PL series Planetary Roller Screw



PL series Planetary Roller Screw is mainly composed of the main screw, nut and rollers. The main screw is multiple thread. The adjacent sides of the threads are in 90°. The teeth shape is triangular. The nut is internally threaded with the same teeth shape as the main screw; the roller is single thread and the teeth are in circular arc.

The side of roller is in convex tooth shape and the two ends are both made into small gears and cylindrical smooth shafts which are provided and fixed in the hole of retaining collar at the end side to maintain the equal distance between rollers. The retaining collar at the end side is provided flexibly within the nut and is fixed axially by elasticity. The small gears at the two ends of roller are engaged with the fixed gear rings within the nut to ensure axial parallelism between rollers so as to achieve the optimal performance.





Planetary Roller Screws-PL Series(Standard)

	Model			PL															
	Nominal diameter	D	mm	12				15				18				21			
	Lead	P	mm	1	2	3	4	2	3	4	5	3	4	5	6	3	4	5	6
	Number of starts of thread	N		4	5			5				5				5			
	Lead angle		°	1.52	3.04	4.55	6.06	2.43	3.64	4.85	6.06	3.04	4.05	5.05	6.06	2.6	3.47	4.33	5.2
Single nut	Rated dynamic load	Ca	kN	13.3	14.2	15.5	17.1	24.4	25.2	26.4	28.2	35.1	37.5	36.6	38.4	52.8	56.4	59.2	62.1
	Rated dead load	Coa	kN	24.8	26.5	25.7	27.2	54.9	50.5	49.2	51.2	75.8	76.1	67.9	69.5	105	105.2	104.5	105.8
	Stiffness coefficient	Fk	N2/3um	56.4	47.6	37.9	33.3	66.7	50.9	43.3	39.4	61.8	53.2	44	40.6	70.9	61.3	54.2	49.6
	Axial clearance	*	mm	0.02	0.02	0.02	0.03	0.02	0.02	0.03	0.04	0.02	0.02	0.03	0.04	0.02	0.02	0.03	0.03
Double nut	Rated dynamic load	Ca	kN	13.3	14.2	15.5	17.1	24.4	25.2	26.4	28.2	35.1	37.5	36.6	38.4	52.8	56.4	59.2	62.1
	Rated dead load	Coa	kN	24.8	26.5	25.7	27.2	54.9	50.5	49.2	51.2	75.8	76.1	67.9	69.5	105	105.2	104.5	105.8
	Stiffness coefficient	Fk	N2/3um	84.6	71.3	56.8	50	100.1	76.3	64.9	59.1	92.7	79.8	66	61	106.4	91.9	81.3	74.4
	Pretightening force	Fv	N	653	558	465	372	597	520	446	374	702	625	544	470	1062	963	866	771
	Pretension torsional moment	Mv	Nm	0.08	0.08	0.08	0.08	0.1	0.1	0.1	0.1	0.15	0.15	0.15	0.15	0.25	0.25	0.25	0.25
Preload nut	Rated dynamic load	Ca	kN	7.4	7.9	8.6	9.4	13.5	13.9	14.7	15.8	19.2	20.5	20	21.2	29	31.1	32.6	34.3
	Rated dead load	Coa	kN	12.4	13.3	12.9	13.5	27.6	25.2	24.6	25.6	37.9	38	33.9	34.8	52.5	52.7	52.3	52.9
	Stiffness coefficient	Fk	N2/3um	35.4	29.9	23.7	20.9	41.9	31.9	27.2	24.7	38.8	33.4	27.6	25.5	44.6	38.5	34.1	31.1
	Pretightening force	Fv	N	653	558	465	372	597	520	446	374	702	625	544	470	1062	963	866	771
	Pretension torsional moment	Mv	Nm	0.08	0.08	0.08	0.08	0.1	0.1	0.1	0.1	0.15	0.15	0.15	0.15	0.25	0.25	0.25	0.25
	Forward efficiency			0.77	0.85	0.87	0.88	0.83	0.86	0.87	0.88	0.85	0.87	0.88	0.88	0.83	0.86	0.87	0.88
	Inversion efficiency			0.7	0.82	0.86	0.87	0.79	0.84	0.86	0.87	0.82	0.85	0.86	0.87	0.8	0.84	0.85	0.86





Planetary Roller Screws-PL Series(Standard)

	Model			PL																
	Nominal diameter	D	mm	25				27				30					36				
	Lead	P	mm	4	5	6	8	4	5	6	8	4	5	6	8	10	4	5	6	8	10
	Number of starts of thread	N		5				5				5					5				
	Lead angle		°	2.92	3.64	4.37	5.82	2.7	3.37	4.05	5.39	2.43	3.04	3.64	4.85	6.06	2.03	2.53	3.04	4.05	5.05
Single nut	Rated dynamic load	Ca	kN	76.9	81.2	84.1	90.7	85	90.1	93.7	98.6	100.7	107.1	111	117.1	126.2	128	135.1	140.3	149.3	159.5
	Rated dead load	Coa	kN	161.1	161.4	159.5	162.3	178.1	179.6	178.8	174.6	221.5	224.6	222.3	217.6	226.4	296.8	297.3	294.5	292.2	299.5
	Stiffness coefficient	Fk	N2/3um	74	65.9	59.5	51.8	76.5	68.5	62	52.7	83.9	75.4	68.2	58	52.8	95.3	84.4	76.6	65.5	59
	Axial clearance	*	mm	0.02	0.03	0.03	0.04	0.02	0.03	0.03	0.03	0.02	0.03	0.03	0.03	0.04	0.02	0.03	0.03	0.04	0.04
Double nut	Rated dynamic load	Ca	kN	76.9	81.2	84.1	90.7	85	90.1	93.7	98.6	100.7	107.1	111	117.1	126.2	128	135.1	140.3	149.3	159.5
	Rated dead load	Coa	kN	161.1	161.4	159.5	162.3	178.1	179.6	178.8	174.6	221.5	224.6	222.3	217.6	226.4	296.8	297.3	294.5	292.2	299.5
	Stiffness coefficient	Fk	N2/3um	111.1	98.9	89.3	77.7	114.8	102.8	93	79.1	126	113.2	102.3	87	79.2	143	126.6	115	98.4	88.6
	Pretightening force	Fv	N	1245	1140	1035	840	1312	1218	1123	940	1520	1426	1330	1140	963	1714	1631	1546	1373	1205
	Pretension torsional moment	Mv	Nm	0.35	0.35	0.35	0.35	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.65	0.65	0.65	0.65	0.65
Preload nut	Rated dynamic load	Ca	kN	42.3	44.7	46.3	49.9	46.8	49.6	51.6	54.3	55.4	58.9	61.1	64.5	69.5	70.5	74.4	77.2	82.2	87.9
	Rated dead load	Coa	kN	80.5	80.7	79.7	81.1	89	89.8	89.3	87.2	110.7	112.2	111.1	108.8	113.2	148.3	148.6	147.2	146.1	149.7
	Stiffness coefficient	Fk	N2/3um	46.7	41.6	37.5	32.7	48.3	43.2	39.1	33.3	52.9	47.6	43	36.6	33.3	60.1	53.2	48.3	41.3	37.2
	Pretightening force	Fv	N	1245	1140	1035	840	1312	1218	1123	940	1520	1426	1330	1140	963	1714	1631	1546	1373	1205
	Pretension torsional moment	Mv	Nm	0.35	0.35	0.35	0.35	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.65	0.65	0.65	0.65	0.65
	Forward efficiency			0.85	0.86	0.87	0.88	0.84	0.85	0.87	0.88	0.83	0.85	0.86	0.87	0.88	0.81	0.83	0.85	0.87	0.88
	Inversion efficiency			0.82	0.84	0.86	0.87	0.81	0.83	0.85	0.86	0.79	0.82	0.84	0.86	0.87	0.76	0.8	0.82	0.85	0.86





Planetary Roller Screws-PL Series(Standard)

	Model			PL																
	Nominal diameter	D	mm	39					44		48			51			56			
	Lead	P	mm	4	5	6	8	10	6	12	5	10	15	5	10	15	6	12	18	
	Number of starts of thread	N		5					6		5			5			6			
	Lead angle		°	1.87	2.34	2.8	3.74	4.67	2.49	4.96	1.9	3.79	5.68	1.79	3.57	5.35	1.95	3.9	5.84	
Single nut	Rated dynamic load	Ca	kN	149.6	159.3	166	174.8	185.4	145.4	168.7	218.5	258.4	284.4	262.9	307.9	338.9	219.4	256	277.8	
	Rated dead load	Coa	kN	366.1	371.9	370.6	361.1	365.6	341.4	334.5	556.1	559	562	725.8	717.2	720.3	584.8	575.8	566.8	
	Stiffness coefficient	Fk	N2/3um	104.8	93.1	84.8	72	64.4	94.1	64.9	111.5	77.4	62.8	126.2	86.8	70.2	118.9	82.1	66.1	
	Axial clearance	*	mm	0.02	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.04	
Double nut	Rated dynamic load	Ca	kN	149.6	159.3	166	174.8	185.4	145.4	168.7	218.5	258.4	284.4	262.9	307.9	338.9	219.4	256	277.8	
	Rated dead load	Coa	kN	366.1	371.9	370.6	361.1	365.6	341.4	334.5	556.1	559	562	725.8	717.2	720.3	584.8	575.8	566.8	
	Stiffness coefficient	Fk	N2/3um	157.3	139.7	127.2	108.1	96.7	141.2	97.4	167.3	116.1	94.2	189.3	130.2	105.4	178.4	123.3	99.3	
	Pretightening force	Fv	N	1980	1892	1804	1623	1444	2069	1540	2410	1969	1535	2675	2221	1768	2743	2223	1717	
	Pretension torsional moment	Mv	Nm	0.8	0.8	0.8	0.8	0.8	1	1	1.2	1.2	1.2	1.4	1.4	1.4	1.6	1.6	1.6	
Preload nut	Rated dynamic load	Ca	kN	82.4	87.7	91.4	96.3	102.1	80.1	92.9	120.3	142.3	156.6	144.8	169.6	186.7	120.8	141	153	
	Rated dead load	Coa	kN	183	185.9	185.3	180.5	182.7	170.7	167.2	278	279.5	280.9	362.8	358.6	360.1	292.4	287.9	283.4	
	Stiffness coefficient	Fk	N2/3um	66	58.6	53.4	45.3	40.5	59.2	40.8	70.2	48.7	39.5	79.5	54.6	44.2	74.9	51.7	41.6	
	Pretightening force	Fv	N	1980	1892	1804	1623	1444	2069	1540	2410	1969	1535	2675	2221	1768	2743	2223	1717	
	Pretension torsional moment	Mv	Nm	0.8	0.8	0.8	0.8	0.8	1	1	1.2	1.2	1.2	1.4	1.4	1.4	1.6	1.6	1.6	
	Forward efficiency			0.8	0.82	0.84	0.86	0.87	0.83	0.88	0.8	0.86	0.88	0.79	0.86	0.88	0.8	0.86	0.88	
	Inversion efficiency			0.75	0.79	0.81	0.84	0.86	0.8	0.86	0.75	0.84	0.87	0.74	0.84	0.86	0.76	0.85	0.87	





Planetary Roller Screws-PL Series(Standard)

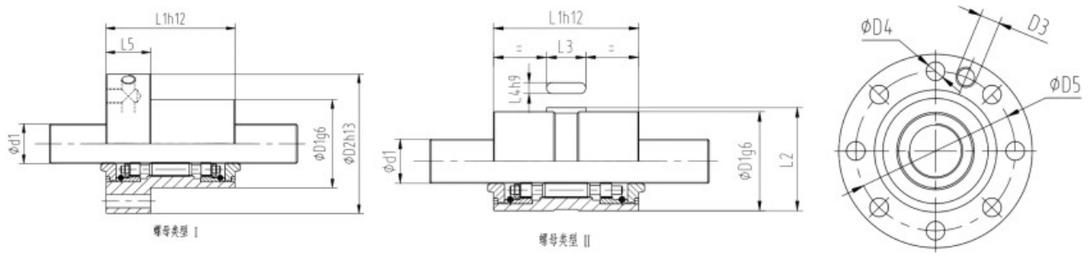
	Model			PL																	
	Nominal diameter	D	mm	60				64			75				80			87				
	Lead	P	mm	5	10	15	20	6	12	18	10	15	20	25	12	18	24	10	15	20	25	30
	Number of starts of thread	N		5				6			5				6			5				
	Lead angle		°	1.52	3.04	4.55	6.06	1.71	3.42	5.12	2.43	3.64	4.85	6.06	2.73	4.1	5.45	2.1	3.14	4.19	5.23	6.26
Single nut	Rated dynamic load	Ca	kN	321.1	380	414.9	500.3	255.4	303	332.7	497.7	549.4	639.4	642.3	385.2	428.1	524.5	606.5	656.6	767.9	767.7	785
	Rated dead load	Coa	kN	921.9	925.7	915.8	1057	802.1	791.7	781.3	1452.6	1440.3	1666	1651.6	1040.8	1045.7	1225.7	1857.2	1862.7	2179.4	2140.2	2191.8
	Stiffness coefficient	Fk	N2/3um	139.4	96.4	77.4	68.3	137.2	94.4	75.9	116.6	94.2	82.6	73.6	105.2	85.3	75.6	129.7	105	92.4	81.8	75.5
	Axial clearance	*	mm	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Double nut	Rated dynamic load	Ca	kN	321.1	380	414.9	500.3	255.4	303	332.7	-	-	-	-	-	-	-	-	-	-	-	-
	Rated dead load	Coa	kN	921.9	925.7	915.8	1057	802.1	791.7	781.3	-	-	-	-	-	-	-	-	-	-	-	-
	Stiffness coefficient	Fk	N2/3um	209.2	144.7	116.2	102.5	205.9	141.7	113.9	-	-	-	-	-	-	-	-	-	-	-	-
	Pretightening force	Fv	N	2994	2581	2153	1749	3069	2578	2081	-	-	-	-	-	-	-	-	-	-	-	-
	Pretension torsional moment	Mv	Nm	1.8	1.8	1.8	1.8	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
Preload nut	Rated dynamic load	Ca	kN	176.9	209.3	228.5	275.6	142.6	169.2	185.8	-	-	-	-	-	-	-	-	-	-	-	-
	Rated dead load	Coa	kN	460.9	462.8	457.9	528.4	401	395.8	390.6	-	-	-	-	-	-	-	-	-	-	-	-
	Stiffness coefficient	Fk	N2/3um	87.8	60.7	48.8	43	86.4	59.4	47.8	-	-	-	-	-	-	-	-	-	-	-	-
	Pretightening force	Fv	N	2994	2581	2153	1749	3069	2578	2081	-	-	-	-	-	-	-	-	-	-	-	-
	Pretension torsional moment	Mv	Nm	1.8	1.8	1.8	1.8	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
	Forward efficiency			0.77	0.85	0.87	0.88	0.78	0.86	0.88	0.83	0.86	0.87	0.88	0.84	0.87	0.88	0.81	0.85	0.87	0.88	0.88
	Inversion efficiency			0.7	0.82	0.86	0.87	0.73	0.83	0.86	0.79	0.84	0.86	0.87	0.81	0.85	0.86	0.77	0.83	0.85	0.86	0.87





Planetary Roller Screws-PL Series(Standard)

	Model			PL													
	Nominal diameter	D	mm	92				99				120					
	Lead	P	mm	12	18	24	30	12	18	24	30	15	20	25	30	35	
	Number of starts of thread	N		6				6				5					
	Lead angle		°	2.38	3.56	4.75	5.93	2.19	3.28	4.37	5.45	2.28	3.04	3.79	4.55	5.3	
Single nut	Rated dynamic load	Ca	kN	532.7	583.2	695.2	714.5	790.1	843.6	858.1	857.7	1181.8	1214	1213.9	1232.4	1220.5	
	Rated dead load	Coa	kN	1646.6	1611.1	1886.1	1940.3	2649.6	2603.2	2610.1	2563.8	4248.3	4320.2	4234.1	4274.2	4156.9	
	Stiffness coefficient	Fk	N2/3um	129	103.3	91.4	82.8	153.1	122.9	105.9	93.9	143	124.3	109.4	99.9	91.3	
	Axial clearance	*	mm	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	
Double nut	Rated dynamic load	Ca	kN	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Rated dead load	Coa	kN	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Stiffness coefficient	Fk	N2/3um	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Pretightening force	Fv	N	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Pretension torsional moment	Mv	Nm	-	-	-	-	-	-	-	-	-	-	-	-	-	
Preload nut	Rated dynamic load	Ca	kN	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Rated dead load	Coa	kN	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Stiffness coefficient	Fk	N2/3um	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Pretightening force	Fv	N	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Pretension torsional moment	Mv	Nm	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Forward efficiency			0.82	0.86	0.87	0.88	0.81	0.85	0.87	0.88	0.82	0.85	0.86	0.87	0.88	
	Inversion efficiency			0.79	0.84	0.86	0.87	0.78	0.83	0.85	0.86	0.78	0.82	0.84	0.86	0.86	



Model	D	P	Roller Screw			Nut										
			d1	d0	d2	D1	D2	D3	D4	D5	L1		L2	L3	L4	L5
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
PL	12	1	12.1	12	11.9	30	48	M5	4.5	38	35	43	31.2	10	3	14
		2	12.1		11.8											
		3	12.2		11.7											
		4	12.3		11.6											
	15	2	15.1	15	14.8	36	57	M6	5.5	47	44	52	37.5	14	4	18
		3	15.2		14.7											
		4	15.3		14.6											
		5	15.3		14.5											
	18	3	18.2	18	17.7	45	64	M6	5.5	55	50	60	46.5	18	4	18
		4	18.3		17.6											
		5	18.3		17.5											
		6	18.4		17.4											
	21	3	21.2	21	20.7	50	72	M6	5.5	61	62	72	52	20	5	20
		4	21.3		20.6											
		5	21.3		20.5											
		6	21.4		20.4											
	25	4	24.3	24	23.6	57	84	M6	6.5	70	68	82	59.5	25	6	24
		5	24.3		23.5											
		6	24.4		23.4											
		8	24.5		23.2											
	27	4	27.3	27	26.6	60	92	M6	6.5	72	80	91	62	20	5	24
		5	27.3		26.5											
		6	27.4		26.4											
		8	27.5		26.2											
	30	4	30.3	30	29.6	68	98	M6	9	83	85	99	70.5	20	6	27
		5	30.3		29.5											
		6	30.4		29.4											
		8	30.5		29.2											
		10	30.6		29.0											
	36	4	36.3	36	35.6	74	110	M6	9	92	96	106	76.5	28	6	32
		5	36.4		35.5											
		6	36.4		35.4											
		8	36.5		35.2											
		10	36.7		35.0											
	39	4	39.3	39	38.6	86	121	M6	11	103	94	110	88.5	28	6	30
		5	39.4		38.5											
		6	39.4		38.4											
		8	39.5		38.2											
		10	39.7		38.0											
	44	6	44.4	44	43.5	86	121	M6	11	103	94	110	88.5	28	6	30
		12	44.7		43.0											
	48	5	48.4	48	47.5	100	142	M8X1	13.5	122	115	135	103	45	8	37
		10	48.7		47.1											
		15	49.0		46.5											
	51	5	51.4	51	50.5	108	152	M8X1	13.5	128	122	142	111	50	8	37
		10	51.7		50.1											
		15	52.0		49.5											
	56	6	56.4	56	55.5	108	152	M8X1	13.5	128	107	127	111	40	8	37
		12	56.7		55.1											
		18	57.0		54.5											