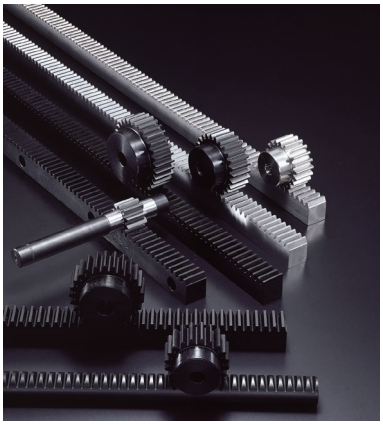


CP Racks & Pinions

KTSCP
CP Tapered Pinions
Precision: N8
Material: SCM440
Heat Treatment: Thermal refined
CP5, 10 Page 244

STRCPF/STRCPFD
CP Tapered Racks
Precision: KHK 4
Material: S45C
CP5, 10 Page 244

MSCPG
CP Ground Spur Gears
Precision: N5
Material: SCM415
Heat Treatment: Carburized
CP5, 10 Page 246

MRGCPF/MRGCPFD
CP Hardened Ground Racks
J Series
Precision: KHK 1
Material: SCM415
Heat Treatment: Tooth area carburized
CP5, 10 Page 246

KSCPG
CP Ground Spur Gears
New
Precision: N6
Material: SCM440
Heat Treatment: Thermal refined / gear teeth induction hardened
CP5, 10 Page 248

KRGCPF-H/KRGCPFD-H
CP Hardened Ground Racks
J Series
Precision: KHK 1
Material: SCM440
Heat Treatment: Thermal refined / gear teeth induction hardened
CP5, 10 Page 248

KRGCP/KRGCPF/KRGCPD
CP Thermal Refined Ground Racks
Precision: KHK 1
Material: SCM440
Heat Treatment: Thermal refined
CP5, 10 Page 250

SSCPGS
CP Ground Spur Pinion Shafts
Precision: N7
Material: S45C
Heat Treatment: Thermal refined / gear teeth induction hardened
CP5, 10 Page 252

SSCPG
CP Ground Spur Gears
J Series
Precision: N7
Material: S45C
Heat Treatment: Gear teeth induction hardened
CP5 ~ 20 Page 252

SRGCP/SRGCPF/SRGCPFD
CP Hardened Ground Racks
J Series
Precision: KHK 3
Material: S45C
Heat Treatment: Gear teeth induction hardened
CP5 ~ 20 Page 254

KRCPF-H/KRCPFD-H
CP Hardened Racks
J Series
Precision: KHK 5
Material: SCM440
Heat Treatment: Thermal refined / gear teeth induction hardened
CP5, 10 Page 256

KSSCP-H
CP Hardened Spur Gears
New
Hardened Plus
Precision: N9 equivalent
Material: SCM440
Heat Treatment: Thermal refined / gear teeth induction hardened
CP5, 10 Page 258

KSSCP
CP Thermal Refined Spur Gears
New
Precision: N8
Material: SCM440
Heat Treatment: Thermal refined
CP5, 10 Page 258

KRCPF/KRCPFD
CP Thermal Refined Racks
J Series
Precision: KHK 4
Material: SCM440
Heat Treatment: Thermal refined
CP5, 10 Page 258

SSCP-H
CP Hardened Spur Gears
New
Hardened Plus
Precision: N9 equivalent
Material: S45C
Heat Treatment: Gear teeth induction hardened
CP2.5 ~ 20 Page 260

SSCP
CP Spur Gears
J Series
Precision: N8
Material: S45C
CP2.5 ~ 20 Page 260

SRCPF-H/SRCPFD-H
CP Hardened Racks
J Series
Precision: KHK 5
Material: S45C
Heat Treatment: Gear teeth induction hardened
CP5 ~ 20 Page 262

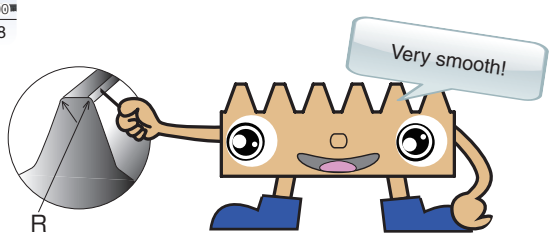
SRCP/SRCPF/SRCPFD/SRCPFK
CP Racks
J Series
Precision: KHK 4
Material: S45C
CP2.5 ~ 20 Page 264

SUSCP
CP Stainless Steel Spur Gears
J Series
Precision: N8
Material: SUS303
CP5, 10 Page 266

SURCPF/SURCPFD
CP Stainless Steel Racks
J Series
Precision: KHK 5
Material: SUS304
Heat Treatment: Solution treated
CP5, 10 Page 266

SROCP
CP Round Racks
Precision: KHK 4
Material: S45C
CP2.5 ~ 10 Page 268

FRCP
CP Metal Flexible Racks
Precision: KHK 8
Material: SS400
CP5 Page 268



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) Racks

S R CP 5 - 100

- 100 — Total Length (100mm)
- 5 — Circular pitch (5)
- CP — Type (Rack)
- S — Material (S45C)

Material

S	S45C
K	SCM440
SU	Stainless Steel
F	SS400

Type

R	Racks
RO	Round Racks
S	Spur Gears
TR(TS)	Tapered Racks (Spur Gears)

Other Information

F	Racks with Machined Ends
D	Racks with Bolt Holes
K	Racks with Drill Holes
G	Ground Gears
H	Gear teeth induction hardened
S	Pinion Shafts

Features

KHK stock CP racks and pinions are suitable in applications where very accurate positioning in linear motion is required. For your convenience, we offer circular pitches of 2.5 to 20 mm and in lengths of 100 to 2000 mm. (FRCP is available to 4000 mm)

■ Racks

Catalog Number Note 1	Pitch mm	Total length mm Parentheses show no. of teeth	Material	Heat Treatment	Tooth Surface Finish	Gear Accuracy KHK R 001 Parentheses show JIS B 1702-1	Features
STRCPF STRCPFD	5, 10	1000	S45C	—	Cut	4	By pairing with a KTSCP pinion, the backlash may be adjusted.
MRGCPF MRGCPFD	5, 10	500	SCM415	Tooth area carburized	Ground	1	A ground rack made of carburized chromoly steel. Our highest-performance rack, with accumulated pitch error of 10μm or less. J Series products are also available.
KRGCPF - H KRGCPFD - H	5, 10	500, 1000	SCM440	Thermal refined, gear teeth induction hardened	Ground	1	Heat treated ground gears with high precision and strength has excellent cost-performance ratio. J Series products are also available.
KRGCP/KRGCPF KRGCPD	5, 10	100, 500, 1000	SCM440	Thermal refined	Ground	1	High strength and abrasion-resistant for precision positioning.
SRGCP/SRGCPF SRGCPFD	5, 10, 15, 20	100, 500, 1000	S45C	Gear teeth induction hardened	Ground	3	Reasonably priced ground racks with abrasion-resistant characteristics. J Series products are also available.
KRCPF-H KRCPFD-H	5, 10	1000	SCM440	Thermal refined, gear teeth induction hardened	Cut	5	A high-strength, long-life, tough hardened rack suitable for compact designs. J Series products are also available.
SRCPF-H SRCPFD-H	5, 10, 15, 20	1000	S45C	Gear teeth induction hardened	Cut	5	Stable hardened racks with high strength, long life span are reasonably priced. J Series products are also available.
KRCPF/KRCPFD	5, 10	500, 1000	SCM440	Thermal refined	Cut	4	Increased strength with SCM440 material which is thermal refined. J Series products are also available.
SRCP/SRCPF SRCPFD/SRCPFK	2.5, 5, 10, 15, 20	100, 500, 1000, 1500, 2000	S45C	—	Cut	4	Low cost and widely applicable, with a large selection of pitches and lengths. J Series products are also available.
SURCPF SURCPFD	5, 10	500, 1000	SUS304	Solution treated	Cut	5	Suitable for food machinery due to SUS304's rust-resistant qualities. J Series products are also available.
SROCP	2.5, 5, 10	500	S45C	—	Cut	4	Convenient in applications where the rack has the reciprocal motion.
FRCP	5	2000, 3000, 4000	SS400	—	Cut	8	A continuously cut product that's long and can be deformed.

■ Pinion

KTSCP	5, 10	(20 to 40)	SCM440	Thermal refined	Cut	(N8)	By pairing with STRCPF rack, the backlash may be adjusted.
MSCPG	5, 10	(20 to 40)	SCM415	Carburized	Ground	(N5)	Designed with positive partial transposition for enhanced strength. Designed to have an integral value (mm) for the mounting distance, so both strength and usability are enhanced.
KSCPG	5, 10	(20 to 40)	SCM440	Thermal refined, gear teeth induction hardened	Ground	(N6)	High-strength and high-precision spur gear made of thermally refined and hardened chromoly steel. Allows secondary operations.
SSCPGS	5, 10	(10 to 25)	S45C	Thermal refined, gear teeth induction hardened	Ground	(N7)	Ground Spur Gears with Pinions, can be directly assembled with the shaft bearing, by modifying the pinion.
SSCPG	5, 10, 15, 20	(20 to 40)	S45C	Gear teeth induction hardened	Ground	(N7)	Perform secondary operations to suit your requirement on these ground CP spur gears. J Series products are also available.
KSCP	5, 10	(20 to 40)	SCM440	Thermal refined, gear teeth induction hardened	Cut	(N9)	Thermal refined and tooth-hardened chromoly steel racks, excellent in abrasion resistance. Use as mating pinions for KRCPF(-H) racks.
KSSCP	5, 10	(20 to 40)	SCM440	Thermal refined	Cut	(N8)	Increased durability with SCM440 material which is thermal refined. Hardened Plus (induction hardened gear teeth) is also available.
SSCP	2.5, 5, 10, 15, 20	(20 to 40)	S45C	—	Cut	(N8)	Low cost and widely applicable, with a large selection of pitches and numbers of teeth. J Series products are also available.
SUSCP	5, 10	(20 to 30)	SUS303	—	Cut	(N8)	Suitable for food machinery due to SUS303's rust-resistant qualities. J Series products are also available.

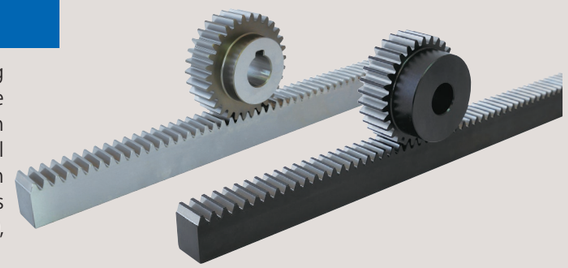
[NOTE 1] The catalog numbers in the above tables with a suffix of F have both ends machined so that they can be butted against each other to make any desired length. They can be butt-jointed to make any desired length.
The items with (D) have mounting screw holes for easier assembly.

- **For safer handling and to prevent damage such as deformation, KHK stock CP racks have round chamfering on the corners of the top land of the gear tooth. This rounded chamfered shape is patented by KHK. It is also effective for reducing noise.**
- **Black products are KHK stock CP racks & pinions that have an applied black oxide coating for rust resistance. This "blackness" is a product characteristic of KHK stock gears.**

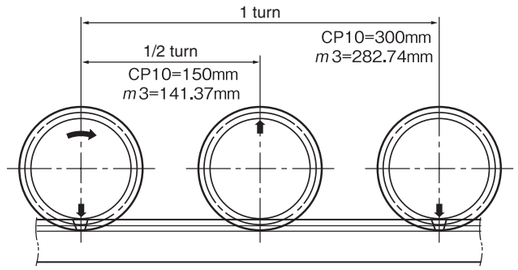
CP racks & pinions are ideal for linear positioning.

CP Racks & Pinions

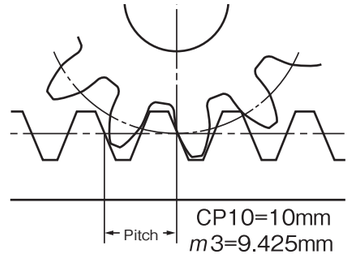
The reference pitch of a metric module is computed by multiplying the module number *m* by π (3.14159). For example, the reference pitch of *m*3 rack is 9.425 mm (3 × π). When using a rack and a pinion in a linear motion application, the fact that the pitch is not an integral number presents a difficulty in accurate positioning. Circular pitch products solve these problems. This problem is solved by CP racks and pinions where one rotation of a pinion moves it precisely 50, 100, 150, ... 600 mm, etc. The following table lists the main features.



■ Movement of one cycle of the CP10-30 pinion on a CP rack vs. SS3-30 (*m*3) on a *m*3 rack.



■ Difference between CP10 and *m*3



STRCPF/STRCPFD & KTSCP

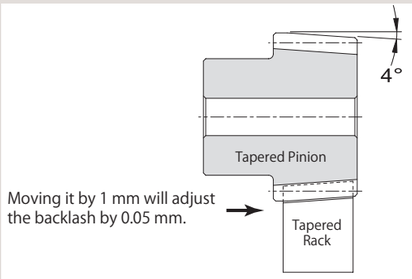
Taper Racks & Pinions

- **Easy to adjust the backlash**
  Normally, the backlash is adjusted by the mounting distance (height of pinion shaft), but for KHK Tapered Racks & Pinions, it can simply be adjusted by moving the pinion mounting position in the axial direction.
- **Backlash within 0.05 mm**
  The backlash of the conventional stock racks & pinions (SRCP5-1000 & SSCP 5-30) is 0.09 to 0.25 mm, but KHK Tapered Racks & Pinions (STRCPF5-1000 & KTSCP5-30) are manufactured within 0.05 mm.
- **Thrust load is not applied**
  KHK Tapered Racks & Pinions are basically straight racks & spur gears.
  Although the pinion looks like a bevel gear, it is actually a profile shifted gear whose tooth thickness in the helix direction is continuously changed.
  Therefore, as with ordinary racks & pinions, you can use them without worrying about the thrust load.

＊ For product details, please see Page 244.

■ Assembly and backlash adjustment method

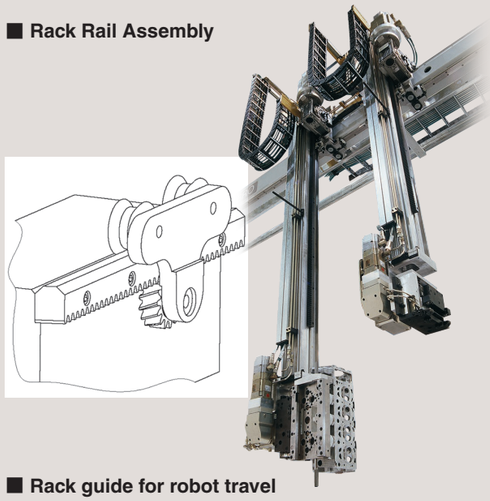
· Assemble at the mounting distance of the theoretical value at the reference tooth position of the racks & pinions.
  For the mounting distance and backlash, see the dimension table of the tapered spur gear.
· The backlash can be adjusted by moving the tapered spur gear in the axial direction. Moving it by 1 mm will adjust the backlash by 0.05 mm.
· When the tapered spur gear is pushed to the large end of the rack, the backlash is reduced. Conversely, retracting it will increase the backlash.



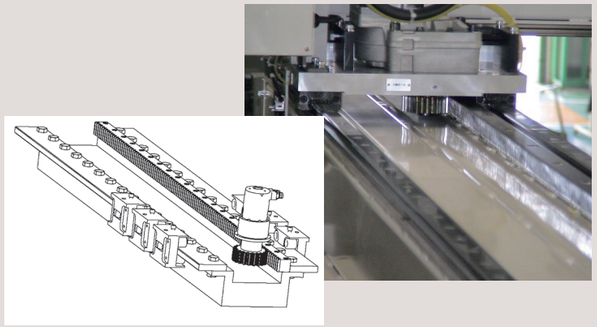
Application Examples

KHK stock CP racks & pinions are adopted in driving devices for all kinds of linear systems, including transport devices.

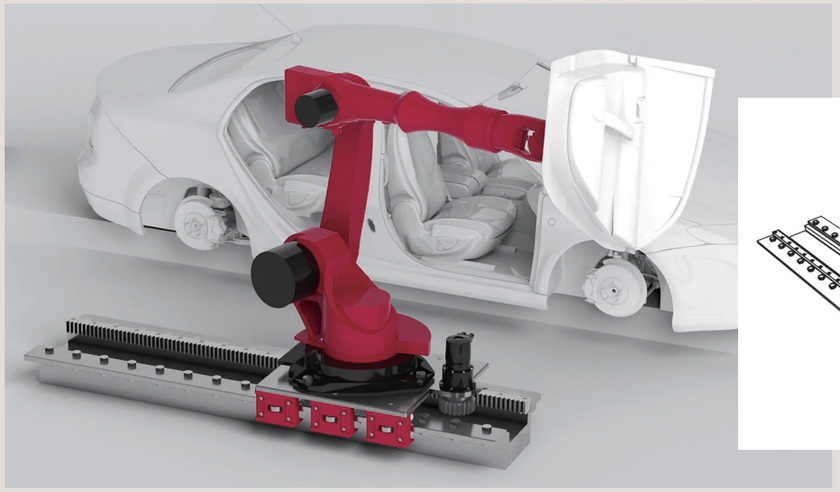
■ **Rack Rail Assembly**

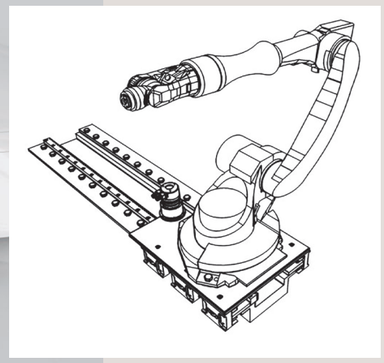


■ **Rack Drive Linear Guide**



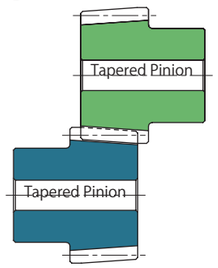
■ **Rack guide for robot travel**



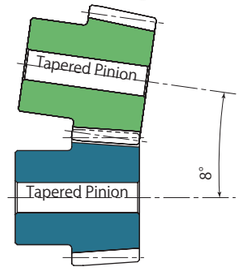


■ Examples of using tapered spur gears

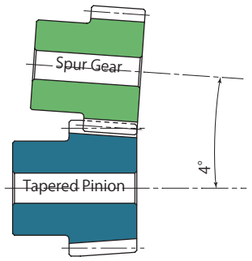
Changing the assembly direction of the tapered spur gear or assembling it with a general spur gear will allow it to be used at the axial angle shown below.



When the boss is set in the opposite direction, the axial angle is 0° (parallel shaft).



When the boss is set in the same direction, the axial angle is 8° .



When the taper spur gear and general spur gear are set, the axial angle is 4° .

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 notes shown below before the final selection.

1. Caution in Selecting the Mating Gears

① KHK stock CP racks are mated with CP spur gears having the same pitch. Since CP2.5 (m0.796), CP5 (m1.592) and CP10 (m3.183) are very close in size to m0.8, m1.5 and m3 respectively, selecting the proper mating gear should be verified to make sure that the items are correct. Otherwise, complications could arise.

② STRCPF and STRCPFD Tapered Racks are mated with KTSCP Spur Gears having the same pitch. They can also be mated with other spur gears; however, they cannot be used as parallel axis gears due to the setting angles.

2. Caution in Selecting Gears Based on Gear Strength

Allowable bending strength and surface durability values shown in product tables were computed by assuming a certain application environment. They should be used as reference only. We recommend that each user computes their own values by applying the actual usage conditions. The table below contains the assumptions established for various products in order to compute gear strengths.

■ Calculation of Bending Strength of Gears

Item \ Catalog Number	Racks: MRGCPF MRGCPFD	Racks: KRGCPF-H KRGCPFD-H KRCPF-H KRCPFD-H	Racks: KRGCP KRGCPF KRGCPD KRCPF KRCPFD	Racks: SRGCP SRGCPF SRGCPFD SRCPF-H SRCPFD-H	Racks: SRCP/SRCPF SRCPFD SRCPFK SROCP STRCPF STRCPFD	Racks: SURCPF SURCPFD FRCP	Pinions: MSCPG	Pinions: KSCPG	Pinions: SSCPGS	Pinions: SSCPG	Pinions: KTSCP	Pinions: KSCP	Pinions: KSSCP	Pinions: SSCP	Pinions: SUSCP
Formula NOTE 1	Formula of spur and helical gears on bending strength (JGMA401-01)														
No. of teeth of mating gears	30						Racks								
Rotational speed	100rpm														
Design life (durability)	Over 10^7cycles														
Impact from motor	Uniform load														
Impact from load	Uniform load														
Direction of load	Bidirectional														
Allowable bending stress at root σ_{Flim} (kgf/mm^2) NOTE 2	47	32	32	20	20	10.5	47	30	24.5	19	28.5	30	32	19	10.5
Safety factor S_F	1.2														

■ Calculation of Surface Durability (Except where it is common with bending strength)

Formula NOTE 1	Formula of spur and helical gears on surface durability (JGMA402-01)														
Kinematic viscosity of lubricant	100cSt(50℃)														
How to support pinions	Supported on one end.														
Allowable Hertz stress σ_{Hlim} (kgf/mm^2)	166	112	79	90	52.5	41.3	166	112	99	90	74.5	112	79	49	41.3
Safety factor S_H	1.15														

[NOTE 1] The gear strength formula is based on JGMA (Japanese Gear Manufacturers Association) specifications.
The units for the rotational speed (rpm) and the stress (kgf/mm^2) are adjusted to the units needed in the formula.

[NOTE 2] The allowable bending stress at the root σ_{Flim} is calculated from JGMA401-01, and set to 2/3 of the value in the consideration of the use of planetary-, idler-, or other gear systems, loaded in both directions.

3. Cautions on Selecting Racks By Precision

The precision standards of KHK stock racks are established by us.
The table below indicates the tolerance ranges of our racks.

① Pitch Error of Racks (KHK R 001) → Page 192
② Precision of Rack Blanks → Page 193
③ Backlash of Rack Teeth → Page 193

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

① Products not listed in this catalog or materials, modules, number of teeth and the like not listed in the dimensional tables can be manufactured as custom items. Please see Page 16 for more details about custom-made orders.
② 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.
③ The details (specifications, dimensions, prices, etc.) listed in the catalog may be changed without prior notice. Changes are announced on the KHK website.

Website URL: https://khkgears.net/
Overseas Sales Department: TEL: 81-48-254-1744 FAX: 81-48-254-1765 E-mail: info@khkgears.net

Application Hints

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

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

1. Cautions on Handling

① KHK products are packaged one by one to prevent scratches and dents, but if you find issues such as rust, scratches, or dents when the product is removed from the box after purchase, please contact the supplier.

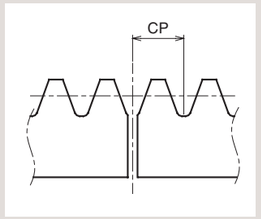
② Depending on the handling method, the product may become deformed or damaged. Long racks and round racks deform particularly easily, so please handle with care.

2. Caution on Performing Secondary Operations

① Secondary operations can be performed on all KHK stock CP racks except for the racks where the gear teeth are induction hardened. The precision of ground racks and racks with mounting holes may drop if you do not exercise extreme caution during installation or while modifying.

② Pitch lines of racks are controlled by using the bottom surface as the reference datum and over-pin measurements on tooth thickness. If you machine the bottom surfaces, the precision of the racks may be affected.

③ When connecting two racks, the machining of the mating end pitch (CP) requires careful consideration. The meshing will be poor if the pitch straddling the connection has a positive tolerance. We recommend a minus tolerance on pitch of at the connection. The below is an indication of pitch tolerance for each module.



Unit: mm

CP	Tolerance
CP2.5	−0.05 −0.25
CP5	−0.1 −0.3
CP10	−0.1 −0.4
CP15	
CP20	

④ To use dowel pins to secure racks, attach the racks to the base and drill both simultaneously.

⑤ KHK stock CP racks made of S45C and SCM440 (except for ground racks) can be induction hardened. However, the precision of pitch is decreased.

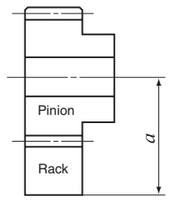
⑥ To be able to handle parts safely, all burrs and sharp corners should be removed after the secondary operations are done.

⑦ If you are going to modify the gear by gripping the teeth, please exercise caution not to crush the teeth by applying too much pressure. Any scarring will cause noise during operation.

3. Points of Caution during Assembly

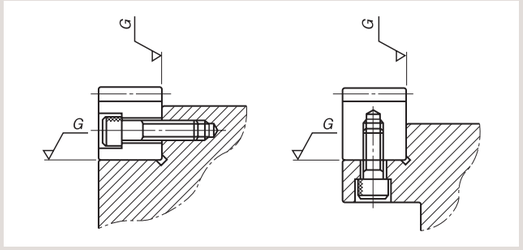
① KHK stock CP racks are designed to give the proper normal direction backlash when assembled using the mounting distance given by the formula below (mounting distance tolerance of H7 to H8 required). The backlash values are given in the table on Page 193. Make sure that the mounting distance stays constant for the length of the rack.

Mounting distance a = Height of pitch line of rack + Pitch radius of pinion



[NOTE] Pinions are assumed to be standard stock spur gears (x=0).

② KRGCP type of KHK stock ground racks have four surfaces ground parallel to within 10 ～ 15μm. In order to maintain the straightness, set it on a mounting base with high accuracy as shown below to correct the straightness error of the rack gear. Recently, no-backlash drive is often required, so assemble as shown below.

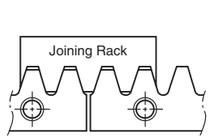


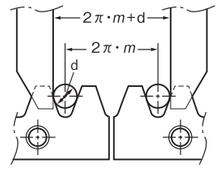
③ If the racks are not secured properly to the base, they could shift during operation and cause unexpected problems. It is very important to insure firm mounting by the use of dowel pins or similar devices.

④ Machined end type racks such as SRCPF and SRCPFD series have pitch tolerance of -0.05 to -0.4mm at the end face. If you try to connect the racks without any space, the pitch at the connection will be too small and will cause problems. Please follow the following diagrams for assembly.

⑤ With SRCPFD etc., if using more than 10 racks connected together to form a rack with mounting holes machined along a length of 1 meter, the pitch precision and machining precision may cause the rack and base mounting holes to deviate, leading to set screw interference with the counterbored hole and preventing mounting. When using a rack for long lengths such as 10 meters or 20 meters, have the mounting holes additionally machined into long holes.

As an example of Rack Joining, we recommend the following method.

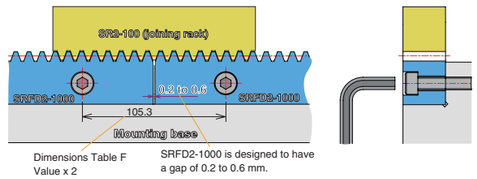




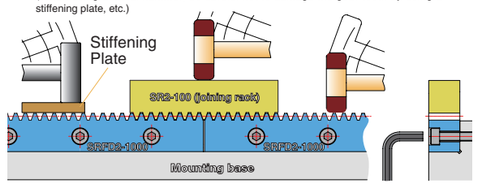
[NOTE] Joining gauge racks for helical racks must have the opposite hand from the racks. Please use 100 mm long racks as a joining gauge rack, or alternatively the rack of the same specifications on hand.

How to mount racks on a mounting base (For SRFD2-1000)

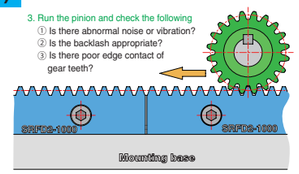
1. Pitch alignment
Place SRFD2-1000 on the mounting base, align SR2-100 and temporarily tighten the bolt.



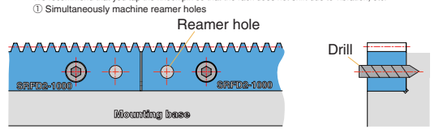
2. Securing to the mounting base
Tap with a plastic hammer, bring it into close contact with the mounting base, and further tighten the bolt.
(When using a metal hammer, be careful not to damage the gear teeth by using a stiffening plate, etc.)



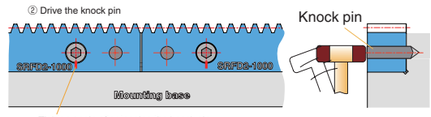
3. Run the pinion and check the following
① Is there abnormal noise or vibration?
② Is the backlash appropriate?
③ Is there poor edge contact of gear teeth?



4. Secure fixation to the mounting base
We recommend that you tap the knock pin so that the rack does not shift due to vibration, etc.
① Simultaneously machine reamer holes



② Drive the knock pin



4. Cautions on Starting

① Check the following items before starting.
- Are the gears installed securely?
- Is there uneven tooth contact?
- Is there adequate backlash?
  Be sure to avoid zero-backlash.
- Has proper lubrication been supplied?

② If gears are exposed, be sure to attach a safety cover to ensure safety. Also, be careful not to touch rotating gears.

③ Gears can be lubricated with the "grease lubrication method", "splash lubrication method (oil bath method)", or "forced lubrication method (circulation lubrication method)". For initial operation, the lubricant may deteriorate markedly, so check the condition of the lubricant after starting. For more technical information, please see the section "Gear Lubrication" (Page 112) of our technical reference book.

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

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

⚠ Warning: Precautions for preventing physical and property damage

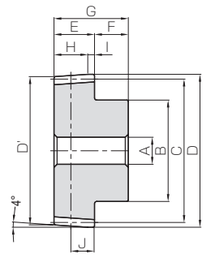
1. When using KHK products, follow relevant safety regulations (Occupational Safety and Health Regulations, etc.).
2. Pay attention to the following items when installing, removing, or performing maintenance and inspection of the product.
   ① Turn off the power switch.
   ② Do not reach or crawl under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

⚠ 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.

CP Tapered Pinions

Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat Treatment	Thermal refining only
Tooth hardness	225 to 285HB
Surface treatment	Black oxide coating

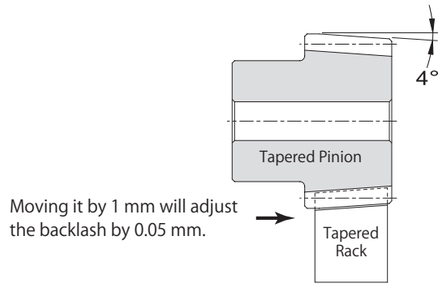


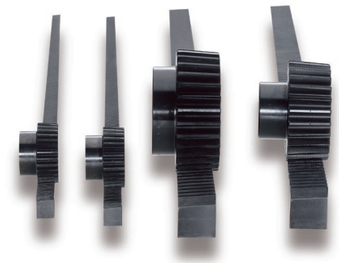
ST

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia. (major)	Outside dia. (minor)	Total tooth width	Hub width	Total Length
				A_{H7}	B	C	D	D'	E	F	G
KTSCP5-20	**CP5** (1.5915)	20	ST	8	25	31.83	36.06	33.97	18	15	33
KTSCP5-25		25		10	32	39.79	44.02	41.92			
KTSCP5-30		30		10	38	47.75	51.98	49.88			
KTSCP5-40		40		12	45	63.66	67.89	65.8			
KTSCP10-20	**CP10** (3.1831)	20		15	50	63.66	72.13	67.93	36	20	56
KTSCP10-25		25		20	60	79.58	88.04	83.85			
KTSCP10-30		30		20	75	95.49	103.96	99.76			
KTSCP10-40		40		20	80	127.32	135.79	131.59			

[Caution on Product Characteristics]
① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash values shown in the table are the theoretical values when these gears and STRCP Tapered Racks are in mesh.

Tapered Spur Gears

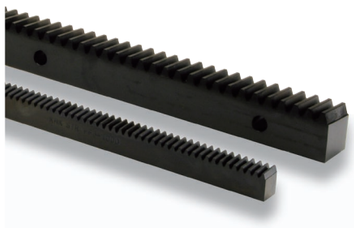




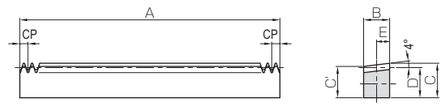
Reference face width	Adjustable width	Position of reference tooth	Distance traveled in one turn (mm)	Allowable torque (N·m)		Allowable torque (kgf·m)		Mounting distance (mm)	Backlash (mm)	Weight (kg)	Catalog Number
H	I	J		Bending strength	Surface durability	Bending strength	Surface durability				
15	3	10.5	100	41.2	8.13	4.20	0.83	33.30	0 ～ 0.11	0.16	**KTSCP5-20**
			125	55.6	14.0	5.67	1.43	37.28		0.25	**KTSCP5-25**
			150	70.3	21.9	7.16	2.23	41.26		0.37	**KTSCP5-30**
			200	100	43.3	10.2	4.41	49.21		0.61	**KTSCP5-40**
30	6	21	200	329	71.2	33.6	7.26	62.10	0 ～ 0.12	1.13	**KTSCP10-20**
			250	445	122	45.3	12.4	70.06		1.71	**KTSCP10-25**
			300	562	189	57.3	19.2	78.02		2.58	**KTSCP10-30**
			400	801	371	81.7	37.8	93.93		4.25	**KTSCP10-40**

[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 26) 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 Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.

CP Tapered Racks



Specifications	
Precision grade	KHK R 001 grade 4
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	—
Tooth hardness	(less than 95HRB)
Surface treatment	Black oxide coating



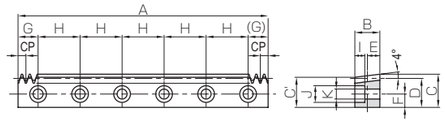
RF

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height (major)	Height (minor)	Height to pitch line	Position of reference tooth
				A	B	C	C'	D	E
STRCPF5-1000	**CP5** (1.5915)	200	RF	1000	15	19.5	18.45	17.38	7.5
STRCPF10-1000	**CP10** (3.1831)	100			30	34.5	32.4	30.27	15

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height (major)	Height (minor)	Height to pitch line	Position of reference tooth	Mounting hole dimensions				
				A	B	C	C'	D	E	F	G	H	No. of holes	Screw size
STRCPFD5-1000	**CP5** (1.5915)	200	RD	1000	15	19.5	18.45	17.38	7.5	8	50	180	6	M5
STRCPFD10-1000	**CP10** (3.1831)	100			30	34.5	32.4	30.27	15	14				M10

[Caution on Product Characteristics]
① The allowable forces shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash of the CP Tapered Racks equates to the value of the mating gear shown in the table.
③ After attaching the racks to the base, please fasten with dowel pins. Clamping only with mounting screws could possibly cause the screws to be broken, due to a heavy load. For details, please see the assembly method to the mounting base on Page 243.
④ When connecting the racks for use, correctly adjust the joint pitch with identical products at hand or with an SRCP-100 rack product of the same pitch. Please read 2. Points of Caution in Assembling (Page 242) for details.

Tapered Racks



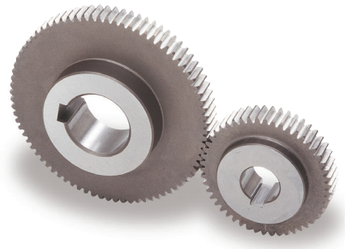
RD

Allowable force (N)		Allowable force (kgf)		Weight (kg)	Catalog Number
Bending strength	Surface durability	Bending strength	Surface durability		
2290	468	233	47.7	2.05	**STRCPF5-1000**
9150	1870	933	191	7.13	**STRCPF10-1000**

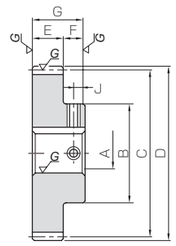
Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Weight (kg)	Catalog Number
I	J	K	Bending strength	Surface durability	Bending strength	Surface durability		
6	10	6	2290	468	233	47.7	2.01	**STRCPFD5-1000**
10.8	17.5	11	9150	1870	933	191	6.92	**STRCPFD10-1000**

[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 242) 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 gear tooth hardening, or thermal refining, is applied, the decarburization layer (approx. 0.5 mm thickness) on the rectangular surfaces cannot have the hardness you designate.
③ Avoid hardening Racks with bolt holes, due to deformation occurring at the mounting hole and the difficulty of straightening the rack after hardening.

CP Ground Spur Gears



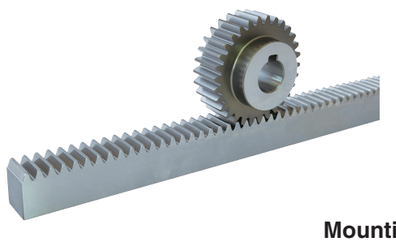
Specifications	
Precision grade	JIS grade N5 (JIS B1702-1: 1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat Treatment	Carburized
Tooth hardness	55 to 60HRC

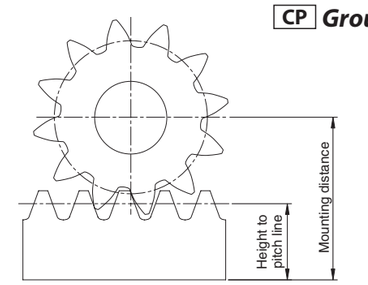


S1K

Catalog Number	Pitch mm (Module)	No. of teeth	Dislocation coefficient	Mounting distance	Shape	Bore A_{H7}	Hub dia. B	Pitch dia. C	Outside dia. D	Face width E	Hub width F	Total Length G
MSCPG5-20A	**CP5** (1.5915)	20	+0.425	35	S1K	12	28	31.83	36.37	15	15	30
MSCPG5-20B						15						
MSCPG5-25A		25	+0.438	39		12	35	39.79	44.37			
MSCPG5-25B						15						
MSCPG5-30A		30	+0.451	43		15	40	47.75	52.37			
MSCPG5-30B						20						
MSCPG5-40A		40	+0.478	51		15	45	63.66	68.37			
MSCPG5-40B						20						
MSCPG5-40C						25						
MSCPG10-20A	**CP10** (3.1831)	20	+0.111	64	S1K	20	50	63.66	70.73	30	20	50
MSCPG10-20B						25						
MSCPG10-25A		25	+0.124	72		25	60	79.58	86.73			
MSCPG10-25B						30						
MSCPG10-30A		30	+0.137	80		30	70	95.49	102.73			
MSCPG10-30B						40						
MSCPG10-40A		40	+0.164	96		30	70	127.32	134.73			
MSCPG10-40B						40						

[Caution on Product Characteristics]
① Although the dimensions of the keyway are made to the JIS B1301 (Js9) tolerance, there may be some deviations due to the effects of the heat treatment.
② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
③ The backlash values shown in the table are the theoretical values (the above mounting distance) when these gears and MRGCPF Racks are in mesh. When joining with other products, calculate the mounting distance using the profile shifted gear formula. Please see Page 18 of our technical reference book for more details.



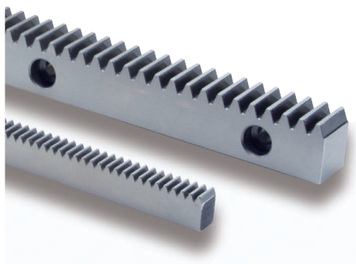


Mounting distance of a profile shifted gear and the meshing rack

Keyway	Socket head screw		Distance traveled in one turn (mm)	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
Width × Depth	Size	J		Bending strength	Surface durability	Bending strength	Surface durability			
4x 1.8	M4	7.5	100	70.0	46.7	7.13	4.76	0.04-0.13	0.14	**MSCPG5-20A**
5x 2.3									0.13	**MSCPG5-20B**
4x 1.8	M4		125	91.8	78.2	9.37	7.97		0.24	**MSCPG5-25A**
5x 2.3									0.22	**MSCPG5-25B**
5x 2.3	M4		150	114	119	11.6	12.2		0.32	**MSCPG5-30A**
6x 2.8	M5								0.29	**MSCPG5-30B**
5x 2.3	M4		200	159	229	16.2	23.4		0.53	**MSCPG5-40A**
6x 2.8	M5								0.50	**MSCPG5-40B**
8x 3.3	M6								0.45	**MSCPG5-40C**
6x 2.8	M5	10	200	514	375	52.4	38.2	0.06-0.16	0.94	**MSCPG10-20A**
8x 3.3	M6								0.87	**MSCPG10-20B**
8x 3.3	M6		250	689	628	70.3	64.1		1.43	**MSCPG10-25A**
									1.34	**MSCPG10-25B**
8x 3.3	M6		300	868	960	88.5	97.9		2.03	**MSCPG10-30A**
12x 3.3	M8								1.80	**MSCPG10-30B**
8x 3.3	M6		400	1230	1850	126	188		3.36	**MSCPG10-40A**
12x 3.3	M8								3.13	**MSCPG10-40B**

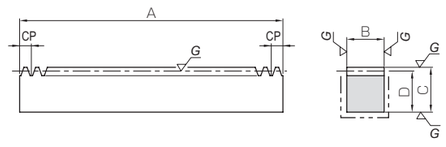
[Caution on Secondary Operations]
① No secondary operations can be performed on these precision finished gears due to the applied carburizing process. For products which are different in specifications, such as bore size, we accept custom-made gear orders and provide a price quote.

CP Hardened Ground Racks J Series



Specifications	
Precision grade	KHK R 001 Grade 1 *
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat Treatment	Tooth area carburized
Tooth hardness	55 to 60HRC

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



RF

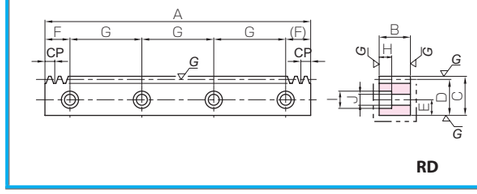
Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)
MRGCPF5-500	**CP5** (1.5915)	100	RF	500	15	20	18.41	5380	5000	548	509	1.08
MRGCPF10-500	**CP10** (3.1831)	50			30	35	31.82	21500	20100	2190	2050	3.75

Catalog Number ● : J Series (Available-on-request)	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Mounting hole dimensions E	F	G	No. of holes	Screw size
● **MRGCPFD5-500J**	**CP5** (1.5915)	100	RD	500	15	20	18.41	8	25	150	4	M5
● **MRGCPFD10-500J**	**CP10** (3.1831)	50			30	35	31.82	14				M10

[Caution on Product Characteristics]
① The allowable forces shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash of racks differs depending on the size of the mating pinion. Calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Teeth (Amount of Tooth Thinning)' on Page 193.

[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 242) 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 In the illustration, the area surrounded with — - - — line is masked during the carburization process and can be modified. However, the end faces on both sides do not have an anti-carburization coating on the taped holes, as otherwise they could not be machined.

J Series



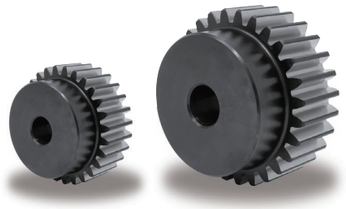
RD

Surface durability is 4 times higher than SRGCP Hardened Ground Racks, 2 times higher than KRGCP-H Hardened Ground Racks.

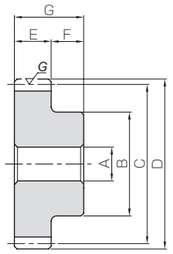
Counterbore dimensions H	I	J	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)	Catalog Number ● : J Series (Available-on-request)
6	10	6	5380	5000	548	509	1.06	● **MRGCPFD5-500J**
10.8	17.5	11	21500	20100	2190	2050	3.61	● **MRGCPFD10-500J**

[Caution on J series]
① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

CP Ground Spur Gears



Specifications	
Precision grade	JIS grade N6 (JIS B1702-1: 1998)
Gear teeth	Standard full depth
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 teeth



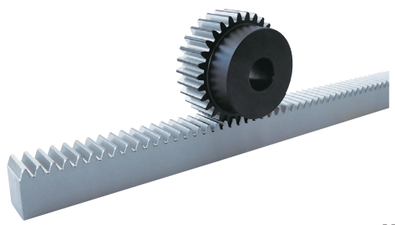
S1

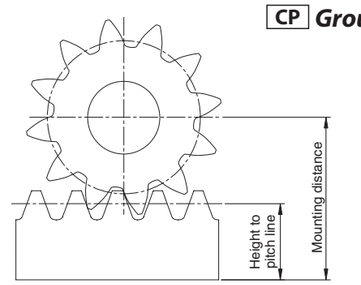
Catalog Number	Pitch mm (Module)	No. of teeth	Dislocation coefficient	Mounting distance	Shape	Bore A_{H7}	Hub dia. B	Pitch dia. C	Outside dia. D	Face width E	Hub width F	Total Length G
KSCPG5-20	**CP5** (1.5915)	20	+0.425	35	S1	10	25	31.83	36.37	15	15	30
KSCPG5-25		25	+0.438	39		10	35	39.79	44.37			
KSCPG5-30		30	+0.451	43		15	40	47.75	52.37			
KSCPG5-40		40	+0.478	51		15	55	63.66	68.37			
KSCPG10-20	**CP10** (3.1831)	20	+0.111	64		15	50	63.66	70.73	30	20	50
KSCPG10-25		25	+0.124	72		20	70	79.58	86.73			
KSCPG10-30		30	+0.137	80		20	85	95.49	102.73			
KSCPG10-40		40	+0.164	96		25	110	127.32	134.73			

[Caution on Product Characteristics]
① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of KRGCPF-H Racks with the same pitch.

CP Ground Spur Gears

New Product



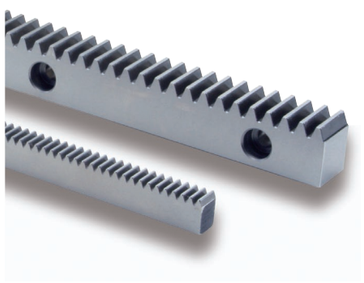


Mounting distance of a profile shifted gear and the meshing rack

Distance traveled in one turn (mm)	Allowable torque (N·m) Bending strength	Allowable torque (N·m) Surface durability	Allowable torque (kgf·m) Bending strength	Allowable torque (kgf·m) Surface durability	Backlash (mm)	Weight (kg)	Catalog Number
100	44.7	21.3	4.55	2.17	0.04 ～ 0.14	0.14	**KSCPG5-20**
125	58.6	35.6	5.98	3.63		0.25	**KSCPG5-25**
150	72.8	54.3	7.42	5.54		0.33	**KSCPG5-30**
200	101	104	10.3	10.6		0.63	**KSCPG5-40**
200	328	171	33.4	17.4	0.06 ～ 0.17	1.01	**KSCPG10-20**
250	440	286	44.9	29.2		1.68	**KSCPG10-25**
300	554	437	56.5	44.5		2.49	**KSCPG10-30**
400	786	841	80.1	85.8		4.35	**KSCPG10-40**

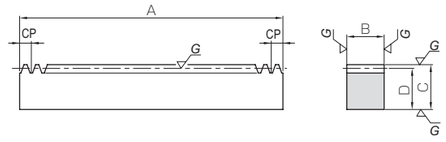
[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

CP Hardened Ground Racks J Series



Specifications	
Precision grade	KHK R 001 Grade 1 *
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat Treatment	Thermal refined, gear teeth induction hardened
Tooth hardness	50 to 60HRC

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



RF

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)
KRGCPF5-500H	**CP5** (1.5915)	100	RF	500	15	20	18.41	3660	2270	373	232	1.08
KRGCPF5-1000H		200		1000								2.17
KRGCPF10-500H	**CP10** (3.1831)	50		500	30	35	31.82	14600	9150	1490	933	3.75
KRGCPF10-1000H		100		1000								7.49

Catalog Number ● : J Series (Available-on-request)	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Mounting hole dimensions E	F	G	No. of holes	Screw size
● **KRGCPFD5-500HJ**	**CP5** (1.5915)	100	RD	500	15	20	18.41	8	25	150	4	M5
● **KRGCPFD5-1000HJ**		200		1000					50	180	6	
● **KRGCPFD10-500HJ**	**CP10** (3.1831)	50		500	30	35	31.82	14	25	150	4	M10
● **KRGCPFD10-1000HJ**		100		1000					50	180	6	

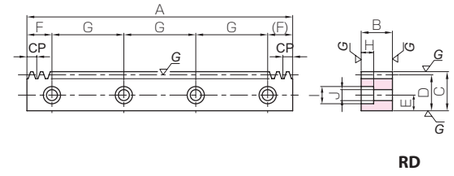
[Caution on Product Characteristics]
① The allowable forces shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash of racks differs depending on the size of the mating pinion. Calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Teeth (Amount of Tooth Thinning)' on Page 193.

[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 242) 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 wire EDM or other carbide tools to modify the length.

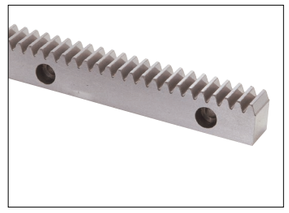
[Caution on J series]
① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered) after placing an order, but will involve separate consultation when out of stock.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

CP Ground Racks

J Series



RD

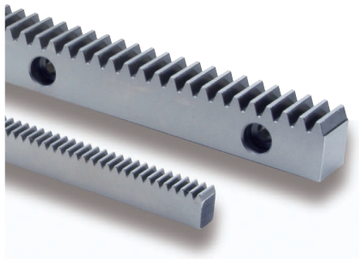


*** CP30 and ground racks with total length up to (A) 1500mm and heights up to (C) 120mm are also available by request as custom-made products.**

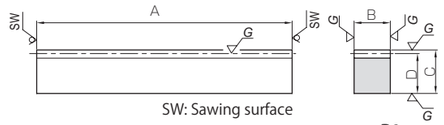
Counterbore dimensions H	I	J	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)	Catalog Number ● : J Series (Available-on-request)
6	10	6	3660	2270	373	232	1.06	● **KRGCPFD5-500HJ**
							2.13	● **KRGCPFD5-1000HJ**
10.8	17.5	11	14600	9150	1490	933	3.61	● **KRGCPFD10-500HJ**
							7.28	● **KRGCPFD10-1000HJ**

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

CP Thermal Refined Ground Racks

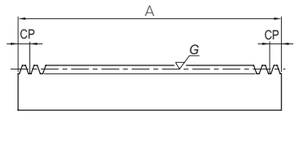


Specifications	
Precision grade	KHK R 001 grade 1
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat Treatment	Thermal refining only
Tooth hardness	225 to 285HB

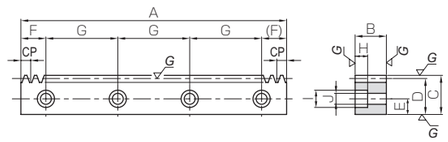


SW: Sawing surface

R1



RF



RD

Catalog Number	Pitch mm (Module)	Effective number of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)
KRGCP5-100	**CP5** (1.5915)	18	R1	98	15	20	18.41	3660	1560	373	159	0.21
KRGCP5-500		99		505								1.09
KRGCP10-100	**CP10** (3.1831)	8		98	30	35	31.82	14600	6230	1490	635	0.73
KRGCP10-500		49		505								3.78

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)
KRGCPF5-1000	**CP5** (1.5915)	200	RF	1000	15	20	18.41	3660	1560	373	159	2.17
KRGCPF10-1000	**CP10** (3.1831)	100			30	35	31.82	14600	6230	1490	635	7.49

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Mounting hole dimensions E	F	G	No. of holes	Screw size
KRGCPD5-500	**CP5** (1.5915)	100	RD	500	15	20	18.41	8	40	140	4	M5
KRGCPD10-500	**CP10** (3.1831)	50			30	35	31.82	14				M10

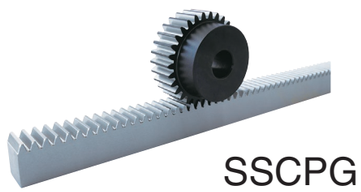
Counterbore dimensions H	I	J	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)	Catalog Number
6	10	6	3660	1560	373	159	1.06	**KRGCPD5-500**
10.8	17.5	11	14600	6230	1490	635	3.61	**KRGCPD10-500**

∗ CP30 and ground racks with total length up to (A) 1500mm and heights up to (C) 120mm are also available by request as custom-made products.

[Caution on Product Characteristics]
① The allowable forces shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash of racks differs depending on the size of the mating pinion. Calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Teeth (Amount of Tooth Thinning)' on Page 193.
③ After attaching the racks to the base, please fasten with dowel pins. Clamping only with mounting screws could possibly cause the screws to be broken, due to a heavy load. For details, please see the assembly method to the mounting base on Page 243.

[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 242) 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.

Recommended Mating Pinion

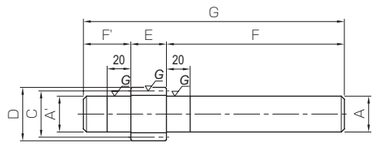


SSCPG

Please see Page 252 for more details.

CP Ground Spur Pinion Shafts

Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	Thermal refined, gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coated except for ground part

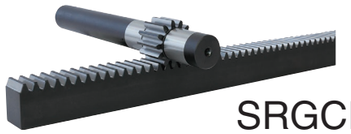


S7

Catalog Number	Pitch mm (Module)	No. of teeth	Dislocation coefficient	Shape	Shaft diameter (L) A'	Shaft length (L) F'	Pitch dia. C	Outside dia. D	Face width E	Shaft diameter (R) A	Shaft length (R) F
SSCPGS5-15	**CP5** (1.5915)	15	0	S7	19.2	25	23.87	27.06	15	19.2	100
SSCPGS5-20		20	0		27.2		31.83	35.01		27.2	
SSCPGS5-25		25	0		30.2		39.79	42.97		30.2	
SSCPGS10-10	**CP10** (3.1831)	10	+0.5		25.2	40	31.83	41.38	30	25.2	150
SSCPGS10-15		15	0		35.2		47.75	54.11		35.2	
SSCPGS10-20		20	0		40.2		63.66	70.03		40.2	

[Caution on Product Characteristics]
① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash values shown in the table are the theoretical values when these gears and SRGCP Racks are in mesh.
③ For the center distance of the profile shifted gear, please refer to "Center distance of stock spur gear meshing with profile shifted gear" on Pages 40 to 41.

Recommended mating rack



SRGCP

Please see Page 254 for more details.

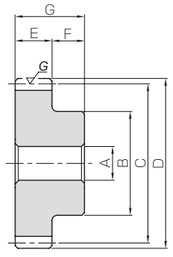
Total Length G	Distance traveled in one turn (mm)	Allowable torque (N·m) Bending strength	Allowable torque (N·m) Surface durability	Allowable torque (kgf·m) Bending strength	Allowable torque (kgf·m) Surface durability	Backlash (mm)	Weight (kg)	Catalog Number
140	75	21.2	8.49	2.16	0.87	0.04 ～ 0.18	0.34	**SSCPGS5-15**
	100	32.0	16.6	3.26	1.70		0.66	**SSCPGS5-20**
	125	43.2	27.8	4.40	2.83		0.85	**SSCPGS5-25**
220	100	121	25.9	12.4	2.64	0.06 ～ 0.21	0.97	**SSCPGS10-10**
	150	169	67.9	17.3	6.93		1.87	**SSCPGS10-15**
	200	256	133	26.1	13.6		2.64	**SSCPGS10-20**

[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 26) 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.

CP Ground Spur Gears J Series

Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	Gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coated except for teeth

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



S1

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Bore A_{H7}	Hub dia. B	Pitch dia. C	Outside dia. D	Face width E	Hub width F	Total Length G	Distance traveled in one turn (mm)	Allowable torque (N·m) Bending strength	Allowable torque (N·m) Surface durability	Allowable torque (kgf·m) Bending strength	Allowable torque (kgf·m) Surface durability	Backlash (mm)	Weight (kg)
SSCPG5-20	**CP5** (1.5915)	20	S1	8	25	31.83	35.01	15	15	30	100	24.8	13.7	2.53	1.40	0.04 ～ 0.18	0.14
SSCPG5-25		25		10	32	39.79	42.97				125	33.5	23.0	3.41	2.34		0.22
SSCPG5-30		30		10	38	47.75	50.93				150	42.3	35.0	4.32	3.57		0.33
SSCPG5-40		40		12	50	63.66	66.85				200	60.4	66.9	6.16	6.82		0.58
SSCPG10-20	**CP10** (3.1831)	20		15	50	63.66	70.03	30	20	50	200	198	110	20.2	11.2	0.06 ～ 0.21	0.99
SSCPG10-25		25		20	60	79.58	85.94				250	268	184	27.3	18.7		1.49
SSCPG10-30		30		20	75	95.49	101.86				300	339	280	34.5	28.5		2.26
SSCPG10-40		40		25	80	127.32	133.69				400	483	535	49.3	54.6		3.59
SSCPG15-20	**CP15** (4.7746)	20		25	75	95.49	105.04	50	27	77	300	744	399	75.9	40.7	0.07 ～ 0.23	3.45
SSCPG15-25		25		25	100	119.37	128.92				375	1005	667	102	68.0		5.76
SSCPG15-30		30		25	110	143.24	152.79				450	1270	1020	130	104		8.04
SSCPG20-20	**CP20** (6.3662)	20		25	100	127.32	140.06	60	30	90	400	1590	880	162	89.7	0.09 ～ 0.25	7.50
SSCPG20-25		25		30	130	159.15	171.89				500	2140	1470	219	150		12.0
SSCPG20-30		30		30	150	190.99	203.72				600	2710	2240	276	228		17.2

[Caution on Product Characteristics]
① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash values shown in the table are the theoretical values when these gears and SRGCP Racks are in mesh.

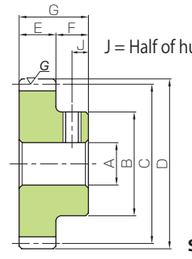
[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

Recommended mating rack

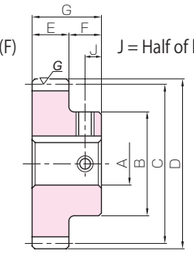
SRGCP

Please see Page 254 for more details.

J Series



S1T

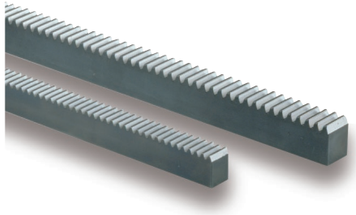


S1K

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

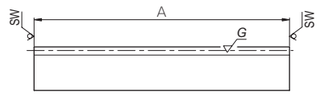
Bore H7	* The product shapes of J Series items are identified by background color.																			
Keyway Js9	8	10	12	14	15	16	17	18	19	20	22	25	28	30	32	35	40	45	50
Screw size	—	4×1.8		5×2.3				6×2.8				8×3.3			10×3.3		12×3.3	14×3.8	
Catalog Number	M5	M4						M5				M6			M8			M10	
SSCPG5-20 J BORE	S1T	S1K	S1K																
SSCPG5-25 J BORE		S1K	S1K	S1K	S1K	S1K	S1K												
SSCPG5-30 J BORE		S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K								
SSCPG5-40 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K					
SSCPG10-20 J BORE					S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K					
SSCPG10-25 J BORE										S1K	S1K	S1K	S1K	S1K	S1K	S1K			
SSCPG10-30 J BORE										S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	
SSCPG10-40 J BORE												S1K	S1K	S1K	S1K	S1K	S1K	S1K	

[Caution on J series]
① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
④ Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap. Please see the Web Catalog or Master Catalog for more details.
⑤ Areas of products which have been re-worked will not be black oxide coated.
⑥ For products having a tapped hole, a set screw is included.
⑦ When using S1T 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.



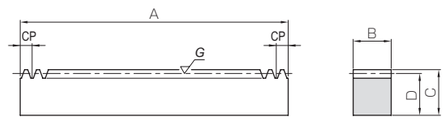
Specifications	
Precision grade	KHK R 001 Grade 3＊
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	Gear teeth induction hardened
Tooth hardness	50 ～ 60HRC＊＊
Surface treatment	Black oxide coated except for teeth

＊ The precision grade of J Series products is equivalent to the value shown in the table.
＊＊ The block surface has a decarburization layer (approx. 0.5 mm thickness), with hardness of 187 HB or less.



SW: Sawing surface

R1



RF

Catalog Number	Pitch mm (Module)	Effective number of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)
SRGCP5-100	**CP5** (1.5915)	18	R1	98	15	20	18.41	2290	1460	233	149	0.21
SRGCP10-100	**CP10** (3.1831)	8		98	30	35	31.82	9150	5860	933	597	0.73
SRGCP15-100	**CP15** (4.7746)	5		103	50	50	45.23	22900	14200	2330	1450	1.83
SRGCP20-100	**CP20** (6.3662)	3		98	60	60	53.63	36600	23400	3730	2390	2.48

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)
SRGCPF5-500	**CP5** (1.5915)	100	RF	500	15	20	18.41	2290	1460	233	149	1.08
SRGCPF5-1000		200		1000								2.17
SRGCPF10-500	**CP10** (3.1831)	50		500	30	35	31.82	9150	5860	933	597	3.75
SRGCPF10-1000		100		1000								7.49
SRGCPF15-500	**CP15** (4.7746)	33		495	50	50	45.23	22900	14200	2330	1450	8.79
SRGCPF15-1000		67		1005								17.8
SRGCPF20-500	**CP20** (6.3662)	25		500	60	60	53.63	36600	23400	3730	2390	12.6
SRGCPF20-1000		50		1000								25.3

Catalog Number ● : J Series (Available-on-request)	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Mounting hole dimensions E	F	G	No. of holes	Screw size
● **SRGCPFD5-500J**	**CP5** (1.5915)	100	RD	500	15	20	18.41	8	25	150	4	M5
● **SRGCPFD5-1000J**		200		1000					50	180	6	
● **SRGCPFD10-500J**	**CP10** (3.1831)	50		500	30	35	31.82	14	25	150	4	M10
● **SRGCPFD10-1000J**		100		1000					50	180	6	
● **SRGCPFD15-500J**	**CP15** (4.7746)	33		495	50	50	45.23	20	27.5	220	3	M14
● **SRGCPFD15-1000J**		67		1005					62.5	220	5	
● **SRGCPFD20-500J**	**CP20** (6.3662)	25		500	60	60	53.63	23	30	220	3	M16
● **SRGCPFD20-1000J**		50		1000					60	220	5	

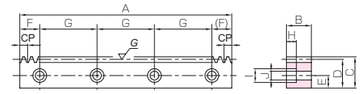
[Caution on Product Characteristics]
① The allowable forces shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash of racks differs depending on the size of the mating pinion. Calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Teeth (Amount of Tooth Thinning)' on Page 193.

[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 242) 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 wire EDM or other carbide tools to modify the length.

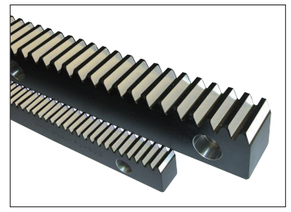
[Caution on J series]
① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Black oxide is NOT re-applied after the secondary operation of adding mounting holes.

J Series

CP Ground Racks



RD



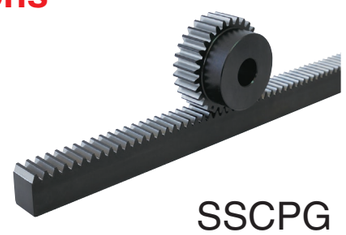
＊ CP30 and ground racks with total length up to (A) 1500mm and heights up to (C) 120mm are also available by request as custom-made products.

Counterbore dimensions H	I	J	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)	Catalog Number ● : J Series (Available-on-request)
6	10	6	2290	1460	233	149	1.06	● **SRGCPFD5-500J**
							2.13	● **SRGCPFD5-1000J**
10.8	17.5	11	9150	5860	933	597	3.61	● **SRGCPFD10-500J**
							7.29	● **SRGCPFD10-1000J**
15.2	23	16	22900	14200	2330	1450	8.47	● **SRGCPFD15-500J**
							17.3	● **SRGCPFD15-1000J**
17.5	26	18	36600	23400	3730	2390	12.2	● **SRGCPFD20-500J**
							24.5	● **SRGCPFD20-1000J**

Recommended Mating Pinions

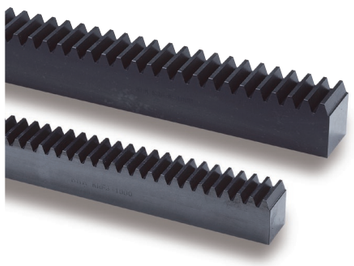
SSCPGS

Please see Page 252 for more details.



SSCPG

Please see Page 252 for more details.



Specifications	
Precision grade	KHK R 001 Grade 5＊
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat Treatment	Thermal refined, gear teeth induction hardened
Tooth hardness	50 ～ 60HRC＊＊
Surface treatment	Black oxide coating

＊ The precision grade of these products is equivalent to the value shown in the table.
＊＊ The block surface has a decarburization layer (approx. 0.5 mm thickness), with hardness of 187 HB or less.

RF

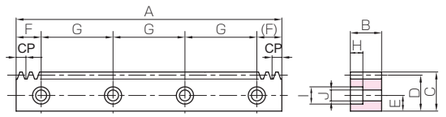
Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)
KRCPF5-1000H	**CP5** (1.5915)	200	RF	1000	15	20	18.41	3330	1850	339	189	2.17
KRCPF10-1000H	**CP10** (3.1831)	100			30	35	31.82	13300	7710	1360	786	7.49

Catalog Number ● : J Series (Available-on-request)	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Mounting hole dimensions E	F	G	No. of holes	Screw size
● **KRCPFD5-1000HJ**	**CP5** (1.5915)	200	RD	1000	15	20	18.41	8	50	180	6	M5
● **KRCPFD10-1000HJ**	**CP10** (3.1831)	100			30	35	31.82	14				M10

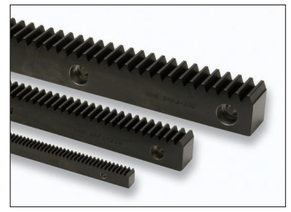
[Caution on Product Characteristics]
① The allowable forces shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash of racks differs depending on the size of the mating pinion. Calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Teeth (Amount of Tooth Thinning)' on Page 193.

[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 242) 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 wire EDM or other carbide tools to modify the length.

J Series
CP Hardened Racks



RD



＊ CP30 and ground racks with total length up to (A) 1500mm and heights up to (C) 120mm are also available by request as custom-made products.

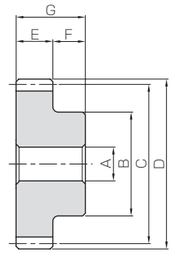
Counterbore dimensions H	I	J	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)	Catalog Number ● : J Series (Available-on-request)
6	10	6	3330	1850	339	189	2.13	● **KRCPFD5-1000HJ**
10.8	17.5	11	13300	7710	1360	786	7.29	● **KRCPFD10-1000HJ**

[Caution on J series]
① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Black oxide is NOT re-applied after the secondary operation of adding mounting holes.

CP Spur Gears

New Product

Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat Treatment	Thermal refined
Tooth hardness	225 to 285HB
Surface treatment	Black oxide coating



S1

(H) To order Hardened Plus, please specify Catalog No. + H.

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Bore A_{H7}	Hub dia. B	Pitch dia. C	Outside dia. D	Face width E	Hub width F	Total Length G
KSSCP5-20 (H)	**CP5** (1.5915)	20	S1	8	25	31.83	35.01	15	15	30
KSSCP5-25 (H)		25		10	32	39.79	42.97			
KSSCP5-30 (H)		30		10	38	47.75	50.93			
KSSCP5-40 (H)		40		12	50	63.66	66.85			
KSSCP10-20 (H)	**CP10** (3.1831)	20		15	50	63.66	70.03	30	20	50
KSSCP10-25 (H)		25		20	60	79.58	85.94			
KSSCP10-30 (H)		30		20	75	95.49	101.86			
KSSCP10-40 (H)		40		20	80	127.32	133.69			

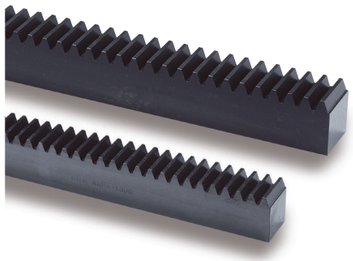
Distance traveled in one turn (mm)	Allowable torque (N·m) Bending strength	Allowable torque (N·m) Surface durability	Allowable torque (kgf·m) Bending strength	Allowable torque (kgf·m) Surface durability	Backlash (mm)	Weight (kg)	Catalog Number
100	41.8	12.7	4.27	1.30	0.09-0.26	0.14	**KSSCP5-20**
125	56.5	20.8	5.76	2.12		0.22	**KSSCP5-25**
150	71.4	30.5	7.28	3.11		0.33	**KSSCP5-30**
200	102	56.1	10.4	5.72		0.58	**KSSCP5-40**
200	335	110	34.1	11.2	0.14-0.36	0.99	**KSSCP10-20**
250	452	180	46.1	18.3		1.49	**KSSCP10-25**
300	571	265	58.2	27.0		2.26	**KSSCP10-30**
400	814	487	83.0	49.7		3.66	**KSSCP10-40**

[Caution on Product Characteristics]
① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash values shown in the table are the theoretical values when these gears and KRCPF Racks are in mesh.

[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 26) 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 Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.

J Series

CP Thermal Refined Racks



Specifications	
Precision grade	KHK R 001 Grade 4*
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat Treatment	Thermal refining only
Tooth hardness	225 ~ 285HB**
Surface treatment	Black oxide coating

* The precision grade of J Series products is equivalent to the value shown in the table.
** The block surface has a decarburization layer (approx. 0.5 mm thickness), with hardness of 187 HB or less.

RF

RD

Catalog Number ● : J Series (Available-on-request)	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Mounting hole dimensions E	F	G	No. of holes	Screw size
● **KRCPFD5-500J**	**CP5** (1.5915)	100	RD	500	15	20	18.41	8	25	150	4	M5
● **KRCPFD5-1000J**		200		1000					50	180	6	
● **KRCPFD10-500J**	**CP10** (3.1831)	50		500	30	35	31.82	14	25	150	4	M10
● **KRCPFD10-1000J**		100		1000					50	180	6	

Counterbore dimensions H	I	J	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)	Catalog Number ● : J Series (Available-on-request)
6	10	6	3660	1040	373	106	1.06	● **KRCPFD5-500J**
							2.13	● **KRCPFD5-1000J**
10.8	17.5	11	14600	4480	1490	457	3.61	● **KRCPFD10-500J**
							7.29	● **KRCPFD10-1000J**

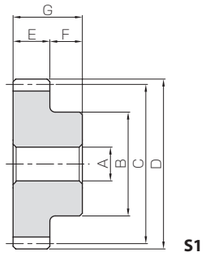
[Caution on Product Characteristics]
① The allowable forces shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash of racks differs depending on the size of the mating pinion. Calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Teeth (Amount of Tooth Thinning)' on Page 193.

[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 242) 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 gear tooth hardening, or thermal refining, is applied, the decarburization layer (approx. 0.5 mm thickness) on the rectangular surfaces cannot have the hardness you designate.

[Caution on J series]
① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Black oxide is NOT re-applied after the secondary operation of adding mounting holes.

Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998)*
Gear teeth	Standard full depth
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.



S1

(H) To order Hardened Plus, please specify Catalog No. + H.

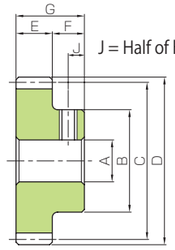
Catalog Number		Pitch mm (Module)	No. of teeth	Shape	Bore A_{H7}	Hub dia. B	Pitch dia. C	Outside dia. D	Face width E	Hub width F	Total Length G	Distance traveled in one turn (mm)	Allowable torque (N·m) Bending strength	Allowable torque (N·m) Surface durability	Allowable torque (kgf·m) Bending strength	Allowable torque (kgf·m) Surface durability	Backlash (mm)	Weight (kg)
SSCP2.5-20	(H)	CP2.5 (0.7958)	20	S1	6	13	15.92	17.51	10	10	20	50	4.14	0.48	0.42	0.049	0 ～0.14	0.022
SSCP2.5-25	(H)		25		8	17	19.89	21.49				62.5	5.58	0.83	0.57	0.085		0.034
SSCP2.5-30	(H)		30		8	21	23.87	25.46				75	7.06	1.30	0.72	0.13		0.054
SSCP2.5-40	(H)		40		10	28	31.83	33.42				100	10.1	2.64	1.03	0.27		0.098
SSCP5-20	(H)	CP5 (1.5915)	20		8	25	31.83	35.01	15	15	30	100	24.8	3.52	2.53	0.36	0.09 ～0.24	0.14
SSCP5-25	(H)		25		10	32	39.79	42.97				125	33.5	6.06	3.42	0.62		0.22
SSCP5-30	(H)		30		10	38	47.75	50.93				150	42.3	9.45	4.32	0.96		0.33
SSCP5-40	(H)		40		12	45	63.66	66.85				200	60.4	18.7	6.16	1.91		0.54
SSCP10-20	(H)	CP10 (3.1831)	20		15	50	63.66	70.03	30	20	50	200	198	30.8	20.2	3.14	0.14 ～0.34	0.99
SSCP10-25	(H)		25		20	60	79.58	85.94				250	268	52.7	27.3	5.37		1.49
SSCP10-30	(H)		30		20	75	95.49	101.86				300	339	81.7	34.5	8.33		2.26
SSCP10-40	(H)		40		20	80	127.32	133.69				400	483	160	49.3	16.4		3.66
SSCP15-20	(H)	CP15 (4.7746)	20		22	75	95.49	105.04	50	27	77	300	744	116	75.9	11.9	0.19 ～0.46	3.52
SSCP15-25	(H)		25		25	100	119.37	128.92				375	1000	199	102	20.3		5.76
SSCP15-30	(H)		30		25	110	143.24	152.79				450	1270	308	130	31.4		8.04
SSCP20-20	(H)	CP20 (6.3662)	20		25	100	127.32	140.06	60	30	90	400	1590	264	162	26.9	0.21 ～0.52	7.50
SSCP20-25	(H)		25		30	130	159.15	171.89				500	2140	449	219	45.8		12.0
SSCP20-30	(H)		30		30	150	190.99	203.72				600	2710	693	276	70.7		17.2

[Caution on Product Characteristics]
① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash values shown in the table are the theoretical values when these gears and SRCP Racks are in mesh.
③ If the bore diameter is less than φ 4, the bore tolerance class is H8. If the bore diameter is φ 5 or φ 6, and the hole length (total length) exceeds 3 times the diameter, then the class is also H8.

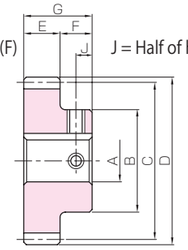
[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
② Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.

J Series

CP Spur Gears
New Product



S1T



S1K

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

Bore H7 / Keyway Js9 / Screw size / Catalog Number		* The product shapes of J Series items are identified by background color.																		
		6	8	10	12	14	15	16	17	18	19	20	22	25	28	30	32	35	40	45
Screw size		—		4×1.8		5×2.3				6×2.8				8×3.3			10×3.3		12×3.3	14×3.8
Catalog Number		M4	M5	M4						M5				M6			M8			M10
SSCP2.5-20 J BORE		S1T																		
SSCP2.5-25 J BORE			S1T																	
SSCP2.5-30J BORE			S1T																	
SSCP2.5-40 J BORE				S1K	S1K	S1K	S1K													
SSCP5-20 J BORE			S1T	S1K	S1K															
SSCP5-25 J BORE				S1K	S1K	S1K	S1K	S1K	S1K											
SSCP5-30 J BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
SSCP5-40 J BORE					S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K						
SSCP10-20 J BORE							S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K				
SSCP10-25 J BORE												S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SSCP10-30 J BORE												S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K
SSCP10-40 J BORE												S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K

[Caution on J series]
① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
④ Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap. Please see the Web Catalog or Master Catalog for more details.
⑤ Areas of products which have been re-worked will not be black oxide coated.
⑥ For products having a tapped hole, a set screw is included.
⑦ When using S1T 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.

SSCP-(H) CP Hardened Spur Gear recommended mating rack

SRCPF-H/SRCPFD-H
CP Hardened Racks

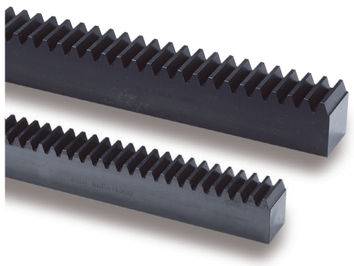
Please see Page 262 for more details.

SSCP CP Spur Gear recommended mating rack

SRCP/SRCPF/SRCPFD(K)
CP Racks

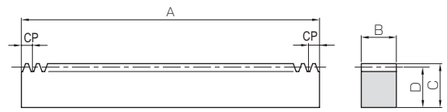
Please see Page 264 for more details.

CP Hardened Racks J Series



Specifications	
Precision grade	KHK R 001 Grade 5＊
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	Gear teeth induction hardened
Tooth hardness	50 ～ 60HRC＊＊
Surface treatment	Black oxide coating

＊The precision grade of these products is equivalent to the value shown in the table.
＊＊The block surface has a decarburization layer (approx. 0.5 mm thickness), with hardness of 187 HB or less.



RF

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)
SRCPF5-1000H	**CP5** (1.5915)	200	RF	1000	15	20	18.41	2080	1200	212	122	2.17
SRCPF10-1000H	**CP10** (3.1831)	100		1000	30	35	31.82	8320	4980	848	508	7.49
SRCPF15-1000H	**CP15** (4.7746)	67		1005	50	50	45.23	20800	12400	2120	1260	17.8
SRCPF20-1000H	**CP20** (6.3662)	50		1000	60	60	53.63	33300	20800	3390	2120	25.3

Catalog Number ● : J Series (Available-on-request)	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Mounting hole dimensions E	F	G	No. of holes	Screw size
● **SRCPFD5-1000HJ**	**CP5** (1.5915)	200	RD	1000	15	20	18.41	8	50	180	6	M5
● **SRCPFD10-1000HJ**	**CP10** (3.1831)	100		1000	30	35	31.82	14	50	180	6	M10
● **SRCPFD15-1000HJ**	**CP15** (4.7746)	67		1005	50	50	45.23	20	62.5	220	5	M14
● **SRCPFD20-1000HJ**	**CP20** (6.3662)	50		1000	60	60	53.63	23	60	220	5	M16

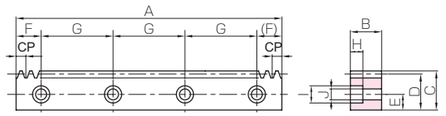
[Caution on Product Characteristics]
① The allowable forces shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash of racks differs depending on the size of the mating pinion. Calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Teeth (Amount of Tooth Thinning)' on Page 193.

[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 242) 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 wire EDM or other carbide tools to modify the length.

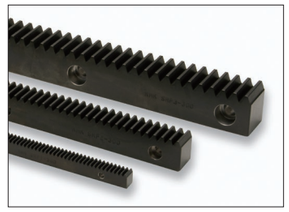
[Caution on J series]
① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Black oxide is NOT re-applied after the secondary operation of adding mounting holes.

J Series

CP Hardened Racks



RD



Counterbore dimensions H	I	J	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)	Catalog Number ● : J Series (Available-on-request)
6	10	6	2080	1200	212	122	2.13	● **SRCPFD5-1000HJ**
10.8	17.5	11	8320	4980	848	508	7.29	● **SRCPFD10-1000HJ**
15.2	23	16	20800	12400	2120	1260	17.3	● **SRCPFD15-1000HJ**
17.5	26	18	33300	20800	3390	2120	24.5	● **SRCPFD20-1000HJ**

＊ CP30 and ground racks with total length up to (A) 1500mm and heights up to (C) 120mm are also available by request as custom-made products.

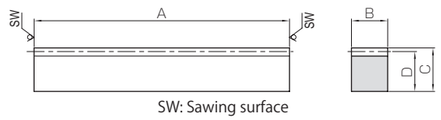
Recommended Mating Pinion

SSCP-H

Please see Page 260 for more details.

Specifications	
Precision grade	KHK R 001 Grade 4＊
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	—
Tooth hardness	(less than 95HRB)
Surface treatment	Black oxide coating

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



SW: Sawing surface

R1

Catalog Number	Pitch mm (Module)	Effective number of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)
SRCP2.5-100	**CP2.5** (0.7958)	38	R1	98	10	12	11.2	763	143	77.8	14.5	0.086
SRCP5-100	**CP5** (1.5915)	18		98	15	20	18.41	2290	468	233	47.7	0.21
SRCP10-100	**CP10** (3.1831)	8		98	30	35	31.82	9150	1870	933	191	0.73
SRCP15-100	**CP15** (4.7746)	5		103	50	50	45.23	22900	4530	2330	462	1.83
SRCP20-100	**CP20** (6.3662)	3		98	60	60	53.63	36600	7480	3730	763	2.48

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)
SRCPF2.5-500	**CP2.5** (0.7958)	200	RF	500	10	12	11.2	763	143	77.8	14.5	0.44
SRCPF2.5-1000		400		1000								0.88
SRCPF5-500	**CP5** (1.5915)	100		500	15	20	18.41	2290	468	233	47.7	1.08
SRCPF5-1000		200		1000								2.17
SRCPF5-1500		300		1500								3.25
SRCPF5-2000		410		2050								4.44
SRCPF10-500	**CP10** (3.1831)	50		500	30	35	31.82	9150	1870	933	191	3.75
SRCPF10-1000		100		1000								7.49
SRCPF10-1500		150		1500								11.2
SRCPF10-2000		205		2050								15.4
SRCPF15-500	**CP15** (4.7746)	33		495	50	50	45.23	22900	4530	2330	462	8.79
SRCPF15-1000		67		1005								17.8
SRCPF15-1500		100		1500								26.6
SRCPF15-2000		136		2040								36.2
SRCPF20-500	**CP20** (6.3662)	25		500	60	60	53.63	36600	7480	3730	763	12.6
SRCPF20-1000		50		1000								25.3
SRCPF20-1500		75		1500								37.9
SRCPF20-2000		102		2040								51.5

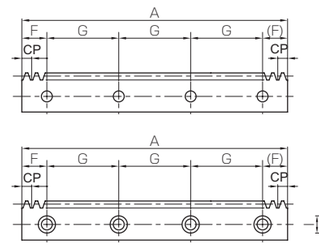
Catalog Number ● : J Series (Available-on-request)	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Mounting hole dimensions E	F	G	No. of holes	Screw size
● **SRCPFK2.5-500J**	**CP2.5** (0.7958)	200	RA	500	10	12	11.2	5	25	150	4	M4
● **SRCPFD5-500J**	**CP5** (1.5915)	100	RD	500	15	20	18.41	8	25	150	4	M5
SRCPFD5-1000		200		1000					50	180	6	
SRCPFD5-1500		300		1500					30	180	9	
SRCPFD5-2000		410		2050					35	180	12	
● **SRCPFD10-500J**	**CP10** (3.1831)	50		500	30	35	31.82	14	25	150	4	M10
SRCPFD10-1000		100		1000					50	180	6	
SRCPFD10-1500		150		1500					30	180	9	
SRCPFD10-2000		205		2050					35	180	12	
● **SRCPFD15-500J**	**CP15** (4.7746)	33		495	50	50	45.23	20	27.5	220	3	M14
SRCPFD15-1000		67		1005					62.5		5	
SRCPFD15-1500		100		1500					90		7	
SRCPFD15-2000		136		2040					30		10	
● **SRCPFD20-500J**	**CP20** (6.3662)	25		500	60	60	53.63	23	30	220	3	M16
SRCPFD20-1000		50		1000					60		5	
SRCPFD20-1500		75		1500					90		7	
SRCPFD20-2000		102		2040					30		10	

Recommended Mating Pinion

SSCP

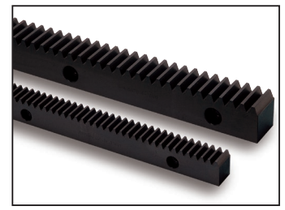
Please see Page 260 for more details.

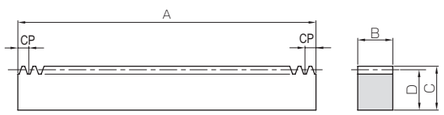
J Series — CP Racks



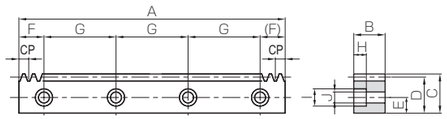
RA

RD





RF



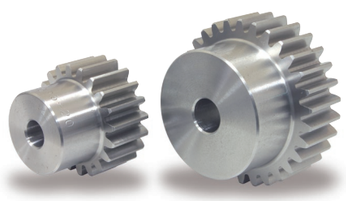
RD

[Caution on Product Characteristics]
① The allowable forces shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash of racks differs depending on the size of the mating pinion. Calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Teeth (Amount of Tooth Thinning)' on Page 193.
③ After attaching the racks to the base, please fasten with dowel pins. Clamping only with mounting screws could possibly cause the screws to be broken, due to a heavy load. For details, please see the assembly method to the mounting base on Page 243.

[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 242) 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 gear tooth hardening, or thermal refining, is applied, the decarburization layer (approx. 0.5 mm thickness) on the rectangular surfaces cannot have the hardness you designate.
③ Avoid hardening Racks with bolt holes, due to deformation occurring at the mounting hole and the difficulty of straightening the rack after hardening.

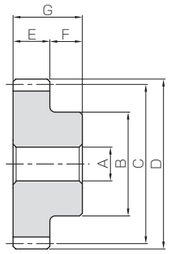
[Caution on J series]
① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Black oxide is NOT re-applied after the secondary operation of adding mounting holes.

Counterbore dimensions H	I	J	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)	Catalog Number ● : J Series (Available-on-request)
—	—	4.5	763	143	77.8	14.5	0.43	● **SRCPFK2.5-500J**
6	10	6	2290	468	233	47.7	1.06	● **SRCPFD5-500J**
							2.13	**SRCPFD5-1000**
							3.20	**SRCPFD5-1500**
							4.38	**SRCPFD5-2000**
10.8	17.5	11	9150	1870	933	191	3.61	● **SRCPFD10-500J**
							7.29	**SRCPFD10-1000**
							10.9	**SRCPFD10-1500**
							14.9	**SRCPFD10-2000**
15.2	23	16	22900	4530	2330	462	8.47	● **SRCPFD15-500J**
							17.3	**SRCPFD15-1000**
							25.9	**SRCPFD15-1500**
							35.2	**SRCPFD15-2000**
17.5	26	18	36600	7480	3730	763	12.2	● **SRCPFD20-500J**
							24.5	**SRCPFD20-1000**
							36.8	**SRCPFD20-1500**
							50.0	**SRCPFD20-2000**



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998)*
Gear teeth	Standard full depth
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.

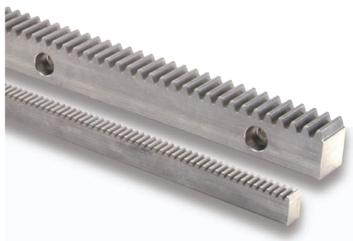


S1

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Bore A_{H7}	Hub dia. B	Pitch dia. C	Outside dia. D	Face width E	Hub width F	Total Length G	Distance traveled in one turn (mm)	Allowable torque (N-m) Bending strength	Allowable torque (N-m) Surface durability	Allowable torque (kgf-m) Bending strength	Allowable torque (kgf-m) Surface durability	Backlash (mm)	Weight (kg)
SUSCP5-20	**CP5** (1.5915)	20	S1	8	25	31.83	35.01	15	15	30	100	13.7	2.50	1.40	0.25	0.09 ~ 0.26	0.14
SUSCP5-25		25		10	32	39.78	42.97				125	18.5	4.31	1.89	0.44		0.22
SUSCP5-30		30		10	38	47.74	50.93				150	23.4	6.72	2.39	0.68		0.32
SUSCP10-20	**CP10** (3.1831)	20		15	50	63.66	70.03	30	20	50	200	110	21.9	11.2	2.23	0.14 ~ 0.36	0.98
SUSCP10-25		25		20	60	79.57	85.94				250	148	37.4	15.1	3.82		1.48
SUSCP10-30		30		20	75	95.49	101.86				300	187	58.0	19.1	5.92		2.24

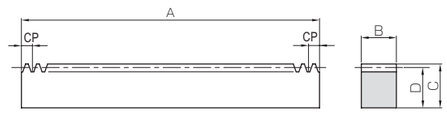
[Caution on Product Characteristics]
① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash values shown in the table are the theoretical values when these gears and SURCPF Racks are in mesh.

[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 26) 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 Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.



Specifications	
Precision grade	KHK R 001 Grade 5*
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS304
Heat Treatment	Solution treated
Tooth hardness	(less than 187HB)

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



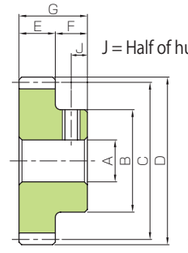
RF

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)
SURCPF5-500	**CP5** (1.5915)	100	RF	500	15	20	18.41	1090	263	111	26.8	1.08
SURCPF5-1000		200		1000								2.16
SURCPF10-500	**CP10** (3.1831)	50		500	30	35	31.82	4370	1050	445	107	3.73
SURCPF10-1000		100		1000								7.46

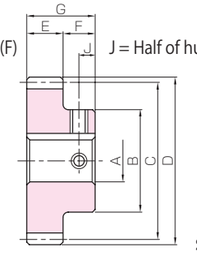
Catalog Number ● : J Series (Available-on-request)	Pitch mm (Module)	No. of teeth	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Mounting hole dimensions E	F	G	No. of holes	Screw size
● **SURCPFD5-500J**	**CP5** (1.5915)	100	RD	500	15	20	18.41	8	25	150	4	M5
SURCPFD5-1000		200		1000					50	180	6	
● **SURCPFD10-500J**	**CP10** (3.1831)	50		500	30	35	31.82	14	25	150	4	M10
SURCPFD10-1000		100		1000					50	180	6	

[Caution on Product Characteristics]
① The allowable forces shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash of racks differs depending on the size of the mating pinion. Calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Teeth (Amount of Tooth Thinning)' on Page 193.
③ The stainless steel material is given *solution treatment and **passivation. Passivation improves the anti-rust performance, but it is not effective on the processed surface of the product. Note that this product is not completely rustproof.
*Solution treatment
Heat treatment for melting the carbide generated on the surface into the material when manufacturing the material
**Passivation
Pickled (nitric hydrofluoric acid) to make it more rust resistant
④ After attaching the racks to the base, please fasten with dowel pins. Clamping only with mounting screws could possibly cause the screws to be broken, due to a heavy load.

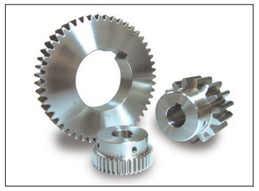
J Series
CP Stainless Steel Spur Gears



S1T



S1K

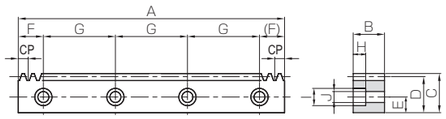


To order J Series products, please specify: Catalog No. + J + BORE.

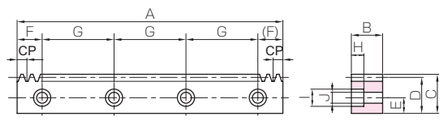
Bore H7	* The product shapes of J Series items are identified by background color.																	
Keyway Js9	8	10	12	14	15	16	17	18	19	20	22	25	28	30	32	35	40	45
Screw size	—	4×1.8		5×2.3				6×2.8				8×3.3			10×3.3		12×3.3	14×3.8
Catalog Number	M5	M4						M5				M6			M8			M10
SUSCP5-20 J BORE	S1T	S1K	S1K															
SUSCP5-25 J BORE		S1K	S1K	S1K	S1K	S1K	S1K											
SUSCP5-30 J BORE		S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
SUSCP10-20 J BORE					S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K				
SUSCP10-25 J BORE										S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SUSCP10-30 J BORE										S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K

[Caution on J series]
① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
④ Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap. Please see the Web Catalog or Master Catalog for more details.
⑤ For products having a tapped hole, a set screw is included.
⑥ When using S1T 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.

J Series
CP Stainless Steel Racks



RD



RD

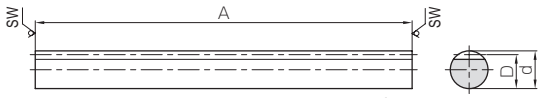
Counterbore dimensions H	I	J	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)	Catalog Number ● : J Series (Available-on-request)
6	10	6	1090	263	111	26.8	1.06	● **SURCPFD5-500J**
							2.12	**SURCPFD5-1000**
10.8	17.5	11	4370	1050	445	107	3.59	● **SURCPFD10-500J**
							7.25	**SURCPFD10-1000**

[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 242) 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.

[Caution on J series]
① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order.
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

SROCP CP Round Racks

Specifications	
Precision grade	KHK R 001 grade 4
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	—
Tooth hardness	(less than 95HRB)
Surface treatment	Black oxide coating



SW: Sawing surface

R2

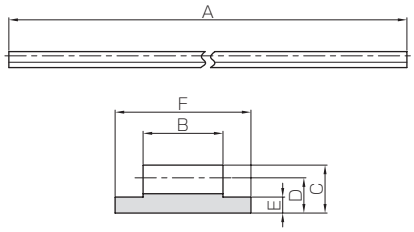
Catalog Number	Pitch mm (Module)	Effective number of teeth	Shape	Total Length A	Outside dia. d_{h9}	Height to pitch line D	Allowable force (N) Bending strength	Allowable force (N) Surface durability	Allowable force (kgf) Bending strength	Allowable force (kgf) Surface durability	Weight (kg)
SROCP2.5-500	**CP2.5** (0.7958)	200	R2	505	10	9.2	474	91.8	48.3	9.36	0.30
SROCP5-500	**CP5** (1.5915)	99		505	15	13.41	1650	324	169	33.1	0.65
SROCP10-1000	**CP10** (3.1831)	99		1010	30	26.82	6610	1300	674	132	5.16

[Caution on Product Characteristics]
① The allowable forces shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② The backlash of racks differs depending on the size of the mating pinion. Calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Teeth (Amount of Tooth Thinning)' on Page 193.

[Caution on Secondary Operations]
① Please read "Cautions on Performing Secondary Operations" (Page 242) 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 Avoid hardening round racks, due to twisting and deformation occurring and the difficulty of straightening the rack after hardening.

FRCP CP Metal Flexible Racks

Specifications	
Precision grade	KHK R 001 grade 8
Gear teeth	Standard full depth
Pressure angle	20°
Material	SS400
Heat Treatment	—
Tooth hardness	(less than 187HB)
Surface treatment	Black oxide coating

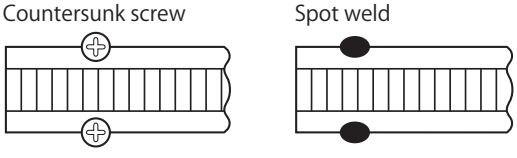


R3

Catalog Number	Pitch mm (Module)	Shape	Total Length A	Face width B	Height C	Height to pitch line D	Base thickness E	Base width F	Allowable force (N) Bending strength	Allowable force (kgf) Bending strength	Weight (kg)
FRCP5-2000	**CP5** (1.5915)	R3	2000	10	6	4.41	2	17	801	81.7	0.91
FRCP5-3000			3000								1.37
FRCP5-4000			4000								1.83

[Caution on Product Characteristics]
① The allowable forces shown in the table are calculated values according to the assumed usage conditions. Please see Page 241 for more details.
② When using a flexible rack in a circular arc, the pitch error and tooth profile error increase and abnormal engagement occurs.
Before use, adjust the center distance and check whether it turns without problems.
③ It cannot be used where positioning accuracy is required.

■ Installation Example of FRCP Metal Flex Rack



(View of Flexible Rack from the top)

Recommended Mating Pinion

SSCP

Please see Page 260 for more details.