



WPSFN

The shortest spiral right angle gearbox with flange output shaft and hollow shaft

Our **WPSFN** is extremely light and easy to integrate thanks to its standardized flange interface. It achieves optimized synchronization with the spiral gearing and the helical-toothed planetary stage for the best surface qualities. The shortest right angle precision gearbox with integrated hollow shaft provides you with new structural solutions.

Nominal output torque **22 - 625 Nm**

Torsional backlash **3 - 5 arcmin**

Tilting moment **132 - 1989 Nm**

Protection class **IP65**

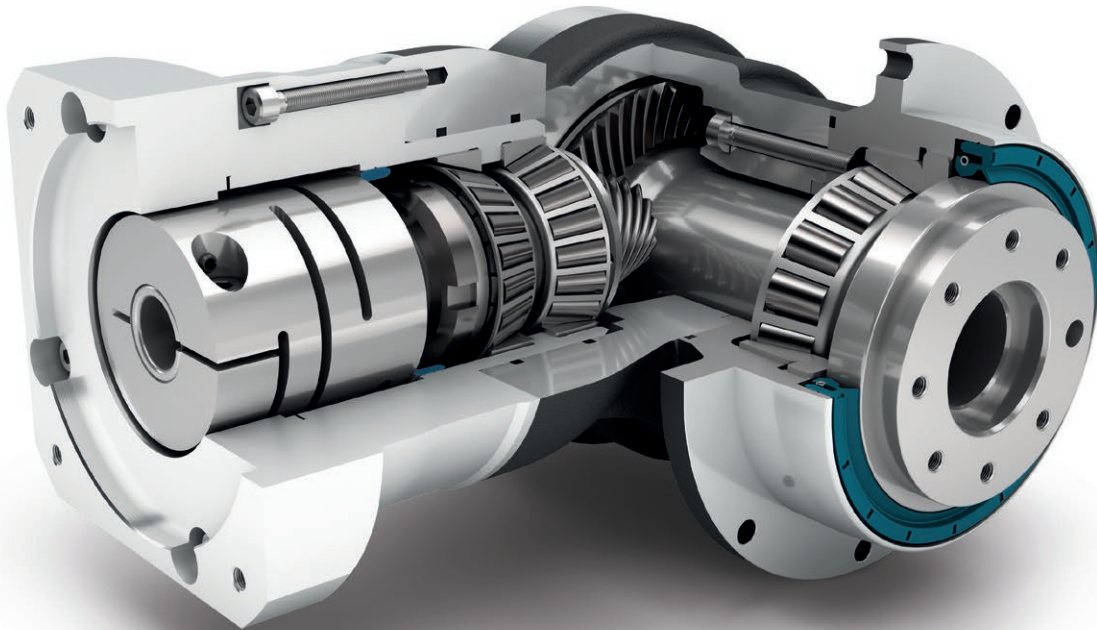
Frame sizes

64

90

110

140



Precision Line



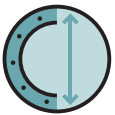
Right angle gearbox



Counterdirectional rotation



Hypoid gear right angle stage



Extra large round type output flange



Preloaded angular contact roller bearings



Rotary shaft seal



Flange output shaft (ISO 9409)



Hollow shaft



Option: Reduced backlash

Code	Gearbox characteristics			WPSFN064	WPSFN090	WPSFN110	WPSFN140	p ⁽¹⁾
	Service life (L _{10h})	t _L	h	20,000				
	Service life at T _{2N} × 0.88			30,000				
	Efficiency at full load ⁽²⁾	η	%	94				1
				93				2
	Min. operating temperature	T _{min}	°C (°F)	-25 (-13)				
	Max. operating temperature	T _{max}		90 (194)				
	Protection class			IP65				
S	Standard lubrication			Oil (lifetime lubrication)				
F	Food grade lubrication			Oil (lifetime lubrication)				
	Installation position			Any				
S	Standard backlash			< 5				
R	Reduced backlash	j _t	arcmin	-				1
				< 3				2
	Torsional stiffness ⁽²⁾	c _g	Nm/arcmin (lb _r .in/ arcmin)	1.9 - 2.6 (17 - 23)	4.0 - 5.5 (35 - 49)	10.1 - 13.5 (89 - 119)	26.0 - 34.5 (230 - 305)	1
				5.3 - 6.9 (47 - 61)	15.3 - 20.5 (135 - 181)	33.5 - 44.0 (296 - 389)	85.0 - 111.0 (752 - 982)	2
	Gearbox weight	m _G	kg (lb _m)	3.3 (7.3)	6.1 (13.5)	10.9 (24.0)	24 (52.9)	1
				3.7 (8.2)	5.3 (11.7)	8.4 (18.5)	17.8 (39.3)	2
S	Standard surface			Right angle housing: Aluminum – anodized (black)				
	Running noise ⁽³⁾	Q _G	dB(A)	66	67	68	70	
	Max. bending moment based on the gearbox input flange ⁽⁴⁾	M _b	Nm (lb _r .in)	12 (106)	25,5 (226)	53 (469)	120 (1062)	1
				12 (106)	12 (106)	25,5 (226)	53 (469)	2

Output shaft loads			WPSFN064	WPSFN090	WPSFN110	WPSFN140	p ⁽¹⁾
Radial force for 20,000 h ⁽⁵⁾⁽⁶⁾	F _{r,20.000h}	N (lb _r)	2400 (540)	4400 (989)	5500 (1236)	12000 (2698)	1
			2150 (483)	3950 (888)	4900 (1102)	12000 (2698)	2
Axial force for 20,000 h ⁽⁵⁾⁽⁶⁾	F _{a,20.000h}		4200 (944)	7200 (1619)	9500 (2136)	8500 (1911)	1
			4300 (967)	8200 (1843)	9500 (2136)	8500 (1911)	2
Radial force for 30,000 h ⁽⁵⁾⁽⁶⁾	F _{r,30.000h}		2100 (472)	3900 (877)	4800 (1079)	11000 (2473)	1
			1900 (427)	3500 (787)	4350 (978)	11000 (2473)	2
Axial force for 30,000 h ⁽⁵⁾⁽⁶⁾	F _{a,30.000h}		3700 (832)	6300 (1416)	8400 (1888)	7500 (1686)	1
			3800 (854)	7200 (1619)	8400 (1888)	7500 (1686)	2
Maximum radial force ⁽⁷⁾⁽⁶⁾	F _{r,Stat}		2400 (540)	4400 (989)	5500 (1236)	12000 (2698)	1
			2150 (483)	3950 (888)	4900 (1102)	12000 (2698)	2
Maximum axial force ⁽⁷⁾⁽⁶⁾	F _{a,Stat}	4200 (944)	7200 (1619)	9500 (2136)	8500 (1911)	1	
		4300 (967)	8200 (1843)	9500 (2136)	8500 (1911)	2	
Tilting moment for 20,000 h ⁽⁵⁾⁽⁷⁾	M _{K,20.000h}	Nm (lb _r .in)	200 (1770)	484 (4284)	689 (6098)	1989 (17604)	1
			132 (1168)	326 (2885)	475 (4204)	1030 (9116)	2
Tilting moment for 30,000 h ⁽⁵⁾⁽⁷⁾	M _{K,30.000h}		175 (1549)	429 (3797)	601 (5319)	1823 (16135)	1
			117 (1036)	289 (2558)	422 (3735)	944 (8355)	2

Moment of inertia			WPSFN064	WPSFN090	WPSFN110	WPSFN140	p ⁽¹⁾
Mass moment of inertia ⁽²⁾	J	kgcm ² (lb _r .in.s ² 10 ⁻⁴)	0.502 - 0.672 (4.443 - 5.948)	1.046 - 1.591 (9.258 - 14.082)	4.857 - 6.435 (42.988 - 56.955)	15.220 - 21.693 (134.708 - 191.999)	1
			0.497 - 0.642 (4.399 - 5.682)	0.497 - 0.659 (4.399 - 5.833)	1.015 - 1.452 (8.984 - 12.851)	4.810 - 6.449 (42.572 - 57.078)	2

(1) Number of stages
(2) The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com
(3) Sound pressure level from 1 m, measured on input running at n_i=3000 rpm no load; i=5
(4) Max. motor weight* in kg = 0.2 × M₀ / motor length in m
* with symmetrically distributed motor weight
* with horizontal and stationary mounting
(5) These values are based on an output shaft speed of n₂=100 rpm
(6) Based on the end of the output shaft
(7) Other (sometimes higher) values following changes to T_{2N}, F_r, F_a, cycle, and service life of bearing. Application specific configuration with NCP – www.neugart.com

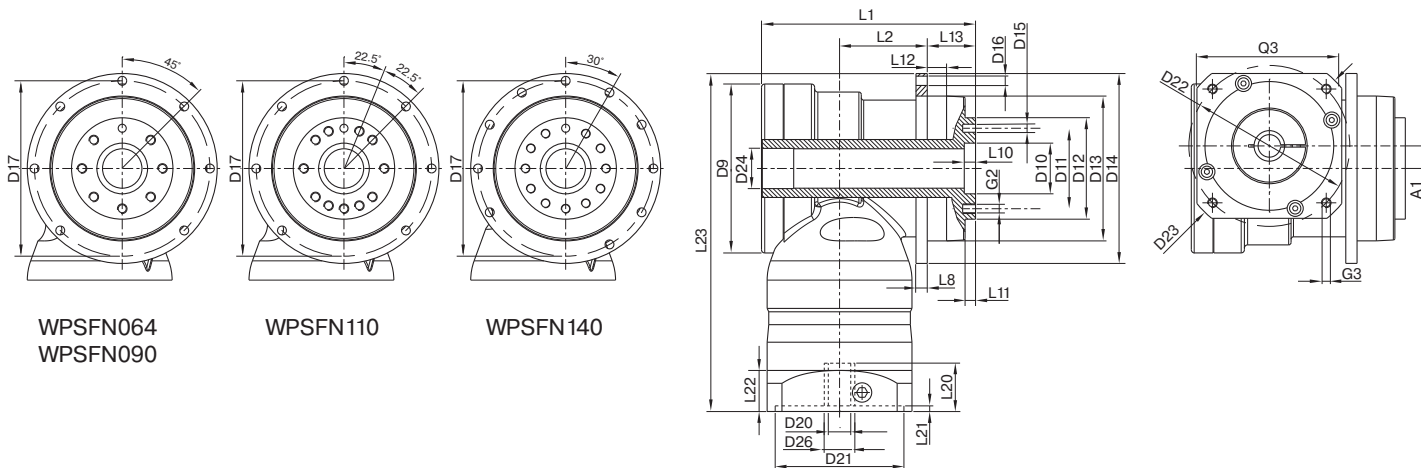
Output torques			WPSFN064	WPSFN090	WPSFN110	WPSFN140	i ⁽¹⁾	p ⁽²⁾
Nominal output torque ⁽³⁾	T _{2N}	Nm (lb _r .in)	45 (398)	90 (797)	160 (1416)	320 (2832)	4	1
			42 (372)	75 (664)	140 (1239)	280 (2478)	5	
			28 (248)	51 (451)	91 (805)	189 (1673)	7	
			27 (239)	50 (443)	90 (797)	180 (1593)	8	
			22 (195)	40 (354)	75 (664)	160 (1416)	10	2
			62 (549)	130 (1151)	310 (2744)	625 (5532)	16	
			62 (549)	130 (1151)	300 (2655)	560 (4956)	20	
			60 (531)	120 (1062)	255 (2257)	540 (4779)	25	
			62 (549)	112 (991)	204 (1806)	364 (3222)	28	
			62 (549)	108 (956)	200 (1770)	360 (3186)	32	
			60 (531)	123 (1089)	255 (2257)	455 (4027)	35	
			60 (531)	123 (1089)	250 (2213)	450 (3983)	40	
			60 (531)	110 (974)	200 (1770)	375 (3319)	50	
			37 (327)	78 (690)	175 (1549)	355 (3142)	70	
28 (248)	59 (522)	140 (1239)	305 (2699)	100				
Max. output torque ⁽⁴⁾	T _{2max}	Nm (lb _r .in)	72 (637)	144 (1275)	256 (2266)	512 (4532)	4	1
			67 (593)	120 (1062)	224 (1983)	448 (3965)	5	
			45 (398)	82 (726)	145 (1283)	302 (2673)	7	
			43 (381)	80 (708)	144 (1275)	288 (2549)	8	
			35 (310)	64 (566)	120 (1062)	256 (2266)	10	2
			99 (876)	210 (1859)	502 (4443)	1003 (8877)	16	
			99 (876)	210 (1859)	480 (4248)	896 (7930)	20	
			96 (850)	197 (1744)	408 (3611)	864 (7647)	25	
			99 (876)	180 (1593)	328 (2903)	580 (5133)	28	
			99 (876)	172 (1522)	320 (2832)	576 (5098)	32	
			96 (850)	197 (1744)	410 (3629)	725 (6417)	35	
			96 (850)	197 (1744)	400 (3540)	720 (6373)	40	
			96 (850)	175 (1549)	320 (2832)	600 (5310)	50	
			59 (522)	125 (1106)	280 (2478)	568 (5027)	70	
45 (398)	94 (832)	224 (1983)	488 (4319)	100				

⁽¹⁾ Ratios (i=n₁/n₂)
⁽²⁾ Number of stages
⁽³⁾ Application specific configuration with NCP – www.neugart.com
⁽⁴⁾ 30,000 rotations of the output shaft permitted; see page 142

Output torques			WPSFN064	WPSFN090	WPSFN110	WPSFN140	i ⁽¹⁾	p ⁽²⁾
Emergency stop torque ⁽³⁾	T _{2Stop}	Nm (lb _f .in)	100 (885)	200 (1770)	400 (3540)	800 (7081)	4	1
			100 (885)	200 (1770)	400 (3540)	800 (7081)	5	
			75 (664)	150 (1328)	300 (2655)	700 (6196)	7	
			75 (664)	150 (1328)	300 (2655)	700 (6196)	8	
			75 (664)	150 (1328)	300 (2655)	700 (6196)	10	
			150 (1328)	300 (2655)	650 (5753)	1600 (14161)	16	2
			150 (1328)	300 (2655)	650 (5753)	1600 (14161)	20	
			150 (1328)	300 (2655)	650 (5753)	1650 (14604)	25	
			150 (1328)	300 (2655)	600 (5310)	1200 (10621)	28	
			150 (1328)	300 (2655)	600 (5310)	1200 (10621)	32	
			150 (1328)	300 (2655)	650 (5753)	1500 (13276)	35	
			150 (1328)	300 (2655)	650 (5753)	1500 (13276)	40	
			150 (1328)	300 (2655)	650 (5753)	1500 (13276)	50	
			80 (708)	175 (1549)	340 (3009)	1300 (11506)	70	
			90 (797)	200 (1770)	480 (4248)	600 (5310)	100	

Input speeds			WPSFN064	WPSFN090	WPSFN110	WPSFN140	i ⁽¹⁾	p ⁽²⁾
Average thermal input speed at T _{2N} and S1 ⁽⁴⁾⁽⁵⁾	n _{1N}	rpm	1850 ⁽⁶⁾	1650 ⁽⁶⁾	1100 ⁽⁶⁾	1000 ⁽⁶⁾	4	1
			2050 ⁽⁶⁾	1900 ⁽⁶⁾	1200 ⁽⁶⁾	1100 ⁽⁶⁾	5	
			2450 ⁽⁶⁾	2350 ⁽⁶⁾	1450 ⁽⁶⁾	1300 ⁽⁶⁾	7	
			2500 ⁽⁶⁾	2400 ⁽⁶⁾	1450 ⁽⁶⁾	1300 ⁽⁶⁾	8	
			2650 ⁽⁶⁾	2550 ⁽⁶⁾	1500 ⁽⁶⁾	1400 ⁽⁶⁾	10	
			2250 ⁽⁶⁾	2100 ⁽⁶⁾	1750 ⁽⁶⁾	1400 ⁽⁶⁾	16	2
			2400 ⁽⁶⁾	2300 ⁽⁶⁾	2000 ⁽⁶⁾	1350 ⁽⁶⁾	20	
			2500 ⁽⁶⁾	2600 ⁽⁶⁾	2300 ⁽⁶⁾	1450 ⁽⁶⁾	25	
			2550 ⁽⁶⁾	2650 ⁽⁶⁾	2400 ⁽⁶⁾	1650 ⁽⁶⁾	28	
			2550 ⁽⁶⁾	2700 ⁽⁶⁾	2450 ⁽⁶⁾	1650 ⁽⁶⁾	32	
			2750 ⁽⁶⁾	2850 ⁽⁶⁾	2450 ⁽⁶⁾	1650 ⁽⁶⁾	35	
			2800 ⁽⁶⁾	2750 ⁽⁶⁾	2500 ⁽⁶⁾	1650 ⁽⁶⁾	40	
			2750 ⁽⁶⁾	2900 ⁽⁶⁾	2650 ⁽⁶⁾	1750 ⁽⁶⁾	50	
			3000 ⁽⁶⁾	3300 ⁽⁶⁾	3000 ⁽⁶⁾	1950 ⁽⁶⁾	70	
			3050 ⁽⁶⁾	3600 ⁽⁶⁾	3300 ⁽⁶⁾	2150 ⁽⁶⁾	100	
Max. mechanical input speed ⁽⁴⁾	n _{1Limit}	rpm	16000	14000	9500	8000		1
			16000	16000	14000	9500		2

(1) Ratios (i=n₁/n₂)
 (2) Number of stages
 (3) Permitted 1000 times
 (4) Application-specific speed configurations with NCP – www.neugart.com
 (5) See page 142 for the definition
 (6) Average thermal input speed at 50% T_{2N} and S1



WPSFN064
WPSFN090

WPSFN110

WPSFN140

Drawing corresponds to a WPSFN090 / 1-stage / flange output hollow shaft with dowel hole / 19 mm clamping system / motor adaptation – 2-part – round universal flange / B5 flange type motor
All other variants can be retrieved in the Tec Data Finder at www.neugart.com

Geometry ⁽¹⁾			WPSFN064	WPSFN090	WPSFN110	WPSFN140	z ⁽²⁾	Code	
Axis offset	A1		10 (0.394)	14 (0.551)	20 (0.787)	26 (1.024)	1		
			10 (0.394)	10 (0.394)	14 (0.551)	20 (0.787)	2		
Max. diameter	D9		86 (3.386)	105 (4.134)	120 (4.724)	170 (6.693)	1		
			86 (3.386)	86 (3.386)	105 (4.134)	120 (4.724)	2		
Centering diameter output shaft	D10	H7	20 (0.787)	31.5 (1.240)	40 (1.575)	50 (1.969)			
Pitch circle diameter output shaft	D11		31.5 (1.240)	50 (1.969)	63 (2.480)	80 (3.150)			
Centering diameter output shaft	D12	h7	40 (1.575)	63 (2.480)	80 (3.150)	100 (3.937)			
Centering diameter output flange	D13		64 (2.520)	90 (3.543)	110 (4.331)	140 (5.512)			
Flange diameter output	D14		86 (3.386)	118 (4.646)	145 (5.709)	179 (7.047)			
Mounting bore output	D16		4.5 7x45°	5.5 7x45°	5.5 7x45°	6.6 10x30°	1		
			4.5 8x45°	5.5 8x45°	5.5 8x45°	6.6 12x30°	2		
Pitch circle diameter output flange	D17		79 (3.110)	109 (4.291)	135 (5.315)	168 (6.614)			
Total length	L1		104.5 (4.114)	132 (5.197)	153.5 (6.043)	201.5 (7.933)	1		
			122.5 (4.823)	139.5 (5.492)	154 (6.063)	224 (8.819)	2		
Housing length	L2		42	53.5	68	76.5	1		
			59.5	66.5	76.5	129.5	2		
Flange thickness output	L8		4 (0.157)	7 (0.276)	8 (0.315)	10 (0.394)			
Centering depth output shaft	L10		4.5 (0.177)	6.5 (0.256)	6.5 (0.256)	6.5 (0.256)			
	L11		3 (0.118)	6 (0.236)	6 (0.236)	6 (0.236)			
Centering depth output flange	L12		10 (0.394)	12 (0.472)	12 (0.472)	14 (0.551)			
Output flange length	L13		19.5	30.0	29.0	38.0			
Min. overall height	L23		179	210	260	323	1		
			179	195	223.5	277	2		
Clamping system diameter input	D26	More information on page 131							
Motor shaft diameter j6/k6	D20	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							
Max./min. permis. motor shaft length	L20								
Centering diameter input	D21								
Centering depth input	L21								
Pitch circle diameter input	D22								
Motor flange length	L22								
Diagonal dimension input	D23								
Mounting thread x depth	G3							4x	
Flange cross section input	Q3							■	
Flange hollow output shaft with dowel hole (EN ISO 9409-1)									
Dowel hole x depth	D15	H7	5x5	6x6	6x6	8x8	1	H	
Hollow shaft diameter	D24		17 (0.669)	25 (0.984)	35 (1.378)	50 (1.969)			
Number x thread x depth	G2		7 x M5x7	7 x M6x10	11 x M6x12	11 x M8x15			
Flange output shaft (similar EN ISO 9409-1)							2	D	
Number x thread x depth	G2		8 x M5x7	8 x M6x10	12 x M6x12	12 x M8x15			
Flange output shaft with dowel hole (EN ISO 9409-1)							2	E	
Dowel hole x depth	D15	H7	5x5	6x6	6x6	8x8			
Number x thread x depth	G2		7 x M5x7	7 x M6x10	11 x M6x12	11 x M8x15			

⁽¹⁾ Dimensions in mm

⁽²⁾ Number of stages