

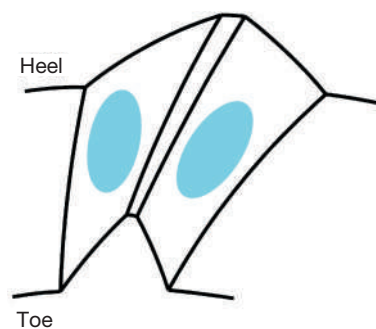
Adjustment of tooth contact

<Center of tooth contact>

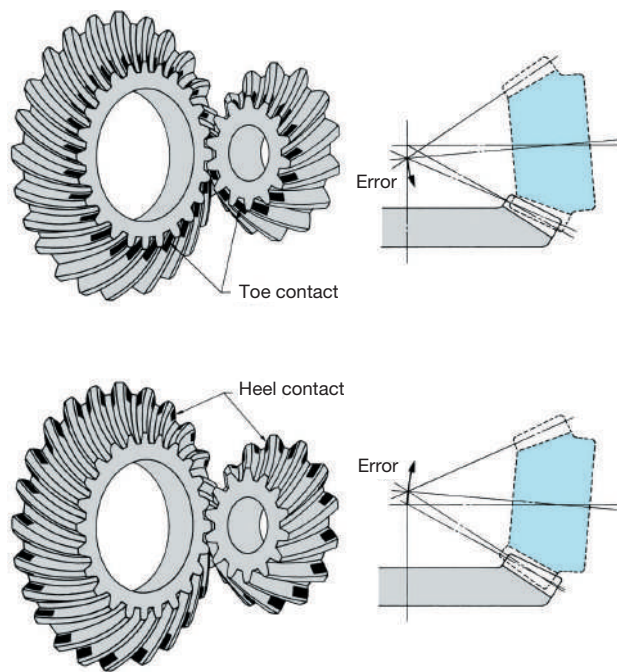
- (1) Near the center of the tooth length for the length direction
- (2) Ideally, the tooth width direction should be at the center of the width or slightly closer to the toe.

When adjusting the backlash and mounting the gear in the case, adjust the case in order to achieve the tooth contact as shown in the figure below.

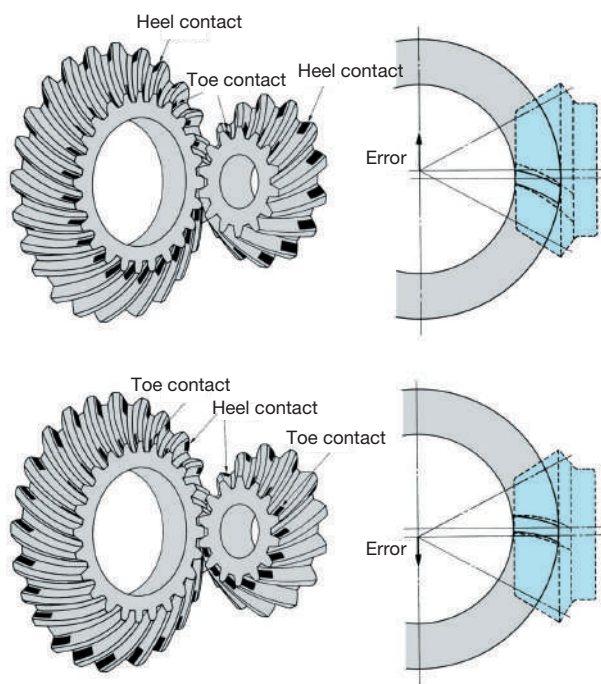
Deviation of the tooth contact from the normal position may adversely affect the strength and quietness.



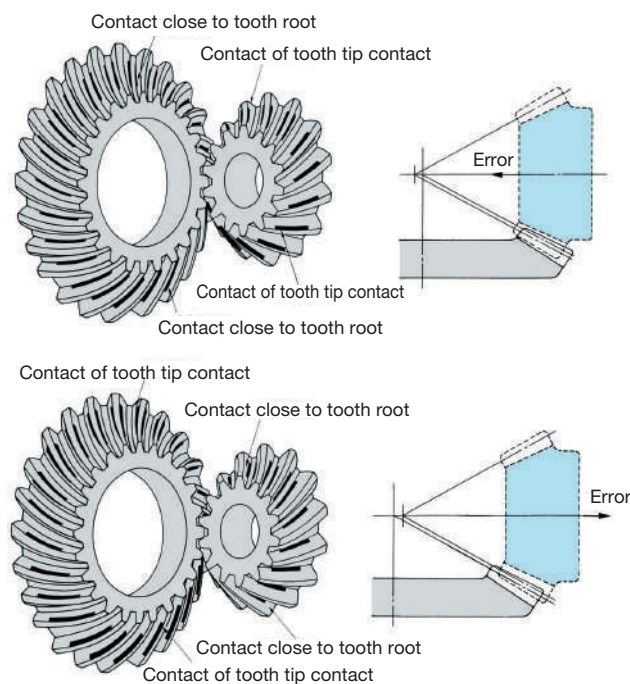
(1) Tooth contact in case of a shaft-angle error



(2) Tooth contact in case of a shaft-offset error



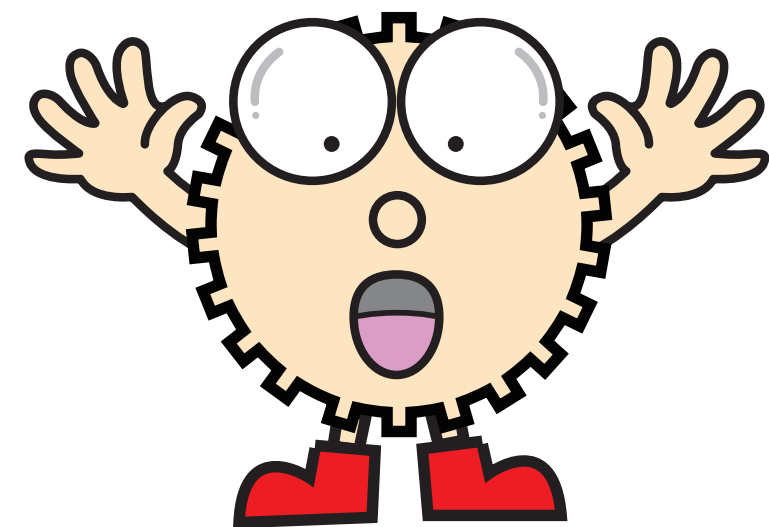
(3) Tooth contact in case of a pinion set position error



Screw Gears

SN-H Hardened Screw Gears	SN Screw Gears	SUN Stainless Steel Screw Gears	AN Screw Gears	PN Plastic Screw Gears
NEW				
Material: S45C m1~4	Material: S45C m1~4	Material: SUS303 m1~3	Material: CAC702 (A & BC2) m1~3	Material: MC901 m1~3
Page 380	Page 380	Page 384	Page 386	Page 388

Includes Made to Order



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) Screw Gears

S **N** **1 - 13** **R**

Material (S45C)
Type (Screw Gears)
Module (1)
No. of Teeth (13)
Direction of Helix (Right)

Material
S S45C
SU Stainless Steel
A CAC702
P MC901

Type
N Screw Gears

Features

KHK stock screw gears come in four materials, S45C, SUS303, CAC702 (old JIS A & BC2) and MC nylon, in modules 1~4 and numbers of teeth from 10 to 30.

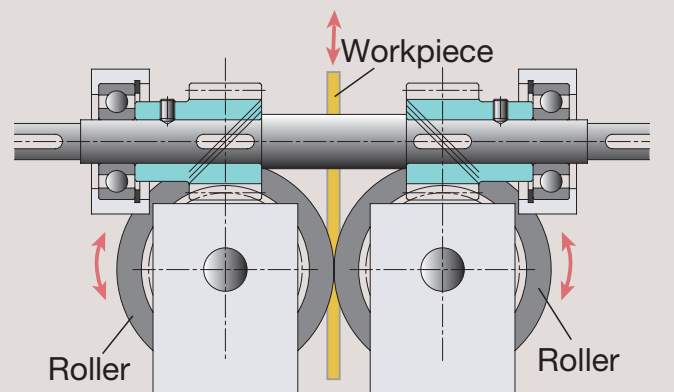
Catalog Number	Module	Material	Heat Treatment	Tooth Surface Finish	Precision JIS B 1702-1:1998	Secondary Operations	Features
SN	1~4	S45C	—	Cut	N9	○	Many lineups are available at a low price. The teeth can be hardened.
SUN	1~3	SUS303	—	Cut	N9	○	Stainless steel gears with rust resistance.
AN	1~3	CAC702 (A & BC2)	—	Cut	N9	○	Aluminum bronze made gears with excellent wear resistance.
PN	1~3	MC901	—	Cut	N10	○	Nylon gears can be used with no lubrication.

○ Possible △ Partly possible × Not possible

Application Examples

KHK stock screw gears are used in various labor-saving machines including conveyor machine and transport.

■ Design example of feeding device (not a design for machinery or a device in actual use)



Rotate the roller in reverse with one input shaft and move the pinched workpiece vertically

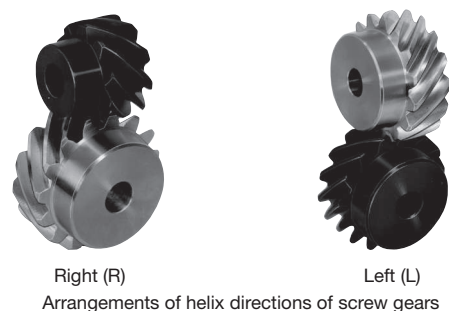
Selection Hints

Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. Since screw gears come in right- or left-hand helix, make sure to include the letter “R” or “L” in the catalog number when you order.

1. Caution in Selecting the Mating Gears

Screw gears are used for offset shafts. Whether the shafts are paralleled offset or skewed offset depends on the helix directions of the mating gears.

Direction of shaft	Arrangement of helix hands
Skewed Axes	RH-RH or LH-LH
Parallel Axes	RH-LH



Right (R) Left (L)
Arrangements of helix directions of screw gears

2. Caution in Selecting Gears Based on Gear Strength

The allowable surface strengths listed in the product pages were derived using the Niemann formula as reference values. (Used with skewed shafts) There is a paucity of data on the strength of screw gears. The values of constant K_0 used in the calculations, which depend on the material of the mating gears, are our estimates. The mathematic expression below shows the Niemann formula to determine allowable tangential force F_t (kgf) and allowable torque T (kgf·m) on a basic circle.

$$F_t = 1.43 d_1^2 f_z K_s$$

$$T = \frac{F_t d_1}{2000}$$

Here, d_1 : standard pitch diameter of pinion (mm)
 f_z : coefficient based on no. of teeth combination
 K_s : coefficient based on materials and sliding speed

$$K_s = K_0 \frac{2}{2 + V_s}$$

Here, K_0 : coefficient based on material selection
 V_s : sliding speed (m/s)

$$V_s = \frac{\pi n d_1}{60000 \cos \beta}$$

Here, n : rotational speed (rpm)
 β : helix angle (45°)

■ f_z value

$Z_2 \backslash Z_1$	10	13	15	20	26	30
10	1.538					
13	2.005	1.538				
15	2.279	1.786	1.538			
20	2.963	2.329	2.053	1.538		
26	3.695	2.963	2.588	2.005	1.538	
30	4.161	3.350	2.963	2.279	1.786	1.538

■ Setting values depending on usage conditions

Catalog Number	Mating gear	K_0 value	Maximum allowable sliding speed m/s	No. of teeth of mating gears	Rotational Speed
SN	SN	0.0030	2.5	Same no. of teeth	100rpm
SUN	SN	0.0030 Note 1	2.5 Note 1		
AN	SN	0.0050	5		
PN	SN	0.0030 Note 1 (0.0021)	2.5 Note 1 (1.0)		

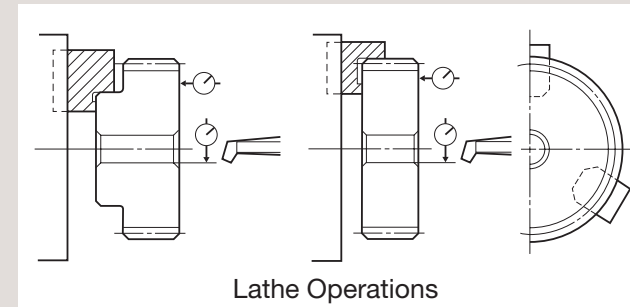
[NOTE 1] K_0 values and the maximum allowable sliding speed of SUN & PN products are set by KHK. Screw gears are basically used with lubrication. In case of using PN products without lubrication, the parenthetical values shown in the table are applied.

Application Hints

In order to use KHK stock screw gears safely, read the Application Hints carefully before proceeding. Please refer to Page 48 for “Cautions on Handling” and Page 49 for “Cautions on Starting”.

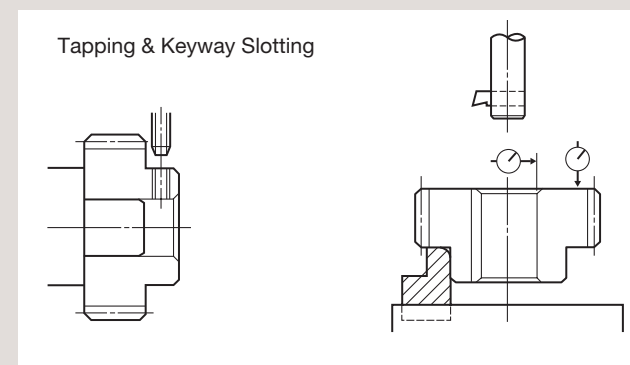
1. Caution on Performing Secondary Operations

- ① If re boring, it is important to pay special attention to locating the center in order to avoid runout.
- ② The reference datum for gear machining is the bore. Therefore, use the bore for locating the center. If it is too difficult to do for small bores, the alternative is to use one spot on the bore and the runout of the side surface.
- ③ If reworking using scroll chucks, we recommend the use of new or re bored jaws for improved precision. Please exercise caution not to crush the teeth.



Lathe Operations

- ④ The maximum bore size is dictated by the requirement that the strength of the hub is to be higher than that of the gear teeth. The maximum bore size should be 60% to 70% of the hub diameter (or tooth root diameter), and 50% to 60% for keyway applied modifications.
- ⑤ In order to avoid stress concentration, round the keyway corners.



Tapping & Keyway Slotting

2. Points of Caution during Assembly

- ① The recommended center distance tolerance of KHK stock screw gears is H7 for ground gears and H8 for cut gears. The amount of backlash is given in the product table for each gear.

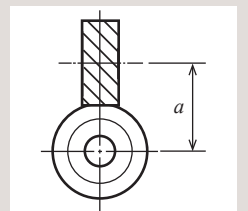
$$a = \frac{d_1 + d_2}{2}$$

Where

a : Center distance

d_1 : Pitch diameter of pinion

d_2 : Pitch diameter of gear

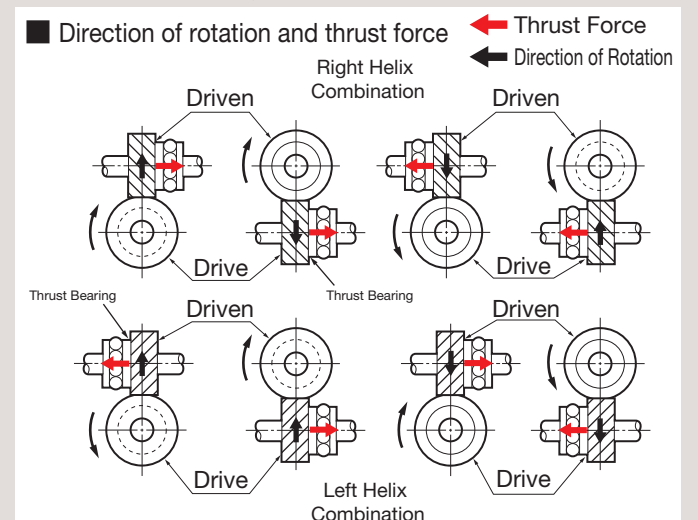


- ② Total Length Tolerance for Screw Gears

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

[NOTE] HardenedPlus, PN Plastic Screw Gears are excluded.

- ③ Due to the helix of screw gears, they produce axial thrust forces. The bearings must be selected properly to be able to handle these thrust forces. The directions of thrust change with the direction of helix and the direction of rotation as illustrated below. For details, use gear calculation software GCSW.



[NOTE] For parallel shaft applications, see the Application Hints for KHK Helical Gears (Page 193).

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.

Selecting the Gears

Step 1

Determine the calculated load torque applied to the gear and the gear type suitable for the purpose.

Step 2

Select provisionally from the allowable torque table in this catalog based on the load torque.

■ For provisional selection from this catalog

カタログ記号	モジュール	歯数	形状	内径 A	穴径 B	基準外径				基準内径 D	歯幅 E	全長 F	許容トルク		バックラッシュ (mm)	質量 (kg)	
						G	C	D	F				G	H			N・m
SN1-13R	13	R	L	15	18.38	20.38							0.19	0.019	0.41	0.04	0.030
SN1-13L	13	R	L	15	18.38	20.38							0.19	0.019	0.41	0.04	0.030
SN1-15R	15	R	L	18	21.21	23.21							0.29	0.029	0.62	0.06	0.043
SN1-15L	15	R	L	18	21.21	23.21							0.29	0.029	0.62	0.06	0.043
SN1-20R	20	R	L	25	28.28	30.28	10	10	20				0.66	0.066	1.44	0.15	0.080
SN1-20L	20	R	L	25	28.28	30.28	10	10	20				0.66	0.066	1.44	0.15	0.080
SN1-26R	26	R	L	30	36.77	38.77							1.42	0.14	3.08	0.31	0.13
SN1-26L	26	R	L	30	36.77	38.77							1.42	0.14	3.08	0.31	0.13
SN1-30R	30	R	L	35	42.43	44.43							2.14	0.22	4.64	0.47	0.17
SN1-30L	30	R	L	35	42.43	44.43							2.14	0.22	4.64	0.47	0.17
SN1.5-10R	10	R	L	8	16	21.21	24.21						0.29	0.029	0.62	0.06	0.048
SN1.5-10L	10	R	L	8	16	21.21	24.21						0.29	0.029	0.62	0.06	0.048
SN1.5-13R	13	R	L	23	27.58	30.58							0.62	0.063	1.34	0.14	0.088
SN1.5-13L	13	R	L	23	27.58	30.58							0.62	0.063	1.34	0.14	0.088
SN1.5-15R	15	R	L	25	31.82	34.82							0.93	0.095	2.03	0.21	0.12
SN1.5-15L	15	R	L	25	31.82	34.82							0.93	0.095	2.03	0.21	0.12
SN1.5-20R	20	R	L	30	42.43	45.43							2.14	0.22	4.64	0.47	0.20
SN1.5-20L	20	R	L	30	42.43	45.43							2.14	0.22	4.64	0.47	0.20
SN1.5-26R	26	R	L	40	55.15	58.15							4.51	0.46	9.90	1.00	0.36
SN1.5-26L	26	R	L	40	55.15	58.15							4.51	0.46	9.90	1.00	0.36
SN1.5-30R	30	R	L	45	63.50	66.50							6.35	0.64	13.90	1.40	0.45
SN1.5-30L	30	R	L	45	63.50	66.50							6.35	0.64	13.90	1.40	0.45

Step 3

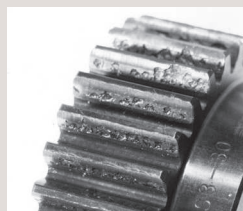
Calculate the strength under the actual usage conditions.

Calculate the strength formally using the various gear strength formulas. We recommend using the simple strength calculation available on our website.

■ Use the strength calculation function on our website.

Surface durability

Calculated values of the strength at which the gear teeth do not wear due to surface fatigue damage.



Example of wear due to insufficient surface durability

Product Precautions



Common Notes

[Caution on Product Characteristics]

- (1) The allowable torque shown in the table are calculated values according to the assumed usage conditions. Please see Page 376 for more details.
- (2) The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- (3) Variations in temperature or humidity can cause dimensional changes in plastic gears, including tooth diameter, bore, and backlash. The accuracy and tolerances shown in the catalog are values obtained when machining is performed.
- (4) When mating screw gears are made of the same material, they may cause abrasion and scoring. It is recommended to mate screw gears composed of different materials.
- (5) For offset shaft applications, match a RH with a RH, or LH with a LH, to make a set of screw gears. For parallel shaft applications, mesh opposite hands (RH and LH) of helical gear sets. See Page 376 for more details on selection precautions.
- (6) For bores of ϕ 4 or below, the bore tolerance is H8. As well, the tolerance is H8 for ϕ 5 or ϕ 6 bores with hole length (total length) 3x the bore or more.
- (7) Keyways are made according to JIS B1301 standards, Js9 tolerance. Also note that keyway tooth position alignment is not performed.
- (8) For products having a tapped hole, a set screw is included.
- (9) These bevel gears produce axial thrust forces. Please see Page 377 for more details.

[Caution on Secondary Operations]

- (1) Please read "Cautions on Performing Secondary Operations" (Page 377) when performing modifications and/or secondary operations for safety concerns.
- (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).
- (3) See Page 22 for more details on Hardened Plus (H Series and HJ Series).

[J Series]

- (1) Cancellation is not possible for made-to-order products. For lead time details, see Page 38.
- (2) Certain products which would otherwise have a very long tapped hole are counterbored. For details, see the KHK website.
- (3) Black oxide is not re-applied to parts undergoing secondary operations.

When selecting KHK standard gears, glance over the Cautions on Product Characteristics and Cautions on Performing Secondary Operations above.

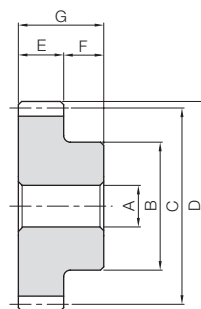
- ① Products not listed in this catalog or materials, modules, number of teeth and the like not listed in the dimensional tables can be manufactured as custom items. Please see Page 26 for more details.
- ② The color and shape of the product images listed on the dimension table page of each product may differ from the actual product.
Be sure to confirm the shape in the dimension table before selection.
- ③ The details (specifications, dimensions, etc.) listed in the catalog may be changed without prior notice.
Changes are announced on the KHK website.

Website URL: <https://khkgears.net/new/>
Overseas Sales Department: Phone: +81-48-254-1744 Fax: +81-48-254-1765
E-mail: info@khkgears.net



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998)*
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle	45°
Material	S45C
Heat treatment	—
Surface treatment	Black oxide coating

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



S1

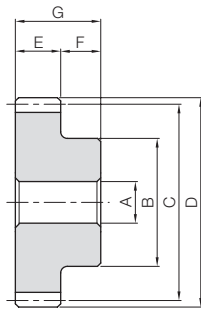
To order Hardened Plus, please specify **Catalog No. + H**. Example: **SN1-13RH**

Catalog Number		Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Allowable torque				Backlash (mm)	Weight (kg)									
						A _{H7}	B	C	D	E	F	G	Surface durability		Surface durability 												
													N·m	kgf·m	N·m	kgf·m											
SN1-13R		m1	13	R	S1	6	15	18.38	20.38	10	10	20	0.19	0.019	0.41	0.04	0.08~0.18	0.030									
SN1-13L			15	R			18	21.21	23.21				0.29	0.029	0.62	0.06			0.043								
SN1-15R			20	R		8	25	28.28	30.28				0.66	0.068	1.44	0.15				0.080							
SN1-15L				L			30	36.77	38.77				1.42	0.14	3.08	0.31					0.13						
SN1-20R			26	R		10	35	42.43	44.43				2.14	0.22	4.64	0.47						0.17					
SN1-20L		L		30	36.77					38.77	1.42	0.14	3.08	0.31	0.13												
SN1-26R		30	R	m1.5	S1		10	23	27.58	30.58	15	10	25	0.62		0.063	1.34	0.14	0.10~0.22	0.088							
SN1-26L			L			25		31.82	34.82	0.93				0.095	2.03	0.21	0.12										
SN1-30R		20	R			12	30	42.43	45.43	2.14				0.22	4.64	0.47		0.20									
SN1-30L			L				40	55.15	58.15	4.51				0.46	9.80	1.00					0.36						
SN1-26R		26	R			m2	S1	12	45	63.64				66.64	20	15						35	6.75	0.69	14.7	1.50	0.12~0.26
SN1-26L			L	45	63.64						66.64	6.75	0.69				14.7		1.50	0.48							
SN1-30R		30	R	10	22			28.28	32.28	0.66	0.068	1.44	0.15	0.11													
SN1-30L			L		30			36.77	40.77	1.42	0.14	3.08	0.31				0.22										
SN2-10R		13	R	m2	S1			15	35	42.43	46.43	20	15					35	2.14		0.22		4.64	0.47	0.12~0.26	0.30	
SN2-10L			L			45	56.57		60.57	4.84	0.49				10.5	1.07			0.53								
SN2-13R		20	R			20	60	73.54	77.54	10.1	1.03				22.0	2.24				0.91							
SN2-13L			L				65	84.85	88.85	15.0	1.53				32.7	3.34					1.19						
SN2-15R		26	R			m2	S1	20	65	84.85	88.85			15.0	1.53	32.7	3.34					0.12~0.26	1.19				
SN2-15L			L	65	84.85							88.85	15.0					1.53						32.7			3.34
SN2-20R		30	R	m2	S1			20	65	84.85	88.85	15.0	1.53					32.7	3.34					0.12~0.26	1.19		
SN2-20L			L																	65	84.85					88.85	15.0
SN2-26R		30	R					m2	S1	20	65									84.85	88.85					15.0	1.53
SN2-26L			L			65	84.85							88.85	15.0	1.53	32.7										
SN2-30R		30	R			m2	S1			20	65			84.85	88.85	15.0	1.53			32.7	3.34	0.12~0.26	1.19				
SN2-30L			L	65	84.85							88.85	15.0					1.53	32.7								



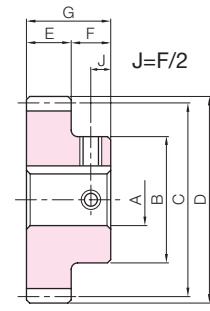
Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998)*
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle	45°
Material	S45C
Heat treatment	—
Surface treatment	Black oxide coating

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



S1

J Series



S1K



H To order Hardened Plus, please specify **Catalog No. + H**. Example: **SN2.5-10RH**

Catalog Number		Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Allowable torque				Backlash (mm)	Weight (kg)
						A _{H7}	B	C	D	E	F	G	Surface durability		Surface durability 			
													N·m	kgf·m	N·m	kgf·m		
SN2.5-10R		m2.5	10	R L	S1	12	26	35.36	40.36	22	16	38	1.27	0.13	2.75	0.28	0.14~0.28	0.20
SN2.5-10L			13	R L		15	35	45.96	50.96				2.68	0.27	5.84	0.60		0.35
SN2.5-13R			15	R L			40	53.03	58.03				4.03	0.41	8.77	0.89		0.49
SN2.5-13L			20	R L		20	60	70.71	75.71				9.07	0.92	19.7	2.01		0.94
SN2.5-15R			26	R L			70	91.92	96.92				18.8	1.91	40.8	4.16		1.54
SN2.5-15L			30	R L			80	106.07	111.07				27.7	2.83	60.3	6.15		2.06
SN2.5-20R																		
SN2.5-20L																		
SN2.5-26R																		
SN2.5-26L																		
SN2.5-30R																		
SN2.5-30L																		
SN3-10R		m3	10	R L	S1	15	34	42.43	48.43	25	18	43	2.14	0.22	4.64	0.47	0.14~0.32	0.35
SN3-10L			13	R L		20	45	55.15	61.15				4.51	0.46	9.80	1.00		0.59
SN3-13R			15	R L			50	63.64	69.64				6.75	0.69	14.7	1.50		0.80
SN3-13L			20	R L		60	84.85	90.85	15.0				1.53	32.7	3.34	1.40		
SN3-15R			26	R L		80	110.31	116.31	30.8				3.14	67.0	6.84	2.48		
SN3-15L			30	R L		90	127.28	133.28	45.4				4.62	98.6	10.1	3.29		
SN3-20R																		
SN3-20L																		
SN3-26R																		
SN3-26L																		
SN3-30R																		
SN3-30L																		
SN4-10R		m4	10	R L	S1	20	45	56.57	64.57	30	20	50	4.84	0.49	10.5	1.07	0.18~0.38	0.72
SN4-10L			13	R L			60	73.54	81.54				10.1	1.03	22.0	2.24		1.32
SN4-13R			15	R L			70	84.85	92.85				15.0	1.53	32.7	3.34		1.81
SN4-13L			20	R L			90	113.14	121.14				33.0	3.37	71.8	7.32		3.24
SN4-15R			26	R L			100	147.08	155.08				66.7	6.80	145	14.8		5.11
SN4-15L			30	R L			110	169.71	177.71				97.1	9.91	211	21.5		6.70
SN4-20R																		
SN4-20L																		
SN4-26R																		
SN4-26L																		
SN4-30R																		
SN4-30L																		

To order J Series products, please specify: **Catalog No. + J + BORE**. Example: **SN2.5-10RJ**

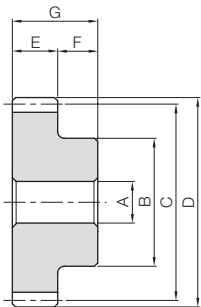
Bore H7	* The product shapes of J Series items are identified by background color.															
Keyway Js9	12	15	16	17	18	19	20	22	25	28	30	32	35	40	45	50
Screw size	4x1.8	5x2.3			6x2.8				8x3.3			10x3.3		12x3.3	14x3.8	
Catalog Number	M4				M5				M6			M8			M10	
SN2.5-10R J BORE	* S1K															
SN2.5-10L J BORE	* S1K															
SN2.5-13R J BORE		* S1K	S1K	S1K	S1K	S1K										
SN2.5-13L J BORE		* S1K	S1K	S1K	S1K	S1K										
SN2.5-15R J BORE		* S1K	S1K	S1K	S1K	S1K	S1K	S1K								
SN2.5-15L J BORE		* S1K	S1K	S1K	S1K	S1K	S1K	S1K								
SN2.5-20R J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K			
SN2.5-20L J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K			
SN2.5-26R J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SN2.5-26L J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SN2.5-30R J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	
SN2.5-30L J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	
SN3-10R J BORE		* S1K	S1K	S1K												
SN3-10L J BORE		* S1K	S1K	S1K												
SN3-13R J BORE							* S1K	S1K	S1K							
SN3-13L J BORE							* S1K	S1K	S1K							
SN3-15R J BORE							* S1K	S1K	S1K	S1K	S1K					
SN3-15L J BORE							* S1K	S1K	S1K	S1K	S1K					
SN3-20R J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K			
SN3-20L J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K			
SN3-26R J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	
SN3-26L J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	
SN3-30R J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K
SN3-30L J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K
SN4-10R J BORE							* S1K	S1K								
SN4-10L J BORE							* S1K	S1K								
SN4-13R J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K			
SN4-13L J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K			
SN4-15R J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SN4-15L J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SN4-20R J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K
SN4-20L J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K
SN4-26R J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K
SN4-26L J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K
SN4-30R J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K
SN4-30L J BORE							* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K

*** is a product with the original bore diameter, so Hardened Plus is not available. See Page 22 for more details on Hardened Plus.

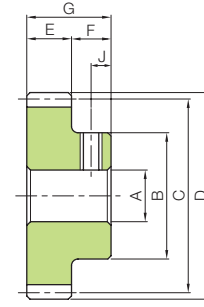


Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998)
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle	45°
Material	SUS303
Heat treatment	—

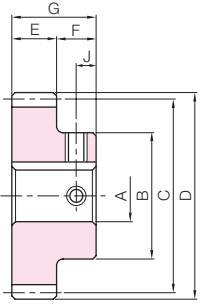
* The precision grade of J Series products is equivalent to the value shown in the table.



S1



S1T



S1K



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

Catalog Number	Module	No. of teeth	Direction of helix	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total length	Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)
					AH7	B									
SUN1-13R SUN1-13L	m1	13	R L	S1	6	15	18.38	20.38	10	10	20	0.19	0.019	0.08~0.18	0.031
SUN1-15R SUN1-15L		15	R L			18	21.21	23.21				0.29	0.029		
SUN1-20R SUN1-20L		20	R L			8	25	30.28				0.66	0.068		
SUN1.5-10R SUN1.5-10L	m1.5	10	R L	S1	8	16	21.21	24.21	15	10	25	0.29	0.029	0.10~0.22	0.048
SUN1.5-13R SUN1.5-13L		13	R L			23	27.58	30.58				0.62	0.063		
SUN1.5-15R SUN1.5-15L		15	R L			25	31.82	34.82				0.93	0.095		
SUN1.5-20R SUN1.5-20L		20	R L			12	30	42.43				2.14	0.22		
SUN2-10R SUN2-10L	m2	10	R L	S1	12	22	28.28	32.28	20	15	35	0.66	0.068	0.12~0.26	0.11
SUN2-13R SUN2-13L		13	R L			30	36.77	40.77				1.42	0.14		
SUN2-15R SUN2-15L		15	R L			35	42.43	46.43				2.14	0.22		
SUN2-20R SUN2-20L		20	R L			15	45	56.57				4.84	0.49		
SUN2.5-10R SUN2.5-10L	m2.5	10	R L	S1	12	26	35.36	40.36	22	16	38	1.27	0.13	0.14~0.28	0.20
SUN2.5-13R SUN2.5-13L		13	R L			35	45.96	50.96				2.68	0.27		
SUN2.5-15R SUN2.5-15L		15	R L			40	53.03	58.03				4.03	0.41		
SUN2.5-20R SUN2.5-20L		20	R L			20	60	70.71				9.07	0.92		
SUN3-10R SUN3-10L	m3	10	R L	S1	15	34	42.43	48.43	25	18	43	2.14	0.22	0.14~0.32	0.35
SUN3-13R SUN3-13L		13	R L			45	55.15	61.15				4.51	0.46		
SUN3-15R SUN3-15L		15	R L			50	63.64	69.64				6.75	0.69		
SUN3-20R SUN3-20L		20	R L			60	84.85	90.85				15.04	1.53		

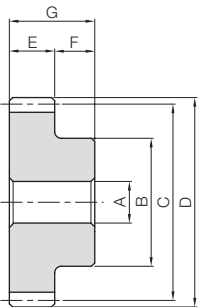
Bore H7		* The product shapes of J Series items are identified by background color.																	
Keyway Js9	6	8	10	12	14	15	16	17	18	19	20	22	25	28	30	32	35		
Screw size	—		4x1.8		5x2.3				6x2.8				8x3.3			10x3.3			
Catalog Number	M4	M5	M4						M5				M6			M8			
SUN1-13RJ BORE	S1T																		
SUN1-13LJ BORE	S1T																		
SUN1-15RJ BORE	S1T	S1T																	
SUN1-15LJ BORE	S1T	S1T																	
SUN1-20RJ BORE		S1T	S1K	S1K															
SUN1-20LJ BORE		S1T	S1K	S1K															
SUN1.5-10RJ BORE		S1T																	
SUN1.5-10LJ BORE		S1T																	
SUN1.5-13RJ BORE			S1K																
SUN1.5-13LJ BORE			S1K																
SUN1.5-15RJ BORE			S1K	S1K															
SUN1.5-15LJ BORE			S1K	S1K															
SUN1.5-20RJ BORE				S1K	S1K	S1K	S1K	S1K											
SUN1.5-20LJ BORE				S1K	S1K	S1K	S1K	S1K											
SUN2-10RJ BORE				S1K															
SUN2-10LJ BORE				S1K															
SUN2-13RJ BORE				S1K	S1K	S1K	S1K	S1K											
SUN2-13LJ BORE				S1K	S1K	S1K	S1K	S1K											
SUN2-15RJ BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K									
SUN2-15LJ BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K									
SUN2-20RJ BORE						S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K						
SUN2-20LJ BORE						S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K					
SUN2.5-10RJ BORE				S1K															
SUN2.5-10LJ BORE				S1K															
SUN2.5-13RJ BORE						S1K	S1K	S1K	S1K	S1K									
SUN2.5-13LJ BORE						S1K	S1K	S1K	S1K	S1K									
SUN2.5-15RJ BORE						S1K	S1K	S1K	S1K	S1K	S1K	S1K							
SUN2.5-15LJ BORE						S1K	S1K	S1K	S1K	S1K	S1K	S1K							
SUN2.5-20RJ BORE											S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SUN2.5-20LJ BORE											S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SUN3-10RJ BORE						S1K	S1K	S1K											
SUN3-10LJ BORE						S1K	S1K	S1K											
SUN3-13RJ BORE											S1K	S1K	S1K						
SUN3-13LJ BORE											S1K	S1K	S1K						
SUN3-15RJ BORE											S1K	S1K	S1K	S1K	S1K				
SUN3-15LJ BORE											S1K	S1K	S1K	S1K	S1K				
SUN3-20RJ BORE											S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SUN3-20LJ BORE											S1K	S1K	S1K	S1K	S1K	S1K	S1K		





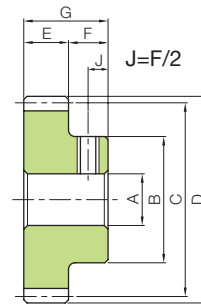
Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998)
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle	45°
Material	CAC702 (old JIS A & BC2)
Heat Treatment	—

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

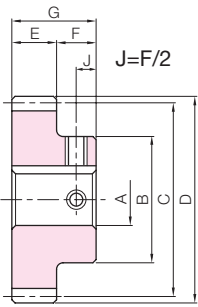


S1

J Series



S1T



S1K



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

Catalog Number	Module	No. of teeth	Direction of helix	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total length	Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)
					AH7	B									
AN1-13R AN1-13L	m1	13	R L	S1	6	15	18.38	20.38	10	10	20	0.31	0.032	0.08~0.18	0.029
AN1-15R AN1-15L		15	R L			18	21.21	23.21							
AN1.5-10R AN1.5-10L	m1.5	10	R L	S1	8	16	21.21	24.21	15	10	25	0.48	0.049	0.10~0.22	0.046
AN1.5-13R AN1.5-13L		13	R L			23	27.58	30.58							
AN1.5-15R AN1.5-15L		15	R L			25	31.82	34.82							
AN2-10R AN2-10L	m2	10	R L	S1	12	22	28.28	32.28	20	15	35	1.10	0.11	0.12~0.26	0.11
AN2-13R AN2-13L		13	R L			30	36.77	40.77							
AN2-15R AN2-15L		15	R L			35	42.43	46.43							
AN2.5-10R (Made to Order) AN2.5-10L (Made to Order)	m2.5	10	R L	S1	12	26	35.36	40.36	22	16	38	2.11	0.22	0.14~0.28	0.20
AN2.5-13R (Made to Order) AN2.5-13L (Made to Order)		13	R L			35	45.96	50.96							
AN2.5-15R (Made to Order) AN2.5-15L (Made to Order)		15	R L			40	53.03	58.03							
AN3-10R (Made to Order) AN3-10L (Made to Order)	m3	10	R L	S1	15	34	42.43	48.43	25	18	43	3.56	0.36	0.14~0.32	0.34
AN3-13R (Made to Order) AN3-13L (Made to Order)		13	R L			45	55.15	61.15							
AN3-15R (Made to Order) AN3-15L (Made to Order)		15	R L			50	63.64	69.64							

*** is a product with the original bore diameter, so Hardened Plus is not available. See Page 22 for more details on Hardened Plus.

Bore H7		* The product shapes of J Series items are identified by background color.															
Keyway Js9		6	8	10	12	14	15	16	17	18	19	20	22	25	28	30	
Screw size		—		4×1.8		5×2.3					6×2.8				8×3.3		
Catalog Number		M4	M5	M4						M5				M6			
AN1-13RJ BORE	S1T																
AN1-13LJ BORE	S1T																
AN1-15RJ BORE	S1T	S1T															
AN1-15LJ BORE	S1T	S1T															
AN1.5-10RJ BORE		S1T															
AN1.5-10LJ BORE		S1T															
AN1.5-13RJ BORE				S1K													
AN1.5-13LJ BORE				S1K													
AN1.5-15RJ BORE				S1K	S1K												
AN1.5-15LJ BORE				S1K	S1K												
AN2-10RJ BORE					S1K												
AN2-10LJ BORE					S1K												
AN2-13RJ BORE					S1K	S1K	S1K	S1K	S1K								
AN2-13LJ BORE					S1K	S1K	S1K	S1K	S1K								
AN2-15RJ BORE					S1K	S1K	S1K	S1K	S1K	S1K	S1K						
AN2-15LJ BORE					S1K	S1K	S1K	S1K	S1K	S1K	S1K						



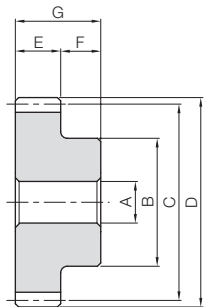


Plastic screw gear (helical gear)



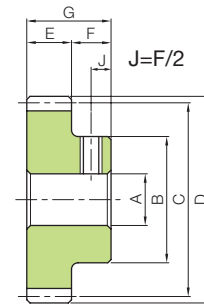
Specifications	
Precision grade	JIS grade N10 (JIS B1702-1: 1998)*
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle	45°
Material	MC901
Heat treatment	—

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

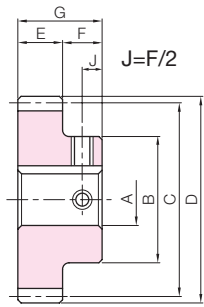


S1

J Series



S1T



S1K



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

Catalog Number	Module	No. of teeth	Direction of helix	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total length	Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)
					A _{H8}	B									
PN1-13R PN1-13L	m1	13	R L	S1	6	15	18.38	20.38	10	10	20	0.19	0.019	0.18~0.32	0.0045
PN1-15R PN1-15L		15	R L			18	21.21	23.21				0.29	0.029	0.20~0.34	0.0064
PN1-20R PN1-20L		20	R L			8	25	30.28				0.66	0.068		0.012
PN1.5-10R PN1.5-10L	m1.5	10	R L	S1	6	16	21.21	24.21	15	10	25	0.29	0.029	0~0.38	0.0077
PN1.5-13R PN1.5-13L		13	R L			23	27.58	30.58				0.62	0.063		0.014
PN1.5-15R PN1.5-15L		15	R L			25	31.82	34.82				0.93	0.095		0.018
PN1.5-20R PN1.5-20L		20	R L			10	30	42.43				2.14	0.22		0.031
PN2-10R PN2-10L	m2	10	R L	S1	10	22	28.28	32.28	20	15	35	0.66	0.068	0~0.42	0.018
PN2-13R PN2-13L		13	R L			30	36.77	40.77				1.42	0.14		0.034
PN2-15R PN2-15L		15	R L			35	42.43	46.43				2.14	0.22		0.046
PN2-20R PN2-20L		20	R L			12	45	56.57				4.84	0.49	0~0.44	0.081
PN2.5-10R PN2.5-10L	m2.5	10	R L	S1	10	26	35.36	40.36	22	16	38	1.27	0.13	0~0.44	0.031
PN2.5-13R PN2.5-13L		13	R L			35	45.96	50.96				2.68	0.27		0.055
PN2.5-15R PN2.5-15L		15	R L			40	53.03	58.03				4.03	0.41		0.075
PN2.5-20R PN2.5-20L		20	R L			60	70.71	75.71				9.07	0.92	0~0.46	0.15
PN3-10R PN3-10L	m3	10	R L	S1	12	34	42.43	48.43	25	18	43	2.14	0.22	0~0.52	0.054
PN3-13R PN3-13L		13	R L			45	55.15	61.15				4.51	0.46		0.094
PN3-15R PN3-15L		15	R L			50	63.64	69.64				6.75	0.69		0.12
PN3-20R PN3-20L		20	R L			60	84.85	90.85				15.0	1.53		0.21

Bore H7		* The product shapes of J Series items are identified by background color.																		
Keyway Js9	6	8	10	12	14	15	16	17	18	19	20	22	25	28	30	32	35			
Screw size	—		4×1.8		5×2.3				6×2.8				8×3.3			10×3.3				
Catalog Number	M4	M5	M4						M5				M6			M8				
PN1-13RJ BORE	S1T																			
PN1-13LJ BORE	S1T																			
PN1-15RJ BORE	S1T	S1T																		
PN1-15LJ BORE	S1T	S1T																		
PN1-20RJ BORE		S1T	S1K	S1K																
PN1-20LJ BORE		S1T	S1K	S1K																
PN1.5-10RJ BORE	S1T																			
PN1.5-10LJ BORE	S1T																			
PN1.5-13RJ BORE		S1T	S1K																	
PN1.5-13LJ BORE		S1T	S1K																	
PN1.5-15RJ BORE		S1T	S1K	S1K																
PN1.5-15LJ BORE		S1T	S1K	S1K																
PN1.5-20RJ BORE			S1K	S1K	S1K	S1K	S1K	S1K												
PN1.5-20LJ BORE			S1K	S1K	S1K	S1K	S1K	S1K												
PN2-10RJ BORE			S1K																	
PN2-10LJ BORE			S1K																	
PN2-13RJ BORE			S1K	S1K	S1K	S1K	S1K	S1K												
PN2-13LJ BORE			S1K	S1K	S1K	S1K	S1K	S1K												
PN2-15RJ BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K										
PN2-15LJ BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K										
PN2-20RJ BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
PN2-20LJ BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
PN2.5-10RJ BORE			S1K	S1K																
PN2.5-10LJ BORE			S1K	S1K																
PN2.5-13RJ BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K										
PN2.5-13LJ BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K										
PN2.5-15RJ BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K								
PN2.5-15LJ BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K								
PN2.5-20RJ BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K			
PN2.5-20LJ BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K			
PN3-10RJ BORE				S1K	S1K	S1K	S1K	S1K												
PN3-10LJ BORE				S1K	S1K	S1K	S1K	S1K												
PN3-13RJ BORE						S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
PN3-13LJ BORE						S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
PN3-15RJ BORE						S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K					
PN3-15LJ BORE						S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K					
PN3-20RJ BORE						S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K			
PN3-20LJ BORE						S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K			

* In regard to MC Nylon gears, other materials are available for plastic gears, including Ultra High Molecular Weight Polyethylene (U-PE), which has excellent abrasion resistance and resin conforming to the Plastic Implementation Measure (PIM). A single piece order is acceptable and will be produced as a custom-made gear. Please see Page 26 for more details on quotations and orders.





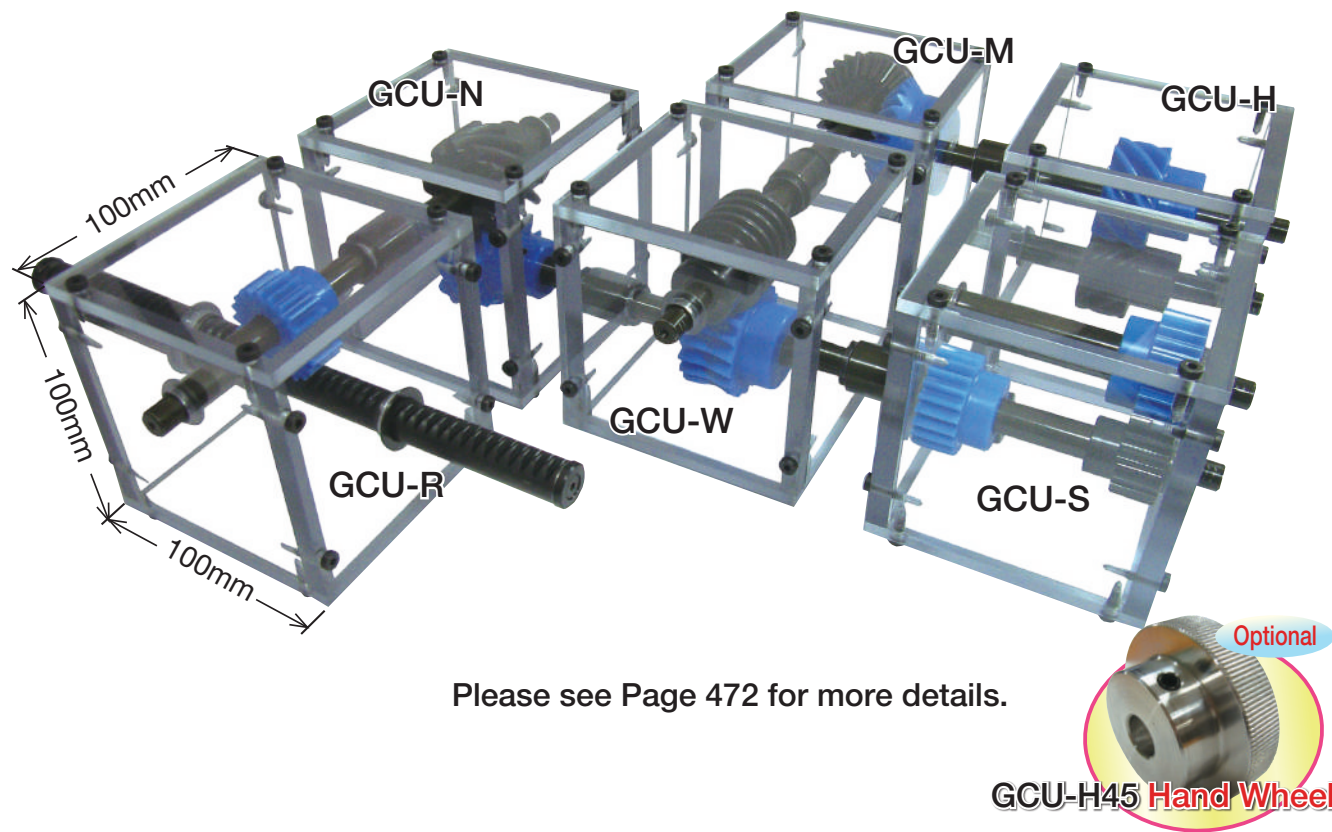
GCU-N Screw Gear Kit



Installation : Nonparallel and
nonintersecting gears
Gear Type : Screw Gears
Gears : SN2.5-10R
PN2.5-10R
Gear Ratio : 1
Weight : Approx. 1kg

Screw Gears are helical
gears used in nonparallel and
nonintersecting situations.
Applications include devices
like conveyers with light loads.

* This is not a gear box for actual use to transmit power. Please use only as representations of gear systems.



Please see Page 472 for more details.

GCU-H45 Hand Wheel



Worm Gears

KWGDL/KWGDLS Duplex Worms	AGDL Duplex Worm Wheels	KWG Ground Worm Shafts	AG Worm Wheels	AGF Worm Wheels	SWG Ground Worms	AG Worm Wheels
Material: SCM440 m1.5~4 Page 402	Reduction Ratio 20~60 Material: CAC702 (A & BC2) m1.5~4 Page 402	Material: SCM440 m0.5~6 Page 410	Reduction Ratio 10~60 Material: CAC702 (A & BC2) m0.5~1.5 Page 410	Reduction Ratio 10~60 Material: CAC702 (A & BC2) m2~6 Page 414	Material: S45C m1~6 Page 420	Reduction Ratio 10~60 Material: CAC702 (A & BC2) m1~6 Page 420
SW Worms	BG Worm Wheels	CG Worm Wheels	SUW Stainless Steel Worms	PG Worm Wheels		
Material: S45C m0.5~6 Page 428	Reduction Ratio 10~60 Material: CAC502 (PBC2) m0.5~6 Page 428	Reduction Ratio 10~120 Material: FC200 m1~6 Page 430	Material: SUS303 m0.5~3 Page 444	Reduction Ratio 10~50 Additional Material: MC901 m1~3 Page 444		

Includes Made to Order

Catalog Number of KHK Stock Gears

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

(Example) Worm Gear Pair
Worms

K W G DL 2 - R1

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

Material
K SCM440
S S45C
SU Stainless Steel

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

Worm Wheels

A G DL 2 - 20 R1

Number of Starts (Right-hand Lead 1)
No. of Teeth (20)
Module (2)
Other Information (Duplex)
Type (Worm Wheel)
Material (CAC702)

Material
A CAC702
B CAC502
C FC200
P MC901

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