

PLS - HP

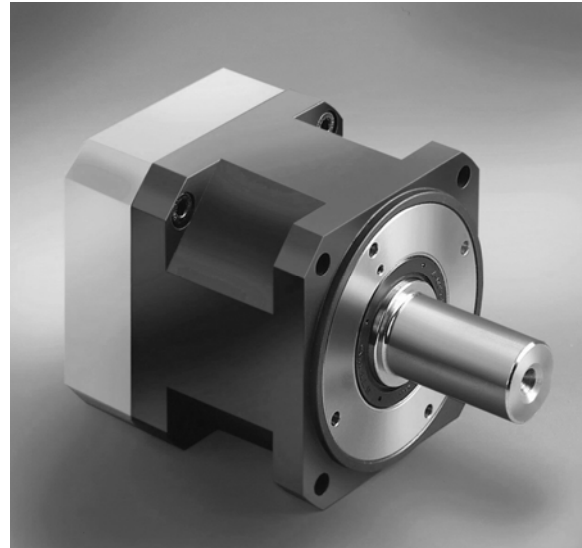
High Performance Planetary Servo Gearhead

Torque Rating, Ratios, Inertias



PLS-HP 70, 90, 115, 142

Highest torque density and precision servo gearhead available today. The external housing main dimensions are similar to the PLS series units, but the internal design is very different using special designed gears, enhanced bearing support, stiffer shafting etc., offering more than a 100% torque load ability increase. This gearbox line is the ultimate choice for highest precision positioning accuracy, repeatability applications. Integrated NIEC (expansion chamber) facilitates high input speeds. Backlash < 1 min is also available as an option.



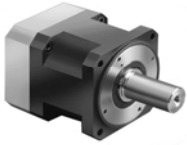
Nominal-Rated Torque ⁽¹⁾		Torque permissible 30000 output shaft rotations ⁽²⁾		Nm (lbin)	
PLS-HP 70	PLS-HP 90	PLS-P 115	PLS-HP 142	Ratio	Stage ⁽³⁾
110 (973) ◊ 176 (1558)	220 (1974) ◊ 352 (3115)	520 (4602) ◊ 832 (7363)	1000 (8850) ◊ 1600 (14160)	4	1
110 (973) ◊ 176 (1558)	220 (1974) ◊ 352 (3115)	520 (4602) ◊ 832 (7363)	1000 (8850) ◊ 1600 (14160)	5	1
60 (531) ◊ 96 (850)	110 (976) ◊ 176 (1558)	250 (2212) ◊ 400 (3540)	305 (2699) ◊ 488 (7080)	10	1
110 (973) ◊ 176 (1558)	220 (1974) ◊ 352 (3115)	520 (4602) ◊ 832 (7363)	1000 (8850) ◊ 1600 (14160)	16	2
110 (973) ◊ 176 (1558)	220 (1974) ◊ 352 (3115)	520 (4602) ◊ 832 (7363)	1000 (8850) ◊ 1600 (14160)	20	2
110 (973) ◊ 176 (1558)	220 (1974) ◊ 352 (3115)	520 (4602) ◊ 832 (7363)	1000 (8850) ◊ 1600 (14160)	25	2
110 (973) ◊ 176 (1558)	220 (1974) ◊ 352 (3115)	520 (4602) ◊ 832 (7363)	1000 (8850) ◊ 1600 (14160)	32	2
110 (973) ◊ 176 (1558)	220 (1974) ◊ 352 (3115)	520 (4602) ◊ 832 (7363)	1000 (8850) ◊ 1600 (14160)	40	2
60 (531) ◊ 96 (850)	110 (976) ◊ 176 (1558)	250 (2212) ◊ 400 (3540)	500 (4425) ◊ 800 (7080)	64	2

(1) Continuous duty rated torque, at uniform load, 30000 hrs L10 design life, at 100 rpm output shaft speed

(2) Maximum torque allowable for 30000 output shaft rotations

(3) Number of planetary reduction stages.

Standard Motor Mount Gearhead Moment of Inertia (at the input)				kgcm ² (lbin.sec ² 10 ⁻⁴)	
PLS-HP 70	PLS-HP 90	PLS-HP 115	PLS-HP 142	Ratio	Stages
0.42 (3.72)	1.05 (9.29)	2.3 (20.4)	7.8 (69.0)	4	1
0.37 (3.27)	0.85 (7.52)	1.8 (15.9)	6.2 (53.3)	5	1
0.32 (2.83)	0.75 (6.64)	1.3 (11.5)	4.5 (40.5)	8	1
0.35 (3.10)	0.85 (7.52)	1.3 (11.5)	4.5 (40.5)	16	2
0.32 (2.38)	0.85 (7.52)	1.1 (9.7)	3.8 (33.6)	20	2
0.32 (2.38)	0.85 (7.52)	1.1 (9.7)	3.8 (33.6)	25	2
0.30 (2.65)	0.75 (6.64)	0.9 (8.0)	3.2 (28.2)	32	2
0.30 (2.65)	0.75 (6.64)	0.9 (8.0)	3.2 (28.2)	40	2
0.30 (2.65)	0.70 (6.20)	0.8 (7.1)	3.1 (27.4)	64	2



PLS-HP

High Performance Planetary Servo Gearhead

Technical Data



Design Life • Emergency Peak Torque • IP Class • Efficiency • Backlash • Torsional Stiffness • Gearhead Weight • Recommended Maximum Unsupported Motor Weight • Operating Temperatures • Lubrication • Mounting Positions •

		PLS-HP 70	PLS-HP 90	PLS-HP 115	PLS-HP 142
Rotational Backlash ⁽¹⁾ (arc.min)	1 stage	< 3	< 3	< 3	< 3
	2 stage	< 5	< 5	< 5	< 5
Torsional (Rotational) Stiffness ⁽²⁾ Nm/arc.min (lbin /arc.min)	1 stage	7 (62)	10 (88)	22 (195)	46 (411)
	2 stage	8 (70)	11 (97)	24 (212)	48 (424)
Gearhead Weight kg (lb)	1 stage	2.6 (5.6)	4.0 (8.9)	7.5 (17)	16 (35)
	2 stage	3.2 (7.0)	5.0 (11)	10 (22)	20 (44)
Max. Unsupported Motor Weight ⁽³⁾ kg (lb)		15 (33)	20 (44)	40 (88)	60 (132)
Operating Temperature ⁽⁴⁾ °C (°F)	Minimum	-25 (-13)			
	Maximum	+110 (232)			
Lubrication		Lubricated for life with semi fluid synthetic grease "Klubersynth GE 46-1200" (Kluber Lubrication LP - www.kluber.com)			
Mounting Positions		Any			

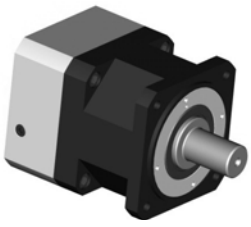
Design Life (L10 Life)	20000 hrs	
Emergency Stop Peak Torque	200% of the continuous duty rated torque. The gearbox will withstand this torque only a very limited time (about 500 to 1000 times during the life of the gearbox) . -Torques at this magnitude should not be part of the standard operating cycle!	
IP Protection Class	IP 65	
Full Load Efficiency %	1 stage	98 %
	2 stage	95 %

- 1) Maximum value of the rotational backlash measured at the output in arc minutes (1 arc min = 1 angular min).
 2) Measured at the output shaft
 3) For horizontal mounting position (support recommended if motor weight exceeds the given value)
 4) Measured at the middle of the gearbox main body

Output Shaft Radial and Axial Loads • Input Speeds • Noise Level •

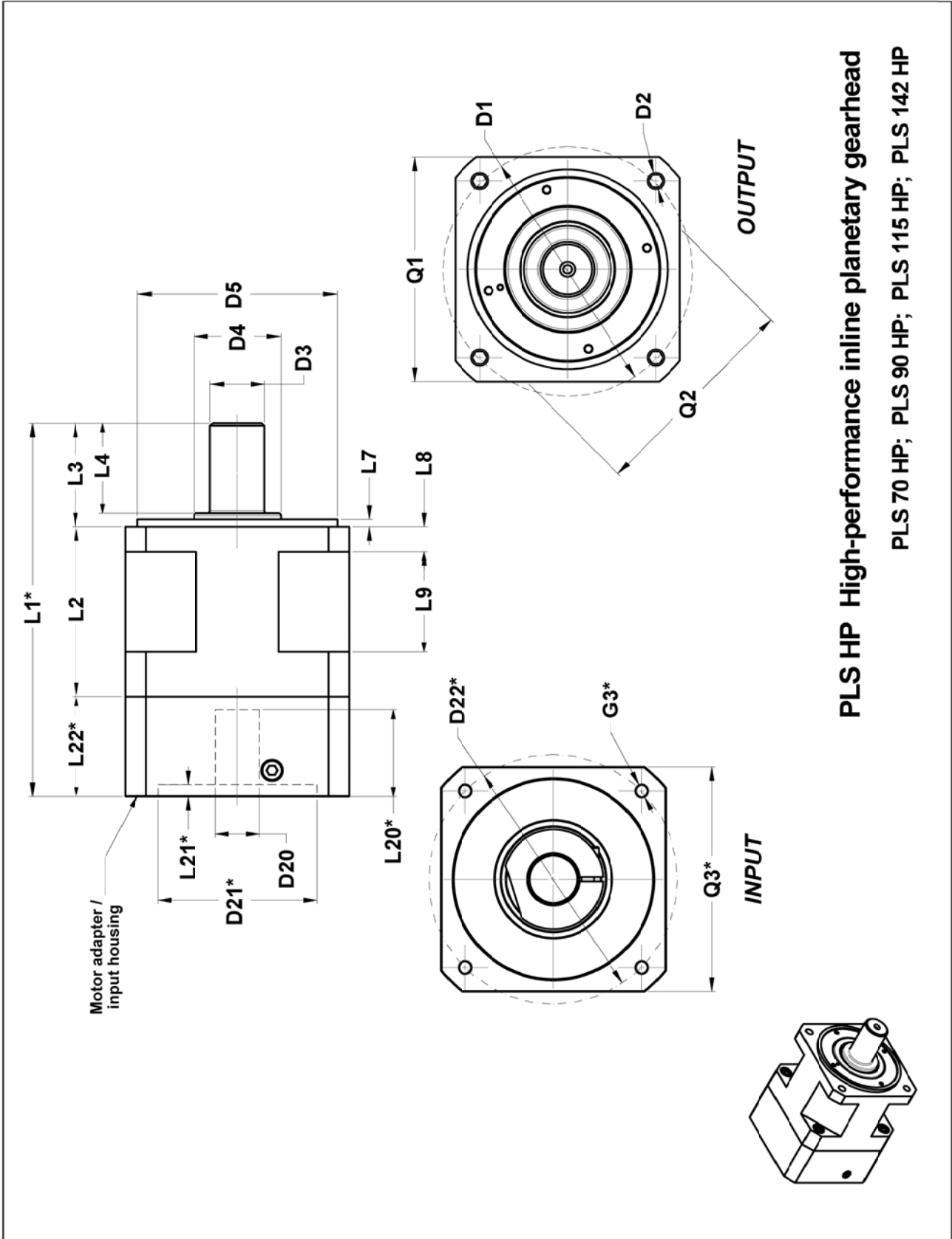
		PLS-HP 70	PLS-HP 90	PLS-HP 115	PLS-HP 142
Output Shaft Radial Load ⁽¹⁾ (at 20000 hrs L10 and 100 output shaft rpm)	N (lb)	4500 (742)	6000 (967)	9000 (1079)	12000 (2023)
Output Shaft Axial Load (at 20000 hrs L10 and 100 output shaft rpm)	N (lb)	4000 (1057)	5000 (1439)	10000 (1798)	12000 (3372)
Output Shaft Radial Load ⁽¹⁾ (at 30000 hrs L10 and 100 output shaft rpm)	N (lb)	4000 (674)	5200 (877)	8500 (967)	1000 (1843)
Output Shaft Axial Load (at 30000 hrs L10 and 100 output shaft rpm)	N (lb)	4000 (922)	5000 (1281)	10000 (1596)	12000 (2990)
Max Input Speed	rpm	16000	12000	10000	80000
Continuous / Average Input Speed	rpm	any rpm as long as the gearbox temperature does not exceed the +110 °C (232 °F)			
Noise Level ⁽²⁾	dBA	65	65	68	70

- (1) Radial load at shaft midpoint.
 (2) Sound pressure level measured at 3000 rpm, no load, 1m distance from the gearbox.

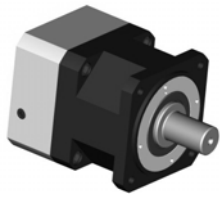


PLS-HP

High Performance Planetary Servo Gearhead
Dimensional Data



PLS HP High-performance inline planetary gearhead
PLS 70 HP; PLS 90 HP; PLS 115 HP; PLS 142 HP



PLS-HP

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Dimensional Data



DIMENSIONS mm (in.)	Tol./#	PLS-HP 70	PLS-HP 90	PLS-HP115	PLS-142 HP
D1 Output flange bolt circle	•	75 (2.952)	100 (3.937)	130 (5.118)	165 (6.496)
D2 Output flange mounting hole diameter	4	5.5 (0.216)	6.5 (0.256)	9 (0.354)	11 (0.433)
D3 Output shaft diameter	k6	19 (0.748)	22 (0.866)	32 (1.259)	40 (1.575)
D4 Output shaft collar diameter	•	23.5 (0.925)	32.5 (1.280)	39.5 (1.555)	53.5 (2.106)
D5 Pilot diameter	h7	60 (2.362)	80 (3.150)	110 (4.331)	130 (5.118)
Q1 Gearbox housing / output flange □	•	70 (2.756)	90 (3.543)	115 (4.528)	142 (5.591)
L2 Main housing length	1-stage	• 63 (2.480)	• 68 (2.677)	• 86.5 (3.406)	• 105 (4.134)
	2-stage	• 95.5 (3.760)	• 109.5 (4.311)	• 133 (5.236)	• 164.5 (6.476)
L3 Output shaft length to mounting face	•	32 (1.259)	41.5 (1.634)	64.5 (2.539)	87 (3.425)
L4 Output shaft length to shaft collar (root)	•	28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)
L7 Output pilot length	•	2.8 (0.110)	3 (0.118)	4 (0.157)	5 (0.197)
L8 Output flange thickness	•	10 (0.394)	10 (0.394)	15 (0.591)	20 (0.787)
L9 Housing recess width	•	30 (1.181)	40 (1.575)	53 (2.087)	58 (2.283)
Q2 Housing recess □ (across flats)	•	65 (2.559)	87 (3.425)	115 (4.528)	140 (5.512)
D20 Maximum input pinion bore ⁽¹⁾	•	19 (0.748)	24 (0.945)	35 (1.378)	48 (1.890)
Available standard bushings ⁽¹⁾ mm		9.525; 10; 11; 12; 12.7; 14; 15.875; 16;	11; 12.7; 14; 15.87; 16; 19; 19.05; 22; 22.22	19; 22; 24; 28; 28.575; 32	28; 32; 35; 38; 42
inch		.375; .393; .433; .472; .500; .551; .625; .630	.433; .500; .551; .625; .630; .748; .750; .866; .875	.748; .866; .944; 1.125; 1.102; 1.260	.945; 1.1260; 1.378; 1.496; 1.654;
⁽¹⁾ For motor shaft smaller than D20 , a precision standard bushing is supplied.					
Motor-dependent dimensions: D21*, D22*, L1*, L20* L21*, L22*, G3*, Q3*		Adapter / input housing dimensions and unit overall length depend on motor output geometry. A motor-specific adapter / input housing is supplied with every gearhead.			
L22* dimension calculation L22* tolerance +5 / -0 (+0.196" / -0)		Determine L22* calc = Motor shaft length + ΔL If L22* calc ≤ L22* minimum → L22* = L22* minimum + tolerance If L22* calc > L22* minimum → L22* = L22* calc + tolerance			
ΔL		3 (0.118)	11 (0.433)	12 (0.472)	11.5 (0.453)
L22* minimum		27 (1.063)	29 (1.142)	38 (1.496)	48.5 (1.909)