

All units are precision-ground, planetary gearsets capable of sustained servo input speed. They can be ordered by themselves or pre-mounted to the SmartMotor™ before shipment.

Each gearhead has a non-captive input pinion gear. This means the pinion is mounted onto the motor shaft and the gearhead is then mounted onto the motor flange.

Torque throughputs for in-line (straight) gearheads are limited by input pinion diameters.

Typically, the 7:1 ratio single-stage and 28:1 ratio two-stage gearheads have the higher torque ratings.

10:1 and 100:1 gearhead input pinions are very small. Therefore, great care should be taken not to exceed maximum torque ratings for those gear ratios.

All right angle gearhead torque levels are limited by the right angle beveled gear sets. This is why all gear ratios show the same torque limits within that series.

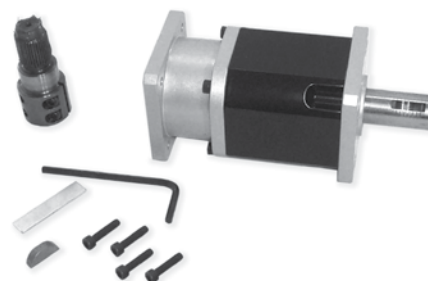
All gearheads are limited to a maximum of 5000 RPM input pinion speed. This limit is due to differential speed across the input pinion bearings and lubrication flow. Exceeding 5000 RPM for any sustained period will GREATLY decrease the life of the gearhead and will not be covered by warranty. However, for typical servo applications, there is no issue with reaching 5000 RPM on each machine cycle's peak speeds.

Please consult the website or factory for load specifications. Load ratings are speed dependent and are charted across curves.



Gearhead Series	Backlash (arc-minutes)	
	Single-Stage	Two-Stage
High Performance (P)	6	10
OEM Series (SP)	12	16
Right Angle (RAP)	10	14

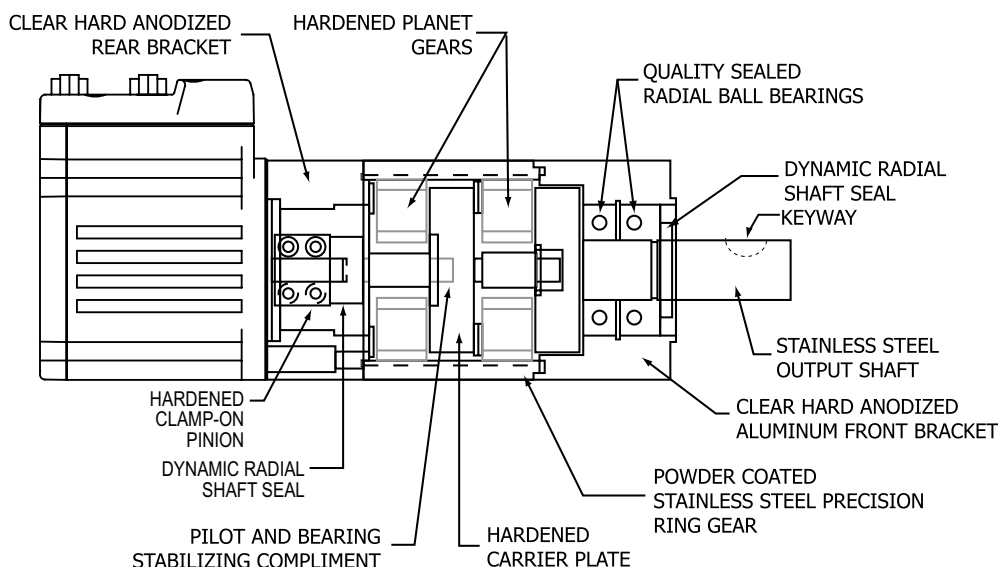
Moog Animatics provides three series of gearheads. The above chart is a quick reference to backlash specs.



Each gearhead is shipped with appropriate mounting hardware, fasteners, Allen key and pinion gap gauge.

Please see the website for mounting instructions:
 NEMA 17 Frame – www.animatics.com/gh17-install
 NEMA 23 Frame – www.animatics.com/gh23-install
 NEMA 34 Frame – www.animatics.com/gh34-install

Two Stage Gearheads Shown



WARNING: Improper assembly of motor to gear head could result in product damage and will not be covered under warranty. Please consult the factory for details.

Planetary Gearheads – NEMA 17 Series

OEM Series

Part #	Ratio	Continuous output torque at 1500 rpm input (in-lbs)	Continuous output torque at 3500 rpm input (in-lbs)	Continuous output torque at 5000 rpm input (in-lbs)	Gearhead inertia at input (lb-in-sec ²)
Single Stage					
GH17SP004	4:1	75	57	49	1.28 x 10 ⁻⁵
GH17SP007	7:1	60	51	46	7.65 x 10 ⁻⁶
GH17SP010	10:1	48	43	39	6.69 x 10 ⁻⁶
Double Stage					
GH17SP016	16:1	81	74	70	1.27 x 10 ⁻⁵
GH17SP028	28:1	83	79	76	7.63 x 10 ⁻⁶
GH17SP049	49:1	61	59	58	7.55 x 10 ⁻⁶
GH17SP070	70:1	61	60	59	6.64 x 10 ⁻⁶
GH17SP100	100:1	47	46	46	6.63 x 10 ⁻⁶

General Specifications

Construction Type	Ratio	Standard Backlash (arc-minutes)	Efficiency	Weight (lbs)	Maximum Tested Input rpm	Standard Input Shaft Diameter (in)
Single Stage	4:1 to 10:1	12	95%	0.59	5000	0.197
Double Stage	16:1 to 100:1	16	90%	0.88	5000	0.197

NOTE: Please consult the website or factory for load specifications. PEAK TORQUE: 15% above continuous rating.

⚠ WARNING: Repeated peak-torque loading may cause failure and will void the warranty.

High-Performance Series

Part #	Ratio	Continuous output torque at 1500 rpm input (in-lbs)	Continuous output torque at 3500 rpm input (in-lbs)	Continuous output torque at 5000 rpm input (in-lbs)	Gearhead inertia at input (lb-in-sec ²)
Single Stage					
GH17P3	3:1	197	140	115	3.25 x 10 ⁻⁵
GH17P4	4:1	177	136	116	1.60 x 10 ⁻⁵
GH17P5.5	5.5:1	157	129	113	1.10 x 10 ⁻⁵
GH17P7	7:1	143	122	110	9.56 x 10 ⁻⁶
GH17P10	10:1	113	101	93	8.36 x 10 ⁻⁶
Double Stage					
GH17P16	16:1	211	194	182	1.59 x 10 ⁻⁵
GH17P22	22:1	216	201	193	1.10 x 10 ⁻⁶
GH17P28	28:1	218	207	199	9.54 x 10 ⁻⁶
GH17P40	40:1	220	212	207	8.35 x 10 ⁻⁶
GH17P49	49:1	158	154	152	9.44 x 10 ⁻⁶
GH17P55	55:1	183	177	175	8.31 x 10 ⁻⁶
GH17P70	70:1	160	156	154	8.30 x 10 ⁻⁶
GH17P100	100:1	122	120	119	8.29 x 10 ⁻⁶

General Specifications

Construction Type	Ratio	Standard Backlash (arc-minutes)	Efficiency	Weight (lbs)	Maximum Tested Input rpm	Standard Input Shaft Diameter (in)
Single Stage	3:1 to 10:1	6	90%	1.14	5000	0.197
Double Stage	16:1 to 100:1	10	85%	1.62	5000	0.197

NOTE: Please consult the website or factory for load specifications. PEAK TORQUE: 15% above continuous rating.

⚠ WARNING: Repeated peak-torque loading may cause failure and will void the warranty.

OEM Series

Part #	Ratio	Continuous output torque at 1500 rpm input (in-lbs)	Continuous output torque at 3500 rpm input (in-lbs)	Continuous output torque at 5000 rpm input (in-lbs)	Gearhead inertia at input (lb-in-sec ²)
Single Stage					
GH23SP4	4:1	185	133	109	4.19 x 10 ⁻⁵
GH23SP7	7:1	155	126	110	1.54 x 10 ⁻⁵
GH23SP10	10:1	125	107	97	1.08 x 10 ⁻⁵
Double Stage					
GH23SP16	16:1	214	190	175	4.26 x 10 ⁻⁵
GH23SP28	28:1	223	208	197	1.57 x 10 ⁻⁵
GH23SP49	49:1	164	158	154	1.52 x 10 ⁻⁵
GH23SP70	70:1	166	161	158	1.06 x 10 ⁻⁵
GH23SP100	100:1	126	124	122	1.06 x 10 ⁻⁵

General Specifications

Construction Type	Ratio	Standard Backlash (arc-minutes)	Efficiency	Weight (lbs)	Maximum Tested Input rpm	Standard Input Shaft Diameter (in)*
Single Stage	4:1 to 10:1	12	95%	1.55	5000	0.25
Double Stage	16:1 to 100:1	16	85%	1.95	5000	0.25

*NOTE: When using with SM23165MT series motors: All gearheads above come standard with 1/4 inch diameter input shaft. For gearheads requiring a 0.375 inch shaft input, please add "-0.375" to the part number. Example: GH23P4-0.375 will provide a 0.375 inch input shaft diameter.

NOTE: Please consult the website or factory for load specifications. PEAK TORQUE: 15% above continuous rating.

⚠ WARNING: Repeated peak-torque loading may cause failure and will void the warranty.

High-Performance Series

Part #	Ratio	Continuous output torque at 1500 rpm input (in-lbs)	Continuous output torque at 3500 rpm input (in-lbs)	Continuous output torque at 5000 rpm input (in-lbs)	Gearhead inertia at input (lb-in-sec ²)
Single Stage					
GH23P3	3:1	442	292	232	1.22 x 10 ⁻⁴
GH23P4	4:1	410	294	242	5.24 x 10 ⁻⁵
GH23P5.5	5.5:1	373	288	247	2.65 x 10 ⁻⁵
GH23P7	7:1	344	279	245	1.93 x 10 ⁻⁵
GH23P10	10:1	277	238	215	1.35 x 10 ⁻⁵
Double Stage					
GH23P16	16:1	521	463	427	5.32 x 10 ⁻⁵
GH23P22	22:1	536	490	460	2.70 x 10 ⁻⁵
GH23P28	28:1	545	506	481	1.96 x 10 ⁻⁵
GH23P40	40:1	553	525	506	1.36 x 10 ⁻⁵
GH23P49	49:1	400	385	375	1.90 x 10 ⁻⁵
GH23P55	55:1	460	443	432	1.34 x 10 ⁻⁵
GH23P70	70:1	404	393	385	1.33 x 10 ⁻⁵
GH23P100	100:1	308	303	298	1.33 x 10 ⁻⁵

General Specifications

Construction Type	Ratio	Standard Backlash (arc-minutes)	Efficiency	Weight (lbs)	Maximum Tested Input rpm	Standard Input Shaft Diameter (in)*
Single Stage	3:1 to 10:1	6	90%	2.29	5000	0.25
Double Stage	16:1 to 100:1	10	85%	3.42	5000	0.25

*NOTE: When using with SM23165MT series motors: All gearheads above come standard with 1/4 inch diameter input shaft. For gearheads requiring a 0.375 inch shaft input, please add "-0.375" to the part number. Example: GH23P4-0.375 will provide a 0.375 inch input shaft diameter.

NOTE: Please consult the website or factory for load specifications. PEAK TORQUE: 15% above continuous rating.

⚠ WARNING: Repeated peak-torque loading may cause failure and will void the warranty.

Planetary Gearheads – NEMA 34 Series

OEM Series

Part #	Ratio	Continuous output torque at 1500 rpm input (in-lbs)	Continuous output torque at 3500 rpm input (in-lbs)	Continuous output torque at 5000 rpm input (in-lbs)	Gearhead inertia at input (lb-in-sec ²)
Single Stage					
GH34SP004	4:1	529	350	279	1.28 x 10 ⁻⁴
GH34SP007	7:1	467	355	301	7.65 x 10 ⁻⁵
GH34SP010	10:1	384	313	275	6.69 x 10 ⁻⁵
Double Stage					
GH34SP016	16:1	667	566	508	1.27 x 10 ⁻⁴
GH34SP028	28:1	670	639	595	7.63 x 10 ⁻⁵
GH34SP049	49:1	528	499	480	7.55 x 10 ⁻⁵
GH34SP070	70:1	534	514	499	6.64 x 10 ⁻⁵
GH34SP100	100:1	409	398	391	6.63 x 10 ⁻⁵

General Specifications

Construction Type	Ratio	Standard Backlash (arc-minutes)	Efficiency	Weight (lbs)	Maximum Tested Input rpm	Standard Input Shaft Diameter (in)*
Single Stage	4:1 to 10:1	12	95%	3.67	5000	0.375
Double Stage	16:1 to 100:1	16	90%	5.10	5000	0.375

*NOTE - When using with SM34165DT and SM34165MT series motors: All gearheads above come standard with 3/8 inch diameter input shaft. For gearheads requiring a 0.5 inch shaft input, please add "-0.5" to the part number. Example: GH34P3-0.5 will provide a 0.5 inch input shaft diameter.

NOTE: Please consult the website or factory for load specifications. PEAK TORQUE: 15% above continuous rating.

⚠ WARNING: Repeated peak-torque loading may cause failure and will void the warranty.

High-Performance Series

Part #	Ratio	Continuous output torque at 1500 rpm input (in-lbs)	Continuous output torque at 3500 rpm input (in-lbs)	Continuous output torque at 5000 rpm input (in-lbs)	Gearhead inertia at input (lb-in-sec ²)
Single Stage					
GH34P3	3:1	1010	615	475	6.77 x 10 ⁻⁴
GH34P4	4:1	972	643	513	2.77 x 10 ⁻⁴
GH34P5.5	5.5:1	913	657	543	1.51 x 10 ⁻⁴
GH34P7	7:1	859	653	554	1.11 x 10 ⁻⁴
GH34P10	10:1	707	575	505	7.90 x 10 ⁻⁵
Double Stage					
GH34P16	16:1	1350	1145	1027	2.86 x 10 ⁻⁴
GH34P22	22:1	1401	1234	1133	1.55 x 10 ⁻⁴
GH34P28	28:1	1432	1293	1203	1.11 x 10 ⁻⁴
GH34P40	40:1	1469	1362	1293	8.04 x 10 ⁻⁵
GH34P49	49:1	1067	1010	971	1.11 x 10 ⁻⁴
GH34P55	55:1	1228	1165	1123	7.94 x 10 ⁻⁵
GH34P70	70:1	1081	1040	1010	7.90 x 10 ⁻⁵
GH34P100	100:1	827	805	790	7.87 x 10 ⁻⁵

General Specifications

Construction Type	Ratio	Standard Backlash (arc-minutes)	Efficiency	Weight (lbs)	Maximum Tested Input rpm	Standard Input Shaft Diameter (in)*
Single Stage	3:1 to 10:1	6	90%	5.67	5000	0.375
Double Stage	16:1 to 100:1	10	85%	8.41	5000	0.375

*NOTE - When using with SM34165DT and SM34165MT series motors: All gearheads above come standard with 3/8 inch diameter input shaft. For gearheads requiring a 0.5 inch shaft input, please add "-0.5" to the part number. Example: GH34P3-0.5 will provide a 0.5 inch input shaft diameter.

NOTE: Please consult the website or factory for load specifications. PEAK TORQUE: 15% above continuous rating.

⚠ WARNING: Repeated peak-torque loading may cause failure and will void the warranty.

NEMA 17 Series

Part #	Ratio	Continuous output torque at 1500 rpm input (in-lbs)	Continuous output torque at 3500 rpm input (in-lbs)	Continuous output torque at 5000 rpm input (in-lbs)	Gearhead inertia at input (lb-in-sec ²)
Single Stage					
GH17RAP3	3:1	80	80	80	4.96 x 10 ⁻⁵
GH17RAP5.5	5.5:1	80	80	80	1.61 x 10 ⁻⁵
GH17RAP7	7:1	80	80	80	1.27 x 10 ⁻⁵
GH17RAP10	10:1	80	80	80	9.90 x 10 ⁻⁶
Double Stage					
GH17RAP16	16:1	100	100	100	1.65 x 10 ⁻⁵
GH17RAP22	22:1	100	100	100	1.13 x 10 ⁻⁵
GH17RAP55	55:1	100	100	100	8.36 x 10 ⁻⁶
GH17RAP100	100:1	100	100	100	8.31 x 10 ⁻⁶

Construction Type	Ratio	Standard Backlash (arc-minutes)	Efficiency	Weight (lbs)	Maximum Tested Input rpm	Standard Input Shaft Diameter (in)
Single Stage	3:1 to 10:1	10	90%	1.96	5000	0.197
Double Stage	16:1 to 100:1	14	85%	2.44	5000	0.197

NOTE: Data and curves from the high-performance planetary gearheads may be used to size right angle planetary gearheads. **PEAK TORQUE:** 15% above continuous rating.

⚠ WARNING: Repeated peak torque loading may cause failure and will void the warranty.

NEMA 23 Series

Part #	Ratio	Continuous output torque at 1500 rpm input (in-lbs)	Continuous output torque at 3500 rpm input (in-lbs)	Continuous output torque at 5000 rpm input (in-lbs)	Gearhead inertia at input (lb-in-sec ²)
Single Stage					
GH23RAP3	3:1	280	280	232	2.94 x 10 ⁻⁴
GH23RAP5.5	5.5:1	280	280	247	7.77 x 10 ⁻⁵
GH23RAP10	10:1	277	238	215	2.90 x 10 ⁻⁵
Double Stage					
GH23RAP16	16:1	350	350	350	5.93 x 10 ⁻⁵
GH23RAP22	22:1	350	350	350	3.02 x 10 ⁻⁵
GH23RAP55	55:1	350	350	350	1.39 x 10 ⁻⁵
GH23RAP100	100:1	308	303	298	1.35 x 10 ⁻⁵

Construction Type	Ratio	Standard Backlash (arc-minutes)	Efficiency	Weight (lbs)	Maximum Tested Input rpm	Standard Input Shaft Diameter (in)*
Single Stage	3:1 to 10:1	10	90%	4.87	5000	0.25
Double Stage	16:1 to 100:1	14	85%	6	5000	0.25

NOTE: Data and curves from the high-performance planetary gearheads may be used to size right angle planetary gearheads. **PEAK TORQUE:** 15% above continuous rating.

⚠ WARNING: Repeated peak torque loading may cause failure and will void the warranty.

*NOTE: When using with SM23165MT series motors: All gearheads above come standard with 1/4 inch diameter input shaft. For gearheads requiring a 0.375 inch shaft input, please add "-0.375" to the part number. Example: GH23RAP3-0.375 will provide a 0.375 inch input shaft diameter.

NEMA 34 Series

Part #	Ratio	Continuous output torque at 1500 rpm input (in-lbs)	Continuous output torque at 3500 rpm input (in-lbs)	Continuous output torque at 5000 rpm input (in-lbs)	Gearhead inertia at input (lb-in-sec ²)
Single Stage					
GH34RAP3	3:1	525	525	475	1.20 x 10 ⁻³
GH34RAP5.5	5.5:1	525	525	525	3.08 x 10 ⁻⁴
GH34RAP10	10:1	525	525	505	1.26 x 10 ⁻⁴
Double Stage					
GH34RAP16	16:1	656	656	656	3.05 x 10 ⁻⁴
GH34RAP22	22:1	656	656	656	1.65 x 10 ⁻⁴
GH34RAP55	55:1	656	656	656	8.10 x 10 ⁻⁵
GH34RAP100	100:1	656	656	656	7.92 x 10 ⁻⁵

Construction Type	Ratio	Standard Backlash (arc-minutes)	Efficiency	Weight (lbs)	Maximum Tested Input rpm	Standard Input Shaft Diameter (in)*
Single Stage	3:1 to 10:1	10	90%	11.89	5000	0.375
Double Stage	16:1 to 100:1	14	85%	14.62	5000	0.375

NOTE: Data and curves from the high-performance planetary gearheads may be used to size right angle planetary gearheads. **PEAK TORQUE:** 15% above continuous rating.

⚠ WARNING: Repeated peak torque loading may cause failure and will void the warranty.

*NOTE: When using with SM34165DT and SM34165MT series motors: All gearheads above come standard with 3/8 inch diameter input shaft. For gearheads requiring a 0.5 inch shaft input, please add "-0.5" to the part number. Example: GH34P3-0.5 will provide a 0.5 inch input shaft diameter.