PSN

斜齿高精度减速机能够实现噪音极低的同步运行，轴承负载能力强

我们的 **PSN** 是纯粹的进步：它的斜齿确保了低噪音级别的同步。高精度行星减速机将振动降低至最小。 **PSN** 在承受极高负荷的情况下仍然保持高精确度，这使其成为全世界性能最强大的减速机之一。

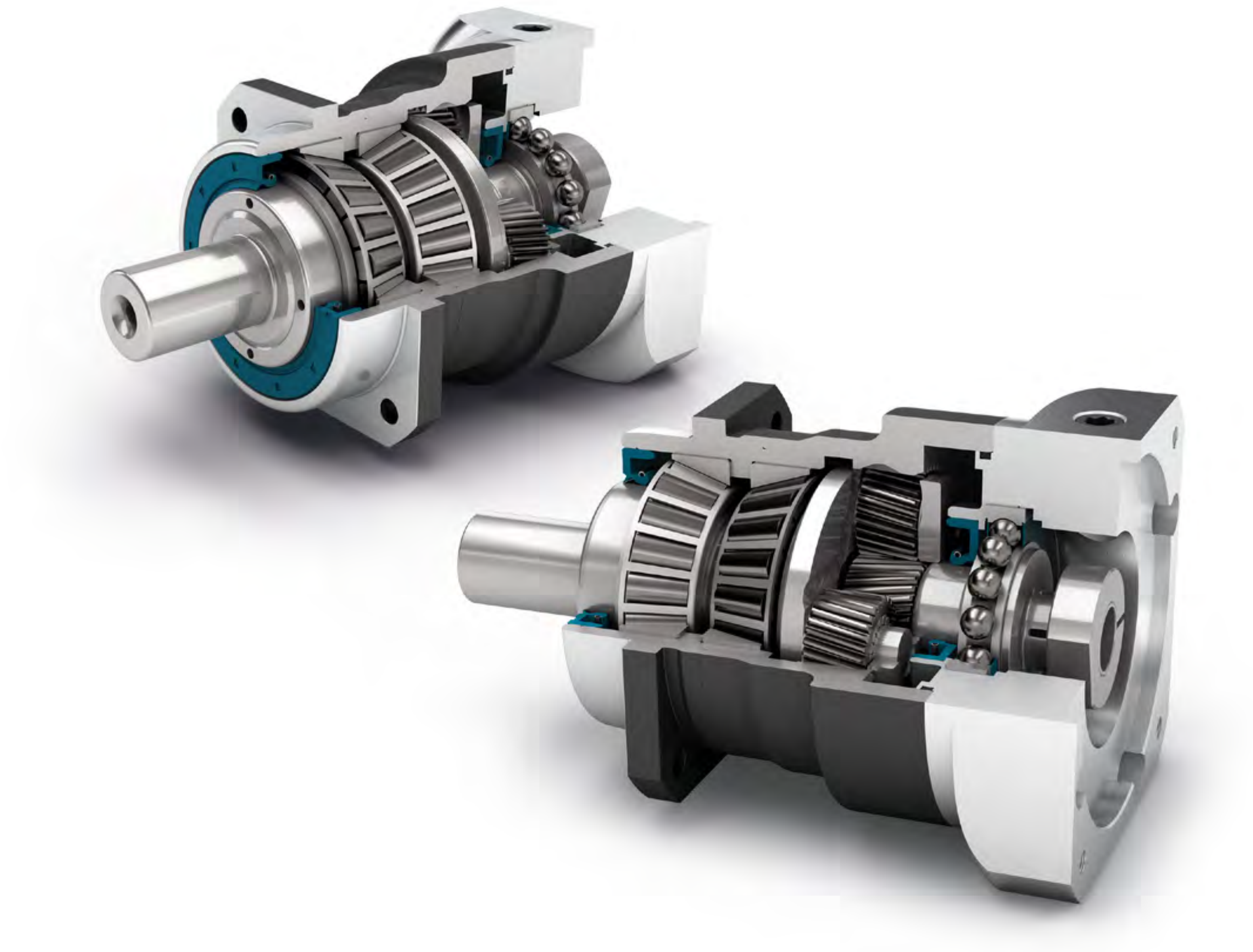
The helical precision planetary gearbox for low-noise operation and high bearing loads

Our **PSN** is pure progress: Its helical gearing ensures low-noise synchronization. With this precision planetary gearbox, vibrations are reduced to a minimum. Precision even under very high loads makes the **PSN** one of the most high-performance gearboxes in the world.

周期性扭矩 Cyclic torque	**14 - 950 Nm**
径向力 Radial force	**950 - 20000 N**
轴向力 Axial force	**2200 - 17000 N**
回程间隙 Torsional backlash	**1 - 8 arcmin**
防护等级 Protection class	**IP65**

结构尺寸
Frame sizes

55	**70**	**90**	**115**	**142**	**190**



精密型
Precision Line

斜齿
Helical gear

配有预紧的圆锥滚子轴承
Preloaded tapered roller bearings

输出端带有超长定心环
Extra long centering collar

可选: 降低回程间隙
Option: Reduced backlash

可选: 齿轮-齿条
行星减速机（细节见第 158 页）
Option: Rack and pinion
Planetary gearbox (Details on page 158)

同轴减速机
Coaxial gearbox

旋转方向 同方向
Equidirectional rotation

正方形输出法兰
Square type output flange

径向轴密封
Rotary shaft seal

行星齿轮架（笼状结构）
Planet carrier in cage design

可选：喷漆表面
——RAL 9005 黑色
Option: Painted surface
– RAL 9005 Jet black

技术特点的详细解释，请从第201页读起。
Detailed explanations of the technical features starting on page 201.

Code	减速机参数	Gearbox characteristics			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	p[1]
	使用寿命[2]	Service life[2]	L_h	h	20.000						
	有效系数[3]	Efficiency[3]	η	%	98						1
					97						2
	最低工作温度	Min. operating temperature	T_{min}	°C	-25						
	最高工作温度	Max. operating temperature	T_{max}		90						
	防护等级	Protection class			IP65						
S	标准润滑	Standard lubrication			润滑油（终生润滑）/ Oil (lifetime lubrication)						
F	食品级润滑	Food grade lubrication			润滑油（终生润滑）/ Oil (lifetime lubrication)						
	安装位置	Installation position			任意 / Any						
S	标准回程间隙	Standard backlash	φ	arcmin	< 6	< 3	< 3	< 3	< 3	< 3	1
					< 8	< 5	< 5	< 5	< 5	< 5	2
R	降低回程间隙	Reduced backlash			< 4	< 2	< 1	< 1	< 1	< 1	1
					< 6	< 2	< 1	< 1	< 1	< 1	2
	抗扭刚度[3]	Torsional stiffness[3]	C_{2t}	Nm / arcmin	1,3 - 1,9	3,6 - 5,0	10,5 - 13,9	28,0 - 39,0	62,0 - 88,0	181,0 - 246,0	1
					1,3 - 1,9	3,6 - 5,0	10,3 - 13,8	28,5 - 39,5	61,0 - 86,0	179,0 - 255,0	2
	减速机重量[3]	Gearbox weight[3]	m	kg	0,8	2,2	4,0 - 4,1	6,9 - 7,3	15,1 - 15,5	34,5 - 36,3	1
					1,1	2,8 - 2,9	4,2	8,4 - 8,6	16,7 - 17,3	38,6 - 40,5	2
S	标准的箱体表面	Standard surface			箱体：钢 – 热处理后氧化（黑色） Housing: Steel – heat-treated and post-oxidized (black)						
B	喷漆表面[4]	Painted surface[4]			RAL 9005 黑色 RAL 9005 Jet black						
	运行噪音[3]	Running noise[3]	L_{pA}	dB(A)	56	57	58	63	66	68	

输出轴载荷	Output shaft loads			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	p[1]
最大径向力	Maximum radial force	$F_{r\,max}$	N	950	3200	5500	6000	13000	20000	
最大轴向力	Maximum axial force	$F_{a\,max}$		2200	3400	4500	6500	12000	17000	
最大倾斜力矩	Maximum tilting moment	$M_{K\,max}$	Nm	40	203	419	562	1566	2887	

输入特性	Input characteristics			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	p[1]
输入端锁紧系统直径（代码）	Clamping system diameter input (Code)	D26	mm	11 (C)[5]	11 (C)	14 (D)	19 (E)	35 (G)[5]	48 (K)[5]	1
				14 (D)	14 (D)[5]	19 (E)[5]	24 (F)[5]	42 (H)	-	
				-	19 (E)	24 (F)	35 (G)	-	-	
				11 (C)[5]	11 (C)	11 (C)	14 (D)	19 (E)	35 (G)[5]	2
				14 (D)	14 (D)[5]	14 (D)[5]	19 (E)[5]	24 (F)[5]	42 (H)	
				-	19 (E)	19 (E)	24 (F)	35 (G)	-	
转动惯量[3][5]	Mass moment of inertia input[3][5]	J_1	kgcm²	0,096 - 0,126	0,150 - 0,294	0,439 - 0,920	1,147 - 2,775	6,475 - 13,112	21,695 - 53,182	1
				0,095 - 0,109	0,146 - 0,199	0,146 - 0,227	0,431 - 0,710	1,131 - 2,252	6,360 - 10,654	2
平均空载扭矩[3][5]	Average idle torque[3][5]	T_0	Nm	0,15 - 0,30	0,20 - 0,65	0,40 - 1,25	0,75 - 2,70	2,05 - 9,60	4,30 - 20,30	1
				0,15 - 0,25	0,15 - 0,45	0,25 - 0,55	0,40 - 1,35	0,70 - 3,40	1,75 - 7,30	2
基于减速机输入法兰的最大弯矩	Max. bending moment based on the gearbox input flange	M_{b1}		10	18	38	80	180	300	1
				10	18	18	38	80	180	2

(1) 减速机级数
(2) 利用 NCP 针对应用进行专门设计 – www.neugart.com
(3) 传动比相关的数值可在 Tec Data Finder 中检索 – www.neugart.com
(4) 更多信息见第 183
(5) 参考 锁紧系统直径

(1) Number of stages
(2) Application specific configuration with NCP – www.neugart.com
(3) The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com
(4) More information on page 183
(5) Reference clamping system diameter

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输出扭矩	Output torques			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	i[1]	p[2]
周期性扭矩[3][4]	Cyclic torque[3][4]	T_{2Z}	Nm	16	29	54	135	380	840	3	1
				18	39	80	180	470	950	4	
				18	40	80	175	405	950	5	
				18	37	78	175	355	900	7	
				18	39	75	155	350	-	8	
				13,5	28	59	140	305	750	10	
				16	29	54	135	380	840	12	2
				16	29	54	135	380	840	15	
				18	39	80	180	470	950	16	
				18	39	80	180	470	950	20	
				18	40	80	175	405	950	25	
				18	40	80	175	405	950	35	
				18	39	80	180	470	950	40	
				18	40	80	175	405	950	50	
				18	37	78	175	355	900	70	
				13,5	28	59	140	305	750	100	
最大扭矩[3][4]	Maximum torque[3][4]	T_{2max}	Nm	25	46	86	215	520	1110	3	1
				28	62	128	285	700	1480	4	
				28	64	128	280	640	1520	5	
				28	58	124	280	560	1440	7	
				28	62	120	245	480	-	8	
				21	44	94	220	485	1050	10	
				25	46	86	215	600	1350	12	2
				25	46	86	215	600	1350	15	
				28	62	128	285	750	1520	16	
				28	62	128	285	750	1520	20	
				28	64	128	280	640	1520	25	
				28	64	128	280	640	1520	35	
				28	62	128	285	750	1520	40	
				28	64	128	280	640	1520	50	
				28	50	124	280	560	1440	70	
				21	44	94	220	485	1050	100	

(1) 传动比 ($i=n_1/n_2$)
(2) 减速机级数
(3) 利用 NCP 针对应用进行专门设计 – www.neugart.com
(4) 参考夹紧系统直径

(1) Ratios ($i=n_1/n_2$)
(2) Number of stages
(3) Application specific configuration with NCP – www.neugart.com
(4) Based on reference clamping system diameter

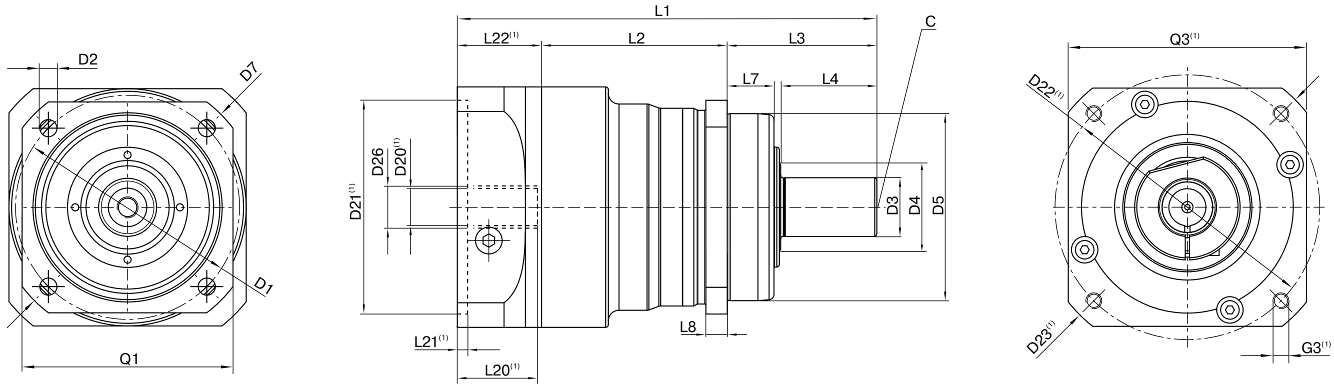
输出扭矩	**Output torques**			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	i[1]	p[2]
连续扭矩[3]	Continuous torque[3]	T_{2D}	Nm	11	24	45	114	320	710	3	1
				15	33	68	153	395	800	4	
				15	34	68	148	340	800	5	
				15	31	66	148	300	760	7	
				15	33	63	131	295	-	8	
				11	23	50	119	255	630	10	
				13,5	24	45	114	320	710	12	2
				13,5	24	45	114	320	710	15	
				15	33	68	153	395	800	16	
				15	33	68	153	395	800	20	
				15	34	68	148	340	800	25	
				15	34	68	148	340	800	35	
				15	33	68	153	395	800	40	
				15	34	68	148	340	800	50	
				15	31	66	148	300	760	70	
				11	23	50	119	255	630	100	

输入转速	**Input speeds**			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	i[1]	p[2]
连续输入转速[3][4]	Continuous input speed[3][4]	n_{1D}	min^{-1}	4050	2500	2150	1600	1000	610	3	1
				4150	3150	2150	1750	1050	610	4	
				4950	3800	2600	2200	1500	800	5	
				5000	4500	3450	3200	2200	1100	7	
				5000	4500	3500	3150	2550	-	8	
				5000	4500	4000	3500	3000	1550	10	
				5000	4500	4450	3100	2000	1350	12	2
				4500	4500	4500	3850	2500	1750	15	
				5000	4500	4300	3150	2000	1450	16	
				4600	4500	4500	3900	2500	1900	20	
				5000	4500	4500	4000	3150	2250	25	
				5000	4500	4500	4000	3500	3000	35	
				5000	4500	4500	4000	3500	3000	40	
				5000	4500	4500	4000	3500	3000	50	
				5000	4500	4500	4000	3500	3000	70	
				5000	4500	4500	4000	3500	3000	100	
最高机械输入转速[3]	Max. mechanical input speed[3]	n_{1max}	min^{-1}	10000	10000	10000	8500	6500	6000		1
				10000	10000	10000	10000	8500	6500		2

输出扭矩	**Output torques**			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	i[1]	p[2]
急停扭矩[4][5]	Emergency stop torque[4][5]	T_{2Stop}	Nm	48	90	210	490	1050	2220	3	1
				48	120	280	650	1400	2960	4	
				48	130	280	650	1650	3200	5	
				48	80	175	340	1300	3200	7	
				48	90	200	380	850	-	8	
				24	52	121	295	600	1700	10	
				48	135	220	500	1250	2400	12	2
				48	135	220	500	1250	2400	15	
				48	150	300	650	1650	3200	16	
				48	150	300	650	1650	3200	20	
				48	150	300	650	1650	3200	25	
				48	150	300	650	1650	3200	35	
				48	150	210	485	1180	2680	40	
				48	150	260	600	1480	3200	50	
				48	80	175	340	1300	3200	70	
				24	52	121	295	600	1700	100	

(1) 传动比 ($i=n_1/n_2$)
(2) 减速机级数
(3) 利用 NCP 针对应用进行专门设计 – www.neugart.com
(4) 参考夹紧系统直径
(5) 允许 1000 次

(1) Ratios ($i=n_1/n_2$)
(2) Number of stages
(3) Application specific configuration with NCP – www.neugart.com
(4) Based on reference clamping system diameter
(5) Permitted 1000 times



图示为带平键的 PSN090 / 1 级 / 光滑输出轴 / 14 mm 锁紧系统 / 适配电机法兰 – 2 件式 – 圆形通用法兰 / B5 电机法兰类型
Drawing corresponds to a PSN090 / 1-stage / smooth output shaft / 14 mm clamping system / motor adaptation – 2-part – round universal flange / B5 flange type motor

(1) 具体尺寸视电机/减速机法兰而定。可以在 www.neugart.com 下 Tec Data Finder。中针对每个电机适配电机特有的输入法兰几何尺寸。
(1) The dimensions vary with the motor/gearbox flange. The input flange dimensions can be retrieved for each specific motor in Tec Data Finder at www.neugart.com

几何尺寸(2)	Geometry(2)			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	p(3)	Code
输出端安装孔节圆直径	Pitch circle diameter output	D1		63	68 - 75	85	120	165	215		
输出端安装孔直径	Mounting bore output	D2	4x	5,5	5,5	6,5	9,0	11,0	13,5		
输出轴直径	Shaft diameter output	D3	k6	12	16	22	32	40	55		
输出轴轴肩直径	Shaft collar output	D4		16	21,5	31,5	41,5	57,5	76,5		
输出端定位凸台直径	Centering diameter output	D5	g7	50	60	70	90	130	160		
输出法兰对角线尺寸	Diagonal dimension output	D7		74	92	100	140	185	240		
输出端法兰外方	Flange cross section output	Q1	■	55	70	80	110	142	190		
最小总长	Min. total length	L1		103,5	134	157	202,5	261,5	310,5	1	
				127	162,5	179	224,5	292,5	355,5	2	
箱体长度	Housing length	L2		43	60,5	69,5	71	101,5	130,5	1	
				66,5	89	98	104,5	139	194	2	
输出端定位凸台深度	Centering depth output	L7		12	19	17,5	28	28	28		
输出端法兰厚度	Flange thickness output	L8		6	7	8	10	12	15		
中心孔（DIN 332，DR 形）	Center hole (DIN 332, type DR)	C		M4x10	M5x12,5	M8x19	M12x28	M16x36	M20x42		
电机轴直径j6/k6	Motor shaft diameter j6/k6	D20		更多信息见第 191/192 页 More information on page 191/192							
输入端锁紧系统直径	Clamping system diameter input	D26		更多信息见第 112 页 More information on page 112							
带平键的输出轴 (DIN 6885-1)	Output shaft with feather key (DIN 6885-1)			A 4x 4x18	A 5x 5x25	A 6x 6x28	A 10x 8x50	A 12x 8x65	A 16x 10x70		A
平键宽度 (DIN 6885-1)	Feather key width (DIN 6885-1)	B1		4	5	6	10	12	16		A
含平键在内的轴高 (DIN 6885-1)	Shaft height including feather key (DIN 6885-1)	H1		13,5	18	24,5	35	43	59		A
输出轴轴长	Shaft length output	L3		36	48	56	88	110	112		A
到轴肩的距离	Shaft length from shoulder	L4		23	28	36	58	80	82		A
平键长度	Feather key length	L5		18	25	28	50	65	70		A
到轴端的距离	Distance from shaft end	L6		2	2	4	4	8	6		A
光滑输出轴	Smooth output shaft										B
输出轴轴长	Shaft length output	L3		36	48	56	88	110	112		B
到轴肩的距离	Shaft length from shoulder	L4		23	28	36	58	80	82		B
花键输出轴 (DIN 5480)	Splined output shaft (DIN 5480)			-	W16x0,8 x18x6m	W22x1,25 x16x6m	W32x1,25 x24x6m	W40x2,0 x18x6m	W55x2,0 x26x6m		C
花键或键槽的长度	Width of gearing	L_v		-	15	15	15	20	22		C
输出轴轴长	Shaft length output	L3		-	46	46	56	70	71,5		C
到轴肩的距离	Shaft length from shoulder	L4		-	26	26	26	40	41,5		C

(2) 所有的尺寸单位为mm
(3) 减速机级数

(2) Dimensions in mm
(3) Number of stages

PSN