

WPSFN

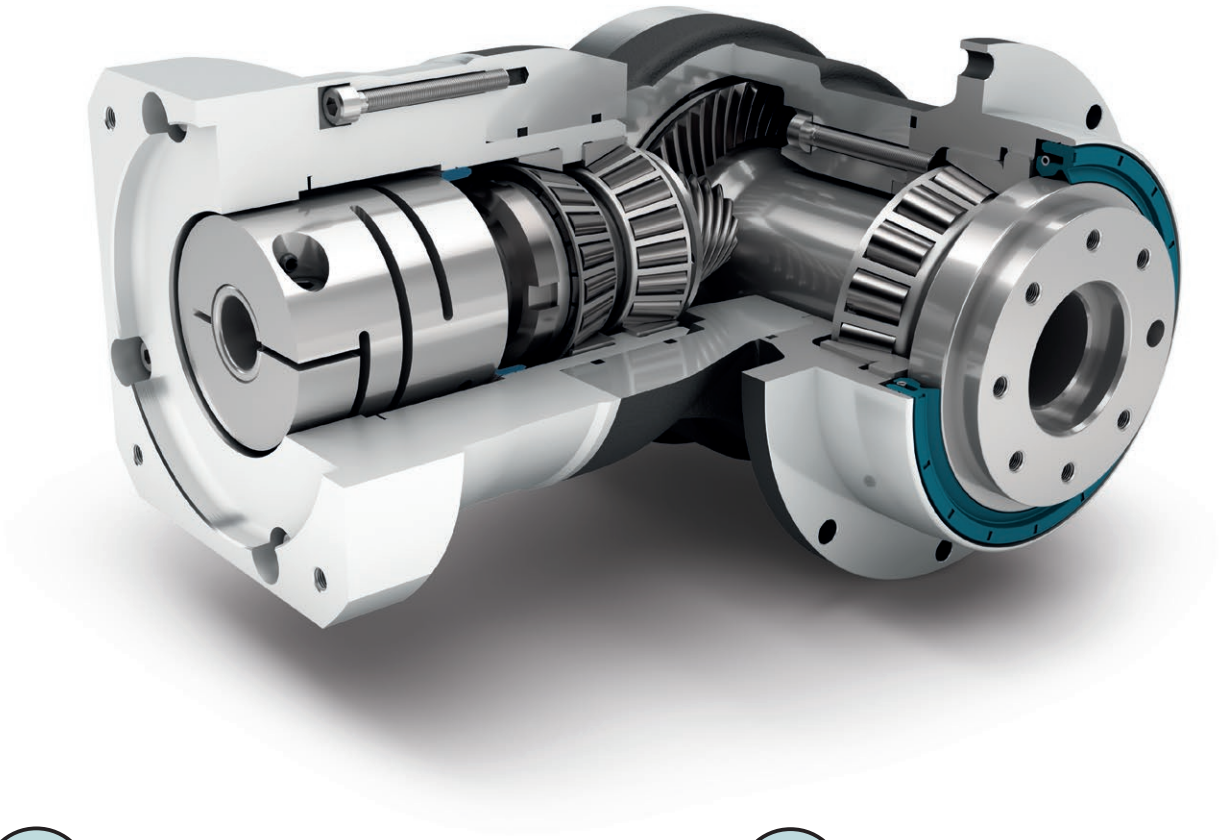
The shortest spiral right angle gearbox with flange output shaft and hollow shaft

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
- Counterdirectional rotation
- Extra large round type output flange
- Rotary shaft seal
- Hollow shaft
- Right angle gearbox
- Hypoid gear right angle stage
- Preloaded angular contact roller bearings
- Flange output shaft (ISO 9409)
- 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} x 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	j_t	arcmin	< 5				
R	Reduced backlash			-				1
				< 3				2
	Torsional stiffness[2]	c_g	Nm/arcmin (lb$_f$.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$_f$.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]	$F_{r\ 20.000\ h}$	N (lb$_f$)	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]	$F_{a\ 20.000\ h}$		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]	$F_{r\ 30.000\ h}$		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]	$F_{a\ 30.000\ h}$		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]	$M_{K\ 20.000\ h}$	Nm (lb$_f$.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]	$M_{K\ 30.000\ h}$		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$_f$.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_1=3000 rpm no load; i=5
[4] Max. motor weight* in kg = 0.2 x M_b / 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_2=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

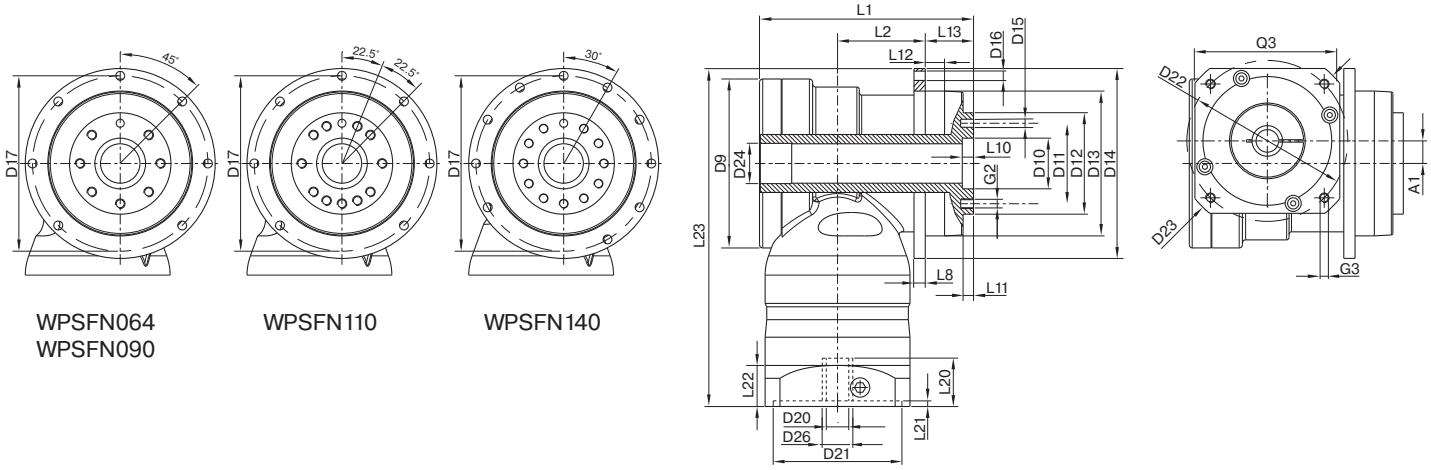
Output torques			WPSFN064	WPSFN090	WPSFN110	WPSFN140	i(1)	p(2)
Nominal output torque(3)	T_{2N}	Nm (lb_f.in)	45 (398)	90 (797)	160 (1416)	320 (2832)	4	1
			42 (372)	75 (664)	140 (1239)	280 (2478)	5	
			28 (248)	51 (451)	91 (805)	189 (1673)	7	
			27 (239)	50 (443)	90 (797)	180 (1593)	8	
			22 (195)	40 (354)	75 (664)	160 (1416)	10	
			62 (549)	130 (1151)	310 (2744)	625 (5532)	16	2
			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_f.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	
			99 (876)	210 (1859)	502 (4443)	1003 (8877)	16	2
			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 ($i=n_1/n_2$)
(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 ($i=n_1/n_2$)
[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)							1	H
Dowel hole x depth	D15	H7	5x5	6x6	6x6	8x8		
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