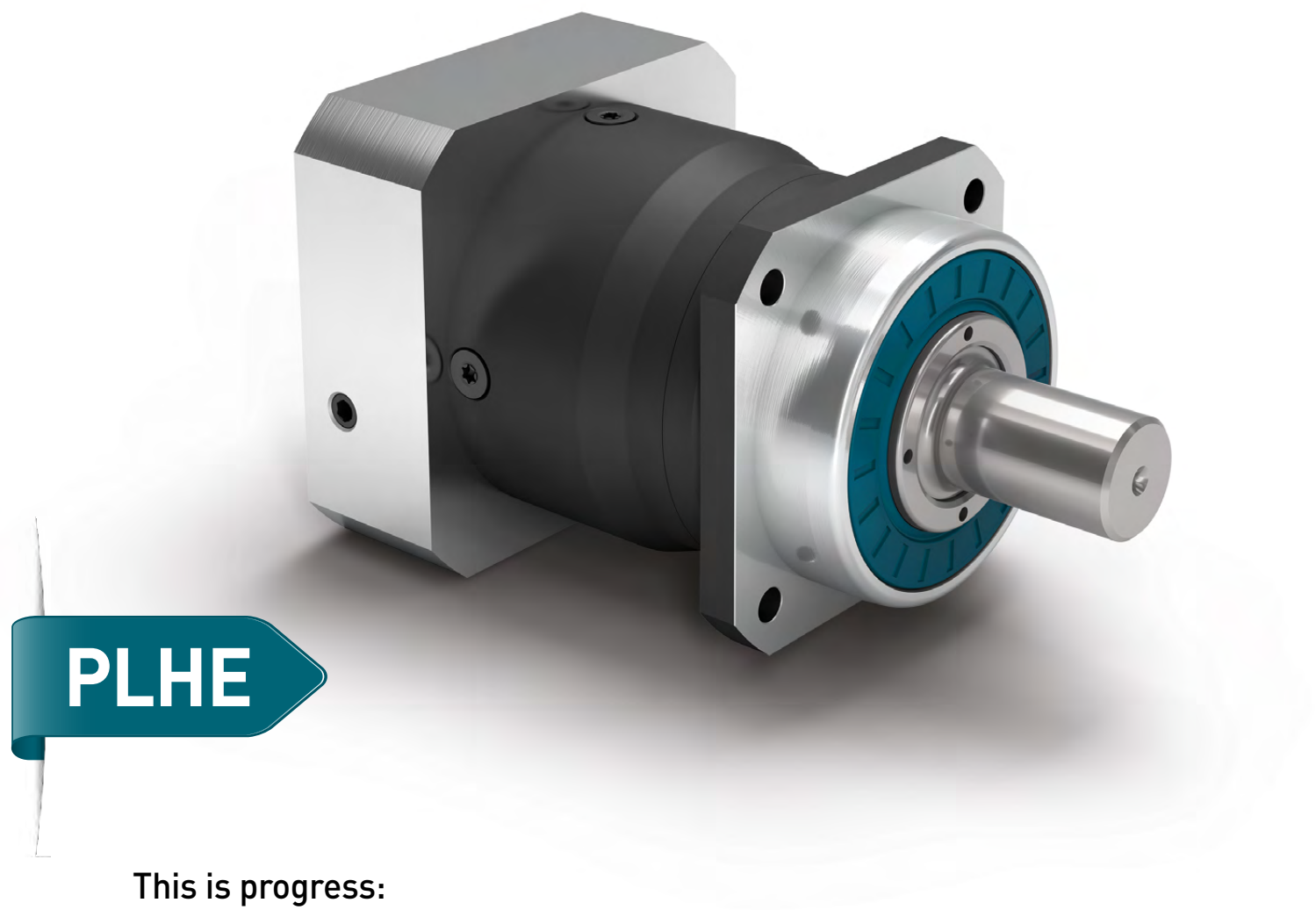


PLHE

This is progress:
In this planetary gearbox, precision and cost effectiveness meet

The **PLHE** is the world's first combination of economy and precision planetary gearboxes. The prestressed tapered roller bearings of our planetary gearboxes safeguard great stiffness even under the highest loads. The seal we have developed provides the perfect protection against dust and water jets.

1 Perfectly sealed

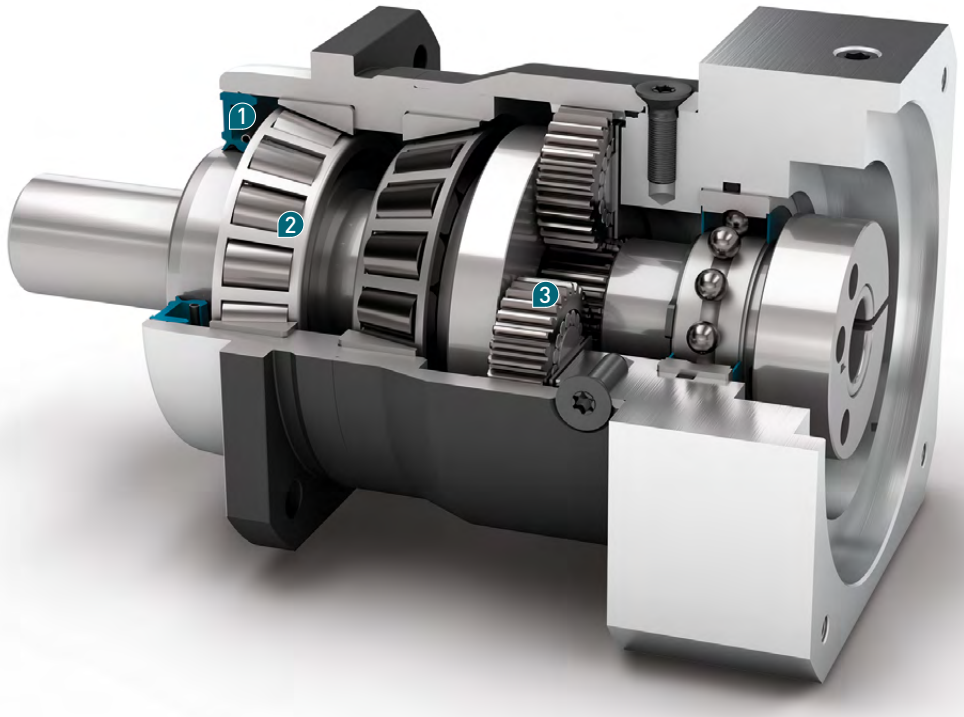
The **PLHE** endures in the most grueling conditions. The prestressed radial shaft seal assembly we have designed even withstands dust and water jets.
Perfect IP 65 protection class, thanks to its smart design.

2 Output bearing for heavy duty applications

The prestressed tapered roller bearings in the **PLHE** safeguard a high stiffness. Even under changing equidirectional rotations, the output bearings remain free of backlash. This gearbox perseveres under continuous loads.

3 The best of both worlds

The **PLHE** is the world's first combination of economy and precision planetary gearbox. It combines high performance with optimal acquisition costs – the perfect symbiosis.



- For any mounting position
- Individual adaptation of the input flange to the motor
- Lifetime lubrication for maintenance-free operation
- Equidirectional rotation
- Wide range of output shaft designs
- Clamping systems with optimized mass moment of inertia
- Precise gearing

Code	Gearbox characteristics			PLHE060	PLHE080	PLHE120	z(1)
	Service life	t_L	h	30,000			
	Efficiency at full load(2)	η	%	97			1
				96			2
	Min. operating temperature	T_{min}	°C (°F)	-25 (-13)			
	Max. operating temperature	T_{max}		90 (194)			
	Protection class			IP 65			
S	Standard lubrication			Grease			
F	Food grade lubrication			Grease			
L	Low temperature lubrication(3)			Grease			
	Installation position			Any			
S	Standard backlash	j_t	arcmin	< 10	< 7	< 7	1
				< 12	< 9	< 9	2
	Torsional stiffness(2)	c_g	Nm/arcmin (lb_f.in/arcmin)	2,2 - 3,0 (19 - 27)	6,0 - 8,0 (53 - 71)	13,4 - 18,0 (119 - 159)	1
				2,3 - 3,0 (20 - 27)	6,1 - 8,0 (54 - 71)	13,7 - 18,0 (121 - 159)	2
	Gearbox weight	m_G	kg (lb_m)	1,4 (3.1)	2,7 (6.0)	6,8 (15.0)	1
				1,6 (3.5)	3,4 (7.5)	8,8 (19.4)	2
S	Standard surface			Housing: Steel – nitrocarburized and post-oxidized (black)			
	Running noise(4)	Q_g	dB(A)	58	60	65	
	Max. bending moment based on the gearbox input flange(5)	M_b	Nm (lb_f.in)	8 (71)	16 (142)	40 (354)	
	Motor flange precision			DIN 42955-N			

Output shaft loads			PLHE060	PLHE080	PLHE120	z(1)
Radial force for 20,000 h(6)(7)	$F_{r\,20.000\,h}$	N (lb_f)	3200 (720)	5500 (1238)	6000 (1350)	
Axial force for 20,000 h(6)(7)	$F_{a\,20.000\,h}$		4400 (990)	6400 (1440)	8000 (1800)	
Radial force for 30,000 h(6)(7)	$F_{r\,30.000\,h}$		3200 (720)	4800 (1080)	5400 (1215)	
Axial force for 30,000 h(6)(7)	$F_{a\,30.000\,h}$		3900 (878)	5700 (1283)	7000 (1575)	
Static radial force(7)(8)	$F_{r\,Stat}$		3200 (720)	5500 (1238)	6000 (1350)	
Static axial force(7)(8)	$F_{a\,Stat}$		4400 (990)	6400 (1440)	8000 (1800)	
Tilting moment for 20,000 h(6)(8)	$M_{K\,20.000\,h}$	Nm (lb_f.in)	191 (1690)	383 (3390)	488 (4319)	
Tilting moment for 30,000 h(6)(8)	$M_{K\,30.000\,h}$		191 (1690)	335 (2965)	439 (3885)	

Moment of inertia			PLHE060	PLHE080	PLHE120	z(1)
Mass moment of inertia(2)	J	kgcm² (lb_f.in.s²10⁻⁴)	0,069 - 0,178 (0.611 - 1.575)	0,370 - 0,775 (3.275 - 6.859)	1,390 - 2,486 (12.302 - 22.001)	1
			0,064 - 0,135 (0.566 - 1.195)	0,357 - 0,638 (3.159 - 5.646)	1,378 - 2,326 (12.195 - 20.585)	2

(1) Number of stages
(2) The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com
(3) T_{min} = -40°C (-40°F). Optimal operating temperature max. 50°C (122°F)
(4) Sound pressure level from 1 m, measured on input running at n_1=3000 rpm no load; i=5
(5) Max. motor weight* in kg = 0.2 x M_b / motor length in m
* with symmetrically distributed motor weight
* with horizontal and stationary mounting
(6) These values are based on an output shaft speed of n_2=100 rpm
(7) Based on center of output shaft
(8) 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

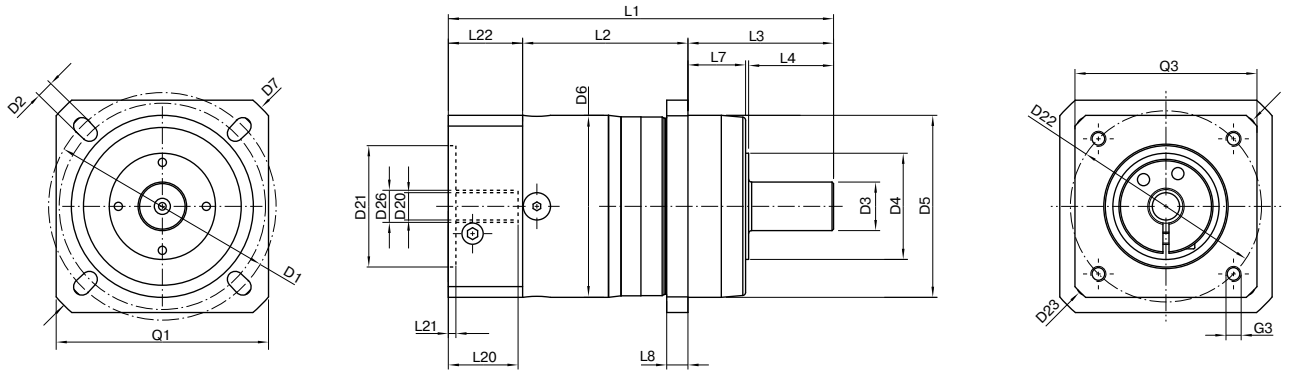
Output torques			PLHE060	PLHE080	PLHE120	i(1)	z(2)
Nominal output torque(3)(4)	T_{2N}	Nm (lb_f.in)	28 (248)	85 (752)	115 (1018)	3	1
			38 (336)	115 (1018)	155 (1372)	4	
			40 (354)	110 (974)	195 (1726)	5	
			25 (221)	65 (575)	135 (1195)	7	
			18 (159)	50 (443)	120 (1062)	8	
			15 (133)	38 (336)	95 (841)	10	
			44 (389)	130 (1151)	210 (1859)	9	2
			44 (389)	120 (1062)	260 (2301)	12	
			44 (389)	110 (974)	230 (2036)	15	
			44 (389)	120 (1062)	260 (2301)	16	
			44 (389)	120 (1062)	260 (2301)	20	
			40 (354)	110 (974)	230 (2036)	25	
			44 (389)	120 (1062)	260 (2301)	32	
			40 (354)	110 (974)	230 (2036)	40	
			18 (159)	50 (443)	120 (1062)	64	
			15 (133)	38 (336)	95 (841)	100	
Max. output torque(4)(5)	T_{2max}	Nm (lb_f.in)	45 (398)	136 (1204)	184 (1628)	3	1
			61 (540)	184 (1628)	248 (2195)	4	
			64 (566)	176 (1558)	312 (2761)	5	
			40 (354)	104 (920)	216 (1912)	7	
			29 (257)	80 (708)	192 (1699)	8	
			24 (212)	61 (540)	152 (1345)	10	
			70 (620)	208 (1841)	336 (2974)	9	2
			70 (620)	192 (1699)	416 (3682)	12	
			70 (620)	176 (1558)	368 (3257)	15	
			70 (620)	192 (1699)	416 (3682)	16	
			70 (620)	192 (1699)	416 (3682)	20	
			64 (566)	176 (1558)	368 (3257)	25	
			70 (620)	192 (1699)	416 (3682)	32	
			64 (566)	176 (1558)	368 (3257)	40	
			29 (257)	80 (708)	192 (1699)	64	
			24 (212)	61 (540)	152 (1345)	100	

(1) Ratios ($i=n_1/n_2$)
(2) Number of stages
(3) Application specific configuration with NCP – www.neugart.com
(4) Values for feather key (code "A"): for repeated load
(5) 30,000 rotations of the output shaft permitted; see page 128

Output torques			PLHE060	PLHE080	PLHE120	i[1]	z[2]
Emergency stop torque[3]	T_{2Stop}	Nm (lb_f.in)	66 (584)	180 (1593)	390 (3452)	3	1
			88 (779)	240 (2124)	520 (4602)	4	
			80 (708)	220 (1947)	500 (4425)	5	
			80 (708)	178 (1575)	340 (3009)	7	
			80 (708)	190 (1682)	380 (3363)	8	
			80 (708)	200 (1770)	480 (4248)	10	
			88 (779)	260 (2301)	500 (4425)	9	2
			88 (779)	240 (2124)	520 (4602)	12	
			88 (779)	220 (1947)	500 (4425)	15	
			88 (779)	240 (2124)	520 (4602)	16	
			88 (779)	240 (2124)	520 (4602)	20	
			80 (708)	220 (1947)	500 (4425)	25	
			88 (779)	240 (2124)	520 (4602)	32	
			80 (708)	220 (1947)	500 (4425)	40	
			80 (708)	190 (1682)	380 (3363)	64	
			80 (708)	200 (1770)	480 (4248)	100	

Input speeds			PLHE060	PLHE080	PLHE120	i[1]	z[2]
Average thermal input speed at T_{2N} and S1[4][5]	n_{1N}	rpm	2950[6]	2450[6]	2150[6]	3	1
			3500[6]	2700[6]	2400[6]	4	
			4200[6]	3250[6]	2600[6]	5	
			4500	4000	3500[6]	7	
			4500	4000	3500[6]	8	
			4500	4000	3500	10	
			4500[6]	4000[6]	3050[6]	9	2
			4500	4000[6]	3200[6]	12	
			4500	4000	3500[6]	15	
			4500	4000	3500[6]	16	
			4500	4000	3500[6]	20	
			4500	4000	3500	25	
			4500	4000	3500	32	
			4500	4000	3500	40	
			4500	4000	3500	64	
			4500	4000	3500	100	
Max. mechanical input speed[4]	n_{1Limit}	rpm	13000	7000	6500		

[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 128 for the definition
[6] Average thermal input speed at 50% T_{2N} and S1



Drawing corresponds to a PLHE060 / 1-stage / smooth output shaft / 11 mm clamping system / motor adaptation – one part / B5 flange type motor
All other variants can be retrieved in the Tec Data Finder at www.neugart.com

Geometry[1]			PLHE060	PLHE080	PLHE120	z[2]	Code
Pitch circle diameter output	D1		68 - 75 (2.677 - 2.953)	85 (3.346)	120 (4.724)		
Mounting bore output	D2	4x	5.5 (0.217)	6.5 (0.256)	9.0 (0.354)		
Shaft diameter output	D3	k6	16 (0.630)	22 (0.866)	32 (1.260)		
Shaft collar output	D4		35 (1.378)	40 (1.575)	45 (1.772)		
Centering diameter output	D5	g7	60 (2.362)	70 (2.756)	90 (3.543)		
Housing diameter	D6		60 (2.362)	80 (3.150)	115 (4.528)		
Diagonal dimension output	D7		92 (3.622)	100 (3.937)	140 (5.512)		
Flange cross section output	Q1	■	70 (2.756)	80 (3.150)	110 (4.331)		
Min. total length	L1		127 (5.000)	159.5 (6.280)	199.5 (7.854)	1	
			140 (5.512)	177 (6.968)	227 (8.937)	2	
Housing length	L2		55 (2.165)	69.5 (2.736)	64 (2.520)	1	
			67.5 (2.657)	87.5 (3.445)	91.5 (3.602)	2	
Shaft length output	L3		48 (1.890)	56 (2.205)	88 (3.465)		
Centering depth output	L7		19 (0.748)	17.5 (0.689)	28 (1.102)		
Flange thickness output	L8		7 (0.276)	8 (0.315)	10 (0.394)		
Clamping system diameter input	D26		More information on page 117				
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 www.neugart.com				
Max. permis. motor shaft length	L20						
Min. permis. motor shaft length							
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	■					
Output shaft with feather key (DIN 6885-1)			A 5x5x25	A 6x6x28	A 10x8x50		A
Feather key width (DIN 6885-1)	B1		5 (0.197)	6 (0.236)	10 (0.394)		
Shaft height including feather key (DIN 6885-1)	H1		18 (0.709)	24.5 (0.965)	35 (1.378)		
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	58 (2.283)		
Feather key length	L5		25 (0.984)	28 (1.102)	50 (1.969)		
Distance from shaft end	L6		2 (0.079)	4 (0.157)	4 (0.157)		
Center hole (DIN 332, type DR)	Z		M5x12.5	M8x19	M12x28		
Smooth output shaft							B
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	58 (2.283)		

[1] Dimensions in mm (in)
[2] Number of stages