

Worm Gears



KWGD/LKWGDLS Duplex Worms	AGDL Duplex Worm Wheels	KWG Ground Worm Shafts	AG Worm Wheels	AGF Worm Wheels	SWG Ground Worms	AG Worm Wheels
						
Material: SCM440 m1.5-4 Page 392	Material: CAC702 (A & BC2) m1.5-4 Page 392	Material: SCM440 m0.5-6 Page 400	Material: CAC702 (A & BC2) m0.5-1.5 Page 400	Material: CAC702 (A & BC2) m2-6 Page 404	Material: S45C m1-6 Page 410	Material: CAC702 (A & BC2) m1-6 Page 410
SW Worms	BG Worm Wheels	CG Worm Wheels	SUW Stainless Steel Worms	DG Worm Wheels	PG Worm Wheels	
						
Material: S45C m0.5-6 Page 418	Material: CAC502 (PBC2) m0.5-6 Page 418	Material: FC200 m1-6 Page 420	Material: SUS303 m0.5-3 Page 434	Material: Polyacetal m0.5, 0.8 Page 434	Material: MC901 m1-3 Page 436	

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 DL 2 - R1

Number of Starts (Right-hand Lead 1)
Module (2)
Other Information (Duplex)
Other Information (Ground Gears)
Type (Worm)
Material (SCM440)

Material
K SCM440
S S45C
SU Stainless Steel

Type
W Worms
Other Information
DL Duplex
G Ground Gears
S Pinion Shafts

Worm Wheels

A G DL 1.5 - 20 R2

Number of Starts (Right-hand Lead 2)
No. of Teeth (20)
Module (1.5)
Other Information (Duplex)
Type (Worm Wheel)
Material (CAC702)

Material
A CAC702
B CAC502
C FC200
D Polyacetal
P MC901

Type
G Worm Wheels
Other Information
DL Duplex
F Double Hubs or Ring Gears

Spur
Gears

Helical
Gears

Internal
Gears

Racks

CP Racks &
Pinions

Miter
Gears

Bevel
Gears

Screw
Gears

**Worm
Gears**

Gearboxes

Other
Products



Worm Gears

Worm Gear Pair

Features



KHK stock worm gears are available in modules 0.5 to 6, reduction ratios of 1/10 to 1/120, and a wide range of materials and shapes. Duplex worm gears with adjustable backlash and highly accurate rotation are also available. The following table lists the main features.

Type	Catalog Number	Module	Number of Starts or Reduction Ratio	Material (Old JIS in parentheses)	Heat treatment	Tooth Surface Finish	Precision Grade KHK W 001 KHK W 002 Note 2	Features
Duplex Worm Gears	Worms KWGD L	2~4	Single Start	SCM440	Thermal refined, gear teeth induction hardened	Ground	1	Duplex worms that have been tempered, hardened and ground that has excellent accuracy, strength and abrasion resistance. Secondary operations can be given except for the teeth. Moving it in axial direction will adjust the backlash.
	Worms KWGD LS	1.5~4	Single Start	SCM440	Thermal refined, gear teeth induction hardened	Ground	1	Duplex worms with shafts that have been tempered, hardened and ground that has excellent accuracy, strength and abrasion resistance. Secondary operations can be given except for the teeth. Moving it in axial direction will adjust the backlash.
	Wheels AGD L	1.5~4	20~60	CAC702 (A & BC2)	—	Cut	1	Duplex worm wheels made of aluminum bronze with excellent accuracy and a good balance between machinability and wear resistance. Used in combination with KWGD or KWGDLS.
Worm Gears	Worms KWG	0.5~6	Single or Double Start	SCM440	Thermal refined, gear teeth induction hardened	Ground	2	Worms with shafts that have been tempered, hardened and ground that has excellent accuracy, strength and abrasion resistance. Secondary operations can be given except for the teeth.
	Wheels AGF NOTE 1	2~6	10~60	CAC702 (A & BC2)	—	Cut	2	Worm wheels made of aluminum bronze with a good balance between machinability and wear resistance. Used in combination with KWG.
	Worms SWG	1~6	Single or Double or Triple Start	S45C	Gear teeth induction hardened	Ground	2	Worms that have been hardened and ground with a good balance of accuracy, wear resistance and cost. Secondary operations are possible except for the teeth.
	Wheels AG NOTE 1	1~6	10~60	CAC702 (A & BC2)	—	Cut	2	Worm wheels made of aluminum bronze with a good balance between machinability and wear resistance. Used in combination with SWG. Note 1
	Worms SW	0.5~6	Single or Double Start	S45C	—	Cut (Rolling)	4	Many lineups are available at a low price and excellent usability.
	Worms SUW	0.5~3	Single or Double Start	SUS303	—	Cut	4	Stainless steel worms with rust resistance.
	Wheels BG	0.5~6	10~60	CAC502 (PBC2)	—	Cut	4	Worm wheels made of phosphorus bronze with excellent wear resistance. Used in combination with SW and SUW.
	Wheels CG	1~6	10~120	FC200	—	Cut	4	Cast iron worm wheels that are inexpensive and suitable for light loads. Used in combination with SW and SUW.
	Wheels DG	0.5~0.8	10~60	Polyacetal	—	Cut	5	Worm wheels made of polyacetal. Used in combination with SW and SUW.
	Wheels PG	1~3	10~50	MC901	—	Cut	5	Worm wheels made of MC nylon. Can be used with no lubrication. Used in combination with SW and SUW.

[Note 1] FC200 is the material for the hubs of AGF and AG worm wheels. The AG worm wheels are normally combined with the SWG worms, but are also compatible with the KWG worms with module 1.5 and below.

[Note 2] The precision grade of KHK stock worm gears controls the product quality based on the KHK standards. Please see "Precision of Worm Gears" in Selection Hints section for details.

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

KHK Technical Information

Application Examples



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

Wiper Drive Device



Image: Provided by PK Design

Worm gear used for the oscillating mechanism of wipers

Yaesu Steam Kettle



SW worm and CG worm wheel used for rotating large pans

Masdac Food Filling Device



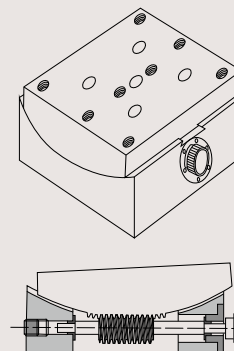
KWGD used for indexing and driving, for accurate filling of a fixed amount of ingredients
Duplex Worms and AGDL Wheels

Fabric Feeding Device



SW worm and BG worm wheel used for adjusting height

Gonio Stage Design Example



Worm gear used for rotating tables (design example)



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.

1. Caution in Selecting the Mating Gears

Worm gears are available in right-hand helix and left-hand helix. Worms and worm wheels of the same helix direction are combined. However, combination may not be possible due to the difference in the number of starts of the worm and the difference in pitch being normal and transverse (axial direction). Below is the Mating Helical Gear Selection Chart for KHK worm gears.

■ Mating Worm Wheel Selection Chart

Worms		KWGDL KWGDL5	KWG			SWG			SW				SUW	
Mating Wheel Note 1	Heat Number/Start	R1	R1	R2	R1	R2	R3	R1	R2	L1	L2	R1	R2	
AGDL	R1	○												
AG0.5-1.5	R1		○											
AGF	R2			○										
AG	R1				○									
	R2					○								
	R3						○							
BG	R1							○						
	R2								○				○	
	L1									○				
CG	L2										○			
	R1								○				○	
	R2									○				
PG	L1										○			
	R1								○					
	R2									○			○	
DG	R1								○				○	
	R2									○				

[Note 1] The mating wheel must have the same module as the worm.

2. Caution in Selecting Gears Based on Gear Strength

The gear strength values shown in the product pages were computed by assuming the application environment in the table 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 of Surface Durability

■ Calculation of Bending Strength of Gears

Catalog Number Item	KWGDL/KWGDLS/AGDL KWG/AGF, SWG/AG	SW/BG	SW/CG	SUW/PG	SUW/DG
Formula <small>NOTE 1</small>	Formula of cylindrical worm gear strength (JGMA405-01)			The Lewis formula	
Lubricating Oil	Lubricating oil with appropriate viscosity that contains extreme pressure additive for gears			Allowable bending stress (kgf/mm ²)	
Lubrication Method	Oil Bath Lubrication (Oil Bath)			1.15 (40°C with No Lubrication)	<small>NOTE 2</small> 1 (40°C with No Lubrication)
Startup Status	The starting torque is 200% or less of the rated torque, and the number of starts per hour is under 2.				
Expected Service Life	26,000 hours				
Impact from motor	Uniform load				
Impact from load	Uniform load				
Allowable Stress Coefficient Sc _{lim}	0.67	0.70	0.42		

[NOTE 1] The gear strength formula is based on JGMA (Japanese Gear Manufacturers Association) specifications, "MC Nylon Technical Data" by Mitsubishi Chemical Advanced Materials. The units for the rotational speed (rpm) and the stress (kgf/mm²) are adjusted to the units needed in the formula.

[NOTE 2] The values for DG worm wheels were assumed by KHK.

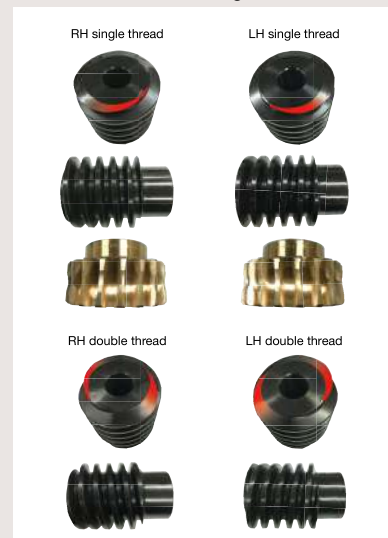
When selecting KHK standard gears, glance over the Cautions on Product Characteristics and Cautions on Performing Secondary Operations in the respective dimension tables.

- 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 24 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, etc.) listed in the catalog may be changed without prior notice. Changes are announced on the KHK website.

Website URL : <https://khkgears.net/new/>

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■ Helix direction of worm gears



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

Step 1

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

■ Maximum allowable sliding speed due to friction

The maximum 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)

$$v_s = \frac{dn}{19100 \cos \gamma}$$

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

Catalog Number	Maximum allowable sliding speed (m/s)
AGDL	* 15
AGF	* 15
AG	* 15
BG	* 10
CG	* 2.5
PG	1 (No Lubrication)

* From JGMA405-01

Step 2

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

■ For provisional selection from the Master Catalog

AG1-20R Series - AG1 Series									
Catalog Number	Module	Pressure Angle	Helix Angle	Material	Heat Treatment	Surface Treatment	Allowable Torque (kgf·m)	Sliding Speed (m/s)	Life (h)
AG1-20R1	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R2	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R3	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R4	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R5	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R6	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R7	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R8	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R9	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R10	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R11	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R12	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R13	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R14	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R15	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R16	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R17	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R18	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R19	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R20	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R21	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R22	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R23	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R24	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R25	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R26	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R27	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R28	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R29	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R30	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R31	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R32	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R33	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R34	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R35	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R36	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R37	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R38	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R39	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R40	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R41	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R42	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R43	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R44	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R45	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R46	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R47	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R48	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R49	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R50	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R51	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R52	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R53	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R54	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R55	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R56	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R57	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R58	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R59	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R60	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R61	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R62	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R63	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R64	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R65	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R66	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R67	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R68	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R69	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R70	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R71	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R72	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R73	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R74	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R75	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R76	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R77	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R78	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R79	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R80	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R81	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R82	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R83	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R84	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R85	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R86	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R87	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R88	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R89	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R90	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R91	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R92	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R93	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R94	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R95	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R96	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R97	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R98	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R99	2.0	20°	1.75°	45	H	10	100	1.5	1000
AG1-20R100	2.0	20°	1.75°	45	H	10	100	1.5	1000

AG1-20R Series (1) AG1-20R Series (2) AG1-20R Series (3) AG1-20R Series (4) AG1-20R Series (5) AG1-20R Series (6) AG1-20R Series (7) AG1-20R Series (8) AG1-20R Series (9) AG1-20R Series (10) AG1-20R Series (11) AG1-20R Series (12) AG1-20R Series (13) AG1-20R Series (14) AG1-20R Series (15) AG1-20R Series (16) AG1-20R Series (17) AG1-20R Series (18) AG1-20R Series (19) AG1-20R Series (20) AG1-20R Series (21) AG1-20R Series (22) AG1-20R Series (23) AG1-20R Series (24) AG1-20R Series (25) AG1-20R Series (26) AG1-20R Series (27) AG1-20R Series (28) AG1-20R Series (29) AG1-20R Series (30) AG1-20R Series (31) AG1-20R Series (32) AG1-20R Series (33) AG1-20R Series (34) AG1-20R Series (35) AG1-20R Series (36) AG1-20R Series (37) AG1-20R Series (38) AG1-20R Series (39) AG1-20R Series (40) AG1-20R Series (41) AG1-20R Series (42) AG1-20R Series (43) AG1-20R Series (44) AG1-20R Series (45) AG1-20R Series (46) AG1-20R Series (47) AG1-20R Series (48) AG1-20R Series (49) AG1-20R Series (50) AG1-20R Series (51) AG1-20R Series (52) AG1-20R Series (53) AG1-20R Series (54) AG1-20R Series (55) AG1-20R Series (56) AG1-20R Series (57) AG1-20R Series (58) AG1-20R Series (59) AG1-20R Series (60) AG1-20R Series (61) AG1-20R Series (62) AG1-20R Series (63) AG1-20R Series (64) AG1-20R Series (65) AG1-20R Series (66) AG1-20R Series (67) AG1-20R Series (68) AG1-20R Series (69) AG1-20R Series (70) AG1-20R Series (71) AG1-20R Series (72) AG1-20R Series (73) AG1-20R Series (74) AG1-20R Series (75) AG1-20R Series (76) AG1-20R Series (77) AG1-20R Series (78) AG1-20R Series (79) AG1-20R Series (80) AG1-20R Series (81) AG1-20R Series (82) AG1-20R Series (83) AG1-20R Series (84) AG1-20R Series (85) AG1-20R Series (86) AG1-20R Series (87) AG1-20R Series (88) AG1-20R Series (89) AG1-20R Series (90) AG1-20R Series (91) AG1-20R Series (92) AG1-20R Series (93) AG1-20R Series (94) AG1-20R Series (95) AG1-20R Series (96) AG1-20R Series (97) AG1-20R Series (98) AG1-20R Series (99) AG1-20R Series (100)

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3. Cautions on Selecting Racks By Precision

The precision standards of KHK stock worm gears are established by us. Check the precision table below.

① Worm Precision (KHK W 001)

For the pitch error and lead error of the worm, the allowable values of 1 to 4 grades are set for each module with reference to the JIS standards. The lead error is the allowable value of the tooth trace error in one lead.

■ Worm Precision KHK W 001 (Unit: μ m)

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

② Worm Wheel Accuracy (KHK W 002)

Our precision grades for pitch errors are established by referring to old JIS Standards. The precision grades are set from 1 to 5, in accordance with the tolerance of a single pitch error (S.P.E.), adjacent tooth-to-tooth error (T.T.E.), and the total composite error (T.C.E.) for each module and pitch diameter.

■ Worm Wheel Accuracy KHK W 002

Unit: μ m

Grade	Error	Over m0.4 to 1					Over m1 to 1.6					Over m1.6 to 2.5					Over m2.5 to 4					Over m4 to 6				
		Pitch dia. (mm)																								
		6 to 12	12 to 25	25 to 50	51 to 100	100 to 200	12 to 25	25 to 50	51 to 100	100 to 200	200 to 400	12 to 25	25 to 50	51 to 100	100 to 200	200 to 400	25 to 50	51 to 100	100 to 200	200 to 400	400 to 800	25 to 50	51 to 100	100 to 200	200 to 400	400 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 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
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 Pitch 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 Pitch 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	18	19	22	25	29	19	21	23	26	30	23	25	28	32	37	26	28	32	35	40
	Total Pitch 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 Pitch 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 Total Length Tolerance for Worm Gears

■ Total Length Tolerance for Worms

Series	Total Length (mm)	Tolerance
KWGDL	Uniform	0 -0.10
	100 or less	0 -0.15
SWG SW SUW	Over 100 200 or less	0 -0.20
	Uniform	Normal Tolerance

■ Total Length Tolerance for Worm Wheels

Total Length (mm)	Tolerance
30 or less	0 -0.10
31 to 100	0 -0.15
Over 100	0 -0.20

[NOTE] PG Plastic Wheels are excluded.

4. Cautions in Selecting Worm Gears Based on Efficiency

The transmission efficiency of worm gears varies slightly depending on the assembled state, lubricating oil and the like, but the transmission efficiency (excludes bearing loss and loss of lubricating oil due to stirring) of worm wheels when driven from the worm is approximately 30% to 90%. The transmission efficiency table of the KHK stock worm gears is shown below (reference values). For details, refer to the "Formula of cylindrical worm gear strength" section in our separate technical reference book.

① Efficiency of Various Worms

■ KWGDL/KWGDL5/AGDL Worm Gear Efficiency (%)

		(rpm = Worm Rotational Speed)					
Worm Rotational Speed		100	300	600	900	1200	1800
Catalog Number							
KWGDL1.5-R1		35	42	47	51	53	57
KWGDL2-R1		38	45	51	55	56	61
KWGDL2.5-R1		40	48	54	57	60	63
KWGDL3-R1		41	49	55	58	62	65
KWGDL3.5-R1		42	50	56	61	62	65
KWGDL4-R1		42	51	56	61	63	67

■ SWG/AG Worm Gear Efficiency (%)

		(rpm = Worm Rotational Speed)					
Worm Rotational Speed		100	300	600	900	1200	1800
Catalog Number							
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

■ KWG/AG/AGF Worm Gear Efficiency (%)

		(rpm = Worm Rotational Speed)					
Worm Rotational Speed		100	300	600	900	1200	1800
Catalog Number							
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

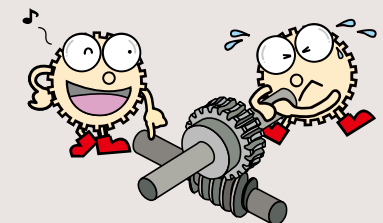
■ SW, SUW/CG, BG, PG Worm Gear Efficiency

The values shown in the table below are estimates and may vary slightly according to conditions such as assembled state, load, lubrication and rotation speed.

Catalog Number	Number of Starts	Efficiency (%)
SW/SUW	1 Start	40~50%
	2 Starts	50~60%

② Self-locking of worm gears

The state of the worm not being able to rotated from the worm wheel is called self-locking. Self-locking happens due to the worm gear's material, lead angle, machining accuracy, bearing type, lubricating oil, etc. There are various factors, so self-lock is not always determined only by the lead angle, but usually a single-row worm self-locks at a lead angle of 4° or less. If complete reverse prevention is required, use another braking mechanism or the like in combination.





Application Hints



In order to use KHK stock worm gears 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.

E-mail: info@khkgears.net

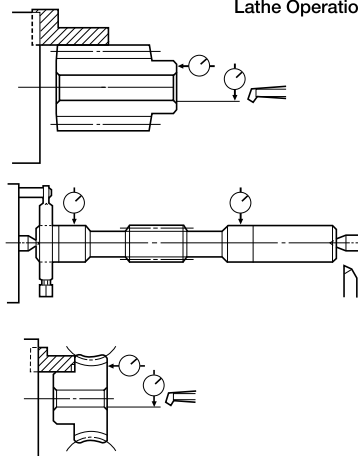
1. Cautions on Handling

- 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 Gears are machined based on the ground section of the hole or shaft. If machining, it is important to pay special attention to locating the center in order to avoid runout. (Fig.1)
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 hub end surface.

Lathe Operations



If reworking using scroll chucks, we recommend the use of new or rebored jaws for improved precision.

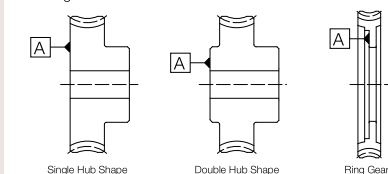
Fig. 1

- ② If enlarging the bore diameter, the wall strength of the hub must be higher than that of the gear teeth. The maximum bore size should be 60% to 70% of the hub diameter (or tooth root diameter), and 50% to 60% for keyway applied modifications. Also, because the cast FC200 hub is weaker and more brittle than other steels, we recommend using a maximum bore diameter about 10% smaller.
- ③ As the worm wheel is casted, bubbles may form inside the material. If the air bubbles found in secondary operations are problematic, contact the supplier.

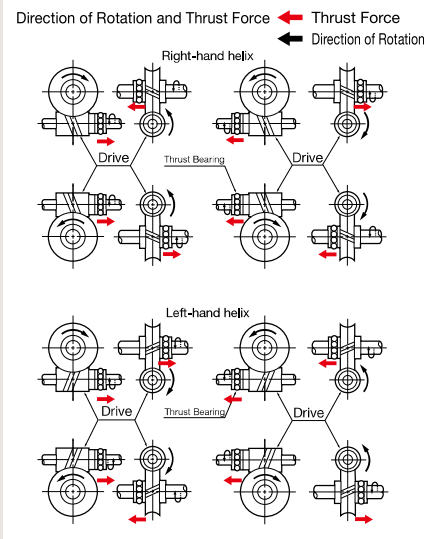
3. Points of Caution during Assembly

- ① The recommended center distance tolerance of KHK stock worm gears is H7 for ground gears and H8 for cut gears. The amount of backlash is given in the product table for each gear.
- ② The mounting reference surface of the worm wheel is as shown in the figure below.
Assemble the worm wheel so that the center of the worm shaft is at the center of its tooth width.

Mounting Reference Surface



- ③ As the tooth trace of worm gears is spiraled, axial thrust force is generated. Also, the directions of thrust change with the hand of helix and the direction of rotation. This is illustrated below. The bearings must be selected properly to be able to handle these thrust forces. For more technical information, please see the section "Gear Forces" in our separate technical reference book.

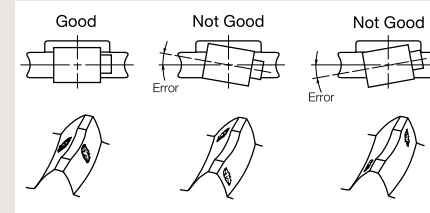


- ④ The worm may move due to a large thrust force that acts on the worm if it is not sufficiently attached to the shaft. Use a stepped shaft to secure the worm and shaft, and be careful not to loosen the bearing.

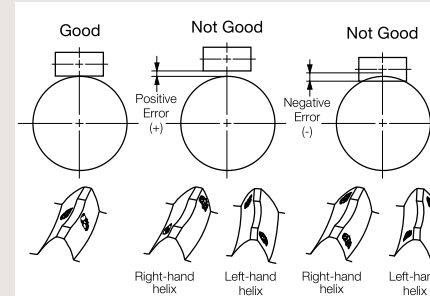
4. Confirming the installation

The wear of a worm gear is greatly affected by the quality of assembly. When assembling, confirm the following items for tooth contact and the like before use. For more technical information, please see the section "Worm Gear Tooth Contact" in our separate technical reference book.

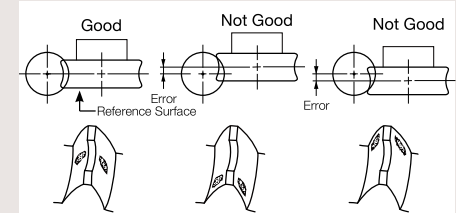
- The shaft angle tolerance between the worm shaft and worm wheel shaft is $90^\circ \pm 1'$.



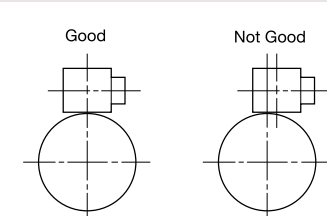
- The center distance tolerance recommended by the worm gear assembly distance is Ground Worm Gears...H7
Cut Worm Gears...H8.



- The tolerance between the center of the worm shaft and center of the worm wheel tooth width is ± 0.2 mm.



- The tolerance between the center of the worm wheel shaft and center of the worm tooth width is ± 2 mm.



If the worm comes too close to one side, the worm wheel will not rotate correctly.

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 For more technical information on lubricating gears, please see the section "Gear Lubrication" in our separate technical reference book.
- ④ If there is any abnormality such as noise or vibration during startup, stop the operation immediately and check the assembly condition such as tooth contact, eccentricity and looseness. For more technical information, please see the section "Gear Noise and Countermeasures" in our separate 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.



Caution: 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.

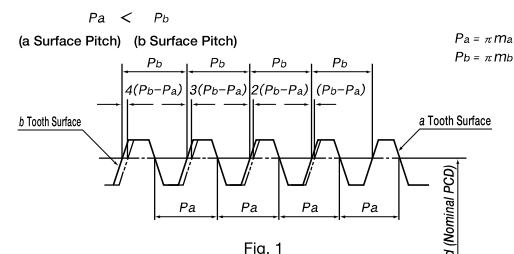
Description of duplex worm gears

The usual method of adjusting the backlash of a worm gear assembly is to modify the center distance. Once assembled, such adjustment requires a major rework of the gearbox housing. The use of duplex worm gears allows the backlash adjustment to be made by axially shifting the worm. This simplifies greatly the assembly and maintenance operations. Because of the unique characteristics of the product, please take time to study its construction and proper use.

Backlash adjustment mechanism and method of adjustment

The dual-lead worm is formed to give a difference between the right tooth surface and left tooth surface so that it provides a unique tooth profile in which the tooth thickness varies continuously, corresponding with the lead difference. (Fig.1)

The worm gear is also formed in its right and left tooth surface. When such a worm and worm gear are set up at a constant assembly distance and the worm is moved in the axial direction, the tooth thickness of the worm in mesh with the worm gear changes making backlash adjustment possible.



[CAUTION] The amount of change in backlash (Δj mm) in relation to the axial movement of the duplex worm shaft (V mm) can be calculated from the formula below.

$$\Delta j = 2V \frac{m_b \cdot m_a}{m_a + m_b}$$

Where
 m_a = Nominal Axial Module - $(0.01 \times \text{Nominal Axial Module})$
 m_b = Nominal Axial Module + $(0.01 \times \text{Nominal Axial Module})$



An arrow marking on the outer circumference of the hub of the KHK duplex worm indicates the direction of assembly as well as acts as a direction for the backlash adjustment. When the worm is held with arrow mark pointing right, the tooth thickness is thinner on the right and thicker on the left. Therefore, moving the worm to the right causes the thicker teeth to come into actual engagement with the worm gear, thereby reducing the backlash. (Fig.2)

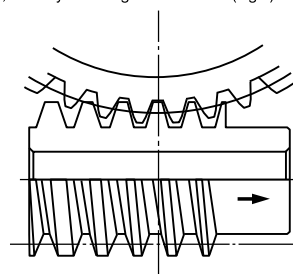


Fig. 2

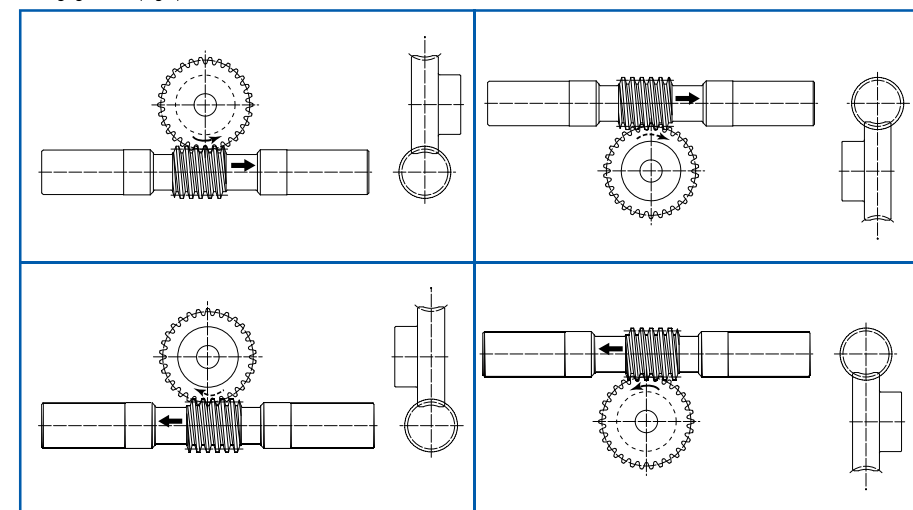
[CAUTION] The KHK duplex worm is designed so that, for all modules, the backlash reduces by 0.02 mm when the worm is shifted 1 mm.

Points of caution during assembly

KHK duplex worm gears differ in module between the right and left tooth surface and, therefore, you must orient the worm and worm wheel properly. Please carefully verify the following two aspects before proceeding with assembly.

1. Verifying the orientation of assembly

An arrow indicating the orientation of assembly is stamped on both the duplex worm and worm wheel. When assembling the worm and worm wheel, check the worm wheel of the arrow mark on the front such that the direction of arrow mark on the worm coincides with that on the worm wheel. Incorrect assembly results in difficulty of assembly and improper gear engagement. (Fig.3)



Arrow mark indicates the correct orientation of two gears when assembled. As shown, the two arrows must point in the same direction. Fig. 3

2. Verifying the reference position

A V-groove (60° , 0.3 mm deep line) on tip peripheral of the duplex worm tooth marks the reference tooth. The gear set is designated to have a backlash of nearly zero (tolerance: ± 0.045) when the reference tooth is positioned in alignment with the center of rotation of the worm wheel with the center distance set at the value "a". (Fig.4)

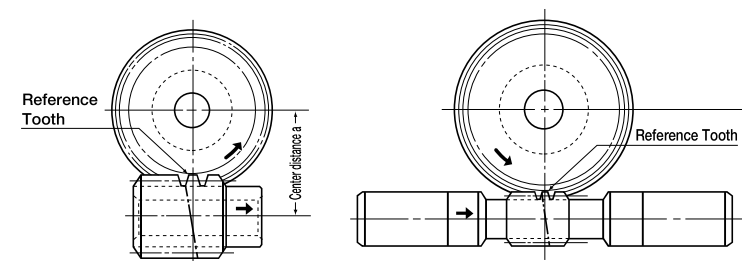
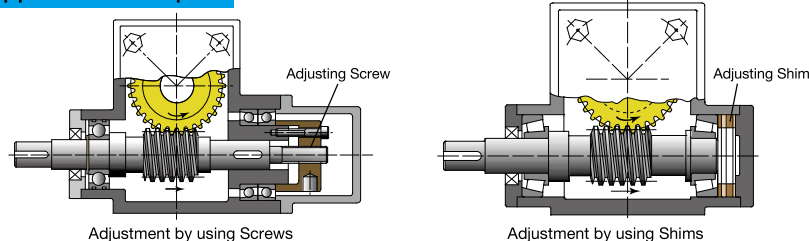


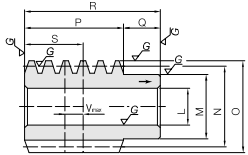
Fig. 4

Application Examples

* The illustration is a design example, not a design for machinery or a device in actual use.



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

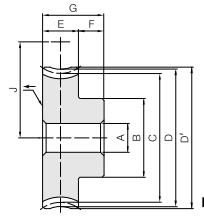


W4

Catalog Number	Nominal axial module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L ₄₇	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width Q	Total length R
KWGDLS1.5-R1	m1.5	1	3°26'	R	W4	14	25	31	35	36	14	50
KWGDLS2-R1	m2	1	3°41'	R	W4	14	25	31	35	36	14	50

[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. Please see Page 390 for more details.

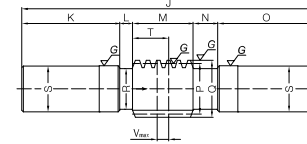
Specifications												
Precision grade	KHK W 002 grade 1											
Reference section of gear	Rotating plane											
Gear teeth	Standard full depth											
Normal pressure angle	17°30'											
Material	CAC702 (old JIS A & BC2)											
Heat Treatment	—											
Tooth hardness	—											



H1

Catalog Number	Reduction ratio	Nominal transverse module	No. of teeth	Lead angle	Direction of helix	Shape	Bore A ₄₇	Hub dia. B	Pitch dia. C	Throat dia. D	Outside dia. D'	Face width E	Hub width F
AGDL1.5-20R1	20	m1.5	20	3°26'	R	H1	8	22	30	33	34.5	14	10
AGDL1.5-30R1	30		30				10	30	45	48	49.5		
AGDL1.5-36R1	36		36				10	35	54	57	58.5		
AGDL1.5-40R1	40		40				12	35	60	63	64.5		
AGDL1.5-50R1	50		50				12	45	75	78	79.5		
AGDL1.5-60R1	60		60				12	50	90	93	94.5		
AGDL2-20R1	20	m2	20	3°41'	R	H1	12	33	40	44	46	18	15
AGDL2-30R1	30		30				15	40	60	64	66		
AGDL2-36R1	36		36				15	45	72	76	78		
AGDL2-40R1	40		40				15	45	80	84	86		
AGDL2-50R1	50		50				15	50	100	104	106		
AGDL2-60R1	60		60				15	60	120	124	126		

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 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 393.



W6

Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog Number
S	Vmax		
22	8	0.21	KWGDLS2-R1

Outside dia.	Neck dia.	Shaft dia.	Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog Number
Q	R	S	T	Vmax		
28	21	26.2	17	6	0.74	KWGDLS1.5-R1
35	24	30.2	22	8	1.17	KWGDLS2-R1

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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). Please use a carbide tool or the like when machining shafts that are close to the tooth root.

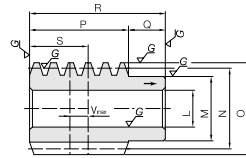
NOTE 1: Allowable torque based on worm speed (rpm)

Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) <small>NOTE 1</small>								Backlash (mm)	Weight (kg)	Catalog Number
				30 _{rpm}	100 _{rpm}	300 _{rpm}	600 _{rpm}	900 _{rpm}	1200 _{rpm}	1800 _{rpm}				
24	—	—	J	27.5	9.84	8.18	6.40	5.30	4.68	4.25	3.68	0±0.045	0.10	AGDL1.5-20R1
				35	20.8	17.5	13.9	11.7	10.4	9.40	8.28		0.22	AGDL1.5-30R1
				39.5	29.3	24.6	19.8	16.8	14.9	13.5	11.9		0.32	AGDL1.5-36R1
				42.5	35.6	30.0	24.2	20.6	18.3	16.6	14.6		0.37	AGDL1.5-40R1
				50	53.8	45.4	36.9	31.6	28.3	25.8	22.6		0.59	AGDL1.5-50R1
				57.5	75.3	63.8	51.9	44.7	40.4	36.7	32.4		0.83	AGDL1.5-60R1
33	—	—	J	35.5	21.0	17.5	13.6	11.2	9.84	8.94	7.75	0±0.045	0.26	AGDL2-20R1
				45.5	44.3	37.3	29.6	24.8	21.9	19.8	17.4		0.51	AGDL2-30R1
				51.5	62.3	52.6	42.0	35.5	31.3	28.4	25.0		0.73	AGDL2-36R1
				55.5	75.8	64.0	51.4	43.6	38.5	34.9	30.7		0.86	AGDL2-40R1
				65.5	115	96.8	78.4	66.9	59.5	54.2	47.6		1.30	AGDL2-50R1
				75.5	160	136	110	94.6	84.9	77.2	68.1		1.88	AGDL2-60R1

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.



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

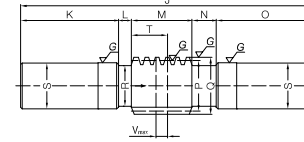


W4

Catalog Number	Nominal axial module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L ₄₇	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width Q	Total length
KWGDLS2.5-R1	m2.5	1	3°52'	R	W4	18	30	37	42	48	17	65
KWGDLS3-R1	m3	1	3°54'	R	W4	20	35	44	50	54	20	74

Catalog Number	Nominal axial module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Total Length	Shaft length (L)	Neck length (left)	Face width	Neck length (right)	Shaft length (R)	Pitch dia.
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

- [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. Please see Page 390 for more details.



W6

Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog Number
S	Vmax		
29	10	0.37	KWGDLS2.5-R1
32	10	0.61	KWGDLS3-R1

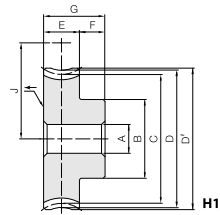
Outside dia.	Neck dia.	Shaft dia.	Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog Number
Q	R	S	T	Vmax		
42	30	36.2	29	10	2.00	KWGDLS2.5-R1
50	34	40.2	32	10	2.95	KWGDLS3-R1

- [Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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). Please use a carbide tool or the like when machining shafts that are close to the tooth root.

AGDL Duplex Worm Wheels



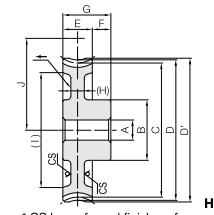
Specifications	
Precision grade	KHK W 002 grade 1
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	17°30'
Material	CAC702 (old JIS A & BC2)
Heat Treatment	—
Tooth hardness	—



H1

Catalog Number	Reduction ratio	Nominal transverse module	No. of teeth	Lead angle	Direction of helix	Shape	Bore A ₄₇	Hub dia. B	Pitch dia. C	Throat dia. D	Outside dia. D'	Face width E	Hub width F
AGDL2.5-20R1	20	m2.5	20	3°52'	R	H1	15	40	50	55	57.5	22	15
AGDL2.5-30R1	30		30			H1		40	75	80	82.5		
AGDL2.5-36R1	36		36			H1		45	90	95	97.5		
AGDL2.5-40R1	40		40			H1		45	100	105	107.5		
AGDL2.5-50R1	50		50			H1		60	125	130	132.5		
AGDL2.5-60R1	60		60			H1		80	150	155	157.5		
AGDL3-20R1	20	m3	20	3°54'	R	H1	20	50	60	66	69	28	17
AGDL3-30R1	30		30			H1		55	90	96	99		
AGDL3-36R1	36		36			H1		60	108	114	117		
AGDL3-40R1	40		40			H1		60	120	126	129		
AGDL3-50R1	50		50			H1		70	150	156	159		
AGDL3-60R1	60		60			H1		80	180	186	189		

- [Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 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 393.



HB

* CS has a forged finish surface.

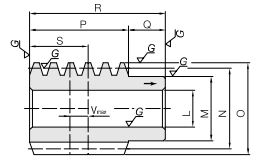
NOTE 1: Allowable torque based on worm speed (rpm)

Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) <small>NOTE 1</small>								Backlash (mm)	Weight (kg)	Catalog Number
				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	0.88	AGDL2.5-20R1
	—	—	56	80.5	67.1	53.1	44.5	39.1	35.5	30.9				
	—	—	63.5	113	94.5	75.5	63.8	56.0	51.0	44.3				
	(10)	(86)	68.5	138	115	92.4	78.3	68.8	62.7	54.4				
	(12)	(108)	81	208	174	141	120	106	97.3	84.3				
45	—	—	93.5	291	245	198	170	152	139	121	0±0.045	0.81	1.65	AGDL3-20R1
	—	—	52	65.0	53.3	41.5	33.8	29.5	26.9	22.8				
	—	—	67	137	114	90.0	74.7	65.5	59.5	51.2				
	—	—	76	193	160	128	107	93.8	85.6	73.4				
	(14)	(106)	82	235	195	157	131	115	105	90.1				
	(14)	(134)	97	355	295	239	202	178	163	140	0±0.045	2.32	2.19	AGDL3-30R1
	(14)	(164)	112	497	415	336	285	254	233	200				

- [Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.
- KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.



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



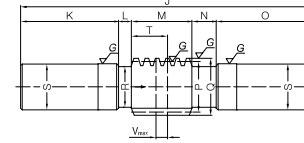
W4

Catalog Number	Nominal axial module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L ₄₇	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width Q	Total length R
KWGDLS3.5-R1	m3.5	1	3°47'	R	W4	24	44	53	60	62	23	85
KWGDLS4-R1	m4	1	3°41'	R	W4	28	50	62	70	74	26	100

Catalog Number	Nominal axial module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Total Length	Shaft length (L)	Neck length (left)	Face width	Neck length (right)	Shaft length (R)	Pitch dia.
KWGDLS3.5-R1	m3.5	1	3°47'	R	W6	330	110	18	62	30	110	53
KWGDLS4-R1	m4	1	3°41'	R	W6	360	120	16	74	30	120	62

[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. Please see Page 390 for more details.



W6

Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog Number
S	Vmax	1.05	KWGDLS3.5-R1
37	12	1.67	KWGDLS4-R1

Outside dia.	Neck dia.	Shaft dia.	Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog Number
Q	R	S	T	Vmax	4.72	KWGDLS3.5-R1
60	42	48.2	37	12	7.10	KWGDLS4-R1
70	50	56.2	44	14		

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

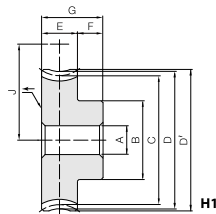
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm). Please use a carbide tool or the like when machining shafts that are close to the tooth root.

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 (old JIS A & BC2)
Heat treatment	—
Tooth hardness	—

*The hub material of H5 is S45C.

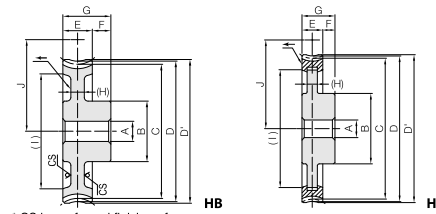


H1

Catalog Number	Reduction ratio	Nominal transverse module	No. of teeth	Lead angle	Direction of helix	Shape	Bore A ₄₇	Hub dia. B	Pitch dia. C	Throat dia. D	Outside dia. D'	Face width E	Hub width 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			H1		60	105	112	115.5		
AGDL3.5-36R1	36		36			H1		70	126	133	136.5		
AGDL3.5-40R1	40		40			H1		70	140	147	150.5		
AGDL3.5-50R1	50		50			H1		80	175	182	185.5		
AGDL3.5-60R1	60		60			H1		90	210	217	220.5		
AGDL4-20R1	20	m4	20	3°41'	R	H1	20	60	80	88	92	35	20
AGDL4-30R1	30		30			H1	20	65	120	128	132		
AGDL4-36R1	36		36			H1	20	75	144	152	156		
AGDL4-40R1	40		40			H1	20	75	160	168	172		
AGDL4-50R1	50		50			H1	20	90	200	208	212		
AGDL4-60R1	60		60			H1	30	120	240	248	252		

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 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 393.



H1

H5

* CS has a forged finish surface.

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

Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m)								Backlash (mm)	Weight (kg)	Catalog Number
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	
	—	—	79	208	172	136	111	98.1	88.3	75.7		2.51	AGDL3.5-30R1	
	—	—	89.5	293	242	193	160	141	127	109		3.61	AGDL3.5-36R1	
	(15)	(124)	96.5	356	295	236	196	173	156	133		3.34	AGDL3.5-40R1	
	(16)	(155)	114	538	446	360	301	267	243	207		5.02	AGDL3.5-50R1	
	(16)	(189)	131.5	753	627	506	425	381	345	296	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	
	(17)	(99)	91	284	234	184	150	132	118	101		3.01	AGDL4-30R1	
	(17)	(121)	103	400	329	262	215	190	170	144		4.18	AGDL4-36R1	
	(17)	(137)	111	486	400	320	264	233	208	177		4.78	AGDL4-40R1	
	(17)	(177)	131	735	605	488	405	361	324	275		7.07	AGDL4-50R1	
	(17)	(200)	151	1030	851	687	572	515	461	393		11.5	AGDL4-60R1	

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.

KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

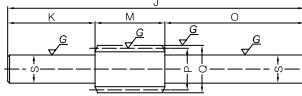


KWG Module 0.5, 0.8

Ground Worm Shafts



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



W5

Catalog Number	Axial module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Total Length	Shaft length (L)	Neck length (left)	Face width	Neck length (right)	Shaft length (R)	Pitch dia.
KWG0.5-R1 KWG0.5-R2	m0.5	1 2	3°11' 6°20'	R	W5	65	19	—	12	—	34	9
KWG0.8-R1 KWG0.8-R2	m0.8	1 2	3°49' 7°36'	R	W5	85	25	—	20	—	40	12

[Caution on Product Characteristics] ① These gears produce axial thrust forces. Please see Page 390 for more details.

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog Number
Q	R	S _{H7}		
10	—	6	0.018	KWG0.5-R1 KWG0.5-R2
13.6	—	8	0.043	KWG0.8-R1 KWG0.8-R2

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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). Please use a carbide tool or the like when machining shafts that are close to the tooth root.

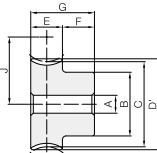


AG Module 0.5, 0.8

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 (old JIS A & BC2)
Heat Treatment	—
Tooth hardness	—



HA

Catalog Number	Reduction ratio	Transverse module	No. of teeth	No. of starts of mating worm	Lead angle	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width
AG0.5-20R1 AG0.5-20R2 AG0.5-30R1 AG0.5-30R2 AG0.5-40R1	20 10 30 15 40	m0.5	20 20 30 30 40	1 2 1 2 1	3°11' 6°20' 3°11' 6°20' 3°11'	R	HA	A _{H7}	B	C	D	D'	E	F
AG0.5-50R1 AG0.5-60R1	50 60		50 60	1 1	3°11' 3°11'			5 5	20 25	25 30		26 31		
AG0.8-20R1 AG0.8-20R2 AG0.8-30R1 AG0.8-30R2 AG0.8-40R1	20 10 30 15 40	m0.8	20 20 30 30 40	1 2 1 2 1	3°49' 7°36' 3°49' 7°36' 3°49'	R	HA	5 5 5 5 6	12 12 18 18 20	16 16 24 24 32		17.6 17.6 25.6 25.6 33.6	8	8
AG0.8-50R1 AG0.8-60R1	50 60		50 60	1 1	3°49' 3°49'			8 8	25 25	40 48		41.6 49.6		

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.

Worm Wheels



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

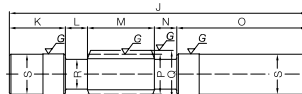
Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) <small>NOTE 1</small>								Backlash (mm)	Weight (kg)	Catalog Number
G	(H)	(I)	J	30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm				
12	—	—	9.5	0.52	0.44	0.36	0.30	0.26	0.24	0.21	0.02~0.14	0.0056	AG0.5-20R1	
			9.5	0.51	0.42	0.33	0.27	0.24	0.22	0.19		0.0056	AG0.5-20R2	
			12	1.09	0.94	0.77	0.65	0.58	0.53	0.48		0.012	AG0.5-30R1	
			12	1.09	0.92	0.73	0.60	0.54	0.49	0.43		0.012	AG0.5-30R2	
			14.5	1.86	1.60	1.34	1.15	1.02	0.94	0.84		0.020	AG0.5-40R1	
			17	2.82	2.42	2.05	1.77	1.58	1.46	1.30		0.035	AG0.5-50R1	
16	—	—	19.5	3.94	3.41	2.89	2.50	2.26	2.08	1.87	0.053	AG0.5-60R1		
			14	1.78	1.50	1.21	1.00	0.88	0.82	0.71	0.018	AG0.8-20R1		
			14	1.76	1.44	1.11	0.91	0.80	0.74	0.63	0.018	AG0.8-20R2		
			18	3.77	3.21	2.62	2.20	1.96	1.81	1.61	0.043	AG0.8-30R1		
			18	3.75	3.14	2.46	2.02	1.80	1.65	1.45	0.043	AG0.8-30R2		
			22	6.45	5.49	4.55	3.87	3.46	3.19	2.83	0.068	AG0.8-40R1		
			26	9.75	8.31	6.94	5.94	5.34	4.96	4.38	0.10	AG0.8-50R1		
			30	13.6	11.7	9.77	8.39	7.63	7.05	6.27	0.14	AG0.8-60R1		

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.

KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.



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



W6

Catalog Number	Axial module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Total Length	Shaft length (L)	Neck length (left)	Face width	Neck length (right)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
KWG1-R1 KWG1-R2	m1	1 2	3°35' 7°08'	R	W6	140	35	10	30	10	55	16
KWG1.5-R1 KWG1.5-R2	m1.5	1 2	3°26' 6°51'	R	W6	190	50	15	40	15	70	25

[Caution on Product Characteristics] ① These gears produce axial thrust forces. Please see Page 390 for more details.

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog Number
Q	R	S		
18	13	18.2	0.25	KWG1-R1 KWG1-R2
28	21	26.2	0.74	KWG1.5-R1 KWG1.5-R2

[Caution on Secondary Operations] ① Please read “Cautions on Performing Secondary Operations” (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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). Please use a carbide tool or the like when machining shafts that are close to the tooth root.

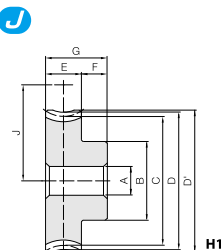
AG Module 1, 1.5
Worm Wheels



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 (old 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	Total length
J	Mounting distance



H1

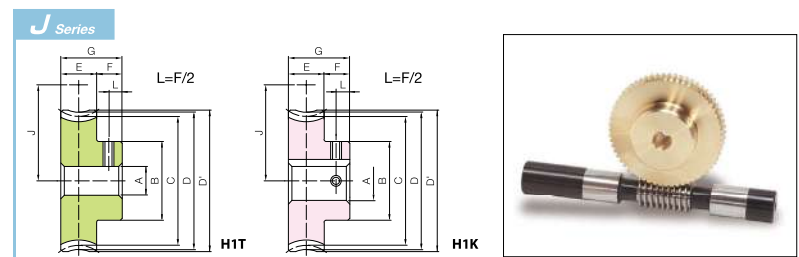
NOTE 1: Allowable torque based on worm speed (rpm)

Catalog Number	Pitch circle size	No. of teeth	Lead angle helix direction	Shape	A _{HP}	B	C	D	D'	E	F	G	J	Allowable torque (N·m) <small>NOTE 1</small>						Backlash (mm)	Weight (kg)			
														30 <small>mm</small>	100 <small>mm</small>	300 <small>mm</small>	600 <small>mm</small>	900 <small>mm</small>	1200 <small>mm</small>			1800 <small>mm</small>		
AG1-20R1	20	20	1	3°35'		6	16	20	22	23			18	3.35	2.79	2.23	1.83	1.63	1.50	1.30		0.038		
AG1-20R2	10	20	2	7°08'		6	16	20	22	23			18	3.31	2.69	2.06	1.68	1.48	1.35	1.15		0.038		
AG1-30R1	30	30	1	3°35'		6	20	30	32	33			23	7.08	5.98	4.84	4.05	3.63	3.31	2.92		0.078		
AG1-30R2	15	30	2	7°08'	R	H1	6	20	30	32	33		10	10	20	23	7.03	5.84	4.56	3.72	3.33	3.03	0.08~0.19	0.078
AG1-40R1	40	40	1	3°35'			8	26	40	42	43		28	12.1	10.2	8.43	7.12	6.38	5.86	5.13		0.13		
AG1-50R1	50	50	1	3°35'			8	30	50	52	53		33	18.3	15.5	12.9	10.9	9.87	9.09	7.95		0.20		
AG1-60R1	60	60	1	3°35'			10	35	60	62	63		38	25.6	21.8	18.1	15.4	14.1	12.9	11.4		0.29		
AG1.5-20R1	20	20	1	3°26'			8	22	30	33	34.5		27.5	9.84	8.18	6.40	5.30	4.68	4.25	3.68		0.10		
AG1.5-20R2	10	20	2	6°51'			8	22	30	33	34.5		27.5	9.72	7.87	5.92	4.87	4.28	3.83	3.27		0.10		
AG1.5-30R1	30	30	1	3°26'			10	30	45	48	49.5		35	20.8	17.5	13.9	11.7	10.4	9.40	8.28		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	0.22		
AG1.5-40R1	40	40	1	3°26'			12	35	60	63	64.5		42.5	35.6	30.0	24.2	20.6	18.3	16.6	14.6		0.37		
AG1.5-50R1	50	50	1	3°26'			12	45	75	78	79.5		50	53.8	45.4	36.9	31.6	28.3	25.8	22.6		0.59		
AG1.5-60R1	60	60	1	3°26'			12	50	90	93	94.5		57.5	75.3	63.8	51.9	44.7	40.4	36.7	32.4		0.83		

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

Worm Wheels



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

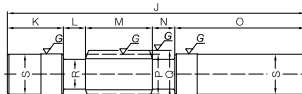
[illegible]

[Caution on J series]

- ① As available-on-request products, **these require a lead-time for shipping of 2 working days (excludes the day ordered), after placing an order.** However, as machining starts immediately after an order is received, **orders cannot be canceled.** Please see Page 34 for more details.
- ② **Number of pieces we can process for one order is 1 to 20 units.** For larger quantities, please request price and delivery quotes.
- ③ **Keywords 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. For details, please see the KHK Web Catalog.
- ⑤ **For products having a tapped hole, a set screw is included.**
- ⑥ **When using HIT set screws for fastening gears to a shaft, only use this method for applications with light load usage.** For secure fastening, please use dowel pins in combination.



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



W6

Catalog Number	Axial module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Total Length	Shaft length (L)	Neck length (left)	Face width	Neck length (right)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
KWG2-R1	m2	1	5°12'	R	W6	200	35	25	40	25	75	22
KWG2-R2		2	10°18'									
KWG2.5-R1	m2.5	1	4°46'	R	W6	250	50	27	46	27	100	30
KWG2.5-R2		2	9°28'									

[Caution on Product Characteristics] ① These gears produce axial thrust forces. Please see Page 390 for more details.

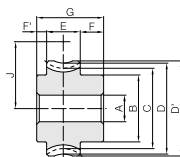


AGF Module 2, 2.5

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 (old JIS A 8 BC2)
Heat treatment	—
Tooth hardness	—



H6

* The hub material of H8 and H9 is FC200.
FC200's tensile strength (200N/mm²) is derived from test specimens and does not represent that of the boss

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

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.

② Some products have a slight gap in the casted section, but this does not affect the holding strength.

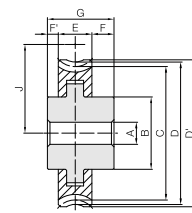
* For products not categorized in our KHK Stock Gear series, custom gear production services with short lead times are available. Please see Page 24 for more details about custom-made orders.

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog Number
Q	R	S		
26	17	25.2	0.64	KWG2-R1 KWG2-R2
35	23	30.2	1.27	KWG2.5-R1 KWG2.5-R2

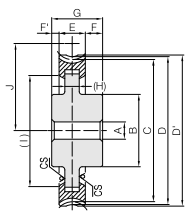
[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

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). Please use a carbide tool or the like when machining shafts that are close to the tooth root.

Worm Wheels



H8



H9

* CS has a forged finish surface.



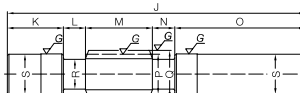
Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) <small>NOTE 1</small>								Backlash (mm)	Weight (kg)	Catalog Number
G	(H)	(I)	J	30 _{mm}	100 _{mm}	300 _{mm}	600 _{mm}	900 _{mm}	1200 _{mm}	1800 _{mm}				
35	—	—	30	19.4	16.1	12.8	10.5	9.30	8.49	7.31	0.11~0.24	0.25	AGF2-20R1	
			30	19.9	16.1	12.2	9.99	8.75	7.92	6.74		0.25	AGF2-20R2	
			35	29.4	24.5	19.6	16.3	14.4	13.2	11.4		0.37	AGF2-25R1	
			40	41.1	34.5	27.7	23.2	20.7	18.8	16.4		0.51	AGF2-30R1	
			40	42.3	35.0	27.0	22.1	19.9	17.7	15.4		0.51	AGF2-30R2	
	(10) (12) (12)	(76) (81) (96)	47	57.8	48.6	39.3	33.2	29.6	27.0	23.6		0.73	AGF2-36R1	
			50	70.3	59.2	48.1	40.7	36.4	33.2	28.9		0.85	AGF2-40R1	
			60	98.5	83.0	68.0	57.9	51.9	47.5	41.3		1.14	AGF2-48R1	
			60	106	89.5	73.4	62.5	56.2	51.5	44.9		1.14	AGF2-50R1	
			70	149	126	103	88.4	80.3	73.3	64.2		1.51	AGF2-60R1	
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	
			40	34.6	27.9	20.9	17.1	14.8	13.4	11.3		0.44	AGF2.5-20R2	
			46.25	53.0	43.9	34.8	28.9	25.3	23.0	20.0		0.66	AGF2.5-25R1	
			52.5	74.1	62.0	49.1	41.2	36.7	32.8	28.7		0.87	AGF2.5-30R1	
			52.5	73.6	60.6	46.2	37.8	33.2	29.9	25.8		0.87	AGF2.5-30R2	
	(13) (13) (13) (13)	(97) (100) (125)	60	104	87.4	69.8	59.0	51.8	47.1	41.2		1.19	AGF2.5-36R1	
			65	127	106	85.4	72.4	63.7	57.9	50.5		1.42	AGF2.5-40R1	
			75	178	149	121	103	90.8	83.1	72.2		1.72	AGF2.5-48R1	
			77.5	192	161	130	111	98.4	90.0	78.3		1.92	AGF2.5-50R1	
			90	268	226	183	157	141	128	112		2.59	AGF2.5-60R1	

[Caution on Secondary Operations] ① Please read “Cautions on Performing Secondary Operations” (Page 390) when performing modifications and/or secondary operations for safety concerns.

② Even though the holding strength of tooth and hub by casting is designed to be stronger than the teeth, a secondary operation may weaken the strength. Avoid performing secondary operations other than hubs.



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



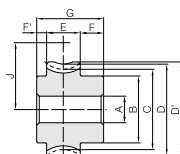
W6

Catalog Number	Axial module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Total Length J	Shaft length (L) K	Neck length (left) L	Face width M	Neck length (right) N	Shaft length (R) O	Pitch dia. P
KWG3-R1 KWG3-R2	m3	1 2	4°31' 8°58'	R	W6	300	55	30	60	30	125	38
KWG4-R1 KWG4-R2	m4	1 2	5°43' 11°19'	R	W6	360	70	32.5	75	32.5	150	40

[Caution on Product Characteristics] ① These gears produce axial thrust forces. Please see Page 390 for more details.



	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 (old JIS A & BC2)
Heat treatment	—
Tooth hardness	—



H6

* The hub material of H8 and H9 is FC200.
FC200's tensile strength (200N/mm²) is derived from test specimens and does not represent that of the boss.

Catalog Number	Reduction ratio	Transverse module	No. of teeth	No. of starting worm	Profile shift coefficient	Lead angle	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width (right)	Hub width (left)		
									A _{H7}	B	C	D	D'	E	F	F'		
AGF3-20R1	20	m3	20	1	+0.333	4°31'	R	H6	20	50	60	68	71	25	17.5	7.5		
AGF3-20R2	10		20	2	+0.333	8°58'		H6		50	60	68	71					
AGF3-25R1	25		25	1	0	4°31'		H6		55	75	81	84					
AGF3-30R1	30		30	1	+0.333	4°31'		H8		55	90	98	101					
AGF3-30R2	15		30	2	+0.333	8°58'		H8		55	90	98	101					
AGF3-36R1	36	m4	36	1	+0.333	4°31'	R	H8	20	60	108	116	119	30	20	10		
AGF3-40R1	40		40								H8	65	120				128	131
AGF3-48R1	48		48								H9	70	144				152	155
AGF3-50R1	50		50								H9	75	150				158	161
AGF3-60R1	60		60								H9	80	180				188	191
AGF4-20R1	20	m4	20	1	0	5°43'	R	H6	20	60	80	88	92	30	20	10		
AGF4-20R2	10		20	2		11°19'		H6		60	80	88	92					
AGF4-25R1	25		25	1		5°43'		H6		65	100	108	112					
AGF4-30R1	30		30	1		5°43'		H8		65	120	128	132					
AGF4-30R2	15		30	2		11°19'		H8		65	120	128	132					
AGF4-36R1	36	m4	36	1	0	5°43'	R	H9	20	70	144	152	156	30	20	10		
AGF4-40R1	40		40							H9	20	80	160				168	172
AGF4-48R1	48		48							H9	20	90	192				200	204
AGF4-50R1	50		50							H9	20	90	200				208	212
AGF4-60R1	60		60							H0	160	—	240				248	252

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.

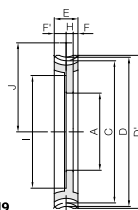
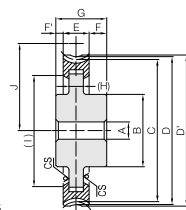
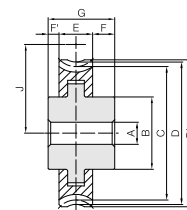
② Some products have a slight gap in the casted section, but this does not affect the holding strength.

* For products not categorized in our KHK Stock Gear series, custom gear production services with short lead times are available. Please see Page 24 for more details about custom-made orders.

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog Number
Q	R	S		
44	30	40.2	2.66	KWG3-R1 KWG3-R2
48	29	45.2	3.85	KWG4-R1 KWG4-R2

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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). Please use a carbide tool or the like when machining shafts that are close to the tooth root.



* CS has a forged finish surface.

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

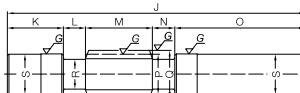
Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) <small>NOTE 1</small>							Backlash (mm)	Weight (kg)	Catalog Number
G	(H)	(I)	J	30 _{mm}	100 _{mm}	300 _{mm}	600 _{mm}	900 _{mm}	1200 _{mm}	1800 _{mm}			
50	—	—	50	59.7	49.1	38.3	31.5	27.5	25.1	21.5	0.16~0.29	0.88	AGF3-20R1
			50	60.2	48.2	36.1	29.5	25.4	23.0	19.4		0.88	AGF3-20R2
			55.5	90.2	74.3	58.8	48.9	42.6	39.0	33.5		1.24	AGF3-25R1
			65	126	105	83.1	69.6	61.0	55.4	48.2		1.63	AGF3-30R1
			65	128	105	79.8	65.2	57.2	51.6	44.3		1.63	AGF3-30R2
	(15)	(120)	74	178	148	118	99.7	87.5	79.4	69.1		2.25	AGF3-36R1
			—	80	216	180	145	122	108	98.0		2.76	AGF3-40R1
			92	303	252	204	174	153	141	121		3.28	AGF3-48R1
			(15)	(125)	95	326	272	220	188	166		3.62	AGF3-50R1
			(15)	(155)	110	457	383	310	265	237		4.76	AGF3-60R1
60	—	—	60	123	101	78.8	64.6	56.3	51.5	43.8	0.19~0.32	1.77	AGF4-20R1
			60	127	101	76.0	61.9	53.2	48.3	40.5		1.77	AGF4-20R2
			70	186	153	121	100	87.3	79.9	68.5		2.56	AGF4-25R1
			80	260	216	171	143	125	114	98.4		3.28	AGF4-30R1
			80	270	220	168	137	120	108	92.2		3.28	AGF4-30R2
			60	(20)	(113)	92	366	304	243	204		4.10	AGF4-36R1
			60	(20)	(128)	100	445	370	297	251		5.25	AGF4-40R1
			60	(20)	(160)	116	624	519	420	356		6.95	AGF4-48R1
30	8	204	60	(20)	(168)	120	673	560	454	385		7.35	AGF4-50R1
			30	8	204	140	941	788	638	544		3.60	AGF4-60R1

[Caution on Secondary Operations] ① Please read “Cautions on Performing Secondary Operations” (Page 390) when performing modifications and/or secondary operations for safety concerns.

② Even though the holding strength of tooth and hub by casting is designed to be stronger than the teeth, a secondary operation may weaken the strength. Avoid performing secondary operations other than hubs.



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



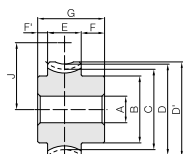
W6

Catalog Number	Axial module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Total Length	Shaft length (L)	Neck length (left)	Face width	Neck length (right)	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 gears produce axial thrust forces. Please see Page 390 for more details.



	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 (old JIS A ̢ BC2)
Heat treatment	—
Tooth hardness	—



H6

* The hub material of H8 and H9 is FC200.

FC200's tensile strength (200N/mm²) is derived from test specimens and does not represent that of the boss

Catalog Number	Reduction ratio	Transverse module	No. of teeth	No. of starts of mating worm	Profile shift coefficient	Lead angle	Direction of helix	Shape	Bore A _{H7}	Hub dia. B	Pitch dia. C	Throat dia. D	Outside dia. D'	Face width E	Hub width (right) F	Hub width (left) F'
AGF5-20R1	20	m5	20	1	0	5°43'	R	H6	22	75	100	110	115	35	23	12
AGF5-25R1	25		H6					75		125	135	140				
AGF5-30R1	30		H8					75		150	160	165				
AGF5-36R1	36		H9					90		180	190	195				
AGF5-40R1	40		H9					110		200	210	215				
AGF5-48R1	48	m6	48	1	0	5°43'	R	H0	140	240	250	255	40	7.5	17.5	
AGF5-50R1	50		H0					150	250	260	265					
AGF5-60R1	60		H0					200	300	310	315					
AGF6-20R1	20	m6	20	1	0	5°43'	R	H6	25	85	120	132	138	40	23	12
AGF6-25R1	25		H6					90		150	162	168				
AGF6-30R1	30		H8					100		180	192	198				
AGF6-36R1	36		H9					110		216	228	234				
AGF6-40R1	40		H0					130		240	252	258				
AGF6-48R1	48	180		288	300	306										
AGF6-50R1	50	190		300	312	318										
AGF6-60R1	60	250		360	372	378										

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.

② Some products have a slight gap in the casted section, but this does not affect the holding strength.

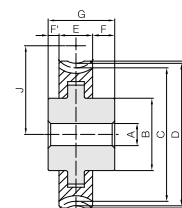
③ For H0 products with bore of $\phi 190$ or larger, the bore tolerance is H8.

* For products not categorized in our KHK Stock Gear series, custom gear production services with short lead times are available. Please see Page 24 for more details about custom-made orders.

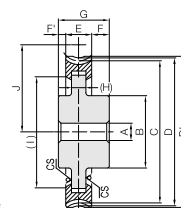
Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog Number
Q	R	S		
60	36	50.2	5.75	KWG5-R1
72	44	60.2	8.09	KWG6-R1

[Caution on Secondary Operations] ① Please read “Cautions on Performing Secondary Operations” (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

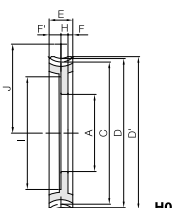
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm). Please use a carbide tool or the like when machining shafts that are close to the tooth root.



H8



H9



H

* CS has a forged finish surface.

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



Worm Wheels

Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) <small>NOTE 1</small>							Backlash (mm)	Weight (kg)	Catalog Number
G	(H)	(I)	J	30 _{mm}	100 _{mm}	300 _{mm}	600 _{mm}	900 _{mm}	1200 _{mm}	1800 _{mm}			
70	—	—	75	211	172	134	108	95.0	86.2	72.7	0.22~0.35	3.26	AGF5-20R1
	—	—	87.5	319	261	206	168	147	134	114		4.48	AGF5-25R1
	—	—	100	446	369	291	239	211	191	164		5.79	AGF5-30R1
	(25)	(140)	115	627	519	414	343	302	274	234		7.70	AGF5-36R1
	(26)	(162)	125	763	632	506	421	371	337	288		9.97	AGF5-40R1
35	10	195	145	1070	886	715	598	530	483	411	5.04	AGF5-48R1	
		205	150	1150	956	772	646	574	523	446	5.28	AGF5-50R1	
		255	175	1610	1340	1090	913	820	744	639	6.48	AGF5-60R1	
75	—	—	90	329	268	208	167	146	131	110	4.95	AGF6-20R1	
	—	—	105	497	405	319	259	227	204	173	7.14	AGF6-25R1	
	—	—	120	696	572	451	368	325	290	248	9.66	AGF6-30R1	
	(30)	(172)	138	978	806	641	528	466	417	355	12.5	AGF6-36R1	
40	12	190	150	1190	981	784	648	572	513	436	6.20	AGF6-40R1	
		240	174	1670	1380	1110	920	816	735	628	7.58	AGF6-48R1	
		250	180	1800	1480	1200	994	885	796	676	8.00	AGF6-50R1	
		310	210	2520	2090	1680	1410	1260	1130	969	10.0	AGF6-60R1	

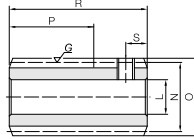
[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.

KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

② Even though the holding strength of tooth and hub by casting is designed to be stronger than the teeth, a secondary operation may weaken the strength. Avoid performing secondary operations other than hubs.



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



W2

Catalog Number	Axial module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L _{H7}	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width (right) Q	Hub width (left) Q'
● J Series (Available-on-request)												
SWG1-R1 SWG1-R2	m1	1 2	3°35' 7°08'	R	W2	8	—	16	18	(20)	—	—
SWG1.5-R1 ● SWG1.5-R1J10	m1.5	1	3°26'	R	W1 W1K	10	20	25	28	30	10	—
SWG1.5-R2 ● SWG1.5-R2J10		2	6°51'		W1 W1K							

[Caution on Product Characteristics] ① Set screws are included with W2 products. Set the mating wheel so that it does not interfere with the set screws.
② These worms produce axial thrust forces. Please see Page 390 for more details.

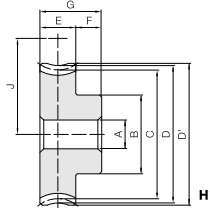
[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

AG Module 1, 1.5 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 (old JIS A2 BC2)
Heat Treatment	—
Tooth hardness	—

A _{H7}	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
E	Face width
F	Hub width
G	Total length
J	Mounting distance



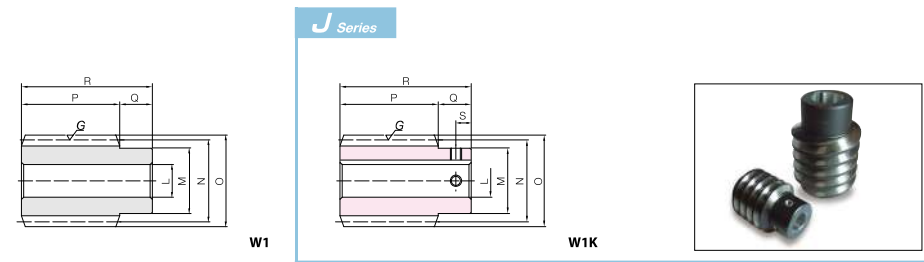
H1

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

Catalog Number	Reducer size	No. of teeth	No. of fluting	Lead angle helix direction	Shape	A _{H7}	B	C	D	D'	E	F	G	J	Allowable torque (N·m) <small>NOTE 1</small>							Backlash (mm)	Weight (kg)
															30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm		
AG1-20R1	20	20	1	3°35'	R	H1	6	16	20	22	23			18	3.35	2.79	2.23	1.83	1.63	1.50	1.30		0.038
AG1-20R2	10	20	2	7°08'			6	16	20	22	23			18	3.31	2.69	2.06	1.68	1.48	1.35	1.15		0.038
AG1-30R1	30	30	1	3°35'			6	20	30	32	33			23	7.08	5.98	4.84	4.05	3.63	3.31	2.92		0.078
AG1-30R2	15	30	2	7°08'			6	20	30	32	33		10	10	20	23	7.03	5.84	4.56	3.72	3.33	3.03	2.63
AG1-40R1	40	40	1	3°35'			8	26	40	42	43			28	12.1	10.2	8.43	7.12	6.38	5.86	5.13		0.13
AG1-50R1	50	50	1	3°35'			8	30	50	52	53			33	18.3	15.5	12.9	10.9	9.87	9.09	7.95		0.20
AG1-60R1	60	60	1	3°35'			10	35	60	62	63			38	25.6	21.8	18.1	15.4	14.1	12.9	11.4		0.29
AG1.5-20R1	20	20	1	3°26'	R	H1	8	22	30	33	34.5			27.5	9.84	8.18	6.40	5.30	4.68	4.25	3.68		0.10
AG1.5-20R2	10	20	2	6°51'			8	22	30	33	34.5			27.5	9.72	7.87	5.92	4.87	4.25	3.83	3.27		0.10
AG1.5-30R1	30	30	1	3°26'			10	30	45	48	49.5			35	20.8	17.5	13.9	11.7	10.4	9.40	8.28		0.22
AG1.5-30R2	15	30	2	6°51'			10	30	45	48	49.5	14	10	24	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'			12	35	60	63	64.5			42.5	35.6	30.0	24.2	20.6	18.3	16.6	14.6		0.37
AG1.5-50R1	50	50	1	3°26'			12	45	75	78	79.5			50	53.8	45.4	36.9	31.6	28.3	25.8	22.6		0.59
AG1.5-60R1	60	60	1	3°26'			12	50	90	93	94.5			57.5	75.3	63.8	51.9	44.7	40.4	36.7	32.4		0.83

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

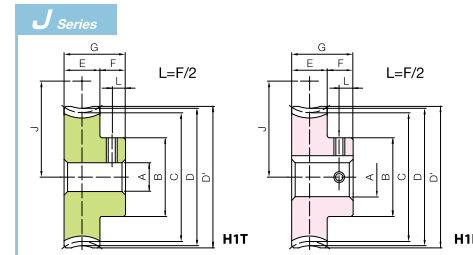


Total length	Keyway	Socket head screw	Weight (kg)	Catalog Number
R	Width x Depth	Size	S	● J Series (Available-on-request)
32	—	M4	5	0.037
40	4 x 1.8	M4	5	0.12
	—	—	—	0.11
	4 x 1.8	M4	5	0.12
				0.11
				SWG1-R1 SWG1-R2
				● SWG1.5-R1J10
				SWG1.5-R2
				● SWG1.5-R2J10

[Caution on J series] ① As available-on-request products, these require a lead-time for shipping of 2 working days (excludes the day ordered), after placing an order. However, as machining starts immediately after an order is received, orders cannot be canceled. Please see Page 34 for more details.
② Number of pieces we can process for one order is 1 to 20 units. For larger quantities, please request price and delivery quotes.
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.



Worm Wheels



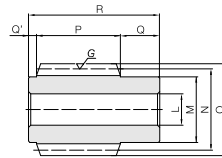
To order J Series products, please specify: **Catalog No. + J + BORE.**

Bore H7		* The product shapes of J Series items are identified by background color.															
Keyway js9	6	8	10	12	14	15	16	17	18	19	20	22	25	28	30		
Screw size	—		4×1.8		5×2.3				6×2.8				8×3.3				
Catalog Number	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	H1K						
AG1.5-50R1 J BORE				H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K				
AG1.5-60R1 J BORE				H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K		

[Caution on J series] ① As available-on-request products, these require a lead-time for shipping of 2 working days (excludes the day ordered), after placing an order. Because the machining starts immediately, we cannot accept cancellations. Please see Page 34 for more details.
② Number of pieces we can process for one order is 1 to 20 units. For larger quantities, please request price and delivery quotes.
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. For details, please see the KHK Web Catalog.
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 load usage. For secure fastening, please use dowel pins in combination.



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



W3

Catalog Number	Axial module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L _{H7}	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width (right) Q	Hub width (left) Q'
SWG2-R1 ● SWG2-R1J12 ● SWG2-R1J14	m2	1	3°41'	R	W3 W3K W3K	12 12 14	25	31	35	32	15	3
SWG2-R2 ● SWG2-R2J12 ● SWG2-R2J14		2	7°21'		W3 W3K W3K	12 12 14						
SWG2.5-R1 ● SWG2.5-R1J15 ● SWG2.5-R1J16 ● SWG2.5-R1J17	m2.5	1	3°52'	R	W3 W3K W3K	15 15 16 17	30	37	42	45	17	3
SWG2.5-R2 ● SWG2.5-R2J15 ● SWG2.5-R2J16 ● SWG2.5-R2J17		2	7°42'		W3 W3K W3K	15 15 16 17						

[Caution on Product Characteristics] ① These gears produce axial thrust forces. Please see Page 390 for more details.

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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 (old JIS A & BC2)
Heat treatment	—
Tooth hardness	—

* The precision grade of J Series products is equivalent to the value shown in the table.
** The hub material of H4 and H5 is FC200. 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	Total length
(H)	Web thickness
(I)	Web O.D.
J	Mounting distance

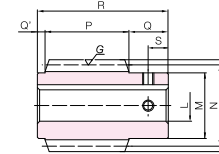
NOTE 1: Allowable torque based on worm speed (rpm)

Catalog Number	Reduction ratio	No. of teeth	Lead angle (deg)	Lead angle helix direction	Shape	A _{H7}	B	C	D	D'	E	F	G	(H)	(I)	J	Allowable torque (N·m) <small>NOTE 1</small>						Backlash (mm)	Weight (kg)		
																	30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm			1800 rpm	
AG2-20R1	20/20	2	3°41'	H1	12	33	40	44	46								35.5	21.0	17.5	13.6	11.2	9.84	8.94	7.75	0.26	
AG2-20R2	10/20	2	7°21'	H1	12	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	3	3°41'	H4	12	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'	H4	12	40	60	64	66								45.5	44.0	36.5	27.8	22.8	20.1	18.0	15.7	0.51	
AG2-40R1	40/40	4	3°41'	H4	12	45	80	84	86		18	15	33				55.5	75.8	64.0	51.4	43.6	38.5	34.9	30.7	0.85	
AG2-50R1	50/50	5	3°41'	H5	12	50	100	104	106							(8)	65.5	115	96.8	78.4	66.9	59.5	54.2	47.6	1.05	
AG2-60R1	60/60	6	3°41'	H5	12	55	120	124	126							(11)	75.5	160	136	110	94.6	84.9	77.2	68.1	1.52	
AG2.5-20R1	20/20	2	3°52'	H1	12	35	50	55	57.5								—	43.5	34.6	28.5	22.3	18.3	16.0	14.6	12.5	0.39
AG2.5-20R2	10/20	2	7°42'	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	3	3°52'	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'	H4	12	40	75	80	82.5								—	56	72.7	59.6	45.5	37.2	32.6	29.4	25.3	0.79
AG2.5-40R1	40/40	4	3°52'	H5	15	45	100	105	107.5		20	14	34			(11)	68.5	125	105	84.0	71.2	62.5	57.0	49.5	1.11	
AG2.5-50R1	50/50	5	3°52'	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	6	3°52'	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 calculated values according to the assumed usage conditions. Please see Page 386 for more details.
② Some products have a slight gap in the casted section, but this does not affect the holding strength.

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
② Even though the holding strength of tooth and hub by casting is designed to be stronger than the teeth, a secondary operation may weaken the strength. Avoid performing secondary operations other than hubs.

J Series

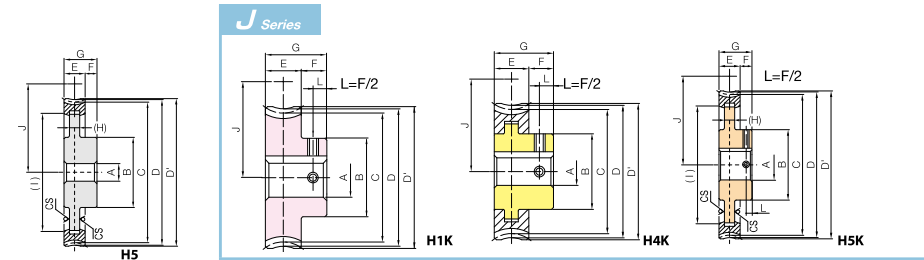


W3K



Total length	Keyway	Socket head screw	Weight (kg)	Catalog Number
R	Width × Depth	Size	S	● J Series (Available-on-request)
50	—	—	0.21	SWG2-R1
	4 × 1.8	M4	7.5	● SWG2-R1J12
	5 × 2.3	M4	7.5	● SWG2-R1J14
65	—	—	0.21	SWG2-R2
	4 × 1.8	M4	7.5	● SWG2-R2J12
	5 × 2.3	M4	7.5	● SWG2-R2J14
65	—	—	0.40	SWG2.5-R1
	5 × 2.3	M4	8.5	● SWG2.5-R1J15
	5 × 2.3	M4	8.5	● SWG2.5-R1J16
65	—	—	0.37	SWG2.5-R1J17
	5 × 2.3	M4	8.5	● SWG2.5-R2J15
	5 × 2.3	M4	8.5	● SWG2.5-R2J16
	5 × 2.3	M4	8.5	● SWG2.5-R2J17

[Caution on J series] ① As available-on-request products, these require a lead-time for shipping of 2 working days (excludes the day ordered), after placing an order. Because the machining starts immediately, we cannot accept cancellations. Please see Page 34 for more details.
② Number of pieces we can process for one order is 1 to 20 units. For larger quantities, please request price and delivery quotes.
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.



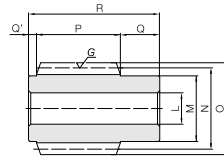
To order J Series products, please specify: **Catalog No. + J + BORE.**

Bore H7		* The product shapes of J Series items are identified by background color.														
Keyway J ₉		12	14	15	16	17	18	19	20	22	25	28	30	32	35	
Screw size		4×1.8	5×2.3					6×2.8				8×3.3			10×3.3	
Catalog Number		M4					M5				M6			M8		
AG2-20R1 J BORE	H1K	H1K	H1K	H1K	H1K											
AG2-20R2 J BORE	H1K	H1K	H1K	H1K	H1K											
AG2-30R1 J BORE	H4K	H4K	H4K	H4K	H4K	H4K	H4K	H4K	H4K							
AG2-30R2 J BORE	H4K	H4K	H4K	H4K	H4K	H4K	H4K	H4K	H4K							
AG2-40R1 J BORE	H4K	H4K	H4K	H4K	H4K	H4K	H4K	H4K	H4K	H4K						
AG2-50R1 J BORE	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K			
AG2-60R1 J BORE	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K		
AG2.5-20R1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K									
AG2.5-20R2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K										
AG2.5-30R1 J BORE	H4K	H4K	H4K	H4K	H4K	H4K	H4K	H4K								
AG2.5-30R2 J BORE	H4K	H4K	H4K	H4K	H4K	H4K	H4K	H4K	H4K							
AG2.5-40R1 J BORE			H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K						
AG2.5-50R1 J BORE			H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K		
AG2.5-60R1 J BORE			H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	H5K	

[Caution on J series] ① As available-on-request products, these require a lead-time for shipping of 2 working days (excludes the day ordered), after placing an order. Because the machining starts immediately, we cannot accept cancellations. Please see Page 34 for more details.
② Number of pieces we can process for one order is 1 to 20 units. For larger quantities, please request price and delivery quotes.
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. For details, please see the KHK Web Catalog.
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 direction
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	Gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coated except for ground part



W3

Catalog Number	Axial module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L _{H7}	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width (right) Q	Hub width (left) Q'
SWG5-R1 SWG5-R2	m5	1 2	4°05' 8°08'	R	W3	25	56	70	80	85	30	5
SWG6-R1 SWG6-R2	m6	1 2	4°17' 8°32'	R	W3	30	63	80	92	100	35	5

[Caution on Product Characteristics] ① These gears produce axial thrust forces. Please see Page 390 for more details.

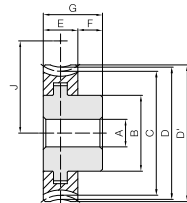
Total length R	Socket head screw Size	Weight (kg) S	Catalog Number
120	—	2.78	SWG5-R1 SWG5-R2
140	—	4.15	SWG6-R1 SWG6-R2

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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 (old JIS A & BC2)
Heat treatment	—
Tooth hardness	—

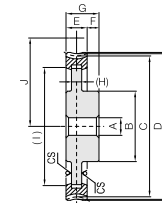
* The hub material of H4 and H5 is FC200.
FC200's tensile strength (200N/mm²) is derived from test specimens and does not represent that of the boss.



H4

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

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.
② Some products have a slight gap in the casted section, but this does not affect the holding strength.



H5

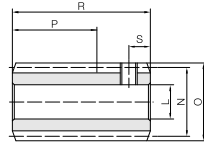
NOTE 1: Allowable torque based on worm speed (rpm)

Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N·m)	Backlash (mm)	Weight (kg)	Catalog Number
					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
		—	—	85	200 157 117 93.2 80.2 71.1 58.1		2.79	AG5-20R2
		(21)	(120)	110	427 348 275 224 196 175 147		4.75	AG5-30R1
		(21)	(120)	110	425 340 259 206 180 159 132		4.75	AG5-30R2
		(23)	(168)	135	597 478 394 346 309 259		8.84	AG5-40R1
		(24)	(260)	185	1110 903 729 605 534 479 402		12.7	AG5-50R1
		(24)	(260)	185	1550 1270 1030 855 763 682 575		17.6	AG5-60R1
30	70	—	—	100	315 252 196 157 135 121 99.6	0.24~0.37	4.53	AG6-20R1
		—	—	100	314 244 182 145 124 110 89.3		4.53	AG6-20R2
		(26)	(142)	130	666 538 424 346 300 267 224		8.52	AG6-30R1
		(26)	(142)	130	668 532 403 321 278 246 203		8.52	AG6-30R2
		(30)	(200)	160	1140 923 738 609 528 472 394		14.2	AG6-40R1
		(30)	(258)	190	1720 1400 1130 935 816 733 611		21.0	AG6-50R1
		(30)	(312)	220	2410 1960 1580 1320 1170 1040 875		29.7	AG6-60R1

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
② Even though the holding strength of tooth and hub by casting is designed to be stronger than the teeth, a secondary operation may weaken the strength. Avoid performing secondary operations other than hubs.



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 Number	Normal module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L±h	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width (right) Q	Hub width (left) Q'
SW0.5-R1 SW0.5-R2	m0.5	1 2	2°36' 5°13'	R	W2	5	—	11	12	(10)	—	—
SW0.8-R1 SW0.8-R2	m0.8	1 2	3°17' 6°34'	R	W2	6	—	14	15.6	(18)	—	—

[Caution on Product Characteristics] ① Set screws are included with W2 products. Set the mating wheel so that it does not interfere with the set screws.
② These worms produce axial thrust forces. Please see Page 390 for more details.

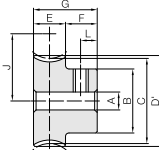
Total length R	Socket head screw Size	Weight (kg)	Catalog Number
18	M3	0.010	SW0.5-R1 SW0.5-R2
30	M4	0.029	SW0.8-R1 SW0.8-R2

[Caution on Secondary Operations] ① Please read “Cautions on Performing Secondary Operations” (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
② If the tooth surface of the worm is hardened, the precision grade (lead error, pressure angle error) will decrease. Avoid hardening the tooth surface as it may worsen tooth contact and cause wear to the wheel.

BG Module 0.5, 0.8
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 (old JIS PBC2)
Heat Treatment	—
Tooth hardness	—



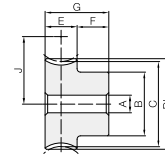
HAT

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

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

[Caution on Product Characteristics] ① The worm wheel is shifted to fit the mounting distance.
② For products having a tapped hole, a set screw is included.
③ The allowable torque shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.
④ If the bore diameter is less than $\phi 4$, the bore tolerance class is H8. If the bore diameter is $\phi 5$ or $\phi 6$, and the hole length (total length) exceeds 3 times the diameter, then the class is also H8.

Bronze Worm Wheels



HA



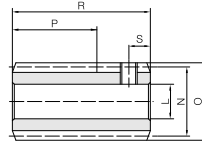
Hub width F	Total length G	Mounting distance J	Socket head screw		Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog Number
			Size	L	30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm				
7	12	10.5	M3	3.5	0.27	0.23	0.19	0.15	0.14	0.13	0~0.16	0.0061	0.0061	BG0.5-20R1 BG0.5-20R2 BG0.5-30R1 BG0.5-30R2 BG0.5-40R1
			M3		0.28	0.23	0.18	0.15	0.13	0.12				
			M3		0.58	0.50	0.41	0.34	0.30	0.28				
			M3		0.59	0.49	0.39	0.32	0.29	0.26				
			M4		0.99	0.85	0.71	0.60	0.54	0.50				
			M4		1.50	1.28	1.08	0.92	0.83	0.77				
		20.5	M4		2.10	1.80	1.52	1.31	1.19	1.09		0.039	0.059	BG0.5-50R1 BG0.5-60R1

Hub width F	Total length G	Mounting distance J	Socket head screw		Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog Number
			Size	L	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	0.44	0.40	0.04~0.22	0.023	0.023	BG0.8-20R1 BG0.8-20R2 BG0.8-30R1 BG0.8-30R2 BG0.8-40R1
			1.06	0.86	0.66	0.54	0.48	0.44	0.40	0.36				
			1.89	1.53	1.29	1.15	1.06	0.98	0.90	0.82				
			2.24	1.87	1.46	1.20	1.07	0.98	0.90	0.82				
			3.81	3.24	2.67	2.26	2.02	1.87	1.70	1.54				
			5.76	4.90	4.07	3.47	3.13	2.90	2.70	2.50				
		31	8.06	6.88	5.73	4.90	4.46	4.12	3.80	3.48		0.13	0.18	BG0.8-50R1 BG0.8-60R1

[Caution on Secondary Operations] ① Please read “Cautions on Performing Secondary Operations” (Page 390) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK 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 Number	Normal module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L _H (7+H8)	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width (right) Q	Hub width (left) Q'
SW1-R1 SW1-R2	m1	1 2	3°35' 7°11'	R	W2	6 H8	—	16	18	(20)	—	—
SW1.25-R1 SW1.25-R2	m1.25	1 2	3°25' 6°50'	R	W2	8	—	21	23.5	(25)	—	—

[Caution on Product Characteristics] ① Set screws are included with W2 products. Set the mating wheel so that it does not interfere with the set screws.
② These worms produce axial thrust forces. Please see Page 390 for more details.

Total length R	Socket head screw Size	S	Weight (kg)	Catalog Number
32	M4	5	0.043	SW1-R1 SW1-R2
37	M5	5	0.085	SW1.25-R1 SW1.25-R2

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
② If the tooth surface of the worm is hardened, the precision grade (lead error, pressure angle error) will decrease. Avoid hardening the tooth surface as it may worsen tooth contact and cause wear to the wheel.

BG/CG Module 1, 1.25
Worm Wheels

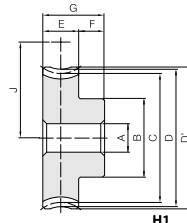
J



Specifications	
Catalog Number	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 (old 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
J	Mounting distance



H1

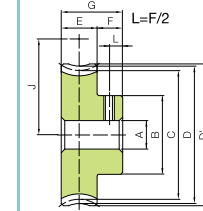
Catalog Number	Ratio	No. of teeth	No. of start	Lead angle direction	Shape	A _{H7}	B	C	D	D'	E	F	G	J	Allowable torque (N·m) <small>NOTE 1</small>						Backlash (mm)	Weight (kg)
															30 mm	100 mm	300 mm	600 mm	900 mm	1200 mm		
BG1-20R1	20/20	1	3°35'		R	H1	6	16	20.05	22	23			18	1.89	1.58	1.26	1.04	0.92	0.85	0.043	
BG1-20R2	10/20	2	7°11'		R	H1	6	16	20.16	22	23			18	1.90	1.54	1.18	0.97	0.85	0.078	0.043	
BG1-30R1	30/30	1	3°35'		R	H1	6	20	30.07	32	33		10	23	4.00	3.38	2.74	2.29	2.05	1.87	0.089	
BG1-30R2	15/30	2	7°11'		R	H1	6	20	30.24	32	33		10	23	4.03	3.35	2.62	2.14	1.91	1.74	0.089	
BG1-40R1	40/40	1	3°35'		R	H1	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'		R	H1	8	30	50.10	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'		R	H1	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'		R	H1	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'		R	H1	6	25	37.57	40	41.25		9	29.25	6.75	5.67	4.56	3.81	3.40	3.09	0.15	
BG1.25-30R2	15/30	2	6°50'		R	H1	6	25	37.77	40	41.25		9	29.25	6.77	5.60	4.33	3.54	3.16	2.85	0.15	
BG1.25-40R1	40/40	1	3°25'		R	H1	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'		R	H1	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						30	60.12	62	63				38	8.69	7.39	6.14	5.24	4.78	4.39	0.25	
CG1-80R1	80/80						35	80.16	82	83			10	48	14.7	12.6	10.5	9.11	8.30	7.72	0.43	
CG1-100R1	100/100		1	3°35'	R	H1	10	40	100.20	102	103		10	58	21.9	19.0	16.0	13.9	12.7	11.9	0.66	
CG1-120R1	120/120						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 The worm wheel is shifted to fit the mounting distance.
② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.
③ If the bore diameter is less than $\phi 4$, the bore tolerance class is H8. If the bore diameter is $\phi 5$ or $\phi 6$, and the hole length (total length) exceeds 3 times the diameter, then the class is also H8.

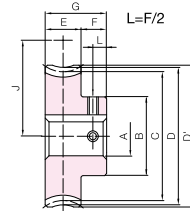
[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

Bronze Worm Wheels & Gray Iron Worm Wheels

J Series



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 Jsb	—		4x1.8				5x2.3				6x2.8					
Screw size	—		4x1.8				5x2.3				6x2.8					
Catalog Number	M4	M5	M4				M5				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						
CG1-60R1 J BORE			H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K						
CG1-80R1 J BORE			H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K					
CG1-100R1 J BORE			H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K		
CG1-120R1 J BORE			H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	

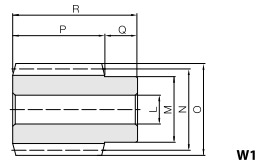
[Caution on J series] ① As available-on-request products, these require a lead-time for shipping of 2 working days (excludes the day ordered), after placing an order. Because the machining starts immediately, we cannot accept cancellations. Please see Page 34 for more details.
② Number of pieces we can process for one order is 1 to 20 units. For larger quantities, please request price and delivery quotes.
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. For details, please see the KHK Web Catalog.
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 load usage. 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.



Catalog Number	Normal module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L _{H7}	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width (right) Q	Hub width (left) Q'
SW1.5-R1 SW1.5-R1J8 SW1.5-R1J10	m1.5	1	3°26'	R	W1	8	20	25	28	30	10	—
SW1.5-R2 SW1.5-R2J8 SW1.5-R2J10		2	6°54'		W1	8						
					W1K	10						

[Caution on Product Characteristics] ① These gears produce axial thrust forces. Please see Page 390 for more details.

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
② If the tooth surface of the worm is hardened, the precision grade (lead error, pressure angle error) will decrease. Avoid hardening the tooth surface as it may worsen tooth contact and cause wear to the wheel.

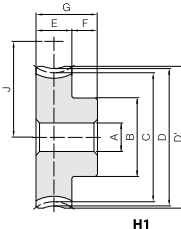
BG/CG Module 1.5 Worm Wheels



Specifications	
Catalog Number	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 (old 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
J	Mounting distance



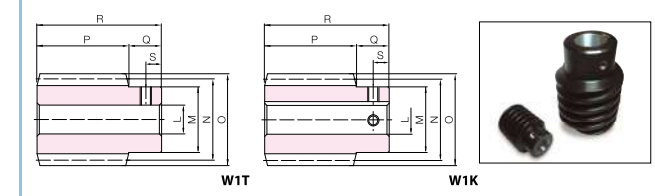
Catalog Number	Reducer ratio	No. of teeth	No. of grinding teeth	Lead angle helix direction	Shape	A _{H7}	B	C	D	D'	E	F	G	J	Allowable torque (N·m)					Backlash (mm)	Weight (kg)
															NOTE 1						
															30 rpm	100 rpm	300 rpm	600 rpm	900 rpm		
BG1.5-20R1	20	20	1	3°26'	R	H1	8	22	30.05	33	34.5	12	22	27.5	4.76	3.96	3.10	2.56	2.27	2.06	0.10
BG1.5-20R2	10	20	2	6°54'			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'			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	H1	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'			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'			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			R	H1	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					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					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					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

[Caution on Product Characteristics] ① The worm wheel is shifted to fit the mounting distance.

② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

J Series

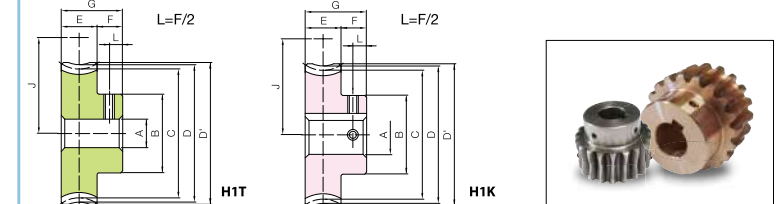


Total length	Keyway	Socket head screw	Weight (kg)	Catalog Number
R	Width x Depth	Size S		SW1.5-R1 SW1.5-R1J8 SW1.5-R1J10
40	—	M5	0.12	SW1.5-R2 SW1.5-R2J8 SW1.5-R2J10
	4 x 1.8	M4	0.12	
	—	M5	0.12	

[Caution on J series] ① As available-on-request products, these require a lead-time for shipping of 2 working days (excludes the day ordered), after placing an order.
Because the machining starts immediately, we cannot accept cancellations. Please see Page 34 for more details.
② Number of pieces we can process for one order is 1 to 20 units. For larger quantities, please request price and delivery quotes.
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.

Bronze Worm Wheels & Gray Iron Worm Wheels

J Series



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 J ₉	8	10	12	14	15	16	17	18	19	20	22	25	28	30				
Screw size	—	4x1.8		5x2.3				6x2.8				8x3.3						
Catalog Number	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											
BG1.5-30R2 J BORE		H1K	H1K	H1K	H1K	H1K	H1K											
BG1.5-40R1 J BORE		H1K	H1K	H1K	H1K	H1K	H1K											
BG1.5-50R1 J BORE		H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K							
CG1.5-30R1 J BORE		H1K	H1K	H1K	H1K	H1K	H1K											
CG1.5-40R1 J BORE		H1K	H1K	H1K	H1K	H1K	H1K											
CG1.5-50R1 J BORE		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						

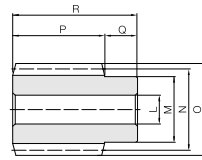
[Caution on J series] ① As available-on-request products, these require a lead-time for shipping of 2 working days (excludes the day ordered), after placing an order. Because the machining starts immediately, we cannot accept cancellations. Please see Page 34 for more details.

② Number of pieces we can process for one order is 1 to 20 units. For larger quantities, please request price and delivery quotes.
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. For details, please see the KHK Web Catalog.
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 load usage. 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 Number	Normal module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L _{H7}	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width (right) Q	Hub width (left) Q'
SW2-R1 SW2-R1J12 SW2-R1J14	m2	1	3°42'	R	W1 W1K W1K	12 12 14	25	31	35	32	14	—
SW2-R2 SW2-R2J12 SW2-R2J14		2	7°25'		W1 W1K W1K	12 12 14						
SW2-L1 SW2-L1J12 SW2-L1J14		1	3°42'		W1 W1K W1K	12 12 14						
SW2-L2 SW2-L2J12 SW2-L2J14		2	7°25'		W1 W1K W1K	12 12 14						

[Caution on Product Characteristics] ① These gears produce axial thrust forces. Please see Page 390 for more details.

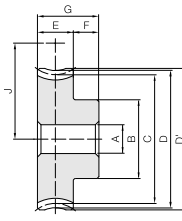
BG/CG Module 2 Worm Wheels



Specifications	
Catalog Number	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 (old 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)

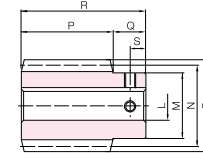
Catalog Number	Reducer ratio	No. of teeth	Helix angle helix direction	Lead angle helix direction	Shape	A _{H7}	B	C	D	D'	E	F	G	(H)	(I)	J	Allowable torque (N·m) <small>NOTE 1</small>						Backlash (mm)	Weight (kg)						
																	30 rpm								100 rpm					
																	300 rpm	600 rpm	900 rpm	1200 rpm	300 rpm	600 rpm			900 rpm	1200 rpm				
BG2-20R1	20	10	1	3°42'	R	H1	12	33	40.08	44	46	22	13	35	—	—	35.5	12.3	10.2	8.00	6.59	5.78	5.25	0.10~0.28	0.33					
BG2-20R2	20	10	2	7°25'	R	H1	12	33	40.08	44	46	22	13	35	—	—	35.5	12.3	10.0	7.51	6.15	5.32	4.80							
BG2-20L1	20	10	1	3°42'	L	H1	12	33	40.08	44	46	22	13	35	—	—	35.5	12.3	10.2	8.00	6.59	5.78	5.25							
BG2-20L2	20	10	2	7°25'	L	H1	12	33	40.08	44	46	22	13	35	—	—	35.5	12.3	10.0	7.51	6.15	5.32	4.80							
CG2-20R1	20	20	1	3°42'	R	H1	12	33	33	40.08	44	46	22	13	35	—	—	35.5	7.38	6.15	4.80	3.95	3.47	3.15	0.10~0.28	0.27				
CG2-20R2	20	20	2	7°25'	R	H1	12	33	33	40.08	44	46	22	13	35	—	—	35.5	7.40	6.00	4.51	3.69	3.19	2.88						
CG2-30R1	30	30	1	3°42'	R	H1	12	33	40	60.13	64	66	22	13	35	—	—	45.5	15.6	13.1	10.4	8.74	7.70	6.96						
CG2-30R2	30	30	2	7°25'	R	H1	12	33	40	60.51	64	66	22	13	35	—	—	45.5	15.7	13.1	9.96	8.15	7.16	6.45						
CG2-40R1	40	40	1	3°42'	R	H1	12	33	45	80.17	84	86	22	13	35	—	—	55.5	26.7	22.5	18.1	15.4	13.55	12.3						
CG2-50R1	50	50	1	3°42'	R	H1	12	33	48	100.21	104	106	22	13	35	—	—	65.5	40.3	34.1	27.6	23.6	21.0	19.1	0.10~0.28	1.44				
CG2-50R2	25	50	2	7°25'	R	H1	12	33	48	100.84	104	106	22	13	35	—	—	65.5	40.7	34.0	26.9	22.4	19.6	17.8						
CG2-60R1	60	60	1	3°42'	R	H1	12	33	60	120.25	124	126	22	13	35	—	—	75.5	56.4	47.9	38.9	33.3	29.9	27.2						
CG2-20L1	20	20	1	3°42'	L	H1	12	33	33	40.08	44	46	22	13	35	—	—	35.5	7.38	6.15	4.80	3.95	3.47	3.15	0.10~0.28	1.44				
CG2-20L2	20	20	2	7°25'	L	H1	12	33	33	40.08	44	46	22	13	35	—	—	35.5	7.40	6.00	4.51	3.69	3.19	2.88						
CG2-30L1	30	30	1	3°42'	L	H1	12	33	40	60.13	64	66	22	13	35	—	—	45.5	15.6	13.1	10.4	8.74	7.70	6.96						
CG2-40L1	40	40	1	3°42'	L	H1	12	33	45	80.17	84	86	22	13	35	—	—	55.5	26.7	22.5	18.1	15.4	13.55	12.3						
CG2-50L1	50	50	1	3°42'	L	H1	12	33	48	100.21	104	106	22	13	35	—	—	65.5	40.3	34.1	27.6	23.6	21.0	19.1	0.10~0.28	2.09				
CG2-60L1	60	60	1	3°42'	L	H1	12	33	60	120.25	124	126	22	13	35	—	—	75.5	56.4	47.9	38.9	33.3	29.9	27.2						

* Please see Page 422 for Cautions on Product Characteristics and Cautions on Performing Secondary Operations.

[Caution on Product Characteristics] ① The worm wheel is shifted to fit the mounting distance.
 ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.
 KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

J Series



W1K

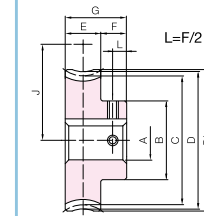


Total length	Keyway	Socket head screw	Weight (kg)	Catalog Number
R	Width x Depth	Size	S	J Series (Available-on-request)
46	—	—	0.20	SW2-R1
	4 x 1.8	M4	7	SW2-R1J12
	5 x 2.3	M4	7	SW2-R1J14
	—	—	0.20	SW2-R2
	4 x 1.8	M4	7	SW2-R2J12
	5 x 2.3	M4	7	SW2-R2J14
	—	—	0.20	SW2-L1
	4 x 1.8	M4	7	SW2-L1J12
46	—	—	0.20	SW2-L2
	4 x 1.8	M4	7	SW2-L2J12
	5 x 2.3	M4	7	SW2-L2J14
	—	—	0.18	SW2-L2J14

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.
 KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
 ② If the tooth surface of the worm is hardened, the precision grade (lead error, pressure angle error) will decrease. Avoid hardening the tooth surface as it may worsen tooth contact and cause wear to the wheel.



J Series



H1K

Bronze Worm Wheels & Gray Iron Worm Wheels



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

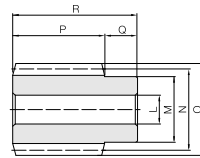
Bore H7		* The product shapes of J Series items are identified by background color.													
Keyway Jd9	12	14	15	16	17	18	19	20	22	25	28	30	32	35	
Screw size	4x1.8	5x2.3				6x2.8				8x3.3				10x3.3	
Catalog Number	M4					M5					M6			M8	
BG2-20R1 J BORE	H1K	H1K	H1K	H1K	H1K										
BG2-20R2 J BORE	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	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K				
CG2-50R2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K			
CG2-60R1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	
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						
CG2-40L1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K					
CG2-50L1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K				
CG2-60L1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	

* For [Caution on J Series], please see Page 423.



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

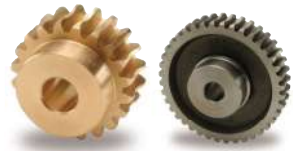
Catalog Number	Normal module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L _{H7}	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width (right) Q	Hub width (left) Q'
SW2.5-R1 SW2.5-R1J15 SW2.5-R1J16 SW2.5-R1J17	m2.5	1	3°52'	R	W1	15	30	37	42	45	18	—
SW2.5-R2 SW2.5-R2J15 SW2.5-R2J16 SW2.5-R2J17		2	7°46'		W1	15						
SW2.5-L1 SW2.5-L1J15 SW2.5-L1J16 SW2.5-L1J17		1	3°52'		W1	15						
SW2.5-L2 SW2.5-L2J15 SW2.5-L2J16 SW2.5-L2J17		2	7°46'		W1	15						

[Caution on Product Characteristics] ① These gears produce axial thrust forces. Please see Page 390 for more details.

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

② If the tooth surface of the worm is hardened, the precision grade (lead error, pressure angle error) will decrease. Avoid hardening the tooth surface as it may worsen tooth contact and cause wear to the wheel.

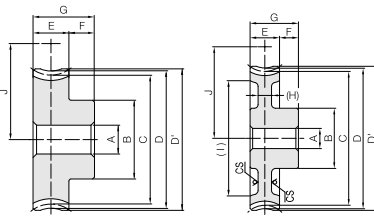
BG/CG Module 2.5 Worm Wheels



Specifications	
Catalog Number	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 (old JIS PBC2)
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.

Abbreviation	Meaning
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



** CS has a forged finish surface.

NOTE 1: Allowable torque based on worm speed [rpm]

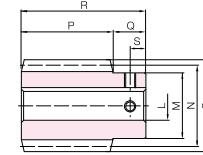
Catalog Number	Reduction ratio	No. of teeth	Lead angle (°)	Helix direction	Shape	A _{H7}	B	C	D	D'	E	F	G	(H)	(I)	J	Allowable torque (N·m) <small>NOTE 1</small>						Backlash (mm)	Weight (kg)		
																	30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm				
BG2.5-20R1	20	10	1	3°52'	R	H1	12	35	50.11	55	57.5	22	14	36	—	—	43.5	21.5	17.7	13.8	11.4	9.94	9.07	0.13~0.31	0.49	
BG2.5-20R2	20	20	2	7°46'														21.5	17.3	13.0	10.6	9.14	8.27			
BG2.5-20L1	20	10	1	3°52'	L	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	0.13~0.31	0.49	
BG2.5-20L2	20	20	2	7°46'														21.5	17.3	13.0	10.6	9.14	8.27			
CG2.5-20R1	20	20	2	7°46'	R	H1	12	35	50.11	55	57.5	22	14	36	—	—	43.5	12.9	10.6	8.30	6.83	5.97	5.44	0.13~0.31	0.40	
CG2.5-20R2	10	20	2	7°46'														12.9	10.4	7.78	6.36	5.49	4.96			
CG2.5-30R1	30	30	1	3°52'	R	H1	12	40	51.17	80	82.5	—	—	—	—	—	56	27.5	22.8	18.0	15.1	13.2	12.0	0.82	0.82	
CG2.5-30R2	15	30	2	7°46'														56	27.5	22.5	17.2	14.1	12.3			11.1
CG2.5-40R1	40	40	1	3°52'	HB	H1	15	45	100.23	105	107.5	22	14	36	—	—	68.5	46.7	39.0	31.3	26.5	23.3	21.2	0.13~0.31	1.39	
CG2.5-50R1	50	50	1	3°52'														68.5	46.7	39.0	31.3	26.5	23.3			21.2
CG2.5-60R1	60	60	1	3°52'	L	H1	15	55	150.34	155	157.5	22	14	36	(9)	—	—	(110)	93.5	98.8	82.9	67.3	51.5	47.0	0.13~0.31	1.54
CG2.5-20L1	20	20	2	7°46'														(136)	93.5	98.8	82.9	67.3	51.5	47.0		
CG2.5-20L2	10	20	2	7°46'	L	H1	12	35	50.46	55	57.5	22	14	36	—	—	43.5	12.9	10.6	8.30	6.83	5.97	5.44	0.13~0.31	0.40	
CG2.5-40L1	40	40	1	3°52'														12.9	10.4	7.78	6.36	5.49	4.96			
CG2.5-40L2	40	40	1	3°52'	HB	H1	15	45	100.23	105	107.5	22	14	36	—	—	68.5	46.7	39.0	31.3	26.5	23.3	21.2	0.13~0.31	1.39	
CG2.5-50L1	50	50	1	3°52'														68.5	46.7	39.0	31.3	26.5	23.3			21.2

[Caution on Product Characteristics] ① The worm wheel is shifted to fit the mounting distance.

② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

J Series



W1K



Total length	Keyway	Socket head screw	Weight (kg)	Catalog Number
R	Width x Depth	Size	S	J Series (Available-on-request)
63	—	—	0.39	SW2.5-R1
	5 x 2.3	M4	0.39	SW2.5-R1J15
	5 x 2.3	M4	0.37	SW2.5-R1J16
	5 x 2.3	M4	0.36	SW2.5-R1J17
	5 x 2.3	M4	0.39	SW2.5-R2
	5 x 2.3	M4	0.39	SW2.5-R2J15
	5 x 2.3	M4	0.37	SW2.5-R2J16
	5 x 2.3	M4	0.36	SW2.5-R2J17
	—	—	0.39	SW2.5-L1
	5 x 2.3	M4	0.39	SW2.5-L1J15
	5 x 2.3	M4	0.37	SW2.5-L1J16
	5 x 2.3	M4	0.36	SW2.5-L1J17
	—	—	0.39	SW2.5-L2
	5 x 2.3	M4	0.39	SW2.5-L2J15
	5 x 2.3	M4	0.37	SW2.5-L2J16
	5 x 2.3	M4	0.36	SW2.5-L2J17

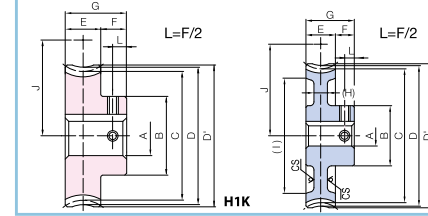
[Caution on J series] ① As available-on-request products, these require a lead-time for shipping of 2 working days (excludes the day ordered), after placing an order. Because the machining starts immediately, we cannot accept cancellations. Please see Page 34 for more details.

② Number of pieces we can process for one order is 1 to 20 units. For larger quantities, please request price and delivery quotes.
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.



J Series

Bronze Worm Wheels & Gray Iron Worm Wheels



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

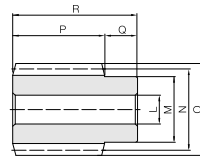
Bore H7		* The product shapes of J Series items are identified by background color.														
Keyway JdB	12	14	15	16	17	18	19	20	22	25	28	30	32	35		
Screw size	4x1.8	5x2.3					6x2.8					8x3.3			10x3.3	
Catalog Number	M4					M5					M6			M8		
BG2.5-20R1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K									
BG2.5-20R2 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			H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K						
CG2.5-50R1 J BORE			HBK	HBK	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	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									
CG2.5-40L1 J BORE			H1K	H1K	H1K	H1K	H1K	H1K	H1K							

[Caution on J series] ① As available-on-request products, these require a lead-time for shipping of 2 working days (excludes the day ordered), after placing an order. Because the machining starts immediately, we cannot accept cancellations. Please see Page 34 for more details.
② Number of pieces we can process for one order is 1 to 20 units. For larger quantities, please request price and delivery quotes.
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. For details, please see the KHK Web Catalog.
⑤ 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

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



W1

Catalog Number	Normal module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (right)	Hub width (left)
 J Series (Available-on-request)						L _{H7}	M	N	O	P	Q	Q'
SW3-R1  SW3-R1J17  SW3-R1J18  SW3-R1J19  SW3-R1J20	m3	1	3°55'	R	W1	16	35	44	50	50	20	—
W1K					17							
W1K					18							
W1K					19							
W1K					20							
SW3-R2  SW3-R2J17  SW3-R2J18  SW3-R2J19  SW3-R2J20		2	7°50'		W1	16						
W1K					17							
W1K					18							
W1K					19							
W1K					20							
SW3-L1  SW3-L1J17  SW3-L1J18  SW3-L1J19  SW3-L1J20		1	3°55'	L	W1	16						
W1K					17							
W1K					18							
W1K					19							
W1K					20							
SW3-L2  SW3-L2J17  SW3-L2J18  SW3-L2J19  SW3-L2J20	2	7°50'	W1		16							
W1K			17									
W1K			18									
W1K			19									
W1K			20									

[Caution on Product Characteristics] ① These gears produce axial thrust forces. Please see Page 390 for more details.

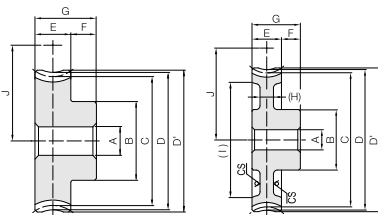
BG/CG Module 3 Worm Wheels



Specifications	
Catalog Number	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 (oil JS FBC2) 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 forged finish surface.

Catalog Number	Reduction ratio	No. of teeth	Lead angle helix direction	Shape	A _{H7}	B	C	D	D'	E	F	G	(H)	(I)	J	Allowable torque (N·m)	Backlash (mm)	Weight (kg)
BG3-20R1	20	10	1 3°55'	R	H1	20	50	60.14	66	69	28	15	43	—	52	36.8 30.1 23.5 19.1 16.7 15.2	0.15~0.33	0.89
BG3-20R2	20	10	2 7°50'	R	H1	20	50	60.14	66	69	28	15	43	—	52	37.0 29.5 22.1 17.9 15.4 14.0	0.15~0.33	0.89
BG3-20L1	20	10	1 3°55'	L	H1	20	50	60.14	66	69	28	15	43	—	52	36.8 30.1 23.5 19.1 16.7 15.2	0.15~0.33	0.89
BG3-20L2	20	10	2 7°50'	L	H1	20	50	60.14	66	69	28	15	43	—	52	37.0 29.5 22.1 17.9 15.4 14.0	0.15~0.33	0.89
CG3-20R1	20	20	1 3°55'	R	H1	20	50	60.14	66	69	28	15	43	—	52	22.1 18.1 14.1 11.5 10.0	0.15~0.33	0.73
CG3-20R2	20	20	2 7°50'	R	H1	20	50	60.57	66	69	28	15	43	—	52	22.2 17.7 13.3 10.7 9.24	0.15~0.33	0.73
CG3-30R1	30	30	1 3°55'	R	H1	20	50	90.21	96	99	28	15	43	—	52	46.6 38.7 30.6 25.4 22.2	0.15~0.33	1.50
CG3-30R2	15	30	2 7°50'	R	H1	20	50	90.85	96	99	28	15	43	—	52	47.2 38.5 29.3 23.7 20.8	0.15~0.33	1.50
CG3-40R1	40	40	1 3°55'	R	HB	20	50	120.28	126	129	30	45	(9)	(107)	82	79.8 66.3 53.2 44.6 39.1	0.15~0.33	1.93
CG3-50R1	50	50	1 3°55'	R	HB	20	50	150.35	156	159	30	45	(9)	(136)	97	121 100 81.1 68.4 60.5	0.15~0.33	2.67
CG3-60R1	60	60	1 3°55'	R	HB	20	50	180.42	186	189	30	45	(9)	(166)	112	169 141 114 96.7 86.3	0.15~0.33	3.58
CG3-20L1	20	20	1 3°55'	L	H1	20	50	60.14	66	69	28	15	43	—	52	22.1 18.1 14.1 11.5 10.0	0.15~0.33	0.73
CG3-20L2	10	20	2 7°50'	L	H1	20	50	60.57	66	69	28	15	43	—	52	22.2 17.7 13.3 10.7 9.24	0.15~0.33	0.73
CG3-30L1	30	30	1 3°55'	L	H1	20	50	90.21	96	99	28	15	43	—	52	46.6 38.7 30.6 25.4 22.2	0.15~0.33	1.50
CG3-50L1	50	50	1 3°55'	L	HB	20	50	150.35	156	159	30	45	(9)	(136)	97	121 100 81.1 68.4 60.5	0.15~0.33	2.67
CG3-60L1	60	60	1 3°55'	L	HB	20	50	180.42	186	189	30	45	(9)	(166)	112	169 141 114 96.7 86.3	0.15~0.33	3.58

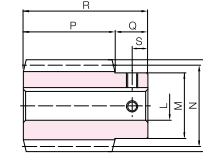
[Caution on Product Characteristics] ① The worm wheel is shifted to fit the mounting distance.

② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.

KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

J Series



W1K



Total length R	Keyway Width × Depth	Socket head screw Size	Weight (kg)	Catalog Number
—	5 × 2.3	M4	0.64	SW3-R1
—	6 × 2.8	M5	0.62	SW3-R1J17
—	6 × 2.8	M5	0.60	SW3-R1J18
—	6 × 2.8	M5	0.58	SW3-R1J19
—	6 × 2.8	M5	0.56	SW3-R1J20
—	5 × 2.3	M4	0.64	SW3-R2
—	6 × 2.8	M5	0.62	SW3-R2J17
—	6 × 2.8	M5	0.60	SW3-R2J18
—	6 × 2.8	M5	0.58	SW3-R2J19
—	6 × 2.8	M5	0.56	SW3-R2J20
—	5 × 2.3	M4	0.64	SW3-L1
—	6 × 2.8	M5	0.62	SW3-L1J17
—	6 × 2.8	M5	0.60	SW3-L1J18
—	6 × 2.8	M5	0.58	SW3-L1J19
—	6 × 2.8	M5	0.56	SW3-L1J20
—	5 × 2.3	M4	0.64	SW3-L2
—	6 × 2.8	M5	0.62	SW3-L2J17
—	6 × 2.8	M5	0.60	SW3-L2J18
—	6 × 2.8	M5	0.58	SW3-L2J19
—	6 × 2.8	M5	0.56	SW3-L2J20

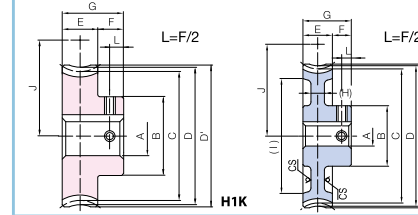
[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

② If the tooth surface of the worm is hardened, the precision grade (lead error, pressure angle error) will decrease. Avoid hardening the tooth surface as it may worsen tooth contact and cause wear to the wheel.



Bronze Worm Wheels & Gray Iron Worm Wheels

J Series



H1K

HBK



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

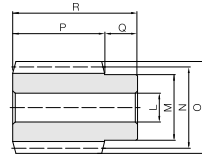
Bore H ₇	* The product shapes of J Series items are identified by background color.															
Keyway js9	20	22	25	28	30	32	35	40								
Screw size	6×2.8				8×3.8				10×3.3				12×3.3			
Catalog Number	M5				M6				M8							
BG3-20R1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
BG3-20R2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
BG3-20L1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
BG3-20L2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
CG3-20R1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
CG3-20R2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
CG3-30R1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
CG3-30R2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
CG3-40R1 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK								
CG3-50R1 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK								
CG3-60R1 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK								
CG3-20L1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
CG3-20L2 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
CG3-30L1 J BORE	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K								
CG3-50L1 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK								
CG3-60L1 J BORE	HBK	HBK	HBK	HBK	HBK	HBK	HBK	HBK								

[Caution on J series]

- As available-on-request products, these require a lead-time for shipping of 2 working days (excludes the day ordered), after placing an order. Because the machining starts immediately, we cannot accept cancellations. Please see Page 34 for more details.
- Number of pieces we can process for one order is 1 to 20 units. For larger quantities, please request price and delivery quotes.
- 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 details, please see the KHK Web Catalog.
- 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 Number	Normal module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L _{H7}	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width (right) Q	Hub width (left) Q'
SW4-R1 SW4-R2	m4	1 2	3°42' 7°25'	R	W1	22	50	62	70	70	25	—

[Caution on Product Characteristics] ① These gears produce axial thrust forces. Please see Page 390 for more details.

Total length R	Socket head screw Size	Weight (kg) S	Catalog Number
95	—	—	SW4-R1 SW4-R2

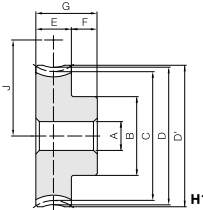
[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
② If the tooth surface of the worm is hardened, the precision grade (lead error, pressure angle error) will decrease. Avoid hardening the tooth surface as it may worsen tooth contact and cause wear to the wheel.

BG/CG Module 4
Worm Wheels



Specifications	
Catalog Number	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 (old JIS PBC2) FC200*
Heat Treatment	—
Tooth hardness	—

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



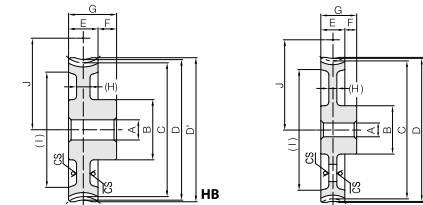
H1

Catalog Number	Reduction ratio	Normal module	No. of teeth	No. of starts of mating worm	Lead angle	Direction of helix	Shape	Bore A _{H7}	Hub dia. B	Pitch dia. C	Throat dia. D	Outside dia. D*	Face width E
BG4-20R1 BG4-20R2	20 10	m4	20	1 2	3°42' 7°25'	R	H1	20	60	80.17 80.67	88	90	35

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

[Caution on Product Characteristics] ① The worm wheel is shifted to fit the mounting distance.
② H2 has a long cast hole in the web (H) section.
③ The allowable torque shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.

Bronze Worm Wheels & Gray Iron Worm Wheels



HB

H2

* CS has a forged finish surface. NOTE 1: Allowable torque based on worm speed (rpm)

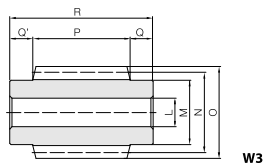
Hub width F	Total length G	Mounting distance J	Allowable torque (N-m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog Number
17	52	71	30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	0.17~0.37	1.91	BG4-20R1 BG4-20R2
			75.9 75.9	61.7 60.0	47.9 44.8	38.4 35.7	33.7 30.9	30.1 27.5			

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 Number
17	52	—	—	71	45.6	37.0	28.7	23.0	0.17~0.37	1.56			CG4-20R1
		—	—	71	45.5	36.0	26.9	21.4		1.56			CG4-20R2
		—	—	91	96.3	79.1	62.3	50.9		3.17			CG4-30R1
		—	—	91	96.8	78.3	59.4	47.3		3.17			CG4-30R2
		(11)	(136)	111	165	136	108	89.4		4.02			CG4-40R1
		(12)	(176)	131	249	205	165	137		4.97			CG4-50R1
		(12)	(176)	131	250	204	160	130		4.97			CG4-50R2
		(12)	(218)	151	348	288	233	194		6.58			CG4-60R1

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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



Catalog Number	Normal module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L _{H7}	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width (right) Q	Hub width (left) Q'
SW5-R1 SW5-R2	m5	1 2	4°06' 8°13'	R	W3	25	56	70	80	85	20	20
SW6-R1 SW6-R2	m6	1 2	4°18' 8°38'	R	W3	30	64	80	92	100	25	25

[Caution on Product Characteristics] ① These gears produce axial thrust forces. Please see Page 390 for more details.

Total length R	Socket head screw Size	Weight (kg) S	Catalog Number
125	—	—	SW5-R1 SW5-R2
150	—	—	SW6-R1 SW6-R2

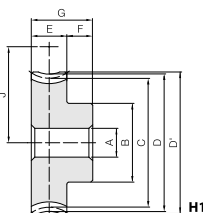
[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
② If the tooth surface of the worm is hardened, the precision grade (lead error, pressure angle error) will decrease. Avoid hardening the tooth surface as it may worsen tooth contact and cause wear to the wheel.

BG/CG Module 5, 6
Worm Wheels



Specifications	
Catalog Number	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 (old JIS PBC2) FC200*
Heat Treatment	—
Tooth hardness	—

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

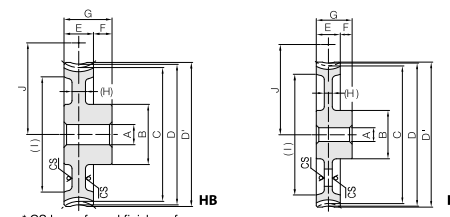


Catalog Number	Reduction ratio	Normal module	No. of teeth	No. of starts of mating worm	Lead angle	Direction of helix	Shape	Bore A _{H7}	Hub dia. B	Pitch dia. C	Throat dia. D	Outside dia. D'	Face width E
BG5-20R1 BG5-20R2	20 10	m5	20	1 2	4°06' 8°13'	R	H1	22	75	100.26 101.04	110	113	45
BG6-20R1 BG6-20R2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

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

[Caution on Product Characteristics] ① The worm wheel is shifted to fit the mounting distance.
② H2 has a long cast hole in the web (H) section.
③ The allowable torque shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.

Bronze Worm Wheels & Gray Iron Worm Wheels



* CS has a forged finish surface.

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

Hub width F	Total length G	Mounting distance J	Allowable torque (N·m) NOTE 1								Backlash (mm)	Weight (kg)	Catalog Number
			30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm					
20	65	85	146 146	117 115	91.2 85.8	73.0 68.4	63.7 58.8	56.9 52.2	0.20~0.40	3.89			BG5-20R1 BG5-20R2
20	72	100	232 235	185 183	144 136	115 109	99.2 92.3	88.8 82.0	0.22~0.42	6.60			BG6-20R1 BG6-20R2

NOTE 1: Allowable torque 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 Number
					30 rpm	100 rpm	300 rpm	600 rpm			
20	65	(—) (13) (13) (16)	(—) (127) (127) (172)	85 110 110 135	87.4 185 187 316	70.3 150 150 258	54.7 119 114 206	43.8 96.8 90.6 170	0.20~0.40	3.18 5.07 5.07 7.75	CG5-20R1 CG5-30R1 CG5-30R2 CG5-40R1
		(16) (223) (276)	(160) (185) (276)	160 185 276	477 668 548	390 315 443	261 369			10.1 12.3	CG5-50R1 CG5-60R1
20	72	(—) (15) (15) (16)	(—) (155) (213) (275)	100 130 160 190	139 294 502 760	111 237 407 615	86.2 187 325 496	54.7 96.8 90.6 698	0.22~0.42	5.39 8.72 11.4 20.3	CG6-20R1 CG6-30R1 CG6-40R1 CG6-50R1 CG6-60R1

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

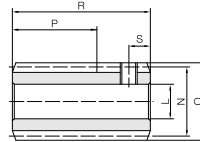


SUW Module 0.5, 0.8

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 Number	Normal module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L±s	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width Q	Total length R
SUW0.5-R1 SUW0.5-R2	m0.5	1 2	2°36' 5°13'	R	W2	5	—	11	12	(10)	—	18
SUW0.8-R1 SUW0.8-R2	m0.8	1 2	3°17' 6°34'	R	W2	6	—	14	15.6	(18)	—	30

[Caution on Product Characteristics] ① Set screws are included with W2 products. Set the mating wheel so that it does not interfere with the set screws.
② These worms produce axial thrust forces. Please see Page 390 for more details.

Socket head screw		Weight (kg)	Catalog Number
Size	S		
M3	3	0.010	SUW0.5-R1 SUW0.5-R2
M4	5	0.029	SUW0.8-R1 SUW0.8-R2

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

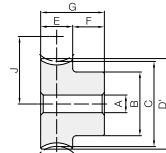


DG Module 0.5, 0.8

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

[Caution on Product Characteristics] ① The worm wheel is shifted to fit the mounting distance.
② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.
③ Since the bore is finished with negative tolerance, it can be driven into the shaft and used as is.

Stainless Steel Worms

Plastic Worm Wheels



Hub width F	Total length G	Mounting distance J	Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (g)	Catalog Number
7	12	10.5	0.067	0.0068	0~0.16	1.01	DG0.5-20R1
		10.5	0.067	0.0069		1.01	DG0.5-20R2
		13	0.11	0.011		2.21	DG0.5-30R1
		13	0.11	0.011		2.21	DG0.5-30R2
		15.5	0.16	0.016		3.72	DG0.5-40R1
9	18	18	0.21	0.022	0.04~0.22	6.36	DG0.5-50R1
		20.5	0.26	0.027		9.67	DG0.5-60R1
		15	0.31	0.031		3.73	DG0.8-20R1
		15	0.31	0.032		3.73	DG0.8-20R2
		19	0.52	0.053		8.84	DG0.8-30R1
		19	0.52	0.053		8.84	DG0.8-30R2
		23	0.74	0.076		14.0	DG0.8-40R1
		27	0.98	0.10		21.6	DG0.8-50R1
		31	1.21	0.12		28.8	DG0.8-60R1

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

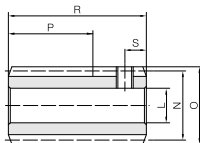


J



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 Number	Normal module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L _H (H8)	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width Q	Total length R
SUW1-R1 SUW1-R2	m1	1 2	3°35' 7°11'	R	W2 W2	6 H8	—	16	18	(20)	—	32
SUW1.5-R1 ● SUW1.5-R1J8 ● SUW1.5-R1J10	m1.5	1	3°26'	R	W1 W1T W1K	8 8 10	20	25	28	30	10	40
SUW1.5-R2 ● SUW1.5-R2J8 ● SUW1.5-R2J10		2	6°54'		W1 W1T W1K	8 8 10						

[Caution on Product Characteristics] ① Set screws are included with W2 products. Set the mating wheel so that it does not interfere with the set screws.
② These worms produce axial thrust forces. Please see Page 390 for more details.

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.



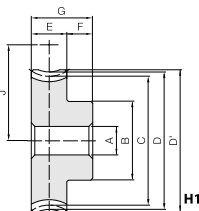
J



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
Heat treatment	—
Tooth hardness	—

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

A	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
E	Face width
F	Hub width
G	Total length
J	Mounting distance



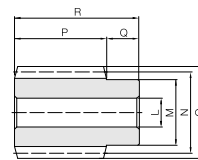
H1

Catalog Number	Reduction ratio	No. of teeth	No. of starts	Lead angle helix direction	Shape	A	B	C	D	D'	E	F	G	J	Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)
PG1-20R1	20	20	1	3°35'	R H1	6	16	20.04	22	23	10	10	20	18	0.62	0.060	0~0.28	0.0058
PG1-20R2	10	20	2	7°11'		6	16	20.16	22	23					18	0.62	0.060	0.0058
PG1-30R1	30	30	1	3°35'		6	20	30.06	32	33					23	1.03	0.10	0.012
PG1-40R1	40	40	1	3°35'		8	26	40.08	42	43					28	1.49	0.15	0.021
PG1-50R1	50	50	1	3°35'		8	30	50.1	52	53					33	1.96	0.20	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'											1.68			

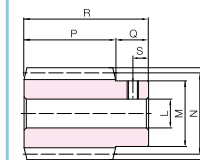
[Caution on Product Characteristics] ① The worm wheel is shifted to fit the mounting distance.
② Significant variations in temperature or humidity can cause dimensional changes in plastic gears, including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in our separate technical reference book.
③ The allowable torque shown in the table are calculated values according to the assumed usage conditions. Please see Page 386 for more details.

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK 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.

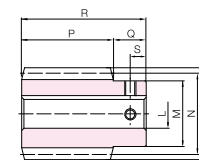
J Series



W1



W1T



W1K

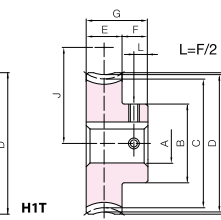
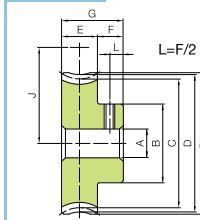


Keyway Width × Depth	Socket head screw Size	S	Weight (kg)	Catalog Number ● J Series (Available-on-request)
—	M4	5	0.042	SUW1-R1 SUW1-R2
—	M5	5	0.12	SUW1.5-R1
4 x 1.8	M4	5	0.11	● SUW1.5-R1J8 ● SUW1.5-R1J10
—	M5	5	0.12	SUW1.5-R2
4 x 1.8	M4	5	0.11	● SUW1.5-R2J8 ● SUW1.5-R2J10

[Caution on J series] ① As available-on-request products, these require a lead-time for shipping of 2 working days (excludes the day ordered), after placing an order. Because the machining starts immediately, we cannot accept cancellations. Please see Page 34 for more details.
② Number of pieces we can process for one order is 1 to 20 units. For larger quantities, please request price and delivery quotes.
③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
④ For products having a tapped hole, a set screw is included.



J Series



H1T



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.										
Keyway J49	6	8	10	12	14	15	16	17				
Screw size	—		4x1.8		5x2.3							
Catalog Number	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	H1K			
PG1.5-20R1J BORE		H1T	H1K									
PG1.5-20R2J BORE		H1T	H1K									

[Caution on J series] ① As available-on-request products, these require a lead-time for shipping of 2 working days (excludes the day ordered), after placing an order. Because the machining starts immediately, we cannot accept cancellations. Please see Page 34 for more details.
② Number of pieces we can process for one order is 1 to 20 units. For larger quantities, please request price and delivery quotes.
③ Plastic gears are susceptible to dimensional changes due to the effects of temperature and moisture. The dimensions and tolerances shown in the table are values obtained when machining is performed.
④ Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap. For details, please see the KHK Web Catalog.
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 load usage. For secure fastening, please use dowel pins in combination.

* In regard to MC Nylon gears, other materials are available for plastic gears, including Ultra High Molecular Weight Polyethylene (U-PE), which has excellent abrasion resistance Poly Ether Ether Ketone (PEEK) also has quality properties. A single piece order is acceptable and will be produced as a custom-made gear. Please see Page 24 for more details on quotations and orders.

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



SUW Module 2, 2.5, 3

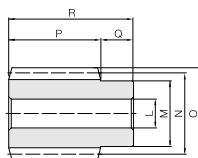
Stainless Steel Worms

J



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)

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



W1

Catalog Number	Normal module	Number of Starts	Nominal lead angle	Direction of helix	Shape	Bore L _{H7}	Hub dia. M	Pitch dia. N	Outside dia. O	Face width P	Hub width Q	Total length R
● J Series (Available-on-request)												
SUW2-R1 ● SUW2-R1J12 ● SUW2-R1J14	m2	1	3°42'	R	W1 W1K W1K	12 12 14	25	31	35	32	14	46
SUW2-R2 ● SUW2-R2J12 ● SUW2-R2J14		2	7°25'		W1 W1K W1K	12 12 14						
SUW2.5-R1 ● SUW2.5-R1J15 ● SUW2.5-R1J16 ● SUW2.5-R1J17		1	3°52'		W1 W1K W1K W1K	15 15 16 17	30	37	42	45	18	63
SUW2.5-R2 ● SUW2.5-R2J15 ● SUW2.5-R2J16 ● SUW2.5-R2J17	m2.5	2	7°46'	R	W1 W1K W1K W1K	15 15 16 17						
SUW3-R1 ● SUW3-R1J17 ● SUW3-R1J18 ● SUW3-R1J19 ● SUW3-R1J20		1	3°55'		W1 W1K W1K W1K W1K	16 17 18 19 20	35	44	50	50	20	70
SUW3-R2 ● SUW3-R2J17 ● SUW3-R2J18 ● SUW3-R2J19 ● SUW3-R2J20	m3	2	7°50'	R	W1 W1K W1K W1K W1K	16 17 18 19 20						

[Caution on Product Characteristics] ① These gears produce axial thrust forces. Please see Page 390 for more details.



PG Module 2, 2.5, 3

Worm Wheels

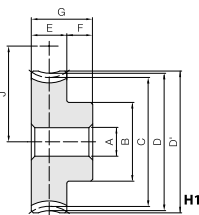
J



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
Heat treatment	—
Tooth hardness	—

* The precision grade is equivalent to the value shown in the table.
 ** The pressure angle of module 2.5 is 20°.

A	Bore
B	Hub dia.
C	Pitch dia.
D	Throat dia.
D'	Outside dia.
E	Face width
F	Hub width
G	Total length
J	Mounting distance



H1

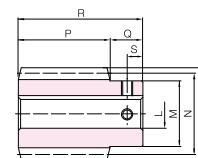
Catalog Number	Reduction ratio	No. of teeth	Lead angle to helix direction	Shape	A	B	C	D	D'	E	F	G	J	Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)
PG2-20R1 PG2-20R2	20 10	20 2	3°42' 7°25'	R	H1	10	33 40.08 40.34	44	46	22	13	35	35.5	4.78 4.82	0.49 0.49	0~0.33	0.046
PG2.5-20R1 PG2.5-20R2	20 10	20 2	3°52' 7°46'	R	H1	12	35 50.11 50.46	55	57.5	22	14	36	43.5	(8.46) (8.54)	0.86 0.87	0~0.36	0.066
PG3-20R1 PG3-20R2	20 10	20 2	3°55' 7°50'	R	H1	15	50 60.14 60.57	66	69	28	15	43	52	(13.7) (13.8)	1.40 1.41	0~0.38	0.13

[Caution on Product Characteristics] ① The worm wheel is shifted to fit the mounting distance.
 ② Significant variations in temperature or humidity can cause dimensional changes in plastic gears, including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in our separate technical reference book.
 ③ The allowable torque shown in the table are calculated values according to the assumed usage conditions. The values in parentheses exceed the maximum seizing allowable sliding speed without lubrication, so be sure to lubricate before use. Please see Page 386 for more details.

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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.

Stainless Steel Worms

J Series



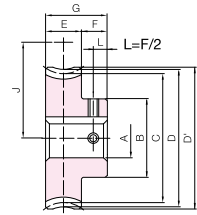
W1K



Keyway	Socket head screw	Weight (kg)	Catalog Number
Width × Depth	Size	S	● J Series (Available-on-request)
—	—	—	SUW2-R1
4 × 1.8	M4	7	● SUW2-R1J12
5 × 2.3	M4	7	● SUW2-R1J14
—	—	—	SUW2-R2
4 × 1.8	M4	7	● SUW2-R2J12
5 × 2.3	M4	7	● SUW2-R2J14
—	—	—	SUW2.5-R1
5 × 2.3	M4	9	● SUW2.5-R1J15
5 × 2.3	M4	9	● SUW2.5-R1J16
5 × 2.3	M4	9	● SUW2.5-R1J17
—	—	—	SUW2.5-R2
5 × 2.3	M4	9	● SUW2.5-R2J15
5 × 2.3	M4	9	● SUW2.5-R2J16
5 × 2.3	M4	9	● SUW2.5-R2J17
—	—	—	SUW3-R1
5 × 2.3	M4	10	● SUW3-R1J17
6 × 2.8	M5	10	● SUW3-R1J18
6 × 2.8	M5	10	● SUW3-R1J19
6 × 2.8	M5	10	● SUW3-R1J20
—	—	—	SUW3-R2
5 × 2.3	M4	10	● SUW3-R2J17
6 × 2.8	M5	10	● SUW3-R2J18
6 × 2.8	M5	10	● SUW3-R2J19
6 × 2.8	M5	10	● SUW3-R2J20

[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 390) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.

J Series



H1K

Plastic Worm Wheels



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

Bore		* The product shapes of J Series items are identified by background color.														
Keyway _{ISO}	10	12	14	15	16	17	18	19	20	22	25	28	30			
Screw size	4×1.8		5×2.3				6×2.8				8×3.3					
Catalog Number	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								
PG3-20R1 J BORE				H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K			
PG3-20R2 J BORE				H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K	H1K			

[Caution on J series] ① As available-on-request products, these require a lead-time for shipping of 2 working days (excludes the day ordered), after placing an order. Because the machining starts immediately, we cannot accept cancellations. Please see Page 34 for more details.
 ② Number of pieces we can process for one order is 1 to 20 units. For larger quantities, please request price and delivery quotes.
 ③ Plastic gears are susceptible to dimensional changes due to the effects of temperature and moisture. The dimensions and tolerances shown in the table are values obtained when machining is performed.
 ④ Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap. For details, please see the KHK Web Catalog.
 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.

Custom-made worm gears are available.

KHK offers high-precision products.



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



Please see Page 24 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