axial}	N (lbs)		250 (56)	425 (96)	700 (158)	1150 (259)
Weight	m	kg (lbs)		1.3 (3)	2.2 (5)	3.9 (9)	6.4 (14)
Inertia at the Input	J ₁	kg cm ² (lb-in ²)	1:1	0.49 (0.17)	1.24 (0.42)	3.86 (1.32)	9.56 (3.27)
			2:1	0.3 (0.1)	0.61 (0.21)	1.86 (0.64)	4.18 (1.43)
Ratios Available			1:1, 2:1				
Efficiency at Load			> 98%				
Service Lifetime			> 10,000 hours				
Lubrication			Synthetic Grease				
Maximum Temperature			100°C				

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



mm (in)		60	75	90	110
D1 _{k6}	shaft diameters	12 (0.47)	15 (0.59)	20 (0.79)	25 (0.98)
D2 _{k5}	pilot bore diameter	42 (1.65)	55 (2.17)	68 (2.68)	80 (3.15)
D3	housing diameter	66 (2.6)	72 (2.83)	82 (3.23)	95 (3.74)
D4 _{h7}	hollow bore diameter	11 (0.43)	14 (0.55)	19 (0.75)	24 (0.94)
	key width (PL-H)	4 (0.16)	5 (0.2)	6 (0.24)	8 (0.31)
f1	mounting holes	M5	M6	M6	M8
L1	total length	123 (4.84)	145.5 (5.73)	171 (6.73)	200 (7.87)
L2	housing size	60 (2.36)	75 (2.95)	90 (3.54)	110 (4.33)
L3	housing width	70 (2.76)	85 (3.35)	105 (4.13)	120 (4.72)
L4	usable shaft length	23 (0.91)	28 (1.1)	36 (1.42)	45 (1.77)
L5	shoulder height	2 (0.08)	2 (0.08)	2 (0.08)	2 (0.08)
L6	usable shaft length	23 (0.91)	28 (1.1)	36 (1.42)	45 (1.77)
L7	slot location	14.5 (0.57)	17.5 (0.69)	22.5 (0.89)	27.5 (1.08)
L8	hole location	25.0 (0.98)	32 (1.26)	38 (1.5)	46 (1.81)
L9	pilot depth	2 (0.08)	2.5 (0.1)	3 (0.12)	3 (0.12)
L10	gearbox width	74 (2.91)	89 (3.5)	109 (4.29)	124 (4.88)
L11*	hollow depth	40 (1.57)	50 (1.97)	60 (2.36)	70 (2.76)
L12	slot width	6.2 (0.24)	8.2 (0.32)	8.2 (0.32)	10.2 (0.4)
L13	slot width	14 (0.55)	19 (0.75)	19 (0.75)	22 (0.87)
L14	slot depth	2 (0.08)	3 (0.12)	4 (0.16)	6 (0.24)
L15	slot depth	4.5 (0.18)	6 (0.24)	6 (0.24)	8 (0.31)
L16	gearbox width	120 (4.72)	145 (5.71)	181 (7.13)	214 (8.43)
L17**	total length	150 (5.91)	180 (7.09)	205 (8.07)	245 (9.65)

*mating shaft for hollow bore is only supported through the L11 length.

** length may vary depending on motor



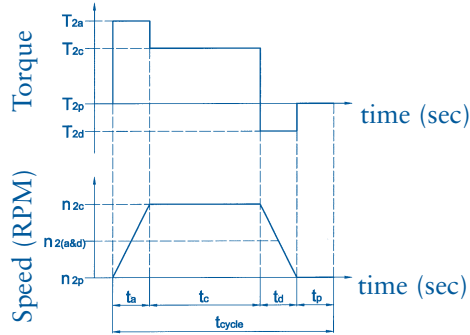
Recommended Output Coupling (if necessary)				
metal bellows elastomer	KM-20 EKM-15	KM-35 EKM-30	KM-60 EKM-60	KM-170 EKM-150

Coupling specifications on pages 48-49.



Determination of the Duty Cycle (ED)

Sample Output Profile



$$ED = \frac{t_a + t_c + t_d}{t_{\text{cycle}}}$$

If $ED < 60\%$ and $(t_a + t_c + t_d) < 20$ minutes, perform a cycle operation selection (S5)

If $ED > 60\%$ or $(t_a + t_c + t_d) > 20$ minutes, perform a continuous operation selection (S1)

Index	
1	Input
2	Output
a	Acceleration
B	Maximum Acceleration
c	Constant
d	Deceleration
m	Mean
max	Maximum
n	Nominal
p	Pause

Symbol	Unit	Description
ED	%	Duty Cycle
fs	—	Shock Factor
i	—	Ratio
J	kg-cm ²	Moment of Inertia
n	RPM	Speed
t	s	Time
T	Nm	Torque
Zh	—	Number of Cycles
η	%	Efficiency

Selection of Optimum Gearbox for a Continuous Operation (S1)

Data needed before selection can be performed:

1. Output profile
2. Desired ratio (i)

Calculations to be performed:

1. Mean Output Speed

$$\Rightarrow n_{2m} = \frac{n_{2a}t_a + n_{2c}t_c + n_{2d}t_d}{t_a + t_c + t_d} = \underline{\hspace{2cm}}$$

2. Root – Mean Output Torque

$$\Rightarrow T_{2m} = \sqrt[3]{\frac{n_{2a}t_a T_{2a}^3 + n_{2c}t_c T_{2c}^3 + n_{2d}t_d T_{2d}^3}{n_{2a}t_a + n_{2c}t_c + n_{2d}t_d}} = \underline{\hspace{2cm}}$$

Selection Criteria for Gearbox:

1. Mean Output Speed

must not exceed the nominal speed rating of the gearbox.

$$n_{2m} \cdot i \leq n_{1n}$$

2. Mean Output Torque must

not exceed the nominal torque rating of the gearbox.

$$T_{2m} \leq T_{2n}$$

See technical data tables for values

of n_{1n} and T_{2n}

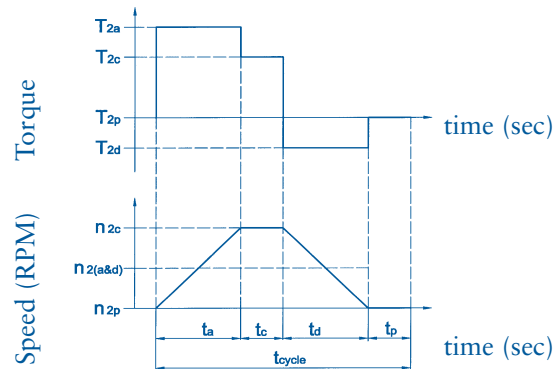
Selection of Optimum Gearbox for a Cycle Operation (S5)

Data needed before selection can be performed:

1. Maximum Torque of the motor (T_{1B})
2. Output profile
3. Desired ratio (i)
4. Inertia of the load (J_L)*
5. Inertia of the motor (J_{motor})*

* optional

Sample Output Profile



Calculations to be performed:

1. Shock Factor (f_s)

$$Z_h = \frac{3600}{t_{cycle}}$$

$Z_h < 1000$	$\Rightarrow f_s = 1.0$
$1000 < Z_h < 1500$	$\Rightarrow f_s = 1.1$
$1500 < Z_h < 2000$	$\Rightarrow f_s = 1.3$
$2000 < Z_h < 3000$	$\Rightarrow f_s = 1.6$
$3000 < Z_h$	$\Rightarrow f_s = 2.0$

2. Maximum Output Torque $T_{2max} = T_{1B} \cdot i \cdot f_s \cdot \eta =$ _____

Selection Criteria for Gearbox:

1. Maximum Output Speed

must not exceed the maximum

speed rating of the gearbox.

$$n_{2c} \cdot i \leq n_{1max}$$

2. Maximum Output Torque

must not exceed the maximum

torque rating of the gearbox.

$$T_{2max} \leq T_{2B}$$

3. (optional) Match inertia of the

motor to the inertia of the load.

$$J_{motor} \approx J_1 + \frac{J_L}{i^2}$$

See technical data tables for values

of η , n_{1max} , T_{2B} , and J_1



I.M.P.A.C.T.™ SERIES

Example: **JPG - W - 090 - 005 G - [115 - 201] - S111**

Gearbox Series _____
I.M.P.A.C.T.™ JPG

Gearbox Style _____
Output shaft W
Bellows coupling output KB
Elastomer coupling output KE

Gearbox Size _____
050, 090, 200, 400, 600

Ratio _____
3, 4, 5, 7, 10, 16, 20, 28, 40, 50, 70, 100

Options Available for This Product _____
(See options table)
All options available

Special Options
Assigned by GAM

Motor Mount Kit Number
Assigned by GAM

OPTION	LOW BACKLASH	VERTICAL MOUNTING (Output shaft up)	OUTPUT KEYWAY
A =	Y	N	N
B =	Y	Y	N
C =	Y	N	Y
D =	Y	Y	Y
E =	N	Y	N
F =	N	Y	Y
G =	N	N	Y
H =	N	N	N

DYNA SERIES

Example: **DS - W B - 090 - 005 G - [115 - 201] - S111**

Gearbox Series _____
Dyna DS

Gearbox Style _____
Single output shaft W
Hollow output shaft H
Dual output shaft T

Input Type _____
Bellows coupling input B
Elastomer coupling input E
Shaft input L

Gearbox Size _____
055, 075, 090, 115, 140, 190

Ratio _____
3, 4, 5, 6, 8, 10, 12, 15, 30, 40, 50, 70, 100

Special Options
Assigned by GAM

Motor Mount Kit Number
Assigned by GAM

Options Available for This Product
(See options table)

OPTION	LOW BACKLASH	OUTPUT KEYWAY
A =	Y	N
C =	Y	Y
G =	N	Y
H =	N	N

Hollow Output Shaft not available with output key. (Use Option A or H)

Example:		HPS - W B - 090 - 005 G - [115 - 201] - S111	
Gearbox Series	_____		
High Power	HPS		
High Power Series with Xtra Torque (available in 1:1)	HPX		
Output Type	_____		
Single output shaft	W		
Hollow output shaft	H		
Dual output shaft	T		
Input Type	_____		
Bellows coupling input	B		
Elastomer coupling input	E		
Shaft input	L		
Gearbox Size	_____		
075, 090, 110, 140, 170, 210, 240, 280			

Special Options
Assigned by GAM

Motor Mount Kit Number
Assigned by GAM if required
No motor mount None

Options Available for This Product
Low backlash C
Standard backlash G

Ratio
1(001), 1.5(015), 2(002),
3(003), 4(004), 5(005)

Example: EPL - W - 084 - 005 G - [115 - 201] - S111

Gearbox Series Economy EPL

Gearbox Style Output shaft W

Gearbox Size 040, 064, 084, 118, 150

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 Number Assigned by GAM

Options Available for This Product
Keyway on output shaft per DIN6885 G

Example: EPL - N23 - 005 G - [115 - 201] - S111

Gearbox Series EPL
Economy w/ NEMA output

NEMA Size N23
NEMA17
NEMA23
NEMA34
NEMA42
NEMA56

Ratio 005
3, 4, 5, 7, 10, 12, 16, 20, 25, 35, 40, 50, 70, 100,
120, 160, 200, 250, 350, 490, 000=1000

Motor Mount Kit Number G
Assigned by GAM

Special Options 115
Assigned by GAM

Options Available for This Product 201
Keyway on output

RIGHT-ANGLE PLANETARY SERIES – NEMA OUTPUT FACE**Example: RPL – N23 – 025 G – [115 – 201] – S111****Gearbox Series**Right-Angle Planetary with
NEMA output face RPL**NEMA Size**

NEMA23	N23
NEMA34	N34
NEMA42	N42

Ratio

25, 40, 50, 70, 100

Options Available for This Product

Keyway on output

G

Special Options

Assigned by GAM

Motor Mount Kit Number

No motor Mount

ULTRA LOW-COST PLANETARY SERIES – NEMA OUTPUT FACE**Example: UPL – N23 – 005 G****Gearbox Series**Ultra Low-Cost Planetary
with NEMA output face UPL**NEMA Size**

NEMA23	N23
NEMA34	N34
NEMA42	N42

Ratio

5, 10, 25, 50, 100

Options Available for This Product

Keyway on output

G

POWER-LITE SERIES**Example: PL – W B – 090 – 001 G – [115 – 201] – S111****Gearbox Series**

Power-Lite PL

Output Type

Single output shaft	W
Hollow output shaft	H
Dual output shaft	T

Input Type

Bellows coupling input	B
Elastomer coupling input	E
Shaft input	L

Gearbox Size

060, 075, 090, 110

Ratio

1:1	001
2:1	002

Special Options

Assigned by GAM

Motor Mount Kit NumberAssigned by GAM if
required
No motor mount None**Options Available for This Product**

Plain shaft	H
Keyway on output	G



KM COUPLING SERIES



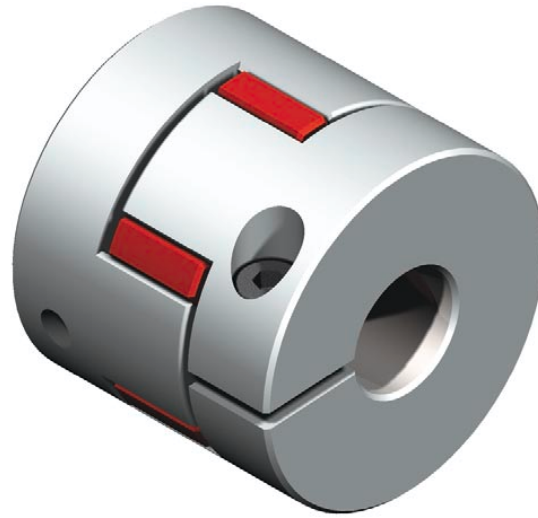
Technical Data / Dimensions: mm (inch)

Size	Nominal Torque	Moment of Inertia	Torsion Resistance	Max. Misalignment	Torque to Tighten Screws	Outer Diameter mm (inch)	Length mm (inch)	Bore Range	
	Nm (lb-in)	10 ³ kgm ² (lb-in ²)	10 ³ Nm/rad (lb-ft/Deg)	Lateral				min. mm (inch)	max. mm (inch)
				mm (inch)	Nm (lb-in)				
KM-0.4	0.4 (3.54)	0.0004 (0.001)	0.2 (2.57)	0.1 (0.004)	1 (0.014)	16.5 (0.65)	30 (1.181)	3 (0.118)	6 (0.236)
KM-0.9	0.9 (7.97)	0.0004 (0.001)	0.4 (5.15)	0.1 (0.004)	1 (8.85)	16.5 (0.65)	31.5 (1.24)	3 (0.118)	6 (0.236)
KM-2	2 (18)	0.003 (0.01)	0.9 (11.59)	0.1 (0.004)	2 (18)	24.5/27.5 (.964/1.082)	42 (1.654)	3 (0.118)	10/14 (.394/.551)
KM-4	4 (35)	0.003 (0.01)	1.8 (23)	0.1 (0.004)	2 (18)	24.5/27.5 (.964/1.082)	43.5 (1.713)	3 (0.118)	10/14 (.394/.551)
KM-8	8 (71)	0.028 (0.096)	5 (64)	0.27 (0.011)	6 (53)	39.5/44.5 (1.555/1.752)	59.5 (2.343)	6 (0.236)	19/21 (.748/.826)
KM-12	12 (106)	0.03 (0.103)	6.8 (88)	0.21 (0.008)	7 (62)	39.5/44.5 (1.555/1.752)	62 (2.441)	10 (0.394)	19/21 (.748/.826)
KM-20	20 (177)	0.14 (0.478)	20 (257)	0.2 (0.008)	14 (124)	56 (2.205)	70 (2.756)	9 (0.354)	30 (1.181)
KM-35	35 (310)	0.14 (0.478)	22 (283)	0.2 (0.008)	14 (124)	56 (2.205)	70 (2.756)	14 (.551)	30 (1.181)
KM-60	60 (531)	0.29 (0.991)	33 (425)	0.2 (0.008)	30 (266)	66 (2.598)	77 (3.031)	18 (0.709)	34 (1.339)
KM-80	80 (708)	0.79 (2.7)	53 (682)	0.2 (0.008)	50 (443)	82 (3.228)	90 (3.543)	17 (0.669)	43 (1.693)
KM-170	170 (1505)	0.83 (2.84)	63 (811)	0.2 (0.008)	65 (575)	82 (3.228)	92 (3.622)	22 (0.866)	43 (1.693)
KM-270	270 (2390)	2.21 (7.45)	111 (1429)	0.2 (0.008)	115 (1018)	101 (3.976)	100 (3.937)	27 (1.063)	54 (2.126)
KM-400	400 (3540)	2.42 (8.27)	162 (2085)	0.2 (0.008)	115 (1018)	101 (3.976)	106 (4.173)	34 (1.339)	54 (2.126)
KM-550	550 (4868)	4.63 (15.82)	238 (3064)	0.2 (0.008)	115 (1018)	122 (4.803)	112 (4.409)	38 (1.496)	75 (2.953)
KM-900	900 (7965)	8.90 (30.42)	335 (4312)	0.15 (0.006)	200 (1770)	133 (5.236)	143 (5.63)	40 (1.575)	76 (2.992)

Coupling must be selected so that the nominal torque M_N is higher than the highest operational torque of the application (i.e., during acceleration). Exceeding the nominal torque M_N can result in a permanent distortion of the metal bellow.

Bore diameters smaller than $\varnothing D_{min}$ are possible but reliable transmission of nominal torque M_N cannot be guaranteed.

EKM COUPLING SERIES



Coupling Specifications

Technical Data / Dimensions: mm (inch)

Size	Nominal Torque	Elastomer Hardness	Moment of Inertia	Torsion Resistance	Max. Misalignment	Torque to Tighten Screws	Outer Diameter mm (inch)	Length mm (inch)	Bore Range	
	Nm (lb-in)	Shore	10 ³ Nm/rad (lb-in ²)	10 ³ kgm ² (lb-ft/Deg)	Lateral				min. mm (inch)	max. mm (inch)
					mm (inch)	Nm (lb-in)				
EKM-8	8 (71)	98 Sh-A	0.01 (0.03)	.160 (2.1)	0.1 (0.004)	4 (35)	32 (1.26)	40 (1.574)	8 (0.315)	15 (0.591)
EKM-15	15 (133)	98 Sh-A	0.03 (0.1)	.820 (10.6)	0.1 (0.004)	8 (71)	40 (1.575)	50 (1.969)	10 (0.394)	19 (0.748)
EKM-20	20 (177)	72 Sh-D	0.03 (0.1)	1.20 (15.4)	0.07 (0.003)	8 (71)	40 (1.575)	50 (1.969)	12 (0.472)	19 (0.748)
EKM-30	30 (266)	98 Sh-A	0.09 (0.31)	1.40 (18)	0.1 (0.004)	14 (124)	50 (1.969)	58 (2.283)	13 (0.512)	26 (1.024)
EKM-45	45 (398)	72 Sh-D	0.09 (0.31)	2.00 (25.7)	0.07 (0.003)	14 (124)	50 (1.969)	58 (2.283)	18 (0.709)	26 (1.024)
EKM-60	60 (531)	98 Sh-A	0.18 (0.62)	2.10 (27)	0.1 (0.004)	35 (310)	60 (2.362)	62 (2.441)	15 (0.591)	29 (1.142)
EKM-90	90 (797)	72 Sh-D	0.18 (0.62)	3.10 (39.9)	0.07 (0.003)	35 (310)	60 (2.362)	62 (2.441)	20 (0.787)	29 (1.142)
EKM-150	150 (1328)	98 Sh-D	0.38 (1.3)	3.60 (46.3)	0.1 (0.004)	35 (310)	70 (2.756)	73 (2.874)	22 (0.866)	38 (1.496)
EKM-200	200 (1770)	72 Sh-D	0.38 (1.3)	5.20 (66.9)	0.07 (0.003)	67 (593)	70 (2.756)	73 (2.874)	26 (1.024)	33 (1.299)
EKM-300	300 (2655)	98 Sh-A	1 (3.42)	6.80 (87.5)	0.12 (0.005)	67 (593)	85 (3.346)	86 (3.386)	30 (1.181)	46 (1.811)
EKM-400	400 (3540)	72 Sh-D	1 (3.42)	9.80 (126.2)	0.1 (0.004)	115 (1018)	85 (3.346)	86 (3.386)	35 (1.378)	42 (1.654)
EKM-500	500 (4425)	98 Sh-A	2.2 (7.52)	20.0 (257.5)	0.15 (0.006)	115 (1018)	100 (3.937)	94 (3.701)	38 (1.496)	56 (2.205)
EKM-700	700 (6195)	98 Sh-A	5.2 (17.77)	24.0 (309)	0.15 (0.006)	185 (1637)	120 (4.724)	109 (4.291)	40 (1.575)	70 (2.756)

Coupling must be selected so that the nominal torque M_N is higher than the highest operational torque of the application (i.e., during acceleration). Exceeding the nominal torque M_N can result in a permanent distortion of the metal bellow.

Bore diameters smaller than $\varnothing D_{min}$ are possible but reliable transmission of nominal torque M_N cannot be guaranteed.

