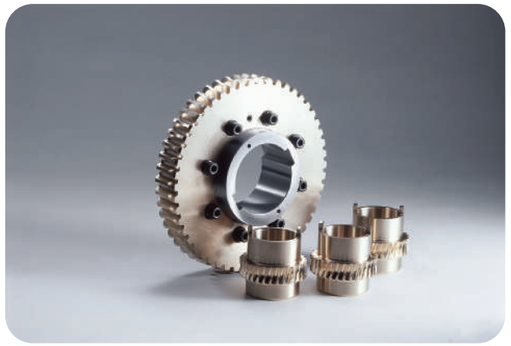
Custom-made worm gears are available.

KHK offers high-precision products.

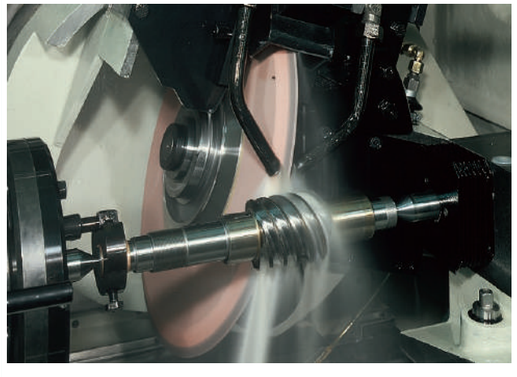


◆ Production Range
Module : 0.5~10
Worm outer diameter : ϕ100 mm or less
Wheel outer diameter : ϕ600 mm or less
Assembly distance : 350 mm or less

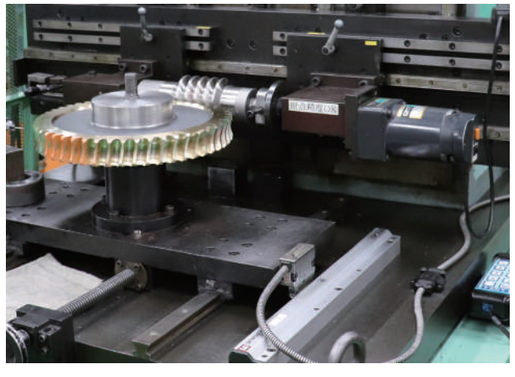
Please see Page 26 for more details about custom-made orders.

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

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



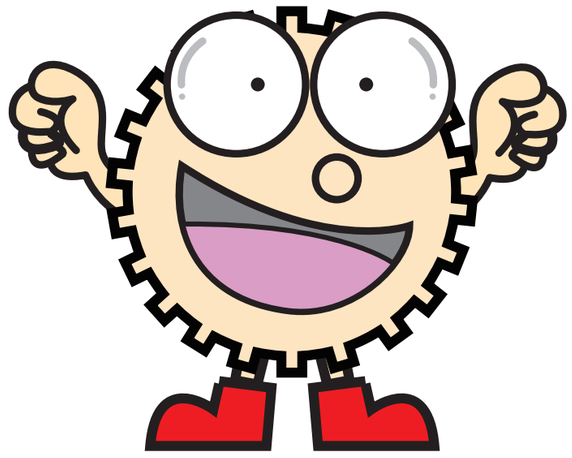
Klingelnberg Worm Grinding Machine



Worm Gear Tooth Contact Machine

Gearboxes

KBX Bevel Gearboxes	CBX Bevel Gearboxes
	
Material: -	Material: -
Model L/T Page 452	Model L/T Page 456



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) Gearboxes

K BX - 10 1 L

- L: Type (L)
- 1: Gear Ratio (1)
- 10: Shaft Diameter (4 mm)
- BX: Type (Bevel Gearboxes)
- K: Case Material (Light Alloy)

Case Material		Type	
K	Light Alloy	BX	Bevel Gearboxes
C	FC250		

■ Features

① Compact

The structure is simple and the case is made of aluminum die-cast

② Low-noise and high-efficiency

Uses spiral bevel gears that are made of carburized special steel

③ Flexible mounting direction

Can be installed in all directions and is easy to install

④ Maintenance-free

Shipped with high-grade grease enclosed

⑤ Gear ratio

Gear ratio of 1 and 2 can be selected according to the application

■ Lubrication

Lubricating oil of specified amount is enclosed at the time of shipment.

Machine Type	Approximate amount of oil	Lubricant type	
KBX-10 KBX-15 KBX-20	10g 30g 50g	Grease	NLGI-00 with Li extreme pressure additive

■ Application Hints

1. Installation Location

① Ambient temperature : −10°C to 40°C
② Ambient humidity : 80% or less
③ Atmosphere : A space free of corrosive gas and steam
A well-ventilated space free of dust and dirt
④ Installation location : Indoors

2. Installation Method

① Securely fix the mounting surface to a machined flat surface without vibration using bolts.
② No secondary operations such as boring can be made on the case. Also, do not disassemble or modify the product. If the device is damaged, the product will not be covered by the warranty.
③ For devices for which oil must be avoided such as food machinery, be sure to take measures to prevent damage such as oil reservoir in case of oil leakage due to failure, aging, etc.

3. Connection with the mating machine

① Check the rotation direction before connecting to the mating machine. There is a risk of the device being damaged due to difference in rotation direction.
② When attaching the coupling, sprocket, pulley, gear or the like to the shaft of the gear box, make sure that it does not interfere with the oil seal or case surface in models that have no steps on the shaft. We also recommend H7 for hole fitting.
③ For direct connection, locate the center accurately so that the axial center of the gear box and mating axis match. We also recommend using flexible fastening supplies.
④ When using a chain, belt or gear, make sure that the gear box shaft and mating shaft are parallel, and install it so that the line connecting the centers of two shafts is perpendicular to the shafts.

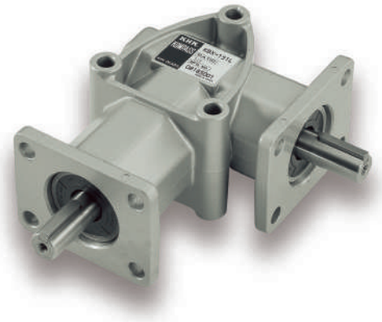
4. Precautions during driving

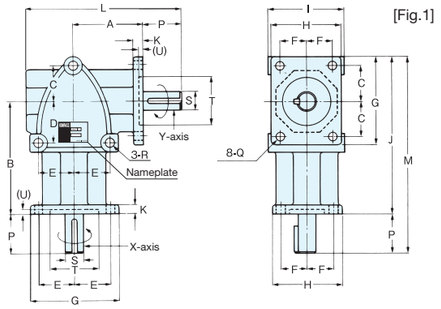
① Do not approach or touch rotating objects such as the shafts during operation. There is a risk of entanglement and injury.
② If there is abnormal noise or temperature rise, stop the operation immediately and do not operate until the cause of the abnormality is investigated and measures are taken.
③ Forward and reverse rotations due to plucking adversely affect the gear box and mating machine, so be sure to stop the unit and then start in the opposite direction.
④ Be sure to set the load torque and O.H.L. (overhang load) within the permissible values before operation.

■ KBX Performance Table

Speed ratio	Model Code	Specification Symbol	X-axis Rotation Speed (rpm) 50	100	200	300	400	600	900	1200	1500	1800	2500	3600	Allowable Thrust Load (N) {kgf} X-axis	Y-axis
1:1	KBX-101	Allowable Capacity (kW)	0.01	0.02	0.05	0.07	0.09	0.14	0.20	0.26	0.31	0.35	0.38	0.44	59 {6}	69 {7}
		Allowable X, Y-axis Torque (N·m) {kgf·m}	2.35 {0.24}	2.35 {0.24}	2.25 {0.23}	2.25 {0.23}	2.16 {0.22}	2.16 {0.22}	2.06 {0.21}	2.06 {0.21}	1.96 {0.20}	1.86 {0.19}	1.47 {0.15}	1.18 {0.12}		
		Allowable X-axis O.H.L. (N) {kgf}	78 {8}	78 {8}	78 {8}	78 {8}	69 {7}	69 {7}	69 {7}	69 {7}	69 {7}	59 {6}	49 {5}	39 {4}		
		Allowable Y-axis O.H.L. (N) {kgf}	127 {13}	127 {13}	118 {12}	118 {12}	118 {12}	118 {12}	108 {11}	108 {11}	108 {11}	98 {10}	78 {8}	59 {6}		
		Transmission Efficiency (Reference)	90%													
	KBX-151	Allowable Capacity (kW)	0.05	0.09	0.18	0.27	0.35	0.51	0.75	0.96	1.16	1.30	1.44	1.66	98 {10}	118 {12}
		Allowable X, Y-axis Torque (N·m) {kgf·m}	8.82 {0.90}	8.82 {0.90}	8.62 {0.88}	8.53 {0.87}	8.33 {0.85}	8.13 {0.83}	7.94 {0.81}	7.64 {0.78}	7.35 {0.75}	6.86 {0.70}	5.49 {0.56}	4.41 {0.45}		
		Allowable X-axis O.H.L. (N) {kgf}	255 {26}	255 {26}	255 {26}	245 {25}	245 {25}	235 {24}	225 {23}	216 {22}	216 {22}	186 {19}	157 {16}	127 {13}		
		Allowable Y-axis O.H.L. (N) {kgf}	294 {30}	294 {30}	284 {29}	284 {29}	274 {28}	265 {27}	265 {27}	255 {26}	245 {25}	216 {22}	176 {18}	147 {15}		
		Transmission Efficiency (Reference)	90%													
	KBX-201	Allowable Capacity (kW)	0.09	0.18	0.36	0.52	0.68	0.95	1.38	1.78	2.15	2.50	2.55	2.95	196 {20}	274 {28}
		Allowable X, Y-axis Torque (N·m) {kgf·m}	17.6 {1.80}	17.6 {1.80}	17.2 {1.75}	16.7 {1.70}	16.2 {1.65}	15.2 {1.55}	14.7 {1.50}	14.2 {1.45}	13.7 {1.40}	13.2 {1.35}	9.80 {1.00}	7.84 {0.80}		
		Allowable X-axis O.H.L. (N) {kgf}	353 {36}	353 {36}	343 {35}	333 {34}	333 {34}	323 {33}	314 {32}	304 {31}	294 {30}	265 {27}	216 {22}	176 {18}		
		Allowable Y-axis O.H.L. (N) {kgf}	529 {54}	529 {54}	519 {53}	510 {52}	500 {51}	490 {50}	470 {48}	451 {46}	441 {45}	392 {40}	314 {32}	255 {26}		
		Transmission Efficiency (Reference)	90%													
1:2	KBX-102	Allowable Capacity (kW)	0.005	0.01	0.02	0.03	0.04	0.06	0.09	0.12	0.14	0.16	0.17	0.20	59 {6}	69 {7}
		Allowable Y-axis Torque (N·m) {kgf·m}	2.06 {0.21}	2.06 {0.21}	2.06 {0.21}	1.96 {0.20}	1.96 {0.20}	1.96 {0.20}	1.86 {0.19}	1.86 {0.19}	1.76 {0.18}	1.67 {0.17}	1.27 {0.13}	1.08 {0.11}		
		Allowable X-axis O.H.L. (N) {kgf}	88 {9}	88 {9}	88 {9}	88 {9}	88 {9}	78 {8}	78 {8}	78 {8}	78 {8}	69 {7}	59 {6}	49 {5}		
		Allowable Y-axis O.H.L. (N) {kgf}	137 {14}	137 {14}	137 {14}	127 {13}	127 {13}	127 {13}	127 {13}	118 {12}	118 {12}	108 {11}	88 {9}	69 {7}		
		Transmission Efficiency (Reference)	90%										85%			
	KBX-152	Allowable Capacity (kW)	0.02	0.04	0.08	0.13	0.17	0.25	0.36	0.46	0.55	0.62	0.69	0.80	98 {10}	118 {12}
		Allowable Y-axis Torque (N·m) {kgf·m}	8.43 {0.86}	8.43 {0.86}	8.23 {0.84}	8.13 {0.83}	8.04 {0.82}	7.84 {0.80}	7.55 {0.77}	7.25 {0.74}	7.06 {0.72}	6.57 {0.67}	5.29 {0.54}	4.21 {0.43}		
		Allowable X-axis O.H.L. (N) {kgf}	255 {26}	255 {26}	255 {26}	245 {25}	245 {25}	235 {24}	225 {23}	216 {22}	216 {22}	186 {19}	157 {16}	127 {13}		
		Allowable Y-axis O.H.L. (N) {kgf}	294 {30}	294 {30}	284 {29}	284 {29}	274 {28}	265 {27}	265 {27}	255 {26}	245 {25}	216 {22}	176 {18}	147 {15}		
		Transmission Efficiency (Reference)	90%										85%			
	KBX-202	Allowable Capacity (kW)	0.05	0.10	0.19	0.28	0.37	0.53	0.77	0.99	1.15	1.31	1.40	1.57	196 {20}	274 {28}
		Allowable Y-axis Torque (N·m) {kgf·m}	19.6 {2.00}	19.6 {2.00}	18.6 {1.90}	18.1 {1.85}	17.6 {1.80}	17.0 {1.73}	16.4 {1.67}	15.7 {16.0}	14.7 {1.50}	13.9 {1.42}	10.8 {1.10}	8.33 {0.85}		
		Allowable X-axis O.H.L. (N) {kgf}	372 {38}	372 {38}	363 {37}	363 {37}	353 {36}	343 {35}	333 {34}	323 {33}	314 {32}	274 {28}	235 {24}	186 {19}		
		Allowable Y-axis O.H.L. (N) {kgf}	588 {60}	588 {60}	578 {59}	568 {58}	559 {57}	539 {55}	529 {54}	510 {52}	490 {50}	441 {45}	363 {37}	294 {30}		
		Transmission Efficiency (Reference)	90%										85%			

[Note] ① Be sure to use the product below the permissible values. The speed ratio (1:2) decelerates to the Y axis.
② The values in this performance table are where the service factor is 1. When using the product under other conditions, refer to the Selection Guide.
③ O.H.L. (overhang load) is the allowable load that can be applied to the center of the shaft. When using the product under other conditions, refer to the coefficients K_1 and K_2 in the Selection Guide (Page 460).
④ When the speed ratio (1:2) type is used at increased speed (from Y-axis to X-axis), the allowable X-axis torque is 1/2 of the value in the performance table (allowable Y-axis torque).
⑤ Y-axis torque of the model T is the total value of the left and right axes.
⑥ Y-axis O.H.L. of the model T is the total value of the left and right axes.

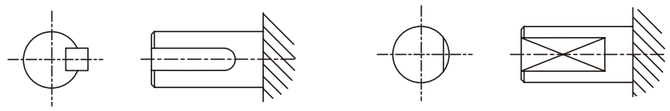




[Fig.1]

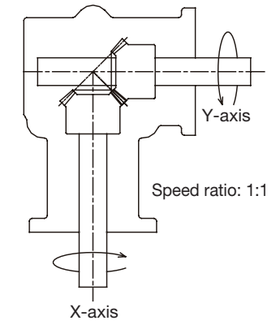
Catalog Number	Speed ratio	A	B	C	D	E	F	G	H	I	J	K	L	M	P	Q	R	S
KBX-101L	1:1	37	58	18	18	18	14	46	38	40	82	5	82	102	20	ϕ5.5	ϕ6.5	ϕ10
KBX-102L	1:2																	
KBX-151L	1:1	66	100	31	36	31	22	80	62	66	140	8	137	170	30	ϕ8.5	ϕ8.5	ϕ15
KBX-152L	1:2																	
KBX-201L	1:1	80	120	36	36	36	26	92	72	76	166	10	168	206	40	ϕ8.5	ϕ8.5	ϕ20
KBX-202L	1:2																	

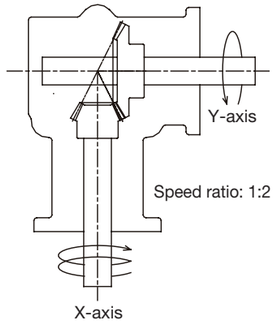
[NOTES]
① The rotation direction of the arrow does not limit the direction.
Both the forward and reverse rotations are allowed.
② The X-axis rotates clockwise and the Y-axis rotates counterclockwise.
③ The phases of the X-axis and Y-axis key grooves do not always match.
④ The shaft diameter tolerance is JIS h7.
⑤ The 1:2 speed ratio type decelerates from the X-axis (input axis) to the Y-axis (output axis).
⑥ JIS B 1301-1976 (normal) is used for the key dimensions
⑦ The indicated angular backlash is reference values measured on the X-axis (input axis).

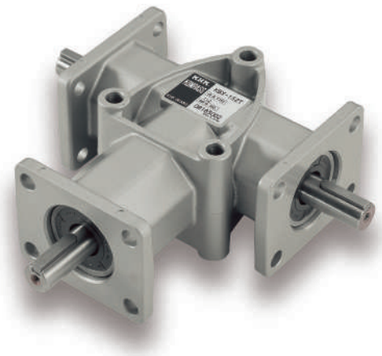


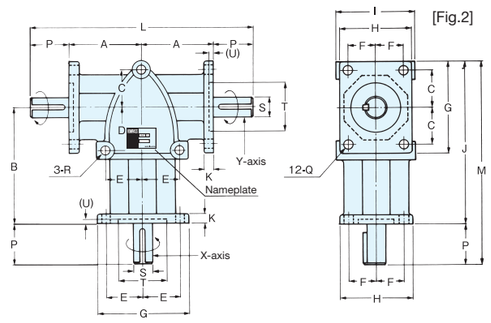
Key Detail Diagram

T	(U)	Key	Angular Backlash	Weight (kg)	Catalog Number
ϕ26$_{H7}$	(2)	Depth 1 x 15 ℓ Horizontal	16′~44′	0.40	**KBX-101L**
			30′ ~1° 23′		**KBX-102L**
ϕ42$_{H7}$	(3)	5 x 5 x 27 ℓ	10′~37′	1.80	**KBX-151L**
			19′ ~1° 09′		**KBX-152L**
ϕ52$_{H7}$	(4)	6 x 6 x 35 ℓ	8′~33′	3.10	**KBX-201L**
			15′~60′		**KBX-202L**









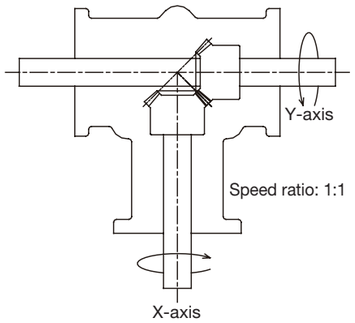
[Fig.2]

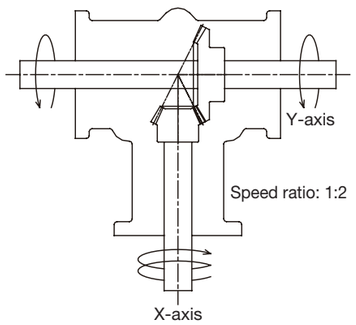
Catalog Number	Speed ratio	A	B	C	D	E	F	G	H	I	J	K	L	M	P	Q	R	S
KBX-101T	1:1	37	58	18	18	18	14	46	38	40	82	5	114	102	20	ϕ5.5	ϕ6.5	ϕ10
KBX-102T	1:2																	
KBX-151T	1:1	66	100	31	36	31	22	80	62	66	140	8	192	170	30	ϕ8.5	ϕ8.5	ϕ15
KBX-152T	1:2																	
KBX-201T	1:1	80	120	36	36	36	26	92	72	76	166	10	240	206	40	ϕ8.5	ϕ8.5	ϕ20
KBX-202T	1:2																	

[NOTES]
① The rotation direction of the arrow does not limit the direction.
Both the forward and reverse rotations are allowed.
② The X-axis rotates clockwise and the Y-axis rotates counterclockwise.
③ The phases of the X-axis and Y-axis key grooves do not always match.
④ The shaft diameter tolerance is JIS h7.
⑤ The 1:2 speed ratio type decelerates from the X-axis (input axis) to the Y-axis (output axis).
⑥ JIS B 1301-1976 (normal) is used for the key dimensions
⑦ The indicated angular backlash is reference values measured on the X-axis (input axis).

Key Detail Diagram

T	(U)	Key	Angular Backlash	Weight (kg)	Catalog Number
ϕ26$_{H7}$	(2)	Depth 1 x 15 ℓ Horizontal	16′~ 44′	0.50	**KBX-101T**
			30′~1° 23′		**KBX-102T**
ϕ42$_{H7}$	(3)	5 x 5 x 27 ℓ	10′~ 37′	2.20	**KBX-151T**
			19′~1° 09′		**KBX-152T**
ϕ52$_{H7}$	(4)	6 x 6 x 35 ℓ	8′~ 33′	3.40	**KBX-201T**
			15′~ 60′		**KBX-202T**





Shaft arrangement and shaft arrangement numbers

The CBX bevel box standardizes 24 different shaft arrangements depending on the rotation direction of the shaft. When using the product, consider not only the catalog number but also the shaft arrangement.

[NOTES]
① This figure shows the mounting base and flat surface mounting (floor mounting).
② The rotation direction of the arrow does not limit the direction. Both the forward and reverse rotations are allowed.
③ ▼ indicates the wall surface with fuel filler port and drain plug when mounted on a flat surface (floor mounting). Unmarked items are the back of this figure. (standard specifications)
④ Shaft arrangement: For products other than LI to LL and TE to TF, the input shaft (X-axis) cannot be installed facing upward.
⑤ When installing the product other than on a flat surface, consider adding an oil drain port (Page 459).

Features

① Tough
High-grade cast iron is used for the case and tapered roller bearing is used for the bearing

② Low-noise and high-efficiency
Uses spiral bevel gears that are made of carburized special steel

③ Flexible mounting direction
Various installations are possible depending on the shaft arrangement

④ Lubricant enclosed
High-grade oil enclosed upon shipment

⑤ Speed ratio
Gear ratio of 1/1 and 1/2 can be selected according to the applications

Lubrication

Lubricating oil of specified amount is enclosed at the time of shipment.

Machine Type	Approximate amount of oil	Lubricant type	
CBX-19 CBX-25 CBX-32 CBX-40	0.3L 0.7L 1.0L 1.5L	Oil	JIS gear oil Class 2 for industrial use

Application Hints

Refer to KBX (Page 452).

CBX Shaft Arrangement Table

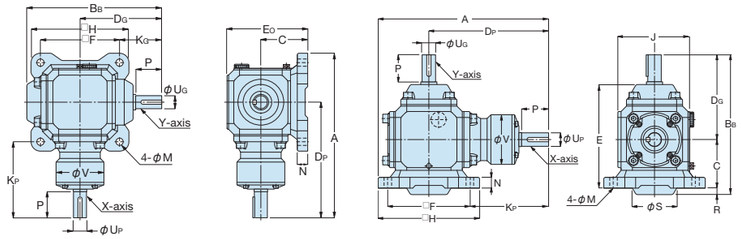
	CBX-L Diagram				CBX-T Diagram	
Horizontal (Plan View)	A	B	C	D	A	B
Vertical (Front View)	E	F	G	H	C	D
	I	J	K	L	E	F
	M	N	O	P	G	H

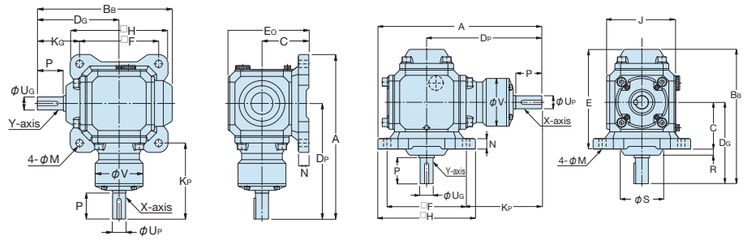
CBX Performance Table

Speed ratio	Model Code	Specification Symbol	X-axis Rotation Speed (rpm) 20	50	100	200	300	400	600	900	1200	1500	1800	2500	3600
1:1	CBX-191	Allowable Capacity (kW)	0.08	0.20	0.39	0.77	1.15	1.50	2.05	2.67	3.30	3.95	4.40	4.40	4.40
		Allowable X, Y-axis Torque (N·m) {kgf·m}	37.2 {3.8}	37.2 {3.8}	37.2 {3.8}	36.3 {3.7}	36.3 {3.7}	36.3 {3.6}	32.3 {3.3}	28.4 {2.9}	26.5 {2.7}	24.5 {2.5}	23.5 {2.4}	16.7 {1.7}	10.8 {1.1}
		Allowable X-axis O.H.L. (N) {kgf}	1760 {180}	1760 {180}	1760 {180}	1760 {180}	1670 {170}	1620 {165}	1270 {130}	1080 {110}	882 {90}	833 {85}	784 {80}	686 {70}	637 {65}
		Allowable Y-axis O.H.L. (N) {kgf}	1960 {200}	1960 {200}	1960 {200}	1960 {200}	1960 {200}	1810 {185}	1470 {150}	1180 {120}	1030 {105}	980 {100}	931 {95}	784 {80}	735 {75}
		Transmission Efficiency (Reference)	95%							90%					
	CBX-251	Allowable Capacity (kW)	0.25	0.62	1.24	2.47	3.68	4.70	6.40	8.60	10.5	12.3	13.8	—	—
		Allowable X, Y-axis Torque (N·m) {kgf·m}	118 {12.0}	118 {12.0}	118 {12.0}	118 {12.0}	116 {11.8}	112 {11.4}	101 {10.3}	91.1 {9.3}	83.3 {8.5}	78.4 {8.0}	73.5 {7.5}	— —	— —
		Allowable X-axis O.H.L. (N) {kgf}	3920 {400}	3920 {400}	3920 {400}	3920 {400}	3630 {370}	3330 {340}	2940 {300}	2450 {250}	2160 {220}	1960 {200}	1760 {180}	— —	— —
		Allowable Y-axis O.H.L. (N) {kgf}	4120 {420}	4120 {420}	4120 {420}	4120 {420}	4020 {410}	3920 {400}	3430 {350}	2940 {300}	2550 {260}	2450 {250}	2250 {230}	— —	— —
		Transmission Efficiency (Reference)	95%							90%				—	—
	CBX-321	Allowable Capacity (kW)	0.36	0.88	1.77	3.53	5.26	6.72	9.15	12.3	15.0	17.5	19.7	—	—
		Allowable X, Y-axis Torque (N·m) {kgf·m}	167 {17.0}	167 {17.0}	167 {17.0}	167 {17.0}	165 {16.8}	160 {16.3}	144 {14.7}	130 {13.3}	119 {12.1}	112 {11.4}	104 {10.6}	— —	— —
		Allowable X-axis O.H.L. (N) {kgf}	4900 {500}	4900 {500}	4900 {500}	4900 {500}	4610 {470}	4210 {430}	3720 {380}	3140 {320}	2740 {280}	2450 {250}	2160 {220}	— —	— —
		Allowable Y-axis O.H.L. (N) {kgf}	5190 {530}	5190 {530}	5190 {530}	5190 {530}	5100 {520}	4900 {500}	4310 {440}	3720 {380}	3230 {330}	3140 {320}	2840 {290}	— —	— —
		Transmission Efficiency (Reference)	95%							90%				—	—
	CBX-401	Allowable Capacity (kW)	0.62	1.59	3.18	6.32	9.50	12.0	16.1	22.0	26.5	—	—	—	—
		Allowable X, Y-axis Torque (N·m) {kgf·m}	294 {30.0}	294 {30.0}	294 {30.0}	294 {30.0}	294 {30.0}	284 {29.0}	225 {26.0}	231 {23.6}	211 {21.5}	— —	— —	— —	— —
		Allowable X-axis O.H.L. (N) {kgf}	9800 {1000}	9800 {1000}	9800 {1000}	7840 {800}	5880 {600}	4900 {500}	4410 {450}	3720 {380}	3430 {350}	— —	— —	— —	— —
		Allowable Y-axis O.H.L. (N) {kgf}	11760 {1200}	11760 {1200}	11760 {1200}	9800 {1000}	7350 {750}	6370 {650}	5880 {600}	5100 {520}	4020 {410}	— —	— —	— —	— —
		Transmission Efficiency (Reference)	95%							90%		—	—	—	—

Speed ratio	Model Code	Specification Symbol	X-axis Rotation Speed (rpm) 20	50	100	200	300	400	600	900	1200	1500	1800	2500	3600
1:2	CBX-192	Allowable Capacity (kW)	0.03	0.07	0.14	0.27	0.40	0.53	0.78	1.15	1.50	1.85	2.17	2.20	2.20
		Allowable Y-axis Torque (N·m) {kgf·m}	25.5 {2.6}	25.5 {2.6}	25.5 {2.6}	25.5 {2.6}	25.5 {2.6}	24.5 {2.5}	24.5 {2.5}	24.5 {2.5}	23.5 {2.4}	23.5 {2.4}	22.5 {2.3}	16.7 {1.7}	10.8 {1.1}
		Allowable X-axis O.H.L. (N) {kgf}	1180 {120}	1180 {120}	1180 {120}	1180 {120}	1180 {120}	1130 {115}	1130 {115}	1080 {110}	1080 {110}	882 {90}	833 {85}	784 {80}	735 {75}
		Allowable Y-axis O.H.L. (N) {kgf}	1760 {180}	1760 {180}	1760 {180}	1760 {180}	1760 {180}	1720 {175}	1670 {170}	1470 {150}	1270 {130}	1080 {110}	980 {100}	833 {85}	784 {80}
		Transmission Efficiency (Reference)	90%							85%					
	CBX-252	Allowable Capacity (kW)	0.09	0.23	0.45	0.90	1.34	1.78	2.67	4.00	5.30	6.33	7.50	7.50	—
		Allowable Y-axis Torque (N·m) {kgf·m}	85.3 {8.7}	85.3 {8.7}	85.3 {8.7}	85.3 {8.7}	85.3 {8.7}	84.3 {8.6}	84.3 {8.6}	84.3 {8.6}	84.3 {8.6}	80.4 {8.2}	79.4 {8.1}	56.8 {5.8}	— —
		Allowable X-axis O.H.L. (N) {kgf}	3920 {400}	3920 {400}	3920 {400}	3920 {400}	3920 {400}	3720 {380}	3630 {370}	3530 {360}	3230 {330}	2740 {280}	2250 {230}	1670 {170}	— —
		Allowable Y-axis O.H.L. (N) {kgf}	4120 {420}	4120 {420}	4120 {420}	4120 {420}	4020 {410}	3920 {400}	3820 {390}	3720 {380}	3430 {350}	3040 {310}	2650 {270}	2350 {240}	— —
		Transmission Efficiency (Reference)	90%							85%					—
	CBX-322	Allowable Capacity (kW)	0.13	0.32	0.64	1.28	1.91	2.54	3.80	5.72	7.57	9.05	10.7	—	—
		Allowable Y-axis Torque (N·m) {kgf·m}	123 {12.5}	123 {12.5}	123 {12.5}	123 {12.5}	122 {12.4}	122 {12.4}	121 {12.3}	121 {12.3}	120 {12.2}	115 {11.7}	114 {11.6}	— —	— —
		Allowable X-axis O.H.L. (N) {kgf}	4900 {500}	4900 {500}	4900 {500}	4900 {500}	4900 {500}	4700 {480}	4610 {470}	4410 {450}	4120 {420}	3430 {350}	2840 {290}	— —	— —
		Allowable Y-axis O.H.L. (N) {kgf}	5190 {530}	5190 {530}	5190 {530}	5190 {530}	5100 {520}	4900 {500}	4800 {490}	4700 {480}	4310 {440}	3820 {390}	3330 {340}	— —	— —
		Transmission Efficiency (Reference)	90%							85%				—	—
	CBX-402	Allowable Capacity (kW)	0.20	0.48	0.96	1.93	2.90	3.84	5.72	8.55	11.0	13.8	16.4	—	—
		Allowable Y-axis Torque (N·m) {kgf·m}	183 {18.7}	183 {18.7}	183 {18.7}	183 {18.7}	183 {18.7}	182 {18.6}	181 {18.5}	180 {18.4}	174 {17.8}	173 {17.6}	172 {17.5}	— —	— —
		Allowable X-axis O.H.L. (N) {kgf}	9800 {1000}	9800 {1000}	9800 {1000}	9800 {1000}	9800 {1000}	8820 {900}	7840 {800}	6860 {700}	5880 {600}	4900 {500}	3920 {400}	— —	— —
		Allowable Y-axis O.H.L. (N) {kgf}	11760 {1200}	11760 {1200}	11760 {1200}	11760 {1200}	11760 {1200}	9800 {1000}	8820 {900}	8820 {900}	8820 {900}	7840 {800}	6860 {700}	— —	— —
		Transmission Efficiency (Reference)	90%							85%				—	—

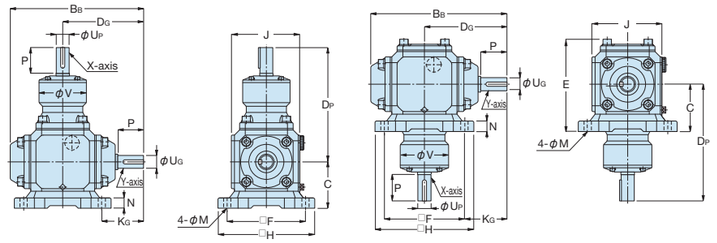
[Note] ① Be sure to use the product below the permissible values. The speed ratio (1:2) decelerates to the Y axis.
② The values in this performance table are where the service factor is 1. When using the product under other conditions, refer to Table 1 (Page 460) Service Factors.
③ O.H.L. (overhang load) is the allowable load that can be applied to the center of the shaft length. When using the product under other conditions, refer to the coefficients K_1 and K_2 in Table 2 and 3 (Page 460).
④ When the speed ratio (1:2) type is used at increased speed (from Y-axis to X-axis), the allowable X-axis torque is 1/2 of the value in the performance table (allowable Y-axis torque).
⑤ Y-axis torque of the model CBX-T is the total value of the left and right axes.
⑥ Y-axis O.H.L. of the model CBX-T is the total value of the left and right axes.
⑦ The allowable thrust load is half of respective O.H.L. value.

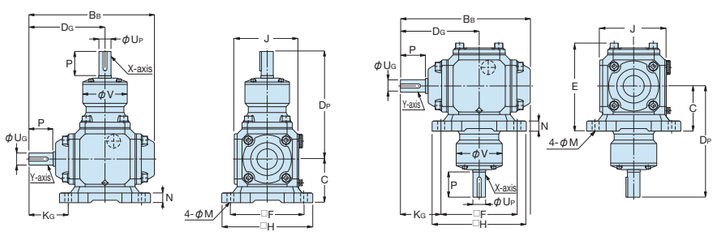




Catalog Number	Speed ratio	A	B_B	C	D_P	D_G	E	E_O	F	H	J	K_P	K_G	ϕM	N	P	R	ϕS
CBX-191L□	1:1	257	193	76	180	116	146	129	125	154	109	117.5	53.5	10.5	17	38	—	—
CBX-192L□	1:2																	
CBX-251L□	1:1	316	259	90	222	157	177.5	155	152	188	133	146	81	14	20	50	12	82.5
CBX-252L□	1:2																	
CBX-321L□	1:1	340	277	100	242	168	192.5	174	160	196	151	162	88	14	20	55	9	88.5
CBX-322L□	1:2																	
CBX-401L□	1:1	425	337	115	308	208	225	200	195	234	173	210.5	110.5	14	22	75	14	114.5
CBX-402L□	1:2																	

When placing an order, select the model code (A to P) from the Shaft Arrangement Table on Page 456 in the □ at the end of the catalog number.



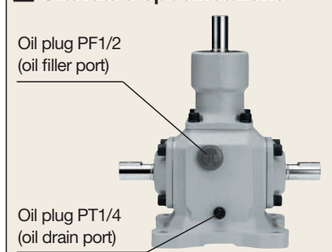


ϕV	X-axis diameter ϕU_P	Y-axis diameter ϕU_G	Key	Angular Backlash	Weight (kg)	Catalog Number
66	19	19	6 x 6 x 27ℓ	11′~30′	10.0	**CBX-191L**□
	18			17′~47′		**CBX-192L**□
92	25	25	8 x 7 x 40ℓ	9′~22′	17.0	**CBX-251L**□
				15′~36′		**CBX-252L**□
100	32	32	10 x 8 x 50ℓ	9′~21′	22.0	**CBX-321L**□
				15′~36′		**CBX-322L**□
124	40	40	12 x 8 x 60ℓ	8′~20′	33.0	**CBX-401L**□
				15′~37′		**CBX-402L**□

[NOTES]

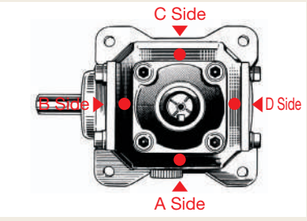
① The phases of the X-axis and Y-axis key grooves do not always match.
② The shaft diameter tolerance is JIS h6.
③ JIS B 1301-1976 (normal) is used for the key dimensions
④ The indicated angular backlash is reference values measured on the X-axis (input axis).
⑤ The standard specifications of the oil plug are flat surface mounting (floor mounting), oil filler port → PF1/2, and oil drain port → PT1/4.
When mounting on the ceiling or on the wall, an oil drain port can be added to the position shown in the figure below as a custom order.

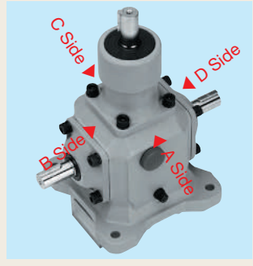
■ Standard specifications



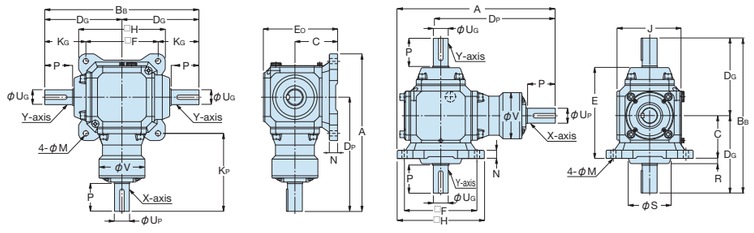
■ Oil drain port added (estimated separately)

● Oil plug drain port PT1/4 can be added at the marked location. Please make the request when asking for a quote.





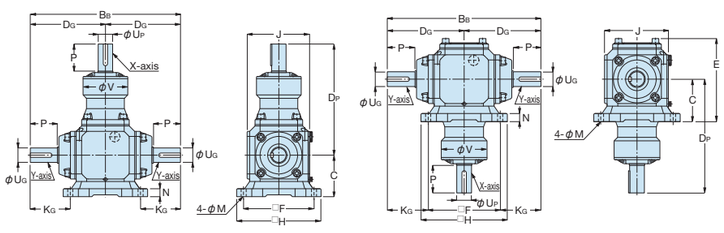
* The side with the standard oil plug is the A side, and B, C and D are displayed clockwise when viewed from above.



Catalog Number	Speed ratio	A	B_B	C	D_P	D_G	E	E_O	F	H	J	K_P	K_G	ϕM	N	P	R	ϕS
CBX-191T□	1:1	257	232	76	180	116	146	129	125	154	109	117.5	53.5	10.5	17	38	—	—
CBX-192T□	1:2																	
CBX-251T□	1:1	316	314	90	222	157	177.5	155	152	188	133	146	81	14	20	50	12	82.5
CBX-252T□	1:2																	
CBX-321T□	1:1	340	336	100	242	168	192.5	174	160	196	151	162	88	14	20	55	9	88.5
CBX-322T□	1:2																	
CBX-401T□	1:1	425	416	115	308	208	225	200	195	234	173	210.5	110.5	14	22	75	14	114.5
CBX-402T□	1:2																	

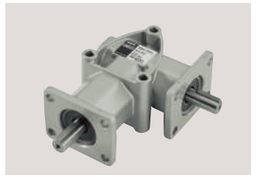
When placing an order, select the model code (A to H) from the Shaft Arrangement Table on Page 456 in the □ at the end of the catalog number.

* As this product is assembled according to customer specifications, delivery will be made about 10 days after an order is received. Please be aware of this when ordering.

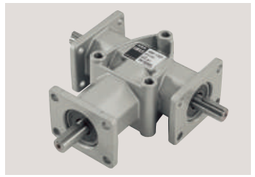


ϕV	X-axis diameter ϕU_P	Y-axis diameter ϕU_G	Key	Angular Backlash	Weight (kg)	Catalog Number
66	19	19	6 x 6 x 27ℓ	11′~30′	10.0	**CBX-191T**□
	18			17′~47′		**CBX-192T**□
92	25	25	8 x 7 x 40ℓ	9′~22′	18.0	**CBX-251T**□
				15′~36′		**CBX-252T**□
100	32	32	10 x 8 x 50ℓ	9′~21′	23.0	**CBX-321T**□
				15′~36′		**CBX-322T**□
124	40	40	12 x 8 x 60ℓ	8′~20′	34.0	**CBX-401T**□
				15′~37′		**CBX-402T**□

■ Selection Guide



KBX-L



KBX-T

Items required for selection

Load torque, prime mover type, input rotation speed, speed ratio, operating time, connection method, frequency of start/stop

Selection Procedure

The performance table in the catalog is where the load is uniform, the prime mover is a motor and the operating time is 10 hours/day.

A) When using under other conditions, correct the load torque according to the Service Factors in <Table 1>.

Corrected load torque = Load torque applied to the gear box × Service factor <See Table 1>

Service Factor (Sf) <Table 1>

Load State	Service Factor (Sf)		
	Operation of 3H or less / day	Operation of 3~10H / day	Operation of 10H or more / day
Uniform load	1 (1)	1 (1.25)	1.25 (1.50)
Light impact load	1 (1.25)	1.25 (1.50)	1.50 (1.75)
Severe impact load	1.25 (1.50)	1.50 (1.75)	1.75 (2.00)

(Note) 1. If the frequency of start/stop is 10 times or more per hour, the coefficient in parentheses will be used.
2. For a prime mover other than electric motor is used (engine, etc.), the coefficient in parentheses will also be used.

Make sure that the corrected load torque is smaller than the X/Y-axis allowable torque or the Y-axis allowable torque in the performance table at the operating rotation speed.

B) For the shaft arrangement, select from the Shaft Arrangement Diagram of respective model.

C) Confirming the overhang load (O.H.L.)
Overhang load (O.H.L.) is a suspended load acting on the shaft. The O.H.L. must be considered if a chain, belt, gear or the like is used to connect the gear box shaft and mating machine.

$$\text{O.H.L.} = \frac{T_{LE} \times K_1 \times K_2}{R} \text{ (N) \{kgf\}}$$

T_{LE} : Corrected load torque (N·m) {kgf·m} applied to the gear box shaft
R : Pitch circle radius (m) of a sprocket, pulley, gear or the like attached to the gear box shaft
K_1 : Coefficient by connection method <See Table 2>
K_2 : Coefficient by load position <See Table 3>
* Make sure that the O.H.L. calculated using the above formula is smaller than the allowable O.H.L. for the X-axis and Y-axis shown in the performance table.

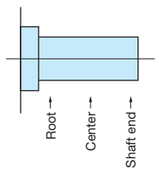
Coefficient K_1 <Table 2>

Connection method	K_1
Chain, timing belt	1.00
Gear	1.25
V-belt	1.50

Coefficient K_2 <Table 3>

Load position	K_2
Shaft root	0.75
Shaft center	1.00
Shaft end	1.50

● Load position



D) Select a model that satisfies all of A), B) and C) obtained using the above formula.

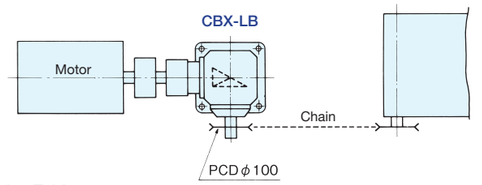
■ Selection Example

CBX-L

CBX-T

Selection example 1

Application / Conveyor (uniform load)
Load torque / 78.4N·m {8kgf·m}
X-axis rotation speed / 300rpm
Speed ratio / 1:2
Shaft arrangement / As shown in the diagram on the right
Operating time / 12 hours/day
Connection method / X-axis - Coupling
Y-axis - Chain (located in the center of the shaft)
Installation method / Horizontal mounting
Installation location / Indoors



① Considering the torque

The service factor based on the load status is Sf = 1.25 as shown in <Table 1>.
Therefore, the corrected load torque applied to the Y-axis is:
T_{LE} = 78.4×1.25 = 98N·m {T_{LE} = 8×1.25 = 10kgf·m}.

② Considering the O.H.L.

The load O.H.L. of Y-axis is:

$$\text{O.H.L.} = \frac{T_{LE} \times K_1 \times K_2}{R} = \frac{98 \times 1 \times 1}{\frac{100}{2 \times 1000}} = 1960\text{N} \quad \{\text{O.H.L.} = \frac{T_{LE} \times K_1 \times K_2}{R} = \frac{10 \times 1 \times 1}{\frac{100}{2 \times 1000}} = 200\text{kgf}\}$$

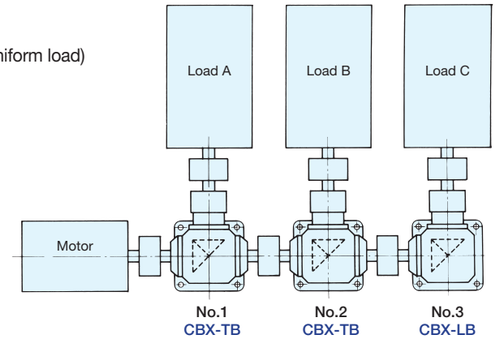
③ Determining the model

A model that satisfies all the conditions, torque and O.H.L. is **CBX-322LB**.

Selection example 2

Application / Line shaft drive
Load torque / Load A, B, and C are 58.8N·m {6kgf·m} respectively (uniform load)
Rotation speed / 600rpm
Speed ratio / 1:1
Shaft arrangement / As shown in the diagram on the right
Operating time / 8 hours/day
Connection method / All coupling
Installation method / Horizontal mounting
Installation location / Indoors

For line shaft drive, the load applied to the Y-axis differs depending on the position of the gear box, so it is necessary to select each separately. The Service Factors <Table 1> based on the conditions are all Sf = 1.0.



① Gearboxes No.1

The corrected load torque applied to the X-axis drives only load A.
Therefore, 58.8 × 1.0 = 58.8 N·m {6 × 1.0 = 6 kgf·m}
The corrected load torque applied to the Y-axis drives loads A, B and C.
Therefore, (58.8 + 58.8 + 58.8) × 1.0 = 176.4 N·m
{(6 + 6 + 6) × 1.0 = 18kgf·m}
Based on the performance table, **CBX-401TB** is selected.

② Gearboxes No.2

The corrected load torque applied to the X-axis drives only load B.
Therefore, 58.8 × 1.0 = 58.8 N·m {6 × 1.0 = 6 kgf·m}
The corrected load torque applied to the Y-axis drives loads B and C.
Therefore, (58.8 + 58.8) × 1.0 = 117.6N·m
{(6 + 6) × 1.0 = 12kgf·m}
Based on the performance table, **CBX-321TB** is selected.

③ Gearboxes No.3

The corrected load torque applied to the X-axis drives only load C.
Therefore, 58.8 × 1.0 = 58.8 N·m {6 × 1.0 = 6 kgf·m}
The corrected load torque applied to the Y-axis drives only load C.
Therefore, 58.8 × 1.0 = 58.8 N·m {6 × 1.0 = 6 kgf·m}
Based on the performance table, **CBX-251LB** is selected.

④ Determining the model

No.1 Gear Box **CBX-401TB**
No.2 Gear Box **CBX-321TB**
No.3 Gear Box **CBX-251LB**

Moment of Inertia of KBX Bevel Box

Unit: kg·m²

Model	Item	Pinion Axis (X)	Gear Axis (Y)
L	KBX-101L	4.45×10^{-6}	4.45×10^{-6}
	KBX-102L	2.16×10^{-6}	8.65×10^{-6}
	KBX-151L	5.30×10^{-5}	5.30×10^{-5}
	KBX-152L	3.65×10^{-5}	1.47×10^{-4}
	KBX-201L	1.79×10^{-4}	1.79×10^{-4}
	KBX-202L	7.85×10^{-5}	3.15×10^{-4}
T	KBX-101T	4.75×10^{-6}	4.75×10^{-6}
	KBX-102T	2.23×10^{-6}	8.93×10^{-6}
	KBX-151T	5.60×10^{-5}	5.60×10^{-5}
	KBX-152T	3.37×10^{-5}	1.50×10^{-4}
	KBX-201T	1.94×10^{-4}	1.94×10^{-4}
	KBX-202T	8.20×10^{-5}	3.28×10^{-4}

[NOTES] Consider the indicated moment of inertia as reference values.

Moment of Inertia of CBX Bevel Box

Unit: kg·m²

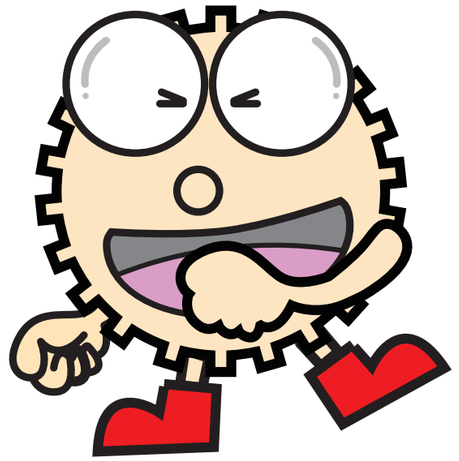
Model	Item	Pinion Axis (X)	Gear Axis (Y)
L	CBX-191L	4.00×10^{-4}	4.00×10^{-4}
	CBX-192L	1.86×10^{-4}	7.43×10^{-4}
	CBX-251L	2.48×10^{-3}	2.48×10^{-3}
	CBX-252L	1.03×10^{-3}	4.13×10^{-3}
	CBX-321L	4.00×10^{-3}	4.00×10^{-3}
	CBX-322L	1.29×10^{-3}	5.18×10^{-3}
	CBX-401L	8.95×10^{-3}	8.95×10^{-3}
	CBX-402L	3.83×10^{-3}	1.53×10^{-2}
T	CBX-191T	4.05×10^{-4}	4.05×10^{-4}
	CBX-192T	1.87×10^{-4}	7.48×10^{-4}
	CBX-251T	2.50×10^{-3}	2.50×10^{-3}
	CBX-252T	1.04×10^{-3}	4.15×10^{-3}
	CBX-321T	4.08×10^{-3}	4.08×10^{-3}
	CBX-322T	1.31×10^{-3}	5.25×10^{-3}
	CBX-401T	9.20×10^{-3}	9.20×10^{-3}
	CBX-402T	3.88×10^{-3}	1.55×10^{-2}

[NOTES] Consider the indicated moment of inertia as reference values.

Other Products

SRT/SRT-C Ratchets & Pawls — J — Material: S45C — P2.09~12.57 — Page 464
SRTB/SRT-C Ratchets & Pawls — M — Material: S45C — P2.09~12.57 — Page 466
GC/GC-I Gear Couplings — J — Material: S45C — m2, 2.5 — Page 468
SV/SVI Involute Spline Shafts, Spline Bushings — Material: S45C — m1.667 — Page 470
GCU Gear Assembly Kit — Material: - — Page 472
DLS Rack & Pinion Lubrication System — M — Material: - — Page 474
Racks & Pinions Aluminum Frame Transport Device — Material: - — Page 30

M 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) Other Products

S V 20 - 200

- 200: Total Length (200mm)
- 20: Outer diameter (20mm)
- V: Type (Involute Spline Shafts)
- S: Material (S45C)

Material	
S	S45C

Type	
RT	Ratchets
GC	Gear Couplings
V	Involute Spline