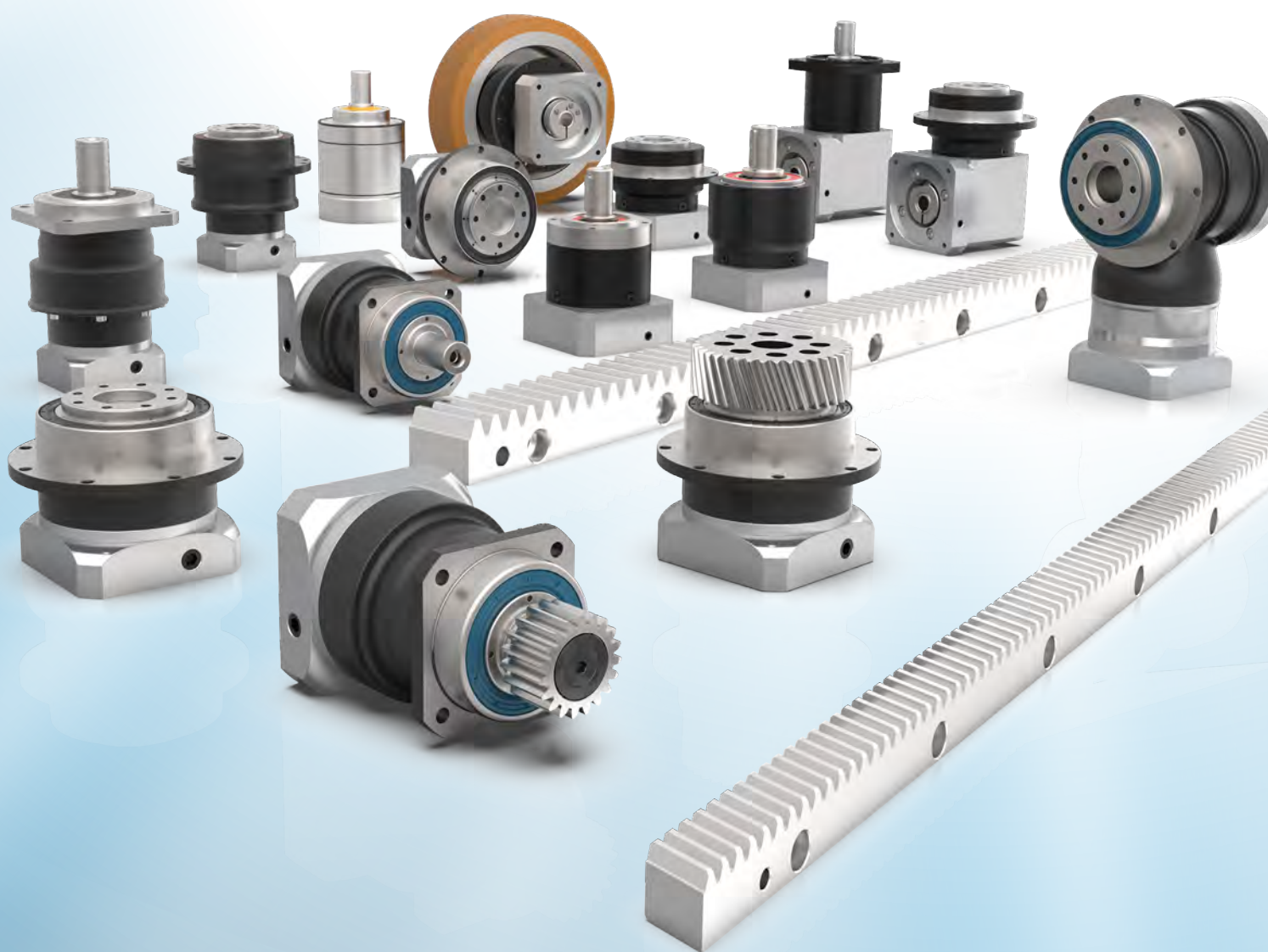


WE SHAPE MOTION.



Complete gearbox catalog





### **More than just gearboxes — solutions for your ideas**

At Neugart, our customers are always at the center of what we do. Our aim is to deliver gearboxes of the highest quality — precise, reliable, and globally available. Our products are used in numerous industries and applications providing real added value through flexible adaptation to your needs.

We listen, respond to challenge, and develop solutions precisely tailored to your projects. With production sites on three continents, we guarantee customer support, short delivery times, and outstanding delivery reliability.

Neugart stands for quality, reliability, and partnership on equal terms — worldwide.

Holger Obergföll & Swen Herrmann  
CEOs

Power, precision and partnership — these values have shaped our company philosophy and our work, for nearly 100 years.

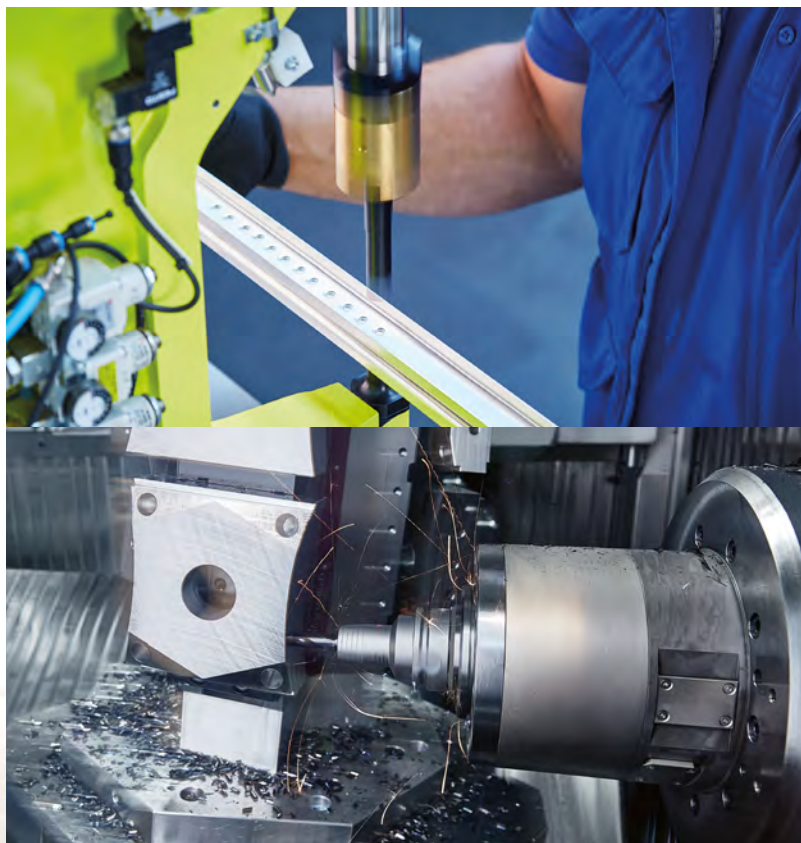
Our offered product range includes numerous innovative, technologically mature, and highly reliable gearbox solutions. We now offer 21 different gearbox series for the economy and precision sectors, as well as two additional planetary gearbox series for specific application areas.

As a technology partner, we also provide customized solutions; specialized, custom designed gearboxes.

Please contact us with any questions about our products or services — we appreciate every opportunity to assist and meet your automation, precise motion and power transmission requirements.



Editorial.....	1
Industry solutions .....	4
Quality .....	5
Collaboration.....	7
Custom made gearboxes .....	9
Tools and trainings .....	10
Quick overview .....	12
Our gearboxes features.....	15
Performance classes.....	16
<b>Economy Line</b>	
PLE.....	18
PLQE .....	26
PLPE.....	34
PLHE.....	40
PLFE .....	46
PFHE .....	52
WPLE .....	58
WPLQE.....	66
WPLPE .....	74
WPLHE.....	80
WPLFE .....	86
<b>Precision Line</b>	
PSNpro .....	92
PSFNpro .....	98
PSBNpro.....	104
PSN .....	110
PSFN .....	116
PSBN.....	122
PLN .....	128
PLFN.....	134
WPLN.....	140
WPSFN.....	146
WGN .....	152
<b>Neugart Rack System</b> .....	158
Rack and pinion .....	160
PK1 .....	162
PM1 .....	164
PM2.....	166
<b>Application specific gearboxes</b>	
NGV .....	168
HLAE.....	176
Option: Painted surface .....	183
Option: Output flange design .....	184
Option: Input design .....	186
Low temperature application .....	189
Product code .....	190
Gearbox torque.....	194
Contact.....	196
Explanation of technical features .....	201
Glossary.....	206



## **We are your specialist in planetary gearboxes.**

As a reliable, trusted and innovative planetary gearbox manufacturer, Neugart has been supporting all industrial sectors for over half a century. Our products get the job done, regardless of how complex our customers' needs may be. Over the years, we have become the foremost leaders in drive technology specialization. Our vast industry knowledge allows us to support customers with their most challenging projects and to offer the latest technologies and solutions.

Our constantly expanding product inventory provides effective solutions for virtually every application of gearbox technology.

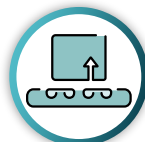
Our customers' challenges and concerns are always at the fore-front of our thoughts. Listening to and reflecting upon problems helps us to expand our knowledge, in order to achieve the highest standard in design and innovation. Our mechanical and industrial expertise includes everything from automation and robotics to food and packaging to medical and pharmaceutical.

## Neugart gearboxes are world-class products.

Unique possibilities are available for countless industries as we continuously optimize all technologies and services related to our products. We invite you to benefit from our competitive advantages.

### Automation and robotics

- Cost-effective gearbox solutions
- Smart software for all product aspects



### Packaging machines

- Dynamic and hardwearing gearboxes
- Cost-effective gearbox solutions



### Machine tools

- Extensive application experience
- Reliable and long-lasting gearboxes



### Food and beverage industry

- Certified products
- Worldwide, comprehensive application knowledge



### Medical engineering and pharmaceuticals

- Smart software for all product aspects
- Certified products



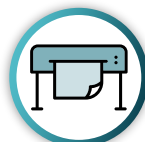
### Intralogistics

- AGV-specific gearboxes
- Available starting from a quantity of one



### Printing industry

- Extensive application experience
- Higher quality end product



### Agricultural machinery

- Reliable and long-lasting gearboxes
- Suitable for use in harsh conditions



Neugart's fully developed product portfolio can handle virtually all applications with controlled motion. We are already precision gearbox partner in over 40 industries.



## Power at a high level: Our quality.

Your satisfaction is our measuring stick – that's why the quality of our products and services is always our top priority. With our quality and environmental policies we secure and expand our economic success throughout international markets.

Our high standard in product quality, support and service is appreciated internationally: With over 70 representatives and branches, we are represented in all major industrial nations.

We manufacture our products exclusively in Germany. In the USA and China, our assembly factories serve regional markets, guaranteeing a high level of flexibility for adaptations as well as the shortest delivery times.





## **Perfection in every detail: Our products and our service.**

We support you with a wide range of services – from NCP, our free calculation tool, to the Neugart dimension sheet and product finders to our integrated, certified claims management.

We are represented in all major markets with local companies. Our internal information network and the business software we use ensure smooth internal communication and optimally coordinated business processes.

Powerful, efficient and innovative: We create forward-looking solutions in gearbox technology – high quality at reasonable prices.



**Decidedly different:  
Neugart – for good reason.**

Neugart distinguishes itself with advanced, innovative technology, with high-precision production technology and has been doing so for decades. Worldwide, renowned customers put their trust in our vast experience.

Our precise planetary gearboxes and our experience in the construction of custom made gearboxes are highly sought after in national and international markets.

Put your trust in the highest level of performance – Made in Germany: In our well-balanced portfolio you will find the right product for your needs.

We can provide you with good reasons to make a decision for Neugart now.





## **Innovative and individual: Our custom made gearboxes.**

Compact form and high performance, special construction requirements, food grade certification or individual design: We fulfill even your most complex requirements – in all sectors of machine building.

The qualified specialists of our engineering department design gearbox solutions and systems. According to your performance, price and quality needs.

Your benefit from innovation: We utilize our experience and at the same time take advantage of new developments, integrating them into our customer solutions.

Close collaboration with our customers is important to us even in the earliest development phases of individual drive solutions. We believe in providing on-site advice and optimal service in relation to every aspect of your custom made gearbox.





## **Powerful and intuitive interface: Neugart Calculation Program – NCP**

With the Neugart Calculation Program, you can put together the optimal motor-gearbox combination with just a few clicks. In addition to the extensive motor database, predefined applications and cycles support you in this process.

Dynamic data and loads are displayed graphically in each section. This allows you to see in real time whether the components used are suitable or not. At the same time, the cost and energy efficiency of your application can be optimized.

### **Your benefits at a glance:**

- Simple and intuitive operation
- Transparent dimensioning – input and output values at a glance
- Free of charge for you (as a Neugart customer or prospective)
- Motor database with more than 20,000 motors
- Comprehensive technical documentation in seven languages
- Direct online access to dimension sheets and CAD files

Neugart offers regular NCP training courses.  
Please contact [training@neugart.com](mailto:training@neugart.com)

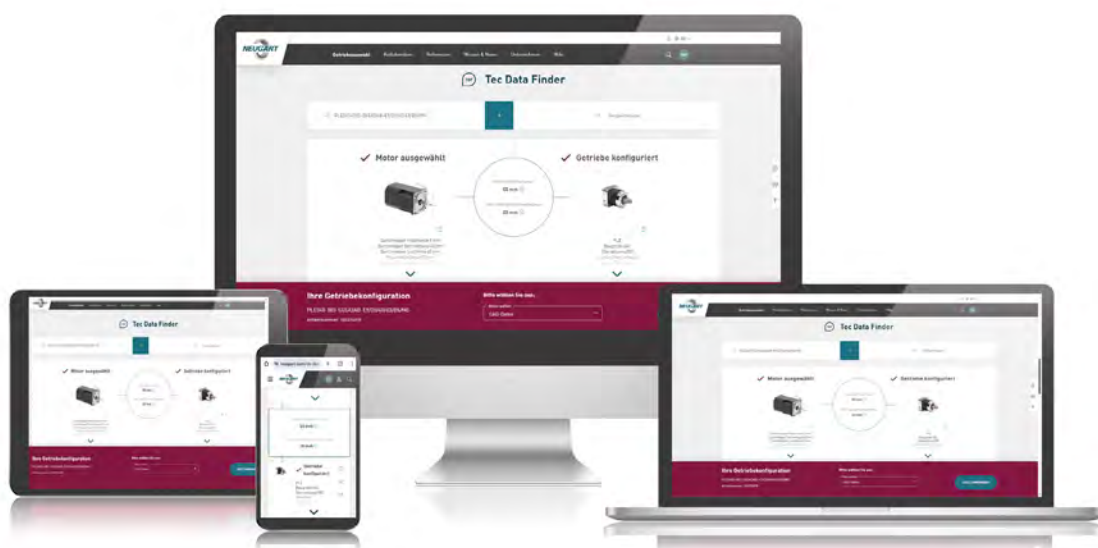
## Find the right gearbox: Tec Data Finder – TDF

With just a few clicks, the Tec Data Finder (TDF) generates all the relevant information about your gearbox. This includes specific technical and geometric data in the form of a dimension sheet, as well as CAD models in all common formats.

The gearbox geometry can be directly adapted and adjusted to your specific motor. This is done using a comprehensive motor database or by entering individual connection dimensions.

### Your benefits at a glance:

- Free online tool
- Extensive motor database (over 20,000 motors)
- Gearbox model with matching motor mounting flange
- Request card – for fast quote requests and CAD data
- Configuration start – begin with motor or gearbox
- Comparison list (up to 5 gearboxes)



## Your gearbox has something to tell you: Online service

Can't see the technical specifications on your gearbox? Your smartphone or tablet has a different opinion: simply scan the data matrix code on the type plate of your gearbox and you will be shown relevant digital product information. You also have immediate access to our after-sales services.

### Your benefits at a glance:

- Digital after-sales service
- Important technical parameters at a glance
- Direct access to spare parts and accessories – with no effort.
- Relevant documentation, direct download
- Fast support via service request

You can find the NCP and TDF tools on our website:

[www.neugart.com](http://www.neugart.com)

Economy Line coaxial gearboxes



**PLE**

Page 18



**PLQE**

Page 26



**PLPE**

Page 34



**PLHE**

Page 40



**PLFE**

Page 46



**PFHE**

Page 52

Economy Line right angle gearboxes



**WPLE**

Page 58



**WPLQE**

Page 66



**WPLPE**

Page 74



**WPLHE**

Page 80



**WPLFE**

Page 86

Precision Line coaxial gearboxes



NEW

**PSNpro**

Page 92



NEW

**PSFNpro**

Page 98



NEW

**PSBNpro**

Page 104



**PSN**

Page 110



**PSFN**

Page 116



**PSBN**

Page 122



**PLN**

Page 128



**PLFN**

Page 134

Precision Line right angle gearboxes



**WPLN**

Page 140



**WPSFN**

Page 146



**WGN**

Page 152

## Rack and pinion

NEW



**NRS**

Page **158**

**PK1**

Page **162**



**PM1**

Page **164**



**PM2**

Page **166**

## Application-specific gearboxes



**NGV**

Page **168**

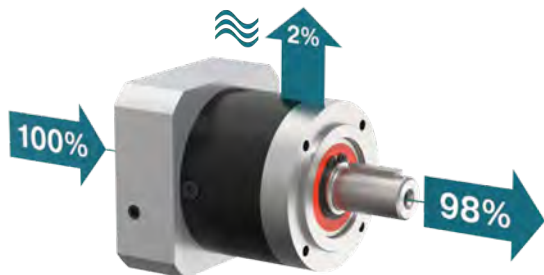


**HLAE**

Page **176**

## High efficiency

Planetary gearboxes have an excellent efficiency of up to 98%. The torque being transmitted is distributed over several gearing elements, so that the friction per engaged tooth is reduced.



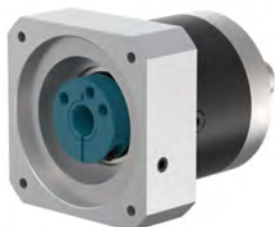
## Individual adaptation of the drive flange to the motor

From a wide range of different motor adapters, the right adapter for up to 20,000 different motors can be found with just a few clicks in the Neugart Tec Data Finder (TDF).



## Clamping systems with optimized mass moment of inertia

The clamping systems of our gearboxes are optimized for low weight, which can increase the dynamics of the entire drive train.



## Can be mounted in all spatial orientations

Thanks to the optimized lubrication concept, our gearboxes can be operated in any position without any loss of performance.



## Lifetime lubrication for maintenance-free operation

Use of high-quality lubricants, optimized specifically for the requirements in planetary gearboxes, makes Neugart gearboxes maintenance-free over their service life under normal operating conditions.

20.000 h



## Our program at a glance.

In this overview you will find a direct comparison of the key features of our products.

Economy Line		Cyclic torque	Backlash	Bearing load	Protection class	Running noise	Input speeds	Torsional stiffness	Wide range of ratios
PLE		Standard	Standard	Standard	Standard	Standard	Excellent	Standard	Excellent
PLQE		Standard	Standard	Standard	Standard	Standard	Excellent	Standard	Excellent
PLPE		Standard	Standard	Standard	Standard	Standard	Excellent	Standard	Excellent
PLHE		Standard	Standard	Standard	Standard	Standard	Excellent	Standard	Excellent
PLFE		Standard	Standard	Standard	Standard	Standard	Excellent	Standard	Excellent
PFHE		Standard	Standard	Standard	Standard	Standard	Excellent	Standard	Excellent
WPLE		Standard	Standard	Standard	Standard	Standard	Excellent	Standard	Excellent
WPLQE		Standard	Standard	Standard	Standard	Standard	Excellent	Standard	Excellent
WPLPE		Standard	Standard	Standard	Standard	Standard	Excellent	Standard	Excellent
WPLHE		Standard	Standard	Standard	Standard	Standard	Excellent	Standard	Excellent
WPLFE		Standard	Standard	Standard	Standard	Standard	Excellent	Standard	Excellent

Standard      Excellent

Precision Line		Cyclic torque	Backlash	Bearing load	Protection class	Running noise	Input speeds	Torsional stiffness	Wide range of ratios
<b>PSNpro</b>		Standard	Excellent	Standard	Standard	Standard	Standard	Standard	Standard
<b>PSFNpro</b>		Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
<b>PSBNpro</b>		Standard	Excellent	Standard	Standard	Standard	Standard	Standard	Standard
<b>PSN</b>		Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
<b>PSFN</b>		Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
<b>PSBN</b>		Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
<b>PLN</b>		Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
<b>PLFN</b>		Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
<b>WPLN</b>		Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
<b>WPSFN</b>		Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
<b>WGN</b>		Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard

Application specific gearboxes		Cyclic torque	Backlash	Bearing load	Protection class	Running noise	Input speeds	Torsional stiffness	Wide range of ratios
<b>HLAE</b>		Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
<b>NGV</b>		Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard

Standard      Excellent



# PLE

**Unparalleled: This planetary gearbox maintains its maximum efficiency even at the highest speeds**

The **PLE** is our price/performance wonder. It is particularly lightweight, extremely powerful and yet still suitable for demanding production cycles thanks to its low-friction bearing concept and optimized lubrication. A real powerhouse at an attractive and fair price.

Cyclic torque **5 - 800 Nm**



Radial force **200 - 5000 N**



Axial force **240 - 11000 N**



Torsional backlash **6 - 22 arcmin**

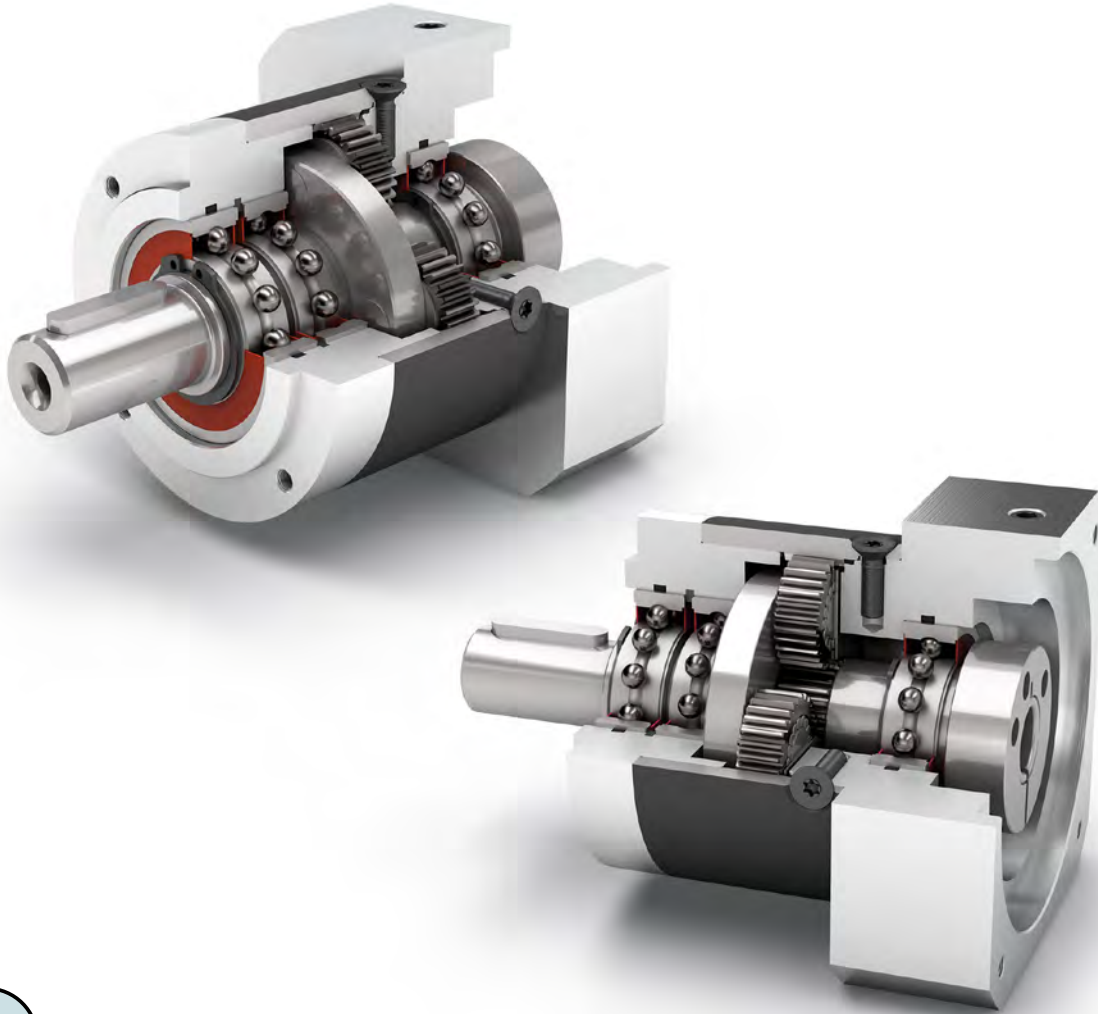


Protection class **IP54**

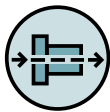


Frame sizes

- 40
- 60
- 80
- 120
- 160



Economy Line



Coaxial gearbox



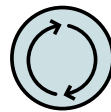
Spur gear



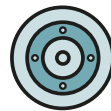
Low-friction deep groove ball bearings



Planet carrier in disc design



Equidirectional rotation



Round type output flange



High ratio variety  $i=3$  up to  $i=512$



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			PLE040	PLE060	PLE080	PLE120	PLE160	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000					
	Efficiency <sup>(3)</sup>	η	%	98					1
97					2				
92					3				
	Min. operating temperature	T <sub>min</sub>	°C (°F)	-25 (-13)					
	Max. operating temperature	T <sub>max</sub>		90 (194)					
	Protection class			IP54					
<b>S</b>	Standard lubrication			Grease (lifetime lubrication)					
<b>F</b>	Food grade lubrication			Grease (lifetime lubrication)					
	Installation position			Any					
<b>S</b>	Standard backlash	φ	arcmin	< 15	< 10	< 7	< 7	< 6	1
				< 19	< 12	< 9	< 9	< 9	2
				< 22	< 15	< 11	< 11	-	3
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>t</sub> .in/ arcmin)	0.7 - 1.0 (6 - 8)	2.0 - 2.7 (18 - 24)	7.2 - 10.0 (64 - 89)	15.5 - 21.0 (137 - 186)	57.5 - 69.0 (509 - 611)	1
				0.8 - 1.0 (7 - 9)	2.3 - 2.8 (20 - 25)	7.9 - 10.4 (70 - 92)	17.5 - 22.0 (155 - 195)	61.0 - 75.0 (540 - 664)	2
				0.8 - 1.0 (7 - 9)	2.3 - 2.8 (20 - 25)	7.9 - 10.5 (70 - 93)	17.5 - 22.0 (155 - 195)	-	3
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	0.4 (0.8)	0.9 (1.9 - 2.0)	2.1 - 2.2 (4.6 - 4.7)	5.6 - 5.9 (12.3 - 13.0)	17.3 - 17.5 (38.2 - 38.5)	1
				0.4 - 0.5 (1.0)	1.0 - 1.1 (2.3 - 2.4)	2.6 - 2.7 (5.6 - 5.8)	7.3 - 7.7 (16.1 - 17.0)	23.2 - 23.5 (51.3 - 51.7)	2
				0.5 (1.2)	1.2 - 1.3 (2.7 - 2.8)	3.0 - 3.2 (6.7 - 7.0)	9.1 - 9.5 (20.1 - 21.0)	-	3
<b>S</b>	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)					
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black					
	Running noise <sup>(3)</sup>	L <sub>pA</sub>	dB(A)	58	58	60	65	70	

Output shaft loads			PLE040	PLE060	PLE080	PLE120	PLE160	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N (lb <sub>t</sub> )	200 (45)	700 (157)	1000 (225)	2000 (450)	5000 (1124)	
Maximum axial force	F <sub>a max</sub>		240 (54)	800 (180)	1450 (326)	3800 (854)	11000 (2473)	
Maximum tilting moment	M <sub>k max</sub>	Nm (lb <sub>t</sub> .in)	6 (49)	25 (220)	41 (364)	115 (1018)	474 (4191)	

Input characteristics			PLE040	PLE060	PLE080	PLE120	PLE160	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	8 (A)	11 (C)	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	35 (G) <sup>(5)</sup>	
			9 (B) <sup>(5)</sup>	14 (D) <sup>(5)</sup>	24 (F)	35 (G)	-	
			11 (C)	19 (E)	-	-	-	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>t</sub> . in.s <sup>2</sup> 10 <sup>-4</sup> )	0.022 - 0.033 (0.195 - 0.292)	0.085 - 0.149 (0.752 - 1.319)	0.359 - 0.654 (3.177 - 5.788)	1.378 - 2.361 (12.196 - 20.897)	3.726 - 11.999 (32.978 - 106.200)	1
			0.022 - 0.032 (0.195 - 0.283)	0.086 - 0.142 (0.761 - 1.257)	0.365 - 0.613 (3.231 - 5.426)	1.414 - 2.288 (12.515 - 20.251)	3.502 - 10.087 (30.995 - 89.277)	2
			0.022 - 0.031 (0.195 - 0.274)	0.086 - 0.096 (0.761 - 0.850)	0.365 - 0.590 (3.231 - 5.222)	1.413 - 2.196 (12.506 - 19.436)	-	3
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>t</sub> .in)	0.05 (0)	0.10 - 0.15 (1)	0.20 - 0.35 (2 - 3)	0.50 - 1.05 (4 - 9)	1.10 - 2.90 (10 - 26)	1
			0.05 (0)	0.10 (1)	0.15 - 0.25 (1 - 2)	0.45 - 0.80 (4 - 7)	0.80 - 1.80 (7 - 16)	2
			0.05 (0)	0.10 (1)	0.15 - 0.20 (1 - 2)	0.45 - 0.75 (4 - 7)	-	3
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		4.5 (40)	12 (106)	16 (142)	40 (354)	140 (1239)	

<sup>(1)</sup> Number of stages

<sup>(2)</sup> Application specific configuration with NCP – www.neugart.com

<sup>(3)</sup> The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com

<sup>(4)</sup> More information on page 183

<sup>(5)</sup> Reference clamping system diameter

Output torques			PLE040	PLE060	PLE080	PLE120	PLE160	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>zz</sub>	Nm (lb.in)	11 (97)	28 (248)	85 (752)	115 (1018)	400 (3540)	3	1
			15 (133)	38 (336)	115 (1018)	155 (1372)	450 (3983)	4	
			14 (124)	40 (354)	110 (974)	195 (1726)	450 (3983)	5	
			8.5 (75)	25 (221)	65 (575)	135 (1195)	-	7	
			6 (53)	18 (159)	50 (443)	120 (1062)	450 (3983)	8	
			5 (44)	15 (133)	38 (336)	95 (841)	-	10	2
			16.5 (146)	44 (389)	130 (1151)	210 (1859)	-	9	
			20 (177)	44 (389)	120 (1062)	260 (2301)	800 (7081)	12	
			18 (159)	44 (389)	110 (974)	230 (2036)	700 (6196)	15	
			20 (177)	44 (389)	120 (1062)	260 (2301)	800 (7081)	16	
			20 (177)	44 (389)	120 (1062)	260 (2301)	800 (7081)	20	
			18 (159)	40 (354)	110 (974)	230 (2036)	700 (6196)	25	
			20 (177)	44 (389)	120 (1062)	260 (2301)	800 (7081)	32	
			18 (159)	40 (354)	110 (974)	230 (2036)	700 (6196)	40	
			7.5 (66)	18 (159)	50 (443)	120 (1062)	450 (3983)	64	
			20 (177)	44 (389)	120 (1062)	260 (2301)	-	60	
			20 (177)	44 (389)	120 (1062)	260 (2301)	-	80	
			20 (177)	44 (389)	120 (1062)	260 (2301)	-	100	
			18 (159)	44 (389)	110 (974)	230 (2036)	-	120	
			20 (177)	44 (389)	120 (1062)	260 (2301)	-	160	
			18 (159)	40 (354)	110 (974)	230 (2036)	-	200	
			20 (177)	44 (389)	120 (1062)	260 (2301)	-	256	
			18 (159)	40 (354)	110 (974)	230 (2036)	-	320	
			7.5 (66)	18 (159)	50 (443)	120 (1062)	-	512	
Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb.in)	11 (97)	44 (389)	105 (929)	184 (1629)	450 (3983)	3	1
			24 (212)	60 (531)	140 (1239)	245 (2168)	600 (5310)	4	
			22 (195)	61 (540)	175 (1549)	310 (2744)	720 (6373)	5	
			13.5 (119)	40 (354)	104 (920)	215 (1903)	-	7	
			9.5 (84)	28 (248)	80 (708)	192 (1699)	720 (6373)	8	
			8 (71)	24 (212)	60 (531)	152 (1345)	-	10	
			16.5 (146)	70 (620)	182 (1611)	335 (2965)	-	9	
			32 (283)	65 (575)	192 (1699)	415 (3673)	1280 (11329)	12	
			28 (248)	70 (620)	176 (1558)	365 (3231)	1120 (9913)	15	
			32 (283)	65 (575)	192 (1699)	415 (3673)	1280 (11329)	16	
			32 (283)	65 (575)	192 (1699)	415 (3673)	1280 (11329)	20	
			28 (248)	61 (540)	176 (1558)	365 (3231)	1120 (9913)	25	
			32 (283)	65 (575)	192 (1699)	415 (3673)	1280 (11329)	32	
			28 (248)	61 (540)	176 (1558)	365 (3231)	1120 (9913)	40	3
			12 (106)	28 (248)	80 (708)	192 (1699)	720 (6373)	64	
			32 (283)	65 (575)	192 (1699)	415 (3673)	-	60	
			32 (283)	65 (575)	192 (1699)	415 (3673)	-	80	
			32 (283)	65 (575)	192 (1699)	415 (3673)	-	100	
			28 (248)	70 (620)	176 (1558)	365 (3231)	-	120	
			32 (283)	65 (575)	192 (1699)	415 (3673)	-	160	
			28 (248)	61 (540)	176 (1558)	365 (3231)	-	200	
			32 (283)	65 (575)	192 (1699)	415 (3673)	-	256	
			28 (248)	61 (540)	176 (1558)	365 (3231)	-	320	
			12 (106)	28 (248)	80 (708)	192 (1699)	-	512	

<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

<sup>(4)</sup> Based on reference clamping system diameter

Output torques			PLE040	PLE060	PLE080	PLE120	PLE160	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>r</sub> .in)	3.5 (31)	22 (195)	37 (327)	97 (859)	340 (3009)	3	1
			12.5 (111)	23 (204)	82 (726)	131 (1159)	380 (3363)	4	
			11.5 (102)	24 (212)	84 (743)	165 (1460)	380 (3363)	5	
			7 (62)	19,5 (173)	55 (487)	114 (1009)	-	7	
			5 (44)	15 (133)	42 (372)	102 (903)	380 (3363)	8	
			4 (35)	12,5 (111)	32 (283)	80 (708)	-	10	
			10.5 (93)	30 (266)	87 (770)	178 (1575)	-	9	
			14.5 (128)	32 (283)	102 (903)	220 (1947)	680 (6019)	12	
			15 (133)	35 (310)	93 (823)	195 (1726)	590 (5222)	15	
			17 (150)	35 (310)	102 (903)	220 (1947)	680 (6019)	16	
		17 (150)	37 (327)	102 (903)	220 (1947)	680 (6019)	20	2	
		15 (133)	34 (301)	93 (823)	195 (1726)	590 (5222)	25		
		17 (150)	37 (327)	102 (903)	220 (1947)	680 (6019)	32		
		15 (133)	34 (301)	93 (823)	195 (1726)	590 (5222)	40		
		6 (53)	15 (133)	42 (372)	102 (903)	380 (3363)	64		
		17 (150)	37 (327)	102 (903)	220 (1947)	-	60		
		17 (150)	37 (327)	102 (903)	220 (1947)	-	80		
		17 (150)	37 (327)	102 (903)	220 (1947)	-	100		
		15 (133)	37 (327)	93 (823)	195 (1726)	-	120		
		17 (150)	37 (327)	102 (903)	220 (1947)	-	160		
15 (133)	34 (301)	93 (823)	195 (1726)	-	200	3			
17 (150)	37 (327)	102 (903)	220 (1947)	-	256				
15 (133)	34 (301)	93 (823)	195 (1726)	-	320				
6 (53)	15 (133)	42 (372)	102 (903)	-	512				

Input speeds			PLE040	PLE060	PLE080	PLE120	PLE160	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	5000	4500	4000	2150	1250	3	1
			5000	4500	3750	2300	1400	4	
			5000	4500	4000	2500	1700	5	
			5000	4500	4000	3500	-	7	
			5000	4500	4000	3500	2200	8	
			5000	4500	4000	3500	-	10	
			5000	4500	4000	2650	-	9	
			5000	4500	4000	2750	1850	12	
			5000	4500	4000	3000	2000	15	
			5000	4500	4000	2850	1950	16	
		5000	4500	4000	3350	2300	20	2	
		5000	4500	4000	3500	2500	25		
		5000	4500	4000	3500	2900	32		
		5000	4500	4000	3500	3000	40		
		5000	4500	4000	3500	3000	64		
		5000	4500	4000	3500	-	60		
		5000	4500	4000	3500	-	80		
		5000	4500	4000	3500	-	100		
		5000	4500	4000	3500	-	120		
		5000	4500	4000	3500	-	160		
5000	4500	4000	3500	-	200	3			
5000	4500	4000	3500	-	256				
5000	4500	4000	3500	-	320				
5000	4500	4000	3500	-	512				
Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	18000	13000	7000		6500	6500	

<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> Based on reference clamping system diameter

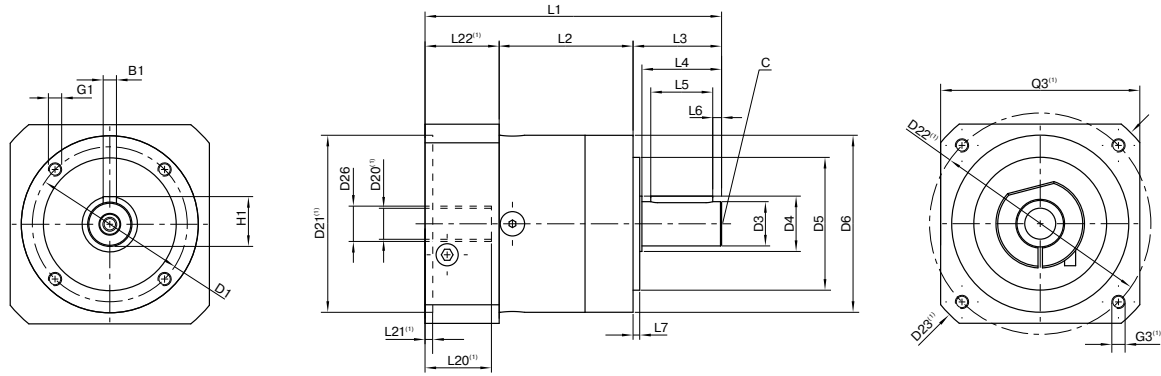
Output torques			PLE040	PLE060	PLE080	PLE120	PLE160	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(3)(4)</sup>	T <sub>2Stop</sub>	Nm (lb.in)	22 (195)	60 (531)	150 (1328)	375 (3319)	800 (7081)	3	1
			30 (266)	80 (708)	200 (1770)	500 (4425)	900 (7966)	4	
			36 (319)	80 (708)	220 (1947)	500 (4425)	900 (7966)	5	
			26 (230)	80 (708)	178 (1575)	340 (3009)	-	7	
			27 (239)	80 (708)	190 (1682)	380 (3363)	900 (7966)	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)	1600 (14161)	12	
			36 (319)	88 (779)	220 (1947)	500 (4425)	1400 (12391)	15	
			40 (354)	88 (779)	240 (2124)	520 (4602)	1600 (14161)	16	
			40 (354)	88 (779)	240 (2124)	520 (4602)	1600 (14161)	20	
			36 (319)	80 (708)	220 (1947)	500 (4425)	1400 (12391)	25	
			40 (354)	88 (779)	240 (2124)	520 (4602)	1600 (14161)	32	
			36 (319)	80 (708)	220 (1947)	500 (4425)	1400 (12391)	40	
			27 (239)	80 (708)	190 (1682)	380 (3363)	900 (7966)	64	
			40 (354)	88 (779)	220 (1947)	520 (4602)	-	60	
			40 (354)	88 (779)	240 (2124)	520 (4602)	-	80	
			40 (354)	88 (779)	240 (2124)	520 (4602)	-	100	
			36 (319)	88 (779)	220 (1947)	500 (4425)	-	120	
			40 (354)	88 (779)	240 (2124)	520 (4602)	-	160	
			36 (319)	80 (708)	220 (1947)	500 (4425)	-	200	
			40 (354)	88 (779)	240 (2124)	520 (4602)	-	256	
			36 (319)	80 (708)	220 (1947)	500 (4425)	-	320	
			27 (239)	80 (708)	190 (1682)	380 (3363)	-	512	

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

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

<sup>(3)</sup> Permitted 1000 times

<sup>(4)</sup> Based on reference clamping system diameter



Drawing corresponds to a PLE060 / 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>			PLE040	PLE060	PLE080	PLE120	PLE160	p <sup>(3)</sup>	Code
Pitch circle diameter output	D1		34 (1.339)	52 (2.047)	70 (2.756)	100 (3.937)	145 (5.709)		
Shaft diameter output	D3	h7	10 (0.394)	14 (0.551)	20 (0.787)	25 (0.984)	40 (1.575)		
Shaft collar output	D4		12 (0.472)	17 (0.669)	25 (0.984)	35 (1.378)	55 (2.165)		
Centering diameter output	D5	h7	26 (1.024)	40 (1.575)	60 (2.362)	80 (3.150)	130 (5.118)		
Housing diameter	D6		40 (1.575)	60 (2.362)	80 (3.150)	115 (4.528)	160 (6.299)		
Mounting thread x depth	G1	4x	M4x6	M5x8	M6x10	M10x16	M12x20		
Min. total length	L1		88.5 (3.484)	106 (4.173)	133.5 (5.256)	176.5 (6.949)	255.5 (10.059)	1	
			106.5 (4.193)	118.5 (4.665)	150.5 (5.925)	204 (8.032)	305 (12.008)	2	
			114 (4.488)	131 (5.157)	168.5 (6.634)	231.5 (9.114)	-	3	
Housing length	L2		39 (1.535)	47 (1.850)	60 (2.362)	74 (2.913)	104 (4.094)	1	
			51.5 (2.028)	59.5 (2.343)	78 (3.071)	102 (4.016)	153.5 (6.043)	2	
			64.5 (2.539)	72 (2.835)	95 (3.740)	129.5 (5.098)	-	3	
Shaft length output	L3		26 (1.024)	35 (1.378)	40 (1.575)	55 (2.165)	87 (3.425)		
Centering depth output	L7		2 (0.079)	3 (0.118)	3 (0.118)	4 (0.157)	5 (0.197)		
Motor shaft diameter j6/k6	D20		More information on page 191/192						
Clamping system diameter input	D26		More information on page 20						
Output shaft with feather key (DIN 6885-1)			A 3x3x18	A 5x5x25	A 6x6x28	A 8x7x40	A 12x8x65		<b>A</b>
Feather key width (DIN 6885-1)	B1		3 (0.118)	5 (0.197)	6 (0.236)	8 (0.315)	12 (0.472)		
Shaft height including feather key (DIN 6885-1)	H1		11.2 (0.441)	16 (0.630)	22.5 (0.886)	28 (1.102)	43 (1.693)		
Shaft length from shoulder	L4		23 (0.906)	30 (1.181)	36 (1.417)	50 (1.969)	80 (3.150)		
Feather key length	L5		18 (0.709)	25 (0.984)	28 (1.102)	40 (1.575)	65 (2.559)		
Distance from shaft end	L6		2.5 (0.098)	2.5 (0.098)	4 (0.157)	5 (0.197)	8 (0.315)		
Center hole (DIN 332, type DR)	C		M3x9	M5x12.5	M6x16	M10x22	M16x36		
Smooth output shaft									<b>B</b>
Shaft length from shoulder	L4		23 (0.906)	30 (1.181)	36 (1.417)	50 (1.969)	80 (3.150)		

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

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





# PLQE

The easy to install planetary gearbox absorbs high forces with low heat generation

Our **PLQE** is uncomplicated and powerful. It can be connected directly to your installation without the need for an intermediate flange. The larger deep groove ball bearings on the output allow higher axial and radial forces to be absorbed. Thanks to its favorable efficiency, this means that it always operates reliably even when production cycles are demanding.

Cyclic torque **5 - 260 Nm**



Radial force **520 - 4000 N**



Axial force **620 - 3800 N**



Torsional backlash **7 - 22 arcmin**

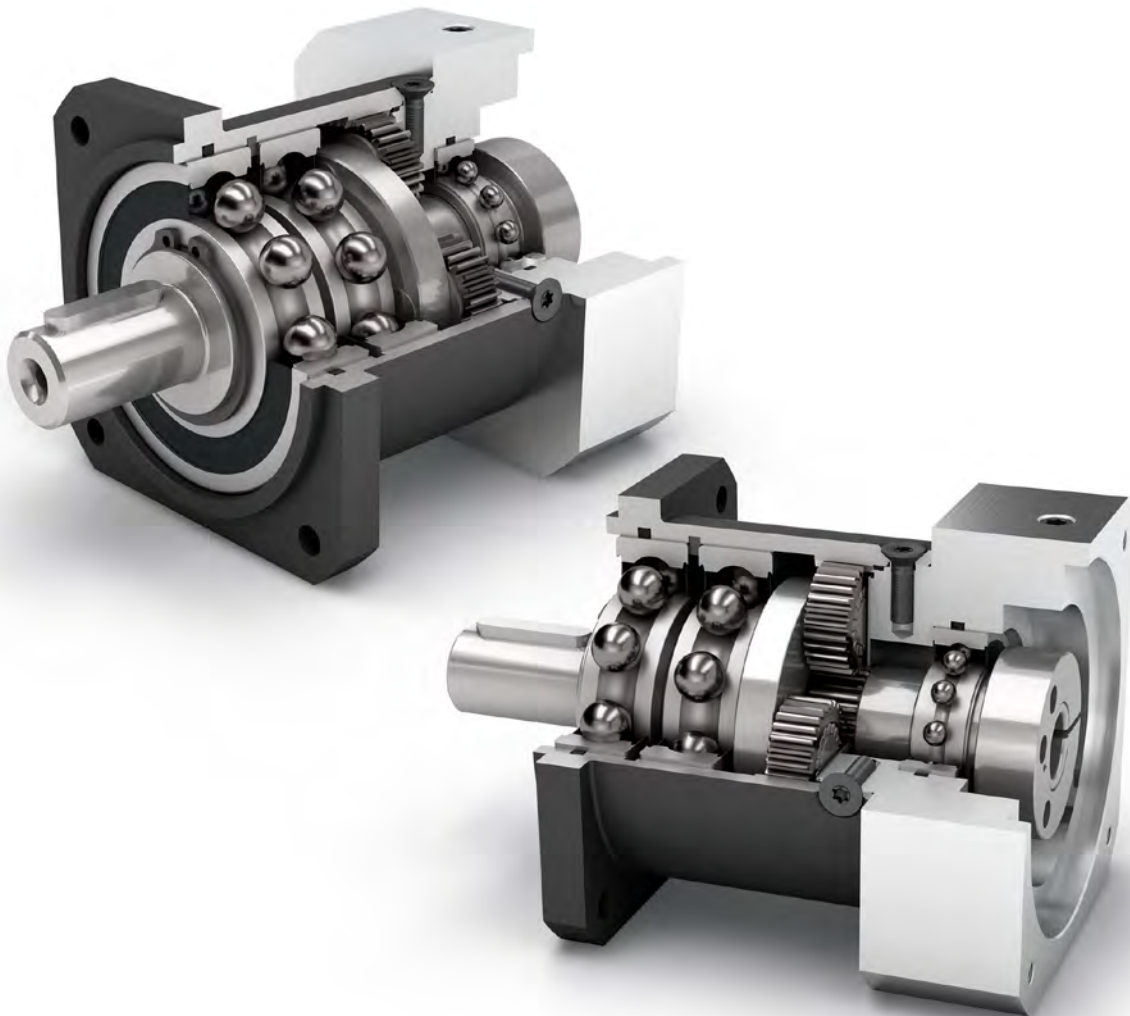


Protection class **IP54**

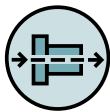


Frame sizes

- 40
- 60
- 80
- 120



Economy Line



Coaxial gearbox



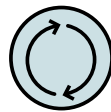
Spur gear



Reinforced deep groove ball bearings



Planet carrier in disc design



Equidirectional rotation



Square type output flange



High ratio variety  $i=3$  up to  $i=512$



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

PLQE

Code	Gearbox characteristics			PLQE040	PLQE060	PLQE080	PLQE120	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000				
	Efficiency <sup>(3)</sup>	η	%	98				1
97				2				
92				3				
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)				
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)				
	Protection class			IP54				
<b>S</b>	Standard lubrication			Grease (lifetime lubrication)				
<b>F</b>	Food grade lubrication			Grease (lifetime lubrication)				
	Installation position			Any				
<b>S</b>	Standard backlash	φ	arcmin	< 15	< 10	< 7	< 7	1
				< 19	< 12	< 9	< 9	2
				< 22	< 15	< 11	< 11	3
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>i</sub> .in/ arcmin)	1.2 - 2.2 (10 - 19)	2.8 - 3.9 (25 - 35)	8.5 - 12.6 (75 - 112)	14.0 - 18.5 (124 - 164)	1
				1.4 - 2.5 (12 - 22)	3.3 - 4.1 (29 - 36)	9.4 - 13.3 (83 - 118)	15.6 - 19.0 (138 - 168)	2
				1.5 - 2.6 (13 - 23)	3.3 - 4.1 (29 - 36)	9.4 - 13.4 (83 - 119)	15.6 - 19.0 (138 - 168)	3
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	0.4 (0.8 - 0.9)	1.1 (2.4)	2.6 - 3.0 (5.8 - 6.6)	6.4 - 6.7 (14.0 - 14.7)	1
				0.5 (1.0 - 1.1)	1.3 (2.8 - 2.9)	3.4 - 3.5 (7.4 - 7.7)	8.1 - 8.5 (17.9 - 18.7)	2
				0.6 (1.2 - 1.3)	1.5 (3.2 - 3.3)	3.9 - 4.0 (8.5 - 8.8)	9.9 - 10.3 (21.8 - 22.7)	3
<b>S</b>	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)				
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black				
	Running noise <sup>(3)</sup>	L <sub>pA</sub>	dB(A)	58	58	60	65	

Output shaft loads			PLQE040	PLQE060	PLQE080	PLQE120	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N	520 (117)	1500 (337)	2500 (562)	4000 (899)	
Maximum axial force	F <sub>a max</sub>	(lb <sub>i</sub> )	620 (139)	1950 (438)	3800 (854)	3800 (854)	
Maximum tilting moment	M <sub>k max</sub>	Nm (lb <sub>i</sub> .in)	14 (120)	62 (544)	124 (1096)	314 (2779)	

Input characteristics			PLQE040	PLQE060	PLQE080	PLQE120	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	8 (A)	11 (C)	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	
			9 (B) <sup>(5)</sup>	14 (D) <sup>(5)</sup>	24 (F)	35 (G)	
			11 (C)	19 (E)	-	-	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>i</sub> . in.s <sup>2</sup> 10 <sup>-4</sup> )	0.022 - 0.035 (0.195 - 0.310)	0.086 - 0.162 (0.761 - 1.434)	0.371 - 0.783 (3.284 - 6.930)	1.381 - 2.393 (12.223 - 21.180)	1
			0.022 - 0.032 (0.195 - 0.283)	0.086 - 0.143 (0.761 - 1.266)	0.366 - 0.625 (3.239 - 5.532)	1.414 - 2.292 (12.515 - 20.286)	2
			0.022 - 0.031 (0.195 - 0.274)	0.086 - 0.096 (0.761 - 0.850)	0.365 - 0.590 (3.231 - 5.222)	1.413 - 2.196 (12.506 - 19.436)	3
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>i</sub> .in)	0.05 - 0.15 (0 - 1)	0.10 - 0.20 (1 - 2)	0.25 - 0.55 (2 - 5)	0.50 - 1.05 (4 - 9)	1
			0.05 - 0.15 (0 - 1)	0.10 - 0.15 (1)	0.20 - 0.30 (2 - 3)	0.45 - 0.80 (4 - 7)	2
			0.05 - 0.10 (0 - 1)	0.10 (1)	0.15 - 0.20 (1 - 2)	0.45 - 0.75 (4 - 7)	3
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		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			PLQE040	PLQE060	PLQE080	PLQE120	$i^{(1)}$	$p^{(2)}$
Cyclic torque <sup>(3)(4)</sup>	$T_{zz}$	Nm (lb <sub>r</sub> .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	3
			18 (159)	40 (354)	110 (974)	230 (2036)	40	
			7.5 (66)	18 (159)	50 (443)	120 (1062)	64	
			20 (177)	44 (389)	120 (1062)	260 (2301)	60	
			20 (177)	44 (389)	120 (1062)	260 (2301)	80	
			20 (177)	44 (389)	120 (1062)	260 (2301)	100	
			18 (159)	44 (389)	110 (974)	230 (2036)	120	3
			20 (177)	44 (389)	120 (1062)	260 (2301)	160	
			18 (159)	40 (354)	110 (974)	230 (2036)	200	
			20 (177)	44 (389)	120 (1062)	260 (2301)	256	
			18 (159)	40 (354)	110 (974)	230 (2036)	320	
			7.5 (66)	18 (159)	50 (443)	120 (1062)	512	
Maximum torque <sup>(3)(4)</sup>	$T_{2max}$	Nm (lb <sub>r</sub> .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	3
			28 (248)	61 (540)	176 (1558)	365 (3231)	40	
			12 (106)	28 (248)	80 (708)	192 (1699)	64	
			32 (283)	65 (575)	192 (1699)	415 (3673)	60	
			32 (283)	65 (575)	192 (1699)	415 (3673)	80	
			32 (283)	65 (575)	192 (1699)	415 (3673)	100	
			28 (248)	70 (620)	176 (1558)	365 (3231)	120	3
			32 (283)	65 (575)	192 (1699)	415 (3673)	160	
			28 (248)	61 (540)	176 (1558)	365 (3231)	200	
			32 (283)	65 (575)	192 (1699)	415 (3673)	256	
			28 (248)	61 (540)	176 (1558)	365 (3231)	320	
			12 (106)	28 (248)	80 (708)	192 (1699)	512	

PLQE

<sup>(1)</sup> Ratios ( $i=n_1/n_2$ )  
<sup>(2)</sup> Number of stages  
<sup>(3)</sup> Application specific configuration with NCP – [www.neugart.com](http://www.neugart.com)  
<sup>(4)</sup> Based on reference clamping system diameter

Output torques			PLQE040	PLQE060	PLQE080	PLQE120	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>r</sub> .in)	3.5 (31)	22 (195)	37 (327)	97 (859)	3	1
			12.5 (111)	23 (204)	86 (761)	131 (1159)	4	
			11.5 (102)	24 (212)	85 (752)	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	2
			10.5 (93)	30 (266)	87 (770)	178 (1575)	9	
			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	3
			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	
			17 (150)	37 (327)	102 (903)	220 (1947)	60	3
			17 (150)	37 (327)	102 (903)	220 (1947)	80	
			17 (150)	37 (327)	102 (903)	220 (1947)	100	
			15 (133)	37 (327)	93 (823)	195 (1726)	120	
			17 (150)	37 (327)	102 (903)	220 (1947)	160	
15 (133)	34 (301)	93 (823)	195 (1726)	200	3			
17 (150)	37 (327)	102 (903)	220 (1947)	256				
15 (133)	34 (301)	93 (823)	195 (1726)	320				
6 (53)	15 (133)	42 (372)	102 (903)	512				

Input speeds			PLQE040	PLQE060	PLQE080	PLQE120	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	5000	4500	4000	2150	3	1
			5000	4500	3200	2300	4	
			5000	4500	3850	2500	5	
			5000	4500	4000	3500	7	
			5000	4500	4000	3500	8	
			5000	4500	4000	3500	10	2
			5000	4500	4000	2650	9	
			5000	4500	4000	2750	12	
			5000	4500	4000	3000	15	
			5000	4500	4000	2850	16	
			5000	4500	4000	3350	20	3
			5000	4500	4000	3500	25	
			5000	4500	4000	3500	32	
			5000	4500	4000	3500	40	
			5000	4500	4000	3500	64	
			5000	4500	4000	3500	60	3
			5000	4500	4000	3500	80	
			5000	4500	4000	3500	100	
			5000	4500	4000	3500	120	
			5000	4500	4000	3500	160	
5000	4500	4000	3500	200	3			
5000	4500	4000	3500	256				
5000	4500	4000	3500	320				
5000	4500	4000	3500	512				
Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	18000	13000		7000	6500	

<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> Based on reference clamping system diameter

Output torques			PLQE040	PLQE060	PLQE080	PLQE120	$i^{(1)}$	$p^{(2)}$
Emergency stop torque <sup>(3)(4)</sup>	$T_{2Stop}$	Nm (lb.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	
			40 (354)	88 (779)	220 (1947)	520 (4602)	60	
			40 (354)	88 (779)	240 (2124)	520 (4602)	80	3
			40 (354)	88 (779)	240 (2124)	520 (4602)	100	
			36 (319)	88 (779)	220 (1947)	500 (4425)	120	
			40 (354)	88 (779)	240 (2124)	520 (4602)	160	
			36 (319)	80 (708)	220 (1947)	500 (4425)	200	
			40 (354)	88 (779)	240 (2124)	520 (4602)	256	
			36 (319)	80 (708)	220 (1947)	500 (4425)	320	
			27 (239)	80 (708)	190 (1682)	380 (3363)	512	

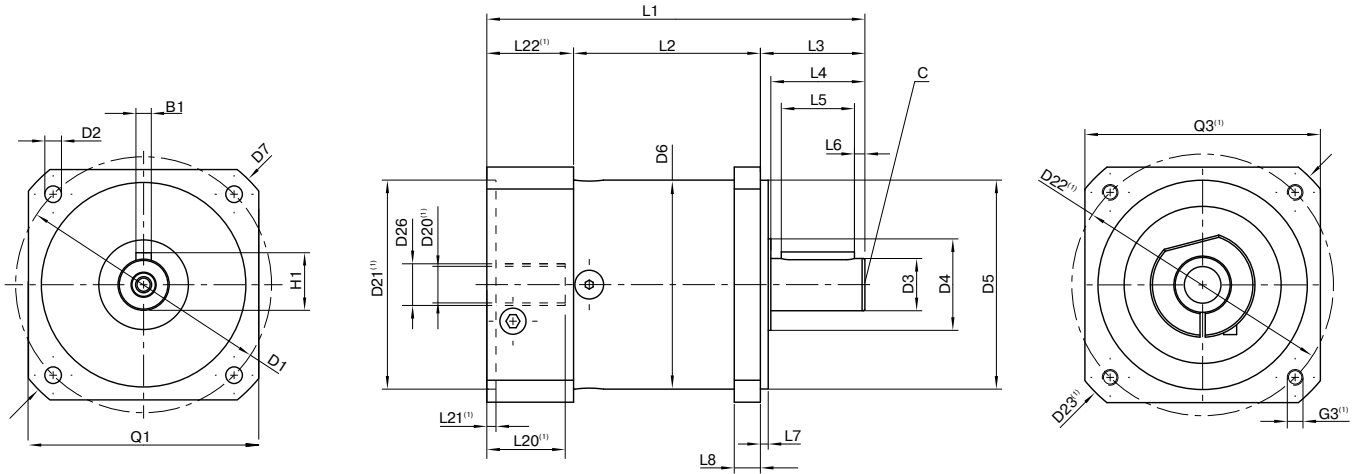
PLQE

<sup>(1)</sup> Ratios ( $i=n_1/n_2$ )

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

<sup>(3)</sup> Permitted 1000 times

<sup>(4)</sup> Based on reference clamping system diameter

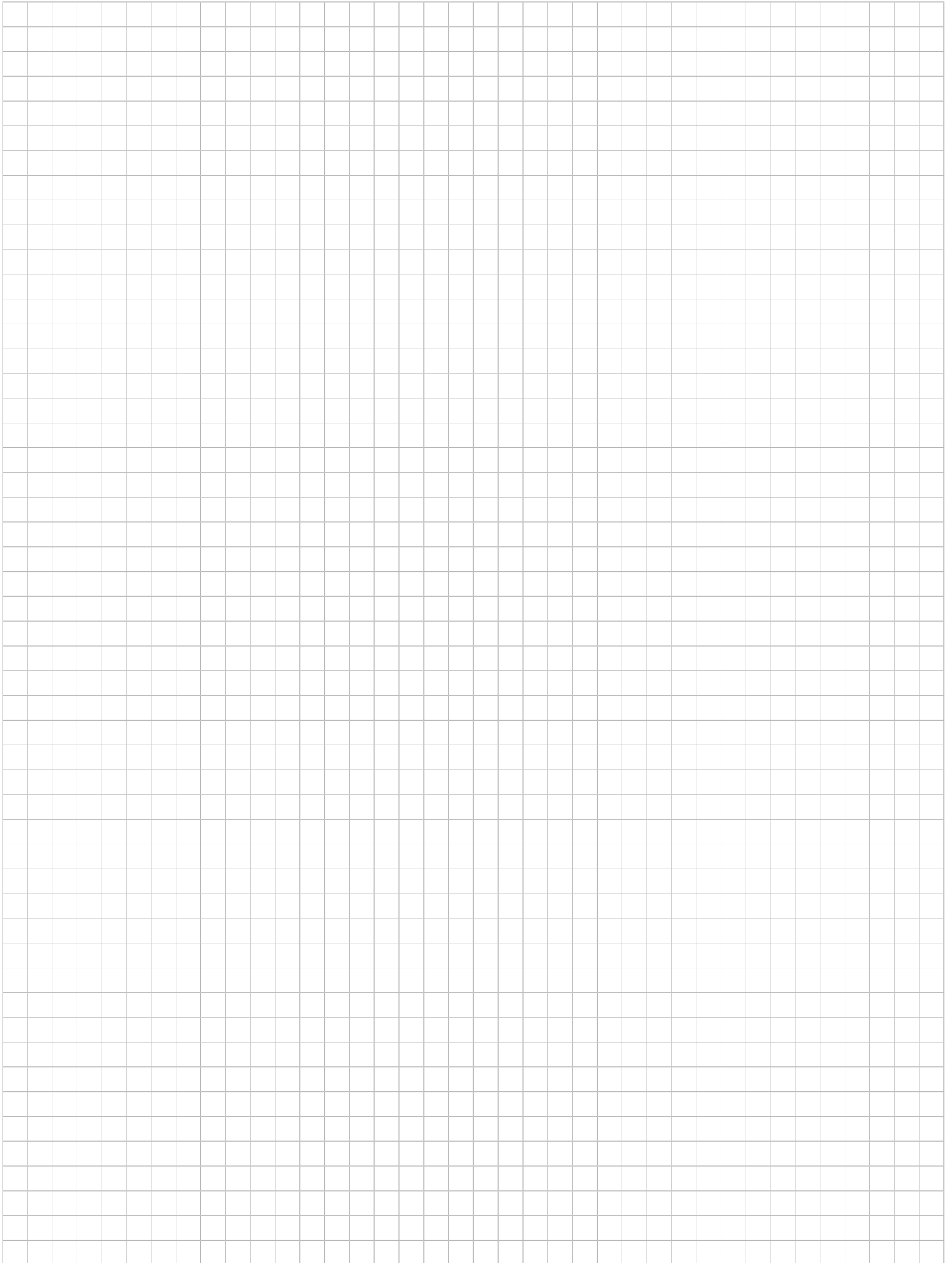


Drawing corresponds to a PLQE080 / 1-stage / output shaft with feather key / 19 mm clamping system / motor adaptation – one part / B5 flange type motor

<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>			PLQE040	PLQE060	PLQE080	PLQE120	p <sup>(3)</sup>	Code
Pitch circle diameter output	D1		50 (1.969)	75 (2.953)	100 (3.937)	130 (5.118)		
Mounting bore output	D2	4x	3.4 (0.134)	5.5 (0.217)	6.5 (0.256)	8.5 (0.335)		
Shaft diameter output	D3	h7	13 (0.512)	16 (0.630)	20 (0.787)	25 (0.984)		
Shaft collar output	D4		17 (0.669)	20 (0.787)	35 (1.378)	35 (1.378)		
Centering diameter output	D5	h7	35 (1.378)	60 (2.362)	80 (3.150)	110 (4.331)		
Housing diameter	D6		40 (1.575)	60 (2.362)	80 (3.150)	115 (4.528)		
Diagonal dimension output	D7		57 (2.244)	92 (3.622)	116 (4.567)	145 (5.709)		
Flange cross section output	Q1	■	42 (1.654)	70 (2.756)	90 (3.543)	115 (4.528)		
Min. total length	L1		90 (3.543)	111 (4.370)	145 (5.709)	201.5 (7.933)	1	
			103 (4.055)	123.5 (4.862)	162.5 (6.398)	229.5 (9.035)	2	
			115.5 (4.547)	136 (5.354)	180 (7.087)	257 (10.118)	3	
Housing length	L2		35.5 (1.398)	55 (2.165)	71 (2.795)	99 (3.898)	1	
			48.5 (1.909)	67.5 (2.657)	89 (3.504)	127 (5.000)	2	
			61 (2.402)	80.5 (3.169)	106.5 (4.193)	154.5 (6.083)	3	
Shaft length output	L3		26 (1.024)	32 (1.260)	40 (1.575)	55 (2.165)		
Centering depth output	L7		5.5 (0.217)	3 (0.118)	3 (0.118)	4 (0.157)		
Flange thickness output	L8		7 (0.256)	10 (0.394)	10 (0.394)	15 (0.591)		
Motor shaft diameter j6/k6	D20		More information on page 191/192					
Clamping system diameter input	D26		More information on page 28					
Output shaft with feather key (DIN 6885-1)			A 5x5x14	A 5x5x20	A 6x6x28	A 8x7x40		A
Feather key width (DIN 6885-1)	B1		5 (0.197)	5 (0.197)	6 (0.236)	8 (0.315)		
Shaft height including feather key (DIN 6885-1)	H1		15 (0.591)	18 (0.709)	22.5 (0.886)	28 (1.102)		
Shaft length from shoulder	L4		18 (0.709)	28 (1.102)	36 (1.417)	50 (1.969)		
Feather key length	L5		14 (0.551)	20 (0.787)	28 (1.102)	40 (1.575)		
Distance from shaft end	L6		2 (0.079)	4 (0.157)	4 (0.157)	5 (0.197)		
Center hole (DIN 332. type DR)	C		M4x10	M5x12.5	M6x16	M10x22		
Smooth output shaft								B
Shaft length from shoulder	L4		18 (0.709)	28 (1.102)	36 (1.417)	50 (1.969)		

<sup>(2)</sup> Dimensions in mm  
<sup>(3)</sup> Number of stages





# PLPE

The cost effective planetary gearbox with the best torque-low heat performance

Our **PLPE** combines the best features of the Economy series with a performance bonus: The optimized output bearing is designed for higher radial and axial forces. The compact outer contour of the **PLPE** also allows it to be used in limited spaces.

Cyclic torque **5- 460 Nm**



Radial force **1300 - 8400 N**



Axial force **1000 - 11000 N**



Torsional backlash **6 - 19 arcmin**

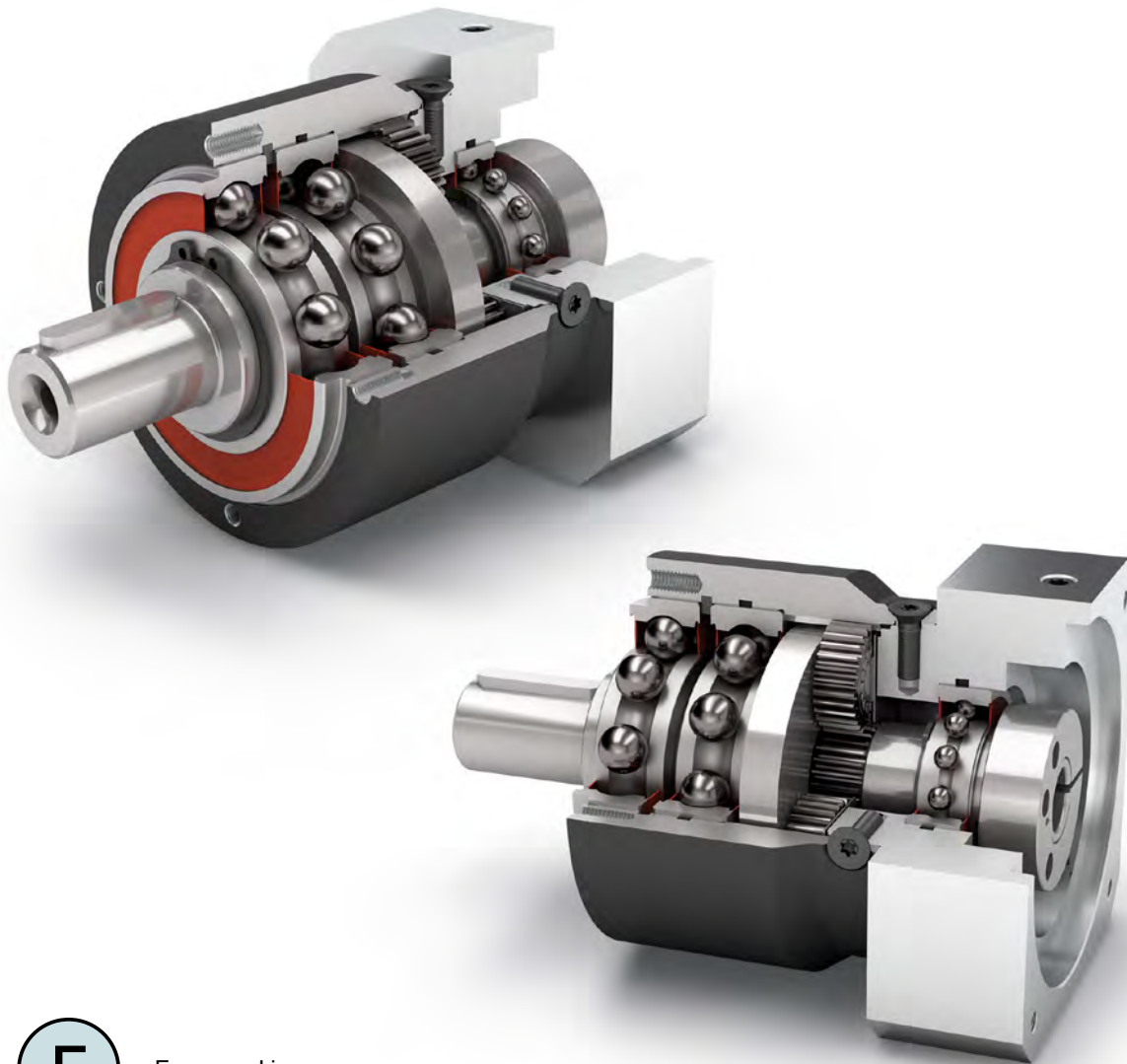


Protection class **IP54**



Frame sizes





Economy Line



Equidirectional rotation



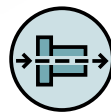
Round type output flange



Planet carrier in disc design



Option: Rack and pinion  
Planetary gearbox (Details on page 158)



Coaxial gearbox



Spur gear



Reinforced deep groove ball bearings



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			PLPE050	PLPE070	PLPE090	PLPE120	PLPE155	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000					
	Efficiency <sup>(3)</sup>	η	%	98					1
				97					2
	Min. operating temperature	T <sub>min</sub>	°C (°F)	-25 (-13)					
	Max. operating temperature	T <sub>max</sub>		90 (194)					
	Protection class			IP54					
<b>S</b>	Standard lubrication			Grease (lifetime lubrication)					
<b>F</b>	Food grade lubrication			Grease (lifetime lubrication)					
	Installation position			Any					
<b>S</b>	Standard backlash	φ	arcmin	< 15	< 10	< 7	< 7	< 6	1
				< 19	< 12	< 9	< 9	< 9	2
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>f</sub> .in/ arcmin)	0.7 - 1.0 (6 - 9)	3.5 - 6.6 (31 - 58)	9.7 - 18.5 (86 - 164)	24.5 - 52.5 (217 - 465)	54.5 - 96.0 (482 - 850)	1
				0.7 - 1,1 (6 - 9)	3.3 - 7.0 (29 - 62)	9.7 - 20.0 (86 - 177)	21.0 - 60.0 (186 - 531)	55.0 - 100.0 (487 - 885)	2
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	0.6 (1.4)	1.4 (3.1 - 3.2)	3.2 - 3.3 (7.1 - 7.3)	7.4 - 7.7 (16.3 - 17.0)	16.7 (36.7 - 36.9)	1
				0.8 (1.7 - 1.8)	1.7 - 1.9 (3.7 - 4.1)	3.9 - 4.1 (8.5 - 8.9)	9.3 - 9.8 (20.5 - 21.6)	21.9 - 22.3 (48.3 - 49.2)	2
<b>S</b>	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)					
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black					
	Running noise <sup>(3)</sup>	L <sub>pA</sub>	dB(A)	58	58	60	65	70	

Output shaft loads			PLPE050	PLPE070	PLPE090	PLPE120	PLPE155	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N (lb <sub>f</sub> )	1300 (292)	1500 (337)	3100 (697)	4000 (899)	8400 (1888)	
Maximum axial force	F <sub>a max</sub>		1000 (225)	2000 (450)	3800 (854)	5900 (1326)	11000 (2473)	
Maximum tilting moment	M <sub>K max</sub>	Nm (lb <sub>f</sub> .in)	42 (369)	61 (537)	162 (1429)	268 (2372)	803 (7104)	

Input characteristics			PLPE050	PLPE070	PLPE090	PLPE120	PLPE155	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	8 (A)	11 (C)	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	35 (G) <sup>(5)</sup>	
			9 (B) <sup>(5)</sup>	14 (D) <sup>(5)</sup>	24 (F)	35 (G)	42 (H)	
			11 (C)	19 (E)	-	-	-	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>f</sub> . in.s <sup>2</sup> 10 <sup>-4</sup> )	0.022 - 0.035 (0.195 - 0.310)	0.090 - 0.195 (0.797 - 1.726)	0.374 - 0.789 (3.310 - 6.983)	1.419 - 2.764 (12.559 - 24.463)	4.932 - 7.611 (43.652 - 67.363)	1
			0.022 - 0.032 (0.195 - 0.283)	0.084 - 0.147 (0.743 - 1.301)	0.356 - 0.625 (3.151 - 5.532)	1.376 - 2.334 (12.179 - 20.658)	4.759 - 7.108 (42.121 - 62.911)	2
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>f</sub> .in)	0.05 - 0.10 (0 - 1)	0.15 - 0.40 (1 - 4)	0.25 - 0.75 (2 - 7)	0.60 - 1.80 (5 - 16)	0.75 - 1.70 (7 - 15)	1
			0.05 (0)	0.10 - 0.15 (1)	0.15 - 0.30 (1 - 3)	0.45 - 0.85 (4 - 8)	0.65 - 1.45 (6 - 13)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		4.5 (40)	12 (106)	16 (142)	40 (354)	180 (1593)	

<sup>(1)</sup> Number of stages

<sup>(2)</sup> Application specific configuration with NCP – www.neugart.com

<sup>(3)</sup> The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com

<sup>(4)</sup> More information on page 183

<sup>(5)</sup> Reference clamping system diameter

Output torques			PLPE050	PLPE070	PLPE090	PLPE120	PLPE155	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>zz</sub>	Nm (lb <sub>r</sub> .in)	11 (97)	28 (248)	85 (752)	115 (1018)	-	3	1
			15 (133)	33 (292)	90 (797)	155 (1372)	460 (4071)	4	
			13 (115)	30 (266)	82 (726)	172 (1522)	445 (3939)	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)	210 (1859)	10	
			12 (106)	33 (292)	97 (859)	157 (1390)	-	9	2
			15 (133)	33 (292)	90 (797)	195 (1726)	-	12	
			13 (115)	33 (292)	82 (726)	172 (1522)	-	15	
			15 (133)	33 (292)	90 (797)	195 (1726)	460 (4071)	16	
			15 (133)	33 (292)	90 (797)	195 (1726)	460 (4071)	20	
			13 (115)	30 (266)	82 (726)	172 (1522)	445 (3939)	25	
			15 (133)	33 (292)	90 (797)	195 (1726)	-	32	
			13 (115)	30 (266)	82 (726)	172 (1522)	460 (4071)	40	
			-	-	-	-	445 (3939)	50	
			7.5 (66)	18 (159)	50 (443)	120 (1062)	-	64	
			5 (44)	15 (133)	38 (336)	95 (841)	210 (1859)	100	
			Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	11 (97)	44 (389)	105 (929)	
24 (212)	48 (425)	140 (1239)				245 (2168)	600 (5310)	4	
20 (177)	46 (407)	131 (1159)				275 (2434)	710 (6284)	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)	335 (2965)	10	
14.5 (128)	52 (460)	146 (1292)				250 (2213)	-	9	2
24 (212)	48 (425)	144 (1275)				310 (2744)	-	12	
20 (177)	52 (460)	131 (1159)				275 (2434)	-	15	
24 (212)	48 (425)	144 (1275)				310 (2744)	730 (6461)	16	
24 (212)	48 (425)	144 (1275)				310 (2744)	730 (6461)	20	
20 (177)	46 (407)	131 (1159)				275 (2434)	710 (6284)	25	
24 (212)	48 (425)	144 (1275)				310 (2744)	-	32	
20 (177)	46 (407)	131 (1159)				275 (2434)	730 (6461)	40	
-	-	-				-	710 (6284)	50	
12 (106)	28 (248)	80 (708)				192 (1699)	-	64	
8 (71)	24 (212)	60 (531)				152 (1345)	335 (2965)	100	

PLPE

<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  
<sup>(4)</sup> Based on reference clamping system diameter

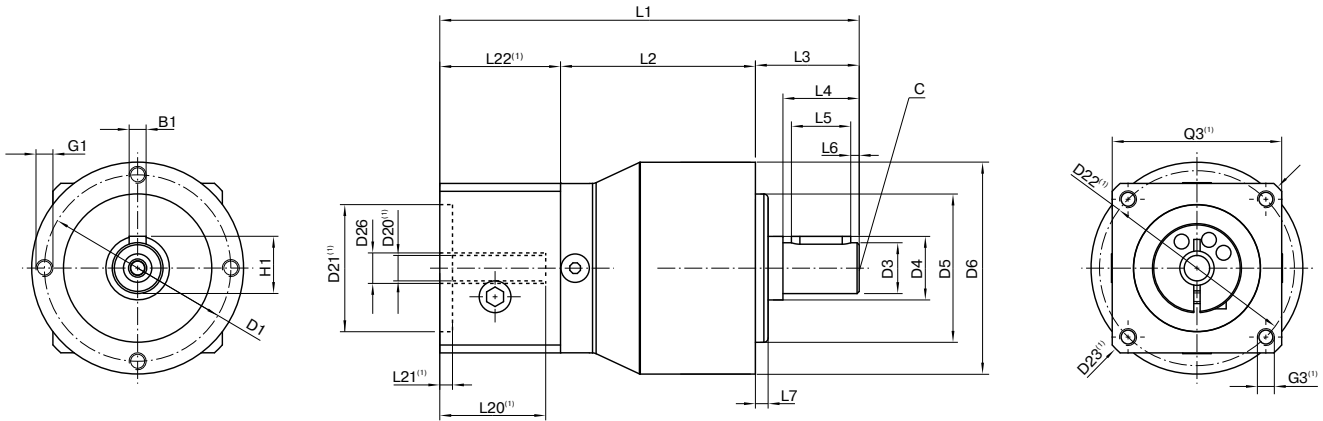
PLPE

Output torques			PLPE050	PLPE070	PLPE090	PLPE120	PLPE155	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>f</sub> .in)	3.5 (31)	16.5 (146)	37 (327)	97 (859)	-	3	1
			11 (97)	17.5 (155)	60 (531)	131 (1159)	390 (3452)	4	
			11 (97)	18 (159)	63 (558)	146 (1292)	375 (3319)	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)	178 (1575)	10	
			5 (44)	23 (204)	52 (460)	133 (1177)	-	9	
			12.5 (111)	24 (212)	76 (673)	165 (1460)	-	12	
		2	11 (97)	26 (230)	69 (611)	146 (1292)	-	15	
			12.5 (111)	26 (230)	76 (673)	165 (1460)	390 (3452)	16	
			12.5 (111)	28 (248)	76 (673)	165 (1460)	390 (3452)	20	
			11 (97)	25 (221)	69 (611)	146 (1292)	375 (3319)	25	
			12.5 (111)	28 (248)	76 (673)	165 (1460)	-	32	
			11 (97)	25 (221)	69 (611)	146 (1292)	390 (3452)	40	
			-	-	-	-	375 (3319)	50	
			6 (53)	15 (133)	42 (372)	102 (903)	-	64	
4 (35)	12.5 (111)	32 (283)	80 (708)	178 (1575)	100				

Input speeds			PLPE050	PLPE070	PLPE090	PLPE120	PLPE155	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	5000	4500	4000	1550	-	3	1
			5000	4500	4000	1750	1400	4	
			5000	4500	4000	2150	1600	5	
			5000	4500	4000	2800	-	7	
			5000	4500	4000	3500	-	8	
			5000	4500	4000	3500	2700	10	
			5000	4500	4000	2250	-	9	
			5000	4500	4000	2350	-	12	
		2	5000	4500	4000	3100	-	15	
			5000	4500	4000	2800	2600	16	
			5000	4500	4000	3400	2950	20	
			5000	4500	4000	3500	3000	25	
			5000	4500	4000	3500	-	32	
			5000	4500	4000	3500	3000	40	
			-	-	-	-	3000	50	
			5000	4500	4000	3500	-	64	
5000	4500	4000	3500	3000	100				
Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	18000	13000	7000	6500	5500		

Output torques			PLPE050	PLPE070	PLPE090	PLPE120	PLPE155	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>f</sub> .in)	22 (195)	60 (531)	150 (1328)	375 (3319)	-	3	1
			30 (266)	80 (708)	200 (1770)	500 (4425)	920 (8143)	4	
			36 (319)	80 (708)	220 (1947)	500 (4425)	890 (7877)	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)	420 (3717)	10	
			33 (292)	88 (779)	260 (2301)	500 (4425)	-	9	
			40 (354)	88 (779)	240 (2124)	520 (4602)	-	12	
		2	36 (319)	88 (779)	220 (1947)	500 (4425)	-	15	
			40 (354)	88 (779)	240 (2124)	520 (4602)	920 (8143)	16	
			40 (354)	88 (779)	240 (2124)	520 (4602)	920 (8143)	20	
			36 (319)	80 (708)	220 (1947)	500 (4425)	890 (7877)	25	
			40 (354)	88 (779)	240 (2124)	520 (4602)	-	32	
			36 (319)	80 (708)	220 (1947)	500 (4425)	920 (8143)	40	
			-	-	-	-	890 (7877)	50	
			27 (239)	80 (708)	190 (1682)	380 (3363)	-	64	
27 (239)	75 (664)	200 (1770)	480 (4248)	420 (3717)	100				

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times



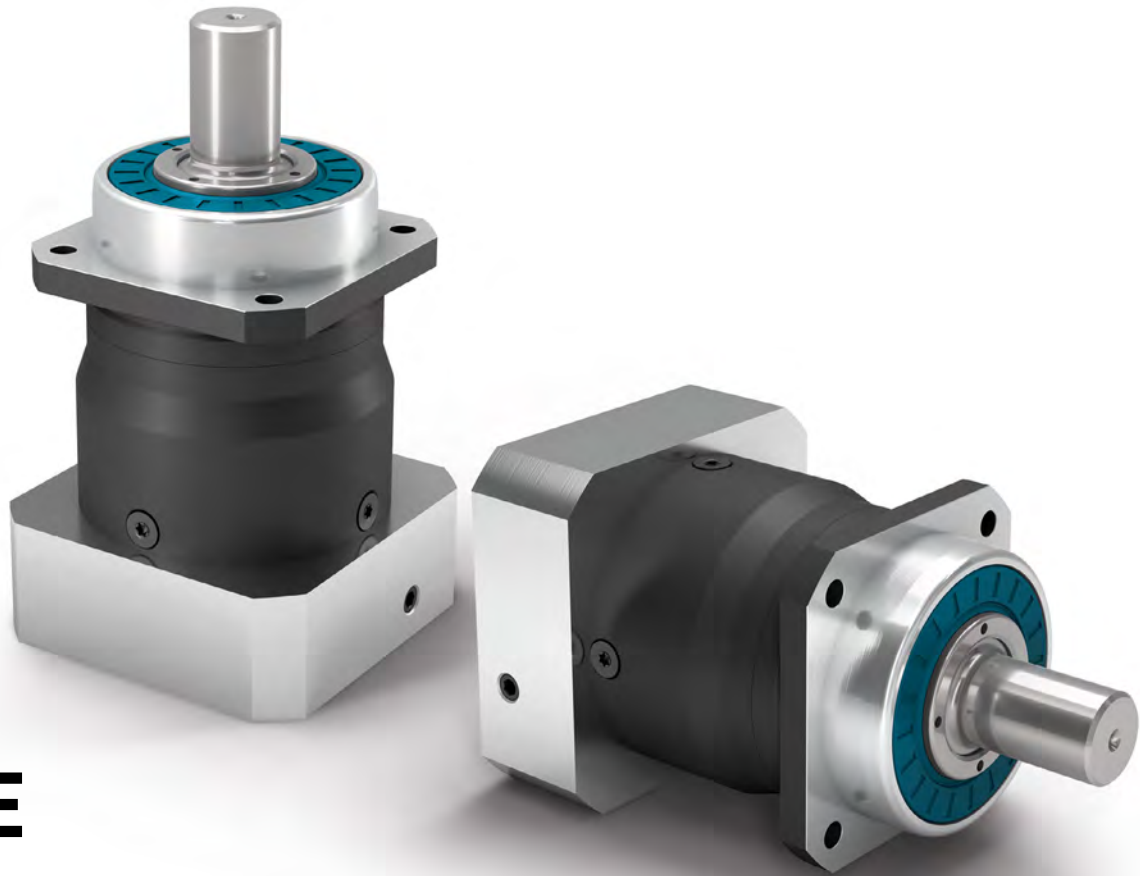
Drawing corresponds to a PLPE050 / 1-stage / output shaft with feather key / 8 mm clamping system / motor adaptation – one part / B5 flange type motor

<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>			PLPE050	PLPE070	PLPE090	PLPE120	PLPE155	p <sup>(3)</sup>	Code
Pitch circle diameter output	D1		44 (1.732)	62 (2.441)	80 (3.150)	108 (4.252)	140 (5.512)		
Shaft diameter output	D3	k7	12 (0.472)	16 (0.630)	22 (0.866)	32 (1.260)	40 (1.575)		
Shaft collar output	D4		15 (0.591)	30 (1.181)	35 (1.378)	50 (1.969)	55 (2.165)		
Centering diameter output	D5	h7	35 (1.378)	52 (2.047)	68 (2.677)	90 (3.543)	120 (4.724)		
Housing diameter	D6		50 (1.969)	70 (2.756)	90 (3.543)	120 (4.724)	155 (6.102)		
Mounting thread x depth	G1	4x	M4x8	M5x8	M6x9	M8x20	M10x20		
Min. total length	L1		94 (3.701)	111 (4.370)	147 (5.787)	192 (7.559)	275.5 (10.846)	1	
			106.5 (4.193)	124 (4.882)	165 (6.496)	219.5 (8.642)	320 (12.598)	2	
Housing length	L2		46 (1.811)	51 (2.008)	67.5 (2.657)	76.5 (3.012)	100 (3.937)	1	
			58.5 (2.303)	64 (2.520)	85 (3.346)	104 (4.094)	144.5 (5.689)	2	
Shaft length output	L3		24.5 (0.965)	36 (1.417)	46 (1.811)	68 (2.677)	97 (3.819)		
Centering depth output	L7		3 (0.118)	3 (0.118)	4 (0.157)	5 (0.197)	8 (0.315)		
Motor shaft diameter j6/k6	D20		More information on page 191/192						
Clamping system diameter input	D26		More information on page 36						
Output shaft with feather key (DIN 6885-1)			A 4x4x14	A 5x5x25	A 6x6x32	A 10x8x50	A 12x8x70		A
Feather key width (DIN 6885-1)	B1		4 (0.157)	5 (0.197)	6 (0.236)	10 (0.394)	12 (0.472)		
Shaft height including feather key (DIN 6885-1)	H1		13.5 (0.531)	18 (0.709)	24.5 (0.965)	35 (1.378)	43 (1.693)		
Shaft length from shoulder	L4		18 (0.709)	28 (1.102)	36 (1.417)	58 (2.283)	82 (3.228)		
Feather key length	L5		14 (0.551)	25 (0.984)	32 (1.260)	50 (1.969)	70 (2.756)		
Distance from shaft end	L6		2 (0.079)	2 (0.079)	2 (0.079)	4 (0.157)	6 (0.236)		
Center hole (DIN 332, type DR)	C		M4x10	M5x12,5	M8x19	M12x28	M16x36		
Smooth output shaft									B
Shaft length from shoulder	L4		18 (0.709)	28 (1.102)	36 (1.417)	58 (2.283)	82 (3.228)		

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

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



# PLHE

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

The **PLHE** is our ideal combination of economy and precision gearboxes. The preloaded tapered roller bearings of this planetary gearbox guarantee high rigidity even under maximum load. The high-performance seal provides increased protection against dust and water spray.

Cyclic torque **15 - 260 Nm**



Radial force **3200 - 6000 N**



Axial force **4400 - 8000 N**



Torsional backlash **7 - 12 arcmin**



Protection class **IP65**

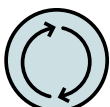


Frame sizes

- 60
- 80
- 120



Economy Line



Equidirectional rotation



Square type output flange



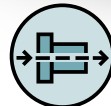
Preloaded tapered roller bearings



Planet carrier in disc design



Option: Rack and pinion Planetary gearbox (Details on page 158)



Coaxial gearbox



Spur gear



Preloaded tapered roller bearings



Extra long centering collar



Option: Splined output shaft (DIN 5480)



Option: Painted surface – RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics		PLHE060	PLHE080	PLHE120	p <sup>(1)</sup>	
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000			
	Efficiency <sup>(3)</sup>	η	%	97			1
				96			2
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)			
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)			
	Protection class				IP65		
<b>S</b>	Standard lubrication				Grease (lifetime lubrication)		
<b>F</b>	Food grade lubrication				Grease (lifetime lubrication)		
	Installation position				Any		
<b>S</b>	Standard backlash	φ	arcmin	< 10	< 7	< 7	1
				< 12	< 9	< 9	2
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>f</sub> .in/ arcmin)	2.6 - 4.4 (23 - 39)	7.3 - 11.6 (65 - 103)	18.5 - 26.0 (164 - 230)	1
				2.5 - 4.6 (22 - 41)	7.3 - 12.3 (65 - 109)	16.7 - 27.5 (148 - 243)	2
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	1.5 - 1.6 (3.4 - 3.5)	3.0 - 3.1 (6.6 - 6.7)	6.8 - 7.1 (15.1 - 15.7)	1
				1.7 - 1.8 (3.8 - 3.9)	3.5 - 3.6 (7.6 - 7.9)	8.5 - 9.0 (18.7 - 19.8)	2
<b>S</b>	Standard surface				Housing: Steel – heat-treated and post-oxidized (black)		
<b>B</b>	Painted surface <sup>(4)</sup>				RAL 9005 Jet black		
	Running noise <sup>(3)</sup>	L <sub>pA</sub>	dB(A)	58	60	65	

Output shaft loads		PLHE060	PLHE080	PLHE120	p <sup>(1)</sup>	
Maximum radial force	F <sub>r max</sub>	N (lb <sub>f</sub> )	3200 (719)	5500 (1236)	6000 (1349)	
Maximum axial force	F <sub>a max</sub>		3400 (764)	4500 (1012)	6500 (1461)	
Maximum tilting moment	M <sub>K max</sub>	Nm (lb <sub>f</sub> .in)	191 (1690)	383 (3393)	488 (4317)	

Input characteristics		PLHE060	PLHE080	PLHE120	p <sup>(1)</sup>	
Clamping system diameter input (Code)	D26	mm	11 (C)	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	
			14 (D) <sup>(5)</sup>	24 (F)	35 (G)	
			19 (E)	-	-	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>f</sub> .in.s <sup>2</sup> 10 <sup>-4</sup> )	0.090 - 0.198 (0.797 - 1.752)	0.370 - 0.775 (3.275 - 6.859)	1.390 - 2.486 (12.303 - 22.003)	1
			0.085 - 0.155 (0.752 - 1.372)	0.357 - 0.641 (3.160 - 5.673)	1.378 - 2.326 (12.196 - 20.587)	2
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>f</sub> .in)	0.15 - 0.50 (1 - 4)	0.30 - 0.90 (3 - 8)	0.65 - 1.75 (6 - 15)	1
			0.10 - 0.20 (1 - 2)	0.15 - 0.40 (1 - 4)	0.45 - 0.95 (4 - 8)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		8 (71)	16 (142)	40 (354)	

<sup>(1)</sup> Number of stages

<sup>(2)</sup> Application specific configuration with NCP – www.neugart.com

<sup>(3)</sup> The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com

<sup>(4)</sup> More information on page 183

<sup>(5)</sup> Reference clamping system diameter

Output torques			PLHE060	PLHE080	PLHE120	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>2z</sub>	Nm (lb <sub>r</sub> .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	
Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	44 (389)	105 (929)	184 (1629)	3	1
			60 (531)	140 (1239)	245 (2168)	4	
			61 (540)	175 (1549)	310 (2744)	5	
			40 (354)	104 (920)	215 (1903)	7	
			28 (248)	80 (708)	192 (1699)	8	
			24 (212)	60 (531)	152 (1345)	10	
			70 (620)	182 (1611)	335 (2965)	9	2
			65 (575)	192 (1699)	415 (3673)	12	
			70 (620)	176 (1558)	365 (3231)	15	
			65 (575)	192 (1699)	415 (3673)	16	
			65 (575)	192 (1699)	415 (3673)	20	
			61 (540)	176 (1558)	365 (3231)	25	
			65 (575)	192 (1699)	415 (3673)	32	
			61 (540)	176 (1558)	365 (3231)	40	
			28 (248)	80 (708)	192 (1699)	64	
			24 (212)	60 (531)	152 (1345)	100	

PLHE

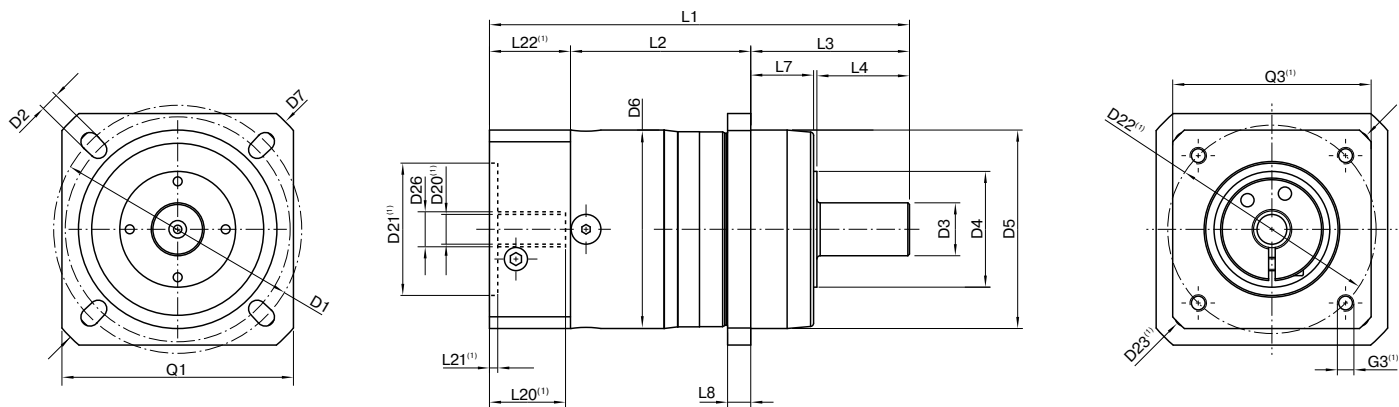
<sup>(1)</sup> Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
<sup>(2)</sup> Number of stages  
<sup>(3)</sup> Application specific configuration with NCP – [www.neugart.com](http://www.neugart.com)  
<sup>(4)</sup> Based on reference clamping system diameter

Output torques			PLHE060	PLHE080	PLHE120	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>r</sub> .in)	23 (204)	43 (381)	97 (859)	3	1
			25 (221)	95 (841)	131 (1159)	4	
			25 (221)	93 (823)	165 (1460)	5	
			19.5 (173)	55 (487)	114 (1009)	7	
			15 (133)	42 (372)	102 (903)	8	
			12.5 (111)	32 (283)	80 (708)	10	
			30 (266)	88 (779)	178 (1575)	9	2
			32 (283)	102 (903)	220 (1947)	12	
			35 (310)	93 (823)	195 (1726)	15	
			35 (310)	102 (903)	220 (1947)	16	
			37 (327)	102 (903)	220 (1947)	20	
			34 (301)	93 (823)	195 (1726)	25	
			37 (327)	102 (903)	220 (1947)	32	
			34 (301)	93 (823)	195 (1726)	40	
			15 (133)	42 (372)	102 (903)	64	
			12.5 (111)	32 (283)	80 (708)	100	

Input speeds			PLHE060	PLHE080	PLHE120	i <sup>(1)</sup>	p <sup>(2)</sup>				
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	2250	2550	1350	3	1				
			3400	2300	1600	4					
			3950	2800	1800	5					
			4500	3800	2500	7					
			4500	4000	3150	8					
			4500	4000	3500	10					
			4500	3850	1750	9	2				
			4500	4000	2000	12					
			4500	4000	2550	15					
			4500	4000	2300	16					
			4500	4000	2850	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 <sup>(3)</sup>	n <sub>1max</sub>	rpm	13000		7000	6500		

Output torques			PLHE060	PLHE080	PLHE120	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>r</sub> .in)	60 (531)	150 (1328)	375 (3319)	3	1
			80 (708)	200 (1770)	500 (4425)	4	
			80 (708)	220 (1947)	500 (4425)	5	
			80 (708)	178 (1575)	340 (3009)	7	
			80 (708)	190 (1682)	380 (3363)	8	
			75 (664)	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	
			75 (664)	200 (1770)	480 (4248)	100	

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times



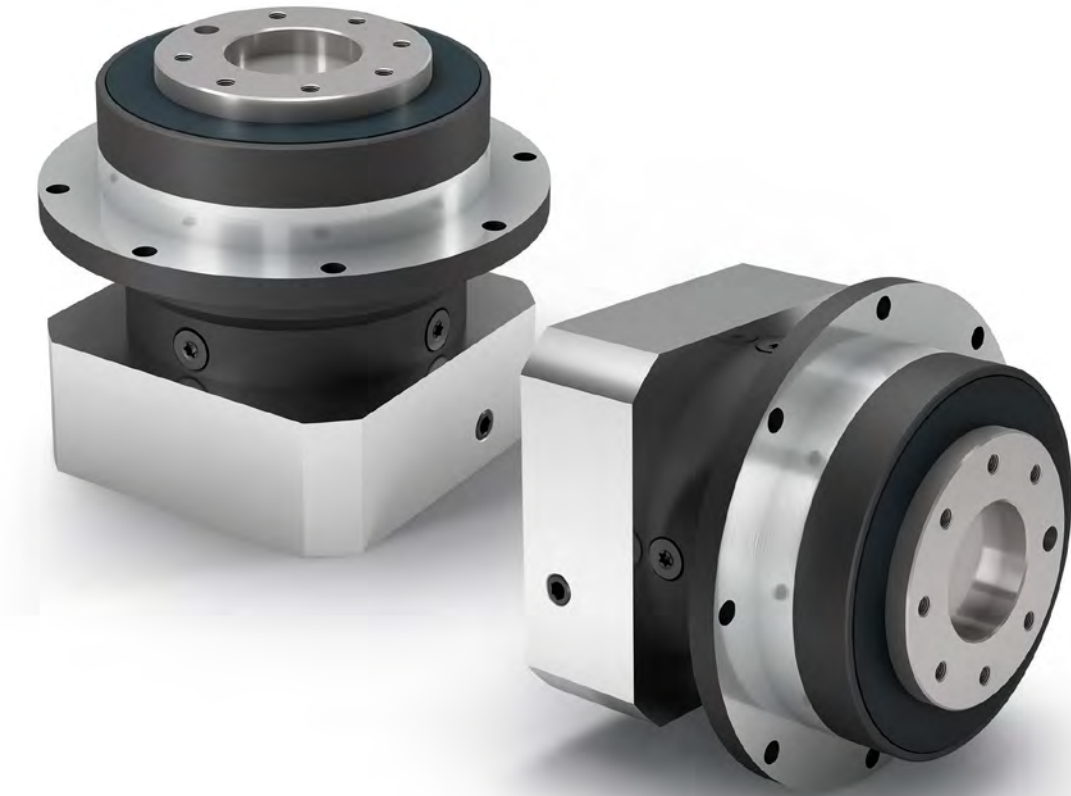
Drawing corresponds to a PLHE060 / 1-stage / smooth output shaft / 11 mm clamping system / motor adaptation – one part / B5 flange type motor

<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>			PLHE060	PLHE080	PLHE120	p <sup>(3)</sup>	Code
Pitch circle diameter output	D1		68 (2.677) - 75 (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 (6.260)	199.5 (7.854)	1	
			139.5 (5.492)	177 (6.969)	227 (8.937)	2	
Housing length	L2		55 (2.165)	69.5 (2.736)	64 (2.520)	1	
			67.5 (2.657)	87 (3.425)	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)		
Motor shaft diameter j6/k6	D20		More information on page 191/192				
Clamping system diameter input	D26		More information on page 42				
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)	C		M5x12.5	M8x19	M12x28		
Smooth output shaft							B
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	58 (2.283)		
Splined output shaft (DIN 5480)			W16x0,8x18x6m	W22x1,25x16x6m	W32x1,25x24x6m		C
Width of gearing	L <sub>v</sub>		15 (0.591)	15 (0.591)	15 (0.591)		
Shaft length output	L3		46 (1.811)	46 (1.811)	56 (2.205)		
Shaft length from shoulder	L4		26 (1.024)	26 (1.024)	26 (1.024)		
Center hole (DIN 332, type DR)	C		M5x12.5	M8x19	M12x28		

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

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



# 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**

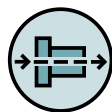


Frame sizes

- 55
- 64
- 90
- 110



Economy Line



Coaxial gearbox



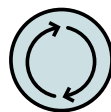
Spur gear



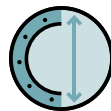
Low-friction deep groove ball bearings



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 <sup>(1)</sup>	
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000				
	Efficiency <sup>(3)</sup>	η	%	98			1	
				97			2	
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)				
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)				
	Protection class			IP54				
<b>S</b>	Standard lubrication			Grease (lifetime lubrication)				
<b>F</b>	Food grade lubrication			Grease (lifetime lubrication)				
	Installation position			Any				
<b>S</b>	Standard backlash	φ	arcmin	< 15	< 10	< 7	< 7	1
				< 19	< 12	< 9	< 9	2
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>f</sub> .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 <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	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
<b>S</b>	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)				
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black				
	Running noise <sup>(3)</sup>	L <sub>pA</sub>	dB(A)	58	58	60	65	

Output shaft loads		PLFE055	PLFE064	PLFE090	PLFE110	p <sup>(1)</sup>	
Maximum radial force	F <sub>r max</sub>	N (lb <sub>f</sub> )	1150 (259)	900 (202)	2200 (495)	3800 (854)	
Maximum axial force	F <sub>a max</sub>		1000 (225)	1200 (270)	3300 (742)	5200 (1169)	
Maximum tilting moment	M <sub>k max</sub>	Nm (lb <sub>f</sub> .in)	25 (224)	20 (175)	73 (643)	173 (1530)	

Input characteristics		PLFE055	PLFE064	PLFE090	PLFE110	p <sup>(1)</sup>	
Clamping system diameter input (Code)	D26	mm	8 (A)	11 (C)	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	
			9 (B) <sup>(5)</sup>	14 (D) <sup>(5)</sup>	24 (F)	35 (G)	
			11 (C)	19 (E)	-	-	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>f</sub> .in.s <sup>2</sup> 10 <sup>-4</sup> )	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 <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>f</sub> .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 <sub>b1</sub>		4,5 (40)	12 (106)	16 (142)	40 (354)	

<sup>(1)</sup> Number of stages

<sup>(2)</sup> Application specific configuration with NCP – www.neugart.com

<sup>(3)</sup> The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com

<sup>(4)</sup> More information on page 183

<sup>(5)</sup> Reference clamping system diameter

Output torques			PLFE055	PLFE064	PLFE090	PLFE110	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>2z</sub>	Nm (lb <sub>r</sub> .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 <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .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	

PLFE

<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  
<sup>(4)</sup> Based on reference clamping system diameter

Output torques			PLFE055	PLFE064	PLFE090	PLFE110	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>r</sub> .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		

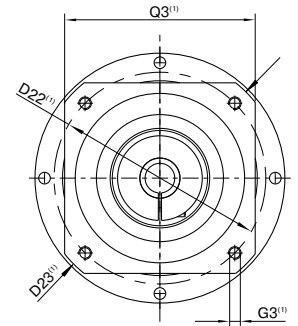
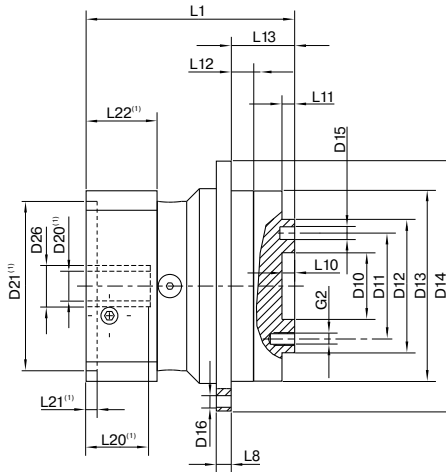
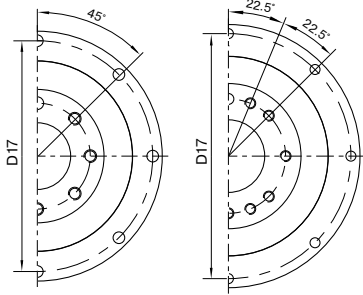
Input speeds			PLFE055	PLFE064	PLFE090	PLFE110	i <sup>(1)</sup>	p <sup>(2)</sup>			
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	5000	2850	2750	1350	3	1			
			5000	4400	2350	1600	4				
			5000	4500	2850	1750	5				
			5000	4500	3850	2500	7				
			5000	4500	4000	3150	8				
			5000	4500	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 <sup>(3)</sup>	n <sub>1max</sub>	rpm	18000	13000		7000	6500		

Output torques			PLFE055	PLFE064	PLFE090	PLFE110	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>r</sub> .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<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – [www.neugart.com](http://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

<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>			PLFE055	PLFE064	PLFE090	PLFE110	p <sup>(3)</sup>	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		

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

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



# PFHE


## The planetary gearbox with flange output shaft for high-load applications

The **PFHE** represents an economically attractive alternative for high-load applications in which high radial loads occur. The combination of special pre-stressed inclined roller bearings and a flanged output shaft in accordance with ISO 9409-1 gives the **PFHE** a very high load capacity. Thanks to the radial shaft seal that is used, this gearbox achieves protection class IP65 at the output side and can therefore also withstand adverse usage conditions.

Cyclic torque **15 - 260 Nm**



Radial force **2300 - 5150 N**



Axial force **2850 - 6450 N**



Torsional backlash **7 - 12 arcmin**



Protection class **IP65**

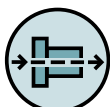


Frame sizes

- 64
- 90
- 110



Economy Line



Coaxial gearbox



Spur gear



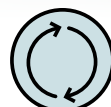
Preloaded angular contact roller bearings



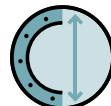
Flange output shaft (ISO 9409-1)



Option: Rack and pinion  
Planetary gearbox (Details on page 158)



Equidirectional rotation



Extra large round type output flange



Rotary shaft seal



Planet carrier in disc design



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			PFHE064	PFHE090	PFHE110	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000			
	Efficiency <sup>(3)</sup>	η	%	97			
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)			
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)			
	Protection class			IP65			
<b>S</b>	Standard lubrication			Grease (lifetime lubrication)			
<b>F</b>	Food grade lubrication			Grease (lifetime lubrication)			
	Installation position			Any			
<b>S</b>	Standard backlash	φ	arcmin	< 10	< 7	< 7	1
				< 12	< 9	< 9	2
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>f</sub> .in/ arcmin)	5.4 - 10.3 (48 - 91)	16.1 - 32.5 (142 - 288)	37.0 - 77.0 (327 - 682)	1
				5.0 - 11.5 (44 - 102)	15.7 - 38.5 (139 - 341)	30.0 - 95.0 (266 - 841)	2
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	1.1 (2.4 - 2.5)	3.1 (6.7 - 6.9)	5.9 - 6.1 (12.9 - 13.5)	1
				1.3 - 1.4 (2.9 - 3.2)	3.5 - 3.8 (7.7 - 8.4)	7.6 - 8.1 (16.7 - 17.8)	2
<b>S</b>	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)			
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black			
	Running noise <sup>(3)</sup>	L <sub>pA</sub>	dB(A)	60	62	65	

Output shaft loads				PFHE064	PFHE090	PFHE110	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N (lb <sub>f</sub> )		2300 (517)	4100 (922)	5150 (1158)	
Maximum axial force	F <sub>a max</sub>			2850 (641)	5450 (1225)	6450 (1450)	
Maximum tilting moment	M <sub>K max</sub>	Nm (lb <sub>f</sub> .in)		110 (972)	278 (2462)	407 (3603)	

Input characteristics				PFHE064	PFHE090	PFHE110	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm		11 (C)	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	
				14 (D) <sup>(5)</sup>	24 (F)	35 (G)	
				19 (E)	-	-	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>f</sub> .in.s <sup>2</sup> 10 <sup>-4</sup> )		0.094 - 0.245 (0.832 - 2.168)	0.407 - 1.170 (3.602 - 10.355)	1.505 - 3.658 (13.320 - 32.376)	1
				0.084 - 0.152 (0.743 - 1.345)	0.356 - 0.667 (3.151 - 5.903)	1.377 - 2.432 (12.187 - 21.525)	2
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>f</sub> .in)		0.25 - 0.85 (2 - 8)	0.45 - 1.75 (4 - 15)	0.80 - 3.65 (7 - 32)	1
				0.15 - 0.30 (1 - 3)	0.20 - 0.55 (2 - 5)	0.30 - 1.15 (3 - 10)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>			8 (71)	16 (142)	40 (354)	

<sup>(1)</sup> Number of stages

<sup>(2)</sup> Application specific configuration with NCP – www.neugart.com

<sup>(3)</sup> The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com

<sup>(4)</sup> More information on page 183

<sup>(5)</sup> Reference clamping system diameter

Output torques			PFHE064	PFHE090	PFHE110	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>2z</sub>	Nm (lb <sub>r</sub> .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	
Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	44 (389)	105 (929)	184 (1629)	3	1
			60 (531)	140 (1239)	245 (2168)	4	
			61 (540)	175 (1549)	310 (2744)	5	
			40 (354)	104 (920)	215 (1903)	7	
			28 (248)	80 (708)	192 (1699)	8	
			24 (212)	60 (531)	152 (1345)	10	
			70 (620)	182 (1611)	335 (2965)	9	2
			65 (575)	192 (1699)	415 (3673)	12	
			70 (620)	176 (1558)	365 (3231)	15	
			65 (575)	192 (1699)	415 (3673)	16	
			65 (575)	192 (1699)	415 (3673)	20	
			61 (540)	176 (1558)	365 (3231)	25	
			65 (575)	192 (1699)	415 (3673)	32	
			61 (540)	176 (1558)	365 (3231)	40	
			28 (248)	80 (708)	192 (1699)	64	
			24 (212)	60 (531)	152 (1345)	100	

PFHE

<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  
<sup>(4)</sup> Based on reference clamping system diameter

Output torques			PFHE064	PFHE090	PFHE110	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>r</sub> .in)	23 (204)	38 (336)	97 (859)	3	1
			23 (204)	88 (779)	131 (1159)	4	
			24 (212)	87 (770)	165 (1460)	5	
			19.5 (173)	55 (487)	114 (1009)	7	
			15 (133)	42 (372)	102 (903)	8	
			12.5 (111)	32 (283)	80 (708)	10	
			30 (266)	87 (770)	178 (1575)	9	2
			32 (283)	102 (903)	220 (1947)	12	
			35 (310)	93 (823)	195 (1726)	15	
			35 (310)	102 (903)	220 (1947)	16	
			37 (327)	102 (903)	220 (1947)	20	
			34 (301)	93 (823)	195 (1726)	25	
			37 (327)	102 (903)	220 (1947)	32	
			34 (301)	93 (823)	195 (1726)	40	
			15 (133)	42 (372)	102 (903)	64	
			12.5 (111)	32 (283)	80 (708)	100	

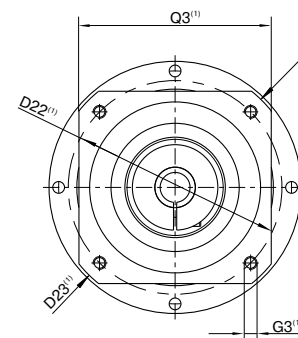
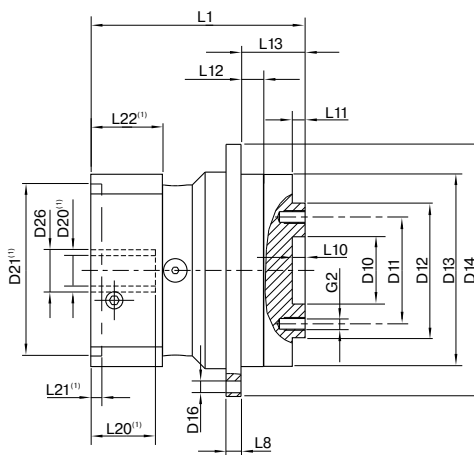
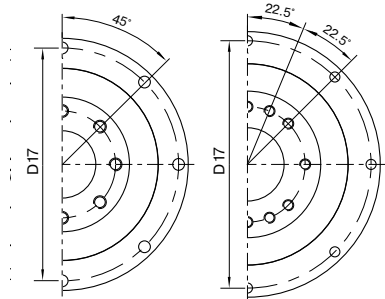
Input speeds			PFHE064	PFHE090	PFHE110	i <sup>(1)</sup>	p <sup>(2)</sup>				
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	3800	3750	1550	3	1				
			4500	2950	1750	4					
			4500	3550	1950	5					
			4500	4000	2750	7					
			4500	4000	3450	8					
			4500	4000	3500	10					
			4500	4000	2050	9	2				
			4500	4000	2200	12					
			4500	4000	2450	15					
			4500	4000	2400	16					
			4500	4000	2750	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 <sup>(3)</sup>	n <sub>1max</sub>	rpm	7500		7000	6500		

Output torques			PFHE064	PFHE090	PFHE110	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>r</sub> .in)	60 (531)	150 (1328)	375 (3319)	3	1
			80 (708)	200 (1770)	500 (4425)	4	
			80 (708)	220 (1947)	500 (4425)	5	
			80 (708)	178 (1575)	340 (3009)	7	
			80 (708)	190 (1682)	380 (3363)	8	
			75 (664)	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	
			75 (664)	200 (1770)	480 (4248)	100	

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times

PFHE064  
PFHE090

PFHE110



Drawing corresponds to a PFHE090 / 1-stage / flange output shaft / 19 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>			PFHE064	PFHE090	PFHE110	p <sup>(3)</sup>	Code	
Centering diameter output shaft	D10	H7	20 (0.787)	31.5 (1.240)	40 (1.575)			
Pitch circle diameter output shaft	D11		31.5 (1.240)	50 (1.969)	63 (2.480)			
Centering diameter output shaft	D12	h7	40 (1.575)	63 (2.480)	80 (3.150)			
Centering diameter output flange	D13		64 (2.520)	90 (3.543)	110 (4.331)			
Flange diameter output	D14		86 (3.386)	118 (4.646)	145 (5.709)			
Mounting bore output	D16		4.5 8x45°	5.5 8x45°	5.5 8x45°			
Pitch circle diameter output flange	D17		79 (3.110)	109 (4.291)	135 (5.315)			
Min. total length	L1		72 (2.835)	100.5 (3.957)	117 (4.606)	1		
			84.5 (3.327)	118 (4.646)	144 (5.669)	2		
Flange thickness output	L8		4 (0.157)	7 (0.276)	8 (0.315)			
Centering depth output shaft	L10		4 (0.157)	6 (0.236)	6 (0.236)			
	L11		3 (0.118)	6 (0.236)	7 (0.256)			
Centering depth output flange	L12		7.5 (0.295)	10.5 (0.413)	10.5 (0.413)			
Output flange length	L13		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 54						
Flange output shaft (similar ISO 9409-1)							<b>D</b>	
Number x thread x depth	G2		8 x M5x7	8 x M6x10	12 x M6x12			

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

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



# WPLE

The versatile right angle planetary gearbox with lower weight and appealing cost effectiveness

The **WPLE** consistently continues the advantages of the Economy series. With its compact but powerful design, it is perfectly suited for dynamic multi-axis systems. Our right-angle gearbox is lubricated for life, easy to mount and offers an unmatched price/performance ratio.

Cyclic torque **5 - 260 Nm**



Radial force **200 - 2000 N**



Axial force **240 - 3800 N**



Torsional backlash **11 - 28 arcmin**

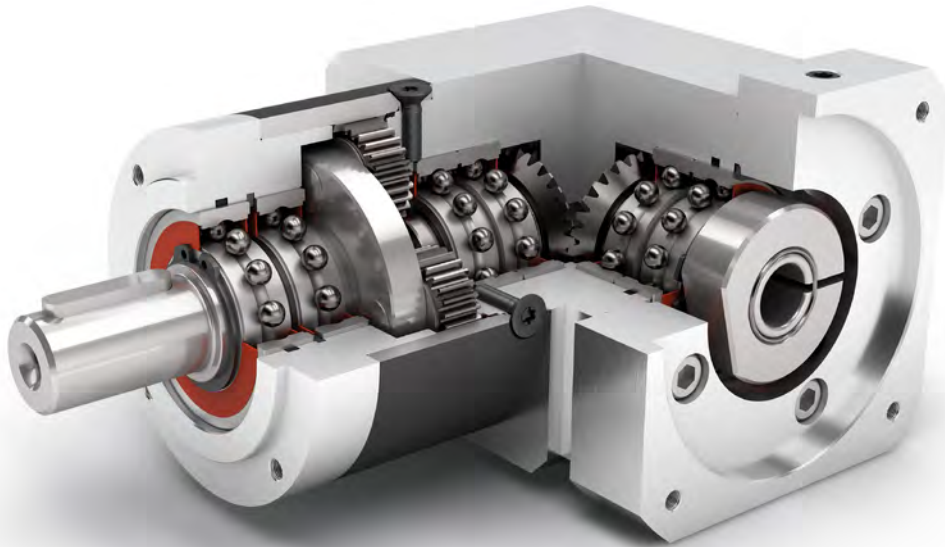


Protection class **IP54**

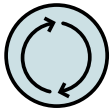


Frame sizes

- 40
- 60
- 80
- 120



Economy Line



Equidirectional rotation



Bevel gear right angle stage



Low-friction deep groove ball bearings



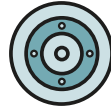
Planet carrier in disc design



Right angle gearbox



Spur gear



Round type output flange



High ratio variety  $i=3$  up to  $i=512$



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			WPLE040	WPLE060	WPLE080	WPLE120	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000				
	Efficiency <sup>(3)</sup>	η	%	95				1
94				2				
88				3				
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)				
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)				
	Protection class			IP54				
<b>S</b>	Standard lubrication			Grease (lifetime lubrication)				
<b>F</b>	Food grade lubrication			Grease (lifetime lubrication)				
	Installation position			Any				
<b>S</b>	Standard backlash	φ	arcmin	< 21	< 16	< 13	< 11	1
				< 25	< 18	< 15	< 13	2
				< 28	< 21	< 17	< 15	3
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>f</sub> .in/ arcmin)	0.5 - 0.8 (4 - 7)	1.5 - 2.3 (13 - 20)	4.0 - 7.9 (35 - 70)	9.9 - 17.5 (88 - 155)	1
				0.7 - 1.0 (6 - 9)	2.3 - 2.8 (20 - 25)	7.2 - 10.3 (64 - 91)	17.5 - 22.0 (155 - 195)	2
				0.8 - 1.0 (7 - 9)	2.3 - 2.8 (20 - 25)	7.9 - 10.4 (70 - 92)	17.5 - 22.0 (155 - 195)	3
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	0.6 (1.2 - 1.3)	1.6 (3.5 - 3.6)	3.7 (8.0 - 8.1)	9.6 - 9.7 (21.2 - 21.4)	1
				0.7 (1.4 - 1.5)	1.8 (3.9 - 4.0)	4.1 - 4.2 (9.1 - 9.2)	11.3 - 11.5 (25.0 - 25.4)	2
				0.7 - 0.8 (1.6 - 1.7)	2.0 (4.3 - 4.4)	4.6 - 4.7 (10.1 - 10.3)	13.1 - 13.3 (29.0 - 29.4)	3
<b>S</b>	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)				
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black				
	Running noise <sup>(3)</sup>	L <sub>pA</sub>	dB(A)	68	70	73	75	

Output shaft loads			WPLE040	WPLE060	WPLE080	WPLE120	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N	200 (45)	700 (157)	1000 (225)	2000 (450)	
Maximum axial force	F <sub>a max</sub>	(lb <sub>f</sub> )	240 (54)	800 (180)	1450 (326)	3800 (854)	
Maximum tilting moment	M <sub>K max</sub>	Nm (lb <sub>f</sub> .in)	6 (49)	25 (220)	41 (364)	115 (1018)	

Input characteristics			WPLE040	WPLE060	WPLE080	WPLE120	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	8 (A)	11 (C)	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	
			9 (B) <sup>(5)</sup>	14 (D) <sup>(5)</sup>	-	-	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>f</sub> .in.s <sup>2</sup> ·10 <sup>-4</sup> )	0.040 - 0.057 (0.354 - 0.504)	0.227 - 0.363 (2.009 - 3.213)	0.862 - 1.226 (7.629 - 10.851)	2.645 - 3.670 (23.410 - 32.482)	1
			0.040 - 0.057 (0.354 - 0.504)	0.228 - 0.356 (2.018 - 3.151)	0.868 - 1.184 (7.682 - 10.479)	2.679 - 3.597 (23.711 - 31.836)	2
			0.040 - 0.056 (0.354 - 0.496)	0.228 - 0.238 (2.018 - 2.106)	0.868 - 1.162 (7.682 - 10.285)	2.679 - 3.506 (23.711 - 31.031)	3
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>f</sub> .in)	0.05 (0)	0.15 - 0.20 (1 - 2)	0.25 - 0.60 (2 - 5)	0.80 - 1.35 (7 - 12)	1
			0.05 (0)	0.15 - 0.20 (1 - 2)	0.25 - 0.60 (2 - 5)	0.85 - 1.45 (8 - 13)	2
			0.05 (0)	0.15 (1)	0.25 - 0.35 (2 - 3)	0.85 - 1.05 (8 - 9)	3
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		2 (18)	5 (44)	10,5 (93)	26 (230)	

<sup>(1)</sup> Number of stages

<sup>(2)</sup> Application specific configuration with NCP – www.neugart.com

<sup>(3)</sup> The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com

<sup>(4)</sup> More information on page 183

<sup>(5)</sup> Reference clamping system diameter

Output torques			WPLE040	WPLE060	WPLE080	WPLE120	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>zz</sub>	Nm (lb <sub>r</sub> .in)	4.5 (40)	14 (124)	40 (354)	78 (690)	3	1
			6 (53)	19 (168)	53 (469)	104 (920)	4	
			7.5 (66)	24 (212)	67 (593)	130 (1151)	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	
			13.5 (119)	43 (381)	120 (1062)	210 (1859)	9	
			18 (159)	44 (389)	120 (1062)	260 (2301)	12	2
			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	3
			20 (177)	44 (389)	120 (1062)	260 (2301)	60	
			20 (177)	44 (389)	120 (1062)	260 (2301)	80	
			20 (177)	44 (389)	120 (1062)	260 (2301)	100	
			18 (159)	44 (389)	110 (974)	230 (2036)	120	
			20 (177)	44 (389)	120 (1062)	260 (2301)	160	
			18 (159)	40 (354)	110 (974)	230 (2036)	200	
			20 (177)	44 (389)	120 (1062)	260 (2301)	256	
			18 (159)	40 (354)	110 (974)	230 (2036)	320	
			7.5 (66)	18 (159)	50 (443)	120 (1062)	512	
Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	7 (62)	23 (204)	64 (566)	124 (1097)	3	1
			9.5 (84)	30 (266)	85 (752)	166 (1469)	4	
			12 (106)	38 (336)	107 (947)	205 (1814)	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)	69 (611)	182 (1611)	335 (2965)	9	
			28 (248)	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	3
			12 (106)	28 (248)	80 (708)	192 (1699)	64	
			32 (283)	65 (575)	192 (1699)	415 (3673)	60	
			32 (283)	65 (575)	192 (1699)	415 (3673)	80	
			32 (283)	65 (575)	192 (1699)	415 (3673)	100	
			28 (248)	70 (620)	176 (1558)	365 (3231)	120	
			32 (283)	65 (575)	192 (1699)	415 (3673)	160	
			28 (248)	61 (540)	176 (1558)	365 (3231)	200	
			32 (283)	65 (575)	192 (1699)	415 (3673)	256	
			28 (248)	61 (540)	176 (1558)	365 (3231)	320	
			12 (106)	28 (248)	80 (708)	192 (1699)	512	

WPLE

<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  
<sup>(4)</sup> Based on reference clamping system diameter

Output torques			WPLE040	WPLE060	WPLE080	WPLE120	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>f</sub> .in)	1.5 (13)	6 (53)	13.5 (119)	32 (283)	3	1
			2.5 (22)	8.5 (75)	18 (159)	43 (381)	4	
			3 (27)	10.5 (93)	22 (195)	53 (469)	5	
			4.5 (40)	15 (133)	32 (283)	75 (664)	7	
			5 (44)	15 (133)	36 (319)	86 (761)	8	
			4 (35)	12.5 (111)	32 (283)	80 (708)	10	
			5.5 (49)	19 (168)	41 (363)	96 (850)	9	
			7.5 (66)	25 (221)	55 (487)	129 (1142)	12	
			9.5 (84)	32 (283)	68 (602)	161 (1425)	15	
			10 (89)	34 (301)	73 (646)	172 (1522)	16	
		12.5 (111)	37 (327)	91 (805)	215 (1903)	20	2	
		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		
		17 (150)	37 (327)	102 (903)	220 (1947)	60		
		17 (150)	37 (327)	102 (903)	220 (1947)	80		
		17 (150)	37 (327)	102 (903)	220 (1947)	100		
		15 (133)	37 (327)	93 (823)	195 (1726)	120		
		17 (150)	37 (327)	102 (903)	220 (1947)	160		
15 (133)	34 (301)	93 (823)	195 (1726)	200	3			
17 (150)	37 (327)	102 (903)	220 (1947)	256				
15 (133)	34 (301)	93 (823)	195 (1726)	320				
6 (53)	15 (133)	42 (372)	102 (903)	512				

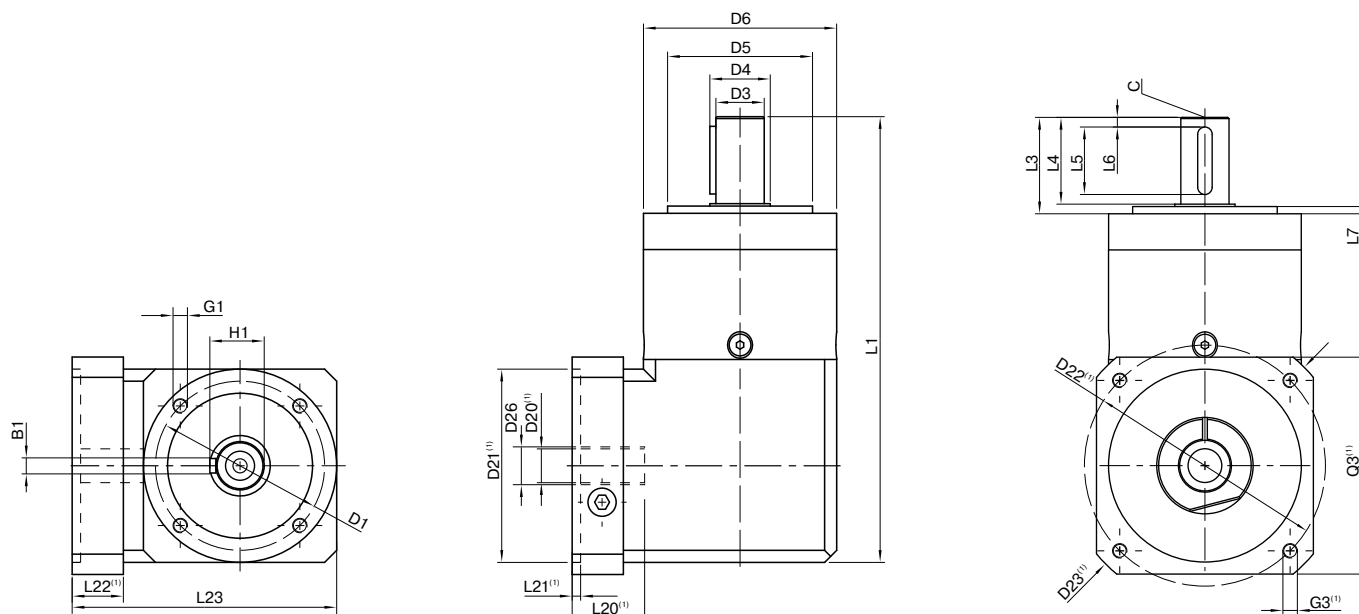
Input speeds			WPLE040	WPLE060	WPLE080	WPLE120	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	5000	4500	4000	3500	3	1
			5000	4500	4000	3500	4	
			5000	4500	4000	3500	5	
			5000	4500	4000	3500	7	
			5000	4500	4000	3500	8	
			5000	4500	4000	3500	10	
			5000	4500	4000	3500	9	
			5000	4500	4000	3500	12	
			5000	4500	4000	3500	15	
			5000	4500	4000	3500	16	
		5000	4500	4000	3500	20	2	
		5000	4500	4000	3500	25		
		5000	4500	4000	3500	32		
		5000	4500	4000	3500	40		
		5000	4500	4000	3500	64		
		5000	4500	4000	3500	60		
		5000	4500	4000	3500	80		
		5000	4500	4000	3500	100		
		5000	4500	4000	3500	120		
		5000	4500	4000	3500	160		
5000	4500	4000	3500	200	3			
5000	4500	4000	3500	256				
5000	4500	4000	3500	320				
5000	4500	4000	3500	512				
Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	18000	13000		7000	6500	

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times

Output torques			WPLE040	WPLE060	WPLE080	WPLE120	$i^{(1)}$	$p^{(2)}$
Emergency stop torque <sup>(4)(5)</sup>	$T_{2Stop}$	Nm (lb.in)	12 (106)	60 (531)	135 (1195)	300 (2655)	3	1
			16 (142)	80 (708)	180 (1593)	400 (3540)	4	
			20 (177)	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	
			25 (221)	70 (620)	170 (1505)	430 (3806)	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	3
			36 (319)	80 (708)	220 (1947)	500 (4425)	40	
			27 (239)	80 (708)	190 (1682)	380 (3363)	64	
			40 (354)	88 (779)	220 (1947)	520 (4602)	60	
			40 (354)	88 (779)	240 (2124)	520 (4602)	80	
			40 (354)	88 (779)	240 (2124)	520 (4602)	100	
			36 (319)	88 (779)	220 (1947)	500 (4425)	120	
			40 (354)	88 (779)	240 (2124)	520 (4602)	160	
			36 (319)	80 (708)	220 (1947)	500 (4425)	200	
			40 (354)	88 (779)	240 (2124)	520 (4602)	256	
			36 (319)	80 (708)	220 (1947)	500 (4425)	320	
			27 (239)	80 (708)	190 (1682)	380 (3363)	512	

WPLE

(1) Ratios ( $i=n_1/n_2$ )  
 (2) Number of stages  
 (3) Application specific configuration with NCP – [www.neugart.com](http://www.neugart.com)  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times



Drawing corresponds to a WPLE080 / 1-stage / output shaft with feather key / 19 mm clamping system / motor adaptation – 2-part – square universal flange / 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>			WPLE040	WPLE060	WPLE080	WPLE120	p <sup>(3)</sup>	Code
Pitch circle diameter output	D1		34 (1.339)	52 (2.047)	70 (2.756)	100 (3.937)		
Shaft diameter output	D3	h7	10 (0.394)	14 (0.551)	20 (0.787)	25 (0.984)		
Shaft collar output	D4		12 (0.472)	17 (0.669)	25 (0.984)	35 (1.378)		
Centering diameter output	D5	h7	26 (1.024)	40 (1.575)	60 (2.362)	80 (3.150)		
Housing diameter	D6		40 (1.575)	60 (2.362)	80 (3.150)	115 (4.528)		
Mounting thread x depth	G1	4x	M4x6	M5x8	M6x10	M10x16		
Total length	L1		110 (4.331)	147 (5.787)	184 (7.244)	249.5 (9.823)	1	
			123 (4.843)	159.5 (6.280)	201.5 (7.933)	277 (10.906)	2	
			135.5 (5.335)	172 (6.772)	219 (8.622)	304.5 (11.988)	3	
Shaft length output	L3		26 (1.024)	35 (1.378)	40 (1.575)	55 (2.165)		
Centering depth output	L7		2 (0.079)	3 (0.118)	3 (0.118)	4 (0.157)		
Min. overall height	L23		67 (2.638)	85.5 (3.366)	109.5 (4.311)	145.5 (5.728)		
Motor shaft diameter j6/k6	D20		More information on page 191/192					
Clamping system diameter input	D26		More information on page 60					
Output shaft with feather key (DIN 6885-1)			A 3x3x18	A 5x5x25	A 6x6x28	A 8x7x40		A
Feather key width (DIN 6885-1)	B1		3 (0.118)	5 (0.197)	6 (0.236)	8 (0.315)		
Shaft height including feather key (DIN 6885-1)	H1		11.2 (0.441)	16 (0.630)	2.5 (0.886)	28 (1.102)		
Shaft length from shoulder	L4		23 (0.906)	30 (1.181)	36 (1.417)	50 (1.969)		
Feather key length	L5		18 (0.709)	25 (0.984)	28 (1.102)	40 (1.575)		
Distance from shaft end	L6		2.5 (0.098)	2.5 (0.098)	4 (0.157)	5 (0.197)		
Center hole (DIN 332, type DR)	C		M3x9	M5x12,5	M6x16	M10x22		
Smooth output shaft								B
Shaft length from shoulder	L4		23 (0.906)	30 (1.181)	36 (1.417)	50 (1.969)		

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

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





# WPLQE

The right angle planetary gearbox with universal output flange – flexible installation options and for high forces

Our **WPLQE** is the right-angle gearbox with a square output flange. This makes it particularly easy to mount, versatile and, thanks to its larger deep groove ball bearings, also suitable for higher radial and axial forces.

Cyclic torque **14 - 260 Nm**



Radial force **1500 - 4000 N**



Axial force **1950 - 3800 N**



Torsional backlash **11 - 21 arcmin**

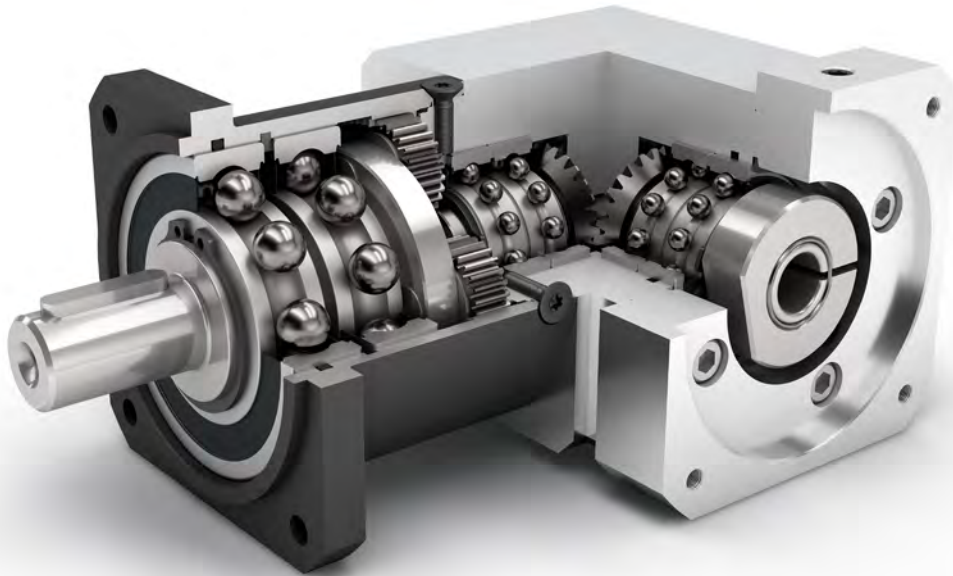


Protection class **IP54**



Frame sizes

- 60
- 80
- 120



WPLQE



Economy Line



Equidirectional rotation



Bevel gear right angle stage



Reinforced deep groove ball bearings



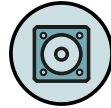
Planet carrier in disc design



Right angle gearbox



Spur gear



Square type output flange



High ratio variety  $i=3$  up to  $i=512$



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			WPLQE060	WPLQE080	WPLQE120	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000			
	Efficiency <sup>(3)</sup>	η	%	95			1
94				2			
88				3			
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)			
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)			
	Protection class	IP54					
<b>S</b>	Standard lubrication	Grease (lifetime lubrication)					
<b>F</b>	Food grade lubrication	Grease (lifetime lubrication)					
	Installation position	Any					
<b>S</b>	Standard backlash	φ	arcmin	< 16	< 13	< 11	1
				< 18	< 15	< 13	2
				< 21	< 17	< 15	3
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>t</sub> .in/ arcmin)	1.9 - 3.1 (17 - 27)	4.4 - 9.4 (39 - 83)	9.3 - 15.3 (82 - 135)	1
				3.3 - 4.0 (29 - 35)	8.5 - 13.0 (75 - 115)	15.3 - 19.0 (135 - 168)	2
				3.3 - 4.1 (29 - 36)	9.4 - 13.3 (83 - 118)	15.6 - 19.0 (138 - 168)	3
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	1.8 (4.0)	4.2 - 4.5 (9.3 - 9.9)	10.4 - 10.5 (22.9 - 23.1)	1
				1.9 - 2.0 (4.3 - 4.5)	4.9 - 5.0 (10.9 - 11.0)	12.1 - 12.3 (26.7 - 27.1)	2
				2.2 (4.8 - 4.9)	5.4 - 5.5 (11.9 - 12.1)	13.9 - 14.1 (30.7 - 31.1)	3
<b>S</b>	Standard surface	Housing: Steel – heat-treated and post-oxidized (black)					
<b>B</b>	Painted surface <sup>(4)</sup>	RAL 9005 Jet black					
	Running noise <sup>(3)</sup>	L <sub>pA</sub>	dB(A)	70	73	75	

Output shaft loads			WPLQE060	WPLQE080	WPLQE120	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N (lb <sub>f</sub> )	1500 (337)	2500 (562)	4000 (899)	
Maximum axial force	F <sub>a max</sub>		1950 (438)	3800 (854)	3800 (854)	
Maximum tilting moment	M <sub>k max</sub>	Nm (lb <sub>t</sub> .in)	62 (544)	124 (1096)	314 (2779)	

Input characteristics			WPLQE060	WPLQE080	WPLQE120	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	11 (C)	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	
			14 (D) <sup>(5)</sup>	-	-	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>t</sub> . in.s <sup>2</sup> 10 <sup>-4</sup> )	0.228 - 0.377 (2.018 - 3.337)	0.874 - 1.355 (7.736 - 11.993)	2.648 - 3.702 (23.437 - 32.765)	1
			0.228 - 0.357 (2.018 - 3.160)	0.869 - 1.196 (7.691 - 10.585)	2.679 - 3.601 (23.711 - 31.872)	2
			0.228 - 0.238 (2.018 - 2.106)	0.868 - 1.162 (7.682 - 10.285)	2.679 - 3.506 (23.711 - 31.031)	3
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>t</sub> .in)	0.15 - 0.20 (1 - 2)	0.25 - 0.65 (2 - 6)	0.80 - 1.35 (7 - 12)	1
			0.15 - 0.20 (1 - 2)	0.25 - 0.60 (2 - 5)	0.85 - 1.45 (8 - 13)	2
			0.15 (1)	0.25 - 0.35 (2 - 3)	0.85 - 1.00 (8 - 9)	3
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		5 (44)	10,5 (93)	26 (230)	

<sup>(1)</sup> Number of stages

<sup>(2)</sup> Application specific configuration with NCP – www.neugart.com

<sup>(3)</sup> The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com

<sup>(4)</sup> More information on page 183

<sup>(5)</sup> Reference clamping system diameter

Output torques			WPLQE060	WPLQE080	WPLQE120	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)</sup>	T <sub>zz</sub>	Nm (lb <sub>r</sub> .in)	14 (124)	40 (354)	78 (690)	3	1
			19 (168)	53 (469)	104 (920)	4	
			24 (212)	67 (593)	130 (1151)	5	
			25 (221)	65 (575)	135 (1195)	7	
			18 (159)	50 (443)	120 (1062)	8	
			15 (133)	38 (336)	95 (841)	10	
			43 (381)	120 (1062)	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	3
			40 (354)	110 (974)	230 (2036)	40	
			18 (159)	50 (443)	120 (1062)	64	
			44 (389)	120 (1062)	260 (2301)	60	
			44 (389)	120 (1062)	260 (2301)	80	
			44 (389)	120 (1062)	260 (2301)	100	
			44 (389)	110 (974)	230 (2036)	120	3
			44 (389)	120 (1062)	260 (2301)	160	
			40 (354)	110 (974)	230 (2036)	200	
			44 (389)	120 (1062)	260 (2301)	256	
			40 (354)	110 (974)	230 (2036)	320	
			18 (159)	50 (443)	120 (1062)	512	
Maximum torque <sup>(3)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	23 (204)	64 (566)	124 (1097)	3	1
			30 (266)	85 (752)	166 (1469)	4	
			38 (336)	107 (947)	205 (1814)	5	
			40 (354)	104 (920)	215 (1903)	7	
			28 (248)	80 (708)	192 (1699)	8	
			24 (212)	60 (531)	152 (1345)	10	
			69 (611)	182 (1611)	335 (2965)	9	2
			65 (575)	192 (1699)	415 (3673)	12	
			70 (620)	176 (1558)	365 (3231)	15	
			65 (575)	192 (1699)	415 (3673)	16	
			65 (575)	192 (1699)	415 (3673)	20	
			61 (540)	176 (1558)	365 (3231)	25	
			65 (575)	192 (1699)	415 (3673)	32	3
			61 (540)	176 (1558)	365 (3231)	40	
			28 (248)	80 (708)	192 (1699)	64	
			65 (575)	192 (1699)	415 (3673)	60	
			65 (575)	192 (1699)	415 (3673)	80	
			65 (575)	192 (1699)	415 (3673)	100	
			70 (620)	176 (1558)	365 (3231)	120	3
			65 (575)	192 (1699)	415 (3673)	160	
			61 (540)	176 (1558)	365 (3231)	200	
			65 (575)	192 (1699)	415 (3673)	256	
			61 (540)	176 (1558)	365 (3231)	320	
			28 (248)	80 (708)	192 (1699)	512	

WPLQE

<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)

Output torques			WPLQE060	WPLQE080	WPLQE120	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>r</sub> .in)	6 (53)	13.5 (119)	32 (283)	3	1
			8.5 (75)	18 (159)	43 (381)	4	
			10.5 (93)	22 (195)	53 (469)	5	
			15 (133)	32 (283)	75 (664)	7	
			15 (133)	36 (319)	86 (761)	8	
			12.5 (111)	32 (283)	80 (708)	10	
			19 (168)	41 (363)	96 (850)	9	2
			25 (221)	55 (487)	129 (1142)	12	
			32 (283)	68 (602)	161 (1425)	15	
			34 (301)	73 (646)	172 (1522)	16	
			37 (327)	91 (805)	215 (1903)	20	
			34 (301)	93 (823)	195 (1726)	25	
			37 (327)	102 (903)	220 (1947)	32	3
			34 (301)	93 (823)	195 (1726)	40	
			15 (133)	42 (372)	102 (903)	64	
			37 (327)	102 (903)	220 (1947)	60	
			37 (327)	102 (903)	220 (1947)	80	
			37 (327)	102 (903)	220 (1947)	100	
			37 (327)	93 (823)	195 (1726)	120	
			37 (327)	102 (903)	220 (1947)	160	
			34 (301)	93 (823)	195 (1726)	200	
			37 (327)	102 (903)	220 (1947)	256	
			34 (301)	93 (823)	195 (1726)	320	
			15 (133)	42 (372)	102 (903)	512	

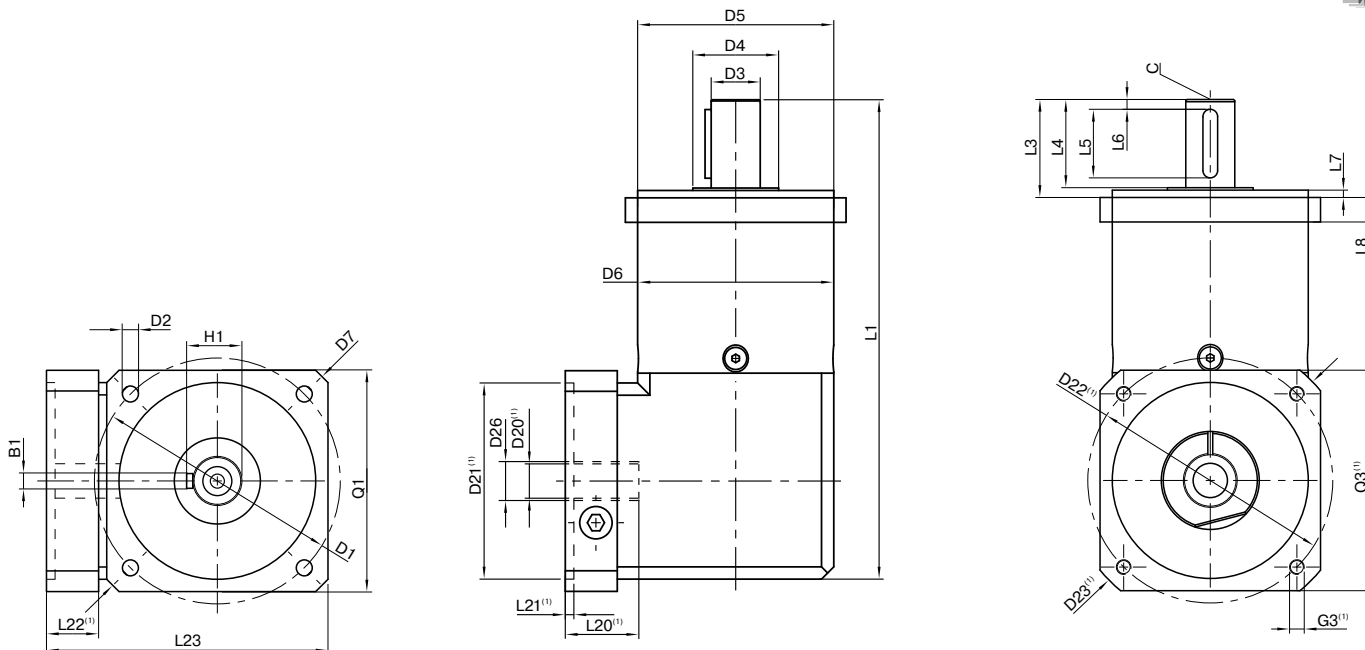
Input speeds			WPLQE060	WPLQE080	WPLQE120	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	4500	4000	3500	3	1
			4500	4000	3500	4	
			4500	4000	3500	5	
			4500	4000	3500	7	
			4500	4000	3500	8	
			4500	4000	3500	10	
			4500	4000	3500	9	2
			4500	4000	3500	12	
			4500	4000	3500	15	
			4500	4000	3500	16	
			4500	4000	3500	20	
			4500	4000	3500	25	
			4500	4000	3500	32	3
			4500	4000	3500	40	
			4500	4000	3500	64	
			4500	4000	3500	60	
			4500	4000	3500	80	
			4500	4000	3500	100	
			4500	4000	3500	120	
			4500	4000	3500	160	
			4500	4000	3500	200	
			4500	4000	3500	256	
			4500	4000	3500	320	
			4500	4000	3500	512	
Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	13000	7000	6500		

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – [www.neugart.com](http://www.neugart.com)  
 (4) Based on reference clamping system diameter

Output torques			WPLQE060	WPLQE080	WPLQE120	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(3)(4)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>r</sub> .in)	60 (531)	135 (1195)	300 (2655)	3	1
			80 (708)	180 (1593)	400 (3540)	4	
			80 (708)	220 (1947)	500 (4425)	5	
			80 (708)	178 (1575)	340 (3009)	7	
			80 (708)	190 (1682)	380 (3363)	8	
			70 (620)	170 (1505)	430 (3806)	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	
			88 (779)	220 (1947)	520 (4602)	60	
			88 (779)	240 (2124)	520 (4602)	80	
			88 (779)	240 (2124)	520 (4602)	100	
			88 (779)	220 (1947)	500 (4425)	120	
			88 (779)	240 (2124)	520 (4602)	160	
			80 (708)	220 (1947)	500 (4425)	200	
			88 (779)	240 (2124)	520 (4602)	256	
			80 (708)	220 (1947)	500 (4425)	320	
			80 (708)	190 (1682)	380 (3363)	512	

WPLQE

<sup>(1)</sup> Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
<sup>(2)</sup> Number of stages  
<sup>(3)</sup> Permitted 1000 times  
<sup>(4)</sup> Based on reference clamping system diameter



Drawing corresponds to a WPLQE080 / 1-stage / output shaft with feather key / 19 mm clamping system / motor adaptation – 2-part – square universal flange / 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>			WPLQE060	WPLQE080	WPLQE120	p <sup>(3)</sup>	Code
Pitch circle diameter output	D1		75 (2.953)	100 (3.937)	130 (5.118)		
Mounting bore output	D2	4x	5.5 (0.217)	6.5 (0.256)	8.5 (0.335)		
Shaft diameter output	D3	h7	16 (0.630)	20 (0.787)	25 (0.984)		
Shaft collar output	D4		20 (0.787)	35 (1.378)	35 (1.378)		
Centering diameter output	D5	h7	60 (2.362)	80 (3.150)	110 (4.331)		
Housing diameter	D6		60 (2.362)	80 (3.150)	115 (4.528)		
Diagonal dimension output	D7		92 (3.622)	116 (4.567)	145 (5.709)		
Flange cross section output	Q1	■	70 (2.756)	90 (3.543)	115 (4.528)		
Total length	L1		152 (5.984)	195,5 (7.697)	274,5 (10.807)	1	
			164.5 (6.476)	213 (8.386)	302.5 (11.909)	2	
			177 (6.969)	230.5 (9.075)	330 (12.992)	3	
Shaft length output	L3		32 (1.260)	40 (1.575)	55 (2.165)		
Centering depth output	L7		3 (0.118)	3 (0.118)	4 (0.157)		
Flange thickness output	L8		10 (0.394)	10 (0.394)	15 (0.591)		
Min. overall height	L23		90.5 (3.563)	114.5 (4.508)	145.5 (5.728)		
Motor shaft diameter j6/k6	D20		More information on page 191/192				
Clamping system diameter input	D26		More information on page 68				
Output shaft with feather key (DIN 6885-1)			A 5x5x20	A 6x6x28	A 8x7x40		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		18 (0.709)	22.5 (0.886)	28 (1.102)		
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	50 (1.969)		
Feather key length	L5		20 (0.787)	28 (1.102)	40 (1.575)		
Distance from shaft end	L6		4 (0.157)	4 (0.157)	5 (0.197)		
Center hole (DIN 332, type DR)	C		M5x12,5	M6x16	M10x22		
Smooth output shaft							B
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	50 (1.969)		

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

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





# WPLPE

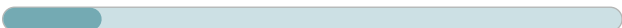
The economical right angle planetary gearbox for particularly high forces – flexible installation options and lifetime lubrication

The **WPLPE** is the sought-after angle solution from our Economy range: space-saving yet powerful at an attractive price. You attach your drive elements directly to the output shaft, which can also withstand high radial forces thanks to extra-strong deep groove ball bearings.

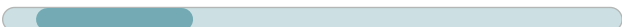
Cyclic torque **5 - 195 Nm**



Radial force **1300 - 4000 N**



Axial force **1000 - 5900 N**



Torsional backlash **11 - 25 arcmin**



Protection class **IP54**



Baugrößen  
Frame sizes

- 50
- 70
- 90
- 120



Economy Line



Right angle gearbox



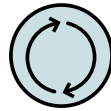
Spur gear



Round type output flange



Reinforced deep groove ball bearings



Equidirectional rotation



Bevel gear right angle stage



Reinforced deep groove ball bearings



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			WPLPE050	WPLPE070	WPLPE090	WPLPE120	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000				
	Efficiency <sup>(3)</sup>	η	%	95				1
				94				2
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)				
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)				
	Protection class			IP54				
<b>S</b>	Standard lubrication			Grease (lifetime lubrication)				
<b>F</b>	Food grade lubrication			Grease (lifetime lubrication)				
	Installation position			Any				
<b>S</b>	Standard backlash	φ	arcmin	< 21	< 16	< 13	< 11	1
				< 25	< 18	< 15	< 13	2
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>f</sub> .in/ arcmin)	0.5 - 0.8 (4 - 7)	2.2 - 4.1 (19 - 36)	4.7 - 10.8 (42 - 96)	13.1 - 28.0 (116 - 248)	1
				0.7 - 1.1 (6 - 9)	3.3 - 5.7 (29 - 50)	9.7 - 15.7 (86 - 139)	21.0 - 42.5 (186 - 376)	2
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	0.8 (1.8 - 1.9)	2.1 - 2.2 (4.7)	4.8 (10.5 - 10.7)	11.4 - 11.5 (25.1 - 25.4)	1
				1.0 - 1.3 (2.2 - 2.9)	2.4 - 2.6 (5.3 - 5.7)	5.4 - 5.6 (12.0 - 12.3)	13.3 - 13.6 (29.4 - 30.1)	2
<b>S</b>	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)				
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black				
	Running noise <sup>(3)</sup>	L <sub>pA</sub>	dB(A)	68	70	73	75	

Output shaft loads			WPLPE050	WPLPE070	WPLPE090	WPLPE120	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N (lb <sub>f</sub> )	1300 (292)	1500 (337)	3100 (697)	4000 (899)	
Maximum axial force	F <sub>a max</sub>		1000 (225)	2000 (450)	3800 (854)	5900 (1326)	
Maximum tilting moment	M <sub>K max</sub>	Nm (lb <sub>f</sub> .in)	42 (369)	61 (537)	162 (1429)	268 (2372)	

Input characteristics			WPLPE050	WPLPE070	WPLPE090	WPLPE120	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	8 (A)	11 (C)	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	
			9 (B) <sup>(5)</sup>	14 (D) <sup>(5)</sup>	-	-	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>f</sub> .in.s <sup>2</sup> ·10 <sup>-4</sup> )	0.040 - 0.060 (0.354 - 0.531)	0.224 - 0.336 (1.983 - 2.974)	0.877 - 1.361 (7.762 - 12.046)	2.686 - 4.073 (23.773 - 36.049)	1
			0.040 - 0.057 (0.354 - 0.504)	0.224 - 0.333 (1.983 - 2.947)	0.859 - 1.197 (7.603 - 10.594)	2.643 - 3.643 (23.393 - 32.243)	2
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>f</sub> .in)	0.05 (0)	0.15 - 0.20 (1 - 2)	0.25 - 0.65 (2 - 6)	0.85 - 1.55 (8 - 14)	1
			0.05 (0)	0.15 - 0.20 (1 - 2)	0.25 - 0.60 (2 - 5)	0.80 - 1.55 (7 - 14)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		2 (18)	5 (44)	10.5 (93)	26 (230)	

<sup>(1)</sup> Number of stages

<sup>(2)</sup> Application specific configuration with NCP – www.neugart.com

<sup>(3)</sup> The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com

<sup>(4)</sup> More information on page 183

<sup>(5)</sup> Reference clamping system diameter

Output torques			WPLPE050	WPLPE070	WPLPE090	WPLPE120	i <sup>(1)</sup>	p <sup>(2)</sup>		
Cyclic torque <sup>(3)</sup>	T <sub>2z</sub>	Nm (lb <sub>r</sub> .in)	4.5 (40)	14 (124)	40 (354)	78 (690)	3	1		
			6 (53)	19 (168)	53 (469)	104 (920)	4			
			7.5 (66)	24 (212)	67 (593)	130 (1151)	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			
			12 (106)	33 (292)	97 (859)	157 (1390)	9			
			15 (133)	33 (292)	90 (797)	195 (1726)	12			
				Nm (lb <sub>r</sub> .in)	13 (115)	33 (292)	82 (726)	172 (1522)	15	2
					15 (133)	33 (292)	90 (797)	195 (1726)	16	
					15 (133)	33 (292)	90 (797)	195 (1726)	20	
					13 (115)	30 (266)	82 (726)	172 (1522)	25	
					15 (133)	33 (292)	90 (797)	195 (1726)	32	
					13 (115)	30 (266)	82 (726)	172 (1522)	40	
					7.5 (66)	18 (159)	50 (443)	120 (1062)	64	
					5 (44)	15 (133)	38 (336)	95 (841)	100	
Maximum torque <sup>(3)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	7 (62)	23 (204)	64 (566)	124 (1097)	3	1		
			9.5 (84)	30 (266)	85 (752)	166 (1469)	4			
			12 (106)	38 (336)	107 (947)	205 (1814)	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			
			14.5 (128)	52 (460)	146 (1292)	250 (2213)	9			
			24 (212)	48 (425)	144 (1275)	310 (2744)	12			
				Nm (lb <sub>r</sub> .in)	20 (177)	52 (460)	131 (1159)	275 (2434)	15	2
					24 (212)	48 (425)	144 (1275)	310 (2744)	16	
					24 (212)	48 (425)	144 (1275)	310 (2744)	20	
					24 (212)	48 (425)	144 (1275)	310 (2744)	25	
					24 (212)	48 (425)	144 (1275)	310 (2744)	32	
					20 (177)	46 (407)	131 (1159)	275 (2434)	40	
					12 (106)	28 (248)	80 (708)	192 (1699)	64	
					8 (71)	24 (212)	60 (531)	152 (1345)	100	

WPLPE

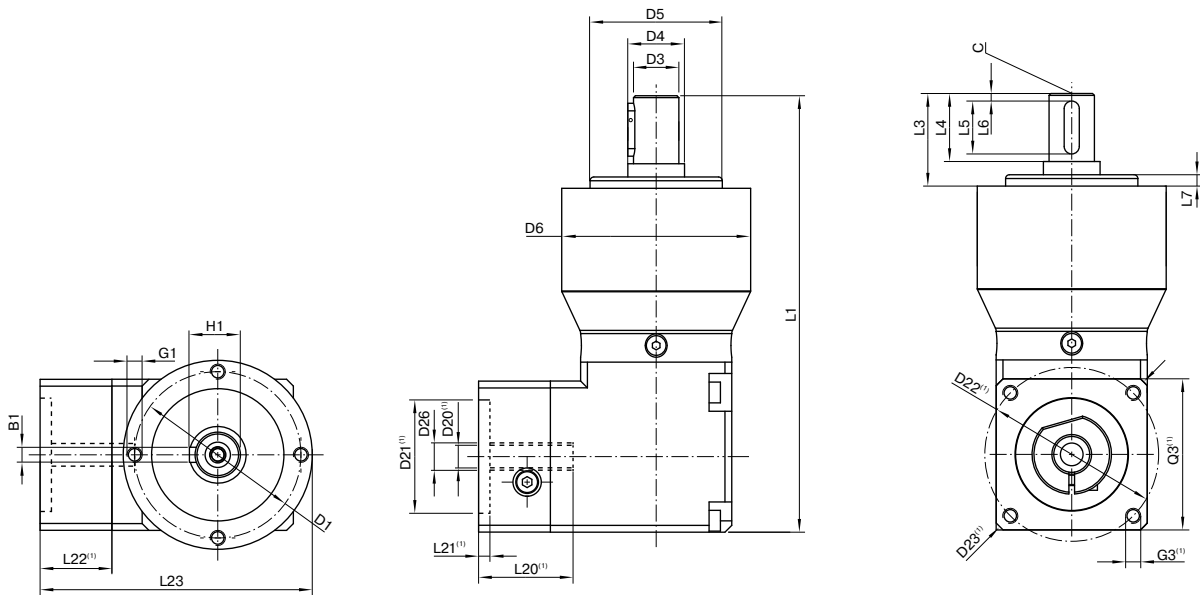
<sup>(1)</sup> Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
<sup>(2)</sup> Number of stages  
<sup>(3)</sup> Application specific configuration with NCP – [www.neugart.com](http://www.neugart.com)

Output torques			WPLPE050	WPLPE070	WPLPE090	WPLPE120	$i^{(1)}$	$p^{(2)}$
Continuous torque <sup>(3)</sup>	$T_{2D}$	Nm (lb <sub>f</sub> .in)	1.5 (13)	6 (53)	13.5 (119)	32 (283)	3	1
			2.5 (22)	8.5 (75)	18 (159)	43 (381)	4	
			3 (27)	10.5 (93)	22 (195)	53 (469)	5	
			4.5 (40)	15 (133)	32 (283)	75 (664)	7	
			5 (44)	15 (133)	36 (319)	86 (761)	8	
			4 (35)	12.5 (111)	32 (283)	80 (708)	10	
		5 (44)	19 (168)	41 (363)	98 (867)	9	2	
		7.5 (66)	24 (212)	55 (487)	129 (1142)	12		
		9.5 (84)	25 (221)	68 (602)	146 (1292)	15		
		10 (89)	26 (230)	73 (646)	165 (1460)	16		
		12.5 (111)	25 (221)	69 (611)	165 (1460)	20		
		11 (97)	25 (221)	69 (611)	146 (1292)	25		
		12.5 (111)	15 (133)	42 (372)	165 (1460)	32		
		11 (97)	15 (133)	42 (372)	146 (1292)	40		
		6 (53)	15 (133)	42 (372)	102 (903)	64		
		4 (35)	12.5 (111)	32 (283)	80 (708)	100		

Input speeds			WPLPE050	WPLPE070	WPLPE090	WPLPE120	$i^{(1)}$	$p^{(2)}$
Continuous input speed <sup>(3)(4)</sup>	$n_{1D}$	rpm	5000	4500	4000	3500	3	1
			5000	4500	4000	3500	4	
			5000	4500	4000	3500	5	
			5000	4500	4000	3500	7	
			5000	4500	4000	3500	8	
			5000	4500	4000	3500	10	
		5000	4500	4000	3300	9	2	
		5000	4500	4000	3500	12		
		5000	4500	4000	3500	15		
		5000	4500	4000	3500	16		
		5000	4500	4000	3500	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 <sup>(3)</sup>	$n_{1max}$	rpm	18000	13000	7000	6500		

Output torques			WPLPE050	WPLPE070	WPLPE090	WPLPE120	$i^{(1)}$	$p^{(2)}$
Emergency stop torque <sup>(4)(5)</sup>	$T_{2Stop}$	Nm (lb <sub>f</sub> .in)	12 (106)	60 (531)	135 (1195)	300 (2655)	3	1
			16 (142)	80 (708)	180 (1593)	400 (3540)	4	
			20 (177)	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	
			25 (221)	70 (620)	170 (1505)	430 (3806)	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)	205 (1814)	520 (4602)	32		
		36 (319)	80 (708)	205 (1814)	500 (4425)	40		
		27 (239)	80 (708)	190 (1682)	380 (3363)	64		
		27 (239)	75 (664)	170 (1505)	430 (3806)	100		

(1) Ratios ( $i=n_1/n_2$ )  
 (2) Number of stages  
 (3) Application specific configuration with NCP – [www.neugart.com](http://www.neugart.com)  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times



Drawing corresponds to a WPLPE090 / 1-stage / output shaft with feather key / 19 mm clamping system / motor adaptation – 2-part – square universal flange / 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>			WPLPE050	WPLPE070	WPLPE090	WPLPE120	p <sup>(3)</sup>	Code
Pitch circle diameter output	D1		44 (1.732)	62 (2.441)	80 (3.150)	108 (4.252)		
Shaft diameter output	D3	k7	12 (0.472)	16 (0.630)	22 (0.866)	32 (1.260)		
Shaft collar output	D4		15 (0.591)	30 (1.181)	35 (1.378)	50 (1.969)		
Centering diameter output	D5	h7	35 (1.378)	52 (2.047)	68 (2.677)	90 (3.543)		
Housing diameter	D6		50 (1.969)	70 (2.756)	90 (3.543)	120 (4.724)		
Mounting thread x depth	G1	4x	M4x8	M5x8	M6x9	M8x20		
Total length	L1		115.5 (4.547)	152.5 (6.004)	197.5 (7.776)	265 (10.433)	1	
			128 (5.039)	165.5 (6.516)	215.5 (8.484)	292.5 (11.516)	2	
Shaft length output	L3		24.5 (0.965)	36 (1.417)	46 (1.811)	68 (2.677)		
Centering depth output	L7		3 (0.118)	3 (0.118)	4 (0.157)	5 (0.197)		
Min. overall height	L23		72 (2.835)	90.5 (3.563)	114.5 (4.508)	148 (5.827)		
Motor shaft diameter j6/k6	D20		More information on page 191/192					
Clamping system diameter input	D26		More information on page 76					
Output shaft with feather key (DIN 6885-1)			A 4x4x14	A 5x5x25	A 6x6x32	A 10x8x50		A
Feather key width (DIN 6885-1)	B1		4 (0.157)	5 (0.197)	6 (0.236)	10 (0.394)		
Shaft height including feather key (DIN 6885-1)	H1		13.5 (0.531)	18 (0.709)	24,5 (0.965)	35 (1.378)		
Shaft length from shoulder	L4		18 (0.709)	28 (1.102)	36 (1.417)	58 (2.283)		
Feather key length	L5		14 (0.551)	25 (0.984)	32 (1.260)	50 (1.969)		
Distance from shaft end	L6		2 (0.079)	2 (0.079)	2 (0.079)	4 (0.157)		
Center hole (DIN 332, type DR)	C		M4x10	M5x12,5	M8x19	M12x28		
Smooth output shaft								B
Shaft length from shoulder	L4		18 (0.709)	28 (1.102)	36 (1.417)	58 (2.283)		

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

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



# WPLHE

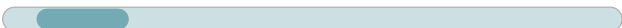
## Economical and with a heavy-duty output bearing: The WPLHE right-angle gearbox

Axially space-saving, economical, IP65-compliant and designed for high radial and axial forces at the output:  
The **WPLHE** combines all the advantages of the successful PLHE, the world's first combination of the Economy and Precision gearboxes, as an right-angle variant.

Cyclic torque **14 - 260 Nm**



Radial force **3200 - 6000 N**



Axial force **4400 - 8000 N**



Torsional backlash **11 - 18 arcmin**

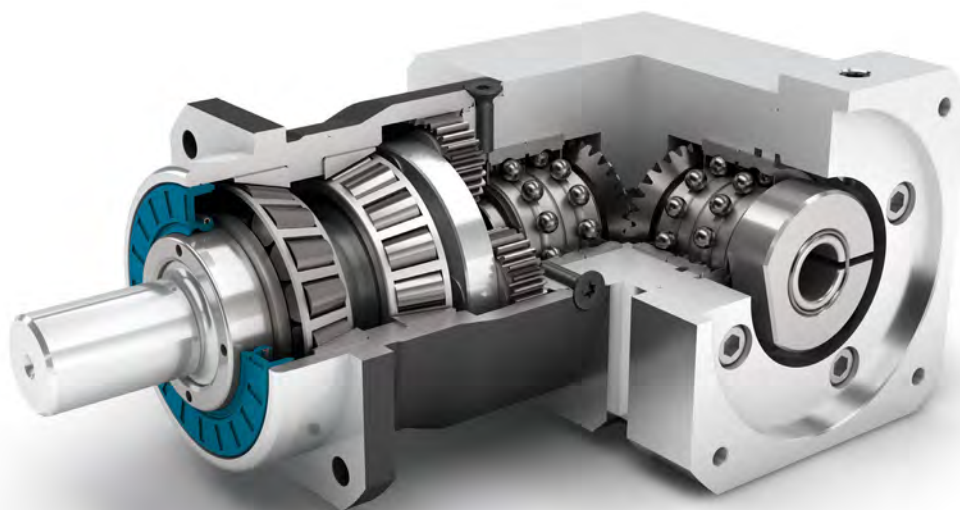


Protection class **IP65**



Frame sizes

- 60
- 80
- 120



WPLHE



Economy Line



Spur gear



Square type output flange



Rotary shaft seal



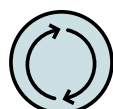
Planet carrier in disc design



Option: Rack and pinion  
Planetary gearbox (Details on page 158)



Right angle gearbox



Equidirectional rotation



Bevel gear right angle stage



Preloaded tapered roller bearings



Extra long centering collar



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			WPLHE060	WPLHE080	WPLHE120	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000			
	Efficiency <sup>(3)</sup>	η	%	94			
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)			
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)			
	Protection class			IP65			
<b>S</b>	Standard lubrication			Grease (lifetime lubrication)			
<b>F</b>	Food grade lubrication			Grease (lifetime lubrication)			
	Installation position			Any			
<b>S</b>	Standard backlash	φ	arcmin	< 16	< 13	< 11	1
				< 18	< 15	< 13	2
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>f</sub> .in/ arcmin)	1.8 - 3.4 (16 - 30)	4.1 - 9.0 (36 - 80)	11.2 - 20.5 (99 - 181)	1
				2.5 - 4.5 (22 - 40)	7.3 - 12.1 (65 - 107)	16.7 - 27.0 (148 - 239)	2
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	2.3 (5.0 - 5.1)	4.6 (10.0 - 10.1)	10.9 - 11.0 (23.9 - 24.2)	1
				2.5 (5.4 - 5.5)	5.0 - 5.1 (11.0 - 11.3)	12.5 - 12.8 (27.6 - 28.3)	2
<b>S</b>	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)			
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black			
	Running noise <sup>(3)</sup>	L <sub>pA</sub>	dB(A)	70	73	75	

Output shaft loads			WPLHE060	WPLHE080	WPLHE120	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N	3200 (719)	5500 (1236)	6000 (1349)	
Maximum axial force	F <sub>a max</sub>	(lb <sub>f</sub> )	3400 (764)	4500 (1012)	6500 (1461)	
Maximum tilting moment	M <sub>k max</sub>	Nm (lb <sub>f</sub> .in)	191 (1690)	383 (3393)	488 (4317)	

Input characteristics			WPLHE060	WPLHE080	WPLHE120	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm (in)	11 (C)	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	
			14 (D) <sup>(5)</sup>	-	-	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>f</sub> .in.s <sup>2</sup> 10 <sup>-4</sup> )	0.231 - 0.413 (2.045 - 3.655)	0.921 - 1.394 (8.152 - 12.338)	1.832 - 2.970 (16.215 - 26.287)	1
			0.226 - 0.361 (2.000 - 3.195)	0.906 - 1.246 (8.019 - 11.028)	1.818 - 2.787 (16.091 - 24.667)	2
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>f</sub> .in)	0.30 - 0.65 (3 - 6)	0.60 - 1.20 (5 - 11)	1.10 - 2.20 (10 - 19)	1
			0.20 - 0.30 (2 - 3)	0.45 - 0.65 (4 - 6)	0.90 - 1.40 (8 - 12)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		5 (44)	10.5 (93)	26 (230)	

<sup>(1)</sup> Number of stages

<sup>(2)</sup> Application specific configuration with NCP – [www.neugart.com](http://www.neugart.com)

<sup>(3)</sup> The ratio-dependent values can be retrieved in Tec Data Finder – [www.neugart.com](http://www.neugart.com)

<sup>(4)</sup> More information on page 183

<sup>(5)</sup> Reference clamping system diameter

Output torques			WPLHE060	WPLHE080	WPLHE120	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)</sup>	T <sub>zz</sub>	Nm (lb <sub>r</sub> .in)	14 (124)	40 (354)	78 (690)	3	1
			19 (168)	53 (469)	104 (920)	4	
			24 (212)	67 (593)	130 (1151)	5	
			25 (221)	65 (575)	135 (1195)	7	
			18 (159)	50 (443)	120 (1062)	8	
			15 (133)	38 (336)	95 (841)	10	
			43 (381)	120 (1062)	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	
Maximum torque <sup>(3)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	23 (204)	64 (566)	124 (1097)	3	1
			30 (266)	85 (752)	166 (1469)	4	
			38 (336)	107 (947)	205 (1814)	5	
			40 (354)	104 (920)	215 (1903)	7	
			28 (248)	80 (708)	192 (1699)	8	
			24 (212)	60 (531)	152 (1345)	10	
			69 (611)	182 (1611)	335 (2965)	9	2
			65 (575)	192 (1699)	415 (3673)	12	
			70 (620)	176 (1558)	365 (3231)	15	
			65 (575)	192 (1699)	415 (3673)	16	
			65 (575)	192 (1699)	415 (3673)	20	
			61 (540)	176 (1558)	365 (3231)	25	
			65 (575)	192 (1699)	415 (3673)	32	
			61 (540)	176 (1558)	365 (3231)	40	
			28 (248)	80 (708)	192 (1699)	64	
			24 (212)	60 (531)	152 (1345)	100	

WPLHE

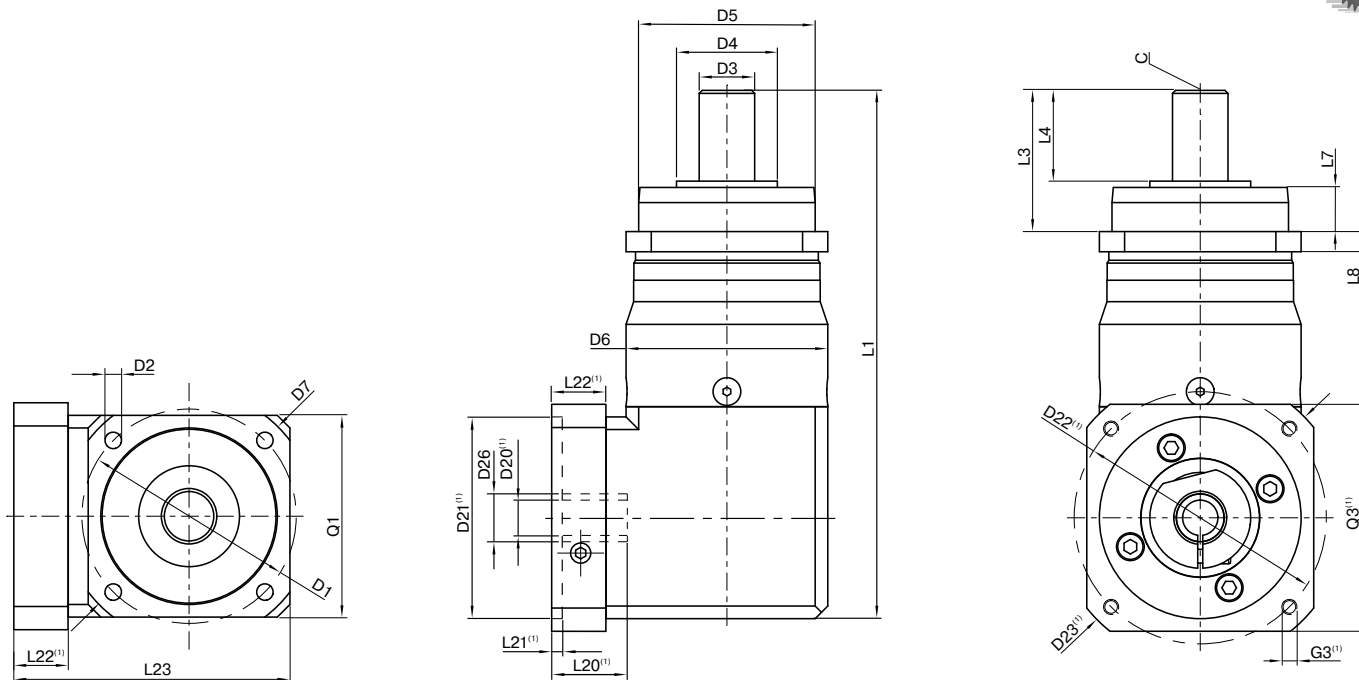
<sup>(1)</sup> Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
<sup>(2)</sup> Number of stages  
<sup>(3)</sup> Application specific configuration with NCP – www.neugart.com

Output torques			WPLHE060	WPLHE080	WPLHE120	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>f</sub> .in)	7 (62)	15.5 (137)	34 (301)	3	1
			8.5 (75)	19.5 (173)	43 (381)	4	
			10.5 (93)	23 (204)	53 (469)	5	
			15 (133)	32 (283)	75 (664)	7	
			15 (133)	36 (319)	86 (761)	8	
			12.5 (111)	32 (283)	80 (708)	10	
			20 (177)	42 (372)	107 (947)	9	2
			25 (221)	55 (487)	137 (1213)	12	
			32 (283)	68 (602)	168 (1487)	15	
			34 (301)	73 (646)	181 (1602)	16	
			37 (327)	91 (805)	220 (1947)	20	
			34 (301)	93 (823)	195 (1726)	25	
			37 (327)	102 (903)	220 (1947)	32	
			34 (301)	93 (823)	195 (1726)	40	
			15 (133)	42 (372)	102 (903)	64	
			12.5 (111)	32 (283)	80 (708)	100	

Input speeds			WPLHE060	WPLHE080	WPLHE120	i <sup>(1)</sup>	p <sup>(2)</sup>				
Continuous input speed <sup>(3/4)</sup>	n <sub>1D</sub>	rpm	3100	2750	3000	3	1				
			3950	3300	3500	4					
			4500	3800	3500	5					
			4500	4000	3500	7					
			4500	4000	3500	8					
			4500	4000	3500	10					
			3900	3600	2550	9	2				
			4500	3950	2900	12					
			4500	4000	3100	15					
			4500	4000	3000	16					
			4500	4000	3100	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 <sup>(3)</sup>	n <sub>1max</sub>	rpm	13000		7000	6500		

Output torques			WPLHE060	WPLHE080	WPLHE120	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4/5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>f</sub> .in)	60 (531)	135 (1195)	300 (2655)	3	1
			80 (708)	180 (1593)	400 (3540)	4	
			80 (708)	220 (1947)	500 (4425)	5	
			80 (708)	178 (1575)	340 (3009)	7	
			80 (708)	190 (1682)	380 (3363)	8	
			70 (620)	170 (1505)	430 (3806)	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	
			75 (664)	200 (1770)	430 (3806)	100	

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times



Drawing corresponds to a WPLHE080 / 1-stage / smooth output shaft / 19 mm clamping system / motor adaptation – 2-part – square universal flange / 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>			WPLHE060	WPLHE080	WPLHE120	p <sup>(3)</sup>	Code
Pitch circle diameter output	D1		68 (2.677) - 75 (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	k7	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	h7	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)		
Total length	L1		168 (6.614)	209.5 (8.248)	272.5 (10.728)	1	
			180.5 (7.106)	227.5 (8.957)	300 (11.811)	2	
Shaft length output	L3		48 (1.890)	56 (2.205)	88 (3.465)		
Centering depth output	L7		19 (0.748)	18 (0.689)	28 (1.102)		
Flange thickness output	L8		7 (0.276)	8 (0.315)	10 (0.394)		
Min. overall height	L23		90.5 (3.563)	109.5 (4.311)	145.5 (5.728)		
Motor shaft diameter j6/k6	D20		More information on page 191/192				
Clamping system diameter input	D26		More information on page 82				
Output shaft with feather key (DIN 6885-1)			A 5x5x25	A 6x6x28	A 10x8x50		
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)		A
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)	C		M5x12.5	M8x19	M12x28		
Smooth output shaft							
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	58 (2.283)		B
Splined output shaft (DIN 5480)			W16x0.8x18x6m	W22x1.25x16x6m	W32x1.25x24x6m		
Width of gearing	L <sub>v</sub>		15 (0.591)	15 (0.591)	15 (0.591)		C
Shaft length output	L3		46 (1.811)	46 (1.811)	56 (2.205)		
Shaft length from shoulder	L4		26 (1.024)	26 (1.024)	26 (1.024)		
Center hole (DIN 332, type DR)	C		M5x12.5	M8x19	M12x28		

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

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



# WPLFE

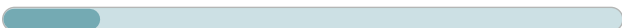
The shortest right-angle gearbox with flange output shaft and high torsional stiffness

The **WPLFE** is our right-angle planetary gearbox with a compact flange output shaft. You save up to a third of the space. Its standardized flange interface makes it particularly easy to install. The integrated dowel pin drill hole provides additional stability during installation.

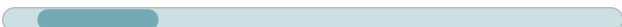
Cyclic torque **14 - 260 Nm**



Radial force **900 - 3800 N**



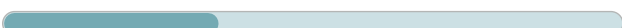
Axial force **1200 - 5200 N**



Torsional backlash **11 - 18 arcmin**

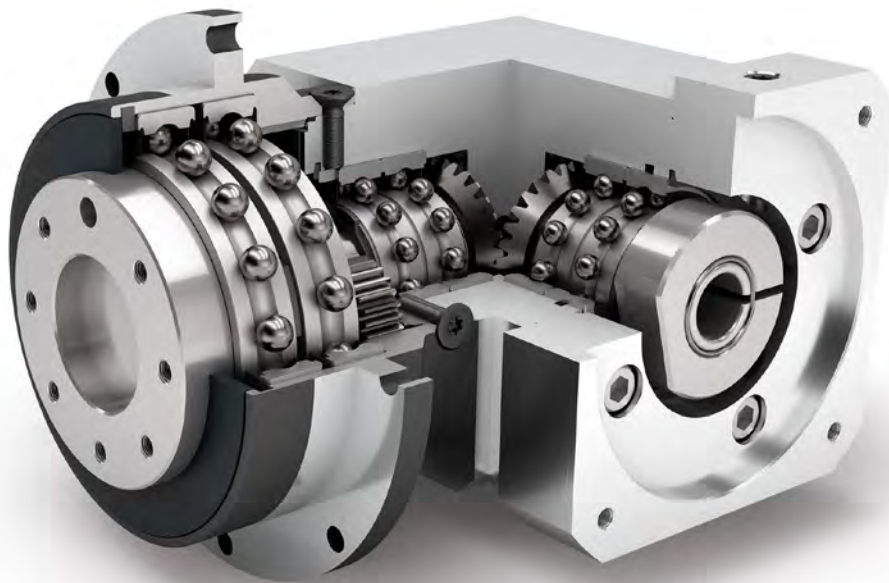


Protection class **IP54**



Frame sizes

- 64
- 90
- 110



WPLFE



Economy Line



Equidirectional rotation



Bevel gear right angle stage



Low-friction deep groove ball bearings



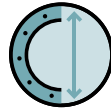
Planet carrier in disc design



Right angle gearbox



Spur gear



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		WPLFE064	WPLFE090	WPLFE110	p <sup>(1)</sup>	
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000			
	Efficiency <sup>(3)</sup>	η	%	94			1
				93			2
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)			
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)			
	Protection class			IP54			
<b>S</b>	Standard lubrication			Grease (lifetime lubrication)			
<b>F</b>	Food grade lubrication			Grease (lifetime lubrication)			
	Installation position			Any			
<b>S</b>	Standard backlash	φ	arcmin	< 16	< 13	< 11	1
				< 18	< 15	< 13	2
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>f</sub> .in/ arcmin)	2.9 - 6.2 (26 - 55)	5.8 - 17.5 (51 - 155)	15.9 - 40.5 (141 - 358)	1
				5.1 - 11.6 (45 - 103)	15.9 - 37.5 (141 - 332)	29.5 - 83.0 (261 - 735)	2
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	1.8 (4.0)	4.5 - 4.6 (9.9 - 10.0)	10.4 - 10.5 (23.0 - 23.2)	1
				2.0 - 2.1 (4.4 - 4.7)	5.0 - 5.2 (11.0 - 11.5)	12.1 - 12.5 (26.7 - 27.5)	2
<b>S</b>	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)			
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black			
	Running noise <sup>(3)</sup>	L <sub>pA</sub>	dB(A)	70	73	75	

Output shaft loads		WPLFE064	WPLFE090	WPLFE110	p <sup>(1)</sup>	
Maximum radial force	F <sub>r max</sub>	N	900 (202)	2200 (495)	3800 (854)	
Maximum axial force	F <sub>a max</sub>	(lb <sub>f</sub> )	1200 (270)	3300 (742)	5200 (1169)	
Maximum tilting moment	M <sub>K max</sub>	Nm (lb <sub>f</sub> .in)	20 (175)	73 (643)	173 (1530)	

Input characteristics		WPLFE064	WPLFE090	WPLFE110	p <sup>(1)</sup>	
Clamping system diameter input (Code)	D26	mm	11 (C)	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	
			14 (D) <sup>(5)</sup>	-	-	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>f</sub> .in.s <sup>2</sup> 10 <sup>-4</sup> )	0.234 - 0.445 (2.071 - 3.939)	0.909 - 1.735 (8.045 - 15.356)	2.751 - 4.739 (24.348 - 41.944)	1
			0.226 - 0.365 (2.000 - 3.231)	0.861 - 1.238 (7.620 - 10.957)	2.644 - 3.716 (23.401 - 32.889)	2
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>f</sub> .in)	0.15 - 0.30 (1 - 3)	0.35 - 0.95 (3 - 8)	1.10 - 2.30 (10 - 20)	1
			0.15 - 0.20 (1 - 2)	0.25 - 0.70 (2 - 6)	0.85 - 1.80 (8 - 16)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		5 (44)	10.5 (93)	26 (230)	

<sup>(1)</sup> Number of stages

<sup>(2)</sup> Application specific configuration with NCP – [www.neugart.com](http://www.neugart.com)

<sup>(3)</sup> The ratio-dependent values can be retrieved in Tec Data Finder – [www.neugart.com](http://www.neugart.com)

<sup>(4)</sup> More information on page 183

<sup>(5)</sup> Reference clamping system diameter

Output torques			WPLFE064	WPLFE090	WPLFE110	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)</sup>	T <sub>2z</sub>	Nm (lb <sub>r</sub> .in)	14 (124)	40 (354)	78 (690)	3	1
			19 (168)	53 (469)	104 (920)	4	
			24 (212)	67 (593)	130 (1151)	5	
			25 (221)	65 (575)	135 (1195)	7	
			18 (159)	50 (443)	120 (1062)	8	
			15 (133)	38 (336)	95 (841)	10	
			43 (381)	120 (1062)	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	
Maximum torque <sup>(3)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	23 (204)	64 (566)	124 (1097)	3	1
			30 (266)	85 (752)	166 (1469)	4	
			38 (336)	107 (947)	205 (1814)	5	
			40 (354)	104 (920)	215 (1903)	7	
			28 (248)	80 (708)	192 (1699)	8	
			24 (212)	60 (531)	152 (1345)	10	
			69 (611)	182 (1611)	335 (2965)	9	2
			65 (575)	192 (1699)	415 (3673)	12	
			70 (620)	176 (1558)	365 (3231)	15	
			65 (575)	192 (1699)	415 (3673)	16	
			65 (575)	192 (1699)	415 (3673)	20	
			61 (540)	176 (1558)	365 (3231)	25	
			65 (575)	192 (1699)	415 (3673)	32	
			61 (540)	176 (1558)	365 (3231)	40	
			28 (248)	80 (708)	192 (1699)	64	
			24 (212)	60 (531)	152 (1345)	100	

WPLFE

<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)

Output torques			WPLFE064	WPLFE090	WPLFE110	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>f</sub> .in)	6 (53)	14 (124)	33 (292)	3	1
			8.5 (75)	18 (159)	43 (381)	4	
			10.5 (93)	22 (195)	53 (469)	5	
			15 (133)	32 (283)	75 (664)	7	
			15 (133)	36 (319)	86 (761)	8	
			12.5 (111)	32 (283)	80 (708)	10	
			19 (168)	41 (363)	99 (876)	9	2
			25 (221)	55 (487)	131 (1159)	12	
			32 (283)	68 (602)	162 (1434)	15	
			34 (301)	73 (646)	172 (1522)	16	
			0 (0)	91 (805)	0 (0)	20	
			34 (301)	93 (823)	195 (1726)	25	
			0 (0)	102 (903)	0 (0)	32	
			0 (0)	0 (0)	0 (0)	40	
			15 (133)	42 (372)	102 (903)	64	
			12.5 (111)	32 (283)	80 (708)	100	

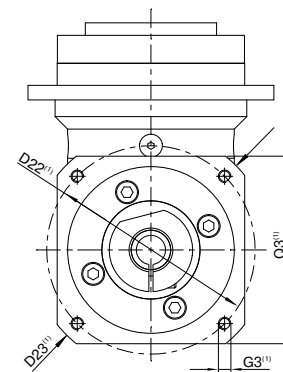
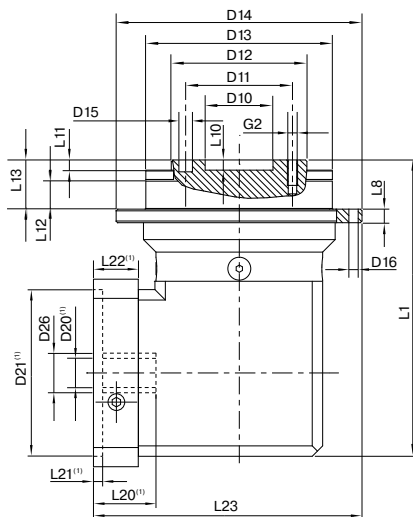
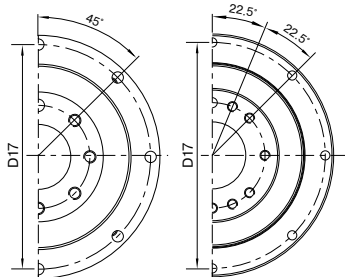
Input speeds			WPLFE064	WPLFE090	WPLFE110	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	4500	3550	3050	3	1
			4500	4000	3500	4	
			4500	4000	3500	5	
			4500	4000	3500	7	
			4500	4000	3500	8	
			4500	4000	3500	10	
			4500	4000	3200	9	2
			4500	4000	3300	12	
			4500	4000	3450	15	
			4500	4000	3500	16	
			4500	4000	3500	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 <sup>(3)</sup>	n <sub>1max</sub>	rpm	13000	7000	6500		

Output torques			WPLFE064	WPLFE090	WPLFE110	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>f</sub> .in)	60 (531)	135 (1195)	300 (2655)	3	1
			80 (708)	180 (1593)	400 (3540)	4	
			80 (708)	220 (1947)	500 (4425)	5	
			80 (708)	178 (1575)	340 (3009)	7	
			80 (708)	190 (1682)	380 (3363)	8	
			70 (620)	170 (1505)	430 (3806)	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)	205 (1814)	520 (4602)	32	
			80 (708)	205 (1814)	500 (4425)	40	
			80 (708)	190 (1682)	380 (3363)	64	
			75 (664)	200 (1770)	430 (3806)	100	

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times

WPLFE064  
WPLFE090

WPLFE110



Drawing corresponds to a WPLFE090 / 1-stage / flange output shaft with dowel hole / 19 mm clamping system / motor adaptation – 2-part – square universal flange / 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)

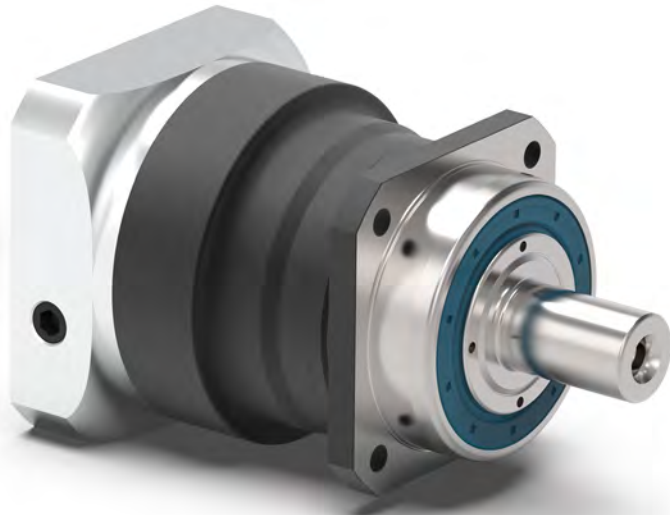
Geometry <sup>(2)</sup>			WPLFE064	WPLFE090	WPLFE110	p <sup>(3)</sup>	Code
Centering diameter output shaft	D10	H7	20 (0.787)	31.5 (1.240)	40 (1.575)		
Pitch circle diameter output shaft	D11		31.5 (1.240)	50 (1.969)	63 (2.480)		
Centering diameter output shaft	D12	h7	40 (1.575)	63 (2.480)	80 (3.150)		
Centering diameter output flange	D13		64 (2.520)	90 (3.543)	110 (4.331)		
Flange diameter output	D14		86 (3.386)	118 (4.646)	145 (5.709)		
Mounting bore output	D16		4.5 8x45°	5.5 8x45°	5.5 8x45°		
Pitch circle diameter output flange	D17		79 (3.110)	109 (4.291)	135 (5.315)		
Total length	L1		110.5 (4.350)	149 (5.866)	198.5 (7.815)	1	
			123 (4.843)	166.5 (6.555)	225.5 (8.878)	2	
Flange thickness output	L8		4 (0.157)	7 (0.276)	8 (0.315)		
Centering depth output shaft	L10		4 (0.157)	6 (0.236)	6 (0.236)		
	L11		3 (0.118)	6 (0.236)	6 (0.236)		
Centering depth output flange	L12		7.5 (0.295)	10.5 (0.413)	10.5 (0.413)		
Output flange length	L13		19.5 (0.768)	30.0 (1.181)	29.0 (1.142)		
Min. overall height	L23		98.5 (3.878)	128.5 (5.059)	160.5 (6.319)		
Motor shaft diameter j6/k6	D20		More information on page 191/192				
Clamping system diameter input	D26		More information on page 88				
Flange output shaft with dowel hole (ISO 9409-1)							E
Dowel hole x depth	D15	H7	5x6	6x7	6x7		
Number x thread x depth	G2		7 x M5x7	7 x M6x10	11 x M6x12		

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

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



**pro** **NEW**



# PSNpro

The helical precision planetary gearbox for low-noise operation and maximum performance

Thanks to its helical gearing, the **PSNpro** enables low-noise operation and maximum synchronisation quality. It is also ideal for high cycle torques. Its preloaded tapered roller bearings and square output flange ensure a high load capacity and allow high output shaft loads, even under extreme conditions.

Cyclic torque **14 - 1800 Nm**



Radial force **950 - 20000 N**



Axial force **2200 - 17000 N**



Torsional backlash **1 - 8 arcmin**



Protection class **IP65**



Frame sizes

- 55
- 70
- 90
- 115
- 142
- 190



2-stage



PSNpro



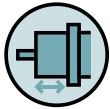
Precision Line



Helical gear



Preloaded tapered roller bearings



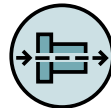
Extra long centering collar



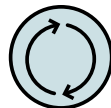
Option: Reduced backlash



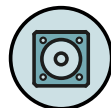
Option: Rack and pinion  
Planetary gearbox (Details on page 158)



Coaxial gearbox



Equidirectional rotation



Square type output flange



Rotary shaft seal



Planet carrier in cage design



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			PSNpro055	PSNpro070	PSNpro090	PSNpro115	PSNpro142	PSNpro190	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000						
	Efficiency <sup>(3)</sup>	η	%	97						1
				96						2
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)						
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)						
	Protection class			IP65						
<b>S</b>	Standard lubrication			Oil (lifetime lubrication)						
<b>F</b>	Food grade lubrication			Oil (lifetime lubrication)						
	Installation position			Any						
<b>S</b>	Standard backlash	φ	arcmin	< 6	< 3	< 3	< 3	< 3	< 3	1
				< 8	< 5	< 5	< 5	< 5	< 5	2
<b>R</b>	Reduced backlash	φ	arcmin	< 4	< 2	< 1	< 1	< 1	< 1	1
				< 6	< 3	< 1	< 1	< 1	< 1	2
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>i</sub> .in / arcmin)	1.3 - 1.9 (11 - 17)	3.6 - 5.0 (32 - 44)	10.5 - 13.9 (93 - 123)	28.0 - 39.0 (248 - 345)	62.0 - 88.0 (549 - 779)	181.0 - 246.0 (1602 - 2177)	1
				1.3 - 1.9 (11 - 17)	3.4 - 4.9 (30 - 43)	10.3 - 13.8 (91 - 122)	28.5 - 39.5 (252 - 350)	61.0 - 86.0 (540 - 761)	179.0 - 255.0 (1584 - 2257)	2
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	0.8 (1.7 - 1.9)	2.2 (4.8 - 4.9)	4.0 - 4.1 (8.8 - 8.9)	6.9 - 7.3 (15.3 - 16.1)	15.1 - 15.5 (33.3 - 34.2)	34.5 - 36.3 (76.1 - 80.1)	1
				1.1 (2.5)	2.2 (4.8 - 4.9)	4.1 - 4.2 (9.0 - 9.2)	8.2 - 8.4 (18.1 - 18.5)	16.3 - 16.8 (36.0 - 37.1)	37.5 - 39.4 (82.7 - 86.8)	2
<b>S</b>	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)						
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black						
	Running noise <sup>(5)</sup>	L <sub>pA</sub>	dB(A)	56	57	58	63	66	68	

Output shaft loads			PSNpro055	PSNpro070	PSNpro090	PSNpro115	PSNpro142	PSNpro190	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N	950 (214)	3200 (719)	5500 (1236)	6000 (1349)	13000 (2923)	20000 (4496)	
Maximum axial force	F <sub>a max</sub>	(lb <sub>f</sub> )	2200 (495)	3400 (764)	4500 (1012)	6500 (1461)	12000 (2698)	17000 (3822)	
Maximum tilting moment	M <sub>K max</sub>	Nm (lb <sub>f</sub> .in)	40 (353)	203 (1800)	419 (3709)	562 (4972)	1566 (13856)	2887 (25552)	

Input characteristics			PSNpro055	PSNpro070	PSNpro090	PSNpro115	PSNpro142	PSNpro190	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	11 (C) <sup>(5)</sup>	11 (C)	14 (D)	19 (E)	35 (G) <sup>(5)</sup>	48 (K) <sup>(5)</sup>	1
			14 (D)	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	42 (H)	-	
			-	19 (E)	24 (F)	35 (G)	-	-	
			11 (C) <sup>(5)</sup>	11 (C) <sup>(5)</sup>	11 (C)	14 (D)	19 (E)	35 (G) <sup>(5)</sup>	2
			14 (D)	14 (D)	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	42 (H)	
-	-	19 (E)	24 (F)	35 (G)	-				
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>i</sub>	kgcm <sup>2</sup> (lb <sub>f</sub> .in.s <sup>2</sup> ·10 <sup>-4</sup> )	0.096 - 0.126 (0.850 - 1.115)	0.150 - 0.294 (1.328 - 2.602)	0.439 - 0.920 (3.885 - 8.143)	1.147 - 2.775 (10.152 - 24.561)	6.475 - 13.112 (57.309 - 116.051)	21.695 - 53.182 (192.017 - 470.700)	1
			0.095 - 0.109 (0.841 - 0.965)	0.168 - 0.227 (1.487 - 2.009)	0.327 - 0.408 (2.894 - 3.611)	1.279 - 1.559 (11.320 - 13.798)	3.444 - 4.565 (30.482 - 40.404)	18.722 - 23.015 (165.704 - 203.700)	2
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>f</sub> .in)	0.15 - 0.30 (1 - 3)	0.30 - 0.75 (3 - 7)	0.60 - 1.45 (5 - 13)	1.00 - 3.00 (9 - 27)	2.30 - 7.95 (20 - 70)	5.20 - 17.65 (46 - 156)	1
			0.15 - 0.25 (1 - 2)	0.15 - 0.35 (1 - 3)	0.25 - 0.50 (2 - 4)	0.50 - 1.20 (4 - 11)	0.85 - 2.65 (8 - 23)	2.00 - 5.85 (18 - 52)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		10 (89)	18 (159)	38 (336)	80 (708)	180 (1593)	300 (2655)	1
			10 (89)	18 (159)	18 (159)	38 (336)	80 (708)	180 (1593)	2

(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			PSNpro055	PSNpro070	PSNpro090	PSNpro115	PSNpro142	PSNpro190	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>2z</sub>	Nm (lb <sub>f</sub> .in)	20 (177)	48 (425)	114 (1009)	250 (2213)	520 (4602)	1110 (9824)	3	1
			25 (221)	68 (602)	150 (1328)	330 (2921)	700 (6196)	1480 (13099)	4	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	1800 (15931)	5	
			18.5 (164)	45 (398)	108 (956)	300 (2655)	600 (5310)	1450 (12834)	7	
			18 (159)	40 (354)	84 (743)	190 (1682)	425 (3762)	-	8	
			13.5 (119)	32 (283)	72 (637)	190 (1682)	315 (2788)	850 (7523)	10	2
			20 (177)	48 (425)	114 (1009)	250 (2213)	650 (5753)	1500 (13276)	12	
			20 (177)	48 (425)	114 (1009)	250 (2213)	650 (5753)	1500 (13276)	15	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	1800 (15931)	16	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	1800 (15931)	20	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	1800 (15931)	25	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	1800 (15931)	35	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	1800 (15931)	40	
			25 (221)	67 (593)	150 (1328)	330 (2921)	850 (7523)	1580 (13984)	50	
18.5 (164)	44 (389)	108 (956)	300 (2655)	600 (5310)	1450 (12834)	70				
13.5 (119)	32 (283)	72 (637)	190 (1682)	315 (2788)	850 (7523)	100				
Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>f</sub> .in)	29 (257)	77 (682)	139 (1230)	300 (2655)	520 (4602)	1110 (9824)	3	1
			40 (354)	83 (735)	200 (1770)	400 (3540)	700 (6196)	1480 (13099)	4	
			40 (354)	79 (699)	184 (1629)	440 (3894)	870 (7700)	1850 (16374)	5	
			29 (257)	59 (522)	167 (1478)	395 (3496)	800 (7081)	1680 (14869)	7	
			28 (248)	64 (566)	134 (1186)	295 (2611)	490 (4337)	-	8	
			21 (186)	52 (460)	116 (1027)	280 (2478)	500 (4425)	1050 (9293)	10	2
			29 (257)	77 (682)	139 (1230)	395 (3496)	770 (6815)	1880 (16639)	12	
			29 (257)	77 (682)	139 (1230)	395 (3496)	770 (6815)	1880 (16639)	15	
			40 (354)	83 (735)	220 (1947)	520 (4602)	1030 (9116)	2210 (19560)	16	
			40 (354)	83 (735)	220 (1947)	520 (4602)	1030 (9116)	2210 (19560)	20	
			40 (354)	79 (699)	184 (1629)	440 (3894)	1070 (9470)	1960 (17347)	25	
			40 (354)	79 (699)	184 (1629)	440 (3894)	1070 (9470)	1960 (17347)	35	
			40 (354)	79 (699)	220 (1947)	520 (4602)	1170 (10355)	2210 (19560)	40	
			40 (354)	79 (699)	184 (1629)	440 (3894)	1070 (9470)	1960 (17347)	50	
29 (257)	51 (451)	167 (1478)	395 (3496)	800 (7081)	1680 (14869)	70				
21 (186)	52 (460)	116 (1027)	280 (2478)	500 (4425)	1050 (9293)	100				

PSNpro

<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  
<sup>(4)</sup> Based on reference clamping system diameter

Output torques			PSNpro055	PSNpro070	PSNpro090	PSNpro115	PSNpro142	PSNpro190	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>f</sub> .in)	11 (97)	30 (266)	62 (549)	155 (1372)	475 (4204)	1110 (9824)	3	1
			18.5 (164)	39 (345)	94 (832)	194 (1717)	600 (5310)	1380 (12214)	4	
			17.5 (155)	37 (327)	84 (743)	167 (1478)	550 (4868)	1230 (10886)	5	
			15.5 (137)	37 (327)	80 (708)	156 (1381)	500 (4425)	1070 (9470)	7	
			15 (133)	34 (301)	71 (628)	154 (1363)	425 (3762)	-	8	
			11 (97)	27 (239)	61 (540)	159 (1407)	315 (2788)	720 (6373)	10	
		2	17.5 (155)	40 (354)	77 (682)	200 (1770)	550 (4868)	1270 (11240)	12	
			17.5 (155)	41 (363)	79 (699)	200 (1770)	520 (4602)	1270 (11240)	15	
			25 (221)	55 (487)	80 (708)	194 (1717)	530 (4691)	1610 (14250)	16	
			25 (221)	57 (504)	87 (770)	194 (1717)	530 (4691)	1600 (14161)	20	
			25 (221)	57 (504)	76 (673)	164 (1452)	435 (3850)	1530 (13542)	25	
			25 (221)	61 (540)	89 (788)	190 (1682)	475 (4204)	1540 (13630)	35	
			25 (221)	61 (540)	94 (832)	200 (1770)	500 (4425)	0 (0)	40	
			25 (221)	57 (504)	103 (912)	220 (1947)	550 (4868)	1580 (13984)	50	
			15.5 (137)	40 (354)	92 (814)	220 (1947)	510 (4514)	1230 (10886)	70	
			11 (97)	27 (239)	61 (540)	162 (1434)	315 (2788)	720 (6373)	100	

Input speeds			PSNpro055	PSNpro070	PSNpro090	PSNpro115	PSNpro142	PSNpro190	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>ID</sub>	rpm	4050	2500	2050	1500	830	500	3	1
			4100	3150	1950	1650	1050	460	4	
			4950	3800	2500	2250	1500	650	5	
			5000	4500	3400	3200	2200	970	7	
			5000	4500	3350	3150	2600	-	8	
			5000	4500	4000	3500	2950	1400	10	
		2	3800	3800	3900	2500	1350	990	12	
			4300	4500	4500	3050	1950	1300	15	
			3650	4000	4300	3050	1850	1100	16	
			4100	4500	4500	3800	2300	1400	20	
			4250	4500	4500	4000	3050	1550	25	
			4850	4500	4500	4000	3500	2150	35	
			4900	4500	4500	4000	3500	2850	40	
			5000	4500	4500	4000	3500	2750	50	
			5000	4500	4500	4000	3500	3000	70	
			5000	4500	4500	4000	3500	3000	100	
Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	10000	10000	10000	8500	6500	6000		1
			10000	10000	10000	10000	8500	6500		2

Output torques			PSNpro055	PSNpro070	PSNpro090	PSNpro115	PSNpro142	PSNpro190	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>f</sub> .in)	55 (487)	120 (1062)	210 (1859)	495 (4381)	1050 (9293)	2220 (19649)	3	1
			55 (487)	150 (1328)	280 (2478)	650 (5753)	1400 (12391)	2960 (26198)	4	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	1750 (15489)	3600 (31863)	5	
			55 (487)	102 (903)	255 (2257)	650 (5753)	1390 (12303)	3240 (28676)	7	
			50 (443)	117 (1036)	295 (2611)	500 (4425)	850 (7523)	-	8	
			24 (212)	61 (540)	141 (1248)	345 (3054)	740 (6550)	1830 (16197)	10	
		2	55 (487)	150 (1328)	300 (2655)	650 (5753)	1340 (11860)	3260 (28853)	12	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	1340 (11860)	3260 (28853)	15	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	1780 (15754)	3600 (31863)	16	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	1780 (15754)	3600 (31863)	20	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	2000 (17701)	3600 (31863)	25	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	2000 (17701)	3600 (31863)	35	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	2000 (17701)	2970 (26287)	40	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3600 (31863)	50	
			55 (487)	89 (788)	255 (2257)	600 (5310)	1390 (12303)	3230 (28588)	70	
			24 (212)	61 (540)	116 (1027)	345 (3054)	740 (6550)	1830 (16197)	100	

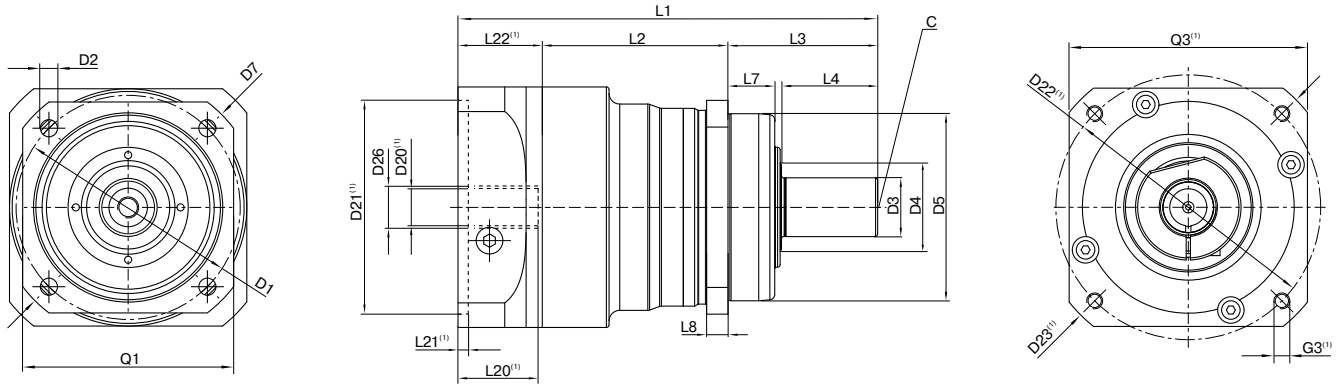
<sup>(1)</sup> Ratios (i=n<sub>1</sub>/n<sub>2</sub>)

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

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

<sup>(4)</sup> Based on reference clamping system diameter

<sup>(5)</sup> Permitted 1000 times



Drawing corresponds to a PSNpro090 / 1-stage / smooth output shaft / 14 mm clamping system / motor adaptation – 2-part – round universal flange / 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>			PSNpro055	PSNpro070	PSNpro090	PSNpro115	PSNpro142	PSN1 pro90	p <sup>(3)</sup>	Code
Pitch circle diameter output	D1		63 (2.480)	68 - 75 (2.677 - 2.953)	85 (3.346)	120 (4.724)	165 (6.496)	215 (8.465)		
Mounting bore output	D2	4x	5.5 (0.217)	5.5 (0.217)	6.5 (0.256)	9.0 (0.354)	11.0 (0.433)	13.5 (0.531)		
Shaft diameter output	D3	k6	12 (0.472)	16 (0.630)	22 (0.866)	32 (1.260)	40 (1.575)	55 (2.165)		
Shaft collar output	D4		16 (0.630)	21.5 (0.846)	31.5 (1.240)	41.5 (1.634)	57.5 (2.264)	76.5 (3.012)		
Centering diameter output	D5	g7	50 (1.969)	60 (2.362)	70 (2.756)	90 (3.543)	130 (5.118)	160 (6.299)		
Diagonal dimension output	D7		74 (2.913)	92 (3.622)	100 (3.937)	140 (5.512)	185 (7.283)	240 (9.449)		
Flange cross section output	Q1	■	55 (2.165)	70 (2.756)	80 (3.150)	110 (4.331)	142 (5.591)	190 (7.480)		
Min. total length	L1		103.5 (4.075)	134 (5.276)	157 (6.181)	202.5 (7.972)	261.5 (10.295)	310.5 (12.224)	1	
			127 (5.000)	162.5 (6.398)	179 (7.047)	224.5 (8.839)	292.5 (11.516)	355.5 (13.996)	2	
Housing length	L2		43 (1.693)	60.5 (2.382)	69.5 (2.736)	71 (2.795)	101.5 (3.996)	130.5 (5.138)	1	
			66.5 (2.618)	89 (3.504)	98 (3.858)	104.5 (4.114)	139 (5.472)	194 (7.638)	2	
Centering depth output	L7		12 (0.472)	19 (0.748)	17.5 (0.689)	28 (1.102)	28 (1.102)	28 (1.102)		
Flange thickness output	L8		6 (0.236)	7 (0.276)	8 (0.315)	10 (0.394)	12 (0.472)	15 (0.591)		
Center hole (DIN 332. type DR)	C		M4x10	M5x12.5	M8x19	M12x28	M16x36	M20x42		
Motor shaft diameter j6/k6	D20		More information on page 191/192							
Clamping system diameter input	D26		More information on page 94							
Output shaft with feather key (DIN 6885-1)			A 4x4x18	A 5x5x25	A 6x6x28	A 10x8x50	A 12x8x65	A 16x10x70		
Feather key width (DIN 6885-1)	B1		4 (0.157)	5 (0.197)	6 (0.236)	10 (0.394)	12 (0.472)	16 (0.630)		A
Shaft height including feather key (DIN 6885-1)	H1		13.5 (0.531)	18 (0.709)	24.5 (0.965)	35 (1.378)	43 (1.693)	59 (2.323)		
Shaft length output	L3		36 (1.417)	48 (1.890)	56 (2.205)	88 (3.465)	110 (4.331)	112 (4.409)		
Shaft length from shoulder	L4		23 (0.906)	28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)	82 (3.228)		
Feather key length	L5		18 (0.709)	25 (0.984)	28 (1.102)	50 (1.969)	65 (2.559)	70 (2.756)		
Distance from shaft end	L6		2 (0.079)	2 (0.079)	4 (0.157)	4 (0.157)	8 (0.315)	6 (0.236)		
Smooth output shaft										
Shaft length output	L3		36 (1.417)	48 (1.890)	56 (2.205)	88 (3.465)	110 (4.331)	112 (4.409)		B
Shaft length from shoulder	L4		23 (0.906)	28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)	82 (3.228)		
Splined output shaft (DIN 5480)			-	W16x 0.8x18x6m	W22x 1.25x16x6m	W32x 1.25x24x6m	W40x 2.0x18x6m	W55x 2.0x26x6m		C
Width of gearing	L <sub>v</sub>		-	15 (0.591)	15 (0.591)	15 (0.591)	20 (0.787)	22 (0.866)		
Shaft length output	L3		-	46 (1.811)	46 (1.811)	56 (2.205)	70 (2.756)	71.5 (2.815)		
Shaft length from shoulder	L4		-	26 (1.024)	26 (1.024)	26 (1.024)	40 (1.575)	41.5 (1.634)		

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

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

pro NEW



# PSFNpro

The precision gearbox with flange output shaft for complex and dynamic applications

The high-torque and extremely torsion-resistant **PSFNpro** combines maximum precision and power in the smallest of spaces. Its short overall length allows for space-saving integration, and the standardized flange output shaft guarantees secure installation in a wide variety of applications.

Cyclic torque **14 - 1800 Nm**



Radial force **1450 - 23000 N**



Axial force **2350 - 12000 N**



Torsional backlash **1 - 8 arcmin**



Protection class **IP65**



Frame sizes

- 55
- 64
- 90
- 110
- 140
- 200



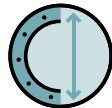
PSFNpro



Precision Line



Equidirectional rotation



Extra large round type output flange



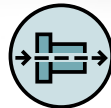
Rotary shaft seal



Planet carrier in cage design



Option: Rack and pinion  
Planetary gearbox (Details on page 158)



Coaxial gearbox



Helical gear



Preloaded angular contact roller bearings



Flange output shaft (ISO 9409-1)



Option: Reduced backlash



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			PSFNpro055	PSFNpro064	PSFNpro090	PSFNpro110	PSFNpro140	PSFNpro200	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000						
	Efficiency <sup>(3)</sup>	η	%	97						1
				95						2
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)						
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)						
	Protection class				IP65					
<b>S</b>	Standard lubrication				Oil (lifetime lubrication)					
<b>F</b>	Food grade lubrication				Oil (lifetime lubrication)					
	Installation position				Any					
<b>S</b>	Standard backlash	φ	arcmin	< 6	< 3	< 3	< 3	< 3	< 3	1
				< 8	< 5	< 5	< 5	< 5	< 5	2
<b>R</b>	Reduced backlash	φ	arcmin	< 4	< 2	< 1	< 1	< 1	< 1	1
				< 6	< 3	< 1	< 1	< 1	< 1	2
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>i</sub> .in / arcmin)	2.4 - 4.8 (21 - 42)	8.3 - 12.8 (73 - 113)	21.5 - 32.0 (190 - 283)	64.0 - 81.0 (566 - 717)	129.0 - 218.0 (1142 - 1929)	374.0 - 602.0 (3310 - 5328)	1
				2.5 - 4.9 (22 - 43)	7.2 - 12.2 (64 - 108)	21.0 - 31.5 (186 - 279)	64.0 - 83.0 (566 - 735)	127.0 - 206.0 (1124 - 1823)	365.0 - 668.0 (3231 - 5912)	2
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	0.7 - 0.8 (1.6 - 1.7)	1.6 (3.5)	3.5 - 3.6 (7.7 - 7.9)	5.2 - 5.3 (11.4 - 11.8)	11.5 - 11.7 (25.3 - 25.9)	28.1 - 29.1 (62.0 - 64.2)	1
				1.1 (2.4)	1.6 - 1.7 (3.5 - 3.6)	3.6 - 3.7 (8.0 - 8.2)	6.5 - 6.7 (14.3 - 14.7)	12.7 - 13.1 (28.0 - 28.9)	31.2 - 32.5 (68.9 - 71.7)	2
<b>S</b>	Standard surface				Housing: Steel – heat-treated and post-oxidized (black)					
<b>B</b>	Painted surface <sup>(4)</sup>				RAL 9005 Jet black					
	Running noise <sup>(5)</sup>	L <sub>pA</sub>	dB(A)	56	57	58	63	66	68	

Output shaft loads			PSFNpro055	PSFNpro064	PSFNpro090	PSFNpro110	PSFNpro140	PSFNpro200	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N	1450 (326)	2150 (483)	3950 (888)	4900 (1102)	12000 (2698)	23000 (5171)	
Maximum axial force	F <sub>a max</sub>	(lb <sub>i</sub> )	2350 (528)	2850 (641)	5450 (1225)	6450 (1450)	7500 (1686)	12000 (2698)	
Maximum tilting moment	M <sub>K max</sub>	Nm (lb <sub>i</sub> .in)	75 (667)	132 (1170)	326 (2888)	475 (4207)	1030 (9113)	2445 (21639)	

Input characteristics			PSFNpro055	PSFNpro064	PSFNpro090	PSFNpro110	PSFNpro140	PSFNpro200	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm (in)	11 (C) <sup>(5)</sup>	11 (C)	14 (D)	19 (E)	35 (G) <sup>(5)</sup>	48 (K) <sup>(5)</sup>	1
			14 (D)	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	42 (H)	-	
			-	19 (E)	24 (F)	35 (G)	-	-	2
			11 (C) <sup>(5)</sup>	11 (C) <sup>(5)</sup>	11 (C)	14 (D)	19 (E)	35 (G) <sup>(5)</sup>	
			14 (D)	14 (D)	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	42 (H)	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>i</sub>	kgcm <sup>2</sup> (lb <sub>i</sub> .in.s <sup>2</sup> 10 <sup>-4</sup> )	0.097 - 0.117 (0.859 - 1.036)	0.149 - 0.210 (1.319 - 1.859)	0.450 - 0.719 (3.983 - 6.364)	1.180 - 2.029 (10.444 - 17.958)	6.526 - 9.670 (57.760 - 85.587)	22.520 - 40.642 (199.319 - 359.712)	1
			0.095 - 0.109 (0.841 - 0.965)	0.096 - 0.151 (0.850 - 1.336)	0.147 - 0.219 (1.301 - 1.938)	0.435 - 0.697 (3.850 - 6.169)	1.144 - 2.127 (10.125 - 18.826)	6.434 - 10.410 (56.946 - 92.136)	2
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>i</sub> .in)	0.20 - 0.45 (2 - 4)	0.25 - 0.55 (2 - 5)	0.60 - 1.35 (5 - 12)	1.05 - 2.70 (9 - 24)	3.15 - 8.90 (28 - 79)	7.95 - 24.20 (70 - 214)	1
			0.15 - 0.25 (1 - 2)	0.15 - 0.30 (1 - 3)	0.25 - 0.50 (2 - 4)	0.50 - 1.15 (4 - 10)	0.85 - 2.80 (8 - 25)	2.10 - 6.70 (19 - 59)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		10 (89)	18 (159)	38 (336)	80 (708)	180 (1593)	300 (2655)	1
			10 (89)	18 (159)	18 (159)	38 (336)	80 (708)	180 (1593)	2

(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			PSFNpro055	PSFNpro064	PSFNpro090	PSFNpro110	PSFNpro140	PSFNpro200	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)/(4)</sup>	T <sub>zz</sub>	Nm (lb <sub>f</sub> .in)	25 (221)	68 (602)	150 (1328)	330 (2921)	700 (6196)	1480 (13099)	4	1
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	1800 (15931)	5	
			18.5 (164)	45 (398)	108 (956)	300 (2655)	600 (5310)	1450 (12834)	7	
			18 (159)	40 (354)	84 (743)	190 (1682)	425 (3762)	-	8	
			13.5 (119)	32 (283)	72 (637)	190 (1682)	315 (2788)	850 (7523)	10	2
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	1800 (15931)	16	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	1800 (15931)	20	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	1800 (15931)	25	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	1800 (15931)	35	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	1800 (15931)	40	
			25 (221)	67 (593)	150 (1328)	330 (2921)	850 (7523)	1580 (13984)	50	
			18.5 (164)	44 (389)	108 (956)	300 (2655)	600 (5310)	1450 (12834)	70	
			13.5 (119)	32 (283)	72 (637)	190 (1682)	315 (2788)	850 (7523)	100	
Maximum torque <sup>(3)/(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>f</sub> .in)	40 (354)	83 (735)	200 (1770)	400 (3540)	700 (6196)	1480 (13099)	4	1
			40 (354)	79 (699)	184 (1629)	440 (3894)	870 (7700)	1850 (16374)	5	
			29 (257)	59 (522)	167 (1478)	395 (3496)	800 (7081)	1680 (14869)	7	
			28 (248)	64 (566)	134 (1186)	295 (2611)	490 (4337)	-	8	
			21 (186)	52 (460)	116 (1027)	280 (2478)	500 (4425)	1050 (9293)	10	2
			40 (354)	83 (735)	220 (1947)	520 (4602)	1030 (9116)	2210 (19560)	16	
			40 (354)	83 (735)	220 (1947)	520 (4602)	1030 (9116)	2210 (19560)	20	
			40 (354)	79 (699)	184 (1629)	440 (3894)	1070 (9470)	1960 (17347)	25	
			40 (354)	79 (699)	184 (1629)	440 (3894)	1070 (9470)	1960 (17347)	35	
			40 (354)	79 (699)	184 (1629)	440 (3894)	1070 (9470)	1960 (17347)	40	
			40 (354)	79 (699)	184 (1629)	440 (3894)	1070 (9470)	1960 (17347)	50	
			29 (257)	51 (451)	167 (1478)	395 (3496)	800 (7081)	1680 (14869)	70	
			21 (186)	52 (460)	116 (1027)	280 (2478)	500 (4425)	1050 (9293)	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  
<sup>(4)</sup> Based on reference clamping system diameter

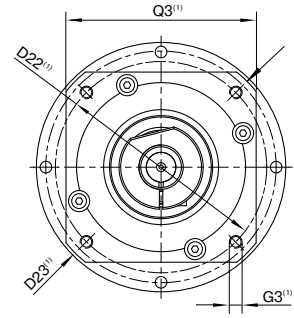
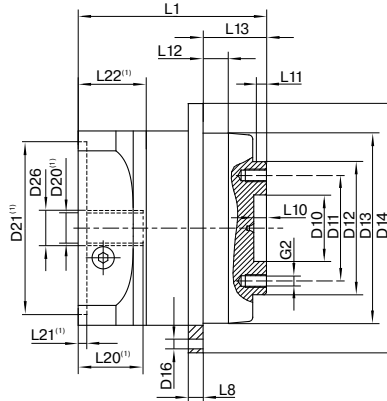
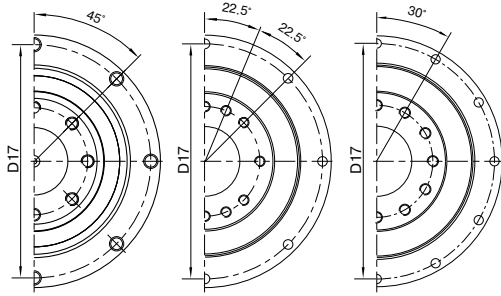
Output torques			PSFNpro055	PSFNpro064	PSFNpro090	PSFNpro110	PSFNpro140	PSFNpro200	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>f</sub> .in)	19.5 (173)	36 (319)	85 (752)	184 (1629)	620 (5487)	1350 (11949)	4	1
			18.5 (164)	35 (310)	76 (673)	161 (1425)	580 (5133)	1200 (10621)	5	
			15.5 (137)	37 (327)	77 (682)	152 (1345)	510 (4514)	1060 (9382)	7	
			15 (133)	34 (301)	71 (628)	150 (1328)	425 (3762)	-	8	
			11 (97)	27 (239)	61 (540)	159 (1407)	315 (2788)	720 (6373)	10	
			25 (221)	53 (469)	79 (699)	186 (1646)	540 (4779)	1670 (14781)	16	
		2	25 (221)	57 (504)	87 (770)	190 (1682)	540 (4779)	1660 (14692)	20	
			25 (221)	57 (504)	76 (673)	164 (1452)	445 (3939)	1500 (13276)	25	
			25 (221)	61 (540)	89 (788)	190 (1682)	475 (4204)	1520 (13453)	35	
			25 (221)	61 (540)	94 (832)	200 (1770)	500 (4425)	0 (0)	40	
			25 (221)	57 (504)	103 (912)	220 (1947)	550 (4868)	1580 (13984)	50	
			15.5 (137)	40 (354)	92 (814)	220 (1947)	510 (4514)	1230 (10886)	70	
			11 (97)	27 (239)	61 (540)	162 (1434)	315 (2788)	720 (6373)	100	

Input speeds			PSFNpro055	PSFNpro064	PSFNpro090	PSFNpro110	PSFNpro140	PSFNpro200	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	3450	4150	2700	1950	910	490	4	1
			3950	4500	3450	2550	1200	700	5	
			4500	4500	4000	3500	1750	1000	7	
			5000	4500	4000	3500	2000	-	8	
			5000	4500	4000	3500	2400	1400	10	
			4250	4500	4500	3350	1800	980	16	
		2	4800	4500	4500	4000	2250	1250	20	
			5000	4500	4500	4000	2950	1650	25	
			5000	4500	4500	4000	3500	2250	35	
			5000	4500	4500	4000	3500	2900	40	
			5000	4500	4500	4000	3500	2750	50	
			5000	4500	4500	4000	3500	3000	70	
			5000	4500	4500	4000	3500	3000	100	
Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	10000	10000	10000	8500	6500	6000		1
			10000	10000	10000	10000	8500	6500		2

Output torques			PSFNpro055	PSFNpro064	PSFNpro090	PSFNpro110	PSFNpro140	PSFNpro200	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>f</sub> .in)	55 (487)	150 (1328)	280 (2478)	650 (5753)	1400 (12391)	2960 (26198)	4	1
			55 (487)	150 (1328)	300 (2655)	650 (5753)	1750 (15489)	3600 (31863)	5	
			55 (487)	102 (903)	255 (2257)	650 (5753)	1390 (12303)	3240 (28676)	7	
			50 (443)	117 (1036)	295 (2611)	500 (4425)	850 (7523)	-	8	
			24 (212)	61 (540)	141 (1248)	345 (3054)	740 (6550)	1830 (16197)	10	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	1780 (15754)	3600 (31863)	16	
		2	55 (487)	150 (1328)	300 (2655)	650 (5753)	1780 (15754)	3600 (31863)	20	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	2000 (17701)	3600 (31863)	25	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	2000 (17701)	3600 (31863)	35	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	2000 (17701)	2970 (26287)	40	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3600 (31863)	50	
			55 (487)	89 (788)	255 (2257)	600 (5310)	1390 (12303)	3230 (28588)	70	
			24 (212)	61 (540)	141 (1248)	345 (3054)	740 (6550)	1830 (16197)	100	

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times

PSFNpro055    PSFNpro110    PSFNpro140  
 PSFNpro064    PSFNpro200



Drawing corresponds to a PSFNpro090 / 1-stage / flange output shaft / 14 mm clamping system / motor adaptation – 2-part – round universal flange / 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)

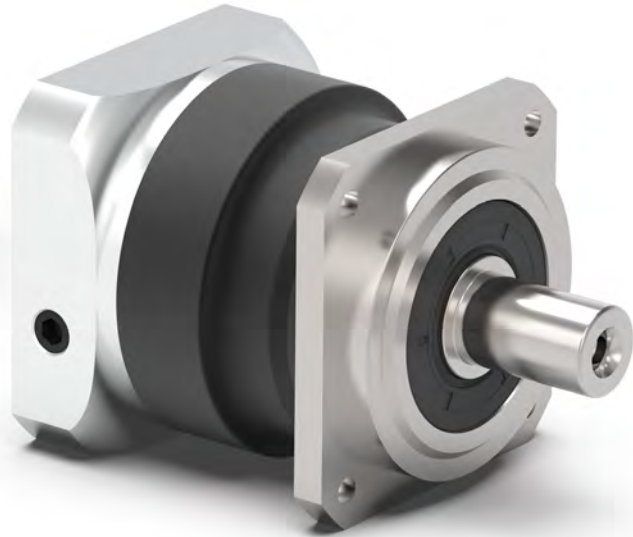
Geometry <sup>(2)</sup>			PSFNpro 055	PSFNpro 064	PSFNpro 090	PSFNpro 110	PSFNpro 140	PSFNpro 200	p <sup>(3)</sup>	Code
Centering diameter output shaft	D10	H7	16 (0.630)	20 (0.787)	31.5 (1.240)	40 (1.575)	50 (1.969)	80 (3.150)		
Pitch circle diameter output shaft	D11		25 (0.984)	31.5 (1.240)	50 (1.969)	63 (2.480)	80 (3.150)	125 (4.921)		
Centering diameter output shaft	D12	h7	34 (1.339)	40 (1.575)	63 (2.480)	80 (3.150)	100 (3.937)	160 (6.299)		
Centering diameter output flange	D13		55 (2.165)	64 (2.520)	90 (3.543)	110 (4.331)	140 (5.512)	200 (7.874)		
Flange diameter output	D14		72 (2.835)	86 (3.386)	118 (4.646)	145 (5.709)	179 (7.047)	247 (9.724)		
Mounting bore output	D16		3.4 8x45°	4.5 8x45°	5.5 8x45°	5.5 8x45°	6.6 12x30°	9 12x30°		
Pitch circle diameter output flange	D17		67 (2.638)	79 (3.110)	109 (4.291)	135 (5.315)	168 (6.614)	233 (9.173)		
Min. total length	L1		66 (2.598)	71 (2.795)	89.5 (3.524)	108 (4.252)	142 (5.591)	172 (6.772)	1	
			89.5 (3.524)	99.5 (3.917)	111.5 (4.390)	130 (5.118)	173 (6.811)	217 (8.543)	2	
Flange thickness output	L8		4 (0.157)	4 (0.157)	7 (0.276)	8 (0.315)	10 (0.394)	12 (0.472)		
Centering depth output shaft	L10		4.1 (0.161)	4.5 (0.177)	6.5 (0.256)	6.5 (0.256)	6.5 (0.256)	10 (0.394)		
	L11		3 (0.118)	3 (0.118)	6 (0.236)	6 (0.236)	6 (0.236)	7 (0.276)		
Centering depth output flange	L12		8 (0.315)	10 (0.394)	12 (0.472)	12 (0.472)	14 (0.551)	17.5 (0.689)		
Output flange length	L13		19.0	19.5	30.0	29.0	38.0	50.0		
Motor shaft diameter j6/k6	D20		More information on page 191/192							
Clamping system diameter input	D26		More information on page 100							
Flange output shaft (similar ISO 9409-1)										<b>D</b>
Number x thread x depth	G2		8 x M4x6	8 x M5x7	8 x M6x10	12 x M6x12	12 x M8x15	12 x M10x20		
Flange output shaft with dowel hole (ISO 9409-1)										<b>E</b>
Dowel hole x depth	D15	H7	4x5	5x5	6x6	6x6	8x8	10x10		
Number x thread x depth	G2		7 x M4x6	7 x M5x7	7 x M6x10	11 x M6x12	11 x M8x15	11 x M10x20		

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

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



**pro** **NEW**

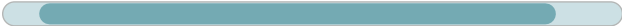


# PSBNpro

**The precision planetary gearbox with helical gearing for high speeds and quiet operation**

Our **PSBNpro** combines precision planetary gearboxes and efficient bearing technology. Designed for high speeds, it delivers maximum performance thanks to its homogeneous, particularly quiet helical gearing. As a pro variant, it also offers higher torques – reliable, compact, and efficient.

Cyclic torque **14 - 850 Nm**



Radial force **830 - 9500 N**



Axial force **800 - 9600 N**



Torsional backlash **1 - 8 arcmin**



Protection class **IP65**

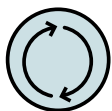


Frame sizes

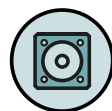
- 55
- 70
- 90
- 115
- 142



Precision Line



Equidirectional rotation



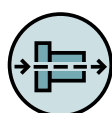
Square type output flange



Rotary shaft seal



Option: Reduced backlash



Coaxial gearbox



Helical gear



Reinforced deep groove ball bearings



Planet carrier in cage design



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			PSBNpro055	PSBNpro070	PSBNpro090	PSBNpro115	PSBNpro142	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000					
	Efficiency <sup>(3)</sup>	η	%	98					1
				96					2
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)					
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)					
	Protection class			IP65					
<b>S</b>	Standard lubrication			Oil (lifetime lubrication)					
<b>F</b>	Food grade lubrication			Oil (lifetime lubrication)					
	Installation position			Any					
<b>S</b>	Standard backlash	φ	arcmin	< 6	< 3	< 3	< 3	< 3	1
				< 8	< 5	< 5	< 5	< 5	2
<b>R</b>	Reduced backlash	φ	arcmin	< 4	< 2	< 1	< 1	< 1	1
				< 6	< 3	< 1	< 1	< 1	2
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>i</sub> .in/ arcmin)	1.4 - 2.3 (12 - 20)	4.2 - 5.6 (37 - 50)	10.7 - 13.7 (95 - 121)	29.0 - 36.5 (257 - 323)	59.5 - 76.0 (527 - 673)	1
				1.4 - 2.4 (12 - 21)	3.9 - 5.4 (35 - 48)	10.3 - 13.5 (91 - 119)	26.0 - 35.0 (230 - 310)	58.0 - 71.0 (513 - 628)	2
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	0.8 - 0.9 (1.8 - 1.9)	1.6 - 1.7 (3.6 - 3.7)	3.3 - 3.4 (7.4 - 7.5)	5.6 - 6.0 (12.4 - 13.2)	13.2 - 13.5 (29.0 - 29.7)	1
				1.1 (2.5)	1.7 (3.6 - 3.8)	3.4 - 3.5 (7.5 - 7.7)	6.9 - 7.1 (15.2 - 15.6)	14.6 - 15.1 (32.3 - 33.2)	2
<b>S</b>	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)					
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black					
	Running noise <sup>(5)</sup>	L <sub>pA</sub>	dB(A)	56	57	58	63	66	

Output shaft loads			PSBNpro055	PSBNpro070	PSBNpro090	PSBNpro115	PSBNpro142	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N (lb <sub>i</sub> )	830 (187)	1600 (360)	3100 (697)	4500 (1012)	9500 (2136)	
Maximum axial force	F <sub>a max</sub>		800 (180)	1500 (337)	2800 (629)	4500 (1012)	9600 (2158)	
Maximum tilting moment	M <sub>k max</sub>	Nm (lb <sub>i</sub> .in)	42 (373)	109 (961)	251 (2222)	442 (3916)	1314 - 1329 (11633 - 11759)	

Input characteristics			PSBNpro055	PSBNpro070	PSBNpro090	PSBNpro115	PSBNpro142	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	11 (C) <sup>(5)</sup>	11 (C)	14 (D)	19 (E)	35 (G) <sup>(5)</sup>	1
			14 (D)	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	42 (H)	2
			-	19 (E)	24 (F)	35 (G)	-	
			11 (C) <sup>(5)</sup>	11 (C) <sup>(5)</sup>	11 (C)	14 (D)	19 (E)	
			14 (D)	14 (D)	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>i</sub> .in.s <sup>2</sup> 10 <sup>-4</sup> )	0.096 - 0.133 (0.850 - 1.177)	0.182 - 0.283 (1.611 - 2.505)	0.548 - 0.895 (4.850 - 7.921)	0.357 - 0.386 (3.160 - 3.416)	8.335 - 14.440 (73.771 - 127.805)	1
			0.096 - 0.113 (0.850 - 1.000)	0.127 - 0.394 (1.124 - 3.487)	0.371 - 0.474 (3.284 - 4.195)	0.327 - 0.338 (2.894 - 2.992)	4.085 - 10.714 (36.155 - 94.827)	2
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>i</sub> .in)	0.15 - 0.25 (1 - 2)	0.25 - 0.55 (2 - 5)	0.50 - 1.20 (4 - 11)	0.85 - 2.55 (8 - 23)	2.00 - 6.65 (18 - 59)	1
			0.15 - 0.25 (1 - 2)	0.15 - 0.30 (1 - 3)	0.20 - 0.45 (2 - 4)	0.50 - 1.10 (4 - 10)	0.80 - 2.40 (7 - 21)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		10 (89)	18 (159)	38 (336)	80 (708)	180 (1593)	1
			10 (89)	18 (159)	18 (159)	38 (336)	80 (708)	2

(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			PSBNpro055	PSBNpro070	PSBNpro090	PSBNpro115	PSBNpro142	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>2z</sub>	Nm (lb <sub>r</sub> .in)	20 (177)	48 (425)	114 (1009)	250 (2213)	520 (4602)	3	1
			25 (221)	68 (602)	150 (1328)	330 (2921)	700 (6196)	4	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	5	
			18.5 (164)	45 (398)	108 (956)	300 (2655)	600 (5310)	7	
			18 (159)	40 (354)	84 (743)	190 (1682)	425 (3762)	8	
			13.5 (119)	32 (283)	72 (637)	190 (1682)	315 (2788)	10	
			20 (177)	48 (425)	114 (1009)	250 (2213)	650 (5753)	12	2
			20 (177)	48 (425)	114 (1009)	250 (2213)	650 (5753)	15	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	16	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	20	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	25	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	35	
			25 (221)	68 (602)	150 (1328)	330 (2921)	850 (7523)	40	
			25 (221)	67 (593)	150 (1328)	330 (2921)	850 (7523)	50	
18.5 (164)	44 (389)	108 (956)	300 (2655)	600 (5310)	70	100			
13.5 (119)	32 (283)	72 (637)	190 (1682)	315 (2788)	100				
Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	29 (257)	77 (682)	139 (1230)	300 (2655)	520 (4602)	3	1
			40 (354)	83 (735)	200 (1770)	400 (3540)	700 (6196)	4	
			40 (354)	79 (699)	184 (1629)	440 (3894)	870 (7700)	5	
			29 (257)	59 (522)	167 (1478)	395 (3496)	800 (7081)	7	
			28 (248)	64 (566)	134 (1186)	295 (2611)	490 (4337)	8	
			21 (186)	52 (460)	116 (1027)	280 (2478)	500 (4425)	10	
			29 (257)	77 (682)	139 (1230)	395 (3496)	770 (6815)	12	2
			29 (257)	77 (682)	139 (1230)	395 (3496)	770 (6815)	15	
			40 (354)	83 (735)	220 (1947)	520 (4602)	1030 (9116)	16	
			40 (354)	83 (735)	220 (1947)	520 (4602)	1030 (9116)	20	
			40 (354)	79 (699)	184 (1629)	440 (3894)	1070 (9470)	25	
			40 (354)	79 (699)	184 (1629)	440 (3894)	1070 (9470)	35	
			40 (354)	79 (699)	220 (1947)	520 (4602)	1170 (10355)	40	
			40 (354)	79 (699)	184 (1629)	440 (3894)	1070 (9470)	50	
29 (257)	51 (451)	167 (1478)	395 (3496)	800 (7081)	70	100			
21 (186)	52 (460)	116 (1027)	280 (2478)	500 (4425)	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  
<sup>(4)</sup> Based on reference clamping system diameter

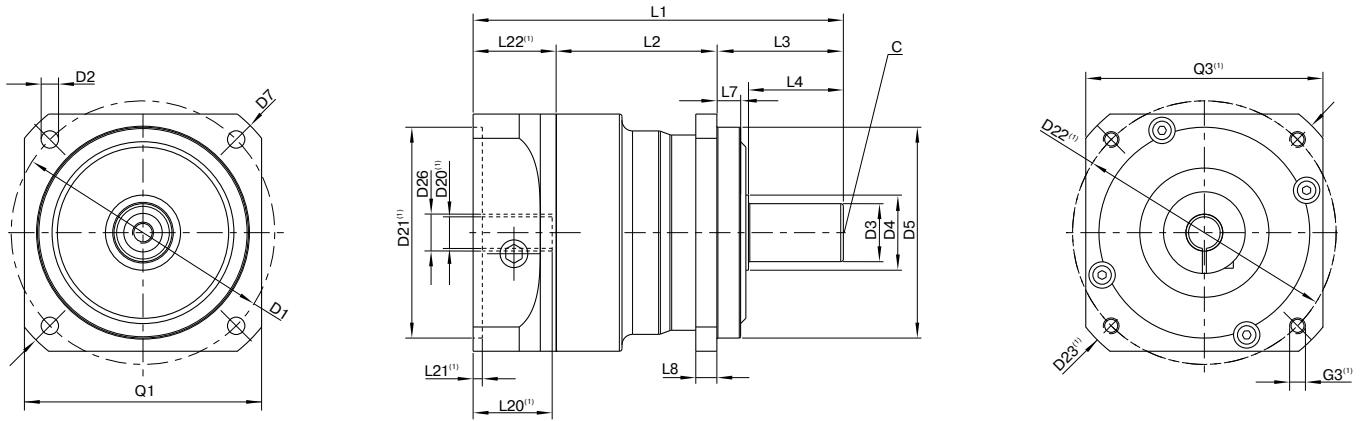
Output torques			PSBNpro055	PSBNpro070	PSBNpro090	PSBNpro115	PSBNpro142	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>f</sub> .in)	11 (97)	27 (239)	54 (478)	141 (1248)	430 (3806)	3	1
			18.5 (164)	35 (310)	82 (726)	177 (1567)	510 (4514)	4	
			17.5 (155)	35 (310)	74 (655)	152 (1345)	475 (4204)	5	
			15.5 (137)	37 (327)	77 (682)	152 (1345)	460 (4071)	7	
			15 (133)	34 (301)	71 (628)	150 (1328)	425 (3762)	8	
			11 (97)	27 (239)	61 (540)	159 (1407)	315 (2788)	10	
		16 (142)	38 (336)	74 (655)	191 (1690)	550 (4868)	12	2	
		17.5 (155)	41 (363)	79 (699)	192 (1699)	475 (4204)	15		
		25 (221)	53 (469)	79 (699)	180 (1593)	465 (4116)	16		
		25 (221)	57 (504)	87 (770)	190 (1682)	465 (4116)	20		
		25 (221)	57 (504)	76 (673)	164 (1452)	410 (3629)	25		
		25 (221)	61 (540)	89 (788)	190 (1682)	475 (4204)	35		
		25 (221)	61 (540)	94 (832)	200 (1770)	500 (4425)	40		
		25 (221)	57 (504)	103 (912)	220 (1947)	550 (4868)	50		
		15.5 (137)	40 (354)	92 (814)	220 (1947)	510 (4514)	70		
		11 (97)	27 (239)	61 (540)	162 (1434)	315 (2788)	100		

Input speeds			PSBNpro055	PSBNpro070	PSBNpro090	PSBNpro115	PSBNpro142	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	4300	3500	3150	2050	1150	3	1
			4300	4450	3000	2250	1750	4	
			4850	4500	3850	3050	2400	5	
			5000	4500	4000	3500	3000	7	
			5000	4500	4000	3500	3000	8	
			5000	4500	4000	3500	3000	10	
		5000	4500	4500	3000	1900	12	2	
		4750	4500	4500	3700	2700	15		
		5000	4500	4500	3600	2550	16		
		4500	4500	4500	4000	3200	20		
		5000	4500	4500	4000	3500	25		
		5000	4500	4500	4000	3500	35		
		5000	4500	4500	4000	3500	40		
		5000	4500	4500	4000	3500	50		
		5000	4500	4500	4000	3500	70		
		5000	4500	4500	4000	3500	100		
Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	10000	10000	10000	8500	6500		1
			10000	10000	10000	10000	8500		2

Output torques			PSBNpro055	PSBNpro070	PSBNpro090	PSBNpro115	PSBNpro142	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>f</sub> .in)	55 (487)	120 (1062)	210 (1859)	495 (4381)	1050 (9293)	3	1
			55 (487)	150 (1328)	280 (2478)	650 (5753)	1400 (12391)	4	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	1750 (15489)	5	
			55 (487)	102 (903)	255 (2257)	650 (5753)	1390 (12303)	7	
			50 (443)	117 (1036)	295 (2611)	500 (4425)	850 (7523)	8	
			24 (212)	61 (540)	141 (1248)	295 (2611)	740 (6550)	10	
		55 (487)	150 (1328)	300 (2655)	650 (5753)	1340 (11860)	12	2	
		55 (487)	150 (1328)	300 (2655)	650 (5753)	1340 (11860)	15		
		55 (487)	150 (1328)	300 (2655)	650 (5753)	1780 (15754)	16		
		55 (487)	150 (1328)	300 (2655)	650 (5753)	1780 (15754)	20		
		55 (487)	150 (1328)	300 (2655)	650 (5753)	2000 (17701)	25		
		55 (487)	150 (1328)	300 (2655)	650 (5753)	2000 (17701)	35		
		55 (487)	150 (1328)	300 (2655)	650 (5753)	2000 (17701)	40		
		55 (487)	150 (1328)	300 (2655)	650 (5753)	1490 (13188)	50		
		55 (487)	89 (788)	255 (2257)	600 (5310)	1390 (12303)	70		
		24 (212)	61 (540)	116 (1027)	295 (2611)	740 (6550)	100		

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times

# PSBNpro Dimensions



Drawing corresponds to a PSBNpro090 / 1-stage / smooth output shaft / 14 mm clamping system / motor adaptation – 2-part – round universal flange / 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](http://www.neugart.com)

Geometry <sup>(2)</sup>			PSBNpro 055	PSBNpro 070	PSBNpro 090	PSBNpro 115	PSBNpro 142	p <sup>(3)</sup>	Code
Pitch circle diameter output	D1		63 (2.480)	70 (2.756)	100 (3.937)	130 (5.118)	165 (6.496)		
Mounting bore output	D2	4x	5.5 (0.217)	5.5 (0.217)	6.6 (0.260)	9.0 (0.354)	11.0 (0.433)		
Shaft diameter output	D3	j6	13 (0.512)	16 (0.630)	22 (0.866)	32 (1.260)	40 (1.575)		
Shaft collar output	D4		17 (0.669)	25 (0.984)	28.5 (1.122)	38.5 (1.516)	48.5 (1.909)		
Centering diameter output	D5	g6	50 (1.969)	50 (1.969)	80 (3.150)	110 (4.331)	130 (5.118)		
Diagonal dimension output	D7		74 (2.913)	80 (3.150)	115 (4.528)	148 (5.827)	185 (7.283)		
Flange cross section output	Q1	■	55 (2.165)	60 (2.362)	90 (3.543)	115 (4.528)	140 (5.512)		
Min. total length	L1		93.5 (3.681)	116.5 (4.587)	140.5 (5.531)	182.5 (7.185)	247.5 (9.744)	1	
			117 (4.606)	145 (5.709)	162.5 (6.398)	204 (8.032)	279 (10.984)	2	
Housing length	L2		43 (1.693)	54 (2.126)	61 (2.402)	74 (2.913)	100.5 (3.957)	1	
			56.5 (2.224)	82.5 (3.248)	89 (3.504)	107.5 (4.232)	138.5 (5.453)	2	
Shaft length output	L3		26 (1.024)	37 (1.457)	48 (1.890)	65 (2.559)	97 (3.819)		
Centering depth output	L7		6 (0.217)	6 (0.236)	9 (0.354)	4 (0.157)	12 (0.472)		
Flange thickness output	L8		6 (0.236)	6 (0.236)	8 (0.315)	10 (0.394)	12 (0.472)		
Center hole (DIN 332. type DR)	C		M4x10	M5x12.5	M8x19	M12x28	M16x36		
Motor shaft diameter j6/k6	D20		More information on page 191/192						
Clamping system diameter input	D26		More information on page 106						
Output shaft with feather key (DIN 6885-1)			A 5x5x16	A 5x5x25	A 6x6x28	A 10x8x50	A 12x8x65		<b>A</b>
Feather key width (DIN 6885-1)	B1		5 (0.197)	5 (0.197)	6 (0.236)	10 (0.394)	12 (0.472)		
Shaft height including feather key (DIN 6885-1)	H1		15 (0.591)	18 (0.709)	24.5 (0.965)	35 (1.378)	43 (1.693)		
Shaft length from shoulder	L4		19 (0.748)	28 (1.102)	36 (1.417)	58 (2.283)	82 (3.228)		
Feather key length	L5		16 (0.630)	25 (0.984)	28 (1.102)	50 (1.969)	65 (2.559)		
Distance from shaft end	L6		2 (0.079)	2 (0.079)	4 (0.157)	4 (0.157)	8 (0.315)		
Smooth output shaft									
Shaft length from shoulder	L4		19 (0.748)	28 (1.102)	36 (1.417)	58 (2.283)	82 (3.228)		

(2) Dimensions in mm

(3) Number of stages



# PSN

## The helical precision planetary gearbox for low-noise operation and high bearing loads

Our **PSN** is pure progress: Its helical gearing ensures low-noise synchronization. With this precision planetary gearbox, vibrations are reduced to a minimum. Precision even under very high loads makes the **PSN** one of the most high-performance gearboxes in the world.

Cyclic torque **14 - 950 Nm**



Radial force **950 - 20000 N**



Axial force **2200 - 17000 N**



Torsional backlash **1 - 8 arcmin**

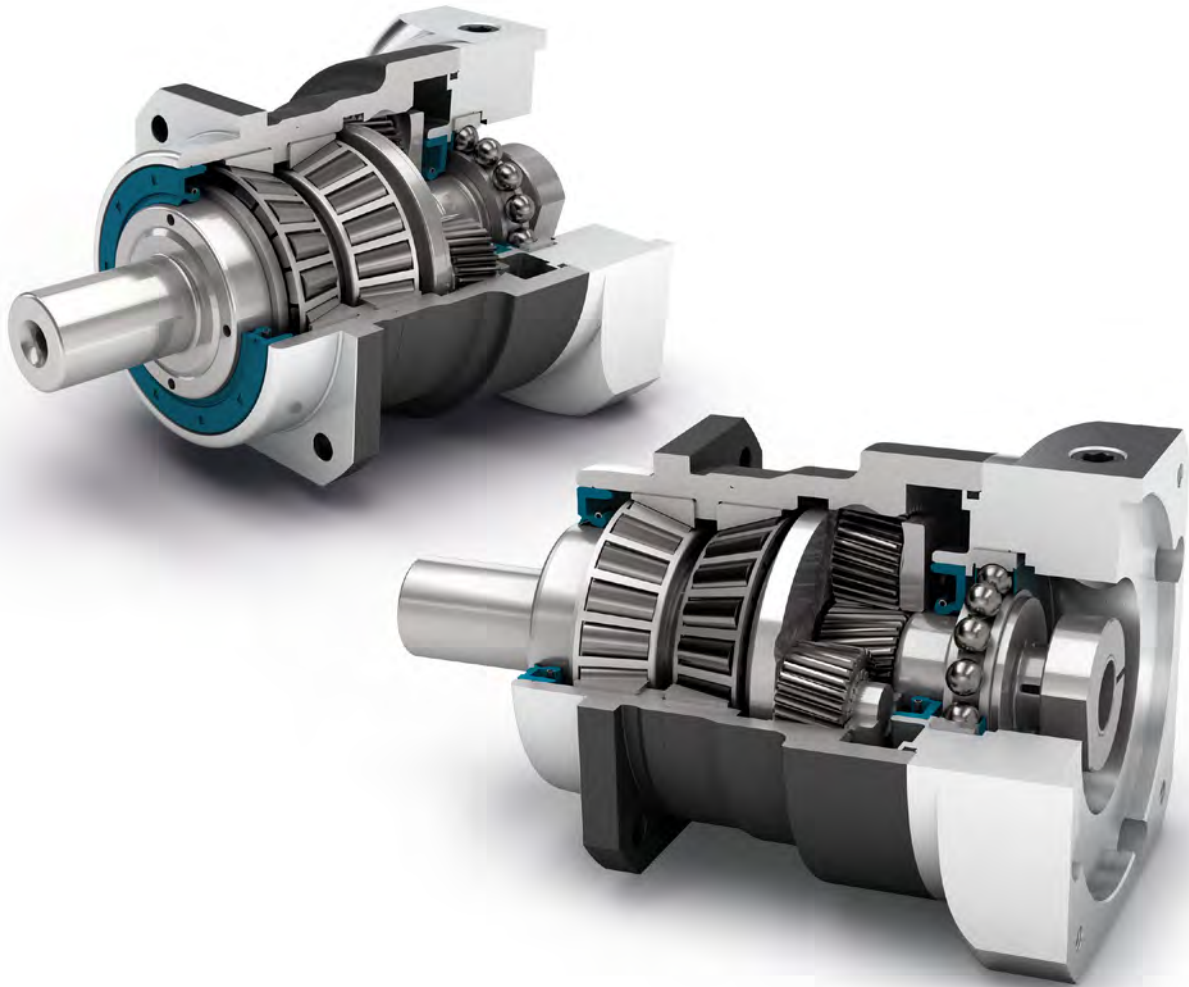


Protection class **IP65**



Frame sizes

- 55
- 70
- 90
- 115
- 142
- 190



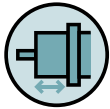
Precision Line



Helical gear



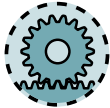
Preloaded tapered roller bearings



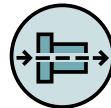
Extra long centering collar



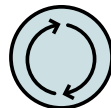
Option: Reduced backlash



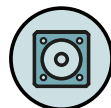
Option: Rack and pinion  
Planetary gearbox (Details on page 158)



Coaxial gearbox



Equidirectional rotation



Square type output flange



Rotary shaft seal



Planet carrier in cage design



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000						
	Efficiency <sup>(3)</sup>	η	%	98						1
				97						2
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)						
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)						
	Protection class			IP65						
<b>S</b>	Standard lubrication			Oil (lifetime lubrication)						
<b>F</b>	Food grade lubrication			Oil (lifetime lubrication)						
	Installation position			Any						
<b>S</b>	Standard backlash	φ	arcmin	< 6	< 3	< 3	< 3	< 3	< 3	1
				< 8	< 5	< 5	< 5	< 5	< 5	< 5
<b>R</b>	Reduced backlash	φ	arcmin	< 4	< 2	< 1	< 1	< 1	< 1	1
				< 6	< 2	< 1	< 1	< 1	< 1	< 1
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>f</sub> .in / arcmin)	1.3 - 1.9 (11 - 17)	3.6 - 5.0 (32 - 44)	10.5 - 13.9 (93 - 123)	28.0 - 39.0 (248 - 345)	62.0 - 88.0 (549 - 779)	181.0 - 246.0 (1602 - 2177)	1
				1.3 - 1.9 (11 - 17)	3.6 - 5.0 (32 - 44)	10.3 - 13.8 (91 - 122)	28.5 - 39.5 (252 - 350)	61.0 - 86.0 (540 - 761)	179.0 - 255.0 (1584 - 2257)	2
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	0.8 (1.7 - 1.9)	2.2 (4.8 - 4.9)	4.0 - 4.1 (8.8 - 8.9)	6.9 - 7.3 (15.3 - 16.1)	15.1 - 15.5 (33.3 - 34.2)	34.5 - 36.3 (76.1 - 80.1)	1
				1.1 (2.4 - 2.5)	2.8 - 2.9 (6.2 - 6.3)	4.2 (9.2 - 9.4)	8.4 - 8.6 (18.5 - 18.9)	16.7 - 17.3 (36.9 - 38.1)	38.6 - 40.5 (85.2 - 89.3)	2
<b>S</b>	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)						
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black						
	Running noise <sup>(5)</sup>	L <sub>pA</sub>	dB(A)	56	57	58	63	66	68	

Output shaft loads			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N (lb <sub>f</sub> )	950 (214)	3200 (719)	5500 (1236)	6000 (1349)	13000 (2923)	20000 (4496)	
Maximum axial force	F <sub>a max</sub>		2200 (495)	3400 (764)	4500 (1012)	6500 (1461)	12000 (2698)	17000 (3822)	
Maximum tilting moment	M <sub>K max</sub>	Nm (lb <sub>f</sub> .in)	40 (353)	203 (1800)	419 (3709)	562 (4972)	1566 (13856)	2887 (25552)	

Input characteristics			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	11 (C) <sup>(5)</sup>	11 (C)	14 (D)	19 (E)	35 (G) <sup>(5)</sup>	48 (K) <sup>(5)</sup>	1
			14 (D)	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	42 (H)	-	
			-	19 (E)	24 (F)	35 (G)	-	-	
			11 (C) <sup>(5)</sup>	11 (C)	11 (C)	14 (D)	19 (E)	35 (G) <sup>(5)</sup>	2
			14 (D)	14 (D) <sup>(5)</sup>	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	42 (H)	
			-	19 (E)	19 (E)	24 (F)	35 (G)	-	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>f</sub> .in.s <sup>2</sup> 10 <sup>-4</sup> )	0.096 - 0.126 (0.850 - 1.115)	0.150 - 0.294 (1.328 - 2.602)	0.439 - 0.920 (3.885 - 8.143)	1.147 - 2.775 (10.152 - 24.561)	6.475 - 13.112 (57.309 - 116.051)	21.695 - 53.182 (192.017 - 470.700)	1
			0.095 - 0.109 (0.841 - 0.965)	0.146 - 0.199 (1.292 - 1.761)	0.146 - 0.227 (1.292 - 2.009)	0.431 - 0.710 (3.815 - 6.284)	1.131 - 2.252 (10.010 - 19.932)	6.360 - 10.654 (56.291 - 94.296)	2
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>f</sub> .in)	0.15 - 0.30 (1 - 3)	0.20 - 0.65 (2 - 6)	0.40 - 1.25 (4 - 11)	0.75 - 2.70 (7 - 24)	2.05 - 9.60 (18 - 85)	4.30 - 20.30 (38 - 180)	1
			0.15 - 0.25 (1 - 2)	0.15 - 0.45 (1 - 4)	0.25 - 0.55 (2 - 5)	0.40 - 1.35 (4 - 12)	0.70 - 3.40 (6 - 30)	1.75 - 7.30 (15 - 65)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		10 (89)	18 (159)	38 (336)	80 (708)	180 (1593)	300 (2655)	1
			10 (89)	18 (159)	18 (159)	38 (336)	80 (708)	180 (1593)	2

<sup>(1)</sup> Number of stages

<sup>(2)</sup> Application specific configuration with NCP – www.neugart.com

<sup>(3)</sup> The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com

<sup>(4)</sup> More information on page 183

<sup>(5)</sup> Reference clamping system diameter

Output torques			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>2z</sub>	Nm (lb <sub>r</sub> .in)	16 (142)	29 (257)	54 (478)	135 (1195)	380 (3363)	840 (7435)	3	1
			18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	950 (8408)	4	
			18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	5	
			18 (159)	37 (327)	78 (690)	170 (1505)	355 (3142)	900 (7966)	7	
			18 (159)	39 (345)	75 (664)	155 (1372)	350 (3098)	-	8	
			13.5 (119)	28 (248)	59 (522)	140 (1239)	270 (2390)	730 (6461)	10	
			16 (142)	29 (257)	54 (478)	135 (1195)	380 (3363)	840 (7435)	12	2
			16 (142)	29 (257)	54 (478)	135 (1195)	380 (3363)	840 (7435)	15	
			18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	950 (8408)	16	
			18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	950 (8408)	20	
			18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	25	
			18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	35	
			18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	950 (8408)	40	
			18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	50	
			18 (159)	37 (327)	78 (690)	170 (1505)	355 (3142)	900 (7966)	70	
			13.5 (119)	28 (248)	59 (522)	140 (1239)	270 (2390)	730 (6461)	100	
Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	25 (221)	46 (407)	86 (761)	215 (1903)	520 (4602)	1110 (9824)	3	1
			28 (248)	62 (549)	128 (1133)	285 (2522)	700 (6196)	1480 (13099)	4	
			28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	1520 (13453)	5	
			28 (248)	59 (522)	124 (1097)	270 (2390)	560 (4956)	1440 (12745)	7	
			28 (248)	62 (549)	120 (1062)	245 (2168)	490 (4337)	-	8	
			21 (186)	44 (389)	94 (832)	220 (1947)	435 (3850)	1050 (9293)	10	
			25 (221)	46 (407)	86 (761)	215 (1903)	600 (5310)	1350 (11949)	12	2
			25 (221)	46 (407)	86 (761)	215 (1903)	600 (5310)	1350 (11949)	15	
			28 (248)	62 (549)	128 (1133)	285 (2522)	750 (6638)	1520 (13453)	16	
			28 (248)	62 (549)	128 (1133)	285 (2522)	750 (6638)	1520 (13453)	20	
			28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	1520 (13453)	25	
			28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	1520 (13453)	35	
			28 (248)	62 (549)	128 (1133)	285 (2522)	750 (6638)	1520 (13453)	40	
			28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	1520 (13453)	50	
			28 (248)	51 (451)	124 (1097)	270 (2390)	560 (4956)	1440 (12745)	70	
			21 (186)	44 (389)	94 (832)	220 (1947)	435 (3850)	1050 (9293)	100	

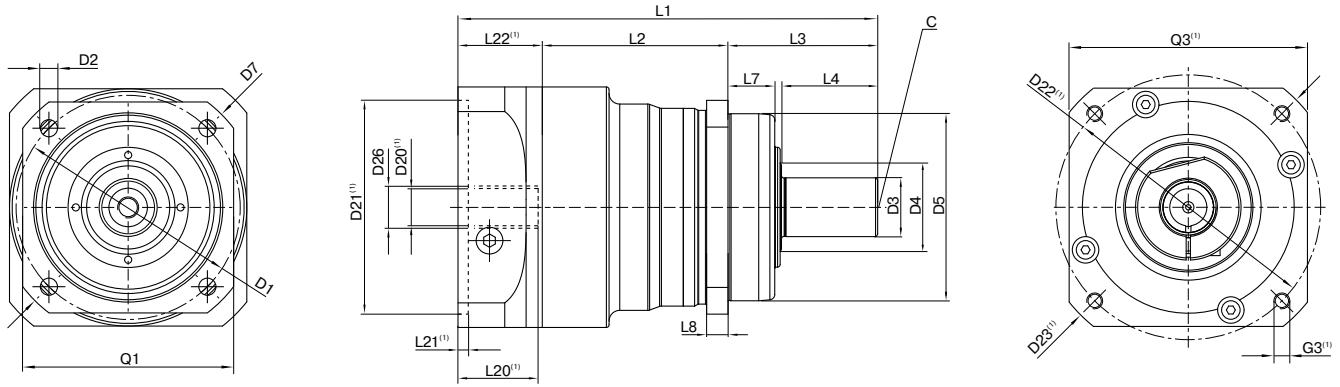
<sup>(1)</sup> Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
<sup>(2)</sup> Number of stages  
<sup>(3)</sup> Application specific configuration with NCP – www.neugart.com  
<sup>(4)</sup> Based on reference clamping system diameter

Output torques			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	i <sup>(1)</sup>	p <sup>(2)</sup>		
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>f</sub> .in)	11 (97)	24 (212)	45 (398)	114 (1009)	320 (2832)	710 (6284)	3	1		
			15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	800 (7081)	4			
			15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	800 (7081)	5			
			15 (133)	31 (274)	66 (584)	148 (1310)	300 (2655)	760 (6727)	7			
			15 (133)	33 (292)	63 (558)	131 (1159)	295 (2611)	-	8			
			11 (97)	23 (204)	50 (443)	119 (1053)	255 (2257)	630 (5576)	10			
			13.5 (119)	24 (212)	45 (398)	114 (1009)	320 (2832)	710 (6284)	12			
			13.5 (119)	24 (212)	45 (398)	114 (1009)	320 (2832)	710 (6284)	15			
					15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	800 (7081)	16	2
					15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	800 (7081)	20	
					15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	800 (7081)	25	
					15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	800 (7081)	35	
					15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	800 (7081)	40	
					15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	800 (7081)	50	
					15 (133)	31 (274)	66 (584)	148 (1310)	300 (2655)	760 (6727)	70	
					11 (97)	23 (204)	50 (443)	119 (1053)	255 (2257)	630 (5576)	100	

Input speeds			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	i <sup>(1)</sup>	p <sup>(2)</sup>		
Continuous input speed <sup>(3)(4)</sup>	n <sub>ID</sub>	rpm	4050	2500	2150	1600	1000	610	3	1		
			4150	3150	2150	1750	1050	610	4			
			4950	3800	2600	2200	1500	800	5			
			5000	4500	3450	3200	2200	1100	7			
			5000	4500	3500	3150	2550	-	8			
			5000	4500	4000	3500	3000	1550	10			
			5000	4500	4450	3100	2000	1350	12			
			4500	4500	4500	3850	2500	1750	15			
					5000	4500	4300	3150	2000	1450	16	2
					4600	4500	4500	3900	2500	1900	20	
					5000	4500	4500	4000	3150	2250	25	
					5000	4500	4500	4000	3500	3000	35	
					5000	4500	4500	4000	3500	3000	40	
					5000	4500	4500	4000	3500	3000	50	
					5000	4500	4500	4000	3500	3000	70	
					5000	4500	4500	4000	3500	3000	100	
Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	10000	10000	10000	8500	6500	6000		1		
			10000	10000	10000	10000	8500	6500	6500		2	

Output torques			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	i <sup>(1)</sup>	p <sup>(2)</sup>		
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>f</sub> .in)	48 (425)	90 (797)	210 (1859)	490 (4337)	1050 (9293)	2220 (19649)	3	1		
			48 (425)	120 (1062)	280 (2478)	650 (5753)	1400 (12391)	2960 (26198)	4			
			48 (425)	130 (1151)	280 (2478)	650 (5753)	1650 (14604)	3200 (28322)	5			
			48 (425)	80 (708)	175 (1549)	340 (3009)	1300 (11506)	3200 (28322)	7			
			48 (425)	90 (797)	200 (1770)	380 (3363)	850 (7523)	-	8			
			24 (212)	52 (460)	121 (1071)	295 (2611)	600 (5310)	1700 (15046)	10			
			48 (425)	135 (1195)	220 (1947)	500 (4425)	1250 (11063)	2400 (21242)	12			
			48 (425)	135 (1195)	220 (1947)	500 (4425)	1250 (11063)	2400 (21242)	15			
					48 (425)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	16	2
					48 (425)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	20	
					48 (425)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	25	
					48 (425)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	35	
					48 (425)	150 (1328)	210 (1859)	485 (4293)	1180 (10444)	2680 (23720)	40	
					48 (425)	150 (1328)	260 (2301)	600 (5310)	1480 (13099)	3200 (28322)	50	
					48 (425)	80 (708)	175 (1549)	340 (3009)	1300 (11506)	3200 (28322)	70	
					24 (212)	52 (460)	121 (1071)	295 (2611)	600 (5310)	1700 (15046)	100	

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times



Drawing corresponds to a PSN090 / 1-stage / smooth output shaft / 14 mm clamping system / motor adaptation – 2-part – round universal flange / 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>			PSN055	PSN070	PSN090	PSN115	PSN142	PSN190	p <sup>(3)</sup>	Code
Pitch circle diameter output	D1		63 (2.480)	68 - 75 (2.677 - 2.953)	85 (3.346)	120 (4.724)	165 (6.496)	215 (8.465)		
Mounting bore output	D2	4x	5.5 (0.217)	5.5 (0.217)	6.5 (0.256)	9.0 (0.354)	11.0 (0.433)	13.5 (0.531)		
Shaft diameter output	D3	k6	12 (0.472)	16 (0.630)	22 (0.866)	32 (1.260)	40 (1.575)	55 (2.165)		
Shaft collar output	D4		16 (0.630)	21.5 (0.846)	31.5 (1.240)	41.5 (1.634)	57.5 (2.264)	76.5 (3.012)		
Centering diameter output	D5	g7	50 (1.969)	60 (2.362)	70 (2.756)	90 (3.543)	130 (5.118)	160 (6.299)		
Diagonal dimension output	D7		74 (2.913)	92 (3.622)	100 (3.937)	140 (5.512)	185 (7.283)	240 (9.449)		
Flange cross section output	Q1	■	55 (2.165)	70 (2.756)	80 (3.150)	110 (4.331)	142 (5.591)	190 (7.480)		
Min. total length	L1		103.5 (4.075)	134 (5.276)	157 (6.181)	202.5 (7.972)	261.5 (10.295)	310.5 (12.224)	1	
			127 (5.000)	162.5 (6.398)	179 (7.047)	224.5 (8.839)	292.5 (11.516)	355.5 (13.996)	2	
Housing length	L2		43 (1.693)	60.5 (2.382)	69.5 (2.736)	71 (2.795)	101.5 (3.996)	130.5 (5.138)	1	
			66.5 (2.618)	89 (3.504)	98 (3.858)	104.5 (4.114)	139 (5.472)	194 (7.638)	2	
Centering depth output	L7		12 (0.472)	19 (0.748)	17.5 (0.689)	28 (1.102)	28 (1.102)	28 (1.102)		
Flange thickness output	L8		6 (0.236)	7 (0.276)	8 (0.315)	10 (0.394)	12 (0.472)	15 (0.591)		
Center hole (DIN 332. type DR)	C		M4x10	M5x12.5	M8x19	M12x28	M16x36	M20x42		
Motor shaft diameter j6/k6	D20		More information on page 191/192							
Clamping system diameter input	D26		More information on page 112							
Output shaft with feather key (DIN 6885-1)			A 4x4x18	A 5x5x25	A 6x6x28	A 10x8x50	A 12x8x65	A 16x10x70		
Feather key width (DIN 6885-1)	B1		4 (0.157)	5 (0.197)	6 (0.236)	10 (0.394)	12 (0.472)	16 (0.630)		
Shaft height including feather key (DIN 6885-1)	H1		13.5 (0.531)	18 (0.709)	24.5 (0.965)	35 (1.378)	43 (1.693)	59 (2.323)		<b>A</b>
Shaft length output	L3		36 (1.417)	48 (1.890)	56 (2.205)	88 (3.465)	110 (4.331)	112 (4.409)		
Shaft length from shoulder	L4		23 (0.906)	28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)	82 (3.228)		
Feather key length	L5		18 (0.709)	25 (0.984)	28 (1.102)	50 (1.969)	65 (2.559)	70 (2.756)		
Distance from shaft end	L6		2 (0.079)	2 (0.079)	4 (0.157)	4 (0.157)	8 (0.315)	6 (0.236)		
Smooth output shaft										
Shaft length output	L3		36 (1.417)	48 (1.890)	56 (2.205)	88 (3.465)	110 (4.331)	112 (4.409)		<b>B</b>
Shaft length from shoulder	L4		23 (0.906)	28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)	82 (3.228)		
Splined output shaft (DIN 5480)			-	W16x 0.8x18x6m	W22x 1.25x16x6m	W32x 1.25x24x6m	W40x 2.0x18x6m	W55x 2.0x26x6m		
Width of gearing	L <sub>v</sub>		-	15 (0.591)	15 (0.591)	15 (0.591)	20 (0.787)	22 (0.866)		<b>C</b>
Shaft length output	L3		-	46 (1.811)	46 (1.811)	56 (2.205)	70 (2.756)	71.5 (2.815)		
Shaft length from shoulder	L4		-	26 (1.024)	26 (1.024)	26 (1.024)	40 (1.575)	41.5 (1.634)		

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

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



# PSFN

The precision planetary gearbox for maximum loads with particularly quiet drive and flange output shaft

Thanks to its standardized flange interface and a planet carrier in a cage design, our **PSFN** is extremely torsionally rigid. The specially developed helical gearing reduces vibrations to a minimum. With its high tilting moment, you can demand a lot from this precision planetary gearbox.

Cyclic torque **14 - 950 Nm**



Radial force **1450 - 23000 N**



Axial force **2350 - 12000 N**



Torsional backlash **1 - 8 arcmin**



Protection class **IP65**

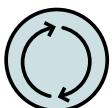


Frame sizes

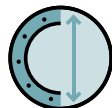
- 55
- 64
- 90
- 110
- 140
- 200



Precision Line



Equidirectional rotation



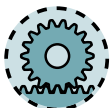
Extra large round type output flange



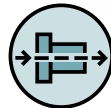
Rotary shaft seal



Planet carrier in cage design



Option: Rack and pinion  
Planetary gearbox (Details on page 158)



Coaxial gearbox



Helical gear



Preloaded angular contact roller bearings



Flange output shaft (ISO 9409-1)



Option: Reduced backlash



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			PSFN055	PSFN064	PSFN090	PSFN110	PSFN140	PSFN200	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000						
	Efficiency <sup>(3)</sup>	η	%	97						1
				96						2
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)						
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)						
	Protection class			IP65						
<b>S</b>	Standard lubrication			Oil (lifetime lubrication)						
<b>F</b>	Food grade lubrication			Oil (lifetime lubrication)						
	Installation position			Any						
<b>S</b>	Standard backlash	φ	arcmin	< 6	< 3	< 3	< 3	< 3	< 3	1
				< 8	< 5	< 5	< 5	< 5	< 5	< 5
<b>R</b>	Reduced backlash	φ	arcmin	< 4	< 2	< 1	< 1	< 1	< 1	1
				< 6	< 2	< 1	< 1	< 1	< 1	< 1
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>f</sub> .in / arcmin)	2.8 - 6.2 (25 - 55)	8.3 - 12.8 (73 - 113)	21.5 - 32.0 (190 - 283)	64.0 - 81.0 (566 - 717)	129.0 - 218.0 (1142 - 1929)	374.0 - 602.0 (3310 - 5328)	1
				2.8 - 6.5 (25 - 58)	8.2 - 13.3 (73 - 118)	21.0 - 31.5 (186 - 279)	64.0 - 83.0 (566 - 735)	127.0 - 206.0 (1124 - 1823)	365.0 - 668.0 (3231 - 5912)	2
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	0.7 (1.6)	1.6 (3.5)	3.5 - 3.6 (7.7 - 7.9)	5.2 - 5.3 (11.4 - 11.8)	11.5 - 11.7 (25.3 - 25.9)	28.1 - 29.1 (62.0 - 64.2)	1
				1.1 (2.3 - 2.4)	2.2 - 2.3 (4.9 - 5.0)	3.7 - 3.8 (8.2 - 8.4)	6.7 - 6.9 (14.8 - 15.2)	13.1 - 13.5 (28.9 - 29.8)	32.4 - 33.6 (71.4 - 74.2)	2
<b>S</b>	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)						
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black						
	Running noise <sup>(5)</sup>	L <sub>pA</sub>	dB(A)	56	57	58	63	66	68	

Output shaft loads			PSFN055	PSFN064	PSFN090	PSFN110	PSFN140	PSFN200	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N (lb <sub>f</sub> )	1450 (326)	2150 (483)	3950 (888)	4900 (1102)	12000 (2698)	23000 (5171)	
Maximum axial force	F <sub>a max</sub>		2350 (528)	2850 (641)	5450 (1225)	6450 (1450)	7500 (1686)	12000 (2698)	
Maximum tilting moment	M <sub>K max</sub>	Nm (lb <sub>f</sub> .in)	75 (667)	132 (1170)	326 (2888)	475 (4207)	1030 (9113)	2445 (21639)	

Input characteristics			PSFN055	PSFN064	PSFN090	PSFN110	PSFN140	PSFN200	p <sup>(1)</sup>		
Clamping system diameter input (Code)	D26	mm	11 (C) <sup>(5)</sup>	11 (C)	14 (D)	19 (E)	35 (G) <sup>(5)</sup>	48 (K) <sup>(5)</sup>	1		
			14 (D)	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	42 (H)	-			
			-	19 (E)	24 (F)	35 (G)	-	-			
					11 (C) <sup>(5)</sup>	11 (C)	11 (C)	14 (D)	19 (E)	35 (G) <sup>(5)</sup>	2
					14 (D)	14 (D) <sup>(5)</sup>	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	42 (H)	
					-	19 (E)	19 (E)	24 (F)	35 (G)	-	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>i</sub>	kgcm <sup>2</sup> (lb <sub>f</sub> .in.s <sup>2</sup> ·10 <sup>-4</sup> )	0.097 - 0.117 (0.859 - 1.036)	0.149 - 0.210 (1.319 - 1.859)	0.450 - 0.719 (3.983 - 6.364)	1.180 - 2.029 (10.444 - 17.958)	6.526 - 9.670 (57.760 - 85.587)	22.520 - 40.642 (199.319 - 359.712)	1		
			0.095 - 0.109 (0.841 - 0.965)	0.146 - 0.203 (1.292 - 1.797)	0.147 - 0.219 (1.301 - 1.938)	0.435 - 0.697 (3.850 - 6.169)	1.144 - 2.127 (10.125 - 18.826)	6.434 - 10.410 (56.946 - 92.136)	2		
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>f</sub> .in)	0.20 - 0.35 (2 - 3)	0.25 - 0.65 (2 - 6)	0.50 - 1.65 (4 - 15)	1.00 - 3.80 (9 - 34)	2.60 - 9.10 (23 - 81)	6.70 - 26.90 (59 - 238)	1		
			0.15 - 0.25 (1 - 2)	0.15 - 0.45 (1 - 4)	0.25 - 0.60 (2 - 5)	0.45 - 1.45 (4 - 13)	0.75 - 3.40 (7 - 30)	1.80 - 8.00 (16 - 71)	2		
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		10 (89)	18 (159)	38 (336)	80 (708)	180 (1593)	300 (2655)	1		
			10 (89)	18 (159)	18 (159)	38 (336)	80 (708)	180 (1593)	2		

(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			PSFN055	PSFN064	PSFN090	PSFN110	PSFN140	PSFN200	i <sup>(1)</sup>	p <sup>(2)</sup>		
Cyclic torque <sup>(3)/(4)</sup>	T <sub>zz</sub>	Nm (lb <sub>f</sub> .in)	18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	950 (8408)	4	1		
			18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	5			
			18 (159)	37 (327)	78 (690)	170 (1505)	355 (3142)	900 (7966)	7			
			18 (159)	39 (345)	75 (664)	155 (1372)	350 (3098)	-	8			
												2
			13.5 (119)	28 (248)	59 (522)	140 (1239)	270 (2390)	730 (6461)	10			
			18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	950 (8408)	16			
			18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	950 (8408)	20			
			18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	25			
			18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	35			
			18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	950 (8408)	40			
			18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	950 (8408)	50			
			18 (159)	37 (327)	78 (690)	170 (1505)	355 (3142)	900 (7966)	70			
			13.5 (119)	28 (248)	59 (522)	140 (1239)	270 (2390)	730 (6461)	100			
Maximum torque <sup>(3)/(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>f</sub> .in)	28 (248)	62 (549)	128 (1133)	285 (2522)	700 (6196)	1480 (13099)	4	1		
			28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	1520 (13453)	5			
			28 (248)	59 (522)	124 (1097)	270 (2390)	560 (4956)	1440 (12745)	7			
			28 (248)	62 (549)	120 (1062)	245 (2168)	490 (4337)	-	8			
												2
			21 (186)	44 (389)	94 (832)	220 (1947)	435 (3850)	1050 (9293)	10			
			28 (248)	62 (549)	128 (1133)	285 (2522)	750 (6638)	1520 (13453)	16			
			28 (248)	62 (549)	128 (1133)	285 (2522)	750 (6638)	1520 (13453)	20			
			28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	1520 (13453)	25			
			28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	1520 (13453)	35			
			28 (248)	62 (549)	128 (1133)	285 (2522)	750 (6638)	1520 (13453)	40			
			28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	1520 (13453)	50			
			28 (248)	51 (451)	124 (1097)	270 (2390)	560 (4956)	1440 (12745)	70			
			21 (186)	44 (389)	94 (832)	220 (1947)	435 (3850)	1050 (9293)	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  
<sup>(4)</sup> Based on reference clamping system diameter

Output torques			PSFN055	PSFN064	PSFN090	PSFN110	PSFN140	PSFN200	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>r</sub> .in)	15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	800 (7081)	4	1
			15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	800 (7081)	5	
			15 (133)	31 (274)	66 (584)	148 (1310)	300 (2655)	760 (6727)	7	
			15 (133)	33 (292)	63 (558)	131 (1159)	295 (2611)	-	8	
			11 (97)	23 (204)	50 (443)	119 (1053)	255 (2257)	630 (5576)	10	
			15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	800 (7081)	16	2
			15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	800 (7081)	20	
			15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	800 (7081)	25	
			15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	800 (7081)	35	
			15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	800 (7081)	40	
			15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	800 (7081)	50	
			15 (133)	31 (274)	66 (584)	148 (1310)	300 (2655)	760 (6727)	70	
			11 (97)	23 (204)	50 (443)	119 (1053)	255 (2257)	630 (5576)	100	

Input speeds			PSFN055	PSFN064	PSFN090	PSFN110	PSFN140	PSFN200	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	3550	4200	2800	2000	680	560	4	1
			4000	4500	3450	2600	940	730	5	
			4550	4500	4000	3500	1350	1000	7	
			5000	4500	4000	3500	1550	-	8	
			5000	4500	4000	3500	1950	1450	10	
			5000	4500	4500	3350	1650	1300	16	2
			5000	4500	4500	4000	2050	1650	20	
			5000	4500	4500	4000	2550	1950	25	
			5000	4500	4500	4000	3500	2750	35	
			5000	4500	4500	4000	3500	3000	40	
			5000	4500	4500	4000	3500	3000	50	
			5000	4500	4500	4000	3500	3000	70	
			5000	4500	4500	4000	3500	3000	100	
Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	10000	10000	10000	8500	6500	6000		1
			10000	10000	10000	10000	8500	6500		2

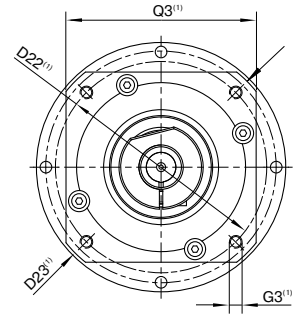
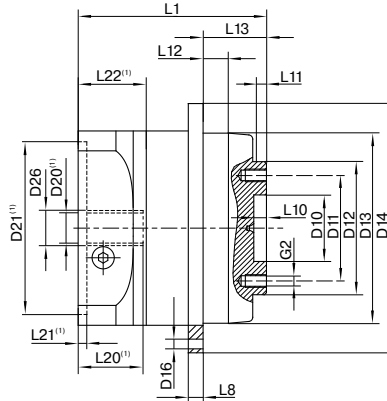
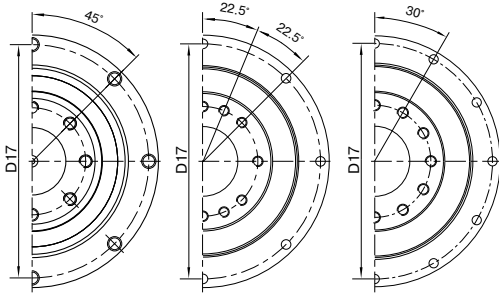
Output torques			PSFN055	PSFN064	PSFN090	PSFN110	PSFN140	PSFN200	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>r</sub> .in)	55 (487)	120 (1062)	280 (2478)	650 (5753)	1400 (12391)	2960 (26198)	4	1
			55 (487)	130 (1151)	280 (2478)	650 (5753)	1650 (14604)	3200 (28322)	5	
			55 (487)	80 (708)	175 (1549)	340 (3009)	1300 (11506)	3200 (28322)	7	
			50 (443)	90 (797)	200 (1770)	380 (3363)	850 (7523)	-	8	
			24 (212)	52 (460)	121 (1071)	295 (2611)	600 (5310)	1700 (15046)	10	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	16	2
			55 (487)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	20	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	25	
			55 (487)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	3200 (28322)	35	
			55 (487)	150 (1328)	210 (1859)	485 (4293)	1180 (10444)	2680 (23720)	40	
			55 (487)	150 (1328)	260 (2301)	600 (5310)	1480 (13099)	3200 (28322)	50	
			55 (487)	80 (708)	175 (1549)	340 (3009)	1300 (11506)	3200 (28322)	70	
			24 (212)	52 (460)	121 (1071)	295 (2611)	600 (5310)	1700 (15046)	100	

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times

PSFN055  
PSFN064  
PSFN090

PSFN110

PSFN140  
PSFN200



Drawing corresponds to a PSFN090 / 1-stage / flange output shaft / 14 mm clamping system / motor adaptation – 2-part – round universal flange / 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>			PSFN055	PSFN064	PSFN090	PSFN110	PSFN140	PSFN200	p <sup>(3)</sup>	Code
Centering diameter output shaft	D10	H7	16 (0.630)	20 (0.787)	31.5 (1.240)	40 (1.575)	50 (1.969)	80 (3.150)		
Pitch circle diameter output shaft	D11		25 (0.984)	31.5 (1.240)	50 (1.969)	63 (2.480)	80 (3.150)	125 (4.921)		
Centering diameter output shaft	D12	h7	34 (1.339)	40 (1.575)	63 (2.480)	80 (3.150)	100 (3.937)	160 (6.299)		
Centering diameter output flange	D13		55 (2.165)	64 (2.520)	90 (3.543)	110 (4.331)	140 (5.512)	200 (7.874)		
Flange diameter output	D14		72 (2.835)	86 (3.386)	118 (4.646)	145 (5.709)	179 (7.047)	247 (9.724)		
Mounting bore output	D16		3.4 8x45°	4.5 8x45°	5.5 8x45°	5.5 8x45°	6.6 12x30°	9 12x30°		
Pitch circle diameter output flange	D17		67 (2.638)	79 (3.110)	109 (4.291)	135 (5.315)	168 (6.614)	233 (9.173)		
Min. total length	L1		66 (2.598)	71 (2.795)	89.5 (3.524)	108 (4.252)	142 (5.591)	172 (6.772)	1	
			89.5 (3.524)	99.5 (3.917)	111.5 (4.390)	130 (5.118)	173 (6.811)	217 (8.543)	2	
Flange thickness output	L8		4 (0.157)	4 (0.157)	7 (0.276)	8 (0.315)	10 (0.394)	12 (0.472)		
Centering depth output shaft	L10		4.1 (0.161)	4.5 (0.177)	6.5 (0.256)	6.5 (0.256)	6.5 (0.256)	10 (0.394)		
	L11		3 (0.118)	3 (0.118)	6 (0.236)	6 (0.236)	6 (0.236)	7 (0.276)		
Centering depth output flange	L12		8 (0.315)	10 (0.394)	12 (0.472)	12 (0.472)	14 (0.551)	17.5 (0.689)		
Output flange length	L13		19.0	19.5	30.0	29.0	38.0	50.0		
Motor shaft diameter j6/k6	D20		More information on page 191/192							
Clamping system diameter input	D26		More information on page 118							
Flange output shaft (similar ISO 9409-1)										D
Number x thread x depth	G2		8 x M4x6	8 x M5x7	8 x M6x10	12 x M6x12	12 x M8x15	12 x M10x20		
Flange output shaft with dowel hole (ISO 9409-1)										E
Dowel hole x depth	D15	H7	4x5	5x5	6x6	6x6	8x8	10x10		
Number x thread x depth	G2		7 x M4x6	7 x M5x7	7 x M6x10	11 x M6x12	11 x M8x15	11 x M10x20		

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

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



# PSBN

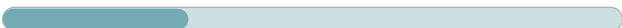
The high-performance precision planetary gearbox with helical gearing for a particularly quiet drive

Our **PSBN** is the ideal combination of a precision planetary gearbox and efficient bearing technology. It was designed specifically to achieve maximum performance at high speed. Thanks to the helical gearing, it operates particularly smoothly - and is quieter than average.

Cyclic torque **11 - 470 Nm**



Radial force **830 - 9500 N**



Axial force **800 - 9600 N**



Torsional backlash **1 - 8 arcmin**

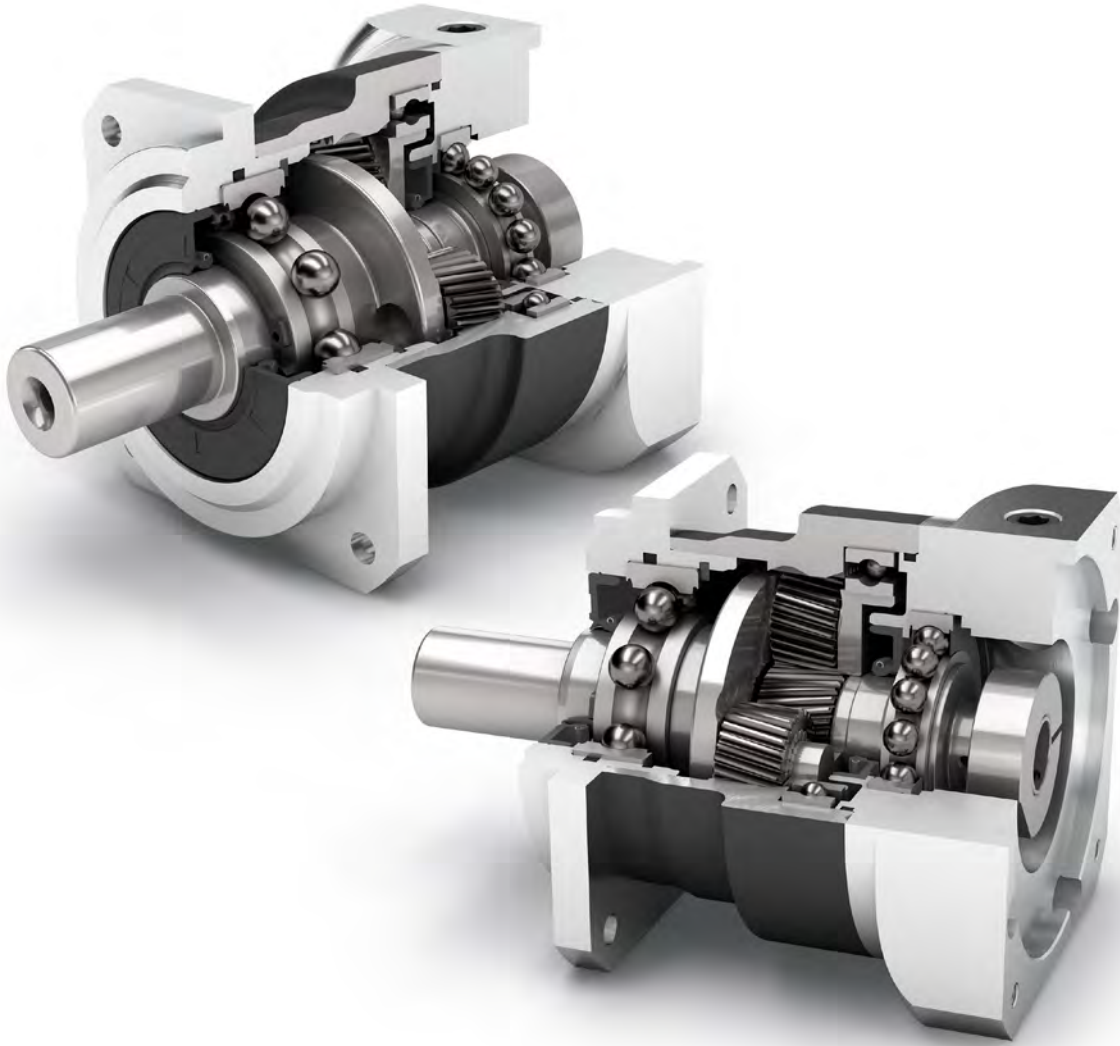


Protection class **IP65**

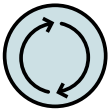


Frame sizes

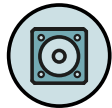
- 55
- 70
- 90
- 115
- 142



Precision Line



Equidirectional rotation



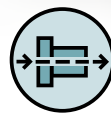
Square type output flange



Rotary shaft seal



Option: Reduced backlash



Coaxial gearbox



Helical gear



Reinforced deep groove ball bearings



Planet carrier in cage design



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			PSBN055	PSBN070	PSBN090	PSBN115	PSBN142	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000					
	Efficiency <sup>(3)</sup>	η	%	98					1
				96					2
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)					
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)					
	Protection class			IP65					
<b>S</b>	Standard lubrication			Oil (lifetime lubrication)					
<b>F</b>	Food grade lubrication			Oil (lifetime lubrication)					
	Installation position			Any					
<b>S</b>	Standard backlash	φ	arcmin	< 6	< 3	< 3	< 3	< 3	1
				< 8	< 5	< 5	< 5	< 5	2
<b>R</b>	Reduced backlash	φ	arcmin	< 4	< 2	< 1	< 1	< 1	1
				< 6	< 2	< 1	< 1	< 1	2
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>r</sub> .in / arcmin)	1.4 - 2.3 (12 - 20)	4.2 - 5.6 (37 - 50)	10.7 - 13.7 (95 - 121)	29.0 - 36.5 (257 - 323)	59.5 - 76.0 (527 - 673)	1
				1.5 - 2.4 (13 - 21)	4.1 - 5.7 (36 - 50)	10.3 - 13.5 (91 - 119)	26.0 - 35.0 (230 - 310)	58.0 - 71.0 (513 - 628)	2
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	0.8 (1.7 - 1.9)	1.6 - 1.7 (3.6 - 3.7)	3.3 - 3.4 (7.4 - 7.5)	5.6 - 6.0 (12.4 - 13.2)	1.2 - 13.5 (29.0 - 29.7)	1
				1.1 (2.5)	2.3 (5.1 - 5.2)	3.5 - 3.6 (7.8 - 7.9)	7.1 - 7.3 (15.6 - 16.0)	15.0 - 15.5 (33.2 - 34.1)	2
<b>S</b>	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)					
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black					
	Running noise <sup>(5)</sup>	L <sub>pA</sub>	dB(A)	56	57	58	63	66	

Output shaft loads			PSBN055	PSBN070	PSBN090	PSBN115	PSBN142	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N (lb <sub>r</sub> )	830 (187)	1600 (360)	3100 (697)	4500 (1012)	9500 (2136)	
Maximum axial force	F <sub>a max</sub>		800 (180)	1500 (337)	2800 (629)	4500 (1012)	9600 (2158)	
Maximum tilting moment	M <sub>K max</sub>	Nm (lb <sub>r</sub> .in)	42 (373)	109 (961)	251 (2222)	442 (3916)	1314 - 1329 (11633 - 11759)	

Input characteristics			PSBN055	PSBN070	PSBN090	PSBN115	PSBN142	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	11 (C) <sup>(5)</sup>	11 (C)	14 (D)	19 (E)	35 (G) <sup>(5)</sup>	1
			14 (D)	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	42 (H)	
			-	19 (E)	24 (F)	35 (G)	-	
			11 (C) <sup>(5)</sup>	11 (C)	11 (C)	14 (D)	19 (E)	2
			14 (D)	14 (D) <sup>(5)</sup>	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	
			-	19 (E)	19 (E)	24 (F)	35 (G)	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>r</sub> .in.s <sup>2</sup> 10 <sup>-4</sup> )	0.096 - 0.133 (0.850 - 1.177)	0.149 - 0.283 (1.319 - 2.505)	0.436 - 0.895 (3.859 - 7.921)	1.164 - 2.941 (10.302 - 26.030)	6.539 - 14.440 (57.875 - 127.805)	1
			0.096 - 0.113 (0.850 - 1.000)	0.146 - 0.197 (1.292 - 1.744)	0.146 - 0.222 (1.292 - 1.965)	0.431 - 0.709 (3.815 - 6.275)	1.131 - 2.293 (10.010 - 20.295)	2
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>r</sub> .in)	0.15 - 0.25 (1 - 2)	0.20 - 0.60 (2 - 5)	0.40 - 1.20 (4 - 11)	0.70 - 2.40 (6 - 21)	1.30 - 6.60 (12 - 58)	1
			0.15 - 0.25 (1 - 2)	0.20 - 0.40 (2 - 4)	0.25 - 0.60 (2 - 5)	0.45 - 1.20 (4 - 11)	0.65 - 2.70 (6 - 24)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		10 (89)	18 (159)	38 (336)	80 (708)	180 (1593)	1
			10 (89)	18 (159)	18 (159)	38 (336)	80 (708)	2

(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			PSBN055	PSBN070	PSBN090	PSBN115	PSBN142	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>2z</sub>	Nm (lb <sub>r</sub> .in)	16 (142)	29 (257)	54 (478)	135 (1195)	380 (3363)	3	1
			18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	4	
			18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	5	
			18 (159)	37 (327)	78 (690)	170 (1505)	355 (3142)	7	
			18 (159)	39 (345)	75 (664)	155 (1372)	350 (3098)	8	
			13.5 (119)	28 (248)	59 (522)	140 (1239)	270 (2390)	10	
		16 (142)	29 (257)	54 (478)	135 (1195)	380 (3363)	12	2	
		16 (142)	29 (257)	54 (478)	135 (1195)	380 (3363)	15		
		18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	16		
		18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	20		
		18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	25		
		18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	35		
		18 (159)	39 (345)	80 (708)	180 (1593)	470 (4160)	40		
		18 (159)	40 (354)	80 (708)	175 (1549)	405 (3585)	50		
		18 (159)	37 (327)	78 (690)	170 (1505)	355 (3142)	70		
		13.5 (119)	28 (248)	59 (522)	140 (1239)	270 (2390)	100		
Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	25 (221)	46 (407)	86 (761)	215 (1903)	520 (4602)	3	1
			28 (248)	62 (549)	128 (1133)	285 (2522)	700 (6196)	4	
			28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	5	
			28 (248)	59 (522)	124 (1097)	270 (2390)	560 (4956)	7	
			28 (248)	62 (549)	120 (1062)	245 (2168)	490 (4337)	8	
			21 (186)	44 (389)	94 (832)	220 (1947)	435 (3850)	10	
		25 (221)	46 (407)	86 (761)	215 (1903)	600 (5310)	12	2	
		25 (221)	46 (407)	86 (761)	215 (1903)	600 (5310)	15		
		28 (248)	62 (549)	128 (1133)	285 (2522)	750 (6638)	16		
		28 (248)	62 (549)	128 (1133)	285 (2522)	750 (6638)	20		
		28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	25		
		28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	35		
		28 (248)	62 (549)	128 (1133)	285 (2522)	750 (6638)	40		
		28 (248)	64 (566)	128 (1133)	280 (2478)	640 (5664)	50		
		28 (248)	51 (451)	124 (1097)	270 (2390)	560 (4956)	70		
		21 (186)	44 (389)	94 (832)	220 (1947)	435 (3850)	100		

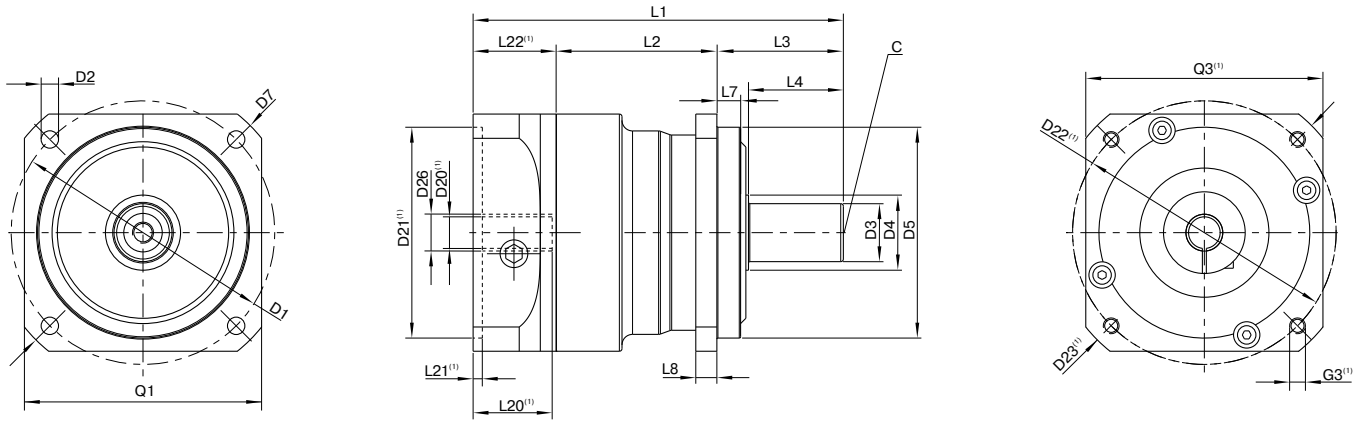
<sup>(1)</sup> Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
<sup>(2)</sup> Number of stages  
<sup>(3)</sup> Application specific configuration with NCP – www.neugart.com  
<sup>(4)</sup> Based on reference clamping system diameter

Output torques			PSBN055	PSBN070	PSBN090	PSBN115	PSBN142	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>f</sub> .in)	11 (97)	24 (212)	45 (398)	114 (1009)	320 (2832)	3	1
			15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	4	
			15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	5	
			15 (133)	31 (274)	66 (584)	148 (1310)	300 (2655)	7	
			15 (133)	33 (292)	63 (558)	131 (1159)	295 (2611)	8	
			11 (97)	23 (204)	50 (443)	119 (1053)	255 (2257)	10	
		13.5 (119)	24 (212)	45 (398)	114 (1009)	320 (2832)	12	2	
		13.5 (119)	24 (212)	45 (398)	114 (1009)	320 (2832)	15		
		15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	16		
		15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	20		
		15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	25		
		15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	35		
		15 (133)	33 (292)	68 (602)	153 (1354)	395 (3496)	40		
		15 (133)	34 (301)	68 (602)	148 (1310)	340 (3009)	50		
		15 (133)	31 (274)	66 (584)	148 (1310)	300 (2655)	70		
		11 (97)	23 (204)	50 (443)	119 (1053)	255 (2257)	100		

Input speeds			PSBN055	PSBN070	PSBN090	PSBN115	PSBN142	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	4300	4500	3150	2100	1450	3	1
			4300	4450	3050	2250	1750	4	
			4850	4500	3850	3050	2400	5	
			5000	4500	4000	3500	3000	7	
			5000	4500	4000	3500	3000	8	
			5000	4500	4000	3500	3000	10	
		5000	4500	4500	3650	2550	12	2	
		4900	4500	4500	4000	3200	15		
		5000	4500	4500	3600	2500	16		
		5000	4500	4500	4000	3150	20		
		5000	4500	4500	4000	3500	25		
		5000	4500	4500	4000	3500	35		
		5000	4500	4500	4000	3500	40		
		5000	4500	4500	4000	3500	50		
		5000	4500	4500	4000	3500	70		
		5000	4500	4500	4000	3500	100		
Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	10000	10000	10000	8500	6500		1
			10000	10000	10000	10000	8500		2

Output torques			PSBN055	PSBN070	PSBN090	PSBN115	PSBN142	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>f</sub> .in)	48 (425)	90 (797)	210 (1859)	490 (4337)	1050 (9293)	3	1
			48 (425)	120 (1062)	280 (2478)	650 (5753)	1400 (12391)	4	
			48 (425)	130 (1151)	280 (2478)	650 (5753)	1650 (14604)	5	
			48 (425)	80 (708)	175 (1549)	340 (3009)	1300 (11506)	7	
			48 (425)	90 (797)	200 (1770)	380 (3363)	850 (7523)	8	
			24 (212)	52 (460)	121 (1071)	295 (2611)	600 (5310)	10	
		48 (425)	135 (1195)	220 (1947)	500 (4425)	1250 (11063)	12	2	
		48 (425)	135 (1195)	220 (1947)	500 (4425)	1250 (11063)	15		
		48 (425)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	16		
		48 (425)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	20		
		48 (425)	150 (1328)	300 (2655)	650 (5753)	1650 (14604)	25		
		48 (425)	89 (788)	300 (2655)	650 (5753)	1650 (14604)	35		
		48 (425)	150 (1328)	210 (1859)	485 (4293)	1180 (10444)	40		
		48 (425)	150 (1328)	260 (2301)	600 (5310)	1480 (13099)	50		
		48 (425)	80 (708)	175 (1549)	340 (3009)	1300 (11506)	70		
		24 (212)	52 (460)	121 (1071)	295 (2611)	600 (5310)	100		

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times



Drawing corresponds to a PSBN090 / 1-stage / smooth output shaft / 14 mm clamping system / motor adaptation – 2-part – round universal flange / B5 flange type motor

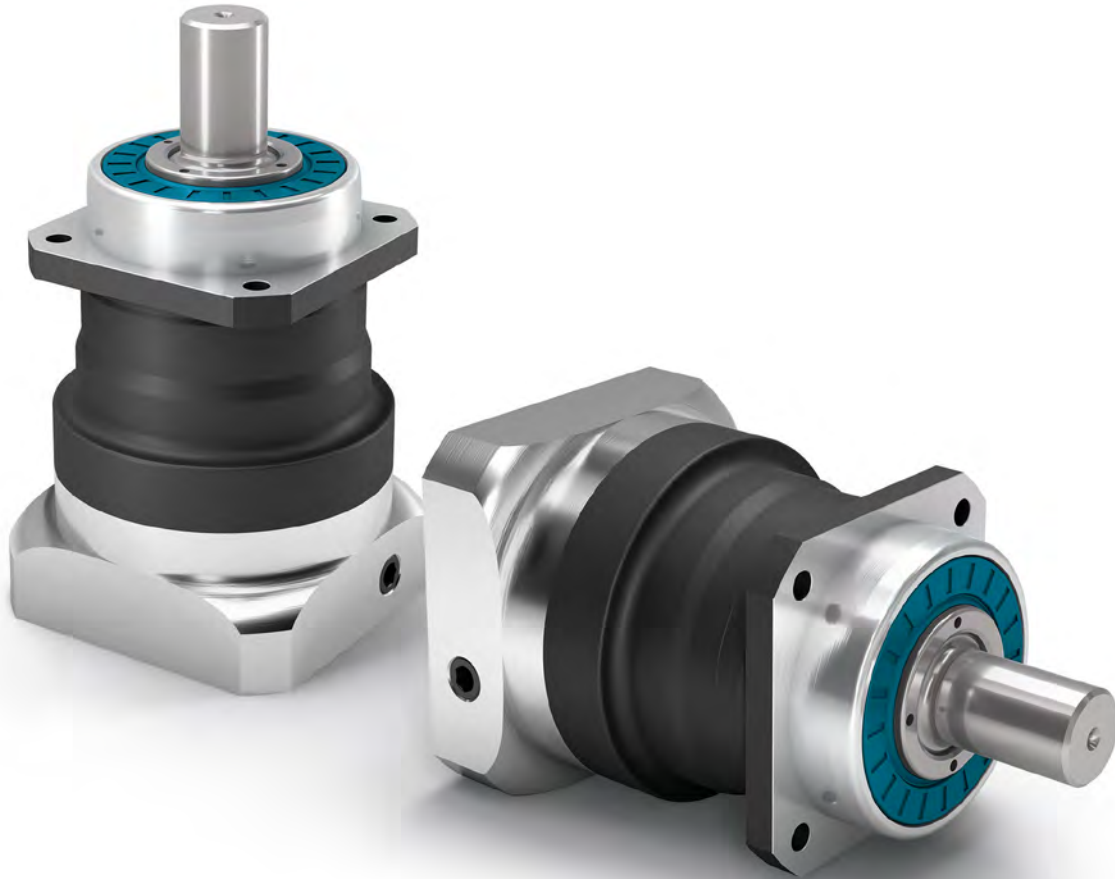
<sup>(1)</sup> The dimensions vary with the motor/gearbox flange. The input flange dimensions can be retrieved for each specific motor in Tec Data Finder at [www.neugart.com](http://www.neugart.com)

Geometry <sup>(1)</sup>			PSBN055	PSBN070	PSBN090	PSBN115	PSBN142	p <sup>(2)</sup>	Code
Pitch circle diameter output	D1		63 (2.480)	70 (2.756)	100 (3.937)	130 (5.118)	165 (6.496)		
Mounting bore output	D2	4x	5.5 (0.217)	5.5 (0.217)	6.6 (0.260)	9.0 (0.354)	11.0 (0.433)		
Shaft diameter output	D3	j6	13 (0.512)	16 (0.630)	22 (0.866)	32 (1.260)	40 (1.575)		
Shaft collar output	D4		17 (0.669)	25 (0.984)	28.5 (1.122)	38.5 (1.516)	48.5 (1.909)		
Centering diameter output	D5	g6	50 (1.969)	50 (1.969)	80 (3.150)	110 (4.331)	130 (5.118)		
Diagonal dimension output	D7		74 (2.913)	80 (3.150)	115 (4.528)	148 (5.827)	185 (7.283)		
Flange cross section output	Q1	■	55 (2.165)	60 (2.362)	90 (3.543)	115 (4.528)	140 (5.512)		
Min. total length	L1		93.5 (3.681)	116.5 (4.587)	140.5 (5.531)	182.5 (7.185)	247.5 (9.744)	1	
			117 (4.606)	145 (5.709)	162.5 (6.398)	204 (8.032)	279 (10.984)	2	
Housing length	L2		43 (1.693)	54 (2.126)	61 (2.402)	74 (2.913)	100.5 (3.957)	1	
			56.5 (2.224)	82.5 (3.248)	89 (3.504)	107.5 (4.232)	138.5 (5.453)	2	
Shaft length output	L3		26 (1.024)	37 (1.457)	48 (1.890)	65 (2.559)	97 (3.819)		
Centering depth output	L7		6 (0.217)	6 (0.236)	9 (0.354)	4 (0.157)	12 (0.472)		
Flange thickness output	L8		6 (0.236)	6 (0.236)	8 (0.315)	10 (0.394)	12 (0.472)		
Center hole (DIN 332. type DR)	C		M4x10	M5x12.5	M8x19	M12x28	M16x36		
Motor shaft diameter j6/k6	D20		More information on page 191/192						
Clamping system diameter input	D26		More information on page 124						
Output shaft with feather key (DIN 6885-1)			A 5x5x16	A 5x5x25	A 6x6x28	A 10x8x50	A 12x8x65		
Feather key width (DIN 6885-1)	B1		5 (0.197)	5 (0.197)	6 (0.236)	10 (0.394)	12 (0.472)		A
Shaft height including feather key (DIN 6885-1)	H1		15 (0.591)	18 (0.709)	24.5 (0.965)	35 (1.378)	43 (1.693)		
Shaft length from shoulder	L4		19 (0.748)	28 (1.102)	36 (1.417)	58 (2.283)	82 (3.228)		
Feather key length	L5		16 (0.630)	25 (0.984)	28 (1.102)	50 (1.969)	65 (2.559)		
Distance from shaft end	L6		2 (0.079)	2 (0.079)	4 (0.157)	4 (0.157)	8 (0.315)		
Smooth output shaft									
Shaft length from shoulder	L4		19 (0.748)	28 (1.102)	36 (1.417)	58 (2.283)	82 (3.228)		B

<sup>(1)</sup> Dimensions in mm

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

PSBN



# PLN

The perfectly sealed planetary gearbox with straight gearing delivers the maximum performance without ever losing the required stiffness

Our precision straight-toothed planetary gearbox is designed for maximum power and torque. The preloaded tapered roller bearings in the **PLN** and the specially matched seal guarantee optimum performance even in applications where dust and water spray are encountered.

Cyclic torque **27 - 1800 Nm**



Radial force **3200 - 21000 N**



Axial force **4400 - 21000 N**



Torsional backlash **1 - 5 arcmin**

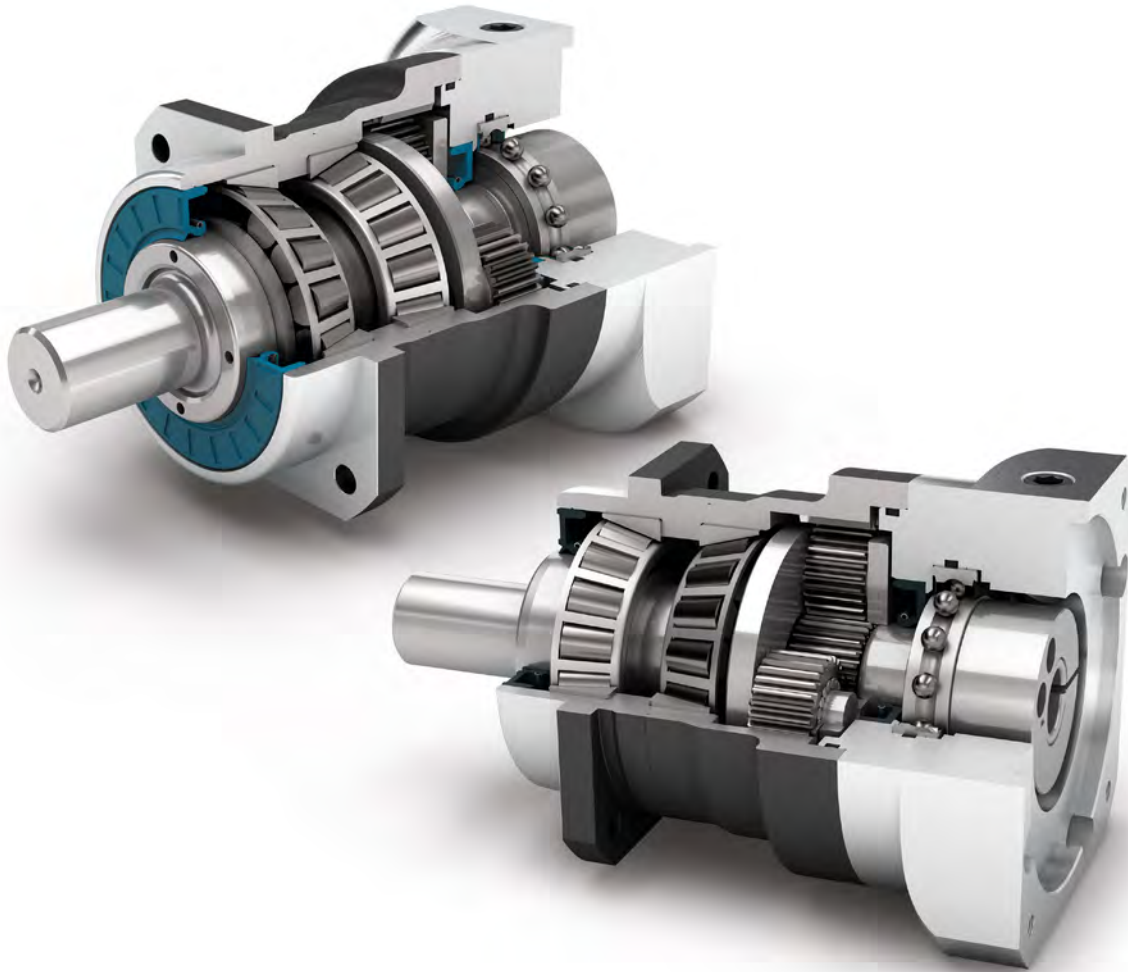


Protection class **IP65**



Frame sizes

- 70
- 90
- 115
- 142
- 190



Precision Line



Spur gear



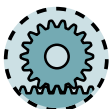
Preloaded tapered roller bearings



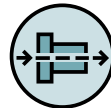
Extra long centering collar



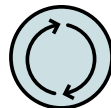
Option: Reduced backlash



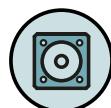
Option: Rack and pinion  
Planetary gearbox (Details on page 158)



Coaxial gearbox



Equidirectional rotation



Square type output flange



Rotary shaft seal



Planet carrier in cage design



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			PLN070	PLN090	PLN115	PLN142	PLN190	p <sup>(1)</sup>	
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000						
	Efficiency <sup>(3)</sup>	η	%	98					1	
				95					2	
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)						
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)						
	Protection class				IP65					
<b>S</b>	Standard lubrication				Oil (lifetime lubrication)					
<b>F</b>	Food grade lubrication				Oil (lifetime lubrication)					
	Installation position				Any					
<b>S</b>	Standard backlash	φ	arcmin	< 3					1	
				< 5					2	
<b>R</b>	Reduced backlash				< 2	< 1	< 1	< 1	< 1	
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>i</sub> .in / arcmin)	3.4 - 5.0 (30 - 44)	9.4 - 12.4 (83 - 110)	22.0 - 29.0 (195 - 257)	61.0 - 76.0 (540 - 673)	155.0 - 218.0 (1372 - 1929)	1	
				3.4 - 5.0 (30 - 44)	9.0 - 12.4 (80 - 110)	22.5 - 29.5 (199 - 261)	61.0 - 78.0 (540 - 690)	169.0 - 224.0 (1496 - 1983)	2	
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	1.9 - 2.0 (4.3 - 4.4)	3.3 - 3.5 (7.3 - 7.6)	6.4 - 7.2 (14.1 - 15.9)	15.8 - 17.3 (34.8 - 38.2)	32.9 - 41.5 (72.6 - 91.5)	1	
				2.4 - 2.5 (5.4 - 5.5)	4.0 - 4.2 (8.8 - 9.2)	8.0 - 8.8 (17.7 - 19.4)	20.8 - 21.5 (45.9 - 47.4)	44.3 - 48.5 (97.7 - 106.9)	2	
<b>S</b>	Standard surface				Housing: Steel – heat-treated and post-oxidized (black)					
<b>B</b>	Painted surface <sup>(4)</sup>				RAL 9005 Jet black					
	Running noise <sup>(5)</sup>	L <sub>pA</sub>	dB(A)	60	62	65	70	74		

Output shaft loads			PLN070	PLN090	PLN115	PLN142	PLN190	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N (lb <sub>i</sub> )	3200 (719)	5500 (1236)	6000 (1349)	12500 (2810)	21000 (4721)	
Maximum axial force	F <sub>a max</sub>		3400 (764)	4500 (1012)	6500 (1461)	12000 (2698)	17000 (3822)	
Maximum tilting moment	M <sub>K max</sub>	Nm (lb <sub>i</sub> .in)	191 (1690)	383 (3393)	488 (4317)	1420 (12572)	2535 (22434)	

Input characteristics			PLN070	PLN090	PLN115	PLN142	PLN190	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	35 (G) <sup>(5)</sup>	48 (K) <sup>(5)</sup>	
			19 (E)	24 (F)	35 (G)	42 (H)	-	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>i</sub>	kgcm <sup>2</sup> (lb <sub>i</sub> .in.s <sup>2</sup> 10 <sup>-4</sup> )	0.216 - 0.365 (1.912 - 3.231)	0.560 - 1.028 (4.956 - 9.099)	1.942 - 3.256 (17.188 - 28.818)	7.008 - 15.270 (62.026 - 135.151)	22.876 - 63.815 (202.470 - 564.810)	1
			0.209 - 0.249 (1.850 - 2.204)	0.544 - 0.699 (4.815 - 6.187)	1.933 - 2.373 (17.108 - 21.003)	6.811 - 9.813 (60.282 - 86.852)	22.430 - 36.003 (198.522 - 318.653)	2
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>i</sub> .in)	0.25 - 0.70 (2 - 6)	0.40 - 1.15 (4 - 10)	0.85 - 2.30 (8 - 20)	1.85 - 8.00 (16 - 71)	3.70 - 18.90 (33 - 167)	1
			0.20 - 0.35 (2 - 3)	0.30 - 0.70 (3 - 6)	0.65 - 1.75 (6 - 15)	1.40 - 5.70 (12 - 50)	2.90 - 13.90 (26 - 123)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		18 (159)	38 (336)	80 (708)	180 (1593)	300 (2655)	

<sup>(1)</sup> Number of stages

<sup>(2)</sup> Application specific configuration with NCP – www.neugart.com

<sup>(3)</sup> The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com

<sup>(4)</sup> More information on page 183

<sup>(5)</sup> Reference clamping system diameter

Output torques			PLN070	PLN090	PLN115	PLN142	PLN190	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>z2</sub>	Nm (lb <sub>f</sub> .in)	45 (398)	105 (929)	230 (2036)	450 (3983)	990 (8762)	3	1
			60 (531)	140 (1239)	300 (2655)	600 (5310)	1330 (11771)	4	
			65 (575)	140 (1239)	260 (2301)	750 (6638)	1660 (14692)	5	
			39 (345)	86 (761)	170 (1505)	510 (4514)	1100 (9736)	7	
			40 (354)	80 (708)	150 (1328)	450 (3983)	1000 (8851)	8	
			27 (239)	60 (531)	125 (1106)	270 (2390)	630 (5576)	10	
			68 (602)	110 (974)	250 (2213)	780 (6904)	1500 (13276)	12	2
			68 (602)	110 (974)	250 (2213)	780 (6904)	1500 (13276)	15	
			77 (682)	150 (1328)	300 (2655)	1000 (8851)	1800 (15931)	16	
			77 (682)	150 (1328)	300 (2655)	1000 (8851)	1800 (15931)	20	
			65 (575)	140 (1239)	260 (2301)	900 (7966)	1800 (15931)	25	
			77 (682)	150 (1328)	300 (2655)	1000 (8851)	1800 (15931)	32	
			65 (575)	140 (1239)	260 (2301)	900 (7966)	1800 (15931)	40	
			40 (354)	80 (708)	150 (1328)	450 (3983)	1000 (8851)	64	
			27 (239)	60 (531)	125 (1106)	280 (2478)	600 (5310)	100	
			Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>f</sub> .in)	45 (398)	105 (929)	230 (2036)	
60 (531)	140 (1239)	305 (2699)				600 (5310)	1330 (11771)	4	
75 (664)	175 (1549)	385 (3408)				750 (6638)	1660 (14692)	5	
59 (522)	138 (1221)	260 (2301)				810 (7169)	1270 (11240)	7	
64 (566)	128 (1133)	240 (2124)				560 (4956)	1410 (12480)	8	
43 (381)	96 (850)	200 (1770)				325 (2876)	1000 (8851)	10	
105 (929)	176 (1558)	400 (3540)				1240 (10975)	2400 (21242)	12	2
105 (929)	176 (1558)	400 (3540)				1240 (10975)	2400 (21242)	15	
103 (912)	240 (2124)	480 (4248)				1600 (14161)	2880 (25490)	16	
103 (912)	240 (2124)	480 (4248)				1600 (14161)	2880 (25490)	20	
97 (859)	220 (1947)	415 (3673)				1440 (12745)	2880 (25490)	25	
103 (912)	240 (2124)	480 (4248)				1600 (14161)	2880 (25490)	32	
97 (859)	220 (1947)	415 (3673)				1440 (12745)	2880 (25490)	40	
62 (549)	128 (1133)	240 (2124)				560 (4956)	1410 (12480)	64	
43 (381)	96 (850)	200 (1770)				325 (2876)	840 (7435)	100	

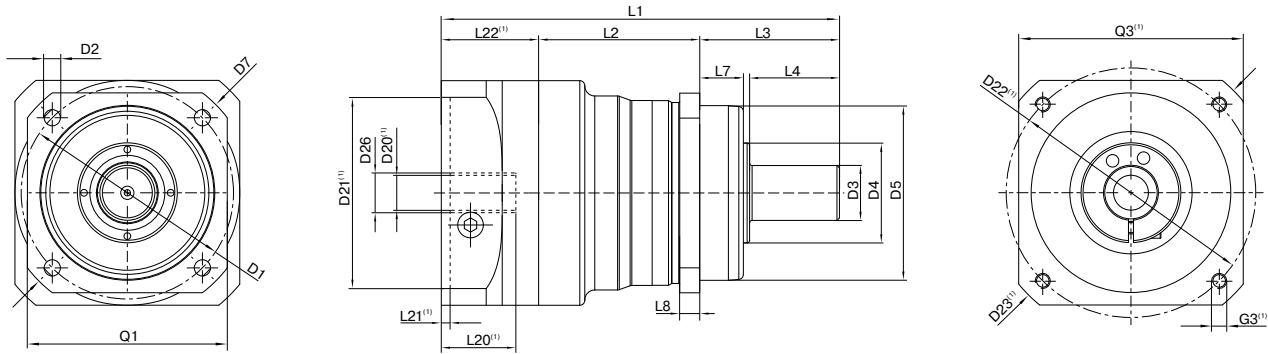
<sup>(1)</sup> Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
<sup>(2)</sup> Number of stages  
<sup>(3)</sup> Application specific configuration with NCP – www.neugart.com  
<sup>(4)</sup> Based on reference clamping system diameter

Output torques			PLN070	PLN090	PLN115	PLN142	PLN190	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>r</sub> .in)	22 (195)	50 (443)	115 (1018)	225 (1991)	500 (4425)	3	1
			30 (266)	70 (620)	150 (1328)	300 (2655)	650 (5753)	4	
			32 (283)	70 (620)	130 (1151)	375 (3319)	800 (7081)	5	
			22 (195)	45 (398)	90 (797)	265 (2345)	650 (5753)	7	
			20 (177)	40 (354)	75 (664)	225 (1991)	500 (4425)	8	
			13.5 (119)	30 (266)	62 (549)	152 (1345)	315 (2788)	10	
			34 (301)	55 (487)	125 (1106)	390 (3452)	750 (6638)	12	2
			34 (301)	55 (487)	125 (1106)	390 (3452)	750 (6638)	15	
			38 (336)	75 (664)	150 (1328)	500 (4425)	900 (7966)	16	
			38 (336)	75 (664)	150 (1328)	500 (4425)	900 (7966)	20	
			32 (283)	70 (620)	130 (1151)	450 (3983)	900 (7966)	25	
			38 (336)	75 (664)	150 (1328)	500 (4425)	900 (7966)	32	
			32 (283)	70 (620)	130 (1151)	450 (3983)	900 (7966)	40	
			20 (177)	40 (354)	75 (664)	225 (1991)	500 (4425)	64	
			13.5 (119)	30 (266)	62 (549)	152 (1345)	315 (2788)	100	

Input speeds			PLN070	PLN090	PLN115	PLN142	PLN190	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	2050	1950	1500	850	700	3	1
			2300	2100	1600	950	750	4	
			2650	2500	2000	1050	850	5	
			3450	3550	2800	1550	1200	7	
			3800	3950	3200	1800	1450	8	
			4400	4000	3500	2250	1900	10	
			3550	3400	2450	1300	1000	12	2
			4000	4000	3000	1600	1250	15	
			3800	3550	2550	1350	1050	16	
			4300	4000	3050	1600	1300	20	
			4500	4000	3400	1850	1400	25	
			4500	4000	3500	2300	1900	32	
			4500	4000	3500	2550	2100	40	
			4500	4000	3500	3000	2500	64	
			4500	4000	3500	3000	2500	100	
			Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	10000	10000	8500	

Output torques			PLN070	PLN090	PLN115	PLN142	PLN190	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>r</sub> .in)	60 (531)	150 (1328)	375 (3319)	850 (7523)	1890 (16728)	3	1
			80 (708)	200 (1770)	500 (4425)	1140 (10090)	2520 (22304)	4	
			100 (885)	250 (2213)	620 (5487)	1420 (12568)	3150 (27880)	5	
			80 (708)	175 (1549)	340 (3009)	1300 (11506)	2210 (19560)	7	
			90 (797)	200 (1770)	380 (3363)	970 (8585)	2440 (21596)	8	
			52 (460)	121 (1071)	295 (2611)	570 (5045)	1350 (11949)	10	
			135 (1195)	220 (1947)	500 (4425)	1500 (13276)	3000 (26552)	12	2
			135 (1195)	220 (1947)	500 (4425)	1500 (13276)	3000 (26552)	15	
			150 (1328)	300 (2655)	650 (5753)	2000 (17701)	3600 (31863)	16	
			150 (1328)	300 (2655)	650 (5753)	2000 (17701)	3600 (31863)	20	
			150 (1328)	300 (2655)	650 (5753)	1800 (15931)	3600 (31863)	25	
			150 (1328)	300 (2655)	650 (5753)	2000 (17701)	3600 (31863)	32	
			150 (1328)	300 (2655)	650 (5753)	1800 (15931)	3600 (31863)	40	
			80 (708)	200 (1770)	380 (3363)	970 (8585)	2440 (21596)	64	
			50 (443)	120 (1062)	240 (2124)	560 (4956)	1350 (11949)	100	

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times



Drawing corresponds to a PLN090 / 1-stage / smooth output shaft / 19 mm clamping system / motor adaptation – 2-part – round universal flange / 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>			PLN070	PLN090	PLN115	PLN142	PLN190	p <sup>(3)</sup>	Code
Pitch circle diameter output	D1		68 (2.677) - 75 (2.953)	85 (3.346)	120 (4.724)	165 (6.496)	215 (8.465)		
Mounting bore output	D2	4x	5.5 (0.217)	6.5 (0.256)	9.0 (0.354)	11.0 (0.433)	13.5 (0.531)		
Shaft diameter output	D3	k6	16 (0.630)	22 (0.866)	32 (1.260)	40 (1.575)	55 (2.165)		
Shaft collar output	D4		35 (1.378)	40 (1.575)	45 (1.772)	70 (2.756)	80 (3.150)		
Centering diameter output	D5	g7	60 (2.362)	70 (2.756)	90 (3.543)	130 (5.118)	160 (6.299)		
Diagonal dimension output	D7		92 (3.622)	100 (3.937)	140 (5.512)	185 (7.283)	240 (9.449)		
Flange cross section output	Q1	■	70 (2.756)	80 (3.150)	110 (4.331)	142 (5.591)	190 (7.480)		
Min. total length	L1		137.5 (5.413)	159.5 (6.280)	201 (7.913)	276 (10.866)	310.5 (12.224)	1	
			166.5 (6.555)	191.5 (7.539)	241 (9.488)	335 (13.189)	382.5 (15.059)	2	
Housing length	L2		58.5 (2.303)	64.5 (2.539)	61 (2.402)	91.5 (3.602)	116 (4.567)	1	
			88 (3.465)	96.5 (3.799)	101.5 (3.996)	150.5 (5.925)	188 (7.402)	2	
Centering depth output	L7		19 (0.748)	17.5 (0.689)	28 (1.102)	28 (1.102)	28 (1.102)		
Flange thickness output	L8		7 (0.276)	8 (0.315)	10 (0.394)	12 (0.472)	15 (0.591)		
Motor shaft diameter j6/k6	D20		More information on page 191/192						
Clamping system diameter input	D26		More information on page 130						
Output shaft with feather key (DIN 6885-1)			A 5x5x25	A 6x6x28	A 10x8x50	A 12x8x65	A 16x10x70		<b>A</b>
Feather key width (DIN 6885-1)	B1		5 (0.197)	6 (0.236)	10 (0.394)	12 (0.472)	16 (0.630)		
Shaft height including feather key (DIN 6885-1)	H1		18 (0.709)	24,5 (0.965)	35 (1.378)	43 (1.693)	59 (2.323)		
Shaft length output	L3		48 (1.890)	56 (2.205)	88 (3.465)	110 (4.331)	112 (4.409)		
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)	82 (3.228)		
Feather key length	L5		25 (0.984)	28 (1.102)	50 (1.969)	65 (2.559)	70 (2.756)		
Distance from shaft end	L6		2 (0.079)	4 (0.157)	4 (0.157)	8 (0.315)	6 (0.236)		
Center hole (DIN 332, type DR)	C		M5x12.5	M8x19	M12x28	M16x36	M20x42		
Smooth output shaft									<b>B</b>
Shaft length output	L3		48 (1.890)	56 (2.205)	88 (3.465)	110 (4.331)	112 (4.409)		
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)	82 (3.228)		
Splined output shaft (DIN 5480)			W16x0.8x18x6m	W22x1.25x16x6m	W32x1.25x24x6m	W40x2.0x18x6m	W55x2.0x26x6m		<b>C</b>
Width of gearing	L <sub>v</sub>		15 (0.591)	15 (0.591)	15 (0.591)	20 (0.787)	22 (0.866)		
Shaft length output	L3		46 (1.811)	46 (1.811)	55.5 (2.185)	70 (2.756)	71 (2.795)		
Shaft length from shoulder	L4		26 (1.024)	26 (1.024)	26 (1.024)	40 (1.575)	41,5 (1.634)		
Center hole (DIN 332, type DR)	C		M5x12.5	M8x19	M12x28	M16x36	M20x42		

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

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



# PLFN

The precision planetary gearbox for maximum loads and the highest performance – fast and easy to install

Our **PLFN** has a standardized flange interface, which allows easy mounting. The straight-toothed precision planetary gearbox is designed for high performance and torque. Its high tilting moment allows the best performance even with the highest radial and axial forces.

Cyclic torque **27 - 1800 Nm**



Radial force **2150 - 33000 N**



Axial force **4300 - 15000 N**



Torsional backlash **1 - 5 arcmin**



Protection class **IP65**



Frame sizes

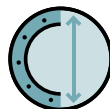
- 64
- 90
- 110
- 140
- 200



Precision Line



Equidirectional rotation



Extra large round type output flange



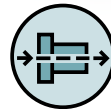
Rotary shaft seal



Planet carrier in cage design



Option: Planetary gearbox with mounted pinion on page 158



Coaxial gearbox



Spur gear



Preloaded angular contact roller bearings



Flange output shaft (ISO 9409-1)



Option: Reduced backlash



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			PLFN064	PLFN090	PLFN110	PLFN140	PLFN200	p <sup>(1)</sup>	
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000						
	Efficiency <sup>(3)</sup>	η	%	97					1	
				96					2	
	Min. operating temperature	T <sub>min</sub>	°C (°F)	-25 (-13)						
	Max. operating temperature	T <sub>max</sub>		90 (194)						
	Protection class				IP65					
<b>S</b>	Standard lubrication				Oil (lifetime lubrication)					
<b>F</b>	Food grade lubrication				Oil (lifetime lubrication)					
	Installation position				Any					
<b>S</b>	Standard backlash	φ	arcmin	< 3					1	
				< 5					2	
<b>R</b>	Reduced backlash				< 2	< 1	< 1	< 1	< 1	
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>f</sub> .in/ arcmin)	7.7 - 14.8 (68 - 131)	22.0 - 40.5 (195 - 358)	59.0 - 92.0 (522 - 814)	156.0 - 255.0 (1381 - 2257)	330.0 - 636.0 (2921 - 5629)	1	
				7.6 - 14.7 (67 - 130)	18.5 - 38.0 (164 - 336)	58.0 - 91.0 (513 - 805)	177.0 - 264.0 (1567 - 2337)	391.0 - 656.0 (3461 - 5806)	2	
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	1.3 (2.9 - 3.0)	2.9 (6.3 - 6.5)	4.9 - 5.2 (10.8 - 11.5)	12.6 - 13.2 (27.9 - 29.1)	36.6 - 38.8 (80.7 - 85.5)	1	
				1.8 - 1.9 (4.0 - 4.2)	3.3 - 3.4 (7.3 - 7.5)	5.8 - 6.1 (12.7 - 13.4)	14.4 - 15.0 (31.7 - 33.1)	42.3 - 44.7 (93.3 - 98.7)	2	
<b>S</b>	Standard surface				Housing: Steel – heat-treated and post-oxidized (black)					
<b>B</b>	Painted surface <sup>(4)</sup>				RAL 9005 Jet black					
	Running noise <sup>(5)</sup>	L <sub>pA</sub>	dB(A)	60	62	65	70	74		

Output shaft loads			PLFN064	PLFN090	PLFN110	PLFN140	PLFN200	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N (lb <sub>f</sub> )	2150 (483)	3950 (888)	4900 (1102)	12000 (2698)	33000 (7419)	
Maximum axial force	F <sub>a max</sub>		2850 (641)	5450 (1225)	6450 (1450)	7500 (1686)	12000 (2698)	
Maximum tilting moment	M <sub>K max</sub>	Nm (lb <sub>f</sub> .in)	132 (1170)	326 (2888)	475 (4207)	1219 (10786)	4957 (43870)	

Input characteristics			PLFN064	PLFN090	PLFN110	PLFN140	PLFN200	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	35 (G) <sup>(5)</sup>	48 (K) <sup>(5)</sup>	1
			19 (E)	24 (F)	35 (G)	42 (H)	-	
			14 (D) <sup>(5)</sup>	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	35 (G) <sup>(5)</sup>	2
			19 (E)	19 (E)	24 (F)	35 (G)	42 (H)	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>i</sub>	kgcm <sup>2</sup> (lb <sub>f</sub> . in.s <sup>2</sup> 10 <sup>-4</sup> )	0.217 - 0.288 (1.921 - 2.549)	0.580 - 0.920 (5.133 - 8.143)	2.036 - 2.942 (18.020 - 26.039)	7.313 - 12.365 (64.726 - 109.439)	26.880 - 61.170 (237.908 - 541.400)	1
			0.209 - 0.243 (1.850 - 2.151)	0.211 - 0.269 (1.868 - 2.381)	0.546 - 0.737 (4.833 - 6.523)	1.951 - 2.784 (17.268 - 24.640)	6.911 - 11.813 (61.168 - 104.554)	2
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>f</sub> .in)	0.30 - 0.70 (3 - 6)	0.55 - 1.55 (5 - 14)	1.15 - 3.70 (10 - 33)	2.60 - 9.40 (23 - 83)	6.00 - 25.80 (53 - 228)	1
			0.20 - 0.35 (2 - 3)	0.20 - 0.40 (2 - 4)	0.30 - 0.95 (3 - 8)	0.75 - 3.00 (7 - 27)	1.60 - 7.80 (14 - 69)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		18 (159)	38 (336)	80 (708)	180 (1593)	300 (2655)	1
			18 (159)	18 (159)	38 (336)	80 (708)	180 (1593)	2

(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			PLFN064	PLFN090	PLFN110	PLFN140	PLFN200	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>zz</sub>	Nm (lb <sub>f</sub> .in)	60 (531)	140 (1239)	300 (2655)	600 (5310)	1330 (11771)	4	1
			65 (575)	140 (1239)	260 (2301)	750 (6638)	1660 (14692)	5	
			39 (345)	86 (761)	170 (1505)	510 (4514)	1100 (9736)	7	
			40 (354)	80 (708)	150 (1328)	450 (3983)	1000 (8851)	8	
			27 (239)	60 (531)	125 (1106)	270 (2390)	630 (5576)	10	2
			77 (682)	150 (1328)	300 (2655)	1000 (8851)	1800 (15931)	16	
			77 (682)	150 (1328)	300 (2655)	1000 (8851)	1800 (15931)	20	
			65 (575)	140 (1239)	260 (2301)	900 (7966)	1800 (15931)	25	
			77 (682)	150 (1328)	300 (2655)	600 (5310)	1800 (15931)	32	
			65 (575)	140 (1239)	260 (2301)	750 (6638)	1800 (15931)	40	
			65 (575)	135 (1195)	260 (2301)	620 (5487)	1420 (12568)	50	
			40 (354)	80 (708)	150 (1328)	450 (3983)	1000 (8851)	64	
			27 (239)	60 (531)	125 (1106)	280 (2478)	600 (5310)	100	
			Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>f</sub> .in)	60 (531)	140 (1239)	305 (2699)	
75 (664)	175 (1549)	385 (3408)				750 (6638)	1660 (14692)	5	
59 (522)	138 (1221)	260 (2301)				810 (7169)	1270 (11240)	7	
64 (566)	128 (1133)	240 (2124)				560 (4956)	1410 (12480)	8	
43 (381)	96 (850)	200 (1770)				325 (2876)	1000 (8851)	10	2
103 (912)	240 (2124)	480 (4248)				1230 (10886)	2400 (21242)	16	
103 (912)	240 (2124)	480 (4248)				1540 (13630)	2880 (25490)	20	
97 (859)	220 (1947)	415 (3673)				1440 (12745)	2880 (25490)	25	
103 (912)	240 (2124)	480 (4248)				960 (8497)	2250 (19914)	32	
97 (859)	220 (1947)	415 (3673)				1200 (10621)	2810 (24871)	40	
97 (859)	215 (1903)	415 (3673)				1000 (8851)	1640 (14515)	50	
62 (549)	128 (1133)	240 (2124)				560 (4956)	1410 (12480)	64	
43 (381)	96 (850)	200 (1770)				325 (2876)	840 (7435)	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  
<sup>(4)</sup> Based on reference clamping system diameter

Output torques			PLFN064	PLFN090	PLFN110	PLFN140	PLFN200	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>r</sub> .in)	30 (266)	70 (620)	150 (1328)	300 (2655)	650 (5753)	4	1
			32 (283)	70 (620)	130 (1151)	375 (3319)	800 (7081)	5	
			22 (195)	45 (398)	90 (797)	265 (2345)	650 (5753)	7	
			20 (177)	40 (354)	75 (664)	225 (1991)	500 (4425)	8	
			13.5 (119)	30 (266)	62 (549)	152 (1345)	315 (2788)	10	
			38 (336)	75 (664)	150 (1328)	500 (4425)	900 (7966)	16	2
			38 (336)	75 (664)	150 (1328)	500 (4425)	900 (7966)	20	
			32 (283)	70 (620)	130 (1151)	450 (3983)	900 (7966)	25	
			38 (336)	75 (664)	150 (1328)	300 (2655)	900 (7966)	32	
			32 (283)	70 (620)	130 (1151)	375 (3319)	900 (7966)	40	
			32 (283)	65 (575)	130 (1151)	310 (2744)	760 (6727)	50	
			20 (177)	40 (354)	75 (664)	225 (1991)	500 (4425)	64	
			13.5 (119)	30 (266)	62 (549)	152 (1345)	315 (2788)	100	

Input speeds			PLFN064	PLFN090	PLFN110	PLFN140	PLFN200	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	2100	1750	1300	850	500	4	1
			2450	2100	1650	950	600	5	
			3200	3000	2350	1400	850	7	
			3550	3350	2650	1650	1000	8	
			4100	4000	3150	2050	1300	10	
			3700	3850	3150	1700	1100	16	2
			4200	4450	3750	2100	1350	20	
			4500	4500	4000	2500	1550	25	
			4500	4500	4000	3500	2000	32	
			4500	4500	4000	3500	2250	40	
			4500	4500	4000	3500	2750	50	
			4500	4500	4000	3500	3000	64	
			4500	4500	4000	3500	3000	100	
			Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	10000	10000	8500	
10000	10000	10000				8500	6500		2

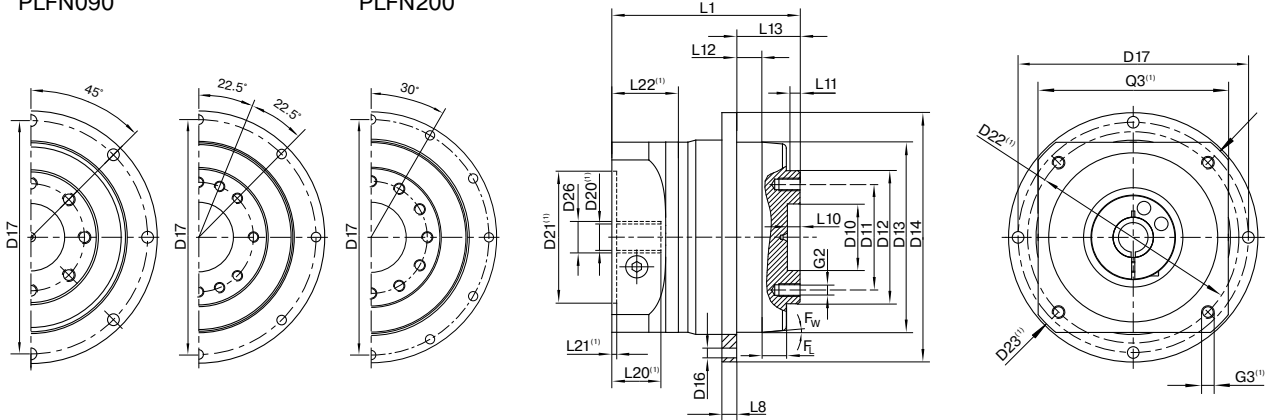
Output torques			PLFN064	PLFN090	PLFN110	PLFN140	PLFN200	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>r</sub> .in)	80 (708)	200 (1770)	500 (4425)	1140 (10090)	2520 (22304)	4	1
			100 (885)	250 (2213)	620 (5487)	1420 (12568)	3150 (27880)	5	
			90 (797)	175 (1549)	340 (3009)	1300 (11506)	2210 (19560)	7	
			90 (797)	200 (1770)	380 (3363)	970 (8585)	2440 (21596)	8	
			52 (460)	121 (1071)	295 (2611)	570 (5045)	1350 (11949)	10	
			150 (1328)	300 (2655)	650 (5753)	2000 (17701)	3600 (31863)	16	2
			150 (1328)	300 (2655)	650 (5753)	2000 (17701)	3600 (31863)	20	
			150 (1328)	300 (2655)	650 (5753)	1800 (15931)	3600 (31863)	25	
			150 (1328)	300 (2655)	650 (5753)	1500 (13276)	3600 (31863)	32	
			150 (1328)	300 (2655)	650 (5753)	1500 (13276)	3600 (31863)	40	
			150 (1328)	250 (2213)	600 (5310)	1200 (10621)	2850 (25225)	50	
			80 (708)	200 (1770)	380 (3363)	970 (8585)	2440 (21596)	64	
			50 (443)	120 (1062)	240 (2124)	560 (4956)	1350 (11949)	100	

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times

PLFN064  
PLFN090

PLFN110

PLFN140  
PLFN200



Drawing corresponds to a PLFN090 / 1-stage / flange output shaft / 19 mm clamping system / motor adaptation – 2-part – round universal flange / 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>			PLFN064	PLFN090	PLFN110	PLFN140	PLFN200	p <sup>(3)</sup>	Code
Centering diameter output shaft	D10	H7	20 (0.787)	31.5 (1.240)	40 (1.575)	50 (1.969)	80 (3.150)		
Pitch circle diameter output shaft	D11		31.5 (1.240)	50 (1.969)	63 (2.480)	80 (3.150)	125 (4.921)		
Centering diameter output shaft	D12	h7	40 (1.575)	63 (2.480)	80 (3.150)	100 (3.937)	160 (6.299)		
Centering diameter output flange	D13		64 (2.520)	90 (3.543)	110 (4.331)	140 (5.512)	200 (7.874)		
Flange diameter output	D14		86 (3.386)	118 (4.646)	145 (5.709)	179 (7.047)	247 (9.724)		
Mounting bore output	D16		4.5 8x45°	5.5 8x45°	5.5 8x45°	6.6 12x30°	9 12x30°		
Pitch circle diameter output flange	D17		79 (3.110)	109 (4.291)	135 (5.315)	168 (6.614)	233 (9.173)		
Min. total length	L1		71 (2.795)	89 (3.504)	108 (4.252)	157 (6.181)	212.5 (8.366)	1	
			99.5 (3.917)	111 (4.370)	130 (5.118)	187.5 (7.382)	264 (10.394)	2	
Flange thickness output	L8		4 (0.157)	7 (0.276)	8 (0.315)	10 (0.394)	12 (0.472)		
Centering depth output shaft	L10		4.5 (0.177)	6.5 (0.256)	6.5 (0.256)	6.5 (0.256)	10 (0.394)		
	L11		3 (0.118)	6 (0.236)	6 (0.236)	6 (0.236)	8 (0.315)		
Centering depth output flange	L12		10 (0.394)	12 (0.472)	12 (0.472)	14 (0.551)	17.5 (0.689)		
Output flange length	L13		19.5	30.0	29.0	38.0	50.0		
Motor shaft diameter j6/k6	D20		More information on page 191/192						
Clamping system diameter input	D26		More information on page 136						
Flange output shaft (similar ISO 9409-1)									D
Number x thread x depth	G2		8 x M5x7	8 x M6x10	12 x M6x12	12 x M8x15	12 x M10x20		
Flange output shaft with dowel hole (ISO 9409-1)									E
Dowel hole x depth	D15	H7	5x5	6x6	6x6	8x8	10x10		
Number x thread x depth	G2		7 x M5x7	7 x M6x10	11 x M6x12	11 x M8x15	11 x M10x20		

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

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



# WPLN

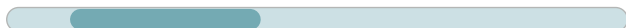
## The versatile right-angle gearbox with hypoid gearing for a quiet drive

Due to its hypoid gearing, our **WPLN** achieves optimal synchronization. Because vibrations are reduced to a minimum, it operates smoothly, precisely and quietly. The right-angle precision gearbox is lubricated for life and can be mounted in a variety of ways.

Cyclic torque **22 - 800 Nm**



Radial force **3200 - 12500 N**



Axial force **4300 - 15000 N**



Torsional backlash **3 - 5 arcmin**

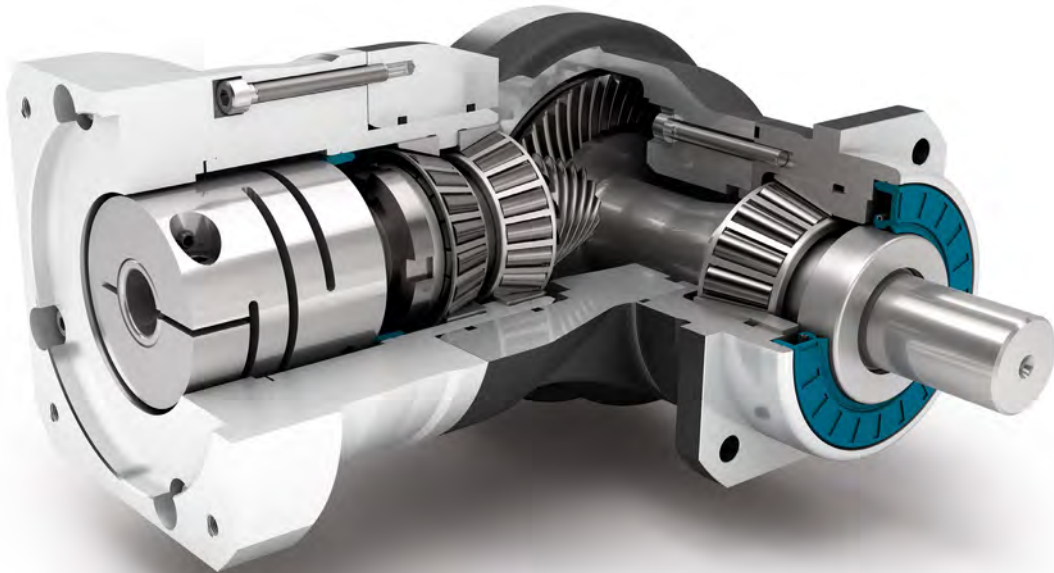


Protection class **IP65**



Frame sizes

- 70
- 90
- 115
- 142



Precision Line



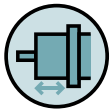
Right angle gearbox



Hypoid gear right angle stage



Preloaded tapered roller bearings



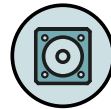
Extra long centering collar



Option: Rack and pinion  
Planetary gearbox (Details on page 158)



Counterdirectional rotation



Square type output flange



Rotary shaft seal



Option: Reduced backlash (2-stage)



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			WPLN070	WPLN090	WPLN115	WPLN142	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000				
	Efficiency <sup>(3)</sup>	η	%	95				1
				94				2
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)				
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)				
	Protection class			IP65				
<b>S</b>	Standard lubrication			Oil (lifetime lubrication)				
<b>F</b>	Food grade lubrication			Oil (lifetime lubrication)				
	Installation position			Any				
<b>S</b>	Standard backlash			< 5				
<b>R</b>	Reduced backlash	φ	arcmin	-				1
				< 3				2
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>f</sub> .in / arcmin)	1.8 - 3.1 (16 - 27)	4.6 - 7.0 (41 - 62)	8.6 - 13.5 (76 - 119)	24.5 - 34.0 (217 - 301)	1
				2.3 - 3.6 (20 - 32)	5.9 - 8.6 (52 - 76)	11.3 - 16.9 (100 - 150)	31.5 - 42.5 (279 - 376)	2
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	3.3 - 3.4 (7.3 - 7.4)	5.3 - 5.8 (11.7 - 12.7)	11.0 - 11.1 (24.3 - 24.5)	25.3 - 25.9 (55.8 - 57.0)	1
				4.3 - 4.4 (9.5 - 9.6)	5.6 - 5.7 (12.3 - 12.7)	10.0 - 10.3 (22.1 - 22.8)	23.7 - 24.3 (52.4 - 53.5)	2
<b>S</b>	Standard surface			Right angle housing: Aluminum – anodized (black)				
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black				
	Running noise <sup>(5)</sup>	L <sub>pA</sub>	dB(A)	66	67	68	70	

Output shaft loads			WPLN070	WPLN090	WPLN115	WPLN142	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N (lb <sub>f</sub> )	3200 (719)	5200 (1169)	6000 (1349)	12500 (2810)	1
			3200 (719)	5500 (1236)	6000 (1349)	12500 (2810)	2
Maximum axial force	F <sub>a max</sub>		3400 (764)	4500 (1012)	6500 (1461)	12000 (2698)	
Maximum tilting moment	M <sub>k max</sub>	Nm (lb <sub>f</sub> .in)	322 (2846)	624 (5523)	1010 (8935)	2225 (19693)	1
			191 (1690)	383 (3393)	488 (4317)	1420 (12572)	2

Input characteristics			WPLN070	WPLN090	WPLN115	WPLN142	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	35 (G) <sup>(5)</sup>	1
			19 (E)	24 (F)	35 (G)	42 (H)	
			14 (D) <sup>(5)</sup>	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	2
			19 (E)	19 (E)	24 (F)	35 (G)	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>f</sub> .in.s <sup>2</sup> 10 <sup>-4</sup> )	0.500 - 0.658 (4.425 - 5.824)	1.013 - 1.387 (8.966 - 12.276)	4.767 - 5.875 (42.192 - 51.998)	15.090 - 20.883 (133.558 - 184.830)	1
			0.498 - 0.642 (4.408 - 5.682)	0.497 - 0.649 (4.399 - 5.744)	1.014 - 1.419 (8.975 - 12.559)	4.807 - 6.387 (42.546 - 56.530)	2
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>f</sub> .in)	1.20 - 1.50 (11 - 13)	1.80 - 2.30 (16 - 20)	6.00 - 6.90 (53 - 61)	16.00 (142)	1
			0.75 - 1.00 (7 - 9)	0.75 - 1.25 (7 - 11)	1.15 - 2.05 (10 - 18)	4.00 - 7.70 (35 - 68)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		12 (106)	25.5 (226)	53 (469)	120 (1062)	1
			12 (106)	12 (106)	25.5 (226)	53 (469)	2

(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			WPLN070	WPLN090	WPLN115	WPLN142	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>zz</sub>	Nm (lb <sub>r</sub> .in)	45 (398)	90 (797)	160 (1416)	320 (2832)	4	1
			42 (372)	75 (664)	140 (1239)	280 (2478)	5	
			28 (248)	51 (451)	91 (805)	189 (1673)	7	
			27 (239)	50 (443)	90 (797)	180 (1593)	8	
			22 (195)	40 (354)	75 (664)	160 (1416)	10	2
			77 (682)	150 (1328)	300 (2655)	640 (5664)	16	
			77 (682)	150 (1328)	300 (2655)	800 (7081)	20	
			65 (575)	140 (1239)	260 (2301)	700 (6196)	25	
			77 (682)	112 (991)	200 (1770)	360 (3186)	28	
			77 (682)	108 (956)	200 (1770)	360 (3186)	32	
			65 (575)	140 (1239)	255 (2257)	455 (4027)	35	
			65 (575)	135 (1195)	250 (2213)	450 (3983)	40	
			65 (575)	110 (974)	200 (1770)	375 (3319)	50	
			40 (354)	80 (708)	150 (1328)	450 (3983)	64	
24 (212)	60 (531)	125 (1106)	290 (2567)	100				
Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	60 (531)	140 (1239)	255 (2257)	510 (4514)	4	1
			67 (593)	120 (1062)	220 (1947)	445 (3939)	5	
			44 (389)	81 (717)	145 (1283)	300 (2655)	7	
			43 (381)	80 (708)	144 (1275)	285 (2522)	8	
			35 (310)	64 (566)	120 (1062)	255 (2257)	10	2
			103 (912)	240 (2124)	480 (4248)	1020 (9028)	16	
			103 (912)	240 (2124)	480 (4248)	1280 (11329)	20	
			97 (859)	220 (1947)	415 (3673)	1120 (9913)	25	
			103 (912)	179 (1584)	325 (2876)	580 (5133)	28	
			103 (912)	172 (1522)	320 (2832)	570 (5045)	32	
			97 (859)	220 (1947)	405 (3585)	720 (6373)	35	
			97 (859)	215 (1903)	400 (3540)	720 (6373)	40	
			97 (859)	176 (1558)	320 (2832)	600 (5310)	50	
			64 (566)	128 (1133)	240 (2124)	570 (5045)	64	
38 (336)	96 (850)	200 (1770)	335 (2965)	100				

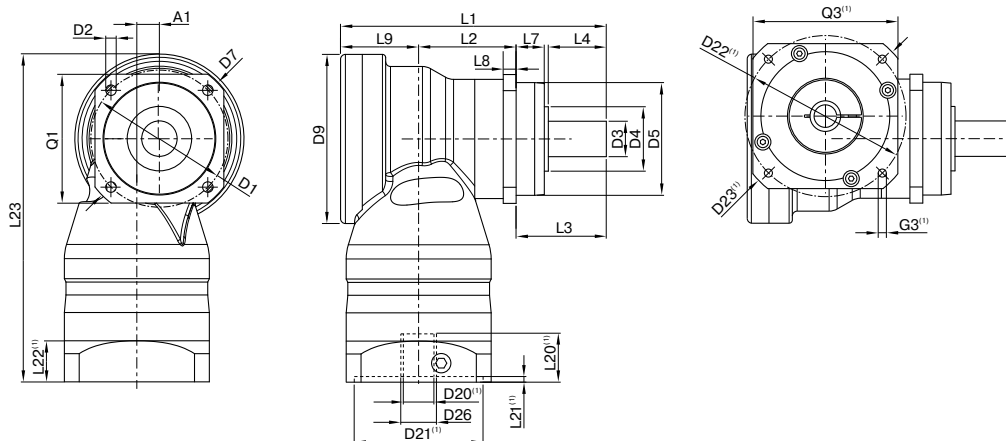
<sup>(1)</sup> Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
<sup>(2)</sup> Number of stages  
<sup>(3)</sup> Application specific configuration with NCP – www.neugart.com  
<sup>(4)</sup> Based on reference clamping system diameter

Output torques			WPLN070	WPLN090	WPLN115	WPLN142	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>r</sub> .in)	29 (257)	41 (363)	104 (920)	235 (2080)	4	1
			32 (283)	39 (345)	101 (894)	235 (2080)	5	
			23 (204)	40 (354)	77 (682)	160 (1416)	7	
			22 (195)	38 (336)	76 (673)	153 (1354)	8	
			18.5 (164)	34 (301)	63 (558)	136 (1204)	10	
			65 (575)	123 (1089)	170 (1505)	435 (3850)	16	2
			65 (575)	127 (1124)	200 (1770)	540 (4779)	20	
			55 (487)	119 (1053)	199 (1761)	520 (4602)	25	
			65 (575)	95 (841)	167 (1478)	305 (2699)	28	
			65 (575)	91 (805)	156 (1381)	305 (2699)	32	
			55 (487)	119 (1053)	205 (1814)	385 (3408)	35	
			55 (487)	114 (1009)	210 (1859)	380 (3363)	40	
			55 (487)	93 (823)	170 (1505)	315 (2788)	50	
			34 (301)	68 (602)	127 (1124)	380 (3363)	64	
22 (195)	51 (451)	106 (938)	255 (2257)	100				

Input speeds			WPLN070	WPLN090	WPLN115	WPLN142	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	1650	1700	1050	870	4	1
			1800	1850	1150	880	5	
			2050	2050	1300	1100	7	
			2100	2100	1300	970	8	
			2300	2200	1400	1000	10	
			1550	1500	1550	910	16	2
			1700	1750	1850	920	20	
			1900	1850	1850	1000	25	
			1850	1900	1900	1200	28	
			2000	2000	2000	1250	32	
			2150	1950	1900	1200	35	
			2200	2000	2000	1250	40	
			2300	2200	2150	1350	50	
			2450	2750	2650	1600	64	
2650	3000	2900	1800	100				
Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	16000	14000	9500	8000		1
			16000	16000	14000	9500		2

Output torques			WPLN070	WPLN090	WPLN115	WPLN142	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>r</sub> .in)	80 (708)	200 (1770)	400 (3540)	800 (7081)	4	1
			100 (885)	200 (1770)	400 (3540)	800 (7081)	5	
			75 (664)	150 (1328)	300 (2655)	700 (6196)	7	
			75 (664)	150 (1328)	300 (2655)	700 (6196)	8	
			75 (664)	150 (1328)	300 (2655)	700 (6196)	10	
			150 (1328)	300 (2655)	650 (5753)	1600 (14161)	16	2
			150 (1328)	300 (2655)	650 (5753)	1600 (14161)	20	
			150 (1328)	300 (2655)	650 (5753)	1600 (14161)	25	
			120 (1062)	280 (2478)	600 (5310)	1200 (10621)	28	
			150 (1328)	300 (2655)	600 (5310)	1200 (10621)	32	
			130 (1151)	280 (2478)	650 (5753)	1500 (13276)	35	
			150 (1328)	300 (2655)	650 (5753)	1500 (13276)	40	
			150 (1328)	300 (2655)	600 (5310)	1200 (10621)	50	
			80 (708)	200 (1770)	380 (3363)	980 (8674)	64	
50 (443)	120 (1062)	240 (2124)	580 (5133)	100				

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times



Drawing corresponds to a WPLN090 / 1-stage / smooth output shaft / 19 mm clamping system / motor adaptation – 2-part – round universal flange / 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>			WPLN070	WPLN090	WPLN115	WPLN142	p <sup>(3)</sup>	Code
Axis offset	A1		10 (0.394)	14 (0.551)	20 (0.787)	26 (1.024)	1	
			10 (0.394)	10 (0.394)	14 (0.551)	20 (0.787)	2	
Pitch circle diameter output	D1		68 (2.677) - 75 (2.953)	85 (3.346)	120 (4.724)	165 (6.496)		
Mounting bore output	D2	4x	5.5 (0.217)	6.5 (0.256)	9.0 (0.354)	11.0 (0.433)		
Shaft diameter output	D3	k6	16 (0.630)	22 (0.866)	32 (1.260)	40 (1.575)		
Shaft collar output	D4		30 (1.181)	40 (1.575)	45 (1.772)	70 (2.756)	1	
			35 (1.378)	40 (1.575)	45 (1.772)	70 (2.756)	2	
Centering diameter output	D5	g7	60 (2.362)	70 (2.756)	90 (3.543)	130 (5.118)		
Diagonal dimension output	D7		92 (3.622)	100 (3.937)	140 (5.512)	185 (7.283)		
Max. diameter	D9		86 (3.386)	105 (4.134)	120 (4.724)	170 (6.693)	1	
			86 (3.386)	86 (3.386)	105 (4.134)	120 (4.724)	2	
Flange cross section output	Q1	■	70 (2.756)	80 (3.150)	110 (4.331)	142 (5.591)		
Total length	L1		137.5 (5.413)	165 (6.496)	218 (8.583)	273 (10.748)	1	
			185 (7.283)	207 (8.150)	248.5 (9.783)	342.5 (13.484)	2	
Housing length	L2		46.5 (1.831)	60.5 (2.382)	73.5 (2.894)	76 (2.992)	1	
			94 (3.701)	108 (4.252)	112 (4.409)	176 (6.929)	2	
Shaft length output	L3		48 (1.890)	56 (2.205)	88 (3.465)	110 (4.331)		
Centering depth output	L7		18 (0.709)	17.5 (0.689)	28 (1.102)	28 (1.102)	1	
			19 (0.748)	17.5 (0.689)	28 (1.102)	28 (1.102)	2	
Flange thickness output	L8		7 (0.276)	8 (0.315)	10 (0.394)	12 (0.472)		
Offset length	L9		43 (1.693)	48.5 (1.909)	56.5 (2.224)	87 (3.425)	1	
			43 (1.693)	43 (1.693)	48.5 (1.909)	56.5 (2.224)	2	
Min. overall height	L23		179 (7.047)	203.5 (8.012)	247.5 (9.744)	318 (12.520)	1	
			179 (7.047)	182.5 (7.185)	210 (8.268)	258.5 (10.177)	2	
Motor shaft diameter j6/k6	D20		More information on page 191/192					
Clamping system diameter input	D26		More information on page 142					
Output shaft with feather key (DIN 6885-1)			A 5x5x25	A 6x6x28	A 10x8x50	A 12x8x65		<b>A</b>
Feather key width (DIN 6885-1)	B1		5 (0.197)	6 (0.236)	10 (0.394)	12 (0.472)		
Shaft height including feather key (DIN 6885-1)	H1		18 (0.709)	24.5 (0.965)	35 (1.378)	43 (1.693)		
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)		
Feather key length	L5		25 (0.984)	28 (1.102)	50 (1.969)	65 (2.559)		
Distance from shaft end	L6		2 (0.079)	4 (0.157)	4 (0.157)	8 (0.315)		
Center hole (DIN 332, type DR)	C		M5x12.5	M8x19	M12x28	M16x36		
Smooth output shaft								<b>B</b>
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)		
Splined output shaft (DIN 5480)			W16x0.8x18x6m	W22x1.25x16x6m	W32x1.25x24x6m	W40x2.0x18x6m		<b>C</b>
Width of gearing	L <sub>v</sub>		15 (0.591)	15 (0.591)	15 (0.591)	20 (0.787)		
Shaft collar output	L3		46 (1.811)	46 (1.811)	56 (2.205)	70 (2.756)		
Shaft length from shoulder	L4		26 (1.024)	26 (1.024)	26 (1.024)	40 (1.575)		
Center hole (DIN 332, type DR)	C		M5x12.5	M8x19	M12x28	M16x36		

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

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



# WPSFN

## The shortest hypoid-toothed right angle gearbox with flange output shaft and hollow shaft

Our **WPSFN** is particularly easy and quick to integrate thanks to its standardized flange interface and offers high torsional rigidity. With its hypoid gearing, as well as the helical-toothed planetary stage, it achieves optimal synchronization for best surface qualities. The shortest right-angle precision gearbox, in a single-stage design with integrated hollow shaft, offers you new design solutions.

Cyclic torque **22 - 620 Nm**

Radial force **2150 - 12000 N**

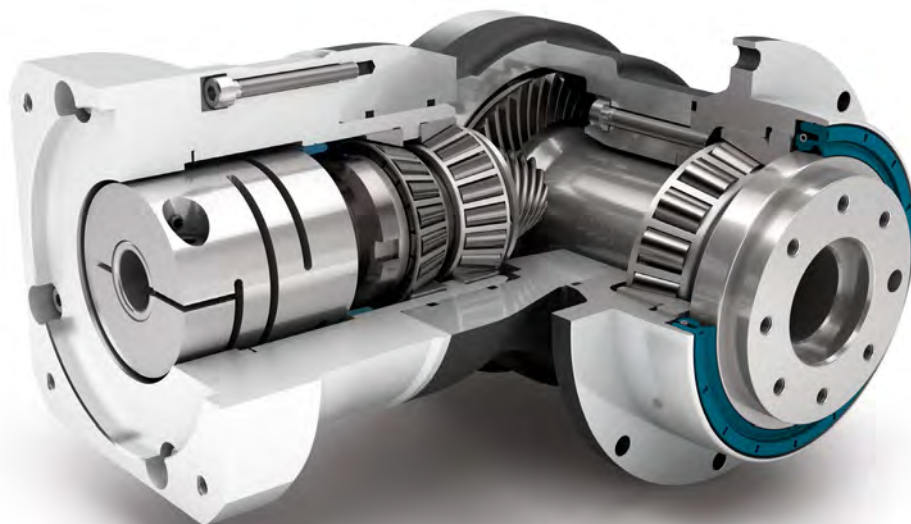
Axial force **4200 - 9500 N**

Torsional backlash **3 - 5 arcmin**

Protection class **IP65**

Frame sizes

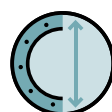
- 64
- 90
- 110
- 140



Precision Line



Counterdirectional rotation



Extra large round type output flange



Rotary shaft seal



Hollow shaft (1-stage)



Option: Rack and pinion  
Planetary gearbox (Details on page 158)



Right angle gearbox



Hypoid gear right angle stage



Preloaded angular contact roller bearings



Flange output shaft (ISO 9409-1)



Option: Reduced backlash (2-stage)



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			WPSFN064	WPSFN090	WPSFN110	WPSFN140	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000				
	Efficiency <sup>(3)</sup>	η	%	94				1
				93				2
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)				
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)				
	Protection class			IP65				
<b>S</b>	Standard lubrication			Oil (lifetime lubrication)				
<b>F</b>	Food grade lubrication			Oil (lifetime lubrication)				
	Installation position			Any				
<b>S</b>	Standard backlash			< 5				
<b>R</b>	Reduced backlash	φ	arcmin	-				1
				< 3				2
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>f</sub> .in/ arcmin)	1.9 - 2.6 (17 - 23)	4.0 - 5.5 (35 - 49)	10.1 - 13.5 (89 - 119)	26.0 - 34.5 (230 - 305)	1
				5.3 - 6.9 (47 - 61)	15.3 - 20.5 (135 - 181)	33.5 - 44.0 (296 - 389)	85.0 - 111.0 (752 - 982)	2
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	3.4 - 3.5 (7.6 - 7.7)	6.5 - 6.9 (14.3 - 15.3)	11.4 - 11.5 (25.1 - 25.3)	24.8 - 25.3 (54.7 - 55.9)	1
				3.8 - 3.9 (8.5 - 8.7)	5.4 - 5.6 (12.0 - 12.3)	8.7 - 9.0 (19.1 - 19.8)	18.3 - 18.8 (40.3 - 41.4)	2
<b>S</b>	Standard surface			Right angle housing: Aluminum – anodized (black)				
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black				
	Running noise <sup>(5)</sup>	L <sub>pA</sub>	dB(A)	66	67	68	70	

Output shaft loads			WPSFN064	WPSFN090	WPSFN110	WPSFN140	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N (lb <sub>f</sub> )	2400 (540)	4400 (989)	5500 (1236)	12000 (2698)	1
			2150 (483)	3950 (888)	4900 (1102)	12000 (2698)	2
Maximum axial force	F <sub>a max</sub>		2850 (641)	5450 (1225)	6450 (1450)	7500 (1686)	
Maximum tilting moment	M <sub>k max</sub>	Nm (lb <sub>f</sub> .in)	200 (1767)	484 (4283)	689 (6096)	1989 (17602)	1
			132 (1170)	326 (2888)	475 (4207)	1030 (9113)	2

Input characteristics			WPSFN064	WPSFN090	WPSFN110	WPSFN140	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	35 (G) <sup>(5)</sup>	1
			19 (E)	24 (F)	35 (G)	42 (H)	2
			14 (D) <sup>(5)</sup>	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	
			19 (E)	19 (E)	24 (F)	35 (G)	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>f</sub> .in.s <sup>2</sup> 10 <sup>-4</sup> )	0.502 - 0.672 (4.443 - 5.948)	1,046 - 1.591 (9.258 - 14.082)	4.857 - 6,435 (42.988 - 56.955)	15.220 - 21.693 (134.708 - 191.999)	1
			0.497 - 0.642 (4.399 - 5.682)	0.497 - 0.659 (4.399 - 5.833)	1.015 - 1.452 (8.984 - 12.851)	4,810 - 6,449 (42.572 - 57.078)	2
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>f</sub> .in)	1.25 - 1.55 (11 - 14)	1.90 - 2.60 (17 - 23)	6,20 - 7.40 (55 - 65)	14,00 - 16,00 (124 - 142)	1
			0.80 - 1.10 (7 - 10)	0.80 - 1.65 (7 - 15)	1.20 - 2,90 (11 - 26)	4.00 - 8,30 (35 - 73)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		12 (106)	25,5 (226)	53 (469)	120 (1062)	1
			12 (106)	12 (106)	25,5 (226)	53 (469)	2

(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			WPSFN064	WPSFN090	WPSFN110	WPSFN140	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>zz</sub>	Nm (lb <sub>r</sub> .in)	45 (398)	90 (797)	160 (1416)	320 (2832)	4	1
			42 (372)	75 (664)	140 (1239)	280 (2478)	5	
			28 (248)	51 (451)	91 (805)	189 (1673)	7	
			27 (239)	50 (443)	90 (797)	180 (1593)	8	
			22 (195)	40 (354)	75 (664)	160 (1416)	10	
			62 (549)	130 (1151)	310 (2744)	620 (5487)	16	2
			62 (549)	130 (1151)	300 (2655)	560 (4956)	20	
			60 (531)	123 (1089)	255 (2257)	540 (4779)	25	
			62 (549)	112 (991)	200 (1770)	360 (3186)	28	
			62 (549)	108 (956)	200 (1770)	360 (3186)	32	
			60 (531)	123 (1089)	255 (2257)	455 (4027)	35	
			60 (531)	123 (1089)	250 (2213)	450 (3983)	40	
			60 (531)	110 (974)	200 (1770)	375 (3319)	50	
			37 (327)	78 (690)	164 (1452)	355 (3142)	70	
			27 (239)	57 (504)	140 (1239)	305 (2699)	100	
			Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	60 (531)	140 (1239)	
67 (593)	120 (1062)	220 (1947)				445 (3939)	5	
44 (389)	81 (717)	145 (1283)				300 (2655)	7	
43 (381)	80 (708)	144 (1275)				285 (2522)	8	
35 (310)	64 (566)	120 (1062)				255 (2257)	10	
83 (735)	205 (1814)	495 (4381)				1000 (8851)	16	2
83 (735)	205 (1814)	480 (4248)				890 (7877)	20	
79 (699)	184 (1629)	405 (3585)				860 (7612)	25	
83 (735)	179 (1584)	325 (2876)				580 (5133)	28	
83 (735)	172 (1522)	320 (2832)				570 (5045)	32	
79 (699)	184 (1629)	405 (3585)				720 (6373)	35	
79 (699)	184 (1629)	400 (3540)				720 (6373)	40	
79 (699)	176 (1558)	320 (2832)				600 (5310)	50	
59 (522)	124 (1097)	255 (2257)				560 (4956)	70	
43 (381)	91 (805)	220 (1947)				485 (4293)	100	

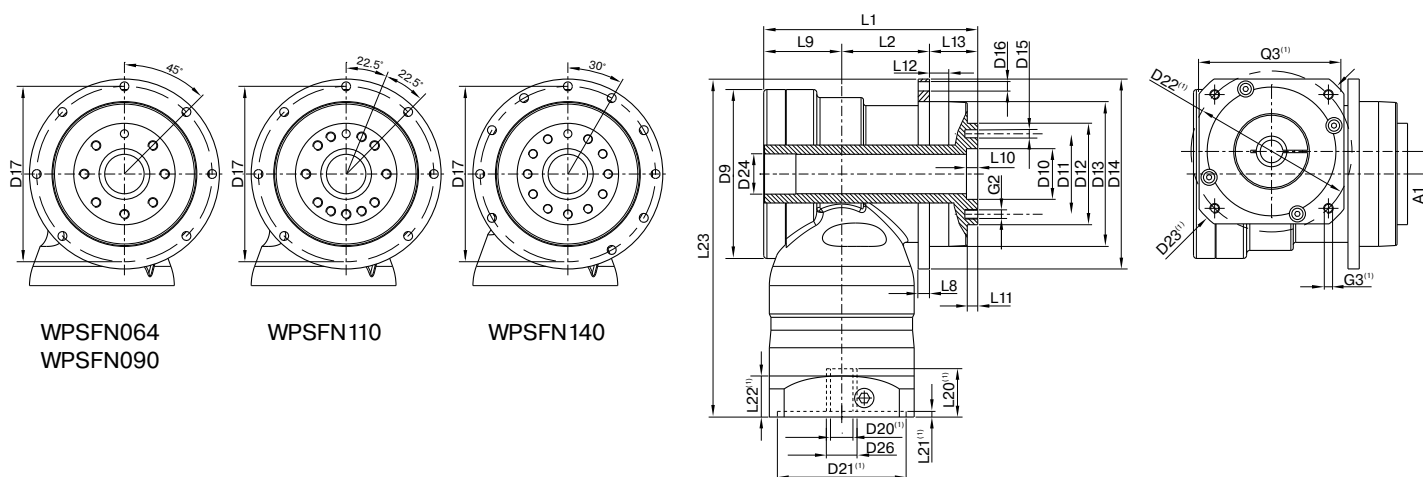
<sup>(1)</sup> Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
<sup>(2)</sup> Number of stages  
<sup>(3)</sup> Application specific configuration with NCP – www.neugart.com  
<sup>(4)</sup> Based on reference clamping system diameter

Output torques			WPSFN064	WPSFN090	WPSFN110	WPSFN140	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>f</sub> .in)	29 (257)	41 (363)	105 (929)	230 (2036)	4	1
			31 (274)	39 (345)	102 (903)	225 (1991)	5	
			23 (204)	40 (354)	77 (682)	160 (1416)	7	
			22 (195)	37 (327)	76 (673)	153 (1354)	8	
			18.5 (164)	34 (301)	63 (558)	136 (1204)	10	
			52 (460)	110 (974)	165 (1460)	405 (3585)	16	
			52 (460)	110 (974)	200 (1770)	475 (4204)	20	
			51 (451)	104 (920)	193 (1708)	455 (4027)	25	
		2	52 (460)	95 (841)	160 (1416)	305 (2699)	28	
			52 (460)	91 (805)	151 (1336)	305 (2699)	32	
			51 (451)	104 (920)	198 (1752)	385 (3408)	35	
			51 (451)	104 (920)	210 (1859)	380 (3363)	40	
			51 (451)	93 (823)	170 (1505)	315 (2788)	50	
			31 (274)	66 (584)	148 (1310)	300 (2655)	70	
			23 (204)	50 (443)	119 (1053)	255 (2257)	100	

Input speeds			WPSFN064	WPSFN090	WPSFN110	WPSFN140	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	1700	1650	1000	930	4	1
			1900	1850	1100	1000	5	
			2200	2150	1250	1200	7	
			2250	2250	1300	1200	8	
			2450	2350	1400	1250	10	
			2150	1850	1700	1150	16	
			2200	2050	1900	1250	20	
			2300	2300	2050	1300	25	
		2	2300	2350	2200	1450	28	
			2350	2400	2250	1500	32	
			2550	2550	2250	1500	35	
			2600	2500	2300	1500	40	
			2550	2650	2450	1650	50	
			2900	3100	2850	1850	70	
			3000	3500	3200	2050	100	
			Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	16000	14000	9500
16000	16000	14000				9500		2

Output torques			WPSFN064	WPSFN090	WPSFN110	WPSFN140	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>f</sub> .in)	80 (708)	200 (1770)	400 (3540)	800 (7081)	4	1
			100 (885)	200 (1770)	400 (3540)	800 (7081)	5	
			75 (664)	150 (1328)	300 (2655)	700 (6196)	7	
			75 (664)	150 (1328)	300 (2655)	700 (6196)	8	
			75 (664)	150 (1328)	300 (2655)	700 (6196)	10	
			150 (1328)	300 (2655)	650 (5753)	1600 (14161)	16	
			150 (1328)	300 (2655)	650 (5753)	1600 (14161)	20	
			150 (1328)	300 (2655)	650 (5753)	1650 (14604)	25	
		2	150 (1328)	300 (2655)	600 (5310)	1200 (10621)	28	
			150 (1328)	300 (2655)	600 (5310)	1200 (10621)	32	
			150 (1328)	300 (2655)	650 (5753)	1500 (13276)	35	
			150 (1328)	300 (2655)	650 (5753)	1500 (13276)	40	
			150 (1328)	300 (2655)	650 (5753)	1500 (13276)	50	
			80 (708)	175 (1549)	340 (3009)	930 (8231)	70	
			50 (443)	120 (1062)	240 (2124)	600 (5310)	100	

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times



Drawing corresponds to a WPSFN090 / 1-stage / flange hollow output shaft / 19 mm clamping system / motor adaptation – 2-part – round universal flange / 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>			WPSFN064	WPSFN090	WPSFN110	WPSFN140	p <sup>(3)</sup>	Code
Axis offset	A1		10 (0.394)	14 (0.551)	20 (0.787)	26 (1.024)	1	
			10 (0.394)	10 (0.394)	14 (0.551)	20 (0.787)	2	
Max. diameter	D9		86 (3.386)	105 (4.134)	120 (4.724)	170 (6.693)	1	
			86 (3.386)	86 (3.386)	105 (4.134)	120 (4.724)	2	
Centering diameter output shaft	D10	H7	20 (0.787)	31.5 (1.240)	40 (1.575)	50 (1.969)		
Pitch circle diameter output shaft	D11		31.5 (1.240)	50 (1.969)	63 (2.480)	80 (3.150)		
Centering diameter output shaft	D12	h7	40 (1.575)	63 (2.480)	80 (3.150)	100 (3.937)		
Centering diameter output flange	D13		64 (2.520)	90 (3.543)	110 (4.331)	140 (5.512)		
Flange diameter output	D14		86 (3.386)	118 (4.646)	145 (5.709)	179 (7.047)		
Mounting bore output	D16		4.5 7x45°	5.5 7x45°	5.5 7x45°	6.6 10x30°	1	
			4.5 8x45°	5.5 8x45°	5.5 8x45°	6.6 12x30°	2	
Pitch circle diameter output flange	D17		79 (3.110)	109 (4.291)	135 (5.315)	168 (6.614)		
Min. total length	L1		104.5 (4.114)	132 (5.197)	153.5 (6.043)	201.5 (7.933)	1	
			122.5 (4.823)	139.5 (5.492)	154 (6.063)	224 (8.819)	2	
Housing length	L2		42	53.5	68	76.5	1	
			59.5	66.5	76.5	129.5	2	
Flange thickness output	L8		4 (0.157)	7 (0.276)	8 (0.315)	10 (0.394)		
Offset length	L9		43	48.5	56.5	87	1	
			43	43	48.5	56.5	2	
Centering depth output shaft	L10		4.5 (0.177)	6.5 (0.256)	6.5 (0.256)	6.5 (0.256)		
	L11		3 (0.118)	6 (0.236)	6 (0.236)	6 (0.236)		
Centering depth output flange	L12		10 (0.394)	12 (0.472)	12 (0.472)	14 (0.551)		
Output flange length	L13		19.5	30.0	29.0	38.0		
Min. overall height	L23		179	210	260	323	1	
			179	195	223.5	277	2	
Motor shaft diameter j6/k6	D20		More information on page 191/192					
Clamping system diameter input	D26		More information on page 148					
Flange output hollow shaft with dowel hole (EN ISO 9409-1)								
Dowel hole x depth	D15	H7	5x5	6x6	6x6	8x8	1	H
Hollow shaft diameter	D24		17 (0.669)	25 (0.984)	35 (1.378)	50 (1.969)		
Number x thread x depth	G2		7 x M5x7	7 x M6x10	11 x M6x12	11 x M8x15		
Flange output shaft (similar ISO 9409-1)								
Number x thread x depth	G2		8 x M5x7	8 x M6x10	12 x M6x12	12 x M8x15	2	D
Flange output shaft with dowel hole (ISO 9409-1)								
Dowel hole x depth	D15	H7	5x5	6x6	6x6	8x8	2	E
Number x thread x depth	G2		7 x M5x7	7 x M6x10	11 x M6x12	11 x M8x15		

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

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



# WGN

## The hypoid-toothed right-angle gearbox with hollow shaft – low-noise and force-fit mounting

Our **WGN** is the right-angle hollow shaft gearbox that operates particularly quietly. At the same time, the hypoid gearing increases the quality of the surface of your work-piece. With a shrink disc, it can be connected directly to the application - this is uncomplicated, safe and opens up new design possibilities.

Cyclic torque **22 - 320 Nm**



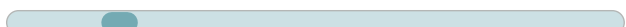
Radial force **2700 - 10000 N**



Axial force **4300 - 14500 N**



Torsional backlash **5 arcmin**

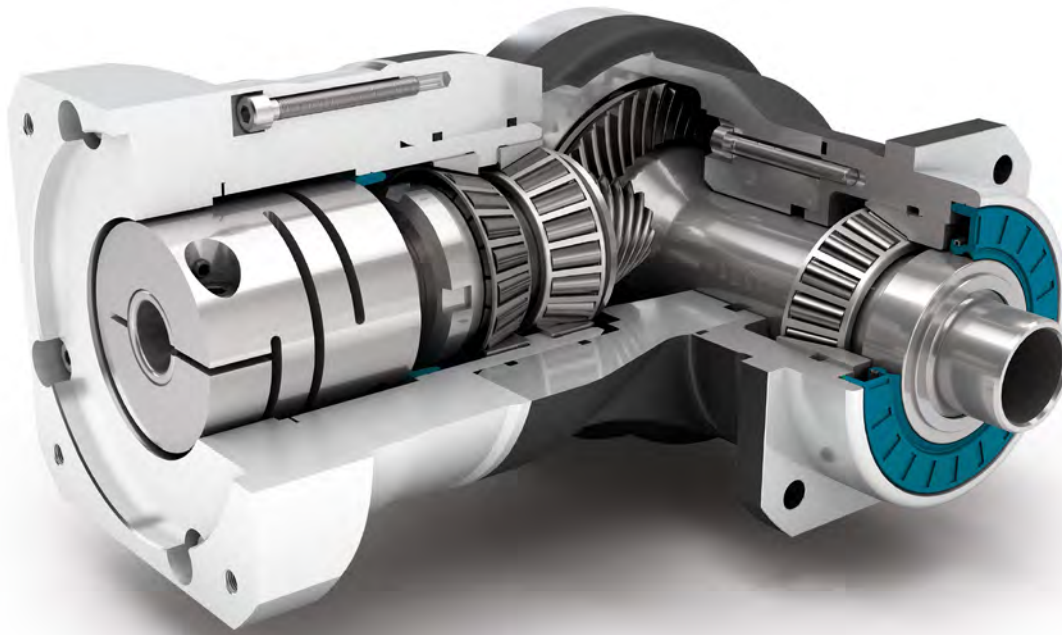


Protection class **IP65**



Frame sizes

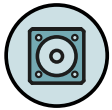
- 70
- 90
- 115
- 142



Precision Line



Counterdirectional rotation



Square type output flange



Rotary shaft seal



Hollow shaft for clamping system with shrink disc



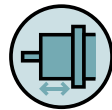
Right angle gearbox



Hypoid gear right angle stage



Preloaded tapered roller bearings



Extra long centering collar



Option: Painted surface – RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			WGN070	WGN090	WGN115	WGN142	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000				
	Efficiency <sup>(3)</sup>	η	%	95				
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)				
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)				
	Protection class			IP65				
<b>S</b>	Standard lubrication			Oil (lifetime lubrication)				
<b>F</b>	Food grade lubrication			Oil (lifetime lubrication)				
	Installation position			Any				
<b>S</b>	Standard backlash	φ	arcmin	< 5				
<b>R</b>	Reduced backlash			-				
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>i</sub> .in / arcmin)	1.6 - 2.2 (14 - 19)	4.2 - 5.7 (37 - 50)	9.2 - 12.4 (81 - 110)	23.5 - 31.5 (208 - 279)	
	Gearbox weight <sup>(3)</sup>	m	kg (lb <sub>m</sub> )	3.2 (7.1)	5.1 - 5.5 (11.2 - 12.2)	10.7 - 10.8 (23.7 - 23.8)	22.9 - 23.5 (50.6 - 51.8)	
<b>S</b>	Standard surface			Right angle housing: Aluminum – anodized (black)				
<b>B</b>	Painted surface <sup>(4)</sup>			RAL 9005 Jet black				
	Running noise <sup>(3)</sup>	L <sub>pA</sub>	dB(A)	66	67	68	70	

Output shaft loads			WGN070	WGN090	WGN115	WGN142	p <sup>(1)</sup>
Maximum radial force	F <sub>r max</sub>	N (lb <sub>r</sub> )	2700 (607)	4000 (899)	6500 (1461)	10000 (2248)	
Maximum axial force	F <sub>a max</sub>		3400 (764)	4500 (1012)	6500 (1461)	12000 (2698)	
Maximum tilting moment	M <sub>K max</sub>	Nm (lb <sub>r</sub> .in)	253 (2235)	442 (3912)	970 (8586)	1505 (13320)	

Input characteristics			WGN070	WGN090	WGN115	WGN142	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	14 (D) <sup>(5)</sup>	19 (E) <sup>(5)</sup>	24 (F) <sup>(5)</sup>	35 (G) <sup>(5)</sup>	
			19 (E)	24 (F)	35 (G)	42 (H)	
Mass moment of inertia input <sup>(3)(5)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>r</sub> .in.s <sup>2</sup> ·10 <sup>-4</sup> )	0.502 - 0.834 (4.443 - 7.382)	1.018 - 1.417 (9.010 - 12.542)	4.805 - 6.111 (42.528 - 54.087)	12.934 - 18.905 (114.476 - 167.323)	
Average idle torque <sup>(3)(5)</sup>	T <sub>0</sub>	Nm (lb <sub>r</sub> .in)	1.20 - 1.50 (11 - 13)	1.85 - 2.35 (16 - 21)	6.00 - 6.90 (53 - 61)	16.00 - 16.10 (142)	
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		12 (106)	25,5 (226)	53 (469)	120 (1062)	

<sup>(1)</sup> Number of stages

<sup>(2)</sup> Application specific configuration with NCP – www.neugart.com

<sup>(3)</sup> The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com

<sup>(4)</sup> More information on page 183

<sup>(5)</sup> Reference clamping system diameter

Output torques			WGN070	WGN090	WGN115	WGN142	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>2z</sub>	Nm (lb.in)	45 (398)	90 (797)	160 (1416)	320 (2832)	4	1
			42 (372)	75 (664)	140 (1239)	280 (2478)	5	
			28 (248)	51 (451)	91 (805)	189 (1673)	7	
			27 (239)	50 (443)	90 (797)	180 (1593)	8	
			22 (195)	40 (354)	75 (664)	160 (1416)	10	
Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb.in)	60 (531)	140 (1239)	255 (2257)	510 (4514)	4	
			67 (593)	120 (1062)	220 (1947)	445 (3939)	5	
			44 (389)	81 (717)	145 (1283)	300 (2655)	7	
			43 (381)	80 (708)	144 (1275)	285 (2522)	8	
			35 (310)	64 (566)	120 (1062)	255 (2257)	10	
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb.in)	30 (266)	42 (372)	105 (929)	240 (2124)	4	
			32 (283)	40 (354)	102 (903)	235 (2080)	5	
			23 (204)	41 (363)	77 (682)	160 (1416)	7	
			22 (195)	38 (336)	76 (673)	153 (1354)	8	
			18,5 (164)	34 (301)	63 (558)	136 (1204)	10	

Input speeds			WGN070	WGN090	WGN115	WGN142	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	1600	1600	1000	850	4	1
			1750	1750	1100	850	5	
			2000	2000	1250	1100	7	
			2050	2050	1250	940	8	
			2250	2150	1350	970	10	
Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	16000	14000	9500	8000		

Output torques			WGN070	WGN090	WGN115	WGN142	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb.in)	80 (708)	200 (1770)	400 (3540)	800 (7081)	4	1
			100 (885)	200 (1770)	400 (3540)	800 (7081)	5	
			75 (664)	150 (1328)	300 (2655)	700 (6196)	7	
			75 (664)	150 (1328)	300 (2655)	700 (6196)	8	
			75 (664)	150 (1328)	300 (2655)	700 (6196)	10	

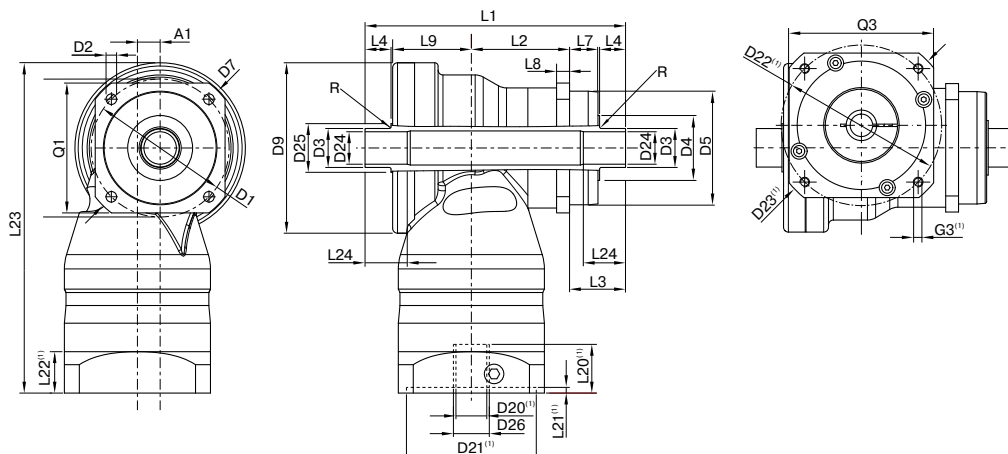
<sup>(1)</sup> Ratios (i=n<sub>1</sub>/n<sub>2</sub>)

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

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

<sup>(4)</sup> Based on reference clamping system diameter

<sup>(5)</sup> Permitted 1000 times



Drawing corresponds to a WGN090 / 1-stage / hollow output shaft on both sides / 19 mm clamping system / motor adaptation – 2-part – round universal flange / B5 flange type motor

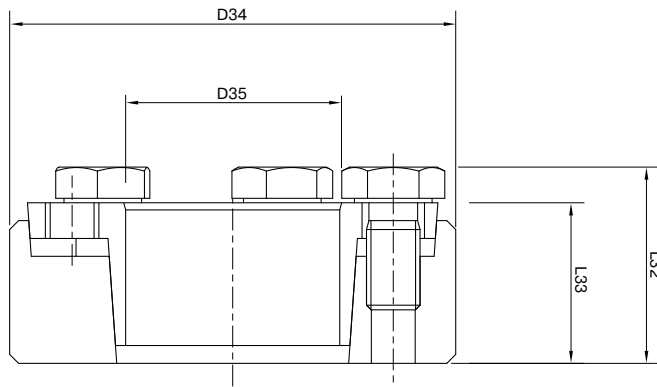
<sup>(1)</sup> The dimensions vary with the motor/gearbox flange. The input flange dimensions can be retrieved for each specific motor in Tec Data Finder at [www.neugart.com](http://www.neugart.com)

Geometry <sup>(2)</sup>			WGN070	WGN090	WGN115	WGN142	p <sup>(3)</sup>	Code
Axis offset	A1		10 (0.394)	14 (0.551)	20 (0.787)	26 (1.024)	1	
Pitch circle diameter output	D1		68 (2.677) - 75 (2.953)	85 (3.346)	120 (4.724)	165 (6.496)		
Mounting bore output	D2	4x	5.5 (0.217)	6.5 (0.256)	9.0 (0.354)	11.0 (0.433)		
Shaft diameter output	D3	h8	18 (0.709)	24 (0.945)	36 (1.417)	50 (1.969)		
Shaft collar output	D4		30 (1.181)	34 (1.339)	45 (1.772)	70 (2.756)		
Centering diameter output	D5	g7	60 (2.362)	70 (2.756)	90 (3.543)	130 (5.118)		
Diagonal dimension output	D7		92 (3.622)	100 (3.937)	140 (5.512)	185 (7.283)		
Max. diameter	D9		86 (3.386)	105 (4.134)	120 (4.724)	170 (6.693)		
Flange cross section output	Q1	■	70 (2.756)	80 (3.150)	110 (4.331)	142 (5.591)		
Housing length	L2		46.5 (1.831)	60.5 (2.382)	73.5 (2.894)	76 (2.992)		
Shaft length output	L3		33 (1.299)	34.5 (1.358)	48 (1.890)	54 (2.126)		
Centering depth output	L7		18 (0.709)	17.5 (0.689)	27 (1.063)	28 (1.102)		
Flange thickness output	L8		7 (0.276)	8 (0.315)	10 (0.394)	12 (0.472)		
Offset length	L9		43 (1.693)	48.5 (1.909)	56.5 (2.224)	87 (3.425)		
Min. overall height	L23		179 (7.047)	203.5 (8.012)	247.5 (9.744)	318 (12.520)		
Max. radius	R		1.5 (0.059)					
Motor shaft diameter j6/k6	D20		More information on page 191/192					
Clamping system diameter input	D26		More information on page 154					
Hollow output shaft on one side							F	
Hollow shaft diameter	D24	H6	15 (0.591)	20 (0.787)	30 (1.181)	40 (1.575)		
Total length	L1		122.5 (4.823)	143.5 (5.650)	178 (7.008)	217 (8.543)		
Shaft length from shoulder	L4		14 (0.551)	16 (0.630)	20 (0.787)	25 (0.984)		
Min. fit length	L24		20 (0.787)	25 (0.984)	30 (1.181)	35 (1.378)	G	
Hollow output shaft on both sides								
Hollow shaft diameter	D24	H6	15 (0.591)	20 (0.787)	30 (1.181)	40 (1.575)		
Shaft collar	D25		25 (0.984)	30 (1.181)	42 (1.654)	55 (2.165)		
Total length	L1		137.5 (5.413)	160.5 (6.319)	199 (7.835)	243 (9.567)		
Shaft length from shoulder	L4		14 (0.551)	16 (0.630)	20 (0.787)	25 (0.984)		
Min. fit length	L24		20 (0.787)	25 (0.984)	30 (1.181)	35 (1.378)		

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

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

WGN Shrink disc



This shrink disc can be used to make a force-fit connection between your machine shaft and the right angle hollow shaft gearbox WGN.

			WGN070	WGN090	WGN115	WGN142
<b>Art. No.</b>			<b>58365</b>	<b>58366</b>	<b>58367</b>	<b>58368</b>
Outside diameter	D34	mm (in)	44 (1.732)	50	72	90
Inner diameter	D35		18 (0.709)	24 (0.945)	36 (1.417)	50 (1.968)
Overall length <sup>(1)</sup>	L32		19 (0.748)	22 (0.866)	27.3 (1.075)	31.3 (1.232)
Clamp length <sup>(1)</sup>	L33		15 (0.591)	18 (0.709)	22 (0.866)	26 (1.024)
Width across flats	SW30		10 (0.394)	10 (0.394)	13 (0.512)	13 (0.512)
Number of clamp screws	N30		4 (0.157)	5 (0.197)	5 (0.197)	5 (0.197)
Mass moment of inertia	J <sub>1</sub>	kgcm <sup>2</sup> (lbf.in.s <sup>2</sup> 10 <sup>-4</sup> )	0.4251 (3.672)	0.7831 (6.930)	4.212 (37.276)	11.55 (102.218)

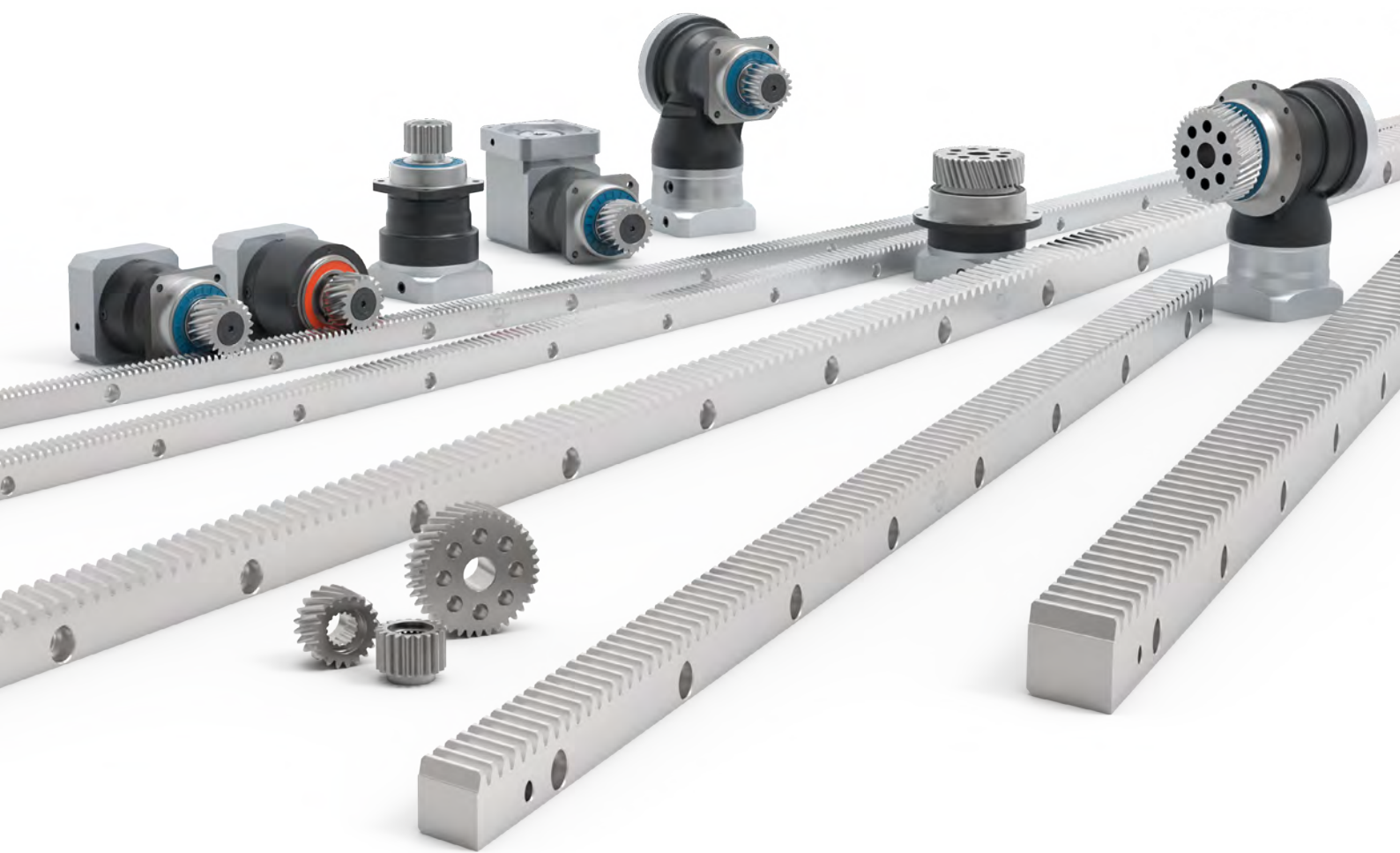
For the load shaft, we recommend a tolerance of h6 and a surface roughness of Ra < 3.2 µm. CAD data can be accessed at [www.neugart.com](http://www.neugart.com)

For correct installation of the shrink disc, please refer to the corresponding mounting instructions ([www.neugart.com](http://www.neugart.com))

**Included parts**

1 x Shrink disc (incl. screws)

<sup>(1)</sup> Dimensions in unclamped state



## Neugart Rack System

### Precision racks for the highest demands

Neugart offers racks of the highest quality with straight or helical gearing. Our standard racks are made of induction-hardened tempered steel, cover a module range from 1.5 to 5 mm, and comply with quality level 6.

The racks are heat-treated and ground to optimize their mechanical properties. The standard versions are available in lengths of 1000 mm and 2000 mm. Customized lengths can also be produced on request.



## Planetary gearboxes with mounted pinion

Numerous combination options from three different pinion types with helical and straight teeth ensure that the ideal solution is available for every application.

The pinion can be combined with different gearbox types, including precision gearboxes for maximum accuracy, economy gears for maximum durability and efficiency, and angular planetary gears for special installation situations.

This allows you to benefit from maximum flexibility and technical coordination for a wide range of requirements.

### PK1

- The PK1 pinion is mounted directly on the gearbox's toothed output shaft.
- The precise design of the internal teeth in accordance with DIN 5480 enables optimum power transmission and ensures a permanently high level of connection reliability, even in demanding applications.



### PM1

- The PM1 pinion is specially designed for gearboxes with flange output shafts.
- Thanks to its large circumference, the PM1 pinion enables particularly high feed speeds.



### PM2

- The PM2 pinion is specially designed for gearboxes with flange output shafts.
- Thanks to its low number of teeth, the PM2 pinion enables particularly high feed forces.



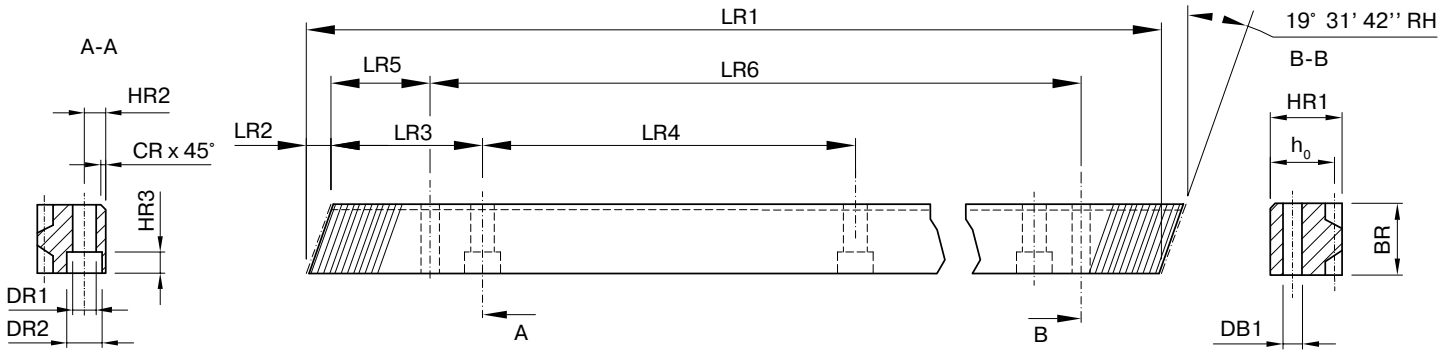
### Helical rack

Helix angle  $\beta = 19,5283^\circ$  (right-hand)

Neugart tempered steel, hardened (HRC 56-60)

Profile ground on all sides

Quality 6



Product code	m	LR1	LR2	LR3	LR4	LR5	LR6	BR	HR1	HR2	DB1	CR	DR1	DR2	HR3	h <sub>0</sub>	z	Number of mounting holes
mm																		
NRS15-6B1000-R1	1.5	1000	6.739	62.5	125	29.94	939.42	19	19	8	5.7	2	7	11	7	17.5	200	8
NRS20-6B1000-R1	2	1000	8.512	62.5	125	31.71	936.58	24	24	8	5.7	2	7	11	7	22	150	8
NRS20-6B2000-R1	2	2000	8.512	62.5	125	31.71	1936.58	24	24	8	5.7	2	7	11	7	22	300	16
NRS30-6B1000-R1	3	1000	10.286	62.5	125	34.99	930.02	29	29	9	7.7	2	9	15	9	26	100	8
NRS30-6B2000-R1	3	2000	10.286	62.5	125	34.99	1930.02	29	29	9	7.7	2	9	15	9	26	200	16
NRS40-6B1000-R1	4	1000	13.832	62.5	125	33.30	933.40	39	39	12	7.7	3	9	15	9	35	75	8
NRS40-6B2000-R1	4	2000	13.832	62.5	125	33.30	1933.40	39	39	12	7.7	3	9	15	9	35	150	16

Product code	Article No.	m	LR1	Weight
		mm		kg
NRS15-6B1000-R1	100789973	1.5	1000	2.52
NRS20-6B1000-R1	100777056	2	1000	4.03
NRS20-6B2000-R1	100777057	2	2000	8.07
NRS30-6B1000-R1	100789982	3	1000	5.66
NRS30-6B2000-R1	100789984	3	2000	11.34
NRS40-6B1000-R1	100789986	4	1000	10.37
NRS40-6B2000-R1	100789988	4	2000	20.76



NRS + Pin.

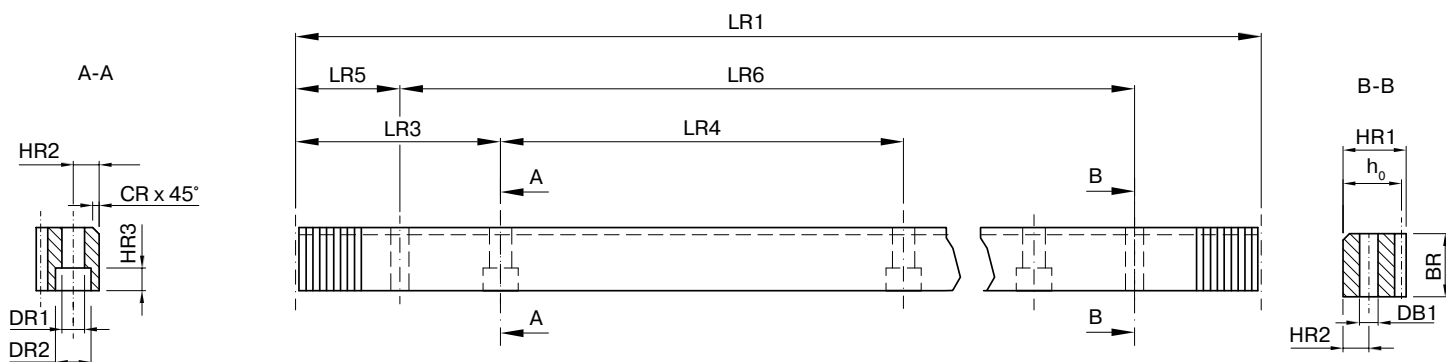
## Straight rack

Helix angle  $\beta = 0^\circ$

Neugart tempered steel, hardened (HRC 56-60)

Profile ground on all sides

Quality 6



Product code	m	LR1	LR3	LR4	LR5	LR6	BR	HR1	HR2	DB1	CR	DR1	DR2	HR3	h <sub>0</sub>	z	Number of mounting holes
mm																	
NRS15-6B1018-L0	1.5	1017.876	63.617	127.235	34.4	949.076	19	19	8	5.7	2	7	11	7	17.5	216	8
NRS20-6B1005-L0	2	1005.310	62.832	125.664	31.3	942.710	24	24	8	5.7	2	7	11	7	22	160	8
NRS20-6B2011-L0	2	2010.619	62.832	125.664	31.3	1948.019	24	24	8	5.7	2	7	11	7	22	320	16
NRS30-6B1018-L0	3	1017.876	63.617	127.235	34.4	949.076	29	29	9	7.7	2	10	15	9	26	108	8
NRS30-6B2036-L0	3	2035.752	63.617	127.235	34.4	1966.952	29	29	9	7.7	2	10	15	9	26	216	16
NRS40-6B1005-L0	4	1005.310	62.832	125.664	37.5	930.310	39	39	12	7.7	3	10	15	9	35	80	8
NRS40-6B2011-L0	4	2010.619	62.832	125.664	37.5	1935.619	39	39	12	7.7	3	10	15	9	35	160	16
NRS50-6B1005-L0	5	1005.310	62.832	125.664	30.1	945.110	49	39	12	11.7	3	14	20	13	34	64	8
NRS50-6B2011-L0	5	2010.619	62.832	125.664	30.1	1950.419	49	39	12	11.7	3	14	20	13	34	128	16

Product code	Article No.	m	LR1	Weight
mm kg				
NRS15-6B1018-L0	100789990	1.5	1017.876	2.56
NRS20-6B1005-L0	100789992	2	1005.310	4.05
NRS20-6B2011-L0	100790009	2	2010.619	8.11
NRS30-6B1018-L0	100790003	3	1017.876	5.76
NRS30-6B2036-L0	100790011	3	2035.752	11.55
NRS40-6B1005-L0	100790005	4	1005.310	10.42
NRS40-6B2011-L0	100790017	4	2010.619	20.87
NRS50-6B1005-L0	100790007	5	1005.310	12.34
NRS50-6B2011-L0	100790019	5	2010.619	24.76





### Pinion with helical teeth

Helix angle  $\beta = -19,5283^\circ$  (left-hand)

hardened and ground, Quality 6

Pinion type	Module	Number of teeth	Pitch circle diameter	Profile modification factor	Feed constant	Pinion weight	Max. torque	Max. feed force	Suitable for gearbox <sup>(1)</sup>						
									PSNro	PSN	PLN	WPLN	PLHE	WPLHE	PLPE
	m	z	d <sub>0</sub>	x	d <sub>0</sub> × π	m <sub>p</sub>	T <sub>vmax</sub>	F <sub>v</sub>							
	mm		mm		mm/U	kg	Nm	N							
PK1	1.5	19	30.239	0.30	95.00	0.11	68	4517	070	070	070	070	060	060	70
PK1	2	15	31.831	0.55	100.00	0.16	90	5650							
PK1	2	16	33.953	0.55	106.67	0.18	103	6060							
PK1	2	18	38.197	0.45	120.00	0.23	108	5540							
PK1	2	18	38.197	0.45	120.00	0.21	141	7380	090	090	090	090	080	080	90
PK1	2	20	42.441	0.45	133.33	0.27	183	8620							
PK1	2	22	46.686	0.45	146.67	0.33	200	8559							
PK1	2	23	48.808	0.45	153.33	0.32	229	9380							
PK1	2	25	53.052	0.45	166.67	0.39	250	9420	115	115	115	115	120	120	120
PK1	2	26	55.174	0.40	173.33	0.42	263	9534							
PK1	2	27	57.296	0.35	180.00	0.46	275	9590							
PK1	3	20	63.662	0.45	200.00	0.69	436	13701							
PK1	3	20	63.662	0.45	200.00	0.77	534	16770	142	142	142	142	-	-	155
PK1	3	22	70.028	0.45	220.00	0.94	602	17190							
PK1	3	24	76.394	0.45	240.00	1.12	660	17270							
PK1	4	20	84.883	0.40	266.67	1.64	1295	30510							

### Pinion with straight teeth

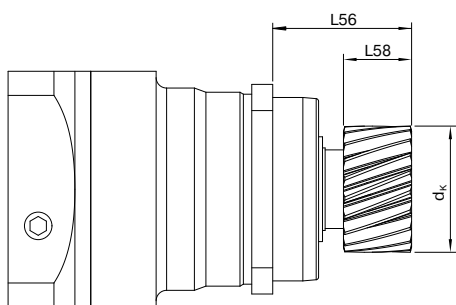
Helix angle  $\beta = 0^\circ$

hardened and ground, Quality 6

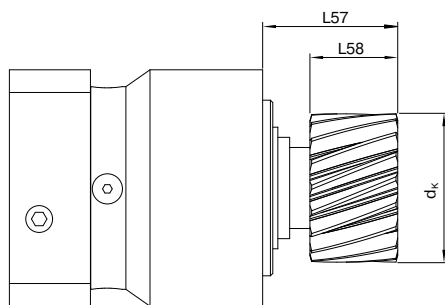


Pinion type	Module	Number of teeth	Pitch circle diameter	Profile modification factor	Feed constant	Pinion weight	Max. torque	Max. feed force	Suitable for gearbox <sup>(1)</sup>						
									PSNpro	PSN	PLN	WPLN	PLHE	WPLHE	PLPE
	m	z	d <sub>0</sub>	x	d <sub>0</sub> × π	m <sub>p</sub>	T <sub>vmax</sub>	F <sub>v</sub>							
	mm		mm		mm/U	kg	Nm	N							
PK1	1.5	20	30.00	0.30	94.25	0.11	43	2860	070	070	070	070	060	060	070
PK1	2	16	32.00	0.50	100.53	0.16	61	3810							
PK1	2	19	38.00	0.40	119.38	0.22	94	4947							
PK1	2	19	38.00	0.40	119.38	0.20	94	4940	090	090	090	090	080	080	090
PK1	2	22	44.00	0.30	138.23	0.28	133	6046							
PK1	3	17	51.00	0.40	160.22	0.40	225	8820							
PK1	3	22	66.00	0.20	207.35	0.71	397	12030	115	115	115	115	120	120	120
PK1	3	22	66.00	0.20	207.35	0.79	397	12030							
PK1	3	25	75.00	0.20	235.62	1.04	525	14000							
PK1	4	19	76.00	0.30	238.76	1.32	712	18730	142	142	142	142	-	-	155
PK1	4	22	88.00	0.20	276.46	1.71	986	22400							
PK1	5	19	95.00	0.40	298.45	2.38	1481	31170							

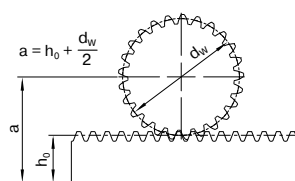
<sup>(1)</sup> Application specific configuration with NCP.  
More information about the gearboxes can be found on the product pages or at [www.neugart.com](http://www.neugart.com)



PSNpro with pinion (also applies to WPLN, PLHE and WPLHE)



PLPE with pinion



## Pinion with helical teeth

Frame size	Pinion type	Module	Number of teeth	Tip diameter	Operating pitch circle diameter	Pinion width	Center distance <sup>(1)</sup>	Output shaft length with pinion	
		m	z	$d_k$	$d_w$	L 58	a	L56	L57
		mm		mm	mm	mm	mm	mm	
060 / 070	PK1	1.5	19	34.06	31.14	21	33.10	51	39.1
	PK1	2	15	37.95	34.03	26	39.02	52	40.1
	PK1	2	16	40.07	36.15	26	40.08	52	40.1
	PK1	2	18	43.92	40.00	26	42.00	52	40.1
080 / 090	PK1	2	18	43.92	40.00	26	42.00	52	42.9
	PK1	2	20	48.16	44.24	26	44.12	53	42.9
	PK1	2	22	52.40	48.49	26	46.24	53	42.9
115 / 120	PK1	2	23	54.53	50.61	26	47.30	64	54
	PK1	2	25	58.74	54.85	26	49.43	64	54
	PK1	2	26	60.66	56.77	26	50.39	64	54
	PK1	2	27	62.59	58.70	26	51.35	64	54
	PK1	3	20	72.25	66.36	31	59.18	69.5	59.5
142 / 155	PK1	3	20	72.25	66.36	31	59.18	81	65.9
	PK1	3	22	76.62	72.73	31	62.36	81	65.9
	PK1	3	24	84.99	79.09	31	65.55	81	65.9
190	PK1	4	20	95.97	88.08	41	79.04	84	-

## Pinion with straight teeth

Frame size	Pinion type	Module	Number of teeth	Tip diameter	Operating pitch circle diameter	Pinion width	Center distance <sup>(1)</sup>	Output shaft length with pinion	
		m	z	$d_k$	$d_w$	L58	a	L56	L57
		mm		mm	mm	mm	mm	mm	
060 / 070	PK1	1.5	20	33.82	30.90	21	32.95	51	39.1
	PK1	2	16	37.92	34.00	26	39.00	52	40.1
	PK1	2	19	43.52	39.60	26	41.80	52	40.1
080 / 090	PK1	2	19	43.52	39.60	26	41.80	53	42.9
	PK1	2	22	49.12	45.20	26	44.60	53	42.9
115 / 120	PK1	3	17	59.29	53.40	31	52.70	69.5	59.5
	PK1	3	22	73.09	67.20	31	59.60	69.5	59.5
142 / 155	PK1	3	22	73.09	67.20	31	59.60	81	59.5
	PK1	3	25	82.09	76.20	31	64.12	81	65.9
	PK1	4	19	86.29	78.40	41	74.20	84	68.9
190	PK1	4	22	97.49	89.60	41	79.80	84	-
	PK1	5	19	108.89	99.00	51	83.50	84	-

<sup>(1)</sup> For standard toothed rack height  $h_0$ . Module 1,5 ( $h_0=17,5$ ), Module 2 ( $h_0=22$  mm), Module 3 ( $h_0=26$  mm), Module 4 ( $h_0=35$  mm), Module 5 ( $h_0=34$  mm).

## Pinion with helical teeth

Helix angle  $\beta = -19,5283^\circ$  (left-hand)

hardened and ground, Quality 6



Pinion type	Module	Number of teeth	Adapter flange (inclusive) <sup>2) 3)</sup>	Pitch circle diameter	Profile modification factor	Feed constant	Pinion weight	Max. feed force	Suitable for gearbox <sup>(1)</sup>			Mounting method
				$d_0$					$x$	$d_0 \times \pi$	$m_p$	
	m	z		$d_0$	$x$	$d_0 \times \pi$	$m_p$	$F_v$	PSFNro	WPSFN	PFHE	
	mm			mm		mm/U	kg	N				
PM1	2	26	–	55.174	0.40	173.33	0.43	2853	064	064	064	2)
PM1	2	27	–	57.296	0.35	180.00	0.47	2794				
PM1	2	26	064 → 090	55.174	0.40	173.33	0.60	2853	090	090	090	3)
PM1	2	27	064 → 090	57.296	0.35	180.00	0.64	2794				
PM1	2	35	064 → 090	74.272	0.35	233.33	1.00	2378				
PM1	2	37	–	78.517	0.35	246.67	0.89	4404	090	090	090	2)
PM1	2	26	064 → 110	55.174	0.40	173.33	0.76	2853	110	110	110	3)
PM1	2	27	064 → 110	57.296	0.35	180.00	0.79	2794				
PM1	2	35	064 → 110	74.272	0.35	233.33	1.16	2378				
PM1	2	40	–	84.883	0.35	266.67	0.94	7232	110	110	110	2)
PM1	2	45	–	95.493	0.30	300.00	1.25	6784				
PM1	2	37	090 → 140	78.517	0.35	246.67	1.54	4404	140	140	–	3)
PM1	3	31	090 → 140	98.676	0.35	310.00	2.40	3830				
PM1	3	35	–	111.409	0.35	350.00	2.18	13796	140	140	–	2)
PM1	3	40	–	127.324	0.35	400.00	2.92	12810				
PM1	4	30	–	127.324	0.20	400.00	3.67	12829				
PM1	3	35	140 → 200	111.409	0.35	350.00	4.20	13796	200	–	–	3)
PM1	3	40	140 → 200	127.324	0.35	400.00	4.93	12810				
PM1	4	30	140 → 200	127.324	0.20	400.00	5.68	12829				

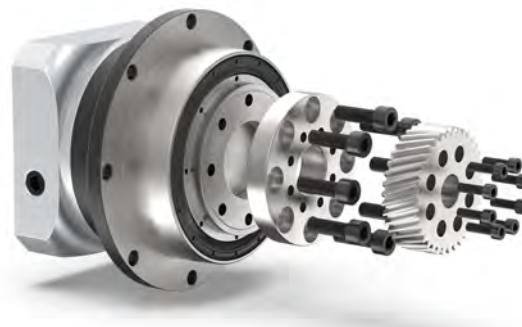
<sup>(1)</sup> Application specific configuration with NCP.  
More information about the gearboxes can be found on the product pages or at [www.neugart.com](http://www.neugart.com)

### 2) Direct mounting of the pinion

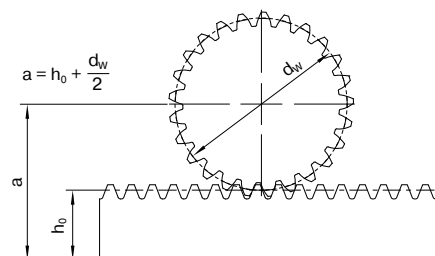
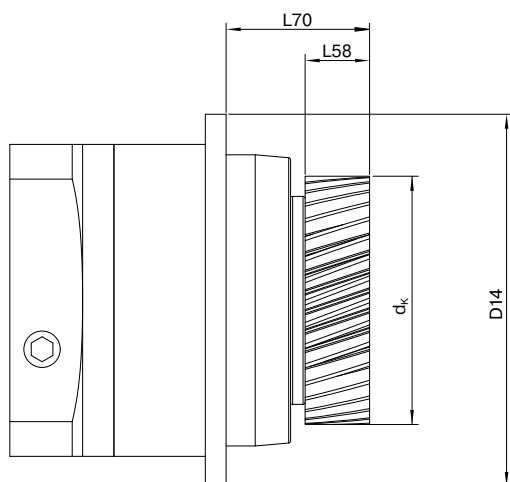
### 3) Use of an adapter flange for installing the pinion



PSFNpro with PM1 pinion for gearbox frame size 090



PSFNpro with adapter flange (064 → 090) and PM1 pinion for gearbox frame size 064



## Pinion with helical teeth

Frame size	Pinion type	Module	Number of teeth	Adapter flange (inclusive)	Tip diameter	Operating pitch circle diameter	Center distance <sup>(1)</sup>	Pinion width	Flange diameter	Output shaft length with pinion
		m	z		dk	dw	a	L 58	D14	L70
		mm			mm	mm	mm	mm	mm	
064	PM1	2	26	–	60.66	56.77	50.39	26	86	45.5
	PM1	2	27	–	62.59	58.70	51.35	26	86	45.5
090	PM1	2	26	064 → 090	60.66	56.77	50.39	26	118	66
	PM1	2	27	064 → 090	62.59	58.70	51.35	26	118	66
	PM1	2	35	064 → 090	79.56	75.67	59.84	26	118	66
	PM1	2	37	–	83.81	79.92	61.96	26	118	56
110	PM1	2	26	064 → 110	60.66	56.77	50.39	26	145	65
	PM1	2	27	064 → 110	62.59	58.70	51.35	26	145	65
	PM1	2	35	064 → 110	79.56	75.67	59.84	26	145	65
	PM1	2	40	–	90.17	86.28	65.14	26	145	55
	PM1	2	45	–	100.58	96.69	70.35	26	145	55
140	PM1	2	37	090 → 140	83.81	79.92	61.96	26	179	77
	PM1	3	31	090 → 140	106.67	100.78	76.39	31	179	82
	PM1	3	35	–	119.40	113.51	82.75	31	179	69
	PM1	3	40	–	135.27	139.42	90.71	31	179	69
	PM1	4	30	–	136.77	128.92	99.46	41	179	79
200	PM1	3	35	140 → 200	119.40	113.51	82.75	31	247	100
	PM1	3	40	140 → 200	135.27	129.42	90.71	31	247	100
	PM1	4	30	140 → 200	136.77	128.92	99.46	41	247	110

<sup>(1)</sup> For standard toothed rack height  $h_0$ . Module 2 ( $h_0 = 22$  mm), Module 3 ( $h_0 = 26$  mm), Module 4 ( $h_0 = 35$  mm).

### Pinion with helical teeth

Helix angle  $\beta = -19,5283^\circ$  (left-hand)

hardened and ground, Quality 6



Pinion type	Module	Number of teeth	Pitch circle diameter	Profile modification factor	Feed constant	Pinion weight	Max. torque	Max. feed force	Suitable for gearbox <sup>(1)</sup>		
									PSFNpro	WPSFN	PFHE
	m	z	$d_0$	x	$d_0 \times \pi$	$m_P$	$T_{vmax}$	$F_v$	PSFNpro	WPSFN	PFHE
	mm		mm		mm/U	kg	Nm	N			
PM2	2	16	33.95	0.25	106.67	0.46	124	7300	090	090	090
PM2	2	20	42.44	0.45	133.33	0.81	226	10650	110	110	110
PM2	3	14	44.56	0.20	140.00	0.89	228	10230			
PM2	2	20	42.44	0.45	133.33	1.15	231	10930	140	140	-
PM2	3	17	54.11	0.45	170.00	3.16	349	12930			
PM2	3	17	54.11	0.45	170.00	1.41	349	12930	200	-	-
PM2	4	20	84.88	0.40	266.67	4.47	1279	30140			

### Pinion with straight teeth

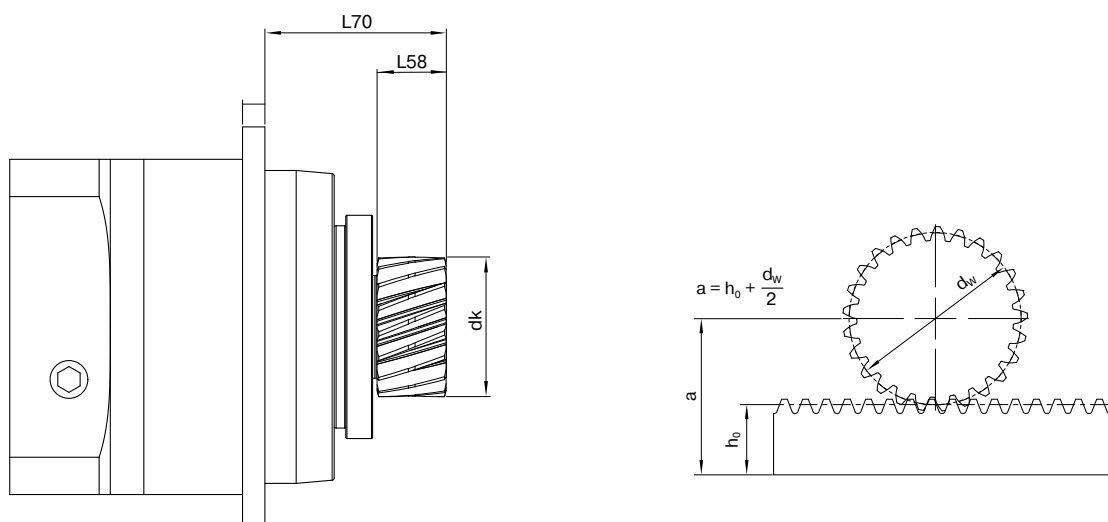
Helix angle  $\beta = 0^\circ$

hardened and ground, Quality 6



Pinion type	Module	Number of teeth	Pitch circle diameter	Profile modification factor	Feed constant	Pinion weight	Max. torque	Max. feed force	Suitable for gearbox <sup>(1)</sup>		
									PSFNpro	WPSFN	PFHE
	m	z	$d_0$	x	$d_0 \times \pi$	$m_P$	$T_{vmax}$	$F_v$	PSFNpro	WPSFN	PFHE
	mm		mm		mm/U	kg	Nm	N			
PM2	2	17	34.00	0.20	106.81	0.45	98	5780	090	090	090
PM2	2	22	44.00	0.40	138.23	0.82	194	8840	110	110	110
PM2	3	19	57.00	0.40	179.07	1.46	275	9650	140	140	-
PM2	4	22	88.00	0.20	276.46	4.54	847	19260	200	-	-
PM2	5	19	95.00	0.20	298.45	5.41	1304	27460			

<sup>(1)</sup> Application specific configuration with NCP.  
More information about the gearboxes can be found on the product pages or at [www.neugart.com](http://www.neugart.com)



## Pinion with helical teeth

Frame size	Pinion type	Module	Number of teeth	Tip diameter	Operating pitch circle diameter	Pinion width	Center distance <sup>(1)</sup>	Output shaft length with pinion
		m	z	$d_k$	$d_w$	L58	a	L70
		mm		mm	mm	mm	mm	
090	PM2	2	16	38.87	34.95	26	39.48	66.45
110	PM2	2	20	48.16	44.24	26	44.12	67.45
	PM2	3	14	51.68	45.76	31	43.88	72.45
140	PM2	2	20	48.16	44.24	26	44.12	77.45
	PM2	3	17	62.70	56.81	31	49.41	101.00
200	PM2	3	17	62.70	56.81	31	49.41	83.00
	PM2	4	20	95.97	88.08	41	64.04	111.00

## Pinion with straight teeth

Frame size	Pinion type	Module	Number of teeth	Tip diameter	Operating pitch circle diameter	Pinion width	Center distance <sup>(1)</sup>	Output shaft length with pinion
		m	z	$d_k$	$d_w$	L58	a	L70
		mm		mm	mm	mm	mm	
090	PM2	2	17	38.72	34.80	26	39.40	66.45
110	PM2	2	22	49.52	45.60	26	44.80	67.45
140	PM2	3	19	65.29	59.40	31	50.70	83.00
200	PM2	4	22	97.49	89.60	41	64.80	111.00
	PM2	5	19	106.89	97.00	51	67.50	121.00

<sup>(1)</sup> For standard toothed rack height  $h_0$ . Module 2 ( $h_0 = 22$  mm), Module 3 ( $h_0 = 26$  mm), Module 4 ( $h_0 = 35$  mm), Module 5 ( $h_0 = 34$  mm).



# NGV

## The planetary gearbox for industrial fork lift trucks. Compact and extremely resilient

Automated guided vehicles have special requirements when it comes to drive technology. These include high radial loads, space-saving design, 24/7 use and energy efficiency. With its special output bearing concept and the option of direct mounting to the vehicle chassis, our **NGV** planetary gearbox precisely meets these requirements.

Cyclic torque **18 - 260 Nm**



Radial force **2700 - 7200 N**



Axial force **2850 - 6450 N**



Torsional backlash **9 - 12 arcmin**



Protection class **IP65**

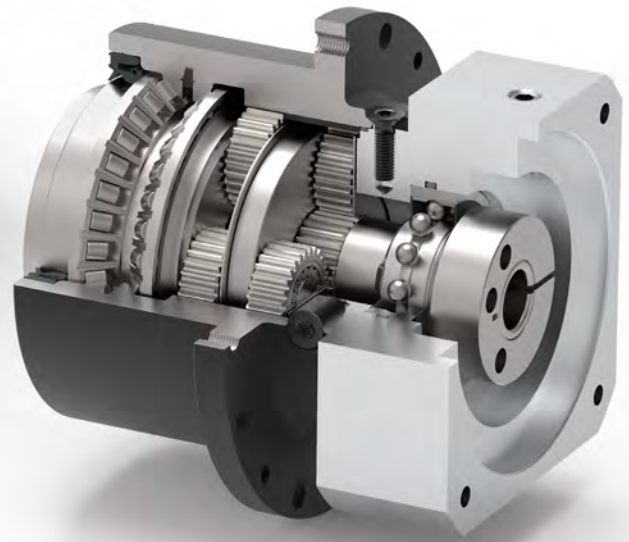
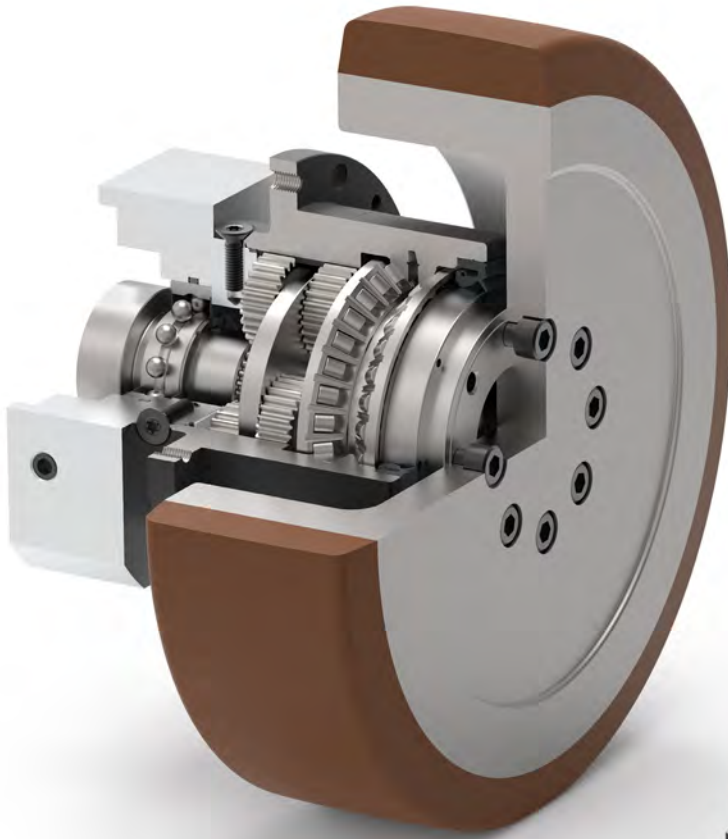


### Dynamic load capacity per gearbox

Max. dynamic load capacity	kg (lbm)
NGV064 incl. wheel Ø 160 mm	350 (772)
NGV090 incl. wheel Ø 200 mm	675 (1488)
NGV110 incl. wheel Ø 250 mm	1075 (2370)

### Frame sizes

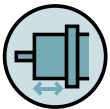




Application-specific gearbox



Rotary shaft seal



Extra long centering collar



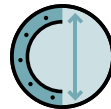
Flange output shaft (ISO 9409-1)



Planet carrier in disc design



Spur gear



Extra large round type output flange



Preloaded angular contact roller bearings



Option: Painted surface  
– RAL 9005 Jet black

Detailed explanations of the technical features starting on page 201.

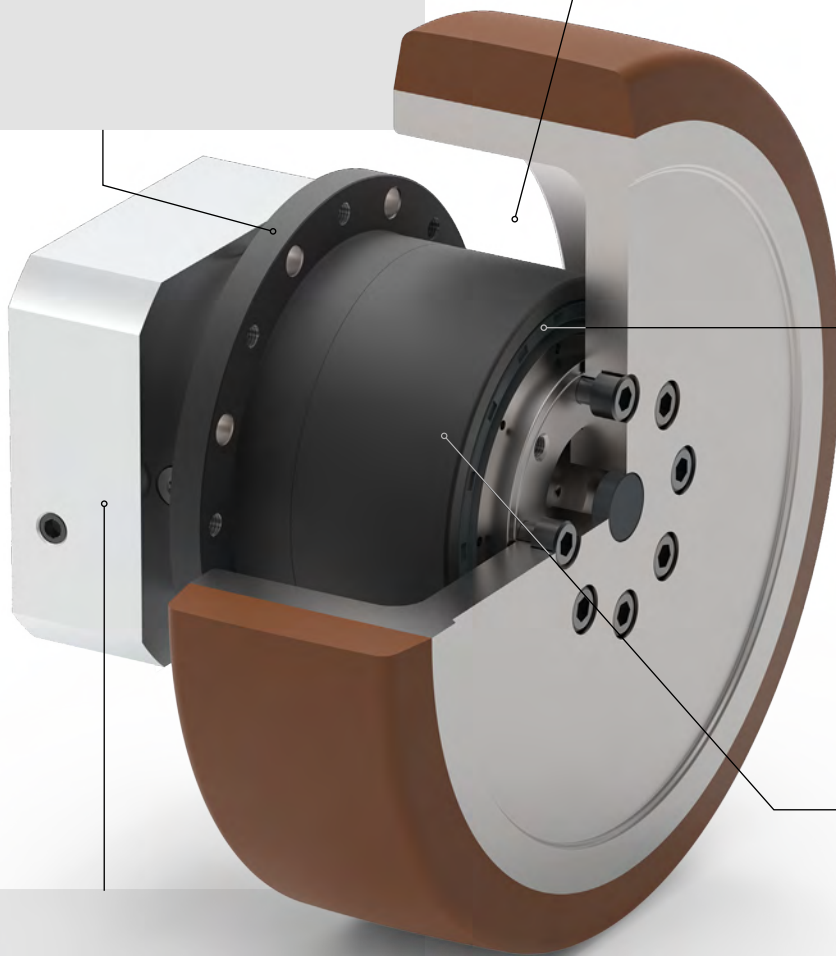
## NGV: The perfect gearbox for AGVs.

### + Direct mounting

The mounting interface allows direct mounting of the gearbox to the vehicle. No additional adapters are required.

### + Reduction of installation space

The gearbox is almost completely enclosed by the wheel. The required installation space in the vehicle is therefore reduced to a minimum.



### + High load capacity

The preloaded, double-designed angular contact roller bearings permit very high radial forces.

### + Motor independent

By using different motor adapters it is possible to mount almost any motor. Direct assembly of the motor is also possible.

### + High efficiency and reliability

The proven gearbox type from the Neugart Economy series is characterized by a high efficiency. Thanks to its lifetime lubrication, it is also maintenance-free and extremely reliable, even in continuous operation.

## Customer-specific AGV gearbox solutions

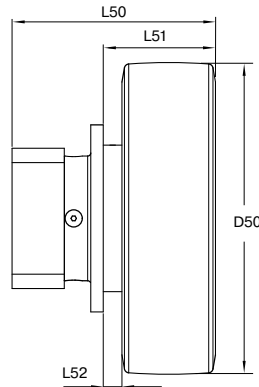
Because of the comprehensive engineering and manufacturing know-how, Neugart is your competent partner for the development and manufacture of customized gearboxes. Also for your vehicle.



Example of custom gearbox developments.

**Gearbox incl. wheel**

Characteristics (gearbox incl. wheel)			NGV064	NGV090	NGV110
Maximum dynamic load capacity <sup>(1)</sup>		kg (lb <sub>m</sub> )	350 (772)	675 (1488)	1075 (2370)
Max. speed	v	m/s (in/s)	2 (78.7)		
Positioning precision		mm (in)	0.3 (0.012)	0.4 (0.016)	0.4 (0.016)
Total weight		kg (lb)	3.9 (8.6)	7.7 (17.0)	16.4 (36.2)



Geometry			NGV064	NGV090	NGV110
Wheel diameter	D50	mm (in)	160 (6.299)	200 (7.874)	250 (9.843)
Min. total length	L50		98.5 (3.878)	130.5 (5.138)	158.0 (6.22)
Distance between flange and outer edge	L51		58.0 (2.283)	72.0 (2.835)	94.0 (3.701)
Distance between flange and inner edge	L52		8.0 (0.315)	12.0 (0.472)	14.0 (0.551)

**Gearbox**

Code	Gearbox characteristics			NGV064	NGV090	NGV110	p <sup>(2)</sup>
	Service life <sup>(3)</sup>	L <sub>n</sub>	h	20,000			
	Efficiency <sup>(4)</sup>	η	%	97			
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)			
	Max. operating temperature	T <sub>max</sub>	(°F)	90 (194)			
	Protection class			IP65			
<b>S</b>	Standard lubrication			Grease (lifetime lubrication)			
<b>F</b>	Food grade lubrication			Grease (lifetime lubrication)			
	Installation position			Any			
<b>S</b>	Standard backlash	φ	arcmin	< 12	< 9	< 9	
	Torsional stiffness <sup>(4)</sup>	C <sub>2t</sub>	Nm / arcmin (lb <sub>i</sub> .in/arcmin)	7.3 - 11.5 (65 - 102)	19.5 - 38.5 (173 - 341)	52.0 - 95.0 (460 - 841)	
	Gearbox weight <sup>(4)</sup>	m	kg (lb <sub>m</sub> )	1.6 - 1.7 (3.6 - 3.7)	3.9 - 4.0 (8.7 - 8.9)	8.5 - 8.9 (18.8 - 19.6)	
<b>S</b>	Standard surface			Housing: Steel – heat-treated and post-oxidized (black)			
<b>B</b>	Painted surface <sup>(5)</sup>			RAL 9005 Jet black			
	Running noise <sup>(3)</sup>	L <sub>pA</sub>	dB(A)	60	62	65	

Output shaft loads			NGV064	NGV090	NGV110	p <sup>(2)</sup>
Maximum radial force	F <sub>r max</sub>	N (lb <sub>i</sub> )	2700 (607)	4950 (1113)	7200 (1619)	
Maximum axial force	F <sub>a max</sub>		2850 (641)	5450 (1225)	6450 (1450)	
Maximum tilting moment	M <sub>K max</sub>	Nm / (lb <sub>i</sub> .in)	129 (1141)	336 (2973)	569 (5038)	

Input characteristics			NGV064	NGV090	NGV110	p <sup>(2)</sup>
Clamping system diameter input (Code)	D26	mm	11 (C)	19 (E) <sup>(6)</sup>	24 (F) <sup>(6)</sup>	
			14 (D) <sup>(6)</sup>	24 (F)	35 (G)	
			19 (E)	-	-	
Mass moment of inertia input <sup>(4)(6)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>i</sub> .in.s <sup>2</sup> ·10 <sup>-4</sup> )	0,087 - 0,152 (0.770 - 1.345)	0,367 - 0,667 (3.248 - 5.903)	1,416 - 2,432 (12.533 - 21.525)	
Average idle torque <sup>(4)(6)</sup>	T <sub>0</sub>	Nm (lb <sub>i</sub> .in)	0,15 - 0,30 (1 - 3)	0,20 - 0,55 (2 - 5)	0,35 - 1,15 (3 - 10)	
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		12 (106)	16 (142)	40 (354)	

<sup>(1)</sup> Max. load capacity of NGV gearbox with NGV wheel and dynamic load with cyclic torque (T<sub>2z</sub>). Application-specific design with NCP required.  
<sup>(2)</sup> Number of stages  
<sup>(3)</sup> Application specific configuration with NCP – www.neugart.com  
<sup>(4)</sup> The ratio-dependent values can be retrieved in Tec Data Finder – www.neugart.com  
<sup>(5)</sup> More information on page 183  
<sup>(6)</sup> Reference clamping system diameter

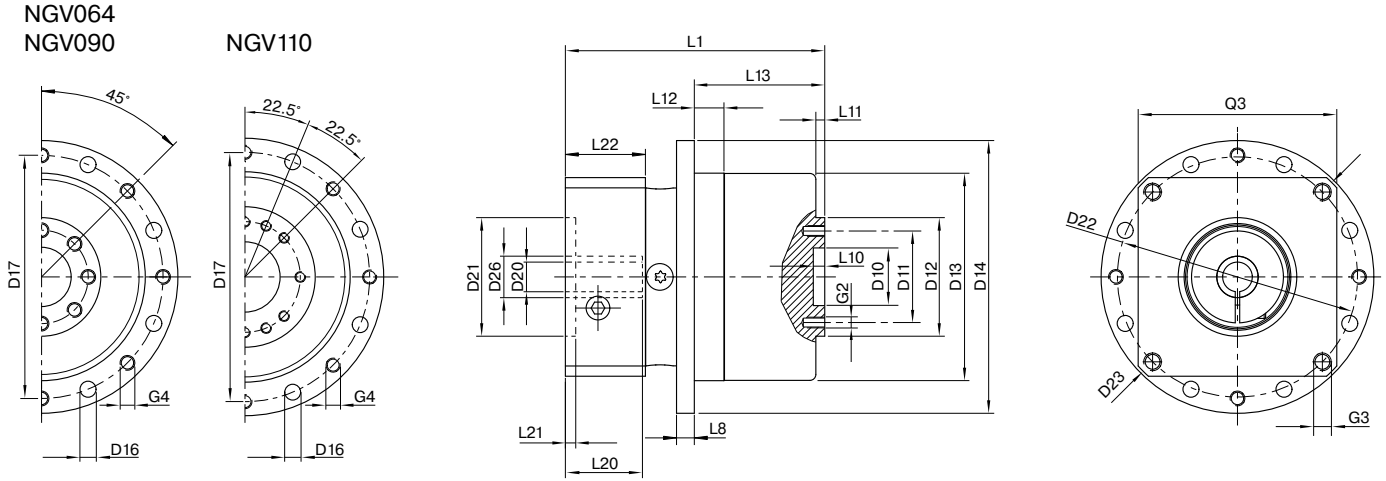
Output torques			NGV064	NGV090	NGV110	i <sup>(1)</sup>	p <sup>(2)</sup>
Cyclic torque <sup>(3)(4)</sup>	T <sub>2z</sub>	Nm (lb <sub>r</sub> .in)	44 (389)	130 (1151)	210 (1859)	9	2
			44 (389)	120 (1062)	260 (2301)	12	
			44 (389)	110 (974)	230 (2036)	15	
			44 (389)	120 (1062)	260 (2301)	16	
			44 (389)	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	
Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	70 (620)	182 (1611)	335 (2965)	9	2
			65 (575)	192 (1699)	415 (3673)	12	
			70 (620)	176 (1558)	365 (3231)	15	
			65 (575)	192 (1699)	415 (3673)	16	
			65 (575)	192 (1699)	415 (3673)	20	
			61 (540)	176 (1558)	365 (3231)	25	
			65 (575)	192 (1699)	415 (3673)	32	
			61 (540)	176 (1558)	365 (3231)	40	
			28 (248)	80 (708)	192 (1699)	64	
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>r</sub> .in)	30 (266)	87 (770)	178 (1575)	9	2
			32 (283)	102 (903)	220 (1947)	12	
			35 (310)	93 (823)	195 (1726)	15	
			35 (310)	102 (903)	220 (1947)	16	
			37 (327)	102 (903)	220 (1947)	20	
			34 (301)	93 (823)	195 (1726)	25	
			37 (327)	102 (903)	220 (1947)	32	
			34 (301)	93 (823)	195 (1726)	40	
			15 (133)	42 (372)	102 (903)	64	

Input speeds			NGV064	NGV090	NGV110	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	4500	4000	2050	9	2
			4500	4000	2200	12	
			4500	4000	2450	15	
			4500	4000	2400	16	
			4500	4000	2750	20	
			4500	4000	3500	25	
			4500	4000	3500	32	
			4500	4000	3500	40	
			4500	4000	3500	64	
Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	7500	7000	6500		

Output torques			NGV064	NGV090	NGV110	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>r</sub> .in)	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	

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times

Gearbox



Drawing corresponds to a NGV090 / 2-stage / flange output shaft / 19 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>			NGV064	NGV090	NGV110	p <sup>(3)</sup>	Code	
Centering diameter output shaft	D10	H7	20 (0.787)	31.5 (1.240)	40 (1.575)			
Pitch circle diameter output shaft	D11		31.5 (1.240)	50 (1.969)	63 (2.480)			
Centering diameter output shaft	D12	h7	40 (1.575)	63 (2.480)	80 (3.150)			
Centering diameter output flange	D13		70 (2.756)	94 (3.701)	120 (4.724)			
Flange diameter output	D14		92 (3.622)	120 (4.724)	158 (6.220)			
Mounting bore output	D16		5.4 8x45°	6.6 8x45°	9 8x45°			
Pitch circle diameter output flange	D17		82 (3.228)	108 (4.252)	142 (5.591)			
Min. total length	L1		84.5 (3.327)	118 (4.646)	144 (5.669)			
Flange thickness output	L8		6 (0.236)	8 (0.315)	10 (0.394)			
	L10		4 (0.157)	6 (0.236)	6 (0.236)			
Centering depth output shaft	L11		3 (0.118)	6 (0.236)	7 (0.256)			
	L12		10 (0.394)	15 (0.591)	21 (0.827)			
Output flange length	L13		44 (1.732)	59.5 (2.343)	80 (3.150)			
Motor shaft diameter j6/k6	D20	More information on page 191/192						
Clamping system diameter input	D26	More information on page 172						
Flange output shaft (similar ISO 9409-1)								
Number x thread x depth	G2		8 x M5x7	8 x M6x10	12 x M6x12		<b>D</b>	
Number x thread	G4		8 x M5	8 x M6	8 x M8			

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

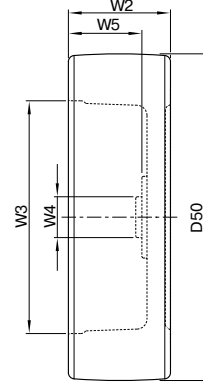
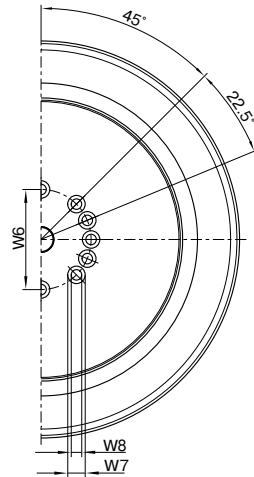
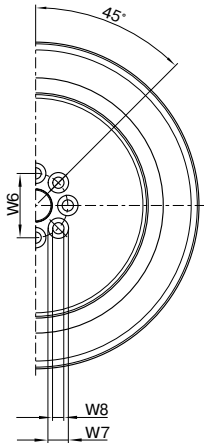
<sup>(3)</sup> Number of stages

NGV wheel

NGV wheel 160

NGV wheel 200

NGV wheel 250



Geometry NGV wheel <sup>(1)</sup>			NGV wheel 160	NGV wheel 200	NGV wheel 250
Art. No.			100507551	100507802	100507976
Outer diameter of wheel	D50		160 ± 1.2 (6.299 ± 0.047)	200 ± 1.2 (7.874 ± 0.047)	250 ± 1.2 (9.843 ± 0.047)
Width of wheel	W2		50 ± 0.5 (1.969 ± 0.020)	60 ± 0.5 (2.362 ± 0.020)	80 ± 0.5 (3.150 ± 0.020)
Inner diameter of rim	W3		114 (4.488)	155 (6.102)	183 (7.205)
Centering outside diameter	W4	h7	20 (0.787)	31.5 (1.240)	40 (1.575)
Rim depth	W5		36 (1.417)	47.5 (1.870)	66 (2.598)
Screw connection pitch circle diameter	W6		31.5 (1.240)	50 (1.969)	63 (2.480)
Screw connection head diameter	W7	H13	8 x Ø 10 (8 x Ø 0.394)	8 x Ø 11 (8 x Ø 0.433)	12 x Ø 11 (12 x Ø 0.472)
Screw connection diameter	W8	H13	8 x Ø 5.5 (8 x Ø 0.217)	8 x Ø 6.6 (8 x Ø 0.260)	12 x Ø 6.6 (12 x Ø 0.260)

Scope of delivery: NGV wheel incl. screws and closure cap

Characteristics NGV wheel			NGV wheel 160	NGV wheel 200	NGV wheel 250
Weight		kg (lb <sub>m</sub> )	ca. 2.3 (5.1)	ca. 3.7 (8.2)	ca. 7.6 (16.8)
Mass inertia	J <sub>R</sub>	kgcm <sup>2</sup> (lb <sub>r</sub> .in. <sup>2</sup> ·10 <sup>-4</sup> )	74 (16.636)	203 (45.636)	644 (144.777)
Roll resistance <sup>(2)</sup>		N (lb <sub>r</sub> )	65 (14.6)	95 (21.4)	165 (37.1)
Static friction coefficient <sup>(3)</sup>	μ		> 0.25		
Floor protection (corresponds to surface pressure of wheel)		N/mm <sup>2</sup> (lb <sub>r</sub> /in <sup>2</sup> )	8 (113.786)		
Temperature range			-30°C (-22°F) to +70°C (+158°F), up to +90°C (+194°F) for short periods. The load-bearing capacity is reduced at ambient temperatures higher than +40°C (+104°F).		
Tread			Blickle Besthane®		
Tread color			Brown		
Tread hardness			92° Shore A		
Wheel unit			Gray cast iron		
Wheel unit color			Silver		
Corrosion protection			Wheel unit, painted		
Tread characteristics (according to tread manufacturer)			Low-noise operation, extremely low rolling resistance, high dynamic loading capability, floor protecting, extremely abrasion resistant, high degree of cutting and tear resistance, traceless, contact coloration-free.		

<sup>(1)</sup> Dimensions in mm

<sup>(2)</sup> Empirical values. At 4 km/h and with maximum load.

<sup>(3)</sup> On grinded, dry steel rail as well as on smooth, dry concrete.



# HLAE

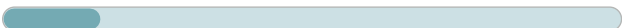
The unique Hygienic Design planetary gearbox – ideal for safe cleaning processes

Our **HLAE** is unique: It is the world's first planetary gearbox in a 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.

Cyclic torque **15 - 171 Nm**



Radial force **1000 - 5000 N**



Axial force **1200 - 3800 N**



Torsional backlash **7 - 12 arcmin**

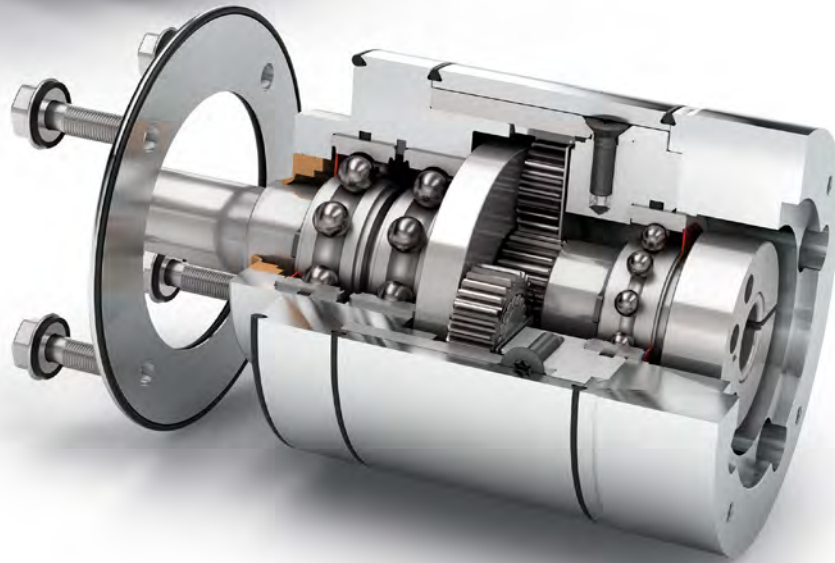
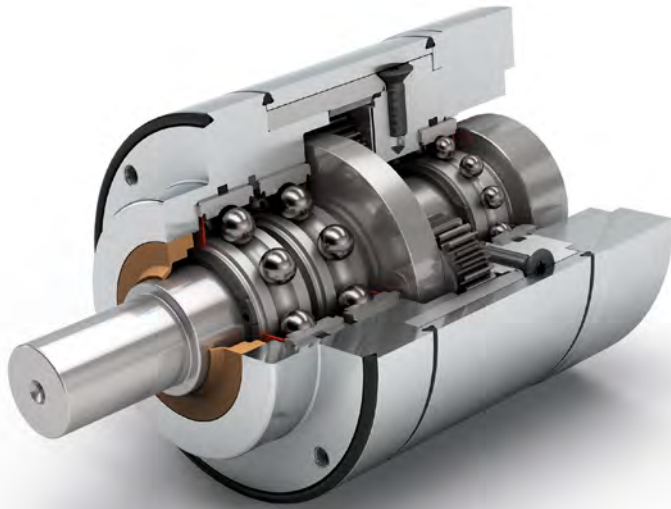


Protection class **IP69K**



Frame sizes

- 70
- 90
- 110



Hygienic Design



Application-specific gearbox



Equidirectional rotation



Round type output flange



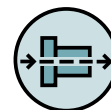
Rotary shaft seal



Extra long centering collar



FDA certified materials



Coaxial gearbox



Spur gear



Low-friction deep groove ball bearings



Planet carrier in disc design

Detailed explanations of the technical features starting on page 201.

Code	Gearbox characteristics			HLAE070	HLAE090	HLAE110	p <sup>(1)</sup>
	Service life <sup>(2)</sup>	L <sub>h</sub>	h	20,000			
	Efficiency <sup>(3)</sup>	η	%	98			1
				97			2
	Min. operating temperature	T <sub>min</sub>	°C	-25 (-13)			
	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	φ	arcmin	< 10	< 7	< 7	1
				< 12	< 9	< 9	2
	Torsional stiffness <sup>(3)</sup>	C <sub>2t</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>(3)</sup>	m	kg (lb <sub>m</sub> )	2.1 (4.6 - 4.7)	3.7 - 3.8 (8.2 - 8.4)	7.3 - 7.4 (16.1 - 16.3)	1
				2.3 - 2.5 (5.2 - 5.6)	4.3 - 4.5 (9.5 - 9.8)	8.6 - 9.0 (19.0 - 19.8)	2
<b>S</b>	Standard surface			Housing: Stainless steel 1.4404 – electropolished (R <sub>a</sub> < 0,8μm)			
	Running noise <sup>(3)</sup>	L <sub>pA</sub>	dB(A)	58	60	65	

Output shaft loads			HLAE070	HLAE090	HLAE110	p <sup>(1)</sup>
Maximum radial force	F <sub>r,max</sub>	N	1000 (225)	1250 (281)	5000 (1124)	
Maximum axial force	F <sub>a,max</sub>	(lb <sub>f</sub> )	1200 (270)	1600 (360)	3800 (854)	
Maximum tilting moment	M <sub>K,max</sub>	Nm (lb <sub>f</sub> .in)	48 (428)	68 (603)	376 (3331)	

Input characteristics			HLAE070	HLAE090	HLAE110	p <sup>(1)</sup>
Clamping system diameter input (Code)	D26	mm	11 (C)	19 (E) <sup>(4)</sup>	24 (F) <sup>(4)</sup>	
			14 (D) <sup>(4)</sup>	-	-	
Mass moment of inertia input <sup>(3)(4)</sup>	J <sub>1</sub>	kgcm <sup>2</sup> (lb <sub>f</sub> . in.s <sup>2</sup> 10 <sup>-4</sup> )	0,086 - 0,135 (0.761 - 1.195)	0,753 - 0,866 (6.665 - 7.665)	1,579 - 2,630 (13.975 - 23.277)	1
			0,077 - 0,138 (0.682 - 1.221)	0,740 - 0,983 (6.550 - 8.700)	1,569 - 2,620 (13.887 - 23.189)	2
Average idle torque <sup>(3)(4)</sup>	T <sub>0</sub>	Nm (lb <sub>f</sub> .in)	0,15 - 0,40 (1 - 4)	0,25 - 0,75 (2 - 7)	0,60 - 1,85 (5 - 16)	1
			0,10 - 0,15 (1)	0,15 - 0,35 (1 - 3)	0,45 - 0,95 (4 - 8)	2
Max. bending moment based on the gearbox input flange	M <sub>b1</sub>		8 (71)	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) Reference clamping system diameter

Output torques			HLAE070	HLAE090	HLAE110	i <sup>(1)</sup>	p <sup>(2)</sup>				
Cyclic torque <sup>(3)(4)</sup>	T <sub>2z</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)	87 (770)	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					
			Maximum torque <sup>(3)(4)</sup>	T <sub>2max</sub>	Nm (lb <sub>r</sub> .in)	44 (389)		105 (929)	184 (1629)	3	1
						48 (425)		139 (1230)	245 (2168)	4	
46 (407)	131 (1159)	270 (2390)				5					
40 (354)	104 (920)	215 (1903)				7					
28 (248)	80 (708)	192 (1699)				8					
24 (212)	60 (531)	152 (1345)				10					
52 (460)	139 (1230)	250 (2213)				9	2				
48 (425)	139 (1230)	270 (2390)				12					
52 (460)	131 (1159)	270 (2390)				15					
48 (425)	139 (1230)	270 (2390)				16					
48 (425)	139 (1230)	270 (2390)				20					
46 (407)	131 (1159)	270 (2390)				25					
48 (425)	139 (1230)	270 (2390)				32					
46 (407)	131 (1159)	270 (2390)				40					
28 (248)	80 (708)	192 (1699)				64					
24 (212)	60 (531)	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

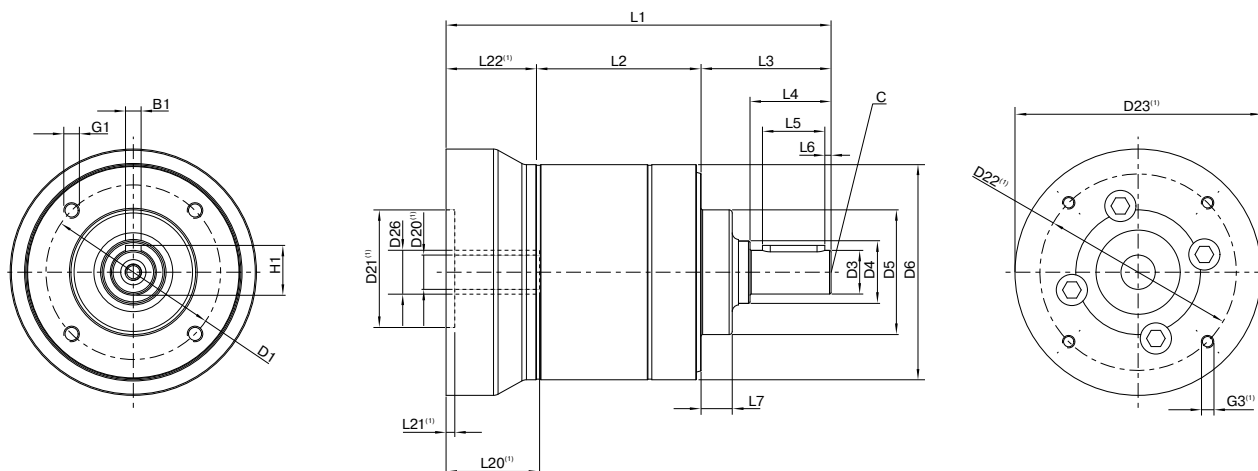
<sup>(4)</sup> Based on reference clamping system diameter

Output torques			HLAE070	HLAE090	HLAE110	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous torque <sup>(3)</sup>	T <sub>2D</sub>	Nm (lb <sub>f</sub> .in)	23 (204)	41 (363)	97 (859)	3	1
			24 (212)	76 (673)	131 (1159)	4	
			25 (221)	69 (611)	146 (1292)	5	
			20 (177)	55 (487)	114 (1009)	7	
			15 (133)	42 (372)	102 (903)	8	
			12.5 (111)	32 (283)	80 (708)	10	
			28 (248)	82 (726)	133 (1177)	9	
			28 (248)	76 (673)	165 (1460)	12	2
			28 (248)	69 (611)	146 (1292)	15	
			28 (248)	76 (673)	165 (1460)	16	
			28 (248)	76 (673)	165 (1460)	20	
			25 (221)	69 (611)	146 (1292)	25	
			28 (248)	76 (673)	165 (1460)	32	
			25 (221)	69 (611)	146 (1292)	40	
			15 (133)	42 (372)	102 (903)	64	
			12.5 (111)	32 (283)	80 (708)	100	

Input speeds			HLAE070	HLAE090	HLAE110	i <sup>(1)</sup>	p <sup>(2)</sup>
Continuous input speed <sup>(3)(4)</sup>	n <sub>1D</sub>	rpm	3950	3000	1250	3	1
			4000	2350	1350	4	
			4000	2750	1500	5	
			4000	2950	1700	7	
			4000	3500	2250	8	
			4000	3500	2600	10	
			4000	2550	1400	9	
			4000	2750	1500	12	2
			4000	3400	1600	15	
			4000	3300	1650	16	
			4000	3500	2000	20	
			4000	3500	2400	25	
			4000	3500	2550	32	
			4000	3500	3000	40	
			4000	3500	3000	64	
			4000	3500	3000	100	
			Max. mechanical input speed <sup>(3)</sup>	n <sub>1max</sub>	rpm	13000	
13000	7000	6500					2

Output torques			HLAE070	HLAE090	HLAE110	i <sup>(1)</sup>	p <sup>(2)</sup>
Emergency stop torque <sup>(4)(5)</sup>	T <sub>2Stop</sub>	Nm (lb <sub>f</sub> .in)	56 (496)	150 (1328)	230 (2036)	3	1
			66 (584)	174 (1540)	310 (2744)	4	
			60 (531)	164 (1452)	340 (3009)	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)	310 (2744)	9	
			66 (584)	174 (1540)	340 (3009)	12	2
			66 (584)	164 (1452)	340 (3009)	15	
			66 (584)	174 (1540)	340 (3009)	16	
			66 (584)	174 (1540)	340 (3009)	20	
			60 (531)	164 (1452)	340 (3009)	25	
			66 (584)	174 (1540)	340 (3009)	32	
			60 (531)	164 (1452)	340 (3009)	40	
			36 (319)	100 (885)	240 (2124)	64	
			30 (266)	76 (673)	190 (1682)	100	

(1) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (2) Number of stages  
 (3) Application specific configuration with NCP – www.neugart.com  
 (4) Based on reference clamping system diameter  
 (5) Permitted 1000 times



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

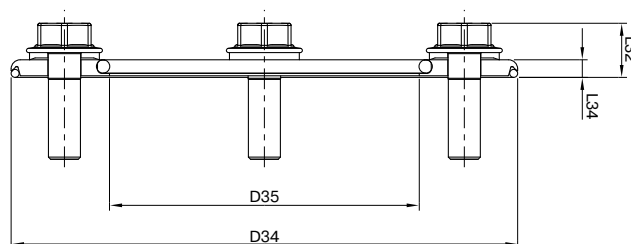
<sup>(1)</sup> The dimensions vary with the motor/gearbox flange. The input flange dimensions can be retrieved for each specific motor in Tec Data Finder at [www.neugart.com](http://www.neugart.com)

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 191/192				
Clamping system diameter input	D26		More information on page 178				
Output shaft with feather key (DIN 6885-1)			A 5x5x20	A 6x6x25	A 8x7x35		
Feather key width (DIN 6885-1)	B1		5 (0.197)	6 (0.236)	8 (0.315)		<b>A</b>
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							
Shaft length from shoulder	L4		26 (1.024)	32 (1.260)	45 (1.772)		<b>B</b>

<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
Art. No.			63911	63858	64130
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	L33		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	N30		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



#### **Individual appearance and additional protection for your gearbox**

With the Option: Painted surface, Neugart offers a high-quality surface finish for all gearboxes and sizes. The standard color RAL 9005 jet black ensures a modern, elegant appearance and allows harmonious integration into a wide variety of applications. The paint structure is based on a robust two-component system and guarantees reliable adhesion and an even, high-quality surface.

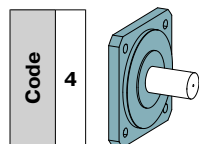
#### **Advantages of the painted surface – RAL 9005 jet black:**

- High-quality appearance
- Robust paint system
- High chemical resistance (individual testing recommended)
- Improved durability
- Flexibly available – even for quantities of 1 for all gearboxes and sizes

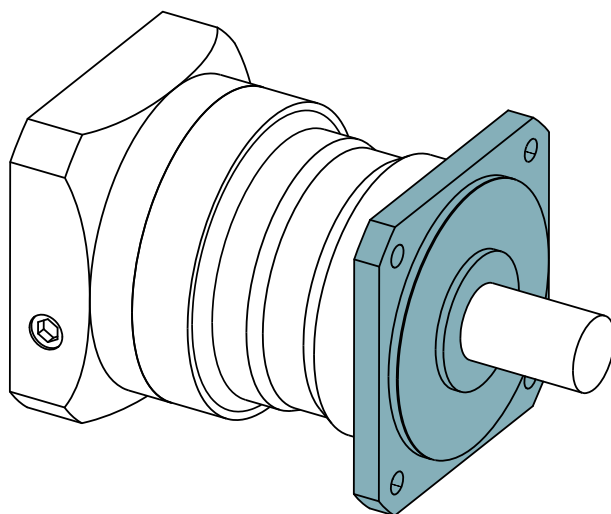
#### **Note:**

The screw-on surfaces on the drive flange to the motor and on the output side to the application are not painted for functional reasons.

The paint finish is primarily for visual enhancement and does not provide corrosion protection for long-term use in salt-laden environments, for example. If you have special requirements for a corrosion-protected paint finish, please contact us.



For PLN

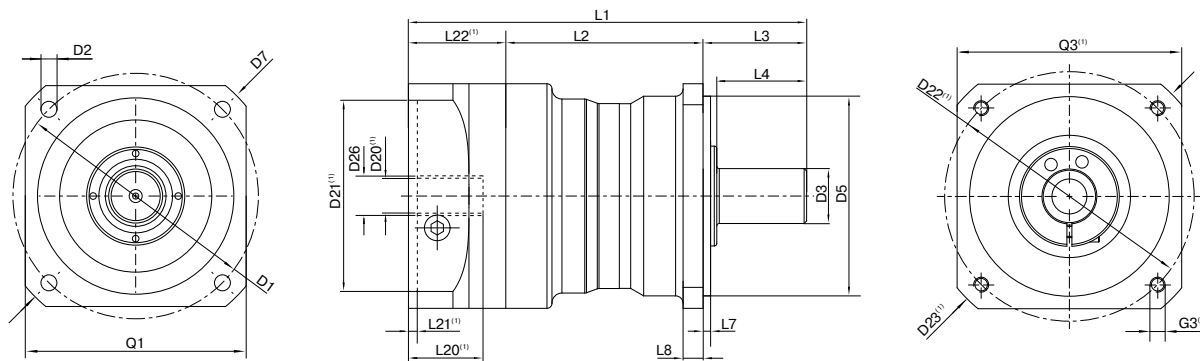


Other specifications for gearbox characteristics, output shaft loads, output torques, input speeds and dimensions not listed here correspond to the details on pages 130 to 133.

Output shaft loads			PLN070	PLN090	PLN115	PLN142	PLN190	p <sup>(1)</sup>
Maximum radial force <sup>(2)(3)</sup>	$F_{r \max}$	N (lb <sub>f</sub> )	4200 (944)	5500 (1236)	6000 (1349)	12500 (2810)	21000 (4721)	
Maximum tilting moment <sup>(2)</sup>	$M_{K \max}$	Nm (lb <sub>f</sub> .in)	251 (2219)	383 (3393)	488 (4317)	1420 (12572)	2535 (22434)	

Input speeds			PLN070	PLN090	PLN115	PLN142	PLN190	i <sup>(4)</sup>	p <sup>(1)</sup>
Continuous input speed <sup>(2)(5)</sup>	n <sub>ID</sub>	rpm	2600	2250	1800	870	700	3	1
			3200	2250	1850	920	730	4	
			3350	3050	2250	940	740	5	
			4200	3900	2950	1300	1050	7	
			4500	4000	3250	1450	1150	8	
			4500	4000	3500	2300	1650	10	
			4500	4000	3050	1400	1050	12	
			4500	4000	3500	1750	1300	15	
		rpm	4500	3950	2850	1300	1100	16	2
			4500	4000	3500	1600	1400	20	
			4500	4000	3500	2000	1600	25	
			4500	4000	3500	2050	1800	32	
			4500	4000	3500	2650	2100	40	
			4500	4000	3500	3000	2500	64	
			4500	4000	3500	3000	2500	100	

(1) Number of stages  
 (2) Application specific configuration with NCP – [www.neugart.com](http://www.neugart.com)  
 (3) Based on center of output shaft  
 (4) Ratios ( $i=n_1/n_2$ )  
 (5) Based on reference clamping system diameter



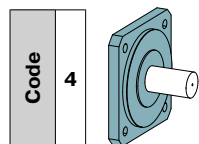
Drawing corresponds to a PLN090 / 1-stage / smooth output shaft / output flange PLS-compatible / 19 mm clamping system / motor adaptation – 2-part – round universal flange / B5 flange type motor

<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)

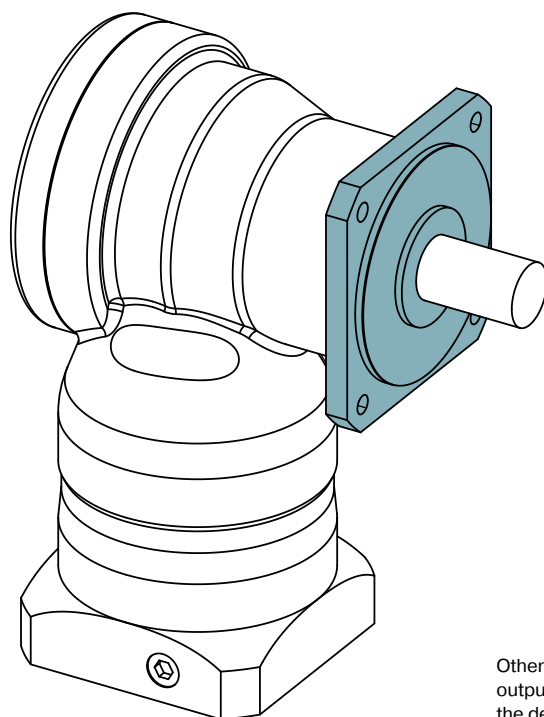
Geometry <sup>(1)</sup>			PLN070	PLN090	PLN115	PLN142	PLN190	p <sup>(2)</sup>	Code
Pitch circle diameter output	D1		75 (2.953)	100 (3.937)	130 (5.118)	165 (6.496)	215 (8.465)		
Mounting bore output	D2	4x	5,5 (0.217)	6,5 (0.256)	8,5 (0.335)	11,0 (0.433)	13,5 (0.531)		
Shaft diameter output	D3	k6	19 (0.748)	22 (0.866)	32 (1.260)	40 (1.575)	55 (2.165)		
Centering diameter output	D5	h7	60 (2.362)	80 (3.150)	110 (4.331)	130 (5.118)	160 (6.299)		
Diagonal dimension output	D7		92 (3.622)	116 (4.567)	145 (5.709)	185 (7.283)	240 (9.449)		
Flange cross section output	Q1	■	70 (2.756)	90 (3.543)	115 (4.528)	142 (5.591)	190 (7.480)		
Min. total length	L1		137,5 (5.413)	159,5 (6.280)	201 (7.913)	276 (10.866)	310,5 (12.224)	1	
			166,5 (6.555)	191,5 (7.539)	241 (9.488)	335 (13.189)	382,5 (15.059)	2	
Housing length	L2		74,5 (2.933)	79 (3.110)	84,5 (3.327)	114,5 (4.508)	138 (5.433)	1	
			104 (4.094)	111 (4.370)	125 (4.921)	173,5 (6.831)	210 (8.268)	2	
Shaft length output	L3		32 (1.260)	41,5 (1.634)	64,5 (2.539)	87 (3.425)	90 (3.543)		
Centering depth output	L7		3 (0.118)	3 (0.118)	4,5 (0.177)	5 (0.197)	6 (0.236)		
Flange thickness output	L8		7 (0.276)	8 (0.315)	10 (0.394)	20 (0.787)	20 (0.787)		
Motor shaft diameter j6/k6	D20		More information on page 191/192						
Clamping system diameter input	D26		More information on page 130						
Output shaft with feather key (DIN 6885-1)	-	-	A 6x6x20	A 6x6x28	A 10x8x50	A 12x8x65	A 16x10x70		
Feather key width (DIN 6885-1)	B1		6 (0.236)	6 (0.236)	10 (0.394)	12 (0.472)	16 (0.630)		<b>A</b>
Shaft height including feather key (DIN 6885-1)	H1		21,5 (0.846)	24,5 (0.965)	35 (1.378)	43 (1.693)	59 (2.323)		
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)	82 (3.228)		
Feather key length	L5		20 (0.787)	28 (1.102)	50 (1.969)	65 (2.559)	70 (2.756)		
Distance from shaft end	L6		4 (0.157)	4 (0.157)	4 (0.157)	8 (0.315)	6 (0.236)		
Center hole (DIN 332, type DR)	C		M6x16	M8x19	M12x28	M16x36	M20x42		
Smooth output shaft									<b>B</b>
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)	82 (3.228)		

<sup>(1)</sup> Dimensions in mm

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



For WPLN

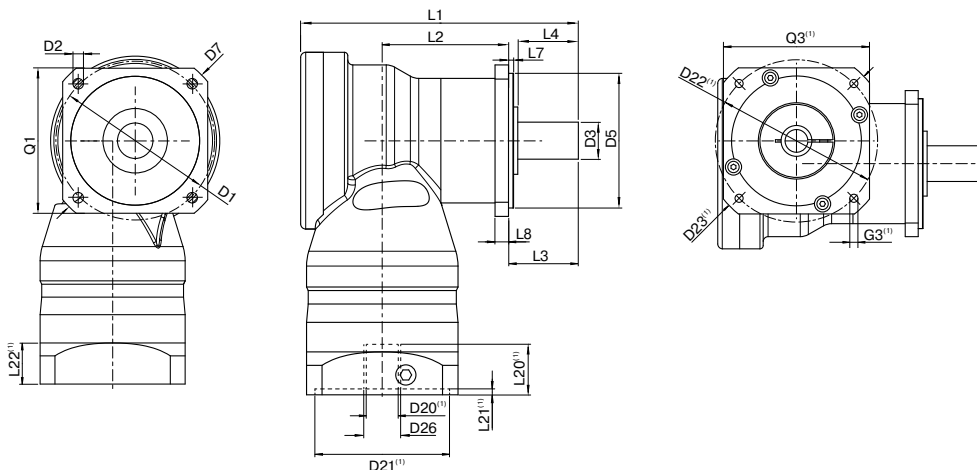


Other specifications for gearbox characteristics, output shaft loads, output torques, input speeds and dimensions not listed here correspond to the details on pages 142 to 145.

Output shaft loads			WPLN070	WPLN090	WPLN115	WPLN142	p <sup>(1)</sup>
Maximum radial force <sup>(2)(3)</sup>	F <sub>r max</sub>	N (lb <sub>r</sub> )	4000 (899)	5200 (1169)	6000 (1349)	12500 (2810)	1
			4200 (944)	5500 (1236)	6000 (1349)	12500 (2810)	2
Maximum tilting moment <sup>(2)</sup>	M <sub>k max</sub>	Nm (lb <sub>r</sub> .in)	402 (3558)	624 (5523)	1010 (8935)	2225 (19693)	1
			251 (2219)	383 (3393)	488 (4317)	1420 (12572)	2

Input speeds			WPLN070	WPLN090	WPLN115	WPLN142	i <sup>(4)</sup>	p <sup>(1)</sup>
Continuous input speed <sup>(2)(5)</sup>	n <sub>ID</sub>	rpm	1650	1700	1050	870	4	1
			1800	1850	1150	880	5	
			2050	2050	1300	1100	7	
			2100	2100	1300	970	8	
			2300	2200	1400	1000	10	
			1550	1500	1550	910	16	
			1700	1750	1850	920	20	2
			1900	1850	1850	1000	25	
			1850	1900	1900	1200	28	
			2000	2000	2000	1250	32	
			2150	1950	1900	1200	35	
			2200	2000	2000	1250	40	
			2300	2200	2150	1350	50	
			2450	2750	2650	1600	64	
			2650	3000	2900	1800	100	

(1) Number of stages  
 (2) Application specific configuration with NCP – [www.neugart.com](http://www.neugart.com)  
 (3) Based on center of output shaft  
 (4) Ratios (i=n<sub>1</sub>/n<sub>2</sub>)  
 (5) Based on reference clamping system diameter



Drawing corresponds to a WPLN090 / 1-stage / smooth output shaft / output flange WPLS-compatible / 14 mm clamping system / motor adaptation – 2-part – round universal flange / B5 flange type motor

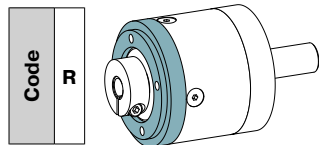
<sup>(1)</sup> The dimensions vary with the motor/gearbox flange. The input flange dimensions can be retrieved for each specific motor in Tec Data Finder at [www.neugart.com](http://www.neugart.com)

Geometry <sup>(1)</sup>			WPLN070	WPLN090	WPLN115	WPLN142	p <sup>(2)</sup>	Code
Pitch circle diameter output	D1		75 (2.953)	100 (3.937)	130 (5.118)	165 (6.496)		
Mounting bore output	D2	4x	5.5 (0.217)	6.5 (0.256)	8.5 (0.335)	11.0 (0.433)		
Shaft diameter output	D3	k6	19 (0.748)	22 (0.866)	32 (1.260)	40 (1.575)		
Centering diameter output	D5	h7	60 (2.362)	80 (3.150)	110 (4.331)	130 (5.118)		
Diagonal dimension output	D7		92 (3.622)	116 (4.567)	145 (5.709)	185 (7.283)		
Flange cross section output	Q1	■	70 (2.756)	90 (3.543)	115 (4.528)	142 (5.591)		
Total length	L1		137.5 (5.413)	165 (6.496)	218 (8.583)	273 (10.748)	1	
			185 (7.283)	207 (8.150)	248.5 (9.783)	342.5 (13.484)	2	
Housing length	L2		62.5	75	97	99	1	
			110	122.5	135.5	199	2	
Shaft length output	L3		32 (1.260)	41.5 (1.634)	64.5 (2.539)	87 (3.425)		
Centering depth output	L7		3 (0.118)	3 (0.118)	4.5 (0.177)	5 (0.197)		
Flange thickness output	L8		7 (0.276)	8 (0.315)	10 (0.394)	20 (0.787)		
Motor shaft diameter j6/k6	D20		More information on page 191/192					
Clamping system diameter input	D26		More information on page 142					
Output shaft with feather key (DIN 6885-1)			A 6x6x20	A 6x6x28	A 10x8x50	A 12x8x65		
Feather key width (DIN 6885-1)	B1		6 (0.236)	6 (0.236)	10 (0.394)	12 (0.472)		<b>A</b>
Shaft height including feather key (DIN 6885-1)	H1		21.5 (0.846)	24.5 (0.965)	35 (1.378)	43 (1.693)		
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)		
Feather key length	L5		20 (0.787)	28 (1.102)	50 (1.969)	65 (2.559)		
Distance from shaft end	L6		4 (0.157)	4 (0.157)	4 (0.157)	8 (0.315)		
Center hole (DIN 332, type DR)	C		M6x16	M8x19	M12x28	M16x36		
Smooth output shaft								
Shaft length from shoulder	L4		28 (1.102)	36 (1.417)	58 (2.283)	80 (3.150)		<b>B</b>

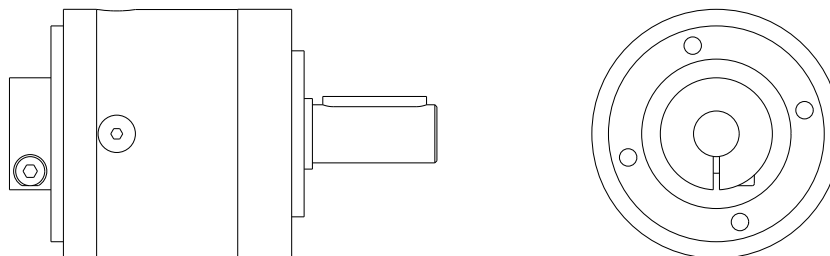
<sup>(1)</sup> Dimensions in mm

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

## Option: Input design



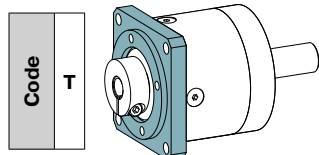
No motor adaptation – round universal flange



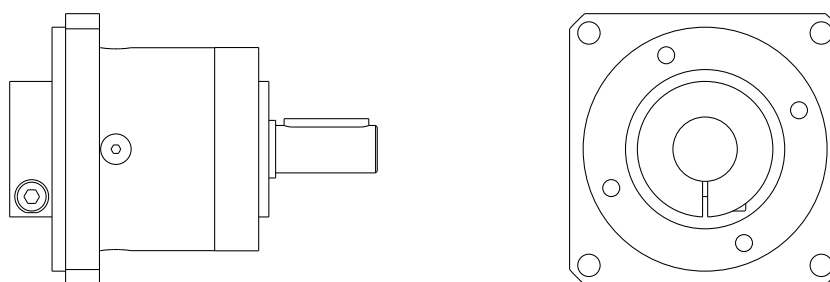
Drawing corresponds to a PLE060 / 1-stage / output shaft with feather key / 11 mm clamping system / no motor adaptation – round universal flange  
All other variants can be retrieved in Tec Data Finder at [www.neugart.com](http://www.neugart.com)

**This input design applies to the series, frame sizes, and associated clamping systems shown in the product code on pages 191-193.**

The respective measurements can be taken from the technical data sheets in Tec Data Finder at [www.neugart.com](http://www.neugart.com)



No motor adaptation – square universal flange



Drawing corresponds to a PLE060 / 1-stage / output shaft with feather key / 19 mm clamping system / no motor adaptation – square universal flange  
All other variants can be retrieved in Tec Data Finder at [www.neugart.com](http://www.neugart.com)

**This input design applies to the series, frame sizes, and associated clamping systems shown in the product code on pages 191-193.**

The respective measurements can be taken from the technical data sheets in Tec Data Finder at [www.neugart.com](http://www.neugart.com)



## Reliable solutions for extreme cold – together with Neugart

If your application operates in freezing conditions as low as  $-40^{\circ}\text{C}$ , standard solutions are often insufficient. This is where Neugart comes in: we work with you to develop solutions tailored to your requirements.



### Typical areas of application for planetary gearboxes in freezing conditions

- Conveyor systems in cold-storage-facilities
- Automated warehouse technology
- Outdoor machinery in cold climates
- Other special applications

Our experts provide you with individual advice and take all relevant factors into account – from the selection of suitable lubricants to the right seals and the appropriate bearing technology. Thanks to our close cooperation with specialized suppliers, we can offer the optimal configuration for a wide variety of planetary and right-angle gearboxes.

Whether your gearbox is grease or oil-lubricated — we will find the ideal solution for your operating conditions. We use high-quality products that perform dependably even at extreme temperatures and help maximize the service life of your gearboxes.

**Contact us — we will advise you personally and develop the perfect solution for your low-temperature application.**

Series	
	<b>PLE</b> PLE Economy planetary gearbox
	<b>PLQE</b> PLQE Economy planetary gearbox
	<b>PLPE</b> PLPE Economy planetary gearbox
	<b>PLHE</b> PLHE Economy planetary gearbox
	<b>PLFE</b> PLFE Economy planetary gearbox
	<b>PFHE</b> PFHE Economy planetary gearbox
	<b>WPLE</b> WPLE Economy right angle gearbox
	<b>WPLQE</b> WPLQE Economy right angle gearbox
	<b>WPLPE</b> WPLPE Economy right angle gearbox
	<b>WPLHE</b> WPLHE Economy right angle gearbox
	<b>WPLFE</b> WPLFE Economy right angle gearbox
	<b>PSNpro</b> PSNpro Precision planetary gearbox
	<b>PSFNpro</b> PSFNpro Precision planetary gearbox
	<b>PSBNpro</b> PSBNpro Precision planetary gearbox
	<b>PSN</b> PSN Precision planetary gearbox
	<b>PSFN</b> PSFN Precision planetary gearbox
	<b>PSBN</b> PSBN Precision planetary gearbox
	<b>PLN</b> PLN Precision planetary gearbox
	<b>PLFN</b> PLFN Precision planetary gearbox
	<b>WPLN</b> WPLN Precision right angle gearbox
	<b>WPSFN</b> WPSFN Precision right angle gearbox
	<b>WGN</b> WGN Precision right angle gearbox
	<b>HLAE</b> HLAE Application specific planetary gearbox
	<b>NGV</b> NGV Application specific planetary gearbox

Frame size

Frame size	Frame size	40	PLE	PLQE	PLPE	PLHE	PLFE	PFHE	WPLE	WPLQE	WPLPE	WPLHE	WPLFE	PSNpro	PSFNpro	PSBNpro	PSN	PSFN	PSBN	PLN	PLFN	WPLN	WPSFN	WGN	HLAE	NGV
040	Frame size	40	•	•					•																	
050	Frame size	50			•						•															
055	Frame size	55				•								•	•	•	•	•	•							
060	Frame size	60	•	•		•			•	•		•									•					
064	Frame size	64					•	•				•			•						•					•
070	Frame size	70										•			•	•	•	•	•		•			•	•	
080	Frame size	80	•	•		•			•	•		•									•			•	•	
090	Frame size	90			•		•	•			•	•			•	•	•	•	•	•	•	•	•	•	•	•
110	Frame size	110					•	•				•					•				•			•	•	
115	Frame size	115													•	•	•	•	•	•	•	•	•	•	•	
120	Frame size	120	•	•	•	•			•	•	•	•									•			•	•	
140	Frame size	140													•			•				•				
142	Frame size	142													•	•	•	•	•	•	•	•	•	•	•	
155	Frame size	155			•																					
160	Frame size	160	•																							
190	Frame size	190													•		•				•					
200	Frame size	200													•	•	•	•	•	•	•	•	•	•	•	

Ratio

Ratio	Ratio	i	3	PLE	PLQE	PLPE	PLHE	PLFE	PFHE	WPLE	WPLQE	WPLPE	WPLHE	WPLFE	PSNpro	PSFNpro	PSBNpro	PSN	PSFN	PSBN	PLN	PLFN	WPLN	WPSFN	WGN	HLAE	NGV	P <sup>3)</sup>
003	Ratio	i = 3	•	•	• <sup>3)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1
004	Ratio	i = 4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1
005	Ratio	i = 5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1
007	Ratio	i = 7	• <sup>3)</sup>	• <sup>3)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1
008	Ratio	i = 8	•	•	• <sup>3)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1
010	Ratio	i = 10	• <sup>3)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1
009	Ratio	i = 9	• <sup>3)</sup>	•	• <sup>3)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
012	Ratio	i = 12	•	•	• <sup>3)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
015	Ratio	i = 15	•	•	• <sup>3)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
016	Ratio	i = 16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
020	Ratio	i = 20	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
025	Ratio	i = 25	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
028	Ratio	i = 28	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
032	Ratio	i = 32	•	•	• <sup>3)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
035	Ratio	i = 35	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
040	Ratio	i = 40	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
050	Ratio	i = 50	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
064	Ratio	i = 64	•	•	• <sup>3)</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
070	Ratio	i = 70	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
060	Ratio	i = 60	• <sup>3)</sup>	•	•					•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	3
080	Ratio	i = 80	• <sup>3)</sup>	•	•					•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	3
100	Ratio	i = 100	• <sup>3)</sup>	•	•	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	3
120	Ratio	i = 120	• <sup>3)</sup>	•	•					•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	3
160	Ratio	i = 160	• <sup>3)</sup>	•	•					•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	3
200	Ratio	i = 200	• <sup>3)</sup>	•	•					•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	3
256	Ratio	i = 256	• <sup>3)</sup>	•	•					•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	3
320	Ratio	i = 320	• <sup>3)</sup>	•	•					•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	3
512	Ratio	i = 512	• <sup>3)</sup>	•	•					•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	3

See next page

Frame size	PLE	PLQE	PLPE	PLHE	PLFE	PFHE	WPLE	WPLQE	WPLPE	WPLHE	WPLFE	PSNpro	PSFNpro	PSBNpro	PSN	PSFN	PSBN	PLN	PLFN	WPLN	WPSFN	WGN	HLAE	NGV	p <sup>3)</sup>	Clamping system diameter input			
	40	40	50		55		40		50																	1/2/3	8 mm	Clamping system diameter A	
40	40	50		55		40		50																		1/2/3	9 mm	Clamping system diameter B	
40	40	50	60	55	64	60	60	60	70	60	64	55	55	55	55	55	55	55							70	64	1	11 mm	Clamping system diameter C
60	60	70	60	64	64	60	60	60	70	60	64	55	55	55	55	55	55	55	70	64	70	64	70			1	14 mm	Clamping system diameter D	
60	60	70	60	64	64	60	60	60	70	60	64	55	55	55	55	55	55	55	70	64	70	64	70			1	19 mm	Clamping system diameter E	
80	80	90	80	90	90	110	120	120	120	120	110	90	90	90	90	90	90	90	90	90	90	90	90	90	90	110	1	24 mm	Clamping system diameter F
120	120	155	120	110	110							115	110	115	115	110	115	115	115	110	115	110	115	110	110	110	1	35 mm	Clamping system diameter G
		155										142	140	142	142	140	142	142	142	140	142	140	142	140	140	1	42 mm	Clamping system diameter H	
												190	200		190	200		190	200							1	48 mm	Clamping system diameter K	

Input system	PLE	PLQE	PLPE	PLHE	PLFE	PFHE	WPLE	WPLQE	WPLPE	WPLHE	WPLFE	PSNpro	PSFNpro	PSBNpro	PSN	PSFN	PSBN	PLN	PLFN	WPLN	WPSFN	WGN	HLAE	NGV	
Standard input system A	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Mountable input system S	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Output flange design	PLE	PLQE	PLPE	PLHE	PLFE	PFHE	WPLE	WPLQE	WPLPE	WPLHE	WPLFE	PSNpro	PSFNpro	PSBNpro	PSN	PSFN	PSBN	PLN	PLFN	WPLN	WPSFN	WGN	HLAE	NGV	
Standard output flange 3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Output flange (W)PLS-compatible 4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Output shaft design	PLE	PLQE	PLPE	PLHE	PLFE	PFHE	WPLE	WPLQE	WPLPE	WPLHE	WPLFE	PSNpro	PSFNpro	PSBNpro	PSN	PSFN	PSBN	PLN	PLFN	WPLN	WPSFN	WGN	HLAE	NGV	p <sup>3)</sup>
Output shaft with feather key (DIN 6885-1) A	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1/2/3
Smooth output shaft B	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1/2/3
Splined output shaft (DIN 5480) C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1/2
Flange output shaft D	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1
Flange output shaft with dowel hole E	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
Hollow output shaft on one side F	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1
Hollow output shaft on both sides G	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1
Flange output hollow shaft with dowel hole H	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1
Spline d output shaft (DIN5480) with mounted pinion K	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1
Flange output shaft with mounted pinion M	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1/2








Surface	PLE	PLQE	PLPE	PLHE	PLFE	PFHE	WPLE	WPLQE	WPLPE	WPLHE	WPLFE	PSNpro	PSFNpro	PSBNpro	PSN	PSFN	PSBN	PLN	PLFN	WPLN	WPSFN	WGN	HLAE	NGV	
Standard surface S	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Painted surface - RAL 9005 jet black B	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Lubrication	PLE	PLQE	PLPE	PLHE	PLFE	PFHE	WPLE	WPLQE	WPLPE	WPLHE	WPLFE	PSNpro	PSFNpro	PSBNpro	PSN	PSFN	PSBN	PLN	PLFN	WPLN	WPSFN	WGN	HLAE	NGV	
Standard lubrication S	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Food grade lubrication F	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Torsional backlash	PLE	PLQE	PLPE	PLHE	PLFE	PFHE	WPLE	WPLQE	WPLPE	WPLHE	WPLFE	PSNpro	PSFNpro	PSBNpro	PSN	PSFN	PSBN	PLN	PLFN	WPLN	WPSFN	WGN	HLAE	NGV	p <sup>3)</sup>
Standard backlash S	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1/2/3
Reduced backlash R	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1
																									2

<sup>1)</sup> Not for frame sizes 50, 70, 90, 120 <sup>3)</sup> Anzahl Getriebestufen - Number of stages

Input design

Input design	PLE	PLQE	PLPE	PLHE	PLFE	PFHE	WPLE	WPLQE	WPLPE	WPLHE	WPLFE
 <b>Z</b> Motor adaptation – 2 part – round universal flange	60 (11/14) 80 (19) 120 (24)	60 (11/14) 80 (19) 120 (24)	70 (11/14) 90 (19) 120 (24)	60 (11/14) 80 (19) 120 (24)	64 (11/14) 90 (19) 110 (24)	64 (11/14) 90 (19) 110 (24)					
 <b>Y</b> Motor adaptation – 2 part – square universal flange	40 (8/9/11) 60 (19) 80 (24) 120 (35) 160 (35)	40 (8/9/11) 60 (19) 80 (24) 120 (35) 160 (35)	50 (8/9/11) 70 (19) 90 (24) 120 (35) 155 (35/42)	60 (19) 80 (24) 120 (35) 160 (35)	55 (8/9/11) 64 (19) 90 (24) 110 (35)	64 (19) 90 (24) 110 (35)	40 (8/9) 60 (11/14) 80 (19) 120 (24)	60 (11/14) 80 (19) 120 (24)	50 (8/9) 70 (11/14) 90 (19) 120 (24)	60 (11/14) 80 (19) 120 (24)	60 (11/14) 90 (19) 110 (24)
 <b>E</b> Motor adaptation – one part	40 (8/9) 60 (11/14) 80 (19) 120 (24) 160 (35)	40 (8/9) 60 (11/14) 80 (19) 120 (24) 160 (35)	50 (8/9) 70 (11/14) 90 (19) 120 (24) 155 (35)	60 (11/14) 80 (19) 120 (24) 160 (35)	55 (8/9) 64 (11/14) 90 (19) 110 (24)	64 (11/14) 90 (19) 110 (24)					
 <b>R</b> No motor adaptation – round universal flange <sup>1)</sup>	60 (11/14) 80 (19) 120 (24)	60 (11/14) 80 (19) 120 (24)	70 (11/14) 90 (19) 120 (24)	60 (11/14) 80 (19) 120 (24)	64 (11/14) 90 (19) 110 (24)	64 (11/14) 90 (19) 110 (24)					
 <b>T</b> No motor adaptation – square universal flange <sup>1)</sup>	40 (8/9/11) 60 (19) 80 (24) 120 (35) 160 (35)	40 (8/9/11) 60 (19) 80 (24) 120 (35) 160 (35)	50 (8/9/11) 70 (19) 90 (24) 120 (35) 155 (35/42)	60 (19) 80 (24) 120 (35) 160 (35)	55 (8/9/11) 64 (19) 90 (24) 110 (35)	64 (19) 90 (24) 110 (35)	40 (8/9) <sup>2)</sup> 60 (11/14) <sup>3)</sup> 80 (19) <sup>3)</sup> 120 (24) <sup>3)</sup>	60 (11/14) <sup>3)</sup> 80 (19) <sup>3)</sup> 120 (24) <sup>3)</sup>	50 (8/9) <sup>2)</sup> 70 (11/14) <sup>3)</sup> 90 (19) <sup>3)</sup> 120 (24) <sup>3)</sup>	60 (11/14) <sup>3)</sup> 80 (19) <sup>3)</sup> 120 (24) <sup>3)</sup>	64 (11/14) <sup>3)</sup> 90 (19) <sup>3)</sup> 110 (24) <sup>3)</sup>

- <sup>1)</sup> The product code ends after "motor shaft diameter" has been entered
- <sup>2)</sup> Angle only with through hole
- <sup>3)</sup> Angle only with thread

11 / 30 / 60 / 75 / B5

		For "clamping system diameter"									
		8	9	11	14	19	24	35	42	48	
<b>4</b>	4 mm Motor shaft diameter	•									
<b>5</b>	5 mm Motor shaft diameter	•	•								
<b>6</b>	6 mm Motor shaft diameter	•	•								
<b>6.35</b>	6.35 mm Motor shaft diameter	•	•	•							
<b>7</b>	7 mm Motor shaft diameter		•	•							
<b>8</b>	8 mm Motor shaft diameter	•	•	•	•						
<b>9</b>	9 mm Motor shaft diameter		•	•	•	•					
<b>9.5</b>	9.5 mm Motor shaft diameter			•	•						
<b>9.525</b>	9.525 mm Motor shaft diameter			•	•						
<b>10</b>	10 mm Motor shaft diameter				•	•					
<b>11</b>	11 mm Motor shaft diameter			•	•	•	•				
<b>12</b>	12 mm Motor shaft diameter				•	•	•				
<b>12.7</b>	12.7 mm Motor shaft diameter				•	•	•				
<b>14</b>	14 mm Motor shaft diameter				•	•					
<b>15.875</b>	15.875 mm Motor shaft diameter					•	•				
<b>16</b>	16 mm Motor shaft diameter					•	•				
<b>19</b>	19 mm Motor shaft diameter					•	•	•			
<b>19.05</b>	19.05 mm Motor shaft diameter						•				
<b>20</b>	20 mm Motor shaft diameter						•				
<b>22</b>	22 mm Motor shaft diameter						•	•			
<b>24</b>	24 mm Motor shaft diameter						•	•	•		
<b>28</b>	28 mm Motor shaft diameter							•	•	•	
<b>32</b>	32 mm Motor shaft diameter							•	•	•	
<b>35</b>	35 mm Motor shaft diameter							•	•	•	
<b>38</b>	38 mm Motor shaft diameter								•	•	•
<b>42</b>	42 mm Motor shaft diameter									•	•
<b>48</b>	48 mm Motor shaft diameter										•

Motor shaft diameter  
Max. motor shaft length [mm]  
Centering diameter [mm]  
Pitch circle diameter [mm]  
Flange type motor

Max. motor shaft length [mm]

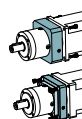
Max. permissible motor shaft length  
→ Free text – length without decimal places

Centering diameter [mm]

Centering diameter  
→ Free text – length to max. two decimal places

Pitch circle diameter [mm]

Pitch circle diameter  
→ Free text – length to max. one decimal place

 **Flange type motor**  
**B5** B5 Flange type motor  
**B14** B14 Flange type motor

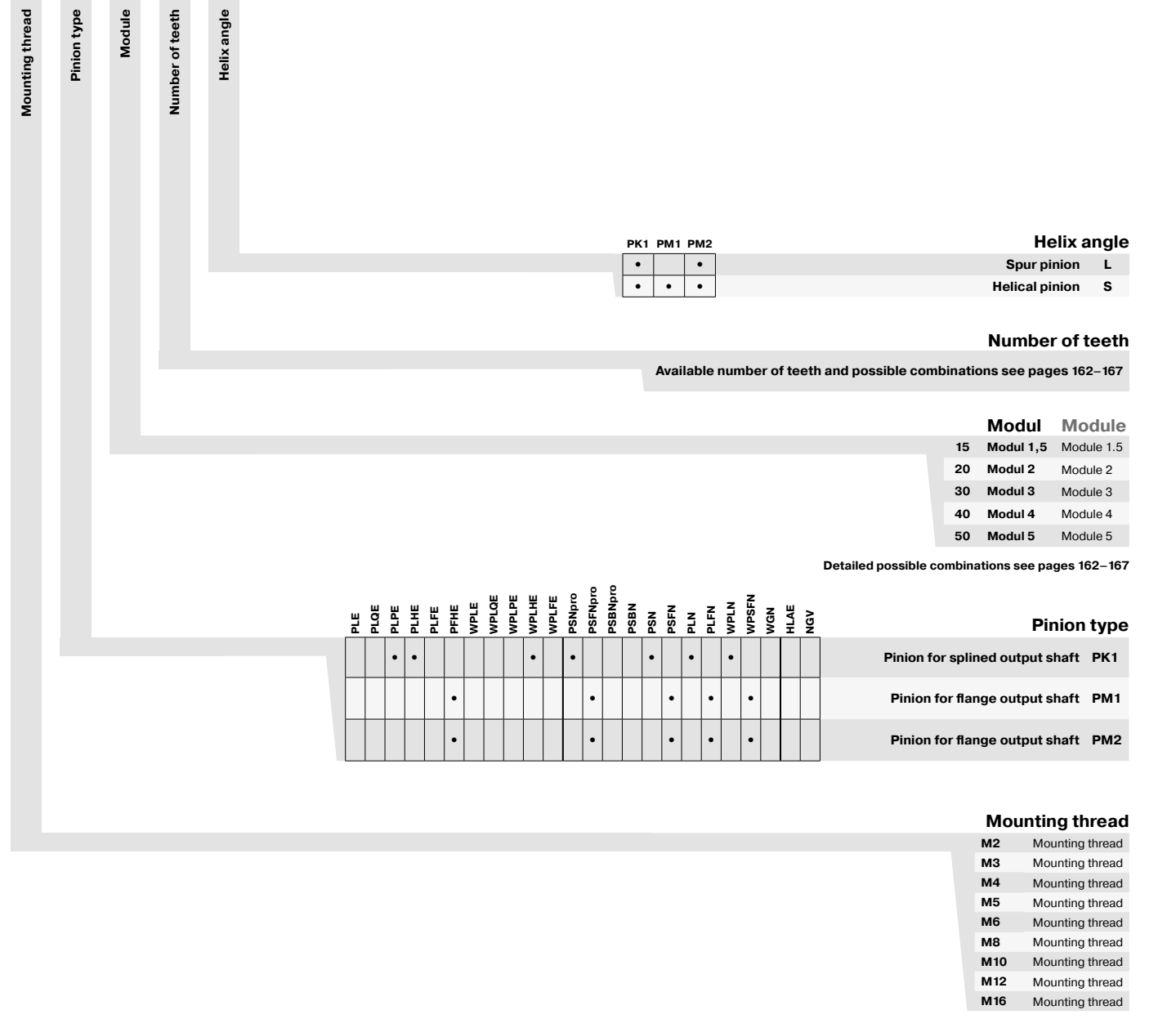
PLE	PLQE	PLPE	PLHE	PLFE	PFHE	WPLE	WPLQE	WPLPE	WPLHE	WPLFE	PSNpro	PSFNpro	PSBNpro	PSBN	PSN	PSFN	PSLN	PSLFN	PSLPLN	WPSFN	WGN	NGV	HLAE
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Available upon inquiry																							

<sup>1)</sup> Not for frame size 55

/ M5 - PK1 - 20 - 18 - S

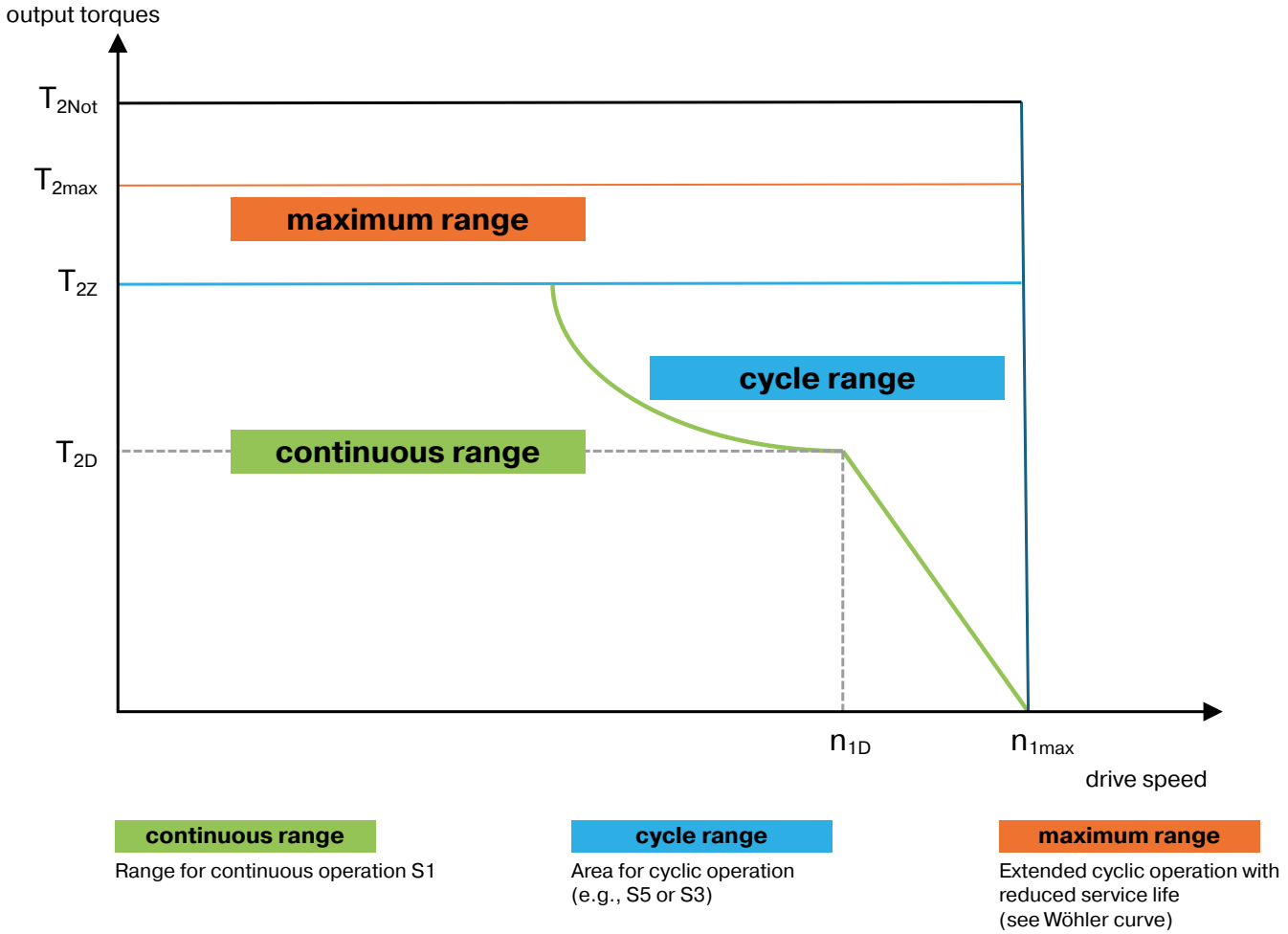
PSNpro	PSFNpro	PSBNpro	PSBN	PSN	PSFN	PLN	PLFN	WPLN	WPSFN	WGN	HLAE	NGV
55 (11/14) 70 (11/14/19) 90 (11/14/19/24) 115 (14/19/24/35) 142 (19/24/35/42) 190 (35/42/48)	55 (11/14) 64 (11/14/19) 90 (11/14/19/24) 110 (14/19/24/35) 140 (19/24/35/42) 200 (35/42/48)	55 (11/14) 70 (11/14/19) 90 (11/14/19/24) 115 (14/19/24/35) 142 (19/24/35/42)	55 (11/14) 70 (11/14/19) 90 (11/14/19/24) 115 (14/19/24/35) 142 (19/24/35/42)	55 (11/14) 70 (11/14/19) 90 (11/14/19/24) 115 (14/19/24/35) 140 (19/24/35/42) 190 (35/42/48)	55 (11/14) 64 (11/14/19) 90 (11/14/19/24) 110 (14/19/24/35) 140 (19/24/35/42) 200 (35/42/48)							
						115 (35) 142 (35/42) 190 (48)	110 (35) 140 (35/42) 200 (35/42)	115 (35) 142 (35/42)	110 (35) 140 (35/42)	115 (35) 142 (35/42)		64 (19) 90 (24) 110 (35)
											70 (11/14) 90 (19) 110 (24)	64 (11/14) 90 (19) 110 (24)
						70 (14/19) 90 (19/24) 115 (24)	64 (14/19) 90 (14/19/24) 110 (19/24) 140 (24) 200 (48)	70 (14/19) 90 (14/19/24) 115 (19/24) 142 (24)	64 (14/19) 90 (14/19/24) 110 (19/24) 140 (24)	70 (14/19) 90 (19/24) 115 (24)		64 (11/14) 90 (19) 110 (24)
						115 (35) 142 (35/42) 190 (48)	110 (35) 140 (35/42) 200 (35/42)	115 (35) 142 (35/42)	110 (35) 140 (35/42)	115 (35) 142 (35/42)		64 (19) 90 (24) 110 (35)

/ M5 - PK1 - 20 - 18 - S



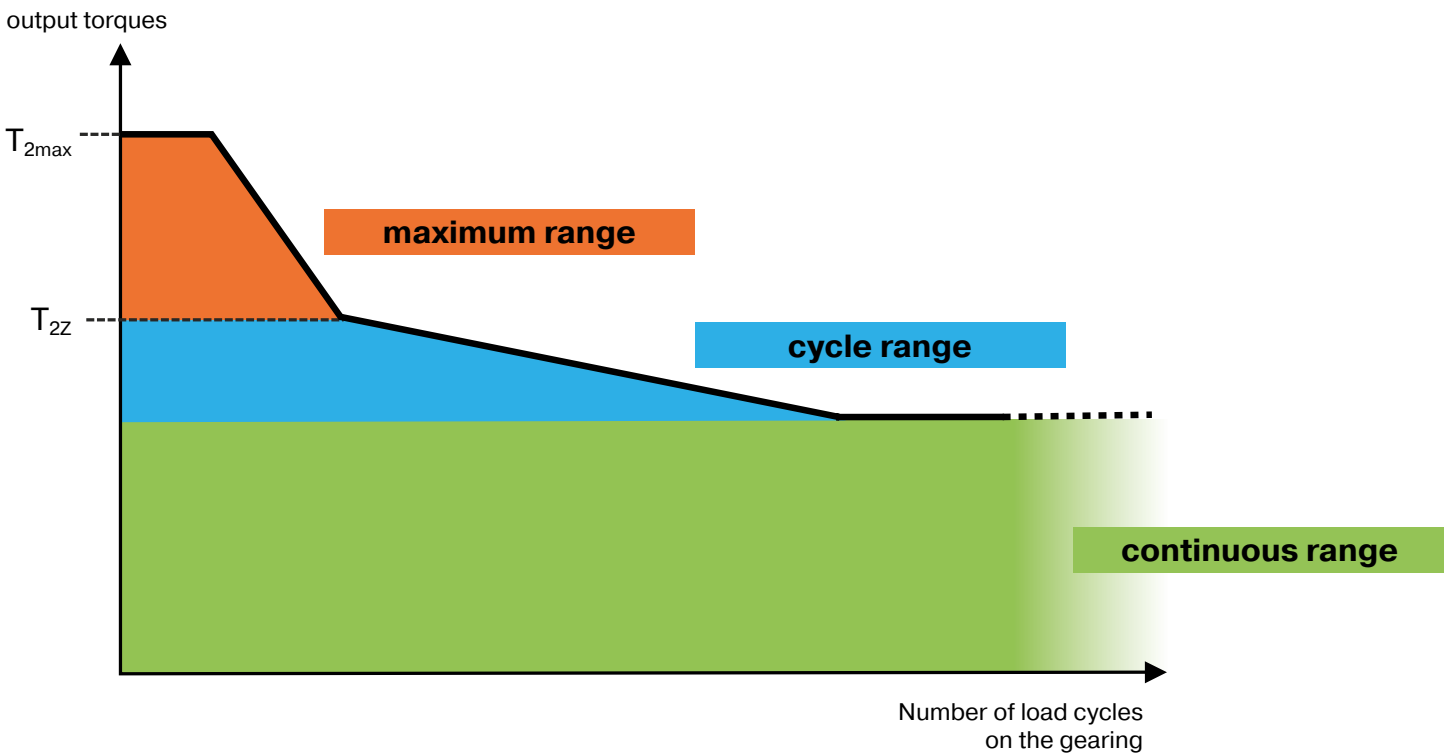
## Characteristic map

Illustrative representation. May vary depending on transmission design.



## Wöhler curve

Shows the number of load cycles acting on the gearing as a function of torque.







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## Economy Line

Precision at an attractive price.

The economical gearbox model series with an outstanding price/performance ratio. The Economy model series impresses with high precision of up to 6 arcmin of torsional backlash and a high performance density, a wide range of variants and numerous adaptation options.



## Precision Line

The Precision Line is suitable for anyone who wants precision. The standard torsional backlash of 3 arcmin and optionally 1 arcmin provides maximum precision for the application. Special bearing and gasket technologies and cage-type planetary carriers increase the performance of the Precision Line. The model series is completed by special low-vibration and high-performance right-angle gearboxes with hypoid teeth.



## Application-specific gearbox

These gearboxes are optimized for application-specific requirements.

Hygienic Design gearboxes meet the sensitive requirements in the food and pharmaceutical sectors. For use in industrial fork lift trucks, the clever concept of the NGV planetary gearbox with matching wheel offers a solution with added value.

## Navigation aid:

On the following pages you will find detailed explanations of the technical features of our gearboxes.

### Transmission direction



#### Coaxial gearbox

The input and the output shafts are in a straight line.



#### Right angle gearbox

The input shaft and the output shaft are offset from each other by 90°.

### Rotation direction



#### Equidirectional rotation

The input and the output shaft rotate in the same direction.



#### Counterdirectional rotation

The drive shaft and the output shaft rotate in opposite directions.

### Gearing



#### Spur gear

Maximum torques can be transmitted with straight teeth. This significantly increases the performance density of the gearbox.



#### Helical gear

Helical teeth reduce the amount of operating noise. Vibration is reduced to a minimum. The surface quality is therefore increased when used in processing machines.

## Category



### Economy Line

Precision at an attractive price.

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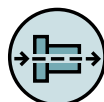


### Application-specific gearbox

These gearboxes are optimized for application-specific requirements.

Hygienic Design gearboxes meet the sensitive requirements in the food and pharmaceutical sectors. For use in industrial fork lift trucks, the clever concept of the NGV planetary gearbox with matching wheel offers a solution with added value.

## Transmission direction



### Coaxial gearbox

The input and the output shafts are in a straight line.



### Right angle gearbox

The input shaft and the output shaft are offset from each other by 90°.

## Rotation direction



### Equidirectional rotation

The input and the output shaft rotate in the same direction.



### Counterdirectional rotation

The drive shaft and the output shaft rotate in opposite directions.

## Gearing



### Spur gear

Maximum torques can be transmitted with straight teeth. This significantly increases the performance density of the gearbox.



### Helical gear

Helical teeth reduce the amount of operating noise. Vibration is reduced to a minimum. The surface quality is therefore increased when used in processing machines.

## Gearing



### Bevel gear right angle stage

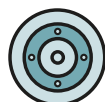
A bevel gear set with straight gearing and a 1:1 transmission ratio is used for the angle step. This angle step technology combines a low installation space requirement with high performance capability. The two axes operate on one level, i.e. without an axis offset.



### Hypoid gear right angle stage

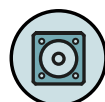
Because of its hypoid teeth, this right angle gearbox operates smoothly and with little vibration. Another advantage of this type of gearing is low noise generation. Both axes are offset to each other, i.e. they are on different levels.

## Output flange



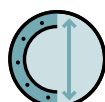
### Round type output flange

The standard interface for uncomplicated, easy assembly. A threaded hole in the machine unit or countering with threaded nuts is not required. The gearbox is directly attached to the threaded holes in the gearbox at the application side with four screws.



### Square type output flange

Because of the square output flange, the gearbox can be screwed directly to the machine without an intermediate flange. The output flange with through holes makes simple but secure installation and universal accessibility possible.



### Extra large round type output flange

The large installation flange with 8 or 12 screw-on holes makes the transmission of extremely high torques possible.

## Bearing



### Low-friction deep groove ball bearings

Thanks to the low-friction bearing concept, the gearbox is optimally designed for fast rotation speeds. The low heat development of this bearing makes permanently fast rotation speeds possible without affecting performance.



### Reinforced deep groove ball bearings

Extra-large deep groove ball bearings make it possible to absorb high levels of radial and axial force. The drive elements can be fitted directly to the output shaft without additional bearing components.



### Preloaded tapered roller bearings

Tapered roller bearings that are pre-stressed in pairs provide additional, permanent rigidity. Even with variable operating directions, the output bearings remain exact.



### Preloaded angular contact roller bearings

Inclined roller bearings arranged in pairs with a large diameter make maximum radial and axial force possible. The tilting moment of the gearbox also increases to a considerable extent. Gearboxes equipped with inclined roller bearings are ideal for rotary tables or rack and pinion applications.

## Seals



### Rotary shaft seal

The pre-tensioned radial shaft seal designed by Neugart resists dust and jets of water achieving an IP65 protection class.



### Option: FFKM seal

An FFKM seal can optionally be used for greater resistance to chemicals and heat.

## Others



### Option: Reduced backlash

Reduced backlash with  $< 1$  arcmin for coaxial gearboxes, or  $< 3$  arcmin for right angle gearboxes can be optionally selected for maximum accuracy.



### Option: Splined output shaft (DIN 5480)

A splined output shaft in accordance with DIN 5480 can be optionally used.



### Option: Planetary gearbox with mounted pinion

The planetary gearboxes are combined with helical-cut or straight-cut pinions, and can be installed directly into your rack-and-pinion application.



### Option: Painted surface

Optionally, the gearbox can be selected with a painted surface. The standard color is RAL 9005 jet black, other colors are available on request.



### High ratio variety

These gearboxes have an extremely wide range of different transmission ratios ranging from  $i=3$  to  $i=512$ .



### Extra long centering collar

The long centering collar moves the output bearing closer to the application and thus improves the support of the radial forces without increasing the axial installation space.



### Flange output shaft ISO 9409-1

The standardized flange interface in accordance with ISO 9409-1 guarantees of quick and easy installation of drive components such as belt pulleys, linear units and turntables. The torsional stiffness of this gearbox is several times greater than those versions with normal output shafts. The integrated dowel pin drill hole provides additional stability during installation. The gearbox is also optionally available without a dowel pin drill hole, but comes with a different thread instead.

## Others



### Planet carrier in disc design

The planets are supported at one side in the disk version of the planetary carrier. With this planetary carrier design, the mass inertia of the gearbox is reduced and the dynamics are therefore significantly increased.



### Planet carrier in cage design

The cage design of the planetary carrier increases the torsional stiffness of the gearbox considerably, since the planets are supported at both sides. The gearbox becomes more torsionally rigid with much more accurate positioning. Greater torque can also be transmitted.



### Hollow shaft

A hollow shaft with 1-stage gearboxes allows flexible line leadthrough towards the application.



### Hollow shaft for clamping system with shrink disc

A hollow shaft makes it possible to use a clamping system with a shrink disc for force-fitting connection of the machine shaft. Clamping at both sides is possible, and lines can also be led through.

## Average idle torque $T_0$ Nm

The idle torque describes the torque required to overcome the internal friction of the gearbox without additional load. The value is determined at an input speed of  $n_1 = 3,000$  rpm and a gearbox temperature of  $20^\circ\text{C}$ . Since the idle torque has a spread due to tolerance variations, the average value is specified.

## Boundary conditions for thermal design

Assumptions for the thermal design of the gearbox:

- No heat exchange between motor and gearbox
- Square steel flange surface  
(area:  $2x$  flange cross section at the output)
- Convective heat dissipation is ensured.
- Ambient temperature:  $20^\circ\text{C}$

Note: Actual ambient conditions may differ from these boundary conditions.

## Continuous range

The continuous range is the limit range for unrestricted operation over the entire service life of the gearbox, even in continuous operation (S1). All components are permanently stable in this range. The gearbox is in a thermally stable state below the maximum operating temperature.

See also: Gearbox characteristic curve, Wöhler curve.

## Continuous operation

Continuous operation (S1) refers to continuous operation without interruption. The gearbox reaches a thermally stable operating state. This operating mode is typical for applications with continuous motion under constant load.

## Continuous input speed $n1D$ min<sup>-1</sup>

The continuous input speed is the speed at which the gearbox is operated in continuous operation (S1) with the continuous torque. This ensures a service life of 20,000 hours, provided that the boundary conditions for thermal conditions are observed. See also: Boundary conditions for thermal design.

## Cycle operation

Cycle operation is an operating mode with repeated start-stop motions and frequent acceleration and deceleration. There are rest periods between the movement phases. Typical for S3/S5 applications.

## Cycle range

The cycle range is the limit range for operation with cyclically recurring load peaks. The torque must not be applied continuously. An application-specific drive train with NCP is required. See also: Gearbox unit characteristic curve, Wöhler curve.

## Cyclic torque $T_{22}$ Nm

The cyclic torque takes into account all mechanical transmission elements such as gearing, shafts or clamping systems. The weakest component determines the permissible value. The actual permissible cyclic torque lies between the continuous torque and the maximum torque and depends on the load frequency. An application-specific drive train with NCP is required if the application torque exceeds the continuous torque.

## Dynamic factor

The dynamic factor is a characteristic value for evaluating torsional vibrations and resonances in the drive train. It is determined in NCP, taking into account the stiffness and inertia of the system in cyclic applications.

## Efficiency $\eta$ %

The efficiency describes the ratio of the mechanical power output to the mechanical power input. It is a measure of the energy efficiency of the gearbox.

$$\eta = \frac{P_{ab}}{P_{an}} * 100 \%$$

The efficiency at NEUGART is determined at the cyclic torque with a drive speed of  $n_1 = 1000$  min<sup>-1</sup> and an operating temperature of the gearbox of  $70^\circ\text{C}$ .

## Emergency stop torque $T_{2stop}$ Nm

The emergency stop torque is the torque that may occur at the output shaft of the gearbox in unscheduled emergency stop situations. Permitted a maximum of 1,000 times over the entire service life. Not intended for regular operation.

## Maximum axial force $F_{a\max}$ N

The maximum axial force refers to the axis of rotation of the gear unit. Other loads are not taken into account. An application-specific drive train with NCP is required.

## Maximum bending moment $M_{b1}$ Nm

The maximum permissible bending moment acting on the motor-side flange surface of the gearbox due to the dead weight of the attached motor. It is calculated from the weight of the motor and the position of its center of gravity. For simplified calculation of the maximum permissible motor weight ( $m$ ), the following applies:

$$m = \frac{2 * M_b}{9.81 \frac{\text{N}}{\text{kg}} * \text{motor length}}$$

Note:

If the motor and gearbox are mounted on a moving axis, the additional load due to acceleration must be taken into account.

## Maximum mechanical input speed $n_{1\max}$ min<sup>-1</sup>

The maximum mechanical input speed must not be exceeded at any time during the application cycle.

## Maximum radial force $F_{r\max}$ N

The maximum radial force refers to the center of the output shaft or the end of the flange output shaft. Other loads are not taken into account. An application-specific drive train with NCP is required.

## Maximum range

The maximum range is the limit range for extended cyclic operation with reduced service life. See also: Gear unit characteristic curve, Wöhler curve.

## Maximum torque $T_{2\max}$ Nm

The maximum torque is the highest permissible torque in the regular application cycle. It takes into account all relevant mechanical transmission elements such as gearing, shafts or clamping systems.

## Operating mode

The operating mode indicates the motion control profile of the gearbox during operation. A distinction is made between continuous operation and cyclic operation.

## Running noise $Q_g$ dB(A)

The running noise of a gearbox is specified as a sound pressure level. It is measured at a drive speed of  $n_1 = 3000$  min<sup>-1</sup> without load at a distance of 1 m.

The catalog specifies the value for  $i=5$ . For a 1-stage planetary gearbox, the running noise is lower at  $i=10$  and higher at  $i=3$ .

**Service life**  $L_h$

The service life is the operating time during which the gearbox remains functional and reliably performs its specified power. An application-specific service life can be calculated using NCP.

**Torsional backlash**  $\varphi$  arcmin

The torsional backlash is the angle by which the output shaft can be rotated when the input shaft is fixed. Measured in angular minutes (arcmin),  $1 \text{ arcmin} = 1/60^\circ$ .

To measure this, the input shaft is blocked and torque is applied to the output shaft to overcome the internal friction of the gearbox.

**Torsional stiffness**  $C_{2t}$   $\frac{Nm}{\text{arcmin}}$

The torsional stiffness indicates the torque required to rotate the output shaft by one arc minute (arcmin) after overcoming the torsional backlash. The input shaft is fixed in position.

**“Wöhler” curve (S-N-Curve)**

The Wöhler curve is a characteristic curve for the behaviour of a component under dynamically changing loads. It shows the relationship between stress amplitude (due to torque) and the number of load cycles that can be withstood before failure.







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