

# HLAE

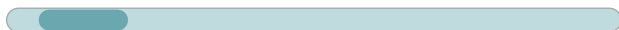
**The unique planetary gearbox with certified hygienic design – ideal for reliable cleaning processes**

Our **HLAE** is unique: It is the world's first planetary gearbox in a certified hygienic design – flexible without a radial bolt, powerful and yet easy and quick to clean. It was developed specifically for applications in sensitive areas such as pharmaceuticals, cosmetics and food.

Nominal output torque **15 - 171 Nm**



Radial force **450 - 1450 N**



Axial force **550 - 2500 N**



Torsional backlash **7 - 12 arcmin**

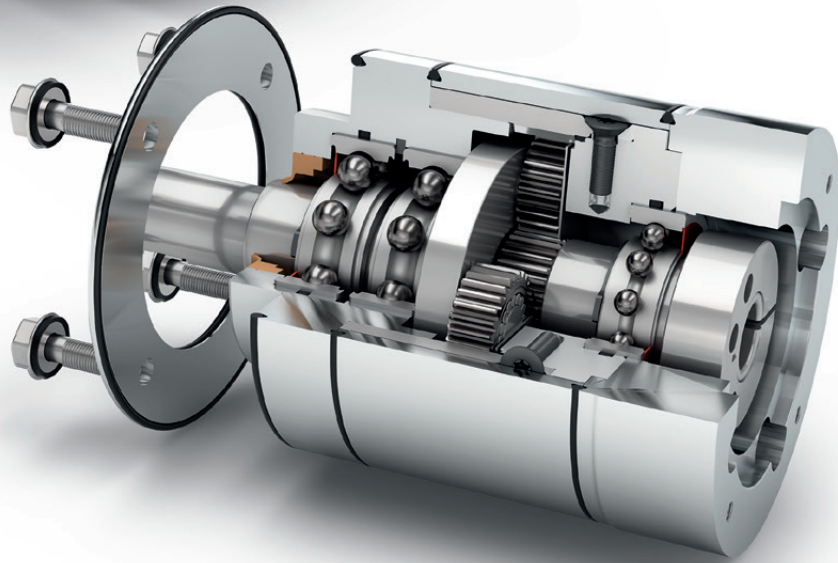
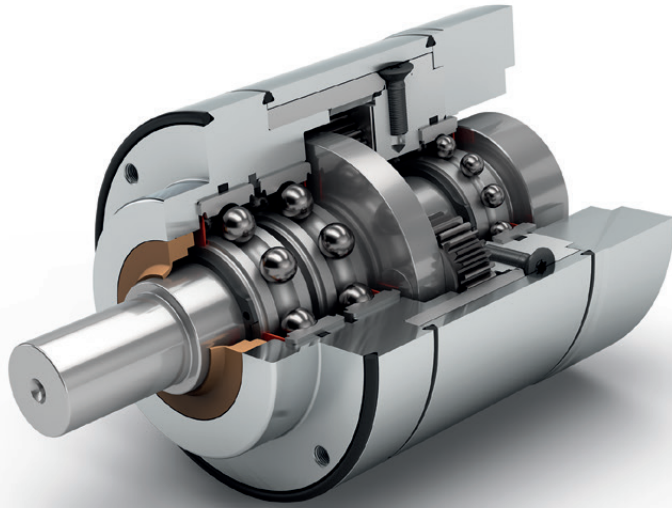


Protection class **IP65**

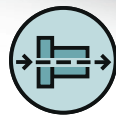


Frame sizes

- 70
- 90
- 110



Application-specific gearbox



Coaxial gearbox



Equidirectional rotation



Spur gear



Round type output flange



Low-friction deep groove ball bearings



Rotary shaft seal



Extra long centering collar



Planet carrier in disc design



Option: FFKM seal

Detailed explanations of the technical features starting on page 173.

Code	Gearbox characteristics			HLAE070	HLAE090	HLAE110	p <sup>(1)</sup>
	Service life (L <sub>10h</sub> )	t <sub>L</sub>	h	30,000			1
	Efficiency at full load <sup>(2)</sup>	η	%	98			
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)			2
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)			
	Protection class			IP69K			
<b>F</b>	Food grade lubrication			Grease (lifetime lubrication)			
	Installation position			Any			
<b>S</b>	Standard backlash	j <sub>t</sub>	arcmin	< 10	< 7	< 7	1
				< 12	< 9	< 9	2
	Torsional stiffness <sup>(2)</sup>	c <sub>g</sub>	Nm /arcmin (lb <sub>f</sub> .in/ arcmin)	2.3 - 3.1 (20 - 27)	6.6 - 8.7 (58 - 77)	14.7 - 19.5 (130 - 173)	1
				2.2 - 3.2 (19 - 28)	6.6 - 9.0 (58 - 80)	13.5 - 20.5 (119 - 181)	2
	Gearbox weight <sup>(2)</sup>	m <sub>G</sub>	kg (lb <sub>m</sub> )	2.1 (4.6)	3.8 (8.4)	7.3 - 7.4 (16.1 - 16.4)	1
				2.4 - 2.5 (5.2 - 5.6)	4.3 - 4.5 (9.5 - 9.9)	8.7 - 9.0 (19.1 - 19.9)	2
<b>S</b>	Standard surface			Housing: Stainless steel 1.4404 – electropolished (R <sub>a</sub> < 0.8 μm)			
	Running noise <sup>(3)</sup>	Q <sub>g</sub>	dB(A)	58	60	65	
	Max. bending moment based on the gearbox input flange <sup>(4)</sup>	M <sub>b</sub>	Nm (lb <sub>f</sub> .in)	8 (71)	16 (142)	40 (354)	

Output shaft loads			HLAE070	HLAE090	HLAE110	p <sup>(1)</sup>
Radial force for 20,000 h <sup>(5)(6)</sup>	F <sub>r20.000h</sub>	N (lb <sub>f</sub> )	450 (101)	900 (202)	1450 (326)	
Axial force for 20,000 h <sup>(5)(6)</sup>	F <sub>a20.000h</sub>		550 (124)	1500 (337)	2500 (562)	
Radial force for 30,000 h <sup>(5)(6)</sup>	F <sub>r30.000h</sub>		400 (90)	600 (135)	1250 (281)	
Axial force for 30,000 h <sup>(5)(6)</sup>	F <sub>a30.000h</sub>		500 (112)	1000 (225)	2000 (450)	
Maximum radial force <sup>(6)(7)</sup>	F <sub>rStat</sub>		1000 (225)	1250 (281)	5000 (1124)	
Maximum axial force <sup>(6)(7)</sup>	F <sub>aStat</sub>		1200 (270)	1600 (360)	3800 (854)	
Tilting moment for 20,000 h <sup>(5)(7)</sup>	M <sub>K20.000h</sub>	Nm (lb <sub>f</sub> .in)	22 (195)	49 (434)	109 (965)	
Tilting moment for 30,000 h <sup>(5)(7)</sup>	M <sub>K30.000h</sub>		19 (168)	33 (292)	94 (832)	

Moment of inertia			HLAE070	HLAE090	HLAE110	p <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> )	0.065 - 0.135 (0.575 - 1.195)	0.753 - 0.866 (6.665 - 7.665)	1.579 - 2.630 (13.975 - 23.277)	1
			0.064 - 0.131 (0.566 - 1.159)	0.740 - 0.983 (6.550 - 8.700)	1.569 - 2.620 (13.887 - 23.189)	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>i</sub>=3000 rpm no load; i=5  
 (4) Max. motor weight\* in kg = 0.2 x 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 center of 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			HLAE070	HLAE090	HLAE110	i <sup>(1)</sup>	p <sup>(2)</sup>				
Nominal output torque <sup>(3)(4)</sup>	T <sub>2N</sub>	Nm (lb <sub>r</sub> .in)	28 (248)	85 (752)	115 (1018)	3	1				
			33 (292)	87 (770)	155 (1372)	4					
			30 (266)	82 (726)	171 (1513)	5					
			25 (221)	65 (575)	135 (1195)	7					
			18 (159)	50 (443)	120 (1062)	8					
			15 (133)	38 (336)	95 (841)	10					
			33 (292)	87 (770)	157 (1390)	9	2				
			33 (292)	80 (708)	171 (1513)	12					
			33 (292)	82 (726)	171 (1513)	15					
			33 (292)	87 (770)	171 (1513)	16					
			33 (292)	87 (770)	171 (1513)	20					
			30 (266)	82 (726)	171 (1513)	25					
			33 (292)	87 (770)	171 (1513)	32					
			30 (266)	82 (726)	171 (1513)	40					
			18 (159)	50 (443)	120 (1062)	64					
			15 (133)	38 (336)	95 (841)	100					
			Max. output torque <sup>(4)(5)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	45 (398)		136 (1204)	184 (1629)	3	1
						53 (469)		140 (1239)	248 (2195)	4	
48 (425)	131 (1159)	274 (2425)				5					
40 (354)	104 (920)	216 (1912)				7					
29 (257)	80 (708)	192 (1699)				8					
24 (212)	61 (540)	152 (1345)				10					
53 (469)	140 (1239)	251 (2222)				9	2				
53 (469)	140 (1239)	274 (2425)				12					
53 (469)	131 (1159)	274 (2425)				15					
53 (469)	140 (1239)	274 (2425)				16					
53 (469)	140 (1239)	274 (2425)				20					
48 (425)	131 (1159)	274 (2425)				25					
53 (469)	140 (1239)	274 (2425)				32					
48 (425)	131 (1159)	274 (2425)				40					
29 (257)	80 (708)	192 (1699)				64					
24 (212)	61 (540)	152 (1345)				100					

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

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

<sup>(3)</sup> Application specific configuration with NCP – [www.neugart.com](http://www.neugart.com)

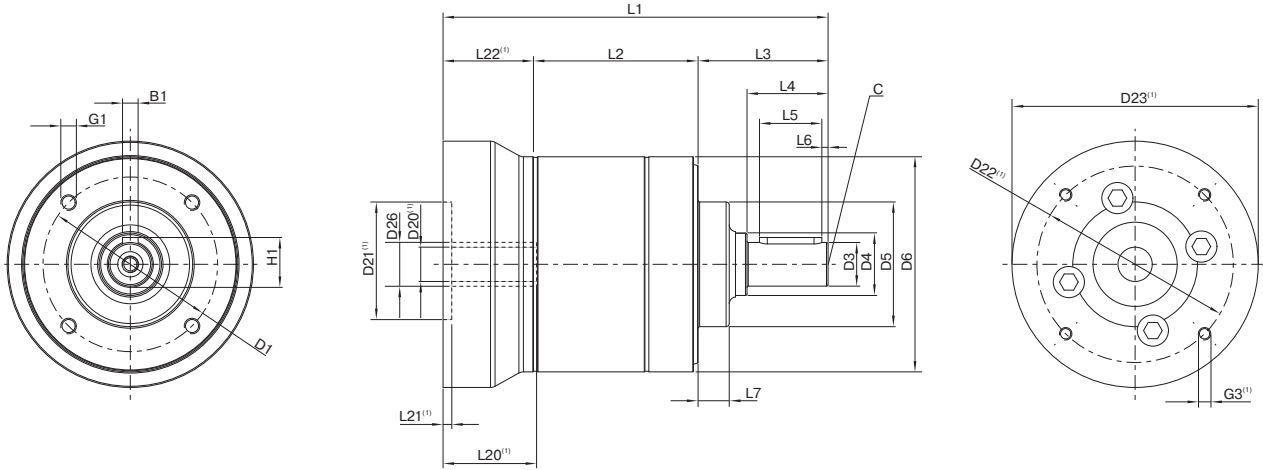
<sup>(4)</sup> Values for feather key (code "A"): for repeated load

<sup>(5)</sup> 30,000 rotations of the output shaft permitted; see page 166

Output torques			HLAE070	HLAE090	HLAE110	$i^{(1)}$	$p^{(2)}$
Emergency stop torque <sup>(3)</sup>	$T_{2Stop}$	Nm (lb <sub>f</sub> .in)	56 (496)	170 (1505)	230 (2036)	3	1
			66 (584)	174 (1540)	310 (2744)	4	
			60 (531)	164 (1452)	342 (3027)	5	
			50 (443)	130 (1151)	270 (2390)	7	
			36 (319)	100 (885)	240 (2124)	8	
			30 (266)	76 (673)	190 (1682)	10	
		66 (584)	174 (1540)	314 (2779)	9	2	
		66 (584)	174 (1540)	342 (3027)	12		
		66 (584)	164 (1452)	342 (3027)	15		
		66 (584)	174 (1540)	342 (3027)	16		
		66 (584)	174 (1540)	342 (3027)	20		
		60 (531)	164 (1452)	342 (3027)	25		
		66 (584)	174 (1540)	342 (3027)	32		
		60 (531)	164 (1452)	342 (3027)	40		
		36 (319)	100 (885)	240 (2124)	64		
		30 (266)	76 (673)	190 (1682)	100		

Input speeds			HLAE070	HLAE090	HLAE110	$i^{(1)}$	$p^{(2)}$				
Average thermal input speed at $T_{2N}$ and S1 <sup>(4)(5)</sup>	$n_{1N}$	rpm	4000 <sup>(6)</sup>	2700 <sup>(6)</sup>	2000 <sup>(6)</sup>	3	1				
			4000 <sup>(6)</sup>	3000 <sup>(6)</sup>	2000 <sup>(6)</sup>	4					
			4000	3400 <sup>(6)</sup>	2150 <sup>(6)</sup>	5					
			4000	3500 <sup>(6)</sup>	2600 <sup>(6)</sup>	7					
			4000	3500	2800 <sup>(6)</sup>	8					
			4000	3500	3000 <sup>(6)</sup>	10					
			4000	3500 <sup>(6)</sup>	2400 <sup>(6)</sup>	9	2				
			4000	3500 <sup>(6)</sup>	2450 <sup>(6)</sup>	12					
			4000	3500	2550 <sup>(6)</sup>	15					
			4000	3500	2650 <sup>(6)</sup>	16					
			4000	3500	2850 <sup>(6)</sup>	20					
			4000	3500	2950 <sup>(6)</sup>	25					
			4000	3500	3000 <sup>(6)</sup>	32					
			4000	3500	3000	40					
			4000	3500	3000	64					
			4000	3500	3000	100					
			Max. mechanical input speed <sup>(4)</sup>	$n_{1Limit}$	rpm	13,000		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 166 for the definition  
 (6) Average thermal input speed at 50%  $T_{2N}$  and S1



Drawing corresponds to a HLAE070 / 1-stage / output shaft with feather key / 11 mm clamping system / motor adaptation – one part / B5 flange type motor

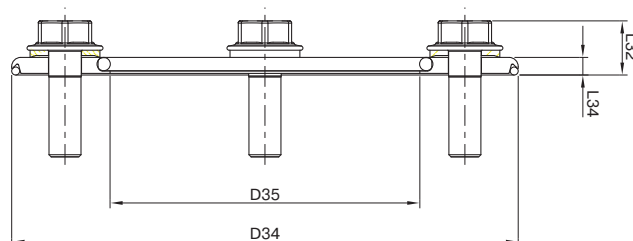
<sup>(1)</sup> The dimensions vary with the motor/gearbox flange. The input flange dimensions can be retrieved for each specific motor in Tec Data Finder at [www.neugart.com](http://www.neugart.com)

Geometry <sup>(2)</sup>			HLAE070	HLAE090	HLAE110	p <sup>(3)</sup>	Code
Pitch circle diameter output	D1		56 (2.205)	75 (2.953)	90 (3.543)		
Shaft diameter output	D3	h7	14 (0.551)	20 (0.787)	25 (0.984)		
Shaft collar output	D4		20 (0.787)	25 (0.984)	35 (1.378)		
Centering diameter output	D5	h7	40 (1.575)	58 (2.283)	65 (2.559)		
Housing diameter	D6		69 (2.717)	88 (3.465)	109 (4.291)		
Mounting thread x depth	G1	4x	M5x11	M6x12	M8x20		
Min. total length	L1		123.5 (4.862)	146 (5.748)	191 (7.520)	1	
			135.5 (5.335)	166 (6.535)	219 (8.622)	2	
Housing length	L2		53.0 (2.087)	68.0 (2.677)	89.0 (3.504)	1	
			65.0 (2.559)	88.0 (3.465)	117.0 (4.606)	2	
Shaft length output	L3		41.7 (1.642)	50 (1.969)	66.5 (2.618)		
Centering depth output	L7		10 (0.394)	13 (0.512)	14 (0.551)		
Motor shaft diameter j6/k6	D20		More information on page 163/164				
Clamping system diameter input	D26						
Output shaft with feather key (DIN 6885-1)			A 5x5x20	A 6x6x25	A 8x7x35		A
Feather key width (DIN 6885-1)	B1		5 (0.197)	6 (0.236)	8 (0.315)		
Shaft height including feather key (DIN 6885-1)	H1		16 (0.630)	22.5 (0.886)	28 (1.102)		
Shaft length from shoulder	L4		26 (1.024)	32 (1.260)	45 (1.772)		
Feather key length	L5		20 (0.787)	25 (0.984)	35 (1.378)		
Distance from shaft end	L6		2 (0.079)	2.5 (0.098)	5 (0.197)		
Center hole (DIN 332, type DR)	C		M5x12.5	M6x16	M10x22		
Smooth output shaft							B
Shaft length from shoulder	L4		26 (1.024)	32 (1.260)	45 (1.772)		

<sup>(2)</sup> Dimensions in mm

<sup>(3)</sup> Number of stages

HLAE Sealing kit



The freely positionable sealing kit for the HLAE provides maximum hygienic protection, making it universally suitable for different machine side thicknesses. It therefore gives you maximum flexibility for connecting to the machine while satisfying the strictest hygienic requirements.

			HLAE070	HLAE090	HLAE110
<b>Art. No.</b>			<b>63911</b>	<b>63858</b>	<b>64130</b>
Outside diameter	D34	mm (in)	75 (2.953)	95 (3.740)	120 (4.724)
Inner diameter	D35		40 (1.575)	58 (2.283)	65 (2.559)
Overall length	L32		8.5 (0.335)	9.5 (0.374)	11.5 (0.453)
Disc length	L34		3 (0.118)	3 (0.118)	3 (0.118)
Width across flats	SW30		8 (0.315)	10 (0.394)	13 (0.512)
Quantity x screw x length	G30		4 x M5x16	4 x M6x20	4 x M8x25

For correct installation of the sealing kit, please refer to the corresponding mounting instructions ([www.neugart.com](http://www.neugart.com)). CAD data can be accessed at [www.neugart.com](http://www.neugart.com)

**Included parts**

- 1 x electropolished stainless steel disc
- 1 x EPDM sealing ring (seal to application)
- 1 x EPDM sealing ring (seal to gearbox)
- 4 x USIT-VA with EPDM coated sealing washer, EHEDG-compliant
- 4 x Hygienic Design stainless steel screw (electropolished), EHEDG-compliant