
















Worm Gear Pair

KWGD/L/KWGDLS Duplex Worms  Precision: KHK 1 Material: SCM440 Heat Treatment: Thermal refined / gear teeth induction hardened m1.5 ~ 4 Page 364	AGDL Duplex Worm Wheels Reduction Ratio 20 ~ 60  Precision: KHK 1 Material: CAC702 (A/BC2) m1.5 ~ 4 Page 366	KWG Ground Worm Shafts  Precision: KHK 2 Material: SCM440 Heat Treatment: Thermal refined / gear teeth induction hardened m0.5 ~ 6 Page 372	AG Worm Wheels Reduction Ratio 10 ~ 60  <i>Series</i> Precision: KHK 2 Material: CAC702 (A/BC2) m0.5 ~ 1.5 Page 372	AGF Worm Wheels Reduction Ratio 10 ~ 60  Precision: KHK 2 Material: CAC702 (A/BC2) m2 ~ 6 Page 376	SWG Ground Worms  <i>Series</i> Precision: KHK 2 Material: S45C Heat Treatment: Gear teeth induction hardened m1 ~ 6 Page 382
AG Worm Wheels Reduction Ratio 10 ~ 60  <i>Series</i> Precision: KHK 2 Material: CAC702 (A/BC2) m1 ~ 6 Page 382	SW Steel Worms  <i>Series</i> Precision: KHK 4 Material: S45C m0.5 ~ 6 Page 390	BG Bronze Worm Wheels Reduction Ratio 10 ~ 60  <i>Series</i> Precision: KHK 4 Material: CAC502 (PBC2) m0.5 ~ 6 Page 390	CG Gray Iron Worm Wheels Reduction Ratio 10 ~ 120  <i>Series</i> Precision: KHK 4 Material: FC200 m1 ~ 6 Page 392	SUW Stainless Steel Worms  <i>Series</i> Precision: KHK 4 Material: SUS303 m0.5 ~ 3 Page 406	DG Plastic Worm Wheels Reduction Ratio 10 ~ 60  Precision: KHK 5 Material: Polyacetal m0.5, 0.8 Page 406
PG Plastic Worm Wheels Reduction Ratio 10 ~ 50  Precision: KHK 5 Material: MC901 m1 ~ 3 Page 408					

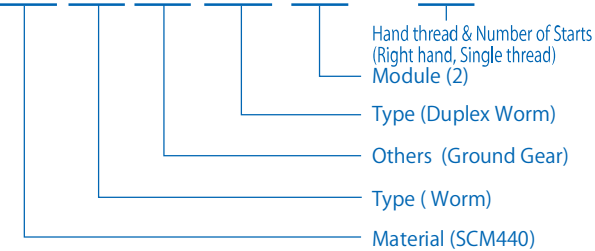
Catalog Number of KHK Stock Gears

The Catalog Number for KHK stock gears is based on the simple formula listed below. Please order KHK gears by specifying the Catalog Numbers.

(Example) Worm Gear Pair

Worms

K W G D L 2 - R 1



Material

K SCM440
S S45C
SU SUS303

Type

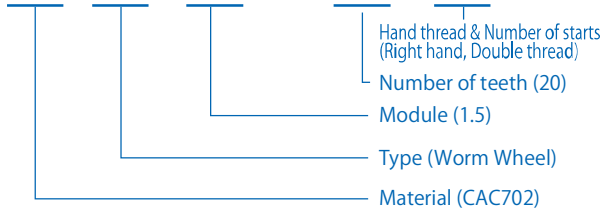
W Worms
DL Duplex Worms

Other Information

G Ground Gears
S Worm Shafts

Worm Wheels

A G 1.5 - 20 R 2



Material

A CAC702(*A/BC2)
B CAC502(*PBC2)
C FC200
D Polyacetal
P MC901

Type

G Worm Wheels
DL Duplex Worms

* () indicates old JIS designation

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pairs

Bevel Gearboxes

Other Products

Characteristics



The simplest way to obtain a large speed reduction with high torque in a compact space is with worm gear drives. KHK stock worms and worm wheels are available in modules 0.5 to 6 and in speed ratios of 1/10 to 1/120, made in a variety of materials and styles. We also offer stock duplex worms and worm wheels with which you can obtain a very low backlash, high rotational precision system. The following table lists the main features for easy selection.

Type	Catalog No.	Module	No. of threads or reduction ratio	Material (JIS)	Heat treatment	Tooth surface finish	Precision KHK W 001 KHK W 002 NOTE 2	Features	
Duplex Worms & Worm Wheels	Worm	KWGDL	2 ~ 4	Single thread	SCM440	Thermal refined, gear teeth induction hardened	Ground	1	High-precision duplex worms with superior strength. A range of backlash values can be obtained by moving the worm axially.
	Worm	KWGDLs	1.5 ~ 4	Single thread	SCM440	Thermal refined, gear teeth induction hardened	Ground	1	High-precision duplex worms with superior strength. A range of backlash values can be obtained by moving the worm axially.
	Worm Wheel	AGDL	1.5 ~ 4	20 ~ 60	CAC702 (A & BC2)	—	Cut	1	Duplex worm wheels made of aluminum bronze, excellent in wear-resistance. The pitch accuracy is first grade.
Worms & Worm Wheels	Worm	KWG	0.5 ~ 6	Single thread - Double thread	SCM440	Thermal refined, gear teeth induction hardened	Ground	2	Ground finished worms with a shaft, including tooth surface quenching treatment. Allows compact design due to having small reference diameters.
	Worm Wheel	AG NOTE 1	0.5 ~ 1.5	10 ~ 60	CAC702 (A & BC2)	—	Cut	2	Made of aluminum bronze, have excellent wear-resistance. Wide selection is available for this item.
	Worm Wheel	AGF NOTE 1	2 ~ 6	10 ~ 60	CAC702 (A & BC2)	—	Cut	2	Made of aluminum bronze, have excellent wear-resistance. Allows compact design.
	Worm	SWG	1 ~ 6	Single thread - Triple thread	S45C	Gear teeth induction hardened	Ground	2	Reasonably priced ground worms. Ready-to-use finished J Series products are also available.
	Worm Wheel	AG NOTE 1	1 ~ 6	10 ~ 60	CAC702 (A & BC2)	—	Cut	2	Made of aluminum bronze, have excellent wear-resistance. Wide selection is available for this item.
	Worm	SW	0.5 ~ 6	Single thread - Double thread	S45C	—	Cut (Thread rolled)	4	Economical, commonly used worms that have broad utility. Ready-to-use finished J Series products are also available.
	Worm	SUW	0.5 ~ 3	Single thread - Double thread	SUS303	—	Cut	4	Rust-resistant worms made of stainless steel suitable for mating with DG or PG worm wheels. Finished J Series products are also available.
	Worm Wheel	BG	0.5 ~ 6	10 ~ 60	CAC502 (PBC2)	—	Cut	4	Phosphorous bronze worm wheels have excellent wear resistance. Interchangeable with CG Worm Wheels, and enhances strength.
	Worm Wheel	CG	1 ~ 6	10 ~ 120	FC200	—	Cut	4	Economical, commonly used worm wheels that have broad utility. Available with a large selection of modules and number of teeth.
	Worm Wheel	DG	0.5 ~ 0.8	10 ~ 60	Polyacetal	—	Cut	5	Fine pitch worm wheels made of polyacetal, a stable plastic material.
	Worm Wheel	PG	1 ~ 3	10 ~ 50	MC901	—	Cut	5	Light weight and strong MC Nylon worm wheels. Suitable for use in food machinery, and can be used without lubricant.

[NOTE 1] The material of cast hubs for AGF and AG worm wheels is FC200(Cast Iron). AG worm wheels mate primarily with SWG worms. But, for Modules 0.8 or smaller, AG worm wheels mate with KWG worms.

[NOTE 2] KHK stock worms and worm wheels are produced to KHK's own precision grades. See the "Precision of Worms and Worm Wheels" in the "Selection Hints" section.

High-precision ground gear worms are available.

We use screw grinding machines manufactured by DRAKE, USA, to manufacture high-precision ground worms of module 0.5 to 8.



CNC Screw Grinding Machine (TE-LM200)

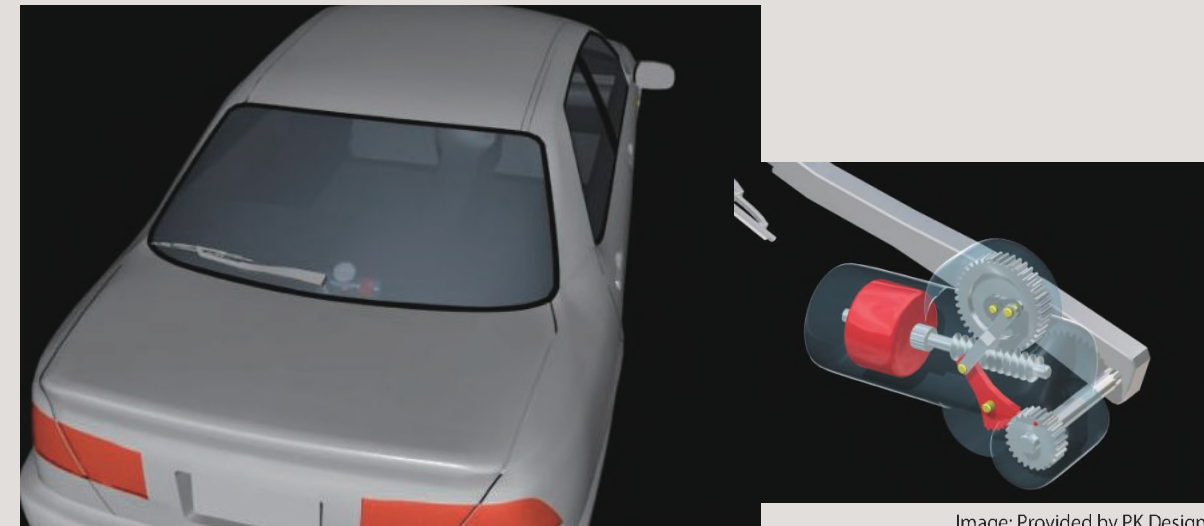
Worm ground gear machining range	
Maximum gear accuracy	KHK Grade 1
Maximum module	m8
Maximum nominal lead angle	± 35°
Maximum outer diameter	φ 200mm
Maximum length	330mm

Application Examples



KHK stock worm gears are used in a wide range of fields, including reduction gears and positioning mechanisms.

Wiper Drive Device



Worm gear used for the oscillating mechanism of wipers

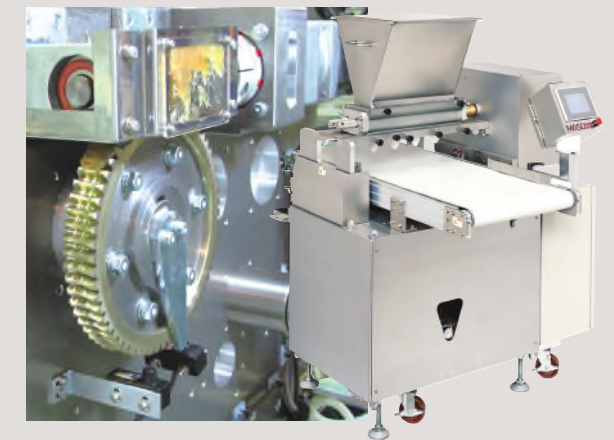
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Yaesu Steam Kettle



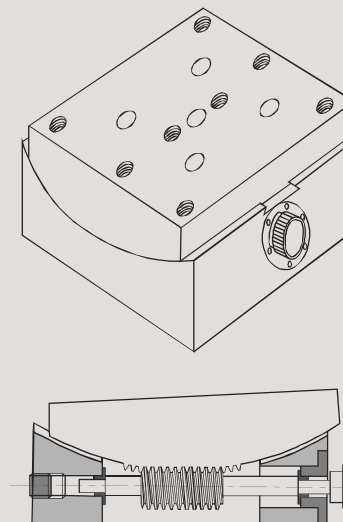
SW worm and CG worm wheel used for rotating large pans

Masdac Food Filling Device



KWGDL used for indexing and driving, for accurate filling of a fixed amount of ingredients
Duplex Worms and AGDL Wheels

Gonio Stage Design Example



Worm gear used for rotating tables (design example)

Fabric Feeding Device



SW worm and BG worm wheel used for adjusting height

Selection Hints

Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. It is also important to read all applicable "CAUTION" notes shown below before the final selection. Use of catalog numbers when ordering will simplify and expedite the processing of your order.

1. Caution in Selecting the Mating Gears

Worms and worm wheels have either right-hand or left-hand helix. The same hand worms and worm wheels comprise sets. However, the number of threads and whether they use normal module or axial module system must also be matched. The table below shows available combinations of KHK stock worms and worm wheels.

Mating Worm Wheels Selection Chart

Worm	Mating Worm/Wheel NOTE 1	Helix/ Thread	KWGDL KWGDLs			KWG			SWG			SW		SUW	
			R1	R1	R2	R1	R2	R3	R1	R2	L1	L2	R1	R2	
AGDL		R1	○												
AG0.5-1.5 AGF		R1		○											
		R2			○										
AG		R1				○									
		R2					○								
		R3						○							
BG		R1						○							
		R2							○						
		L1								○					
CG		R1								○					
		R2									○				
		L1										○			
PG		R1											○		
		R2												○	
DG		R1													○
		R2													○

[NOTE 1] Select the same module for both members.

2. Caution in Selecting Gears Based on Gear Strength

The gear strength values shown in the product pages were computed by assuming a certain application environment as shown below. Therefore, they should be used as reference only. We recommend that each user computes their own values by applying the actual usage conditions.

Calculation assumptions for Surface Durability

Calculation assumptions for Bending Strength

Item	Catalog No.	KWGD/L · KWGDLS/AGDL KWG/AGF, SWG/AG	SW/BG	SW/CG	SUW/PG	SUW/DG
Formula NOTE 2		Formula of worm gear's strength (JGMA405-01)			The Lewis formula	
Rotational speed of the worm		600rpm	100rpm		Allowable bending stress (kgf/mm ²)	
Lubricant		Lubricant for gears with proper viscosity and with anti-pressure additives				
Lubrication		Oil bath				
Starting condition		Starting torque less than 200% of rated torque. Less than 2 starts per hour				
Design Life (Durability)		26000 hours				
Impact from motor		Uniform load				
Impact from load		Uniform load				
Allowable stress factor S_{clim}		0.67	0.70	0.42		

[NOTE 2] The gear strength formula is based on JGMA (Japanese Gear Manufacturer's Association) specifications and "MC Nylon Technical Data" by Nippon Polyenco Limited. The units for the rotational speed (rpm) and the stress (kgf/mm²) are adjusted to the units needed in the formula.

[NOTE 3] Allowable bending stress of DG worm wheel is the value we estimated.

When selecting KHK standard gears, glance over the Cautions on Product Characteristics and Cautions on Performing Secondary Operations in the respective dimension tables.

- Products not listed in this catalog or materials, modules, number of teeth and the like not listed in the dimensional tables can be manufactured as custom items. Please see Page 16 for more details about custom-made orders.
- The color and shape of the product images listed on the dimension table page of each product may differ from the actual product. Be sure to confirm the shape in the dimension table before selection.
- The details (specifications, dimensions, prices, etc.) listed in the catalog may be changed without prior notice. Changes are announced on the KHK website.
Website URL: <https://khkgears.net/>
Overseas Sales Department: TEL: 81-48-254-1744 FAX: 81-48-254-1765 E-mail: info@khkgears.net

The Helixes of Worms and Worm Wheels



The most important factor in selecting gears is the gear strength.

Step 1

Use the actual load torque applied to the gear and the sliding speed to determine the worm gear suitable for the purpose.

Maximum seizing allowable sliding speed of each worm gear

The maximum seizing allowable sliding speed of each worm gear is shown in the table below. Sliding speed should be calculated when making a selection.

Sliding speed v_s (m/s)

$$v_s = \frac{d n}{19100 \cos \gamma}$$

d : Worm pitch dia.
 n : Worm rotational speed
 γ : Worm nominal lead angle

Catalog number	Maximum seizing allowable sliding speed (m/s)
AGDL	* 15
AGF	* 15
AG	* 15
BG	* 10
CG	* 2.5
PG	1 (Not lubricated)

* From JGMA405-01

Definition of Surface Durability

The surface durability of a gear is defined as the allowable tangential force at the pitch circle, which permits the force to be transmitted safely without incurring surface failure. The allowable gear tooth load of a gear is defined as the allowable tangential force at the pitch circle based on the mutual gear tooth strength of two meshing gears under load



Example of wear due to insufficient surface durability

Step 2

Select provisionally from the allowable torque table of the Master Catalog based on the load torque.

For provisional selection from the Master Catalog

Catalog No.	Module (mm)	Helix angle (°)	Pitch dia. (mm)	Addendum dia. (mm)	Pitch dia. (mm)	Pitch dia. (mm)	Pitch dia. (mm)	Pitch dia. (mm)	Pitch dia. (mm)	Pitch dia. (mm)	Allowable torque (kgm) with steel gear						Inclination (mm)	Weight (kg)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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AG1-20R1	20	20	1 3°35'	RH	65	16	20	23	25	28	32	35	38	42	45	48	52	55	58	62	65	68	72	75	78	82	85	88	92	95	98	102	105	108	112	115	118	122	125	128	132	135	138	142	145	148	152	155	158	162	165	168	172	175	178	182	185	188	192	195	198	202	205	208	212	215	218	222	225	228	232	235	238	242	245	248	252	255	258	262	265	268	272	275	278	282	285	288	292	295	298	302	305	308	312	315	318	322	325	328	332	335	338	342	345	348	352	355	358	362	365	368	372	375	378	382	385	388	392	395	398	402	405	408	412	415	418	422	425	428	432	435	438	442	445	448	452	455	458	462	465	468	472	475	478	482	485	488	492	495	498	502	505	508	512	515	518	522	525	528	532	535	538	542	545	548	552	555	558	562	565	568	572	575	578	582	585	588	592	595	598	602	605	608	612	615	618	622	625	628	632	635	638	642	645	648	652	655	658	662	665	668	672	675	678	682	685	688	692	695	698	702	705	708	712	715	718	722	725	728	732	735	738	742	745	748	752	755	758	762	765	768	772	775	778	782	785	788	792	795	798	802	805	808	812	815	818	822	825	828	832	835	838	842	845	848	852	855	858	862	865	868	872	875	878	882	885	888	892	895	898	902	905	908	912	915	918	922	925	928	932	935	938	942	945	948	952	955	958	962	965	968	972	975	978	982	985	988	992	995	998	1002	1005	1008	1012	1015	1018	1022	1025	1028	1032	1035	1038	1042	1045	1048	1052	1055	1058	1062	1065	1068	1072	1075	1078	1082	1085	1088	1092	1095	1098	1102	1105	1108	1112	1115	1118	1122	1125	1128	1132	1135	1138	1142	1145	1148	1152	1155	1158	1162	1165	1168	1172	1175	1178	1182	1185	1188	1192	1195	1198	1202	1205	1208	1212	1215	1218	1222	1225	1228	1232	1235	1238	1242	1245	1248	1252	1255	1258	1262	1265	1268	1272	1275	1278	1282	1285	1288	1292	1295	1298	1302	1305	1308	1312	1315	1318	1322	1325	1328	1332	1335	1338	1342	1345	1348	1352	1355	1358	1362	1365	1368	1372	1375	1378	1382	1385	1388	1392	1395	1398	1402	1405	1408	1412	1415	1418	1422	1425	1428	1432	1435	1438	1442	1445	1448	1452	1455	1458	1462	1465	1468	1472	1475	1478	1482	1485	1488	1492	1495	1498	1502	1505	1508	1512	1515	1518	1522	1525	1528	1532	1535	1538	1542	1545	1548	1552	1555	1558	1562	1565	1568	1572	1575	1578	1582	1585	1588	1592	1595	1598	1602	1605	1608	1612	1615	1618	1622	1625	1628	1632	1635	1638	1642	1645	1648	1652	1655	1658	1662	1665	1668	1672	1675	1678	1682	1685	1688	1692	1695	1698	1702	1705	1708	1712	1715	1718	1722	1725	1728	1732	1735	1738	1742	1745	1748	1752	1755	1758	1762	1765	1768	1772	1775	1778	1782	1785	1788	1792	1795	1798	1802	1805	1808	1812	1815	1818	1822	1825	1828	1832	1835	1838	1842	1845	1848	1852	1855	1858	1862	1865	1868	1872	1875	1878	1882	1885	1888	1892	1895	1898	1902	1905	1908	1912	1915	1918	1922	1925	1928	1932	1935	1938	1942	1945	1948	1952	1955	1958	1962	1965	1968	1972	1975	1978	1982	1985	1988	1992	1995	1998	2002	2005	2008	2012	2015	2018	2022	2025	2028	2032	2035	2038	2042	2045	2048	2052	2055	2058	2062	2065	2068	2072	2075	2078	2082	2085	2088	2092	2095	2098	2102	2105	2108	2112	2115	2118	2122	2125	2128	2132	2135	2138	2142	2145	2148	2152	2155	2158	2162	2165	2168	2172	2175	2178	2182	2185	2188	2192	2195	2198	2202	2205	2208	2212	2215	2218	2222	2225	2228	2232	2235	2238	2242	2245	2248	2252	2255	2258	2262	2265	2268	2272	2275	2278	2282	2285	2288	2292	2295	2298	2302	2305	2308	2312	2315	2318	2322	2325	2328	2332	2335	2338	2342	2345	2348	2352	2355	2358	2362	2365	2368	2372	2375	2378	2382	2385	2388	2392	2395	2398	2402	2405	2408	2412	2415	2418	2422	2425	2428	2432	2435	2438	2442	2445	2448	2452	2455	2458	2462	2465	2468	2472	2475	2478	2482	2485	2488	2492	2495	2498	2502	2505	2508	2512	2515	2518	2522	2525	2528	2532	2535	2538	2542	2545	2548	2552	2555	2558	2562	2565	2568	2572

3. Selecting Worms and Worm Wheels by Precision

The precision standards of KHK stock worms and worm wheels are established by us. The table below indicates the tolerance ranges for our products.

① Precision of worms (KHK W 001)

KHK established allowable profile and lead errors of worms with precision grades 1 to 4, by using the JIS Standard as reference. Lead errors are measured over one full revolution.

■ Precision Grades of Worms (KHK W 001) (Unit: μm)

Grade	Error	Module				
		over m0.4 up to 1	over m1 up to 1.6	over m1.6 up to 2.5	over m2.5 up to 4	over m4 up to 6
1	Tooth profile error	8	12	16	20	25
	Lead error	7	9	11	13	16
2	Tooth profile error	12	16	20	24	29
	Lead error	15	18	21	25	28
3	Tooth profile error	16	23	30	37	50
	Lead error	20	23	27	33	37
4	Tooth profile error	20	30	40	50	70
	Lead error	30	32	38	46	52

② Precision of worm wheels (KHK W 002)

We have established standard grades 1 to 5 of worm wheels using the JIS Standard as reference. The allowable values of Single Pitch Error and Runout Error are defined for each module size and pitch diameter.

■ Precision Grades of Worm Wheels (KHK W 002)

Unit : μm

Grade	Error	Pitch diameter (mm)																								
		Over m0.4 up to 1					Over m1 up to 1.6					Over m1.6 up to 2.5					Over m2.5 up to 4					Over m4 up to 6				
		6 up to 12	12 up to 25	25 up to 50	50 up to 100	100 up to 200	12 up to 25	25 up to 50	50 up to 100	100 up to 200	200 up to 400	12 up to 25	25 up to 50	50 up to 100	100 up to 200	200 up to 400	25 up to 50	50 up to 100	100 up to 200	200 up to 400	400 up to 800					
1	Single pitch error	5	6	7	7	9	6	7	8	9	10	7	7	8	9	11	8	9	10	11	13	9	10	11	13	14
	Total composite error	21	24	26	30	34	25	28	31	35	41	27	30	33	37	43	33	36	40	46	53	37	40	45	50	57
2	Single pitch error	8	8	9	10	12	9	10	11	12	14	9	10	12	13	15	11	13	14	16	18	13	14	16	18	20
	Total composite error	30	33	37	42	48	35	39	44	50	57	38	42	46	52	60	46	51	57	64	74	52	57	63	71	80
3	Single pitch error	11	12	13	15	17	12	14	16	18	20	13	15	16	19	21	16	18	20	23	26	19	20	22	25	29
	Total composite error	43	47	53	60	68	50	55	62	71	81	53	59	66	74	85	65	72	81	91	105	74	81	90	100	115
4	Single pitch error	15	17	19	21	24	19	22	25	29	19	21	23	26	30	23	25	28	32	37	26	28	32	35	40	
	Total composite error	60	66	74	83	95	70	77	87	99	115	75	83	92	105	120	91	100	115	130	145	105	115	125	140	160
5	Single pitch error	21	24	26	30	34	25	28	31	35	41	27	30	33	37	43	33	36	40	46	53	37	40	45	50	57
	Total composite error	86	94	105	120	135	100	110	125	140	165	105	120	130	150	170	130	145	160	185	210	150	160	180	200	230

③ Overall Length Tolerance of Worms

■ Overall Length Tolerance of Worms

Series	Total length(mm)	Tolerance
KWGDL	Uniform	0 - 0.10
SWG SW SUW	Less than 100	0 - 0.15
	Over 100	0 - 0.20
KWGDLS KWG	Uniform	Normal tolerance

■ Overall Length Tolerance of Worms Wheels

Total length(mm)	Tolerance
below 30	0 - 0.10
over 30 up to 100	0 - 0.15
over 100	0 - 0.20

[CAUTION] PG Plastic Wheels are excluded.

4. Cautions in Selecting Worm Gears Based on Efficiency

The efficiency of power transmission varies somewhat with the conditions of assembly and lubricant, but is generally 30 ~ 90% (excludes losses from bearings and churning of lubricants). The efficiency of KHK stock worm gear pair is given below as a reference. To learn more about strength calculations, please refer to the technical information contained in the "Surface Durability of Cylindrical Worm Gearing" section on Page 96.

① Efficiency of Worm Gear Pair

■ Efficiency of KWGDLS/AGDL Worm Gear Pair (%)

(rpm = Rotation of worm)

Catalog No.	Worm rpm					
	100	300	600	900	1200	1800
KWGD1.5-R1	35	42	47	51	53	57
KWGD2-R1	38	45	51	55	56	61
KWGD2.5-R1	40	48	54	57	60	63
KWGD3-R1	41	49	55	58	62	65
KWGD3.5-R1	42	50	56	61	62	65
KWGD4-R1	42	51	56	61	63	67

■ Efficiency of KWG/AG, AGF Worm Gear Pair (%)

(rpm = Rotation of worm)

Catalog No.	Worm rpm					
	100	300	600	900	1200	1800
KWG0.5-R1	30	34	38	41	43	46
KWG0.8-R1	35	40	44	47	49	53
KWG1-R1	34	40	45	48	51	54
KWG1.5-R1	35	42	47	51	53	57
KWG2-R1	45	51	56	60	62	65
KWG2.5-R1	44	51	57	61	62	67
KWG3-R1	44	52	58	61	64	67
KWG4-R1	50	58	64	66	70	72
KWG5-R1	51	60	66	69	71	73
KWG6-R1	53	61	66	70	72	75
KWG0.5-R2	46	50	54	58	60	63
KWG0.8-R2	51	56	61	64	66	69
KWG1-R2	51	56	62	64	67	70
KWG1.5-R2	52	59	64	67	69	73
KWG2-R2	61	67	71	74	76	78
KWG2.5-R2	60	67	72	75	76	80
KWG3-R2	61	68	73	75	78	80
KWG4-R2	66	73	77	79	82	84

② Self-Locking Feature of Worm Gear Pair

Self-locking is defined as the inability of worm wheels to drive the worms. Factors affecting the self-locking feature include the materials of the worm and worm wheel, lead angle, precision of manufacture, types of bearings, lubricant, etc. Thus, it is not dependent simply on the lead angle. But, in general, self-locking will occur when the lead angle in a single thread worm is less than 4°. For systems requiring fail-safe prevention of back drive, we recommend other braking mechanisms or one-way clutches.

■ Efficiency of SWG/AG Worm Gear Pair (%)

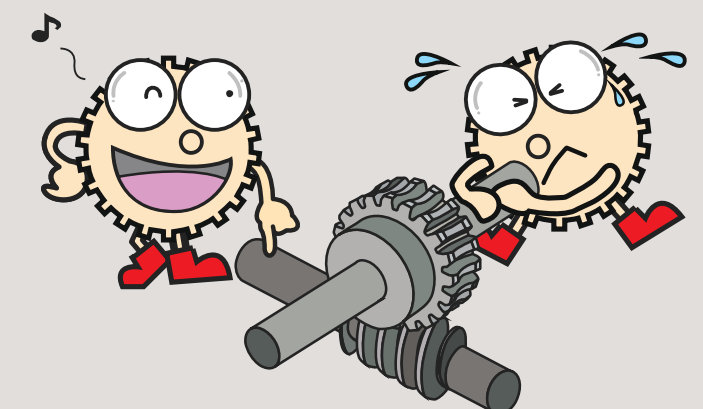
(rpm = Rotation of worm)

Catalog No.	Worm rpm					
	100	300	600	900	1200	1800
SWG1-R1	34	40	45	48	51	54
SWG1.5-R1	35	42	47	51	53	57
SWG2-R1	38	45	51	55	56	61
SWG2.5-R1	40	48	54	57	60	63
SWG3-R1	41	49	55	58	62	65
SWG4-R1	42	51	56	61	63	67
SWG5-R1	46	54	60	64	66	70
SWG6-R1	48	57	64	66	68	73
SWG1-R2	51	56	62	64	67	70
SWG1.5-R2	52	59	64	67	69	73
SWG2-R2	55	62	67	70	72	75
SWG2.5-R2	57	64	69	72	75	77
SWG3-R2	58	66	71	73	76	78
SWG4-R2	59	67	72	75	77	80
SWG5-R2	62	70	75	78	79	82
SWG6-R2	65	72	77	80	81	84
SWG3-R3	67	74	78	80	82	84
SWG4-R3	68	75	79	82	83	86

■ Efficiency of SW, SUM / CG, BG, PG Worm Gear Pair (%)

The efficiency is approximately as follows, depending on the assembly, loading, lubrication and rotational speed.

Catalog No.	Thread	Efficiency (%)
SW/SUW	Single thread	40 ~ 50%
	Double thread	50 ~ 60%



Application Hints

In order to use KHK stock worms and worm wheels safely, carefully read the Application Hints before proceeding. If there are questions or you require clarifications, please contact our technical department or your nearest distributor.

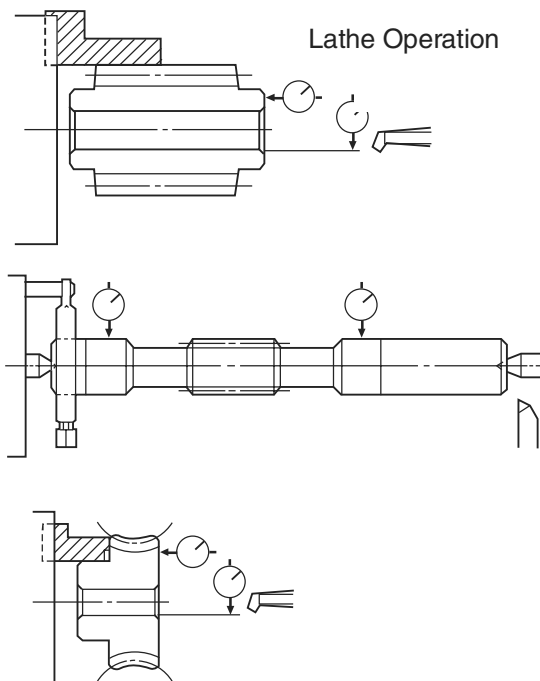
TEL: 81-48-254-1744 FAX: 81-48-254-1765 E-mail: info@khkgears.net

1. Cautions on Handling

- ① KHK products are packaged one by one to prevent scratches and dents, but if you find issues such as rust, scratches, or dents when the product is removed from the box after purchase, please contact the supplier.
- ② Depending on the handling method, the product may become deformed or damaged. Resin gears and ring gears deform particularly easily, so please handle with care.

2. Caution on Performing Secondary Operations

- ① If you are re boring, it is important to pay special attention to locating the center in order to avoid runout. (Fig.1) The reference datum for gear cutting or grinding is the bore. (For worm shafts, it is ground portion of the shaft.) Therefore, use the bore or shaft for locating the center. If it is too difficult to do for small bores, the alternative is to use one spot on the bore and the runout of the side surface.



If chucking operation using scroll chucks is to be done, we recommend the use of new or re bored jaws for improved precision.

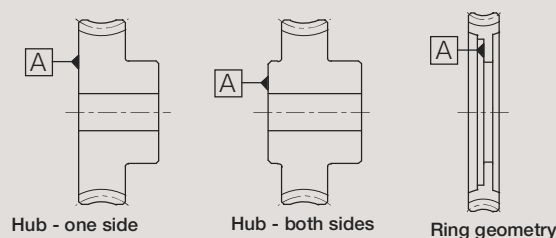
Fig.1

- ② To open up the bore to its maximum, calculate the bore size so that the tooth strength is weaker than the strength of the remaining material. For machining the maximum bore diameter, it should be designed so that the thickness between hub diameter (or root diameter) to bore diameter has more strength than the gear strength. As a guide, the maximum machined bore diameter should be within 60% to 70% of the hub diameter (or root diameter). When the keyway is processed, it should be 50% to 60%. As well, because the cast FC200 boss is weaker and more brittle than other steels, sufficient thickness strength is required. Note that the guideline is about 10% lower again.
- ③ Since DG worm wheels are molded products, they may have air bubbles inside the material. In case you find air bubbles inside when performing secondary operations, and if the bubbles are found to be troublesome, please contact your KHK distributor.

3. Points of Caution in Assembling

- ① KHK stock worms and worm wheels are designed such that when assembled according to the specified mounting distance with a tolerance of H7 to H8, the normal direction backlash shown in the product tables is obtained. Do not attempt to eliminate backlash by pushing worms into worm wheels or operate with the worm shifted in the direction along the tooth.
- ② The figure below shows the datum clamp face of a worm wheel. When assembling worm gears, be sure that the worm axis is in the center of the worm wheel face width.

Datum Clamp Face



- ③ Because of the helix of the gear teeth, worms and worm wheels produce axial thrust forces. The directions of thrust depend on the hand of the helix and the direction of rotation. This is illustrated below in Fig.2. The bearings must be selected properly to be able to handle these thrust forces. See the "Gear Forces" section in separate technical reference book for more details (Page 107).

Direction of rotation and thrust force

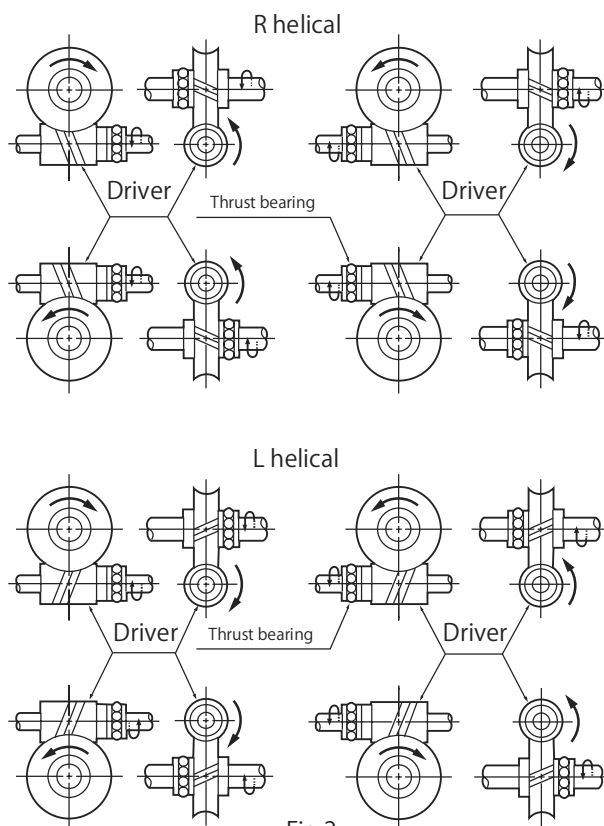


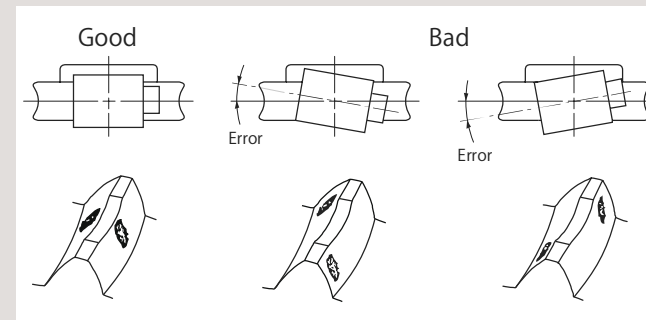
Fig.2

- ④ Because large thrust forces act on worms, if they are not secured to the shaft firmly, they tend to shift. Use of step shafts, set screws, dowel pins, etc., are recommended. Also, check for loosening of bearings due to thrust forces.

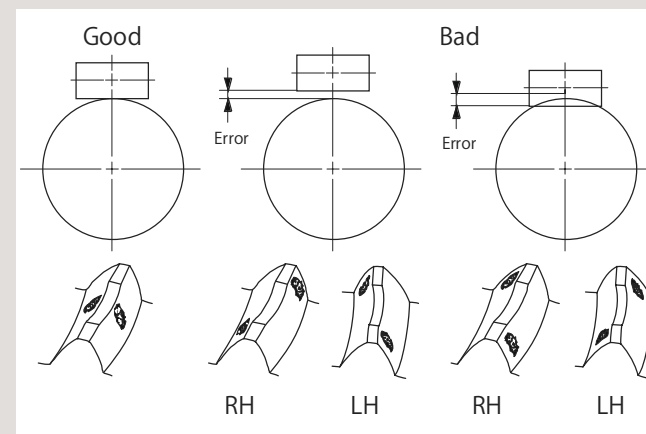
4. Verifying the orientation of assembly

How well the worms and worm wheels are assembled has large effects on the friction of the unit. The tooth contact at the time of assembly must be checked for correctness as shown below. See the "Tooth Contact of a Worm Gear Pair" section in separate technical reference book for more details (Page 67).

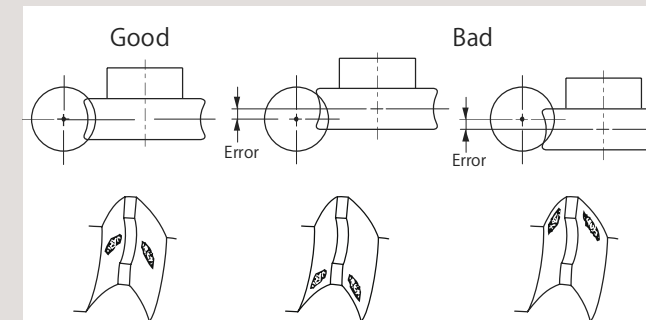
- Verify that the worm axis is perpendicular to the worm wheel axis.



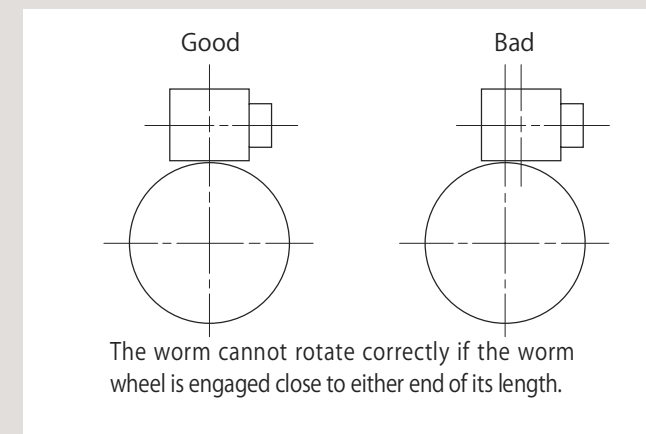
- Check the mounting distance (allowable mounting distance H7 ~ H8).



- Check that the worm axis is in the center of the worm wheel face width.



- Confirm that the center of the worm wheel goes through the midpoint of the worm length.



The worm cannot rotate correctly if the worm wheel is engaged close to either end of its length.

5. Cautions on Starting

- ① Check the following items before starting.
 - Are the gears installed securely?
 - Is there uneven tooth contact?
 - Is there adequate backlash? Be sure to avoid zero-backlash.
 - Has proper lubrication been supplied?
- ② If gears are exposed, be sure to attach a safety cover to ensure safety. Also, be careful not to touch rotating gears.
- ③ Gears can be lubricated with the "grease lubrication method", "splash lubrication method (oil bath method)," or "forced lubrication method (circulation lubrication method)". For initial operation, the lubricant may

deteriorate markedly, so check the condition of the lubricant after starting. For more technical information, please see the section "Gear Lubrication" (Page 112) of our technical reference book.

- ④ If there is any abnormality such as noise or vibration during startup, check the gears and assembly condition. "High gear accuracy", "smooth gear teeth surface" and "correct tooth contact" are some of the measures against gear noise. For more technical information, please see the section "Gear Noise and Countermeasures" (Page 119) of our technical reference book.

KHK considers safety a priority in the use of our products.

When handling, adding secondary operations, assembling, and operating KHK products, please be aware of the following issues in order to prevent accidents.

Warning: Precautions for preventing physical and property damage

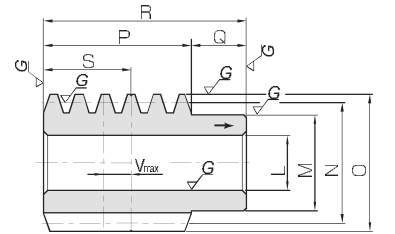
1. When using KHK products, follow relevant safety regulations (Occupational Safety and Health Regulations, etc.).
2. Pay attention to the following items when installing, removing, or performing maintenance and inspection of the product.
 - ① Turn off the power switch.
 - ② Do not reach or crawl under the product.
 - ③ Wear appropriate clothing and protective equipment for the work.

Cautions in Preventing Accidents

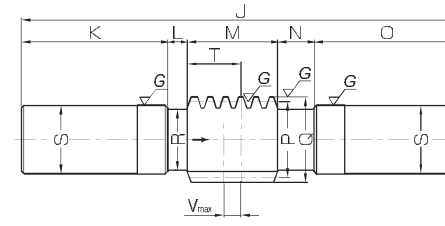
1. Before using a KHK product, read the precautions in the catalog carefully in order to use it correctly.
2. Avoid use in environments that may adversely affect the product.
3. Our products are manufactured under a superior quality control system based on the ISO9000 quality management system; if you notice any malfunctions upon purchasing a product, please contact the supplier.



Specifications	
Precision grade	KHK W 001 grade 1
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC
Surface treatment	Black oxide coated except for ground part



W4



W6

Catalog No.	Nominal axial module	Number of starts	Nominal lead angle	Hand thread	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total length
						L _{H7}	M					
KWGD L2-R1	m2	1	3°41'	R	W4	14	25	31	35	36	14	50

Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
S	V _{max}	0.21	KWGD L2-R1
22	8		

Catalog No.	Nominal axial module	Number of starts	Nominal lead angle	Hand thread	Shape	Total length		Shaft length (L)		Neck length (L)		Face width	Neck length (R)		Pitch dia.
						J	K	L	M	N	O		P		
KWGDLS1.5-R1	m1.5	1	3°26'	R	W6	190	66	12	28	18	66	25			
KWGDLS2-R1	m2	1	3°41'	R	W6	220	75	13	36	21	75	31			

Outside dia.	Neck dia.	Shaft dia.	Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
Q	R	S	T	V _{max}	0.74	KWGDLS1.5-R1
28	21	26.2	17	6		
35	24	30.2	22	8	1.17	KWGDLS2-R1

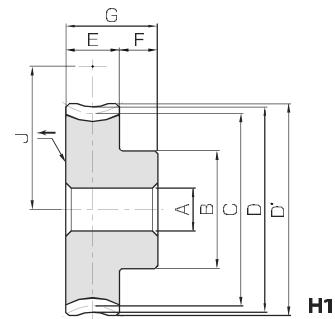
- [Caution on Product Characteristics]
- When the center distance is moved to reduce the backlash, the V_{max} is the maximum amount of distance that you may shift without causing problems with the gear mesh. The V_{max} is not a recommended value to use for adjustment when assembling.
 - These worms produce axial thrust forces. See Page 362 for more details.

- [Caution on Secondary Operations]
- Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
 - Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

AGDL
Duplex Worm Wheels



Specifications	
Precision grade	KHK W 002 grade 1
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	CAC702 (formerly JIS A& BC2)
Heat treatment	—
Tooth hardness	—



H1

Duplex Worm Wheels



Catalog No.	Reduction ratio	Nominal axial module	No. of teeth	Helix angle	Hand thread	Shape	Bore		Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width		Hub width
							A _{H7}	B					C	D	
AGDL1.5-20R1	20	m1.5	20	3°26'	R	H1	8	22	30	33	34.5	14	10	10	
AGDL1.5-30R1	30		30	3°26'	R	H1	10	30	45	48	49.5	14	10	10	
AGDL1.5-36R1	36		36	3°26'	R	H1	10	35	54	57	58.5	14	10	10	
AGDL1.5-40R1	40		40	3°26'	R	H1	12	35	60	63	64.5	14	10	10	
AGDL1.5-50R1	50		50	3°26'	R	H1	12	45	75	78	79.5	14	10	10	
AGDL1.5-60R1	60		60	3°26'	R	H1	12	50	90	93	94.5	14	10	10	
AGDL2-20R1	20	m2	20	3°41'	R	H1	12	33	40	44	46	18	15	15	
AGDL2-30R1	30		30	3°41'	R	H1	15	40	60	64	66	18	15	15	
AGDL2-36R1	36		36	3°41'	R	H1	15	45	72	76	78	18	15	15	
AGDL2-40R1	40		40	3°41'	R	H1	15	45	80	84	86	18	15	15	
AGDL2-50R1	50		50	3°41'	R	H1	15	50	100	104	106	18	15	15	
AGDL2-60R1	60		60	3°41'	R	H1	15	60	120	124	126	18	15	15	

NOTE 1 : Allowable torque based on worm speed (rpm)

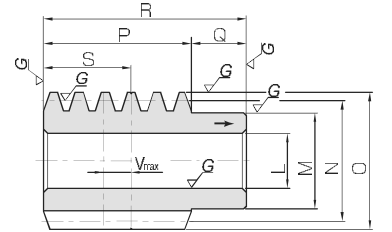
Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.	
				30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}	1800 _{rpm}				
G	(H)	(I)	J											
24	—	—	27.5	9.84	8.18	6.40	5.30	4.68	4.25	3.68	0±0.045	0.10	AGDL1.5-20R1	
24	—	—	35	20.8	17.5	13.9	11.7	10.4	9.40	8.28	0±0.045	0.22	AGDL1.5-30R1	
24	—	—	39.5	29.3	24.6	19.8	16.8	14.9	13.5	11.9	0±0.045	0.32	AGDL1.5-36R1	
24	—	—	42.5	35.6	30.0	24.2	20.6	18.3	16.6	14.6	0±0.045	0.37	AGDL1.5-40R1	
24	—	—	50	53.8	45.4	36.9	31.6	28.3	25.8	22.6	0±0.045	0.59	AGDL1.5-50R1	
24	—	—	57.5	75.3	63.8	51.9	44.7	40.4	36.7	32.4	0±0.045	0.83	AGDL1.5-60R1	
33	—	—	35.5	21.0	17.5	13.6	11.2	9.84	8.94	7.75	0±0.045	0.26	AGDL2-20R1	
33	—	—	45.5	44.3	37.3	29.6	24.8	21.9	19.8	17.4	0±0.045	0.51	AGDL2-30R1	
33	—	—	51.5	62.3	52.6	42.0	35.5	31.3	28.4	25.0	0±0.045	0.73	AGDL2-36R1	
33	—	—	55.5	75.8	64.0	51.4	43.6	38.5	34.9	30.7	0±0.045	0.86	AGDL2-40R1	
33	—	—	65.5	115	96.8	78.4	66.9	59.5	54.2	47.6	0±0.045	1.30	AGDL2-50R1	
33	—	—	75.5	160	136	110	94.6	84.9	77.2	68.1	0±0.045	1.88	AGDL2-60R1	

- [Caution on Product Characteristics]
- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.
 - Duplex worms and worm wheels must be mated in a predetermined orientation, which is indicated by the arrows. Therefore, the arrow on the wheel does not indicate the mounting direction, but the rotating direction. Please refer to the Application Hints on Page 365.

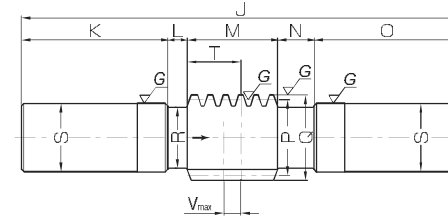
- [Caution on Secondary Operations]
- Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	KHK W 001 grade 1
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC
Surface treatment	Black oxide coated except for ground part



W4



W6

Catalog No.	Nominal axial module	Number of starts	Nominal lead angle	Hand thread	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total length
						L _{H7}	M					
KWGD L2.5-R1	m2.5	1	3°52'	R	W4	18	30	37	42	48	17	65
KWGD L3-R1	m3	1	3°54'	R	W4	20	35	44	50	54	20	74

Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
S	V _{max}	0.37	KWGD L2.5-R1
29	10	0.61	KWGD L3-R1

Catalog No.	Nominal axial module	Number of starts	Nominal lead angle	Hand thread	Shape	Total length		Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K					
KWGDLS2.5-R1	m2.5	1	3°52'	R	W6	260	85	16	48	26	85	37
KWGDLS3-R1	m3	1	3°54'	R	W6	300	100	18	54	28	100	44

Outside dia.	Neck dia.	Shaft dia.	Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
Q	R	S	T	V _{max}		
42	30	36.2	29	10	2.00	KWGDLS2.5-R1
50	34	40.2	32	10	2.95	KWGDLS3-R1

[Caution on Product Characteristics] ① When the center distance is moved to reduce the backlash, the V_{max} is the maximum amount of distance that you may shift without causing problems with the gear mesh. The V_{max} is not a recommended value to use for adjustment when assembling.
② These worms produce axial thrust forces. See Page 362 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

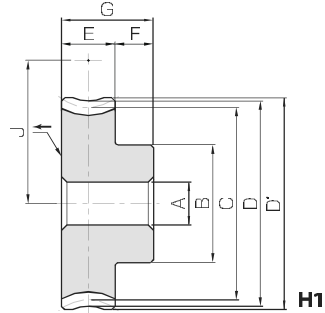
AGDL
Duplex Worm Wheels

Module 2.5, 3

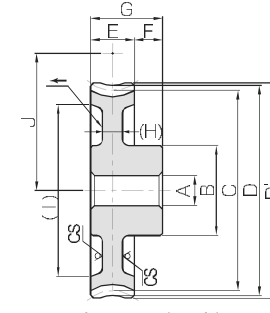
AGDL



Specifications	
Precision grade	KHK W 002 grade 1
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	CAC702 (formerly JIS A& BC2)
Heat treatment	—
Tooth hardness	—



H1



HB

* CS has a sand mold casting finish.

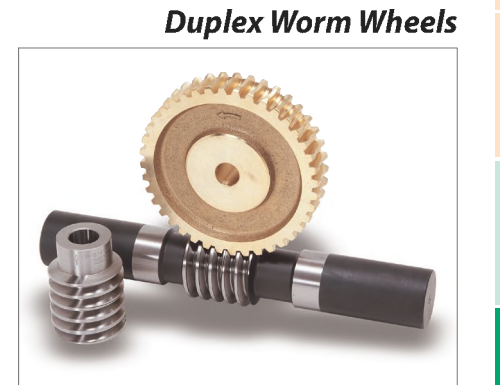
NOTE 1: Allowable torque based on worm speed (rpm)

Catalog No.	Reduction ratio	Nominal axial module	No. of teeth	Helix angle	Hand thread	Shape	Bore		Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width
							A _{H7}	B						
AGDL2.5-20R1	20	m2.5	20	3°52'	R	H1	15	40	50	55	57.5	22	15	
AGDL2.5-30R1	30		30	3°52'	R	H1	15	40	75	80	82.5	22	15	
AGDL2.5-36R1	36		36	3°52'	R	H1	15	45	90	95	97.5	22	15	
AGDL2.5-40R1	40		40	3°52'	R	HB	15	45	100	105	107.5	22	15	
AGDL2.5-50R1	50		50	3°52'	R	HB	15	60	125	130	132.5	22	15	
AGDL2.5-60R1	60		60	3°52'	R	HB	15	80	150	155	157.5	22	15	
AGDL3-20R1	20	m3	20	3°54'	R	H1	20	50	60	66	69	28	17	
AGDL3-30R1	30		30	3°54'	R	H1	20	55	90	96	99	28	17	
AGDL3-36R1	36		36	3°54'	R	H1	20	60	108	114	117	28	17	
AGDL3-40R1	40		40	3°54'	R	HB	20	60	120	126	129	28	17	
AGDL3-50R1	50		50	3°54'	R	HB	20	70	150	156	159	28	17	
AGDL3-60R1	60		60	3°54'	R	HB	20	80	180	186	189	28	17	

Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
				30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm			
G	(H)	(I)	J	30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm			
37	—	—	43.5	38.1	31.4	24.5	20.1	17.6	16.0	13.8	0±0.045	0.45	AGDL2.5-20R1
37	—	—	56	80.5	67.1	53.1	44.5	39.1	35.5	30.9	0±0.045	0.88	AGDL2.5-30R1
37	—	—	63.5	113	94.5	75.5	63.8	56.0	51.0	44.3	0±0.045	1.25	AGDL2.5-36R1
37	(10)	(86)	68.5	138	115	92.4	78.3	68.8	62.7	54.4	0±0.045	1.14	AGDL2.5-40R1
37	(12)	(108)	81	208	174	141	120	106	97.3	84.3	0±0.045	1.93	AGDL2.5-50R1
37	(12)	(133)	93.5	291	245	198	170	152	139	121	0±0.045	2.90	AGDL2.5-60R1
45	—	—	52	65.0	53.3	41.5	33.8	29.5	26.9	22.8	0±0.045	0.81	AGDL3-20R1
45	—	—	67	137	114	90.0	74.7	65.5	59.5	51.2	0±0.045	1.65	AGDL3-30R1
45	—	—	76	193	160	128	107	93.8	85.6	73.4	0±0.045	2.32	AGDL3-36R1
45	(14)	(106)	82	235	195	157	131	115	105	90.1	0±0.045	2.19	AGDL3-40R1
45	(14)	(134)	97	355	295	239	202	178	163	140	0±0.045	3.26	AGDL3-50R1
45	(14)	(164)	112	497	415	336	285	254	233	200	0±0.045	4.48	AGDL3-60R1

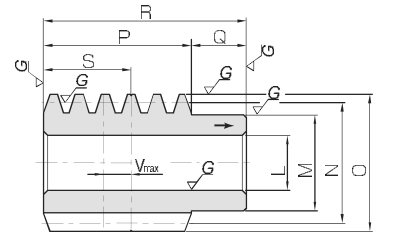
[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.
② Duplex worms and worm wheels must be mated in a predetermined orientation, which is indicated by the arrows. Therefore, the arrow on the wheel does not indicate the mounting direction, but the rotating direction. Please refer to the Application Hints on Page 365.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

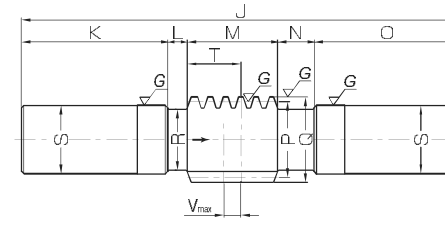




Specifications	
Precision grade	KHK W 001 grade 1
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC
Surface treatment	Black oxide coated except for ground part



W4



W6

Catalog No.	Nominal axial module	Number of starts	Nominal lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
						L _{H7}	M	N	O	P	Q	R
KWGDL3.5-R1	m3.5	1	3°47'	R	W4	24	44	53	60	62	23	85
KWGDL4-R1	m4	1	3°41'	R	W4	28	50	62	70	74	26	100

Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
S	V _{max}	1.05	KWGDL3.5-R1
37	12	1.67	KWGDL4-R1

Catalog No.	Nominal axial module	Number of starts	Nominal lead angle	Hand thread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
KWGDL3.5-R1	m3.5	1	3°47'	R	W6	330	110	18	62	30	110	53
KWGDL4-R1	m4	1	3°41'	R	W6	360	120	16	74	30	120	62

Outside dia.	Neck dia.	Shaft dia.	Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
Q	R	S	T	V _{max}		
60	42	48.2	37	12	4.72	KWGDL3.5-R1
70	50	56.2	44	14	7.10	KWGDL4-R1

[Caution on Product Characteristics] ① When the center distance is moved to reduce the backlash, the V max is the maximum amount of distance that you may shift without causing problems with the gear mesh. The V max is not a recommended value to use for adjustment when assembling.
② These worms produce axial thrust forces. See Page 362 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

AGDL
Duplex Worm Wheels

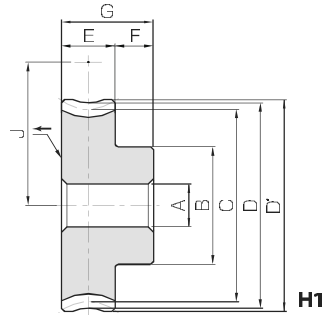
Module 3.5, 4

AGDL

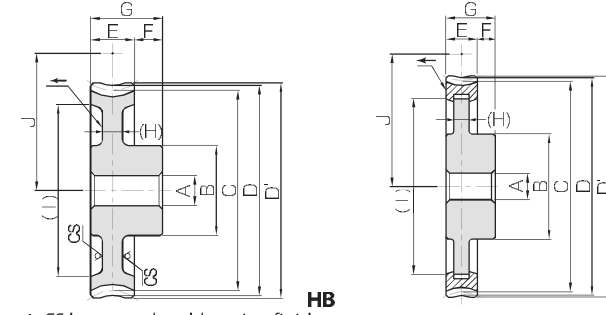


Specifications	
Precision grade	KHK W 002 grade 1
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	CAC702 (formerly JIS A& BC2) *
Heat treatment	—
Tooth hardness	—

* H5 shape have a hub made from S45C cast iron.



H1



HB

H5

* CS has a sand mold casting finish.

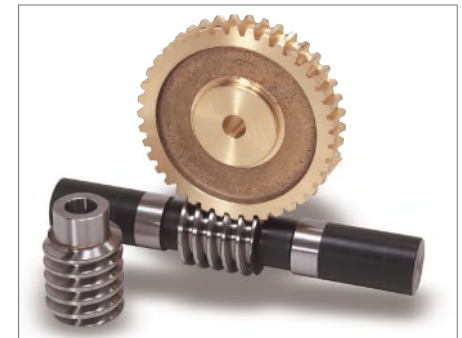
NOTE 1: Allowable torque based on worm speed (rpm)

Catalog No.	Reduction ratio	Nominal axial module	No. of teeth	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width
							A _{H7}	B	C	D	D'	E	F
AGDL3.5-20R1	20	m3.5	20	3°47'	R	H1	20	55	70	77	80.5	32	18
AGDL3.5-30R1	30		30	3°47'	R	H1	20	60	105	112	115.5	32	18
AGDL3.5-36R1	36		36	3°47'	R	H1	20	70	126	133	136.5	32	18
AGDL3.5-40R1	40		40	3°47'	R	HB	20	70	140	147	150.5	32	18
AGDL3.5-50R1	50		50	3°47'	R	HB	20	80	175	182	185.5	32	18
AGDL3.5-60R1	60		60	3°47'	R	HB	20	90	210	217	220.5	32	18
AGDL4-20R1	20	m4	20	3°41'	R	H1	20	60	80	88	92	35	20
AGDL4-30R1	30		30	3°41'	R	HB	20	65	120	128	132	35	20
AGDL4-36R1	36		36	3°41'	R	HB	20	75	144	152	156	35	20
AGDL4-40R1	40		40	3°41'	R	HB	20	75	160	168	172	35	20
AGDL4-50R1	50		50	3°41'	R	HB	20	90	200	208	212	35	20
AGDL4-60R1	60		60	3°41'	R	H5	30	120	240	248	252	35	20

Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1								Backlash (mm)	Weight (kg)	Catalog No.
				30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}	1800 _{rpm}				
G	(H)	(I)	J	30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}	1800 _{rpm}				
50	—	—	61.5	98.5	80.4	62.5	50.4	44.2	40.0	33.7	0±0.045	1.24	AGDL3.5-20R1	
50	—	—	79	208	172	136	111	98.1	88.3	75.7	0±0.045	2.51	AGDL3.5-30R1	
50	—	—	89.5	293	242	193	160	141	127	109	0±0.045	3.61	AGDL3.5-36R1	
50	(15)	(124)	96.5	356	295	236	196	173	156	133	0±0.045	3.34	AGDL3.5-40R1	
50	(16)	(155)	114	538	446	360	301	267	243	207	0±0.045	5.02	AGDL3.5-50R1	
50	(16)	(189)	131.5	753	627	506	425	381	345	296	0±0.045	6.87	AGDL3.5-60R1	
55	—	—	71	134	109	84.8	67.9	59.7	53.4	44.8	0±0.045	1.76	AGDL4-20R1	
55	(17)	(99)	91	284	234	184	150	132	118	101	0±0.045	3.01	AGDL4-30R1	
55	(17)	(121)	103	400	329	262	215	190	170	144	0±0.045	4.18	AGDL4-36R1	
55	(17)	(137)	111	486	400	320	264	233	208	177	0±0.045	4.78	AGDL4-40R1	
55	(17)	(177)	131	735	605	488	405	361	324	275	0±0.045	7.07	AGDL4-50R1	
55	(17)	(200)	151	1030	851	687	572	515	461	393	0±0.045	11.5	AGDL4-60R1	

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.
② Duplex worms and worm wheels must be mated in a predetermined orientation, which is indicated by the arrows. Therefore, the arrow on the wheel does not indicate the mounting direction, but the rotating direction. Please refer to the Application Hints on Page 365.

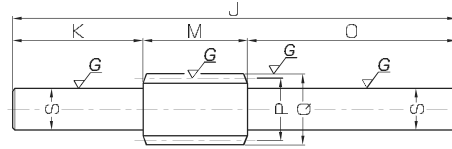
[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.



Duplex Worm Wheels



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC



W5

Catalog No.	Axial module	Number of starts	Lead angle	Hand thread	Shape	Total length		Shaft length (L)		Face width		Neck length (R)		Pitch dia.
						J	K	L	M	N	O	P		
KWG0.5-R1	m0.5	1	3°11'	R	W5	65	19	—	12	—	34	9	9	
KWG0.5-R2		2	6°20'	R	W5	65	19	—	12	—	34			
KWG0.8-R1	m0.8	1	3°49'	R	W5	85	25	—	20	—	40	12	12	
KWG0.8-R2		2	7°36'	R	W5	85	25	—	20	—	40			

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 362 for more details.

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog No.
Q	R	S _{H7}		
10	—	6	0.018	KWG0.5-R1
10	—	6	0.018	KWG0.5-R2
13.6	—	8	0.043	KWG0.8-R1
13.6	—	8	0.043	KWG0.8-R2

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm). Use carbide tools for the modification of the shaft area near the bottom land.

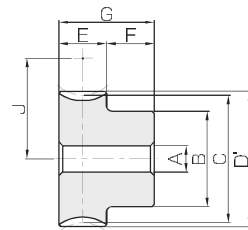
AG
Worm Wheels

Module 0.5, 0.8

AG



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A& BC2)
Heat treatment	—
Tooth hardness	—

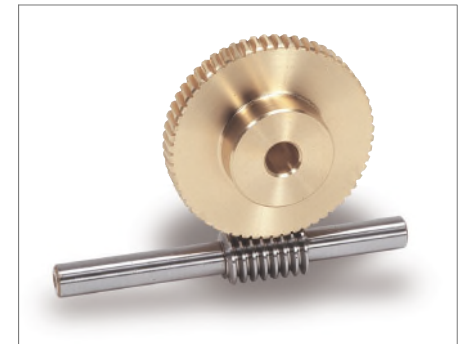


HA

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore		Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B				
AG0.5-20R1	20	m0.5	20	1	3°11'	R	HA	4	9	10	—	11	5
AG0.5-20R2	10		20	2	6°20'	R	HA	4	9	10	—	11	5
AG0.5-30R1	30		30	1	3°11'	R	HA	4	12	15	—	16	5
AG0.5-30R2	15		30	2	6°20'	R	HA	4	12	15	—	16	5
AG0.5-40R1	40		40	1	3°11'	R	HA	5	15	20	—	21	5
AG0.5-50R1	50		50	1	3°11'	R	HA	5	20	25	—	26	5
AG0.5-60R1	60	60	1	3°11'	R	HA	5	25	30	—	31	5	
AG0.8-20R1	20	m0.8	20	1	3°49'	R	HA	5	12	16	—	17.6	8
AG0.8-20R2	10		20	2	7°36'	R	HA	5	12	16	—	17.6	8
AG0.8-30R1	30		30	1	3°49'	R	HA	5	18	24	—	25.6	8
AG0.8-30R2	15		30	2	7°36'	R	HA	5	18	24	—	25.6	8
AG0.8-40R1	40		40	1	3°49'	R	HA	6	20	32	—	33.6	8
AG0.8-50R1	50		50	1	3°49'	R	HA	8	25	40	—	41.6	8
AG0.8-60R1	60	60	1	3°49'	R	HA	8	25	48	—	49.6	8	

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.

Worm Wheels



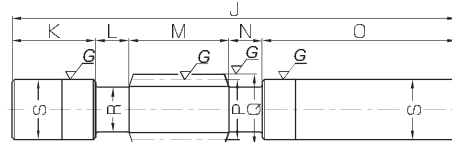
NOTE 1: Allowable torque based on worm speed (rpm)

Hub width	Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1								Backlash (mm)	Weight (kg)	Catalog No.
					30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm				
7	12	—	—	9.5	0.52	0.44	0.36	0.30	0.26	0.24	0.21	0.02~0.14	0.0056	AG0.5-20R1	
7	12	—	—	9.5	0.51	0.42	0.33	0.27	0.24	0.22	0.19	0.02~0.14	0.0056	AG0.5-20R2	
7	12	—	—	12	1.09	0.94	0.77	0.65	0.58	0.53	0.48	0.02~0.14	0.012	AG0.5-30R1	
7	12	—	—	12	1.09	0.92	0.73	0.60	0.54	0.49	0.43	0.02~0.14	0.012	AG0.5-30R2	
7	12	—	—	14.5	1.86	1.60	1.34	1.15	1.02	0.94	0.84	0.02~0.14	0.020	AG0.5-40R1	
7	12	—	—	17	2.82	2.42	2.05	1.77	1.58	1.46	1.30	0.02~0.14	0.035	AG0.5-50R1	
7	12	—	—	19.5	3.94	3.41	2.89	2.50	2.26	2.08	1.87	0.02~0.14	0.053	AG0.5-60R1	
8	16	—	—	14	1.78	1.50	1.21	1.00	0.88	0.82	0.71	0.06~0.17	0.018	AG0.8-20R1	
8	16	—	—	14	1.76	1.44	1.11	0.91	0.80	0.74	0.63	0.06~0.17	0.018	AG0.8-20R2	
8	16	—	—	18	3.77	3.21	2.62	2.20	1.96	1.81	1.61	0.06~0.17	0.043	AG0.8-30R1	
8	16	—	—	18	3.75	3.14	2.46	2.02	1.80	1.65	1.45	0.06~0.17	0.043	AG0.8-30R2	
8	16	—	—	22	6.45	5.49	4.55	3.87	3.46	3.19	2.83	0.06~0.17	0.068	AG0.8-40R1	
8	16	—	—	26	9.75	8.31	6.94	5.94	5.34	4.96	4.38	0.06~0.17	0.10	AG0.8-50R1	
8	16	—	—	30	13.6	11.7	9.77	8.39	7.63	7.05	6.27	0.06~0.17	0.14	AG0.8-60R1	

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC
Surface treatment	Black oxide coated except for ground part



W6

Catalog No.	Axial module	Number of starts	Lead angle	Hand thread	Shape	Total length		Shaft length (L)		Face width		Neck length (H)		Pitch dia.
						J	K	L	M	N	O	P		
KWG1-R1	m1	1	3°35'	R	W6	140	35	10	30	10	55	16	16	
KWG1-R2		2	7°08'	R	W6	140	35	10	30	10	55	16		
KWG1.5-R1	m1.5	1	3°26'	R	W6	190	50	15	40	15	70	25	25	
KWG1.5-R2		2	6°51'	R	W6	190	50	15	40	15	70	25		

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 362 for more details.

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog No.
Q	R	S		
18	13	18.2	0.25	KWG1-R1
18	13	18.2	0.25	KWG1-R2
28	21	26.2	0.74	KWG1.5-R1
28	21	26.2	0.74	KWG1.5-R2

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm). Use carbide tools for the modification of the shaft area near the bottom land.

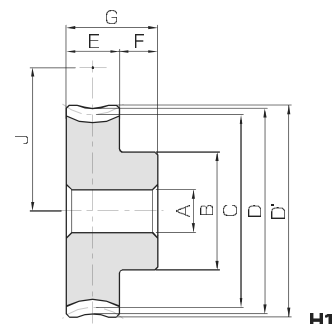
AG
Worm Wheels



Specifications	
Precision grade	KHK W 002 grade 2 *
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS AIBC2)
Heat treatment	—
Tooth hardness	—

* The precision grade of J Series products is equivalent to the value shown in the table.

A _{H7}	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
E	Face width
F	Hub width
G	Length
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance



H1

NOTE 1 : Allowable torque based on worm speed (rpm)

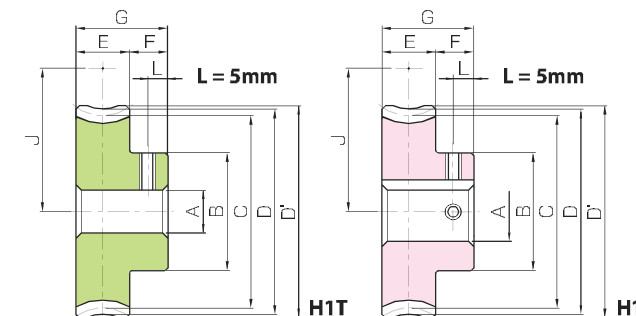
Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	A _{H7}	B	C	D	D'	E	F	G	(H)	(I)	J	Allowable torque (N·m) NOTE1							Backlash (mm)	Weight (kg)	
																		30rpm	100rpm	300rpm	600rpm	900rpm	1200rpm	1800rpm			
AG1-20R1	20	20	1	3°35'	R	H1	6	16	20	22	23	10	10	20	—	—	18	3.35	2.79	2.23	1.83	1.63	1.50	1.30	0.08~0.19	0.038	
AG1-20R2	10	20	2	7°08'	R	H1	6	16	20	22	23							—	—	—	—	—	18	3.31	2.69	2.06	1.68
AG1-30R1	30	30	1	3°35'	R	H1	6	20	30	32	33	10	10	20	—	—	23	7.08	5.98	4.84	4.05	3.63	3.31	2.92	0.08~0.19	0.078	
AG1-30R2	15	30	2	7°08'	R	H1	6	20	30	32	33							—	—	—	—	—	23	7.03	5.84	4.56	3.72
AG1-40R1	40	40	1	3°35'	R	H1	8	26	40	42	43	14	10	24	—	—	28	12.1	10.2	8.43	7.12	6.38	5.86	5.13	0.08~0.19	0.13	
AG1-50R1	50	50	1	3°35'	R	H1	8	30	50	52	53							—	—	—	—	—	33	18.3	15.5	12.9	10.9
AG1-60R1	60	60	1	3°35'	R	H1	10	35	60	62	63	—	—	—	—	—	38	25.6	21.8	18.1	15.4	14.1	12.9	11.4	0.08~0.19	0.29	
AG1.5-20R1	20	20	1	3°26'	R	H1	8	22	30	33	34.5	14	10	24	—	—	27.5	9.84	8.18	6.40	5.30	4.68	4.25	3.83	3.27	0.10~0.21	0.10
AG1.5-20R2	10	20	2	6°51'	R	H1	8	22	30	33	34.5							—	—	—	—	—	27.5	9.72	7.87	5.92	4.87
AG1.5-30R1	30	30	1	3°26'	R	H1	10	30	45	48	49.5	14	10	24	—	—	35	20.8	17.5	13.9	11.7	10.4	9.40	8.28	0.10~0.21	0.22	
AG1.5-30R2	15	30	2	6°51'	R	H1	10	30	45	48	49.5							—	—	—	—	—	35	20.7	17.1	13.1	10.8
AG1.5-40R1	40	40	1	3°26'	R	H1	12	35	60	63	64.5	14	10	24	—	—	42.5	35.6	30.0	24.2	20.6	18.3	16.6	14.6	0.10~0.21	0.37	
AG1.5-50R1	50	50	1	3°26'	R	H1	12	45	75	78	79.5							—	—	—	—	—	50	53.8	45.4	36.9	31.6
AG1.5-60R1	60	60	1	3°26'	R	H1	12	50	90	93	94.5	—	—	—	—	—	57.5	75.3	63.8	51.9	44.7	40.4	36.7	32.4	0.10~0.21	0.83	

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

J Series

Worm Wheels



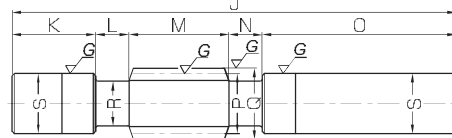
To order J Series products, please specify; **Catalog No. + J + BORE**

Bore H7	* The product shapes of J Series items are identified by background color.															
	6	8	10	12	14	15	16	17	18	19	20	22	25	28	30	
Keyway Js9	—		4 x 1.8		5 x 2.3				6 x 2.8				8 x 3.3			
Screw size	—		4 x 1.8		5 x 2.3				6 x 2.8				8 x 3.3			
Catalog No.	M4	M5	M4				M5				M6					
AG1-20R1 J BORE	H1T															
AG1-20R2 J BORE	H1T															
AG1-30R1 J BORE	H1T	H1T														
AG1-30R2 J BORE	H1T	H1T														
AG1-40R1 J BORE		H1T	H1K	H1K												
AG1-50R1 J BORE		H1T	H1K	H1K	H1K	H1K	H1K	H1K	H1K							
AG1-60R1 J BORE			H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K					
AG1.5-20R1 J BORE		H1T	H1K													
AG1.5-20R2 J BORE		H1T	H1K													
AG1.5-30R1 J BORE			H1K	H1K	H1K	H1K	H1K	H1K								
AG1.5-30R2 J BORE			H1K	H1K	H1K	H1K	H1K	H1K								
AG1.5-40R1 J BORE				H1K	H1K	H1K	H1K	H1K	H1K	H1K						
AG1.5-50R1 J BORE					H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K			
AG1.5-60R1 J BORE						H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	

[Caution on J series] ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
④ Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap.
⑤ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC
Surface treatment	Black oxide coated except for ground part



W6

Catalog No.	Axial module	Number of starts	Lead angle	Hand thread	Shape	Total length		Shaft length (L)		Face width	Neck length (H)		Shaft length (H)	Pitch dia.
						J	K	L	M		N	O		
KWG2-R1	m2	1	5°12'	R	W6	200	35	25	40	25	75	22	22	
KWG2-R2		2	10°18'	R	W6	200	35	25	40	25	75			
KWG2.5-R1	m2.5	1	4°46'	R	W6	250	50	27	46	27	100	30	30	
KWG2.5-R2		2	9°28'	R	W6	250	50	27	46	27	100			

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 362 for more details.

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog No.
Q	R	S		
26	17	25.2	0.64	KWG2-R1
26	17	25.2	0.64	KWG2-R2
35	23	30.2	1.27	KWG2.5-R1
35	23	30.2	1.27	KWG2.5-R2

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm). Use carbide tools for the modification of the shaft area near the bottom land.

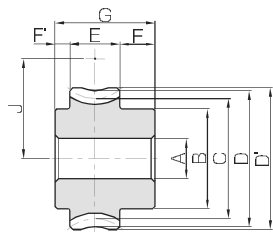
AGF
Worm Wheels

Module 2, 2.5

AGF



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A2/BC2) *
Heat treatment	—
Tooth hardness	—



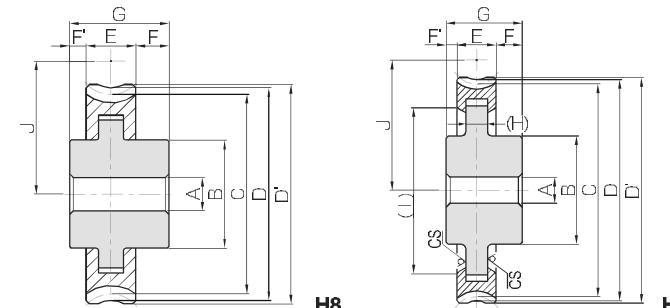
H6

* H8, H9 shape have a hub made from FC200 cast iron. FC200's tensile strength (200N/mm²) is derived from test specimens and does not represent that of the boss.

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of starts	Profile shift coefficient	Helix angle	Hand thread	Shape	Bore		Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width(R)
									A _{H7}	B					
AGF2-20R1	20	m2	20	1	-0.5	5°12'	R	H6	12	32	40	42	44	18	12
AGF2-20R2	10		20	2	-0.5	10°18'	R	H6	12	32	40	42	44	18	12
AGF2-25R1	25		25	1	-0.5	5°12'	R	H6	12	35	50	52	54	18	12
AGF2-30R1	30		30	1	-0.5	5°12'	R	H6	12	38	60	62	64	18	12
AGF2-30R2	15		30	2	-0.5	10°18'	R	H6	12	38	60	62	64	18	12
AGF2-36R1	36		36	1	0	5°12'	R	H6	12	40	72	76	78	18	12
AGF2-40R1	40	40	1	-0.5	5°12'	R	H8	12	45	80	82	84	18	12	
AGF2-48R1	48	48	1	+0.5	5°12'	R	H9	12	50	96	102	104	18	12	
AGF2-50R1	50	50	1	-0.5	5°12'	R	H9	12	50	100	102	104	18	12	
AGF2-60R1	60	60	1	-0.5	5°12'	R	H9	12	50	120	122	124	18	12	
AGF2.5-20R1	20	m2.5	20	1	0	4°46'	R	H6	12	35	50	55	57.5	20	15
AGF2.5-20R2	10		20	2	0	9°28'	R	H6	12	35	50	55	57.5	20	15
AGF2.5-25R1	25		25	1	0	4°46'	R	H6	12	40	62.5	67.5	70	20	15
AGF2.5-30R1	30		30	1	0	4°46'	R	H6	12	40	75	80	82.5	20	15
AGF2.5-30R2	15		30	2	0	9°28'	R	H6	12	40	75	80	82.5	20	15
AGF2.5-36R1	36		36	1	0	4°46'	R	H8	12	45	90	95	97.5	20	15
AGF2.5-40R1	40	40	1	0	4°46'	R	H8	12	45	100	105	107.5	20	15	
AGF2.5-48R1	48	48	1	0	4°46'	R	H9	12	50	120	125	127.5	20	15	
AGF2.5-50R1	50	50	1	0	4°46'	R	H9	12	55	125	130	132.5	20	15	
AGF2.5-60R1	60	60	1	0	4°46'	R	H9	12	60	150	155	157.5	20	15	

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.
② There may be space in the casting between the two materials, but it will not affect the joint strength.

Worm Wheels



H8

H9

* CS has a sand mold casting finish.

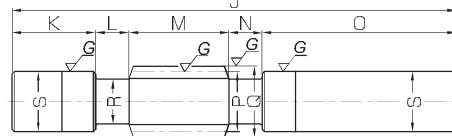
NOTE 1 : Allowable torque based on worm speed (rpm)

Hub width	Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
					30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}	1800 _{rpm}			
F'	G	(H)	(I)	J										
5	35	—	—	30	19.4	16.1	12.8	10.5	9.30	8.49	7.31	0.11~0.24	0.25	AGF2-20R1
5	35	—	—	30	19.9	16.1	12.2	9.99	8.75	7.92	6.74	0.11~0.24	0.25	AGF2-20R2
5	35	—	—	35	29.4	24.5	19.6	16.3	14.4	13.2	11.4	0.11~0.24	0.37	AGF2-25R1
5	35	—	—	40	41.1	34.5	27.7	23.2	20.7	18.8	16.4	0.11~0.24	0.51	AGF2-30R1
5	35	—	—	40	42.3	35.0	27.0	22.1	19.9	17.7	15.4	0.11~0.24	0.51	AGF2-30R2
5	35	—	—	47	57.8	48.6	39.3	33.2	29.6	27.0	23.6	0.11~0.24	0.73	AGF2-36R1
5	35	—	—	50	70.3	59.2	48.1	40.7	36.4	33.2	28.9	0.11~0.24	0.85	AGF2-40R1
5	35	(10)	(76)	60	98.5	83.0	68.0	57.9	51.9	47.5	41.3	0.11~0.24	1.14	AGF2-48R1
5	35	(12)	(81)	60	106	89.5	73.4	62.5	56.2	51.5	44.9	0.11~0.24	1.14	AGF2-50R1
5	35	(12)	(96)	70	149	126	103	88.4	80.3	73.3	64.2	0.11~0.24	1.51	AGF2-60R1
5	40	—	—	40	35.1	29.0	22.6	18.6	16.3	14.8	12.8	0.14~0.27	0.44	AGF2.5-20R1
5	40	—	—	40	34.6	27.9	20.9	17.1	14.8	13.4	11.3	0.14~0.27	0.44	AGF2.5-20R2
5	40	—	—	46.25	53.0	43.9	34.8	28.9	25.3	23.0	20.0	0.14~0.27	0.66	AGF2.5-25R1
5	40	—	—	52.5	74.1	62.0	49.1	41.2	36.7	32.8	28.7	0.14~0.27	0.87	AGF2.5-30R1
5	40	—	—	52.5	73.6	60.6	46.2	37.8	33.2	29.9	25.8	0.14~0.27	0.87	AGF2.5-30R2
5	40	—	—	60	104	87.4	69.8	59.0	51.8	47.1	41.2	0.14~0.27	1.19	AGF2.5-36R1
5	40	—	—	65	127	106	85.4	72.4	63.7	57.9	50.5	0.14~0.27	1.42	AGF2.5-40R1
5	40	(13)	(97)	75	178	149	121	103	90.8	83.1	72.2	0.14~0.27	1.72	AGF2.5-48R1
5	40	(13)	(100)	77.5	192	161	130	111	98.4	90.0	78.3	0.14~0.27	1.92	AGF2.5-50R1
5	40	(13)	(125)	90	268	226	183	157	141	128	112	0.14~0.27	2.59	AGF2.5-60R1

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC
Surface treatment	Black oxide coated except for ground part



W6

Catalog No.	Axial module	Number of starts	Lead angle	Hand thread	Shape	Total length		Shaft length (L)		Face width		Neck length (H)		Pitch dia.
						J	K	L	M	N	O	P		
KWG3-R1	m3	1	4°31'	R	W6	300	55	30	60	30	125	38		
KWG3-R2		2	8°58'	R	W6	300	55	30	60	30	125	38		
KWG4-R1	m4	1	5°43'	R	W6	360	70	32.5	75	32.5	150	40		
KWG4-R2		2	11°19'	R	W6	360	70	32.5	75	32.5	150	40		

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 362 for more details.

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog No.
Q	R	S		
44	30	40.2	2.66	KWG3-R1
44	30	40.2	2.66	KWG3-R2
48	29	45.2	3.85	KWG4-R1
48	29	45.2	3.85	KWG4-R2

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm). Use carbide tools for the modification of the shaft area near the bottom land.

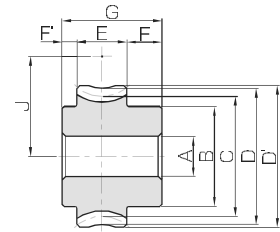
AGF
Worm Wheels

Module 3, 4

AGF



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A&BC2) *
Heat treatment	—
Tooth hardness	—



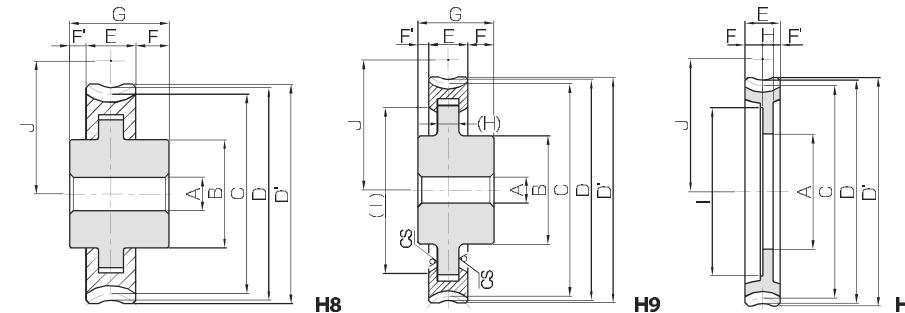
H6

* H8, H9 shape have a hub made from FC200 cast iron. FC200's tensile strength (200N/mm²) is derived from test specimens and does not represent that of the boss.

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of starts	Profile shift coefficient	Helix angle	Hand thread	Shape	Bore		Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width(R)
									A _{H7}	B					
AGF3-20R1	20	m3	20	1	+0.333	4°31'	R	H6	20	50	60	68	71	25	17.5
AGF3-20R2	10		20	2	+0.333	8°58'	R	H6	20	50	60	68	71	25	17.5
AGF3-25R1	25		25	1	0	4°31'	R	H6	20	55	75	81	84	25	17.5
AGF3-30R1	30		30	1	+0.333	4°31'	R	H8	20	55	90	98	101	25	17.5
AGF3-30R2	15		30	2	+0.333	8°58'	R	H8	20	55	90	98	101	25	17.5
AGF3-36R1	36		36	1	+0.333	4°31'	R	H8	20	60	108	116	119	25	17.5
AGF3-40R1	40		40	1	+0.333	4°31'	R	H8	20	65	120	128	131	25	17.5
AGF3-48R1	48		48	1	+0.333	4°31'	R	H9	20	70	144	152	155	25	17.5
AGF3-50R1	50		50	1	+0.333	4°31'	R	H9	20	75	150	158	161	25	17.5
AGF3-60R1	60		60	1	+0.333	4°31'	R	H9	20	80	180	188	191	25	17.5
AGF4-20R1	20	m4	20	1	0	5°43'	R	H6	20	60	80	88	92	30	20
AGF4-20R2	10		20	2	0	11°19'	R	H6	20	60	80	88	92	30	20
AGF4-25R1	25		25	1	0	5°43'	R	H6	20	65	100	108	112	30	20
AGF4-30R1	30		30	1	0	5°43'	R	H8	20	65	120	128	132	30	20
AGF4-30R2	15		30	2	0	11°19'	R	H8	20	65	120	128	132	30	20
AGF4-36R1	36		36	1	0	5°43'	R	H9	20	70	144	152	156	30	20
AGF4-40R1	40		40	1	0	5°43'	R	H9	20	80	160	168	172	30	20
AGF4-48R1	48		48	1	0	5°43'	R	H9	20	90	192	200	204	30	20
AGF4-50R1	50		50	1	0	5°43'	R	H9	20	90	200	208	212	30	20
AGF4-60R1	60		60	1	0	5°43'	R	H0	160	—	240	248	252	30	7

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.
② There may be space in the casting between the two materials, but it will not affect the joint strength.

Worm Wheels



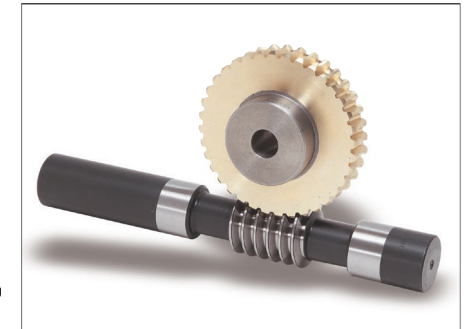
H8

H9

H0

* CS has a sand mold casting finish.

NOTE 1 : Allowable torque based on worm speed (rpm)

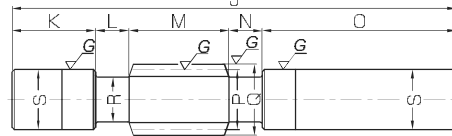


Hub width	Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
					30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}	1800 _{rpm}			
F'	G	(H)	(I)	J										
7.5	50	—	—	50	59.7	49.1	38.3	31.5	27.5	25.1	21.5	0.16~0.29	0.88	AGF3-20R1
7.5	50	—	—	50	60.2	48.2	36.1	29.5	25.4	23.0	19.4	0.16~0.29	0.88	AGF3-20R2
7.5	50	—	—	56.5	90.2	74.3	58.8	48.9	42.6	39.0	33.5	0.16~0.29	1.24	AGF3-25R1
7.5	50	—	—	65	126	105	83.1	69.6	61.0	55.4	48.2	0.16~0.29	1.63	AGF3-30R1
7.5	50	—	—	65	128	105	79.8	65.2	57.2	51.6	44.3	0.16~0.29	1.63	AGF3-30R2
7.5	50	—	—	74	178	148	118	99.7	87.5	79.4	69.1	0.16~0.29	2.25	AGF3-36R1
7.5	50	—	—	80	216	180	145	122	108	98.0	84.9	0.16~0.29	2.76	AGF3-40R1
7.5	50	(15)	(120)	92	303	252	204	174	153	141	121	0.16~0.29	3.28	AGF3-48R1
7.5	50	(15)	(125)	95	326	272	220	188	166	152	132	0.16~0.29	3.62	AGF3-50R1
7.5	50	(15)	(155)	110	457	383	310	265	237	217	188	0.16~0.29	4.76	AGF3-60R1
10	60	—	—	60	123	101	78.8	64.6	56.3	51.5	43.8	0.19~0.32	1.77	AGF4-20R1
10	60	—	—	60	127	101	76.0	61.9	53.2	48.3	40.5	0.19~0.32	1.77	AGF4-20R2
10	60	—	—	70	186	153	121	100	87.3	79.9	68.5	0.19~0.32	2.56	AGF4-25R1
10	60	—	—	80	260	216	171	143	125	114	98.4	0.19~0.32	3.28	AGF4-30R1
10	60	—	—	80	270	220	168	137	120	108	92.2	0.19~0.32	3.28	AGF4-30R2
10	60	(20)	(113)	92	366	304	243	204	179	164	141	0.19~0.32	4.10	AGF4-36R1
10	60	(20)	(128)	100	445	370	297	251	220	201	173	0.19~0.32	5.25	AGF4-40R1
10	60	(20)	(160)	116	624	519	420	356	314	288	248	0.19~0.32	6.95	AGF4-48R1
10	60	(20)	(168)	120	673	560	454	385	340	312	269	0.19~0.32	7.35	AGF4-50R1
15	30	8	204	140	941	788	638	544	486	444	385	0.19~0.32	3.60	AGF4-60R1

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	50 ~ 60HRC
Surface treatment	Black oxide coated except for ground part



W6

Catalog No.	Axial module	Number of starts	Lead angle	Hand thread	Shape	Total length		Shaft length (L)		Neck length (L)		Face width		Neck length (R)		Shaft length (R)		Pitch dia.
						J	K	L	M	N	O	P						
KWG5-R1	m5	1	5°43'	R	W6	400	75	30	90	30	175	50						
KWG6-R1	m6	1	5°43'	R	W6	400	60	40	100	40	160	60						

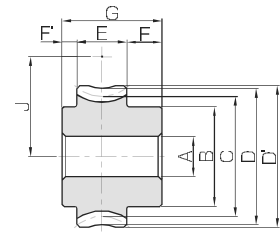
[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 362 for more details.

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog No.
Q	R	S		
60	36	50.2	5.75	KWG5-R1
72	44	60.2	8.09	KWG6-R1

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm). Use carbide tools for the modification of the shaft area near the bottom land.



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A&BC2) *
Heat treatment	—
Tooth hardness	—



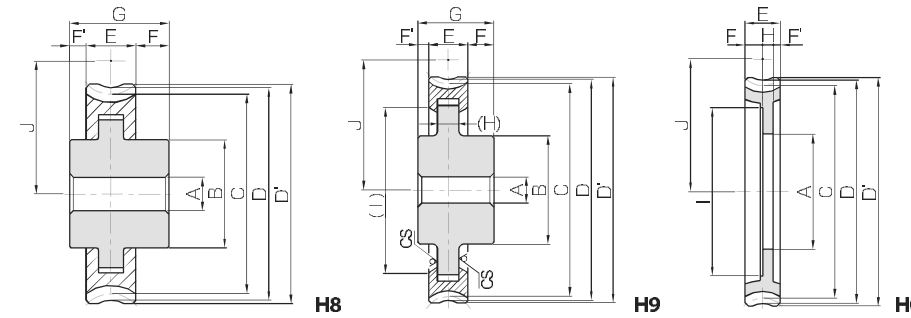
H6

* H8, H9 shape have a hub made from FC200 cast iron. FC200's tensile strength (200N/mm²) is derived from test specimens and does not represent that of the boss.

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of starts	Profile shift coefficient	Helix angle	Hand thread	Shape	Bore		Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width(R)
									A _{H7}	B					
AGF5-20R1	20	m5	20	1	0	5°43'	R	H6	22	75	100	110	115	35	23
AGF5-25R1	25		25	1	0	5°43'	R	H6	22	75	125	135	140	35	23
AGF5-30R1	30		30	1	0	5°43'	R	H8	22	75	150	160	165	35	23
AGF5-36R1	36		36	1	0	5°43'	R	H9	22	90	180	190	195	35	23
AGF5-40R1	40		40	1	0	5°43'	R	H9	22	110	200	210	215	35	23
AGF5-48R1	48	m5	48	1	0	5°43'	R	H0	140	—	240	250	255	35	7.5
AGF5-50R1	50		50	1	0	5°43'	R	H0	150	—	250	260	265	35	7.5
AGF5-60R1	60		60	1	0	5°43'	R	H0	200	—	300	310	315	35	7.5
AGF6-20R1	20	m6	20	1	0	5°43'	R	H6	25	85	120	132	138	40	23
AGF6-25R1	25		25	1	0	5°43'	R	H6	25	90	150	162	168	40	23
AGF6-30R1	30		30	1	0	5°43'	R	H8	25	100	180	192	198	40	23
AGF6-36R1	36		36	1	0	5°43'	R	H9	25	110	216	228	234	40	23
AGF6-40R1	40		40	1	0	5°43'	R	H0	130	—	240	252	258	40	8
AGF6-48R1	48	m6	48	1	0	5°43'	R	H0	180	—	288	300	306	40	8
AGF6-50R1	50		50	1	0	5°43'	R	H0	190	—	300	312	318	40	8
AGF6-60R1	60		60	1	0	5°43'	R	H0	250	—	360	372	378	40	8

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.

- ② There may be space in the casting between the two materials, but it will not affect the joint strength.
- ③ For H0-shaped products with a bore size of φ 190 or more, the bore tolerance is H8.



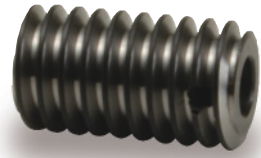
* CS has a sand mold casting finish.

NOTE 1: Allowable torque based on worm speed (rpm)

Hub width (L)	Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1								Backlash (mm)	Weight (kg)	Catalog No.
					30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm				
F'	G	(H)	(I)	J											
12	70	—	—	75	211	172	134	108	95.0	86.2	72.7	0.22~0.35	3.26	AGF5-20R1	
12	70	—	—	87.5	319	261	206	168	147	134	114	0.22~0.35	4.48	AGF5-25R1	
12	70	—	—	100	446	369	291	239	211	191	164	0.22~0.35	5.79	AGF5-30R1	
12	70	(25)	(140)	115	627	519	414	343	302	274	234	0.22~0.35	7.70	AGF5-36R1	
12	70	(26)	(162)	125	763	632	506	421	371	337	288	0.22~0.35	9.97	AGF5-40R1	
17.5	35	10	195	145	1070	886	715	598	530	483	411	0.22~0.35	5.04	AGF5-48R1	
17.5	35	10	205	150	1150	956	772	646	574	523	446	0.22~0.35	5.28	AGF5-50R1	
17.5	35	10	255	175	1610	1340	1090	913	820	744	639	0.22~0.35	6.48	AGF5-60R1	
12	75	—	—	90	329	268	208	167	146	131	110	0.24~0.37	4.95	AGF6-20R1	
12	75	—	—	105	497	405	319	259	227	204	173	0.24~0.37	7.14	AGF6-25R1	
12	75	—	—	120	696	572	451	368	325	290	248	0.24~0.37	9.66	AGF6-30R1	
12	75	(30)	(172)	138	978	806	641	528	466	417	355	0.24~0.37	12.5	AGF6-36R1	
20	40	12	190	150	1190	981	784	648	572	513	436	0.24~0.37	6.20	AGF6-40R1	
20	40	12	240	174	1670	1380	1110	920	816	735	628	0.24~0.37	7.58	AGF6-48R1	
20	40	12	250	180	1800	1480	1200	994	885	796	676	0.24~0.37	8.00	AGF6-50R1	
20	40	12	310	210	2520	2090	1680	1410	1260	1130	969	0.24~0.37	10.0	AGF6-60R1	

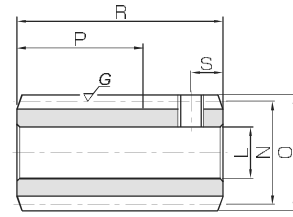
[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

- ② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.

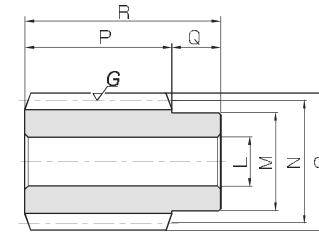


Specifications	
Precision grade	KHK W 001 grade 2 *
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	50 ~ 60HRC
Surface treatment	Black oxide coated except for ground part

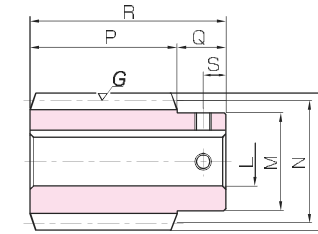
* The precision grade of J Series products is equivalent to the value shown in the table.



W2



W1



W1K



Catalog No.	Axial module	Number of starts	Lead angle	Hand thread	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L _{H7}	M					
SWG1-R1	m1	1	3°35'	R	W2	8	—	16	18	(20)	—	—
SWG1-R2		2	7°08'	R	W2	8	—	16	18	(20)	—	—
SWG1.5-R1	m1.5	1	3°26'	R	W1	10	20	25	28	30	10	—
● SWG1.5-R1J10		10	20	25	28	30	10	—	—	—	—	—
SWG1.5-R2	m1.5	2	6°51'	R	W1	10	20	25	28	30	10	—
● SWG1.5-R2J10		10	20	25	28	30	10	—	—	—	—	—

[Caution on Product Characteristics] ① For W2-shaped products, a set screw is included. When setting up the mating wheel, make sure no friction occurs within the set screw.
② These worms produce axial thrust forces. See Page 362 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

Total length	Keyway	Set Screw		Weight (kg)	Catalog No.
		Width×Depth	Size		
32	—	M4	5	0.037	SWG1-R1
32	—	M4	5	0.037	SWG1-R2
40	—	—	—	0.12	SWG1.5-R1
40	4 x 1.8	M4	5	0.11	● SWG1.5-R1J10
40	—	—	—	0.12	SWG1.5-R2
40	4 x 1.8	M4	5	0.11	● SWG1.5-R2J10

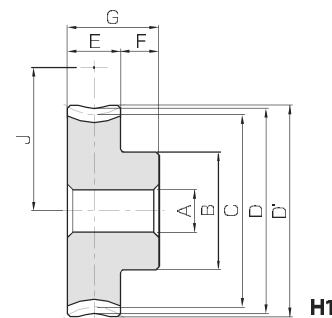
[Caution on J series] ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
④ Areas of products which have been re-worked will not be black oxide coated.
⑤ For products having a tapped hole, a set screw is included.



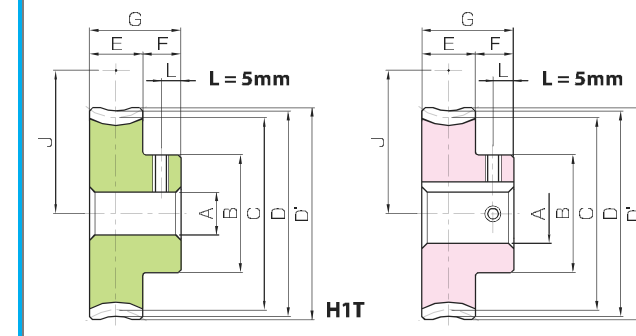
Specifications	
Precision grade	KHK W 002 grade 2 *
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A & BC2)
Heat treatment	—
Tooth hardness	—

* The precision grade of J Series products is equivalent to the value shown in the table.

A _{H7}	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
E	Face width
F	Hub width
G	Length
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance



H1



H1T

H1K



Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	A _{H7}	B	C	D	D'	E	F	G	J	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)
																30rpm	100rpm	300rpm	600rpm	900rpm	1200rpm	1800rpm		
																30rpm	100rpm	300rpm	600rpm	900rpm	1200rpm	1800rpm		
AG1-20R1	20	20	1	3°35'	R	H1	6	16	20	22	23	10	10	20	18	3.35	2.79	2.23	1.83	1.63	1.50	1.30	0.08~0.19	0.038
AG1-20R2	10	20	2	7°08'	R	H1	6	16	20	22	23					18	3.31	2.69	2.06	1.68	1.48	1.35	1.15	0.08~0.19
AG1-30R1	30	30	1	3°35'	R	H1	6	20	30	32	33	14	10	24	23	7.08	5.98	4.84	4.05	3.63	3.31	2.92	0.08~0.19	0.078
AG1-30R2	15	30	2	7°08'	R	H1	6	20	30	32	33					23	7.03	5.84	4.56	3.72	3.33	3.03	2.63	0.08~0.19
AG1-40R1	40	40	1	3°35'	R	H1	8	26	40	42	43	14	10	24	28	12.1	10.2	8.43	7.12	6.38	5.86	5.13	0.08~0.19	0.13
AG1-50R1	50	50	1	3°35'	R	H1	8	30	50	52	53					33	18.3	15.5	12.9	10.9	9.87	9.09	7.95	0.08~0.19
AG1-60R1	60	60	1	3°35'	R	H1	10	35	60	62	63	38	25.6	21.8	18.1	15.4	14.1	12.9	11.4	0.08~0.19	0.29			
AG1.5-20R1	20	20	1	3°26'	R	H1	8	22	30	33	34.5	14	10	24	27.5	9.84	8.18	6.40	5.30	4.68	4.25	3.68	0.10~0.21	0.10
AG1.5-20R2	10	20	2	6°51'	R	H1	8	22	30	33	34.5					27.5	9.72	7.87	5.92	4.87	4.25	3.83	3.27	0.10~0.21
AG1.5-30R1	30	30	1	3°26'	R	H1	10	30	45	48	49.5	14	10	24	35	20.8	17.5	13.9	11.7	10.4	9.40	8.28	0.10~0.21	0.22
AG1.5-30R2	15	30	2	6°51'	R	H1	10	30	45	48	49.5					35	20.7	17.1	13.1	10.8	9.56	8.58	7.46	0.10~0.21
AG1.5-40R1	40	40	1	3°26'	R	H1	12	35	60	63	64.5	14	10	24	42.5	35.6	30.0	24.2	20.6	18.3	16.6	14.6	0.10~0.21	0.37
AG1.5-50R1	50	50	1	3°26'	R	H1	12	45	75	78	79.5					50	53.8	45.4	36.9	31.6	28.3	25.8	22.6	0.10~0.21
AG1.5-60R1	60	60	1	3°26'	R	H1	12	50	90	93	94.5	57.5	75.3	63.8	51.9	44.7	40.4	36.7	32.4	0.10~0.21	0.83			

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

To order J Series products, please specify; Catalog No. + J + BORE

Bore H7	* The product shapes of J Series items are identified by background color.														
	6	8	10	12	14	15	16	17	18	19	20	22	25	28	30
Keyway Js9	—		4 x 1.8			5 x 2.3					6 x 2.8			8 x 3.3	
Screw size	—		4 x 1.8			5 x 2.3					6 x 2.8			8 x 3.3	
Catalog No.	M4	M5	M4					M5			M6				
AG1-20R1 J BORE	H1T														
AG1-20R2 J BORE	H1T														
AG1-30R1 J BORE	H1T	H1T													
AG1-30R2 J BORE	H1T	H1T													
AG1-40R1 J BORE		H1T	H1K	H1K											
AG1-50R1 J BORE		H1T	H1K	H1K	H1K	H1K	H1K	H1K							
AG1-60R1 J BORE			H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K					
AG1.5-20R1 J BORE		H1T	H1K												
AG1.5-20R2 J BORE		H1T	H1K												
AG1.5-30R1 J BORE			H1K	H1K	H1K	H1K	H1K	H1K							
AG1.5-30R2 J BORE			H1K	H1K	H1K	H1K	H1K	H1K							
AG1.5-40R1 J BORE				H1K	H1K	H1K	H1K	H1K	H1K	H1K					
AG1.5-50R1 J BORE					H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K		
AG1.5-60R1 J BORE						H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K

[Caution on J series] ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
④ Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap.
⑤ For products having a tapped hole, a set screw is included.
⑥ The use of H1T shaped Set Screws for fastening gears to a shaft is a method only applicable to the usage for light loads. For secure fastening, please use dowel pins in combination.

You can download CAD data (DXF format) of KHK Products from the Web Catalog.

SWG Ground Worms



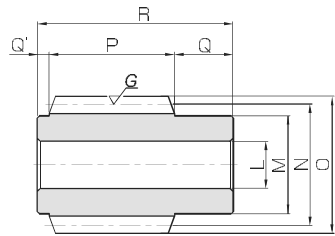
Module 2, 2.5

SWG



Specifications	
Precision grade	KHK W 001 grade 2 *
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	50~60HRC
Surface treatment	Black oxide coated except for ground part

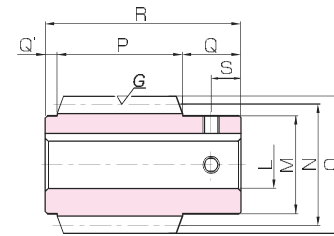
* The precision grade of J Series products is equivalent to the value shown in the table.



W3



Ground Worms



W3K



Catalog No. ● J Series (Available-on-request)	Axial module	Number of starts	Lead angle	Hand thread	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width (R)		Hub width (L)
						L-H7	M				N	O	
SWG2-R1 ● SWG2-R1J12 ● SWG2-R1J14	m2	1	3°41'	R	W3	12	25	31	35	32	15	3	
W3K					12								
W3K					14								
SWG2-R2 ● SWG2-R2J12 ● SWG2-R2J14	m2	2	7°21'	R	W3	12	25	31	35	32	15	3	
W3K					12								
W3K					14								
SWG2.5-R1 ● SWG2.5-R1J15 ● SWG2.5-R1J16 ● SWG2.5-R1J17	m2.5	1	3°52'	R	W3	15	30	37	42	45	17	3	
W3K					15								
W3K					16								
SWG2.5-R2 ● SWG2.5-R2J15 ● SWG2.5-R2J16 ● SWG2.5-R2J17	m2.5	2	7°42'	R	W3	15	30	37	42	45	17	3	
W3K					15								
W3K					16								

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 362 for more details.

Total length	Keyway	Set Screw		Weight (kg)	Catalog No. ● J Series (Available-on-request)
		Size	S		
50	4 x 1.8 5 x 2.3	M4	7.5	0.21	SWG2-R1 ● SWG2-R1J12 ● SWG2-R1J14
		M4	7.5	0.19	
		M4	7.5	0.19	
50	4 x 1.8 5 x 2.3	M4	7.5	0.21	SWG2-R2 ● SWG2-R2J12 ● SWG2-R2J14
		M4	7.5	0.21	
		M4	7.5	0.19	
65	5 x 2.3 5 x 2.3 5 x 2.3	M4	8.5	0.40	SWG2.5-R1 ● SWG2.5-R1J15 ● SWG2.5-R1J16 ● SWG2.5-R1J17
		M4	8.5	0.39	
		M4	8.5	0.37	
65	5 x 2.3 5 x 2.3 5 x 2.3	M4	8.5	0.40	SWG2.5-R2 ● SWG2.5-R2J15 ● SWG2.5-R2J16 ● SWG2.5-R2J17
		M4	8.5	0.39	
		M4	8.5	0.37	

[Caution on J series] ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
④ Areas of products which have been re-worked will not be black oxide coated.
⑤ For products having a tapped hole, a set screw is included.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

AG Worm Wheels



Module 2, 2.5

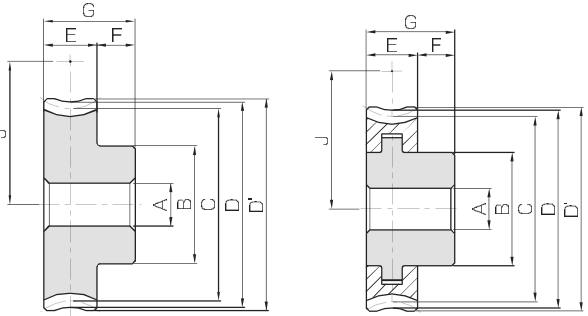
AG



Specifications	
Precision grade	KHK W 002 grade 2 *
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A2/BC2) **
Heat treatment	—
Tooth hardness	—

* The precision grade of J Series products is equivalent to the value shown in the table.
** H4, H5 shape have a hub made from FC200 cast iron. FC200's tensile strength (200N/mm²) is derived from test specimens and does not represent that of the boss.

A-H7	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
E	Face width
F	Hub width
G	Length
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance

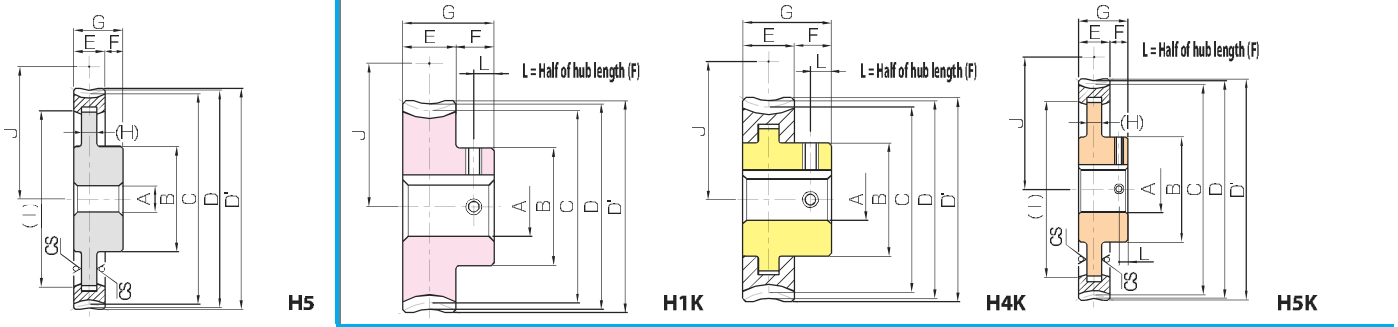


H1

H4



Worm Wheels



H5

H1K

H4K

H5K

To order J Series products, please specify; Catalog No. + J + BORE

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	A-H7	B	C	D	D'	E	F	G	(H)	(I)	J	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)		
																		30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm				
																		* The product shapes of J Series items are identified by background color.										
AG2-20R1	20	20	1	3°41'	R	H1	33	40	44	46	—	—	—	—	—	—	—	35.5	21.0	17.5	13.6	11.2	9.84	8.94	7.75	0.11~0.24	0.26	
AG2-20R2	10	20	2	7°21'	R	H1	33	40	44	46	—	—	—	—	—	—	—	35.5	20.7	16.8	12.6	10.3	8.93	8.05	6.89			0.26
AG2-30R1	30	30	1	3°41'	R	H4	40	60	64	66	—	—	—	—	—	—	—	45.5	44.3	37.3	29.6	24.8	21.9	19.8	17.4			0.51
AG2-30R2	15	30	2	7°21'	R	H4	40	60	64	66	18	15	33	—	—	—	—	45.5	44.0	36.5	27.8	22.8	20.1	18.0	15.7	0.51		
AG2-40R1	40	40	1	3°41'	R	H4	45	80	84	86	—	—	—	—	—	—	—	55.5	75.8	64.0	51.4	43.6	38.5	34.9	30.7	0.85		
AG2-50R1	50	50	1	3°41'	R	H5	50	100	104	106	—	—	—	—	(8)	(83)	65.5	115	96.8	78.4	66.9	59.5	54.2	47.6	1.05			
AG2-60R1	60	60	1	3°41'	R	H5	55	120	124	126	—	—	—	—	(11)	(100)	75.5	160	136	110	94.6	84.9	77.2	68.1	1.52			
AG2.5-20R1	20	20	1	3°52'	R	H1	12	35	50	55	57.5	—	—	—	—	—	—	43.5	34.6	28.5	22.3	18.3	16.0	14.6	12.5	0.14~0.27	0.39	
AG2.5-20R2	10	20	2	7°42'	R	H1	12	35	50	55	57.5	—	—	—	—	—	—	43.5	34.2	27.4	20.6	16.8	14.5	13.1	11.1			0.39
AG2.5-30R1	30	30	1	3°52'	R	H4	12	40	75	80	82.5	—	—	—	—	—	—	56	73.2	61.0	48.3	40.5	35.5	32.2	28.1			0.79
AG2.5-30R2	15	30	2	7°42'	R	H4	12	40	75	80	82.5	20	14	34	—	—	—	56	72.7	59.6	45.5	37.2	32.6	29.4	25.3	0.79		
AG2.5-40R1	40	40	1	3°52'	R	H5	15	45	100	105	107.5	—	—	—	(11)	(81)	68.5	125	105	84.0	71.2	62.5	57.0	49.5	1.11			
AG2.5-50R1	50	50	1	3°52'	R	H5	15	55	125	130	132.5	—	—	—	(12)	(106)	81	189	158	128	109	96.7	88.5	76.7	1.70			
AG2.5-60R1	60	60	1	3°52'	R	H5	15	60	150	155	157.5	—	—	—	(12)	(130)	93.5	265	222	180	154	138	126	110	2.32			

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.

[Caution on J series] ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.

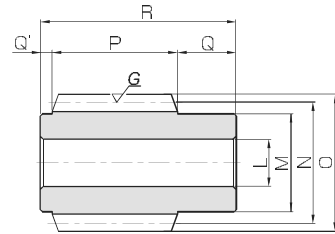
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
④ Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap.
⑤ For products having a tapped hole, a set screw is included.

You can download CAD data (DXF format) of KHK Products from the Web Catalog.



Specifications	
Precision grade	KHK W 001 grade 2 *
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	50~60HRC
Surface treatment	Black oxide coated except for ground part

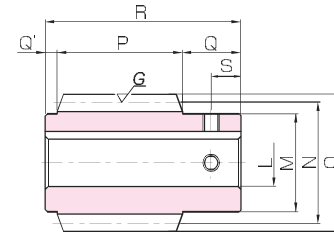
* The precision grade of J Series products is equivalent to the value shown in the table.



W3

Catalog No. ● J Series (Available-on-request)	Axial module	Number of starts	Lead angle	Hand thread	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L _{H7}	M					
SWG3-R1 ● SWG3-R1J17 ● SWG3-R1J18 ● SWG3-R1J19 ● SWG3-R1J20	m3	1	3°54'	R	W3	16	35	44	50	50	20	4
						17						
						18						
						19						
						20						
SWG3-R2 ● SWG3-R2J17 ● SWG3-R2J18 ● SWG3-R2J19 ● SWG3-R2J20	m3	2	7°46'	R	W3	16	35	44	50	50	20	4
						17						
						18						
						19						
						20						
SWG3-R3 ● SWG3-R3J17 ● SWG3-R3J18 ● SWG3-R3J19 ● SWG3-R3J20	m3	3	11°34'	R	W3	16	35	44	50	50	20	4
						17						
						18						
						19						
						20						
SWG4-R1 SWG4-R2 SWG4-R3	m4	1	3°41'	R	W3	22	50	62	70	70	25	5
						22						
						22						

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 362 for more details.



W3K



Total length	Keyway	Set Screw		Weight (kg)	Catalog No. ● J Series (Available-on-request)
		Width×Depth	Size		
74	—	5 × 2.3	M4	10	SWG3-R1
				10	● SWG3-R1J17
				10	● SWG3-R1J18
				10	● SWG3-R1J19
				10	● SWG3-R1J20
74	—	5 × 2.3	M4	10	SWG3-R2
				10	● SWG3-R2J17
				10	● SWG3-R2J18
				10	● SWG3-R2J19
				10	● SWG3-R2J20
74	—	5 × 2.3	M4	10	SWG3-R3
				10	● SWG3-R3J17
				10	● SWG3-R3J18
				10	● SWG3-R3J19
				10	● SWG3-R3J20
100	—	—	—	1.82	SWG4-R1
100	—	—	—	1.82	SWG4-R2
100	—	—	—	1.82	SWG4-R3

[Caution on J series]

- As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- Keyways are made according to JIS B1301 standards, Js9 tolerance.
- Areas of products which have been re-worked will not be black oxide coated.
- For products having a tapped hole, a set screw is included.

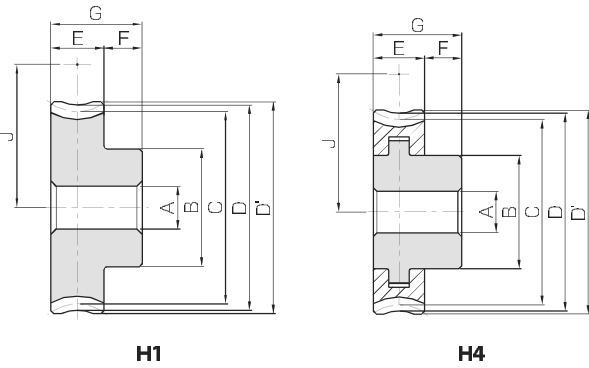
[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).



Specifications	
Precision grade	KHK W 002 grade 2 *
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A2/BC2) **
Heat treatment	—
Tooth hardness	—

* The precision grade of J Series products is equivalent to the value shown in the table.
** H4, H5 shape have a hub made from FC200 cast iron. FC200's tensile strength (200N/mm²) is derived from test specimens and does not represent that of the boss.

A _{H7}	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
E	Face width
F	Hub width
G	Length
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance



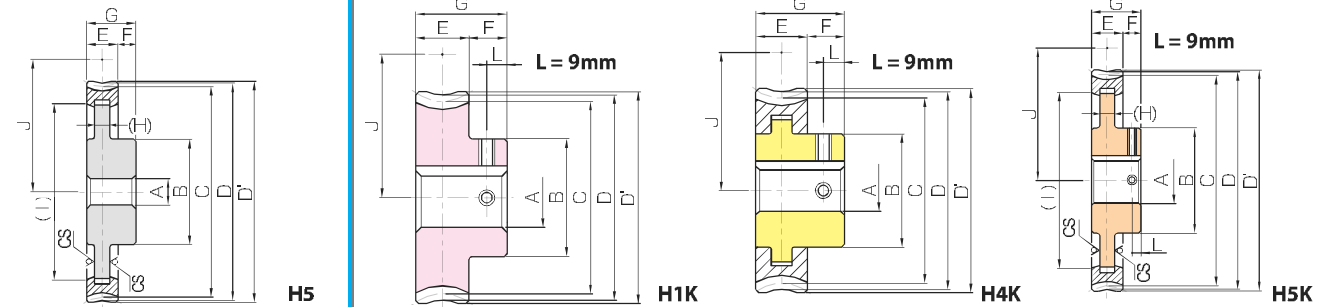
H1

H4

NOTE 1: Allowable torque based on worm speed (rpm)

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	A _{H7}	B	C	D	D'	E	F	G	(H)	(I)	J	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)
																		30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm		
																		30	100	300	600	900	1200	1800		
AG3-20R1	20	20	1	3°54'	R	H1	50	60	66	69							52	59.5	48.8	38.0	30.9	27.0	24.7	20.9	0.16~0.29	0.75
AG3-20R2	10	20	2	7°46'	R	H1	50	60	66	69							52	58.7	46.9	35.1	28.4	24.5	22.2	18.5		0.75
AG3-30R1	30	30	1	3°54'	R	H4	55	90	96	99							67	126	104.3	82.4	68.4	59.9	54.5	46.9		1.46
AG3-30R2	15	30	2	7°46'	R	H4	55	90	96	99							67	125	102	77.6	62.8	55.1	49.7	42.2		1.46
AG3-30R3	10	30	3	11°34'	R	H4	55	90	96	99	25	18	43				67	129	103	77.1	62.4	53.8	48.7	40.6		1.46
AG3-40R1	40	40	1	3°54'	R	H5	65	120	126	129						(10)	(103)	82	215	179	143	120	106	96.4	82.5	2.03
AG3-45R3	15	45	3	11°34'	R	H5	70	135	141	144						(11)	(120)	89.5	274	224	171	138	121	109	92.6	2.44
AG3-50R1	50	50	1	3°54'	R	H5	75	150	156	159						(15)	(130)	97	325	270	219	185	163	150	128	3.22
AG3-60R1	60	60	1	3°54'	R	H5	85	180	186	189						(15)	(155)	112	455	380	308	261	233	213	183	4.52
AG4-20R1	20	20	1	3°41'	R	H1	60	80	88	92							71	115	93.6	72.7	58.2	51.1	45.7	38.4		1.53
AG4-20R2	10	20	2	7°21'	R	H1	60	80	88	92							71	114	90.0	67.2	53.5	46.4	41.2	34.1		1.53
AG4-30R1	30	30	1	3°41'	R	H4	65	120	128	132							91	244	200	158	129	114	101	86.3		3.00
AG4-30R2	15	30	2	7°21'	R	H4	65	120	128	132							91	242	196	148	118	104	92.2	77.6		3.00
AG4-30R3	10	30	3	10°57'	R	H4	65	120	128	132	30	20	50				91	250	198	147	117	102	90.2	74.7		3.00
AG4-40R1	40	40	1	3°41'	R	H5	80	160	168	172						(15)	(133)	111	417	343	274	226	200	179	152	4.32
AG4-45R3	15	45	3	10°57'	R	H5	90	180	188	192						(16)	(153)	121	531	430	326	259	229	202	170	5.44
AG4-50R1	50	50	1	3°41'	R	H5	90	200	208	212						(16)	(173)	131	630	519	418	347	309	277	236	6.25
AG4-60R1	60	60	1	3°41'	R	H5	100	240	248	252						(17)	(210)	151	881	730	589	491	441	395	337	8.74

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.
② There may be space in the casting between the two materials, but it will not affect the joint strength.



H5

H1K

H4K

H5K

To order J Series products, please specify; Catalog No. + J + BORE

Bore H7	* The product shapes of J Series items are identified by background color.											
	20	22	25	28	30	32	35	40	45	50		
	6 × 2.8			8 × 3.3			10 × 3.3		12 × 3.3		14 × 3.8	
Screw size	M5			M6			M8		M10			
Catalog No.	H1K		H1K		H1K		H1K		H1K		H1K	
AG3-20R1 J BORE	H1K	H1K	H1K	H1K	H1K							
AG3-20R2 J BORE	H1K	H1K	H1K	H1K	H1K							
AG3-30R1 J BORE	H4K	H4K	H4K	H4K	H4K	H4K						
AG3-30R2 J BORE	H4K	H4K	H4K	H4K	H4K	H4K						
AG3-30R3 J BORE	H4K	H4K	H4K	H4K	H4K	H4K						
AG3-40R1 J BORE	H5K	H5K	H5K	H5K	H5K	H5K	H5K					
AG3-45R3 J BORE	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K				
AG3-50R1 J BORE	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K			
AG3-60R1 J BORE	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K		

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.

[Caution on J series] ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
④ Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap.
⑤ For products having a tapped hole, a set screw is included.

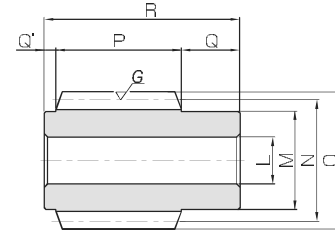


SWG Ground Worms

Module 5, 6



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	50 ~ 60HRC
Surface treatment	Black oxide coated except for ground part



W3

Catalog No.	Axial module	Number of starts	Lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L _{H7}	M	N	O	P	Q	Q'
SWG5-R1	m5	1	4°05'	R	W3	25	56	70	80	85	30	5
SWG5-R2		2	8°08'	R	W3	25	56	70	80	85	30	5
SWG6-R1	m6	1	4°17'	R	W3	30	63	80	92	100	35	5
SWG6-R2		2	8°32'	R	W3	30	63	80	92	100	35	5

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 362 for more details.

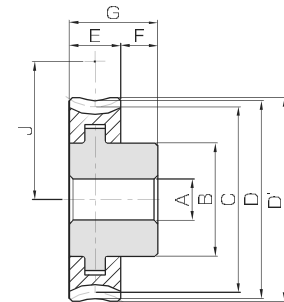


AG Worm Wheels

Module 5, 6



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A/B/C2) *
Heat treatment	—
Tooth hardness	—



H4

* H4, H5 shape have a hub made from FC200 cast iron.
FC200's tensile strength (200N/mm²) is derived from test specimens and does not represent that of the boss.

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B	C	D	D'	E
AG5-20R1	20	m5	20	1	4°05'	R	H4	22	75	100	110	115	35
AG5-20R2	10		20	2	8°08'	R	H4	22	75	100	110	115	35
AG5-30R1	30		30	1	4°05'	R	H5	22	75	150	160	165	35
AG5-30R2	15		30	2	8°08'	R	H5	22	75	150	160	165	35
AG5-40R1	40		40	1	4°05'	R	H5	22	110	200	210	215	35
AG5-50R1	50		50	1	4°05'	R	H5	22	120	250	260	265	35
AG5-60R1	60	60	1	4°05'	R	H5	22	130	300	310	315	35	
AG6-20R1	20	m6	20	1	4°17'	R	H4	25	85	120	132	138	40
AG6-20R2	10		20	2	8°32'	R	H4	25	85	120	132	138	40
AG6-30R1	30		30	1	4°17'	R	H5	25	100	180	192	198	40
AG6-30R2	15		30	2	8°32'	R	H5	25	100	180	192	198	40
AG6-40R1	40		40	1	4°17'	R	H5	25	120	240	252	258	40
AG6-50R1	50		50	1	4°17'	R	H5	25	130	300	312	318	40
AG6-60R1	60	60	1	4°17'	R	H5	25	150	360	372	378	40	

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.

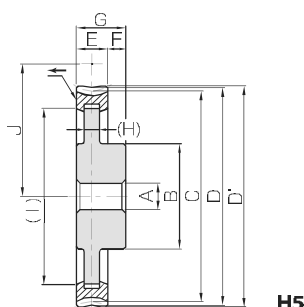
② There may be space in the casting between the two materials, but it will not affect the joint strength.

Total length R	Set Screw		Weight (kg)	Catalog No.
	Size	S		
120	—	—	2.78	SWG5-R1
120	—	—	2.78	SWG5-R2
140	—	—	4.15	SWG6-R1
140	—	—	4.15	SWG6-R2

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

AG

Worm Wheels



H5



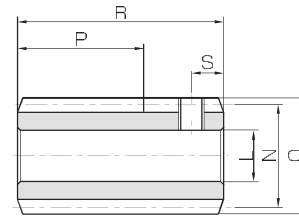
NOTE 1. Allowable torques based on worm speed (rpm)

Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
					30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}	1800 _{rpm}			
25	60	—	—	85	202	163	127	101	88.4	79.0	65.5	0.22~0.35	2.79	AG5-20R1
25	60	—	—	85	200	157	117	93.2	80.2	71.1	58.1	0.22~0.35	2.79	AG5-20R2
25	60	(21)	(120)	110	427	348	275	224	196	175	147	0.22~0.35	4.75	AG5-30R1
25	60	(21)	(120)	110	425	340	259	206	180	159	132	0.22~0.35	4.75	AG5-30R2
25	60	(23)	(168)	135	731	597	478	394	346	309	259	0.22~0.35	8.84	AG5-40R1
25	60	(23)	(215)	160	1110	903	729	605	534	479	402	0.22~0.35	12.7	AG5-50R1
25	60	(24)	(260)	185	1550	1270	1030	855	763	682	575	0.22~0.35	17.6	AG5-60R1
30	70	—	—	100	315	252	196	157	135	121	99.6	0.24~0.37	4.53	AG6-20R1
30	70	—	—	100	314	244	182	145	124	110	89.3	0.24~0.37	4.53	AG6-20R2
30	70	(26)	(142)	130	666	538	424	346	300	267	224	0.24~0.37	8.52	AG6-30R1
30	70	(26)	(142)	130	668	532	403	321	278	246	203	0.24~0.37	8.52	AG6-30R2
30	70	(30)	(200)	160	1140	923	738	609	528	472	394	0.24~0.37	14.2	AG6-40R1
30	70	(30)	(258)	190	1720	1400	1130	935	816	733	611	0.24~0.37	21.0	AG6-50R1
30	70	(30)	(312)	220	2410	1960	1580	1320	1170	1040	875	0.24~0.37	29.7	AG6-60R1

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- ② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.



Specifications	
Precision grade	KHK W 001 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coating



W2

Catalog No.	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore		Hub dia.	Pitch dia.	Outside dia.	Face width		Hub width (R)		Hub width (L)	
						L-B	M				N	O	P	Q	Q'	
SW0.5-R1	m0.5	1	2°36'	R	W2	5	—	—	11	12	(10)	—	—	—	—	—
SW0.5-R2		2	5°13'	R	W2	5	—	—	11	12	(10)	—	—	—	—	—
SW0.8-R1	m0.8	1	3°17'	R	W2	6	—	—	14	15.6	(18)	—	—	—	—	—
SW0.8-R2		2	6°34'	R	W2	6	—	—	14	15.6	(18)	—	—	—	—	—

- [Caution on Product Characteristics]
- For W2-shaped products, a set screw is included. When setting up the mating wheel, make sure no friction occurs within the set screw.
 - These worms produce axial thrust forces. See Page 362 for more details.

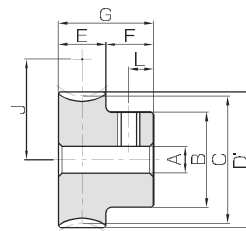
Total length	Set Screw		Weight (kg)	Catalog No.
	R	S		
18	M3	3	0.010	SW0.5-R1
18	M3	3	0.010	SW0.5-R2
30	M4	5	0.029	SW0.8-R1
30	M4	5	0.029	SW0.8-R2

- [Caution on Secondary Operations]
- Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
 - Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat treating as it will create bad tooth contact causing abrasion of the wheel.

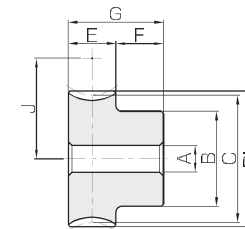
BG Bronze Worm Wheels



Specifications	
Precision grade	KHK W 002 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC502 (formerly JIS PBC2)
Heat treatment	—
Tooth hardness	—



HAT



HA



Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore		Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B					
BG0.5-20R1	20	m0.5	20	1	2°36'	R	HAT	4	9	10.01	—	11	5	
BG0.5-20R2	10		20	2	5°13'	R	HAT	4	9	10.04	—	11	5	
BG0.5-30R1	30		30	1	2°36'	R	HAT	4	12	15.02	—	16	5	
BG0.5-30R2	15		30	2	5°13'	R	HAT	4	12	15.06	—	16	5	
BG0.5-40R1	40		40	1	2°36'	R	HAT	5	15	20.02	—	21	5	
BG0.5-50R1	50	m0.8	50	1	2°36'	R	HAT	5	20	25.03	—	26	5	
BG0.5-60R1	60		60	1	2°36'	R	HAT	5	25	30.03	—	31	5	

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore		Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B					
BG0.8-20R1	20	m0.8	20	1	3°17'	R	HA	5	12	16.03	—	17.6	9	
BG0.8-20R2	10		20	2	6°34'	R	HA	5	12	16.11	—	17.6	9	
BG0.8-30R1	30		30	1	3°17'	R	HA	5	18	24.04	—	25.6	9	
BG0.8-30R2	15		30	2	6°34'	R	HA	5	18	24.16	—	25.6	9	
BG0.8-40R1	40		40	1	3°17'	R	HA	6	20	32.05	—	33.6	9	
BG0.8-50R1	50	m0.8	50	1	3°17'	R	HA	8	25	40.06	—	41.6	9	
BG0.8-60R1	60		60	1	3°17'	R	HA	8	25	48.08	—	49.6	9	

- [Caution on Product Characteristics]
- Worm Wheels are profile shifted to create the proper center distance.
 - For products with a tapped hole, a set screw is included.
 - The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.
 - If bore size is less than φ 4, the diameter tolerance is H8. If bore size is φ 5 or φ 6, and the hole length exceeds 3 times the diameter, the tolerance is also H8.

NOTE 1 : Allowable torque based on worm speed (rpm)

Hub width	Total length	Mounting distance	Set Screw		Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			Size	L	30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}			
F	G	J	M3	3.5	0.27	0.23	0.19	0.15	0.14	0.13	0~0.16	0.0061	BG0.5-20R1
7	12	10.5	M3	3.5	0.28	0.23	0.18	0.15	0.13	0.12	0~0.16	0.0061	BG0.5-20R2
7	12	13	M3	3.5	0.58	0.50	0.41	0.34	0.30	0.28	0~0.16	0.014	BG0.5-30R1
7	12	13	M3	3.5	0.59	0.49	0.39	0.32	0.29	0.26	0~0.16	0.014	BG0.5-30R2
7	12	15.5	M4	3.5	0.99	0.85	0.71	0.60	0.54	0.50	0~0.16	0.023	BG0.5-40R1
7	12	18	M4	3.5	1.50	1.28	1.08	0.92	0.83	0.77	0~0.16	0.039	BG0.5-50R1
7	12	20.5	M4	3.5	2.10	1.80	1.52	1.31	1.19	1.09	0~0.16	0.059	BG0.5-60R1

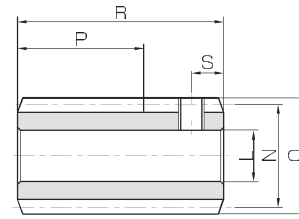
NOTE 1 : Allowable torque based on worm speed (rpm)

Hub width	Total length	Mounting distance	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}			
9	18	15	1.05	0.88	0.71	0.58	0.52	0.48	0.04~0.22	0.023	BG0.8-20R1
9	18	15	1.06	0.86	0.66	0.54	0.48	0.44	0.04~0.22	0.023	BG0.8-20R2
9	18	19	2.23	1.89	1.53	1.29	1.15	1.06	0.04~0.22	0.055	BG0.8-30R1
9	18	19	2.24	1.87	1.46	1.20	1.07	0.98	0.04~0.22	0.055	BG0.8-30R2
9	18	23	3.81	3.24	2.67	2.26	2.02	1.87	0.04~0.22	0.087	BG0.8-40R1
9	18	27	5.76	4.90	4.07	3.47	3.13	2.90	0.04~0.22	0.13	BG0.8-50R1
9	18	31	8.06	6.88	5.73	4.90	4.46	4.12	0.04~0.22	0.18	BG0.8-60R1

- [Caution on Secondary Operations]
- Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	KHK W 001 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coating



W2

Catalog No.	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore		Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)		Hub width (L)
						L _{H7(H8)}	M					N	O	
SW1-R1	m1	1	3°35'	R	W2	6 H8	—	—	16	18	(20)	—	—	—
SW1-R2		2	7°11'	R	W2	6 H8	—	—	16	18	(20)	—	—	—
SW1.25-R1	m1.25	1	3°25'	R	W2	8	—	—	21	23.5	(25)	—	—	—
SW1.25-R2		2	6°50'	R	W2	8	—	—	21	23.5	(25)	—	—	—

[Caution on Product Characteristics] ① For W2-shaped products, a set screw is included. When setting up the mating wheel, make sure no friction occurs within the set screw.
② These worms produce axial thrust forces. See Page 362 for more details.

Total length	Set Screw		Weight (kg)	Catalog No.
	Size	S		
32	M4	5	0.043	SW1-R1
32	M4	5	0.043	SW1-R2
37	M5	5	0.085	SW1.25-R1
37	M5	5	0.085	SW1.25-R2

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat treating as it will create bad tooth contact causing abrasion of the wheel.

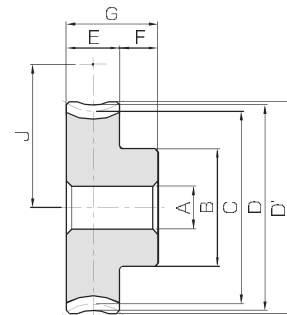
BG • CG Bronze Worm Wheels & Gray Iron Worm Wheels J Series



Specifications	
Catalog No.	BG CG
Precision grade	KHK W 002 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC502 (formerly JIS PBC2) FC200 **
Heat treatment	—
Tooth hardness	—

* The precision grade of J Series products is equivalent to the value shown in the table.
** * FC200's tensile strength (200N/mm²) is derived from test specimens and differs according to the product shape.

A _{H7}	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
E	Face width
F	Hub width
G	Total length
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance



H1

NOTE 1: Allowable torque based on worm speed (rpm)

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle Hand thread	Shape	A _{H7}	B	C	D	D'	E	F	G	J	Allowable torque (N·m) NOTE1						Backlash (mm)	Weight (kg)
															30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}		
BG1-20R1	20	20	1	3°35'	R H1	6	16	20.05	22	23				18	1.89	1.58	1.26	1.04	0.92	0.85	0.06~0.24	0.043
BG1-20R2	30	30	1	7°11'		6	16	20.16	22	23				18	1.90	1.54	1.18	0.97	0.85	0.78	0.043	
BG1-30R1	30	30	1	3°35'		6	20	30.07	32	33	10	10	20	23	4.00	3.38	2.74	2.29	2.05	1.87	0.089	
BG1-30R2	15	30	2	7°11'		6	20	30.24	32	33				23	4.03	3.35	2.62	2.14	1.91	1.74	0.089	
BG1-40R1	40	40	1	3°35'		8	26	40.08	42	43				28	6.85	5.79	4.76	4.03	3.61	3.31	0.15	
BG1-50R1	50	50	1	3°35'		8	30	50.1	52	53				33	10.3	8.76	7.27	6.18	5.58	5.14	0.23	
BG1.25-20R1	20	20	1	3°25'		6	20	25.04	27.5	28.75				23	3.19	2.65	2.10	1.72	1.53	1.40	0.070	
BG1.25-20R2	10	20	2	6°50'		6	20	25.18	27.5	28.75				23	3.19	2.58	1.96	1.60	1.40	1.27	0.070	
BG1.25-30R1	30	30	1	3°25'		6	25	37.57	40	41.25	11	9	20	29.25	6.75	5.67	4.56	3.81	3.40	3.09	0.15	
BG1.25-30R2	15	30	2	6°50'		6	25	37.77	40	41.25				29.25	6.77	5.60	4.33	3.54	3.16	2.85	0.15	
BG1.25-40R1	40	40	1	3°25'		8	30	50.09	52.5	53.75				35.5	11.5	9.71	7.92	6.70	5.98	5.47	0.24	
BG1.25-50R1	50	50	1	3°25'		8	40	62.61	65	66.25				41.75	17.4	14.7	12.1	10.3	9.25	8.49	0.40	
CG1-60R1	60	60	1	3°35'	R H1	10	30	60.12	62	63	10	10	20	38	8.69	7.39	6.14	5.24	4.78	4.39	0.25	
CG1-80R1	80	80				10	35	80.16	82	83					48	14.7	12.6	10.5	9.11	8.30	7.72	0.43
CG1-100R1	100	100				10	40	100.2	102	103					58	21.9	19.0	16.0	13.9	12.7	11.9	0.66
CG1-120R1	120	120				10	40	120.24	122	123					68	30.5	26.7	22.5	19.6	18.0	16.7	0.91

[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.
② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.
③ If bore size is less than φ 4, the diameter tolerance is H8. If bore size is φ 5 or φ 6, and the hole length exceeds 3 times the diameter, the tolerance is also H8.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

J Series Bronze Worm Wheels & Gray Iron Worm Wheels

H1T H1K

To order J Series products, please specify; Catalog No. + J + BORE

Bore H7	* The product shapes of J Series items are identified by background color.											
	6	8	10	12	14	15	16	17	18	19	20	22
Keyway Js9	—											
Screw size	4 x 1.8			5 x 2.3				6 x 2.8				
Catalog No.	M4	M5	M4				M5					
BG1-20R1 J Bore	H1T											
BG1-20R2 J Bore	H1T											
BG1-30R1 J Bore	H1T	H1T										
BG1-30R2 J Bore	H1T	H1T										
BG1-40R1 J Bore		H1T	H1K	H1K								
BG1-50R1 J Bore		H1T	H1K	H1K	H1K	H1K	H1K	H1K				
BG1.25-20R1 J Bore	H1T	H1T										
BG1.25-20R2 J Bore	H1T	H1T										
BG1.25-30R1 J Bore	H1T	H1T	H1K	H1K								
BG1.25-30R2 J Bore	H1T	H1T	H1K	H1K								
BG1.25-40R1 J Bore		H1T	H1K	H1K	H1K	H1K	H1K	H1K				
BG1.25-50R1 J Bore		H1T	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K
CG1-60R1 J Bore			H1K	H1K	H1K	H1K	H1K	H1K				
CG1-80R1 J Bore			H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K
CG1-100R1 J Bore			H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K
CG1-120R1 J Bore			H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K

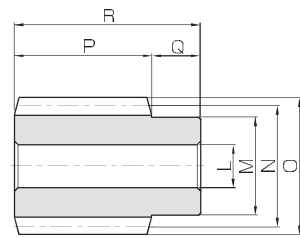
[Caution on J series] ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
④ Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap.
⑤ For products having a tapped hole, a set screw is included.
⑥ When using H1T set screws for fastening gears to a shaft, only use this method for light loads. For secure fastening, please use dowel pins in combination.

You can download CAD data (DXF format) of KHK Products from the Web Catalog.



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coating

* The precision grade of J Series products is equivalent to the value shown in the table.

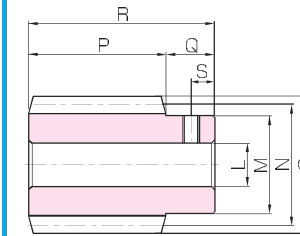


W1

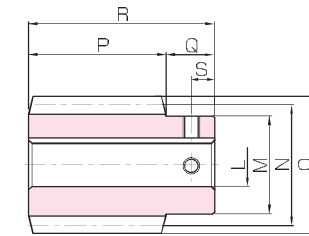
Catalog No. ● J Series (Available-on-request)	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L _{H7}	M	N	O	P	Q	Q'
SW1.5-R1 ● SW1.5-R1J8 ● SW1.5-R1J10	m1.5	1	3°26'	R	W1 W1T W1K	8	20	25	28	30	10	—
8						20	25	28	30	10	—	
SW1.5-R2 ● SW1.5-R2J8 ● SW1.5-R2J10	m1.5	2	6°54'	R	W1 W1T W1K	8	20	25	28	30	10	—
8						20	25	28	30	10	—	

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 362 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat treating as it will create bad tooth contact causing abrasion of the wheel.



W1T



W1K



Total length	Keyway	Set Screw		Weight (kg)	Catalog No. ● J Series (Available-on-request)
		Size	S		
40	4 x 1.8	M5	5	0.12	SW1.5-R1 ● SW1.5-R1J8 ● SW1.5-R1J10
		M4	5	0.11	
40	4 x 1.8	M5	5	0.12	SW1.5-R2 ● SW1.5-R2J8 ● SW1.5-R2J10
		M4	5	0.11	

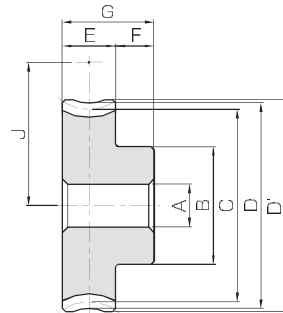
[Caution on J series] ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
④ Areas of products which have been re-worked will not be black oxide coated.
⑤ For products having a tapped hole, a set screw is included.



Specifications	
Catalog No.	BG CG
Precision grade	KHK W 002 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC502 (formerly JIS PBC2) FC200 **
Heat treatment	—
Tooth hardness	—

* The precision grade of J Series products is equivalent to the value shown in the table.
** FC200's tensile strength (200N/mm²) is derived from test specimens and differs according to the product shape.

A _{H7}	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
E	Face width
F	Hub width
G	Total length
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance



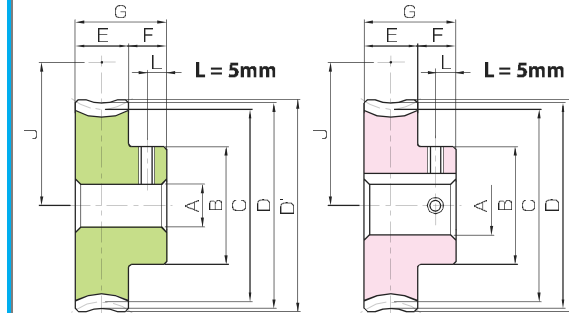
H1

NOTE 1: Allowable torque based on worm speed (rpm)

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	A _{H7}	B	C	D	D'	E	F	G	J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)
																30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm		
BG1.5-20R1	20	20	1	3°26'		R	8	22	30.05	33	34.5	12	22	27.5	4.76	3.96	3.10	2.56	2.27	2.06	0.10	0.08~0.26	
BG1.5-20R2	10	20	2	6°54'		R	8	22	30.22	33	34.5	12	22	27.5	4.75	3.85	2.89	2.38	2.08	1.87	0.10		
BG1.5-30R1	30	30	1	3°26'		R	10	30	45.08	48	49.5	12	22	35	10.1	8.47	6.72	5.67	5.03	4.55	0.22		
BG1.5-30R2	15	30	2	6°54'		R	10	30	45.33	48	49.5	12	22	35	10.1	8.37	6.40	5.26	4.67	4.20	0.22		
BG1.5-40R1	40	40	1	3°26'		R	12	30	60.11	63	64.5	12	22	42.5	17.2	14.5	11.7	9.96	8.86	8.04	0.35		
BG1.5-50R1	50	50	1	3°26'		R	12	40	75.13	78	79.5	14	24	50	30.4	25.6	20.8	17.8	16.0	14.6	0.65		
CG1.5-30R1	30	30	1	3°26'		R	10	30	45.08	48	49.5	12	22	35	6.04	5.08	4.03	3.40	3.02	2.73	0.18		
CG1.5-40R1	40	40	1	3°26'		R	12	30	60.11	63	64.5	12	22	42.5	10.3	8.71	7.01	5.98	5.31	4.83	0.28		
CG1.5-50R1	50	50	1	3°26'		R	12	40	75.13	78	79.5	14	24	50	18.2	15.4	12.5	10.7	9.59	8.74	0.53		
CG1.5-60R1	60	60	1	3°26'		R	12	40	90.16	93	94.5	14	24	57.5	25.5	21.6	17.6	15.1	13.7	12.4	0.73		
CG1.5-80R1	80	80	1	3°26'		R	15	50	120.22	123	124.5	14	24	72.5	43.1	36.8	30.1	26.3	23.8	21.9	1.28		
CG1.5-100R1	100	100	1	3°26'		R	15	50	150.27	153	154.5	14	24	87.5	64.4	55.6	45.8	40.1	36.4	33.6	1.93		

[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.
② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.



H1T

H1K



To order J Series products, please specify; Catalog No. + J + BORE

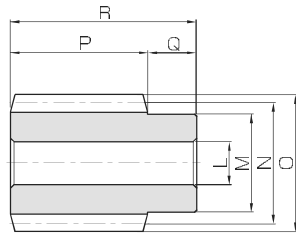
Bore H7	* The product shapes of J Series items are identified by background color.																												
	8	10	12	14	15	16	17	18	19	20	22	25	28	30															
Keyway Js9	8		10		12		14		15		16		17		18		19		20		22		25		28		30		
Screw size	—				4 x 1.8				5 x 2.3				6 x 2.8				8 x 3.3												
Catalog No.	M5		M4				M5				M6																		
BG1.5-20R1 J BORE	H1T	H1K																											
BG1.5-20R2 J BORE	H1T	H1K																											
BG1.5-30R1 J BORE		H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K																			
BG1.5-30R2 J BORE		H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K																			
BG1.5-40R1 J BORE			H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K																			
BG1.5-50R1 J BORE				H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
CG1.5-30R1 J BORE		H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K																			
CG1.5-40R1 J BORE			H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K																			
CG1.5-50R1 J BORE				H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
CG1.5-60R1 J BORE					H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
CG1.5-80R1 J BORE						H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K
CG1.5-100R1 J BORE							H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K

[Caution on J series] ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
④ Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap.
⑤ For products having a tapped hole, a set screw is included.
⑥ When using H1T set screws for fastening gears to a shaft, only use this method for applications with the usage for light loads. For secure fastening, please use dowel pins in combination.



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30'
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coating

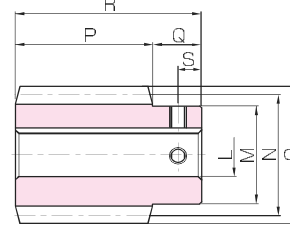
* The precision grade of J Series products is equivalent to the value shown in the table.



W1

Catalog No.	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore ϕ L _{H7}	Hub dia. ϕ M	Pitch dia. ϕ N	Outside dia. ϕ O	Face width ϕ P	Hub width (R) ϕ Q	Hub width (L) ϕ Q'
SW2-R1 • J Series (Available-on-request) SW2-R1J12 SW2-R1J14	m2	1	3°42'	R	W1	12	25	31	35	32	14	—
					W1K	12	25	31	35	32	14	—
					W1K	12	25	31	35	32	14	—
					W1K	14	25	31	35	32	14	—
SW2-R2 SW2-R2J12 SW2-R2J14	m2	2	7°25'	R	W1	12	25	31	35	32	14	—
					W1K	12	25	31	35	32	14	—
					W1K	12	25	31	35	32	14	—
					W1K	14	25	31	35	32	14	—
SW2-L1 SW2-L1J12 SW2-L1J14	m2	1	3°42'	L	W1	12	25	31	35	32	14	—
					W1K	12	25	31	35	32	14	—
					W1K	12	25	31	35	32	14	—
					W1K	14	25	31	35	32	14	—
SW2-L2 SW2-L2J12 SW2-L2J14	m2	2	7°25'	L	W1	12	25	31	35	32	14	—
					W1K	12	25	31	35	32	14	—
					W1K	12	25	31	35	32	14	—
					W1K	14	25	31	35	32	14	—

(Caution on Product Characteristics) ① These worms produce axial thrust forces. See Page 362 for more details.



W1K



Total length	Keyway	Set Screw	Weight	Catalog No.
R	Width×Depth	Size S	(kg)	• J Series (Available-on-request)
46	4 x 1.8 5 x 2.3	M4 7 M4 7	0.20 0.20 0.18	SW2-R1 SW2-R1J12 SW2-R1J14
46	4 x 1.8 5 x 2.3	M4 7 M4 7	0.20 0.20 0.18	SW2-R2 SW2-R2J12 SW2-R2J14
46	4 x 1.8 5 x 2.3	M4 7 M4 7	0.20 0.20 0.18	SW2-L1 SW2-L1J12 SW2-L1J14
46	4 x 1.8 5 x 2.3	M4 7 M4 7	0.20 0.20 0.18	SW2-L2 SW2-L2J12 SW2-L2J14

(Caution on Secondary Operations)

- Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat treating as it will create bad tooth contact causing abrasion of the wheel.

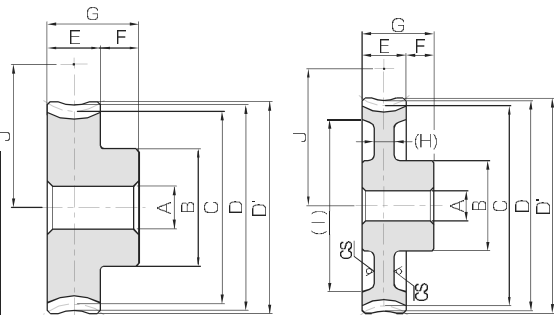
(Caution on J series)

- As available-on-request products, requires a lead-time for shipping within **2 working-days** (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
- Keyways are made according to JIS B1301 standards, Js9 tolerance.
- Areas of products which have been re-worked will not be black oxide coated.
- For products having a tapped hole, a set screw is included.



Specifications		
Catalog No.	BG	CG
Precision grade	KHK W 002 grade 4 *	
Reference section of gear	Normal plane	
Gear teeth	Standard full depth	
Normal pressure angle	14° 30'	
Material	CAC502 (formerly JIS PBC2)	FC200 **
Heat treatment	—	
Tooth hardness	—	

* The precision grade of J Series products is equivalent to the value shown in the table.
** FC200's tensile strength (200N/mm²) is derived from test specimens and differs according to the product shape.



H1

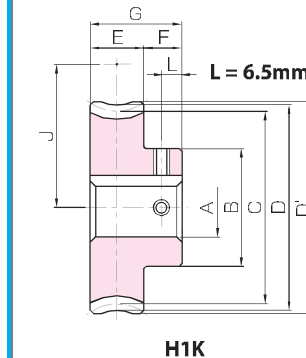
HB

**CS has a sand mold casting finish.

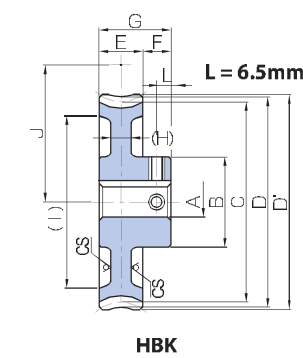
NOTE 1: Allowable torque based on worm speed (rpm)

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	A _{H7}	B	C	D	D'	E	F	G	(H)	(I)	J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)												
																		300 rpm								600 rpm						1200 rpm					
																		30	100	300	600	900	1200			30	100	300	600	900	1200	30	100	300	600	900	1200
BG2-20R1	20	20	1	3°42'	R	H1	33	40.08	44	46	—	—	35.5	7.38	6.15	4.80	3.95	3.47	3.15	0.33	0.27																
BG2-20R2	10	20	2	7°25'	R	H1	33	40.34	44	46	—	—	35.5	7.40	6.00	4.51	3.69	3.19	2.88	0.33	0.27																
BG2-20L1	20	20	1	3°42'	L	H1	33	40.08	44	46	—	—	35.5	7.38	6.15	4.80	3.95	3.47	3.15	0.33	0.27																
BG2-20L2	10	20	2	7°25'	L	H1	33	40.34	44	46	—	—	35.5	7.40	6.00	4.51	3.69	3.19	2.88	0.33	0.27																
CG2-20R1	20	20	1	3°42'	R	H1	40	60.13	64	66	—	—	45.5	15.6	13.1	10.4	8.74	7.70	6.96	0.57	0.57																
CG2-20R2	10	20	2	7°25'	R	H1	40	60.51	64	66	—	—	45.5	15.7	13.1	9.96	8.15	7.18	6.45	0.57	0.57																
CG2-30R1	30	30	1	3°42'	R	H1	45	80.17	84	86	—	—	55.5	26.7	22.5	18.1	15.4	13.55	12.3	0.96	0.96																
CG2-30R2	15	30	2	7°25'	R	H1	45	80.17	84	86	—	—	55.5	26.7	22.5	18.1	15.4	13.55	12.3	0.96	0.96																
CG2-40R1	40	40	1	3°42'	R	H1	45	80.17	84	86	—	—	55.5	26.7	22.5	18.1	15.4	13.55	12.3	0.96	0.96																
CG2-50R1	50	50	1	3°42'	R	HB	48	100.21	104	106	(7)	(88)	65.5	40.3	34.1	27.6	23.6	21.0	19.1	1.01	1.01																
CG2-50R2	25	50	2	7°25'	R	HB	48	100.84	104	106	(7)	(88)	65.5	40.7	34.0	26.9	22.4	19.6	17.8	1.01	1.01																
CG2-60R1	60	60	1	3°42'	R	HB	60	120.25	124	126	(7)	(108)	75.5	56.4	47.9	38.9	33.3	29.9	27.2	1.44	1.44																
CG2-20L1	20	20	1	3°42'	L	H1	33	40.08	44	46	—	—	35.5	7.38	6.15	4.80	3.95	3.47	3.15	0.33	0.27																
CG2-20L2	10	20	2	7°25'	L	H1	33	40.34	44	46	—	—	35.5	7.40	6.00	4.51	3.69	3.19	2.88	0.33	0.27																
CG2-30L1	30	30	1	3°42'	L	H1	40	60.13	64	66	—	—	45.5	15.6	13.1	10.4	8.74	7.70	6.96	0.57	0.57																
CG2-30L2	15	30	2	7°25'	L	H1	40	60.51	64	66	—	—	45.5	15.7	13.1	9.96	8.15	7.18	6.45	0.57	0.57																
CG2-40L1	40	40	1	3°42'	L	H1	45	80.17	84	86	—	—	55.5	26.7	22.5	18.1	15.4	13.55	12.3	0.96	0.96																
CG2-50L1	50	50	1	3°42'	L	HB	48	100.21	104	106	(7)	(88)	65.5	40.3	34.1	27.6	23.6	21.0	19.1	1.01	1.01																
CG2-50L2	25	50	2	7°25'	L	HB	48	100.84	104	106	(7)	(88)	65.5	40.7	34.0	26.9	22.4	19.6	17.8	1.01	1.01																
CG2-60L1	60	60	1	3°42'	L	HB	60	120.25	124	126	(7)	(108)	75.5	56.4	47.9	38.9	33.3	29.9	27.2	1.44	1.44																

* Please see Page 394 for Cautions on Product Characteristics and Cautions on Performing Secondary Operations.



H1K



HBK

To order J Series products, please specify; Catalog No. + J + BORE

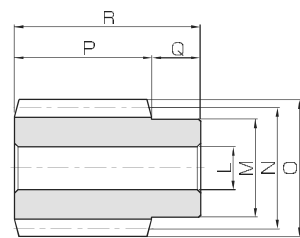
Bore H7		* The product shapes of J Series items are identified by background color.																				
Keyway Js9	12	14	15	16	17	18	19	20	22	25	28	30	32	35								
Screw size	4 x 1.8	5 x 2.3						6 x 2.8			8 x 3.3			10 x 3.3								
Catalog No.	M4											M5			M6			M8				
BG2-20R1 J BORE	H1K	H1K	H1K	H1K	H1K																	
BG2-20R2 J BORE	H1K	H1K	H1K	H1K	H1K																	
BG2-20L1 J BORE	H1K	H1K	H1K	H1K	H1K																	
BG2-20L2 J BORE	H1K	H1K	H1K	H1K	H1K																	
CG2-20R1 J BORE	H1K	H1K	H1K	H1K	H1K																	
CG2-20R2 J BORE	H1K	H1K	H1K	H1K	H1K																	
CG2-30R1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K													
CG2-30R2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K													
CG2-40R1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K												
CG2-50R1 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK								
CG2-50R2 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK					
CG2-60R1 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK
CG2-20L1 J BORE	H1K	H1K	H1K	H1K	H1K																	
CG2-20L2 J BORE	H1K	H1K	H1K	H1K	H1K																	
CG2-30L1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K													
CG2-30L2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K									
CG2-40L1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K											
CG2-50L1 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK
CG2-50L2 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK
CG2-60L1 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK

* For [Caution on J Series], please see Page 395.



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coating

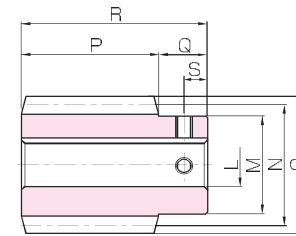
* The precision grade of J Series products is equivalent to the value shown in the table.



W1

Catalog No.	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width (R)		Hub width (L)
						L _{H7}	M				Q	Q'	
SW2.5-R1 SW2.5-R1J15 SW2.5-R1J16 SW2.5-R1J17	m2.5	1	3°52'	R	W1	15	30	37	42	45	18	—	
W1K W1K W1K													
SW2.5-R2 SW2.5-R2J15 SW2.5-R2J16 SW2.5-R2J17		2	7°46'	R	W1	15	30	37	42	45	18	—	
W1K W1K W1K													
SW2.5-L1 SW2.5-L1J15 SW2.5-L1J16 SW2.5-L1J17		1	3°52'	L	W1	15	30	37	42	45	18	—	
W1K W1K W1K													
SW2.5-L2 SW2.5-L2J15 SW2.5-L2J16 SW2.5-L2J17		2	7°46'	L	W1	15	30	37	42	45	18	—	
W1K W1K W1K													

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 362 for more details.



W1K



Total length	Keyway	Set Screw		Weight (kg)	Catalog No.
		Width×Depth	Size		
63	—	5 × 2.3	M4	9	SW2.5-R1 SW2.5-R1J15 SW2.5-R1J16 SW2.5-R1J17
		5 × 2.3	M4	9	
		5 × 2.3	M4	9	
63	—	5 × 2.3	M4	9	SW2.5-R2 SW2.5-R2J15 SW2.5-R2J16 SW2.5-R2J17
		5 × 2.3	M4	9	
		5 × 2.3	M4	9	
63	—	5 × 2.3	M4	9	SW2.5-L1 SW2.5-L1J15 SW2.5-L1J16 SW2.5-L1J17
		5 × 2.3	M4	9	
		5 × 2.3	M4	9	
63	—	5 × 2.3	M4	9	SW2.5-L2 SW2.5-L2J15 SW2.5-L2J16 SW2.5-L2J17
		5 × 2.3	M4	9	
		5 × 2.3	M4	9	

[Caution on Secondary Operations]

- Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat treating as it will create bad tooth contact causing abrasion of the wheel.

[Caution on J series]

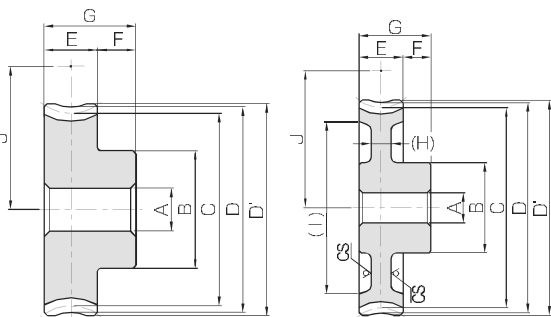
- As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- Keyways are made according to JIS B1301 standards, Js9 tolerance.
- Areas of products which have been re-worked will not be black oxide coated.
- For products having a tapped hole, a set screw is included.



Specifications		
Catalog No.	BG	CG
Precision grade	KHK W 002 grade 4 *	
Reference section of gear	Normal plane	
Gear teeth	Standard full depth	
Normal pressure angle	20°	
Material	CAC502 (formerly JIS PBC2)	FC200 **
Heat treatment	—	
Tooth hardness	—	

* The precision grade of J Series products is equivalent to the value shown in the table.
** FC200's tensile strength (200N/mm²) is derived from test specimens and differs according to the product shape.

A _{H7}	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
E	Face width
F	Hub width
G	Length
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance



H1

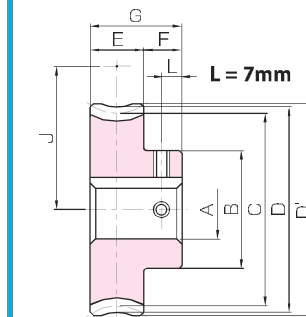
HB

**CS has a sand mold casting finish.

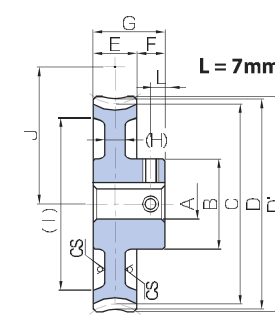
NOTE 1 : Allowable torque based on worm speed (rpm)

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	A _{H7}	B	C	D	D'	E	F	G	(H)	(I)	J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)					
																		30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm							
																										22	14	36		
BG2.5-20R1	20	1	1	3°52'	R	H1	12	35	50.11	55	57.5	22	14	36	—	—	43.5	21.5	17.7	13.8	11.4	9.94	9.07	0.49	0.40					
BG2.5-20R2	10	2	2	7°46'	R	H1	12	35	50.46	55	57.5							21.5	17.3	13.0	10.6	9.14	8.27							
BG2.5-20L1	20	1	1	3°52'	L	H1	12	40	50.11	80	82.5							21.5	17.7	13.8	11.4	9.94	9.07							
BG2.5-20L2	10	2	2	7°46'	L	H1	12	40	50.46	80	82.5							21.5	17.3	13.0	10.6	9.14	8.27							
CG2.5-20R1	20	20	1	3°52'	R	H1	12	35	50.11	55	57.5							—	—	43.5	12.9	10.6	8.30			6.83	5.97	5.44	0.13~0.31	1.46
CG2.5-20R2	10	20	2	7°46'	R	H1	12	35	50.46	55	57.5							—	—	43.5	12.9	10.4	7.78			6.36	5.49	4.96		
CG2.5-30R1	30	30	1	3°52'	R	H1	12	40	75.17	80	82.5							—	—	56	27.3	22.8	18.0			15.1	13.2	12.0		
CG2.5-30R2	15	30	2	7°46'	R	H1	12	40	75.68	80	82.5							—	—	56	27.5	22.5	17.2			14.1	12.3	11.1		
CG2.5-40R1	40	40	1	3°52'	R	HB	15	45	100.23	105	107.5	(9)	(86)	68.5	46.7	39.0	31.3	26.5	23.3	21.2										
CG2.5-50R1	50	50	1	3°52'	R	HB	15	50	125.29	130	132.5	(9)	(110)	81	70.6	59.0	47.8	40.7	36.1	33.0										
CG2.5-50R2	25	50	2	7°46'	R	HB	15	50	126.16	130	132.5	(9)	(110)	81	71.1	58.6	46.4	38.6	33.6	30.7										
CG2.5-60R1	60	60	1	3°52'	R	HB	15	55	150.34	155	157.5	(9)	(136)	93.5	98.8	82.9	67.3	57.6	51.5	47.0										
CG2.5-20L1	20	20	1	3°52'	L	H1	12	35	50.11	55	57.5	—	—	43.5	12.9	10.6	8.30	6.83	5.97	5.44	0.40	0.40								
CG2.5-20L2	10	20	2	7°46'	L	H1	12	35	50.46	55	57.5	—	—	43.5	12.9	10.4	7.78	6.36	5.49	4.96										
CG2.5-30L1	30	30	1	3°52'	L	H1	12	40	75.17	80	82.5	—	—	56	27.3	22.8	18.0	15.1	13.2	12.0										
CG2.5-30L2	15	30	2	7°46'	L	H1	12	40	75.68	80	82.5	—	—	56	27.5	22.5	17.2	14.1	12.3	11.1										
CG2.5-40L1	40	40	1	3°52'	L	HB	15	45	100.23	105	107.5	(9)	(86)	68.5	46.7	39.0	31.3	26.5	23.3	21.2										
CG2.5-50L1	50	50	1	3°52'	L	HB	15	50	125.29	130	132.5	(9)	(110)	81	70.6	59.0	47.8	40.7	36.1	33.0										
CG2.5-50L2	25	50	2	7°46'	L	HB	15	50	126.16	130	132.5	(9)	(110)	81	71.1	58.6	46.4	38.6	33.6	30.7										
CG2.5-60L1	60	60	1	3°52'	L	HB	15	55	150.34	155	157.5	(9)	(136)	93.5	98.8	82.9	67.3	57.6	51.5	47.0										

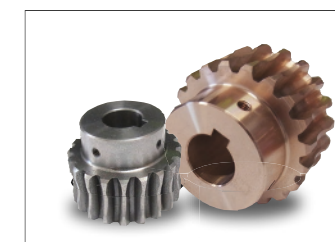
* Please see Page 394 for Cautions on Product Characteristics and Cautions on Performing Secondary Operations.



H1K



HBK



To order J Series products, please specify; Catalog No. + J + BORE

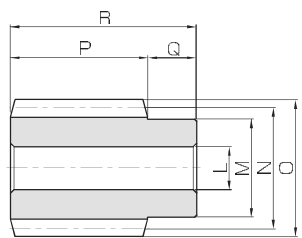
Bore H7	* The product shapes of J Series items are identified by background color.																
	12	14	15	16	17	18	19	20	22	25	28	30	32	35			
Keyway Js9	4 × 1.8			5 × 2.3						6 × 2.8			8 × 3.3			10 × 3.3	
Screw size	M4					M5					M6			M8			
Catalog No.																	
BG2.5-20R1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K										
BG2.5-20R2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K										
BG2.5-20L1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K										
BG2.5-20L2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K										
CG2.5-20R1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K										
CG2.5-20R2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K										
CG2.5-30R1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
CG2.5-30R2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
CG2.5-40R1 J BORE			HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK							
CG2.5-50R1 J BORE			HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK						
CG2.5-50R2 J BORE			HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK					
CG2.5-60R1 J BORE			HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK					
CG2.5-20L1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K										
CG2.5-20L2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K										
CG2.5-30L1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
CG2.5-30L2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
CG2.5-40L1 J BORE			HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	5,890	HBK					
CG2.5-50L1 J BORE			HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	6,680	HBK	HBK	HBK			
CG2.5-50L2 J BORE			HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	6,680	HBK	HBK	HBK			
CG2.5-60L1 J BORE			HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	7,690	HBK	HBK	HBK			

* For [Caution on J Series], please see Page 395.



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30'
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coating

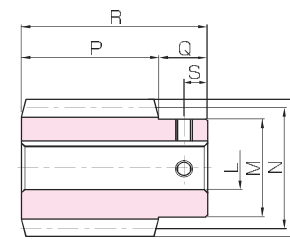
* The precision grade of J Series products is equivalent to the value shown in the table.



W1

Catalog No.	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width (R)		Hub width (L)
						L-H7	M				N	O	
SW3-R1 ● SW3-R1J17 ● SW3-R1J18 ● SW3-R1J19 ● SW3-R1J20	m3	1	3°55'	R	W1	16	35	44	50	50	20	—	
17													
SW3-R2 ● SW3-R2J17 ● SW3-R2J18 ● SW3-R2J19 ● SW3-R2J20		2	7°50'	R	W1	16	35	44	50	50	20	—	
17													
SW3-L1 ● SW3-L1J17 ● SW3-L1J18 ● SW3-L1J19 ● SW3-L1J20		1	3°55'	L	W1	16	35	44	50	50	20	—	
17													
SW3-L2 ● SW3-L2J17 ● SW3-L2J18 ● SW3-L2J19 ● SW3-L2J20		2	7°50'	L	W1	16	35	44	50	50	20	—	
17													

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 362 for more details.



W1K

Total length	Keyway	Set Screw		Weight (kg)	Catalog No.
		Width×Depth	Size		
70	5 × 2.3	M4	10	0.64	SW3-R1
				0.62	● SW3-R1J17
				0.60	● SW3-R1J18
				0.58	● SW3-R1J19
70	6 × 2.8	M5	10	0.64	SW3-R2
				0.62	● SW3-R2J17
				0.60	● SW3-R2J18
				0.58	● SW3-R2J19
70	6 × 2.8	M5	10	0.64	SW3-L1
				0.62	● SW3-L1J17
				0.60	● SW3-L1J18
				0.58	● SW3-L1J19
70	6 × 2.8	M5	10	0.64	SW3-L2
				0.62	● SW3-L2J17
				0.60	● SW3-L2J18
				0.58	● SW3-L2J19

[Caution on Secondary Operations]

- Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
- Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat treating as it will create bad tooth contact causing abrasion of the wheel.

[Caution on J series]

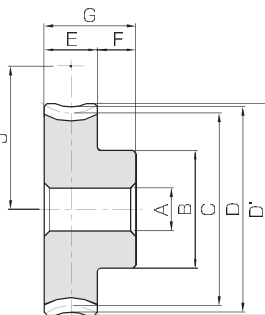
- As available-on-request products, requires a lead-time for shipping within **2 working-days (excludes the day ordered), after placing an order.** Please allow additional shipping time to get to your local distributor.
- Number of products we can process for one order is **1 to 20 units.** For quantities of 21 or more pieces, we need to quote price and lead time.
- Keyways are made according to JIS B1301 standards, Js9 tolerance.
- Areas of products which have been re-worked will not be black oxide coated.
- For products having a tapped hole, a set screw is included.



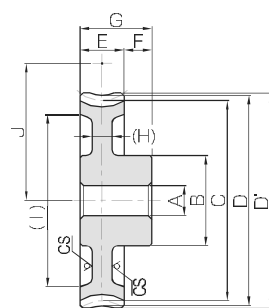
Specifications	
Catalog No.	BG CG
Precision grade	KHK W 002 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30'
Material	CAC502 (formerly JIS PBC2) FC200 **
Heat treatment	—
Tooth hardness	—

* The precision grade of J Series products is equivalent to the value shown in the table.
** FC200's tensile strength (200N/mm²) is derived from test specimens and differs according to the product shape.

A-H7	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
E	Face width
F	Hub width
G	Total length
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance



H1



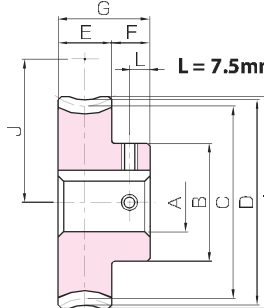
HB

**CS has a sand mold casting finish.

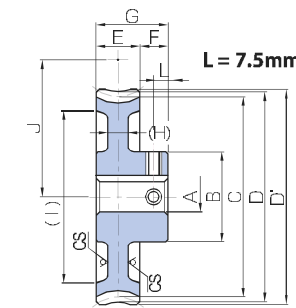
NOTE 1: Allowable torque based on worm speed (rpm)

Catalog No.	Precision ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	A-H7	B	C	D	D'	E	F	G	(H)	(I)	J	Allowable torque (N·m) NOTE1						Backlash (mm)	Weight (kg)
																		30rpm	100rpm	300rpm	600rpm	900rpm	1200rpm		
BG3-20R1	20	10	20	3°55'	R	H1	50	60.14	66	69	28	43	—	—	52	22.1	18.1	14.1	11.5	10.0	0.15~0.33	0.89			
BG3-20R2	10	2																					7°50'	37.0	29.5
BG3-20L1	20	10	20	3°55'	L	H1	50	60.14	66	69	28	43	—	—	52	22.1	18.1	14.1	11.5	10.0	0.15~0.33	0.73			
BG3-20L2	10	2																					7°50'	37.0	30.1
CG3-20R1	20	20	20	3°55'	R	H1	50	60.14	66	69	28	43	—	—	52	22.1	18.1	14.1	11.5	10.0	0.15~0.33	0.73			
CG3-20R2	10	2																					7°50'	37.0	30.1
CG3-30R1	30	30	20	3°55'	R	H1	50	60.14	66	69	28	43	—	—	52	22.1	18.1	14.1	11.5	10.0	0.15~0.33	0.73			
CG3-30R2	15	30																					7°50'	37.0	30.1
CG3-40R1	40	40	20	3°55'	R	H1	50	60.14	66	69	28	43	—	—	52	22.1	18.1	14.1	11.5	10.0	0.15~0.33	0.73			
CG3-40R2	15	40																					7°50'	37.0	30.1
CG3-50R1	50	50	20	3°55'	R	H1	63	150.35	156	159	30	45	(9)	(138)	97	121	100	81.1	68.4	60.5	0.15~0.33	2.50			
CG3-50R2	25	50																					7°50'	97	122
CG3-60R1	60	60	20	3°55'	R	H1	70	180.42	186	189	30	45	(9)	(166)	112	169	141	114	96.7	86.3	0.15~0.33	3.40			
CG3-20L1	20	20																					1	3°55'	H1
CG3-20L2	10	2	7°50'	H1	50	60.57	66	69	28	43	—	—	52	22.2	17.7	13.3	10.7	9.24	0.73						
CG3-30L1	30	30	1	3°55'	H1	55	90.21	96	99	28	43	—	—	67	46.6	38.7	30.6	25.4	22.2	1.50					
CG3-30L2	15	30	2	7°50'	H1	55	90.85	96	99	28	43	—	—	67	47.2	38.5	29.3	23.7	20.8	1.50					
CG3-40L1	40	40	1	3°55'	H1	55	120.28	126	129	30	45	(9)	(107)	82	79.8	66.3	53.2	44.6	39.1	1.79					
CG3-50L1	50	50	1	3°55'	H1	63	150.35	156	159	30	45	(9)	(138)	97	121	100	81.1	68.4	60.5	2.50					
CG3-50L2	25	50	2	7°50'	HB	63	151.41	156	159	30	45	(9)	(138)	97	122	100	79.1	65.1	56.7	2.50					
CG3-60L1	60	60	1	3°55'	HB	70	180.42	186	189	30	45	(9)	(166)	112	169	141	114	96.7	86.3	3.40					

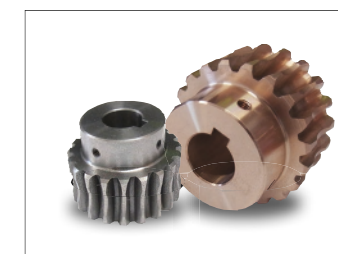
* Please see Page 394 for Cautions on Product Characteristics and Cautions on Performing Secondary Operations.



H1K



HBK



To order J Series products, please specify: Catalog No. + J + BORE

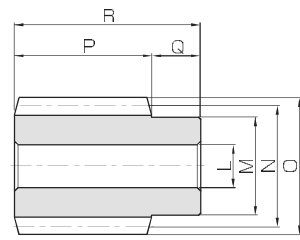
Bore H7	* The product shapes of J Series items are identified by background color.								
Keyway Js9	20	22	25	28	30	32	35	40	
Screw size	6 × 2.8			8 × 3.3			10 × 3.3		12 × 3.3
Catalog No.	M5				M6			M8	
BG3-20R1 J BORE	H1K	H1K	H1K	H1K	H1K				
BG3-20R2 J BORE	H1K	H1K	H1K	H1K	H1K				
BG3-20L1 J BORE	H1K	H1K	H1K	H1K	H1K				
BG3-20L2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K			
CG3-20R1 J BORE	H1K	H1K	H1K	H1K	H1K				
CG3-20R2 J BORE	H1K	H1K	H1K	H1K	H1K				
CG3-30R1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K			
CG3-30R2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K			
CG3-40R1 J BORE	HBK	HBK	HBK	HBK	HBK	HBK			
CG3-50R1 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	
CG3-50R2 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	
CG3-60R1 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK
CG3-20L1 J BORE	H1K	H1K	H1K	H1K	H1K				
CG3-20L2 J BORE	H1K	H1K	H1K	H1K	H1K				
CG3-30L1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K			
CG3-30L2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K			
CG3-40L1 J BORE	HBK	HBK	HBK	HBK	HBK	HBK			
CG3-50L1 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	
CG3-50L2 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	
CG3-60L1 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK

[Caution on J series]

- As available-on-request products, requires a lead-time for shipping within **2 working-days (excludes the day ordered), after placing an order.** Please allow additional shipping time to get to your local distributor.
- Number of products we can process for one order is **1 to 20 units.** For quantities of 21 or more pieces, we need to quote price and lead time.
- Keyways are made according to JIS B1301 standards, Js9 tolerance.
- Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap.
- For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	KHK W 001 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30'
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coating



W1

Catalog No.	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width (R)		Hub width (L)
						L _{H7}	M				Q	Q'	
SW4-R1	m4	1	3°42'	R	W1	22	50	62	70	70	25	—	—
SW4-R2		2	7°25'	R	W1	22	50	62	70	70	25	—	
SW4-L1	m4	1	3°42'	L	W1	22	50	62	70	70	25	—	—
SW4-L2		2	7°25'	L	W1	22	50	62	70	70	25	—	

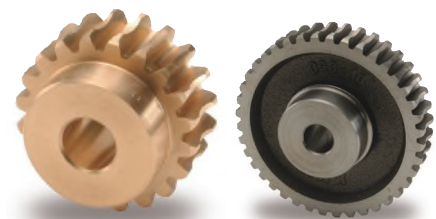
[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 362 for more details.

Total length	Set Screw		Weight (kg)	Catalog No.
	R	S		
95	—	—	1.76	SW4-R1
95	—	—	1.76	SW4-R2
95	—	—	1.76	SW4-L1
95	—	—	1.76	SW4-L2

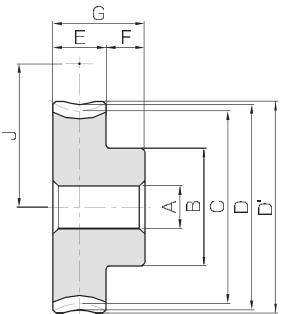
[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears, is also available.
 ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat treating as it will create bad tooth contact causing abrasion of the wheel.

BG • CG Bronze Worm Wheels & Gray Iron Worm Wheels

Bronze Worm Wheels & Gray Iron Worm Wheels



Specifications	
Catalog No.	BG CG
Precision grade	KHK W 002 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30'
Material	CAC502 (formerly JIS PBC2) FC200 *
Heat treatment	—
Tooth hardness	—



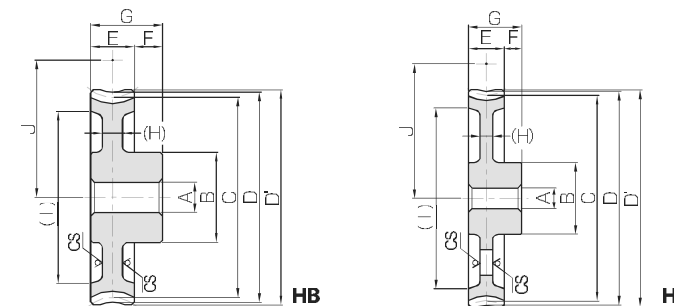
H1

* FC200's tensile strength (200N/mm²) is derived from test specimens and differs according to the product shape.

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore		Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B				
BG4-20R1	20	m4	20	1	3°42'	R	H1	20	60	80.17	88	90	35
BG4-20R2	10		20	2	7°25'	R	H1	20	60	80.67	88	90	35
BG4-20L1	20		20	1	3°42'	L	H1	20	60	80.17	88	90	35
BG4-20L2	10		20	2	7°25'	L	H1	20	60	80.67	88	90	35

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore		Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B				
CG4-20R1	20	m4	20	1	3°42'	R	H1	20	60	80.17	88	90	35
CG4-20R2	10		20	2	7°25'	R	H1	20	60	80.67	88	90	35
CG4-30R1	30		30	1	3°42'	R	HB	20	60	120.25	128	130	35
CG4-30R2	15		30	2	7°25'	R	HB	20	60	121.01	128	130	35
CG4-40R1	40		40	1	3°42'	R	HB	20	70	160.33	168	171	35
CG4-50R1	50		50	1	3°42'	R	H2	20	70	200.42	208	211	35
CG4-50R2	25		50	2	7°25'	R	H2	20	70	201.69	208	211	35
CG4-60R1	60		60	1	3°42'	R	H2	20	80	240.5	248	251	35
CG4-20L1	20		20	1	3°42'	L	H1	20	60	80.17	88	90	35
CG4-20L2	10		20	2	7°25'	L	H1	20	60	80.67	88	90	35
CG4-30L1	30		30	1	3°42'	L	HB	20	60	120.25	128	130	35
CG4-30L2	15		30	2	7°25'	L	HB	20	60	121.01	128	130	35
CG4-40L1	40	40	1	3°42'	L	HB	20	70	160.33	168	171	35	
CG4-50L1	50	50	1	3°42'	L	H2	20	70	200.42	208	211	35	
CG4-50L2	25	50	2	7°25'	L	H2	20	70	201.69	208	211	35	
CG4-60L1	60	60	1	3°42'	L	H2	20	80	240.5	248	251	35	

[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.
 ② H2 Shape Worm Gears have elongated casting holes in the web (H).
 ③ The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.



* CS has a sand mold casting finish.

NOTE 1 : Allowable torque based on worm speed (rpm)

Hub width	Total length	Mounting distance	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}			
F	G	J	30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}	0.17~0.37	1.91	BG4-20R1
17	52	71	75.9	61.7	47.9	38.4	33.7	30.1			
17	52	71	75.9	60.0	44.8	35.7	30.9	27.5	0.17~0.37	1.91	BG4-20R2
17	52	71	75.9	61.7	47.9	38.4	33.7	30.1	0.17~0.37	1.91	BG4-20L1
17	52	71	75.9	60.0	44.8	35.7	30.9	27.5			

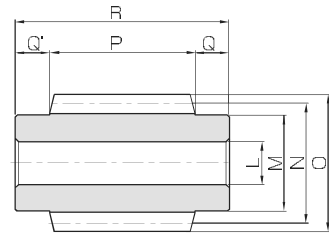
NOTE 1 : Allowable torque based on worm speed (rpm)

Hub width	Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1				Backlash (mm)	Weight (kg)	Catalog No.
					30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}			
F	G	(H)	(I)	J	30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	0.17~0.37	1.56	CG4-20R1
17	52	—	—	71	45.6	37.0	28.7	23.0			
17	52	—	—	71	45.5	36.0	26.9	21.4	0.17~0.37	1.56	CG4-20R2
17	52	(12)	(96)	91	96.3	79.1	62.3	50.9	0.17~0.37	2.52	CG4-30R1
17	52	(12)	(96)	91	96.8	78.3	59.4	47.3	0.17~0.37	2.52	CG4-30R2
17	52	(11)	(136)	111	165	136	108	89.4	0.17~0.37	3.81	CG4-40R1
17	52	(12)	(176)	131	249	205	165	137	0.17~0.37	4.78	CG4-50R1
17	52	(12)	(176)	131	250	204	160	130	0.17~0.37	4.78	CG4-50R2
17	52	(12)	(218)	151	348	288	233	194	0.17~0.37	6.36	CG4-60R1
17	52	—	—	71	45.6	37.0	28.7	23.0	0.17~0.37	1.56	CG4-20L1
17	52	—	—	71	45.5	36.0	26.9	21.4			
17	52	(12)	(96)	91	96.3	79.1	62.3	50.9	0.17~0.37	2.52	CG4-30L1
17	52	(12)	(96)	91	96.8	78.3	59.4	47.3	0.17~0.37	2.52	CG4-30L2
17	52	(11)	(136)	111	165	136	108	89.4	0.17~0.37	3.81	CG4-40L1
17	52	(12)	(176)	131	249	205	165	137	0.17~0.37	4.78	CG4-50L1
17	52	(12)	(176)	131	250	204	160	130	0.17~0.37	4.78	CG4-50L2
17	52	(12)	(218)	151	348	288	233	194	0.17~0.37	6.36	CG4-60L1

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	KHK W 001 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30'
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coating



W3

Catalog No.	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore		Pitch dia.	Outside dia.	Face width		Hub width (R)	
						L _{H7}	M			O	P	Q	Q'
SW5-R1	m5	1	4°06'	R	W3	25	56	70	80	85	20	20	
SW5-R2		2	8°13'	R	W3	25	56	70	80	85	20	20	
SW6-R1	m6	1	4°18'	R	W3	30	64	80	92	100	25	25	
SW6-R2		2	8°38'	R	W3	30	64	80	92	100	25	25	

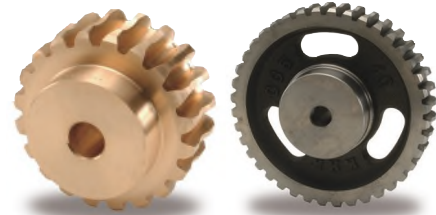
[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 362 for more details.

Total length	Set Screw		Weight (kg)	Catalog No.
	R	S		
125	—	—	2.86	SW5-R1
125	—	—	2.86	SW5-R2
150	—	—	4.38	SW6-R1
150	—	—	4.38	SW6-R2

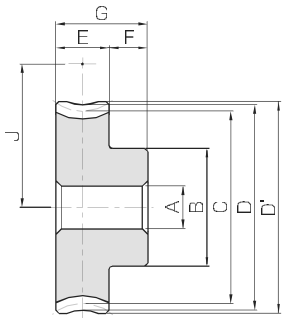
[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
 ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat treating as it will create bad tooth contact causing abrasion of the wheel.

BG • CG Bronze Worm Wheels & Gray Iron Worm Wheels

Bronze Worm Wheels & Gray Iron Worm Wheels



Specifications	
Catalog No.	BG CG
Precision grade	KHK W 002 grade 4 KHK W 002 grade 4
Reference section of gear	Normal plane Normal plane
Gear teeth	Standard full depth Standard full depth
Normal pressure angle	14° 30' 14° 30'
Material	CAC502 (formerly JIS PBC2) FC200 *
Heat treatment	— —
Tooth hardness	— —



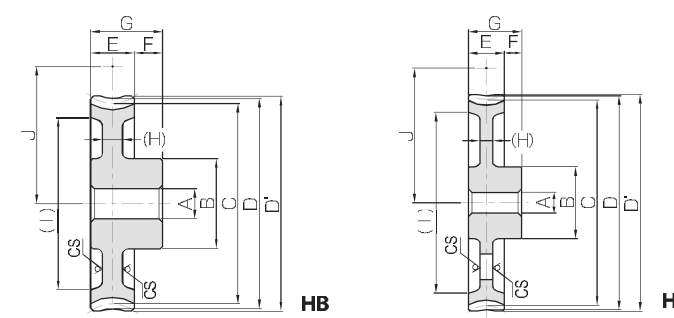
H1

* FC200's tensile strength (200N/mm²) is derived from test specimens and differs according to the product shape.

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore		Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B				
BG5-20R1	20	m5	20	1	4°06'	R	H1	22	75	100.26	110	113	45
BG5-20R2	10		20	2	8°13'	R	H1	22	75	101.04	110	113	45
BG6-20R1	20	m6	20	1	4°18'	R	H1	25	100	120.34	132	136	52
BG6-20R2	10		20	2	8°38'	R	H1	25	100	121.38	132	136	52

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore		Pitch dia.	Throat dia.	Outside dia.	Face width
								A _{H7}	B				
CG5-20R1	20	m5	20	1	4°06'	R	H1	22	75	100.26	110	113	45
CG5-20R2	10		20	2	8°13'	R	H1	22	75	101.04	110	113	45
CG5-30R1	30		30	1	4°06'	R	HB	22	75	150.38	160	163	45
CG5-30R2	15		30	2	8°13'	R	HB	22	75	151.56	160	163	45
CG5-40R1	40		40	1	4°06'	R	H2	22	90	200.51	210	213	45
CG5-50R1	50	m5	50	1	4°06'	R	H2	22	90	250.61	260	263	45
CG5-50R2	25		50	2	8°13'	R	H2	22	90	252.59	260	263	45
CG5-60R1	60		60	1	4°06'	R	H2	22	100	300.77	310	313	45
CG6-20R1	20	m6	20	1	4°18'	R	H1	25	100	120.34	132	136	52
CG6-20R2	10		20	2	8°38'	R	H1	25	100	121.38	132	136	52
CG6-30R1	30		30	1	4°18'	R	HB	25	100	180.51	192	196	52
CG6-30R2	15		30	2	8°38'	R	HB	25	100	182.06	192	196	52
CG6-40R1	40		40	1	4°18'	R	H2	25	100	240.68	252	256	52
CG6-50R1	50	m6	50	1	4°18'	R	H2	25	100	300.85	312	316	52
CG6-50R2	25		50	2	8°38'	R	H2	25	100	303.44	312	316	52
CG6-60R1	60		60	1	4°18'	R	H2	25	120	361.02	372	376	52

[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.
 ② H2 Shape Worm Gears have elongated casting holes in the web (H).
 ③ The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.



* CS has a sand mold casting finish.

NOTE 1 : Allowable torque based on worm speed (rpm)

Hub width	Total length	Mounting distance	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}			
F	G	J	30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}	0.20~0.40	3.89	BG5-20R1
20	65	85	146	117	91.2	73.0	63.7	56.9			
20	65	85	146	115	85.8	68.4	58.8	52.2	0.20~0.40	3.89	BG5-20R2
20	72	100	232	185	144	115	99.2	88.8			
20	72	100	235	183	136	109	92.3	82.0	0.22~0.42	6.60	BG6-20R1
20	72	100	235	183	136	109	92.3	82.0			

NOTE 1 : Allowable torque based on worm speed (rpm)

Hub width	Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1				Backlash (mm)	Weight (kg)	Catalog No.
					30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}			
F	G	(H)	(I)	J	30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	0.20~0.40	3.18	CG5-20R1
20	65	—	—	85	87.4	70.3	54.7	43.8			
20	65	—	—	85	87.9	68.9	51.5	41.0	0.20~0.40	3.18	CG5-20R2
20	65	(13)	(127)	110	185	150	119	96.8			
20	65	(13)	(127)	110	187	150	114	90.6	0.20~0.40	4.78	CG5-30R1
20	65	(16)	(172)	135	316	258	206	170			
20	65	(16)	(172)	135	316	258	206	170	0.20~0.40	7.44	CG5-40R1
20	65	(16)	(223)	160	477	390	315	261			
20	65	(16)	(223)	160	483	390	307	249	0.20~0.40	9.79	CG5-50R1
20	65	(14)	(276)	185	668	548	443	369			
20	65	(14)	(276)	185	668	548	443	369	0.20~0.40	12.0	CG5-60R1
20	72	—	—	100	139	111	86.2	—			
20	72	—	—	100	141	110	81.8	—	0.22~0.42	5.39	CG6-20R1
20	72	(15)	(155)	130	294	237	187	—			
20	72	(15)	(155)	130	299	238	181	—	0.22~0.42	8.28	CG6-30R1
20	72	(15)	(155)	130	299	238	181	—			
20	72	(15)	(213)	160	502	407	325	—	0.22~0.42	10.9	CG6-40R1
20	72	(16)	(275)	190	760	615	496	—			
20	72	(16)	(275)	190	774	620	488	—	0.22~0.42	14.0	CG6-50R1
20	72	(17)	(336)	220	1060	865	698	—			
20	72	(17)	(336)	220	1060	865	698	—	0.22~0.42	19.8	CG6-60R1

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.



SUW Stainless Steel Worms

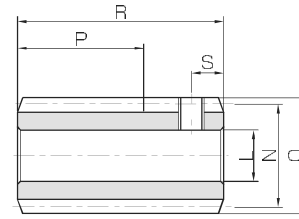
Module 0.5, 0.8

SUW

Stainless Steel Worms



Specifications	
Precision grade	KHK W 001 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	(less than 187HB)



W2

Catalog No.	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total length
						L-B	M					
SUW0.5-R1	m0.5	1	2°36'	R	W2	5	—	11	12	—	—	18
SUW0.5-R2		2	5°13'	R	W2	5	—	11	12	—	—	18
SUW0.8-R1	m0.8	1	3°17'	R	W2	6	—	14	15.6	—	—	30
SUW0.8-R2		2	6°34'	R	W2	6	—	14	15.6	—	—	30

[Caution on Product Characteristics] ① For W2-shaped products, a set screw is included. When setting up the mating wheel, make sure no friction occurs within the set screw.
② These worms produce axial thrust forces. See Page 362 for more details.

Set Screw		Weight (kg)	Catalog No.
Size	S		
M3	3	0.010	SUW0.5-R1
M3	3	0.010	SUW0.5-R2
M4	5	0.029	SUW0.8-R1
M4	5	0.029	SUW0.8-R2

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

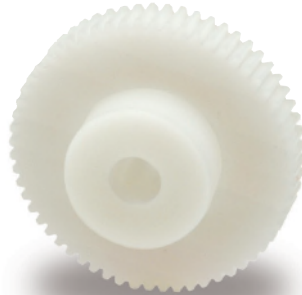


DG Plastic Worm Wheels

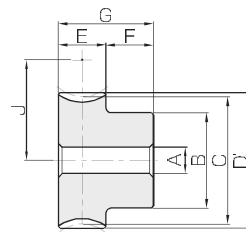
Module 0.5, 0.8

DG

Plastic Worm Wheels



Specifications	
Precision grade	KHK W 002 grade 5
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	Polyacetal
Heat treatment	—
Tooth hardness	—



HA



Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore		Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A $\begin{smallmatrix} -0.05 \\ -0.10 \end{smallmatrix}$	B					
DG0.5-20R1	20	m0.5	20	1	2°36'	R	HA	4	9	10.01	—	11	5	
DG0.5-20R2	10		20	2	5°13'	R	HA	4	9	10.04	—	11	5	
DG0.5-30R1	30		30	1	2°36'	R	HA	4	12	15.02	—	16	5	
DG0.5-30R2	15		30	2	5°13'	R	HA	4	12	15.06	—	16	5	
DG0.5-40R1	40		40	1	2°36'	R	HA	5	15	20.02	—	21	5	
DG0.5-50R1	50	m0.5	50	1	2°36'	R	HA	5	20	25.03	—	26	5	
DG0.5-60R1	60		60	1	2°36'	R	HA	5	25	30.03	—	31	5	
DG0.8-20R1	20	m0.8	20	1	3°17'	R	HA	5	12	16.03	—	17.6	9	
DG0.8-20R2	10		20	2	6°34'	R	HA	5	12	16.11	—	17.6	9	
DG0.8-30R1	30		30	1	3°17'	R	HA	5	18	24.04	—	25.6	9	
DG0.8-30R2	15		30	2	6°34'	R	HA	5	18	24.16	—	25.6	9	
DG0.8-40R1	40		40	1	3°17'	R	HA	6	20	32.05	—	33.6	9	
DG0.8-50R1	50	m0.8	50	1	3°17'	R	HA	8	25	40.07	—	41.6	9	
DG0.8-60R1	60		60	1	3°17'	R	HA	8	25	48.08	—	49.6	9	

[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.
② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.
③ Since the bore is finished with a minus tolerance, you can use a shaft with a force fit.

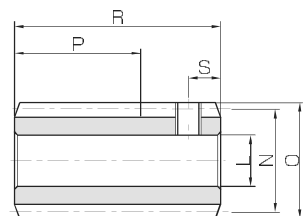
Hub width	Total length	Mounting distance	Allowable torque (N·m)		Backlash (mm)	Weight (g)	Catalog No.
			Bending strength	Bending strength			
7	12	10.5	0.067	0.0068	0~0.16	1.01	DG0.5-20R1
7	12	10.5	0.067	0.0069	0~0.16	1.01	DG0.5-20R2
7	12	13	0.11	0.011	0~0.16	2.21	DG0.5-30R1
7	12	13	0.11	0.011	0~0.16	2.21	DG0.5-30R2
7	12	15.5	0.16	0.016	0~0.16	3.72	DG0.5-40R1
7	12	18	0.21	0.022	0~0.16	6.36	DG0.5-50R1
7	12	20.5	0.26	0.027	0~0.16	9.67	DG0.5-60R1
9	18	15	0.31	0.031	0.04~0.22	3.73	DG0.8-20R1
9	18	15	0.31	0.032	0.04~0.22	3.73	DG0.8-20R2
9	18	19	0.52	0.053	0.04~0.22	8.84	DG0.8-30R1
9	18	19	0.52	0.053	0.04~0.22	8.84	DG0.8-30R2
9	18	23	0.74	0.076	0.04~0.22	14.0	DG0.8-40R1
9	18	27	0.98	0.10	0.04~0.22	21.6	DG0.8-50R1
9	18	31	1.21	0.12	0.04~0.22	28.8	DG0.8-60R1

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	(less than 187HB)

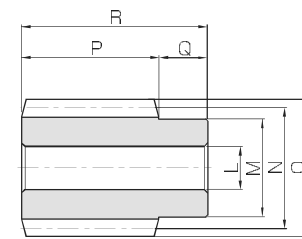
* The precision grade of J Series products is equivalent to the value shown in the table.



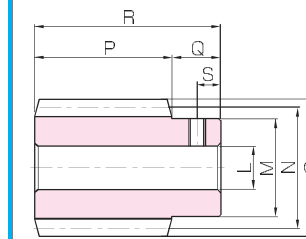
W2

Catalog No.	Norma module	Number of starts	Lead angle	Hand thread	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total length
						LH7(H8)	M					
SUW1-R1 SUW1-R2	m1	1 2	3°35' 7°11'	R R	W2 W2	6 H8 6 H8	—	16	18	(20) (20)	—	32
SUW1.5-R1 ● SUW1.5-R1J8 ● SUW1.5-R1J10	m1.5	1	3°26'	R	W1 W1T W1K	8 8 10	—	25	28	30	10	40
SUW1.5-R2 ● SUW1.5-R2J8 ● SUW1.5-R2J10					2	6°54'	R	W1 W1T W1K	8 8 10	20	25	28

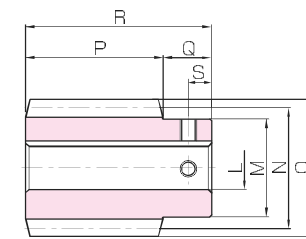
[Caution on Product Characteristics] ① For W2-shaped products, a set screw is included. When setting up the mating wheel, make sure no friction occurs within the set screw.
② These worms produce axial thrust forces. See Page 362 for more details.



W1



W1T



W1K



Keyway Width×Depth	Set Screw		Weight (kg)	Catalog No.
	Size	S		
—	M4	5	0.042	SUW1-R1
—	M4	5	0.042	SUW1-R2
—	—	—	0.12	SUW1.5-R1
—	M5	5	0.12	● SUW1.5-R1J8
4 x 1.8	M4	5	0.11	● SUW1.5-R1J10
—	—	—	0.12	SUW1.5-R2
—	M5	5	0.12	● SUW1.5-R2J8
4 x 1.8	M4	5	0.11	● SUW1.5-R2J10

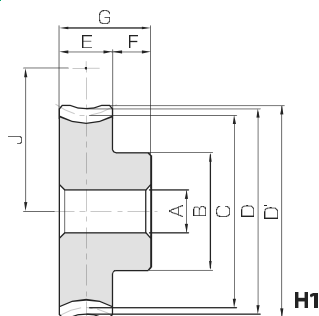
[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.

[Caution on J series]
① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
④ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	KHK W 002 grade 5 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	MC901 Nylon
Heat treatment	—
Tooth hardness	—

* The precision grade of this product is equivalent to the value shown in the table.

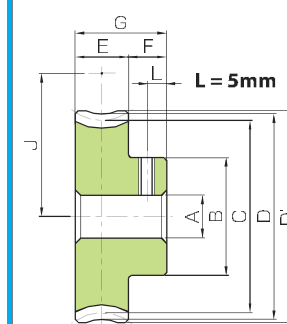


H1

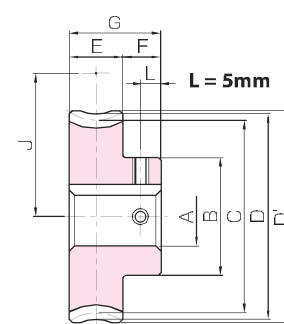
Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Shape	Bore		Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width	Tea length	Mounting distance	Allowable torque (N·m)	Allowable torque (kg·m)	Backlash (mm)	Weight (kg)
							A	B											
PG1-20R1	20	20	1	3°35'	R	H1	6	16	20.04	22	23				18	0.62	0.060	0~0.28	0.0058
PG1-20R2	10	20	2	7°11'	R	H1	6	16	20.16	22	23				18	0.62	0.060	0~0.28	0.0058
PG1-30R1	30	30	1	3°35'	R	H1	6	20	30.06	32	33	10	10	20	23	1.03	0.10	0~0.28	0.012
PG1-40R1	40	40	1	3°35'	R	H1	8	26	40.08	42	43				28	1.49	0.15	0~0.28	0.021
PG1-50R1	50	50	1	3°35'	R	H1	8	30	50.1	52	53				33	1.96	0.20	0~0.28	0.031
PG1.5-20R1	20	20	1	3°26'	R	H1	8	22	30.05	33	34.5	12	10	22	27.5	1.66	0.17	0~0.30	0.014
PG1.5-20R2	10	20	2	6°54'	R	H1	8	22	30.22	33	34.5				27.5	1.68	0.17	0~0.30	0.014

[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.
② Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), for bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in separate technical reference book (Page 101).
③ The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see Page 358 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.



H1T



H1K



Bore	* The product shapes of J Series items are identified by background color.							
Keyway Js9	6	8	10	12	14	15	16	17
Screw size	—			4 x 1.8		5 x 2.3		
Catalog No.	M4	M5			M4			
PG1-20R1 J BORE	H1T							
PG1-20R2 J BORE	H1T							
PG1-30R1 J BORE	H1T	H1T						
PG1-40R1 J BORE		H1T	H1K	H1K				
PG1-50R1 J BORE		H1T	H1K	H1K	H1K	H1K	H1K	H1K
PG1.5-20R1 J BORE		H1T	H1K					
PG1.5-20R2 J BORE		H1T	H1K					

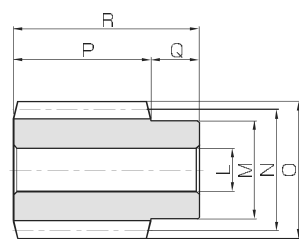
[Caution on J series] ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
④ Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap.
⑤ For products having a tapped hole, a set screw is included.
⑥ When using H1T set screws for fastening gears to a shaft, only use this method for applications with light loads. For secure fastening, please use dowel pins in combination.

To order J Series products, please specify; **Catalog No. + J + BORE**

* In regards to MC Nylon gears, other materials are available, including Ultra High Molecular Weight Polyethylene (UHMW-PE), which has excellent abrasion resistance, and resin conforming to the Plastic Implementation Measure (PIM). A single piece order is acceptable and will be produced as a custom-made gear. For details on quotations and orders please see Page 16.



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30' **
Material	SUS303
Heat treatment	—
Tooth hardness	(less than 187HB)



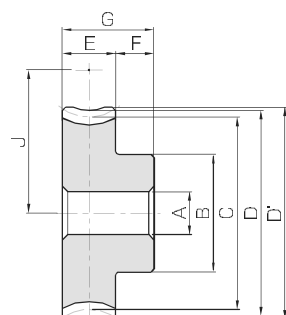
W1

* The precision grade of J Series products is equivalent to the value shown in the table.
 ** The pressure angle is at 20 degrees for module 2.5.

Catalog No. ● J Series (Available-on-request)	Normal module	Number of starts	Lead angle	Hand thread	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total length
						L _H	M					
SUW2-R1 ● SUW2-R1J12 ● SUW2-R1J14	m2	1	3°42'	R	W1	12	25	31	35	32	14	46
						12						
						14						
SUW2-R2 ● SUW2-R2J12 ● SUW2-R2J14	m2	2	7°25'	R	W1	12	30	37	42	45	18	63
						12						
						14						
SUW2.5-R1 ● SUW2.5-R1J15 ● SUW2.5-R1J16 ● SUW2.5-R1J17	m2.5	1	3°52'	R	W1	15	35	44	50	50	20	70
						15						
						17						
SUW2.5-R2 ● SUW2.5-R2J15 ● SUW2.5-R2J16 ● SUW2.5-R2J17	m2.5	2	7°46'	R	W1	15	35	44	50	50	20	70
						15						
						17						
SUW3-R1 ● SUW3-R1J17 ● SUW3-R1J18 ● SUW3-R1J19 ● SUW3-R1J20	m3	1	3°55'	R	W1	16	35	44	50	50	20	70
						17						
						18						
SUW3-R2 ● SUW3-R2J17 ● SUW3-R2J18 ● SUW3-R2J19 ● SUW3-R2J20	m3	2	7°50'	R	W1	16	35	44	50	50	20	70
						17						
						18						



Specifications	
Precision grade	KHK W 002 grade 5 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30' **
Material	MC901 Nylon
Heat treatment	—
Tooth hardness	—



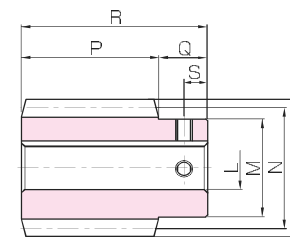
H1

* The precision grade of this product is equivalent to the value shown in the table.
 ** The pressure angle is at 20 degrees for module 2.5.

Catalog No.	Reduction ratio	No. of teeth	Number of starts	Helix angle	Hand thread	Bore		Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width	Total Length	Mounting distance	Allowable torque (N·m)	Allowable torque (kg·m)	Backlash (mm)	Weight (kg)
						A	B											
PG2-20R1	20	1	1	3°42'	R	10	33	40.08	44	46	22	13	35	35.5	4.78	0.49	0~0.33	0.046
PG2-20R2	10	2	2	7°25'	R	10	33	40.34	44	46	22	13	35	35.5	4.82	0.49	0~0.33	0.046
PG2.5-20R1	20	1	1	3°52'	R	12	35	50.11	55	57.5	22	14	36	43.5	(8.46)	0.86	0~0.36	0.066
PG2.5-20R2	10	2	2	7°46'	R	12	35	50.46	55	57.5	22	14	36	43.5	(8.54)	0.87	0~0.36	0.066
PG3-20R1	20	1	1	3°55'	R	15	50	60.14	66	69	28	15	43	52	(13.7)	1.40	0~0.38	0.13
PG3-20R2	10	2	2	7°50'	R	15	50	60.57	66	69	28	15	43	52	(13.8)	1.41	0~0.38	0.13

[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.
 ② Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), for bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in separate technical reference book (Page 101).
 ③ The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Usage above the value in brackets will exceed the maximum allowable sliding speed, if no lubrication is applied. So, lubrication is required. Please see Page 358 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
 ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.

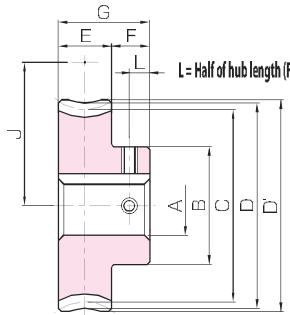


W1K



Keyway WidthxDepth	Set Screw Size	S	Weight (kg)	Catalog No.	
				● J Series (Available-on-request)	● J Series (Available-on-request)
—	—	—	0.20	SUW2-R1	① These worms produce axial thrust forces. See Page 362 for more details.
4 x 1.8	M4	7	0.20	● SUW2-R1J12	[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
5 x 2.3	M4	7	0.18	● SUW2-R1J14	
—	—	—	0.20	SUW2-R2	② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
4 x 1.8	M4	7	0.20	● SUW2-R2J12	
5 x 2.3	M4	7	0.18	● SUW2-R2J14	③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
—	—	—	0.39	SUW2.5-R1	
5 x 2.3	M4	9	0.38	● SUW2.5-R1J15	
5 x 2.3	M4	9	0.37	● SUW2.5-R1J16	
5 x 2.3	M4	9	0.36	● SUW2.5-R1J17	
—	—	—	0.39	SUW2.5-R2	
5 x 2.3	M4	9	0.38	● SUW2.5-R2J15	
5 x 2.3	M4	9	0.37	● SUW2.5-R2J16	
5 x 2.3	M4	9	0.36	● SUW2.5-R2J17	
—	—	—	0.63	SUW3-R1	
5 x 2.3	M4	10	0.62	● SUW3-R1J17	
6 x 2.8	M5	10	0.59	● SUW3-R1J18	
6 x 2.8	M5	10	0.58	● SUW3-R1J19	
6 x 2.8	M5	10	0.56	● SUW3-R1J20	
—	—	—	0.63	SUW3-R2	
5 x 2.3	M4	10	0.62	● SUW3-R2J17	
6 x 2.8	M5	10	0.59	● SUW3-R2J18	
6 x 2.8	M5	10	0.58	● SUW3-R2J19	
6 x 2.8	M5	10	0.56	● SUW3-R2J20	

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See Page 362 for more details.
 [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 362) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK's system for quick modification of KHK stock gears is also available.
 [Caution on J series] ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
 ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
 ④ For products having a tapped hole, a set screw is included.



H1K



To order J Series products, please specify: **Catalog No. + J + BORE**

Bore	* The product shapes of J Series items are identified by background color.															
	10	12	14	15	16	17	18	19	20	22	25	28	30			
Keyway Js9	4 x 1.8			5 x 2.3						6 x 2.8				8 x 3.3		
Screw size	4 x 1.8			5 x 2.3						6 x 2.8				8 x 3.3		
Catalog No.	M4			M5						M6						
PG2-20R1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K										
PG2-20R2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K										
PG2.5-20R1 J BORE		H1K	H1K	H1K	H1K	H1K	H1K	H1K								
PG2.5-20R2 J BORE		H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K							
PG3-20R1 J BORE				H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	
PG3-20R2 J BORE				H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	

[Caution on J series] ① As available-on-request products, requires a lead-time for shipping within 2 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
 ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
 ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
 ④ Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap.
 ⑤ For products having a tapped hole, a set screw is included.

Custom-made worm gears are available.

KHK offers high-precision products.



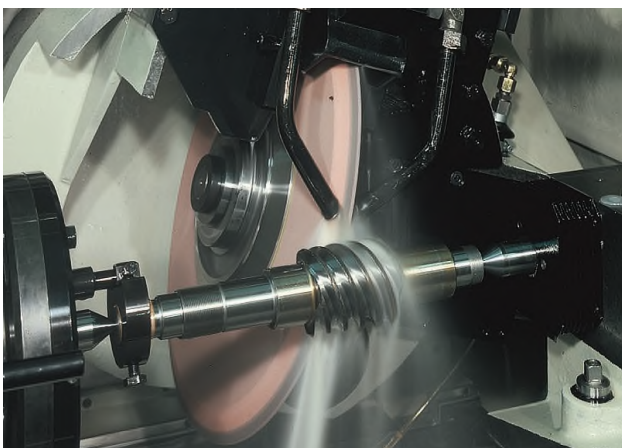
- ◆ Production Range
 - Module 0.5~10
 - Worm outer diameter: \varnothing 100 mm or less
 - Wheel outer diameter: \varnothing 600 mm or less
 - Assembly distance: 350 mm or less



Please see Page 16 for more details about custom-made orders.

High-precision ground gear technology achieves high speed and quiet movement.

Excellent tooth contact and appropriate backlash are essential for worm gears. Give KHK's reliable stock worm gears a try.



Klingelnberg Worm Grinding Machine



Worm Gear Tooth Contact Machine