Highest Precision: Dyna Series

GAM can. Just ask!

If you don't see exactly what you need, let us know. We can modify the Dyna Series gearboxes to meet your needs. Page 3 provides a list of commonly requested modifications to give you a feel for our capabilities.

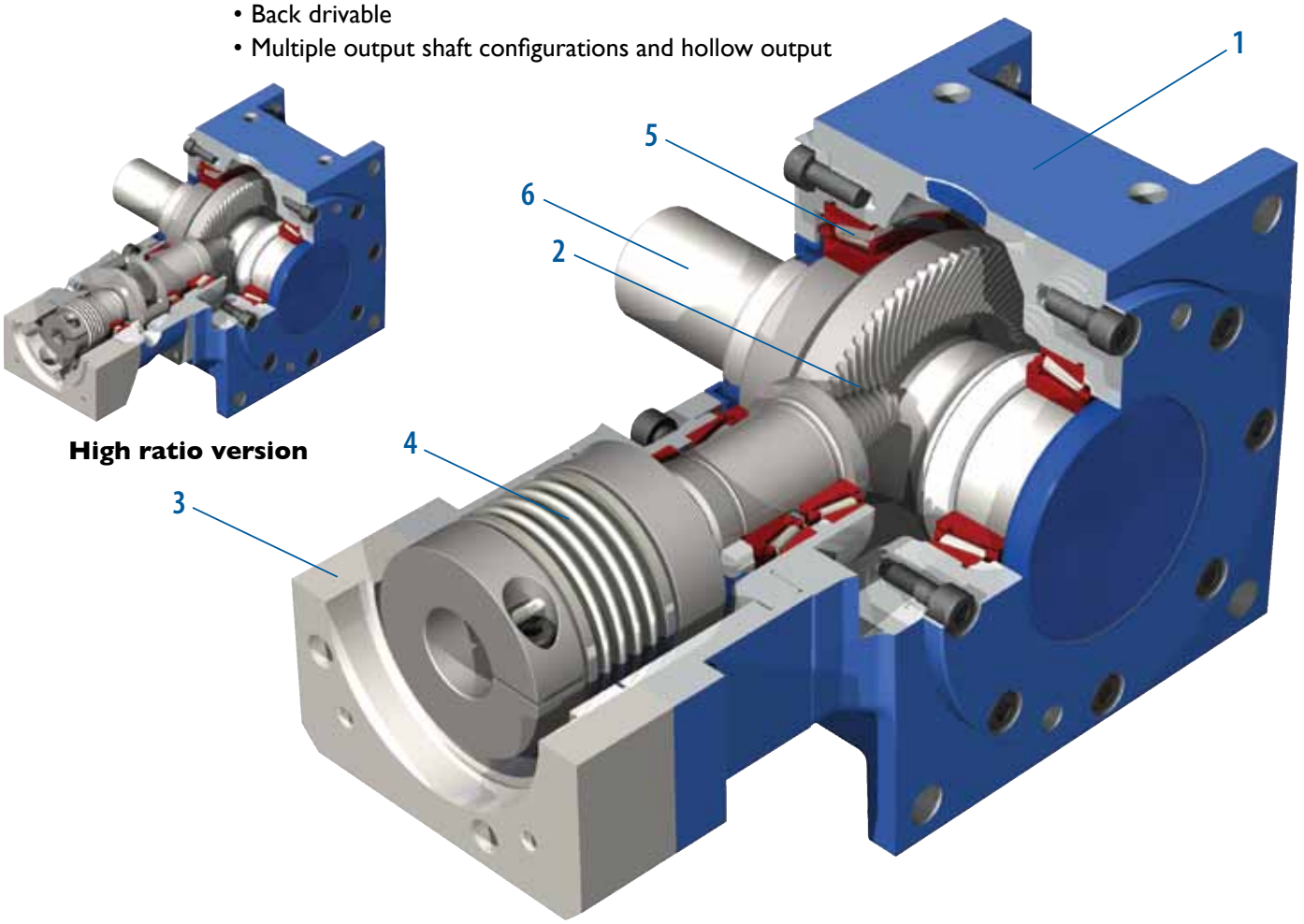
We've taken the highest-performing gearbox on the market and made some design modifications to further distance it from other gearboxes. The housing and construction have been enhanced and now offer even greater durability. Gear rotation is smoother, bearing life improved and noise is reduced.

DSX version for ultra high performance!

For the most demanding motion control applications that require high angular accuracy, choose our new DSX model. It offers extremely low backlash, extremely smooth torque transmission and extremely low noise. Angular accuracy test data is available upon request.

Dyna Series benefits include:

- Ratios up to 15:1 in a single stage – the highest in the market – and 100:1 in just two gear stages
- High efficiencies
- High allowable axial and radial loading
- Ultra low backlash
- Back drivable
- Multiple output shaft configurations and hollow output

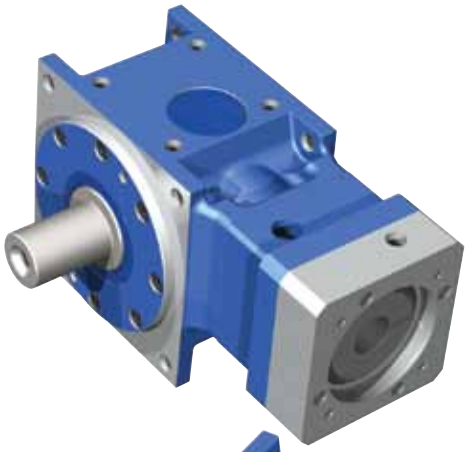


High ratio version

NEW DSX version for the most demanding accuracy applications!

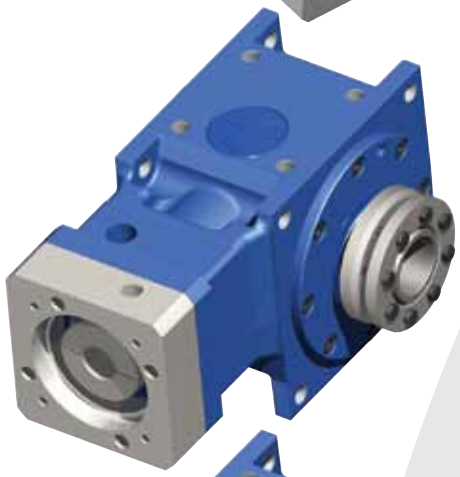
1. Aluminum Housing
   (Aluminum housing significantly reduces the weight of the gearbox)
2. Hypoid Gearing
   (Optimized gearing allows ratios up to 15:1 in a single stage; 100:1 in two stages)
3. Adapter Flange
   (Customized adapter flanges for quick and easy mounting to any motor)
4. Coupling
   (Gearbox can be supplied with either a bellows or elastomer coupling)
5. Tapered Roller Bearings
   (Roller bearings for high radial and axial loading)
6. Output Shaft
   (Gearbox can be supplied with one or two solid shafts or hollow shafts)

Highest Precision: Dyna Series



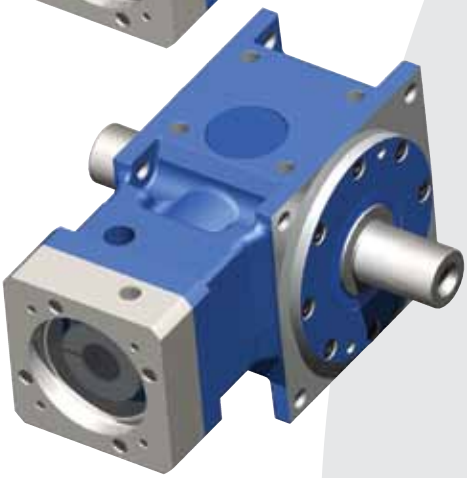
DS-W

- Single output shaft configuration with our high performance bellow coupling input and machined motor flange to mount to any servo motor
- Frame sizes from 55 mm to 190 mm
- DSX option available



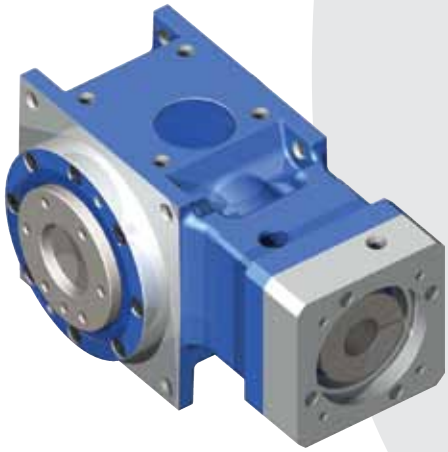
DS-H

- Hollow bore output configuration with our high performance bellow coupling input and machined motor flange to mount to any servo motor
- Zero-backlash shrink disk coupling on the output included with the gearbox
- Frame sizes from 55 mm to 190 mm
- DSX option available



DS-T

- Dual output shaft configuration with our high performance bellow coupling input and machined motor flange to mount to any servo motor
- Frame sizes from 55 mm to 190 mm
- DSX option available



DS-F

- Flange output allows connection of pinion gears, pulleys, rotary index tables, and transmission shafting directly to the output for a more compact and stiffer solution
- Frame sizes from 55 mm to 190 mm
- DSX option available

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.

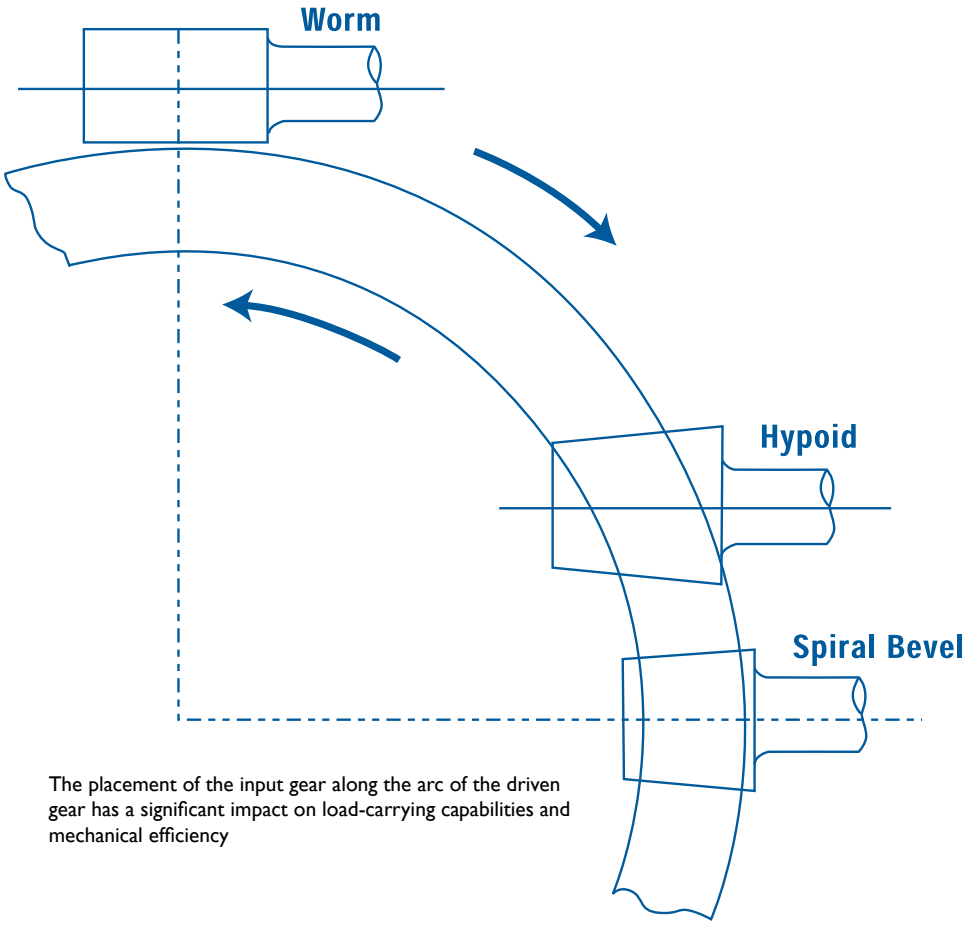
Conventional worm gearing, meshing in the position shown at the top of the drawing, has a very high total tooth contact area. While it offers high torque throughput and high ratio reduction, worm gearing has the lowest mechanical efficiency, due to the friction generated by its high component of sliding 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 gear box.

The GAM Hypoid offers two important advantages:

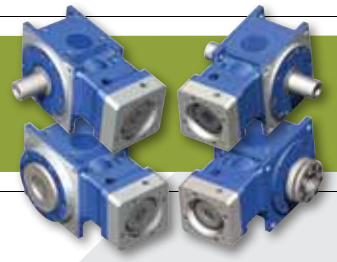
- Single-stage design eliminates backlash from a second set of meshing gears
- Accurate machining and assembly alignment – high-accuracy models offer backlash of ≤ 2 arcminutes.

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



The placement of the input gear along the arc of the driven gear has a significant impact on load-carrying capabilities and mechanical efficiency

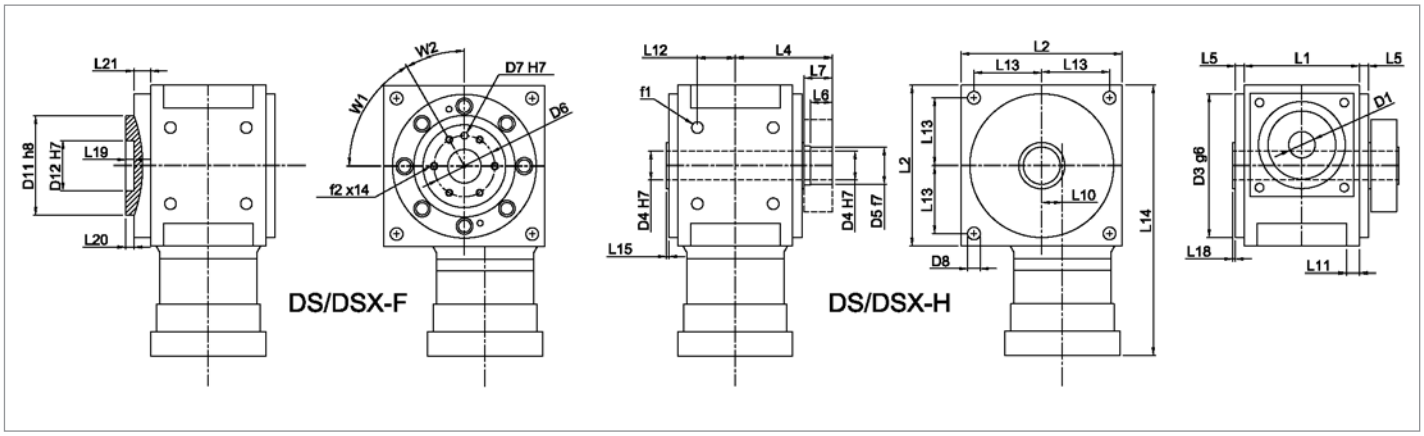
Highest Precision: Dyna Series

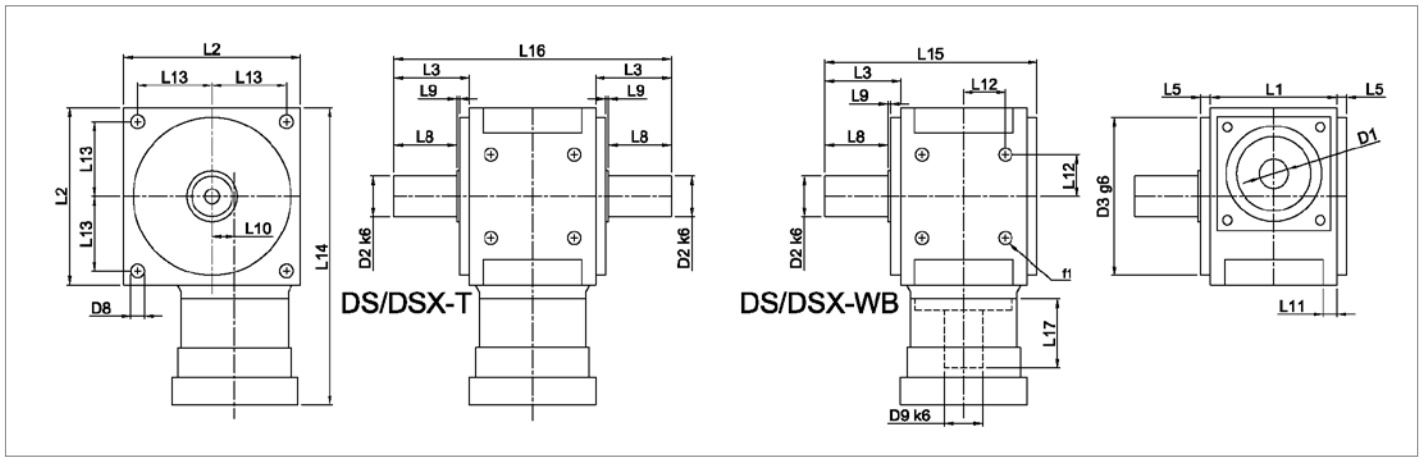


Dyna Series			55	75	90	115	130	140	160	190
Stock Ratios [1]			3, 5, 10, 15, 30, 50, 100		3, 5, 10, 15					N/A
All Ratios Available			1-stage: 3, 4, 5, 6, 8, 10, 12, 15 2-stage: 30, 40, 50, 70 ,100 3-stage: consult GAM							
Thermal Limit [2] (N)	kW	3:1, 4:1	2.4	3.8	5.1	7.4	-	11.5	-	17.5
		5:1, 6:1, 8:1	1.9	3.0	4.1	5.9	-	9.1	-	14.1
		10:1	1.6	2.5	3.4	4.9	-	7.7	-	11.6
		12:1	1.3	2.2	2.9	4.2	-	6.6	-	10.1
		15:1	1.0	1.7	2.2	3.3	-	5.1	-	7.8
Nominal Output Torque (T_{2n})	Nm (lb-in)	12:1, 15:1	20 (177)	40 (354)	75 (664)	145 (1283)	300 (2655)	410 (3629)	815 (7213)	810 (7169)
		all other ratios	35 (310)	70 (620)	140 (1239)	260 (2301)	430 (3806)	720 (6372)	1100 (9735)	1440 (12744)
Max Acceleration Output Torque (T_{2B})	Nm (lb-in)	12:1, 15:1	32 (283)	60 (531)	115 (1018)	220 (1947)	450 (3983)	615 (5443)	1223 (10824)	1230 (10886)
		all other ratios	53 (469)	105 (929)	210 (1859)	390 (3452)	645 (5708)	1080 (9558)	1650 (14603)	2160 (19116)
Emergency Output Torque (T_{2not})	Nm (lb-in)	12:1, 15:1	50 (443)	100 (885)	190 (1682)	360 (3186)	600 (5310)	1020 (9027)	1630 (14426)	2040 (18054)
		all other ratios	70 (620)	140 (1239)	280 (2478)	520 (4602)	860 (7611)	1440 (12744)	2200 (19470)	2880 (25488)
Nominal Input Speed [6] (n_{1n})	RPM	3:1 - 15:1	6000	6000	5000	4000	3000	3000	2500	2500
		30:1 - 100:1	3000	3000	3200	3200	2900	2800	2600	2500
Max Input Speed [6] (n_{1max})	RPM	3:1 - 15:1	8000	8000	7000	6000	5000	5000	4500	4500
		30:1 - 100:1	6000	6000	6000	6000	6000	6000	5000	4500
Standard Output Backlash (j)	arcmin	3:1 - 15:1	< 5	< 5	< 4	< 4	< 4	< 4	< 4	< 4
		30:1 - 100:1	< 7	< 7	< 6	< 6	< 6	< 6	< 6	< 6
Reduced Output Backlash (j)	arcmin	3:1 - 15:1	< 3	< 3	< 2	< 2	< 2	< 2	< 2	< 2
		30:1 - 100:1	< 4	< 4	< 3	< 3	< 3	< 3	< 3	< 3
DSX Precision Output Backlash [3] (j)	arcmin	3:1 - 15:1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
		30:1 - 100:1	< 3	< 3	< 2	< 2	< 2	< 2	< 2	< 2
DSX Noise Level	dB	-	< 64	< 64	< 66	< 66	< 67	< 67	< 69	< 69
Noise Level (L_{PA})	dB	-	< 66	< 66	< 68	< 68	< 70	< 70	< 72	< 72
Allowable Radial Load [4] (F_{rad})	N (lb)	-	3300 (743)	4900 (1103)	7200 (1620)	10000 (2250)	12000 (2700)	15000 (3375)	20000 (4500)	22500 (5063)
Allowable Axial Load (F_{axial})	N (lb)	-	1650 (371)	2450 (551)	3600 (810)	5000 (1125)	6000 (1350)	7500 (1688)	9000 (2025)	11250 (2531)
Torsional Stiffness (C_{t21}) [5]	Nm/arcmin (lb-in/ arcmin)	-	3.5 (31)	7 (62)	17.5 (155)	39 (345)	70 (620)	103 (912)	155 (1372)	210 (1859)
Weight (m)	kg (lbs)	3:1 - 15:1	3.5 (7.7)	5.5 (12.1)	9.5 (20.9)	15.5 (34.2)	23.5 (51.8)	32.5 (71.7)	46.5 (102.5)	60 (132.3)
		30:1 - 100:1	3.5 (7.7)	6 (13.2)	9.9 (21.8)	16.4 (36.2)	- -	30.2 (66.6)	- -	52.5 (115.8)
Mass Moment of Inertia (J_1)	kg cm^2	3:1, 4:1	0.39 (0.13)	0.98 (0.33)	2.42 (0.83)	7.12 (2.43)	14.03 (4.79)	26.96 (9.2)	52.32 (17.86)	91.47 (31.22)
		5:1, 6:1	0.23 (0.08)	0.58 (0.2)	1.41 (0.48)	4 (1.37)	7.12 (2.43)	13.53 (4.62)	24.76 (8.45)	44.29 (15.12)
	(lb-in^2)	8:1 - 15:1	0.17 (0.06)	0.43 (0.15)	1.12 (0.38)	2.85 (0.97)	5.09 (1.74)	8.95 (3.05)	15.67 (5.35)	27.07 (9.24)
		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)
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) Stock ratios listed are available in Standard AND Reduced Backlash. 2) Nominal torque and speed values listed are for gear tooth ratings. Use thermal limit for continuous operation.
3) DSX Precision ground gearing for quieter and smoother operation, improved accuracy, and repeatability. 4) Load applied at center of output shaft @ 100 RPM. 5) Stiffness values relate to DS-W version only. Stiffness for DS-H,F may vary slightly- contact GAM for values. 6) Higher input speeds may be possible – consult GAM.

DYNA SERIES - DS-W, DS-H, DS-T, DS-F





Recommended Output Coupling (if necessary)								
metal bellows	KM-60	KM-170	KM-270	KM-400	KM-900	KM-1300	KSD-2500	KSD-2500
elastomer	EKM-60	EKM-150	EKM-300	EKM-500	EKM-700	EKM-1000	-	-

TYPE CODES FOR DYNA SERIES

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

Gearbox Series
DS = Dyna Series
DSX = Dyna Series Extreme

Gearbox Style
W = Single output shaft
T = Dual output shaft
H = Hollow output shaft
F = Flange output

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

Gearbox Size
055, 075, 090, 115, 130, 140, 160, 190

Ratio
003, 004, 005, 006, 008, 010,
012, 015, 030, 040, 050, 070, 100

Special Options
Assigned by GAM

Motor Mount Kit
Assigned by GAM

Options Available for This Product

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

Options C and G N/A for DS-F/H models.

Tolerances (mm)						
Size	k6	g6	h8	f7	H7	h6
Over 6	+0.010	-0.005	0	-0.013	+0.015	0
Thru 10	+0.001	-0.014	-0.022	-0.028	0	-0.009
Over 10	+0.012	-0.006	0	-0.016	+0.018	0
Thru 18	+0.001	-0.017	-0.027	-0.034	0	-0.011
Over 18	+0.015	-0.007	0	-0.02	+0.021	0
Thru 30	+0.002	-0.020	-0.033	-0.041	0	-0.013
Over 30	+0.018	-0.009	0	-0.025	+0.025	0
Thru 50	+0.002	-0.025	-0.039	-0.05	0	-0.016
Over 50	+0.021	-0.010	0	-0.03	+0.030	0
Thru 80	+0.002	-0.029	-0.046	-0.06	0	-0.019
Over 80	+0.025	-0.012	0	-0.036	+0.035	0
Thru 120	+0.003	-0.034	-0.054	-0.021	0	-0.022
Over 120	+0.028	-0.014	0	-0.043	+0.040	0
Thru 180	+0.003	-0.039	-0.063	-0.083	0	-0.025

Dyna Series		55		75		90		115		130		140		160		190	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)
$D1_{max\ 1\text{-}stage*}$	input shaft diameter	21	(0.827)	28	(1.102)	35	(1.378)	43	(1.693)	55	(2.165)	55	(2.165)	55	(2.165)	55	(2.165)
$D1_{max\ 2\text{-}stage*}$		14	(0.551)	14	(0.551)	24	(0.945)	24	(0.945)	24	(0.945)	38	(1.496)	38	(1.496)	38	(1.496)
D3 g6	pilot diameter	89	(3.504)	105	(4.134)	125	(4.921)	150	(5.906)	173	(6.811)	195	(7.677)	225	(8.858)	245	(9.646)
D8	mounting hole diameter	6.6	(0.26)	9	(0.354)	11	(0.433)	14	(0.551)	14	(0.551)	17.5	(0.689)	17.5	(0.689)	17.5	(0.689)
D9 k6	gearbox input shaft dia	14	(0.551)	18	(0.709)	22	(0.866)	28	(1.102)	32	(1.26)	32	(1.26)	36	(1.417)	40	(1.575)
f1	mounting hole thread	M6		M8		M10		M12		M12		M16		M16		M16	
L1	housing width	60	(2.362)	80	(3.15)	100	(3.937)	120	(4.724)	138	(5.433)	146	(5.748)	166	(6.535)	196	(7.717)
L2	housing size	90	(3.543)	115	(4.528)	140	(5.512)	170	(6.693)	192	(7.559)	215	(8.465)	240	(9.449)	260	(10.236)
L5	pilot height	13.5	(0.531)	8.5	(0.335)	8	(0.315)	8	(0.315)	10	(0.394)	10	(0.394)	10	(0.394)	10	(0.394)
L10	hypoid offset	9	(0.354)	14	(0.551)	18	(0.709)	23	(0.906)	27	(1.063)	32	(1.26)	38	(1.496)	42	(1.654)
L11	flange thickness	8	(0.315)	10	(0.394)	11	(0.433)	13	(0.512)	14	(0.551)	15	(0.591)	16	(0.63)	17	(0.669)
L12	hole location	22	(0.866)	27	(1.063)	33	(1.299)	40	(1.575)	48	(1.89)	52	(2.047)	60	(2.362)	70	(2.756)
L13	hole location	39	(1.535)	49	(1.929)	59	(2.323)	72	(2.835)	82	(3.228)	91	(3.583)	103	(4.055)	112	(4.409)
L14 1-stage **	input length	181	(7.126)	219	(8.622)	250.5	(9.862)	286.5	(11.28)	356	(14.016)	363.5	(14.311)	428	(16.85)	439	(17.283)
L14 2-stage **		229.5	(9.035)	262	(10.315)	247.5	(9.744)	280	(11.024)	Contact GAM		372	(14.646)	Contact GAM		591	(23.268)
L17	input shaft length	20	(0.787)	26	(1.024)	43	(1.693)	48	(1.89)	51	(2.008)	55	(2.165)	59	(2.323)	62	(2.441)

* for larger shaft diameters consult GAM ** depending on motor, length may vary

DS/DSX-F, DS/DSX-H		55		75		90		115		130		140		160		190	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)
D4 H7 **	hollow bore	20	(0.787)	25	(0.984)	30	(1.181)	40	(1.575)	48	(1.89)	55	(2.165)	60	(2.362)	70	(2.756)
D5 f7	hollow outer diameter	24	(0.945)	30	(1.181)	36	(1.417)	50	(1.969)	55	(2.165)	68	(2.677)	75	(2.953)	80	(3.15)
D6	flange bolt circle	40	(1.575)	50	(1.969)	63	(2.48)	80	(3.15)	80	(3.15)	100	(3.937)	100	(3.937)	125	(4.921)
D7 H7	locating hole diameter	6	(0.236)	6	(0.236)	6	(0.236)	8	(0.315)	8	(0.315)	8	(0.315)	8	(0.315)	10	(0.394)
D11 h8	flange pilot (OD)	50	(1.969)	63	(2.48)	80	(3.15)	100	(3.937)	100	(3.937)	125	(4.921)	125	(4.921)	160	(6.299)
D12 H7	flange pilot (ID)	25	(0.984)	31.5	(1.24)	40	(1.575)	50	(1.969)	50	(1.969)	63	(2.48)	63	(2.48)	80	(3.15)
f2	flange tapped holes	7 x M6		7 x M6		7 x M6		11 x M8		11 x M8		11 x M8		11 x M8		11 x M10	
L4	hollow hub length	73	(2.874)	81	(3.189)	95	(3.74)	109	(4.291)	121	(4.764)	129	(5.079)	139	(5.472)	161	(6.339)
L6	hub length	20	(0.787)	22	(0.866)	26	(1.024)	29	(1.142)	32	(1.26)	32	(1.26)	34	(1.339)	34	(1.339)
L7	shoulder + hub length	23	(0.906)	25	(0.984)	29	(1.142)	33	(1.299)	37	(1.457)	37	(1.457)	40	(1.575)	40	(1.575)
L18	shoulder height	1.5	(0.059)	1.5	(0.059)	2	(0.079)	2	(0.079)	2	(0.079)	2	(0.079)	2	(0.079)	2	(0.079)
L19	inner flange pilot depth	6.5	(0.256)	6.5	(0.256)	6.5	(0.256)	8.5	(0.335)	8.5	(0.335)	8.5	(0.335)	8.5	(0.335)	10.5	(0.413)
L20	outer flange pilot height	6.5	(0.256)	6.5	(0.256)	6.5	(0.256)	8.5	(0.335)	8.5	(0.335)	8.5	(0.335)	8.5	(0.335)	8.5	(0.335)
L21	pilot height	20	(0.787)	15.5	(0.61)	17	(0.669)	20	(0.787)	20	(0.787)	17.5	(0.689)	17.5	(0.689)	22.5	(0.886)
W1	hole angle 1	45°		45°		45°		30°		30°		30°		30°		30°	
W2	hole angle 2	45°		45°		45°		30°		30°		30°		30°		30°	

* for larger shaft diameters, consult GAM ** mating shaft should have h6 tolerance *** depending on motor, length may vary

DS/DSX-W, DS/DSX-T		55		75		90		115		130		140		160		190	
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)
D2 k6	output shaft diameter	20	(0.787)	24	(0.945)	32	(1.26)	40	(1.575)	48	(1.89)	55	(2.165)	60	(2.362)	70	(2.756)
L3	output shaft length	50	(1.969)	50	(1.969)	60	(2.362)	70	(2.756)	87	(3.425)	102	(4.016)	112	(4.409)	122	(4.803)
L8	usable shaft length	35	(1.378)	40	(1.575)	50	(1.969)	60	(2.362)	75	(2.953)	90	(3.543)	100	(3.937)	110	(4.331)
L9	shoulder height	1.5	(0.059)	1.5	(0.059)	2	(0.079)	2	(0.079)	2	(0.079)	2	(0.079)	2	(0.079)	2	(0.079)
L15	gearbox width	123.5	(4.862)	138.5	(5.453)	168	(6.614)	198	(7.795)	235	(9.252)	258	(10.157)	288	(11.339)	328	(12.913)
L16	gearbox width	160	(6.299)	180	(7.087)	220	(8.661)	260	(10.236)	312	(12.283)	350	(13.78)	390	(15.354)	440	(17.323)

* for larger shaft diameters consult GAM ** depending on motor, length may vary

High Precision: Dyna-Lite Series

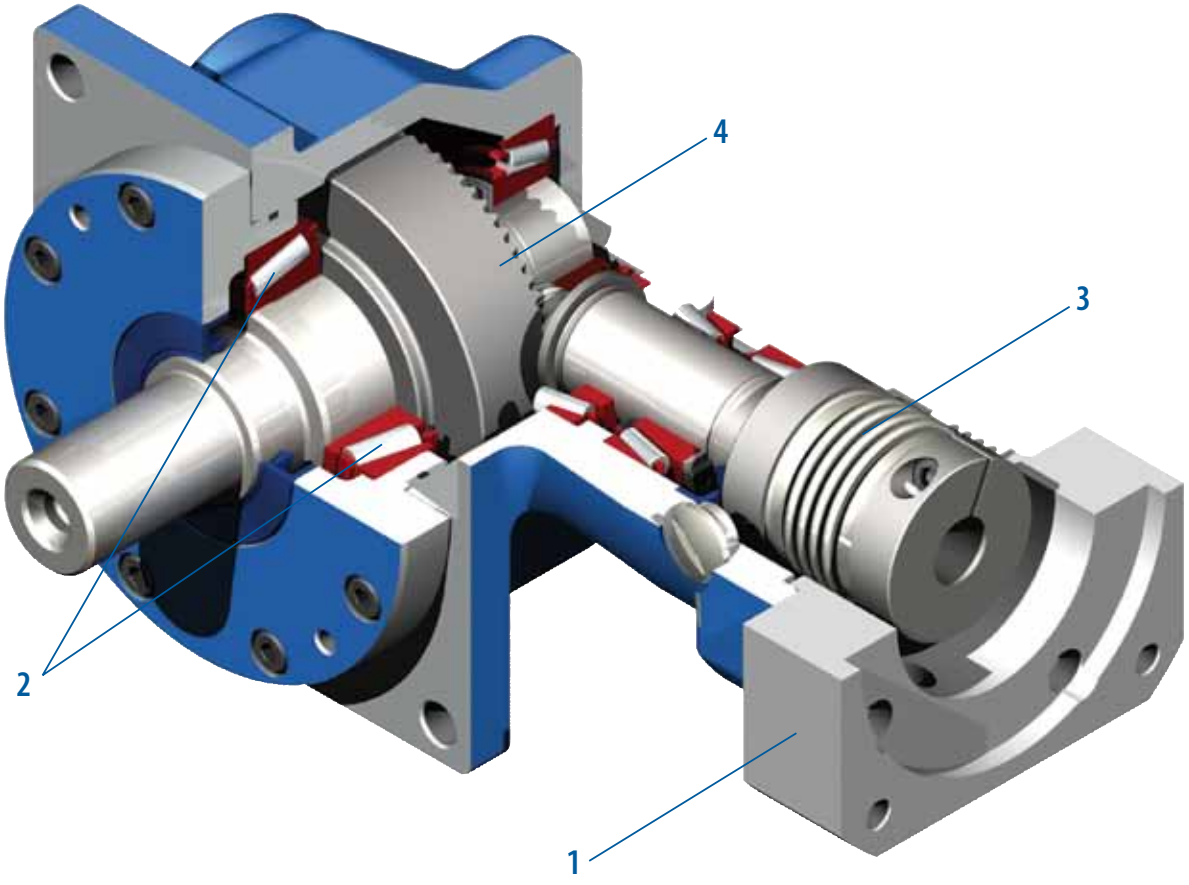
GAM can. Just ask!

If you don't see exactly what you need, let us know. We can modify the Dyna-Lite Series gearboxes to meet your needs. Page 3 provides a list of commonly requested modifications to give you a feel for our capabilities.

Now there's a right-angle gearbox that has the performance and price point of a precision in-line gearbox. Our redesigned Dyna-Lite Series use hypoid gearing that combines the space and configuration advantages of worm gearing with the high efficiency of bevel gearing. It is drop-in replacement for many right-angle and in-line planetary gear reducers.

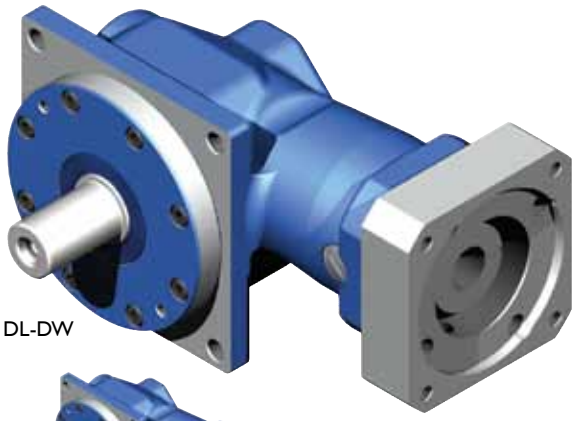
Dyna-Lite Series benefits include:

- Ratios up to 15:1 in a single stage and 150:1 in two stages
- High efficiency – 96%
- Standard backlash < 6 arcmin
- Back drivable
- High radial loading
- Available in shaft output and hollow output



1. Adapter Plate
   (Allows for quick and easy motor mounting)
2. Bearings
   (Taper roller bearings allows high radial loading of output shaft)
3. Bellows Coupling
   (Bellows coupling for quick motor mounting)
4. Hypoid Gearing
   (Optimized gearing allows ratios up to 15:1 in a single stage; 150:1 in two stages)

High Precision: Dyna-Lite Series

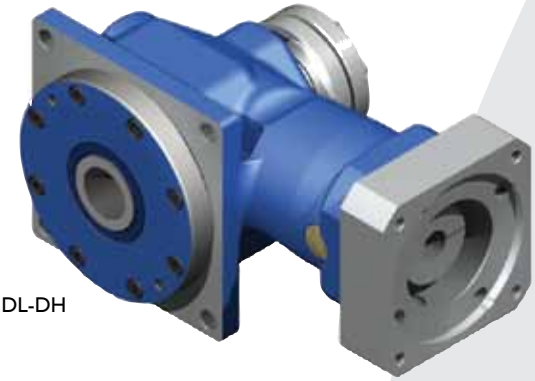


DL-DW

DL-DW High Ratio
(High Ratio available on all versions)

DL-DW

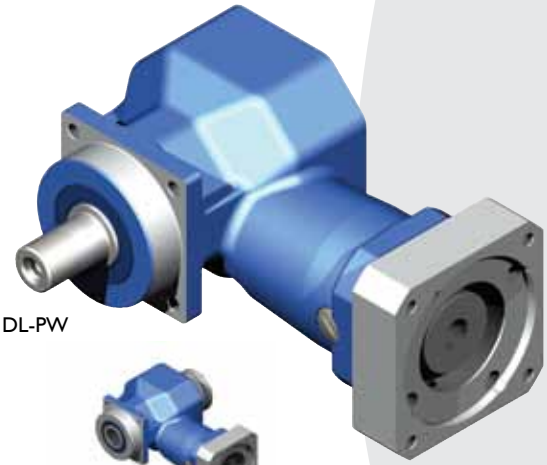
- Single output shaft configuration with our high performance bellow coupling
- Input and housing to mount to any servo motor
- Ratios up to 15:1 in a single stage and 150:1 in two stages
- Frame sizes: 55, 75 and 90 mm
- Drop-in for our highest precision Dyna Series



DL-DH

DL-DH

- Smooth hollow output shaft configuration (includes shrink disc)
- Input and housing to mount to any servo motor
- Ratios up to 15:1 in a single stage and 150:1 in two stages
- Frame sizes: 55, 75 and 90 mm
- Drop-in for our highest precision Dyna Series



DL-PW

DL-PH
(Available upon request)

DL-PW

- Single output shaft configuration with our high performance bellow coupling
- Input and housing to mount to any servo motor
- Ratios up to 15:1 in a single stage and 150:1 in two stages
- Frame sizes: 55, 75 and 90 mm
- Drop-in for many right-angle and in-line planetary gear reducers
- Rotation direction is opposite for DW and PW models.

DL-PH (Contact GAM for availability)

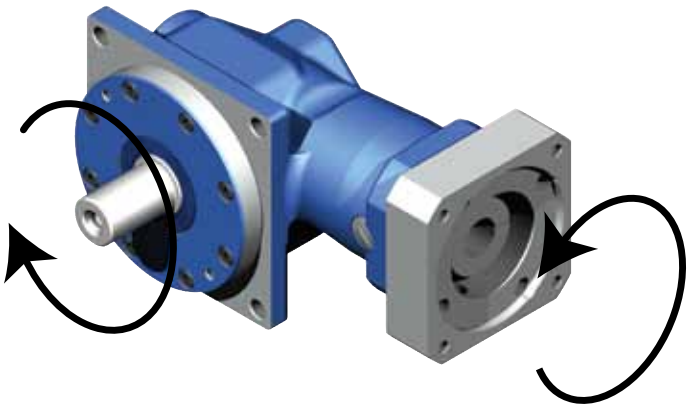
- Smooth hollow output shaft configuration (includes shrink disc)

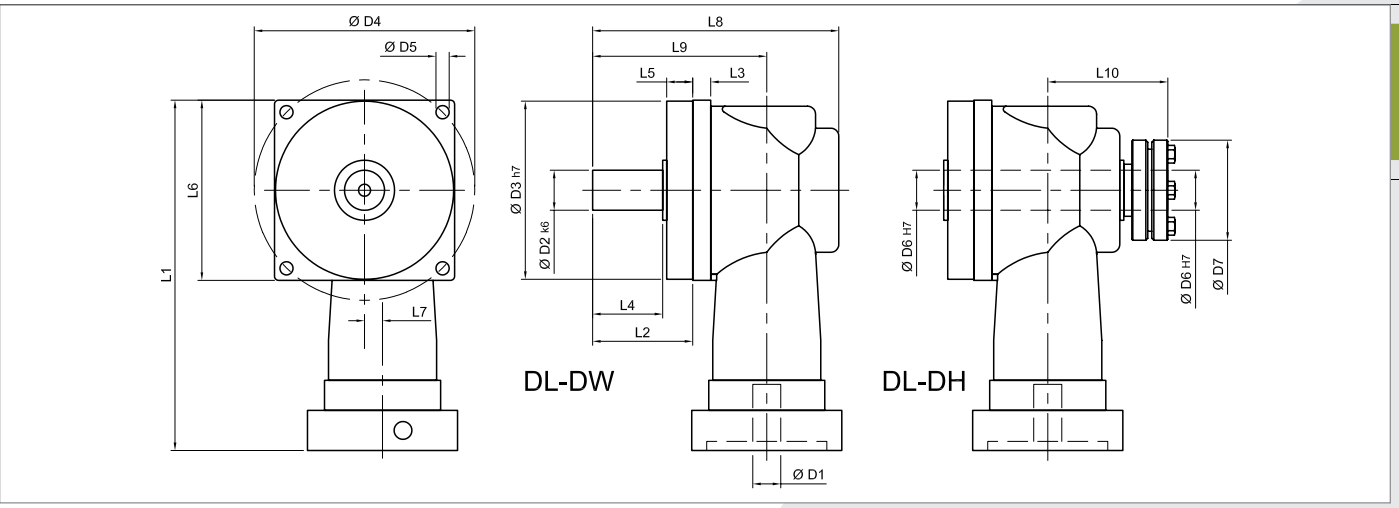
Dyna-Lite Series - DL-DW

Dyna-Lite Series			55	75	90
Stock Ratios			5, 10, 25, 50, 100, 150		
All Ratios Available*			1-stage: 5, 10, 15 2-stage: 25, 50, 100, 150* For other ratios, consult GAM.		
Nominal Output Torque (T_{2n})	Nm (lb-in)	5:1, 10:1, 25:1, 50:1, 100:1	35 (310)	70 (620)	140 (1239)
		15:1, 150:1	25 (221)	50 (443)	90 (797)
Max Acceleration Output Torque (T_{2B})	Nm (lb-in)	5:1, 10:1, 25:1, 50:1, 100:1	53 (469)	105 (929)	210 (1859)
		15:1, 150:1	38 (336)	75 (664)	143 (1266)
Emergency Output Torque (T_{2not})	Nm (lb-in)	5:1, 10:1, 25:1, 50:1, 100:1	70 (620)	140 (1239)	280 (2478)
		15:1, 150:1	50 (443)	100 (885)	190 (1682)
Nominal Input Speed (n_{1n})	RPM	5:1	3700	3100	2700
		10:1, 15:1	4200	3500	3000
		2-stage	3500	3000	3000
Max Input Speed (n_{1max})	RPM		6000	6000	5000
Standard Output Backlash (j)	arcmin	1-stage	< 7	< 7	< 6
		2-stage	< 9	< 9	< 8
Allowable Radial Load (F_{rad})[1]	N (lbs)		3300 (743)	4900 (1103)	7200 (1620)
Allowable Axial Load (F_{axial})	N (lbs)		1650 (371)	2450 (551)	3600 (810)
Torsional Stiffness (C_{t21})	Nm/arcmin		1.5	4.0	10.0
	(lb-in/arcmin)		(13.28)	(35.40)	(88.51)
Weight (m)	kg (lbs)	1-stage	2.6 (5.7)	4.5 (9.9)	9 (19.8)
		2-stage	3.6 (7.9)	6.8 (15)	14.8 (32.6)
Noise Level (L_{PA})	dB(A)	1-stage	< 66	< 66	< 68
		2-stage	< 69	< 70	< 72
Mass Moment of Inertia (J_1)	kg cm² (lb-in²)	5:1	0.44 (0.15)	1.06 (0.36)	3.6 (1.224)
		10:1, 15:1	0.35 (0.119)	0.84 (0.286)	2.9 (0.986)
		25:1	0.17 (0.058)	0.45 (0.153)	1.65 (0.561)
		50:1, 100:1	0.14 (0.048)	0.34 (0.116)	1.1 (0.374)
Efficiency at Load			5,10: 96% 15: 93% 25,50,100,150: 87%		
Service Life			>15000 hours		
Lubrication			Life Time Lubrication		
Protection Rating			IP 64		
Operating Temperature Range			-10°C to 100°C (14°F to 212°F)		

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

* other ratios available





DL - DW and DL - DH		55		75		90	
		mm	(in)	mm	(in)	mm	(in)
D1 max (1 stage)*	motor shaft diameter	16	(0.63)	20	(0.787)	35	(1.378)
D1 max (2 stage standard)*	motor shaft diameter	14	(0.551)	19	(0.748)	19	(0.748)
D1 max (2 stage available)*	motor shaft diameter	16	(0.63)	24	(0.945)	24	(0.945)
D2 k6	output shaft diameter	20	(0.787)	24	(0.945)	32	(1.26)
D3 h7	pilot diameter	89	(3.504)	105	(4.134)	125	(4.921)
D4	bolt circle	110.3	(4.343)	138.6	(5.457)	166.8	(6.567)
D5	mounting holes	6.6	(0.26)	9	(0.354)	11	(0.433)
D6 H7**	hollow bore diameter	20	(0.787)	25	(0.984)	30	(1.181)
D7	shrink disc OD (included)	50	(1.97)	60	(2.36)	72	(2.83)
L1 1-stage***	gearbox length	175	(6.89)	213.5	(8.406)	257	(10.118)
L1 2-stage***		236	(9.291)	304.5	(11.99)	336	(13.23)
L2	shaft length	50.0	(1.969)	55	(2.165)	68	(2.677)
L3	flange thickness	9	(0.354)	11	(0.433)	14	(0.551)
L4	usable shaft length	35	(1.378)	40	(1.575)	50	(1.969)
L5	pilot height	13	(0.512)	13	(0.512)	16	(0.63)
L6	flange size	90	(3.543)	115	(4.528)	140	(5.512)
L7	gear offset	9	(0.354)	14	(0.551)	18	(0.709)
L8	gearbox width	123	(4.843)	142	(5.591)	175	(6.89)
L9	shaft to centerline	87	(3.425)	100	(3.937)	126	(4.961)
L10	shrink disc to centerline	64.5	(2.539)	73.5	(2.894)	87	(3.425)

* for larger motor shaft diameters, please contact GAM **mating shaft should have h6 tolerance ***depending on motor, length may vary

Recommended Output Coupling (if necessary)				
metal bellows	KLC-50	KLC-125	KM-270
elastomer	EKC-80	EKC-110	EKM-300

TYPE CODES FOR DYNA-LITE SERIES (DL-DW)

Example: DL - DW - 075 - 005 H 1 - [090 - 15A] - S111

- **Gearbox Series** — DL = Dyna-Lite
- **Gearbox Style** — DW = shaft output; DH = hollow output
- **Gearbox Size** — 055, 075, 090
- **Ratio** — 5, 8, 10, 15, 25, 50, 100
- **Options Available for This Product** — G = Keyed output shaft; H = Smooth output shaft
- **Number of Gear Stages** — 1-stage, 2-stages, 3-stages
- **Motor Mount Kit** — Assigned by GAM
- **Special Options** — Assigned by GAM

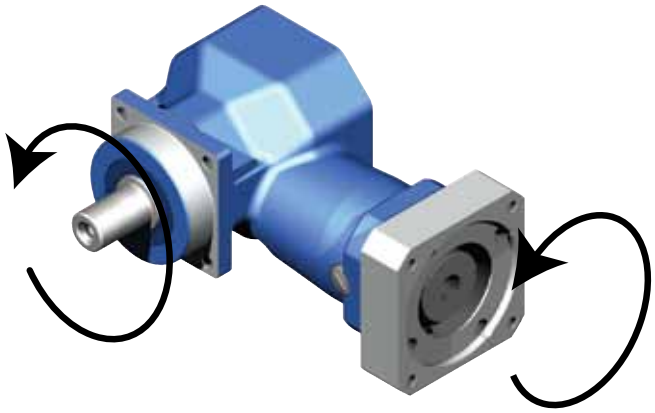
Tolerances (mm)				
Size	k6	h7	H7	h6
Over 18	+0.015	0	+0.021	0
Thru 30	+0.002	-0.021	0	-0.013
Over 30	+0.018	0	+0.025	0
Thru 50	+0.002	-0.025	0	-0.016
Over 50	+0.021	0	+0.030	0
Thru 80	+0.002	-0.030	0	-0.019
Over 80	+0.025	0	+0.035	0
Thru 120	+0.003	-0.035	0	-0.022
Over 120	+0.0028	0	+0.040	0
Thru 180	+0.003	-0.040	0	-0.025

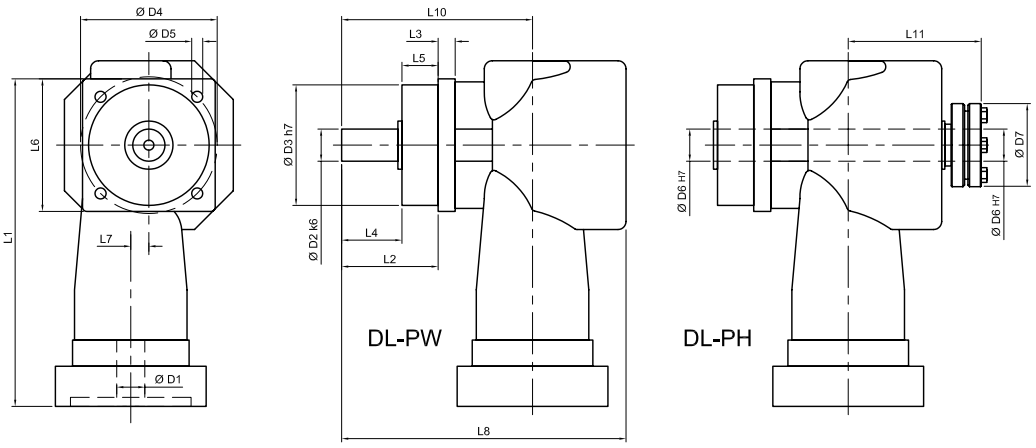
Dyna-Lite Series - DL-PW

Dyna-Lite Series			55	75	90
Stock Ratios			5, 10, 25, 50, 100, 150		
All Ratios Available*			1-stage: 5, 10, 15 2-stage: 25, 50, 100, 150* For other ratios, consult GAM.		
Nominal Output Torque (T_{2n})	Nm (lb-in)	5:1, 10:1, 25:1, 50:1, 100:1	35 (310)	70 (620)	140 (1239)
		15:1, 150:1	25 (221)	50 (443)	90 (797)
Max Acceleration Output Torque (T_{2B})	Nm (lb-in)	5:1, 10:1, 25:1, 50:1, 100:1	53 (469)	105 (929)	210 (1859)
		15:1, 150:1	38 (336)	75 (664)	143 (1266)
Emergency Output Torque (T_{2not})	Nm (lb-in)	5:1, 10:1, 25:1, 50:1, 100:1	70 (620)	140 (1239)	280 (2478)
		15:1, 150:1	50 (443)	100 (885)	190 (1682)
Nominal Input Speed (n_{1n})	RPM	5:1	3700	3100	2700
		10:1, 15:1	4200	3500	3000
		2-stage	3500	3000	3000
Max Input Speed (n_{1max})	RPM		6000	6000	5000
Standard Output Backlash (j)	arcmin	1-stage	< 7	< 7	< 6
		2-stage	< 9	< 9	< 8
Allowable Radial Load (F_{rad})[1]	N (lbs)		2200 (495)	4050 (911)	6200 (1395)
Allowable Axial Load (F_{axial})	N (lbs)		1100 (248)	2025 (456)	3100 (698)
Torsional Stiffness (C_{t21})	Nm/arcmin		1.5	4.0	10.0
	(lb-in/arcmin)		(13.28)	(35.40)	(88.51)
Weight (m)	kg (lbs)	1-stage	2.6 (5.7)	4.5 (9.9)	9 (19.8)
		2-stage	3.6 (7.9)	6.8 (15)	14.8 (32.6)
Noise Level (L_{PA})	dB(A)	1-stage	< 66	< 66	< 68
		2-stage	< 69	< 70	< 72
Mass Moment of Inertia (J_1)	kg cm² (lb-in²)	5:1	0.44 (0.15)	1.08 (0.37)	3.7 (1.258)
		10:1, 15:1	0.35 (0.119)	0.84 (0.286)	2.9 (0.986)
		25:1	0.17 (0.058)	0.45 (0.153)	1.65 (0.561)
		50:1, 100:1	0.14 (0.048)	0.34 (0.116)	1.1 (0.374)
Efficiency at Load			5,8,10: 96% 15: 93% 25,50,100,150: 87%		
Service Life			>15000 hours		
Lubrication			Life Time Lubrication		
Protection Rating			IP 64		
Operating Temperature Range			-10°C to 100°C (14°F to 212°F)		

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

* other ratios available





DL - PW and DL - PH		55		75		90	
		mm	(in)	mm	(in)	mm	(in)
D1 max (1 stage)*	motor shaft diameter	16	(0.63)	20	(0.787)	35	(1.378)
D1 max (2 stage standard)*	motor shaft diameter	14	(0.551)	19	(0.748)	19	(0.748)
D1 max (2 stage available)*	motor shaft diameter	16	(0.63)	24	(0.945)	24	(0.945)
D2 k6	output shaft diameter	16	(0.63)	22	(0.866)	32	(1.26)
D3 h7	pilot diameter	60	(2.362)	70	(2.756)	90	(3.543)
D4	bolt circle	68	(2.677)	85	(3.346)	120	(4.724)
D5	mounting holes	5.5	(0.217)	6.6	(0.26)	9	(0.354)
D6 H7**	hollow bore diameter	15	(0.591)	20	(0.787)	30	(1.181)
D7	shrink disc OD (included)	44	(1.732)	50	(1.969)	72	(2.835)
L1 1-stage***	gearbox length	172	(6.772)	206	(8.11)	249.5	(9.823)
L1 2-stage***		236	(9.291)	304.5	(11.99)	336	(13.23)
L2	shaft length	48.0	(1.89)	56	(2.205)	80	(3.15)
L3	flange thickness	8.5	(0.335)	10	(0.394)	13	(0.512)
L4	usable shaft length	28	(1.102)	36	(1.417)	58	(2.283)
L5	pilot height	18	(0.709)	18	(0.709)	20	(0.787)
L6	flange size	66	(2.598)	76	(2.992)	101	(3.976)
L7	gear offset	9	(0.354)	14	(0.551)	18	(0.709)
L8	gearbox width	141.5	(5.571)	166	(6.535)	216	(8.504)
L10	shaft to centerline	95	(3.740)	110	(4.331)	148	(5.827)
L11	shrink disc to centerline	estimated 70	(2.756)	estimated 86	(3.386)	estimated 108	(4.252)

*** for larger motor shaft diameters, please contact GAM **mating shaft should have h6 tolerance ***depending on motor, length may vary**

Recommended Output Coupling (if necessary)			
metal bellows	KLC-50	KLC-125	KM-270
elastomer	EKC-80	EKC-110	EKM-300

TYPE CODES FOR DYNA-LITE SERIES (DL-DW)

Example: DL - DW - 075 - 005 H 1 - [090 - 15A] - S111

Gearbox Series
DL = Dyna-Lite

Gearbox Style
DW = shaft output
DH = hollow output

Gearbox Size
055, 075, 090

Ratio
5, 8, 10, 15, 25, 50, 100

Options Available for This Product
G = Keyed output shaft
H = Smooth output shaft

Number of Gear Stages
1-stage, 2-stages, 3-stages

Motor Mount Kit
Assigned by GAM

Special Options
Assigned by GAM

Tolerances (mm)				
Size	k6	h7	H7	h6
Over 18	+0.015	0	+0.021	0
Thru 30	+0.002	-0.021	0	-0.013
Over 30	+0.018	0	+0.025	0
Thru 50	+0.002	-0.025	0	-0.016
Over 50	+0.021	0	+0.030	0
Thru 80	+0.002	-0.030	0	-0.019
Over 80	+0.025	0	+0.035	0
Thru 120	+0.003	-0.035	0	-0.022
Over 120	+0.0028	0	+0.040	0
Thru 180	+0.003	-0.040	0	-0.025

High Precision: VC Series

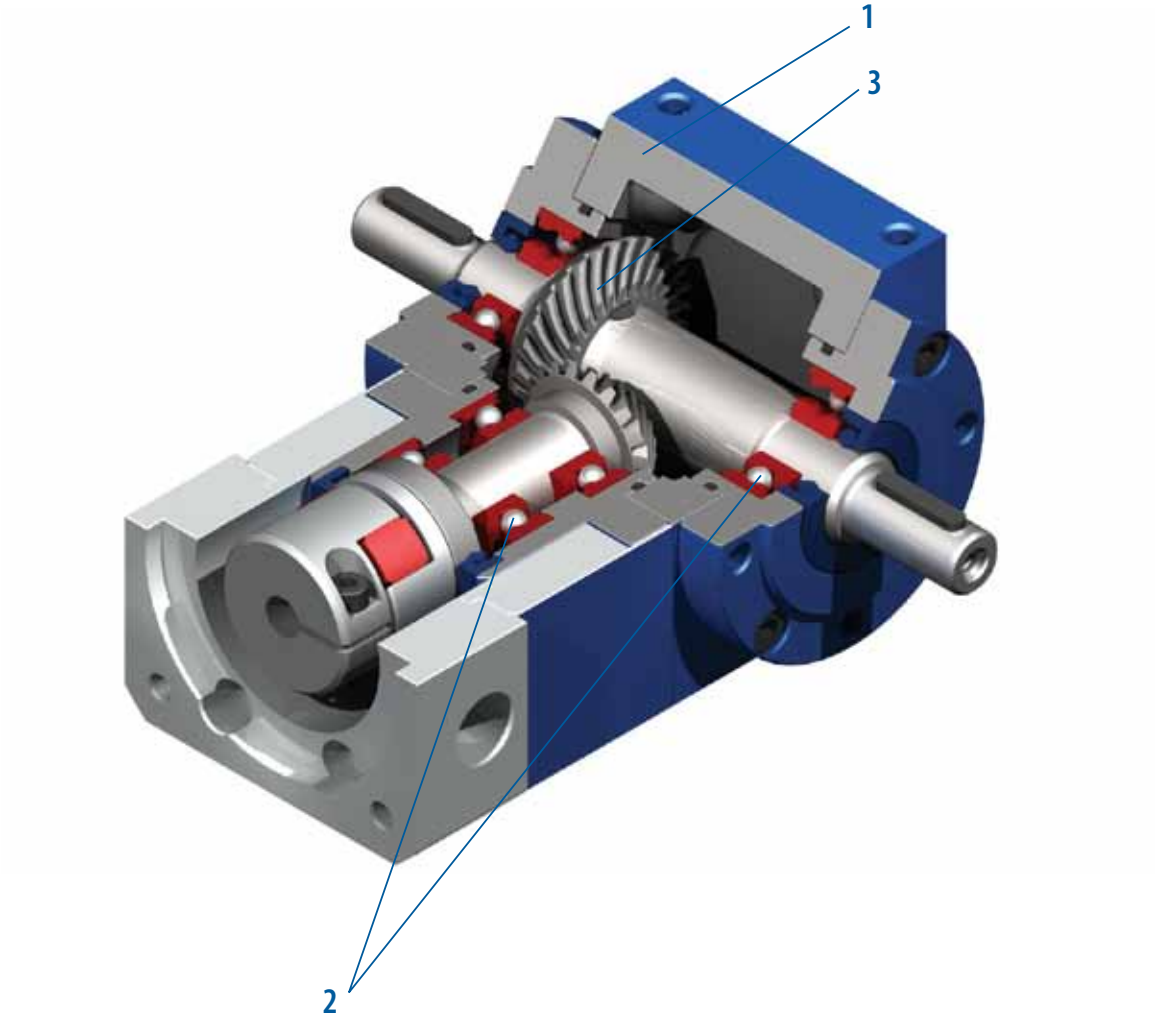
GAM can. Just ask!

If you don't see exactly what you need, let us know. We can modify the VC Series gearboxes to meet your needs. Page 3 provides a list of commonly requested modifications to give you a feel for our capabilities.

Our VC Series is a great spiral bevel gearbox solution. These robust gearboxes feature many output configurations and include the integrated motor mounts. Single, multiple shaft or hollow shaft configurations are available. 1:1 up to 6:1 ratios are available.

VC Series benefits include:

- High efficiencies 94-98%
- Lubricated for life with synthetic oil
- Includes motor mount



1. Housing
2. Bearings
(Handle high radial and axial loads)
(Size 200 uses taper roller bearings)
3. Spiral Bevel Gearing
(Precision spiral bevel gears)

High Precision: VC Series

VC-W
- Single output shaft
- Includes motor mount
- Ratios from 1:1 to 6:1
- Frame sizes from 35 to 200 mm

VC-T
- Dual output shaft
- Includes motor mount
- Ratios from 1:1 to 6:1
- Frame sizes from 35 to 200 mm

VC-S
- Smooth hollow output shaft
- Includes motor mount and shrink disc
- Ratios from 1:1 to 6:1
- Frame sizes from 35 to 200 mm

VC-K
- Keyed hollow output shaft
- Includes motor mount
- Ratios from 1:1 to 6:1
- Frame sizes from 35 to 200 mm

V-Series

Bevel gearboxes with shaft input
(Available with or without a motor mount & bellow coupling)
See seperate GAM catalog for details.
V-R version shown.

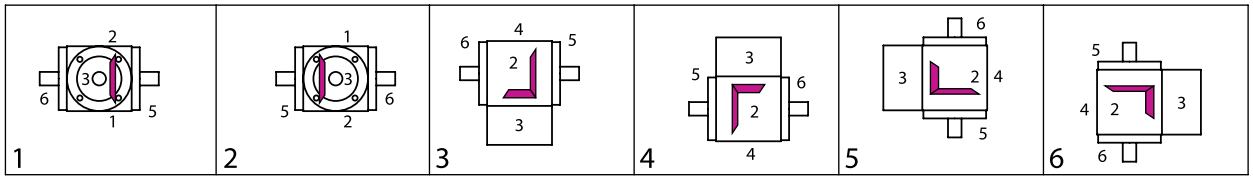
VC Series - S5 (cyclic) operation			035	045	065	090	120	140	160	200
	S5 = 30% per hour with ambient temperature of -10 to +30 degrees C									
Ratios Available			1:1	1,2,3,4:1	1, 1.5, 2, 3:1	1, 1.5, 2, 3, 4, 5, 6:1				
Nominal Output Torque (T_{2n})	Nm (lb-in)	1:1	4.5 (40)	9 (80)	8 (71)	25 (221)	50 (443)	120 (1062)	180 (1593)	350 (3098)
		1.5:1	-	-	10 (89)	25 (221)	61 (540)	113 (1000)	185 (1637)	330 (2921)
		2:1	-	7 (62)	10 (89)	25 (221)	65 (575)	110 (974)	185 (1637)	320 (2832)
		3:1	-	5.5 (49)	8 (71)	23 (204)	58 (513)	110 (974)	190 (1682)	420 (3717)
		4:1	-	4.5 (40)	-	23 (204)	60 (531)	105 (929)	180 (1593)	350 (3098)
		5:1	-	-	-	23 (204)	60 (531)	100 (885)	180 (1593)	300 (2655)
		6:1	-	-	-	23 (204)	54 (478)	95 (841)	130 (1151)	210 (1859)
Max Acceleration Output Torque (T_{2B})	Nm (lb-in)	1:1	5.5 (49)	11 (97)	15 (133)	40 (354)	70 (620)	180 (1593)	350 (3098)	700 (6196)
		1.5:1	-	-	17 (150)	37 (327)	105 (929)	200 (1770)	330 (2921)	690 (6107)
		2:1	-	8.5 (75)	17 (150)	36 (319)	98 (867)	190 (1682)	320 (2832)	600 (5311)
		3:1	-	6.5 (58)	15 (133)	36 (319)	95 (841)	177 (1567)	280 (2478)	630 (5576)
		4:1	-	5.5 (49)	-	36 (319)	87 (770)	162 (1434)	270 (2390)	550 (4868)
		5:1	-	-	-	36 (319)	92 (814)	143 (1266)	270 (2390)	505 (4470)
		6:1	-	-	-	31 (274)	71 (628)	122 (1080)	200 (1947)	315 (2788)
Emergency Output Torque (T_{2NOT})	Nm (lb-in)	1:1	8 (71)	16 (142)	23 (204)	50 (443)	150 (1328)	260 (2301)	480 (4248)	980 (8674)
		1.5:1	-	-	25 (221)	50 (443)	140 (1239)	280 (2478)	500 (4426)	850 (7523)
		2:1	-	12.5 (111)	25 (221)	60 (531)	140 (1239)	280 (2478)	550 (4868)	800 (7081)
		3:1	-	10 (89)	20 (177)	60 (531)	140 (1239)	260 (2301)	400 (3540)	850 (7523)
		4:1	-	8 (71)	-	60 (531)	140 (1239)	260 (2301)	400 (3540)	800 (7081)
		5:1	-	-	-	50 (443)	120 (1062)	220 (1947)	380 (3363)	800 (7081)
		6:1	-	-	-	45 (398)	110 (974)	200 (1947)	350 (3098)	625 (5532)
Vent Filter may be required (n_1)	RPM	all ratios	-	-	-	>2200	>1700	>1400	>1200	>900
			-	-	-	if housing temperature > 50 degrees C (also depends on duty cycle, ambient temperature, and mounting orientation)				
Max Input Speed (n_{1max})	RPM	1:1	3000	3000	4400	3200	2400	2100	1800	1500
		1.5:1	-	-	6000	4800	3600	3000	2500	2250
		2:1	-	3000	6000	6000	4800	4200	3200	3000
		3:1	-	3000	6000	6000	6000	5000	4500	4000
		4:1	-	3000	-	6000	6000	6000	5000	4500
		5:1	-	-	-	6000	6000	6000	6000	5000
		6:1	-	-	-	6000	6000	6000	6000	6000
Standard Backlash (j)	arcmin	all ratios	<15	<15	<20	<20	<20	<20	<20	<20
Reduced Backlash (j)	arcmin	1:1 - 2:1	<8	<8	<6	< 6	< 6	< 6	< 6	< 6
		3:1 - 6:1	-	<8	<10	<10	<10	<10	<10	<10
Allowable Radial Load (F_{rad})	N (lbs)	nominal load @100 rpm output	Contact GAM		750 (169)	1250 (281)	2000 (450)	3000 (675)	5300 (1193)	8000 (1800)
Allowable Axial Load (F_{axial})	N (lbs)		Contact GAM		375 (84)	625 (141)	1000 (225)	1500 (338)	2650 (596)	4000 (900)
Weight (m) [3]	kg (lbs)	-	Contact GAM		2 (4)	4.5 (10)	8 (18)	13 (29)	22 (49)	38.5 (85)
Efficiency at Load			94-98%							
Service Life / Housing Material			10,000 hours / Aluminum		15,000 hours / Steel					
Lubrication			Synthetic Grease?		Synthetic Oil					

High Precision: VC Series

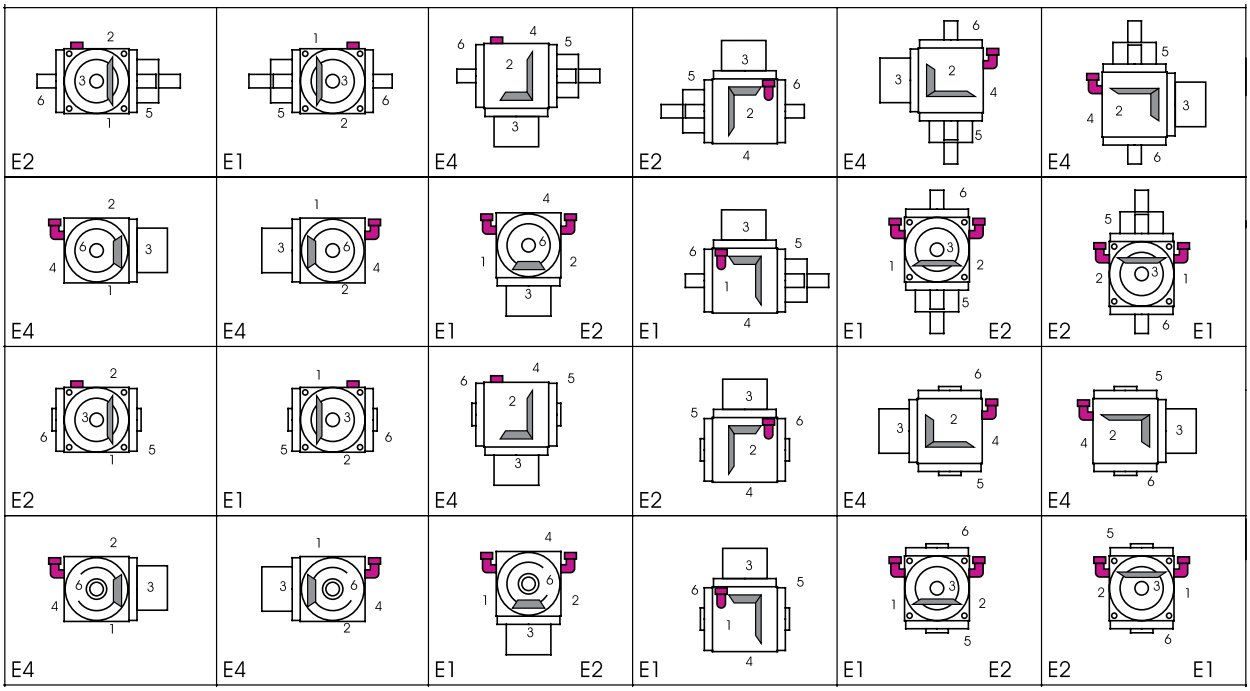
VC Series - S1 continuous operation		035	045	065	090	120	140	160	200
	Thermal Limit	0.35 kw	0.60 kw	Housing Temperature <= 90 degrees C					
		Continuous Output Torque (T_n)							
Ratio	Input Speed	Nm (lb-in)							
1:1	4000 rpm	-	-	3.6 (32)	8 (71)	-	-	-	-
	3000 rpm	1.11 (9.8)	1.9 (16.9)	4.8 (42)	11 (97)	18 (159)	-	-	-
	2400 rpm	1.39 (12.3)	2.39 (21.1)	6 (51)	14 (124)	23 (204)	37 (327)	56 (496)	-
	1500 rpm	2.23 (19.7)	3.8 (33.8)	8 (71)	17 (150)	37 (327)	60 (531)	90 (797)	157 (1390)
1.5:1	4000 rpm	-	-	5.4 (48)	12 (106)	21 (186)	34 (301)	-	-
	3000 rpm	-	-	7.2 (64)	17 (150)	28 (248)	45 (398)	68 (602)	-
	2400 rpm	-	-	9 (80)	21 (186)	35 (310)	56 (496)	85 (752)	147 (1301)
	1500 rpm	-	-	10 (89)	25 (221)	56 (496)	90 (797)	136 (1204)	236 (2089)
2:1	4000 rpm	-	-	7.2 (64)	17 (150)	28 (248)	45 (398)	-	-
	3000 rpm	-	3.81 (33.7)	9.6 (85)	23 (204)	37 (327)	60 (531)	90 (797)	157 (1390)
	2400 rpm	-	4.77 (42)	10 (89)	24 (212)	46 (407)	75 (664)	113 (1000)	196 (1735)
	1500 rpm	-	7 (62)	10 (89)	27 (239)	73 (646)	120 (1062)	181 (1602)	314 (2779)
3:1	4000 rpm	-	-	7.2 (64)	21 (186)	42 (372)	68 (602)	102 (903)	177 (1567)
	3000 rpm	-	5.5 (49)	9.6 (85)	23 (204)	56 (496)	90 (797)	136 (1204)	235 (2080)
	2400 rpm	-	5.5 (49)	10 (89)	24 (212)	63 (558)	113 (1000)	170 (1505)	294 (2602)
	1500 rpm	-	5.5 (49)	10 (89)	27 (239)	74 (655)	130 (1151)	230 (2036)	472 (4178)
4:1	4000 rpm	-	-	-	21 (186)	52 (460)	85 (752)	136 (1204)	235 (2080)
	3000 rpm	-	4.5 (39.8)	-	23 (204)	60 (531)	103 (912)	180 (1593)	314 (2779)
	2400 rpm	-	4.5 (39.8)	-	25 (221)	67 (593)	111 (982)	200 (1770)	393 (3478)
	1500 rpm	-	4.5 (39.8)	-	27 (239)	74 (655)	120 (1062)	220 (1947)	455 (4027)
5:1	4000 rpm	-	-	-	21 (186)	52 (460)	90 (797)	160 (1416)	275 (2434)
	3000 rpm	-	-	-	23 (204)	60 (531)	100 (885)	180 (1593)	300 (2655)
	2400 rpm	-	-	-	25 (221)	65 (575)	105 (929)	198 (1752)	340 (3009)
	1500 rpm	-	-	-	27 (239)	72 (637)	115 (1018)	215 (1903)	380 (3363)
6:1	4000 rpm	-	-	-	21 (186)	45 (398)	85 (752)	115 (1018)	190 (1682)
	3000 rpm	-	-	-	23 (204)	54 (478)	95 (841)	130 (1151)	210 (1859)
	2400 rpm	-	-	-	25 (221)	59 (522)	102 (903)	137 (1213)	225 (1991)
	1500 rpm	-	-	-	27 (239)	64 (566)	108 (956)	145 (1283)	240 (2124)

High Precision: VC Series Dimensions

Mounting Configuration



Breather Location



Recommended Output Coupling								
VC Series	**035**	**045**	**065**	**090**	**120**	**140**	**160**	**200**
bellows	KG-5 or KM-4	KG-10 or KM-12	KM-12 or 20	KLC-25 or 50	KLC-50 or 125	KLC-125 or KM-170	KM-170,270 or 400	KM-270,400 or 550
elastomer	EKC-5	EKM-8 or 15	EKC-5 or 25	EKC-35 or EKM-45	EKC-80 or 110	EKC-110 or EKM-200	EKM-200,300 or 400	EKM-300,500 or 700

TYPE CODES FOR VC SERIES

Example: VC - W - 090 - 002 S - [115 - 2AA] - 1-S1-2500-E1-S111

Gearbox Series
VC - Spiral Bevel Series

Gearbox Style
K = Keyed hollow shaft
W = Single output shaft
T = Dual output shaft
S = Smooth hollow output shaft with shrink disc

Gearbox Size
035, 045, 065, 090
120, 140, 160, 200

Ratio
1, 1.5, 2, 3, 4, 5, 6

Backlash
S = Standard Backlash
R = Reduced Backlash

Motor Mount Kit
Assigned by GAM

Mounting Configuration

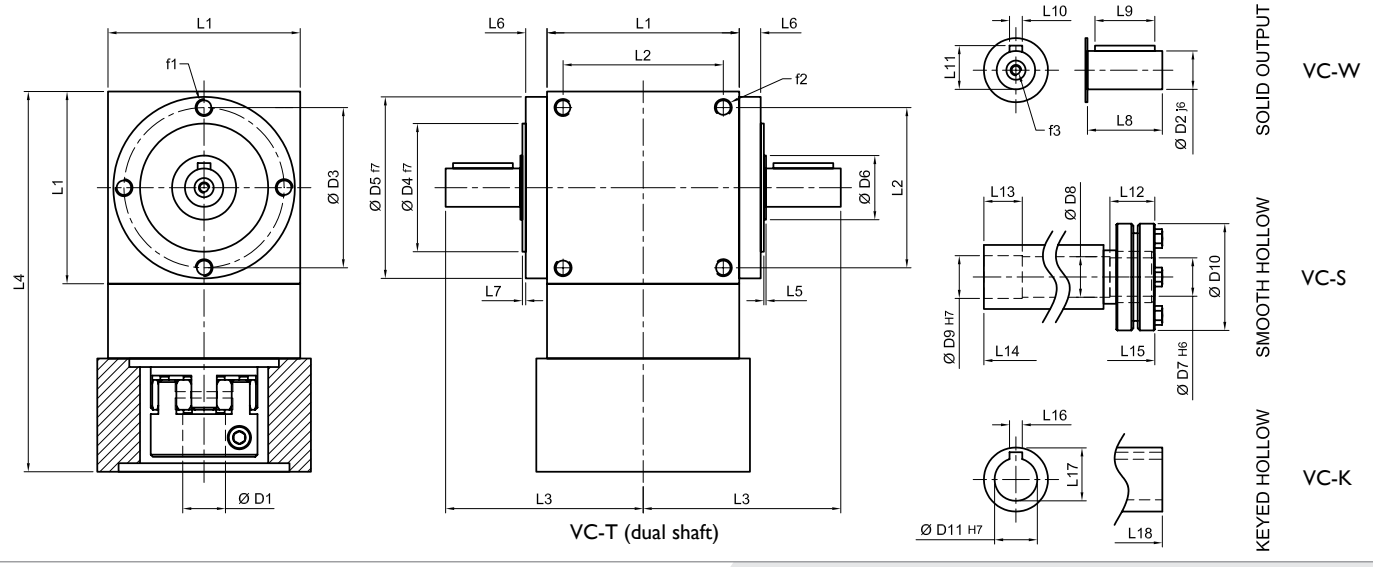
Duty Cycle
S1 = continuous speed
S5 = cyclic

Maximum Input Speed

Breather Location (if required)

Special Options
Assigned by GAM

Tolerances (mm)						
Size	**h6**	**j6**	**H6**	**H7**	**Size**	**f7**
Over 3	0	+0.006	+0.008	+0.012	**Over 18**	-0.020
Thru 6	-0.008	-0.002	0	0	**Thru 30**	-0.041
Over 6	0	+0.007	+0.009	+0.015	**Over 30**	-0.025
Thru 10	-0.009	-0.002	0	0	**Thru 50**	-0.050
Over 10	0	+0.008	+0.011	+0.018	**Over 50**	-0.030
Thru 18	-0.011	-0.003	0	0	**Thru 80**	-0.060
Over 18	0	+0.009	+0.013	+0.021	**Over 80**	-0.036
Thru 30	-0.013	-0.004	0	0	**Thru 120**	-0.071
Over 30	0	+0.011	+0.016	+0.025	**Over 120**	-0.043
Thru 50	-0.016	-0.005	0	0	**Thru 180**	-0.083
Over 50	0	+0.012	+0.019	+0.030	**Over 180**	-0.050
Thru 80	-0.019	-0.007	0	0	**Thru 250**	-0.096



mm (in)		035		045		65		90		120		140		160		200	
D1 min	motor shaft diameter	?	?	?	?	5	(0.197)	8	(0.315)	13	(0.512)	19	(0.748)	19	(0.748)	24	(0.945)
D1 max		?	?	?	?	16	(0.630)	20	(0.787)	28	(1.102)	38.1	(1.500)	38.1	(1.500)	45	(1.772)
D2 j6	output shaft diameter	6	(0.236)	10	(0.393)	12	(0.472)	18	(0.709)	25	(0.984)	32	(1.260)	35	(1.378)	42	(1.654)
	output shaft key size	2 x 2 x 10		3 x 3 x 18		4 x 4 x 20		6 x 6 x 28		8 x 7 x 36		10 x 8 x 45		10 x 8 x 50		12 x 8 x 70	
D3	mounting bolt circle 1	29	(1.142)	39	(1.535)	54	(2.126)	75	(2.953)	100	(3.937)	115	(4.528)	135	(5.315)	175	(6.890)
D4 f7	pilot diameter 1	22	(0.866)	32	(1.260)	44	(1.732)	60	(2.362)	80	(3.150)	90	(3.543)	110	(4.331)	120	(4.724)
D5 f7	pilot diameter 2	35	(1.378)	45	(1.772)	64	(2.520)	89	(3.504)	119	(4.685)	135	(5.315)	159	(6.260)	199	(7.835)
D6	shoulder diameter	10	(0.394)	15	(0.591)	17	(0.669)	30	(1.181)	35	(1.378)	50	(1.969)	40	(1.575)	55	(2.165)
D7 H6*	smooth hollow diameter 1	-		-		12	(0.472)	18	(0.709)	25	(0.984)	32	(1.260)	35	(1.378)	42	(1.654)
D8	opened up ID	-		-		13	(0.512)	19	(0.748)	26	(1.024)	33	(1.299)	36	(1.417)	43	(1.693)
D9 H7**	smooth hollow diameter 2	-		-		14	(0.551)	20	(0.787)	27	(1.063)	34	(1.339)	37	(1.457)	44	(1.732)
D10	shrink disc OD	-		-		38	(1.496)	50	(1.969)	60	(2.362)	80	(3.150)	80	(3.150)	100	(3.937)
D11 H7***	keyed hollow diameter	6	(0.236)	10	(0.393)	12	(0.472)	18	(0.709)	25	(0.984)	32	(1.260)	35	(1.378)	42	(1.654)
	hollow shaft key size	2 x 2		3 x 3		4 x 4		6 x 6		8 x 7		10 x 8		10 x 8		12 x 8	
L1	housing size	35	(1.378)	45	(1.772)	65	(2.559)	90	(3.543)	120	(4.724)	140	(5.512)	160	(6.299)	200	(7.874)
L2	mounting bolt location 2	25	(0.984)	30	(1.181)	45	(1.772)	70	(2.756)	100	(3.937)	110	(4.331)	120	(4.724)	160	(6.299)
L3	output shaft to centerline	40	(1.575)	57.5	(2.264)	72	(2.835)	95	(3.740)	122	(4.803)	137	(5.394)	160	(6.299)	203	(7.992)
L4****	overall length	Contact GAM				134	(5.276)	185	(7.283)	230	(9.055)	266	(10.47)	295	(11.61)	362	(14.25)
L5	shoulder thickness	0.5	(0.020)	2	(0.079)	2	(0.079)	2	(0.079)	2	(0.079)	2	(0.079)	2	(0.079)	2	(0.079)
L6	output pilot height 2	5.5	(0.217)	8	(0.315)	9.5	(0.374)	10	(0.393)	12	(0.472)	12	(0.472)	15	(0.591)	17	(0.669)
L7	output pilot height 1	1.5	(0.059)	2	(0.079)	2	(0.079)	2	(0.079)	3	(0.118)	3	(0.118)	3	(0.118)	3	(0.118)
L8	output shaft length	15	(0.591)	23	(0.906)	26	(1.024)	35	(1.378)	45	(1.772)	50	(1.969)	60	(2.362)	80	(3.150)
L9	key length	10	(0.393)	18	(0.709)	20	(0.787)	28	(1.102)	36	(1.417)	45	(1.772)	50	(1.969)	70	(2.756)
L10	key width	2	(0.079)	3	(0.118)	4	(0.157)	6	(0.236)	8	(0.315)	10	(0.393)	10	(0.393)	12	(0.472)
L11	shaft height with key	6.8	(0.268)	11.1	(0.437)	13.5	(0.531)	20.5	(0.807)	28	(1.102)	35	(1.378)	38	(1.496)	45	(1.772)
L12	stub shaft length	-		-		17	(0.669)	25	(0.984)	27	(1.063)	32	(1.260)	32	(1.260)	37	(1.457)
L13	diameter 2 length	-		-		15	(0.591)	18	(0.709)	22	(0.866)	25	(0.984)	25	(0.984)	35	(1.378)
L14	hollow shaft to centerline	-		-		46	(1.811)	62	(2.441)	80	(3.150)	90	(3.543)	103	(4.055)	125	(4.921)
L15	shrink disc to centerline	-		-		63	(2.480)	87	(3.425)	107	(4.213)	122	(4.803)	135	(5.315)	162	(6.378)
L16	hollow key width	2	(0.079)	3	(0.118)	4	(0.157)	6	(0.236)	8	(0.315)	10	(0.393)	10	(0.393)	12	(0.472)
L17	hollow height with keyway	7	(0.276)	11.4	(0.449)	13.8	(0.543)	20.8	(0.819)	28.3	(1.114)	35.3	(1.390)	38.3	(1.508)	45.3	(1.783)
L18	hollow shaft to centerline	27	(1.063)	36.5	(1.437)	46	(1.811)	62	(2.441)	80	(3.150)	90	(3.543)	103	(4.055)	125	(4.921)
f1	mounting holes 1	M3 x 5		M4 x 8		M6 x 12		M8 x 14		M10 x 16		M10 x 20		M12 x 24		M12 x 24	
f2	mounting holes 2	M3 x 5		M4 x 8		M6 x 9.5		M8 x 10		M10 x 12		M10 x 12		M12 x 15		M12 x 17	
f3	shaft thread DIN 332	M3		M3		M4		M6		M10		M12		M12		M16	

* Mating shaft should have j6 tolerance ** Mating shaft should have h6 tolerance *** Mating shaft should have g6 tolerance ****Depending on motor, length may change