PLFE

The shortest planetary gearbox with high torsional stiffness and flange output shaft

There is no such thing as too short: The **PLFE** is our planetary gearbox with compact flange output shaft. They are more than one-third smaller in size. Its standardized flange interface makes it particularly easy to install. The integrated dowel pin drill hole provides additional stability during installation.

Cyclic torque	**5 - 260 Nm**
Radial force	**900 - 3800 N**
Axial force	**1000 - 5200 N**
Torsional backlash	**7 - 19 arcmin**
Protection class	**IP54**

Frame sizes

55 **64** **90** **110**

- Economy Line
- Coaxial gearbox
- Spur gear
- Low-friction deep groove ball bearings
- Planet carrier in disc design
- Equidirectional rotation
- Extra large round type output flange
- Flange output shaft (ISO 9409-1)
- Option: Painted surface – RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			PLFE055	PLFE064	PLFE090	PLFE110	p(1)
	Service life(2)	L_h	h	20,000				
	Efficiency(3)	η	%	98				1
				97				2
	Min. operating temperature	T_{min}	°C (°F)	-25 (-13)				
	Max. operating temperature	T_{max}		90 (194)				
	Protection class			IP54				
S	Standard lubrication			Grease (lifetime lubrication)				
F	Food grade lubrication			Grease (lifetime lubrication)				
	Installation position			Any				
S	Standard backlash	φ	arcmin	< 15	< 10	< 7	< 7	1
				< 19	< 12	< 9	< 9	2
	Torsional stiffness(3)	C_{2t}	Nm / arcmin (lb_f.in/ arcmin)	1.7 - 4.1 (15 - 36)	5.5 - 10.6 (49 - 94)	16.3 - 33.5 (144 - 296)	36.0 - 72.0 (319 - 637)	1
				1.5 - 5.6 (13 - 50)	5.1 - 11.9 (45 - 105)	15.9 - 39.5 (141 - 350)	29.5 - 88.0 (261 - 779)	2
	Gearbox weight(3)	m	kg (lb_m)	0,7 (1.5)	1.1 (2.4)	3.0 (6.5 - 6.7)	6.4 - 6.7 (14.1 - 14.8)	1
				0.8 (1.7)	1.3 - 1.4 (2.8 - 3.1)	3.4 - 3.7 (7.5 - 8.2)	8.1 - 8.6 (17.9 - 19.0)	2
S	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)				
B	Painted surface(4)			RAL 9005 Jet black				
	Running noise(3)	L_{pA}	dB(A)	58	58	60	65	

Output shaft loads			PLFE055	PLFE064	PLFE090	PLFE110	p(1)
Maximum radial force	$F_{r\,max}$	N (lb_f)	1150 (259)	900 (202)	2200 (495)	3800 (854)	
Maximum axial force	$F_{a\,max}$		1000 (225)	1200 (270)	3300 (742)	5200 (1169)	
Maximum tilting moment	$M_{K\,max}$	Nm (lb_f.in)	25 (224)	20 (175)	73 (643)	173 (1530)	

Input characteristics			PLFE055	PLFE064	PLFE090	PLFE110	p(1)
Clamping system diameter input (Code)	D26	mm	8 (A)	11 (C)	19 (E)(5)	24 (F)(5)	
			9 (B)(5)	14 (D)(5)	24 (F)	35 (G)	
			11 (C)	19 (E)	-	-	
Mass moment of inertia input(3)(5)	J_1	kgcm² (lb_f. in.s²10⁻⁴)	0.025 - 0.070 (0.221 - 0.620)	0.093 - 0.231 (0.823 - 2.045)	0.406 - 1.164 (3.593 - 10.302)	1.484 - 3.430 (13.135 - 30.358)	1
			0.022 - 0.036 (0.195 - 0.319)	0.084 - 0.151 (0.743 - 1.336)	0.356 - 0.666 (3.151 - 5.895)	1.377 - 2.407 (12.187 - 21.304)	2
Average idle torque(3)(5)	T_0	Nm (lb_f.in)	0.10 - 0.25 (1 - 2)	0.10 - 0.30 (1 - 3)	0.25 - 0.60 (2 - 5)	0.55 - 1.30 (5 - 12)	1
			0.05 - 0.15 (0 - 1)	0.10 - 0.15 (1)	0.15 - 0.30 (1 - 3)	0.45 - 0.85 (4 - 8)	2
Max. bending moment based on the gearbox input flange	M_{b1}		4,5 (40)	12 (106)	16 (142)	40 (354)	

(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

Output torques			PLFE055	PLFE064	PLFE090	PLFE110	i(1)	p(2)
Cyclic torque(3)(4)	T_{2Z}	Nm (lb_f.in)	11 (97)	28 (248)	85 (752)	115 (1018)	3	1
			15 (133)	38 (336)	115 (1018)	155 (1372)	4	
			14 (124)	40 (354)	110 (974)	195 (1726)	5	
			8.5 (75)	25 (221)	65 (575)	135 (1195)	7	
			6 (53)	18 (159)	50 (443)	120 (1062)	8	
			5 (44)	15 (133)	38 (336)	95 (841)	10	
			16.5 (146)	44 (389)	130 (1151)	210 (1859)	9	2
			20 (177)	44 (389)	120 (1062)	260 (2301)	12	
			18 (159)	44 (389)	110 (974)	230 (2036)	15	
			20 (177)	44 (389)	120 (1062)	260 (2301)	16	
			20 (177)	44 (389)	120 (1062)	260 (2301)	20	
			18 (159)	40 (354)	110 (974)	230 (2036)	25	
			20 (177)	44 (389)	120 (1062)	260 (2301)	32	
			18 (159)	40 (354)	110 (974)	230 (2036)	40	
			7.5 (66)	18 (159)	50 (443)	120 (1062)	64	
			5 (44)	15 (133)	38 (336)	95 (841)	100	
Maximum torque(3)(4)	T_{2max}	Nm (lb_f.in)	11 (97)	44 (389)	105 (929)	184 (1629)	3	1
			24 (212)	60 (531)	140 (1239)	245 (2168)	4	
			22 (195)	61 (540)	175 (1549)	310 (2744)	5	
			13.5 (119)	40 (354)	104 (920)	215 (1903)	7	
			9.5 (84)	28 (248)	80 (708)	192 (1699)	8	
			8 (71)	24 (212)	60 (531)	152 (1345)	10	
			16.5 (146)	70 (620)	182 (1611)	335 (2965)	9	2
			32 (283)	65 (575)	192 (1699)	415 (3673)	12	
			28 (248)	70 (620)	176 (1558)	365 (3231)	15	
			32 (283)	65 (575)	192 (1699)	415 (3673)	16	
			32 (283)	65 (575)	192 (1699)	415 (3673)	20	
			28 (248)	61 (540)	176 (1558)	365 (3231)	25	
			32 (283)	65 (575)	192 (1699)	415 (3673)	32	
			28 (248)	61 (540)	176 (1558)	365 (3231)	40	
			12 (106)	28 (248)	80 (708)	192 (1699)	64	
			8 (71)	24 (212)	60 (531)	152 (1345)	100	

(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

Output torques			PLFE055	PLFE064	PLFE090	PLFE110	i[1]	p[2]
Continuous torque[3]	T_{2D}	Nm (lb_f.in)	3.5 (31)	23 (204)	42 (372)	97 (859)	3	1
			12.5 (111)	23 (204)	94 (832)	131 (1159)	4	
			11.5 (102)	24 (212)	93 (823)	165 (1460)	5	
			7 (62)	19.5 (173)	55 (487)	114 (1009)	7	
			5 (44)	15 (133)	42 (372)	102 (903)	8	
			4 (35)	12.5 (111)	32 (283)	80 (708)	10	
			10.5 (93)	30 (266)	89 (788)	178 (1575)	9	2
			14.5 (128)	32 (283)	102 (903)	220 (1947)	12	
			15 (133)	35 (310)	93 (823)	195 (1726)	15	
			17 (150)	35 (310)	102 (903)	220 (1947)	16	
			17 (150)	37 (327)	102 (903)	220 (1947)	20	
			15 (133)	34 (301)	93 (823)	195 (1726)	25	
			17 (150)	37 (327)	102 (903)	220 (1947)	32	
			15 (133)	34 (301)	93 (823)	195 (1726)	40	
			6 (53)	15 (133)	42 (372)	102 (903)	64	
			4 (35)	12.5 (111)	32 (283)	80 (708)	100	

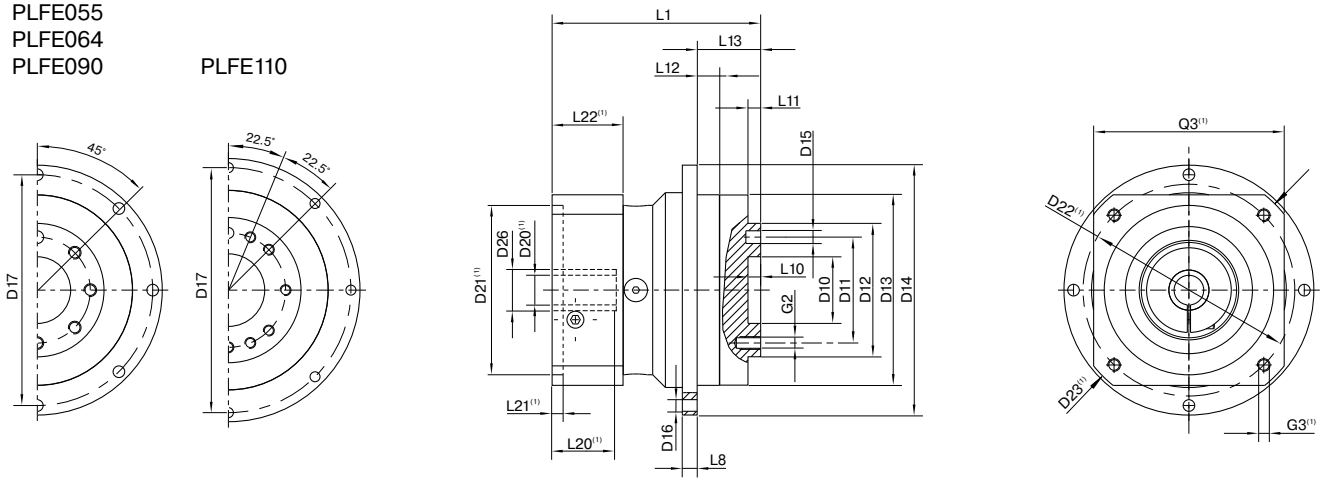
Input speeds			PLFE055	PLFE064	PLFE090	PLFE110	i[1]	p[2]
Continuous input speed[3][4]	n_{1D}	rpm	5000	2850	2750	1350	3	1
			5000	4400	2350	1600	4	
			5000	4500	2850	1750	5	
			5000	4500	3850	2500	7	
			5000	4500	4000	3150	8	
			5000	4500	4000	3500	10	
			5000	4500	3750	1850	9	2
			5000	4500	3800	2000	12	
			5000	4500	4000	2400	15	
			5000	4500	4000	2200	16	
			5000	4500	4000	2650	20	
			5000	4500	4000	3500	25	
			5000	4500	4000	3500	32	
			5000	4500	4000	3500	40	
			5000	4500	4000	3500	64	
			5000	4500	4000	3500	100	
Max. mechanical input speed[3]	n_{1max}	rpm	18000	13000	7000	6500		

Output torques			PLFE055	PLFE064	PLFE090	PLFE110	i[1]	p[2]
Emergency stop torque[4][5]	T_{2Stop}	Nm (lb_f.in)	22 (195)	60 (531)	150 (1328)	375 (3319)	3	1
			30 (266)	80 (708)	200 (1770)	500 (4425)	4	
			36 (319)	80 (708)	220 (1947)	500 (4425)	5	
			26 (230)	80 (708)	178 (1575)	340 (3009)	7	
			27 (239)	80 (708)	190 (1682)	380 (3363)	8	
			27 (239)	75 (664)	200 (1770)	480 (4248)	10	
			33 (292)	88 (779)	260 (2301)	500 (4425)	9	2
			40 (354)	88 (779)	240 (2124)	520 (4602)	12	
			36 (319)	88 (779)	220 (1947)	500 (4425)	15	
			40 (354)	88 (779)	240 (2124)	520 (4602)	16	
			40 (354)	88 (779)	240 (2124)	520 (4602)	20	
			36 (319)	80 (708)	220 (1947)	500 (4425)	25	
			40 (354)	88 (779)	240 (2124)	520 (4602)	32	
			36 (319)	80 (708)	220 (1947)	500 (4425)	40	
			27 (239)	80 (708)	190 (1682)	380 (3363)	64	
			27 (239)	75 (664)	200 (1770)	480 (4248)	100	

[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

PLFE055
PLFE064
PLFE090

PLFE110



Drawing corresponds to a PLFE090 / 1-stage / flange output shaft with dowel hole / 19 mm clamping system / motor adaptation – one part / B5 flange type motor

(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

Geometry(2)			**PLFE055**	**PLFE064**	**PLFE090**	**PLFE110**	**p**(3)	**Code**
Centering diameter output shaft	D10	H7	16 (0.630)	20 (0.787)	31.5 (1.240)	40 (1.575)		
Pitch circle diameter output shaft	D11		25 (0.984)	31.5 (1.240)	50 (1.969)	63 (2.480)		
Centering diameter output shaft	D12	h7	34 (1.339)	40 (1.575)	63 (2.480)	80 (3.150)		
Centering diameter output flange	D13		55 (2.165)	64 (2.520)	90 (3.543)	110 (4.331)		
Flange diameter output	D14		72 (2.835)	86 (3.386)	118 (4.646)	145 (5.709)		
Mounting bore output	D16		3.4 8x45°	4.5 8x45°	5.5 8x45°	5.5 8x45°)		
Pitch circle diameter output flange	D17		67 (2.638)	79 (3.110)	109 (4.291)	135 (5.315)		
Min. total length	L1		71.5 (2.815)	69 (2.717)	98.5 (3.878)	125.5 (4.941)	1	
			84.5 (3.327)	81.5 (3.209)	116 (4.567)	152.5 (6.004)	2	
Flange thickness output	L8		4 (0.157)	4 (0.157)	7 (0.276)	8 (0.315)		
Centering depth output shaft	L10		6 (0.236)	4 (0.157)	6 (0.236)	6 (0.236)		
	L11		3 (0.118)	3 (0.118)	6 (0.236)	6 (0.236)		
Centering depth output flange	L12		8 (0.315)	7.5 (0.295)	10.5 (0.413)	10.5 (0.413)		
Output flange length	L13		19 (0.748)	19.5 (0.768)	30 (1.181)	29 (1.142)		
Motor shaft diameter j6/k6	D20		More information on page 191/192					
Clamping system diameter input	D26		More information on page 48					
Flange output shaft with dowel hole (ISO 9409-1)								**E**
Dowel hole x depth	D15	H7	4x5	5x6	6x7	6x7		
Number x thread x depth	G2		7 x M4x6	7 x M5x7	7 x M6x10	11 x M6x12		

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