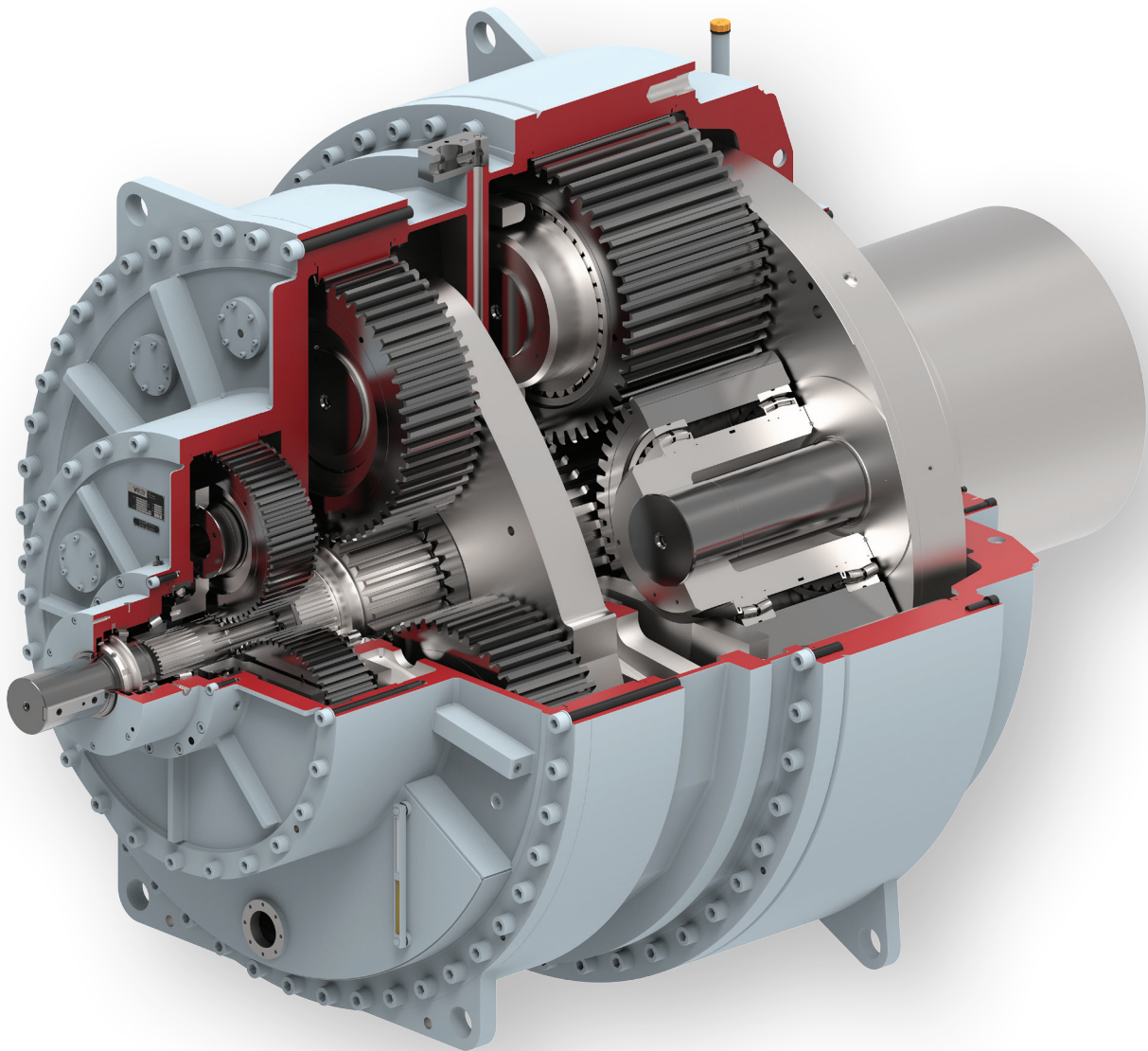


Orbi-flex® Catalogue

Planetary Gear Units Series



WIKOV

The Essence of Engineering

The Essence of Engineering

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1 Introduction

1.1 Introduction

Wikov has been active in mechanical engineering since 1884. For over 100 years, we have been manufacturing gears and mechanical gearboxes.

We propose optimal solutions on the basis of a thorough comprehension of every concrete application.

Our aim is to keep delivering state-of-the-art products to our customers through intensive core engineering and product development.



1 Introduction
2 Product description and key features
3 Gearbox selection
4 Dimension sheets
5 Power Ratings
6 True ratios
7 High and low speed shaft variants
8 Mounting equipment



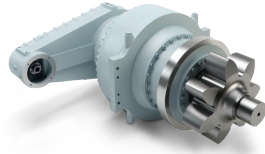
1 Introduction

1.2 Product portfolio

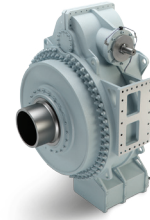
We have been delivering our products to many industries all around the world.

Detailed knowledge of various applications is our key strength in designing new products.

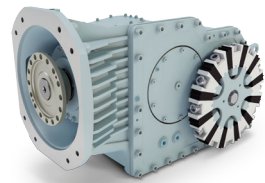
Oil & Gas



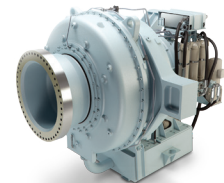
Mining Industry



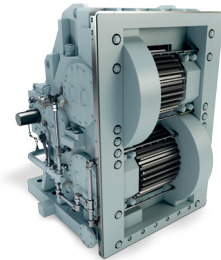
Rail Vehicles



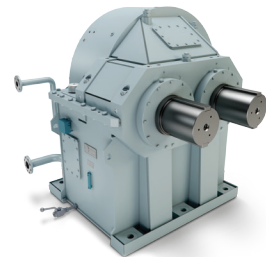
Wind and Tidal Energy



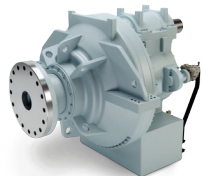
Cement & Mineral Processing Industry



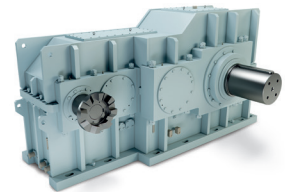
Rubber, Plastic & Chemical Industry



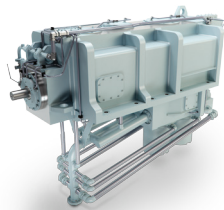
Hydro Energy



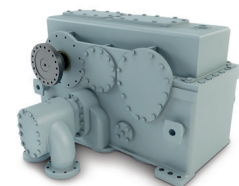
Sugar Industry



Metallurgy



Thermal and Nuclear Power Plants



2 Product description and key features

2.1 Product information

For selection of suitable Orbi-flex® planetary gearbox kindly observe the details given in this catalogue.

Orbi-flex® planetary gear units with patented technology of the flexible pin are designated for use in various industrial sectors.

The series covers a nominal output torque range between 105,000 and 6,000,000 Nm and ratios from 20 to 1,500.

The modular design represents economical solution thanks to standardization of components such as all planetary gear stages

and housing parts at keeping high quality standards.

Optimization of the Orbi-flex® gear unit with regard to specific technology and customer's requirements that cannot be met with the standard Orbi-flex® range is done in collaboration with our project engineers and designers.

Orbi-flex® Planetary Series:

sizes	27
torque range	105,000 - 6,000,000 Nm
ratio	20 - 1,500

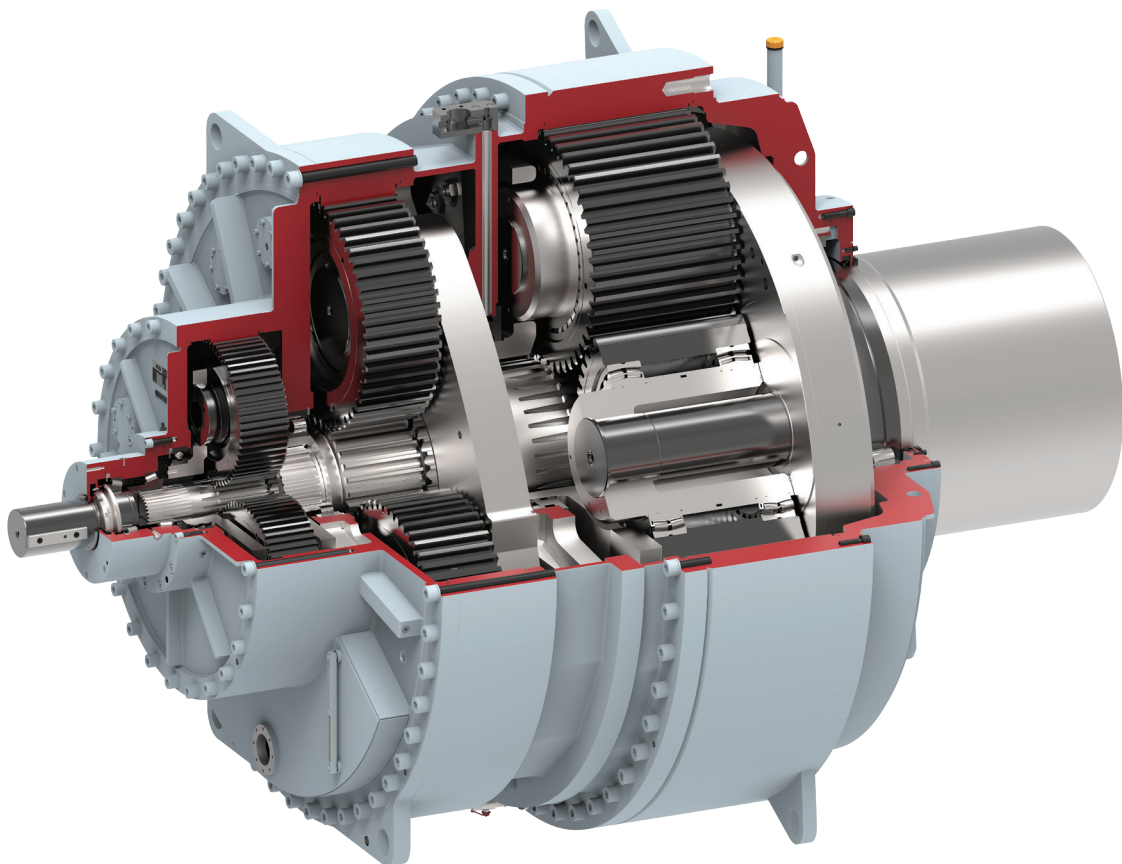


Fig. 1 – Cross-section of the Orbi-flex® planetary gear unit with a flexible pin

2 Product description and key features

2.2 Product description

2.2.1 Flexible pin technology

Flexible pin technology is a key and worldwide patented feature of the Orbi-flex® planetary gear units.

The advantage of the technology is based on internal components' flexibility in case of shock loads that incur during operation of your equipment.

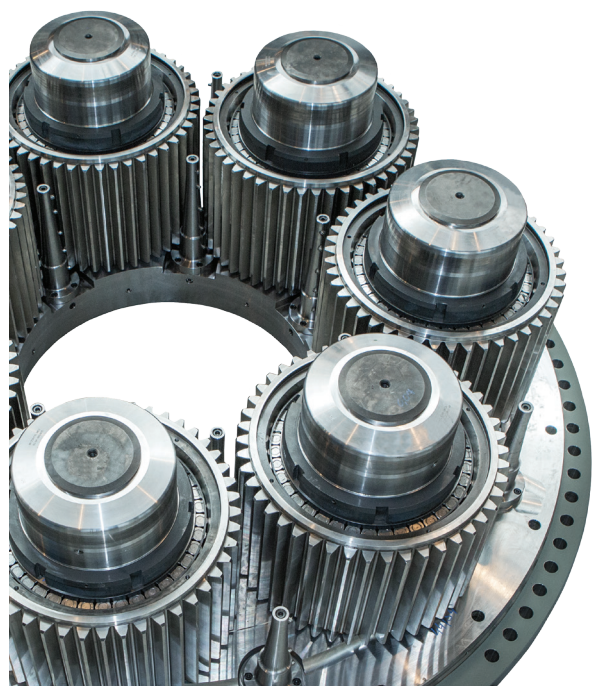


Fig. 2 – Multi-planet gear stage

For detailed technical description of the flexible pin see pages 9-10.

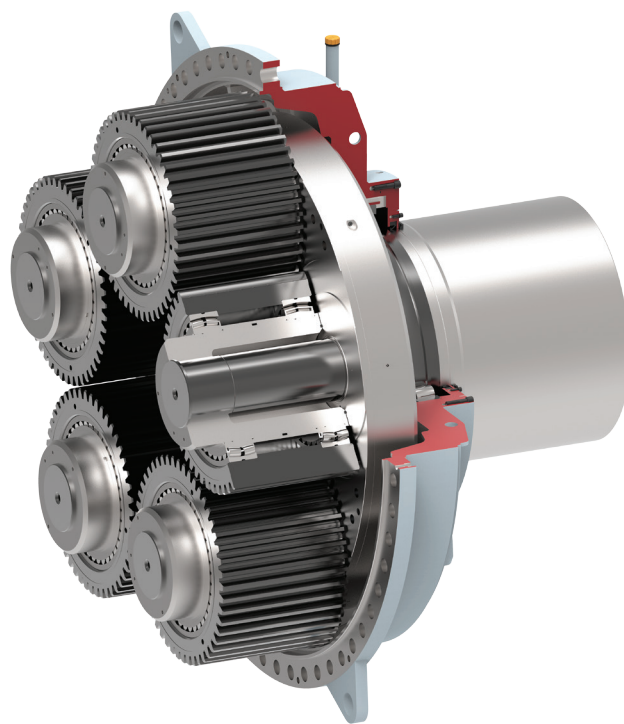


Fig. 3 – Multi-planet gear stage

Technical features:

- Shock load resistance
- Patented overload stop (optional)
- High power density
- Compact dimensions
- Extended lifetime of gears and bearings
- Multi-planet arrangement up to 8 planets



2 Product description and key features

Comparison of conventional carrier and flexible carrier

Conventional design

- to cope with deformation, a pin support on both sides is required to provide sufficient stiffness which results in higher weight and costs

- gear microgeometry optimized for nominal torque

- in case of overload, deformation results in one sided load on tooth flank compromising both gear and bearing life

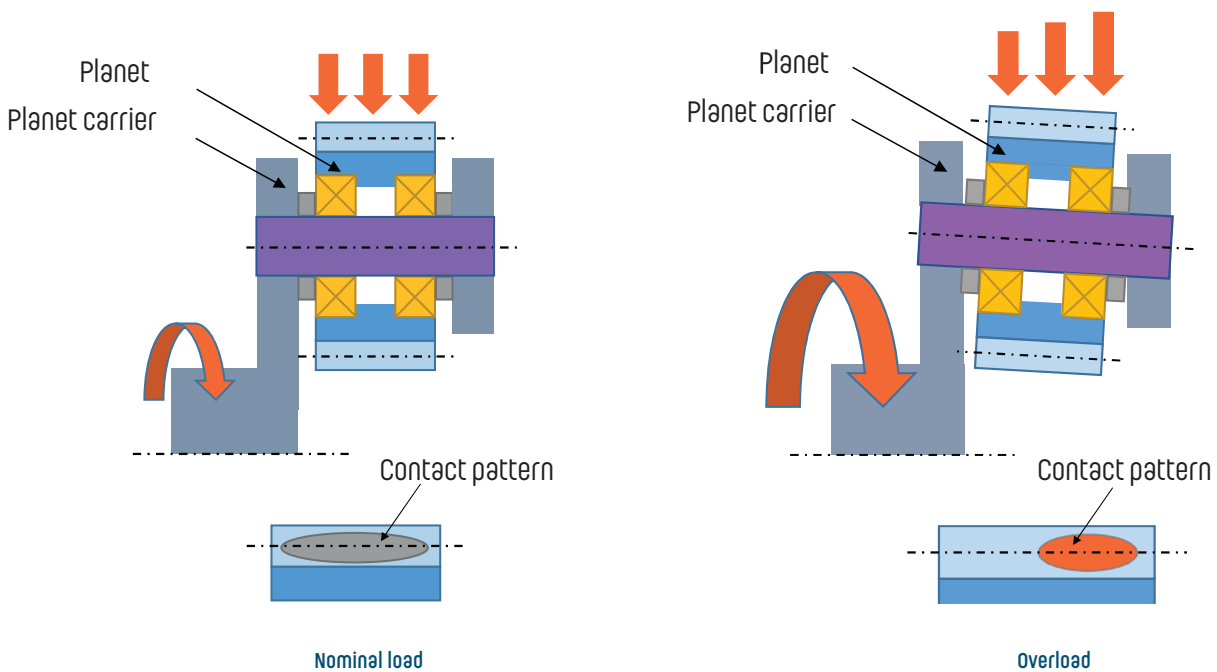


Fig. 4 – Conventional planetary stage



2 Product description and key features

Flexible pin

- no need to support pins on both sides – lighter design

- in case of overload, flexible pin design allows planets to float in limited matter and be parallel with both annulus and sun gear

- contact pattern remains same for both nominal and overload torque, thus significantly improving bearing and gear life

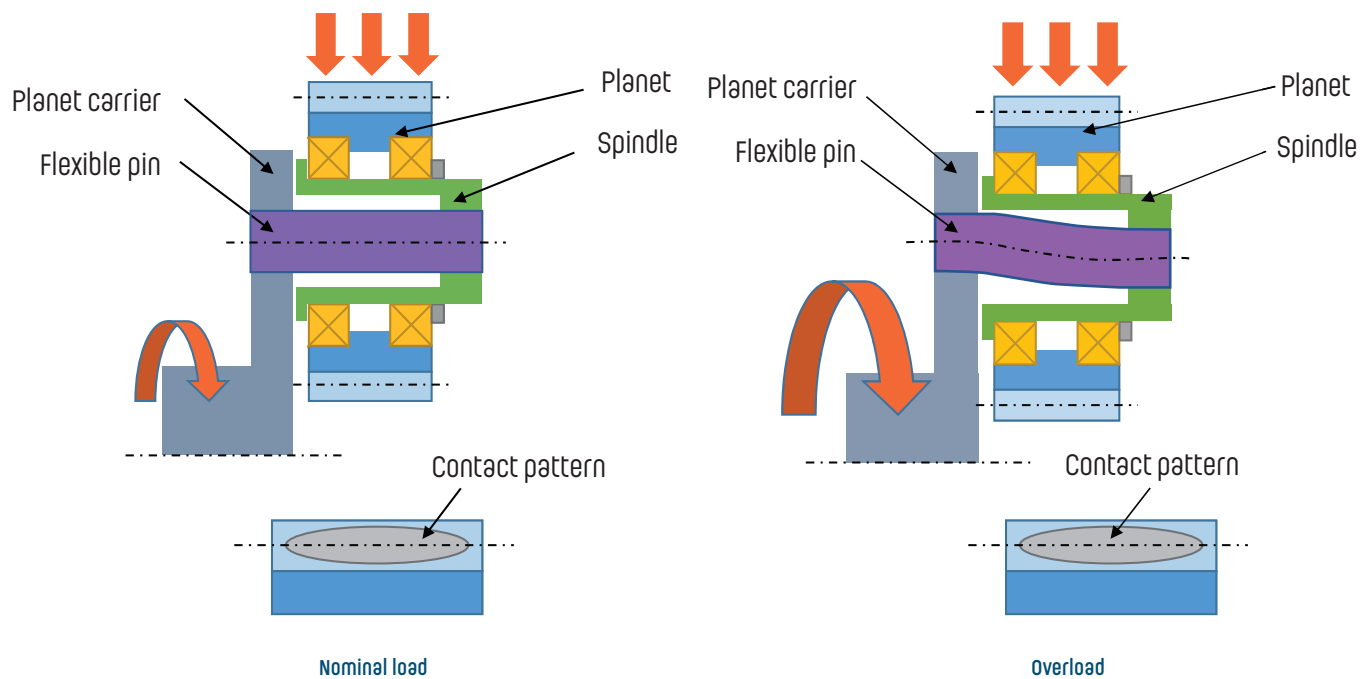


Fig. 5 – Flexible pin planetary stage



2 Product description and key features

2.2.2 Gears

All gears are made according to the highest Wikov quality standards. Planetary gears are designed as spur gears. Sun and planet gears are manufactured as case hardened and ground. Ring gears are either quenched or nitrided, ground or shaped. Input bevel gears (if used) use cyclo-paloid geometry, and are case hardened and HPG-cut. Input parallel shaft gears (if used) are designed as helical and manufactured as case hardened and ground.

2.2.3 Shafts

All shafts are made of high strength tensile steels either quenched or case hardened. Low speed output shafts can be either forged or cast. Carriers are either forged, cast or made of billet

2.2.4 Bearings

Various roller bearings are used to support gears and shafts. Heavy duty bearing arrangement is available on request for all gearboxes.

2.2.5 Housings

Gearbox housings are either cast or fabricated as appropriate. Cast housings are made either from grey cast or spheroidal graphite cast iron. Fabricated housings are made of steel. Both, cast and fabricated housings are optimized by CAE methods to ensure sufficient stiffness, low noise emission, excellent cooling properties and minimum weight.

2.2.6 Lubrication

Gearboxes are primarily designed as splash lubricated. Oil level is set to keep adequate lubrication with minimum churning losses. For non-standard gearbox mounting positions, high nominal speeds or due to cooling requirements, gearboxes may be fitted with forced lubrication and cooling. Oil heaters can be fitted where necessary.

2.2.7 Sealing

Based on gearbox mounting arrangements, environmental and operational requirements, input and output shafts can be fitted with various type of sealing as per fig. 6.

2.2.8 Cooling

Gearboxes are design in order to achieve maximum radiation and convection values from the surface of the gearbox housings. In case gearboxes are operated outside of the thermal capacity limit, forced oil circulation fitted with external cooling is used. Oil to water or oil to air coolers can be used.

2.2.9 NVH (Noise, Vibrations and Harshness)

For all gearboxes, noise emissions have been optimized up to a highest possible level by careful gear microgeometry optimization and gearbox housing design.

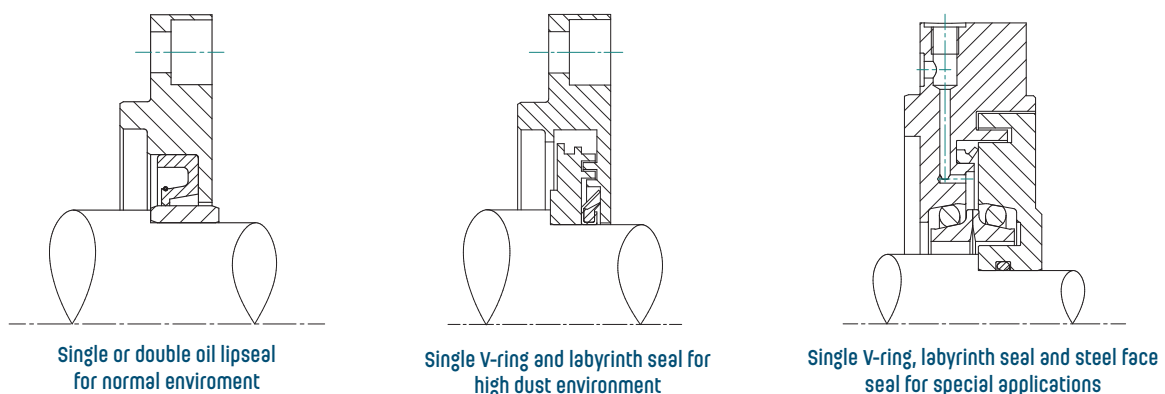


Fig. 6 – Sealing solution examples



2 Product description and key features

2.2.10 Sensors

Gearboxes can be fitted with various thermometer, vibration, speed and pressure sensors. On request, Wikov Condition Monitoring System (WiGuard) can be fitted.

2.2.11 Condition monitoring system – WiGuard

WiGuard (fig. 7) is a condition monitoring system developed by Wikov company. It prevents unexpected downtime or serious gearbox failures by detection of an early warning and thus adjusting the maintenance schedule in case an incipient wear in the gearbox would occur. Monitored values include bearing temperatures and vibrations, oil temperature, pressure and cleanliness, and rotational parts speed.

On a special request, torque – either on the shaft or in the gearbox reaction, can be measured. All key data are on-line monitored, saved, analysed and reported to a remote server via the internet connection (Ethernet and/or GPRS). Customer has got a real time web access to all measured values while reports with evaluation summary and recommendations are sent monthly. Please contact us for more details.

2.2.12 Other equipment

Other equipment, such as various types of gear or flexible couplings, hydrodynamic couplings, drive-shafts, brakes, back-stops etc. can be fitted on request. Electric, hydrostatic or pneumatic motors can be fitted on request.

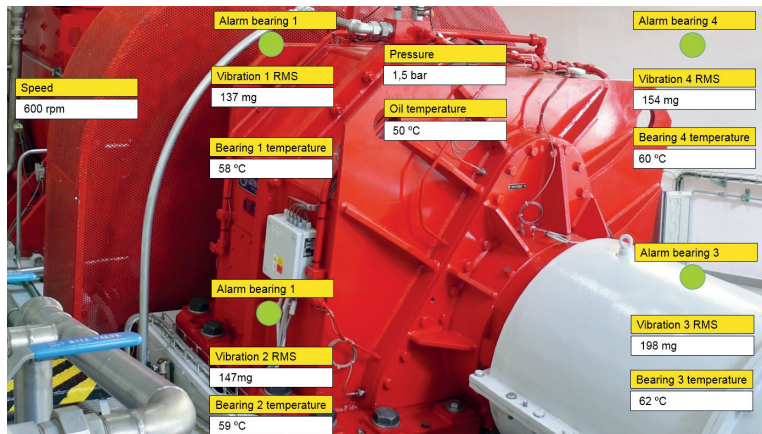
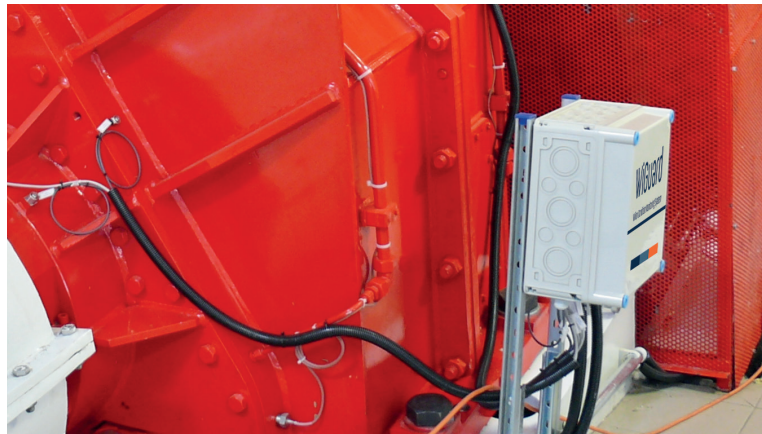


Fig. 7 – WiGuard - condition monitoring system



2 Product description and key features

2.3 General information

2.3.1 Certification

Wikov can deliver gearboxes with certification of any major independent certification body (e.i. DNV GL, ABS, etc.) if requested. Cooperation with customer is expected as detail information about the gearbox applications are required.

2.3.2 Explosive protection certification

Gearboxes can be certified according to 2014/34/EU (ATEX). Please contact us for further details.

2.3.3 Painting

Planetary gear units are painted in RAL 5013 „Cobalt Blue“ as standard. Any special painting available on request.

2.3.4 Technical changes

All parts of this catalogue, such as data, text, images, photos and other intellectual property, correspond to the current state at the time of their creation, and they represent non-binding information. Amendments carried out at a later date shall be subject to change without prior notice. Wikov shall not assume any liability for errors. Weights and dimensions are average values.

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2.3.6 Trade marks

Wikov and Orbi-flex® are registered trade marks of Wikov Industry a.s.



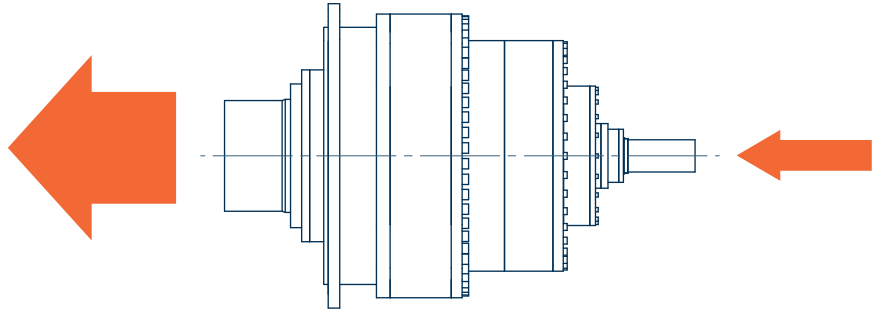
2 Product description and key features

2.4 Summary of basic types

Gearbox types as shown on fig. 8 are available as standard.

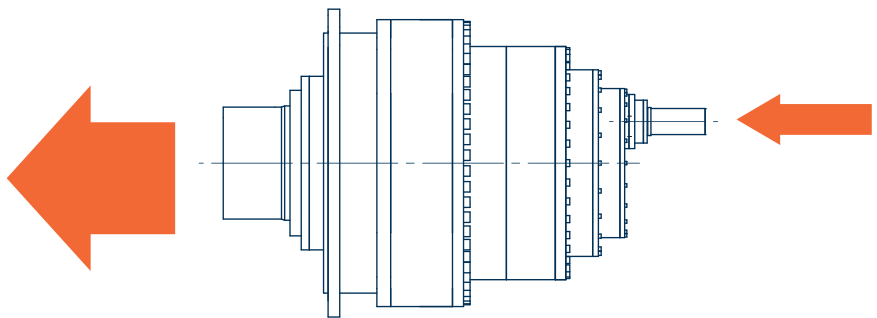
Single or multi-stage co-axial

X P C



Single or multi-stage with parallel shaft input

X P P



Single or multi-stage with bevel gear input

X P B

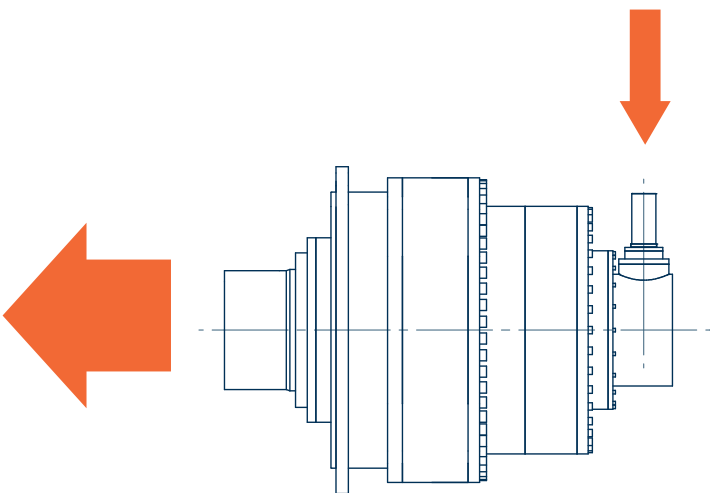


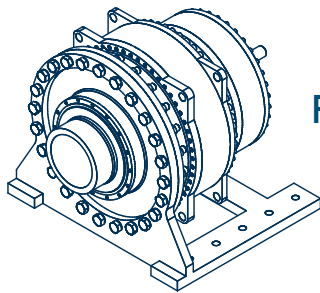
Fig. 8 – Summary of basic variants



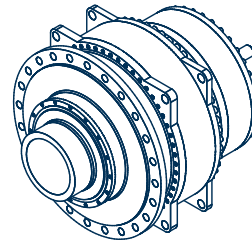
2 Product description and key features

2.5 Mounting arrangements

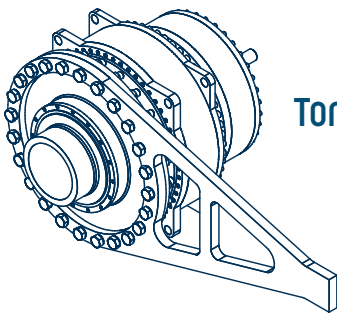
Following gearbox mounting arrangements (fig. 9) are available as standard. Other possible arrangements are available on a request.



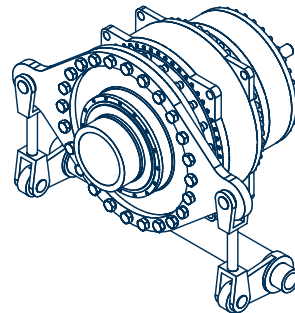
Foot base



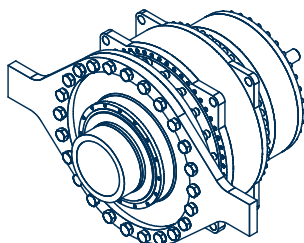
Flange



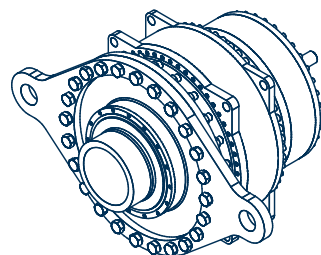
Torque arm



Torque linkage



ESM mounts
(torque only)



ESM mounts

Fig. 9 Gearbox mounting arrangements

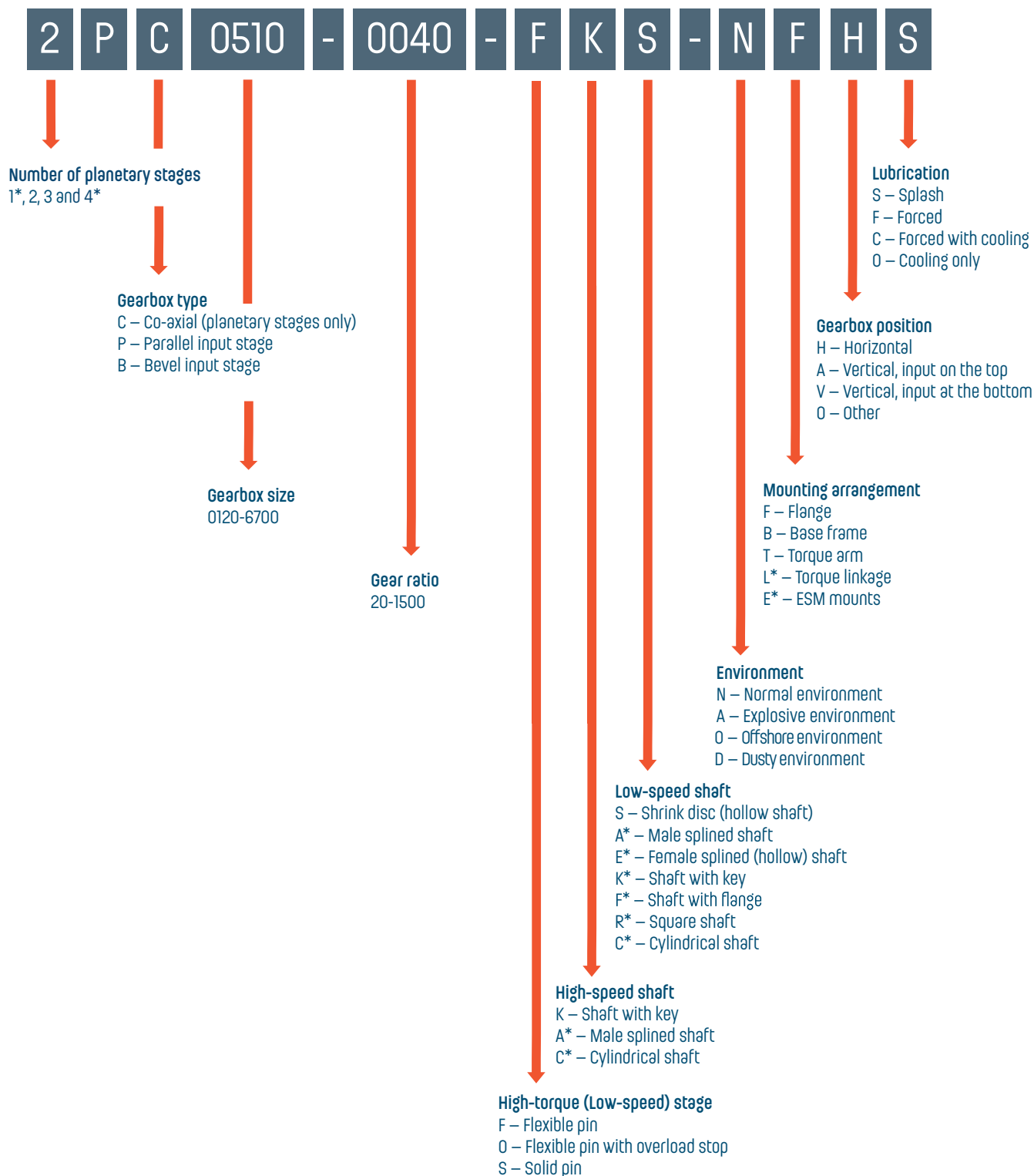


2 Product description and key features

2.6 Gearbox name convention

Gearbox arrangement can be clearly described by an ordering code. Please refer to this code

when requesting a quotation. Variants marked with *) are available on request.



3 Gearbox selection

3.1 Introduction

Based on your requirements, the gearbox type and size can be easily selected through instructions

given in this chapter. For online version, please go to our website www.wikov.com.

3.2 List of used symbols

Symbol	Description	Unit
C_p	Peak torque factor	[-]
C_s	Starting factor	[-]
C_T	Thermal factor	[-]
C_U	Utilization factor	[-]
i_R	Required ratio of the gearbox	[-]
i_N	Nominal ratio of the gearbox	[-]
K_A	Application factor	[-]
L_{10h}	Nominal bearing life	[h]
M_1	High speed side torque	[Nm]
M_2	Low speed side torque	[Nm]
M_{2R}	Required low speed side torque rating	[Nm]
M_N	Gearbox nominal torque rating	[Nm]
M_{MAX}	Maximum torque, that the gearbox can safely withstand	[Nm]
n_1	Speed – high-speed shaft	[rpm]
n_2	Speed – low-speed shaft	[rpm]
n_{2B}	Reference speed - low-speed shaft	[rpm]
n_{2i}	Constant speed during acting of partial loads – low speed shaft	[rpm]
P_2	Transmitted power	[kW]
P_{2eq}	Equivalent power rating	[kW]
P_R	Required power rating	[kW]
P_{th}	Gearbox thermal power rating	[kW]
P_{thC}	Gearbox thermal capacity	[kW]
T_{amb}	Ambient temperature	[°C]
t_i	Time portion of acting of partial loads in the total working cycle	[%]
U	Gearbox utilization	[%]



3 Gearbox selection

3.3 Gearbox type and size selection

3.3.1 Gearbox ratio

$$i_R = \frac{n_1}{n_2}$$

For gearbox nominal ratio i_N follow section 3.9

3.3.2 Required power rating

$$P_R = P_2 \times K_A$$

For K_A see Section 3.7

3.3.3 Required low-speed side torque rating

$$M_{2R} = 9550 \times \frac{P_R}{n_2}$$

3.3.4 Determination of the nominal gearbox size

$$M_N \geq M_{2R}$$

For M_N see Section 3.8

3.3.5 Check for maximum peak torque

Maximum torque, that the gearbox can safely withstand.

$$M_{MAX} = \frac{2 \times M_N}{C_p}$$

For C_p see Section 3.10

$$M_{MAX} \geq M_1 \times i_N \times C_s$$

For C_s see Section 3.11

3.4 Gearbox thermal rating

3.4.1 Low-speed side torque

$$M_2 = 9550 \times \frac{P_2}{n_2}$$

3.4.2 Gearbox utilization

$$U = \frac{M_2}{M_N} \times 100$$

3.4.3 Gearbox thermal capacity

$$P_{thC} = P_{th} \times C_U \times C_T$$

For P_{th} see Section 3.13

For C_U see Section 3.12

For C_T see Section 3.14

3.4.4 External cooling requirement

If $P_2 \leq P_{thC}$ no external cooling required

For $P_2 > P_{thC}$ additional cooling required

3.5 Gearbox bearings life

$$L_{10h} = \left(\frac{M_N}{M_2} \right)^{\frac{10}{3}} \times \frac{n_{2B}}{n_2} \times 10000$$

For n_{2B} see Section 3.15

3.6 Gearbox selection for variable load conditions

For gearboxes which drive the machines with variable loads and speeds the power rating can be determined by using following formulas:

$$P_{2eq} = \sqrt[6,6]{\frac{\sum_{i=1}^n P_{2i}^{6,6} \cdot t_i \cdot n_{2i}}{\sum_{i=1}^n t_i \cdot n_{2i}}}$$

All other equations apply as above, substituting P_{2eq} for P_2 .



3 Gearbox selection

3.7 Application factor - K_A

Industry	Driven machine	Application factor / Effective daily operating period		
		< 3h	3-10h	> 10h
Agitators	Liquids and solids	1.2	1.5	1.65
Agitators	Pure liquids	1	1.25	1.5
Agitators	Uniform solid material	1.1	1.35	1.4
Agitators	Concrete mixers	-	1.5	1.5
Cement & mineral processing	Breakers	-	1.2	1.4
Cement & mineral processing	Ball mills	-	-	2
Cement & mineral processing	Crushers	-	-	2
Cement & mineral processing	HPGR (roller press)	-	-	2
Cement & mineral processing	Roll crushers	-	-	2
Cement & mineral processing	Rotary kilns	-	-	2
Cement & mineral processing	Separators	-	1.6	1.6
Cement & mineral processing	Tube mills	-	-	2
Conveying systems	Apron feeders	-	1.25	1.5
Conveying systems	Belt conveyors < 150 kW	1.15	1.25	1.4
Conveying systems	Belt conveyors > 150 kW	1.15	1.3	1.5
Conveying systems	Bucket conveyors	-	1.4	1.5
Conveying systems	Screw feeders	1.15	1.25	1.5
Conveying systems	Shakers, screens	1.55	1.75	2
Cooling systems	Heat exchangers	1.5	1.5	1.5
Cooling systems	Dry cooling towers	-	-	2
Cooling systems	Wet cooling towers	2	2	2
Cooling systems	Blowers (axial and radial)	-	1.4	1.5
Crushing & shredding	Various	Please contact us		
Fluid pumping	Centrifugical pumps	1.15	1.35	1.45
Fluid pumping	Reciprocating pumps (single cylinder)	1.35	1.5	1.8
Fluid pumping	Reciprocating pumps (multi cylinder)	1.2	1.4	1.5
Fluid pumping	Screw pumps	-	1.3	1.5
Fluid pumping	Rotary pumps (gear type, vane)	-	-	1.25
Hydro energy	Water turbines	Please contact us		
Lifting equipment	Slewing gears for cranes	1	1.4	1.8
Lifting equipment	Luffing gears for cranes	1	1.1	1.4
Lifting equipment	Travelling gears for cranes	1.1	1.6	2
Lifting equipment	Hoisting gears for cranes	1	1.1	1.4
Lifting equipment	Jib cranes	1	1.2	1.6
Lifting equipment	Jack-ups for platforms and lift boats	Please contact us		
Lifting equipment	Hauling winches	1.4	1.6	1.6
Lifting equipment	Hoists	-	1.5	1.8
Lifting equipment	Goods lifts	-	1.2	1.5
Lifting equipment	Passenger lifts	-	1.5	1.8
Metallurgy	Drivers for continuous casting	-	1.4	1.4
Metallurgy	Cooling bed transfer frames	-	1.5	1.5
Metallurgy	Ingot pushers	1	1.2	1.2
Metallurgy	Winding machines	-	1.6	1.6
Metallurgy	Plate tilters	1	1	1.2
Metallurgy	Roller straighteners	-	1.6	1.6
Metallurgy	Roller tables continuous	-	1.5	1.5
Metallurgy	Roller tables intermittent	-	2	2
Metallurgy	Reverse tube mills	-	1.8	1.8
Metallurgy	Shears continuous	-	1.5	1.5
Metallurgy	Shears crank type	1	1	1
Metallurgy	Roll adjustment drives	0.9	1	-
Metallurgy	Rolls - reversing blooming mills	-	2.5	2.5
Metallurgy	Rolls - slabbing blooming mills	-	2.5	2.5
Metallurgy	Rolls - wire blooming mills	-	1.8	1.8
Metallurgy	Rolls - reversing sheet mills	-	2	2
Metallurgy	Rolls - reversing plate mills	-	1.8	1.8



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 2 Product description and key features
 3 Gearbox selection
 4 Dimension sheets
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 7 High and low speed shaft variants
 8 Mounting equipment

3 Gearbox selection

3.7 Application factor - K_A

Industry	Driven machine	Application factor / Effective daily operating period		
		< 3h	3-10h	> 10h
Mining	Track drives	1.2	1.6	1.8
Mining	Crushers	1.55	1.75	2
Mining	Excavator: belt conveyor drive	1.1	1.3	1.4
Mining	Excavator: bucket wheel, pick-up	-	1.7	1.7
Mining	Excavator: bucket wheel, primitive material	-	2.2	2.2
Mining	Excavator: slewing	-	1.4	1.8
Mining	Excavator: track drive	1.2	1.6	1.8
Mining	Screens and shakers	1.55	1.75	2
Mining	Slewing drives	-	1.55	1.8
Mining	Bucket wheel excavators	Please contact us		
Mining	Longwall shearer drum head drive	Please contact us		
Mining	AFC and BSL drives	Please contact us		
Rubber, plastics and chemicals	Extruders	-	1.5	1.8
Rubber, plastics and chemicals	Calenders	-	1.65	1.65
Rubber, plastics and chemicals	Mixers for uniform media	1	1.3	1.4
Rubber, plastics and chemicals	Mixers for non-uniform media	1.4	1.6	1.7
Rubber, plastics and chemicals	Two roll mills	-	-	2.1
Sugar beet industry	Beet washing machines	-	-	1.5
Sugar beet industry	Beet shredders	-	-	2
Sugar beet industry	Beet choppers	-	-	2
Sugar beet industry	Pulp screw presses	Please contact us		
Sugar beet industry	Horizontal lime kiln	-	-	2
Sugar beet industry	Scraper clarifier	Please contact us		
Sugar beet industry	Rotary vacuum mud filters	Please contact us		
Sugar beet industry	Crystallizers	-	1.5	1.8
Sugar beet industry	Drum dryers	Please contact us		
Sugar cane industry	wash/feed tables	Please contact us		
Sugar cane industry	Main cane carrier	1.15	1.3	1.5
Sugar cane industry	Intermediate cane conveyors	1.15	1.3	1.5
Sugar cane industry	Cane mills	-	-	2
Sugar cane industry	Diffusers	-	-	1.5
Sugar cane industry	Baggasse conveyors	1.15	1.3	1.5
Sugar cane industry	Scraper clarifiers	Please contact us		
Sugar cane industry	Vacuum pan stirrers	Please contact us		
Sugar cane industry	Crystallizers	-	1.5	1.8
Sugar cane industry	Drum dryers	Please contact us		
Waste recycling machines and plants	Shredders/crushers	-	-	2
Waste water treatment	Aearators	-	1.8	2
Waste water treatment	Clarifiers	Please contact us		
Waste water treatment	Combined longitudinal and rotary rakes	1	1.3	1.5
Waste water treatment	Filter presses	1	1.3	1.5
Waste water treatment	Flocculation apparates	0.8	1	1.3
Waste water treatment	Pre-thickeners	-	1.1	1.3
Waste water treatment	Raking equipment	1	1.2	1.3
Waste water treatment	Sludge thickeners	-	1.1	1.3
Waste water treatment	Thickeners central drive	-	-	1.2

1 Introduction
2 Product description and key features
3 Gearbox selection
4 Dimension sheets
5 Power Ratings
6 True ratios
7 High and low speed shaft variants
8 Mounting equipment



3 Gearbox selection

3.8 Gearbox nominal torque rating - M_N

Gearbox size	Nominal torque rating M_N
	[Nm]
0120	105,000
0160	145,000
0230	206,000
0280	248,000
0330	300,000
0460	410,000
0510	455,000
0590	535,000
0680	615,000
0790	710,000
0890	803,000
1000	900,000
1100	996,000
1200	1,115,000
1400	1,250,000
1600	1,395,000
1700	1,560,000
2100	1,930,000
2400	2,145,000
2600	2,360,000
3000	2,728,000
3400	3,060,000
3900	3,500,000
4400	3,915,000
5000	4,500,000
5800	5,200,000
6700	6,000,000

3.9 Nominal ratio - i_n

Gearbox type	2PC	2PP	3PC	3PP	2PB	3PB
Nominal ratio i_n	20				32.5	
	25				40	
	30				48	
	38				61.5	
			40		68.5	
			50		88	
			55		96	
			60		122	
			66		145	
			75			160
			80			185
			100			220
				100		260
				120		280
				140		315
				160		330
				180		360
				200		400
				210		450
				220		500
				250		560
				280		630
				310		680
					315	710
					335	800
					360	900
					400	1,000
					430	1,100
				470	1,200	
				540	1,400	
				600	1,500	
				640		
				730		
				800		
				900		
				1,000		

Select suitable gearbox according to the required ratio.

For true ratios see following chapters

2PC 6.1 | 3PC 6.2 | 2PP 6.3 | 3PP 6.4 | 2PB 6.5 | 3PB 6.6



3 Gearbox selection

3.10 Peak torque factor - C_p

Peaks per hour	1-5	6-15	16-35	36-70	70-140	141-180	>180
C_p	1	1.15	1.29	1.45	1.17	1.9	2

3.11 Starting factor - C_s

Start-up mode	C_s
Direct	3
Soft start	1.8
Frequency inverter	1.75
Star/Delta	1.3
Hydraulic coupling	2

3.12 Utilization factor - C_u

Gearbox utilization U	30%	40%	50%	60%	70%	80%	90%	100%
C_u	0.66	0.76	0.83	0.88	0.92	0.95	0.98	1.0

3.13 Gearbox thermal power ratings - P_{th}

Gearbox type	Gearbox size / Gearbox thermal power rating P_{th} [kW]																					
	130	180	230	280	330	410	460	510	590	680	790	890	1000	1100	1200	1400	1600	1700	1900	2100	2400	2600
2PC / 2PB / 2PP	96	117	135	152	171	195	209	223	247	270	295	319	343	366	393	422	452	485	522	555	593	630
3PC / 3PB / 3PP	67	82	96	108	123	140	150	161	178	195	214	231	248	265	284	305	327	351	377	401	428	454

3.14 Thermal factor - C_t

Operating cycles per hour [%]	Ambient temperature T_{amb} [°C]				
	10	20	30	40	50
100	1.14	1.00	0.87	0.73	0.55
80	1.20	1.07	0.94	0.76	0.58
60	1.32	1.16	1.01	0.84	0.68
40	1.54	1.35	1.18	0.99	0.78
20	2.02	1.79	1.56	1.30	1.03

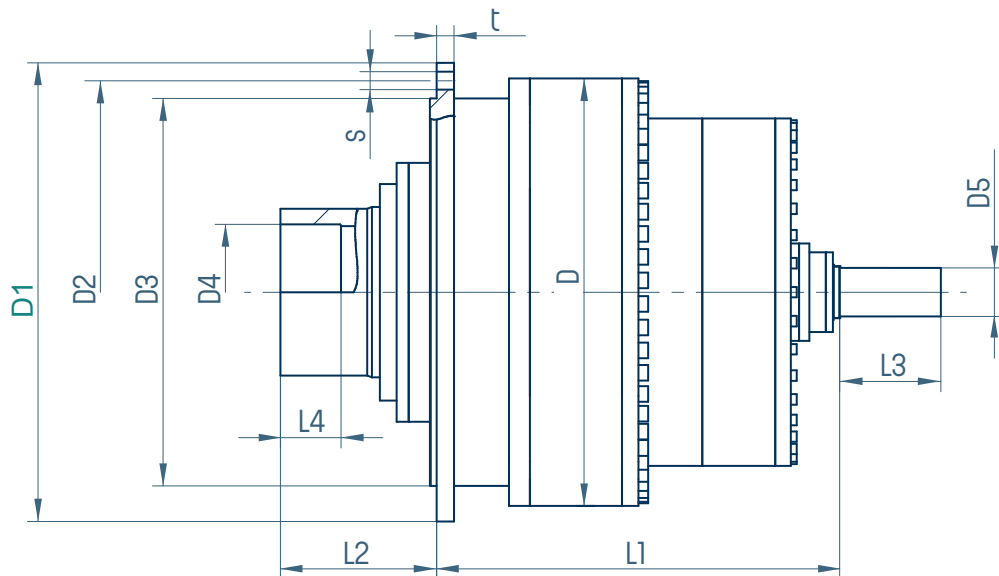
3.15 Reference speed – low-speed side n_{2b}

Gearbox size	Reference output speed [RPM]
0120	17
0160	16
0230	22
0280	22
0330	24
0460	17
0510	14
0590	16
0680	13
0790	30
0890	15
1000	20
1100	20
1200	14
1400	19
1600	13
1700	14
2100	13
2400	18
2600	14
3000	11
3400	14
3900	18
4400	30
5000	30
5800	30
6700	20



4 Dimension sheets

4.1 2PC type dimension chart



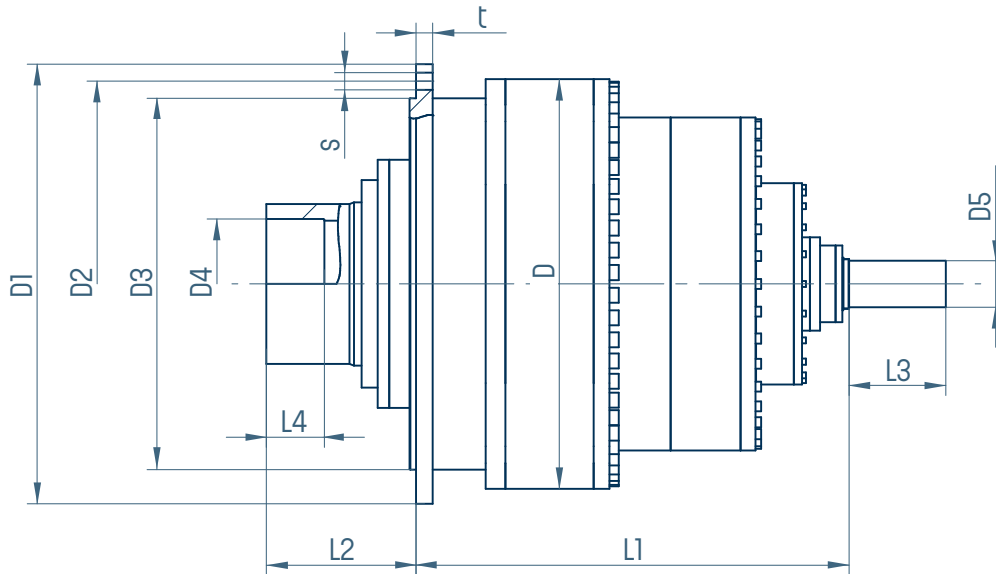
Size	Nominal output torque	D1	D2	D3	D4	D5	D	t	s	No. of bolts	L1	L2	L3	L4	Weight cca. ¹⁾
[-]	[Nm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]	[mm]	[mm]	[mm]	[kg]
0120	105,000	700	635	580	160	See section 71	630	30	26	30	650	252	See section 71	126	850
0160	145,000	735	680	625	170		696	40	26	38	720	264		132	1,100
0230	206,000	900	830	755	190		775	40	33	28	790	300		150	1,350
0280	248,000	930	865	785	210		850	40	33	32	830	326		163	1,570
0330	300,000	980	915	840	210		925	45	33	38	880	326		163	1,840
0460	410,000	1,115	1,025	935	240		1,005	50	39	32	970	352		176	2,580
0510	455,000	1,115	1,025	935	250		1,005	50	39	34	1,010	388		194	2,920
0590	535,000	1,210	1,120	1,025	250		1,080	55	39	36	1,070	388		194	3,495
0680	615,000	1,210	1,120	1,025	270		1,150	55	39	42	1,120	396		198	4,100
0790	710,000	1,320	1,220	1,115	290		1,230	55	45	32	1,180	414		207	4,900
0890	803,000	1,320	1,220	1,115	290		1,230	60	45	38	1,225	414		207	5,600
1000	900,000	1,460	1,345	1,215	320		1,310	65	52	32	1,270	472		236	6,350
1100	996,000	1,460	1,345	1,215	320		1,375	65	52	32	1,310	472		236	7,080
1200	1,115,000	1,565	1,450	1,320	340		1,375	70	52	36	1,360	494		247	8,050
1400	1,250,000	1,565	1,450	1,320	360		1,468	70	52	36	1,400	494		247	9,010
1600	1,395,000	1,665	1,545	1,400	360		1,470	75	62	32	1,445	494		247	9,950
1700	1,560,000	1,665	1,545	1,400	380		1,540	75	62	32	1,495	542		271	11,100
2100	1,930,000	1,755	1,635	1,495	400		1,630	80	62	36	1,610	540		270	13,700
2400	2,145,000	1,755	1,635	1,495	430		1,695	90	62	40	1,670	608		304	15,000
2600	2,360,000	1,945	1,825	1,685	430		1,775	90	62	40	1,605	608		304	16,700
3000	2,728,000	1,945	1,825	1,685	450	1,850	90	62	46	1,760	608	304	18,500		
3400	3,060,000	2,080	1,960	1,820	470	1,977	100	62	48	1,830	652	326	22,000		
3900	3,500,000	2,080	1,960	1,820	500	2,010	100	62	54	1,900	726	363	23,500		
4400	3,915,000	2,260	2,140	2,000	500	2,160	120	62	56	1,970	726	363	27,500		
5000	4,500,000	2,360	2,240	2,100	530	2,240	120	62	60	2,050	726	363	32,000		
5800	5,200,000	2,500	2,380	2,240	560	2,350	130	62	66	2,100	726	363	37,000		
6700	6,000,000	2,670	2,550	2,430	600	2,508	160	62	54	2,240	792	396	45,000		

1) Weight assumed without oil and shrink disc



4 Dimension sheets

4.2 3PC type dimension chart



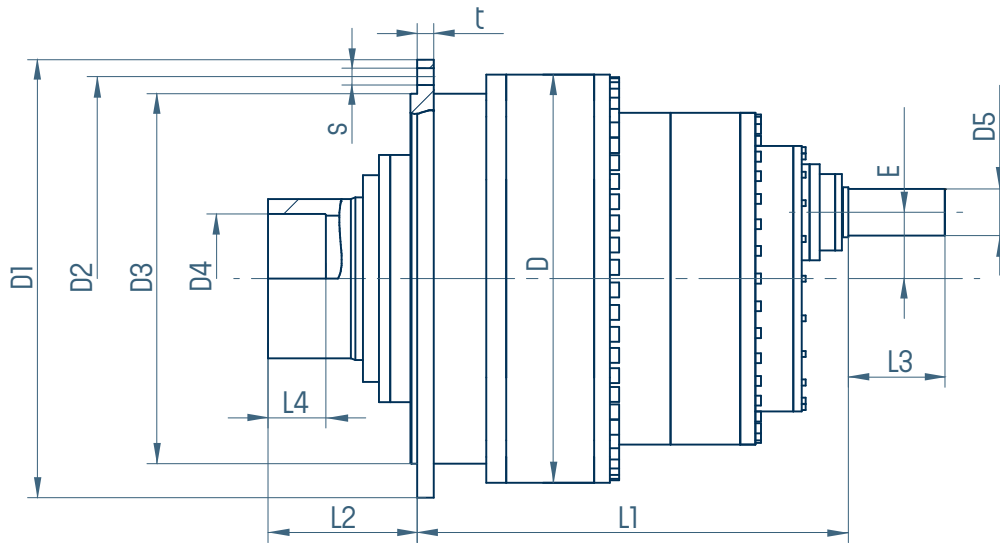
Size	Nominal output torque	D1	D2	D3	D4	D5	D	t	s	No. of bolts	L1	L2	L3	L4	Weight cca. ¹⁾
[-]	[Nm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]	[mm]	[mm]	[mm]	[kg]
0120	105,000	700	635	580	160	See section 71	630	30	26	30	740	252	See section 71	126	1,000
0160	145,000	735	680	625	170		696	40	26	38	800	264		132	1,200
0230	206,000	900	830	755	190		775	40	33	28	852	300		150	1,700
0280	248,000	930	865	785	210		850	40	33	32	870	326		163	2,100
0330	300,000	980	915	840	210		925	45	33	38	920	326		163	2,500
0460	410,000	1,115	1,025	935	240		1,005	50	39	32	1,005	352		176	3,250
0510	455,000	1,115	1,025	935	250		1,005	50	39	34	1,040	388		194	3,600
0590	535,000	1,210	1,120	1,025	250		1,080	55	39	36	1,100	388		194	4,200
0680	615,000	1,210	1,120	1,025	270		1,150	55	39	42	1,150	396		198	4,750
0790	710,000	1,320	1,220	1,115	290		1,230	55	45	32	1,200	414		207	5,450
0890	803,000	1,320	1,220	1,115	290		1,230	60	45	38	1,250	414		207	6,100
1000	900,000	1,460	1,345	1,215	320		1,310	65	52	32	1,295	472		236	7,000
1100	996,000	1,460	1,345	1,215	320		1,375	65	52	32	1,335	472		236	7,450
1200	1,115,000	1,565	1,450	1,320	340		1,375	70	52	36	1,380	494		247	8,350
1400	1,250,000	1,565	1,450	1,320	360		1,468	70	52	36	1,580	494		247	10,000
1600	1,395,000	1,665	1,545	1,400	360		1,470	75	62	32	1,460	494		247	10,500
1700	1,560,000	1,665	1,545	1,400	380		1,540	75	62	32	1,510	542		271	11,500
2100	1,930,000	1,755	1,635	1,495	400		1,630	80	62	36	1,750	540		270	14,100
2400	2,145,000	1,755	1,635	1,495	430		1,695	90	62	40	1,735	608		304	16,000
2600	2,360,000	1,945	1,825	1,685	430		1,775	90	62	40	1,750	608		304	17,700
3000	2,728,000	1,945	1,825	1,685	450	1,850	90	62	46	1,850	608	304	19,500		
3400	3,060,000	2,080	1,960	1,820	470	1,977	100	62	48	1,900	652	326	23,000		
3900	3,500,000	2,080	1,960	1,820	500	2,010	100	62	54	2,000	726	363	25,500		
4400	3,915,000	2,260	2,140	2,000	500	2,160	120	62	56	1,990	726	363	29,500		
5000	4,500,000	2,360	2,240	2,100	530	2,240	120	62	60	2,110	726	363	35,000		
5800	5,200,000	2,500	2,380	2,240	560	2,350	130	62	66	2,120	726	363	40,000		
6700	6,000,000	2,670	2,550	2,430	600	2,508	160	62	54	2,300	792	396	48,000		

1) Weight assumed without oil and shrink disc



4 Dimension sheets

4.3 2PP type dimension chart



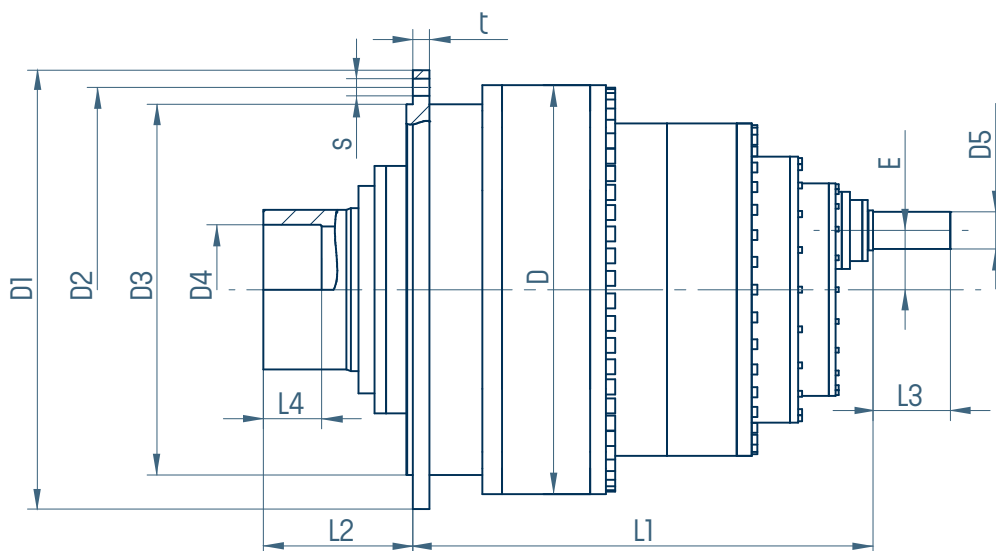
Size	Nominal output torque	D1	D2	D3	D4	D5	D	t	s	No. of bolts	L1	L2	L3	L4	E	Weight cca. ¹⁾
[-]	[Nm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
0120	105,000	700	635	580	160	See section 71	630	30	26	30	743	252	See section 71	126	192	1,100
0160	145,000	735	680	625	170		696	40	26	38	923	264		132	200	1,500
0230	206,000	900	830	755	190		775	40	33	28	980	300		150	200	2,000
0280	248,000	930	865	785	210		850	40	33	32	980	326		163	200	2,200
0330	300,000	980	915	840	210		925	45	33	38	1,050	326		163	200	2,700
0460	410,000	1,115	1,025	935	240		1,005	50	39	32	1,150	352		176	257	3,500
0510	455,000	1,115	1,025	935	250		1,005	50	39	34	1,150	388		194	260	3,800
0590	535,000	1,210	1,120	1,025	250		1,080	55	39	36	1,230	388		194	308	4,300
0680	615,000	1,210	1,120	1,025	270		1,150	55	39	42	1,270	396		198	264	5,080
0790	710,000	1,320	1,220	1,115	290		1,230	55	45	32	1,379	414		207	310	5,700
0890	803,000	1,320	1,220	1,115	290		1,230	60	45	38	1,380	414		207	310	6,300
1000	900,000	1,460	1,345	1,215	320		1,310	65	52	32	1,380	472		236	380	6,800
1100	996,000	1,460	1,345	1,215	320		1,375	65	52	32	1,385	472		236	320	8,100
1200	1,115,000	1,565	1,450	1,320	340		1,375	70	52	36	1,507	494		247	360	9,000
1400	1,250,000	1,565	1,450	1,320	360		1,468	70	52	36	1,644	494		247	375	9,600
1600	1,395,000	1,665	1,545	1,400	360		1,470	75	62	32	1,425	494		247	360	10,500
1700	1,560,000	1,665	1,545	1,400	380		1,540	75	62	32	1,550	542		271	400	11,500
2100	1,930,000	1,755	1,635	1,495	400		1,630	80	62	36	1,815	540		270	445	14,300
2400	2,145,000	1,755	1,635	1,495	430		1,695	90	62	40	1,775	608		304	448	15,650
2600	2,360,000	1,945	1,825	1,685	430		1,775	90	62	40	1,870	608		304	450	17,500
3000	2,728,000	1,945	1,825	1,685	450	1,850	90	62	46	1,970	608	304	450	19,500		
3400	3,060,000	2,080	1,960	1,820	470	1,977	100	62	48	2,057	652	326	490	21,700		
3900	3,500,000	2,080	1,960	1,820	500	2,010	100	62	54	2,150	726	363	510	25,000		
4400	3,915,000	2,260	2,140	2,000	500	2,160	120	62	56	2,217	726	363	535	28,200		
5000	4,500,000	2,360	2,240	2,100	530	2,240	120	62	60	2,487	726	363	560	35,000		
5800	5,200,000	2,500	2,380	2,240	560	2,350	130	62	66	2,520	726	363	630	40,000		
6700	6,000,000	2,670	2,550	2,430	600	2,508	160	62	54	2,544	792	396	715	46,800		

1) Weight assumed without oil and shrink disc



4 Dimension sheets

4.4 3PP type dimension chart



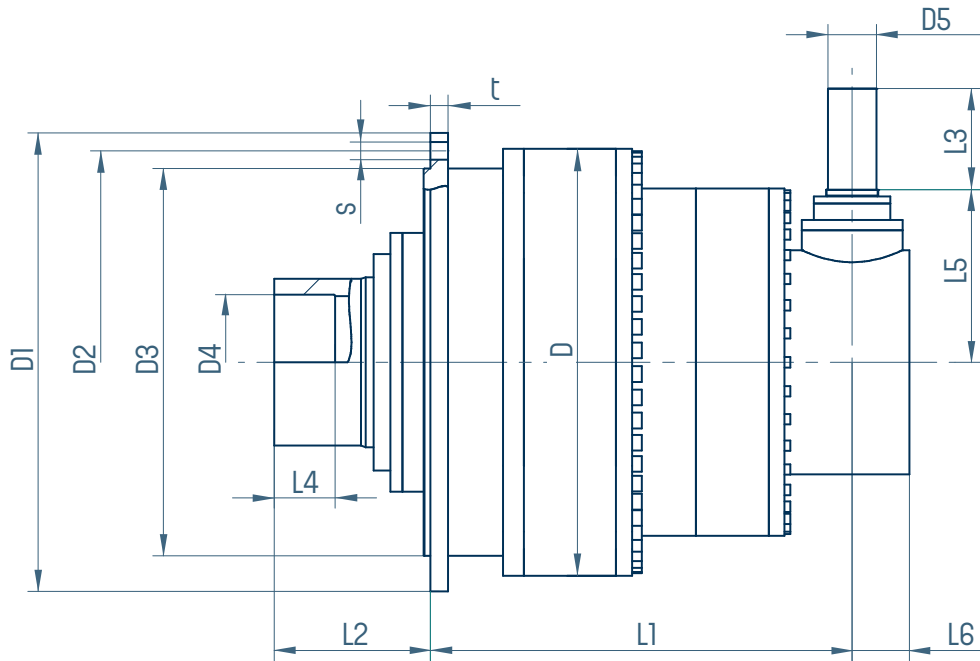
Size	Nominal output torque	D1	D2	D3	D4	D5	D	t	s	No. of bolts	L1	L2	L3	L4	E	Weight cca. ¹⁾
[-]	[Nm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
0120	105,000	700	635	580	160	See section 7.1	630	30	26	30	790	252	See section 7.1	126	95	1,150
0160	145,000	735	680	625	170		696	40	26	38	830	264		132	110	1,550
0230	206,000	900	830	755	190		775	40	33	28	882	300		150	110	2,050
0280	248,000	930	865	785	210		850	40	33	32	900	326		163	135	2,500
0330	300,000	980	915	840	210		925	45	33	38	950	326		163	135	2,900
0460	410,000	1,115	1,025	935	240		1,005	50	39	32	1,035	352		176	150	3,650
0510	455,000	1,115	1,025	935	250		1,005	50	39	34	1,070	388		194	150	4,000
0590	535,000	1,210	1,120	1,025	250		1,080	55	39	36	1,130	388		194	180	4,600
0680	615,000	1,210	1,120	1,025	270		1,150	55	39	42	1,180	396		198	180	5,150
0790	710,000	1,320	1,220	1,115	290		1,230	55	45	32	1,230	414		207	180	5,950
0890	803,000	1,320	1,220	1,115	290		1,230	60	45	38	1,280	414		207	180	6,700
1000	900,000	1,460	1,345	1,215	320		1,310	65	52	32	1,325	472		236	180	7,400
1100	996,000	1,460	1,345	1,215	320		1,375	65	52	32	1,365	472		236	200	8,200
1200	1,115,000	1,565	1,450	1,320	340		1,375	70	52	36	1,410	494		247	200	9,200
1400	1,250,000	1,565	1,450	1,320	360		1,468	70	52	36	1,610	494		247	200	10,400
1600	1,395,000	1,665	1,545	1,400	360		1,470	75	62	32	1,490	494		247	240	10,900
1700	1,560,000	1,665	1,545	1,400	380		1,540	75	62	32	1,520	542		271	240	11,900
2100	1,930,000	1,755	1,635	1,495	400		1,630	80	62	36	1,780	540		270	280	14,500
2400	2,145,000	1,755	1,635	1,495	430		1,695	90	62	40	1,780	608		304	280	16,400
2600	2,360,000	1,945	1,825	1,685	430		1,775	90	62	40	1,780	608		304	280	18,100
3000	2,728,000	1,945	1,825	1,685	450		1,850	90	62	46	1,880	608		304	320	19,950
3400	3,060,000	2,080	1,960	1,820	470		1,977	100	62	48	1,930	652		326	320	23,510
3900	3,500,000	2,080	1,960	1,820	500		2,010	100	62	54	2,030	726		363	320	26,080
4400	3,915,000	2,260	2,140	2,000	500		2,160	120	62	56	2,030	726		363	360	30,160
5000	4,500,000	2,360	2,240	2,100	530		2,240	120	62	60	2,140	726		363	360	35,750
5800	5,200,000	2,500	2,380	2,240	560		2,350	130	62	66	2,150	726		363	400	40,850
6700	6,000,000	2,670	2,550	2,430	600		2,508	160	62	54	2,330	792		396	450	48,960

1) Weight assumed without oil and shrink disc



4 Dimension sheets

4.5 2PB type dimension chart



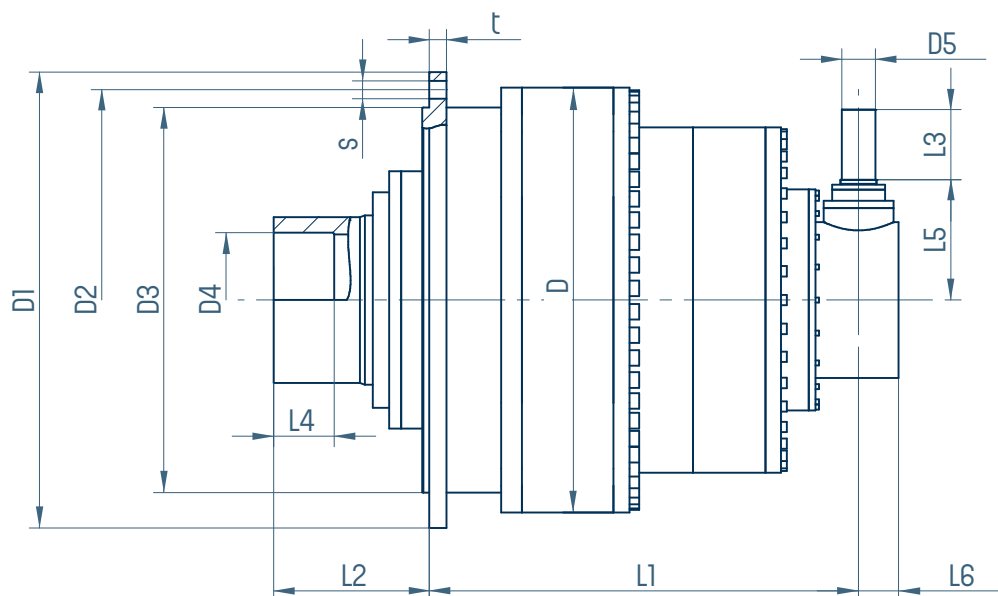
Size	Nominal output torque	D1	D2	D3	D4	D5	D	t	s	No. of bolts	L1	L2	L3	L4	L5	L6	Weight cca. ¹⁾		
[-]	[Nm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]		
0120	105,000	700	635	580	160	See section 71	630	30	26	30	750	252	See section 71	126	491	165	1,200		
0160	145,000	735	680	625	170		696	40	26	38	750	264		132	500	184	1,400		
0230	206,000	900	830	755	190		775	40	33	28	840	300		150	500	195	2,300		
0280	248,000	930	865	785	210		850	40	33	32	840	326		163	570	215	2,500		
0330	300,000	980	915	840	210		925	45	33	38	840	326		163	570	200	2,750		
0460	410,000	1,115	1,025	935	240		1,005	50	39	32	840	352		176	570	180	3,100		
0510	455,000	1,115	1,025	935	250		1,005	50	39	34	1,000	388		194	584	200	3,800		
0590	535,000	1,210	1,120	1,025	250		1,080	55	39	36	1,000	388		194	584	200	4,600		
0680	615,000	1,210	1,120	1,025	270		1,150	55	39	42	1,200	396		198	584	195	5,200		
0790	710,000	1,320	1,220	1,115	290		1,230	55	45	32	1,200	414		207	800	300	5,900		
0890	803,000	1,320	1,220	1,115	290		1,230	60	45	38	1,200	414		207	800	300	6,700		
1000	900,000	1,460	1,345	1,215	320		1,310	65	52	32	1,200	472		236	800	300	7,200		
1100	996,000	1,460	1,345	1,215	320		1,375	65	52	32	1,200	472		236	930	400	7,800		
1200	1,115,000	1,565	1,450	1,320	340		1,375	70	52	36	1,300	494		247	930	400	9,000		
>1200											on request								

1) Weight assumed without oil and shrink disc



4 Dimension sheets

4.6 3PB type dimension chart



Size	Nominal output torque	D1	D2	D3	D4	D5	D	t	s	No. of bolts	L1	L2	L3	L4	L5	L6	Weight cca. ¹⁾		
[-]	[Nm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]		
0120	105,000	700	635	580	160	See section 71	630	30	26	30	800	252	See section 71	126	491	140	1,150		
0160	145,000	735	680	625	170		696	40	26	38	850	264		132	500	140	1,550		
0230	206,000	900	830	755	190		775	40	33	28	900	300		150	500	160	2,050		
0280	248,000	930	865	785	210		850	40	33	32	920	326		163	570	180	2,500		
0330	300,000	980	915	840	210		925	45	33	38	970	326		163	570	180	2,900		
0460	410,000	1,115	1,025	935	240		1,005	50	39	32	1,100	352		176	570	180	3,650		
0510	455,000	1,115	1,025	935	250		1,005	50	39	34	1,150	388		194	584	200	4,000		
0590	535,000	1,210	1,120	1,025	250		1,080	55	39	36	1,200	388		194	584	200	4,600		
0680	615,000	1,210	1,120	1,025	270		1,150	55	39	42	1,250	396		198	584	200	5,150		
0790	710,000	1,320	1,220	1,115	290		1,230	55	45	32	1,300	414		207	700	250	5,950		
0890	803,000	1,320	1,220	1,115	290		1,230	60	45	38	1,350	414		207	700	250	6,700		
1000	900,000	1,460	1,345	1,215	320		1,310	65	52	32	1,400	472		236	700	250	7,400		
1100	996,000	1,460	1,345	1,215	320		1,375	65	52	32	1,450	472		236	800	300	8,200		
1200	1,115,000	1,565	1,450	1,320	340		1,375	70	52	36	1,450	494		247	800	300	9,200		
>1200		on request																	

1) Weight assumed without oil and shrink disc



6 True ratios

Nominal ratios are only theoretical. The true ratio value may vary based on number of teeth and combination

of gear stages. For basic gearbox types, true ratios are as follows.

6.1 2PC type true ratios

Size	Nominal / true ratio			
	20	25	30	38
0120	21.21	24.96	29.84	37.81
0160	21.21	24.96	29.84	37.81
0230	21.21	24.96	29.84	37.81
0280	21.21	24.96	29.84	37.81
0330	21.21	24.96	29.84	37.81
0410	21.21	24.96	29.84	37.81
0460	21.21	24.96	29.84	37.81
0510	21.21	24.96	29.84	37.81
0590	21.21	24.96	29.84	37.81
0680	21.21	24.96	29.84	37.81
0790	21.21	24.96	29.84	37.81
0890	21.21	24.96	29.84	37.81
1000	21.21	24.96	29.84	37.81
1100	21.21	24.96	29.84	37.81
1200	21.21	24.96	29.84	37.81
1400	21.21	24.96	29.84	37.81
1600	21.21	24.96	29.84	37.81
1700	21.21	24.96	29.84	37.81
2100	21.21	24.96	29.84	37.81
2400	21.21	24.96	29.84	37.81
2600	21.21	24.96	29.84	37.81
3000	21.21	24.96	29.84	37.81
3400	21.21	24.96	29.84	37.81
3900	21.21	24.96	29.84	37.81
4400	21.21	24.96	29.84	37.81
5000	21.21	24.96	29.84	37.81
5800	21.21	24.96	29.84	37.81
6700	21.21	24.96	29.84	37.81



6 True ratios

6.2 3PC type true ratios

Size	Nominal / true ratio										
	100	120	140	160	180	200	210	220	250	280	310
0120	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
0160	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
0230	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
0280	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
0330	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
0460	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
0510	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
0590	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
0680	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
0790	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
0890	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
1000	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
1100	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
1200	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
1400	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
1600	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
1700	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
2100	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
2400	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
2600	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
3000	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
3400	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
3900	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
4400	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
5000	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
5800	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45
6700	97.67	114.94	137.43	161.72	174.13	193.38	204.91	221.87	245.02	281.12	310.45



6 True ratios

6.3 2PP type true ratios

Size	Nominal / true ratio							
	40	50	55	60	66	75	80	100
0120	35.13	48.07	55.46	62.74	65.26	72.83	78.04	98.88
0160	40.85	48.07	55.46	57.48	65.26	72.83	78.04	101.35
0230	40.85	48.07	55.46	57.48	69.81	72.83	78.04	98.88
0280	40.85	48.07	55.46	57.48	69.77	72.83	78.04	98.88
0330	40.85	47.64	55.46	57.48	69.77	72.83	78.04	98.88
0460	40.85	48.07	55.55	60.22	63.60	76.48	83.65	98.88
0510	40.85	48.07	55.46	57.48	65.26	72.83	78.04	98.88
0590	40.85	48.07	55.46	57.48	65.26	72.83	87.60	98.88
0680	40.85	48.07	55.46	57.48	63.60	72.83	84.07	98.88
0790	40.85	47.47	55.46	57.48	65.26	72.83	78.04	100.20
0890	40.85	48.07	55.46	57.48	65.26	72.83	78.04	98.88
1000	40.85	48.07	55.46	62.83	65.26	72.83	78.04	90.59
1100	40.85	48.07	55.46	57.48	65.26	72.83	80.33	100.20
1200	40.85	48.07	53.27	57.48	65.26	72.83	80.33	98.88
1400	40.85	48.07	53.27	60.79	65.26	72.83	78.04	98.88
1600	40.85	48.07	53.27	57.48	65.26	72.83	78.04	98.88
1700	40.85	48.07	55.46	57.48	65.26	72.83	78.04	98.88
2100	41.13	48.07	53.91	57.48	65.26	72.83	78.04	98.88
2400	40.85	48.07	55.46	62.83	65.26	72.83	78.04	98.88
2600	41.13	48.07	55.46	57.48	65.26	72.83	78.04	98.88
3000	40.85	48.07	55.46	57.48	65.26	72.83	78.04	98.88
3400	40.85	48.07	55.46	62.83	65.26	72.83	78.04	98.88
3900	40.85	48.07	55.46	60.08	65.26	72.83	78.04	98.88
4400	40.85	48.07	55.46	62.83	65.26	72.83	78.04	98.88
5000	40.85	48.07	55.46	60.08	65.26	72.83	78.04	98.88
5800	40.85	48.07	55.46	57.48	65.26	72.83	78.04	98.88
6700	40.85	48.07	55.46	62.83	69.33	72.83	78.04	98.88

1 Introduction
 2 Product description and key features
 3 Gearbox selection
 4 Dimension sheets
 5 Power Ratings
 6 True ratios
 7 High and low speed shaft variants
 8 Mounting equipment



6 True ratios

6.4 3PP type true ratios

Size	Nominal / true ratio												
	315	335	360	400	430	470	540	600	640	730	800	900	1000
0120	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
0160	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
0230	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
0280	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
0330	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
0460	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
0510	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
0590	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
0680	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
0790	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
0890	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
1000	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
1100	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
1200	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
1400	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
1600	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
1700	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
2100	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
2400	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
2600	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
3000	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
3400	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
3900	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
4400	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
5000	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
5800	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87
6700	311.48	335.38	372.44	394.67	427.32	471.91	541.44	597.93	640.73	735.13	811.84	910.83	1,005.87



6 True ratios

6.5 2PB type true ratios

Size	Nominal / true ratio								
	32,5	40	48	61,5	68,5	80	96	122	145
0120	34.36	40.43	48.34	61.25	68.50	82.55	96.39	122.13	145.93
0160	34.36	40.43	48.34	61.25	68.52	82.55	96.39	110.73	145.93
0230	34.36	42.30	52.73	61.25	68.50	83.50	96.39	122.13	145.93
0280	34.36	40.43	48.34	60.83	68.50	80.61	93.00	112.50	145.93
0330	34.36	40.43	48.34	61.25	68.50	80.61	96.39	122.13	145.93
0460	34.36	40.43	48.34	61.25	68.50	80.61	96.39	112.50	145.93
0510	34.36	40.43	48.34	61.25	68.50	80.61	96.39	122.13	145.93
0590	34.36	40.43	48.34	61.25	68.50	80.61	96.39	122.13	145.93
0680	34.36	40.43	48.34	61.25	68.50	80.61	96.39	122.13	145.93
0790	34.36	40.43	48.34	61.25	68.50	80.61	96.39	122.13	145.93
0890	34.36	40.43	48.34	61.25	68.50	80.61	96.39	122.13	145.93
1000	34.36	40.43	48.34	61.25	68.50	80.61	96.39	122.13	145.93
1100	34.36	40.43	48.34	61.25	68.50	80.61	96.39	122.13	145.93
1200	34.36	40.43	48.34	61.25	68.50	80.61	96.39	122.13	152.50



6 True ratios

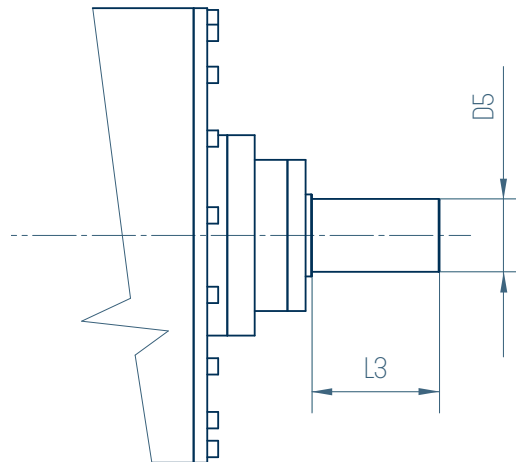
6.6 3PB type true ratios

Size	Nominal / true ratio																					
	160	185	220	260	280	315	330	360	400	450	500	560	630	680	710	800	900	1000	1100	1200	1400	1500
0120	158.23	186.20	222.64	261.99	282.09	313.27	331.96	359.43	396.93	455.42	502.93	562.45	624.61	661.87	716.64	791.41	908.02	1,002.76	1,084.94	1,198.14	1,374.68	1,517.77
0160	158.23	186.20	222.64	261.99	282.09	313.27	331.96	359.43	396.93	455.42	502.93	562.45	624.61	661.87	716.64	791.41	908.02	1,002.76	1,084.94	1,198.14	1,374.68	1,518.12
0230	158.23	186.20	222.64	261.99	282.09	313.27	331.96	359.43	396.93	455.42	502.00	562.45	624.61	661.87	716.64	791.41	908.02	1,002.76	1,084.94	1,198.14	1,374.68	1,518.12
0280	158.23	186.20	222.64	261.99	282.09	313.27	331.96	359.43	396.93	455.42	495.53	597.23	624.61	661.87	716.64	791.41	908.02	1,002.76	1,084.94	1,198.14	1,374.68	1,518.12
0330	158.23	186.20	222.64	261.99	282.09	313.27	331.96	359.43	396.93	455.42	502.93	562.45	624.61	661.87	716.64	791.41	908.02	1,002.76	1,084.94	1,197.87	1,374.68	1,518.12
0460	158.23	186.20	222.64	261.99	282.09	313.27	331.96	359.43	396.93	455.42	502.93	562.45	624.61	661.87	716.64	791.41	908.02	1,002.76	1,084.94	1,198.14	1,374.68	1,518.12
0510	158.23	186.20	222.64	261.99	282.09	313.27	331.96	359.43	396.93	455.42	502.93	562.45	624.61	661.87	716.64	791.41	908.02	1,002.76	1,084.94	1,198.14	1,374.68	1,518.12
0590	158.23	186.20	226.90	261.99	282.09	313.27	331.96	359.43	396.93	455.42	502.93	562.45	624.61	661.87	716.64	791.41	908.02	1,002.76	1,084.94	1,198.14	1,374.68	1,518.12
0680	159.80	186.20	222.64	261.99	282.09	313.27	331.96	359.43	396.93	455.42	502.93	562.45	624.61	661.87	716.64	791.41	908.02	1,002.76	1,084.94	1,198.14	1,374.68	1,518.12
0790	158.23	186.20	222.64	261.99	282.09	313.27	331.96	359.43	396.93	455.42	502.93	562.45	624.61	661.87	716.64	791.41	908.02	1,002.76	1,084.94	1,198.14	1,374.68	1,518.12
0890	158.23	186.20	201.66	261.99	282.09	313.27	331.96	359.43	396.93	455.42	502.93	562.45	624.61	661.87	716.64	791.41	908.02	1,002.76	1,084.94	1,198.14	1,374.68	1,518.12
1000	158.23	186.20	222.64	261.99	282.09	313.27	331.96	359.43	396.93	455.42	502.93	562.45	624.61	661.87	716.64	791.41	908.02	1,002.76	1,084.94	1,198.14	1,374.68	1,518.12
1100	158.23	186.20	222.64	261.99	282.09	313.27	331.96	359.43	396.93	455.42	502.93	562.45	624.61	661.87	716.64	791.41	908.02	1,002.76	1,084.94	1,198.14	1,374.68	1,518.12
1200	169.16	175.00	247.88	264.70	282.09	313.27	331.96	359.43	396.93	455.42	502.93	562.45	624.61	661.87	716.64	791.41	908.02	1,002.76	1,084.94	1,198.14	1,374.68	1,518.12



7 High and low speed shaft variants

7.1 High speed shaft with parallel key



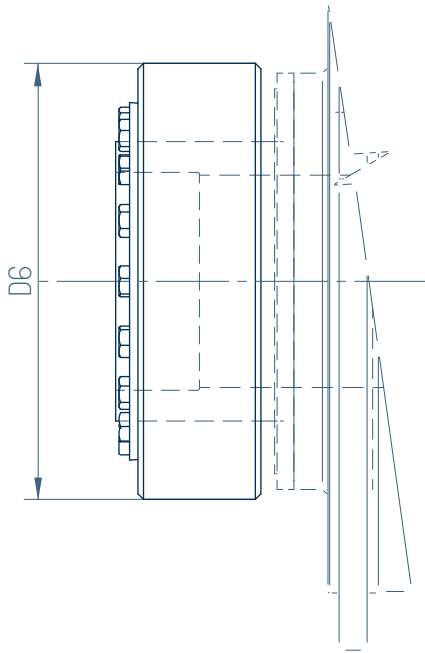
Shaft keys are designed according to DIN 6895/1

Size	Gear ratio / High speed shaft dimensions									
	20-30		over 30 - 50		over 50-100		over 100-300		over 300-1000	
	D5	L3	D5	L3	D5	L3	D5	L3	D5	L3
[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
0120	100	165	90	130	80	130	50	82	40	60
0160	110	165	100	165	80	130	60	105	40	60
0230	125	165	110	165	80	130	60	105	50	82
0280	140	200	125	165	80	130	70	105	50	82
0330	140	200	125	165	90	130	70	105	60	105
0460	160	240	140	200	90	130	80	130	70	105
0510	160	240	140	200	90	130	80	130	70	105
0590	180	240	160	240	100	165	90	130	80	130
0680	180	240	160	240	110	165	90	130	80	130
0790	200	280	180	240	125	165	90	130	80	130
0890	200	280	180	240	125	165	100	165	90	130
1000	200	280	200	280	140	200	100	165	90	130
1100	220	280	200	280	140	200	100	165	90	130
1200	220	280	200	280	140	200	110	165	100	165
1400	250	330	220	280	160	240	125	165	100	165
1600	250	330	220	280	160	240	125	165	100	165
1700	250	330	220	280	180	240	125	165	110	165
2100	280	380	250	330	200	280	140	200	125	165
2400	280	380	250	330	200	280	140	200	125	165
2600	320	430	250	330	200	280	160	240	140	200
3000	320	430	280	380	220	280	160	240	140	200
3400	350	480	280	380	220	280	180	240	140	200
3900	350	480	320	430	220	280	180	240	160	240
4400	380	500	320	430	220	280	200	280	160	240
5000	380	500	350	480	250	330	200	280	180	240
5800	410	530	350	480	250	330	200	280	180	240
6700	410	530	380	500	250	330	220	280	200	280



7 High and low speed shaft variants

7.2 Low speed hollow shaft with shrink disc

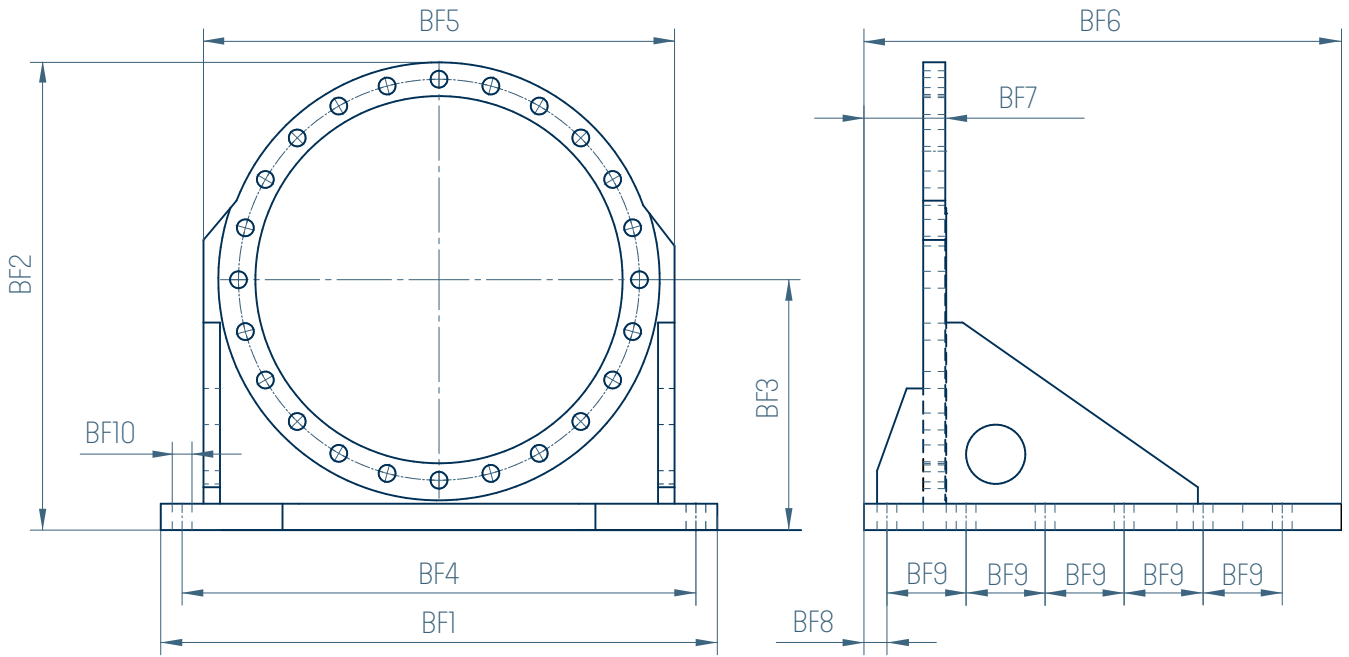


Size	D6	Shrink disc weight
[-]	[mm]	[kg]
0120	460	126
0160	520	171
0230	570	235
0280	570	235
0330	590	251
0460	650	324
0510	670	390
0590	720	505
0680	750	522
0790	780	642
0890	830	714
1000	830	714
1100	860	899
1200	920	1,002
1400	960	1,155
1600	960	1,155
1700	1,000	1,379
2100	1,180	1,582
2400	1,140	1,799
2600	1,190	2,180
3000	1,190	2,180
3400	1,300	2,290
3900	1,350	2,580
4400	1,350	2,580
5000	1,450	3,231
5800	1,490	3,418
6700	1,540	3,774



8 Mounting equipment

8.1 Foot base frame

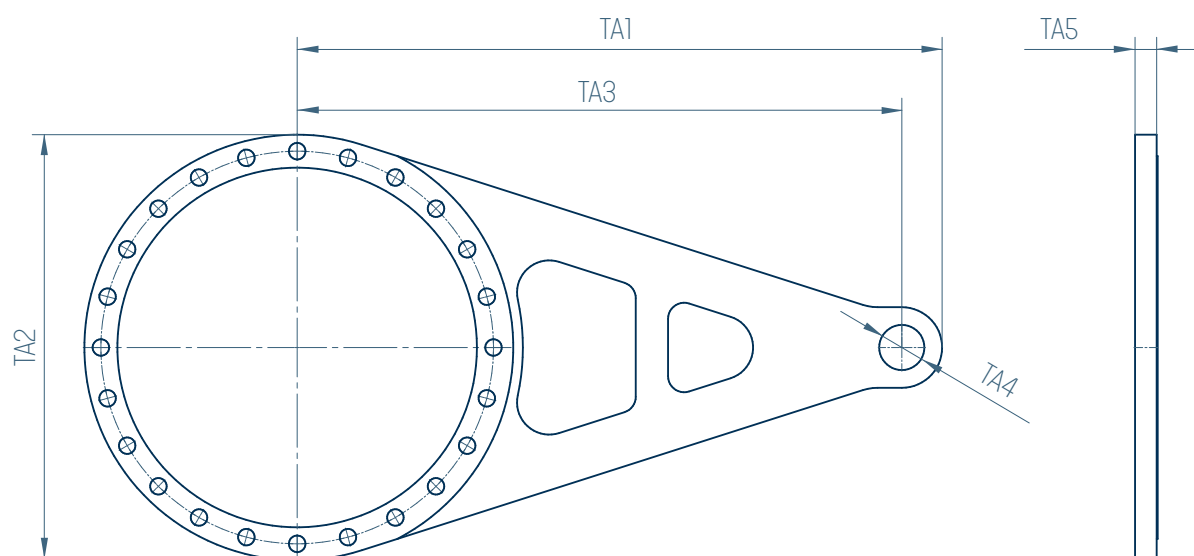


Size	BF1	BF2	BF3	BF4	BF5	BF6	BF7	BF8	BF9	BF10	Weight cca.
[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
0120	1,040	760	410	960	840	750	147	40	130	33	300
0160	1,090	830	440	1,010	890	815	157	45	140	33	320
0230	1,250	953	500	1,150	1,025	847	162	48	145	39	450
0280	1,300	990	520	1,200	1,060	879	167	51	150	39	485
0330	1,390	1,045	550	1,270	1,110	911	172	54	155	45	530
0330	1,440	1,085	570	1,320	1,160	944	177	56	160	45	640
0460	1,570	1,183	620	1,440	1,255	976	182	59	165	52	740
0510	1,580	1,183	620	1,450	1,255	1,008	187	62	170	52	750
0590	1,660	1,280	670	1,530	1,350	1,040	192	65	175	52	830
0680	1,730	1,280	670	1,580	1,360	1,073	197	67	180	62	940
0790	1,840	1,390	730	1,690	1,470	1,105	202	70	185	62	1,150
0890	1,840	1,390	730	1,690	1,472	1,137	207	73	190	62	1,250
1000	1,990	1,535	800	1,840	1,620	1,170	212	75	195	62	1,395
1100	2,040	1,535	800	1,870	1,620	1,202	217	78	200	70	1,425
1200	2,150	1,638	850	1,970	1,725	1,234	222	81	205	70	1,735
1400	2,160	1,648	860	1,980	1,735	1,266	227	84	210	70	1,730
1600	2,260	1,748	910	2,080	1,835	1,299	232	86	215	70	1,895
1700	2,260	1,748	910	2,080	1,835	1,331	237	89	220	70	1,910
2100	2,400	1,843	960	2,210	1,935	1,395	247	95	230	78	2,260
2400	2,400	1,843	960	2,210	1,935	1,428	252	97	235	78	2,270
2600	2,600	2,035	1,060	2,410	2,135	1,460	257	100	240	78	2,800
3000	2,600	2,035	1,060	2,410	2,135	1,460	257	100	240	78	2,800
3400	2,790	2,175	1,130	2,570	2,270	1,527	267	106	250	86	3,115
3900	2,810	2,185	1,140	2,590	2,290	1,560	272	109	255	86	3,420
4400	2,990	2,365	1,230	2,770	2,470	1,593	277	112	260	86	3,820
5000	3,040	2,460	1,280	2,840	2,570	1,650	300	100	250	78	4,295
5800	3,240	2,605	1,350	3,020	2,720	1,659	287	118	270	86	4,670
6700	3,420	2,708	1,445	3,200	2,900	1,750	292	121	275	86	5,720



8 Mounting equipment

8.2 Torque reaction arm



Size	TA1	TA2	TA3	TA4	TA5	Weight cca.
[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
0120	931	700	834	97	37	80
0160	1,067	735	964	103	40	95
0230	1,205	905	1,096	109	42	140
0280	1,273	940	1,161	112	43	155
0330	1,341	990	1,230	115	45	170
0460	1,477	1,125	1,361	121	48	235
0510	1,545	1,125	1,427	124	50	250
0590	1,614	1,220	1,493	127	51	280
0680	1,682	1,220	1,559	130	53	300
0790	1,750	1,330	1,625	133	55	350
0890	1,818	1,330	1,691	135	56	430
1000	1,886	1,470	1,757	138	58	445
1100	1,955	1,470	1,823	141	59	465
1200	2,023	1,575	1,889	144	61	515
1400	2,091	1,575	1,955	147	62	540
1600	2,159	1,675	2,020	150	64	605
1700	2,227	1,675	2,086	153	66	640
2100	2,364	1,765	2,218	159	69	720
2400	2,432	1,765	2,284	162	70	745
2600	2,500	1,945	2,350	165	72	800
3000	2,594	1,945	2,426	171	72	900
3400	2,695	2,090	2,512	177	82	1,040
3900	2,796	2,080	2,598	183	92	1,210
4400	2,897	2,270	2,684	189	102	1,460
5000	2,998	2,360	2,770	195	112	1,620
5800	3,099	2,500	2,856	201	122	1,840
6700	3,200	2,670	3,000	207	132	2,170



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