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CGI Inc.

Quality at Every Turn

TECHNICAL CATALOG



DESIGNERS AND MANUFACTURERS OF PRECISION MOTION CONTROL PRODUCTS

CGI, INC. • 3400 Arrowhead Drive • Carson City, Nevada 89706
Tel 775.882.3422 • Fax 775.882.9599 • www.cgimotion.com

PRECISION



Precision Made in America

Quality, reliability and being customer-driven makes CGI the best value for your motion control requirements.

CGI, Inc.'s core business is manufacturing precision motion control solutions. From 1967 to present, CGI's comprehensive technical knowledge, manufacturing expertise and "can-do" attitude has served the needs of an ever changing motion control marketplace. CGI's diverse customer base and wide range of applications in aerospace, assembly, automotive, coordinate measuring, machine tool, material handling, medical, packaging, pharmaceutical, robotics, semi-conductor, special machinery, telecommunications and textile have earned CGI a reputation for innovation, quality and service.

CGI designs and builds high quality gearheads for AC induction motors, permanent magnet DC motors, stepmotors and servomotors. CGI can supply a complete motion control package, consisting of encoders, gearmotors, motion controllers, etc., to meet your application's requirements. From the simple to the complex, CGI can supply off-the-shelf products or provide a custom-fit solution.

CGI, Inc. operates under an ISO9001:2000 certified quality management system. CGI's Engineering, Manufacturing and Quality departments employ the latest systems available, such as Solidworks with FE analysis, AutoCad, CAD/CAM, Visual Manufacturing with ERP inventory management and CMM technology. We continually strive for new ways to improve standard products as well as minimize the time from the design stage to completion of your new and custom products.

CGI's greatest asset is its people! That is how CGI has accomplished an excellent record for on-time deliveries, rush/emergency production and customer satisfaction that is known throughout the industry. CGI is dedicated to exceeding those levels of support, satisfaction and product quality.

MADE IN AMERICA

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CGI'S PLANETARY GEARHEAD SYSTEM

True planetary gearing is provided by three or more planet gears revolving around a single pinion, or sun gear, which allows internal "load sharing" over the planet gears. When compared to spur gearheads where only two gears mesh simultaneously, a true planetary design can offer three to five times more torque capacity and greater performance. With CGI's studies of various applications, we have determined our true planetary design to be optimum for moderate to high torque factors. These factors include radial and axial loading, weight, lubrication, operating temperature extremes, typical torque/speed load points, etc.

NEMA MOUNTING INTERFACES

Presently there are no interface mounting standards for Brushless DC and servo motor products. Users of motion control equipment may have difficulty trying to mount a motor to a bulkhead and other peripheral equipment, such as gearheads. One motor manufacturer's dimensions may not have the same mounting dimensions as other motor manufacturers.

Step motors experienced a mounting interface standardization in 1972, which was the direct effort of industry leaders in the Incremental Motion Control Society (IMCS) and the National Electrical Manufacturers Association (NEMA). There is an industry trend by these same agencies to establish a set of standard dimensions for all motors. This standard governs the package size (square dimension or diameter if round) commonly called frame size (established sizes are 17, 23, 34, and 42). This also governs mounting hole diameter and bolt circle, pilot diameter, pilot length, shaft diameter and shaft length. Although step motors conform to "NEMA" standards, there is a need for a larger shaft diameter for the more powerful BLDC and servo motors, since the present step motor diameters are not able to transfer the torque ratings that these more powerful motors generate.

The entire CGI standard planetary gearhead family, excluding the PriMetric™, has the same mounting dimensions as "NEMA" motors, with the exception being larger shaft diameters. Due to higher torque levels generated by the gearhead, the larger diameter shafts are required.

GEARHEAD DURABILITY FACTORS

There are many factors that affect the life of a gearhead which fall into four (4) categories: Gear Geometry, Surface Durability, Lubrication, and Service Factors.

CGI adheres to AGMA (American Gear Manufacturers Association) standards in the design and analysis of **gear geometry**. CGI takes into consideration diametral pitch, number of teeth, face width, load distribution, material strength, heat treatment, RPM and hours of life. If any of these factors are not appropriate for the application, it may result in a shortening of the gearhead life. Proper gear geometry ensures smooth transmission of power. By optimizing gear geometry, we can reduce excess heat and noise generated at the gear mesh. CGI has years of experience in application engineering to assist them in determining the correct gearhead design and proper material selections for critical applications

Surface durability is the gear tooth's surface resistance to wear. This wear is the greatest when the RPM is high and the torque being transmitted through the gear is high. Gears must be hardened if they are expected to have a long life. All CGI gear components are specially heat treated to prevent excessive gear tooth surface wear.

Lubrication is very critical for the long life of any gearhead. Lubrications fail for two reasons. First, operating in an ambient temperature that is higher than the grease is rated for and second is time. CGI gearheads can endure wide operating temperature extremes without damage. Our standard synthetic grease has an operating temperature range of -40˚ C to +150˚ C (-40˚ F to +300˚ F). Our front and rear mounting brackets are manufactured from aluminum, which is an excellent heat sink that conducts heat away from the gears and allows for longer lubrication life. CGI has additional lubrications for specialized applications, such as greases and dry film lubricants rated for space use and high vacuum applications that need to conform to very low "out-gassing" requirements.

Service Factors apply to the torque ratings a gearhead is capable of withstanding based on direction, motion, profile, RPM, shock loads, number of cycles per hour and/or how many hours per day it is in operation. To determine the correct service factor when evaluating torque ratings for your application, please look under our **Product Selection Guide/Application Sheet (page 40-42)**.

CGI wants to provide you with the best gearhead solution to match your needs. Here are some factors to consider to maximize your application system's performance:

- Motor Type
- Torque
- Speed/RPM
- Inertia Match
- Radial/Axial Loading
- System Resolution
- Life Expectancy
- Noise
- System Stiffness

AGMA GEAR QUALITY

AGMA stands for the American Gear Manufacturer's Association. This agency has established specific tolerances that are associated with an AGMA Quality Class or Level (per AGMA 2000-A 88). Commercial gears typically are classed between AGMA 5 to AGMA 9. Precision gears range between AGMA 10 to AGMA 14. In comparison master gears are AGMA 15. CGI gears range between AGMA 10 and 13, depending on application.

SINGLE PIECE CONSTRUCTION

CGI uses precision gear cutting machines to obtain high AGMA levels, ensuring the highest quality gears are used in our motion control products. To reduce the effects of tolerance stack-ups during the assembly process of our gearhead products, we make all ring gears, output shaft/carrier plates from a single piece of high strength steel. This process gives our customers a much quieter and stronger gearhead compared to many of the gearheads on the market with two piece construction.

GEARHEAD OUTPUT BEARING SYSTEMS

Our Inline Planetary and Spur gearhead output shafts are soundly supported by a precision radial sealed ball bearing system. Our choice of sealed ball bearings prolongs the life of both the gearhead and bearings by 1) providing a separation between the bearing system lubrication and the gearhead lubrication and 2) retaining and protecting the lubrication systems from both leaks and contaminants.

Our Right Angle Planetary and Spur gearhead output shafts are rigidly supported by a dual, preloaded, tapered roller bearing system capable of very high axial and radial loads. The tapered bearings are also sealed to provide a contamination barrier and retain both gearhead and bearing lubrication.

Our PriMetric™ Planetary, Prime™ Planetary, Paragon™ Planetary and Spur gearhead bearings, when used within the stated maximum performance conditions, will perform throughout the warranted life of the gearhead. (See our catalog bearing data charts for load value on pages 16 and 17.)

CAGED ROLLER BEARINGS

We install high quality caged roller bearings inside our case hardened planet gears for long life, even when subjected to heavy torque loads.

CLAMP-ON PINION GEARS / QUICH INSTALLATION

CGI uses a balanced two-piece clamp and pinion gear design that is easy and quick to install on motor shafts. We make these pinion gears out of high strength steel and finish by heat treating for a long life. Our gearheads come complete with detailed instructions, all mounting hardware, and Allen wrenches. Complete gearhead to motor installation takes only minutes.

VITON O-RINGS

O-Rings seal each joint of our Prime™, PriMetric™ and Spur Inline gearhead families to prevent outside contamination from entering the gearhead. The Viton material is chemically resistant and can withstand temperatures over 400˚ F (204˚ C).

NOTE: For complete sealing of motor to the gearhead, apply Loctite™ 515 (liquid gasket), or equivalent, to the motor's face where it contacts the rear surface of the gearhead.

CGI's Sales and Engineering Staff will gladly assist you with these or any other application/technical issues you may have.

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SINGLE, DOUBLE, TRIPLE STAGE
PRECISION HIGH PERFORMANCE GEARHEADS

CONSTRUCTION FEATURES

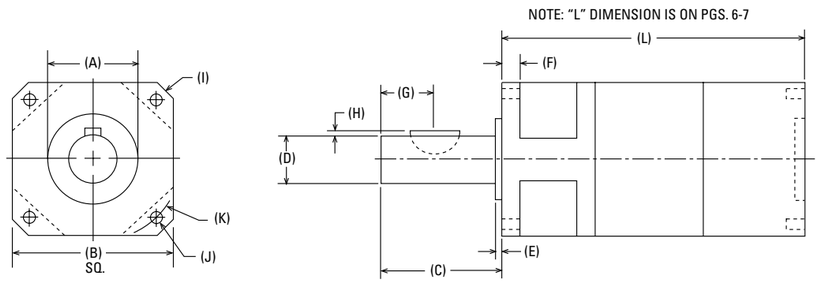
- True planetary design
- Low backlash design
- Input pinion with balanced clamp collar
- Quick installation
- Strong, caged roller bearings
- High reliability design
- High strength steels
- High shaft loading capacity
- Viton O-Ring sealed at each joint
- Sealed ball bearings
- High efficiency design
- All gears are heat treated
- NEMA mounting standards
- 5 year warranty



PL SERIES: PRIME™ PLANETARY GEARHEADS

SINGLE, DOUBLE, TRIPLE STAGE
PRECISION HIGH PERFORMANCE GEARHEADS

NOTE: "L" DIMENSION IS ON PGS. 6-7



PART NUMBER	A PILOT DIAMETER (in.)	B SQUARE FLANGE (in.)	C SHAFT LENGTH (in.)	D SHAFT DIAMETER (in.)	E PILOT LENGTH (in.)	F FLANGE THICKNESS (in.)	G KEY LOCATION (in.)
017PLX	.864/.866	1.65	1.25	.4995/.5000	0.062	0.187	0.56
023PLX	1.498/1.500	2.25	1.25	.4995/.5000	0.062	0.250	0.56
034PLX	2.873/2.875	3.25	1.50	.7495/.7500	0.062	0.312	0.56
042PLX	2.185/2.187	4.20	2.00	.9995/1.0000	0.062	0.500	0.63
056PLX	4.498/4.500	5.75	2.50	1.4995/1.5000	0.125	0.750	0.94
075PLX	5.998/6.000	7.48	3.50	1.9995/2.0000	0.187	0.875	3.00 Lg

PART NUMBER	H KEY HEIGHT (in.)	I HOUSING DIAMETER (in.)	J BOLT HOLE DIAMETER (in.)	K BOLT HOLE CIRCLE (in.)	KEY WIDTH/ WOODRUFF KEY (in.)	RADIAL & AXIAL SHAFT LOADING (LBS.)
017PLX	0.054	2.05	0.125	1.725	0.125 / #404	SEE PAGE 17
023PLX	0.054	2.95	0.205	2.625	0.125 / #404	
034PLX	0.082	4.38	0.220	3.875	0.187 / #606	
042PLX	0.109	5.51	0.280	4.950	0.250 / #808	
056PLX	0.163	7.87	0.410	7.000	0.375 / #1212	
075PLX	0.157	9.64	0.560	8.465	3/8"x 5/8" RECT.	

AVAILABLE RATIOS	EFFICIENCY	SPECIFICATIONS
SINGLE STAGE : 3:1 / 4:1 / 5:1 / 5.5:1 / 7:1 / 10:1	90%	Input RPM: 6500 Max.
DOUBLE STAGE: 15:1/16:1/20:1/22:1/25:1/28:1/30:1/40:1/49:1/50:1/55:1/70:1/100:1	85%	Operating Temperature Range -40˚F to +255˚F
TRIPLE STAGE: 160:1 / 280:1 / 400:1 / 550:1 / 700:1 OTHER RATIOS AVAILABLE	80%	Motor Mounting Hardware Supplied



PRIME™ IN TIME...48 HOUR SHIPPING.

ALL SPECIFICATIONS SUBJECT TO CHANGE.

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SINGLE, DOUBLE, TRIPLE STAGE

MODEL	RATIO	TORQUE RATING Tc IN LBS.	TORQUE RATING Tpeak IN LBS.	INERTIA INPUT PINION 0Z IN SEC²	INERTIA GEARHEAD 0Z IN SEC²	BACKLASH STD/ LOW ARC MINUTES	GEARHEAD WEIGHT LBS.	L GEARHEAD LENGTH
017PLX	3:1	167	261	2.163E-04	1.669E-04	6 / 3	1.0	2.62
017PLX	4:1	158	248	1.352E-04	1.053E-04	6 / 3	1.0	2.62
017PLX	5:1	148	231	1.203E-04	6.954E-05	6 / 3	1.0	2.62
017PLX	5.5:1	143	223	1.174E-04	5.870E-05	6 / 3	1.0	2.62
017PLX	7:1	119	158	1.143E-04	3.692E-05	6 / 3	1.0	2.62
017PLX	10:1	56	84	1.132E-04	1.833E-05	6 / 3	1.0	2.62
017PLX	15:1	178	277	1.203E-04	7.482E-05	10 / 5	1.6	3.28
017PLX	16:1	169	264	1.352E-04	1.045E-04	10 / 5	1.6	3.28
017PLX	20:1	170	266	1.203E-04	6.906E-05	10 / 5	1.6	3.28
017PLX	22:1	171	267	1.174E-04	5.830E-05	10 / 5	1.6	3.28
017PLX	25:1	159	247	1.203E-04	6.699E-05	10 / 5	1.6	3.28
017PLX	28:1	172	269	1.143E-04	3.667E-05	10 / 5	1.6	3.28
017PLX	30:1	183	285	1.132E-04	1.965E-05	10 / 5	1.6	3.28
017PLX	40:1	174	272	1.132E-04	1.821E-05	10 / 5	1.6	3.28
017PLX	49:1	127	199	1.143E-04	3.479E-05	10 / 5	1.6	3.28
017PLX	50:1	161	251	1.132E-04	1.770E-05	10 / 5	1.6	3.28
017PLX	55:1	156	243	1.132E-04	1.755E-05	10 / 5	1.6	3.28
017PLX	70:1	128	201	1.132E-04	1.729E-05	10 / 5	1.6	3.28
017PLX	100:1	52	77	1.132E-04	1.708E-05	10 / 5	1.6	3.28
017PLX	160:1	181	283	1.132E-04	1.812E-05	14 / 7	2.2	3.77
017PLX	280:1	183	286	1.132E-04	1.725E-05	14 / 7	2.2	3.77
017PLX	400:1	185	286	1.132E-04	1.706E-05	14 / 7	2.2	3.77
017PLX	550:1	165	257	1.132E-04	1.705E-05	14 / 7	2.2	3.77
017PLX	700:1	136	212	1.132E-04	1.705E-05	14 / 7	2.2	3.77
023PLX	3:1	380	594	1.194E-03	4.866E-04	6 / 3	1.8	2.66
023PLX	4:1	360	562	9.502E-04	3.113E-04	6 / 3	1.8	2.66
023PLX	5:1	331	518	9.044E-04	2.064E-04	6 / 3	1.8	2.66
023PLX	5.5:1	317	496	8.969E-04	1.746E-04	6 / 3	1.8	2.66
023PLX	7:1	263	411	8.880E-04	1.100E-04	6 / 3	1.8	2.66
023PLX	10:1	119	179	8.846E-04	5.471E-05	6 / 3	1.8	2.66
023PLX	15:1	396	619	9.044E-04	2.355E-04	10 / 5	2.8	3.48
023PLX	16:1	376	587	9.502E-04	3.287E-04	10 / 5	2.8	3.48
023PLX	20:1	378	591	9.044E-04	2.175E-04	10 / 5	2.8	3.48
023PLX	22:1	380	594	8.969E-04	1.838E-04	10 / 5	2.8	3.48
023PLX	25:1	347	543	9.044E-04	2.110E-04	10 / 5	2.8	3.48
023PLX	28:1	384	600	8.880E-04	1.157E-04	10 / 5	2.8	3.48
023PLX	30:1	408	639	8.846E-04	6.200E-05	10 / 5	2.8	3.48
023PLX	40:1	388	607	8.846E-04	5.749E-05	10 / 5	2.8	3.48
023PLX	49:1	286	447	8.880E-04	1.098E-04	10 / 5	2.8	3.48
023PLX	50:1	361	564	8.846E-04	5.586E-05	10 / 5	2.8	3.48
023PLX	55:1	347	542	8.846E-04	5.543E-05	10 / 5	2.8	3.48
023PLX	70:1	288	450	8.846E-04	5.460E-05	10 / 5	2.8	3.48
023PLX	100:1	110	164	8.846E-04	5.393E-05	10 / 5	2.8	3.48
023PLX	160:1	404	631	8.846E-04	5.723E-05	14 / 7	3.8	4.27
023PLX	280:1	409	640	8.846E-04	5.449E-05	14 / 7	3.8	4.27
023PLX	400:1	406	608	8.846E-04	5.388E-05	14 / 7	3.8	4.27
023PLX	550:1	368	575	8.846E-04	5.386E-05	14 / 7	3.8	4.27
023PLX	700:1	303	473	8.846E-04	5.385E-05	14 / 7	3.8	4.27
034PLX	3:1	1285	2008	4.901E-03	4.672E-03	6 / 3	7.0	4.19
034PLX	4:1	1219	1905	2.522E-03	2.833E-03	6 / 3	7.0	4.19
034PLX	5:1	1148	1795	2.115E-03	1.875E-03	6 / 3	7.0	4.19
034PLX	5.5:1	1113	1740	2.040E-03	1.585E-03	6 / 3	7.0	4.19
034PLX	7:1	935	1461	1.955E-03	9.983E-04	6 / 3	7.0	4.19
034PLX	10:1	552	828	1.923E-03	4.961E-04	6 / 3	7.0	4.19
034PLX	15:1	1381	2158	2.115E-03	2.033E-03	10 / 5	8.0	5.31
034PLX	16:1	1315	2055	2.522E-03	2.824E-03	10 / 5	8.0	5.31
034PLX	20:1	1324	2069	2.115E-03	1.869E-03	10 / 5	8.0	5.31
034PLX	22:1	1333	2083	2.040E-03	1.580E-03	10 / 5	8.0	5.31
034PLX	25:1	1244	1945	2.115E-03	1.810E-03	10 / 5	8.0	5.31
034PLX	28:1	1346	2103	1.955E-03	9.952E-04	10 / 5	8.0	5.31
034PLX	30:1	1430	2235	1.923E-03	5.355E-04	10 / 5	8.0	5.31
034PLX	40:1	1364	2132	1.923E-03	4.946E-04	10 / 5	8.0	5.31
034PLX	49:1	1015	1587	1.955E-03	9.417E-04	10 / 5	8.0	5.31
034PLX	50:1	1267	1980	1.923E-03	4.799E-04	10 / 5	8.0	5.31
034PLX	55:1	1232	1925	1.923E-03	4.759E-04	10 / 5	8.0	5.31
034PLX	70:1	1027	1605	1.923E-03	4.684E-04	10 / 5	8.0	5.31
034PLX	100:1	507	761	1.923E-03	4.623E-04	10 / 5	8.0	5.31
034PLX	160:1	1424	2226	1.923E-03	4.905E-04	14 / 7	9.0	6.53
034PLX	280:1	1445	2258	1.923E-03	4.668E-04	14 / 7	9.0	6.53
034PLX	400:1	1458	2278	1.923E-03	4.615E-04	14 / 7	9.0	6.53
034PLX	550:1	1311	2048	1.923E-03	4.613E-04	14 / 7	9.0	6.53
034PLX	700:1	1090	1703	1.923E-03	4.613E-04	14 / 7	9.0	6.53

ALL SPECIFICATIONS SUBJECT TO CHANGE.

PL SERIES: PRIME™ PLANETARY GEARHEADS

SINGLE, DOUBLE, TRIPLE STAGE

MODEL	RATIO	TORQUE RATING Tc IN LBS.	TORQUE RATING Tpeak IN LBS.	INERTIA INPUT PINION 0Z IN SEC²	INERTIA GEARHEAD 0Z IN SEC²	BACKLASH STD/ LOW ARC MINUTES	GEARHEAD WEIGHT LBS.	L GEARHEAD LENGTH
042PLX	3:1	2301	3597	1.680E-02	1.641E-02	6 / 3	11.5	4.73
042PLX	4:1	2195	3430	1.032E-02	1.049E-02	6 / 3	11.5	4.73
042PLX	5:1	2079	3249	9.201E-03	6.945E-03	6 / 3	11.5	4.73
042PLX	5.5:1	2021	3159	8.997E-03	5.878E-03	6 / 3	11.5	4.73
042PLX	7:1	1711	2673	8.766E-03	3.704E-03	6 / 3	11.5	4.73
042PLX	10:1	1122	1684	8.680E-03	1.841E-03	6 / 3	11.5	4.73
042PLX	15:1	2485	3884	9.201E-03	7.783E-03	10 / 5	18.0	6.36
042PLX	16:1	2379	3717	1.032E-02	1.101E-02	10 / 5	18.0	6.36
042PLX	20:1	2397	3745	9.201E-03	7.286E-03	10 / 5	18.0	6.36
042PLX	22:1	2414	3772	8.997E-03	6.156E-03	10 / 5	18.0	6.36
042PLX	25:1	2263	3536	9.201E-03	7.101E-03	10 / 5	18.0	6.36
042PLX	28:1	2438	3811	8.766E-03	3.875E-03	10 / 5	18.0	6.36
042PLX	30:1	2579	4032	8.680E-03	2.050E-03	10 / 5	18.0	6.36
042PLX	40:1	2473	3865	8.680E-03	1.925E-03	10 / 5	18.0	6.36
042PLX	49:1	1867	2918	8.766E-03	3.706E-03	10 / 5	18.0	6.36
042PLX	50:1	2308	3606	8.680E-03	1.879E-03	10 / 5	18.0	6.36
042PLX	55:1	2250	3516	8.680E-03	1.866E-03	10 / 5	18.0	6.36
042PLX	70:1	1890	2953	8.680E-03	1.843E-03	10 / 5	18.0	6.36
042PLX	100:1	1031	1547	8.680E-03	1.823E-03	10 / 5	18.0	6.36
042PLX	160:1	2587	4044	8.680E-03	1.931E-03	14 / 7	18.5	7.93
042PLX	280:1	2627	4105	8.680E-03	1.844E-03	14 / 7	18.5	7.93
042PLX	400:1	2651	4142	8.680E-03	1.824E-03	14 / 7	18.5	7.93
042PLX	550:1	2400	3750	8.680E-03	1.823E-03	14 / 7	18.5	7.93
042PLX	700:1	2009	3140	8.680E-03	1.823E-03	14 / 7	18.5	7.93
056PLX	3:1	5169	8078	5.794E-02	7.141E-02	6 / 3	28.0	7.39
056PLX	4:1	4946	7730	3.123E-02	4.524E-02	6 / 3	28.0	7.39
056PLX	5:1	4693	7335	2.647E-02	2.991E-02	6 / 3	28.0	7.39
056PLX	5.5:1	4567	7137	2.564E-02	2.527E-02	6 / 3	28.0	7.39
056PLX	7:1	3888	6076	2.470E-02	1.590E-02	6 / 3	28.0	7.39
056PLX	10:1	2767	4150	2.435E-02	7.899E-03	6 / 3	28.0	7.39
056PLX	15:1	5619	8781	2.647E-02	3.315E-02	10 / 5	43.0	9.53
056PLX	16:1	5396	8433	3.123E-02	4.702E-02	10 / 5	43.0	9.53
056PLX	20:1	5439	8500	2.647E-02	3.105E-02	10 / 5	43.0	9.53
056PLX	22:1	5482	8567	2.564E-02	2.621E-02	10 / 5	43.0	9.53
056PLX	25:1	5143	8038	2.647E-02	3.026E-02	10 / 5	43.0	9.53
056PLX	28:1	5542	8661	2.470E-02	1.648E-02	10 / 5	43.0	9.53
056PLX	30:1	5850	9142	2.435E-02	8.708E-03	10 / 5	43.0	9.53
056PLX	40:1	5627	8794	2.435E-02	8.184E-03	10 / 5	43.0	9.53
056PLX	49:1	4273	6677	2.470E-02	1.576E-02	10 / 5	43.0	9.53
056PLX	50:1	5253	8210	2.435E-02	7.986E-03	10 / 5	43.0	9.53
056PLX	55:1	5127	8012	2.435E-02	7.932E-03	10 / 5	43.0	9.53
056PLX	70:1	4328	6763	2.435E-02	7.830E-03	10 / 5	43.0	9.53
056PLX	100:1	2543	3814	2.435E-02	7.746E-03	10 / 5	43.0	9.53
056PLX	160:1	5904	9227	2.435E-02	8.201E-03	14 / 7	58.0	11.63
056PLX	280:1	5998	9374	2.435E-02	7.835E-03	14 / 7	58.0	11.63
056PLX	400:1	6055	9463	2.435E-02	7.749E-03	14 / 7	58.0	11.63
056PLX	550:1	5486	8574	2.435E-02	7.747E-03	14 / 7	58.0	11.63
056PLX	700:1	4616	7213	2.435E-02	7.746E-03	14 / 7	58.0	11.63
075PLX	3:1	13339	20009	1.936E-01	2.930E-01	6 / 3	77.0	9.11
075PLX	4:1	12713	19868	6.554E-02	1.889E-01	6 / 3	77.0	9.11
075PLX	5:1	12748	19923	4.403E-02	1.254E-01	6 / 3	77.0	9.11
075PLX	5.5:1	12765	19950	4.015E-02	1.062E-01	6 / 3	77.0	9.11
075PLX	7:1	10809	16892	3.574E-02	6.702E-02	6 / 3	77.0	9.11
075PLX	10:1	7016	10524	3.410E-02	3.335E-02	6 / 3	77.0	9.11
075PLX	15:1	15924	24048	4.403E-02	1.372E-01	10 / 5	116.0	11.99
075PLX	16:1	15298	23907	6.554E-02	1.928E-01	10 / 5	116.0	11.99
075PLX	20:1	15430	24113	4.403E-02	1.279E-01	10 / 5	116.0	11.99
075PLX	22:1	15561	24318	4.015E-02	1.083E-01	10 / 5	116.0	11.99
075PLX	25:1	15333	23962	4.403E-02	1.246E-01	10 / 5	116.0	11.99
075PLX	28:1	15746	24608	3.574E-02	6.831E-02	10 / 5	116.0	11.99
075PLX	30:1	16632	25155	3.410E-02	3.629E-02	10 / 5	116.0	11.99
075PLX	40:1	16006	25014	3.410E-02	3.398E-02	10 / 5	116.0	11.99
075PLX	49:1	11968	18704	3.574E-02	6.523E-02	10 / 5	116.0	11.99
075PLX	50:1	14447	22577	3.410E-02	3.314E-02	10 / 5	116.0	11.99
075PLX	55:1	14464	22604	3.410E-02	3.291E-02	10 / 5	116.0	11.99
075PLX	70:1	12134	18962	3.410E-02	3.247E-02	10 / 5	116.0	11.99
075PLX	100:1	6447	9671	3.410E-02	3.212E-02	10 / 5	116.0	11.99

ALL SPECIFICATIONS SUBJECT TO CHANGE.

NOTES: Other ratios are also available, consult factory.
Tc: Output torque is rated at 3000 RPM, and a minimum life of 10,000 hours.
Bearing load ratings are based on a minimum life of 10,000 hours.

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SINGLE, DOUBLE, TRIPLE STAGE
PRECISION HIGH PERFORMANCE GEARHEADS

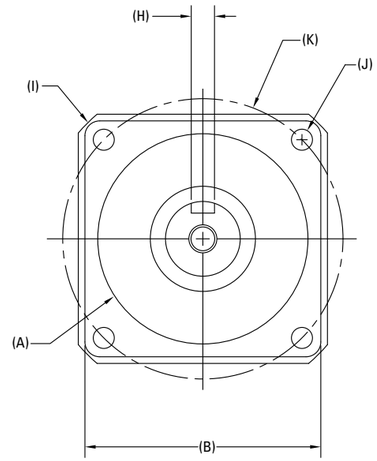
CONSTRUCTION FEATURES

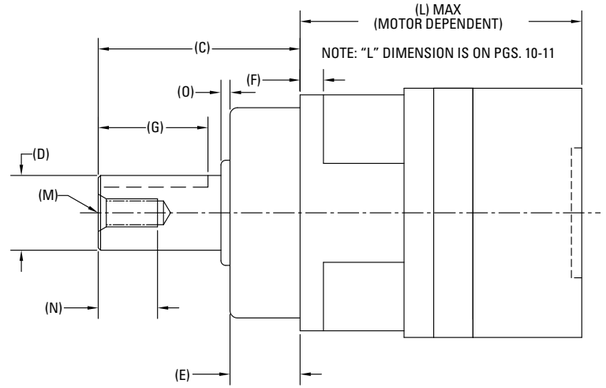
- Metric and standard NEMA motor mounting available
- High radial and axial shaft loading capacity
- True planetary design
- Low start-up torque
- High torque capability
- Compact design
- Popular metric output shaft and front bracket design
- Rigid stepped output shaft design with metric key and threaded mounting hole
- Ratios and sizes available for most applications
- 5 year warranty



PM SERIES: PRIMETRIC™ PLANETARY GEARHEADS

SINGLE, DOUBLE, TRIPLE STAGE
PRECISION HIGH PERFORMANCE GEARHEADS





PART NUMBER	A PILOT DIAMETER mm (in.)	B SQUARE FLANGE mm (in.)	C SHAFT LENGTH mm (in.)	D SHAFT DIAMETER mm (in.)	E PILOT LENGTH mm (in.)	F FLANGE THICKNESS mm (in.)	G KEY LENGTH mm (in.)
040PMX	40.0 (1.575)	42.0 (1.654)	30.0 (1.181)	13.00 (.5118)	12.0 (.472)	5.0 (.197)	16.0 (.62)
060PMX	60.0 (2.362)	62.0 (2.441)	47.0 (1.850)	16.00 (.6299)	20.0 (.787)	6.0 (.236)	20.0 (.79)
075PMX	70.0 (2.756)	76.0 (2.992)	56.0 (2.205)	22.00 (.8661)	20.0 (.787)	7.0 (.276)	30.0 (1.18)
100PMX	90.0 (3.543)	101.0 (3.976)	86.5 (3.406)	32.00 (1.2598)	30.0 (1.181)	10.0 (.394)	47.0 (1.85)
140PMX	130.0 (5.118)	141.0 (5.551)	112.0 (4.409)	40.00 (1.5748)	30.0 (1.181)	19.0 (.748)	47.0 (1.85)
180PMX	160.0 (6.299)	182.0 (7.165)	112.0 (4.409)	55.00 (2.1654)	30.0 (1.181)	22.2 (.874)	60.0 (2.36)

PART NUMBER	H KEY WIDTH mm (in.)	I HOUSING DIAMETER mm (in.)	J BOLT HOLE DIAMETER mm (in.)	K BOLT HOLE CIRCLE mm (in.)	M THREAD	N THREAD DEPTH mm (in.)	O STEP
040PMX	5.0 (.197)	52.0 (2.047)	4.5 (.177)	46.0 (1.811)	M4 x 0.7	12.0 (.472)	1.5 (.060)
060PMX	5.0 (.197)	85.0 (3.346)	5.5 (.217)	68.0 (2.677)	M5 x 0.8	12.7 (.500)	2.0 (.079)
075PMX	8.0 (.315)	111.0 (4.370)	6.6 (.260)	85.0 (3.346)	M8 x 1.25	16.0 (.630)	2.0 (.079)
100PMX	10.0 (.394)	140.0 (5.512)	9.0 (.354)	120.0 (4.724)	M12 x 1.75	25.4 (1.000)	3.9 (.153)
140PMX	12.0 (.472)	200.0 (7.874)	11.0 (.433)	165.0 (6.496)	M16 x 1.5	32.0 (1.260)	5.0 (.197)
180PMX	16.0 (.630)	245.0 (9.646)	13.0 (.512)	215.0 (8.465)	M20 x 1.5	42.0 (1.654)	6.0 (.236)

Radial and Axial Shaft Loading (LBS) See page 16

AVAILABLE RATIOS	EFFICIENCY	SPECIFICATIONS
SINGLE STAGE : 3:1 / 4:1 / 5:1 / 5.5:1 / 7:1 / 10:1	90%	Input RPM: 6500 Max.
DOUBLE STAGE: 15:1/16:1/20:1/22:1/25:1/28:1/30:1/40:1/49:1/50:1/55:1/70:1/100:1	85%	Operating Temperature Range -40˚F to +255˚F
TRIPLE STAGE: 160:1 / 280:1 / 400:1 / 550:1 / 700:1 OTHER RATIOS AVAILABLE	80%	Motor Mounting Hardware Supplied

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SINGLE, DOUBLE, TRIPLE STAGE

MODEL	RATIO	TORQUE RATING Tc IN LBS.	TORQUE RATING TPEAK IN LBS.	INERTIA INPUT PINION OZ IN SEC²	INERTIA GEARHEAD OZ IN SEC²	BACKLASH STD/ LOW ARC MINUTES	GEARHEAD WEIGHT LBS.	L GEARHEAD LENGTH
040PMX	3:1	167	261	2.163E-04	1.669E-04	6 / 3	1.0	2.74
040PMX	4:1	158	248	1.352E-04	1.053E-04	6 / 3	1.0	2.74
040PMX	5:1	148	231	1.203E-04	6.954E-05	6 / 3	1.0	2.74
040PMX	5.5:1	143	223	1.174E-04	5.870E-05	6 / 3	1.0	2.74
040PMX	7:1	119	158	1.143E-04	3.692E-05	6 / 3	1.0	2.74
040PMX	10:1	56	84	1.132E-04	1.833E-05	6 / 3	1.0	2.74
040PMX	15:1	178	277	1.203E-04	7.482E-05	10 / 5	1.6	3.28
040PMX	16:1	169	264	1.352E-04	1.045E-04	10 / 5	1.6	3.28
040PMX	20:1	170	266	1.203E-04	6.906E-05	10 / 5	1.6	3.28
040PMX	22:1	171	267	1.174E-04	5.830E-05	10 / 5	1.6	3.28
040PMX	25:1	159	247	1.203E-04	6.699E-05	10 / 5	1.6	3.28
040PMX	28:1	172	269	1.143E-04	3.667E-05	10 / 5	1.6	3.28
040PMX	30:1	183	285	1.132E-04	1.965E-05	10 / 5	1.6	3.28
040PMX	40:1	174	272	1.132E-04	1.821E-05	10 / 5	1.6	3.28
040PMX	49:1	127	199	1.143E-04	3.479E-05	10 / 5	1.6	3.28
040PMX	50:1	161	251	1.132E-04	1.770E-05	10 / 5	1.6	3.28
040PMX	55:1	156	243	1.132E-04	1.755E-05	10 / 5	1.6	3.28
040PMX	70:1	128	201	1.132E-04	1.729E-05	10 / 5	1.6	3.28
040PMX	100:1	52	77	1.132E-04	1.708E-05	10 / 5	1.6	3.28
040PMX	160:1	181	283	1.132E-04	1.812E-05	14 / 7	2.2	3.89
040PMX	280:1	183	286	1.132E-04	1.725E-05	14 / 7	2.2	3.89
040PMX	400:1	185	286	1.132E-04	1.706E-05	14 / 7	2.2	3.89
040PMX	550:1	165	257	1.132E-04	1.705E-05	14 / 7	2.2	3.89
040PMX	700:1	136	212	1.132E-04	1.705E-05	14 / 7	2.2	3.89
060PMX	3:1	380	594	1.194E-03	4.866E-04	6 / 3	1.8	2.74
060PMX	4:1	360	562	9.502E-04	3.113E-04	6 / 3	1.8	2.74
060PMX	5:1	331	518	9.044E-04	2.064E-04	6 / 3	1.8	2.74
060PMX	5.5:1	317	496	8.969E-04	1.746E-04	6 / 3	1.8	2.74
060PMX	7:1	263	411	8.880E-04	1.100E-04	6 / 3	1.8	2.74
060PMX	10:1	119	179	8.846E-04	5.471E-05	6 / 3	1.8	2.74
060PMX	15:1	396	619	9.044E-04	2.355E-04	10 / 5	2.8	3.56
060PMX	16:1	376	587	9.502E-04	3.287E-04	10 / 5	2.8	3.56
060PMX	20:1	378	591	9.044E-04	2.175E-04	10 / 5	2.8	3.56
060PMX	22:1	380	594	8.969E-04	1.838E-04	10 / 5	2.8	3.56
060PMX	25:1	347	543	9.044E-04	2.110E-04	10 / 5	2.8	3.56
060PMX	28:1	384	600	8.880E-04	1.157E-04	10 / 5	2.8	3.56
060PMX	30:1	408	639	8.846E-04	6.200E-05	10 / 5	2.8	3.56
060PMX	40:1	388	607	8.846E-04	5.749E-05	10 / 5	2.8	3.56
060PMX	49:1	286	447	8.880E-04	1.098E-04	10 / 5	2.8	3.56
060PMX	50:1	361	564	8.846E-04	5.586E-05	10 / 5	2.8	3.56
060PMX	55:1	347	542	8.846E-04	5.543E-05	10 / 5	2.8	3.56
060PMX	70:1	288	450	8.846E-04	5.460E-05	10 / 5	2.8	3.56
060PMX	100:1	110	164	8.846E-04	5.393E-05	10 / 5	2.8	3.56
060PMX	160:1	404	631	8.846E-04	5.723E-05	14 / 7	3.8	4.35
060PMX	280:1	409	640	8.846E-04	5.449E-05	14 / 7	3.8	4.35
060PMX	400:1	406	608	8.846E-04	5.388E-05	14 / 7	3.8	4.35
060PMX	550:1	368	575	8.846E-04	5.386E-05	14 / 7	3.8	4.35
060PMX	700:1	303	473	8.846E-04	5.385E-05	14 / 7	3.8	4.35
075PMX	3:1	1285	2008	4.901E-03	4.672E-03	6 / 3	7.0	4.15
075PMX	4:1	1219	1905	2.522E-03	2.833E-03	6 / 3	7.0	4.15
075PMX	5:1	1148	1795	2.115E-03	1.875E-03	6 / 3	7.0	4.15
075PMX	5.5:1	1113	1740	2.040E-03	1.585E-03	6 / 3	7.0	4.15
075PMX	7:1	935	1461	1.955E-03	9.983E-04	6 / 3	7.0	4.15
075PMX	10:1	552	828	1.923E-03	4.961E-04	6 / 3	7.0	4.15
075PMX	15:1	1381	2158	2.115E-03	2.033E-03	10 / 5	8.0	5.28
075PMX	16:1	1315	2055	2.522E-03	2.824E-03	10 / 5	8.0	5.28
075PMX	20:1	1324	2069	2.115E-03	1.869E-03	10 / 5	8.0	5.28
075PMX	22:1	1333	2083	2.040E-03	1.580E-03	10 / 5	8.0	5.28
075PMX	25:1	1244	1945	2.115E-03	1.810E-03	10 / 5	8.0	5.28
075PMX	28:1	1346	2103	1.955E-03	9.952E-04	10 / 5	8.0	5.28
075PMX	30:1	1430	2235	1.923E-03	5.355E-04	10 / 5	8.0	5.28
075PMX	40:1	1364	2132	1.923E-03	4.946E-04	10 / 5	8.0	5.28
075PMX	49:1	1015	1587	1.955E-03	9.417E-04	10 / 5	8.0	5.28
075PMX	50:1	1267	1980	1.923E-03	4.799E-04	10 / 5	8.0	5.28
075PMX	55:1	1232	1925	1.923E-03	4.759E-04	10 / 5	8.0	5.28
075PMX	70:1	1027	1605	1.923E-03	4.684E-04	10 / 5	8.0	5.28
075PMX	100:1	507	761	1.923E-03	4.623E-04	10 / 5	8.0	5.28
075PMX	160:1	1424	2226	1.923E-03	4.905E-04	14 / 7	9.0	6.50
075PMX	280:1	1445	2258	1.923E-03	4.668E-04	14 / 7	9.0	6.50
075PMX	400:1	1458	2278	1.923E-03	4.615E-04	14 / 7	9.0	6.50
075PMX	550:1	1311	2048	1.923E-03	4.613E-04	14 / 7	9.0	6.50
075PMX	700:1	1090	1703	1.923E-03	4.613E-04	14 / 7	9.0	6.50

ALL SPECIFICATIONS SUBJECT TO CHANGE.

PM SERIES: PRIMETRIC™ PLANETARY GEARHEADS

SINGLE, DOUBLE, TRIPLE STAGE

MODEL	RATIO	TORQUE RATING Tc IN LBS.	TORQUE RATING TPEAK IN LBS.	INERTIA INPUT PINION OZ IN SEC²	INERTIA GEARHEAD OZ IN SEC²	BACKLASH STD/ LOW ARC MINUTES	GEARHEAD WEIGHT LBS.	L GEARHEAD LENGTH
100PMX	3:1	2301	3597	1.680E-02	1.641E-02	6 / 3	11.5	4.75
100PMX	4:1	2195	3430	1.032E-02	1.049E-02	6 / 3	11.5	4.75
100PMX	5:1	2079	3249	9.201E-03	6.945E-03	6 / 3	11.5	4.75
100PMX	5.5:1	2021	3159	8.997E-03	5.878E-03	6 / 3	11.5	4.75
100PMX	7:1	1711	2673	8.766E-03	3.704E-03	6 / 3	11.5	4.75
100PMX	10:1	1122	1684	8.680E-03	1.841E-03	6 / 3	11.5	4.75
100PMX	15:1	2485	3884	9.201E-03	7.783E-03	10 / 5	18.0	6.38
100PMX	16:1	2379	3717	1.032E-02	1.101E-02	10 / 5	18.0	6.38
100PMX	20:1	2397	3745	9.201E-03	7.286E-03	10 / 5	18.0	6.38
100PMX	22:1	2414	3772	8.997E-03	6.156E-03	10 / 5	18.0	6.38
100PMX	25:1	2263	3536	9.201E-03	7.101E-03	10 / 5	18.0	6.38
100PMX	28:1	2438	3811	8.766E-03	3.875E-03	10 / 5	18.0	6.38
100PMX	30:1	2579	4032	8.680E-03	2.050E-03	10 / 5	18.0	6.38
100PMX	40:1	2473	3865	8.680E-03	1.925E-03	10 / 5	18.0	6.38
100PMX	49:1	1867	2918	8.766E-03	3.706E-03	10 / 5	18.0	6.38
100PMX	50:1	2308	3606	8.680E-03	1.879E-03	10 / 5	18.0	6.38
100PMX	55:1	2250	3516	8.680E-03	1.866E-03	10 / 5	18.0	6.38
100PMX	70:1	1890	2953	8.680E-03	1.843E-03	10 / 5	18.0	6.38
100PMX	100:1	1031	1547	8.680E-03	1.823E-03	10 / 5	18.0	6.38
100PMX	160:1	2587	4044	8.680E-03	1.931E-03	14 / 7	18.5	7.95
100PMX	280:1	2627	4105	8.680E-03	1.844E-03	14 / 7	18.5	7.95
100PMX	400:1	2651	4142	8.680E-03	1.824E-03	14 / 7	18.5	7.95
100PMX	550:1	2400	3750	8.680E-03	1.823E-03	14 / 7	18.5	7.95
100PMX	700:1	2009	3140	8.680E-03	1.823E-03	14 / 7	18.5	7.95
140PMX	3:1	5169	8078	5.794E-02	7.141E-02	6 / 3	28.0	7.06
140PMX	4:1	4946	7730	3.123E-02	4.524E-02	6 / 3	28.0	7.06
140PMX	5:1	4693	7335	2.647E-02	2.991E-02	6 / 3	28.0	7.06
140PMX	5.5:1	4567	7137	2.564E-02	2.527E-02	6 / 3	28.0	7.06
140PMX	7:1	3888	6076	2.470E-02	1.590E-02	6 / 3	28.0	7.06
140PMX	10:1	2767	4150	2.435E-02	7.899E-03	6 / 3	28.0	7.06
140PMX	15:1	5619	8781	2.647E-02	3.315E-02	10 / 5	43.0	9.19
140PMX	16:1	5396	8433	3.123E-02	4.702E-02	10 / 5	43.0	9.19
140PMX	20:1	5439	8500	2.647E-02	3.105E-02	10 / 5	43.0	9.19
140PMX	22:1	5482	8567	2.564E-02	2.621E-02	10 / 5	43.0	9.19
140PMX	25:1	5143	8038	2.647E-02	3.026E-02	10 / 5	43.0	9.19
140PMX	28:1	5542	8661	2.470E-02	1.648E-02	10 / 5	43.0	9.19
140PMX	30:1	5850	9142	2.435E-02	8.708E-03	10 / 5	43.0	9.19
140PMX	40:1	5627	8794	2.435E-02	8.184E-03	10 / 5	43.0	9.19
140PMX	49:1	4273	6677	2.470E-02	1.576E-02	10 / 5	43.0	9.19
140PMX	50:1	5253	8210	2.435E-02	7.986E-03	10 / 5	43.0	9.19
140PMX	55:1	5127	8012	2.435E-02	7.932E-03	10 / 5	43.0	9.19
140PMX	70:1	4328	6763	2.435E-02	7.830E-03	10 / 5	43.0	9.19
140PMX	100:1	2543	3814	2.435E-02	7.746E-03	10 / 5	43.0	9.19
140PMX	160:1	5904	9227	2.435E-02	8.201E-03	14 / 7	58.0	11.30
140PMX	280:1	5998	9374	2.435E-02	7.835E-03	14 / 7	58.0	11.30
140PMX	400:1	6055	9463	2.435E-02	7.749E-03	14 / 7	58.0	11.30
140PMX	550:1	5486	8574	2.435E-02	7.747E-03	14 / 7	58.0	11.30
140PMX	700:1	4616	7213	2.435E-02	7.746E-03	14 / 7	58.0	11.30
180PMX	3:1	13339	20009	1.936E-01	2.930E-01	6 / 3	77.0	9.62
180PMX	4:1	12713	19868	6.554E-02	1.889E-01	6 / 3	77.0	9.62
180PMX	5:1	12748	19923	4.403E-02	1.254E-01	6 / 3	77.0	9.62
180PMX	5.5:1	12765	19950	4.015E-02	1.062E-01	6 / 3	77.0	9.62
180PMX	7:1	10809	16892	3.574E-02	6.702E-02	6 / 3	77.0	9.62
180PMX	10:1	7016	10524	3.410E-02	3.335E-02	6 / 3	77.0	9.62
180PMX	15:1	15924	24048	4.403E-02	1.372E-01	10 / 5	116.0	12.51
180PMX	16:1	15298	23907	6.554E-02	1.928E-01	10 / 5	116.0	12.51
180PMX	20:1	15430	24113	4.403E-02	1.279E-01	10 / 5	116.0	12.51
180PMX	22:1	15561	24318	4.015E-02	1.083E-01	10 / 5	116.0	12.51
180PMX	25:1	15333	23962	4.403E-02	1.246E-01	10 / 5	116.0	12.51
180PMX	28:1	15746	24608	3.574E-02	6.831E-02	10 / 5	116.0	12.51
180PMX	30:1	16632	25155	3.410E-02	3.629E-02	10 / 5	116.0	12.51
180PMX	40:1	16006	25014	3.410E-02	3.398E-02	10 / 5	116.0	12.51
180PMX	49:1	11968	18704	3.574E-02	6.523E-02	10 / 5	116.0	12.51
180PMX	50:1	14447	22577	3.410E-02	3.314E-02	10 / 5	116.0	12.51
180PMX	55:1	14464	22604	3.410E-02	3.291E-02	10 / 5	116.0	12.51
180PMX	70:1	12134	18962	3.410E-02	3.247E-02	10 / 5	116.0	12.51
180PMX	100:1	6447	9671	3.410E-02	3.212E-02	10 / 5	116.0	12.51

ALL SPECIFICATIONS SUBJECT TO CHANGE.

NOTES: Other ratios are also available, consult factory.
Tc: Output torque is rated at 3000 RPM, and a minimum life of 10,000 hours.
Bearing load ratings are based on a minimum life of 10,000 hours.

SINGLE AND DOUBLE STAGE PRECISION GEARHEADS

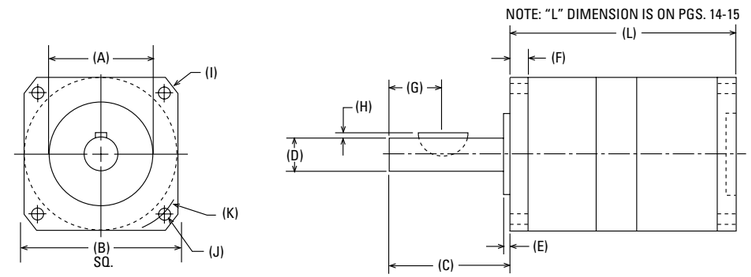
CONSTRUCTION FEATURES

- True planetary design
- Low backlash design
- Input pinion with balanced clamp collar
- Quick installation
- Strong, caged roller bearings
- Sealed ball bearings
- High efficiency design
- All gears are heat treated
- NEMA mounting standards
- 2 year warranty



PN SERIES: PARAGON™ PLANETARY GEARHEADS

SINGLE AND DOUBLE STAGE PRECISION GEARHEADS



PART NUMBER	A PILOT DIAMETER (in.)	B SQUARE FLANGE (in.)	C SHAFT LENGTH (in.)	D SHAFT DIAMETER (in.)	E PILOT LENGTH (in.)	F FLANGE THICKNESS (in.)	G KEY LOCATION (in.)
017PNX	.864/.866	1.65	1.25	.4995/.5000	0.062	0.187	0.56
023PNX	1.498/1.500	2.25	1.25	.4995/.5000	0.062	0.250	0.56
034PNX	2.873/2.875	3.25	1.50	.7495/.7500	0.062	0.375	0.56
042PNX	2.185/2.187	4.20	2.00	.9995/1.0000	0.062	0.500	0.63
056PNX	4.498/4.500	5.75	2.50	1.4995/1.5000	0.125	0.750	0.94
075PNX	5.998/6.000	7.48	3.50	1.9995/2.0000	0.187	0.875	3.00 Lg

PART NUMBER	H KEY HEIGHT (in.)	I HOUSING DIAMETER (in.)	J BOLT HOLE DIAMETER (in.)	K BOLT HOLE CIRCLE (in.)	KEY WIDTH/ WOODRUFF KEY (in.)	RADIAL & AXIAL SHAFT LOADING (LBS.)
017PNX	0.054	2.05	0.125	1.725	0.125 / #404	SEE PAGE 17
023PNX	0.054	2.95	0.205	2.625	0.125 / #404	
034PNX	0.082	4.38	0.220	3.875	0.187 / #606	
042PNX	0.109	5.51	0.280	4.950	0.250 / #808	
056PNX	0.163	7.87	0.410	7.000	0.375 / #1212	
075PNX	0.157	9.64	0.560	8.465	3/8"x 5/8" RECT.	

AVAILABLE RATIOS	EFFICIENCY	SPECIFICATIONS
SINGLE STAGE : 3:1 / 4:1 / 5.5:1 / 7:1 / 10:1	90%	Input RPM: 5000 Max.
DOUBLE STAGE: 16:1 / 22:1 / 28:1 / 40:1 / 49:1 / 55:1 / 70:1 / 100:1	85%	Operating Temperature Range -40˚F to +255˚F
		Motor Mounting Hardware Supplied

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ALL SPECIFICATIONS SUBJECT TO CHANGE.

SINGLE, DOUBLE STAGE

MODEL	RATIO	TORQUE RATING		INERTIA		BACKLASH	GEARHEAD	L
		T_C *IN LBS.*	T_{PEAK} *IN LBS.*	INPUT PINION *OZ IN SEC²*	GEARHEAD *OZ IN SEC²*	STD/ LOW *ARC MINUTES*	WEIGHT *LBS.*	GEARHEAD *LENGTH*
017PNX	3:1	125	174	2.163E-04	1.669E-04	10 / 7	1.0	2.66
017PNX	4:1	119	165	1.352E-04	1.053E-04	10 / 7	1.0	2.66
017PNX	5.5:1	107	149	1.174E-04	5.870E-05	10 / 7	1.0	2.66
017PNX	7:1	89	124	1.143E-04	3.692E-05	10 / 7	1.0	2.66
017PNX	10:1	56	84	1.132E-04	1.833E-05	10 / 7	1.0	2.66
017PNX	16:1	127	176	1.352E-04	1.045E-04	14 / 9	1.6	3.32
017PNX	22:1	128	178	1.174E-04	5.830E-05	14 / 9	1.6	3.32
017PNX	28:1	129	179	1.143E-04	3.667E-05	14 / 9	1.6	3.32
017PNX	40:1	131	181	1.132E-04	1.821E-05	14 / 9	1.6	3.32
017PNX	49:1	95	132	1.143E-04	3.479E-05	14 / 9	1.6	3.32
017PNX	55:1	117	162	1.132E-04	1.755E-05	14 / 9	1.6	3.32
017PNX	70:1	96	134	1.132E-04	1.729E-05	14 / 9	1.6	3.32
017PNX	100:1	52	77	1.132E-04	1.708E-05	14 / 9	1.6	3.32
023PNX	3:1	285	396	1.194E-03	4.866E-04	10 / 7	2.0	3.06
023PNX	4:1	264	366	9.502E-04	3.113E-04	10 / 7	2.0	3.06
023PNX	5.5:1	238	330	8.969E-04	1.746E-04	10 / 7	2.0	3.06
023PNX	7:1	197	274	8.880E-04	1.100E-04	10 / 7	2.0	3.06
023PNX	10:1	119	179	8.846E-04	5.471E-05	10 / 7	2.0	3.06
023PNX	16:1	282	391	9.502E-04	3.287E-04	14 / 9	3.0	3.97
023PNX	22:1	285	396	8.969E-04	1.838E-04	14 / 9	3.0	3.97
023PNX	28:1	288	400	8.880E-04	1.157E-04	14 / 9	3.0	3.97
023PNX	40:1	291	405	8.846E-04	5.749E-05	14 / 9	3.0	3.97
023PNX	49:1	213	295	8.880E-04	1.098E-04	14 / 9	3.0	3.97
023PNX	55:1	260	362	8.846E-04	5.543E-05	14 / 9	3.0	3.97
023PNX	70:1	215	298	8.846E-04	5.460E-05	14 / 9	3.0	3.97
023PNX	100:1	110	164	8.846E-04	5.393E-05	14 / 9	3.0	3.97
034PNX	3:1	964	1339	4.901E-03	4.672E-03	10 / 7	7.0	4.56
034PNX	4:1	914	1270	2.522E-03	2.833E-03	10 / 7	7.0	4.56
034PNX	5.5:1	835	1160	2.040E-03	1.585E-03	10 / 7	7.0	4.56
034PNX	7:1	701	934	1.955E-03	9.983E-04	10 / 7	7.0	4.56
034PNX	10:1	507	704	1.923E-03	4.961E-04	10 / 7	7.0	4.56
034PNX	16:1	986	1370	2.522E-03	2.824E-03	14 / 9	8.0	5.83
034PNX	22:1	1000	1389	2.040E-03	1.580E-03	14 / 9	8.0	5.83
034PNX	28:1	1009	1402	1.955E-03	9.952E-04	14 / 9	8.0	5.83
034PNX	40:1	1023	1421	1.923E-03	4.946E-04	14 / 9	8.0	5.83
034PNX	49:1	762	1058	1.955E-03	9.417E-04	14 / 9	8.0	5.83
034PNX	55:1	924	1283	1.923E-03	4.759E-04	14 / 9	8.0	5.83
034PNX	70:1	770	1070	1.923E-03	4.684E-04	14 / 9	8.0	5.83
034PNX	100:1	507	761	1.923E-03	4.623E-04	14 / 9	8.0	5.83

ALL SPECIFICATIONS SUBJECT TO CHANGE.

PN SERIES: PARAGON™ PLANETARY GEARHEADS

SINGLE, DOUBLE STAGE

MODEL	RATIO	TORQUE RATING		INERTIA		BACKLASH	GEARHEAD	L
		T_C *IN LBS.*	T_{PEAK} *IN LBS.*	INPUT PINION *OZ IN SEC²*	GEARHEAD *OZ IN SEC²*	STD/ LOW *ARC MINUTES*	WEIGHT *LBS.*	GEARHEAD *LENGTH*
042PNX	3:1	1726	2398	1.680E-02	1.641E-02	10 / 7	12.0	5.20
042PNX	4:1	1646	2287	1.032E-02	1.049E-02	10 / 7	12.0	5.20
042PNX	5.5:1	1516	2106	8.997E-03	5.878E-03	10 / 7	12.0	5.20
042PNX	7:1	1283	178a2	8.766E-03	3.704E-03	10 / 7	12.0	5.20
042PNX	10:1	936	1300	8.680E-03	1.841E-03	10 / 7	12.0	5.20
042PNX	16:1	1784	2478	1.032E-02	1.101E-02	14 / 9	18.0	6.80
042PNX	22:1	1810	2515	8.997E-03	6.156E-03	14 / 9	18.0	6.80
042PNX	28:1	1829	2540	8.766E-03	3.875E-03	14 / 9	18.0	6.80
042PNX	40:1	1855	2577	8.680E-03	1.925E-03	14 / 9	18.0	6.80
042PNX	49:1	1400	1945	8.766E-03	3.706E-03	14 / 9	18.0	6.80
042PNX	55:1	1688	2344	8.680E-03	1.866E-03	14 / 9	18.0	6.80
042PNX	70:1	1417	1969	8.680E-03	1.843E-03	14 / 9	18.0	6.80
042PNX	100:1	1024	1423	8.680E-03	1.823E-03	14 / 9	18.0	6.80
056PNX	3:1	3877	5385	5.794E-02	7.141E-02	10 / 7	28.0	8.16
056PNX	4:1	3710	5153	3.123E-02	4.524E-02	10 / 7	28.0	8.16
056PNX	5.5:1	3425	4758	2.564E-02	2.527E-02	10 / 7	28.0	8.16
056PNX	7:1	2916	4051	2.470E-02	1.590E-02	10 / 7	28.0	8.16
056PNX	10:1	2143	2977	2.435E-02	7.899E-03	10 / 7	28.0	8.16
056PNX	16:1	4047	5622	3.123E-02	4.702E-02	14 / 9	43.0	10.30
056PNX	22:1	4111	5711	2.564E-02	2.621E-02	14 / 9	43.0	10.30
056PNX	28:1	4157	5774	2.470E-02	1.648E-02	14 / 9	43.0	10.30
056PNX	40:1	4220	5862	2.435E-02	8.184E-03	14 / 9	43.0	10.30
056PNX	49:1	3204	4451	2.470E-02	1.576E-02	14 / 9	43.0	10.30
056PNX	55:1	3845	5341	2.435E-02	7.932E-03	14 / 9	43.0	10.30
056PNX	70:1	3246	4509	2.435E-02	7.830E-03	14 / 9	43.0	10.30
056PNX	100:1	2361	3279	2.435E-02	7.746E-03	14 / 9	43.0	10.30
075PNX	3:1	10005	36975	1.936E-01	2.930E-01	10 / 7	66.0	10.41
075PNX	4:1	9535	13245	6.554E-02	1.889E-01	10 / 7	66.0	10.41
075PNX	5.5:1	9574	13300	4.015E-02	1.062E-01	10 / 7	66.0	10.41
075PNX	7:1	8107	11261	3.574E-02	6.702E-02	10 / 7	66.0	10.41
075PNX	10:1	5959	8277	3.410E-02	3.335E-02	10 / 7	66.0	10.41
075PNX	16:1	11474	15938	6.554E-02	1.928E-01	14 / 9	105.0	13.29
075PNX	22:1	11671	161212	4.015E-02	1.083E-01	14 / 9	105.0	13.29
075PNX	28:1	11810	16405	3.574E-02	6.831E-02	14 / 9	105.0	13.29
075PNX	40:1	12005	16676	3.410E-02	3.398E-02	14 / 9	105.0	13.29
075PNX	49:1	8976	12469	3.574E-02	6.523E-02	14 / 9	105.0	13.29
075PNX	55:1	10848	15069	3.410E-02	3.291E-02	14 / 9	105.0	13.29
075PNX	70:1	9100	12641	3.410E-02	3.247E-02	14 / 9	105.0	13.29
075PNX	100:1	6447	9184	3.410E-02	3.212E-02	14 / 9	105.0	13.29

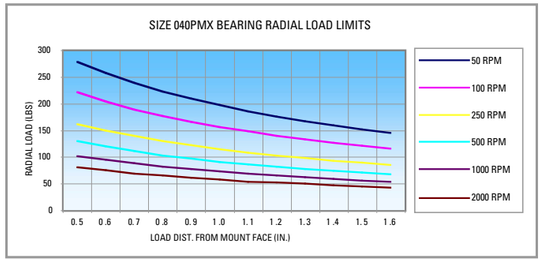
ALL SPECIFICATIONS SUBJECT TO CHANGE.

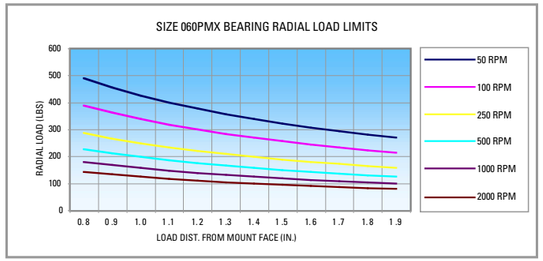
NOTES: Other ratios are also available, consult factory.
T_C: Output torque is rated at 3000 RPM, and a minimum life of 10,000 hours.
Bearing load ratings are based on a minimum life of 10,000 hours.

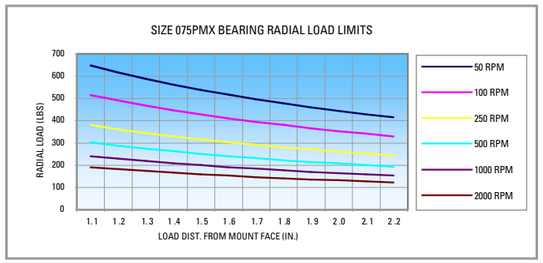
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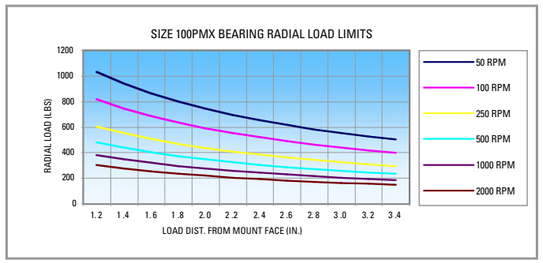
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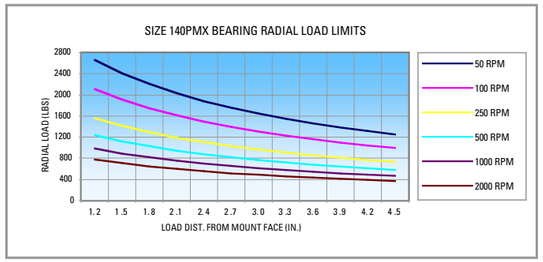
These graphs display the allowable radial load (lbs.) at a given distance (in.) from the mount face based on an L_{10} life of 10,000 hours.

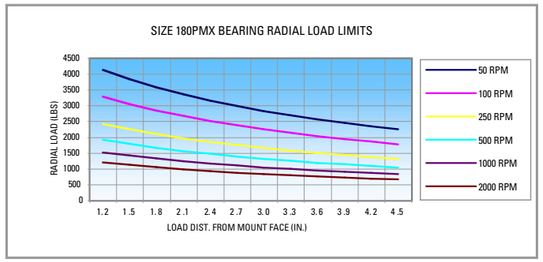


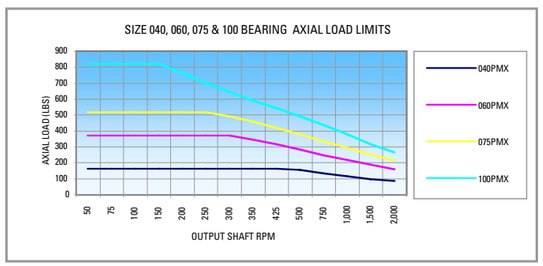


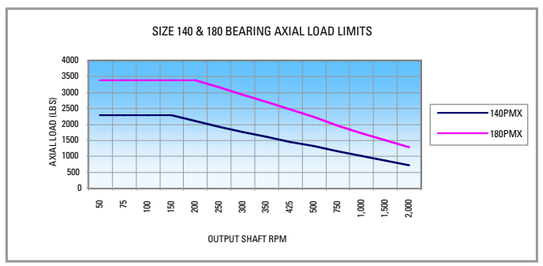






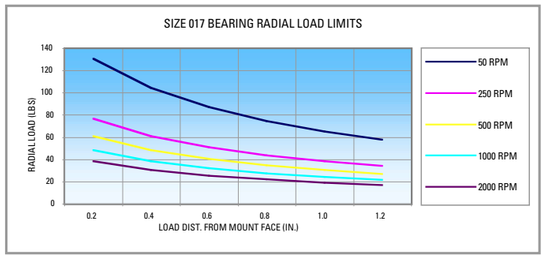


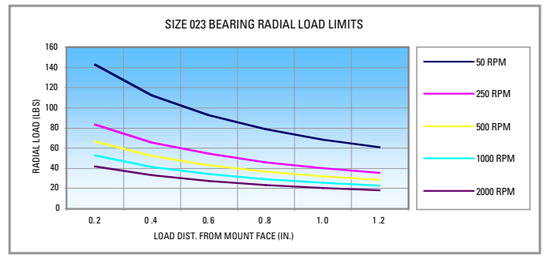


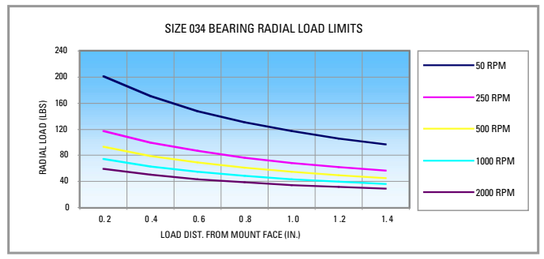


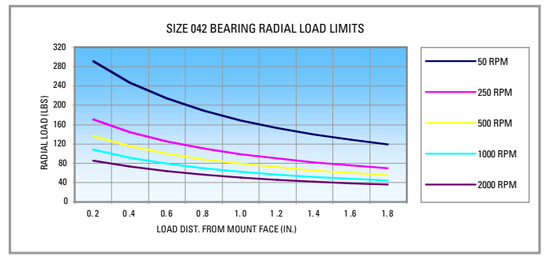
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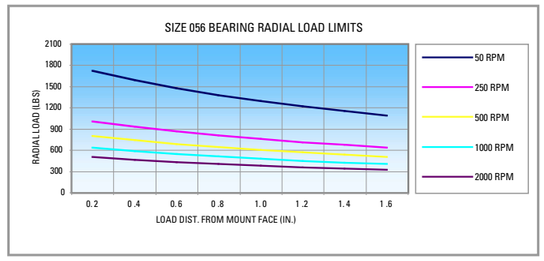
These graphs display the allowable radial load (lbs.) at a given distance (in.) from the mount face based on an L_{10} life of 10,000 hours.

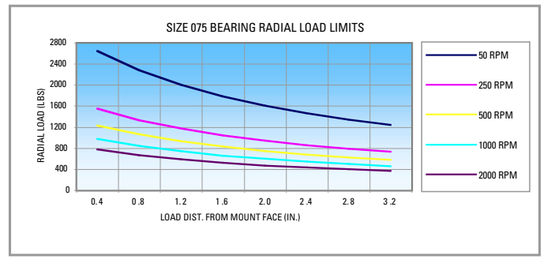


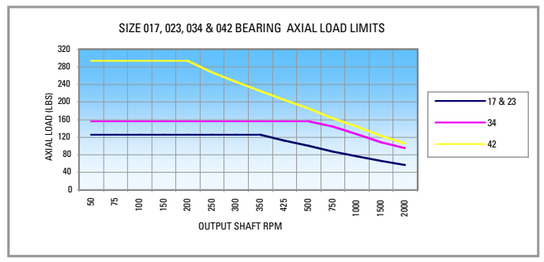


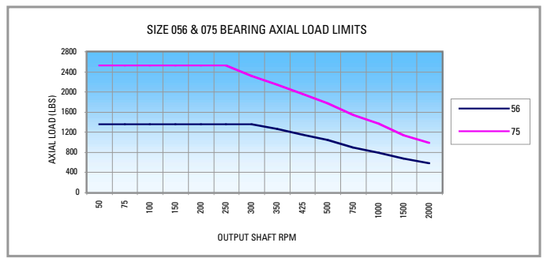












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NEMA DIMENSIONS
PRECISION GEARHEADS

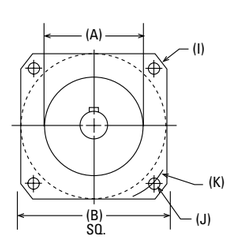
CONSTRUCTION FEATURES

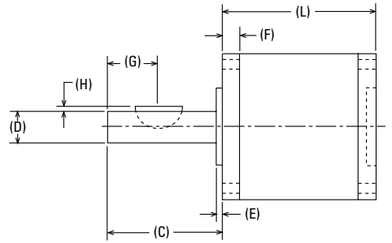
- One-piece gear cluster
- High-quality spur gearhead
- Input pinion with balanced clamp collar
- Quick installation
- High reliability design
- High strength steels
- High shaft loading capacity
- Viton O-Rings sealed at each joint
- Sealed ball bearings
- High efficiency design
- All gears are heat treated
- NEMA mounting standards
- 2 year warranty



SI SERIES: SPUR GEARHEADS

NEMA DIMENSIONS
PRECISION GEARHEADS





PART NUMBER	A PILOT DIAMETER (in.)	B SQUARE FLANGE (in.)	C SHAFT LENGTH (in.)	D SHAFT DIAMETER (in.)	E PILOT LENGTH (in.)	F FLANGE THICKNESS (in.)	G KEY LOCATION (in.)
023SIX	1.498/1.500	2.25	1.00	.3745/.3750	0.062	0.188	0.38
034SIX	2.873/2.875	3.25	1.25	.4995/.5000	0.062	0.375	0.56
042SIX	2.185/2.187	4.20	1.50	.6245/.6250	0.062	0.500	0.50
056SIX	4.498/4.500	5.75	2.00	.9995/1.0000	0.125	1.000	0.63

PART NUMBER	H KEY HEIGHT (in.)	I HOUSING DIAMETER (in.)	J BOLT HOLE DIAMETER (in.)	K BOLT HOLE CIRCLE (in.)	KEY WIDTH/ WOODRUFF KEY (in.)	RADIAL SHAFT LOADING (LBS.)	AXIAL SHAFT LOADING (LBS.)
023SIX	.041	2.95	0.205	2.625	0.094 / #303	75	75
034SIX	.054	4.38	0.220	3.875	0.125 / #404	100	125
042SIX	.068	5.51	0.280	4.950	0.156 / #505	150	150
056SIX	.109	7.87	0.410	7.000	0.250 / #808	200	300

PART NUMBER	L GEARHEAD LENGTH (in.)	BACKLASH STD/LOW (ARC-MINUTES)	CONTINUOUS TORQUE MAX. (IN LBS.)	MOMENTARY TORQUE MAX. (IN LBS.)	GEARHEAD WEIGHT (LBS.)	MAX. INERTIA REFLECTED TO INPUT (OZ. IN. SEC^2)	PINION GEAR INERTIA (OZ. IN. SEC^2)
023SIX	2.25	20/10	20	30	1.5	7.15E-04	7.59E-04
034SIX	3.00	20/10	60	90	3.5	5.35E-04	1.52E-03
042SIX	3.75	20/10	200	300	6.5	4.33E-03	7.59E-03
056SIX	4.50	20/10	350	500	15.5	6.05E-03	4.57E-02

AVAILABLE RATIOS AND SHAFT ROTATION*					
SIZE 023	3:1	SAME	SIZE 034	3:1	SAME
	5:1	SAME		5:1	SAME
	10:1	SAME		10:1	SAME
	15:1	OPPOSITE		15:1	SAME
	20:1	OPPOSITE		20:1	OPPOSITE
	30:1	OPPOSITE		30:1	OPPOSITE
	50:1	OPPOSITE		50:1	SAME
	100:1	SAME		100:1	SAME
SIZE 042	3:1	SAME	SIZE 056	3:1	SAME
	5:1	SAME		5:1	SAME
	10:1	SAME		10:1	OPPOSITE
	15:1	OPPOSITE		15:1	OPPOSITE
	20:1	OPPOSITE		25:1	OPPOSITE
	30:1	SAME		40:1	SAME
	50:1	OPPOSITE			
	100:1	SAME			

SPECIFICATIONS
Input RPM: 4000 Max.
Minimum Efficiency: 90%
Operating Temperature Range -40˚F to +255˚F
Note: Size 056 Requires a Mounting Adapter
Motor Mounting Hardware Supplied

*Rotation references the gearhead output shaft direction with respect to motor shaft direction.

ALL SPECIFICATIONS SUBJECT TO CHANGE.

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SINGLE, DOUBLE, TRIPLE STAGE-SINGLE OR DOUBLE SHAFT PRECISION HIGH PERFORMANCE GEARHEADS

CONSTRUCTION FEATURES

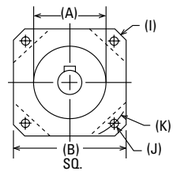
- True planetary design
- Tapered roller bearings
- Low backlash design
- Input pinion with balanced clamp collar
- Quick installation
- Strong, caged roller bearings
- High reliability design
- High strength steels
- High shaft loading capacity
- Viton O-Rings sealed at each joint
- Case hardened spiral bevel gears
- Sealed ball bearings
- High efficiency design
- All gears are heat treated
- NEMA mounting standards
- 5 year warranty

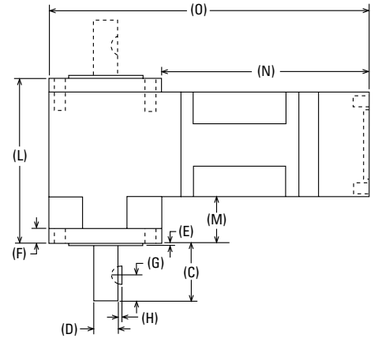


RC/DC SERIES: PRIME™ PLANETARY RIGHT ANGLE GEARHEADS

SINGLE, DOUBLE, TRIPLE STAGE-SINGLE OR DOUBLE SHAFT PRECISION HIGH PERFORMANCE GEARHEADS

NOTE: "O" AND "N" DIMENSION ON PGS. 24-25





PART NUMBER	A PILOT DIAMETER (in.)	B SQUARE FLANGE (in.)	C SHAFT LENGTH (in.)	D SHAFT DIAMETER (in.)	E PILOT LENGTH (in.)	F FLANGE THICKNESS (in.)	G KEY LOCATION (in.)	H KEY HEIGHT (in.)
017RCX/017DCX	.864/.866	1.65	1.25	.3745/.3750	0.062	0.250	0.38	0.041
023RCX/023DCX	1.498/1.500	2.25	1.25	.4995/.5000	0.062	0.312	0.56	0.054
034RCX/034DCX	2.873/2.875	3.25	1.50	.7495/.7500	0.062	0.500	0.56	0.082
042RCX/042DCX	2.185/2.187	4.20	2.00	.9995/1.0000	0.062	0.500	0.63	0.109
056RCX/056DCX	4.498/4.500	5.75	2.50	1.4995/1.5000	0.093	0.750	0.94	0.163
075RCX/075DCX	5.998/6.000	7.48	3.50	1.9995/2.0000	0.187	0.875	3.00 Lg	0.157

PART NUMBER	I HOUSING DIAMETER (in.)	J BOLT HOLE DIAMETER (in.)	K BOLT HOLE CIRCLE (in.)	L RIGHT ANGLE WIDTH (in.)	M OVERHANG WIDTH (in.)	KEY WIDTH/ WOODRUFF KEY (in.)	RADIAL SHAFT LOADING (LBS.)	AXIAL SHAFT LOADING (LBS.)
017RCX/017DCX	2.05	0.125	1.725	2.72	0.82	0.094 / #303	400	400
023RCX/023DCX	2.95	0.205	2.625	3.55	0.99	0.125 / #404	600	600
034RCX/034DCX	4.38	0.220	3.875	5.14	1.38	0.187 / #606	900	900
042RCX/042DCX	5.51	0.280	4.950	5.89	1.18	0.250 / #808	1400	1400
056RCX/056DCX	7.87	0.410	7.000	8.79	2.28	0.375 / #1212	2200	2200
075RCX/075DCX	9.64	0.560	8.465	11.30	2.95	3/8"x 5/8" RECT.	3200	3200

AVAILABLE RATIOS	EFFICIENCY	SPECIFICATIONS
SINGLE STAGE : 3:1 / 4:1 / 5:1 / 5.5:1 / 7:1 / 10:1	85%	Input RPM: 6500 Max.
DOUBLE STAGE: 15:1/16:1/20:1/22:1/25:1/28:1/30:1/40:1/49:1/50:1/55:1/70:1/100:1	80%	Operating Temperature Range -40˚F to +255˚F
TRIPLE STAGE: 160:1 / 280:1 / 400:1 / 550:1 / 700:1 OTHER RATIOS AVAILABLE	75%	Motor Mounting Hardware Supplied



ALL SPECIFICATIONS SUBJECT TO CHANGE.

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SINGLE, DOUBLE, TRIPLE STAGE-SINGLE OR DOUBLE SHAFT

MODEL	RATIO	TORQUE RATING		INERTIA		BACKLASH	GEARHEAD	N	O
		Tc	Tpeak	INPUT PINION	GEARHEAD	STD/ LOW	WEIGHT	LENGTH	GEARHEAD
		IN LBS.	*IN LBS.*	*OZ IN SEC²*	*OZ IN SEC²*	*ARC MINUTES*	*LBS.*	TO FLANGE	LENGTH
017RCX	3:1	167	261	2.163E-04	4.153E-04	11 / 8	2.8	3.30	4.97
017RCX	4:1	158	248	1.352E-04	2.478E-04	11 / 8	2.8	3.30	4.97
017RCX	5:1	148	231	1.203E-04	1.720E-04	11 / 8	2.8	3.30	4.97
017RCX	5.5:1	143	223	1.174E-04	1.341E-04	11 / 8	2.8	3.30	4.97
017RCX	7:1	119	158	1.143E-04	8.344E-05	11 / 8	2.8	3.30	4.97
017RCX	10:1	56	84	1.132E-04	4.113E-05	11 / 8	2.8	3.30	4.97
017RCX	15:1	178	277	1.203E-04	1.142E-04	15 / 10	3.4	3.84	5.51
017RCX	16:1	169	264	1.352E-04	1.088E-04	15 / 10	3.4	3.84	5.51
017RCX	20:1	170	266	1.203E-04	7.664E-05	15 / 10	3.4	3.84	5.51
017RCX	22:1	171	267	1.174E-04	6.056E-05	15 / 10	3.4	3.84	5.51
017RCX	25:1	159	247	1.203E-04	4.931E-05	15 / 10	3.4	3.84	5.51
017RCX	28:1	172	269	1.143E-04	3.806E-05	15 / 10	3.4	3.84	5.51
017RCX	30:1	183	285	1.132E-04	3.487E-05	15 / 10	3.4	3.84	5.51
017RCX	40:1	174	272	1.132E-04	1.889E-05	15 / 10	3.4	3.84	5.51
017RCX	49:1	127	199	1.143E-04	3.525E-05	15 / 10	3.4	3.84	5.51
017RCX	50:1	161	251	1.132E-04	3.236E-05	15 / 10	3.4	3.84	5.51
017RCX	55:1	156	243	1.132E-04	1.791E-05	15 / 10	3.4	3.84	5.51
017RCX	70:1	128	201	1.132E-04	1.751E-05	15 / 10	3.4	3.84	5.51
017RCX	100:1	52	77	1.132E-04	1.719E-05	15 / 10	3.4	3.84	5.51
017RCX	160:1	181	283	1.132E-04	1.821E-05	19 / 12	4.0	4.46	6.11
017RCX	280:1	183	286	1.132E-04	1.735E-05	19 / 12	4.0	4.46	6.11
017RCX	400:1	185	286	1.132E-04	1.769E-05	19 / 12	4.0	4.46	6.11
017RCX	550:1	165	257	1.132E-04	1.767E-05	19 / 12	4.0	4.46	6.11
017RCX	700:1	136	212	1.132E-04	1.766E-05	19 / 12	4.0	4.46	6.11
023RCX	3:1	380	594	1.194E-03	1.539E-03	11 / 8	4.0	4.23	6.49
023RCX	4:1	360	562	9.502E-04	9.035E-04	11 / 8	4.0	4.23	6.49
023RCX	5:1	331	518	9.044E-04	6.264E-04	11 / 8	4.0	4.23	6.49
023RCX	5.5:1	317	496	8.969E-04	4.878E-04	11 / 8	4.0	4.23	6.49
023RCX	7:1	263	411	8.880E-04	3.034E-04	11 / 8	4.0	4.23	6.49
023RCX	10:1	119	179	8.846E-04	1.495E-04	11 / 8	4.0	4.23	6.49
023RCX	15:1	396	619	9.044E-04	3.634E-04	15 / 10	5.0	5.05	7.32
023RCX	16:1	376	587	9.502E-04	3.461E-04	15 / 10	5.0	5.05	7.32
023RCX	20:1	378	591	9.044E-04	2.440E-04	15 / 10	5.0	5.05	7.32
023RCX	22:1	380	594	8.969E-04	1.930E-04	15 / 10	5.0	5.05	7.32
023RCX	25:1	347	543	9.044E-04	1.572E-04	15 / 10	5.0	5.05	7.32
023RCX	28:1	384	600	8.880E-04	1.214E-04	15 / 10	5.0	5.05	7.32
023RCX	30:1	408	639	8.846E-04	1.112E-04	15 / 10	5.0	5.05	7.32
023RCX	40:1	388	607	8.846E-04	6.027E-05	15 / 10	5.0	5.05	7.32
023RCX	49:1	286	447	8.880E-04	1.117E-04	15 / 10	5.0	5.05	7.32
023RCX	50:1	361	564	8.846E-04	1.026E-04	15 / 10	5.0	5.05	7.32
023RCX	55:1	347	542	8.846E-04	5.690E-05	15 / 10	5.0	5.05	7.32
023RCX	70:1	288	450	8.846E-04	5.551E-05	15 / 10	5.0	5.05	7.32
023RCX	100:1	110	164	8.846E-04	5.438E-05	15 / 10	5.0	5.05	7.32
023RCX	160:1	404	631	8.846E-04	5.760E-05	19 / 12	6.0	5.85	8.10
023RCX	280:1	409	640	8.846E-04	5.461E-05	19 / 12	6.0	5.85	8.10
023RCX	400:1	406	608	8.846E-04	5.591E-05	19 / 12	6.0	5.85	8.10
023RCX	550:1	368	575	8.846E-04	5.584E-05	19 / 12	6.0	5.85	8.10
023RCX	700:1	303	473	8.846E-04	5.581E-05	19 / 12	6.0	5.85	8.10
034RCX	3:1	1285	2008	4.901E-03	1.176E-02	11 / 8	12.5	5.91	9.16
034RCX	4:1	1219	1905	2.522E-03	6.818E-03	11 / 8	12.5	5.91	9.16
034RCX	5:1	1148	1795	2.115E-03	4.735E-03	11 / 8	12.5	5.91	9.16
034RCX	5.5:1	1113	1740	2.040E-03	3.693E-03	11 / 8	12.5	5.91	9.16
034RCX	7:1	935	1461	1.955E-03	2.300E-03	11 / 8	12.5	5.91	9.16
034RCX	10:1	552	828	1.923E-03	1.134E-03	11 / 8	12.5	5.91	9.16
034RCX	15:1	1381	2158	2.115E-03	3.091E-03	15 / 10	13.5	7.04	10.29
034RCX	16:1	1315	2055	2.522E-03	2.944E-03	15 / 10	13.5	7.04	10.29
034RCX	20:1	1324	2069	2.115E-03	2.077E-03	15 / 10	13.5	7.04	10.29
034RCX	22:1	1333	2083	2.040E-03	1.644E-03	15 / 10	13.5	7.04	10.29
034RCX	25:1	1244	1945	2.115E-03	1.340E-03	15 / 10	13.5	7.04	10.29
034RCX	28:1	1346	2103	1.955E-03	1.035E-03	15 / 10	13.5	7.04	10.29
034RCX	30:1	1430	2235	1.923E-03	9.482E-04	15 / 10	13.5	7.04	10.29
034RCX	40:1	1364	2132	1.923E-03	5.139E-04	15 / 10	13.5	7.04	10.29
034RCX	49:1	1015	1587	1.955E-03	9.545E-04	15 / 10	13.5	7.04	10.29
034RCX	50:1	1267	1980	1.923E-03	8.764E-04	15 / 10	13.5	7.04	10.29
034RCX	55:1	1232	1925	1.923E-03	4.861E-04	15 / 10	13.5	7.04	10.29
034RCX	70:1	1027	1605	1.923E-03	4.747E-04	15 / 10	13.5	7.04	10.29
034RCX	100:1	507	761	1.923E-03	4.654E-04	15 / 10	13.5	7.04	10.29
034RCX	160:1	1424	2226	1.923E-03	4.930E-04	19 / 12	14.5	8.26	11.51
034RCX	280:1	1445	2258	1.923E-03	4.676E-04	19 / 12	14.5	8.26	11.51
034RCX	400:1	1458	2278	1.923E-03	4.781E-04	19 / 12	14.5	8.26	11.51
034RCX	550:1	1311	2048	1.923E-03	4.775E-04	19 / 12	14.5	8.26	11.51
034RCX	700:1	1090	1703	1.923E-03	4.772E-04	19 / 12	14.5	8.26	11.51

ALL SPECIFICATIONS SUBJECT TO CHANGE.

RC/DC SERIES: PRIME™ PLANETARY RIGHT ANGLE GEARHEADS

SINGLE, DOUBLE, TRIPLE STAGE-SINGLE OR DOUBLE SHAFT

MODEL	RATIO	TORQUE RATING		INERTIA		BACKLASH	GEARHEAD	N	O
		Tc	Tpeak	INPUT PINION	GEARHEAD	STD/ LOW	WEIGHT	LENGTH	GEARHEAD
		IN LBS.	*IN LBS.*	*OZ IN SEC²*	*OZ IN SEC²*	*ARC MINUTES*	*LBS.*	TO FLANGE	LENGTH
042RCX	3:1	2301	3597	1.680E-02	2.667E-02	11 / 8	28.5	7.18	11.39
042RCX	4:1	2195	3430	1.032E-02	1.626E-02	11 / 8	28.5	7.18	11.39
042RCX	5:1	2079	3249	9.201E-03	1.137E-02	11 / 8	28.5	7.18	11.39
042RCX	5.5:1	2021	3159	8.997E-03	8.931E-03	11 / 8	28.5	7.18	11.39
042RCX	7:1	1711	2673	8.766E-03	5.588E-03	11 / 8	28.5	7.18	11.39
042RCX	10:1	1122	1684	8.680E-03	2.765E-03	11 / 8	28.5	7.18	11.39
042RCX	15:1	2485	3884	9.201E-03	1.174E-02	15 / 10	35.0	8.81	13.02
042RCX	16:1	2379	3717	1.032E-02	1.118E-02	15 / 10	35.0	8.81	13.02
042RCX	20:1	2397	3745	9.201E-03	7.888E-03	15 / 10	35.0	8.81	13.02
042RCX	22:1	2414	3772	8.997E-03	6.242E-03	15 / 10	35.0	8.81	13.02
042RCX	25:1	2263	3536	9.201E-03	5.085E-03	15 / 10	35.0	8.81	13.02
042RCX	28:1	2438	3811	8.766E-03	3.928E-03	15 / 10	35.0	8.81	13.02
042RCX	30:1	2579	4032	8.680E-03	3.599E-03	15 / 10	35.0	8.81	13.02
042RCX	40:1	2473	3865	8.680E-03	1.951E-03	15 / 10	35.0	8.81	13.02
042RCX	49:1	1867	2918	8.766E-03	3.724E-03	15 / 10	35.0	8.81	13.02
042RCX	50:1	2308	3606	8.680E-03	3.417E-03	15 / 10	35.0	8.81	13.02
042RCX	55:1	2250	3516	8.680E-03	1.880E-03	15 / 10	35.0	8.81	13.02
042RCX	70:1	1890	2953	8.680E-03	1.851E-03	15 / 10	35.0	8.81	13.02
042RCX	100:1	1031	1547	8.680E-03	1.827E-03	15 / 10	35.0	8.81	13.02
042RCX	160:1	2587	4044	8.680E-03	1.934E-03	19 / 12	36.0	10.37	14.57
042RCX	280:1	2627	4105	8.680E-03	1.845E-03	19 / 12	36.0	10.37	14.57
042RCX	400:1	2651	4142	8.680E-03	1.884E-03	19 / 12	36.0	10.37	14.57
042RCX	550:1	2400	3750	8.680E-03	1.882E-03	19 / 12	36.0	10.37	14.57
042RCX	700:1	2009	3140	8.680E-03	1.881E-03	19 / 12	36.0	10.37	14.57
056RCX	3:1	5169	8078	5.794E-02	9.725E-02	11 / 8	56.0	10.13	15.86
056RCX	4:1	4946	7730	3.123E-02	5.977E-02	11 / 8	56.0	10.13	15.86
056RCX	5:1	4693	7335	2.647E-02	4.189E-02	11 / 8	56.0	10.13	15.86
056RCX	5.5:1	4567	7137	2.564E-02	3.295E-02	11 / 8	56.0	10.13	15.86
056RCX	7:1	3888	6076	2.470E-02	2.065E-02	11 / 8	56.0	10.13	15.86
056RCX	10:1	2767	4150	2.435E-02	1.022E-02	11 / 8	56.0	10.13	15.86
056RCX	15:1	5619	8781	2.647E-02	4.970E-02	15 / 10	71.0	12.27	18.03
056RCX	16:1	5396	8433	3.123E-02	4.733E-02	15 / 10	71.0	12.27	18.03
056RCX	20:1	5439	8500	2.647E-02	3.336E-02	15 / 10	71.0	12.27	18.03
056RCX	22:1	5482	8567	2.564E-02	2.637E-02	15 / 10	71.0	12.27	18.03
056RCX	25:1	5143	8038	2.647E-02	2.148E-02	15 / 10	71.0	12.27	18.03
056RCX	28:1	5542	8661	2.470E-02	1.658E-02	15 / 10	71.0	12.27	18.03
056RCX	30:1	5850	9142	2.435E-02	1.519E-02	15 / 10	71.0	12.27	18.03
056RCX	40:1	5627	8794	2.435E-02	8.233E-03	15 / 10	71.0	12.27	18.03
056RCX	49:1	4273	6677	2.470E-02	1.579E-02	15 / 10	71.0	12.27	18.03
056RCX	50:1	5253	8210	2.435E-02	1.448E-02	15 / 10	71.0	12.27	18.03
056RCX	55:1	5127	8012	2.435E-02	7.958E-03	15 / 10	71.0	12.27	18.03
056RCX	70:1	4328	6763	2.435E-02	7.846E-03	15 / 10	71.0	12.27	18.03
056RCX	100:1	2543	3814	2.435E-02	7.754E-03	15 / 10	71.0	12.27	18.03
056RCX	160:1	5904	9227	2.435E-02	8.210E-03	19 / 12	86.0	14.77	20.52
056RCX	280:1	5998	9374	2.435E-02	7.838E-03	19 / 12	86.0	14.77	20.52
056RCX	400:1	6055	9463	2.435E-02	8.043E-03	19 / 12	86.0	14.77	20.52
056RCX	550:1	5486	8574	2.435E-02	7.998E-03	19 / 12	86.0	14.77	20.52
056RCX	700:1	4616	7213	2.435E-02	7.995E-03	19 / 12	86.0	14.77	20.52
075RCX	3:1	13339	20009	1.936E-01	4.424E-01	11 / 8	154.0	13.47	20.92
075RCX	4:1	12713	19868	6.554E-02	2.729E-01	11 / 8	154.0	13.47	20.92
075RCX	5:1	12748	19923	4.403E-02	1.914E-01	11 / 8	154.0	13.47	20.92
075RCX	5.5:1	12765	19950	4.015E-02	1.507E-01	11 / 8	154.0	13.47	20.92
075RCX	7:1	10809	16892	3.574E-02	9.445E-02	11 / 8	154.0	13.47	20.92
075RCX	10:1	7016	10524	3.410E-02	4.679E-02	11 / 8	154.0	13.47	20.92
075RCX	15:1	15924	24048	4.403E-02	2.044E-01	15 / 10	232.0	16.32	24.01
075RCX	16:1	15298	23907	6.554E-02	1.947E-01	15 / 10	232.0	16.32	24.01
075RCX	20:1	15430	24113	4.403E-02	1.378E-01	15 / 10	232.0	16.32	24.01
075RCX	22:1	15561	24318	4.015E-02	1.093E-01	15 / 10	232.0	16.32	24.01
075RCX	25:1	15333	23962	4.403E-02	8.912E-02	15 / 10	232.0	16.32	24.01
075RCX	28:1	15746	24608	3.574E-02	6.894E-02	15 / 10	232.0	16.32	24.01
075RCX	30:1	16632	25155	3.410E-02	6.317E-02	15 / 10	232.0	16.32	24.01
075RCX	40:1	16006	25014	3.410E-02	3.429E-02	15 / 10	232.0	16.32	24.01
075RCX	49:1	11968	18704	3.574E-02	6.543E-02	15 / 10	232.0	16.32	24.01
075RCX	50:1	14447	22577	3.410E-02	6.004E-02	15 / 10	232.0	16.32	24.01
075RCX	55:1	14464	22604	3.410E-02	3.307E-02	15 / 10	232.0	16.32	24.01
075RCX	70:1	12134	18962	3.410E-02	3.257E-02	15 / 10	232.0	16.32	24.01
075RCX	100:1	6447	9671	3.410E-02	3.217E-02	15 / 10	232.0	16.32	24.01

ALL SPECIFICATIONS SUBJECT TO CHANGE.

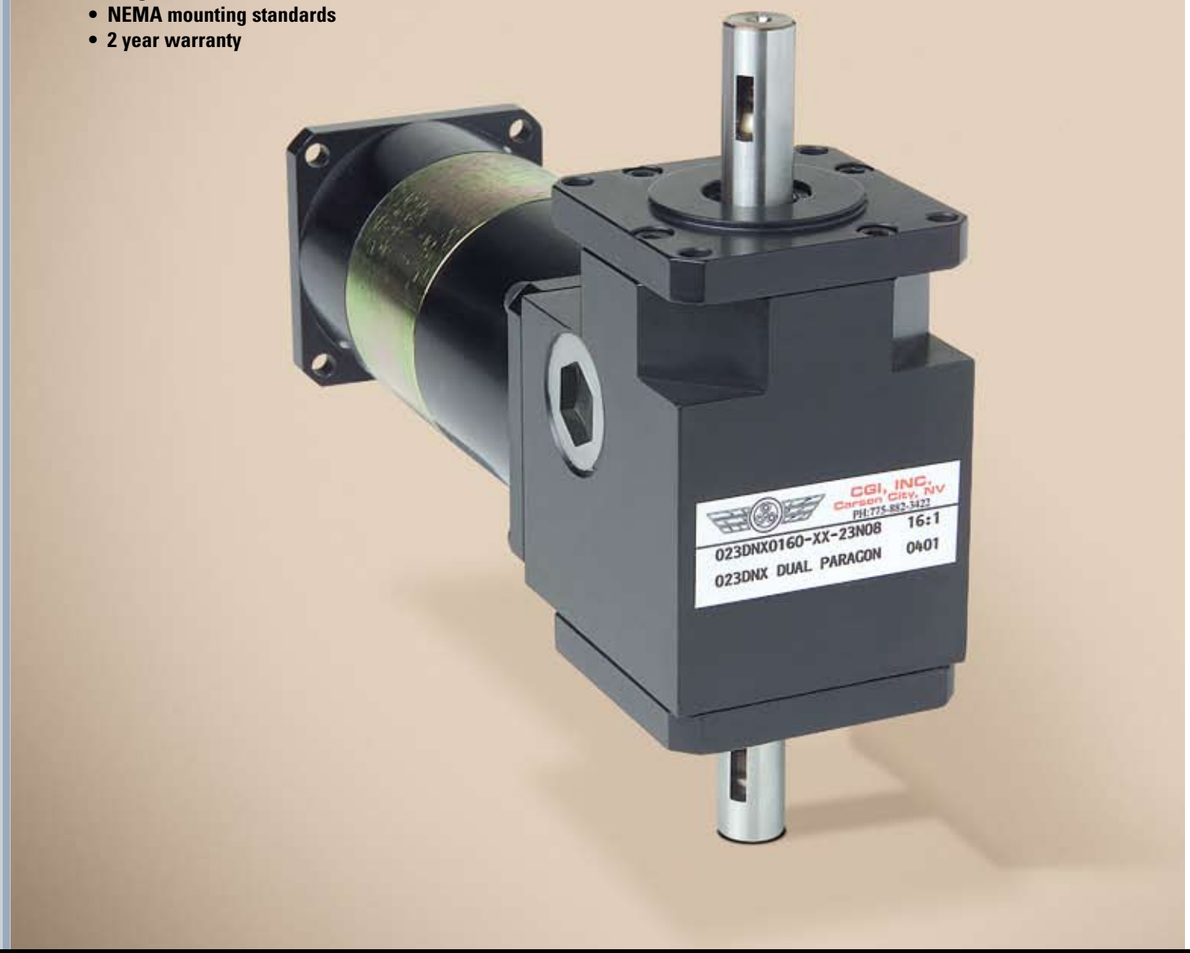
NOTES: Other ratios are also available, consult factory.
Tc: Output torque is rated at 3000 RPM, and a minimum life of 10,000 hours.
Bearing load ratings are based on a minimum life of 10,000 hours.
Torque specifications for the RCX and DCX are the same.

CGI, INC. • 3400 Arrowhead Drive • Carson City, NV 89706 • Tel 775.882.3422 • Fax 775.882.9599 • www.cgimotion.com

SINGLE, DOUBLE STAGE-SINGLE OR DOUBLE SHAFT PRECISION GEARHEADS

CONSTRUCTION FEATURES

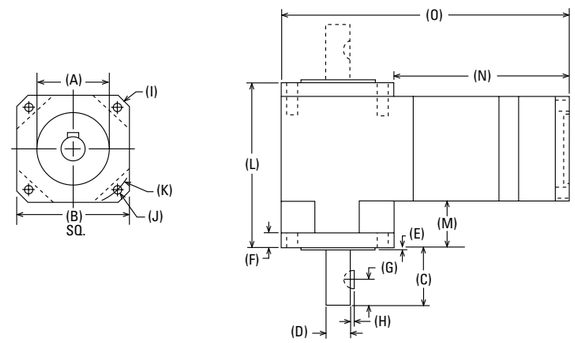
- True planetary design
- Tapered roller bearings
- Low backlash design
- Input pinion with balanced clamp collar
- Quick installation
- Strong, caged roller bearings
- High reliability design
- High strength steels
- High shaft loading capacity
- Case hardened spiral bevel gears
- Sealed ball bearings
- High efficiency design
- All gears are heat treated
- NEMA mounting standards
- 2 year warranty



RN/DN SERIES: PARAGON™ PLANETARY RIGHT ANGLE GEARHEADS

SINGLE, DOUBLE STAGE-SINGLE OR DOUBLE SHAFT PRECISION GEARHEADS

NOTE: "O" AND "N" DIMENSION ON PGS. 28-29



PART NUMBER	A PILOT DIAMETER (in.)	B SQUARE FLANGE (in.)	C SHAFT LENGTH (in.)	D SHAFT DIAMETER (in.)	E PILOT LENGTH (in.)	F FLANGE THICKNESS (in.)	G KEY LOCATION (in.)	H KEY HEIGHT (in.)
017RNX/017DNX	864/.866	1.65	1.25	.3745/.3750	0.062	0.250	0.38	0.041
023RNX/023DNX	1.498/1.500	2.25	1.25	.4995/.5000	0.062	0.312	0.56	0.054
034RNX/034DNX	2.873/2.875	3.25	1.50	.7495/.7500	0.062	0.500	0.56	0.082
042RNX/042DNX	2.185/2.187	4.20	2.00	.9995/1.0000	0.062	0.500	0.63	0.109
056RNX/056DNX	4.498/4.500	5.75	2.50	1.4995/1.5000	0.093	0.750	0.94	0.163
075RNX/075DNX	5.998/6.000	7.48	3.50	1.9995/2.0000	0.187	0.875	3.00 Lg	0.157

PART NUMBER	I HOUSING DIAMETER (in.)	J BOLT HOLE DIAMETER (in.)	K BOLT HOLE CIRCLE (in.)	L RIGHT ANGLE WIDTH (in.)	M OVERHANG WIDTH (in.)	KEY WIDTH/ WOODRUFF KEY (in.)	RADIAL SHAFT LOADING (LBS.)	AXIAL SHAFT LOADING (LBS.)
017RNX/017DNX	2.05	0.125	1.725	2.72	0.82	0.094 / #303	400	400
023RNX/023DNX	2.95	0.205	2.625	3.55	0.99	0.125 / #404	600	600
034RNX/034DNX	4.38	0.220	3.875	5.14	1.38	0.187 / #606	900	900
042RNX/042DNX	5.51	0.280	4.950	5.89	1.18	0.250 / #808	1400	1400
056RNX/056DNX	7.87	0.410	7.000	8.79	2.28	0.375 / #1212	2200	2200
075RNX/075DNX	9.64	0.560	8.465	11.30	2.95	3/8"x 5/8" RECT.	3200	3200

AVAILABLE RATIOS	EFFICIENCY	SPECIFICATIONS
SINGLE STAGE : 3:1 / 4:1 / 5.5:1 / 7:1 / 10:1	85%	Input RPM: 5000 Max.
DOUBLE STAGE: 16:1 / 22:1 / 28:1 / 40:1 / 49:1 / 55:1 / 70:1 / 100:1	80%	Operating Temperature Range -40°F to +255°F
		Motor Mounting Hardware Supplied



PRODUCTS WITH VISION.
FOR ENGINEERS...BY ENGINEERS.
The fountains at the Bellagio Casino in Las Vegas, Nevada are powered by CGI, INC. precision gearheads.

ALL SPECIFICATIONS SUBJECT TO CHANGE.

SINGLE, DOUBLE STAGE-SINGLE OR DOUBLE SHAFT

MODEL	RATIO	TORQUE RATING		INERTIA		BACKLASH	GEARHEAD	N	O
		T_C	T_{PEAK}	INPUT PINION	GEARHEAD	STD/ LOW	WEIGHT	LENGTH	GEARHEAD
		IN LBS.	*IN LBS.*	*OZ IN SEC²*	*OZ IN SEC²*	*ARC MINUTES*	*LBS.*	TO FLANGE	LENGTH
017RNX	3:1	125	174	2.163E-04	1.669E-04	14 / 11	2.8	3.30	4.97
017RNX	4:1	119	165	1.352E-04	1.053E-04	14 / 11	2.8	3.30	4.97
017RNX	5.5:1	107	149	1.174E-04	5.870E-05	14 / 11	2.8	3.30	4.97
017RNX	7:1	89	124	1.143E-04	3.692E-05	14 / 11	2.8	3.30	4.97
017RNX	10:1	56	84	1.132E-04	1.833E-05	14 / 11	2.8	3.30	4.97
017RNX	16:1	127	176	1.352E-04	1.045E-04	18 / 13	3.4	3.97	5.62
017RNX	22:1	128	178	1.174E-04	5.830E-05	18 / 13	3.4	3.97	5.62
017RNX	28:1	129	179	1.143E-04	3.667E-05	18 / 13	3.4	3.97	5.62
017RNX	40:1	131	181	1.132E-04	1.821E-05	18 / 13	3.4	3.97	5.62
017RNX	49:1	95	132	1.143E-04	3.479E-05	18 / 13	3.4	3.97	5.62
017RNX	55:1	117	162	1.132E-04	1.755E-05	18 / 13	3.4	3.97	5.62
017RNX	70:1	96	134	1.132E-04	1.729E-05	18 / 13	3.4	3.97	5.62
017RNX	100:1	52	77	1.132E-04	1.708E-05	18 / 13	3.4	3.97	5.62
023RNX	3:1	285	396	1.194E-03	4.866E-04	14 / 11	4.2	4.51	6.78
023RNX	4:1	264	366	9.502E-04	3.113E-04	14 / 11	4.2	4.51	6.78
023RNX	5.5:1	238	330	8.969E-04	1.746E-04	14 / 11	4.2	4.51	6.78
023RNX	7:1	197	274	8.880E-04	1.100E-04	14 / 11	4.2	4.51	6.78
023RNX	10:1	119	179	8.846E-04	5.471E-05	14 / 11	4.2	4.51	6.78
023RNX	16:1	282	391	9.502E-04	3.287E-04	18 / 13	5.2	5.41	7.68
023RNX	22:1	285	396	8.969E-04	1.838E-04	18 / 13	5.2	5.41	7.68
023RNX	28:1	288	400	8.880E-04	1.157E-04	18 / 13	5.2	5.41	7.68
023RNX	40:1	291	405	8.846E-04	5.749E-05	18 / 13	5.2	5.41	7.68
023RNX	49:1	213	295	8.880E-04	1.098E-04	18 / 13	5.2	5.41	7.68
023RNX	55:1	260	362	8.846E-04	5.543E-05	18 / 13	5.2	5.41	7.68
023RNX	70:1	215	298	8.846E-04	5.460E-05	18 / 13	5.2	5.41	7.68
023RNX	100:1	110	164	8.846E-04	5.393E-05	18 / 13	5.2	5.41	7.68
034RNX	3:1	964	1339	4.901E-03	4.672E-03	14 / 11	12.4	6.27	9.53
034RNX	4:1	914	1270	2.522E-03	2.833E-03	14 / 11	12.4	6.27	9.53
034RNX	5.5:1	835	1160	2.040E-03	1.585E-03	14 / 11	12.4	6.27	9.53
034RNX	7:1	701	934	1.955E-03	9.983E-04	14 / 11	12.4	6.27	9.53
034RNX	10:1	507	704	1.923E-03	4.961E-04	14 / 11	12.4	6.27	9.53
034RNX	16:1	986	1370	2.522E-03	2.824E-03	18 / 13	13.4	7.54	10.80
034RNX	22:1	1000	1389	2.040E-03	1.580E-03	18 / 13	13.4	7.54	10.80
034RNX	28:1	1009	1402	1.955E-03	9.952E-04	18 / 13	13.4	7.54	10.80
034RNX	40:1	1023	1421	1.923E-03	4.946E-04	18 / 13	13.4	7.54	10.80
034RNX	49:1	762	1058	1.955E-03	9.417E-04	18 / 13	13.4	7.54	10.80
034RNX	55:1	924	1283	1.923E-03	4.759E-04	18 / 13	13.4	7.54	10.80
034RNX	70:1	770	1070	1.923E-03	4.684E-04	18 / 13	13.4	7.54	10.80
034RNX	100:1	507	761	1.923E-03	4.623E-04	18 / 13	13.4	7.54	10.80

ALL SPECIFICATIONS SUBJECT TO CHANGE.

RN/DN SERIES: PARAGON™ PLANETARY RIGHT ANGLE GEARHEADS

SINGLE, DOUBLE STAGE-SINGLE OR DOUBLE SHAFT

MODEL	RATIO	TORQUE RATING		INERTIA		BACKLASH	GEARHEAD	N	O
		T_C	T_{PEAK}	INPUT PINION	GEARHEAD	STD/ LOW	WEIGHT	LENGTH	GEARHEAD
		IN LBS.	*IN LBS.*	*OZ IN SEC²*	*OZ IN SEC²*	*ARC MINUTES*	*LBS.*	TO FLANGE	LENGTH
042RNX	3:1	1726	2398	1.680E-02	1.641E-02	14 / 11	29.0	7.64	11.85
042RNX	4:1	1646	2287	1.032E-02	1.049E-02	14 / 11	29.0	7.64	11.85
042RNX	5.5:1	1516	2106	8.997E-03	5.878E-03	14 / 11	29.0	7.64	11.85
042RNX	7:1	1283	1782	8.766E-03	3.704E-03	14 / 11	29.0	7.64	11.85
042RNX	10:1	936	1300	8.680E-03	1.841E-03	14 / 11	29.0	7.64	11.85
042RNX	16:1	1784	2478	1.032E-02	1.101E-02	18 / 13	35.0	9.24	13.45
042RNX	22:1	1810	2515	8.997E-03	6.156E-03	18 / 13	35.0	9.24	13.45
042RNX	28:1	1829	2540	8.766E-03	3.875E-03	18 / 13	35.0	9.24	13.45
042RNX	40:1	1855	2577	8.680E-03	1.925E-03	18 / 13	35.0	9.24	13.45
042RNX	49:1	1400	1945	8.766E-03	3.706E-03	18 / 13	35.0	9.24	13.45
042RNX	55:1	1688	2344	8.680E-03	1.866E-03	18 / 13	35.0	9.24	13.45
042RNX	70:1	1417	1969	8.680E-03	1.843E-03	18 / 13	35.0	9.24	13.45
042RNX	100:1	1024	1423	8.680E-03	1.823E-03	18 / 13	35.0	9.24	13.45
056RNX	3:1	3877	5385	5.794E-02	7.141E-02	14 / 11	56.0	10.90	16.66
056RNX	4:1	3710	5153	3.123E-02	4.524E-02	14 / 11	56.0	10.90	16.66
056RNX	5.5:1	3425	4758	2.564E-02	2.527E-02	14 / 11	56.0	10.90	16.66
056RNX	7:1	2916	4051	2.470E-02	1.590E-02	14 / 11	56.0	10.90	16.66
056RNX	10:1	2143	2977	2.435E-02	7.899E-03	14 / 11	56.0	10.90	16.66
056RNX	16:1	4047	5622	3.123E-02	4.702E-02	18 / 13	71.0	13.03	18.79
056RNX	22:1	4111	5711	2.564E-02	2.621E-02	18 / 13	71.0	13.03	18.79
056RNX	28:1	4157	5774	2.470E-02	1.648E-02	18 / 13	71.0	13.03	18.79
056RNX	40:1	4220	5862	2.435E-02	8.184E-03	18 / 13	71.0	13.03	18.79
056RNX	49:1	3204	4451	2.470E-02	1.576E-02	18 / 13	71.0	13.03	18.79
056RNX	55:1	3845	5341	2.435E-02	7.932E-03	18 / 13	71.0	13.03	18.79
056RNX	70:1	3246	4509	2.435E-02	7.830E-03	18 / 13	71.0	13.03	18.79
056RNX	100:1	2361	3279	2.435E-02	7.746E-03	18 / 13	71.0	13.03	18.79
075RNX	3:1	10005	36975	1.936E-01	2.930E-01	14 / 11	132.0	14.71	22.21
075RNX	4:1	9535	13245	6.554E-02	1.889E-01	14 / 11	132.0	14.71	22.21
075RNX	5.5:1	9574	13300	4.015E-02	1.062E-01	14 / 11	132.0	14.71	22.21
075RNX	7:1	8107	11261	3.574E-02	6.702E-02	14 / 11	132.0	14.71	22.21
075RNX	10:1	5959	8277	3.410E-02	3.335E-02	14 / 11	132.0	14.71	22.21
075RNX	16:1	11474	15938	6.554E-02	1.928E-01	18 / 13	210.0	17.61	25.09
075RNX	22:1	11671	161212	4.015E-02	1.083E-01	18 / 13	210.0	17.61	25.09
075RNX	28:1	11810	16405	3.574E-02	6.831E-02	18 / 13	210.0	17.61	25.09
075RNX	40:1	12005	16676	3.410E-02	3.398E-02	18 / 13	210.0	17.61	25.09
075RNX	49:1	8976	12469	3.574E-02	6.523E-02	18 / 13	210.0	17.61	25.09
075RNX	55:1	10848	15069	3.410E-02	3.291E-02	18 / 13	210.0	17.61	25.09
075RNX	70:1	9100	12641	3.410E-02	3.247E-02	18 / 13	210.0	17.61	25.09
075RNX	100:1	6447	9184	3.410E-02	3.212E-02	18 / 13	210.0	17.61	25.09

ALL SPECIFICATIONS SUBJECT TO CHANGE.

NOTES: Other ratios are also available, consult factory.
T_C: Output torque is rated at 3000 RPM, and a minimum life of 10,000 hours.
Bearing load ratings are based on a minimum life of 10,000 hours.
Torque specifications for the RNX and DNX are the same.

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NEMA DIMENSIONS-SINGLE OR DOUBLE SHAFT PRECISION GEARHEADS

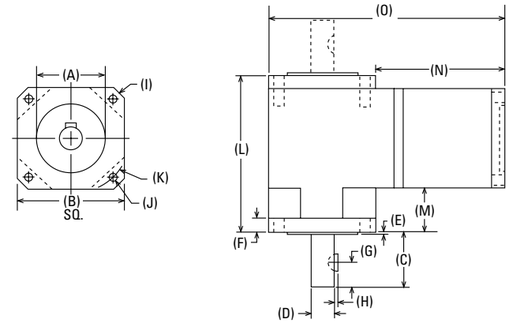
CONSTRUCTION FEATURES

- One-piece gear cluster
- Tapered roller bearings
- High quality spur gearhead
- Input pinion with balanced clamp collar
- Quick installation
- High reliability design
- High strength steels
- High shaft loading capacity
- Viton O-Ring sealed at each joint
- Sealed ball bearings
- High efficiency design
- All gears are heat treated
- NEMA mounting standards
- 2 year warranty



RS/DS SERIES: SPUR RIGHT ANGLE GEARHEADS

NEMA DIMENSIONS-SINGLE OR DOUBLE SHAFT PRECISION GEARHEADS



PART NUMBER	A PILOT DIAMETER (in.)	B SQUARE FLANGE (in.)	C SHAFT LENGTH (in.)	D SHAFT DIAMETER (in.)	E PILOT LENGTH (in.)	F FLANGE THICKNESS (in.)	G KEY LOCATION (in.)	H KEY HEIGHT (in.)
023RSX/023DSX	1.498/1.500	2.25	1.25	.4995/.5000	0.062	0.312	0.56	0.054
034RSX/034DSX	2.873/2.875	3.25	1.50	.7495/.7500	0.062	0.312	0.56	0.082
042RSX/042DSX	2.185/2.187	4.20	2.00	.9995/1.0000	0.062	0.500	0.63	0.109
056RSX/056DSX	4.498/4.500	5.75	2.50	1.4995/1.5000	0.093	0.750	0.94	0.163

PART NUMBER	I HOUSING DIAMETER (in.)	J BOLT HOLE DIAMETER (in.)	K BOLT HOLE CIRCLE (in.)	L RIGHT ANGLE WIDTH (in.)	M OVERHANG WIDTH (in.)	KEY WIDTH/ WOODRUFF KEY (in.)	RADIAL SHAFT LOADING (LBS.)	AXIAL SHAFT LOADING (LBS.)
023RSX/023DSX	2.95	0.205	2.625	3.55	0.99	0.125 / #404	300	300
034RSX/034DSX	4.38	0.220	3.875	5.14	1.38	0.187 / #606	500	500
042RSX/042DSX	5.51	0.280	4.950	5.89	1.18	0.250 / #808	700	700
056RSX/056DSX	7.87	0.410	7.000	8.79	2.28	0.375 / #1212	900	900

PART NUMBER	N LENGTH TO FLANGE (in.)	O GEARHEAD LENGTH (in.)	BACKLASH STD/LOW (ARC-MINUTES)	CONTINUOUS TORQUE MAX. (IN LBS.)	MOMENTARY TORQUE MAX. (IN LBS.)	GEARHEAD WEIGHT (LBS.)	MAX. INERTIA REFLECTED TO INPUT (OZ. IN. SEC^2)	PINION GEAR INERTIA (OZ. IN. SEC^2)
023RSX/023DSX	2.67	4.92	25/15	20	30	4.0	2.58×10^{-5}	7.59×10^{-4}
034RSX/034DSX	3.49	6.74	25/15	60	90	9.0	2.09×10^{-4}	1.52×10^{-3}
042RSX/042DSX	4.01	8.21	25/15	200	300	24.0	6.69×10^{-4}	7.59×10^{-3}
056RSX/056DSX	5.43	11.23	25/15	350	500	44.0	1.73×10^{-3}	4.57×10^{-2}

AVAILABLE RATIOS AND SHAFT ROTATION*

SIZE 023	3:1	SAME
	5:1	SAME
	10:1	SAME
	15:1	OPPOSITE
	20:1	OPPOSITE
	30:1	OPPOSITE
	50:1	OPPOSITE
	100:1	SAME
SIZE 042	3:1	SAME
	5:1	SAME
	10:1	SAME
	15:1	OPPOSITE
	20:1	OPPOSITE
	30:1	SAME
	50:1	OPPOSITE
	100:1	SAME

SIZE 034	3:1	SAME
	5:1	SAME
	10:1	SAME
	15:1	SAME
	20:1	OPPOSITE
	30:1	OPPOSITE
	50:1	SAME
	100:1	SAME
SIZE 056	3:1	SAME
	5:1	SAME
	10:1	OPPOSITE
	15:1	OPPOSITE
	25:1	OPPOSITE
	40:1	SAME

SPECIFICATIONS

Input RPM: 4000 Max.

Minimum Efficiency: 90%

Operating Temperature Range -40°F to +255°F

Note: Size 056 Requires a Mounting Adapter

Motor Mounting Hardware Supplied

ALL SPECIFICATIONS SUBJECT TO CHANGE.

*Rotation references the gearhead output shaft direction with respect to motor shaft direction.

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SIZES 017 AND 023-RATIOS 5, 10, 18:1

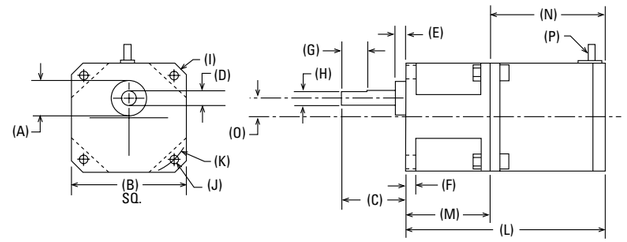
CONSTRUCTION FEATURES

- One-piece gear cluster
- Cost-effective, light duty spur gearmotors
- Composite bushings throughout gearhead
- Gears are high strength steel and precision hobbed
- Output shaft is heat treated stainless steel
- High temperature, molded composite housing
- Supplied with a 17 or 23 frame step motor
- Standard industry dimensions
- 1 year warranty



SP SERIES: LIGHT DUTY OFFSET GEARMOTORS

SIZES 017 AND 023-RATIOS 5, 10, 18:1



PART NUMBER	A PILOT DIAMETER (in.)	B SQUARE FLANGE (in.)	C SHAFT LENGTH (in.)	D SHAFT DIAMETER (in.)	E PILOT LENGTH (in.)	F FLANGE THICKNESS (in.)	O FLAT LENGTH (in.)	H DIMENSION OVER FLAT (in.)
017SPX	.708 / .710	1.65	0.79	.2495 / .2500	0.12	0.19	0.470 (2X)	0.22 (2X)
023SPX	.708 / .710	2.25	1.26	.3120 / .3125	0.20	0.19	0.500 (1X)	0.29 (1X)

PART NUMBER	I HOUSING DIAMETER (in.)	J BOLT HOLE THREAD / DIAMETER	K BOLT HOLE CIRCLE (in.)	L GEARMOTOR LENGTH (in.)	M GEARHEAD LENGTH (in.)	N MOTOR LENGTH (in.)	O OFFSET DIMENSION (in.)	P NUMBER OF LEAD WIRES
017SPX	2.05	M3 x .5	1.725	2.86	0.98	1.88	0.31	8
023SPX	3.05	0.205 (in.)	2.625	4.7	1.67	3.03	0.39	6

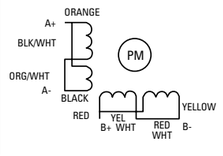
PART NUMBER	RATED PHASE CURRENT (AMPS/PHASE)	NOMINAL MOTOR STEP ANGLE	BACKLASH (ARC-MINUTES)	RADIAL SHAFT PLAY (in.)	AXIAL SHAFT PLAY (in.)	GEARHEAD WEIGHT (OZ.)	PHASE RESISTANCE (OHMS +/-10%)	WINDING INDUCTANCE (mH +/-20%)
017SPX	1.25	1.8" STEP	45	0.002	0.010	13	3.3@25°C	3.0
023SPX	4.70	1.8" STEP	45	0.002	0.010	45	.37@25°C	0.6

PART NUMBER	INPUT RPM (MAX.)	EFFICIENCY (MIN.) (AMPS/PHASE)	GEARHEAD MAX. CONT. TORQUE (OZ. in.)	SPECIFICATIONS
017SPX	1000	80%	160	Gearhead Ambient Operating Temperature Range -40°F to +255°F. Motor is rated to 265°F. Molded Composite Housing (Max. Temp. 420°F). Gears are High-Strength Heat-Treated Steel. Composite Bushings throughout Gearhead. Input/Output shafts turn in the same direction.
023SPX	1000	80%	320	

SIZE 017 MOTOR P/N HT17-075P

Bipolar Chopper Drive Switching Sequence for CW Rotation Facing Mounting End

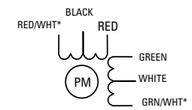
Step	A+	A-	B+	B-
0	+	-	+	-
1	-	+	+	-
2	-	+	-	+
3	+	-	-	+
4	+	-	+	-



SIZE 023 MOTOR P/N 4023-828P

Bipolar Chopper Drive Switching Sequence for CW Rotation Facing Mounting End

Step	Red	Black	Green	White
0	+	-	+	-
1	-	+	+	-
2	-	+	-	+
3	+	-	-	+
4	+	-	+	-



Motor Connection: Center Tap to end

* These wires are not used: do not connect them or ground them. They must be electricly isolated.

ALL SPECIFICATIONS SUBJECT TO CHANGE.

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For custom gearhead requirements...

CORE COMPETENCE AT CGI MEANS...CUSTOMS.

CGI has been building to custom gear requirements for over 36 years and we're still going strong. Time and time again customers continue to bring us application requirements that no other manufacturer can do quickly and inexpensively.

The following products on these two pages are only a few of the hundreds of custom gearheads we have built for a wide variety of industries including Fortune 500 companies in the semiconductor, food packaging, military and medical industries. So whether it's something simple as a special shaft or ratio or something more complex, CGI is the only choice. Contact our applications engineering department for more information.

LINEAR SLIDE

CGI gearheads are easily adapted to any of the commercially available linear slide products on the market. All of our inline or right-angle gearheads can be used to help reduce inertia. Our products match up directly to products manufactured by: Intek, Linear Industries, Daedel, Star Linear, THK, NSK, IKO, Warner, Tol-O-Matic, Macron Dynamics and Industrial Devices.

CUSTOM SHAFT OPTIONS

CGI gearheads offer increased design flexibility when built with custom shaft options such as dual-output shaft, hollow shaft and even custom input shafts that allows easy mounting to options like brakes, encoders or safety couplings that are used between the motor and the gearhead.

AEROSPACE AND MEDICAL

CGI has built custom products for the Hubble Telescope project as well as custom components for surgical hand tools for the medical industry. More and more companies rely on CGI to build non-standard products that meet the stringent requirements of these two very important industries.

SEMICONDUCTOR AND FOOD PACKAGING EQUIPMENT

CGI Prime™ PL Series gearheads can be manufactured with special seals and special grease for both the semiconductor and food packaging equipment industries. The gearheads meet various IP ratings and are usually painted white rather than our standard black anodized.

FOCUSED ON

...CGI is your only choice.



THE FUTURE

COMPONENT PARTS & CUSTOM GEARHEADS







CGI, Inc. is renowned for being able to provide complex precision-machined component parts of high quality and hold tolerances as tight as 2.5 microns. These parts are machined from diverse metals, and involve a variety of hardness, surface treatment, heat-treating and plating requirements. Applications range from nuclear submarines, space vehicles, surgical devices, various semi-conductor manufacturing equipment, robotics and machine tool automation.



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CGI GEARHEADS MOUNT DIRECTLY TO MOTORS MANUFACTURED BY THE FOLLOWING:

Partial Listing:

Aerotech
Allen-Bradley
Anaheim Automation
Animatics
Applied Motion Products
Baldor
Bodine
CMC Torque Systems
Compumotor
Custom Servo Motors
Dynetic Systems
Eastern Air Devices
Electro-Craft
Emerson
Empire Magnetics
GE Fanuc
Glentek
Globe Motors
Hathaway
Hurst Manufacturing
Indramat
Industrial Devices
Industrial Indexing
Infranor
Inland Motor
Kollmorgen
Lin Engineering
Magmotor
MCG
MFM
Mitsubishi
Moog
MyoStat
Nyden
Oriental Motor
Ormec
Pacific-Scientific
Panasonic
Parvex
Pittman
PMI
QuickSilver
Reliance
Sanyo-Denki
SEM
Siemens
Superior Electric
Tamagawa
Teknic
Vickers
Warner
Yaskawa



Our 48 hour shipping program, raises the bar even higher. It ensures the shipment of select standard size and ratio gearheads in stock within 48 hours. By offering quick delivery, we are able to provide this advantage to customers needing a precise solution, and needing it quickly. The market demand for quick turnaround on standard size and ratio gearboxes has become overwhelming. Sales channels need to be able to react to customers' requests quickly. OEMs often face short development timeframes, especially in prototype applications while end-users, losing time and money in a break-down situation, need to get their replacement gearboxes in a hurry. We do our best to accommodate any rush situation.

Featured Ratios and Sizes

48 Hour Shipping is available for popular sizes and ratios from our Prime, Primemetric, Paragon, Victory, Raptor, and Raptor EP Series product lines:

017PLX
023PLX
034PLX



040PMX
060PMX
075PMX



017PNX
023PNX
034PNX



017VPX
023VPX
034VPX



060RTA
075RTA



023RTX
034RTX



0	2	3	P	L	X	0	1	6	0	X	X	0	1	9	1	7

SIZE

	NEMA	METRIC
Size	017	040
Size	023	060
Size	034	075
Size	042	100
Size	056	140
Size	075	180

GH TYPE

PLX	Prime™ Planetary Gearheads
RCX	Prime™ Planetary Right Angle Gearheads
DCX	Prime™ Planetary Right Angle Dual Shaft
PMX	PriMetric™ Planetary Gearheads
PNX	Paragon™ Planetary Gearheads
RNX	Paragon™ Planetary Right Angle Gearheads
DNX	Paragon™ Planetary Right Angle Dual Shaft
SIX	Spur Gearheads NEMA Dimension
RSX	Spur Rignt Angle Single Shaft
DSX	Spur Rignt Angle Dual Shaft
RBD	Right Angle Bevel
DBD	Dual Right Angle Bevel
SPX	Light Duty Offset Gearmotors

RATIO

1:1	0010
3:1	0030
4:1	0040
5:1	0050
5.5:1	0055
7:1	0070
10:1	0100
15:1	0150
16:1	0160
18:1	0180
20:1	0200
22:1	0220
25:1	0250
28:1	0280
30:1	0300
40:1	0400
49:1	0490
50:1	0500
55:1	0550
70:1	0700
100:1	1000
160:1	1600
280:1	2800
400:1	4000
550:1	5500
700:1	7000

FEATURES

XX	-	Standard
LB	-	Low Backlash
VM	-	Vertical Mount
LV	-	Low Backlash/ Vertical Mount
KT	-	Adapter Kit
PK	-	Pinion Kit
RK	-	Rear Bracket Kit

MOTOR CODE
(Rear Bracket / Input Pinion or PROJECT CODE (assigned by CGI)

01917
or
5011X

PLEASE NOTE:

If you have any sizing or technical questions please contact us at

(775) 882-3422



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INERTIA MATCHING

There are several rules that apply to the acceleration responsiveness of a gearmotor and external load system. (See Inertia Matching Example on page 39.) They are as follows:

FOR STEP MOTORS (RULE 1 AND 2)

RULE 1: A system will respond "very fast" if the "System Inertia" is 1 to 3 times larger than the motor's inertia.

RULE 2: A system will respond "acceptably fast" if the "System Inertia" is between 3 and 10 times larger than the motor's inertia.

FOR SERVO MOTORS (RULE 3 AND 4)

RULE 3: A system will respond "very fast" if the "System Inertia" is 1 to 5 times larger than the motor's inertia. Some high performance motor manufacturers state that very fast acceleration response can be obtained with reflected inertia matches as high as 10 times.

RULE 4: A system will respond "acceptably fast" if the "System Inertia" is between 6 and 10 times larger than the motor's inertia. Some high performance motor manufacturers state that acceptably fast response can be obtained with reflected inertia matches as high as 20 times.

Once the "System Inertia" is calculated, divide this by the motor's inertia, take the resultant number and see how it compares with the rules above to get a close approximation of the overall system responsiveness that you require.

RADIAL AND AXIAL BEARING LOAD RATINGS

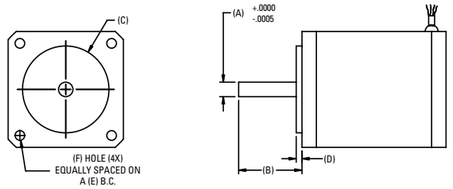
Our radial and axial bearing load information for each gearhead was calculated based on the dynamic load ratings for our bearing systems. Besides lubrication, bearing life is also affected by running speed (rpm) and applied load (radial or axial). Keeping required hours of bearing operation as a constant, as rpm increases, bearing load capacity decreases and vise versa (note: static loads do not apply). Additionally, for gearhead applications, output shaft bearings are affected by the location of any applied radial load on the output shaft. As constant radial load on the output shaft is placed farther from the gearhead output face, the resultant radial load at the bearings increases.

Note: The radial and axial bearing load limit information is provided for singular load components only (not combined axial and radial loads). When combining the load components, it is safe to combine a maximum of one component with only 10% of maximum of the other component. (i.e. 100% of the maximum radial load limit can be combined with only 10% of the maximum axial load limit and vise versa). Consult CGI, Inc. if the second component (axial/radial) exceeds 10% of the first component's load.

GEARHEAD / MOTOR MOUNTING

Any motor matching the mounting dimensions as shown below will attach to any of our Inline Spur, Prime™ Planetary, or Paragon™ Planetary gearheads quickly and easily. If the motor you have selected has a different mounting face than shown, an appropriate adapter can be manufactured to meet your motor's exact mounting surface specifications.

All Gearheads come with a complete mounting kit which includes all hardware necessary for direct attachment to the motor along with easy to follow instruction. The Clamp-On Pinion and Balanced Collar simply slip onto the motor-shaft. The clamp is then fastened by two (2) allen head screws. The motor is then slipped into the gearhead and is held in place by four (4) mounting bolts. This process should take a few minutes at most. No matching or additional components are required.



	NEMA MOTOR MOUNTING DIMENSIONS (INCHES)						
ITEM	DIMENSION	17	23	34	42	56	75
A	MOTOR SHAFT DIAMETER	.1968	.250	.375	.625	1.125	1.260
B	MOTOR SHAFT LENGTH*	.945	.810	1.250	1.380	2.375	2.283
C	PILOT DIAMETER	.866	1.500	2.875	2.186	4.500	7.087
D	PILOT LENGTH*	.080	.094	.094	.094	.125	.160
E	MOUNTING BOLT CIRCLE	1.725	2.625	3.875	4.950	7.000	8.464
F	BOLT HOLE SIZE	4-40 UNC	.195	.218	.281	.406	.551

* These dimensions can be less than value indicated.

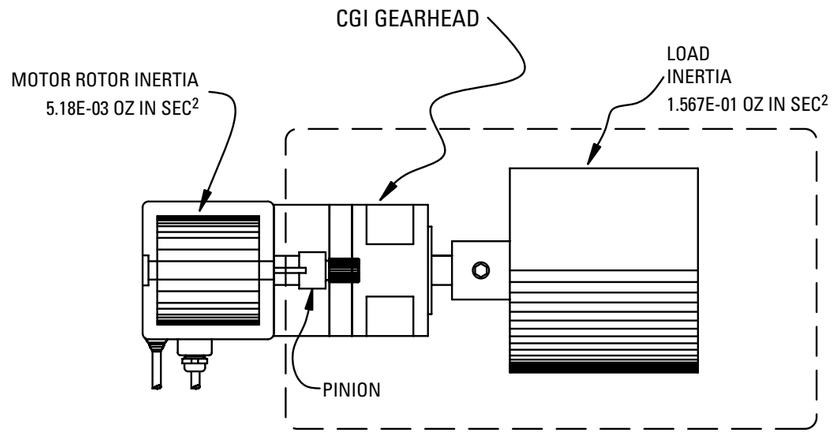


PRODUCT SELECTION GUIDE

INERTIA MATCHING (continued)

One important consideration when choosing a gearhead for your application is proper inertia matching. When an external load has a large inertia and it must accelerate and decelerate responsively, a gearhead with the properly calculated inertia match will accomplish the task. A selected gear ratio will effectively reduce the external load inertia at the motor shaft by an inverse of the square of the gear ratio (see formula below).

INERTIA MATCHING EXAMPLE



FORMULA:

$$\text{SYSTEM INERTIA} = \text{GEARHEAD INERTIA} + \text{PINION INERTIA} + \frac{\text{LOAD INERTIA}}{(\text{GEAR RATIO})^2}$$

GIVEN:

SIZE 23 5.5:1 PRIME GEARHEAD INERTIA = 1.746E-04 OZ IN SEC²
SIZE 23 5.5:1 PRIME PINION INERTIA = 9.062E-04 OZ IN SEC²
LOAD INERTIA = 1.567E-01 OZ IN SEC²
MOTOR ROTOR INERTIA = 5.18E-03 OZ IN SEC²

SOLUTION:

$$\text{SYSTEM INERTIA} = 1.746\text{E-}04 \text{ OZ IN SEC}^2 + 9.062\text{E-}04 \text{ OZ IN SEC}^2 + \frac{1.567\text{E-}01 \text{ OZ IN SEC}^2}{(5.5)^2}$$

SYSTEM INERTIA = 6.26E-03 OZ IN SEC²

RATIO OF THE SYSTEM INERTIA TO (:) THE MOTOR ROTOR INERTIA = (6.26E-03 OZ IN SEC²) : (5.18E-03 OZ IN SEC²)

-OR-

1.2 TO 1 (INERTIA MATCH)

(IDEAL INERTIA MATCH OF 1:1 YIELDS A VERY FAST SYSTEM RESPONSE)

OTHER APPLICATION PARAMETERS TO CONSIDER:

- TORQUE REQUIREMENTS
- SPEED REQUIREMENTS
- RESPONSE REQUIREMENTS
- STIFFNESS REQUIREMENTS
- RESOLUTION REQUIREMENTS

APPLICATION FLOWCHART

1 Calculate Duty Cycle for Application DC (%)

$$DC = \frac{(t_1 + t_2 + t_3)}{(t_1 + t_2 + t_3 + t_4)} * 100\%$$

2 DC < 50% use T_{Peak}
DC > 50% use T_{Cont}
See Below (11)

3 Determine Gearhead Type
Determine Mean Output Speed (RPM) for the Motor
Determine Mean Output Speed (RPM) for the Gearhead

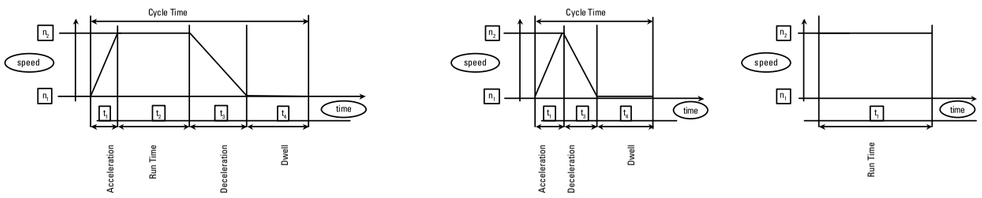
- Inline
- Right Angle Single Shaft
- Right Angle Dual Shaft

Figure 1	Ratios
1 Stage	3, 4, 5, 5.5, 7, 10
2 Stage	15, 16, 20, 22, 25, 28, 30, 40, 49, 50, 55, 70, 100
3 Stage	160, 280, 400, 550, 700

4 Calculate Gear Ratio
See Figure 1 for Standard Ratios

$m = (n_{\text{Mean Output Speed Motor}} / n_{\text{Mean Output Speed Gearhead}})$

5 Determine Acceleration Time
Determine Run Time
Determine Deceleration Time
Determine Dwell Time



6 Determine Motor Peak Torque
Determine Motor Continuous Torque
Determine Load Inertia
Determine Motor Rotor Inertia

7 Determine Direction, Motion Profile, Maximum Speed, Cycles per Hour, Hours per Day, and Shock Load

S.F. = A + B + C + D + E + F

Direction (A):	Cycles per Hour (D):
Motion Profile (B):	Hours per Day (E):
Max Speed (C):	Shock Load (F):

Cycles per Hour (D) = $\frac{3600 \text{ (sec/hr)}}{\text{Cycle Time (sec)}}$

Direction (A):	
Unidirectional:	0.3
Reversing:	0.4

Motion Profile (B):	
Continuous:	0.3
Trapezoidal:	0.4
Triangular:	0.5

Max Speed (C):	
0-999:	0.1
1000-2999	0.2
3000-4999	0.3
5000 +:	0.4

Cycles per Hour (D):	
0-999:	0.1
1000-2999:	0.2
3000-4999:	0.3
5000 +:	0.4

Hours per Day (E):	
0 - 4.0:	0.1
4.1 - 8.0:	0.2
8.1 - 16.0	0.3
16.1 +:	0.4

Shock Load (F):	
None:	0.1
Light:	0.3
Moderate:	0.5
Heavy:	0.7

8 Calculate Service Factor (SF)

9 Is Current being limited to the Motor?
NO
YES

10 Limit Factor (LF) = % of Motor Peak
Limit Factor (LF) = 1.0

11 Calculate Peak Output Torque
or
Calculate Required Mean Continuous Output Torque

$T_{Peak} = (T_{Motor\ Peak} * L.F. * m * S.F. * h)$

$T_{Cont} = (T_{Mean} * S.F.)$

$$T_{Mean} = \sqrt[3]{\frac{n_1 t_1 T_1^3 + \ldots n_n t_n T_n^3}{n_1 t_1 + \ldots n_n t_n}}$$

Inline	Efficiency h
1 Stage	>90%
2 Stage	>85%
3 Stage	>80%

Right Angle	Efficiency h
1 Stage	>85%
2 Stage	>80%
3 Stage	>75%

12 Select Gearhead Size

NEMA	METRIC
017	040
023	060
034	075
042	100
056	140
075	180

PLX	RCX	DCX
PMX	RNX	DNX
PNX	RSX	DSX
PTX	RBD	DBD
SIX		

13 Desired Inertia Match

14 Calculate System Inertia

System Inertia = Gearhead Inertia + Input Pinion Inertia + (Load Inertia / (Gear Ratio)^2)

15 Determine System Inertia Match

System Inertia Match = System Inertia / Motor Rotor Inertia

16 Determine Radial and Axial Loads

17 Determine Drive Type

- Pulley with Belt
- Lead / Ball Screw
- Direct Drive
- Gearhead Input
- Sprocket with Chain

18 Gear Head Mount

19 **Select Part Number**

APPLICATION FLOWCHART

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General Information

Customer Name: _____ Fax #: _____ CGI Ship Date: _____

Buyer Contact: _____ Phone #: _____ Dock Date: _____

Technical Contact: _____ Phone #: _____ Ship Via: _____

Purchase Order #: _____ Your Project #: _____ CGI Part #: _____

Gearhead Type: _____ Gearhead Size: _____ Ratio: _____

Application Information

Motor Manufacturer: _____

Motor Model #: _____

Motor Size: _____

Maximum Motor Speed: _____

Motor Print Attached? ○ Yes ○ No

NEMA Motor: ○ Yes ○ No ○ Not Sure

Note: Any specials (non-cataloged gearheads) send motor print

Special Requirements

OP – Output _____

FB – Front Bracket _____

RB – Rear Bracket _____

Material _____

Other _____

What is the external load inertia? (oz. in sec^2): _____

Accel time to top speed? (sec.): _____

Decel Time? (sec.): _____ Dwell Time? (sec.): _____

Continuous Torque Rating of motor (in. lbs.): _____

Is it mounted?: ○ Vertically or ○ Horizontally?

Peak Torque Rating of motor (in. lbs.): _____

Is the current being limited to the motor? ○ Yes ○ No

If yes, to what peak torque value is it limited? (in. lbs.): _____

Gearhead output speed for application? (rpm): _____

Radial load on output shaft of gearhead (lbs.): _____

Axial load (lbs.): _____

Briefly describe your application: _____

Drive Type: ○ Pulley w/ Belt ○ Lead / Ball Screw ○ Direct Drive ○ Gearhead Input ○ Sprocket w/ Chain

Service Factor

DIRECTION		MOTION PROFILE		MAX SPEED (RPM)		CYCLES / HOUR		HOURS / DAY		SHOCK LOAD	
Unidirectional	.3	Continuous	.3	0-999	.1	0-999	.1	.1 - 4.0	.1	None	.1
Reversing	.4	Trapezoidal	.4	1000-2999	.2	1000-2999	.2	4.1 - 8.0	.2	Light	.3
		Triangular	.5	3000-4999	.3	3000-4999	.3	8.1 - 16.0	.3	Moderate	.5
				5000 +	.4	5000 +	.4	16.1 +	.4	Heavy	.7

Service Factor = Sum of all Elements_____ Circle the Numbers Above

Customer Sign Off: _____

Sales: _____

Engineering: _____

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2000

This is to certify that:

CGI Inc.
3400 Arrowhead Drive
Carson City
Nevada
89706
USA

Holds Certificate No: **FM 66031**
and operates a Quality Management System which complies with the requirements of ISO 9001:2000 for the following scope:

The design, manufacture and distribution of precision power transmission component parts and gear assemblies for motion control and automation applications.

For and on behalf of BSI:

President, BSI Management Systems America, Inc.

Originally Registered: **03/14/2002** Latest Issue: **07/30/2008** Expiry Date: **08/14/2011**

Page: 1 of 1

This certificate remains the property of BSI and shall be returned immediately upon request.
An electronic certificate can be authenticated online. Printed copies can be validated at www.bsigroup.com/ClientDirectory
To be read in conjunction with the scope above or the attached appendix.
Americas Headquarters: 12110 Sunset Hills Road, Suite 200, Reston, VA 20190, USA.

BSI Management Systems

CGI, INC. • 3400 Arrowhead Drive • Carson City, NV 89706 • Tel 775.882.3422 • Fax 775.882.9599 • www.cgimotion.com

WARRANTY TERMS AND CONDITIONS

CGI, Inc. warrants all standard Gearheads, manufactured to be free of defects in materials and workmanship for the periods shown below, when used within Product Specifications and under Normal Operating Conditions, as determined by CGI, Inc. and within the provisions outlined below.

CGI, Inc. warrants all standard PriMetric and Prime Planetary Gearheads for a five (5) year period from date of purchase.

CGI, Inc. warrants all standard Spur Inline, Power Tube and Paragon Planetary Gearheads for a two (2) year period from date of purchase.

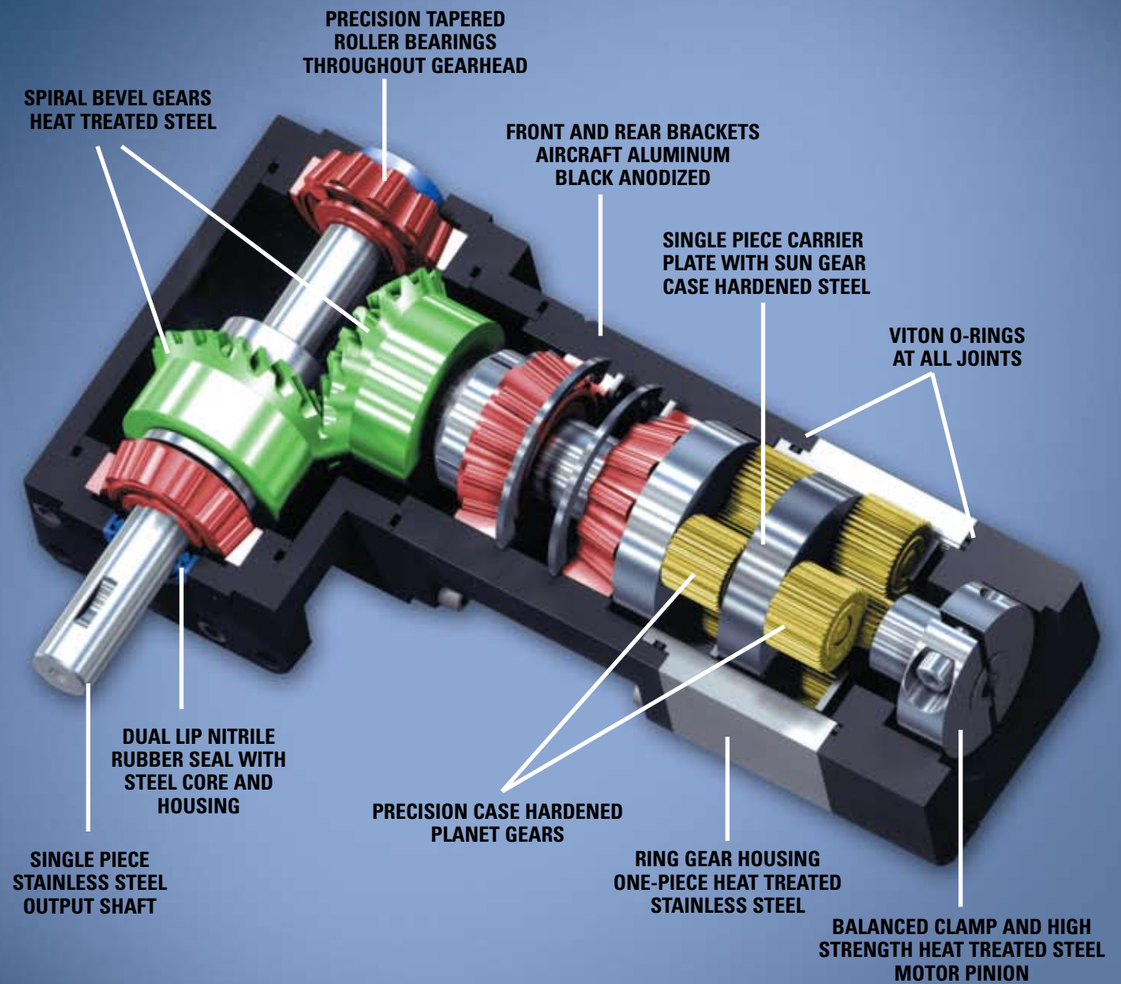
CGI, Inc. warrants all standard Spur Offset Gearheads for a one (1) year period from the date of purchase.

1. CGI, Inc. will repair or replace, at its sole discretion, any of its standard catalog products, which CGI agrees, in writing, are nonconforming. Any claims by Buyer for omissions or shortages in a shipment or that product is nonconforming shall be waived, unless Seller received written notice thereof within thirty (30) days after Buyer's receipt of the shipment, or as authorized by Seller, in writing.
2. All product returned to Seller's facility must have a Return Authorization (RA) Number. Buyer must contact CGI, Inc. before sending product in for evaluation, repair, replacement or modification. Seller assumes no liability for packages returned without proper authorization. The RA number should be clearly marked on the outside of all packages being returned. Product should be properly packaged. CGI, Inc. will not accept responsibility for damage incurred during removal, installation, shipping or handling of returned product.
3. Buyer shall pay costs of transportation for nonconforming product which is returned to Seller's facility, unless prior written authorization is obtained from Seller. Seller shall pay for costs of transportation on warranty repairs or replacements, using standard ground transport, unless agreed to by Seller, in writing.
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6. Buyer agrees that any values of expected life furnished by Seller to Buyer are strictly estimates based on theoretical calculations, load averaging via RMC (root mean cubed) or other industry standard calculation methods. Such estimated values are furnished for Buyer's convenience only and on the express condition that such values do not constitute any representation, warranty or guarantee by Seller whatsoever that such values will be realized in Buyer's application. Any estimated values of expected life, oral or written information, opinions, evaluations, consultations, or cooperation of Seller or any designs, specifications, standards, performance requirements, requirements of third parties or other information of any kind furnished or communicated by Buyer, or its representatives, Buyer specifically agrees that it is Buyer's sole responsibility to select and evaluate the correct product and other items for use in Buyer's application.
7. Seller and Buyer agree that any and all claims, disputes and controversies concerning any product purchased by Buyer, as well as each of the terms set forth herein, shall be construed and interpreted in accordance with the laws of the State of Nevada without resort to conflict of laws principles. The parties further agree that venue with respect to any such claims and/or actions shall be in the state of federal courts having jurisdiction in Carson County, Nevada. Buyer waives any challenges to the jurisdiction of such courts and agrees to submit to the personal jurisdiction thereof.

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