



NEW

WPSFN

## The shortest spiral-toothed 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.

### 1 Space-saving thanks to minimal installation height

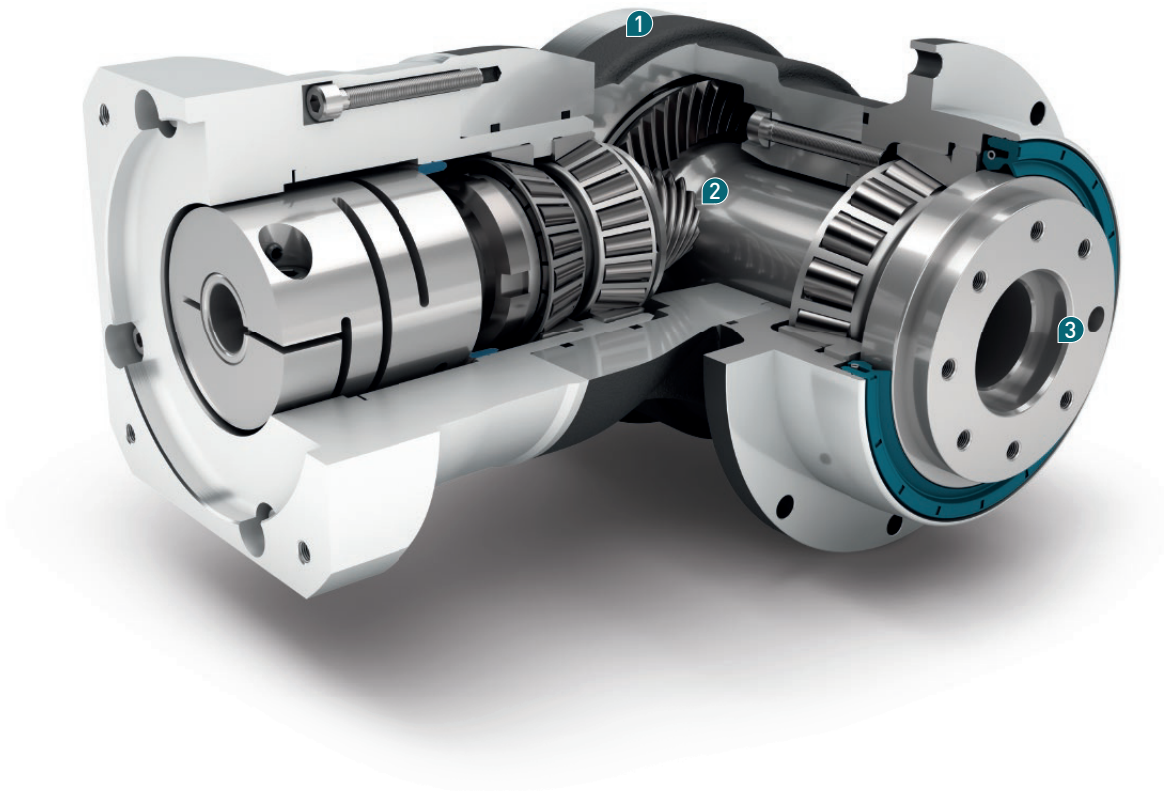
The **WPSFN** is the shortest right angle precision gearbox. Depending on the frame size, you may use up to 25% less installation space than with comparable right angle gearboxes with spiral gearing.

### 2 Greater quality due to high-class gearing

Thanks to its spiral gearing, the **WPSFN** achieves optimal, homogeneous synchronism. The two-stage right angle precision gearbox operates with extremely low vibration with the helical-toothed planetary stage. As a result, your machine produces the highest surface quality and the best prints.

### 3 Standard flange interface with hollow shaft

The **WPSFN** right angle precision gearbox with its EN ISO 9409-1 standard flange interface allows you to quickly integrate drive components such as a flanged pinion or turntable. Discover new design solutions for flexible line routing with the hollow shaft integrated in the single-stage **WPSFN**.



- + Minimized backlash for maximum precision (< 3 arcmin)
- + For any mounting position
- + Individual adaptation of the input flange to the motor
- + Lifetime lubrication for maintenance-free operation
- + Counterdirectional rotation
- + Clamping systems with optimized mass moment of inertia

Code	Gearbox characteristics			WPSFN064	WPSFN090	WPSFN110	WPSFN140	z <sup>(1)</sup>
	Service life	t <sub>L</sub>	h	20,000				
	Service life at T <sub>2N</sub> × 0.88			30,000				
	Efficiency at full load <sup>(2)</sup>	η	%	94				1
				93				2
	Min. operating temperature	T <sub>min</sub>	°C (°F)	-25 (-13)				
	Max. operating temperature	T <sub>max</sub>		90 (194)				
	Protection class			IP65				
<b>S</b>	Standard lubrication			Oil				
<b>F</b>	Food grade lubrication			Oil				
	Installation position			Any				
<b>S</b>	Standard backlash	j <sub>t</sub>	arcmin	< 5				
<b>R</b>	Reduced backlash			< 3				
	Torsional stiffness <sup>(2)</sup>	c <sub>G</sub>	Nm/arcmin (lb <sub>f</sub> .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)
	Gearbox weight	m <sub>G</sub>	kg (lb <sub>m</sub> )	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 (39.2)
<b>S</b>	Standard surface			Right angle housing: Aluminum – anodized (black)				
	Running noise <sup>(3)</sup>	Q <sub>G</sub>	dB(A)	66	67	68	70	
	Max. bending moment based on the gearbox input flange <sup>(4)</sup>	M <sub>b</sub>	Nm (lb <sub>f</sub> .in)	12 (106)	25.5 (226)	53 (469)	120 (1062)	1
					12 (106)	12 (106)	25.5 (226)	53 (469)
	Motor flange precision			DIN 42955-R				

Output shaft loads			WPSFN064	WPSFN090	WPSFN110	WPSFN140	z <sup>(1)</sup>
Radial force for 20,000 h <sup>(5)(6)</sup>	F <sub>r,20.000h</sub>	N (lb <sub>f</sub> )	2400 (540)	4400 (990)	5500 (1238)	12,000 (2700)	
Axial force for 20,000 h <sup>(5)(6)</sup>	F <sub>a,20.000h</sub>		4200 (945)	7200 (1620)	9500 (2138)	8500 (1913)	1
Radial force for 30,000 h <sup>(5)(6)</sup>	F <sub>r,30.000h</sub>		4300 (968)	8200 (1845)	9500 (2138)	8500 (1913)	2
Axial force for 30,000 h <sup>(5)(6)</sup>	F <sub>a,30.000h</sub>		2100 (473)	3900 (878)	4800 (1080)	11,000 (2475)	
Static radial force <sup>(7)(6)</sup>	F <sub>r,Stat</sub>		3700 (833)	6300 (1418)	8400 (1890)	7500 (1688)	1
Static axial force <sup>(7)(6)</sup>	F <sub>a,Stat</sub>		3800 (855)	7200 (1620)	8400 (1890)	7500 (1688)	2
Tilting moment for 20,000 h <sup>(5)(7)</sup>	M <sub>K,20.000h</sub>		2400 (540)	4400 (990)	5500 (1238)	12,000 (2700)	
Tilting moment for 30,000 h <sup>(5)(7)</sup>	M <sub>K,30.000h</sub>		4200 (945)	7200 (1620)	9500 (2138)	8500 (1913)	1
		4300 (968)	8200 (1845)	9500 (2138)	8500 (1913)	2	
		200 (1770)	484 (4283)	689 (6098)	1989 (17,603)	1	
		147 (1301)	361 (3195)	534 (4726)	1030 (9116)	2	
		175 (1549)	429 (3797)	601 (5319)	1823 (16,134)	1	
		129 (1142)	320 (2832)	466 (4124)	944 (8354)	2	

Moment of inertia			WPSFN064	WPSFN090	WPSFN110	WPSFN140	z <sup>(1)</sup>
Mass moment of inertia <sup>(2)</sup>	J	kgcm <sup>2</sup> (lb <sub>f</sub> .in.s <sup>2</sup> 10 <sup>-4</sup> )	0.500 - 0.822 (4.425 - 7.275)	1.046 - 1.591 (9.257 - 14.080)	4.857 - 6.435 (42.984 - 56.950)	15.220 - 18.825 (134.697 - 166.601)	1
			0.497 - 0.642 (4.398 - 5.682)	0.497 - 0.659 (4.398 - 5.832)	1.015 - 1.452 (8.983 - 12.850)	4.810 - 6.449 (42.569 - 57.074)	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<sub>1</sub>=3000 rpm no load; i=5  
(4) Max. motor weight\* in kg = 0.2 × M<sub>b</sub> / 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 n<sub>2</sub>=100 rpm  
(6) Based on the end of the output shaft  
(7) Other (sometimes higher) values following changes to T<sub>2N</sub>, F<sub>r</sub>, F<sub>a</sub>, cycle, and service life of bearing. Application specific configuration with NCP – www.neugart.com

Output torques			WPSFN064	WPSFN090	WPSFN110	WPSFN140	$i^{(1)}$	$z^{(2)}$
Nominal output torque <sup>(3)</sup>	$T_{2N}$	Nm (lb <sub>r</sub> .in)	45 (398)	90 (797)	160 (1416)	320 (2832)	4	1
			42 (372)	75 (664)	140 (1239)	280 (2478)	5	
			27 (239)	50 (443)	90 (797)	180 (1593)	8	
			22 (195)	40 (354)	75 (664)	160 (1416)	10	
			62 (549)	130 (1151)	310 (2744)	625 (5531)	16	2
			62 (549)	130 (1151)	300 (2655)	560 (4956)	20	
			60 (531)	120 (1062)	255 (2257)	540 (4779)	25	
			62 (549)	108 (956)	200 (1770)	360 (3186)	32	
			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 <sup>(4)</sup>	$T_{2max}$	Nm (lb <sub>r</sub> .in)	72 (637)	144 (1274)	256 (2266)	512 (4531)	4	1
			67 (593)	120 (1062)	224 (1982)	448 (3965)	5	
			43 (381)	80 (708)	144 (1274)	288 (2549)	8	
			35 (310)	64 (566)	120 (1062)	256 (2266)	10	
			99 (876)	210 (1859)	502 (4443)	1003 (8877)	16	2
			99 (876)	210 (1859)	480 (4248)	896 (7930)	20	
			96 (850)	197 (1743)	408 (3611)	864 (7646)	25	
			99 (876)	172 (1522)	320 (2832)	576 (5098)	32	
			96 (850)	197 (1743)	400 (3540)	720 (6372)	40	
			96 (850)	175 (1549)	320 (2832)	600 (5310)	50	
			59 (522)	125 (1106)	280 (2478)	568 (5027)	70	
			45 (398)	94 (832)	224 (1982)	488 (4319)	100	

<sup>(1)</sup> Ratios ( $i=n_1/n_2$ )  
<sup>(2)</sup> Number of stages  
<sup>(3)</sup> Application specific configuration with NCP – [www.neugart.com](http://www.neugart.com)  
<sup>(4)</sup> 30,000 rotations of the output shaft permitted; see page 136

Output torques			WPSFN064	WPSFN090	WPSFN110	WPSFN140	i <sup>(1)</sup>	z <sup>(2)</sup>		
Emergency stop torque <sup>(3)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>f</sub> .in)	100 (885)	200 (1770)	400 (3540)	800 (7080)	4	1		
			100 (885)	200 (1770)	400 (3540)	800 (7080)	5			
			75 (664)	150 (1328)	300 (2655)	700 (6195)	8			
			75 (664)	150 (1328)	300 (2655)	700 (6195)	10			
			150 (1328)	300 (2655)	650 (5753)	1600 (14160)	16			
			150 (1328)	300 (2655)	650 (5753)	1600 (14160)	20			
					150 (1328)	300 (2655)	650 (5753)	1650 (14603)	25	2
					150 (1328)	300 (2655)	600 (5310)	1200 (10620)	32	
					150 (1328)	300 (2655)	650 (5753)	1500 (13275)	40	
					150 (1328)	300 (2655)	650 (5753)	1500 (13275)	50	
					80 (708)	175 (1549)	340 (3009)	1300 (11505)	70	
					90 (797)	200 (1770)	480 (4248)	600 (5310)	100	

Input speeds			WPSFN064	WPSFN090	WPSFN110	WPSFN140	i <sup>(1)</sup>	z <sup>(2)</sup>		
Average thermal input speed at T <sub>2N</sub> and S1 <sup>(4)(5)</sup>	n <sub>1N</sub>	rpm	1850 <sup>(6)</sup>	1650 <sup>(6)</sup>	1100 <sup>(6)</sup>	1050 <sup>(6)</sup>	4	1		
			2050 <sup>(6)</sup>	1900 <sup>(6)</sup>	1200 <sup>(6)</sup>	1150 <sup>(6)</sup>	5			
			2500 <sup>(6)</sup>	2400 <sup>(6)</sup>	1450 <sup>(6)</sup>	1350 <sup>(6)</sup>	8			
			2650 <sup>(6)</sup>	2550 <sup>(6)</sup>	1500 <sup>(6)</sup>	1400 <sup>(6)</sup>	10			
			2250 <sup>(6)</sup>	2250 <sup>(6)</sup>	1750 <sup>(6)</sup>	1400 <sup>(6)</sup>	16			
			2400 <sup>(6)</sup>	2500 <sup>(6)</sup>	2000 <sup>(6)</sup>	1600 <sup>(6)</sup>	20			
					2500 <sup>(6)</sup>	2800 <sup>(6)</sup>	2300 <sup>(6)</sup>	1650 <sup>(6)</sup>	25	2
					2550 <sup>(6)</sup>	2900 <sup>(6)</sup>	2450 <sup>(6)</sup>	1900 <sup>(6)</sup>	32	
					2800 <sup>(6)</sup>	2950 <sup>(6)</sup>	2500 <sup>(6)</sup>	1900 <sup>(6)</sup>	40	
					2750 <sup>(6)</sup>	3100 <sup>(6)</sup>	2650 <sup>(6)</sup>	2000 <sup>(6)</sup>	50	
					3000 <sup>(6)</sup>	3700 <sup>(6)</sup>	3000 <sup>(6)</sup>	2200 <sup>(6)</sup>	70	
					3050 <sup>(6)</sup>	3850 <sup>(6)</sup>	3300 <sup>(6)</sup>	2400 <sup>(6)</sup>	100	
Max. mechanical input speed <sup>(4)</sup>	n <sub>1Limit</sub>	rpm	16000	14000	9500	8000		1		
			16000	16000	14000	9500		2		

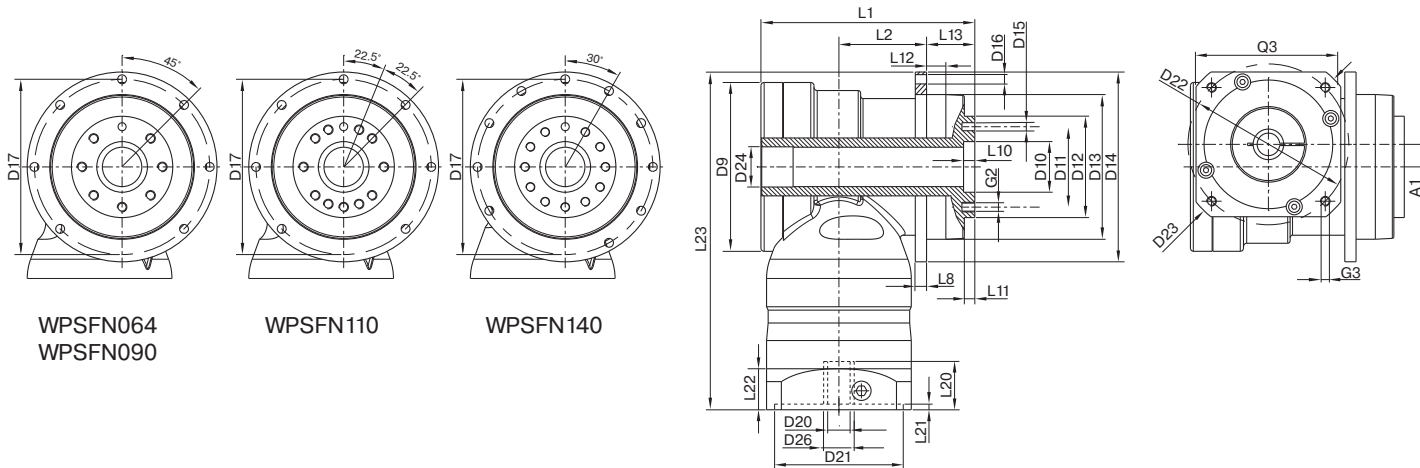
<sup>(1)</sup> Ratios (i=n<sub>1</sub>/n<sub>2</sub>)

<sup>(2)</sup> Number of stages

<sup>(3)</sup> Permitted 1000 times

<sup>(4)</sup> Application-specific speed configurations with NCP – [www.neugart.com](http://www.neugart.com)
<sup>(5)</sup> See page 136 for the definition

<sup>(6)</sup> Average thermal input speed at 50% T<sub>2N</sub> 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](http://www.neugart.com)

Geometry <sup>(1)</sup>			WPSFN064	WPSFN090	WPSFN110	WPSFN140	z <sup>(2)</sup>	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 (4.803)	139.5 (5.492)	154 (6.063)	224 (8.819)	2	
Housing length	L2		42	53.5	68	76.5	1	
			60	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 125					
Motor shaft diameter j6/k6	D20		The dimensions vary with the motor/gearbox flange. The input flange geometries can be retrieved for each specific motor in Tec Data Finder at <a href="http://www.neugart.com">www.neugart.com</a>					
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	M7	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		

<sup>(1)</sup> Dimensions in mm  
<sup>(2)</sup> Number of stages