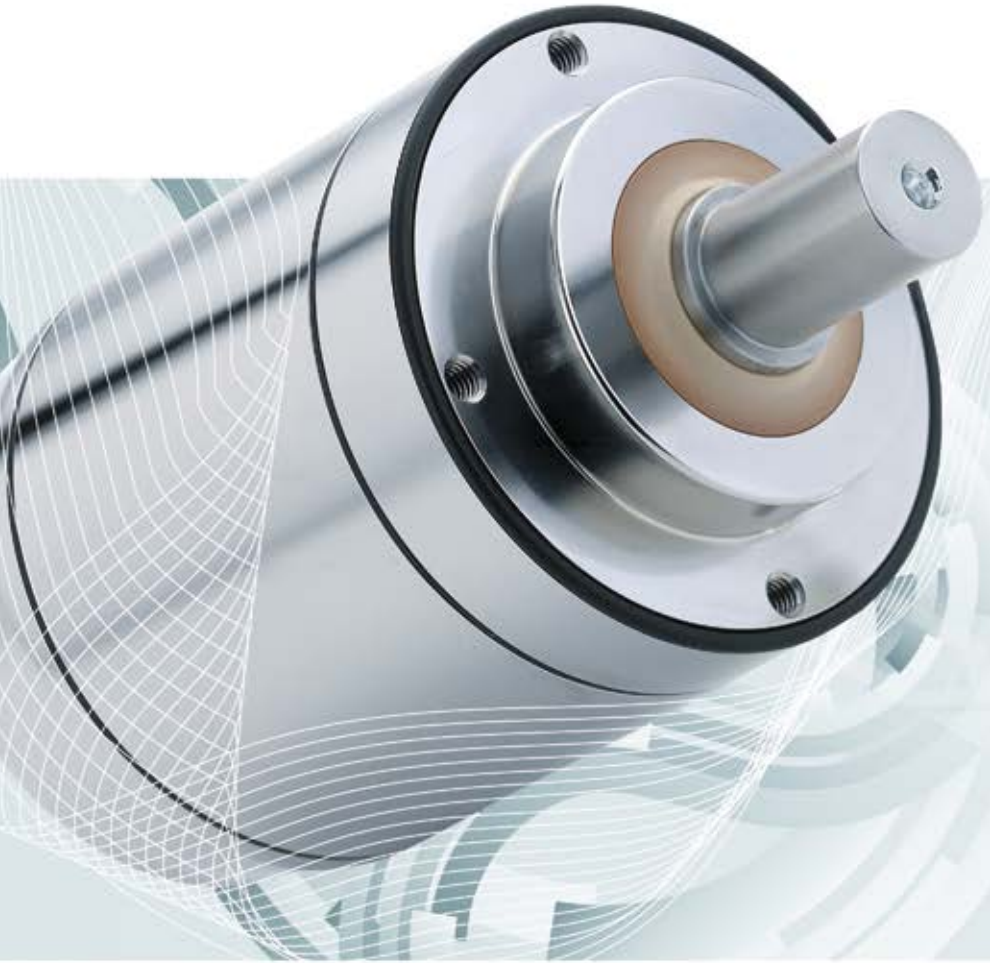
NEUGART



HYGIENIC DESIGN

PLANETARY GEARBOXES

Excellent Neugart technology combined with premium cleaning properties

WHY HYGIENIC DESIGN?

Our Hygienic Design gearbox is not like any other stainless steel gearbox.
Our new **HLAE** series is the logical answer to the requirements of the pharmaceutical industry and food-processing sectors and meets all major certification requirements.

Initially Issued: 11/26/2014 Certificate No.: 8

3-A Sanitary Standards, Inc.

Replacement Parts and System Component Qualification Certificate

This Is To Acknowledge That

Neugart GmbH

Has successfully met the requirements of the Replacement Parts and System Component Qualification Certificate program for

Valid through: December 31, 2015

3-A RPSCQC

The **HLAE** is the world's first Hygienic Design planetary gearbox to be certified by 3-A RPSCQC. The user is therefore assured that the product design has been optimised for his application.

FDA

Another important aspect is the compatibility of the materials used with the products that will be handled. Accordingly, we took special care with our **HLAE** series to ensure that only FDA-certified materials are used.

H1

Inside the gearboxes of the **HLAE** series, we only apply lubricants which are certified suitable for use in food processing.

IP69K

Products in food processing machines must operate under the harshest ambient conditions. The **HLAE** has been designed to fulfil the highest possible protection class, IP69K. This has been validated, tested, and certified by an external testing body.

CERTIFICATIONS

For when cleaning the machine is the most basic requirement for the end customer. Dirt residues, contaminated with germs or bacteria, tend to accumulate at edges, in corners, and in pockets. The geometry of our gearboxes is certified for optimum cleaning properties and maximum hygiene.

FOOD PROCESSING INDUSTRY

Perfect functionality as well as residue-free cleaning of your food processing plant – whether you are producing, handling, dosing, cutting, positioning, or packaging food. The units of the **HLAE** series reliably drive your processes and are designed for fast and thorough cleaning at the end of your workday.

Typical applications:

- Filling plant/dosing feeder
- Slicer
- Belt drives satisfying all hygienic requirements

… and all applications using CIP (Cleaning in Place).

PHARMACEUTICAL INDUSTRY

Highest requirements on surface roughness, paired with absolutely reliable technology – this is where the **HLAE** units made of hygienic steel come into play. Without hesitation, the product can be used for portioning, dosing, pressing or centrifuging tasks in the pharmaceutical & cosmetics industry.

Typical applications:

- Agitating machines/cone mixers
- Capsule filling systems
- Centrifuges

O-rings as approved by the FDA

- **EPDM (standard)**
  Temperature range -50°C to +140°C
  The typical area of application can be found in places where a high hot water and steam resistance is required for the seals used. In addition, EPDM exhibits an excellent ageing and ozone resistance. Chemical resistance is also very good, in particular against agents with an oxidizing effect.

- **FFKM (optional)**
  Temperature range -15°C to +325°C
  Very good chemical resistance and heat resistance of PTFE with the elastomeric properties of FKM. It is used in areas where other elastomeric materials have reached their limits and the highest degree of reliability is required.

No radial screws

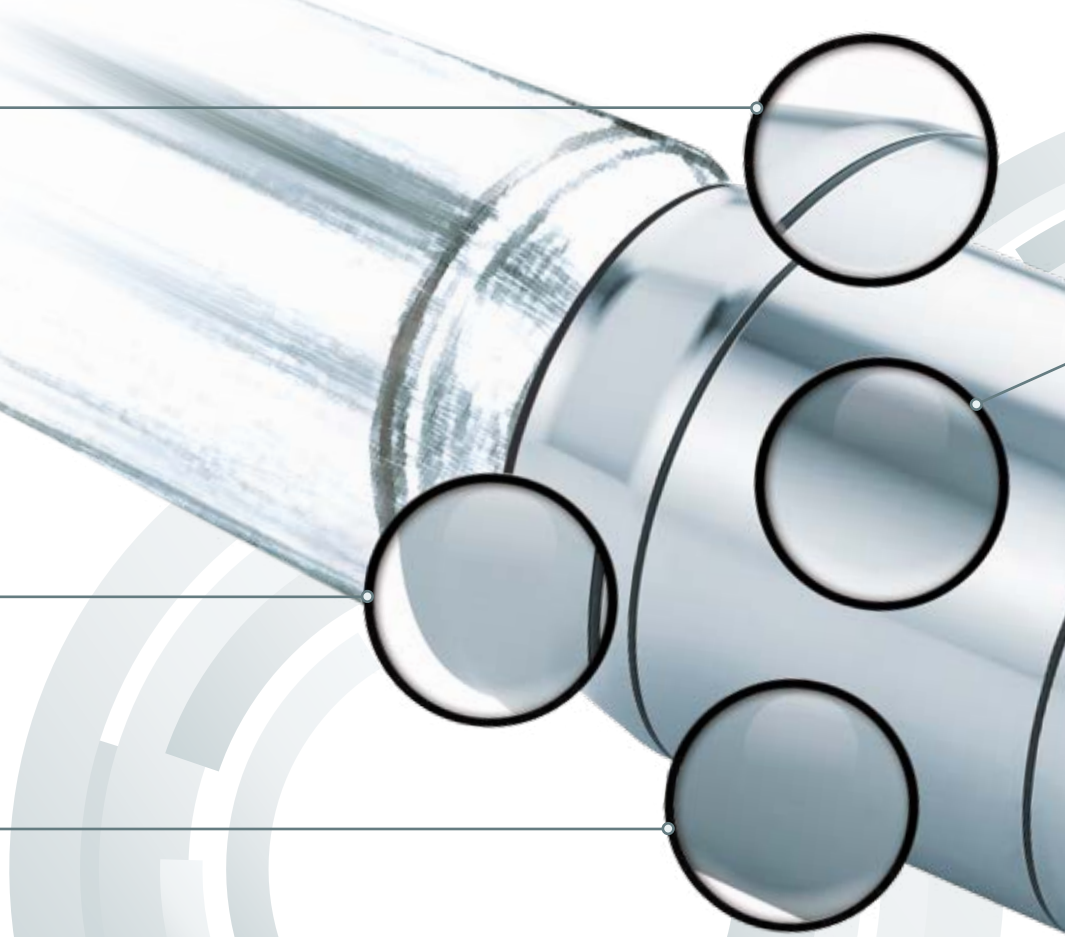
- Usually, a set screw is used to seal the access hole for the motor shaft clamping screw.
- The **HLAE** does not use a screw in this place.

Electro-polished surface

- Highest quality 1.4404 stainless steel (hygienic stainless steel) for optimum resistance

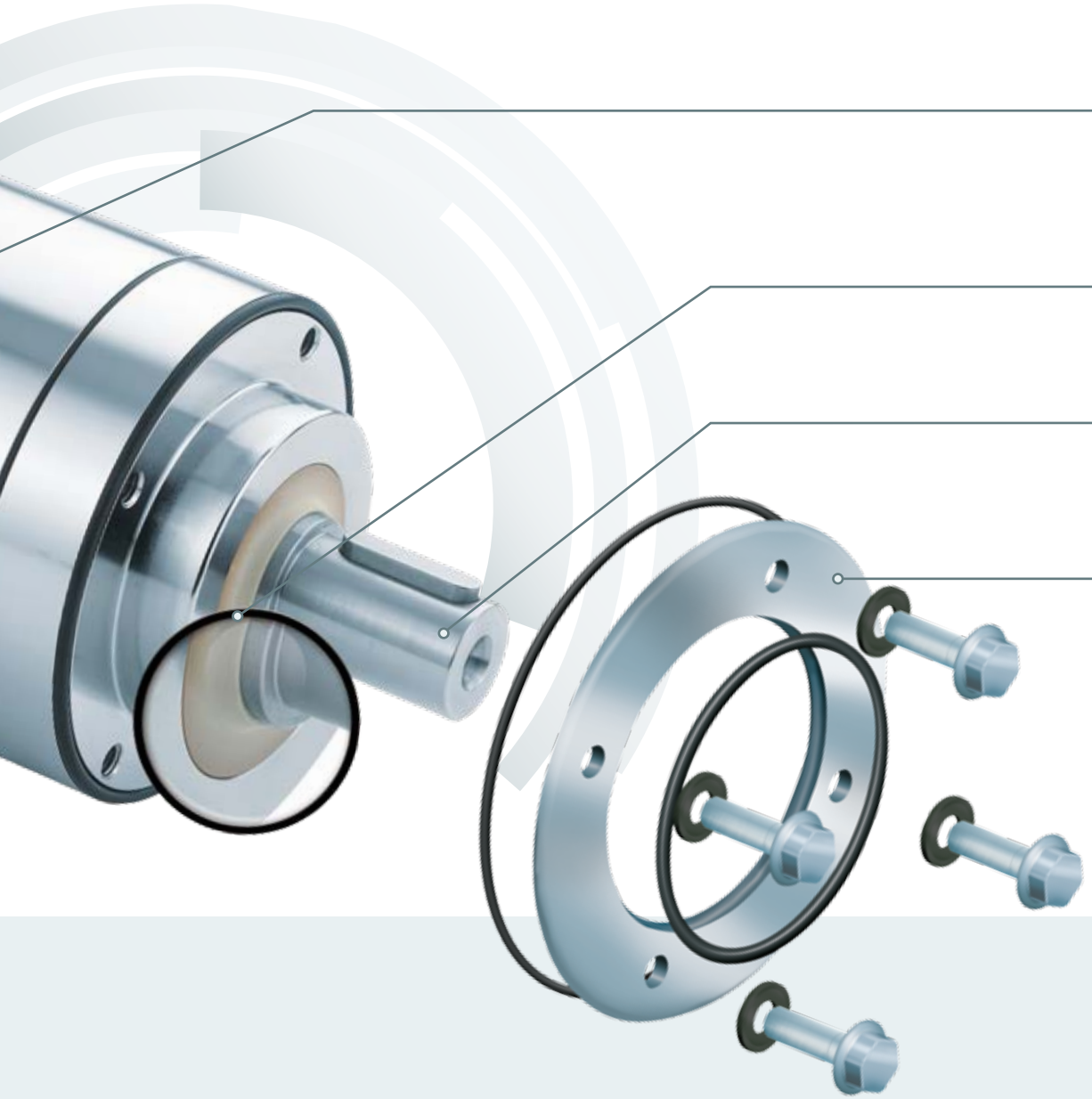
Protection class IP69K

- Highest protection class for unrestricted cleaning



IT'S THE DETAIL THAT COUNTS...

Optimized in terms of design, geometry, material, and performance.



Food-safe lubrication in compliance with NSF

- H1 approvals

Shaft seal free of pockets

- PTFE certified pursuant to FDA

Output shaft

- Output shaft with feather key
- Smooth output shaft

Optional sealing kit

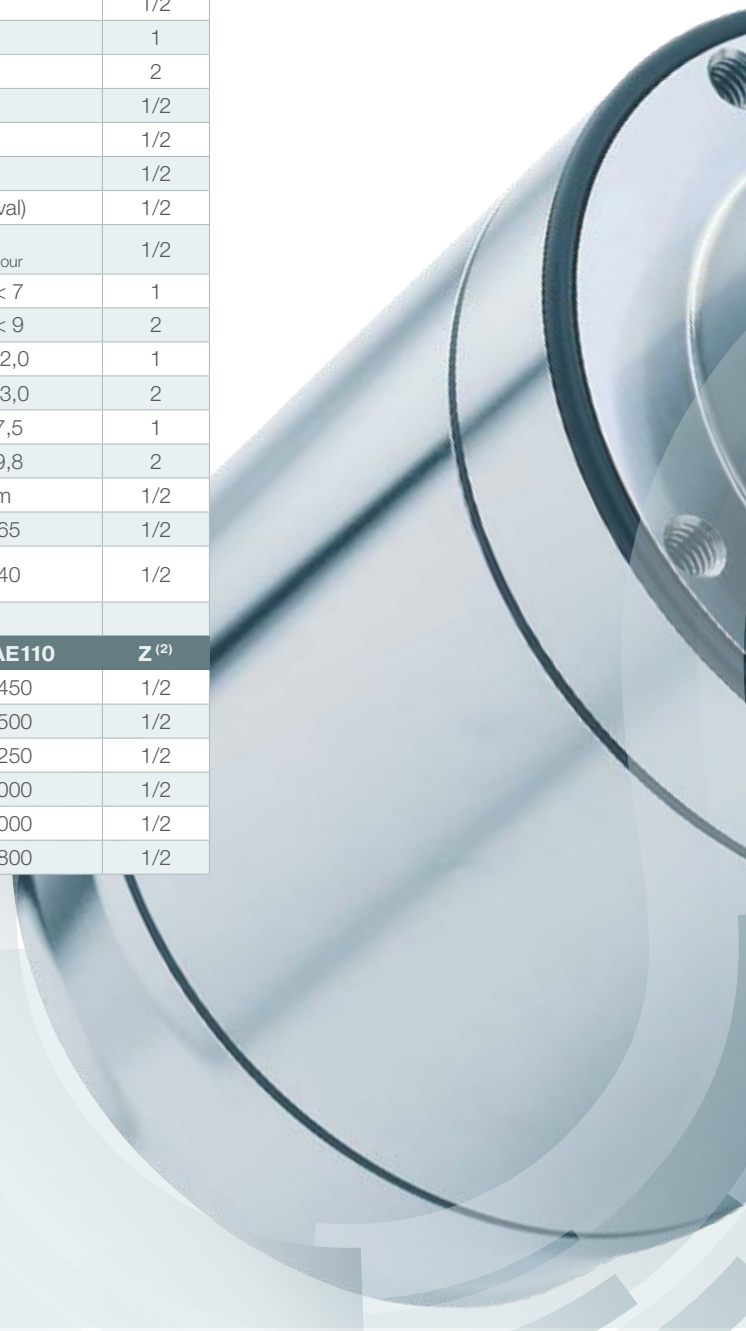
- Seals the gearbox optimally towards the application side
- EPDM screw seals

Gearbox characteristics			HLAE070	HLAE090	HLAE110	Z [2]
Service life	t_L	h	30.000			1/2
Efficiency at full load	η	%	> 97			1
			> 95			2
Operating temperature min.	T_{min}	°C	-25			1/2
Operating temperature max.	T_{max}		90			1/2
Degree of protection			IP69K			1/2
Lubrication			NSF service life lubrication (with H1 approval)			1/2
Installation position			mountable in any position also any rotation, as there is no screw on the outer contour			1/2
Torsional backlash	j_t	arcmin	< 10	< 7	< 7	1
			< 12	<9	< 9	2
Torsional stiffness	c_g	Nm/arcmin	2,3	6,0	12,0	1
			2,5	6,5	13,0	2
Gearbox weight	m_G	kg	2,1	3,5	7,5	1
			2,4	4,2	9,8	2
Surface treatment housing	Ra	µm	electropolished to Ra smaller than 0.8 µm			1/2
Running noise	Q_g	dB(A)	58	60	65	1/2
Max. bending moment based on the gearbox input flange	M_b	Nm	8	16	40	1/2
Motor flange precision			DIN 42955-N			

Output shaft load			HLAE070	HLAE090	HLAE110	Z [2]
Radial force for 20.000 h	$F_{r\ 20.000\ h}$	N	450	900	1450	1/2
Axial force for 20.000 h	$F_{a\ 20.000\ h}$		550	1500	2500	1/2
Radial force for 30.000 h	$F_{r\ 30.000\ h}$		400	600	1250	1/2
Axial force for 30.000 h	$F_{a\ 30.000\ h}$		500	1000	2000	1/2
Static radial force	$F_{r\ Stat}$		1000	1250	5000	1/2
Static axial force	$F_{a\ Stat}$		1200	1600	3800	1/2

[1] Max. motor weight* in kg = $\frac{0{,}2 \times M_b}{\text{Motor length in m}}$

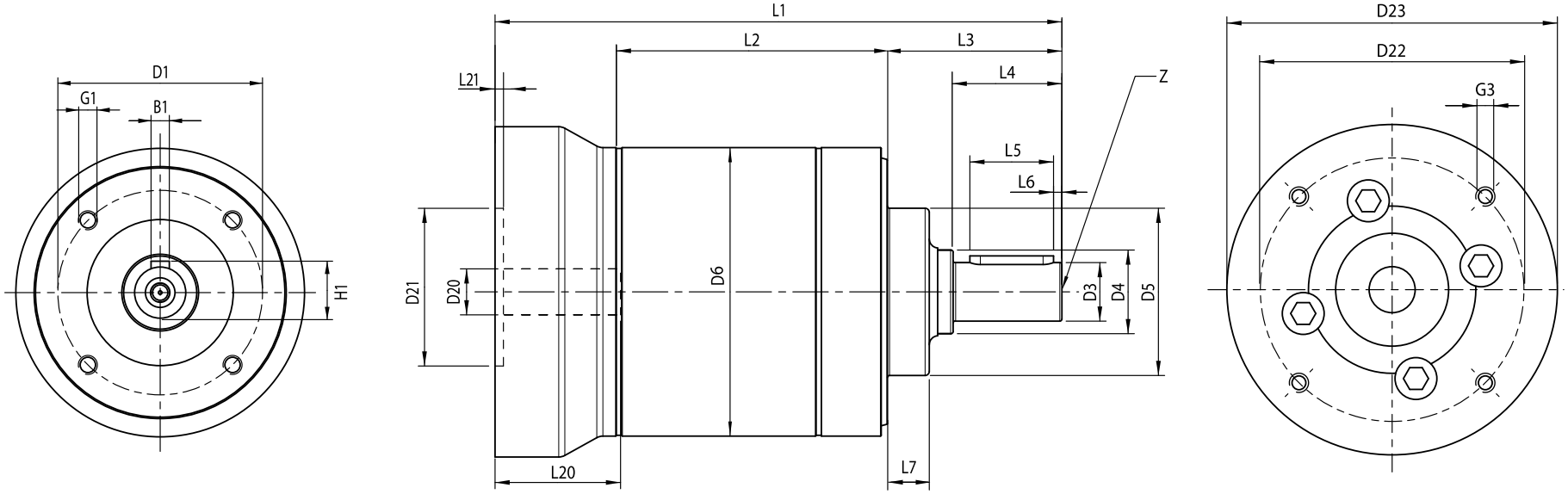
* refered to symmetrical motor weight distribution
* refered to horizontal and stationary mounting



PERFORMANCE

Output torques			HLAE070	HLAE090	HLAE110	i [1]	Z [2]
Nominal output torque	T_{2N}	Nm	28	85	115	3	1
			33	87	155	4	
			30	82	171	5	
			25	65	135	7	
			18	50	120	8	
			15	38	95	10	
			33	87	157	9	2
			33	80	171	12	
			33	82	171	15	
			33	87	171	16	
			33	87	171	20	
			30	82	171	25	
			33	87	171	32	
			30	82	171	40	
			18	50	120	64	
			15	38	95	100	
Max. output torque	T_{2max}	Nm	24 - 53	61 - 140	152 - 274		1
			24 - 53	61 - 140	152 - 274		2
Emergency stop torque	T_{2Stop}	Nm	30 - 66	76 - 174	190 - 342		1
			30 - 66	76 - 174	190 - 342		2
Input speeds			**HLAE070**	**HLAE090**	**HLAE110**		**Z [2]**
Average thermal input speed	n_{1N}	rpm	3000	2500	2000		1
			3500	3000	2500		2
Max. mechanical input speed	n_{1Limit}	rpm	13000	7000	6500		1/2
Mass moment of inertia			**HLAE070**	**HLAE090**	**HLAE110**		**Z [2]**
Mass moment of inertia	J	$kgcm^2$	0,064 - 0,135	0,390 - 0,770	1,300 - 2,630		1
			0,064 - 0,131	0,390 - 0,740	1,300 - 2,620		2

[1] i = transmission
[2] Z = number of stages



THE GEOMETRY

All dimensions in mm			HLAE070	HLAE090	HLAE110	Z [1]
Feather key width (DIN 6885 T1)	B1		5	6	8	1/2
Pitch circle diameter output	D1		56	75	90	1/2
Shaft diameter output	D3	h7	14	20	25	1/2
Shaft shoulder output	D4		20	25	35	1/2
Centering diameter output	D5	h7	40	58	65	1/2
Housing diameter	D6		69	88	109	1/2
Mounting thread x depth	G1	4x	M5x11	M6x12	M8x20	1/2
Shaft height inclusive feather key (DIN 6885 T1)	H1		16	22,5	28	1/2
Housing length	L2		37	52	60	1
			49	70	88	2
Shaft length output	L3		41,7	50	66,5	1/2
Shaft length from shoulder	L4		26	32	45	1/2
Feather key length	L5		20	25	35	1/2
Distance from shaft end	L6		2	2.5	5	1/2
Centering depth output	L7		10	13	14	1/2
Center bore (DIN 332, shape DR)	Z		M5x12,5	M6x16	M10x22	1/2
Total length	L1*		Dimensions may differ depending on motor - / gearbox flange. The relevant dimensions can be gathered from the product key under the heading standard flanges.			
Motor shaft diameter j6/k6	D20*					
Max. permissible motor shaft length	L20*					
Min. permissible motor shaft length						
Centering depth input	L21*					
Centering diameter input	D21*					
Pitch circle diameter input	D22*					
Diagonal dimension input	D23*					
Mounting thread x depth	G3*					

[1] Z = number of stages

* this value may vary depending on the motor - / gearbox flange

PRODUCT KEY **HLAE Gearbox**

HLAE	070	–	004	–	S	F	S	A	3	S	D

Gearbox series

HLAE	Economy hygiene planetary gearbox

Frame size

070	Frame size 70
090	Frame size 90
110	Frame size 110

Separator

–	

Ratio

003	Ratio i = 3	1-stage
004	Ratio i = 4	1-stage
005	Ratio i = 5	1-stage
007	Ratio i = 7	1-stage
008	Ratio i = 8	1-stage
010	Ratio i = 10	1-stage
009	Ratio i = 9	2-stage
012	Ratio i = 12	2-stage
015	Ratio i = 15	2-stage
016	Ratio i = 16	2-stage
020	Ratio i = 20	2-stage
025	Ratio i = 25	2-stage
032	Ratio i = 32	2-stage
040	Ratio i = 40	2-stage
064	Ratio i = 64	2-stage
100	Ratio i = 100	2-stage

Separator

–	

Torsional backlash

S	Standard backlash

Lubrication

F	Food-grade lubrication

Surface

S	Electropolished surface with black EPDM-sealings (standard)
P	Electropolished surface with black FFKM-sealings (on request)

Output shaft design

A	Output shaft with feather key (DIN 6885 T1)
B	Smooth output shaft (standard)

Output flange design

3	Standard output flange

Input system

S	Mountable input system

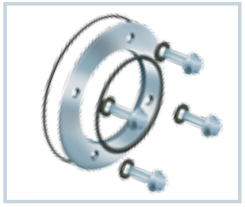
Clamping system diameter input

		Selection information for motor shaft diameter																			
C	11 mm clamping system diameter (for HLAE070)	5	6	6,35	7	8	9	9,5	9,525	-	11	-	-	-	-	-	-	-	-	-	-
D	14 mm clamping system diameter (for HLAE070)	-	-	6,35	-	8	9	9,5	9,525	10	11	12	12,7	14	-	-	-	-	-	-	-
E	19 mm clamping system diameter (for HLAE090)	-	-	-	-	8	9	9,5	9,525	10	11	12	12,7	14	15,875	16	19	-	-	-	-
F	24 mm clamping system diameter (for HLAE110)	-	-	-	-	-	-	-	-	-	11	12	12,7	14	15,875	16	19	19,05	20	22	24

–	E	14	/	30	/	60	/	75	/	B5	/	M5

	B5 standard flanges										B14 standard flanges								Motor -/gearbox information
																			
Mounting thread	M4	M5	M5	M5	M6	M6	M6	M6	M8	M8	M5	M6	M6	M6	M6	M8	M6	M8	G3*
Flange type motor	B5	B5	B5	B5	B5	B5	B5	B5	B5	B5	B14	B14	B14	B14	B14	B14	B14	B14	
Pitch circle diameter in mm	63	75	75	75	100	100	100	100	115	130	58	71	71	71	100	100	100	100	D22*
Centering diameter in mm	40	60	60	60	80	80	80	80	95	110	40	60	60	60	80	85	80	85	D21*
Max. permissible motor shaft length in mm	30	30	30	37	40	47	40	47	58	50	26	26	30	40	40	40	40	40	L20*
Motor shaft diameter in mm																			
Clamping system C	5 -11	5 -11									5 -11	5 -11	5 -11						
Clamping system D	6,35 -14	6,35 -14	-	-	-	-	-	-	-	-	6,35 -14	6,35 -14	6,35 -14	-	-	-	-	-	D20*
Clamping system E	-	-	8 -19	8 -19	8 -19	8 -19					-	-	-	8 -19	8 -19	8 -19			
Clamping system F			-	-	-	-	11 -24	11 -24	11 -24	11 -24				-	-	-	11 -24	11 -24	
Input design																			
Motor adaption - one part	E	E	E	E	E	E	E	E	E	E	-	-	-	-	-	-	-	-	
Motor adaption - two parts - round universal flange	-	-	-	-	-	-	-	-	-	-	Z	Z	Z	Z	Z	Z	Z	Z	
Additional information																			
Diagonal dimension input in mm	79	89	89	89	114	114	114	114	134	148	107	107	107	132	132	132	160	160	D23*
Centering depth input in mm	2,8	3,5	3,5	3,5	4,5	4,5	4,5	4,5	4,5	4,5	5,5	4	4	4	4	4	4	4	L21*
Min. permissible motor shaft length in mm	23	23	23	30	33	40	26	33	44	36	20	20	24	32	32	32	32	32	L20*
	HLAE070		HLAE090				HLAE110				HLAE070			HLAE090			HLAE110		

* Drawing can be found under heading geometry



Sealing kit (output side)			
For gearbox series	HLAE070	HLAE090	HLAE110
Item number	63911	63858	64130

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