



▶ HIGHEST PERFORMANCE: DYNA SERIES

GAM can.

If you don't see exactly what you need, let us know. We can modify the Dyna Series gearboxes to meet your needs. Page 5 provides examples of GAM capabilities.

The Dyna Series is our highest performance 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.

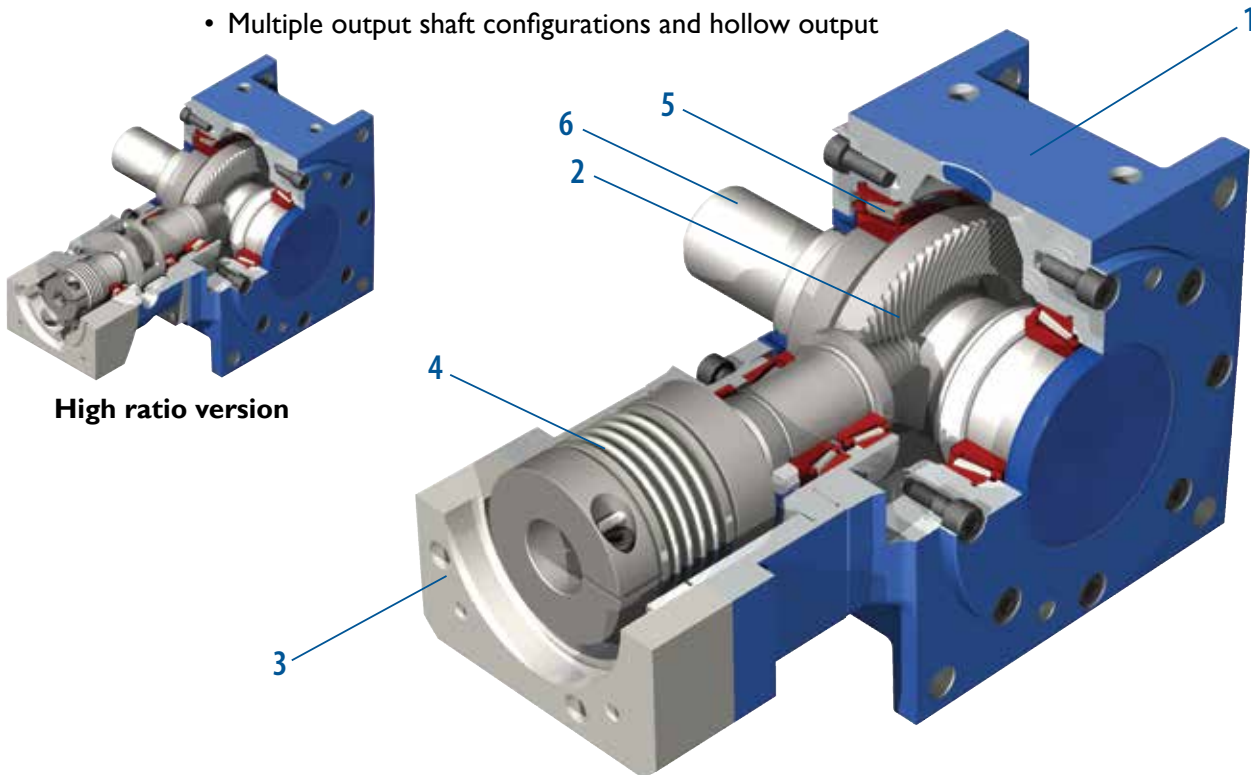
✳️ **DSX version for the highest performance available!**

The DSX is our flagship right angle hypoid gearbox that has been optimized for the most demanding motion control applications that require high angular accuracy. Featuring hypoid gears that have been ground, the DSX has the smoothest torque transmission and extremely low backlash and noise levels.

Contact GAM for further information on the DSX.

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

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. DSX gears are ground for improved performance.

3. Adapter Flange

Customized adapter flanges for quick and easy mounting to any motor

4. Coupling

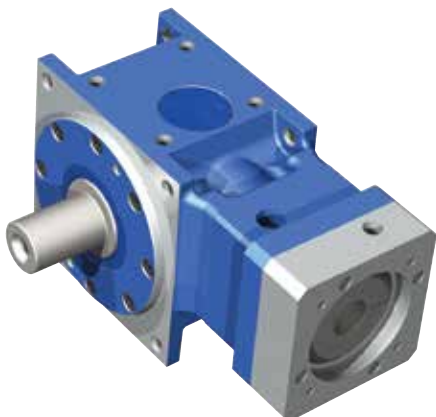
Gearbox can be supplied with either a bellows or elastomer coupling on the input

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



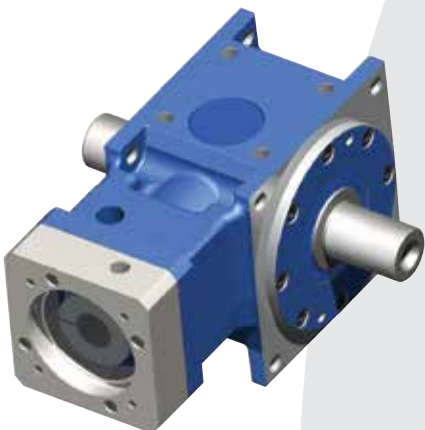
DS-W

- 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](#)



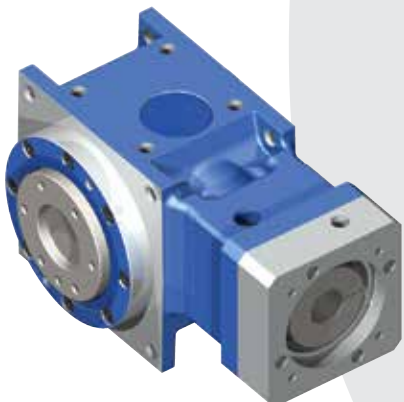
DS-H

- 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
- DS-HP version with pre-mounted GAM helical pinion for use with helical rack for a complete system
- Frame sizes from 55 mm to 190 mm
- * • [DSX option available](#)
- DS-HP available with pre-mounted GAM pinion (see [page 178](#))



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](#)

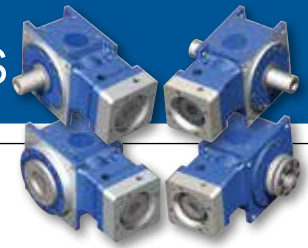


DS-F

- 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](#)
- DS-FP available with pre-mounted GAM pinion (see [page 178](#))



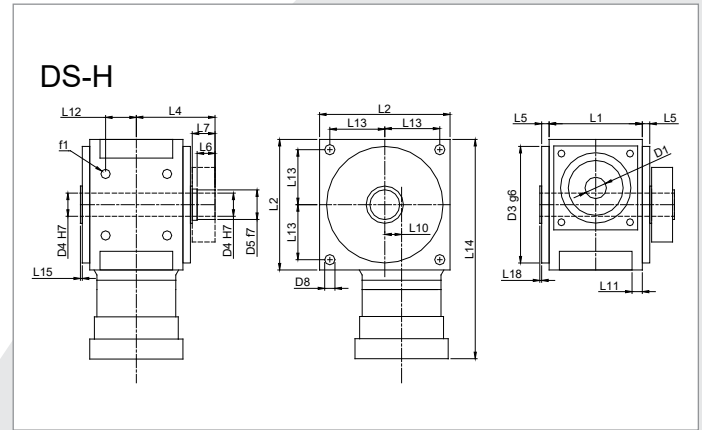
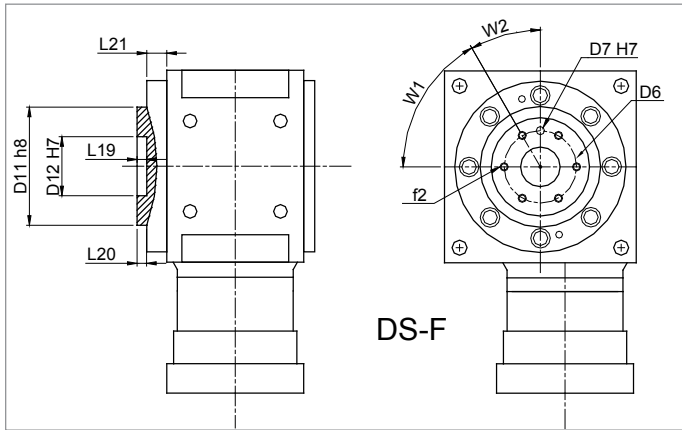
HIGHEST PERFORMANCE: DYNA SERIES



Dyna Series			55	75	90	115	140	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: 25, 30, 40, 50, 70, 100		3-stage: consult GAM	
Nominal Output Torque (T_{2n})	Nm (lb-in)	3:1-10:1	35 (310)	70 (620)	140 (1239)	260 (2301)	720 (6372)	1440 (12744)	
		12:1-15:1	25 (221)	50 (443)	95 (841)	180 (1593)	510 (4514)	1020 (9027)	
		All 2-Stage Ratios	35 (310)	70 (620)	140 (1239)	260 (2301)	720 (6372)	1440 (12744)	
Max Acceleration Output Torque (T_{2a})	Nm (lb-in)	-	1.5 x Nominal	1.5 x Nominal	1.5 x Nominal	1.5 x Nominal	1.5 x Nominal	1.5 x Nominal	
Emergency Output Torque (T_{2not})	Nm (lb-in)	3:1-10:1	70 (620)	140 (1239)	280 (2478)	520 (4602)	1440 (12744)	2880 (25488)	
		12:1-15:1	50 (443)	100 (885)	190 (1682)	360 (3186)	1020 (9027)	2040 (18054)	
		All 2-Stage Ratios	70 (620)	140 (1239)	280 (2478)	520 (4602)	1440 (12744)	2880 (25488)	
Nominal Input Speed ⁶⁾ (n_{1n})	RPM	3:1-5:1	2100	1800	1500	1150	700	550	
		6:1-10:1	3200	2700	2200	1800	1200	1000	
		12:1-15:1	3900	3300	2800	2300	1600	1300	
		2 Stage	3500	3000	3000	2500	2500	2500	
Max Input Speed ⁶⁾ (n_{1max})	RPM	1 stage	8000	8000	7000	6000	5000	4500	
		2 Stage	6000	6000	6000	6000	6000	4500	
Standard Output Backlash* (j)	arcmin	1 Stage	<5	<5	<4	<4	<4	<4	
		2 Stage	<7	<7	<6	<6	<6	<6	
Reduced Output Backlash* (j)	arcmin	1 Stage	<3 ¹⁾	<3	<2	<2	<2	<2	
		2 Stage	<5	<5	<3	<3	<3	<3	
Noise Level (L_{pA})	dB	-	<66	<66	<68	<68	<70	<72	
Allowable Radial Load ⁴⁾ (F_{rad})	N (lbs)	-	3300 (742)	4900 (1102)	7200 (1619)	10000 (2248)	15000 (3372)	22500 (5058)	
Allowable Axial Load (F_{axial})	N (lbs)	-	1650 (371)	2450 (551)	3600 (809)	5000 (1124)	7500 (1686)	11250 (2529)	
Torsional Stiffness (C_{217}) ⁵⁾ *	Nm/arcmin (lb-in/arcmin)	1 Stage	2.1 (18.6)	4.2 (37.2)	10.5 (92.9)	23.4 (207.1)	61.8 (547.0)	126 (1115.2)	
		2 Stage	2.1 (18.6)	4.2 (37.2)	10.2 (90.3)	22.8 (201.8)	60.1 (531.9)	119.2 (1055.0)	
Weight (m)	kg (lbs)	1 Stage	3.5 (7.7)	5.5 (12.1)	9.5 (20.9)	15.5 (34.2)	32.5 (71.6)	60 (132.3)	
		2 Stage	4 (8.8)	6.5 (14.3)	12.5 (27.6)	19.5 (43)	36 (79.4)	61.5 (135.6)	
Mass Moment of Inertia	kg cm ² (lb-in ²)	3:1	0.584 (0.200)	1.32 (0.451)	3.41 (1.165)	8.49 (2.901)	29.7 (10.149)	91.3 (31.199)	
		4:1	0.439 (0.150)	0.993 (0.339)	2.46 (0.841)	6.03 (2.061)	20 (6.834)	61.2 (20.913)	
		5:1	0.357 (0.122)	0.834 (0.285)	1.98 (0.677)	4.79 (1.637)	14.7 (5.023)	45.1 (15.412)	
		6:1	0.258 (0.088)	0.747 (0.255)	1.24 (0.424)	4.04 (1.381)	11.7 (3.998)	34.9 (11.926)	
		8:1	0.214 (0.073)	0.654 (0.223)	0.958 (0.327)	3.36 (1.148)	9.08 (3.103)	25.8 (8.816)	
		10:1	0.192 (0.066)	0.612 (0.209)	0.842 (0.288)	3.04 (1.039)	7.85 (2.683)	21.8 (7.449)	
		12:1	0.181 (0.062)	0.592 (0.202)	0.78 (0.267)	2.87 (0.981)	7.14 (2.440)	19.6 (6.698)	
		15:1	0.17 (0.058)	0.568 (0.194)	0.715 (0.244)	2.72 (0.929)	6.55 (2.238)	19.5 (6.664)	
		30:1	0.405 (0.138)	0.487 (0.166)	1.309 (0.447)	4.043 (1.382)	7.100 (2.426)	13.944 (4.765)	
		40:1	0.367 (0.126)	0.402 (0.137)	1.084 (0.370)	3.477 (1.188)	5.050 (1.726)	7.625 (2.606)	
		50:1	0.354 (0.121)	0.373 (0.128)	1.009 (0.345)	3.292 (1.125)	4.388 (1.499)	5.604 (1.915)	
70:1	0.352 (0.120)	0.356 (0.122)	0.978 (0.334)	3.430 (1.172)	4.779 (1.633)	4.918 (1.681)			
100:1	0.342 (0.117)	0.346 (0.118)	0.938 (0.321)	3.130 (1.070)	3.879 (1.325)	4.018 (1.373)			
Efficiency at Load			3:1 - 8:1 > 96%			10:1 - 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 (DS 055 15:1 Standard Backlash only).
 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 @400 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.
 *See page 224 for definitions

▶ DYNA SERIES DIMENSIONS: DS-F, DS-H

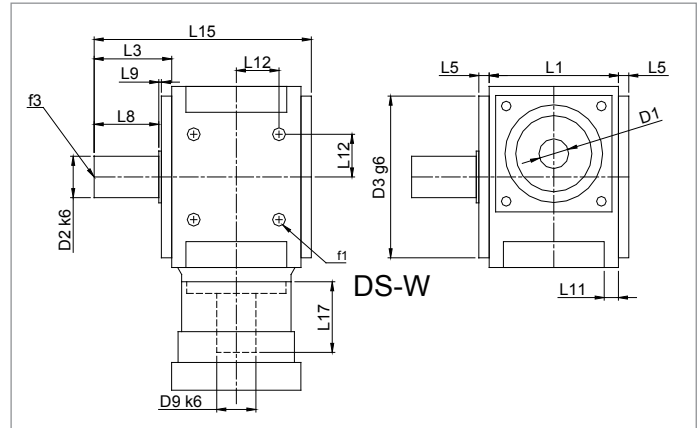
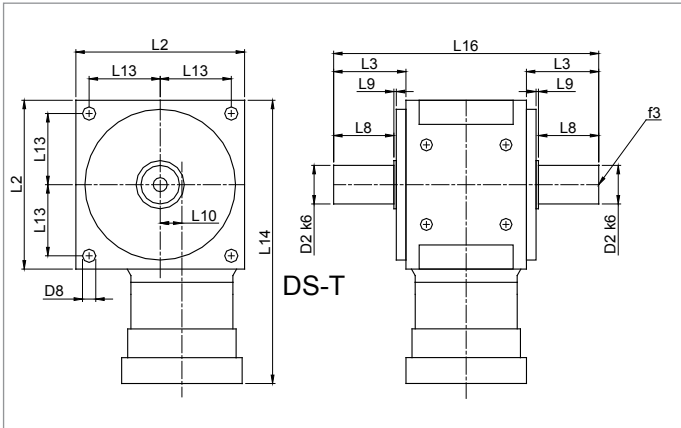


DS-F / DS-H		55		75		90		115		140		190		
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	
D1 _{max 1-stage} *	input shaft diameter	21	(0.827)	28	(1.102)	35	(1.378)	43	(1.693)	55	(2.165)	55	(2.165)	
D1 _{max std 2-stage}		14	(0.551)	14	(0.551)	19	(0.748)	24	(0.945)	28	(1.102)	28	(1.102)	
D1 _{max avail 2-stage}		16	(0.630)	16	(0.630)	24	(0.945)	32	(1.26)	38	(1.496)	38	(1.496)	
D3 g6	pilot diameter	89	(3.504)	105	(4.134)	125	(4.921)	150	(5.906)	195	(7.677)	245	(9.646)	
D4 H7**	hollow bore	20	(0.787)	25	(0.984)	30	(1.181)	40	(1.575)	55	(2.165)	70	(2.756)	
D5 f7	hollow outer diameter	24	(0.945)	30	(1.181)	36	(1.417)	50	(1.969)	68	(2.677)	80	(3.15)	
D6	flange bolt circle	40	(1.575)	50	(1.969)	63	(2.48)	80	(3.15)	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)	10	(0.394)	
D8	mounting hole diameter	6.6	(0.26)	9	(0.354)	11	(0.433)	14	(0.551)	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)	40	(1.575)	
D11 h8	flange pilot (OD)	50	(1.969)	63	(2.48)	80	(3.15)	100	(3.937)	125	(4.921)	160	(6.299)	
D12 H7	flange pilot (ID)	25	(0.984)	31.5	(1.24)	40	(1.575)	50	(1.969)	63	(2.48)	80	(3.15)	
f1	mounting hole thread	M6		M8		M10		M12		M16		M16		
f2	flange tapped holes	7 x M6x9		7 x M6x9		7 x M6x9		11 x M8x12		11 x M8x12		11 x M10x15		
L1	housing width	60	(2.362)	80	(3.15)	100	(3.937)	120	(4.724)	146	(5.748)	196	(7.717)	
L2	housing size	90	(3.543)	115	(4.528)	140	(5.512)	170	(6.693)	215	(8.465)	260	(10.236)	
L4	hollow hub length	73	(2.874)	81	(3.189)	95	(3.74)	109	(4.291)	129	(5.079)	161	(6.339)	
L5	pilot height	13.5	(0.531)	8.5	(0.335)	8	(0.315)	8	(0.315)	10	(0.394)	10	(0.394)	
L6	hub length	20	(0.787)	22	(0.866)	26	(1.024)	29	(1.142)	32	(1.26)	34	(1.339)	
L7	shoulder + hub length	23	(0.906)	25	(0.984)	29	(1.142)	33	(1.299)	37	(1.457)	40	(1.575)	
L10	hypoid offset	9	(0.354)	14	(0.551)	18	(0.709)	23	(0.906)	32	(1.26)	42	(1.654)	
L11	flange thickness	8	(0.315)	10	(0.394)	11	(0.433)	13	(0.512)	15	(0.591)	17	(0.669)	
L12	hole location	22	(0.866)	27	(1.063)	33	(1.299)	40	(1.575)	52	(2.047)	70	(2.756)	
L13	hole location	39	(1.535)	49	(1.929)	59	(2.323)	72	(2.835)	91	(3.583)	112	(4.409)	
L14	input length	1-stage***	181	(7.126)	219	(8.622)	250.5	(9.862)	286.5	(11.28)	363.5	(14.311)	439	(17.283)
L14		2-stage***	229.5	(9.035)	262	(10.315)	247.5	(9.744)	280	(11.024)	372	(14.646)	591	(23.268)
L17	input shaft length	20	(0.787)	26	(1.024)	43	(1.693)	48	(1.89)	55	(2.165)	62	(2.441)	
L18	shoulder height	1.5	(0.059)	1.5	(0.059)	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)	10.5	(0.413)	
L20	outer flange pilot height	7	(0.276)	7	(0.276)	7	(0.276)	10	(0.394)	10	(0.394)	12	(0.472)	
L21	pilot height	20	(0.787)	15.5	(0.61)	16	(0.630)	17	(0.669)	17.5	(0.689)	22.5	(0.886)	
W1	hole angle 1	45°		45°		45°		30°		30°		30°		
W2	hole angle 2	45°		45°		45°		30°		30°		30°		

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



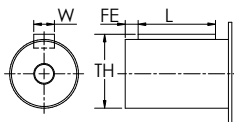
▶ DYNA SERIES DIMENSIONS: DS-W, DS-T



DS-W / DS-T		55		75		90		115		140		190		
		mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	mm	(in)	
D1 _{max 1-stage*}	input shaft diameter	21	(0.827)	28	(1.102)	35	(1.378)	43	(1.693)	55	(2.165)	55	(2.165)	
D1 _{max std 2-stage}		14	(0.551)	14	(0.551)	19	(0.748)	24	(0.945)	28	(1.102)	28	(1.102)	
D1 _{max avail 2-stage}		16	(0.630)	16	(0.630)	24	(0.945)	32	(1.26)	38	(1.496)	38	(1.496)	
D2 k6	output shaft diameter	20	(0.787)	24	(0.945)	32	(1.26)	40	(1.575)	55	(2.165)	70	(2.756)	
D3 g6	pilot diameter	89	(3.504)	105	(4.134)	125	(4.921)	150	(5.906)	195	(7.677)	245	(9.646)	
D8	mounting hole diameter	6.6	(0.26)	9	(0.354)	11	(0.433)	14	(0.551)	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)	40	(1.575)	
f1	mounting hole thread	M6		M8		M10		M12		M16		M16		
f3	shaft thread per DIN332/1	M6x16		M8x19		M12x28		M16x36		M20x42		M20x42		
L1	housing width	60	(2.362)	80	(3.15)	100	(3.937)	120	(4.724)	146	(5.748)	196	(7.717)	
L2	housing size	90	(3.543)	115	(4.528)	140	(5.512)	170	(6.693)	215	(8.465)	260	(10.236)	
L3	output shaft length	50	(1.969)	50	(1.969)	60	(2.362)	70	(2.756)	102	(4.016)	122	(4.803)	
L5	pilot height	13.5	(0.531)	8.5	(0.335)	8	(0.315)	8	(0.315)	10	(0.394)	10	(0.394)	
L8	usable shaft length	35	(1.378)	40	(1.575)	50	(1.969)	60	(2.362)	90	(3.543)	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)	
L10	hypoid offset	9	(0.354)	14	(0.551)	18	(0.709)	23	(0.906)	32	(1.26)	42	(1.654)	
L11	flange thickness	8	(0.315)	10	(0.394)	11	(0.433)	13	(0.512)	15	(0.591)	17	(0.669)	
L12	hole location	22	(0.866)	27	(1.063)	33	(1.299)	40	(1.575)	52	(2.047)	70	(2.756)	
L13	hole location	39	(1.535)	49	(1.929)	59	(2.323)	72	(2.835)	91	(3.583)	112	(4.409)	
L14	input length	1-stage**	181	(7.126)	219	(8.622)	250.5	(9.862)	286.5	(11.28)	363.5	(14.311)	439	(17.283)
		2-stage**	229.5	(9.035)	262	(10.315)	247.5	(9.744)	280	(11.024)	372	(14.646)	591	(23.268)
L17	input shaft length	20	(0.787)	26	(1.024)	43	(1.693)	48	(1.89)	55	(2.165)	62	(2.441)	
L15	gearbox width	123.5	(4.862)	138.5	(5.453)	168	(6.614)	198	(7.795)	258	(10.157)	328	(12.913)	
L16	gearbox width	160	(6.299)	180	(7.087)	220	(8.661)	260	(10.236)	350	(13.78)	440	(17.323)	

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

Optional Output Keyway Dimensions



DS Size	W	L	TH	FE
055	6	32	22.5	1.5
075	8	36	27	2
090	10	40	35	5
115	10	50	35	5
130	14	63	51.5	5
140	16	70	59	5
160	18	90	67	5
190	20	90	74.5	5

Recommended Output Coupling (if necessary)

	KM-60	KM-170	KM-270	KM-400	KM-1300	KSD-2500
metal bellows						
elastomer	EKM-60	EKM-150	EKM-300	EKM-500	EKM-1000	-



▶ DYNA SERIES TYPE CODE

TYPE CODES FOR DYNA SERIES

Example: DS - W B - 090 - 005 G - M0000 - H0000 - C0000

Gearbox Series

DS = Dyna Series
DSX = Dyna Series Extreme

Gearbox Style

W = Single output shaft
T = Dual output shaft
H = Hollow output shaft
(HP with pinion)
F = Flange output
(FP with pinion)

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

Configuration Code

Assigned by GAM

Output Code

Assigned by GAM

Motor Code

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.

Contact GAM for DSX Drawings

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

DS