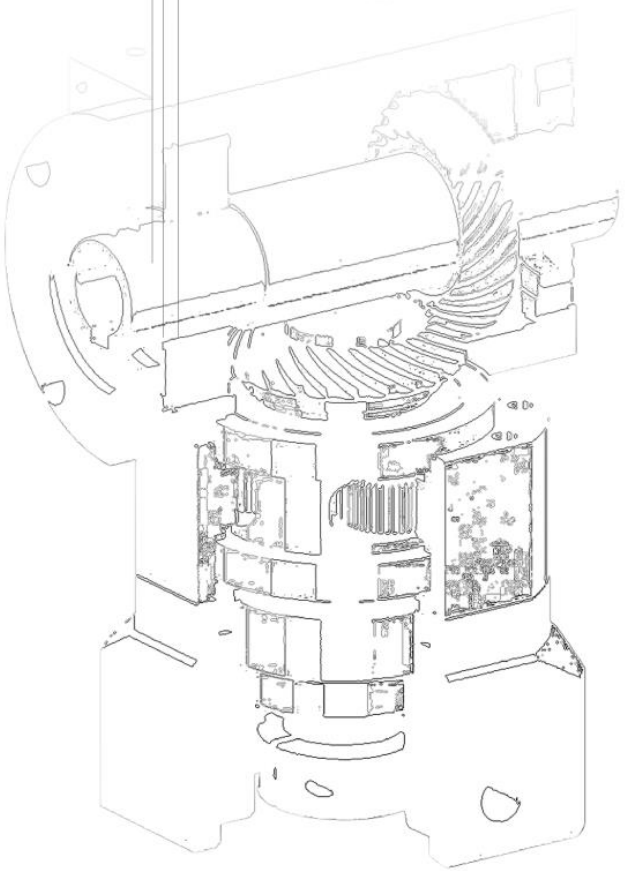
KOJIN PRECISION

For Servomotor of Planetary Gear Reducer



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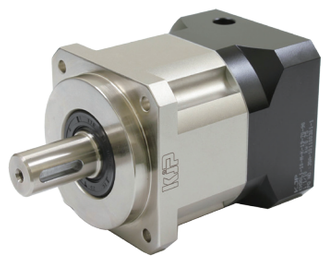
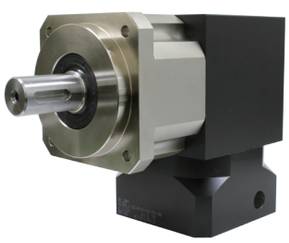




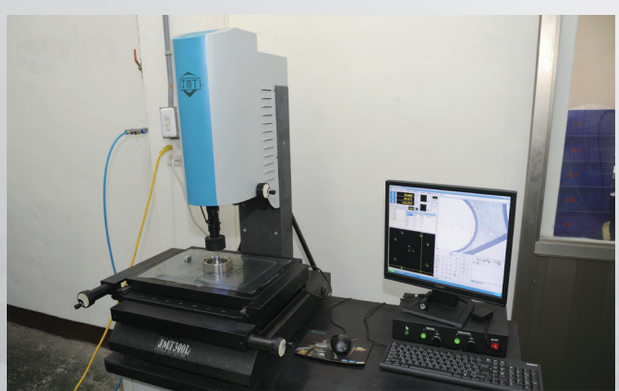
KHT–S1 KHT–S2 KHT–H

Introduction

KOJIN PRECISION INDUSTRIAL CO., LTD.

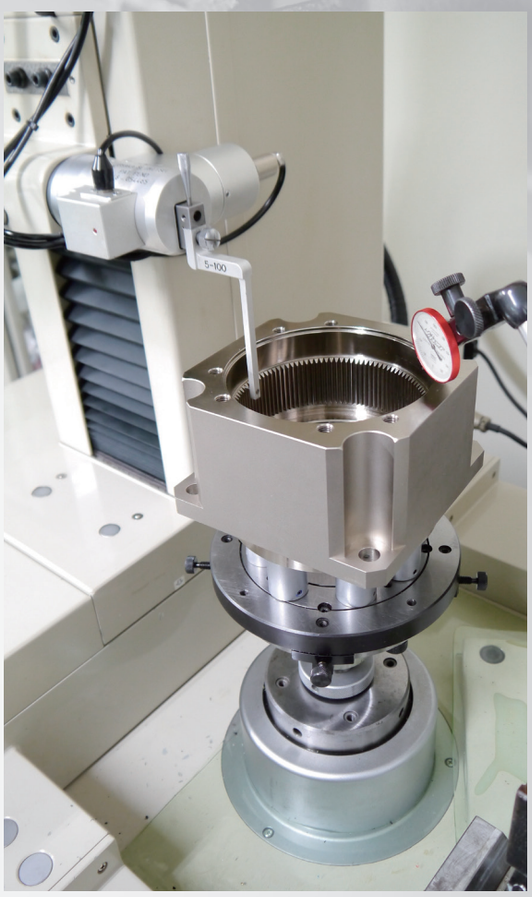
Accumulated 20 years' experience of producing ODM planetary reducer, KJP brand had been set up.

Now Kojin have our own strong R&D team for the continuous innovation and improvement of products.

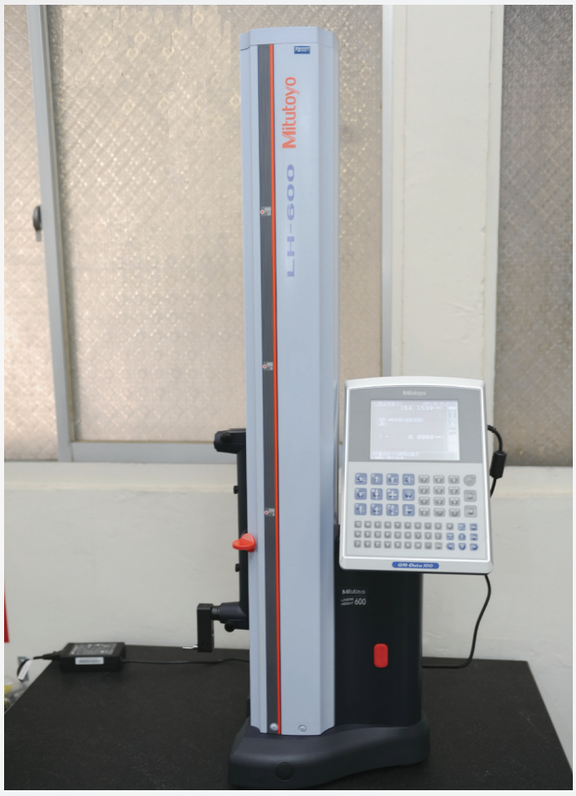


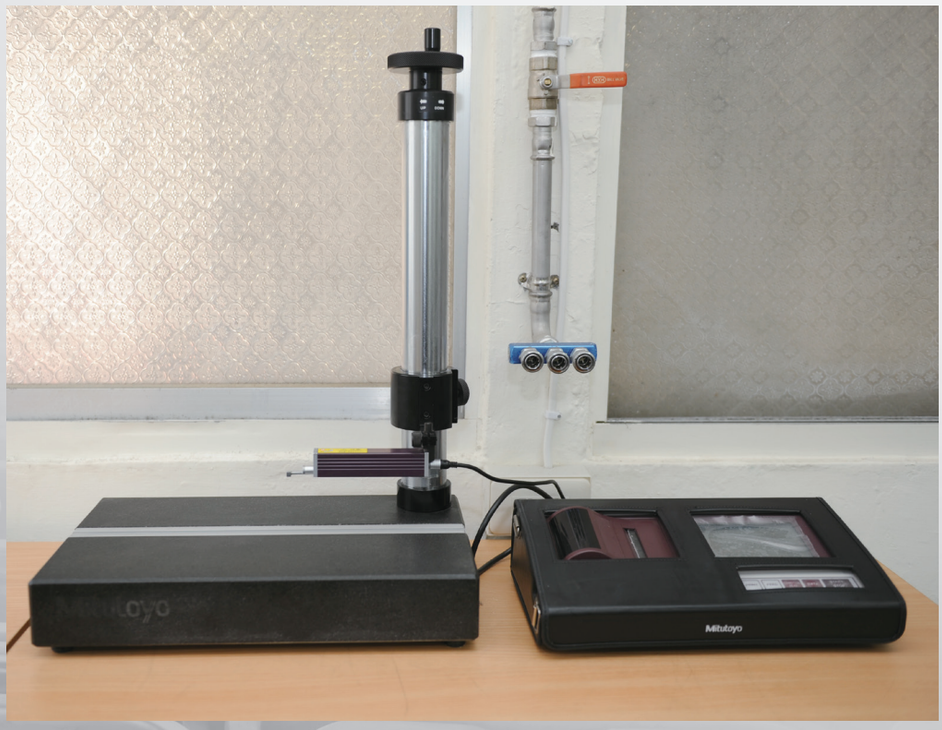
Kojin passed ISO-9000 certification in 2008, at the same year, released high precise planetary gear reducers with backlash in 3' Arcmin and got the positive feedback from market.

For providing the more stable and high quality products, we have purchased various processing & inspection equipment.



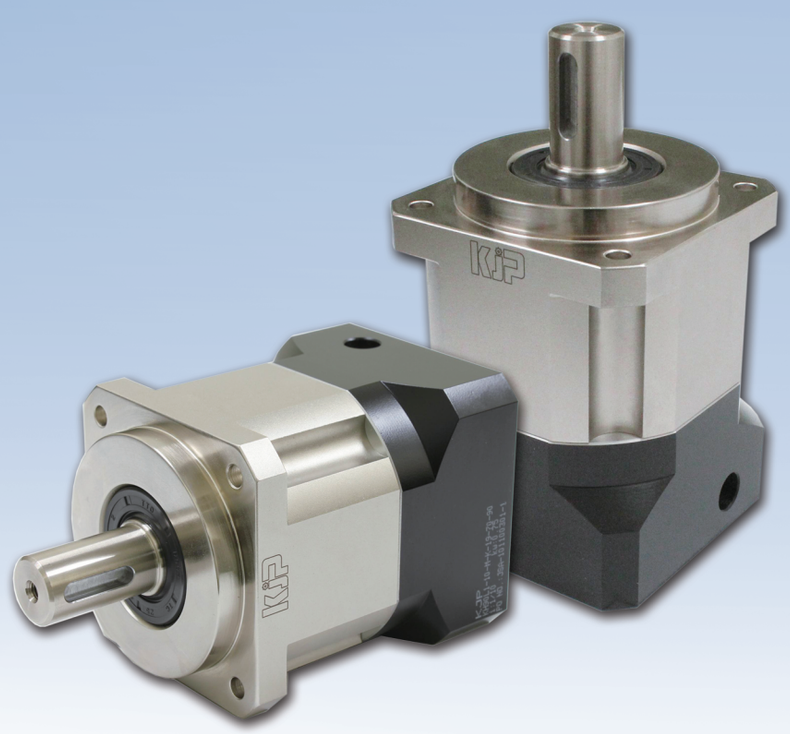
Introduction





KH Series

High Precision & Low Backlash Planetary Gearboxes.



KH

High Precision Planetary Gear Reducers

/ Application & Components Features

Application

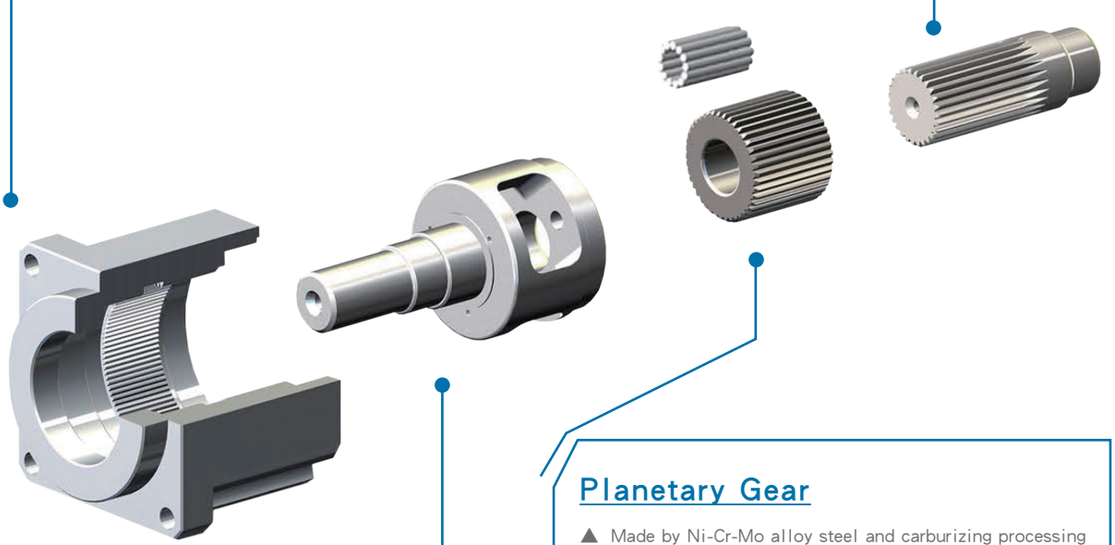
KH series can be applied to precision positioning or reciprocating motion device and can output stably to automated equipment which is operating in minimum vibratility. Such as printing industry, pipe bender, spring machine industry, LCD inspection equipment, connected ball screw transmission mechanism... and so on.

Gearbox

- ▲ With Cr-Mo alloy steel and integrated design for internal gear to make sure the high precision and large output torque.
- ▲ Gearbox surface with electroless plating for corrosion resistance.

Sun Gear

- ▲ Made by Ni-Cr-Mo alloy steel and carburizing process on surface for the high abrasion and impact resistance.
- ▲ Tooth skiving to enhance gear precision and to lower noise.



Planetary Gear

- ▲ Made by Ni-Cr-Mo alloy steel and carburizing processing on surface for the high abrasion and impact resistance.
- ▲ Tooth skiving to enhance gear precision and to lower noise.
- ▲ Needle roller without cage internal the gear for higher abrasion resistance and strength.

Output Shaft

- ▲ Integrated design and structure rigidity to ensure large torque output.
- ▲ Surface by electroless plating to higher anti-rust.

Input Shaft

- ▲ Modular design can apply to various type of servomotors.
- ▲ Shaft surface with blacken process.

Connecting Flange

- ▲ Modular design can apply to various type of servomotors.
- ▲ Sandblasting or higher-grade painting on surface to improve the antioxidant capacity.

KH

High Precision Planetary Gear Reducers

/ Selection Reference Table

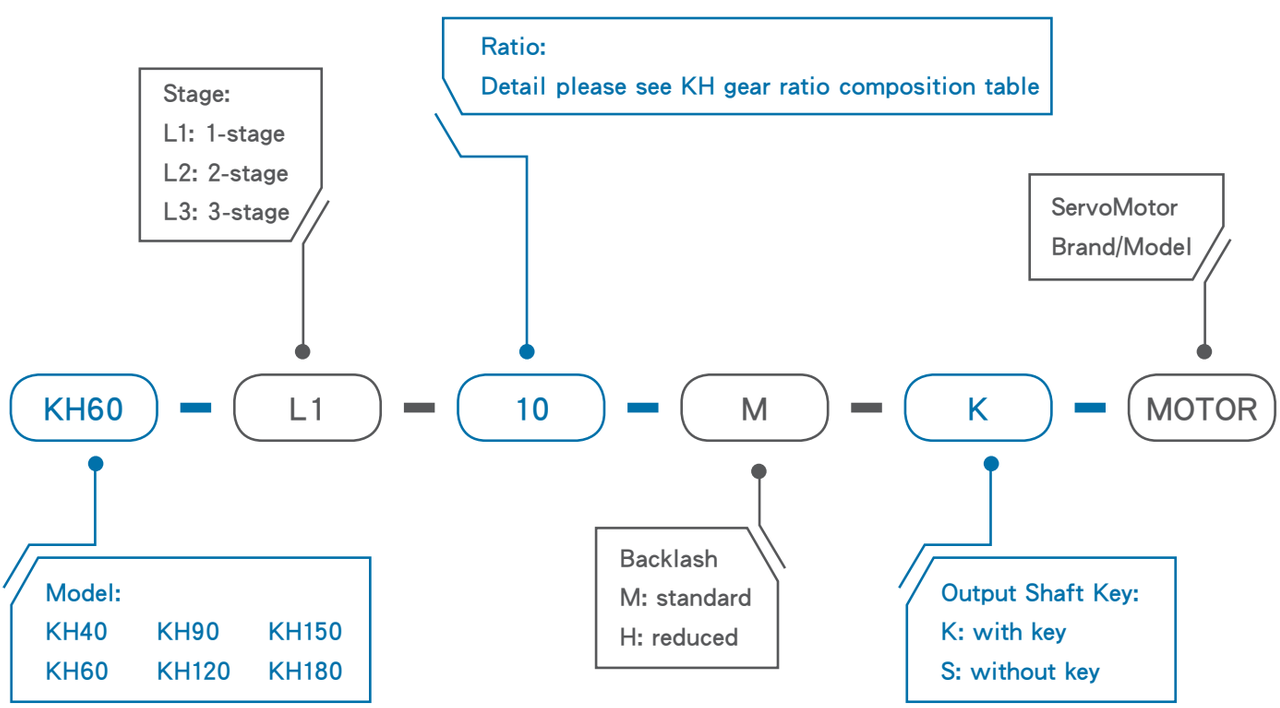
KH Selection Reference Table

Motor Output Power	Model	Ratio																			
		1/3	1/4	1/5	1/6	1/7	1/8	1/9	1/10	1/15	1/20	1/25	1/30	1/35	1/40	1/50	1/60	1/70	1/80	1/90	1/100
50W	KH40	●	●	●	●	●	●		●	●	●	●	●	●	●	●					
100W	KH40	●	●	●	●	●	●		●												
	KH60	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●
200W	KH60	●	●	●	●	●		●	●	●	●	●	●	●	●	●					
	KH90	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
400W	KH60	●	●	●	●	●		●	●	●	●	●	●	●							
	KH90	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
500W	KH90	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
	KH120	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●
750W	KH90	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
	KH120	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●				
1KW	KH120	●	●	●	●	●		●	●	●	●	●	●	●	●	●					
	KH150	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●			●
1.5KW	KH120	●	●	●	●	●		●	●	●	●	●	●	●							
	KH150	●	●	●		●			●	●	●	●	●	●	●	●					
	KH180	●	●	●		●			●	●	●	●	●	●	●	●		●			●
2.0KW	KH150	●	●	●		●			●	●	●	●	●	●	●	●					
	KH180	●	●	●	●	●			●	●	●	●	●	●	●	●		●			●
3.5KW	KH150	●	●	●		●			●	●	●	●	●								
	KH180	●	●	●	●	●			●	●	●	●	●	●	●	●					
5.0KW	KH150	●	●	●		●			●	●	●										
	KH180	●	●	●	●	●			●	●	●	●	●	●	●						
7.0KW	KH150	●	●	●					●												
	KH180	●	●	●		●			●	●	●										
11.0KW	KH180	●	●	●		●			●												

Note :

1. According to motor output power, selecting the suitable reducer models with '●' mark.
2. When applied to bigger torque or torsional rigidity mechanism, larger size of reducer must be used.
3. Please contact our engineers for ratios not being listed in above table.

Reducer Model(KH)



KH

High Precision Planetary Gear Reducers

/ Ratio Composition Table
/ Reducer Monment of Inertia Table

KH Ratio Composition Table

	Ratios Table for Every Stage		
Model	Ratio of 1 Stage (L1)	Ratio of 2 Stages (L2)	Ratio of 3 Stages (L3)
KH40	3，4，5，6，7，8，10	15，20，25，30，35，40，50	
KH60	3，4，5，6，7，9，10	12，15，16，20，21，25，28，30，35，40，45，50， 60，70，90，100	120，150，200，250，300，350，400，450， 500，600，700，900，1000
KH90	3，4，5，6，7，8，9，10	12，15，16，20，21，25，28，30，35，40，45，50， 60，70，80，90，100	120，150，200，250，300，350，400，450， 500，600，700，800，900，1000
KH120	3，4，5，6，7，8，9，10	12，15，16，20，21，25，28，30，35，40，45，50， 60，70，80，90，100	120，150，200，250，300，350，400，450， 500，600，700，800，900，1000
KH150	3，4，5，7，10	12，15，16，20，21，25，28，30，35，40，50，70，100	120，150，200，250，300，350，400， 500，600，700，1000
KH180	3，4，5，6，7，10	12，15，16，20，21，25，28，30，35，40，50，60，70， 100	120，150，200，250，300，350，400， 500，600，700，1000

Ratio of One Stage (L1) = as listed in table (Ratio of stage 1)

Ratio of Two Stages (L2)= Ratio of Stage 1 x Ratio of Stage 2

Ratio of Three Stages (L3)= Ratio of Stage 1 x Ratio of Stage 2 x Ratio of Stage 3

Ex: (L1) 5:1= Gear Ratio is 5

Ex: (L2) 50:1= L1 Ratio 5 x L2 Gear Ratio 10= Ratio 50

Ex: (L3) 500:1= L1 Ratio 5 x L2 Gear Ratio 10 x L3 Gear Ratio 10 = Ratio 500

KH Reducer Moment of Inertia Table

	Stage	Ratio	KH40	KH60	KH90	KH120	KH150	KH180
Moment of Inertia J_1kg*cm^2	L1	3	0.02	0.12	1.05	2.38	10.76	26.48
		4	0.01	0.09	0.94	1.99	8.89	21.51
		5	0.01	0.08	0.91	1.91	8.55	20.60
		6	0.01	0.08	0.90	1.87	—	20.42
		7	0.01	0.08	0.89	1.86	8.42	20.26
		8	0.01	—	0.89	1.86	—	—
		9	—	0.08	0.89	1.84	—	—
		10	0.01	0.08	0.89	1.84	8.38	20.15
	L2	15	0.01	0.08	0.89	1.87	8.51	20.50
		20	0.01	0.08	0.89	1.87	8.51	20.50
		25	0.01	0.08	0.89	1.87	8.51	20.50
		30	0.01	0.08	0.89	1.85	8.51	20.50
		35	0.01	0.08	0.88	1.84	8.40	20.50
		40	0.01	0.08	0.88	1.83	8.37	20.13
		45	—	0.08	0.88	1.83	—	—
		50	0.01	0.08	0.88	1.83	8.37	20.13
		60	—	0.08	0.88	1.83	—	20.13
		70	—	0.08	0.88	1.83	8.37	20.13
		80	—	—	0.88	1.83	—	—
		90	—	0.08	0.88	1.83	—	—
		100	—	0.08	0.88	1.83	8.37	20.13

KH Series Technical Specifications

Specification	Unit	Stage	Ratio	KH40	KH60	KH90	KH120	KH150	KH180
Reducer Nominal Output Torque T_{2N}	Nm	L1	3	16	50	125	248	500	1，000
			4	17	43	136	286	580	1，090
			5	17	52	152	320	660	1，215
			6	16	52	145	308	—	1，060
			7	15	46	136	306	540	1，135
			8	13	—	118	240	—	—
			9	—	35	94	225	—	—
			10	13	35	94	225	460	935
		L2	15	13	50	128	210	500	1，000
			20	14	46	142	285	530	1，090
			25	13	58	158	320	660	1，215
			30	14	52	146	308	610	1，200
			35	13	48	136	306	540	1，135
			40	11	43	118	252	530	1，090
			45	—	36	98	225	—	—
			50	12	56	156	320	660	1，215
			60	—	53	148	308	—	1，060
			70	—	46	135	306	540	1，135
			80	—	—	116	—	—	—
			90	—	35	94	225	—	—
			100	—	35	94	225	460	935
Emergency Stop Torque	Nm	L1，L2	3~100	3 Times of Nominal Output Torque					
Nominal Input Speed n_{1N}	rpm	L1，L2	3~100	3，000	3，000	3，000	2，500	2，500	2，500
Max. Input Speed n_{1B}	rpm	L1，L2	3~100	6，000	6，000	6，000	5，000	5，000	5，000
Reduced Backlash H	arcmin	L1	3~10	≦5	≦3	≦3	≦3	≦3	≦3
		L2	15~100	≦8	≦5	≦5	≦5	≦5	≦5
Standard Backlash M	arcmin	L1	3~10	≦8	≦5	≦5	≦5	≦5	≦5
		L2	15~100	≦10	≦8	≦8	≦8	≦8	≦8
Torsional Rigidity	Nm/arcmin	L1，L2	3~100	2.6	7	15	28	51	142
Max. Radial Load F_{rB}	N	L1，L2	3~100	750	1，530	3，000	6，200	9，000	14，200
Max. Axial Load F_{aB}	N	L1，L2	3~100	375	765	1，500	3，100	4，500	7，100
Warranty	M	L1，L2	3~100	18 Months (Under Normal Usage)					
Average Operation Time	hr	L1，L2	3~100	20，000					
Efficiency of Full Loading η	%	L1	3~10	≧98%					
		L2	15~100	≧95%					
Net Weight	kg	L1	3~10	0.53	1.55	4.37	9.56	17.7	28.75
		L2	15~100	0.7	2	5.52	11.21	22.3	37.8
Operating Temp	℃	L1，L2	3~100	- 10℃ ～ + 90℃					
Lubrication		L1，L2	3~100	Lithium Complex Synthetic Lubrication					
Mounting Position		L1，L2	3~100	All Directions					
Degree of Protection		L1，L2	3~100	IP65					
Running Noise	dBA	L1，L2	3~100	≦65	≦65	≦65	≦68	≦68	≦70

1.Above relative specifications of each model most are measured on 5 : 1 gear ratio
2.Ratios : I = Nin / Nout
3.Backlash : Measured on 2% of nominal output torque
4.Max. Radial and Axial Load : Applied to the output shaft center, and 50% of duty time and at 100 rpm
5.Duty Cycle < 60%, Average Lifetime = List Value; Duty Cycle ≧ 60%, Average Lifetime < 50% List value
6.Noise Level : Numeric measured on idle running in 1m distance, and at nominal input speed

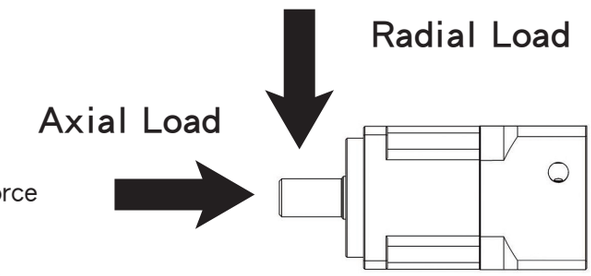
High Precision Planetary Gear Reducers

Permitted Radial Load :

The force exerts perpendicular to output shaft

Permitted Axial Load :

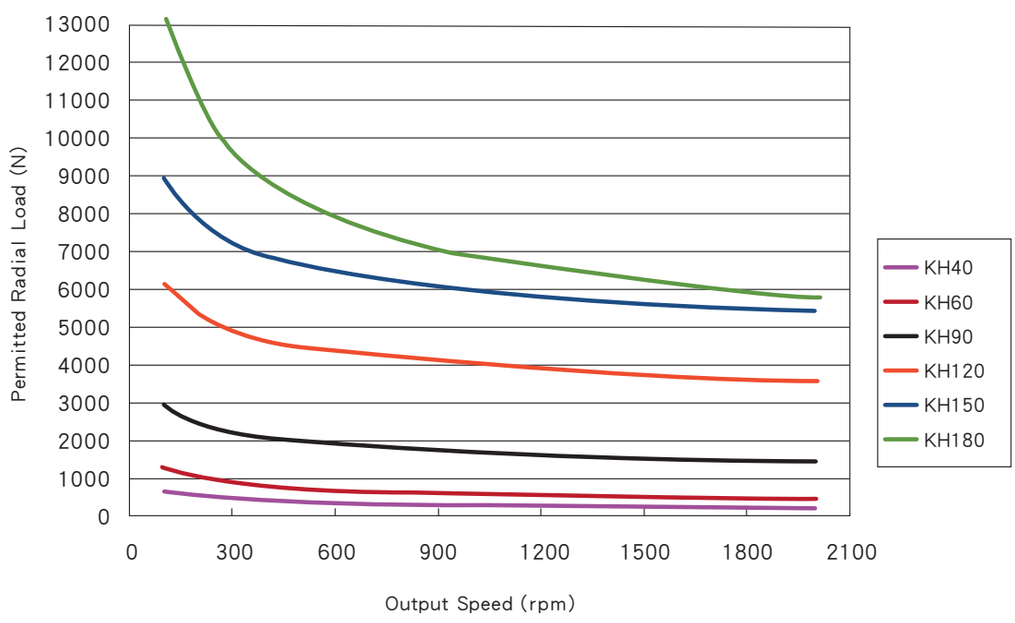
The force exerts parallel to output shaft



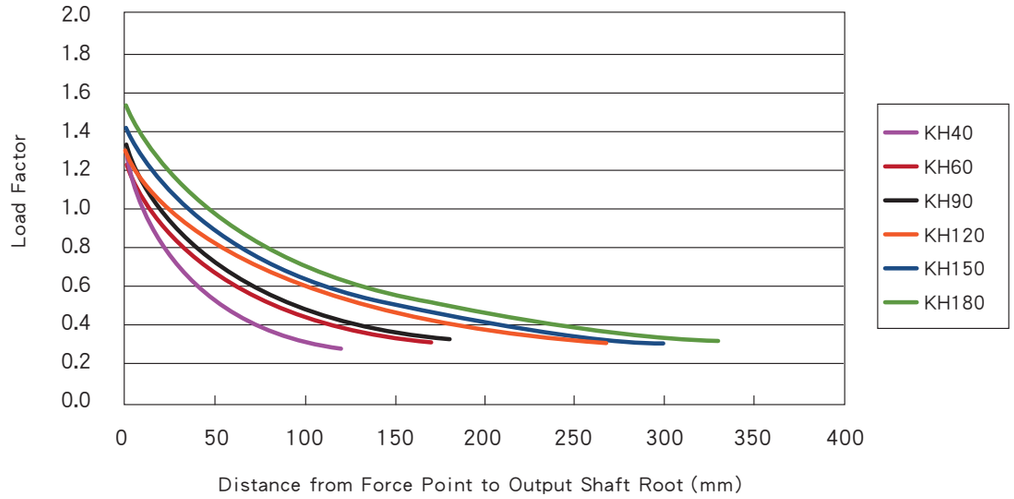
The radial/axial loads are relate to both speed and force point on output shaft.

a: if the output shaft run faster, the radial/axial loads become lower.
b: if the force point get farther from the shaft root, the radial/axial loads get lower.

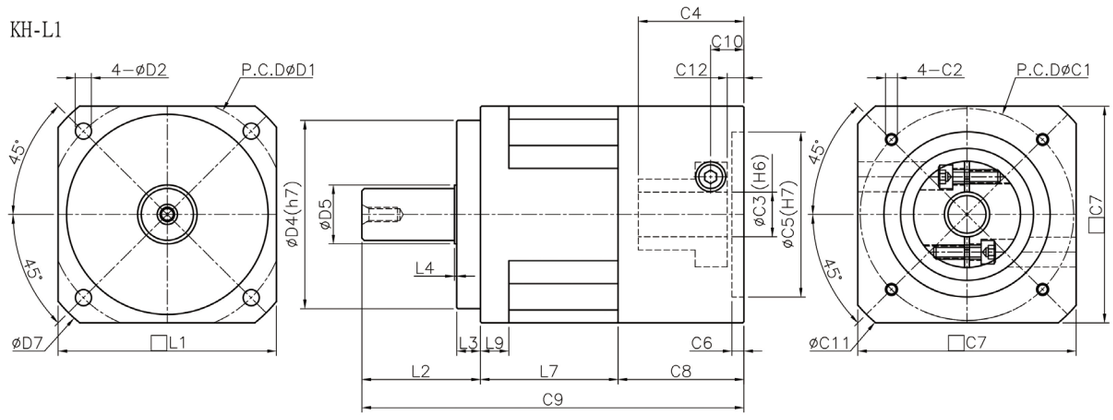
Radial Load Chart (KH)

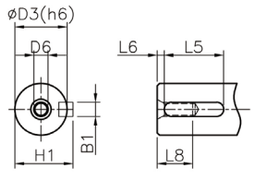


Load Factor Chart (KH)

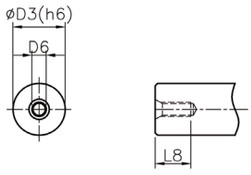


KH-L1





Shaft Option 1(K)



Shaft Option 2(S)

Symbol & Size		KH40-L1	KH60-L1	KH90-L1	KH120-L1	KH150-L1	KH180-L1
D	D1	50	70	100	130	165	215
	D2	3.5	5.5	6.8	8.7	11	13
	D3	13	16	22	32	38 (40)	50 (55)
	D4	35	50	80	110	130	160
	D5	15	18	25	35	40 (45)	60
	D6	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M12×1.75P	M12×1.75P
	D7	55	80	118	158	190	245
L	L1	42	60	92	120	142	182
	L2	25.5	35.5	50	65	86	105
	L3	5.5	7.5	10	12	15	20
	L4	0.5	1.5	1	1	3	2
	L5	15	20	25	40	45	70
	L6	2	3	5	3	5	6
	L7	33.5	49	58	69	79	85.5
	L8	8	12	15	20	32	42
	L9	7	10	12	15	12	15
C	C1	46	70	90	145	200	200
	C2	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M12x1.75P	M12X1.75P
	C3	5~8	6~14	14~19	16~24	19~42	19~42
	C4	28	33	39	65	88	85
	C5	30	50	70	110	114.3	114.3
	C6	4	4	5	7	6	10
	C7	42	60	92	122	176	182
	C8	34	39.5	49	78	97.5	100
	C9	93	124	157	212	262.5	290.5
	C10	12.5	13	15	28.5	38.5	33.5
	C11	56	80	120	161.4	230	230
	C12	7.5	7	7	20	26.5	17
B	B1	$4^{-0.01}_{-0.03}$	$5^{-0.01}_{-0.03}$	$6^{-0.01}_{-0.03}$	$10^{-0.02}_{-0.05}$	$10^{-0.02}_{-0.05}$ (12)	$14^{-0.02}_{-0.06}$ (16)
H	H1	14.5	18	24.5	35	41 (43)	53.5 (59)

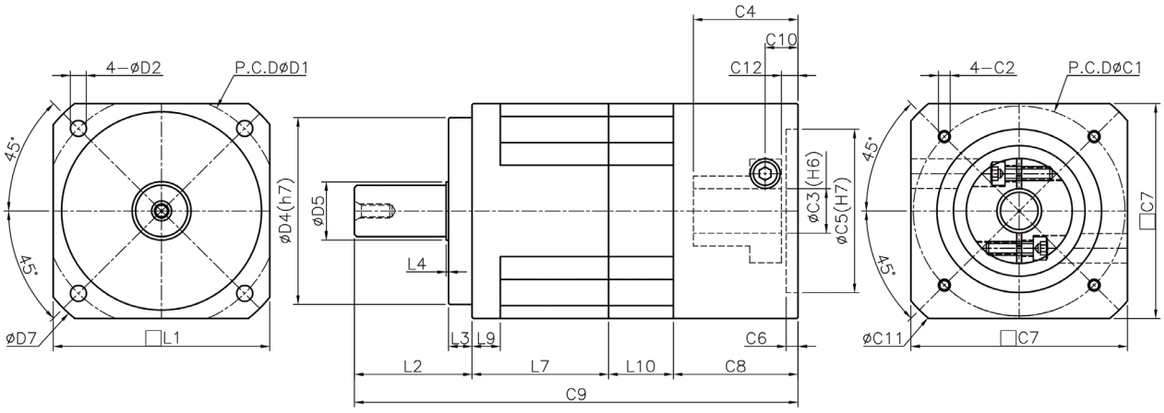
C1~C12 are standard metric motor connect flange dimensions, size may change by motor

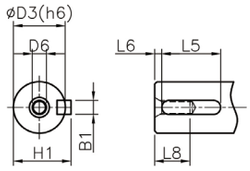
( ) Optional size for output shaft

KH

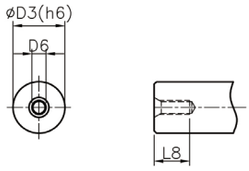
High Precision Planetary Gear Reducers

/ Drawing & Dimension





Shaft Option 1(K)



Shaft Option 2(S)

(Unit：mm)

Symbol & Size		KH40-L2	KH60-L2	KH90-L2	KH120-L2	KH150-L2	KH180-L2
D	D1	50	70	100	130	165	215
	D2	3.5	5.5	6.8	8.7	11	13
	D3	13	16	22	32	38 (40)	50 (55)
	D4	35	50	80	110	130	160
	D5	15	18	25	35	40 (45)	60
	D6	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M12×1.75P	M12×1.75P
	D7	55	80	118	158	190	245
L	L1	42	60	92	120	142	182
	L2	25.5	35.5	50	65	86	105
	L3	5.5	7.5	10	12	15	20
	L4	0.5	1.5	1	1	3	2
	L5	15	20	25	40	45	70
	L6	2	3	5	3	5	6
	L7	33.5	49	58	69	79	85.5
	L8	8	12	15	20	32	42
	L9	7	10	12	15	12	15
	L10	19	16	27.5	33.2	46	51.5
C	C1	46	70	90	145	200	200
	C2	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M12x1.75P	M12X1.75P
	C3	5~8	6~14	14~19	16~24	19~42	19~42
	C4	28	33	39	65	88	85
	C5	30	50	70	110	114.3	114.3
	C6	4	4	5	7	6	10
	C7	42	60	92	122	176	182
	C8	34	39.5	49	78	97.5	100
	C9	112	140	184.5	245.2	308.5	342
	C10	12.5	13	15	28.5	38.5	33.5
	C11	56	80	120	161.4	230	230
	C12	7.5	7	7	20	26.5	17
B	B1	4	$5^{-0.01}_{-0.03}$	$6^{-0.01}_{-0.03}$	$10^{-0.02}_{-0.05}$	$10^{-0.02}_{-0.05}$ (12)	$14^{-0.02}_{-0.06}$ (16)
H	H1	14.5	18	24.5	35	41 (43)	53.5 (59)

C1~C12 are standard metric motor connect flange dimensions, actual size may change by motor
( ) Optional size for output shaft

KX Series

Cost-Effective High Precision Planetary Gearboxes.

KX

High Precision Planetary Gearbox Reducer / Application & Components Features

Application

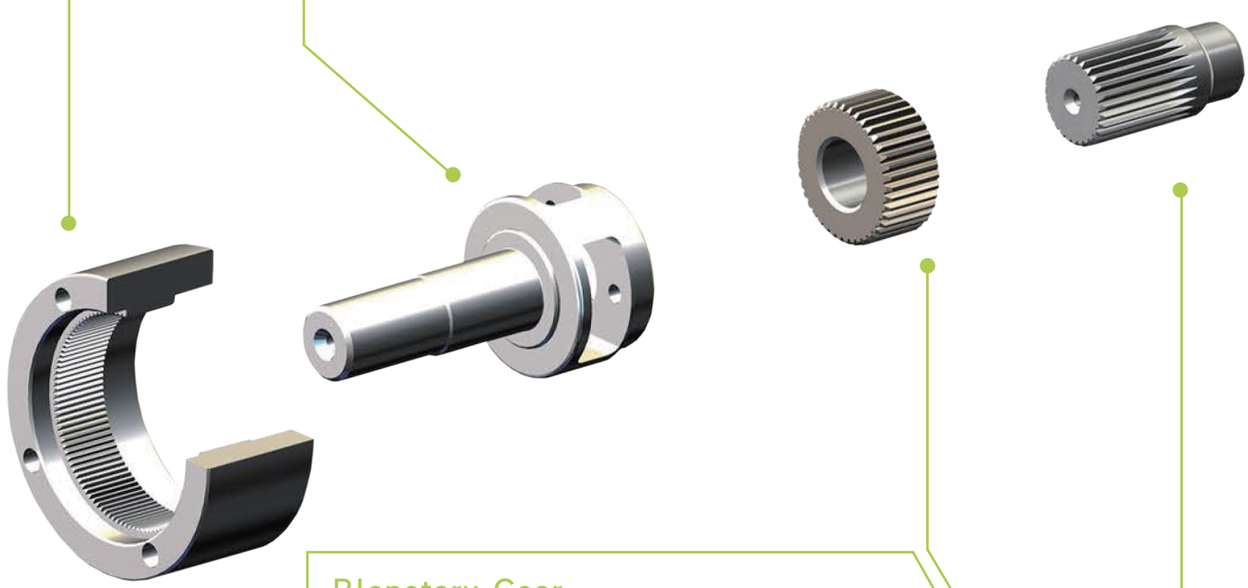
KX serial products can be applied to the automated equipment which is in precision transmission or continuously transmission.
Such as conveyer equipment, pipe bender, spring machine industry, LCD equipment... and so on.

Gearbox

- ▲ With Cr-Mo alloy steel and integrated design for internal gear to make sure the high precision and large output torque.
- ▲ With high corrosion resistance.

Output Shaft

- ▲ Integrated design and structure rigidity to ensure large torque output.



Planetary Gear

- ▲ Made by Ni-Cr-Mo alloy steel and carburizing process on surface for the high abrasion resistance.

Sun Gear

- ▲ Made by Ni-Cr-Mo alloy steel and carburizing process on surface for the high abrasion and impact resistance.
- ▲ Tooth skiving to enhance gear precision and to lower noise.

Input Shaft

- ▲ Modular design can apply to various type of servomotors.
- ▲ Shaft surface with blacken process.

Connecting Flange

- ▲ Modular design can apply to various type of servomotors.
- ▲ Sandblasting or higher-grade painting on surface to improve the antioxidant capacity.

KX

High Precision Planetary Gearbox Reducer

/ Selection Reference Table

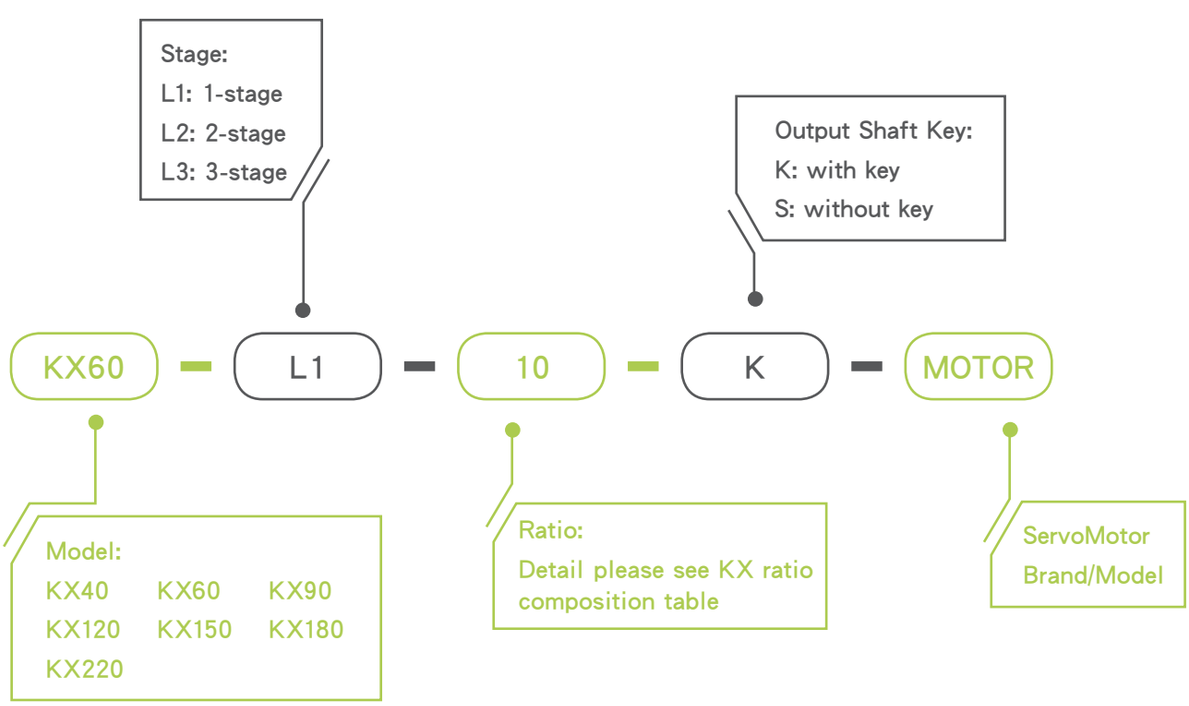
KX Selection Reference Table

Motor Output Power	Model	Ratio																
		1/3	1/4	1/5	1/6	1/7	1/8	1/10	1/15	1/20	1/25	1/30	1/35	1/40	1/50	1/60	1/70	1/100
50W	KX40	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
100W	KX40	●	●	●	●	●	●	●	●	●	●	●						
	KX60	●	●	●		●		●	●	●	●	●	●	●	●		●	●
200W	KX60	●	●	●		●		●	●	●	●	●	●	●	●			
	KX90	●	●	●		●		●	●	●	●	●	●	●	●		●	●
400W	KX60	●	●	●		●		●	●	●	●	●	●					
	KX90	●	●	●		●		●	●	●	●	●	●	●	●		●	
500W	KX90	●	●	●		●		●	●	●	●	●	●	●				
	KX120	●	●	●		●		●	●	●	●	●	●	●	●		●	●
750W	KX90	●	●	●		●		●	●	●	●							
	KX120	●	●	●		●		●	●	●	●	●	●	●	●			
1.0KW	KX120	●	●	●		●		●	●	●	●	●	●	●	●			
	KX150	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●
1.5KW	KX120	●	●	●		●		●	●	●	●	●	●					
	KX150	●	●	●	●	●		●	●	●	●	●	●	●	●	●		
2.0KW	KX150	●	●	●	●	●		●	●	●	●	●	●	●	●			
	KX180	●	●	●	●	●		●	●	●	●	●	●	●	●		●	●
3.5KW	KX150	●	●	●	●	●		●	●	●	●	●						
	KX180	●	●	●	●	●		●	●	●	●	●	●	●	●			
5.0KW	KX150	●	●	●	●	●		●	●	●								
	KX180	●	●	●	●	●		●	●	●	●	●	●	●				
7.0KW	KX180	●	●	●	●	●		●	●	●								
	KX220		●	●		●		●		●	●	●						
11.0KW	KX180	●	●	●	●	●		●										
	KX220		●	●		●		●		●								
12.0KW	KX220		●	●		●		●										
15.0KW	KX220		●	●		●		●										

Note :

1. According to motor output power, selecting the suitable reducer models with '●' mark.
2. When applied to bigger torque or torsional rigidity mechanism, larger size of reducer must be used.
3. Please contact our engineers for ratios not being listed in above table.

Reducer Model(KX)



High Precision Planetary Gearbox Reducer

/ Selection Reference Table
/ Ratios Composition Table

KX Ratio Composition Table

	Ratios Table for Every Stage		
Model	Ratio of 1 Stage (L1)	Ratio of 2 Stages (L2)	Ratio of 3 Stages (L3)
KX40	3，4，5，6，7，8，10	15，20，25，30，35，40，50	
KX60	3，4，5，7，10	12，15，16，20，21，25，28，30，35，40，50，70， 100	120，150，200，250，300，350，400，500， 700，1000
KX90	3，4，5，7，10	12，15，16，20，21，25，28，30，35，40，50，70， 100	120，150，200，250，300，350，400，500， 700，1000
KX120	3，4，5，7，10	12，15，16，20，21，25，28，30，35，40，50，70， 100	120，150，200，250，300，350，400，500， 700，1000
KX150	3，4，5，6，7，10	12，15，16，20，21，25，28，30，35，40，50，60， 70，100	120，150，200，250，300，350，400，500， 700，1000
KX180	3，4，5，6，7，10	12，15，16，20，21，25，28，30，35，40，50，60， 70，100	120，150，200，250，300，350，400，500， 700，1000
KX220	4，5，7，10	16，20，25，28，35，40，50，70，100	

Ratio of One Stage (L1) = as listed in table (Ratio of stage 1)
Ratio of Two Stages (L2)= Ratio of Stage 1 x Ratio of Stage 2
Ratio of Three Stages (L3)= Ratio of Stage 1 x Ratio of Stage 2 x Ratio of Stage 3
Ex: (L1) 5:1= Gear Ratio is 5
Ex: (L2) 50:1= L1 Ratio 5 x L2 Gear Ratio 10= Ratio 50
Ex: (L3) 500:1= L1 Ratio 5 x L2 Gear Ratio 10 x L3 Gear Ratio 10 = Ratio 500

KX Reducer Moment of Inertia Table

	Stage	Ratio	KX40	KX60	KX90	KX120	KX150	KX180	KX220
Moment of Inertia J_1kg*cm^2	L1	3	0.02	0.05	0.93	2.34	10.76	26.48	—
		4	0.01	0.05	0.93	1.95	8.89	21.51	75.08
		5	0.01	0.05	0.90	1.88	8.55	20.60	75.91
		6	0.01	—	—	—	8.47	20.42	—
		7	0.01	0.05	0.88	1.83	8.42	20.26	74.73
		8	0.01	—	—	—	—	—	—
		9	—	—	—	—	—	—	—
		10	0.01	0.05	0.88	1.82	8.38	20.15	74.85
	L2	15	0.01	0.05	0.89	1.86	8.51	20.50	—
		20	0.01	0.05	0.89	1.86	8.51	20.50	75.11
		25	0.01	0.05	0.89	1.86	8.51	20.50	75.11
		30	0.01	0.05	0.89	1.83	8.51	20.50	—
		35	0.01	0.05	0.88	1.82	8.40	20.50	80.46
		40	0.01	0.05	0.88	1.82	8.37	20.13	75.95
		45	—	—	—	—	—	—	—
		50	0.01	0.05	0.88	1.82	8.37	20.13	75.11
		60	—	—	—	—	8.37	20.42	—
		70	—	0.05	0.88	1.82	8.37	20.13	74.68
		80	—	—	—	—	—	—	—
		90	—	—	—	—	—	—	—
		100	—	0.05	0.88	1.82	8.37	20.13	74.68

KX Series Technical Specifications

Specification	Unit	Stage	Ratio	KX40	KX60	KX90	KX120	KX150	KX180	KX220
Reducer Nominal Output Torque T_{2N}	Nm	L1	3	16	50	125	235	500	1，000	—
			4	17	35	136	225	580	1，090	1，530
			5	17	42	152	256	660	1，215	1，900
			6	16	—	—	—	610	1，060	—
			7	15	46	136	235	540	1，135	1，620
			8	13	—	—	—	—	—	—
			10	13	25	94	225	460	935	1，500
		L2	15	13	35	125	210	500	1，000	—
			20	14	35	142	225	530	1，090	1，530
			25	13	42	158	256	660	1，215	1，900
			30	14	42	146	225	610	1，200	—
			35	13	42	136	235	540	1，135	1，620
			40	11	25	118	225	530	1，090	1，530
			45	—	—	—	—	—	—	—
			50	12	25	156	256	660	1，215	1，500
			60	—	—	—	—	610	1，060	—
			70	—	46	135	235	540	1，135	1，620
			80	—	—	—	—	—	—	—
			90	—	—	—	—	—	—	—
			100	—	25	94	225	460	935	1，500
Emergency Stop Torque	Nm	L1，L2	3~100	3 Times of Nominal Output Torque						
Nominal Input Speed n_{1N}	rpm	L1，L2	3~100	3，000	3，000	3，000	2，500	2，500	2，500	2，000
Max. Input Speed n_{1B}	rpm	L1，L2	3~100	6，000	6，000	6，000	5，000	5，000	5，000	4，000
Standard Backlash	arcmin	L1	3~10	≦10	≦10	≦8	≦8	≦6	≦6	≦6
		L2	15~100	≦15	≦15	≦12	≦12	≦10	≦10	≦10
Torsional Rigidity	Nm/arcmin	L1，L2	3~100	3	6	12	25	51	142	215
Max. Radial Load F_{rB}	N	L1，L2	3~100	750	1，200	2，500	5，600	9，000	14，200	24，000
Max. Axial Load F_{aB}	N	L1，L2	3~100	375	600	1，250	2，800	4，500	7，100	12，000
Warranty	M	L1，L2	3~100	18 Months (Under Normal Usage)						
Average Operation Time	hr	L1，L2	3~100	20，000						
Efficiency of Full Loading η	%	L1	3~10	≧98%						
		L2	15~100	≧95%						
Net Weight	kg	L1	3~10	0.5	1.05	2.9	7.46	15.1	26	50.3
		L2	15~100	0.69	1.34	3.75	9.44	18.9	34.33	66.1
Operating Temp	℃	L1，L2	3~100	- 10℃ ～ + 90℃						
Lubrication		L1，L2	3~100	Lithium Complex Synthetic Lubrication						
Mounting Position		L1，L2	3~100	All Directions						
Degree of Protection		L1，L2	3~100	IP65						
Running Noise	dBA	L1，L2	3~100	≦65	≦65	≦65	≦68	≦68	≦70	≦72

1.Above relative specifications of each model most are measured on 5 : 1 gear ratio

2.Ratios : I = Nin / Nout

3.Backlash : Measured on 2% of nominal output torque

4.Max. Radial and Axial Load : Applied to the output shaft center, and 50% of duty time and at 100 rpm

5.Duty Cycle < 60%, Average Lifetime = List Value; Duty Cycle ≧ 60%, Average Lifetime < 50% List value

6.Noise Level : Numeric measured on idle running in 1m distance, and at nominal input speed

High Precision Planetary Gearbox Reducer

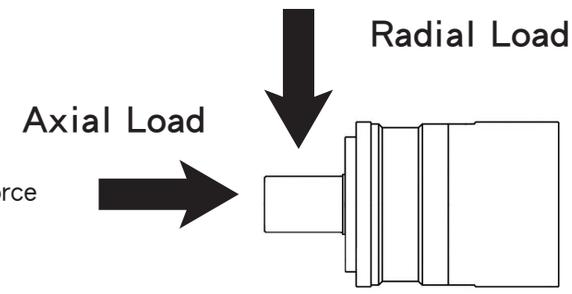
/ Permitted Radial & Axial Load Diagram

Permitted Radial Load :

The force exerts perpendicular to output shaft

Permitted Axial Load :

The force exerts parallel to output shaft

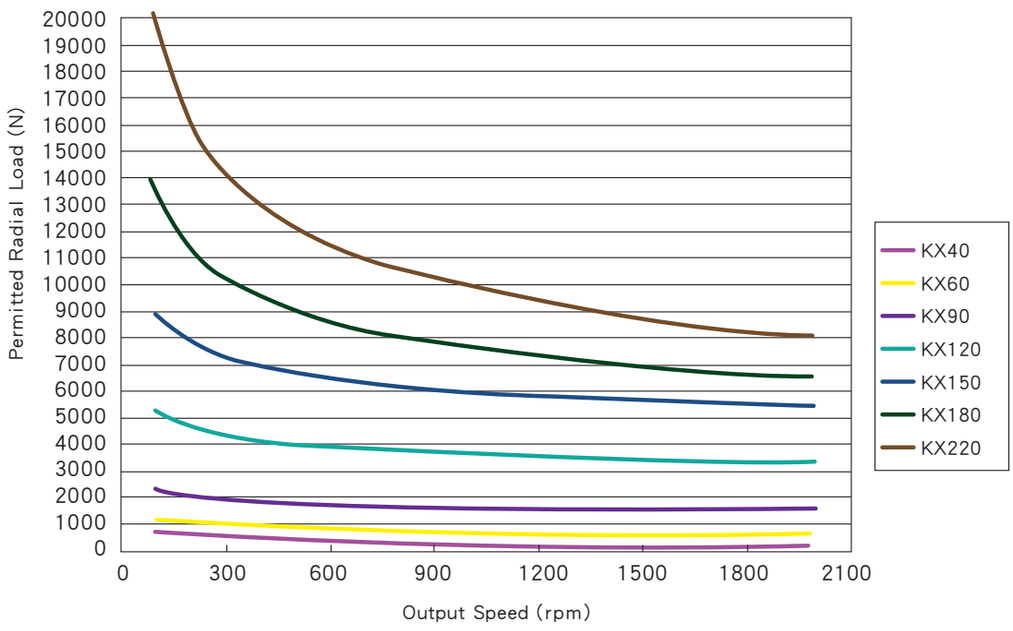


The radial/axial loads are relate to both speed and force point on output shaft.

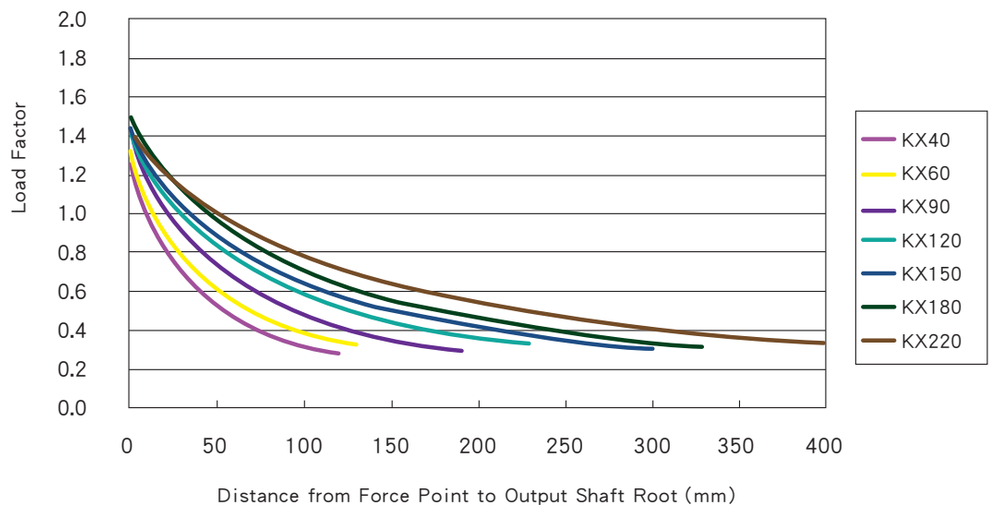
a: if the output shaft run faster, the radial/axial loads become lower.

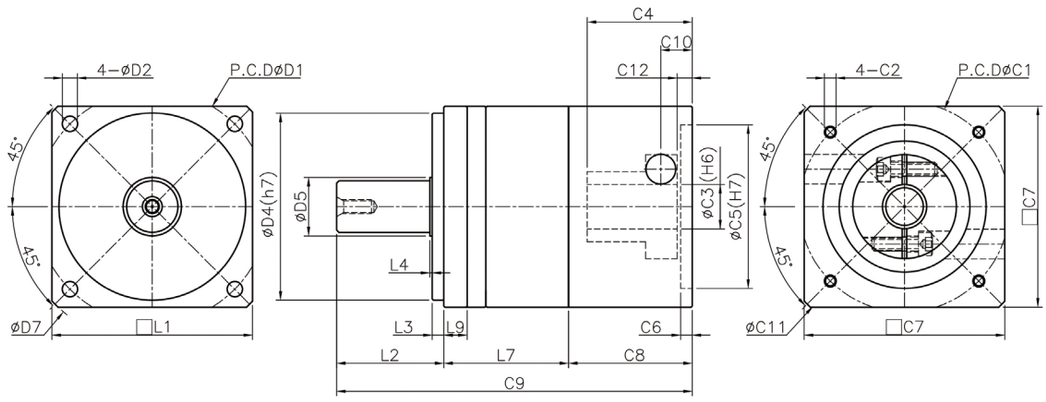
b: if the force point get farther from the shaft root, the radial/axial loads get lower.

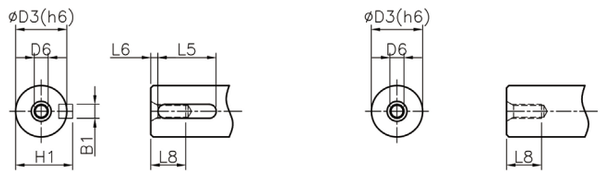
Radial Load Chart (KX)



Load Factor Chart (KX)







Shaft Option 1(K)　　Shaft Option 2(S)

(Unit : mm)

Symbol & Size		KX40-L1	KX60-L1	KX90-L1	KX120-L1	KX150-L1	KX180-L1	KX220-L1
D	D1	50	70	100	130	165	215	250
	D2	3.5	5.5	6.5	8.8	11	13	17
	D3	13	16	22	32	38 (40)	50 (55)	75
	D4	35	50	80	110	130	160	180
	D5	15	17	25	35	40 (45)	60	80
	D6	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M12×1.75P	M12×1.75P	M20×2.5P
	D7	60	80	118	160	190	245	292
L	L1	46	62	86	120	142	182	220
	L2	26	33	46	69.5	75	95	123
	L3	5.5	5	5	10	4	10	15
	L4	1	1.5	1	0.5	3	2	3
	L5	15	20	25	40	45	70	90
	L6	2	3	3	3	5	6	7
	L7	33	43	53.5	70.5	90	95.5	123.5
	L8	8	12	15	20	32	42	52
	L9	9.5	10	10	15	15	15	20
C	C1	46	70	90	145	200	200	235
	C2	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M12x1.75P	M12X1.75P	M12X1.75P
	C3	5~8	6~14	14~19	16~24	19~42	19~42	35~55
	C4	26	31	41	66	88	85	128
	C5	30	50	70	110	114.3	114.3	200
	C6	4	3.5	5	7	6	10	10
	C7	46	62	86	122.0	176	182	220
	C8	32.5	37	49.5	77	97.5	100	148
	C9	91.5	113	149	217	262.5	290.5	394.5
	C10	11	12	15	28.5	38.5	33.5	44
	C11	60	80	118	161.4	230	230	295
	C12	6	6	7	20	26.5	17	27.5
B	B1	4	5	6	10	10 (12)	14 (16)	20
H	H1	14.5	18	24.5	35	41 (43)	53.5 (59)	79.5

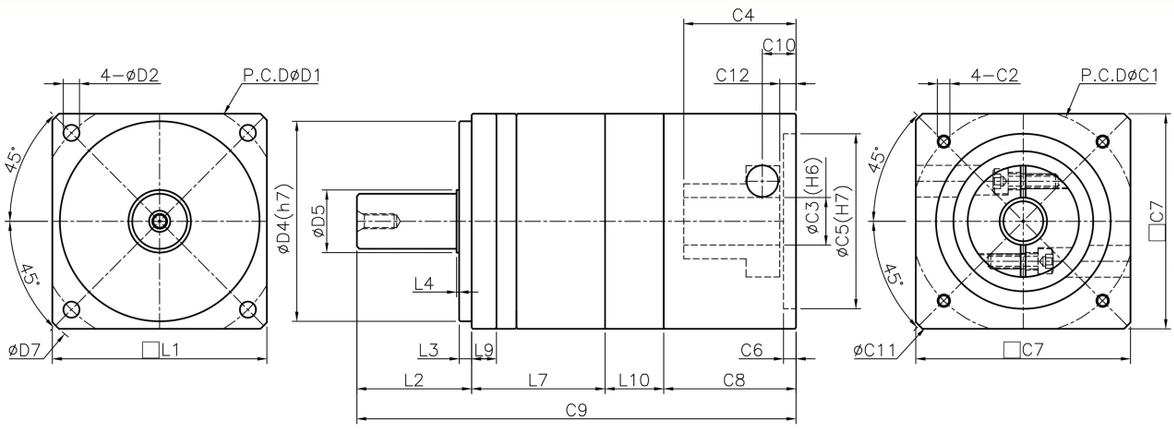
C1~C12 are standard metric motor connect flange dimensions, actual size may change by motor.

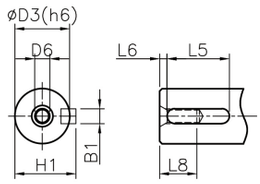
( ) Optional size for output shaft

KX

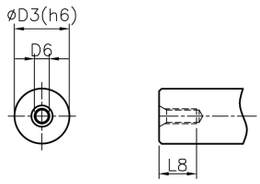
High Precision Planetary Gearbox Reducer

/ Drawing & Dimension





Shaft Option 1(K)



Shaft Option 2(S)

(Unit：mm)

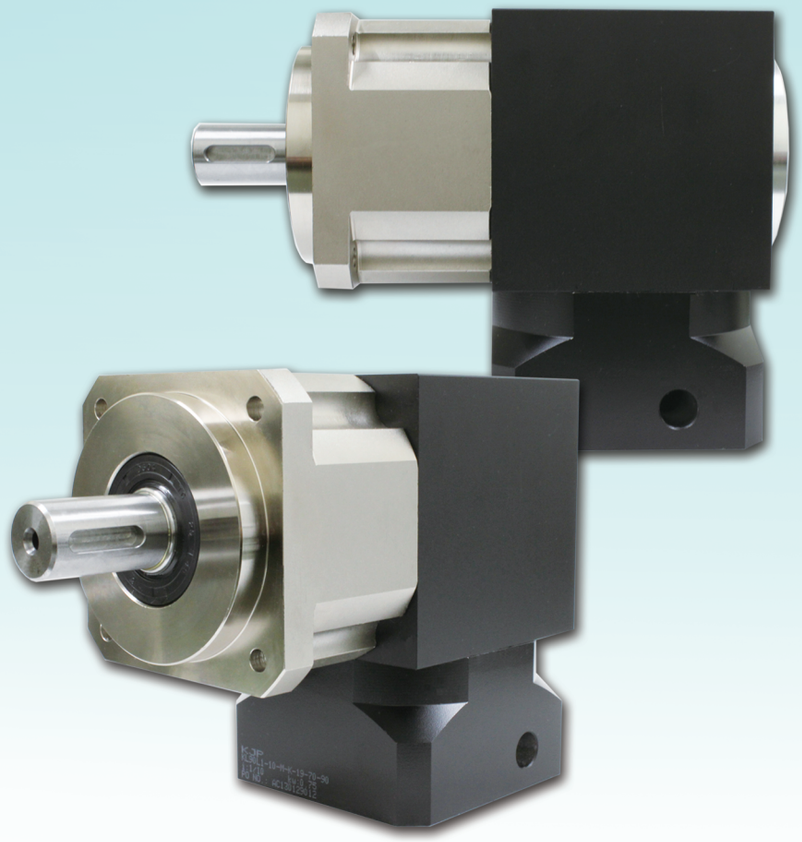
Symbol & Size		KX40-L2	KX60-L2	KX90-L2	KX120-L2	KX150-L2	KX180-L2	KX220-L2
D	D1	50	70	100	130	165	215	250
	D2	3.5	5.5	6.5	8.8	11	13	17
	D3	13	16	22	32	38 (40)	50 (55)	75
	D4	35	50	80	110	130	160	180
	D5	15	17	25	35	40 (45)	60	80
	D6	M4×0.7P	M5×0.8P	M6×1.0P	M8×1.25P	M12×1.75P	M12×1.75P	M20×2.5P
	D7	60	80	118	160	190	245	292
L	L1	46	62	86	120	142	182	220
	L2	26	33	46	69.5	75	95	123
	L3	5.5	5	5	10	4	10	15
	L4	1	1.5	1	0.5	3	2	3
	L5	15	20	25	40	45	70	90
	L6	2	3	3	3	5	6	7
	L7	33	43	53.5	70.5	90	95.5	123.5
	L8	8	12	15	20	32	42	52
	L9	9.5	10	10	15	15	15	20
	L10	19	16	23.5	27.2	46	51.5	56.5
C	C1	46	70	90	145	200	200	235
	C2	M4x0.7P	M5x0.8P	M6x1.0P	M8x1.25P	M12x1.75P	M12X1.75P	M12X1.75P
	C3	5~8	6~14	14~19	16~24	19~42	19~42	35~55
	C4	26	31	41	66	88	85	128
	C5	30	50	70	110	114.3	114.3	200
	C6	4	3.5	5	7	6	10	10
	C7	46	62	86	122.0	176	182	220
	C8	32.5	37	49.5	77	97.5	100	148
	C9	110.5	129	172.5	244.2	308.5	342	451
	C10	11	12	15	28.5	38.5	33.5	44
	C11	60	80	118	161.4	230	230	295
	C12	6	6	7	20	26.5	17	27.5
B	B1	4	5	6	10	10 (12)	14 (16)	20
H	H1	14.5	18	24.5	35	41 (43)	53.5 (59)	79.5

C1~C12 are standard metric motor connect flange dimensions, actual size may change by motor.

( ) Optional size for output shaft

KHL Series

High Precision & Low Backlash Spiral Bevel Planetary Gearboxes.



KHL

High Precision Planetary Gearbox Reducer / Application & Components Features

Application

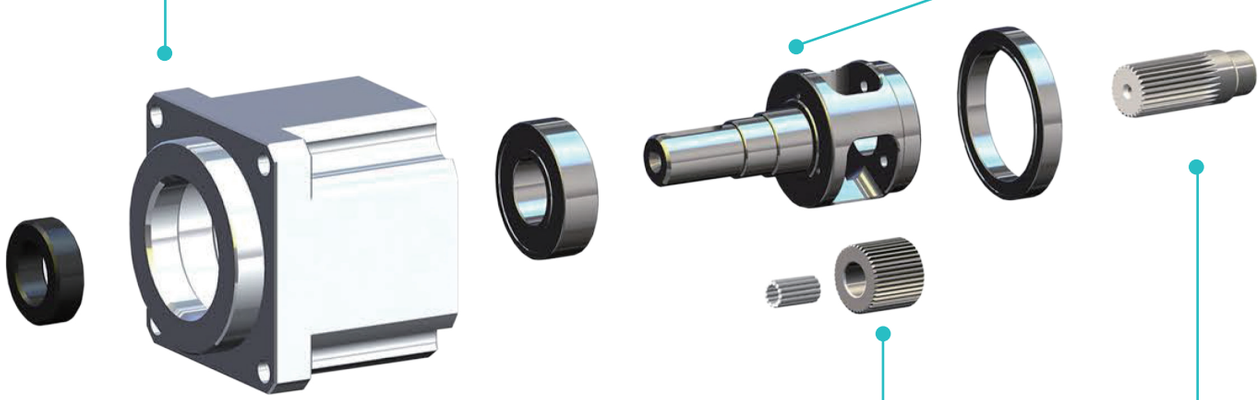
KHL series can be applied to precision positioning or reciprocating motion device and can output stably to automated equipment which is operating in minimum vibratility.
Such as printing industry, pipe bender, spring machine industry, LCD inspection equipment, connected ball screw transmission mechanism... and so on.

Gearbox

- ▲ With Cr-Mo alloy steel and integrated design for internal gear to make sure the high precision and large output torque.
- ▲ With high corrosion resistance.

Output Shaft

- ▲ Integrated design and structure rigidity to ensure large torque output.
- ▲ Surface by electroless plating to higher anti-rust.



Planetary Gear

- ▲ Made by Ni-Cr-Mo alloy steel and carburizing process on surface for the high abrasion and impact resistance.
- ▲ Tooth skiving to enhance gear precision and to lower noise.
- ▲ Needle roller without cage internal the gear for higher abrasion resistance and strength.

Sun Gear

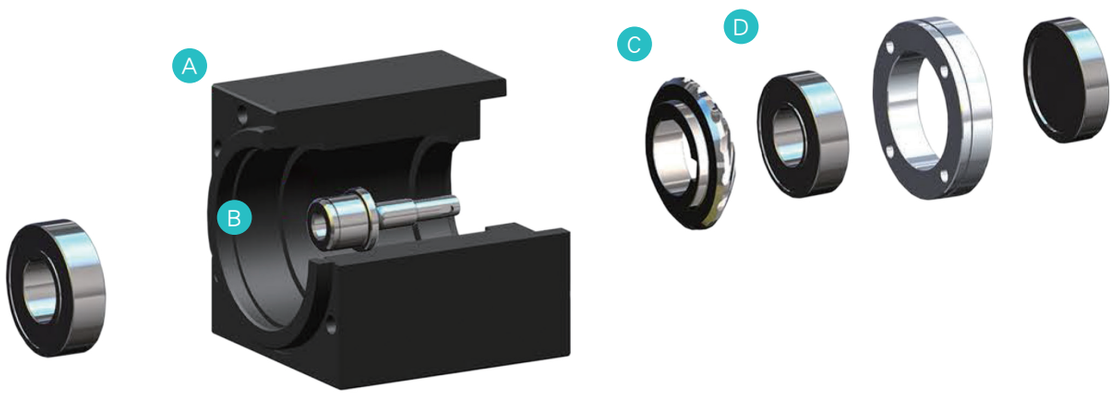
- ▲ Made by Ni-Cr-Mo alloy steel and carburizing process on surface for the high abrasion and impact resistance.
- ▲ Tooth skiving to enhance gear precision and to lower noise.

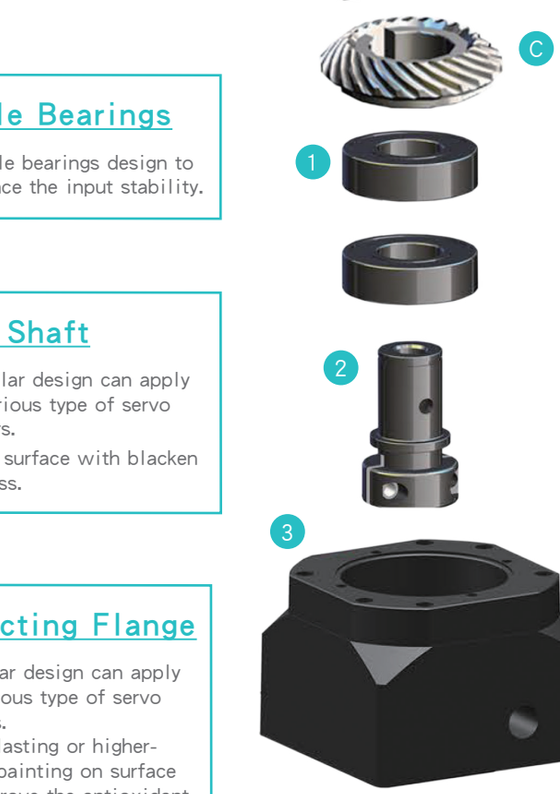
A Steering Gearbox

- Specific process for the gearbox to ensure the alignment of rotating shaft and perpendicularity of input shaft.
- Using Aluminum alloy for the gearbox to slash the weight and sandblasting on surface to improve the antioxidant capacity.

B Rotating Shaft

- Made by Cr-Mo alloy steel.





1 Double Bearings

- Double bearings design to enhance the input stability.

C Helical Bevel Gear

- Made by Ni-Cr-Mo alloy steel with carburizing process on surface to enhance the abrasion and impact resistance.

2 Input Shaft

- Modular design can apply to various type of servo motors.
- Shaft surface with blacken process.

D Ball Bearing

- Using the ball bearing instead of needle bearing on the simple beam for the better loading capacity and the longer life.

3 Connecting Flange

- Modular design can apply to various type of servo motors.
- Sandblasting or higher-grade painting on surface to improve the antioxidant capacity.

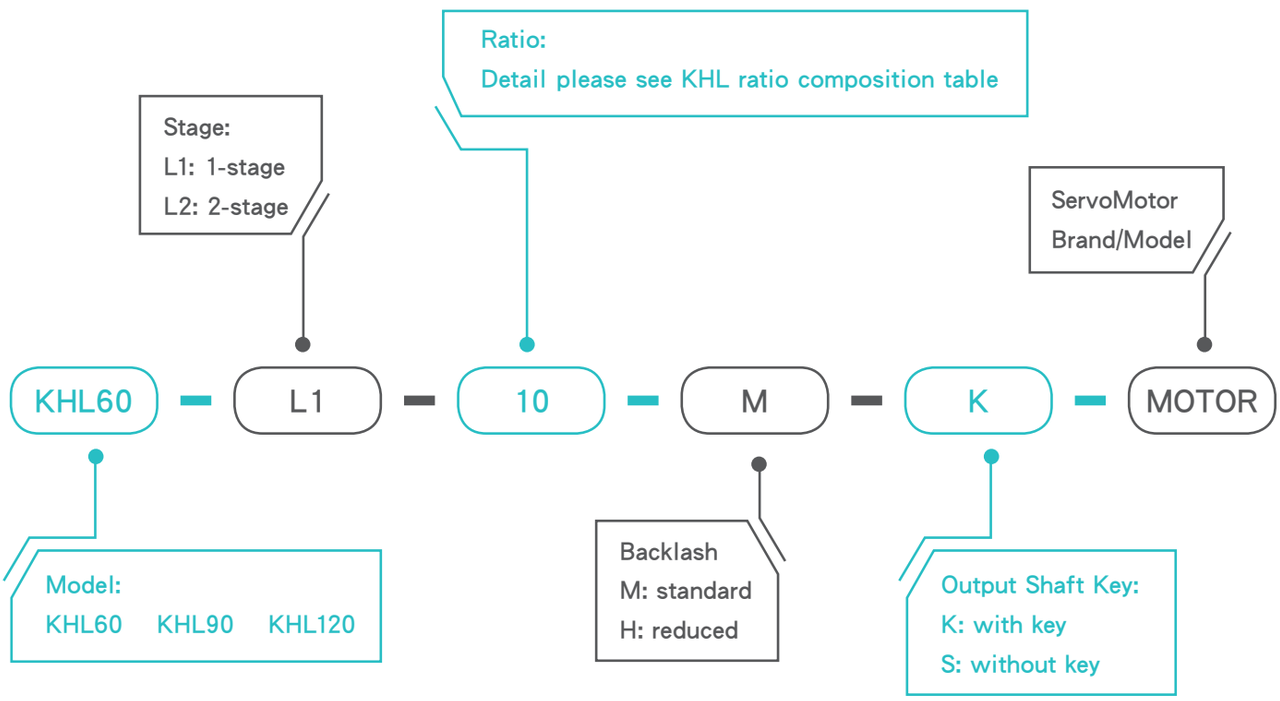
A — D Patented Structure

- The adjustable structure of helical bevel gear can adjust bearing and bevel gear's backlash at the same time.
  Patent no. : M441754

High Precision Planetary Gearbox Reducer

/ Model Code / Ratio Composition
/ Moment of Inertia Table

Reducer Model(KHL)



KHL Ratio Composition Table

	Ratio	
Model	Ratio of 1 Stage (L1)	Ratio of 2 Stages (L2)
KHL60	3，4，5，6，7，8，9，10	14，20，25，30，35，40，45，50，60，70，80，90，100，120，140，180，200
KHL90	3，4，5，6，7，8，9，10	14，20，25，30，35，40，45，50，60，70，80，90，100，120，140，180，200
KHL120	3，4，5，6，7，8，9，10	14，20，25，30，35，40，45，50，60，70，80，90，100，120，140，180，200

KHL Reducer Moment of Inertia Table

Model	Gear Ratio	Moment of inertia J1 kg*cm^2
KHL60	1：1	0.11
	1：2	0.10
KHL90	1：1	1.31
	1：2	1.15
KHL120	1：1	2.91
	1：2	2.48

KHL Series Technical Specifications

Specification	Unit	Stage	Ratio	KHL60	KHL90	KHL120
Reducer Nominal Output Torque T_{2N}	Nm	L1	3	34	116	228
			4	35	120	236
			5	34	117	229
			6	33	113	222
			7	33	110	214
			8	35	100	236
			9	31	107	203
			10	29	94	184
			14	33	110	214
			20	29	94	184
		L2	25	34	117	229
			30	34	113	228
			35	34	117	229
			40	35	120	236
			45	31	107	203
			50	34	117	229
			60	33	113	222
			70	33	110	214
			80	35	100	236
			90	31	107	203
			100	29	94	184
			120	33	113	222
			140	29	94	184
			180	31	107	203
			200	29	94	184
Emergency Stop Torque	Nm	L1 , L2	3~200	3 Times of Nominal Output Torque		
Nominal Input Speed n_{1N}	rpm	L1 , L2	3~200	3 , 000	3 , 000	2 , 500
Max. Input Speed n_{1B}	rpm	L1 , L2	3~200	6 , 000	6 , 000	5 , 000
Reduced Backlash H	arcmin	L1	3~20	≦ 4	≦ 4	≦ 4
		L2	25~200	≦ 7	≦ 7	≦ 7
Standard Backlash M	arcmin	L1	3~20	≦ 6	≦ 6	≦ 6
		L2	25~200	≦ 9	≦ 9	≦ 9
Torsional Rigidity	Nm/arcmin	L1 , L2	3~200	4	11	35
Max. Radial Load F_{rB}	N	L1 , L2	3~200	1 , 328	2 , 340	4 , 000
Max. Axial Load F_{aB}	N	L1 , L2	3~200	664	1 , 170	2 , 000
Warranty	M	L1 , L2	3~200	18 Months (Under Normal Usage)		
Average Operation Time	Hr	L1 , L2	3~100	20 , 000		
Efficiency of Full Loading η	%	L1	3~20	≧ 94%		
		L2	25~200	≧ 91%		
Net Weight	kg	L1	3~20	2.26	6.85	13.5
		L2	25~200	2.56	8.05	15.88
Operating Temp	℃	L1 , L2	3~200	-10℃ ~+90℃		
Lubrication		L1 , L2	3~200	Lithium Complex Synthetic Lubrication		
Mounting Position		L1 , L2	3~200	All Directions		
Degree of Protection		L1 , L2	3~200	IP65		
Running Noise	dBA	L1 , L2	3~200	≦ 68	≦ 70	≦ 70

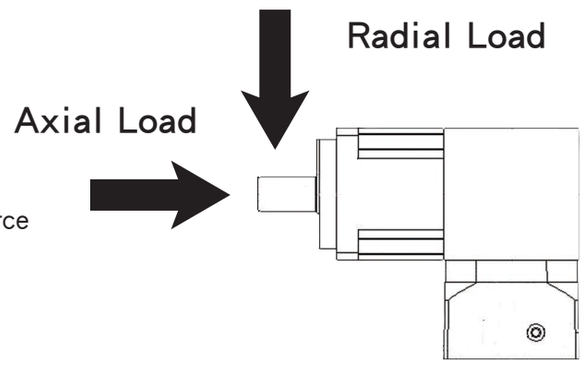
1.Above relative specifications of each model most are measured on 5 : 1 gear ratio
2.Ratios : I = Nin / Nout
3.Backlash : Measured on 2% of nominal output torque
4.Max. Radial and Axial Load : Applied to the output shaft center, and 50% of duty time and at 100 rpm
5.Duty Cycle < 60%, Average Lifetime = List Value; Duty Cycle ≧ 60%, Average Lifetime < 50% List value
6.Noise Level : Numeric measured on idle running in 1m distance, and at nominal input speed

High Precision Planetary Gearbox Reducer

/ Permitted Radial & Axial Load Diagram

Permitted Radial Load :
The force exerts perpendicular to output shaft

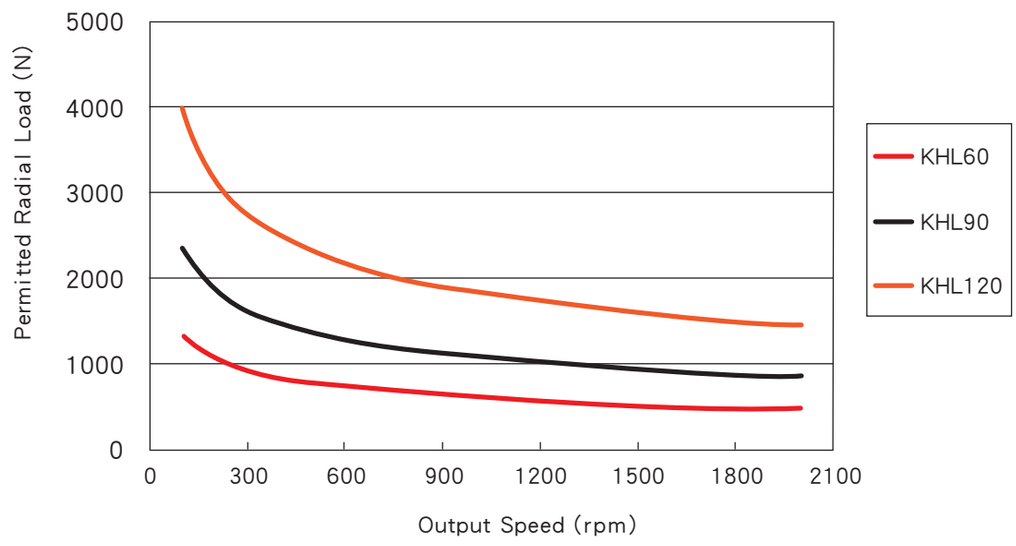
Permitted Axial Load :
The force exerts parallel to output shaft



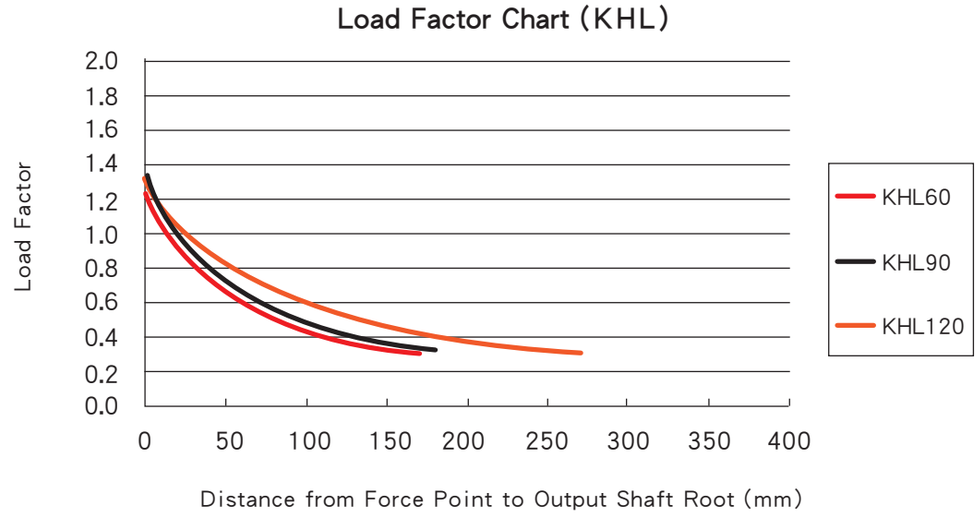
The radial/axial loads are relate to both speed and force point on output shaft.

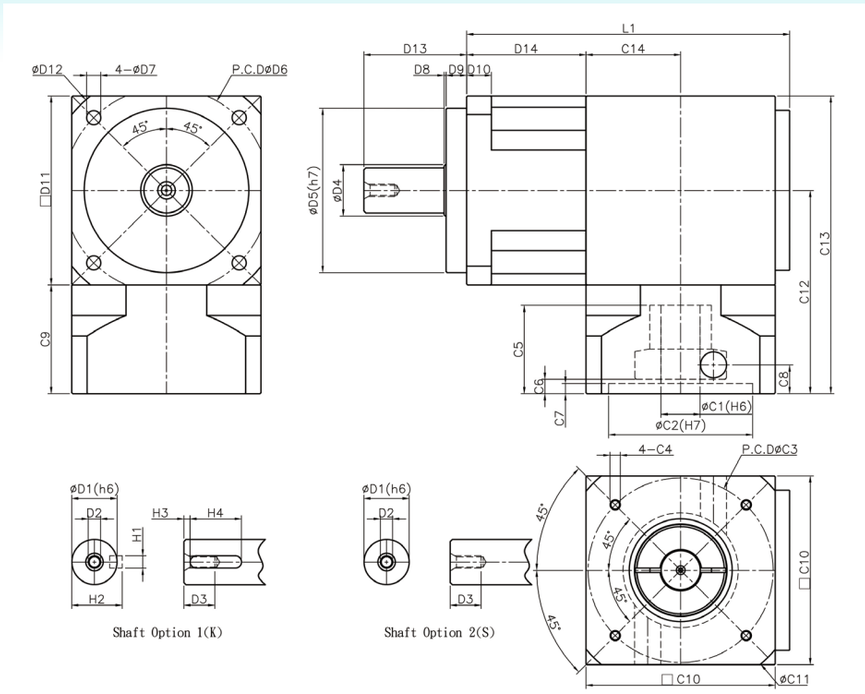
a: if the output shaft run faster, the radial/axial loads become lower.
b: if the force point get farther from the shaft root, the radial/axial loads get lower.

Radial Load Chart (KHL)



Load Factor Chart (KHL)





(Unit : mm)

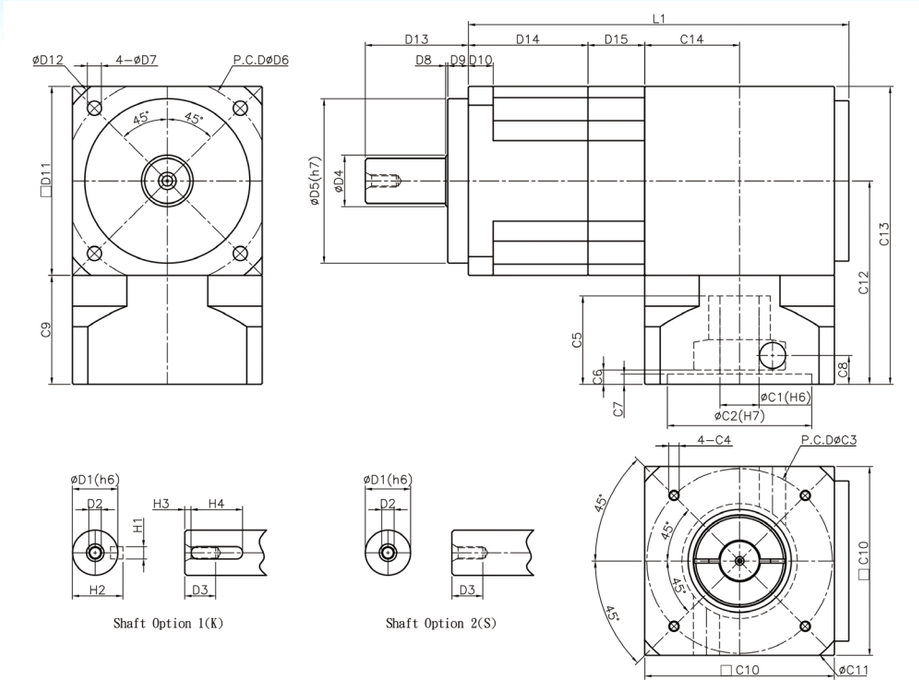
Symbol & Size		KHL60-L1	KHL90-L1	KHL120-L1
C	C1	6~14	14~19	16~24
	C2	50	70	110
	C3	70	90	145
	C4	M5x0.8P	M6x1.0P	M8x1.25P
	C5	35	40	65
	C6	7	7	20
	C7	4	5	7
	C8	13	15	28.5
	C9	39.5	49	78
	C10	60	92	122
	C11	80	120	161.4
	C12	69.5	95	138
	C13	99.5	141	198
	C14	31	46	60
D	D1	16	22	32
	D2	M5x0.8P	M6x1.0P	M8x1.25P
	D3	12	15	20
	D4	18	25	35
	D5	50	80	110
	D6	70	100	130
	D7	5.5	6.8	8.7
	D8	1.5	1	1
	D9	7.5	10	12
	D10	10	12	15
	D11	60	92	120
	D12	80	118	158
	D13	35.5	50	65
	D14	49	58	69
	D15			
H	H1	5	6	10
	H2	18	24.5	35
	H3	3	5	3
	H4	20	25	40
L	L1	114	157	194

C1~C11 are standard metric motor connect flange dimensions, size may change by motor

KHL

High Precision Planetary Gearbox Reducer

/ Drawing & Dimension



(Unit：mm)

Symbol & Size		KHL60-L2	KHL90-L2	KHL120-L2
C	C1	6~14	14~19	16~24
	C2	50	70	110
	C3	70	90	145
	C4	M5x0.8P	M6x1.0P	M8x1.25P
	C5	35	40	65
	C6	7	7	20
	C7	4	5	7
	C8	13	15	28.5
	C9	39.5	49	78
	C10	60	92	122
	C11	80	120	161.4
	C12	69.5	95	138
	C13	99.5	141	198
	C14	31	46	60
D	D1	16	22	32
	D2	M5x0.8P	M6x1.0P	M8x1.25P
	D3	12	15	20
	D4	18	25	35
	D5	50	80	110
	D6	70	100	130
	D7	5.5	6.8	8.7
	D8	1.5	1	1
	D9	7.5	10	12
	D10	10	12	15
	D11	60	92	120
	D12	80	118	158
	D13	35.5	50	65
	D14	49	58	69
	D15	16	27.5	33.2
H	H1	5	6	10
	H2	18	24.5	35
	H3	3	5	3
	H4	20	25	40
L	L1	130	184.5	227.2

C1~C11 are standard metric motor connect flange dimensions, actual size may change by motor

KHT Series

High Precision & Low Backlash Planetary Gearboxes with Single / Both side/ Hollow Output Shaft.

High Precision Planetary Gearbox Reducer / Application & Components Features

Application

KHT series can be applied to precision positioning or reciprocating motion device and can output stably to automated equipment which is operating in minimum vibratility.
Such as printing industry, pipe bender, spring machine industry, LCD inspection equipment, connected ball screw transmission mechanism... and so on.

A — C

Patented Structure

▲ The adjustable structure of helical bevel gear can adjust bearing and bevel gears' backlash at the same time.
Patent no. : M441754

A

Output Gearbox

▲ Specific processing for the gearbox to ensure the alignment of rotating shaft and perpendicularity of input shaft.

▲ Using Aluminum alloy for the gearbox to slash the weight and sandblasting on surface to improve the antioxidant capacity.

B

Helical Bevel Gear

▲ Made by Ni-Cr-Mo alloy steel with carburizing processing on surface to enhance the abrasion and impact resistance.

C

Output Shaft

▲ Made by Ni-Cr-Mo alloy steel with electroless plating on surface for corrosion resistance.

▲ Available with hollow shaft (KHT-H), single-side shaft (KHT-S1) & both-side shaft (KHT-S2).

1 Sun Gear

- ▲ Made by Ni-Cr-Mo alloy steel and carburizing process on surface for the high abrasion and impact resistance.
- ▲ Tooth skiving to enhance gear precision and to lower noise.

2 Reduced Shaft

- ▲ Integrated design and structure rigidity to ensure large torque output.

3 Planetary Gear

- ▲ Made by Ni-Cr-Mo alloy steel and carburizing process on surface for the high abrasion and impact resistance.
- ▲ Tooth skiving to enhance gear precision and to lower noise.
- ▲ Needle roller without cage internal the gear for higher abrasion resistance and strength.

4 Gearbox

- ▲ With Cr-Mo alloy steel and integrated design for internal gear to make sure the high precision and large output torque.
- ▲ Gearbox surface with electroless plating for corrosion resistance.

5 Input Shaft

- ▲ Modular design can apply to various type of servomotors.
- ▲ Shaft surface with blacken process.

6 Connecting Flange

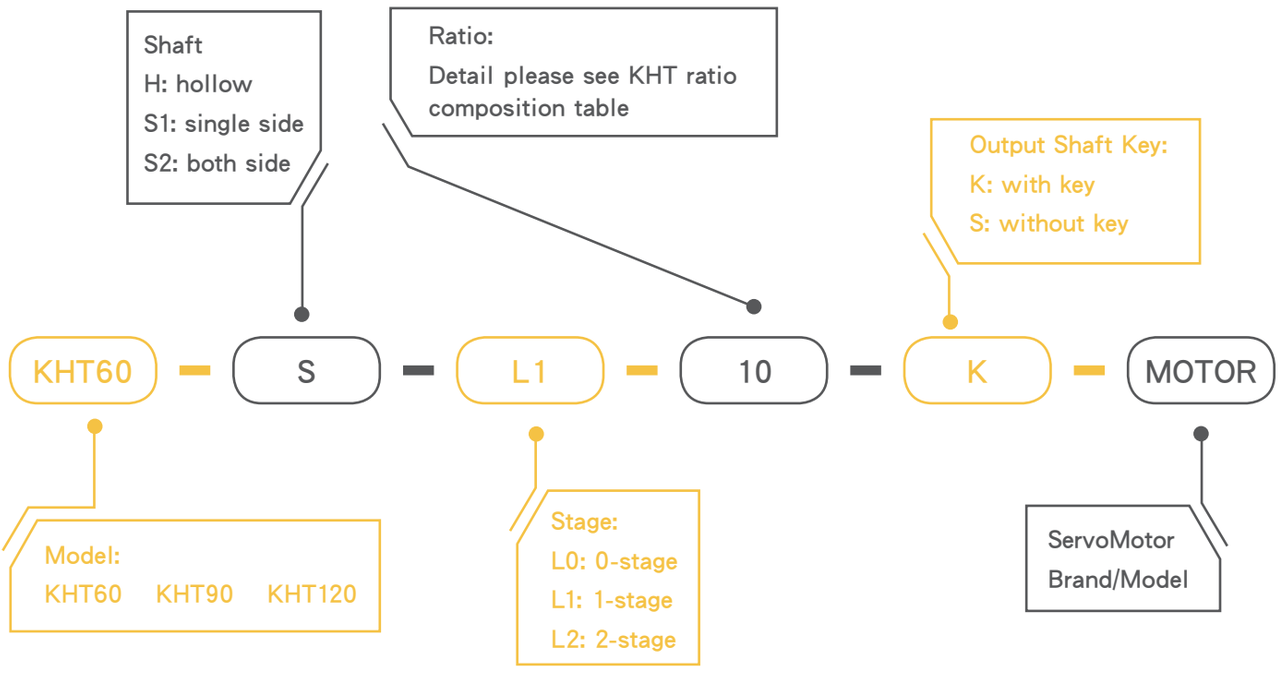
- ▲ Modular design can apply to various type of servomotors.
- ▲ Sandblasting or higher-grade painting on surface to improve the antioxidant capacity.

KHT

High Precision Planetary Gearbox Reducer

/ Model Code / Ratio Composition Table

Reducer Model(KHT)



KHT Ratio Composition Table

	Ratios Table for Every Stage		
Model	Ratio of 0 Stage (L0)	Ratio of 1 Stage (L1)	Ratio of 2 Stages (L2)
KHT60	1	3，4，5，7，10	15，20，25，30，35，40，50，70，100
KHT90	1	3，4，5，7，10	15，20，25，30，35，40，50，70，100
KHT120	1	3，4，5，7，10	15，20，25，30，35，40，50，70，100

KHT Reducer Moment of Inertia Table

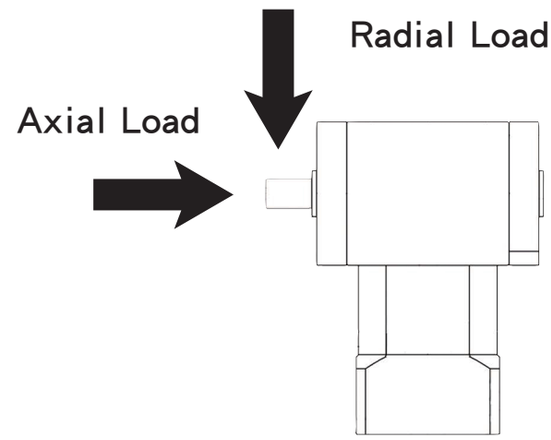
	Stage	Ratio	KHT60	KHT90	KHT120
Moment of Inertia J_1 kg*cm^2	L0	1	0.274	2.14	6.05
	L1	3	0.14	1.25	3.28
		4	0.11	1.14	2.89
		5	0.10	1.11	2.81
		6	—	—	—
		7	0.10	1.10	2.76
		8	—	—	—
		9	—	—	—
		10	0.10	1.10	2.74
	L2	15		1.11	2.81
		20		1.11	2.81
		25		1.11	2.81
		30		1.10	2.74
		35	0.10	1.10	2.76
		40		1.10	2.74
		50		1.10	2.74
		70		1.10	2.74
		100		1.10	2.74

KHT Series Technical Specifications

Specification	Unit	Stage	Ratio	KHT60	KHT90	KHT120
Reducer Nominal Output Torque T_{2N}	Nm	L0	1	15	58	114
	Nm	L1	3~10			
	Nm	L2	15~100			
Emergency Stop Torque	Nm	L0，L1，L2	1~100	1.5 Times of Nominal Output Torque		
Nominal Input Speed n_{1N}	rpm	L0，L1，L2	1~100	3，000	3，000	3，000
Max. Input Speed n_{1B}	rpm	L0，L1，L2	1~100	6，000	6，000	6，000
Standard Backlash M	arcmin	L0	1	≦ 6	≦ 6	≦ 6
		L1	3~10	≦ 8	≦ 8	≦ 8
		L2	15~100	≦ 10	≦ 10	≦ 10
Max. Radial Load F_{rB}	N	L0	1	810	1，220	2，080
	N	L1，L2	3~100	1，108	1，688	2，900
Max. Input Speed F_{aB}	N	L0	1	381	610	1，040
	N	L1，L2	3~100	584	844	1，450
Warranty	M	L0，L1，L2	1~100	18 Months (Under Normal Usage)		
Average Operation Time	Hr	L1，L2	3~100	20，000		
Efficiency of Full Loading η	%	L0	1	≧ 98%		
		L1	3~10	≧ 95%		
		L2	15~100	≧ 92%		
Net Weight	kg	L0	H (Hollow)	1.85	4.29	9.05
			S1 (Single-side shaft)	1.98	4.65	9.66
			S2 (Both-side shaft)	2	4.71	9.77
		L1	H (Hollow)	2.05	6.47	13.8
			S1 (Single-side shaft)	2.18	6.83	14.41
			S2 (Both-side shaft)	2.2	6.89	14.52
		L2	H (Hollow)	2.35	7.6	16.4
			S1 (Single-side shaft)	2.48	7.95	17.01
			S2 (Both-side shaft)	2.5	8.01	17.12
Operating Temp	℃	L0，L1，L2	1~100	-10℃ ~+90℃		
Lubrication		L0，L1，L2	1~100	Lithium Complex Synthetic Lubrication		
Mounting Position		L0，L1，L2	1~100	All Directions		
Degree of Protection		L0，L1，L2	1~100	IP65		
Running Noise (Number of Revolution=1500 rpm)	dBA	L0	1	≦ 73	≦ 76	≦ 79
	dBA	L1，L2	3~100	≦ 65	≦ 65	≦ 65

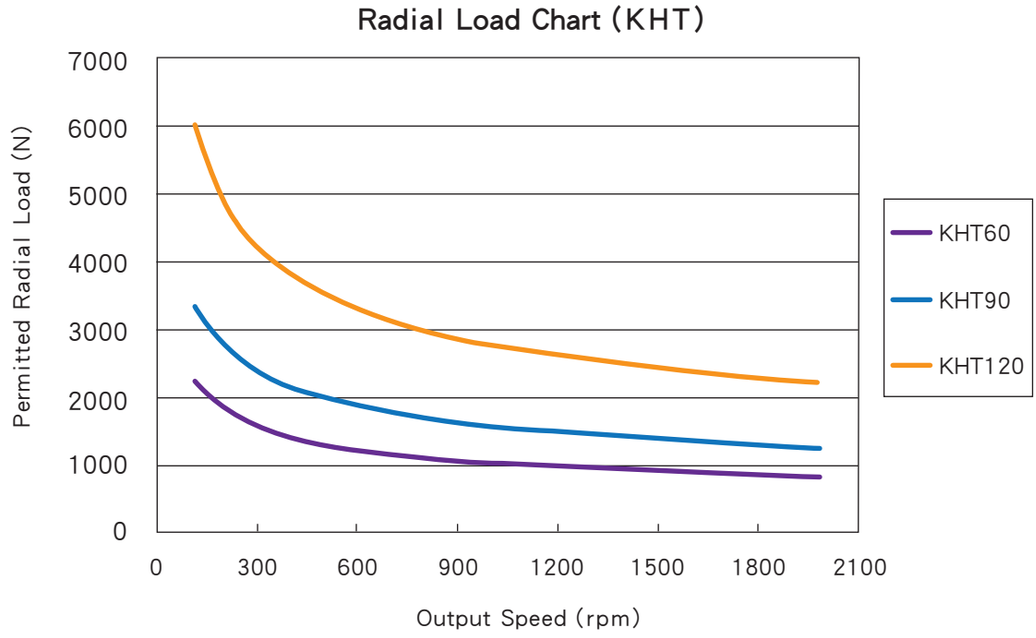
1. Above relative specifications of each model most are measured on 5 : 1 gear ratio
2. Ratios : I = Nin / Nout
3. Backlash : Measured on 2% of nominal output torque
4. Max. Radial and Axial Load : Applied to the output shaft center, and 50% of duty time and at 100 rpm
5. Noise Level : Numeric measured on idle running in 1m distance, and at nominal input speed

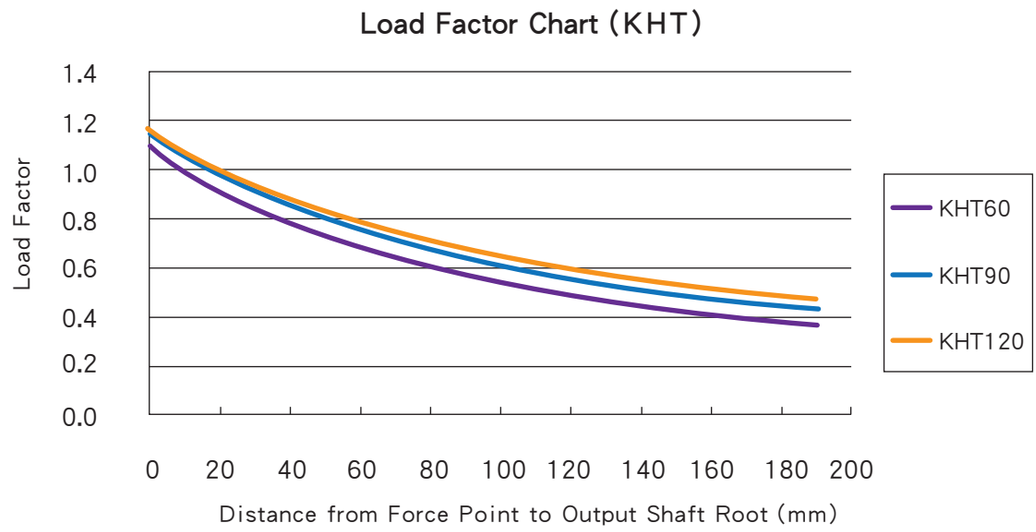
Permitted Radial Load :
The force exerts perpendicular to output shaft
Permitted Axial Load :
The force exerts parallel to output shaft

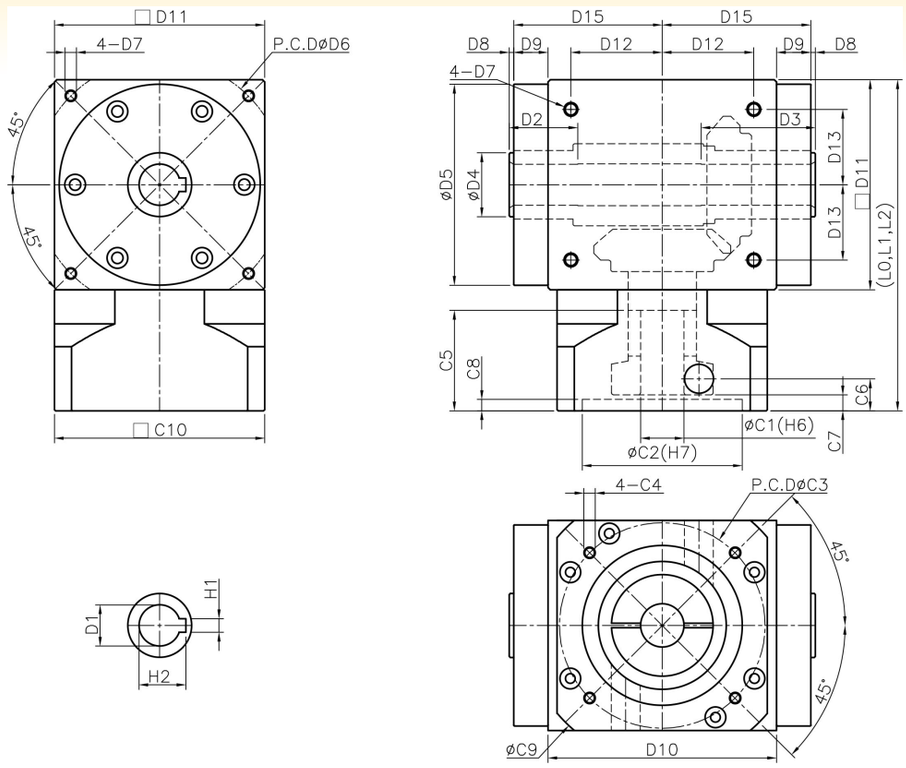


The radial/axial loads are relate to both speed and force point on output shaft.

a: if the output shaft run faster, the radial/axial loads become lower.
b: if the force point get farther from the shaft root, the radial/axial loads get lower.







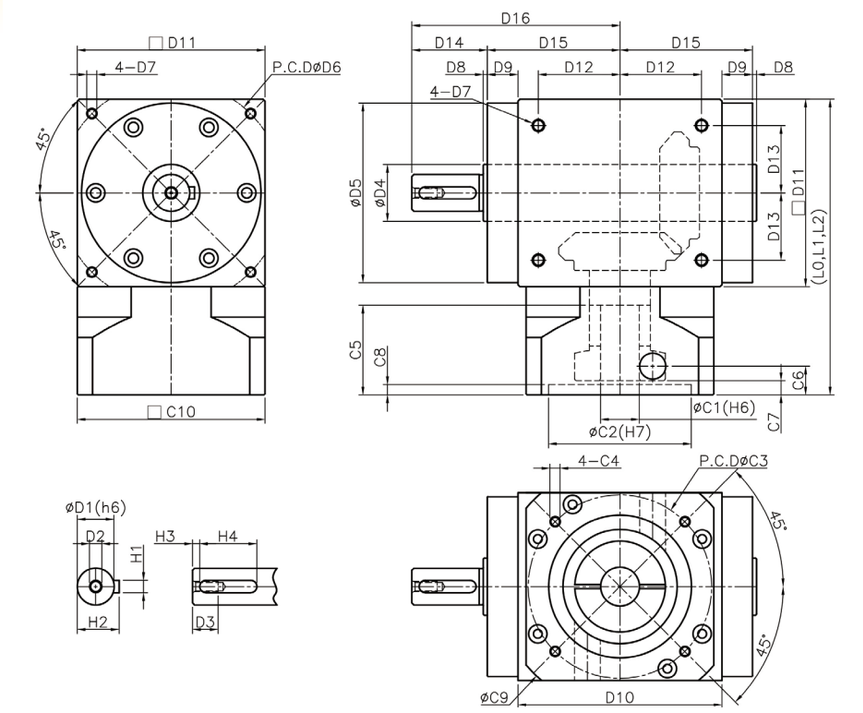
(Unit : mm)

Symbol & Size		KHT60-H	KHT90-H	KHT120-H
C	ØC1	6~14	14~19	16~24
	ØC2	50	70	110
	ØC3	70	90	145
	C4	M5x0.8P	M6x1.0P	M8x1.25P
	C5	33	39	65
	C6	13	15	28.5
	C7	7	7	20
	C8	4	5	7
	ØC9	80	120	161.4
	C10	60	92	122
D	ØD1	13	18	22
	D2	30	30	35
	D3	30	50	55
	ØD4	20	28	35
	ØD5	62	88	108
	ØD6	76	110	145
	D7	M4x0.7P	M6x1.0P	M8x1.25P
	D8	2	2	2
	D9	13	15	15
	D10	70	100	126
	D11	62	92	120
	D12	25	40	50
	D13	25	33	42
	D14			
	D15	48	65	78
	D16			
H	H1	5	6	6
	H2	15.3	20.8	24.8
	H3			
	H4			
L	L0	101.5	141	198
	L1	130	185.5	254
	L2	146	213	287.2

C1~C10 are standard metric motor connect flange dimensions, size may change by motor

High Precision Planetary Gearbox Reducer

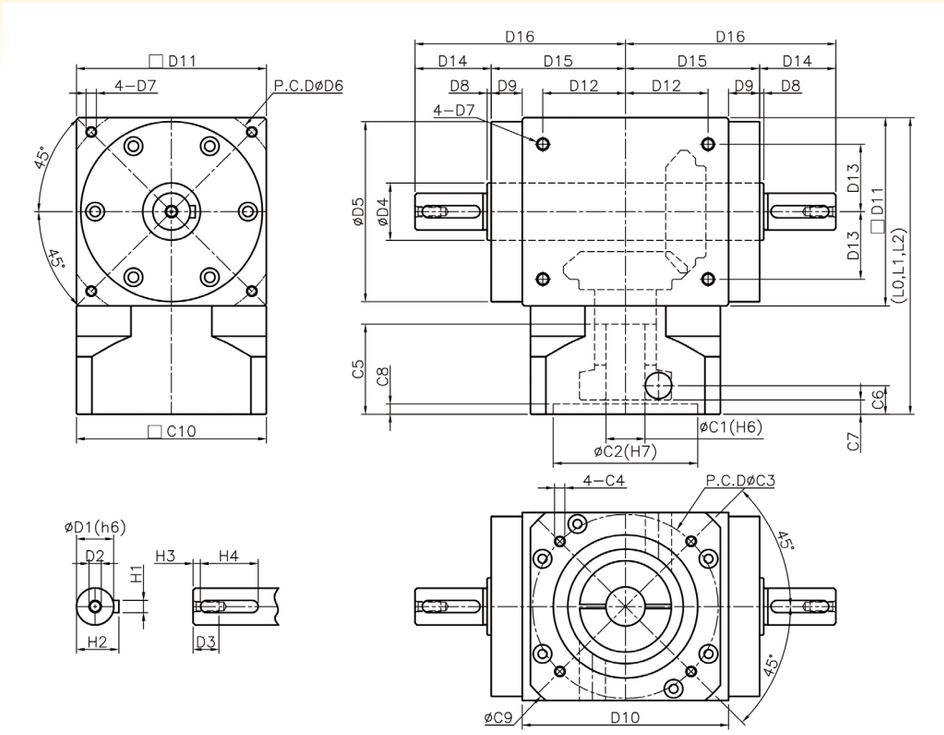
/ Drawing & Dimension



(Unit：mm)

Symbol & Size		KHT60-S1	KHT90-S1	KHT120-S1
C	ØC1	6~14	14~19	16~24
	ØC2	50	70	110
	ØC3	70	90	145
	C4	M5x0.8P	M6x1.0P	M8x1.25P
	C5	33	39	65
	C6	13	15	28.5
	C7	7	7	20
	C8	4	5	7
	ØC9	80	120	161.4
	C10	60	92	122
D	ØD1	13	18	22
	D2	M4x0.7P	M5x0.8P	M8x1.25P
	D3	12	14.5	22
	ØD4	20	28	35
	ØD5	62	88	108
	ØD6	76	110	145
	D7	M4x0.7P	M6x1.0P	M8x1.25P
	D8	2	2	2
	D9	13	15	15
	D10	70	100	126
	D11	62	92	120
	D12	25	40	50
	D13	25	33	42
	D14	22	37	42
	D15	48	65	78
	D16	70	102	120
H	H1	5	6	6
	H2	15	20.5	24.5
	H3	2	3.5	5
	H4	16	25	25
L	L0	101.5	141	198
	L1	130	185.5	254
	L2	146	213	287.2

C1~C10 are standard metric motor connect flange dimensions, size may change by motor



(Unit : mm)

Symbol & Size		KHT60-S2	KHT90-S2	KHT120-S2
C	ØC1	6~14	14~19	16~24
	ØC2	50	70	110
	ØC3	70	90	145
	C4	M5x0.8P	M6x1.0P	M8x1.25P
	C5	33	39	65
	C6	13	15	28.5
	C7	7	7	20
	C8	4	5	7
	ØC9	80	120	161.4
	C10	60	92	122
D	ØD1	13	18	22
	D2	M4x0.7P	M5x0.8P	M8x1.25P
	D3	12	14.5	22
	ØD4	20	28	35
	ØD5	62	88	108
	ØD6	76	110	145
	D7	M4x0.7P	M6x1.0P	M8x1.25P
	D8	2	2	2
	D9	13	15	15
	D10	70	100	126
	D11	62	92	120
	D12	25	40	50
	D13	25	33	42
	D14	22	37	42
	D15	48	65	78
	D16	70	102	120
H	H1	5	6	6
	H2	15	20.5	24.5
	H3	2	3.5	5
	H4	16	25	25
L	L0	101.5	141	198
	L1	130	185.5	254
	L2	146	213	287.2

C1~C10 are standard metric motor connect flange dimensions, size may change by motor

Other

Quick Selection Method

Periodic Duty(S5)

Per Hour Continuous Operation Period ≦ (1000)

Load Operation Period < 60% and < 20 Minutes

1. Torque Confirmation :

T Motor Max. Output Torque × i Ratio < T Gearbox Emergency Stop Torque

2. Technical Specification Confirmation :

1.Motor Shaft Diameter

2.Motor Pilot Diameter

3.Length of Motor Shaft

4.Motor Pilot Depth

5.P.C.D (Pitch Circle Diameter)

6.Bolt Hole Diameter

Continuous Duty (S1)

Load Operation Period ≧ 60% or ≧ 20 Minutes

1. Torque Confirmation :

T Motor Nominal Output Torque × i Ratio < T Gearbox Nominal Input Torque

2. Revolutions Per Minute (RPM) Confirmation :

N Motor Nominal Output Speed ≦ N Gearbox Nominal Input Speed

3. Technical Specification Confirmation :

1.Motor Shaft Diameter

2.Motor Pilot Diameter

3.Length of Motor Shaft

4.Motor Pilot Depth

5.P.C.D (Pitch Circle Diameter)

6.Bolt Hole Diameter

Please contact our sales for further assistance.

Other

High Precision Planetary Gearbox Reducer

/ Order Confirmation Form

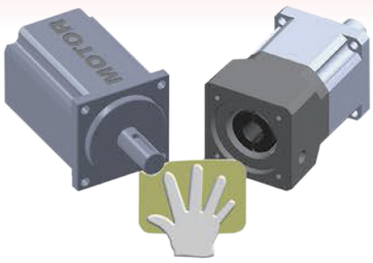
KOJIN PRECISION INDUSTRIAL CO., LTD
E-mail: sales@kojin-precision.com Website: www.kojin-precision.com

Order Date : **Purchase Order** **PO No. :**

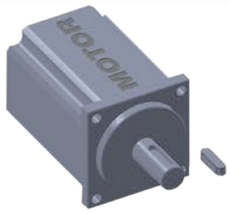
Sales Department : Taipei Branch Office ☐ Tainan Branch Office ☐
Contact Person :
Tel. :

Product Specification/ Confirmation		
Reducer Model :		
Quantity :	Unit Price (Currency) :	Total Amount (Currency) :
Output Shaft Dia (mm) :	Output Shaft Key : Y☐ N☐	Input Shaft Key : Y☐ N☐
Motor Brand :		Motor Model :
Motor Output Power (kw) :		
PCD(mm) :		Length of Motor Shaft :
Motor Shaft Dia (mm) :		Motor Pilot Dia (mm) :
Motor Pilot Depth (mm) :		Bolt Hole Dia (mm) :
Further Information :		
Reducer Model :		
Quantity :	Unit Price (Currency) :	Total Amount (Currency) :
Output Shaft Dia (mm) :	Output Shaft Key : Y☐ N☐	Input Shaft Key : Y☐ N☐
Motor Brand :		Motor Model :
Motor Output Power (kw) :		
PCD (mm) :		Length of Motor Shaft :
Motor Shaft Dia (mm) :		Motor Pilot Dia (mm) :
Motor Pilot Depth (mm) :		Bolt Hole Dia (mm) :
Further Information :		
Reducer Model :		
Quantity :	Unit Price (Currency) :	Total Amount (Currency) :
Output Shaft Dia (mm) :	Output Shaft Key : Y☐ N☐	Input Shaft Key : Y☐ N☐
Motor Brand :		Motor Model :
Motor Output Power (kw) :		
PCD (mm) :		Length of Motor Shaft :
Motor Shaft Dia (mm) :		Motor Pilot Dia (mm) :
Motor Pilot Depth (mm) :		Bolt Hole Dia (mm) :
Further Information :		

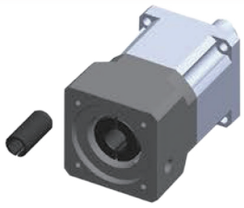
Shipping Information	
Company Name/ Receiver :	Purchase Order :
Tel. :	Fax :
Address :	
Assigned Forwarder :	Delivery Date :
Shipping Method :	Express Account :
Inspection Report : Y ☐ N ☐	
Others :	



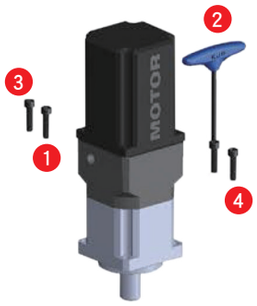
Confirm the servomotor and the gearbox model and specification. Clean up the contact surface.



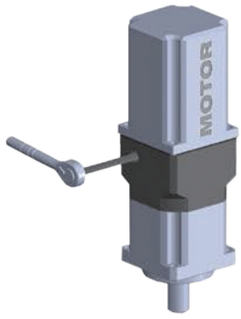
Remove the motor key.



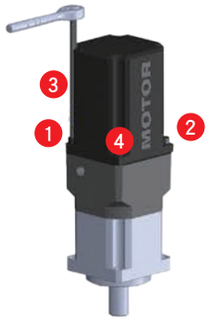
If the servomotor shaft is smaller than the reducer input hole, adapt the correct size bushing.



Set at vertical position. Slide the servomotor into the gearbox and temporarily tighten the mounting bolts (including spring washers) in 1~4 order with wrench to 5% of the suggested torque range on chart 1.



Tighten the set collar bolt per following the torque range on chart 2.



Tighten the mounting bolts in 1~4 order per following the suggested torque range on chart 1.

Chart1 Tightening Torque Recommended for Motor Mounting bolt

bolt Size	Width Across Flats	Strength 8.8 Tightening Torque		Strength 10.9 Tightening Torque		Strength 12.9 Tightening Torque	
	[mm]	[Nm]	[In-lbs]	[Nm]	[In-lbs]	[Nm]	[In-lbs]
M3x0.5P	2.5	1.3	12	1.8	16	2.1	19
M4x0.7P	3	3	27	4.1	37	4.9	44
M5x0.8P	4	6.1	55	8.2	73	9.8	87
M6x1P	5	11	98	14	124	17	151
M8x1.25P	6	25	222	34	302	41	364
M10x1.5P	8	49	434	67	594	80	709
M12x1.75P	10	85	753	116	1028	139	1232
M14x2P	12	137	1214	186	1648	223	1976
M16x2P	14	210	1860	286	2534	343	3038

Chart2 Tightening Torque Recommended for Set Collar Bolt

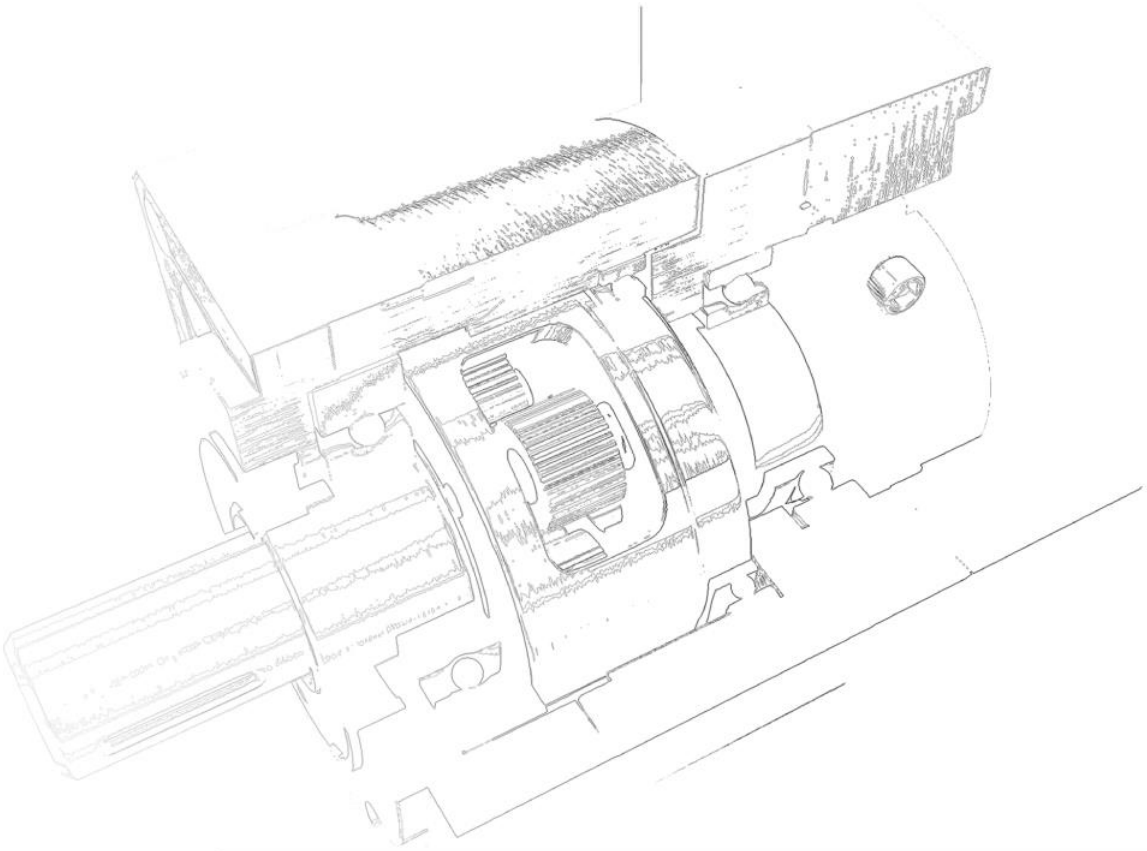
Reducer Model		Motor Shaft	Bolt Size	Width Across Flats	Tightening Torque	
		[mm]	[mm]	[mm]	[Nm]	[In-lbs]
40 Type	1 Stage/ 2 Stage	≦12	M3x0.5Px12L	2.5	2.1	19
60 Type	1 Stage/ 2 Stage	≦16	M5x0.8Px16L	4	9.8	87
90 Type	1 Stage/ 2 Stage	≦24	M6x1.0Px20L	5	17	151
120 Type	1 Stage/ 2 Stage	≦32	M8x1.25Px25L	6	41	364
150 Type	1 Stage/ 2 Stage	≦38	M10x1.5Px30L	8	80	709
180 Type	1 Stage/ 2 Stage	≦50	M12x1.75Px35L	10	139	1232
220 Type	1 Stage/ 2 Stage	≦75	M12x1.75Px40L	10	139	1232

High Precision Planetary Gearbox Reducer

Application	
Automation and Precise Positioning Equipment with ServoMotors	
Robots	**Printing and paper Machines**
Industrial Robots	Printing Presses
Amusement Robots	Folding Machines
Robots Peripheral	Paper Changing Machines
Robot	Paper Positioning Machines
Package Production Machines	**PCB Production Equipments**
Sealing Machines	Electronic Component Insertion Machines
Label Printing Machines	Cream Solder Printing Machines
Robots	Board Inspection Systems
Work Transfer Systems	Transfer Systems
Paper Production Machines	**Metal Working Machines**
Paper-Making Machines	Bending Machines
Corrugated Fiberboard Box Making and Printing Systems	Presses
	Spring Machines
Optical Machines	**Glass and Ceramic Production Equipments**
Positioning Table Drive	Ceramic
Optical Measuring Instruments	Glass Polishing Production Equipment
Surface Inspect	Sheet Glass Cutting Machines
Inspection, Analysis, Test Equipments	**Semiconductor Equipments**
Photometric Equipment	Transfer Systems
Positioning Drive	Wafer Fabrication Systems
Metal Tensile Test Machines	Wafer Fabrication Processing Systems
Work Reversing Machines	Assembly Systems
Surface Treatment Equipment	Inspection Systems
Woodworking, 3D Cutting, Injection Machines	**Metal Cutting Machines**
Woodworking Machines	Machining Centers
5-Axis Machining Centers	Turning Centers
Work Transfer Systems	CNC Drilling Machines
Rotary Table Drive	NC Lathes
LCD Panel Production Equipments	Grinding Machines
Transfer Systems	Milling and Boring Machines
Parts Positioning Drive	EDM Systems
Work Reversing Machines	**Green Energy-Related Industries**
Lifter Drive	**Medical and Rehabilitation Equipment**
	Aerospace Industry

MEMO

MEMO



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KOJIN PRECISION

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