

## PKPL Series ---

### Servo Planetary Gearbox



Processed and manufactured by the high precision German engineered gear grinding craft, the PKPL is one of the best servo planetary gearbox in the world.

#### Product Key Features

- ▶ High precision: backlash <math>< 3 \text{ arc-min}</math>.
- ▶ Processing by ultra precision machine and advanced gear grinding craft, the gear precision can be controlled under ISO4 to ensure the gearboxes high precision and efficiency.
- ▶ Choosing low-carbon alloy forged steel as the raw material of the gear, the hardness can reach HRC60 by deepen harden of carburizing heat treatment to ensure gear strength and lifetime.
- ▶ With integrated design of caged planet carrier and output shaft to realize high rigidity and high precision.
- ▶ Planet-gear bearings use full needle roller bearing cage to increase gearboxes output torque and rigidity.
- ▶ Can be connected with any servo motor around the world.
- ▶ No grease leakage and miantenance free by using synthetic lubricating grease and IP65 protection design.

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## Servo Planetary Gearbox Technical Data

MODEL		PKPL050	PKPL070	PKPL090	PKPL120	PKPL160	PKPL205	PKPL235	Ratio	Stage
Rated Output Torque	Nm	20	46	125	210	450	650	1200	3	1
		21	52	145	300	550	1250	1800	4	
		21	55	155	320	650	1200	2050	5	
		20*	50*	145*	300*	610*	1000*	1850*	6	
		19	50*	135	290*	540	1000	1750*	7	
		18*	45	115	255	510*	1000*	1550	8	
		14	42	105*	220*	440	910	1500*	9	
		14	42	105	220	440	910	1500	10	
		20	56	125	310	500	650	1200	12	2
		21	52	145	300	550	1250	1800	16	
		21	55	145	300	650	1200	2050	20	
		21	55	155	320	650	1200	2050	25	
		-	52	145	305	550*	1250*	1800*	32	
		21	55*	155	320*	650	1200	2050	35	
		-	55	155	320	550*	1200*	2050*	40	
		21	55*	155	320*	650	1200	2050	45	
		21	55	155	320	650	1200	2050	50	3
		18/63	45	115	255	510/63	1000/63	1550	64	
		21	52	155	320	650	1200	2050	80	
		21	52	155	320	650	1200	2050	100	
		21	52	155	320	650	1200	2050	125	
		21/140	52	155	320	650	1200/140	2050/140	160	
		21/180	52	155	320	650	1200/180	2050/180	200	
		21/252	52	155	320	650/224	1200/252	2050/252	256	
21/315	52	155	320	650/280	1200/315	2050/315	320			
18/441	45	115	255	510/504	1000/441	1550/504	512			
Emergency Stop Torque	Nm	Triple rated output torque								
Max Radial Force <sup>1</sup>	N	770	1500	3200	6700	9600	14000	16000		
Max Axial Force <sup>1</sup>	N	380	760	1600	3300	4800	7000	8000		
Full Loading Efficiency	%	97								1
		95								2
		93								3
Average lifetime	h	20000								
Weight	kg	0.6	1.4	3.3	5.5	20	31	53		1
		0.9	1.6	4.5	8	25	39	66		2
		1.1	1.8	5.5	10	30	48	75		3

The subscript "1" in the output speed of 100RPM, in the center of the output shaft position (L/2) permissible radial force and axial force.

Note : with "\*" is not commonly used speed ratio, in the table there are 2 groups of digital representation of the torque corresponding to the actual speed ratio.

The maximum acceleration torque is equal to 180% of the rated torque.

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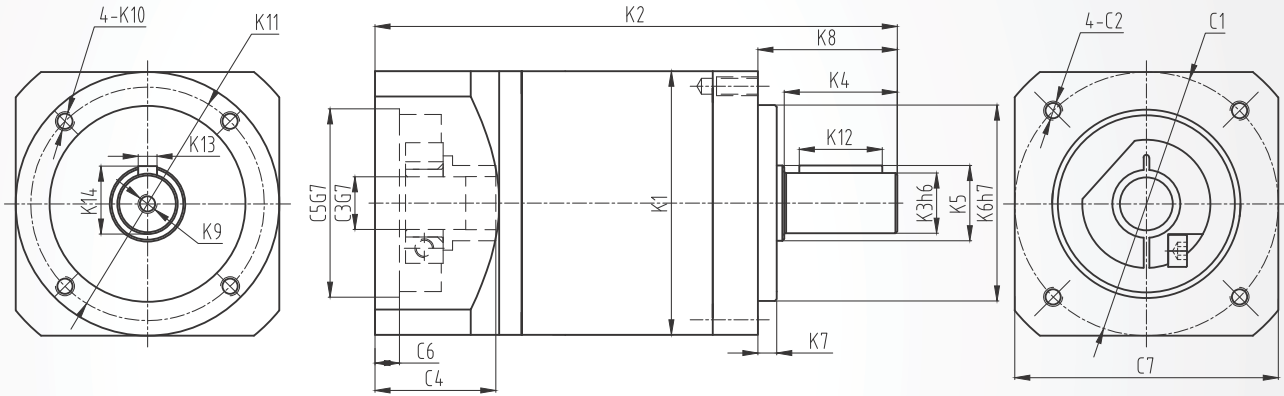
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MODEL		PKPL050	PKPL070	PKPL090	PKPL120	PKPL160	PKPL205	PKPL235	Ratio	Stage	
Rotational Inertia	kgcm <sup>2</sup>	0.031	0.16	0.61	3.25	12.31	28.98	69.61	3	1	
		0.022	0.14	0.48	2.74	7.54	23.67	54.37	4		
		0.019	0.13	0.47	2.71	7.42	22.75	53.27	5		
		0.017	0.13	0.47	2.62	7.25	22.48	50.84	6		
		0.017	0.13	0.47	2.62	7.25	22.48	50.84	7		
		0.017	0.13	0.45	2.62	7.14	22.59	50.84	8		
		0.017	0.13	0.44	2.62	7.14	22.59	50.84	9		
		0.017	0.13	0.44	2.57	7.14	22.55	50.56	10		
		0.029	0.127	0.44	2.56	12.35	12.35	28.98	12		2
		0.022	0.12	0.43	1.75	7.47	7.54	23.67	16		
		0.019	0.075	0.44	1.5	6.65	7.42	22.75	20		
		0.017	0.075	0.44	1.49	5.81	7.54	22.75	25		
		--	0.064	0.39	1.3	6.34	7.14	22.59	32		
		0.016	0.064	0.39	1.3	5.36	7.14	22.59	35		
		--	0.064	0.39	1.3	4.08	7.14	22.59	40		
		0.016	0.064	0.39	1.3	5.36	7.14	22.59	45		
		0.016	0.064	0.39	1.3	4.08	7.14	22.59	50		
		0.016	0.075	0.39	1.5	7.5	7.54	22.59	64		
		0.019	0.075	0.44	1.49	7.4	7.54	22.75	80	3	
		0.019	0.064	0.44	1.45	7.3	7.42	22.59	100		
		0.019	0.064	0.44	1.3	7.3	7.42	22.75	125		
		0.016	0.064	0.39	1.3	6.5	7.14	22.75	160		
		0.016	0.064	0.39	1.3	6.2	7.14	22.75	200		
		0.016	0.064	0.39	1.3	5.7	7.14	22.75	256		
0.016	0.064	0.39	1.3	5.4	7.14	22.75	320				
0.016	0.064	0.39	1.3	5.4	7.14	22.59	512				
Backlash	arcmin	--	≤3	≤3	≤3	≤3	≤3	≤3	High Precision		1
		≤6	≤6	≤6	≤6	≤6	≤6	≤6	Standard Precision		
		--	≤5	≤5	≤5	≤5	≤5	≤5	≤5	High Precision	2
		≤8	≤8	≤8	≤8	≤8	≤8	≤8	≤8	Standard Precision	
		--	≤7	≤7	≤7	≤7	≤7	≤7	≤7	High Precision	3
		≤12	≤10	≤10	≤10	≤10	≤10	≤10	≤10	Standard Precision	
Torsional Rigidity	Nm/arcmin	3	7	14	25	50	140	220			
Noise <sup>2</sup>	dB(A)	56	58	60	63	65	67	70			
Max Input Speed <sup>1</sup>	min <sup>-1</sup>	8000	6000	6000	6000	6000	4000	4000			
Rated Input Speed <sup>1</sup>	min <sup>-1</sup>	4000	3000	3000	3000	3000	3000	2000			

The subscript "1" the environment temperature is 20°C.  
The subscript "2" sound in n1 < 3000min<sup>-1</sup>, measured at 1 m.

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## Servo Planetary Gearbox Standard Size



Model	PKPL050			PKPL070			PKPL090			PKPL120			PKPL160			PKPL205			PKPL235			
Stage	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
K1	φ50			φ70			φ89			φ120			φ160			φ205			φ235			
K2	88.5	103.5	118.8	115	138.7	162.4	138	169.3	200.6	198	239.8	248	275.5	336.5	356	288	348	409	358	402	462	
K3	φ12			φ16			φ22			φ32			φ40			φ55			φ75			
K4	23			30			36			50			80			82			105			
K5	φ15			φ20			φ30			φ40			φ50			φ60			φ85			
K6	φ35			φ52			φ68			φ90			φ130			φ160			φ180			
K7	4			5			10			12			15			15			18			
K8	28			37			48			65			97			100			126			
K9	M3X9			M5X12			M6X16			M10X22			M12X25			M20X40			M20X40			
K10	M4X10			M5X11			M6X15			M8X19			M12X20			M12X22			M16X28			
K11	φ44			φ62			φ80			φ108			φ145			φ184			φ210			
K12	16			22			28			40			70			70			90			
K13	4			5			6			10			12			16			20			
K14	13.5			18			24.5			35			43			59			79.5			
C1	φ46			φ70			φ90			φ145		φ90	φ200		φ145	φ215	φ200		φ235	φ215	φ200	
C2	M4X10			M5X12			M6X15			M8X20		M6X15	M12X25		M8X20	M12X25	M12X25		M12X25	M12X25	M12X25	M12X25
C3	φ8			φ14			φ19			φ24		φ19	φ35		φ24	φ42	φ35		φ55	φ42	φ35	
C4	26.1			32.1			41.6			61.3		41.6	82		61.3	82.5	82		116	82.5	82	
C5	φ30			φ50			φ70			φ110		φ70	φ114.3		φ110	φ180	φ114.3		φ200	φ180	φ114.3	
C6	5			6.5			6.5			8		6.5	8		8	8	8		8	8	8	8
C7	50			70			89			120		89	175		120	190	175		220	190	175	