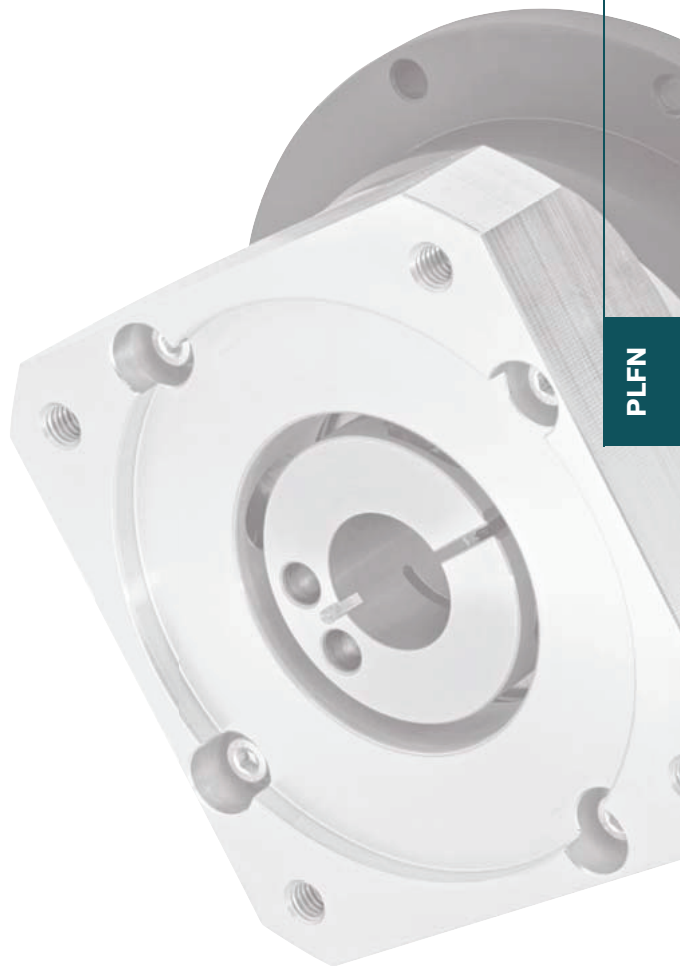




For tough situations

Strong and compact: the PLFN gearboxes fulfills special demands. This gearbox model series is characterised by a highest level of stiffness paired with high performance, low backlash and compactness.





- > Low backlash <3 arcmin (<1 arcmin optional)
- > High output torque - the industry's highest torque density
- > Highest tilting stiffness
- > Precise, easy, and flexible motor mounting (PCS-2 system)
- > High efficiency (up to 98%)
- > Ground and honed gearing
- > 12 ratios 4:1 to 100:1
- > Low noise (<65 dB(A))
- > Consistent quality (ISO 9001 and 14001)
- > Operable in any mounting positions
- > Lifetime lubrication
- > Numerous options
- > Output flange similar to EN ISO 9409
- > Input and output rotate in the same direction

1	Technical data	page 32
2	Dimensions	page 35
3	Options	page 77
4	Possible motor mounting	page 36
5	Sectional drawing	page 37
6	Ordering code	page 76
7	Gearhead sizing/selection	page 78
8	Conversion table	page 77
9	CAD drawings, dimension sheets	www.neugartusa.com
10	Sizing/calculation/selection	NCP Software, free download from the Neugart website

Type-Size		PLFN 64	PLFN 90	PLFN 110	PLFN 140	i ⁽¹⁾	Z ⁽²⁾
Nominal (rated continuous duty) Output torque T _{2N} ⁽³⁾⁽⁵⁾	Nm (lbin)	60 (531)	140 (1239)	300 (2655)	600 (5310)	4	1
		65 (575)	140 (1239)	260 (2301)	750 (6638)	5	
		40 (354)	80 (708)	150 (1328)	450 (3983)	8	
		27 (239)	60 (531)	125 (1106)	305 (2699)	10	
		77 (681)	150 (1328)	300 (2655)	1000 (8850)	16	
	2	77 (681)	150 (1328)	300 (2655)	1000 (8850)	20	
		65 (575)	140 (1239)	260 (2301)	900 (7965)	25	
		77 (681)	150 (1328)	300 (2655)	800 (7080)	32	
		65 (575)	140 (1239)	260 (2301)	800 (7080)	40	
		65 (575)	130 (1151)	260 (2301)	620 (5487)	50	
		40 (354)	80 (708)	150 (1328)	450 (3983)	64	
		27 (239)	60 (531)	125 (1106)	305 (2699)	100	

Type-Size		PLFN 64	PLFN 90	PLFN 110	PLFN 140	i ⁽¹⁾	Z ⁽²⁾
Output torque sustainable 30,000 output shaft rotations ⁽³⁾⁽⁵⁾⁽⁸⁾	Nm (lbin)	96 (850)	224 (1982)	480 (4248)	960 (8496)	4	1
		104 (920)	224 (1982)	416 (3682)	1200 (10620)	5	
		64 (566)	128 (1133)	240 (2124)	720 (6372)	8	
		43 (381)	96 (850)	200 (1770)	488 (4319)	10	
		123 (1089)	240 (2124)	480 (4248)	1600 (14160)	16	
	2	123 (1089)	240 (2124)	480 (4248)	1600 (14160)	20	
		104 (920)	224 (1982)	416 (3682)	1440 (12744)	25	
		123 (1089)	240 (2124)	480 (4248)	1280 (11328)	32	
		104 (920)	224 (1982)	416 (3682)	1280 (11328)	40	
		104 (920)	208 (1841)	416 (3682)	992 (8779)	50	
		64 (566)	128 (1133)	240 (2124)	720 (6372)	64	
		43 (381)	96 (850)	200 (1770)	488 (4319)	100	

Gearbox type		PLFN		Z ⁽²⁾
Gearbox life at full load	h	20,000		
Gearbox life at 88% nominal torque T _{2N} × 0,88		30,000		
Emergency stop torque ⁽⁶⁾	Nm (lbin)	2 - times T _{2N}		
Efficiency at full load ⁽⁷⁾	%	98		1
		95		2
Min. operating temp. ⁽⁴⁾	°C (°F)	-25 (-13)		
Max. operating temp. ⁽⁴⁾		+90 (194)		
Protection class		IP 65		
Lubrication		lifetime lubrication		
Mounting position		any		
Recommended motor flange / shaft tolerance		DIN 42955-R		

(1) Ratio (i=n_{1 rpm high speed side}/n_{2 rpm low speed side})

(2) Number of gear stages

(3) Values reference output shaft speed n₂=100 rpm, S1= 100% duty cycle, K_A=1 application factor and T=30°C, 86°F ambient temperature

(4) Measured at the middle of the gearbox housing surface

(5) Dependent on the motor shaft diameter

(6) Permissible about 1000 times during the gearbox life

(7) Ratio dependent; based on n₂=100 rpm output shaft speed

(8) Permissible for 30,000 output shaft revolutions; see page 80

Type-Size		PLFN 64	PLFN 90	PLFN 110	PLFN 140	Z ⁽²⁾
Standard backlash ⁽⁷⁾	arcmin	< 3	< 3	< 3	< 3	1
		< 5	< 5	< 5	< 5	2
Optional reduced backlash		<2	<1	< 1	< 1	
Fr _{max.} for 20,000 h ⁽³⁾⁽⁴⁾	N (lb)	2400 (540)	4400 (990)	5500 (1238)	12000 (2700)	
Fa _{max.} for 20,000 h ⁽³⁾⁽⁴⁾		4300 (968)	8200 (1845)	9500 (2138)	8500 (1913)	
Fr _{max.} for 30,000 h ⁽³⁾⁽⁴⁾		2100 (473)	3900 (878)	4800 (1080)	11000 (2475)	
Fa _{max.} for 30,000 h ⁽³⁾⁽⁴⁾		3800 (855)	7200 (1620)	8400 (1890)	7500 (1688)	
Torsional stiffness	Nm /arcmin (lbin /arcmin)	16 (142)	35 (310)	90 (797)	200 (1770)	1
		14 (124)	30 (266)	80 (708)	180 (1593)	2
Weight	kg (lb)	1.5 (3.31)	3.0 (6.62)	6.5 (14.33)	13 (28.67)	1
		2.2 (4.85)	4.0 (8.82)	8 (17.64)	16 (35.28)	2
Running noise ⁽⁵⁾	dB(A)	< 65	< 65	< 68	< 70	
Max. recommended input speed ⁽⁶⁾	min ⁻¹ (rpm)	14000	10000	8500	6500	

Type-Size		PLFN 64	PLFN 90	PLFN 110	PLFN 140	i ⁽¹⁾
Recommended max. mean input speed at 50% rated continuous duty torque (S1) rpm ⁽⁶⁾⁽⁸⁾	min ⁻¹ (rpm)	2450	2050	1550	1150	4
		2800	2450	1950	1200	5
		4100	4050	3300	2100	8
		4850	4950	4000	2700	10
		4300	4450	3850	2150	16
		4800	5100	4500	2600	20
		5400	5850	5500	3200	25
		5900	6000	6000	4250	32
		6000	6000	6000	4900	40
		6000	6000	6000	5500	50
		6000	6000	6000	5500	64
		6000	6000	6000	5500	100

Type-Size		PLFN 64	PLFN 90	PLFN 110	PLFN 140	i ⁽¹⁾
Recommended max. mean input speed at 100% rated continuous duty torque (S1) rpm ⁽⁶⁾⁽⁸⁾	min ⁻¹ (rpm)	1950	1500	1050	800	4
		2150	1800	1400	850	5
		3500	3300	2650	1550	8
		4400	4250	3350	2150	10
		3350	3200	2550	1300	16
		3850	3700	3050	1550	20
		4500	4400	3900	2000	25
		4900	5050	4400	2750	32
		5600	5900	5500	3250	40
		6000	6000	6000	3850	50
		6000	6000	6000	5500	64
		6000	6000	6000	5500	100

(1) Ratio (i=n_{1 rpm high speed side}/n_{2 rpm low speed side})

(2) Number of gear stages

(3) Values reference output shaft speed n₂=100 rpm, S1= 100% duty cycle, K_A=1 application factor and T=30°C, 86°F ambient temperature

(4) Reference to the rotating output flange face

(5) Sound pressure level measured 1 m from the gearbox for ratio 5:1 at 3000 input rpm and no load

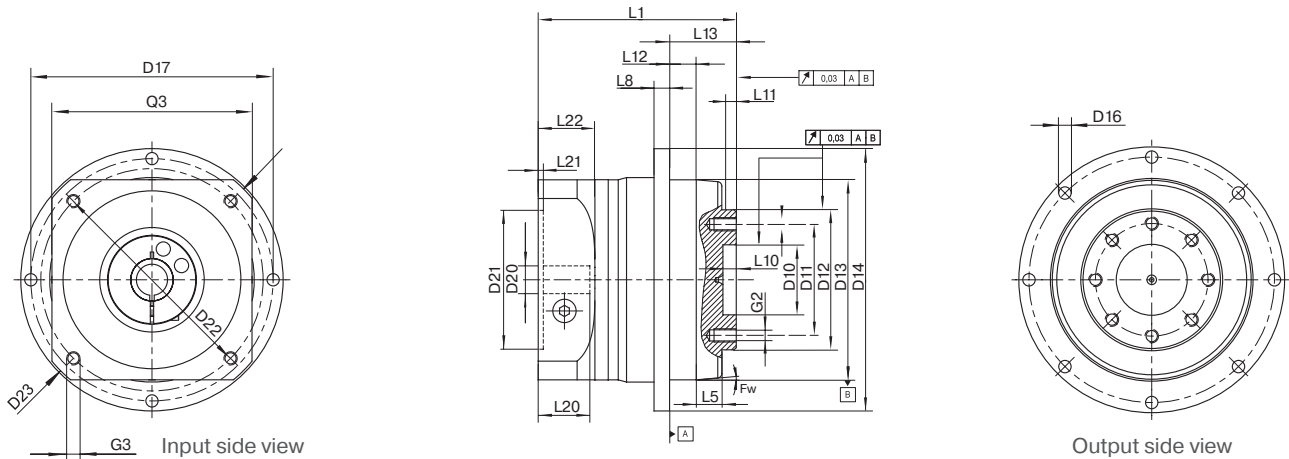
(6) Recommended gearbox operating temperature should not be exceeded, consult Neugart in case higher than listed rpm is required

(7) Lower backlash on inquiry

(8) Exact definition see page 81

Type-Size		PLFN 64	PLFN 90	PLFN 110	PLFN 140	i ⁽¹⁾
Mass moment of inertia ⁽²⁾	kgcm ² (lbin s ² x 10 ⁻⁴)	0.29 (2.57)	0.92 (8.14)	2.94 (26.02)	11.78 (104.25)	4
		0.26 (2.30)	0.77 (6.81)	2.51 (22.21)	9.70 (85.85)	5
		0.22 (1.95)	0.63 (5.58)	2.08 (18.41)	7.71 (68.23)	8
		0.21 (1.86)	0.59 (5.22)	2.00 (17.70)	7.40 (65.49)	10
		0.32 (2.83)	0.58 (5.13)	1.73 (15.31)	6.73 (59.56)	16
		0.30 (2.66)	0.56 (4.96)	1.65 (14.60)	6.51 (57.61)	20
		0.27 (2.39)	0.45 (3.98)	1.30 (11.51)	5.00 (44.25)	25
		0.29 (2.57)	0.54 (4.78)	1.60 (14.16)	6.31 (55.84)	32
		0.26 (2.30)	0.43 (3.81)	1.24 (10.97)	4.82 (42.66)	40
		0.22 (1.95)	0.28 (2.48)	0.80 (7.08)	3.08 (27.26)	50
		0.23 (2.04)	0.30 (2.66)	0.85 (7.52)	3.11 (27.52)	64
		0.22 (1.95)	0.26 (2.30)	0.75 (6.64)	2.67 (23.63)	100

⁽¹⁾ Ratio (i=n_{1 rpm high speed side}/n_{2 rpm low speed side})
⁽²⁾ The moment of inertia relates to the high speed side (typically motor shaft)



Type-Size		PLFN 64	PLFN 90	PLFN 110	PLFN 140	Z ⁽²⁾
All dimensions in mm						
D10 Pilot diameter	H7	20	31.5	40	50	
D11 Motor matching bolt circle diameter		31.5	50	63	80	
D12 Pilot diameter	h7	40	63	80	100	
D13 Pilot diameter		64	90	110	140	
D14 outside diameter		86	118	145	179	
D16 Pinion bore diameter		4.5 8x45°	5.5 8x45°	5.5 8x45°	6.6 12x30°	
D17 Motor matching bolt circle diameter		79	109	135	168	
D20 Pinion bore diameter ⁽¹⁾⁽⁴⁾		11	14	19	24	1
D21 Motor centering pilot diameter ⁽¹⁾		11	11	14	19	2
D22 Motor matching bolt circle diameter ⁽¹⁾		60	80	95	130	1
D23 Motor matching adapter diagonal		60	60	80	95	2
Fw Chamfer angle		75	100	115	165	1
G2 Thread x depth		75	75	100	115	2
G3 Mounting hole thread x depth ⁽¹⁾	4x	92	116	145	185	1
			92	92	116	145
L1 Overall length ⁽³⁾		3	5	5	5	
L5 Chamfer length		M5x7 8x45°	M6x10 8x45°	M6x12 12x22.5°/45°	M8x15 12x30°	
L8 Flange width		M5x10	M6x12	M8x16	M10x20	1
L10 Length of centering		M5x10	M5x10	M6x12	M8x16	2
L11 Pilot depth		71	89	108	157	1
L12 Pilot depth		99.5	111	130	187.5	2
L13 Length of output flange		6	11.5	10.5	17	
L20 Reference motor shaft length ⁽³⁾		4	7	8	10	
L21 Motor pilot depth		4	6	6	6	
L22 Reference motor adapter flange width ⁽³⁾		3	6	6	6	
		10	12	12	14	
		19.5	30	29	38	
		23	30	40	50	1
		23	23	30	40	2
		3	3.5	3.5	4	1
		3	3	3.5	3.5	2
		19	25.5	27.5	50.5	1
		19	19	25.5	27.5	2
		70	90	115	142	1
		70	70	90	115	2

⁽¹⁾ Dimensions reference to the mounted motor-type, see 36

⁽²⁾ Number of gear stages

⁽³⁾ For longer motor shaft > L20, actual minimal L22 dimension = L22 + (Motor shaft length – L20)

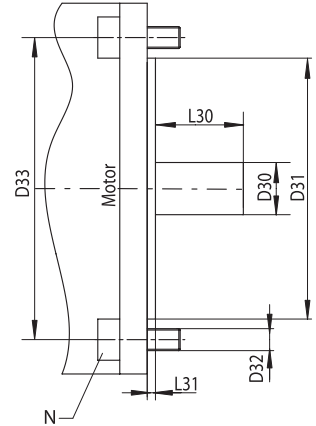
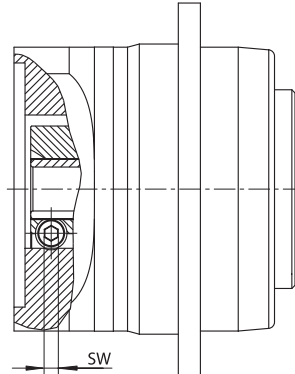
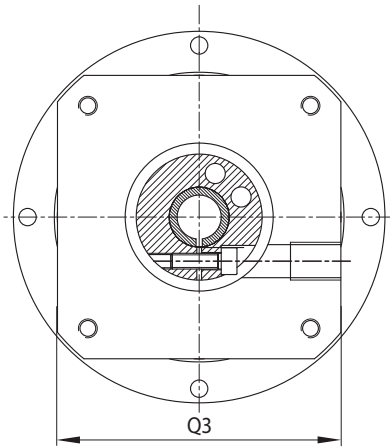
⁽⁴⁾ For shaft fit j6 to k6

OP 2: Motor Mount option

Note: B5 mounting depicted;

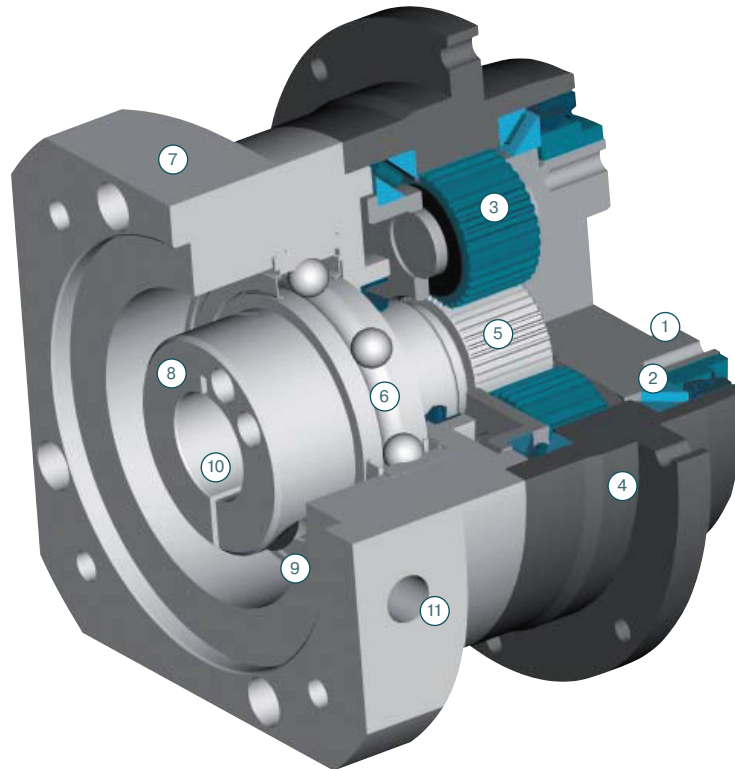
B14 motor mounting requires special/custom motor adapter

See page **77** for other options



Type-Size		PLFN 64		PLFN 90			PLFN 110			PLFN 140		Z ⁽²⁾
D30 Motor shaft diameter / Available pinion bores / bushings ⁽¹⁾⁽⁵⁾	mm	8/9/9.525/10/11/12/14/15.87/16/19		9.525/10/11/12/12.7/14/15.87/16/19/22/24			11/12.7/14/15.87/16/19/22/24/28/32/35			19/22/24/28/32/35/38/42/48		1
		8/9/9.525/10/11/12/14/15.87/16/19		8/9/9.525/10/11/12/14/15.87/16/19			9.525/10/11/12/12.7/14/15.87/16/19/22/24			11/12.7/14/15.87/16/19/22/24/28/32/35		2
D31 Motor pilot diameter ⁽³⁾	mm	any		any			any			any		
D32 Motor bolt hole diameter ⁽³⁾		any		any			any			any		
D33 Hole circle diameter ⁽³⁾		any		any			any			any		
D34 Output flange diagonal ⁽¹⁾		92		116			146			185		
L30 Min. motor shaft length ⁽¹⁾	mm	16 (19 ⁽⁶⁾)		19 (21 ⁽⁷⁾)			21 (26 ⁽⁸⁾)			26(29 ⁽⁹⁾)		1
		16 (19 ⁽⁶⁾)		16 (19 ⁽⁶⁾)			19 (21 ⁽⁷⁾)			21(26 ⁽⁸⁾)		2
L31 Pilot depth		any		any			any			any		
N Number of bolt holes		4		4			4			5		
Q3 Flange square ⁽¹⁾	□	70		90			115			142		1
		70		70			90			115		2
Recommended max. motor weight ⁽⁴⁾	kg (lb)	10 (22.05)		15 (33.08)			34 (74.97)			50 (110.25)		
Motor type ⁽¹⁾		B5		B5			B5			B6		
Recommended clamping screw tightening torque	Nm (lbin)	4.5 (40)	9.5 ⁽⁶⁾ (84 ⁽⁶⁾)	4.5 (40)	9.5 (84)	16.5 ⁽⁷⁾ (146) ⁽⁷⁾	9.5 (84)	16.5 (146)	40 ⁽⁸⁾ (354) ⁽⁸⁾	16.5 (146)	40 ⁽⁹⁾ (354) ⁽⁹⁾	
SW wrench width	mm	3	4 ⁽⁶⁾	3	4	5 ⁽⁷⁾	4	5	6 ⁽⁸⁾	5	6 ⁽⁹⁾	

(1) Other dimensions on inquiry
 (2) Number of gear stages
 (3) Provided that flange dimensions are compatible
 (4) In horizontal and stationary mounting position
 (5) Shaft fit: j6; k6
 (6) D30 > 14 mm
 (7) D30 > 19 mm
 (8) D30 > 24 mm
 (9) D30 > 35mm



- 1 Output flange shaft
Made of high-strength high quality steel for utmost torsional stiffness
- 2 Output shaft bearing
Large high precision preloaded taper roller bearings for zero clearance
- 3 Planet gears
Precision zero helix angle gear with optimized profile modifications and crowning; case hardened and hard finished by honing
- 4 Housing with integrated ring gear
Ring gear is case hardened and precision honed for high loadability, minimum wear, consistent backlash
- 5 Sun gear
Precision machined optimized gear profile, case hardened and honed for high loadability, low running noise, minimum wear, and consistent backlash
- 6 Sun gear bearing
High speed ball bearings in floating arrangement, eliminating thrust loads from thermal expansion, and yet providing exact positioning for easy mounting
- 7 Motor matching adapter plate
Matches the gear head with virtually any servo motor; made of aluminum for enhanced thermal conductivity
- 8 Clamping ring
Balanced ring, suitable for high rpm, made of steel to allow high clamping forces for safe torque transfer
- 9 Clamping screw
High strength steel screw with special low pitch thread to generate a high clamping force
- 10 PCS-2 System
Precision Clamping System - most reliable advanced system available today
- 11 Assembly bore
Access bore for the clamping screw