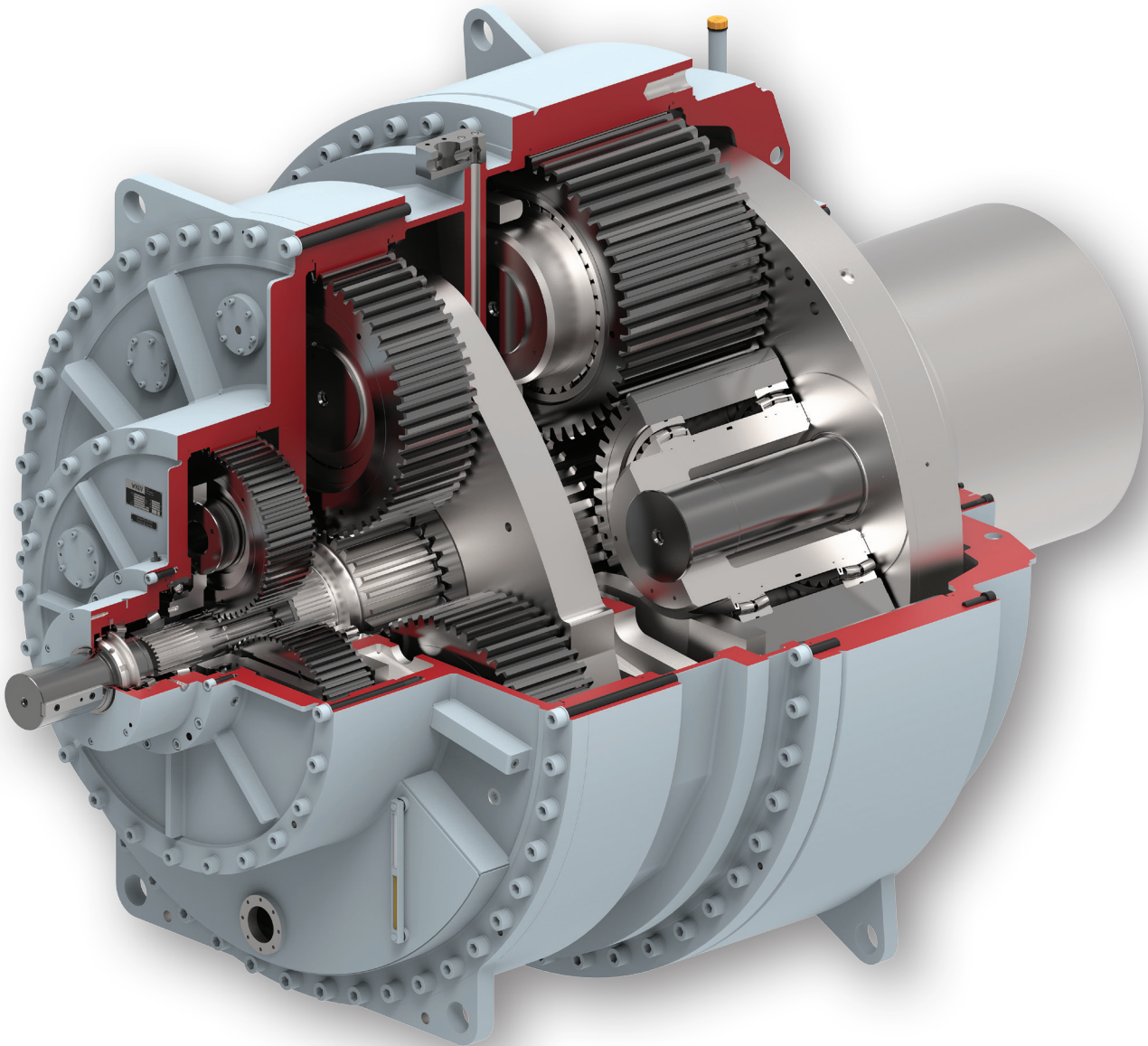


Orbi-flex[®]

Planetary Gear Units Series

WIKOV.COM



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.

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

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



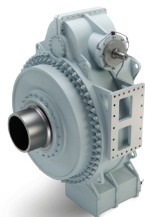
1 Introduction

1.2 Product portfolio

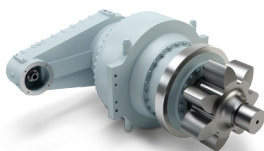
We have been delivering our products to many industries all around the world.

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

Mining Industry



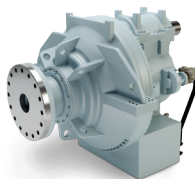
Oil & Gas



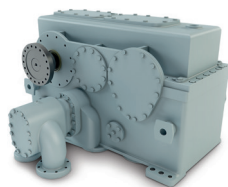
Wind & Tidal



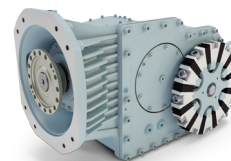
Hydro Energy



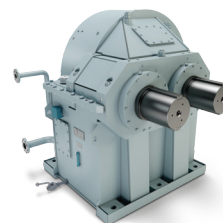
Power Generation



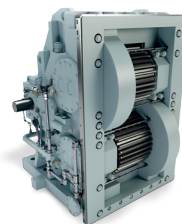
Rail Vehicles



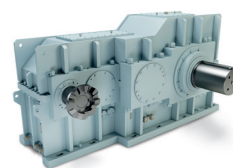
Rubber & Plastics



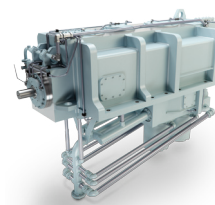
Cement Industry



Sugar Industry



Steel Industry



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

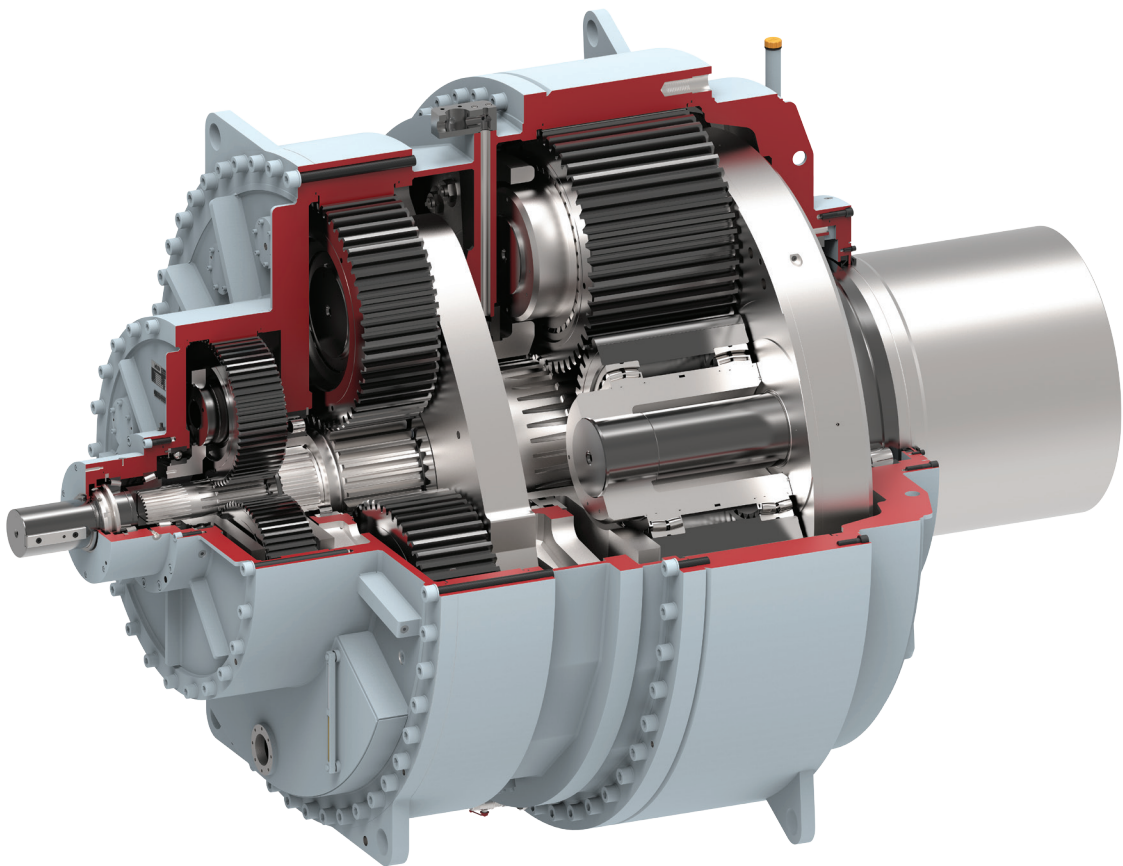


Fig. 1 – Cross-section of the Orbi-flex® planetary gear unit with a flexible pin



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.

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

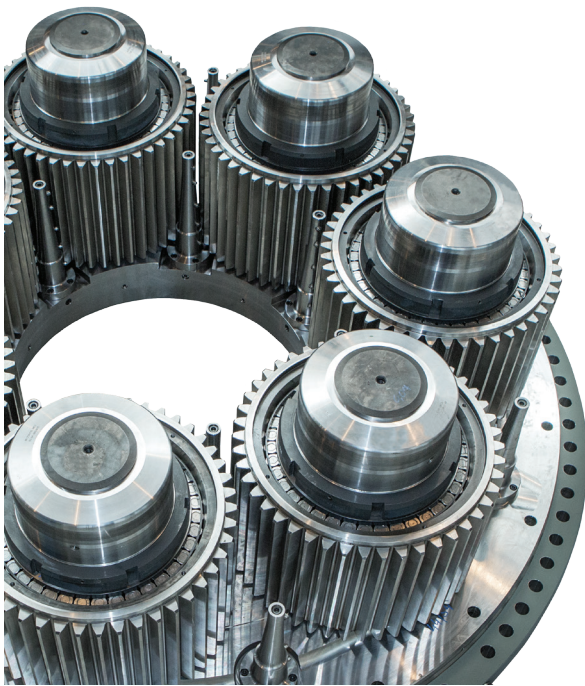


Fig. 2 – Multi-planet gear stage

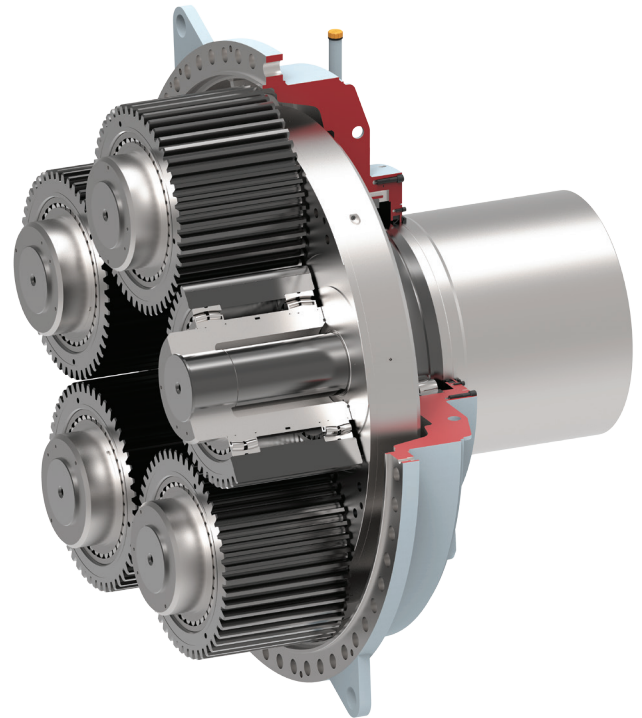


Fig. 3 – Multi-planet gear stage

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

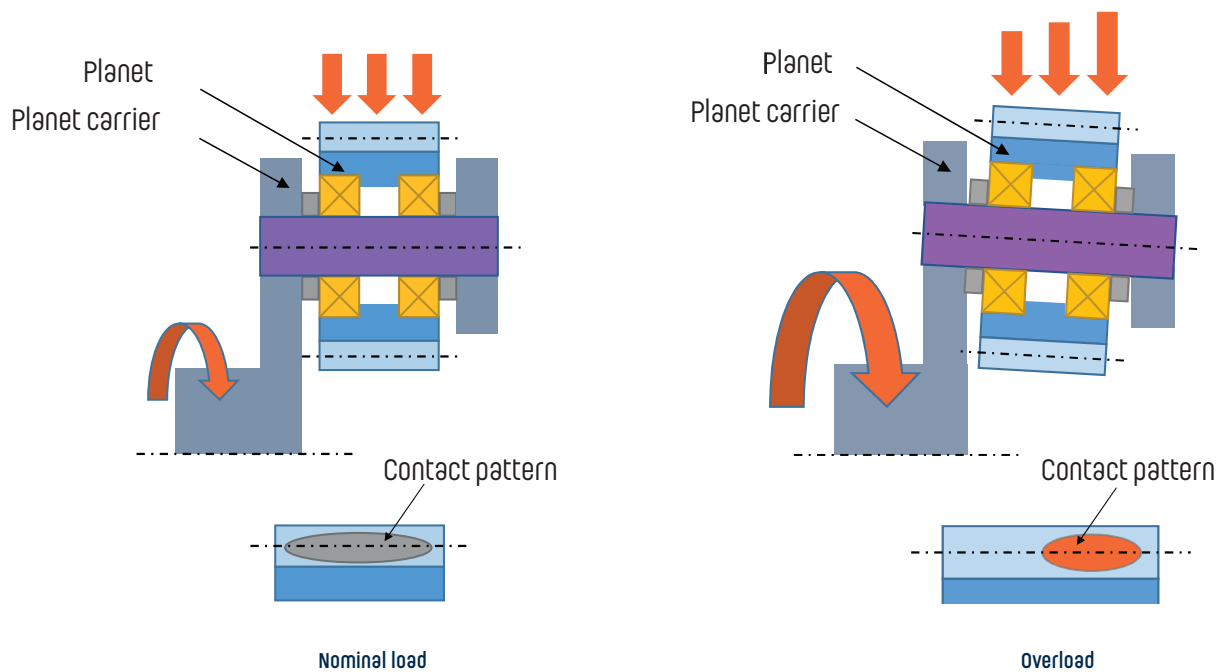


Fig. 4 – Conventional planetary stage



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

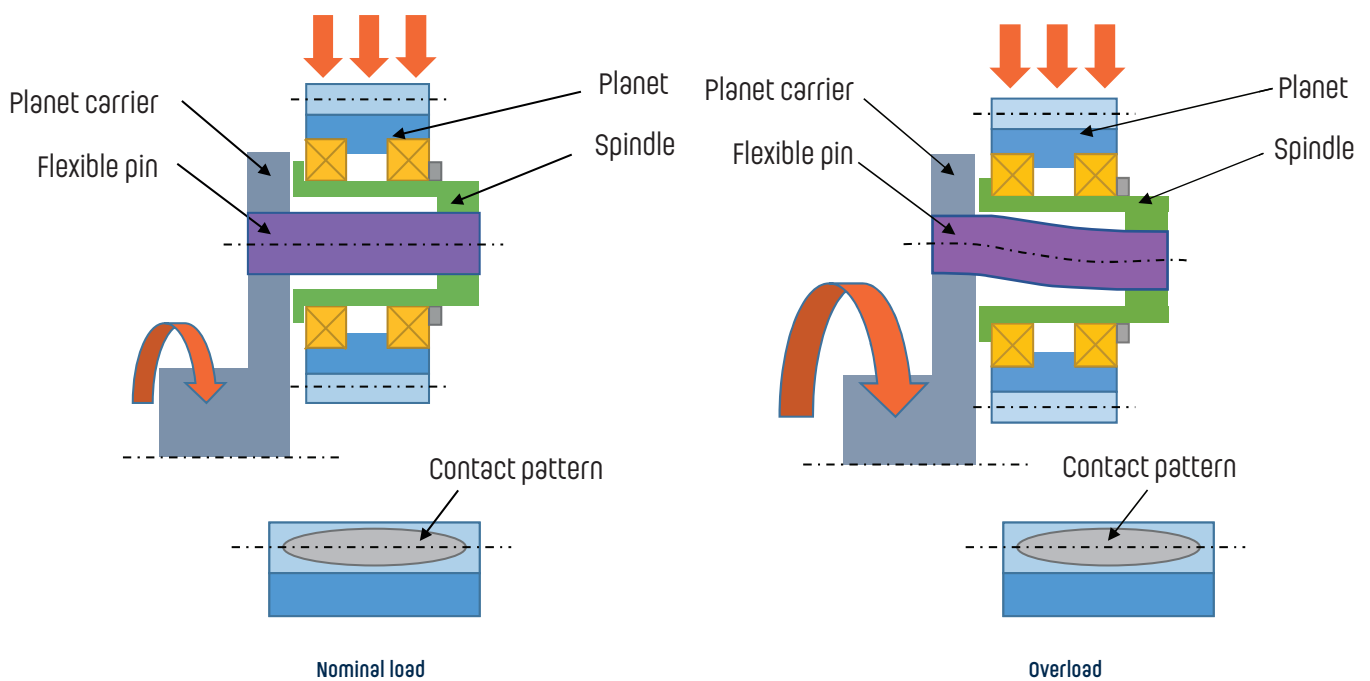


Fig. 5 – Flexible pin planetary stage



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-palloid 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 carefull gear microgeometry optimization and gearbox housing design.

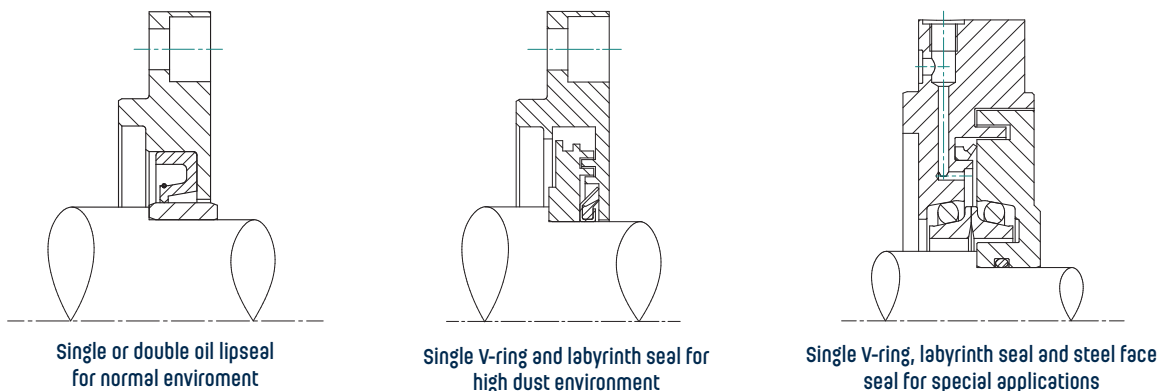


Fig. 6 – Sealing solution examples

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.

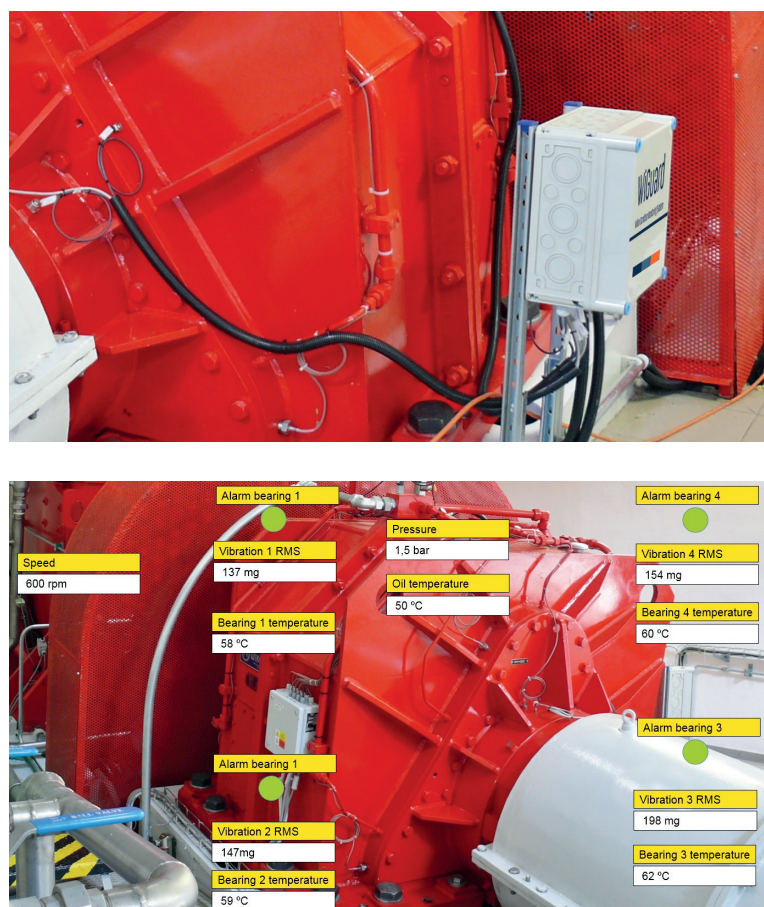


Fig. 7 – WiGuard - condition monitoring system



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.

2.3.5 Copyright

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2.3.6 Trade marks

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



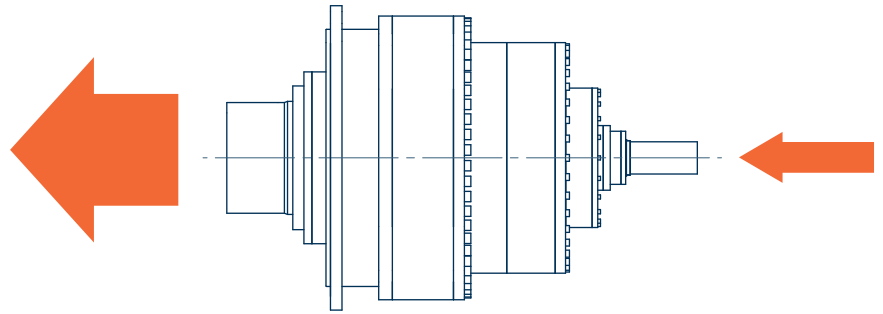
2 Product description and key features

2.4 Summary of basic types

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

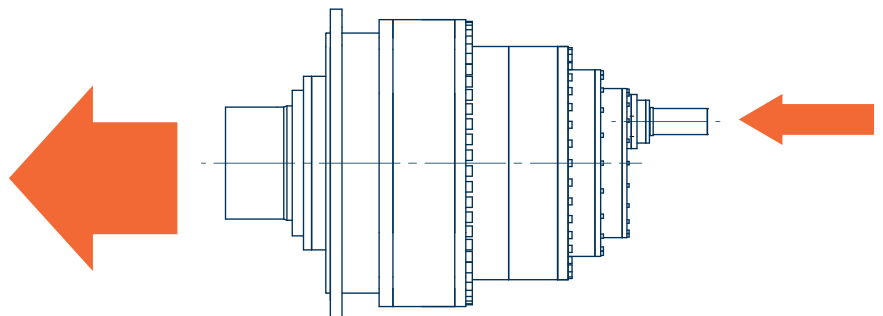
Single or multi-stage co-axial

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

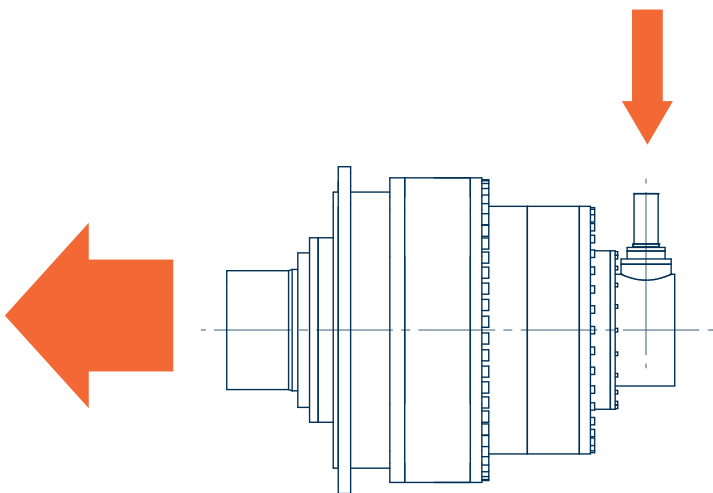


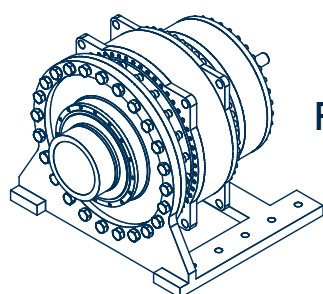
Fig. 8 – Summary of basic variants



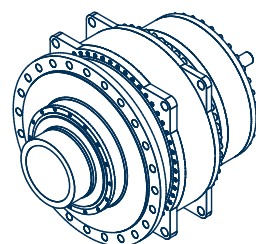
2 Product description and key features

2.5 Mounting arrangements

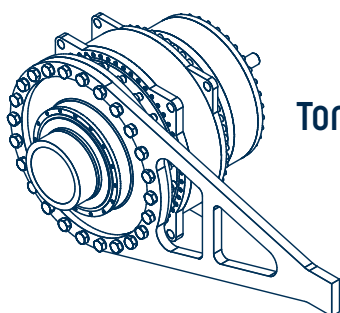
Following gearbox mounting arrangements (fig. 9) are available as standard. Other possible arrangements are available on a request.



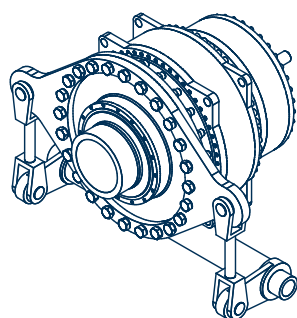
Foot base



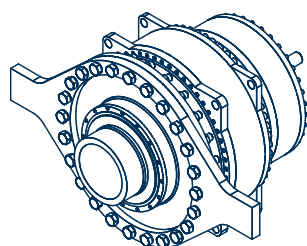
Flange



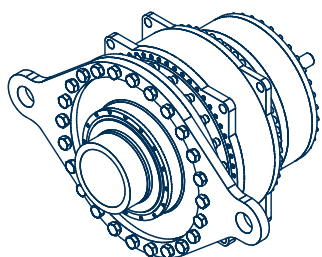
Torque arm



Torque linkage



ESM mounts
(torque only)



ESM mounts

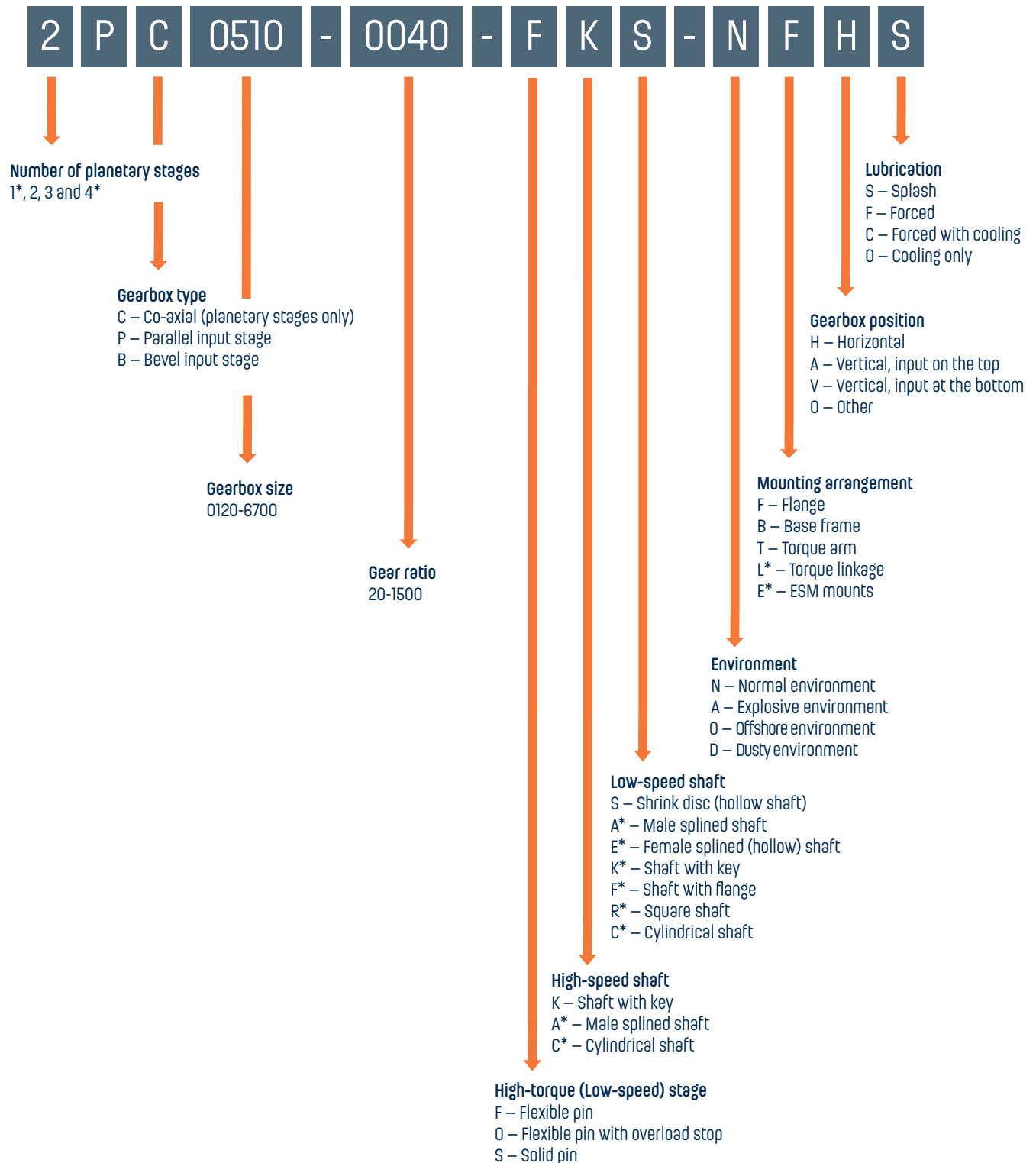
Fig. 9 Gearbox mounting arrangements

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



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	Bagasse 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	Aerators	-	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



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			80	
		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	1.7	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 Pth [kW]																				
[-]	0120	0160	0230	0280	0330	0460	0510	0590	0680	0790	0890	1000	1100	1200	1400	1600	1700	2100	2400	2600	3000
2PC/2PB/2PP	98	113	135	152	171	209	223	247	270	295	319	343	366	393	422	452	485	555	593	630	685
3PC/3PB/3PP	71	82	96	108	123	150	161	178	195	214	231	248	265	284	305	327	351	401	428	454	483

Gearbox type	Gearbox size / Gearbox thermal power rating Pth [kW]					
[-]	3400	3900	4400	5000	5800	6700
2PC/2PB/2PP	723	768	798	823	852	875
3PC/3PB/3PP	509	531	553	572	587	603

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

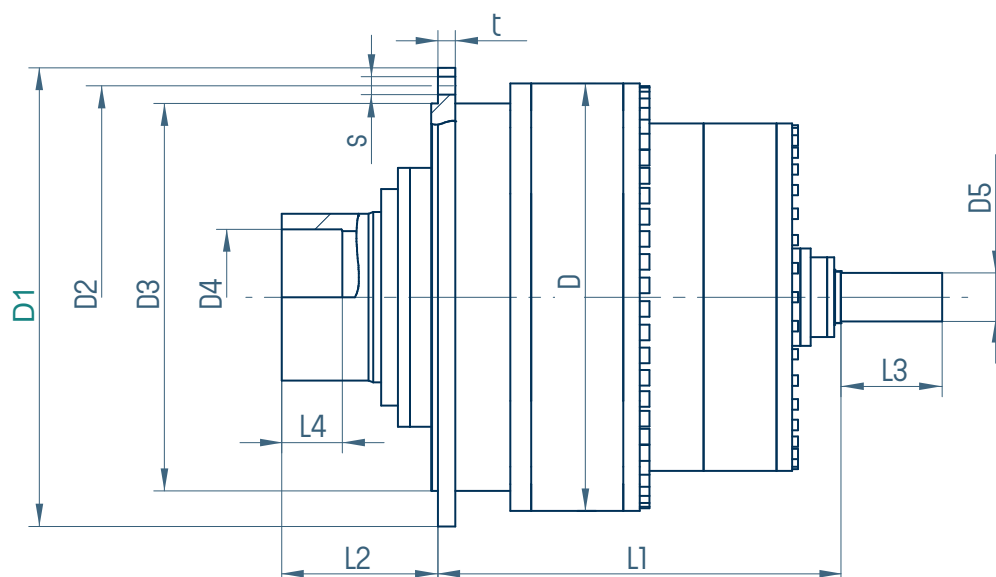
3.15 Reference speed – low-speed side n_{2b}

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



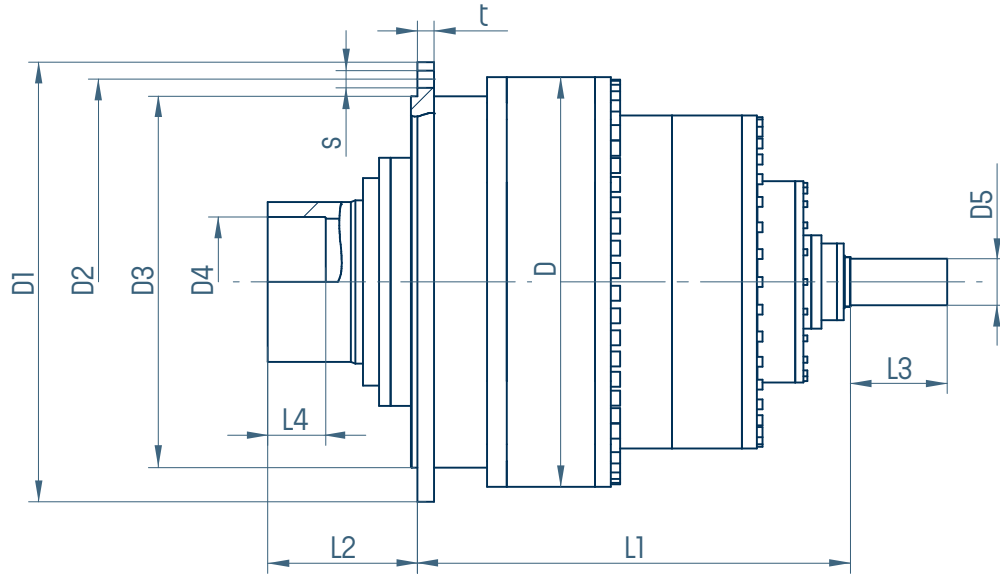
Size	Nominal output torque	D1	D2	D3	D4	D5	D	t	s	No. of bolts	L1	L2	L3	L4	Weight cca. ¹⁾
[-]	[Nm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]	[mm]	[mm]	[mm]	[kg]
0120	105,000	700	635	580	210	See section 7.1	630	30	26	30	650	252	See section 7.1	126	850
0160	145,000	735	680	625	240		696	40	26	38	720	264		132	1,100
0230	206,000	900	830	755	250		775	40	33	28	790	300		150	1,350
0280	248,000	930	865	785	280		850	40	33	32	830	326		163	1,570
0330	300,000	980	915	840	300		925	45	33	38	880	326		163	1,840
0460	410,000	1,115	1,025	935	350		1,005	50	39	32	970	352		176	2,580
0510	455,000	1,115	1,025	935	350		1,005	50	39	34	1,010	388		194	2,920
0590	535,000	1,210	1,120	1,025	360		1,080	55	39	36	1,070	388		194	3,495
0680	615,000	1,210	1,120	1,025	380		1,150	55	39	42	1,120	396		198	4,100
0790	710,000	1,320	1,220	1,115	400		1,230	55	45	32	1,180	414		207	4,900
0890	803,000	1,320	1,220	1,115	430		1,230	60	45	38	1,225	414		207	5,600
1000	900,000	1,460	1,345	1,215	430		1,310	65	52	32	1,270	472		236	6,350
1100	996,000	1,460	1,345	1,215	440		1,375	65	52	32	1,310	472		236	7,080
1200	1,115,000	1,565	1,450	1,320	460		1,375	70	52	36	1,360	494		247	8,050
1400	1,250,000	1,565	1,450	1,320	470		1,468	70	52	36	1,400	494		247	9,010
1600	1,395,000	1,665	1,545	1,400	500		1,470	75	62	32	1,445	494		247	9,950
1700	1,560,000	1,665	1,545	1,400	520		1,540	75	62	32	1,495	542		271	11,100
2100	1,930,000	1,755	1,635	1,495	570		1,630	80	62	36	1,610	540		270	13,700
2400	2,145,000	1,755	1,635	1,495	600		1,695	90	62	40	1,670	608		304	15,000
2600	2,360,000	1,945	1,825	1,685	600		1,775	90	62	40	1,605	608		304	16,700
3000	2,728,000	1,945	1,825	1,685	650		1,850	90	62	46	1,760	608		304	18,500
3400	3,060,000	2,080	1,960	1,820	700		1,977	100	62	48	1,830	652		326	22,000
3900	3,500,000	2,080	1,960	1,820	730		2,010	100	62	54	1,900	726		363	23,500
4400	3,915,000	2,260	2,140	2,000	760		2,160	120	62	56	1,970	726		363	27,500
5000	4,500,000	2,360	2,240	2,100	780		2,240	120	62	60	2,050	726		363	32,000
5800	5,200,000	2,500	2,380	2,240	860		2,350	130	62	66	2,100	726		363	37,000
6700	6,000,000	2,670	2,550	2,430	880		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



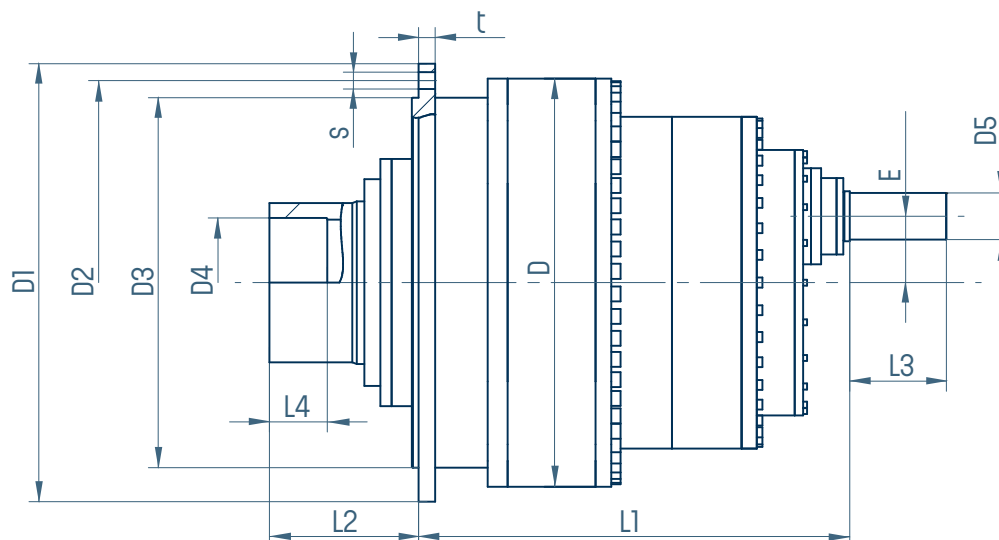
Size	Nominal output torque	D1	D2	D3	D4	D5	D	t	s	No. of bolts	L1	L2	L3	L4	Weight cca. ¹⁾
[-]	[Nm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]	[mm]	[mm]	[mm]	[kg]
0120	105,000	700	635	580	210	See section 71	630	30	26	30	740	252	See section 71	126	1,000
0160	145,000	735	680	625	240		696	40	26	38	800	264		132	1,200
0230	206,000	900	830	755	250		775	40	33	28	852	300		150	1,700
0280	248,000	930	865	785	280		850	40	33	32	870	326		163	2,100
0330	300,000	980	915	840	300		925	45	33	38	920	326		163	2,500
0460	410,000	1,115	1,025	935	350		1,005	50	39	32	1,005	352		176	3,250
0510	455,000	1,115	1,025	935	350		1,005	50	39	34	1,040	388		194	3,600
0590	535,000	1,210	1,120	1,025	360		1,080	55	39	36	1,100	388		194	4,200
0680	615,000	1,210	1,120	1,025	380		1,150	55	39	42	1,150	396		198	4,750
0790	710,000	1,320	1,220	1,115	400		1,230	55	45	32	1,200	414		207	5,450
0890	803,000	1,320	1,220	1,115	430		1,230	60	45	38	1,250	414		207	6,100
1000	900,000	1,460	1,345	1,215	430		1,310	65	52	32	1,295	472		236	7,000
1100	996,000	1,460	1,345	1,215	440		1,375	65	52	32	1,335	472		236	7,450
1200	1,115,000	1,565	1,450	1,320	460		1,375	70	52	36	1,380	494		247	8,350
1400	1,250,000	1,565	1,450	1,320	470		1,468	70	52	36	1,580	494		247	10,000
1600	1,395,000	1,665	1,545	1,400	500		1,470	75	62	32	1,460	494		247	10,500
1700	1,560,000	1,665	1,545	1,400	520		1,540	75	62	32	1,510	542		271	11,500
2100	1,930,000	1,755	1,635	1,495	570		1,630	80	62	36	1,750	540		270	14,100
2400	2,145,000	1,755	1,635	1,495	600		1,695	90	62	40	1,735	608		304	16,000
2600	2,360,000	1,945	1,825	1,685	600		1,775	90	62	40	1,750	608		304	17,700
3000	2,728,000	1,945	1,825	1,685	650		1,850	90	62	46	1,850	608		304	19,500
3400	3,060,000	2,080	1,960	1,820	700		1,977	100	62	48	1,900	652		326	23,000
3900	3,500,000	2,080	1,960	1,820	730		2,010	100	62	54	2,000	726		363	25,500
4400	3,915,000	2,260	2,140	2,000	760		2,160	120	62	56	1,990	726		363	29,500
5000	4,500,000	2,360	2,240	2,100	780		2,240	120	62	60	2,110	726		363	35,000
5800	5,200,000	2,500	2,380	2,240	860		2,350	130	62	66	2,120	726		363	40,000
6700	6,000,000	2,670	2,550	2,430	880		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



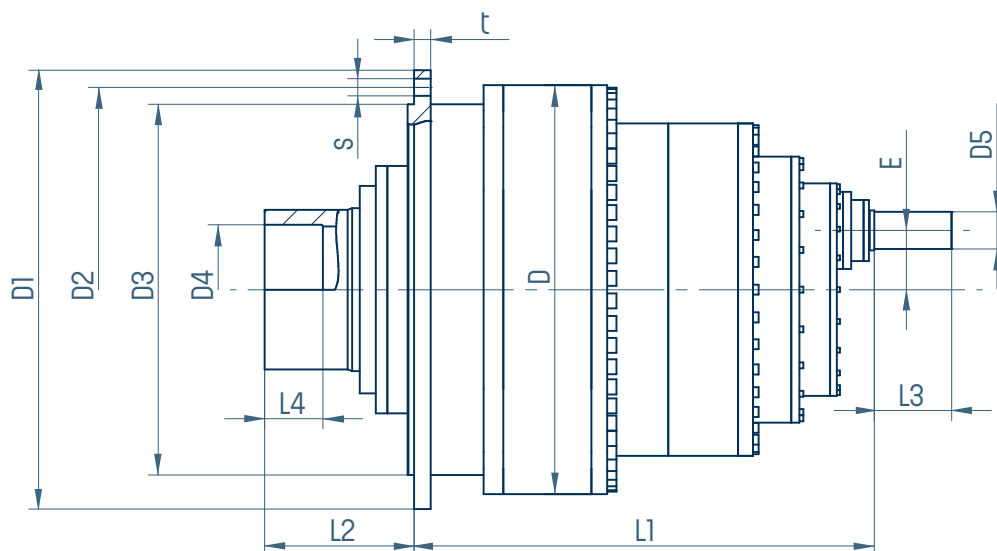
Size	Nominal output torque	D1	D2	D3	D4	D5	D	t	s	No. of bolts	L1	L2	L3	L4	E	Weight cca. ¹⁾
[-]	[Nm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
0120	105,000	700	635	580	210	See section 7.1	630	30	26	30	743	252	See section 7.1	126	192	1,100
0160	145,000	735	680	625	240		696	40	26	38	923	264		132	200	1,500
0230	206,000	900	830	755	250		775	40	33	28	980	300		150	200	2,000
0280	248,000	930	865	785	280		850	40	33	32	980	326		163	200	2,200
0330	300,000	980	915	840	300		925	45	33	38	1,050	326		163	200	2,700
0460	410,000	1,115	1,025	935	350		1,005	50	39	32	1,150	352		176	257	3,500
0510	455,000	1,115	1,025	935	350		1,005	50	39	34	1,150	388		194	260	3,800
0590	535,000	1,210	1,120	1,025	360		1,080	55	39	36	1,230	388		194	308	4,300
0680	615,000	1,210	1,120	1,025	380		1,150	55	39	42	1,270	396		198	264	5,080
0790	710,000	1,320	1,220	1,115	400		1,230	55	45	32	1,280	414		207	310	5,700
0890	803,000	1,320	1,220	1,115	430		1,230	60	45	38	1,380	414		207	310	6,300
1000	900,000	1,460	1,345	1,215	430		1,310	65	52	32	1,380	472		236	380	6,800
1100	996,000	1,460	1,345	1,215	440		1,375	65	52	32	1,385	472		236	320	8,100
1200	1,115,000	1,565	1,450	1,320	460		1,375	70	52	36	1,507	494		247	360	9,000
1400	1,250,000	1,565	1,450	1,320	470		1,468	70	52	36	1,644	494		247	375	9,600
1600	1,395,000	1,665	1,545	1,400	500		1,470	75	62	32	1,425	494		247	360	10,500
1700	1,560,000	1,665	1,545	1,400	520		1,540	75	62	32	1,550	542		271	400	11,500
2100	1,930,000	1,755	1,635	1,495	570		1,630	80	62	36	1,815	540		270	445	14,300
2400	2,145,000	1,755	1,635	1,495	600		1,695	90	62	40	1,775	608		304	448	15,650
2600	2,360,000	1,945	1,825	1,685	600		1,775	90	62	40	1,870	608		304	450	17,500
3000	2,728,000	1,945	1,825	1,685	650		1,850	90	62	46	1,970	608		304	450	19,500
3400	3,060,000	2,080	1,960	1,820	700		1,977	100	62	48	2,057	652		326	490	21,700
3900	3,500,000	2,080	1,960	1,820	730		2,010	100	62	54	2,150	726		363	510	25,000
4400	3,915,000	2,260	2,140	2,000	760		2,160	120	62	56	2,217	726		363	535	28,200
5000	4,500,000	2,360	2,240	2,100	780		2,240	120	62	60	2,487	726		363	560	35,000
5800	5,200,000	2,500	2,380	2,240	860		2,350	130	62	66	2,520	726		363	630	40,000
6700	6,000,000	2,670	2,550	2,430	880		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



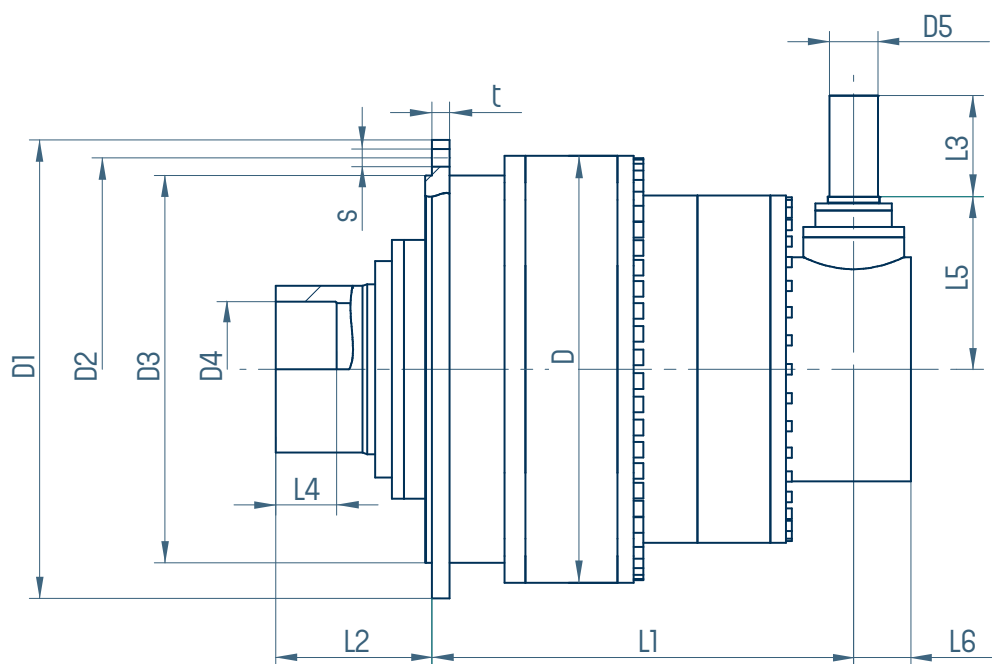
Size	Nominal output torque	D1	D2	D3	D4	D5	D	t	s	No. of bolts	L1	L2	L3	L4	E	Weight cca. ¹⁾
[-]	[Nm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
0120	105,000	700	635	580	210	See section 7.1	630	30	26	30	790	252	See section 7.1	126	95	1,150
0160	145,000	735	680	625	240		696	40	26	38	830	264		132	110	1,550
0230	206,000	900	830	755	250		775	40	33	28	882	300		150	110	2,050
0280	248,000	930	865	785	280		850	40	33	32	900	326		163	135	2,500
0330	300,000	980	915	840	300		925	45	33	38	950	326		163	135	2,900
0460	410,000	1,115	1,025	935	350		1,005	50	39	32	1,035	352		176	150	3,650
0510	455,000	1,115	1,025	935	350		1,005	50	39	34	1,070	388		194	150	4,000
0590	535,000	1,210	1,120	1,025	360		1,080	55	39	36	1,130	388		194	180	4,600
0680	615,000	1,210	1,120	1,025	380		1,150	55	39	42	1,180	396		198	180	5,150
0790	710,000	1,320	1,220	1,115	400		1,230	55	45	32	1,230	414		207	180	5,950
0890	803,000	1,320	1,220	1,115	430		1,230	60	45	38	1,280	414		207	180	6,700
1000	900,000	1,460	1,345	1,215	430		1,310	65	52	32	1,325	472		236	180	7,400
1100	996,000	1,460	1,345	1,215	440		1,375	65	52	32	1,365	472		236	200	8,200
1200	1,115,000	1,565	1,450	1,320	460		1,375	70	52	36	1,410	494		247	200	9,200
1400	1,250,000	1,565	1,450	1,320	470		1,468	70	52	36	1,610	494		247	200	10,400
1600	1,395,000	1,665	1,545	1,400	500		1,470	75	62	32	1,490	494		247	240	10,900
1700	1,560,000	1,665	1,545	1,400	520		1,540	75	62	32	1,520	542		271	240	11,900
2100	1,930,000	1,755	1,635	1,495	570		1,630	80	62	36	1,780	540		270	280	14,500
2400	2,145,000	1,755	1,635	1,495	600		1,695	90	62	40	1,780	608		304	280	16,400
2600	2,360,000	1,945	1,825	1,685	600		1,775	90	62	40	1,780	608		304	280	18,100
3000	2,728,000	1,945	1,825	1,685	650		1,850	90	62	46	1,880	608		304	320	19,950
3400	3,060,000	2,080	1,960	1,820	700		1,977	100	62	48	1,930	652		326	320	23,510
3900	3,500,000	2,080	1,960	1,820	730		2,010	100	62	54	2,030	726		363	320	26,080
4400	3,915,000	2,260	2,140	2,000	760		2,160	120	62	56	2,030	726		363	360	30,160
5000	4,500,000	2,360	2,240	2,100	780		2,240	120	62	60	2,140	726		363	360	35,750
5800	5,200,000	2,500	2,380	2,240	860		2,350	130	62	66	2,150	726		363	400	40,850
6700	6,000,000	2,670	2,550	2,430	880		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



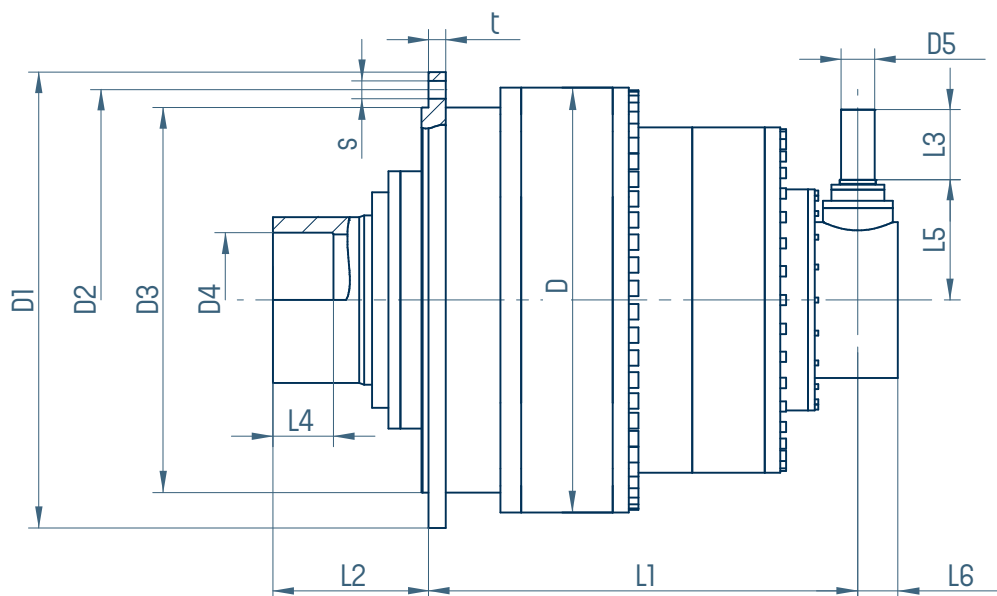
Size	Nominal output torque	D1	D2	D3	D4	D5	D	t	s	No. of bolts	L1	L2	L3	L4	L5	L6	Weight cca. ¹⁾
[-]	[Nm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
0120	105,000	700	635	580	210	See section 71	630	30	26	30	750	252	See section 71	126	491	165	1,200
0160	145,000	735	680	625	240		696	40	26	38	750	264		132	500	184	1,400
0230	206,000	900	830	755	250		775	40	33	28	840	300		150	500	195	2,300
0280	248,000	930	865	785	280		850	40	33	32	840	326		163	570	215	2,500
0330	300,000	980	915	840	300		925	45	33	38	840	326		163	570	200	2,750
0460	410,000	1,115	1,025	935	350		1,005	50	39	32	840	352		176	570	180	3,100
0510	455,000	1,115	1,025	935	350		1,005	50	39	34	1,000	388		194	584	200	3,800
0590	535,000	1,210	1,120	1,025	360		1,080	55	39	36	1,000	388		194	584	200	4,600
0680	615,000	1,210	1,120	1,025	380		1,150	55	39	42	1,200	396		198	584	195	5,200
0790	710,000	1,320	1,220	1,115	400		1,230	55	45	32	1,200	414		207	800	300	5,900
0890	803,000	1,320	1,220	1,115	430		1,230	60	45	38	1,200	414		207	800	300	6,700
1000	900,000	1,460	1,345	1,215	430		1,310	65	52	32	1,200	472		236	800	300	7,200
1100	996,000	1,460	1,345	1,215	440		1,375	65	52	32	1,200	472		236	930	400	7,800
1200	1,115,000	1,565	1,450	1,320	460		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	210	See section 7.1	630	30	26	30	800	252	See section 7.1	126	491	140	1,150
0160	145,000	735	680	625	240		696	40	26	38	850	264		132	500	140	1,550
0230	206,000	900	830	755	250		775	40	33	28	900	300		150	500	160	2,050
0280	248,000	930	865	785	280		850	40	33	32	920	326		163	570	180	2,500
0330	300,000	980	915	840	300		925	45	33	38	970	326		163	570	180	2,900
0460	410,000	1,115	1,025	935	350		1,005	50	39	32	1,100	352		176	570	180	3,650
0510	455,000	1,115	1,025	935	350		1,005	50	39	34	1,150	388		194	584	200	4,000
0590	535,000	1,210	1,120	1,025	360		1,080	55	39	36	1,200	388		194	584	200	4,600
0680	615,000	1,210	1,120	1,025	380		1,150	55	39	42	1,250	396		198	584	200	5,150
0790	710,000	1,320	1,220	1,115	400		1,230	55	45	32	1,300	414		207	700	250	5,950
0890	803,000	1,320	1,220	1,115	430		1,230	60	45	38	1,350	414		207	700	250	6,700
1000	900,000	1,460	1,345	1,215	430		1,310	65	52	32	1,400	472		236	700	250	7,400
1100	996,000	1,460	1,345	1,215	440		1,375	65	52	32	1,450	472		236	800	300	8,200
1200	1,115,000	1,565	1,450	1,320	460		1,375	70	52	36	1,450	494		247	800	300	9,200
>1200	on request																

1) Weight assumed without oil and shrink disc



5 Power ratings

5.1 Power ratings chart for motors with frequency 50 Hz

Gearbox ratio	Input speed [min ⁻¹]	Output speed [min ⁻¹]	Gearbox size / Power rating [kW]																											
			0120	0160	0230	0280	0330	0460	0510	0590	0680	0790	0890	1000	1100	1200	1400	1600	1700	2100	2400	2600	3000	3400	3900	4400	5000	5800	6700	
20	1,500	75	848	1,131	1,626	1,979	2,333	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,000	50	565	754	1,084	1,319	1,555	2,168	2,403	2,780	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	750	38	424	565	813	990	1,166	1,626	1,802	2,085	2,403	2,792	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	1,500	60	679	905	1,301	1,583	1,866	2,601	2,884	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,000	40	452	603	867	1,056	1,244	1,734	1,923	2,224	2,564	2,978	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	750	30	339	452	650	792	933	1,301	1,442	1,668	1,923	2,234	2,516	2,827	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	1,500	50	565	754	1,084	1,319	1,555	2,168	2,403	2,780	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,000	33	377	503	723	880	1,037	1,445	1,602	1,854	2,136	2,482	2,796	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	750	25	283	377	542	660	778	1,084	1,202	1,390	1,602	1,861	2,097	2,356	2,592	2,827	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32.5	1,500	46	522	696	1,000	1,218	1,435	2,001	2,218	2,566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,000	31	348	464	667	812	957	1,334	1,479	1,711	1,972	2,291	2,581	2,900	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	750	23	261	348	500	609	718	1,000	1,109	1,283	1,479	1,718	1,936	2,175	2,392	2,610	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	1,500	39	446	595	856	1,042	1,228	1,711	1,897	2,195	2,530	2,939	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,000	26	298	397	570	694	818	1,141	1,265	1,463	1,687	1,959	2,207	2,480	2,728	2,976	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	750	20	223	298	428	521	614	856	949	1,097	1,265	1,470	1,656	1,860	2,046	2,232	2,604	2,976	-	-	-	-	-	-	-	-	-	-	-	-
40	1,500	38	424	565	813	990	1,166	1,626	1,802	2,085	2,403	2,792	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,000	25	283	377	542	660	778	1,084	1,202	1,390	1,602	1,861	2,097	2,356	2,592	2,827	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	750	19	212	283	406	495	583	813	901	1,043	1,202	1,396	1,573	1,767	1,944	2,121	2,474	2,827	-	-	-	-	-	-	-	-	-	-	-	-
48	1,500	31	353	471	677	825	972	1,355	1,502	1,738	2,003	2,327	2,621	2,945	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,000	21	236	314	452	550	648	903	1,001	1,158	1,335	1,551	1,748	1,963	2,160	2,356	2,749	3,142	3,338	4,123	4,712	-	-	-	-	-	-	-	-	-
	750	16	177	236	339	412	486	677	751	869	1,001	1,163	1,311	1,473	1,620	1,767	2,062	2,356	2,503	3,093	3,534	3,829	4,418	-	-	-	-	-	-	-
55	1,500	27	308	411	591	720	848	1,182	1,311	1,517	1,748	2,031	2,288	2,570	2,827	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,000	18	206	274	394	480	565	788	874	1,011	1,165	1,354	1,525	1,714	1,885	2,056	2,399	2,742	2,913	3,599	4,113	4,455	5,141	5,826	6,683	7,540	8,568	9,939	-	
	750	14	154	206	296	360	424	591	655	758	874	1,015	1,144	1,285	1,414	1,542	1,799	2,056	2,185	2,699	3,084	3,342	3,856	4,370	5,012	5,655	6,426	7,454	8,611	
60	1,500	25	283	377	542	660	778	1,084	1,202	1,390	1,602	1,861	2,097	2,356	2,592	2,827	3,299	3,770	4,006	4,948	-	-	-	-	-	-	-	-	-	-
	1,000	17	188	251	361	440	518	723	801	927	1,068	1,241	1,398	1,571	1,728	1,885	2,199	2,513	2,670	3,299	3,770	4,084	4,712	5,341	6,126	6,912	7,854	9,111	10,524	
	750	13	141	188	271	330	389	542	601	695	801	931	1,049	1,178	1,296	1,414	1,649	1,885	2,003	2,474	2,827	3,063	3,534	4,006	4,535	5,184	5,890	6,833	7,893	
66	1,500	23	257	343	493	600	707	985	1,092	1,264	1,457	1,632	1,906	2,142	2,356	2,570	2,999	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,000	15	171	228	328	400	471	657	728	843	971	1,128	1,271	1,428	1,571	1,714	1,999	2,285	2,428	2,999	3,427	3,713	4,284	4,855	5,569	6,283	7,140	8,282	9,568	
	750	11	129	171	246	300	353	493	546	632	728	846	953	1,071	1,178	1,285	1,499	1,714	1,821	2,249	2,570	2,785	3,213	3,641	4,177	4,712	5,355	6,212	7,176	
75	1,500	20	226	302	434	528	622	867	961	1,112	1,282	1,489	1,678	1,885	2,073	2,262	2,639	3,016	3,204	3,958	4,524	4,901	-	-	-	-	-	-	-	-
	1,000	13	151	201	289	352	415	578	641	741	855	993	1,118	1,257	1,382	1,508	1,759	2,011	2,136	2,639	3,016	3,267	3,770	4,273	4,901	5,529	6,283	7,288	8,419	
	750	10	113	151	217	264	311	434	481	556	641	745	839	942	1,037	1,131	1,319	1,508	1,602	1,979	2,262	2,450	2,827	3,204	3,676	4,147	4,712	5,466	6,315	
80	1,500	19	212	283	406	495	583	813	901	1,043	1,202	1,396	1,573	1,767	1,944	2,121	2,474	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,000	13	141	188	271	330	389	542	601	695	801	931	1,049	1,178	1,296	1,414	1,649	1,885	2,003	2,474	2,827	3,063	3,534	4,006	4,535	5,184	5,890	6,833	7,893	
	750	9	106	141	203	247	292	406	451	521	601	698	786	884	972	1,060	1,237	1,414	1,502	1,856	2,121	2,297	2,651	3,004	3,446	3,888	4,418	5,125	5,920	
100	1,500	15	170	226	325	396	467	650	721	834	961	1,117	1,258	1,414	1,555	1,696	1,979	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,000	10	113	151	217	264	311	434	481	556	641	745	839	942	1,037	1,131	1,319	1,508	1,602	1,979	2,262	2,450	2,827	3,204	3,676	4,147	4,712	5,466	6,315	
	750	8	85	113	163	198	233	325	360	417	481	558	629	707	778	848	990	1,131	1,202	1,484	1,696	1,838	2,121	2,403	2,757	3,110	3,534	4,100	4,736	
120	1,500	12.5	141	188	271	330	389	542	601	695	801	931	1,049	1,178	1,296	1,414	1,649	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,000	8.3	94	126	181	220	259	361	401	463	534	620	699	785	864	942	1,100	1,257	1,335	1,649	1,885	2,042	2,356	2,670	3,063	3,456	3,927	4,555	5,262	
	750	6.3	71	94	135	165	194	271	300	348	401	465	524	589	648	707	825	942	1,001	1,237	1,414	1,532	1,767	2,003	2,297	2,592	2,945	3,416	3,947	
140	1,500	10.7	121	162	232	283	333	465	515	596	687	798	899	1,010	1,111	1,212	1,414	1,616	1,717											

5 Power ratings

5.1 Power ratings chart for motors with frequency 50 Hz

Gearbox ratio	Input speed [min ⁻¹]	Output speed [min ⁻¹]	Gearbox size / Power rating [kW]																											
			0120	0160	0230	0280	0330	0460	0510	0590	0680	0790	0890	1000	1100	1200	1400	1600	1700	2100	2400	2600	3000	3400	3900	4400	5000	5800	6700	
280	1,500	5.4	61	81	116	141	167	232	257	298	343	399	449	505	555	606	707	808	858	1,060	1,212	1,313	1,515	1,777	-	-	-	-	-	
	1,000	3.6	40	54	77	94	111	155	172	199	229	266	300	337	370	404	471	539	572	707	808	875	1,010	1,144	1,313	1,481	1,683	1,952	2,255	
	750	2.7	30	40	58	71	83	116	129	149	172	199	225	252	278	303	353	404	429	530	606	656	757	858	985	1,111	1,262	1,464	1,691	
310	1,500	4.8	55	73	105	128	150	210	233	269	310	360	406	456	502	547	638	730	775	958	1,094	1,186	1,368	1,551	-	-	-	-	-	
	1,000	3.2	36	49	70	85	100	140	155	179	207	240	271	304	334	365	426	486	517	638	730	790	912	1,034	1,186	1,338	1,520	1,763	2,037	
	750	2.4	27	36	52	64	75	105	116	135	155	180	203	228	251	274	319	365	388	479	547	593	684	775	889	1,003	1,140	1,323	1,528	
315	1,500	4.8	54	72	103	126	148	206	229	265	305	355	399	449	494	539	628	718	763	942	1,077	1,167	1,346	1,526	1,750	1,975	2,244	2,603	3,007	
	1,000	3.2	36	48	69	84	99	138	153	177	203	236	266	299	329	359	419	479	509	628	718	778	898	1,017	1,167	1,316	1,496	1,735	2,005	
	750	2.4	27	36	52	63	74	103	114	132	153	177	200	224	247	269	314	359	381	471	539	583	673	763	875	987	1,122	1,302	1,503	
335	1,500	4.5	51	68	97	118	139	194	215	249	287	333	376	422	464	506	591	675	717	886	1,013	1,097	1,266	1,435	1,646	1,857	2,110	2,448	2,827	
	1,000	3.0	34	45	65	79	93	129	143	166	191	222	250	281	309	338	394	450	478	591	675	731	844	957	1,097	1,238	1,407	1,632	1,885	
	750	2.2	25	34	49	59	70	97	108	124	143	167	188	211	232	253	295	338	359	443	506	549	633	717	823	928	1,055	1,224	1,414	
360	1,500	4.2	47	63	90	110	130	181	200	232	267	310	350	393	432	471	550	628	668	825	942	1,021	1,178	1,335	1,532	1,728	1,963	2,278	2,631	
	1,000	2.8	31	42	60	73	86	120	134	154	178	207	233	262	288	314	367	419	445	550	628	681	785	890	1,021	1,152	1,309	1,518	1,754	
	750	2.1	24	31	45	55	65	90	100	116	134	155	175	196	216	236	275	314	334	412	471	511	589	668	766	864	982	1,139	1,316	
400	1,500	3.8	42	57	81	99	117	163	180	209	240	279	315	353	389	424	495	565	601	742	848	919	1,060	1,202	1,378	1,555	1,767	2,050	2,368	
	1,000	2.5	28	38	54	66	78	108	120	139	160	186	210	236	259	283	330	377	401	495	565	613	707	801	919	1,037	1,178	1,367	1,579	
	750	1.9	21	28	41	49	58	81	90	104	120	140	157	177	194	212	247	283	300	371	424	459	530	601	689	778	884	1,025	1,184	
430	1,500	3.5	39	53	76	92	108	151	168	194	224	260	293	329	362	395	460	526	559	690	789	855	986	1,118	1,282	1,447	1,644	1,907	2,203	
	1,000	2.3	26	35	50	61	72	101	112	129	149	173	195	219	241	263	307	351	373	460	526	570	658	745	855	964	1,096	1,271	1,469	
	750	1.7	20	26	38	46	54	76	84	97	112	130	146	164	181	197	230	263	279	345	395	427	493	559	641	723	822	953	1,101	
470	1,500	3.2	36	48	69	84	99	138	153	177	205	238	268	301	331	361	421	481	511	632	722	782	902	1,023	1,173	1,323	1,504	1,745	2,015	
	1,000	2.1	24	32	46	56	66	92	102	118	136	158	178	201	221	241	281	321	341	421	481	521	602	682	782	882	1,003	1,163	1,344	
	750	1.6	18	24	35	42	50	69	77	89	102	119	134	150	165	180	211	241	256	316	361	391	451	511	587	662	752	872	1,008	
540	1,500	2.8	31	42	60	73	86	120	134	154	178	207	233	262	288	314	367	419	445	550	628	681	785	890	1,021	1,152	1,309	1,518	1,754	
	1,000	1.9	21	28	40	49	58	80	89	103	119	138	155	175	192	209	244	279	297	367	419	454	524	593	681	768	873	1,012	1,169	
	750	1.4	16	21	30	37	43	60	67	77	89	103	117	131	144	157	183	209	223	275	314	340	393	445	511	576	654	759	877	
600	1,500	2.5	28	38	54	66	78	108	120	139	160	186	210	236	259	283	330	377	401	495	565	613	707	801	919	1,037	1,178	1,367	1,579	
	1,000	1.7	19	25	36	44	52	72	80	93	107	124	140	157	173	188	220	251	267	330	377	408	471	534	613	691	785	911	1,052	
	750	1.3	14	19	27	33	39	54	60	70	80	93	105	118	130	141	165	188	200	247	283	306	353	401	459	518	589	683	789	
640	1,500	2.3	27	35	51	62	73	102	113	130	150	175	197	221	243	265	309	353	376	464	530	574	663	751	861	972	1,104	1,281	1,480	
	1,000	1.6	18	24	34	41	49	68	75	87	100	116	131	147	162	177	206	236	250	309	353	383	442	501	574	648	736	854	987	
	750	1.2	13	18	25	31	36	51	56	65	75	87	98	110	121	133	155	177	188	232	265	287	331	376	431	486	552	641	740	
730	1,500	2.1	23	31	45	54	64	89	99	114	132	153	172	194	213	232	271	310	329	407	465	504	581	658	755	852	968	1,123	1,298	
	1,000	1.4	15	21	30	36	43	59	66	76	88	102	115	129	142	155	181	207	219	271	310	336	387	439	504	568	646	749	865	
	750	1.0	12	15	22	27	32	45	49	57	66	76	86	97	107	116	136	155	165	203	232	252	290	329	378	426	484	562	649	
800	1,500	1.9	21	28	41	49	58	81	90	104	120	140	157	177	194	212	247	283	300	371	424	459	530	601	689	778	884	1,025	1,184	
	1,000	1.3	14	19	27	33	39	54	60	70	80	93	105	118	130	141	165	188	200	247	283	306	353	401	459	518	589	683	789	
	750	0.9	11	14	20	25	29	41	45	52	60	70	79	88	97	106	124	141	150	186	212	230	265	300	345	389	442	512	592	
900	1,500	1.7	19	25	36	44	52	72	80	93	107	124	140	157	173	188	220	251	267	330	377	408	471	534	613	691	785	911	1,052	
	1,000	1.1	13	17	24	29	35	48	53	62	71	83	93	105	115	126	147	168	178	220	251	272	314	356	408	461	524	607	702	
	750	0.8	9	13	18	22	26	36	40	46	53	62	70	79	86	94	110	126	134	165	188	204	236	267	306	346	393	456	526	
1000	1,500	1.5	17	23	33	40	47	65	72	83	96	112	126	141	156	170	198	226	240	297	339	368	424	481	551	622	707	820	947	
	1,000	1.0	11	15	22	26	31	43	48	56	64	74	84	94	104	113	132	151	160	198	226	245	283	320	368	415	471	547	631	
	750	0.8	8	11	16	20	23	33	36	42	48	56	63	71	78	85	99	113	120	148	170	184	212	240	276	311	353	410	474	



5 Power ratings

5.2 Power ratings chart for motors with frequency 60 Hz

Gearbox ratio	Input speed [min ⁻¹]	Output speed [min ⁻¹]	Gearbox size / Power rating [kW]																											
			0120	0160	0230	0280	0330	0460	0510	0590	0680	0790	0890	1000	1100	1200	1400	1600	1700	2100	2400	2600	3000	3400	3900	4400	5000	5800	6700	
20	1,800	90	1,018	1,357	1,951	2,375	2,799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,200	60	679	905	1,301	1,583	1,866	2,601	2,884	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	900	45	509	679	975	1,188	1,400	1,951	2,163	2,502	2,884	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	1,800	72	814	1,086	1,561	1,900	2,239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,200	48	543	724	1,040	1,267	1,493	2,081	2,307	2,669	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	900	36	407	543	780	950	1,120	1,561	1,730	2,002	2,307	2,680	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	1,800	60	679	905	1,301	1,583	1,866	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,200	40	452	603	867	1,056	1,244	1,734	1,923	2,224	2,564	2,978	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	900	30	339	452	650	792	933	1,301	1,442	1,668	1,923	2,234	2,516	2,827	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32.5	1,800	55	626	835	1,201	1,462	1,723	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,200	37	418	557	800	974	1,148	1,601	1,775	2,053	2,366	2,749	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	900	28	313	418	600	731	861	1,201	1,331	1,540	1,775	2,062	2,323	2,610	2,871	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	1,800	47	536	714	1,027	1,250	1,473	2,054	2,277	2,634	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,200	32	357	476	685	833	982	1,369	1,518	1,756	2,024	2,351	2,649	2,976	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	900	24	268	357	513	625	737	1,027	1,138	1,317	1,518	1,763	1,987	2,232	2,455	2,679	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	1,800	45	509	679	975	1,188	1,400	1,951	2,163	2,502	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,200	30	339	452	650	792	933	1,301	1,442	1,668	1,923	2,234	2,516	2,827	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	900	23	254	339	488	594	700	975	1,081	1,251	1,442	1,675	1,887	2,121	2,333	2,545	2,969	-	-	-	-	-	-	-	-	-	-	-	-	-
48	1,800	38	424	565	813	990	1,166	1,626	1,802	2,085	2,403	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,200	25	283	377	542	660	778	1,084	1,202	1,390	1,602	1,861	2,097	2,356	2,592	2,827	3,299	3,770	4,006	4,948	-	-	-	-	-	-	-	-	-	-
	900	19	212	283	406	495	583	813	901	1,043	1,202	1,396	1,573	1,767	1,944	2,121	2,474	2,827	3,004	3,711	4,241	4,595	-	-	-	-	-	-	-	-
55	1,800	33	370	494	709	864	1,018	1,419	1,573	1,820	2,097	2,437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,200	22	247	329	473	576	679	946	1,049	1,213	1,398	1,624	1,830	2,056	2,262	2,468	2,879	3,290	3,496	4,318	4,935	-	-	-	-	-	-	-	-	-
	900	16	185	247	355	432	509	709	787	910	1,049	1,218	1,373	1,542	1,696	1,851	2,159	2,468	2,622	3,239	3,701	4,010	-	-	-	-	-	-	-	-
60	1,800	30	339	452	650	792	933	1,301	1,442	1,668	1,923	2,234	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,200	20	226	302	434	528	622	867	961	1,112	1,282	1,489	1,678	1,885	2,073	2,262	2,639	3,016	3,204	3,958	4,524	4,901	-	-	-	-	-	-	-	-
	900	15	170	226	325	396	467	650	721	834	961	1,117	1,258	1,414	1,555	1,696	1,979	2,262	2,403	2,969	3,393	3,676	-	-	-	-	-	-	-	-
66	1,800	27	308	411	591	720	848	1,182	1,311	1,517	1,748	2,031	2,288	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,200	18	206	274	394	480	565	788	874	1,011	1,165	1,354	1,525	1,714	1,885	2,056	2,389	2,742	2,913	3,589	4,113	4,455	5,141	5,826	6,683	7,540	8,568	9,939	-	
	900	14	154	206	296	360	424	591	655	758	874	1,015	1,144	1,285	1,414	1,542	1,799	2,056	2,185	2,699	3,084	3,342	3,856	4,370	5,012	5,655	6,426	7,454	8,611	
75	1,800	24	271	362	520	633	746	1,040	1,154	1,335	1,538	1,787	2,013	2,262	2,488	2,714	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,200	16	181	241	347	422	498	694	769	890	1,025	1,191	1,342	1,508	1,659	1,810	2,111	2,413	2,564	3,167	3,619	3,921	4,524	5,127	5,881	6,635	7,540	8,746	10,103	
	900	12	136	181	260	317	373	520	577	667	769	893	1,007	1,131	1,244	1,357	1,583	1,810	1,923	2,375	2,714	2,941	3,393	3,845	4,411	4,976	5,655	6,560	7,578	
80	1,800	23	254	339	488	594	700	975	1,081	1,251	1,442	1,675	1,887	2,121	2,333	2,545	2,969	-	-	-	-	-	-	-	-	-	-	-	-	-
	1,200	15	170	226	325	396	467	650	721	834	961	1,117	1,258	1,414	1,555	1,696	1,979	2,262	2,403	2,969	3,393	3,676	4,241	4,807	5,513	6,220	7,069	8,200	9,472	
	900	11	127	170	244	297	350	488	541	626	721	838	944	1,060	1,166	1,272	1,484	1,696	1,802	2,227	2,545	2,757	3,181	3,605	4,135	4,665	5,301	6,150	7,104	
100	1,800	18	204	271	390	475	560	780	865	1,001	1,154	1,340	1,510	1,696	1,866	2,036	2,375	2,714	2,884	-	-	-	-	-	-	-	-	-	-	-
	1,200	12	136	181	260	317	373	520	577	667	769	893	1,007	1,131	1,244	1,357	1,583	1,810	1,923	2,375	2,714	2,941	3,393	3,845	4,411	4,976	5,655	6,560	7,578	
	900	9	102	136	195	238	280	390	433	500	577	670	755	848	933	1,018	1,188	1,357	1,442	1,781	2,036	2,205	2,545	2,884	3,308	3,732	4,241	4,920	5,683	
120	1,800	15.0	170	226	325	396	467	650	721	834	961	1,117	1,258	1,414	1,555	1,696	1,979	2,262	2,403	2,969	-	-	-	-	-	-	-	-	-	-
	1,200	10.0	113	151	217	264	311	434	481	556	641	745	839	942	1,037	1,131	1,319	1,508	1,602	1,979	2,262	2,450	2,827	3,204	3,676	4,147	4,712	5,466	6,315	
	900	7.5	85	113	163	198	233	325	360	417	481	558	629	707	778	848	990	1,131	1,202	1,484	1,696	1,838	2,121	2,403	2,757	3,110	3,534	4,100	4,736	
140	1,800	12.9	145	194	279	339	400	557	618	715	824	957	1,078	1,212	1,333	1,454	1,696	1,939	2,060	2,545	2,908	-	-	-	-	-	-	-	-	-
	1,200	8.6	97	129	186	226	267	372	412	477	549	638	719	808	889	969	1,131	1,293	1,373	1,696	1,939	2,100	2,424	2,td						

5 Power ratings

5.2 Power ratings chart for motors with frequency 60 Hz

Gearbox ratio	Input speed [min ⁻¹]	Output speed [min ⁻¹]	Gearbox size / Power rating [kW]																											
			0120	0160	0230	0280	0330	0460	0510	0590	0680	0790	0890	1000	1100	1200	1400	1600	1700	2100	2400	2600	3000	3400	3900	4400	5000	5800	6700	
280	1,800	6.4	73	97	139	170	200	279	309	357	412	479	539	606	666	727	848	969	1,030	1,272	1,454	1,575	1,818	2,060	2,363	2,666	-	-	-	
	1200	4.3	48	65	93	113	133	186	206	238	275	319	359	404	444	485	565	646	687	848	969	1,050	1,212	1,373	1,575	1,777	2,020	2,343	2,706	
	900	3.2	36	48	70	85	100	139	154	179	206	239	270	303	333	364	424	485	515	636	727	788	909	1,030	1,181	1,333	1,515	1,757	2,030	
310	1800	5.8	66	88	126	153	181	252	279	323	372	432	487	547	602	657	766	876	930	1,149	1,313	1,423	1,642	1,861	2,134	2,408	2,736	-	-	
	1200	3.9	44	58	84	102	120	168	186	215	248	288	325	365	401	438	511	584	620	766	876	949	1,094	1,240	1,423	1,605	1,824	2,116	2,444	
	900	2.9	33	44	63	77	90	126	140	161	186	216	244	274	301	328	383	438	465	575	657	711	821	930	1,067	1,204	1,368	1,587	1,833	
315	1800	5.7	65	86	124	151	178	248	275	318	366	425	479	539	592	646	754	862	916	1,131	1,293	1,400	1,616	1,831	2,100	2,370	2,693	-	-	
	1200	3.8	43	57	83	101	118	165	183	212	244	284	320	359	395	431	503	574	610	754	862	934	1,077	1,221	1,400	1,580	1,795	2,082	2,406	
	900	2.9	32	43	62	75	89	124	137	159	183	213	240	269	296	323	377	431	458	565	646	700	808	916	1,050	1,185	1,346	1,562	1,804	
335	1,800	5.4	61	81	116	142	167	233	258	299	344	400	451	506	557	608	709	810	861	1,063	1,215	1,317	1,519	1,722	1,975	2,228	2,532	2,937	-	
	1200	3.6	41	54	78	95	111	155	172	199	230	267	300	338	371	405	473	540	574	709	810	878	1,013	1,148	1,317	1,485	1,688	1,958	2,262	
	900	2.7	30	41	58	71	84	116	129	149	172	200	225	253	279	304	354	405	430	532	608	658	760	861	987	1,114	1,266	1,469	1,696	
360	1,800	5.0	57	75	108	132	156	217	240	278	320	372	419	471	518	565	660	754	801	990	1,131	1,225	1,414	1,602	1,838	2,073	2,356	2,733	-	
	1200	3.3	38	50	72	88	104	145	160	185	214	248	280	314	346	377	440	503	534	660	754	817	942	1,068	1,225	1,382	1,571	1,822	2,105	
	900	2.5	28	38	54	66	78	108	120	139	160	186	210	236	259	283	330	377	401	495	565	613	707	801	919	1,037	1,178	1,367	1,579	
400	1,800	4.5	51	68	98	119	140	195	216	250	288	335	377	424	467	509	594	679	721	891	1,018	1,103	1,272	1,442	1,654	1,866	2,121	2,460	2,842	
	1200	3.0	34	45	65	79	93	130	144	167	192	223	252	283	311	339	396	452	481	594	679	735	848	961	1,103	1,244	1,414	1,640	1,894	
	900	2.3	25	34	49	59	70	98	108	125	144	168	189	212	233	254	297	339	360	445	509	551	636	721	827	933	1,060	1,230	1,421	
430	1,800	4.2	47	63	91	110	130	181	201	233	268	312	351	395	434	473	552	631	671	829	947	1,026	1,184	1,341	1,539	1,736	1,973	2,288	2,643	
	1200	2.8	32	42	60	74	87	121	134	155	179	208	234	263	289	316	368	421	447	552	631	684	789	894	1,026	1,157	1,315	1,525	1,762	
	900	2.1	24	32	45	55	65	91	101	116	134	156	176	197	217	237	276	316	335	414	473	513	592	671	769	868	986	1,144	1,322	
470	1,800	3.8	43	58	83	101	119	166	184	213	245	285	321	361	397	433	505	578	614	758	866	938	1,083	1,227	1,408	1,588	1,805	2,094	2,418	
	1200	2.6	29	39	55	67	79	111	123	142	164	190	214	241	265	289	337	385	409	505	578	626	722	818	938	1,059	1,203	1,366	1,612	
	900	1.9	22	29	42	51	60	83	92	106	123	143	161	180	199	217	253	289	307	379	433	469	541	614	704	794	902	1,047	1,209	
540	1,800	3.3	38	50	72	88	104	145	160	185	214	248	280	314	346	377	440	503	534	660	754	817	942	1,068	1,225	1,382	1,571	1,822	2,105	
	1200	2.2	25	34	48	59	69	96	107	124	142	165	186	209	230	251	293	335	356	440	503	545	628	712	817	922	1,047	1,215	1,403	
	900	1.7	19	25	36	44	52	72	80	93	107	124	140	157	173	188	220	251	267	330	377	408	471	534	613	691	785	911	1,052	
600	1,800	3.0	34	45	65	79	93	130	144	167	192	223	252	283	311	339	396	452	481	594	679	735	848	961	1,103	1,244	1,414	1,640	1,894	
	1200	2.0	23	30	43	53	62	87	96	111	128	149	168	188	207	226	264	302	320	396	452	490	565	641	735	829	942	1,093	1,263	
	900	1.5	17	23	33	40	47	65	72	83	96	112	126	141	156	170	198	226	240	297	339	368	424	481	551	622	707	820	947	
640	1,800	2.8	32	42	61	74	87	122	135	156	180	209	236	265	292	318	371	424	451	557	636	689	795	901	1,034	1,166	1,325	1,537	1,776	
	1200	1.9	21	28	41	49	58	81	90	104	120	140	157	177	194	212	247	283	300	371	424	459	530	601	689	778	884	1,025	1,184	
	900	1.4	16	21	30	37	44	61	68	78	90	105	118	133	146	159	186	212	225	278	318	345	398	451	517	583	663	763	888	
730	1,800	2.5	28	37	53	65	77	107	119	137	158	184	207	232	256	279	325	372	395	488	558	604	697	790	906	1,023	1,162	1,348	1,557	
	1200	1.6	19	25	36	43	51	71	79	91	105	122	138	155	170	186	217	248	263	325	372	403	465	527	604	682	775	889	1,038	
	900	1.2	14	19	27	33	38	53	59	69	79	92	103	116	128	139	163	186	198	244	279	302	349	395	453	511	581	674	779	
800	1,800	2.3	25	34	49	59	70	98	108	125	144	168	189	212	233	254	297	339	360	445	509	551	636	721	827	933	1,060	1,230	1,421	
	1200	1.5	17	23	33	40	47	65	72	83	96	112	126	141	156	170	198	226	240	297	339	368	424	481	551	622	707	820	947	
	900	1.1	13	17	24	30	35	49	54	63	72	84	94	106	117	127	148	170	180	223	254	276	318	360	414	467	530	615	710	
900	1,800	2.0	23	30	43	53	62	87	96	111	128	149	168	188	207	226	264	302	320	396	452	490	565	641	735	829	942	1,093	1,263	
	1200	1.3	15	20	29	35	41	58	64	74	85	99	112	126	138	151	176	201	214	264	302	327	377	427	490	553	628	729	842	
	900	1.0	11	15	22	26	31	43	48	56	64	74	84	94	104	113	132	151	160	198	226	245	283	320	368	415	471	547	631	
1000	1,800	1.8	20	27	39	48	56	78	87	100	115	134	151	170	187	204	238	271	288	356	407	441	509	577	662	746	848	984	1,137	
	1200	1.2	14	18	26	32	37	52	58	67	77	89	101	113	124	136	158	181	192	238	271	294	339	385	441	498	565	656	758	
	900	0.9	10	14	20	24	28	39	43	50	58	67	75	85	93	102	119	136	144	178	204	221	254	288	331	373	424	492	568	



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	65.26	70.07	78.04	98.88
0280	40.85	48.07	55.46	57.48	65.26	72.83	78.04	98.88
0330	40.85	47.64	55.46	57.48	65.26	72.83	78.04	98.88
0460	40.85	48.07	55.55	60.22	63.60	76.87	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	65.26	72.83	78.04	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



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	48.34	61.25	68.50	82.55	96.39	122.13	145.93
0280	34.36	40.43	48.34	60.83	68.50	80.61	93.00	122.13	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

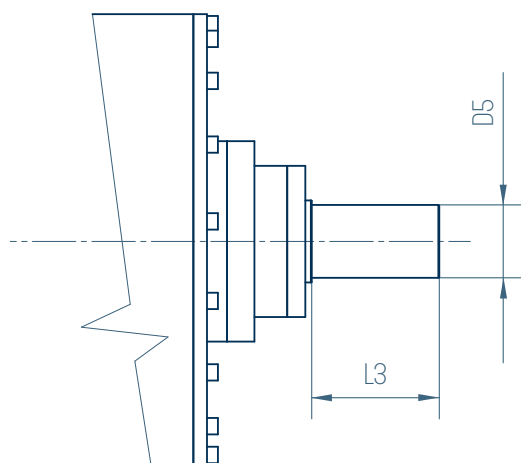
6.6 3PB type true ratios

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	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
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



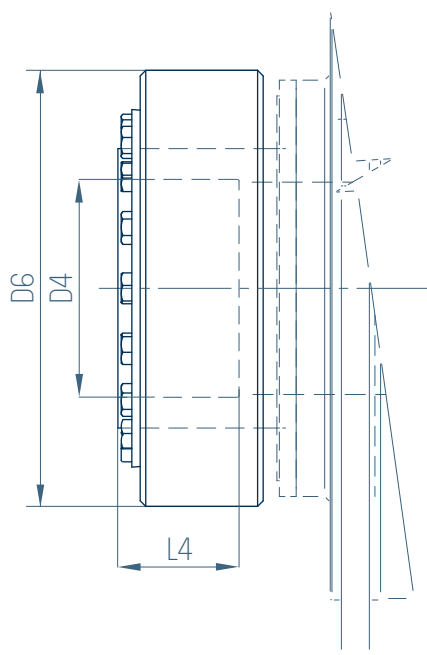
Shaft keys are designed according to DIN 6895/1

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

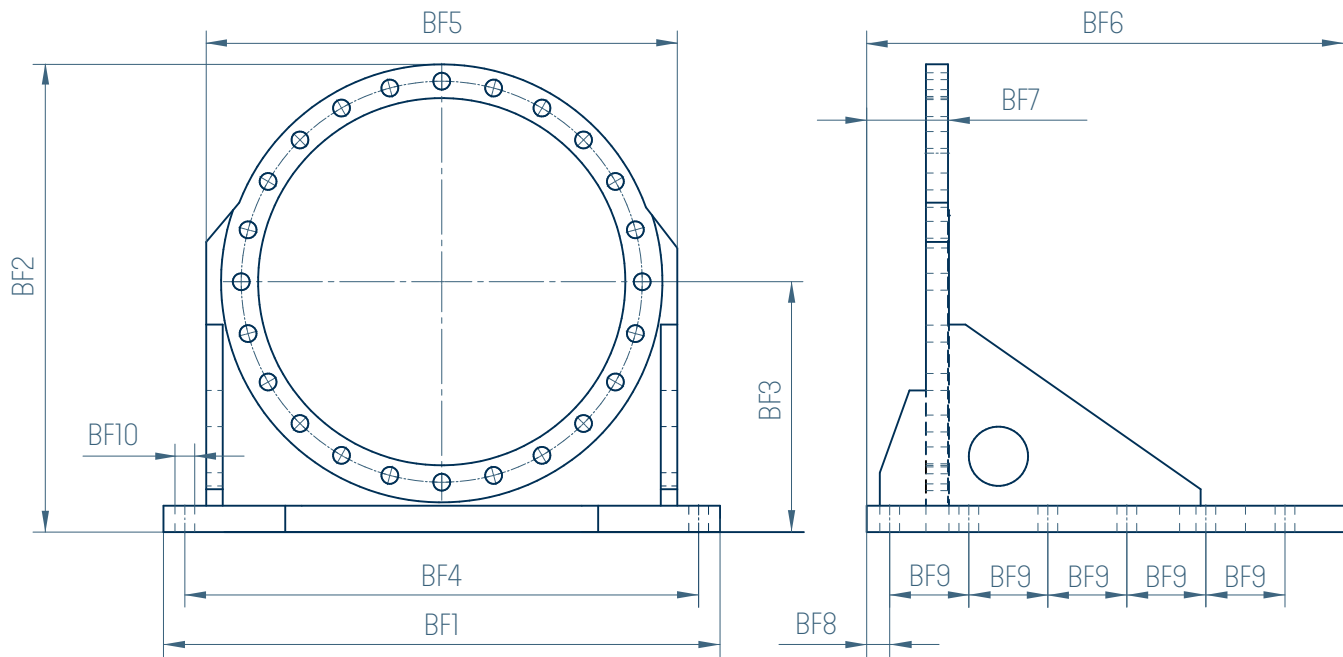


Size	Shrink disc weight	D6	D4	L4
[-]	[kg]	[mm]	[mm]	[mm]
0120	103	460	210	126
0160	138	520	240	132
0230	189	570	250	150
0280	189	570	280	163
0330	207	590	300	163
0460	282	670	350	176
0510	390	670	350	194
0590	386	750	360	194
0680	435	770	380	198
0790	507	820	400	207
0890	507	820	430	207
1000	589	845	430	236
1100	589	845	440	236
1200	589	845	460	247
1400	821	955	470	247
1600	821	955	500	247
1700	872	960	520	271
2100	1,004	1,020	570	270
2400	1,141	1,085	600	304
2600	1,346	1,150	600	304
3000	1,346	1,150	650	304
3400	1,646	1,230	700	326
3900	1,942	1,300	730	363
4400	2,142	1,350	760	363
5000	2,425	1,400	780	363
5800	2,740	1,460	860	363
6700	3,078	1,520	880	396



8 Mounting equipment

8.1 Foot base frame

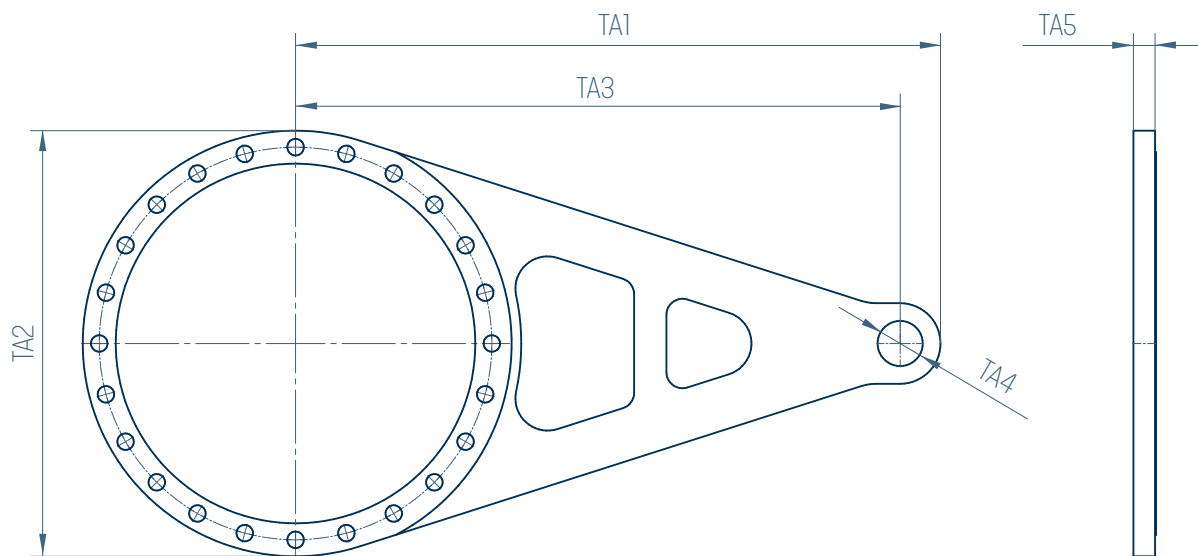


Size	BF1	BF2	BF3	BF4	BF5	BF6	BF7	BF8	BF9	BF10	Weight cca.
[-]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
0120	1,040	760	410	960	840	750	147	40	130	33	300
0160	1,090	830	440	1,010	890	815	157	45	140	33	320
0230	1,250	953	500	1,150	1,025	847	162	48	145	39	450
0280	1,300	990	520	1,200	1,060	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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