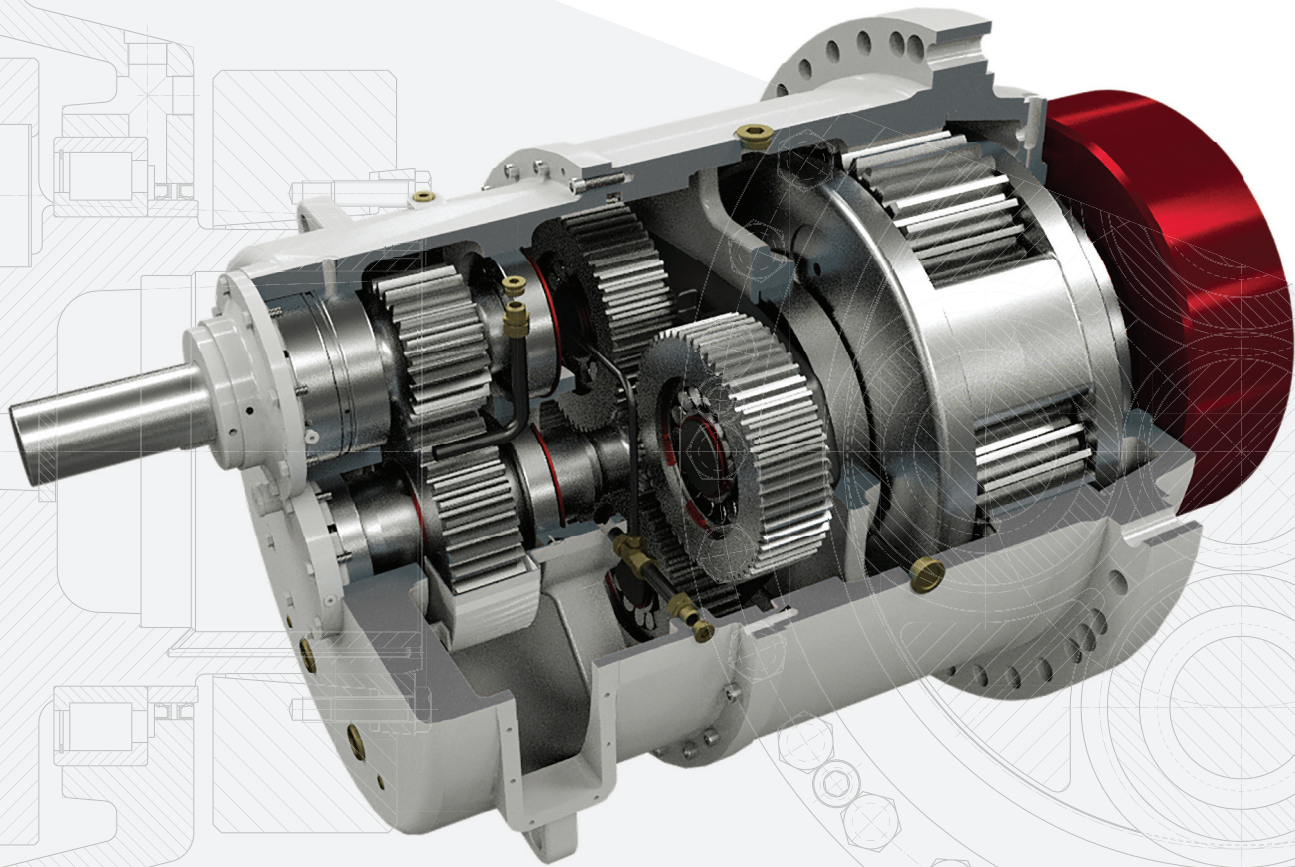




David Brown Santasalo



Cement
Chemicals
Defence
Fibre, paper & tissue
Food & beverage
Marine & port operations
Metals
Mining & minerals
Oil & gas
Panelboard
Power generation
Rail
Rubber
Sugar
Water & wastewater

Quatro+ Series

Proven planetary gearing
for challenging applications



Proven planetary gearing, designed to last

David Brown Santasalo's Quatro+ planetary gear unit series offers basic solutions for specific customer requirements. With decades of experience in planetary gearing through Sauerwald (founded in 1887 and became part of the Santasalo group in 1992), we deliver the latest planetary gearing technology founded on extensive R&D and current materials development.

The planetary gear unit series is based on modular design principles, process optimisation and logistics. Fast and flexible customer specific adaptations are easily available.

Advantages of planetary gear units:

- Fast availability of the main components and optimised manufacturing processes for short manufacturing time
- Reliable gear transmission components for all industrial applications
- Modular construction to suit application specific needs combined with high variability at the input and output
- Space saving construction with high power transmission capability
- Construction of gear sets according to modular design principles
- Easy to service and easy to maintain. Layout and selection of materials according to the state of technology and engineering

Technical data	
Design Sizes	15
Number of Stages	2 - 5
Power Range	up to 1.500 kW
Transmission Ratio	up to 2,800:1
Nominal Output Torque	up to 1,427 kNm

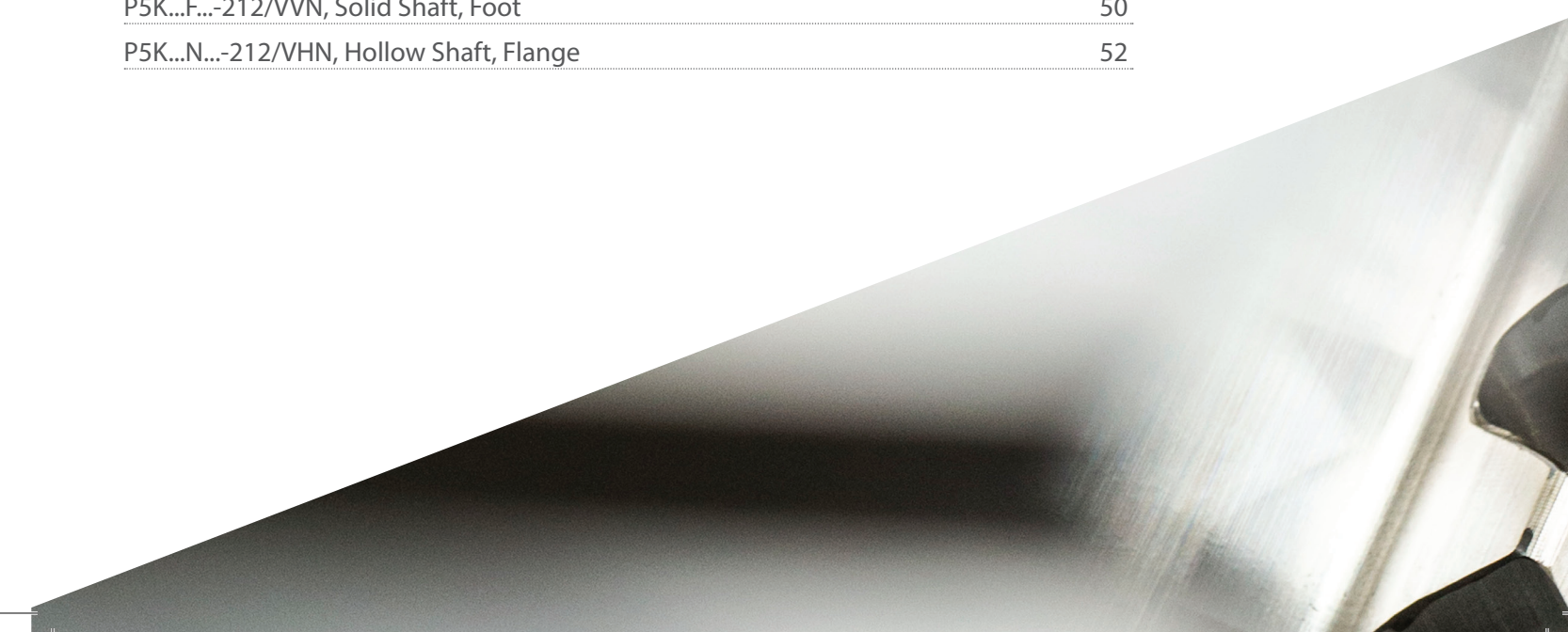


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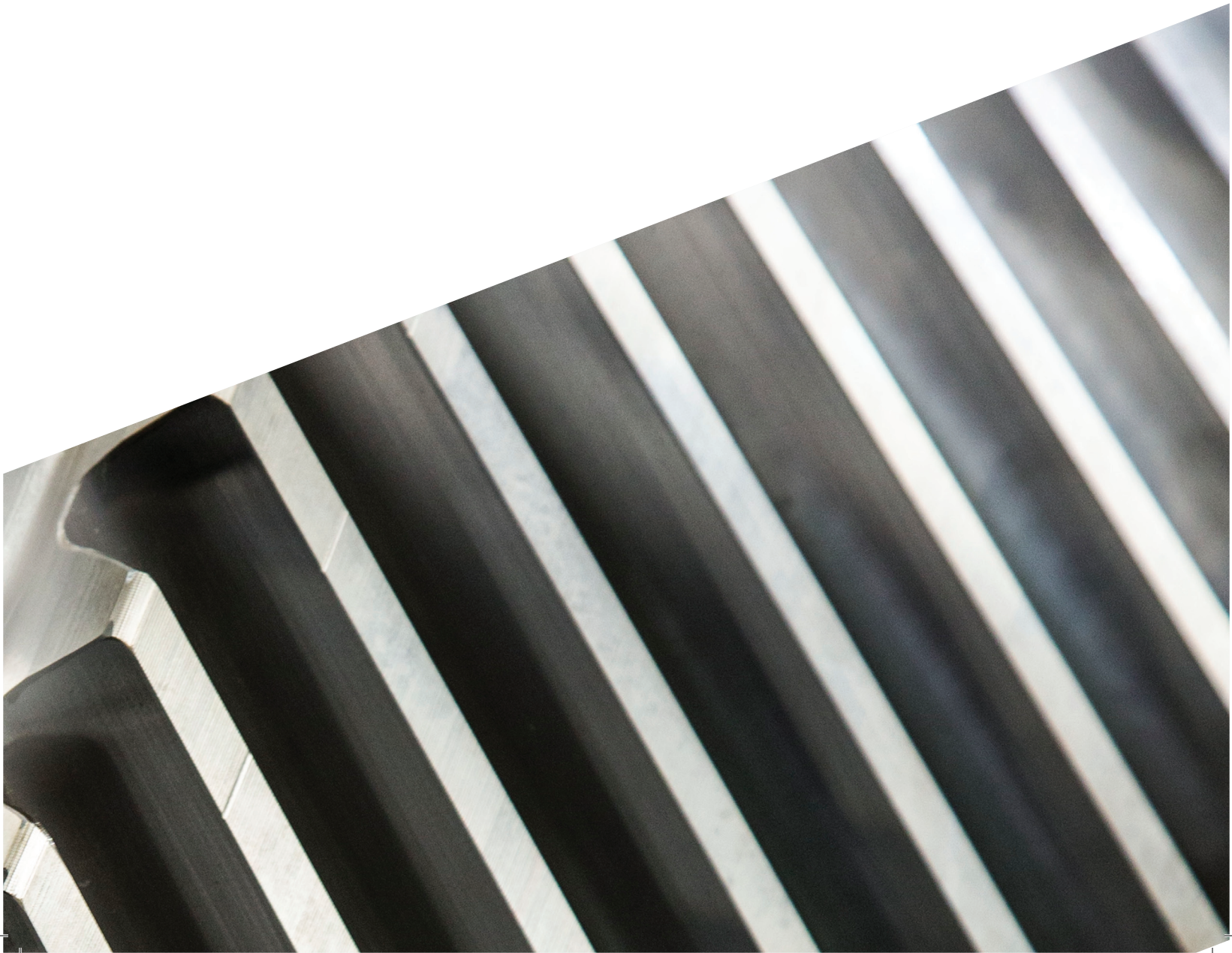
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Drawing & Dimensions / Thermal Ratings / Nominal Mechanical Power Ratings

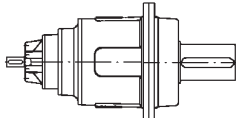
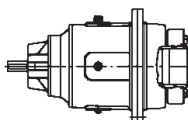
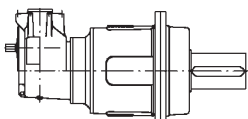
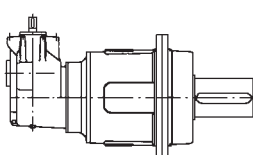
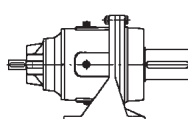
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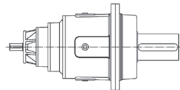
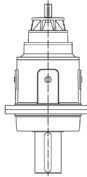
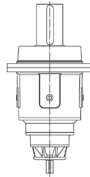
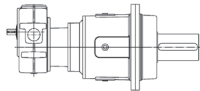
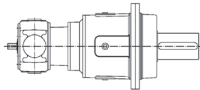
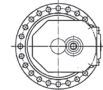
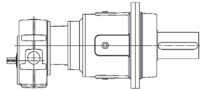
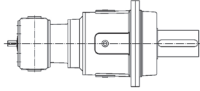
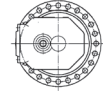
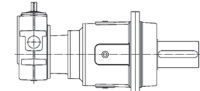
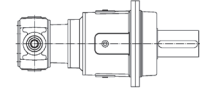
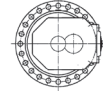
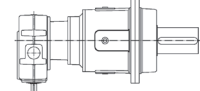
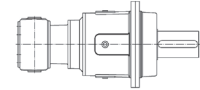
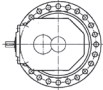


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Type Definition

P3O0053N0100						
Series	Number of Stages	Gear Unit Design	Gear Unit Sizes	Nominal Output Torque T _{2N} in kNm	Mounting	Ratio (x : 1)
Quatro+	2	O Coaxial Planetary 	0013	44	N Flange 	20 - 40
	3		0023	68		80 - 360
	4		0033	79		400 - 2800
			0043	116		
	3	S Helical Planetary 	0053	154		20 - 250
			0063	222		
			0073	277		
	4		0083	384		280 - 2240
			0093	485		
			0103	612		
	4	K Bevel-helical Planetary 	0113	722	F Foot 	80 - 800
			0123	938		
			0133	1014		
	5		0143	1237		900 - 2800
			0153	1427		

—		010		/		V		H		L			
Shaft Positions						High Speed Shaft (HSS)	Low Speed Shaft (LSS)	Specialities					
Horizontal Output Shaft (LSS)			Vertical Output Shaft (LSS)										
010						020							
	040												
111							121						
	112	 											
		113											
			114	 									
211						221							
	212	 											
		213											
			214	 									

Selection Procedure

1. Gear Unit Selection

The selection of the correct gear unit to suit specific applications is the joint responsibility of the customer and David Brown Santasalo. The customer is required to provide the application information, the operational data and all operating and ambient conditions. The user bears the responsibility for ensuring that all accident prevention regulations of the country in which the gear unit is used are complied with. Gears units are delivered without oil.

2. Power Ratings in the Catalogue

The power ratings published in our tables are the nominal power rating P_{2N} and are valid for an application factor $K_A = 1.0$, uniform mode of operation of both the driving and the driven machine, < 3 hours per day and operation with maximum 5 starts per hour, as well as a bearing lifetime $L_{h10} > 15,000$ hours.

3. Calculation of Size

Table 1 defines an operating mode for the driven machine (Uniform, Low, Moderate, Heavy). The application factor K_A is determined from Table 2 taking into account the number of hours of operation per day, the mode of operation of the driven machine and the type of driving machine.

3.1 Nominal Power

The nominal power of the gear unit P_{2N} must be greater equal than the product of the power of the driven machine P_{2eff} and the application factor K_A , divided by the efficiency η .

$$P_{2N} \geq \frac{P_{2eff} \cdot K_A}{\eta}$$

Additional checks for the maximum load (3.3) and maximum thermal rating (3.4) are absolutely essential. Where the direction of drive is reversing and load spectrum, it is necessary to contact us before ordering.

3.2 Gear Unit Size

The gear unit size required is determined from the tables using the nominal ratio i_N and the nominal power P_{2N} .

3.3 Maximum Power Check

Table 3 shows the maximum load factor f_L . This factor takes into account peak loads per hour caused, for example by start-ups, braking and other well-known stochastic shock load conditions. Peak loads may not exceed 5 seconds. The nominal power of the gear unit P_{2N} must be greater than the product of the maximum power of the driven machine P_{2max} and the maximum load factor f_L divided by 2 and the efficiency η . If the maximum power of the driven machine is not known, the power of the driving machine must be used as P_{2max} in the calculation for maximum power check.

$$P_{2N} \geq \frac{P_{2max} \cdot f_L}{2 \cdot \eta}$$

3.4 Thermal Rating

The thermal ratings P_{TN} given in the tables are valid for ambient temperatures of +20°C and maximum operating temperature to +80°C. The thermal ratings take into account the efficiency given under (3.5). Where the ambient temperatures vary from that given, multiply the thermal rating with the temperature factor f_T given in Table 4. Further the factor for altitude f_A in Table 5 must be considered if the installation height is > 1,000 metres above sea level. The power of the driven machine P_{2eff} must be less than the product of the thermal rating, temperature factor f_T and factor for altitude f_A .

$$P_{2eff} \geq P_{GN} \cdot f_T \cdot f_A$$

3.5 Efficiency

Efficiencies η in Table 6 are valid at nominal power and horizontal mounting position.

Table 1.
Load classification of the driven machine

Application	Group	Application	Group
Agitator	M	Press	H **
Antenna drive	M	Press, food industry	H **
Auxiliary drives	U	Pump, chemical industry	M
Bucket wheel drive	H **	Roller mill, cement, lime	H **
Cement mill cyclone dust catcher	M	Roller mill, rubber Rotary plate, bucket	H **
Cement mill horizontal planetary	H **	wheel loader	M
Cement mill vertical bevel planetary	H **	Slewing gear, crane	U
Cement mill, roller crusher	H **	Special units for fun parks	H
Chip board press	M	Steel work, roll drive	M
Conveyor drive	M	Steel work, turn drive	H **
Conveyor drive, belt	U	Steel, plate bending machine	H
Conveyor worm	M	Sugar, diffuser	M
Crane, hoisting, luffing	U	Sugar, extraction plant	M
Crane, drive gear, trolley	M	Sugar, press	H
Discharger	M	Track drive bucket wheel loader	H
Extruder	H **	Water turbine	M
Machines for coating of tubes	H	Wind mill	M
Mining industry, cutting heads	H **	Worm press	H
Paper machine, wetpress	H **		
Pipeline, ball valve	U		

Note:

** Selection based on 24 hours operation

Group U = uniform load

Group M = moderate shocks

Group C = considerable shocks

Group H = heavy shocks

Table 2.
Application Factor K_A

Driving machine	Load classification of driven machine	Service hours per day		
		<3	3 ... 10	>10
Electric motor, steam or gas turbine, water turbine, hydraulic motor	Group U	1.00	1.10	1.25
	Group M	1.15	1.25	1.50
	Group C	1.35	1.50	1.75
	Group H	1.55	1.75	2.00
Multicylinder combustion engine	Group U	1.15	1.25	1.50
	Group M	1.35	1.50	1.75
	Group C	1.55	1.75	2.00
	Group H	1.80	2.00	2.25

Table 3.
Maximum Load Factor f_L

Occurrences per hour	1 - 5	6 - 20	21 - 40	41 - 80	81 - 160	> 160
Maximum load factor f_L	1.0	1.2	1.3	1.5	1.75	2.0

Table 4.
Temperature Factor f_T

Ambient temperature (°C)	20	30	40	50
Temperature Factor f_T	1	0.8	0.6	0.4

Table 5.
Altitude Factor f_A

Altitude (metres above sea level)	0	1,000	2,000	3,000	4,000
Altitude factor f_A	1.0	0.95	0.91	0.87	0.83

Table 6.
Efficiency η

Gear unit type	P20	P30	P40	P3S	P4S	P4K	P5K
Efficiency η	0.98	0.975	0.97	0.97	0.96	0.96	0.95

Example

Example for Selection

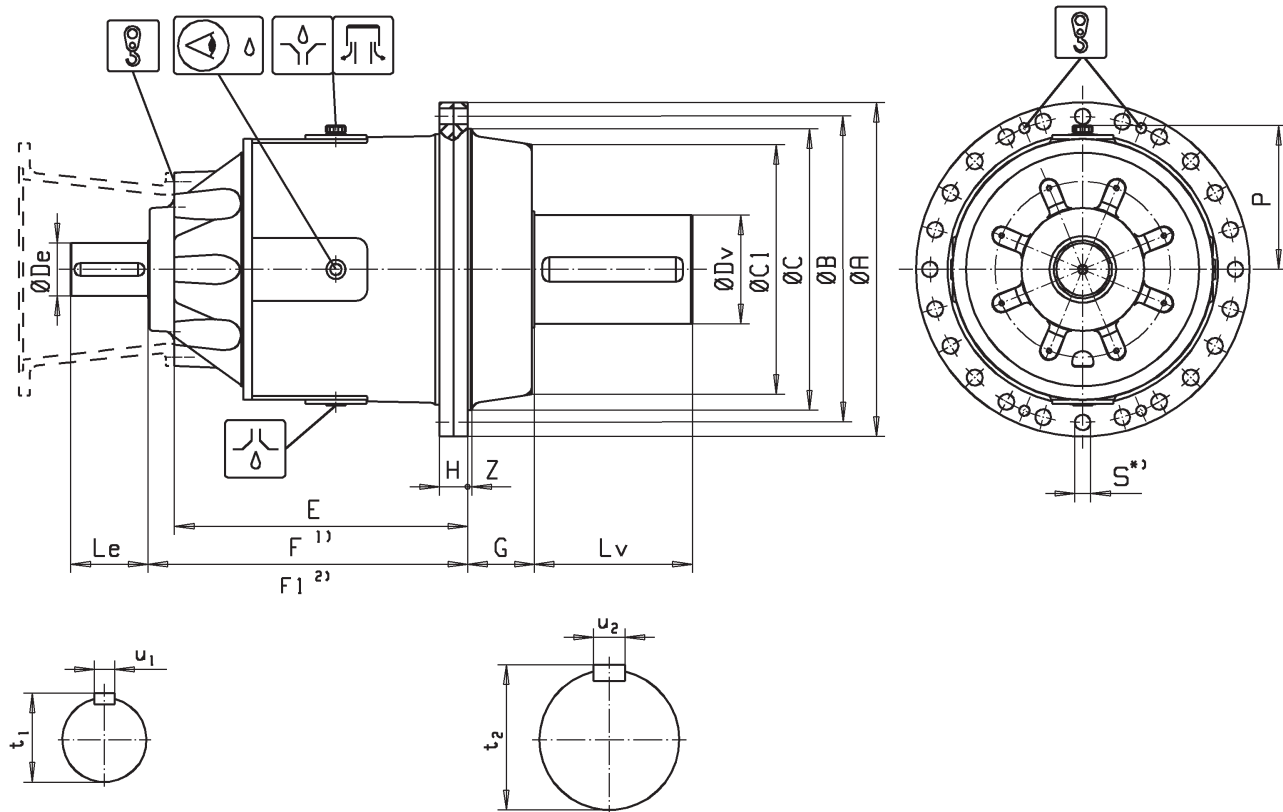
Attribute	Formula symbol	Data	Source
Application	---	Rolling mill	Customer
Power driven machine	P_{2eff}	55 kW	Customer
Speed driven machine	n_2	15 rpm	Customer
Power driving machine	PM	75 kW	Customer
Speed driving machine	n_1	1500 rpm	Customer
Nominal ratio	i_N	$n_1 / n_2 = 100$	---
Load class		C	Catalogue table 1, page 9
Service hours per day		24	Customer
Application factor	KA	1.75	Catalogue table 2, page 9
Occurrences per hour		>10	Customer
Maximum load factor	fL	1.2	Catalogue table 3, page 9
Gear unit type		Coaxial planetary gear unit	Customer / DB Santasalo
Selection of gear unit type		P30	Catalogue, page 6-7
Design		Output shaft hollow with shrink disk	Customer / DB Santasalo
Number of stages		3	Catalogue, page 6-7
Efficiency	η	0.975	Catalogue table 6, page 9
Required nominal power rating	P2	$55 \text{ kW} * 1.75 / 0.975 = 98 \text{ kW}$	Catalogue chapter 3.1, page 8
Selection power rating	P_{2N}	197	Catalogue table, page 23
Exact ratio	i	104.84	Catalogue table, page 62
Maximum power check	P_2	$75 \text{ kW} * 1.2 / 2 / 0.975 = 46 \text{ kW} < 75 \text{ kW}$	Catalogue chapter 3.3, page 8
Ambient temperature	T_u	40 °C	Customer
Temperature factor	f_t	0.6	Catalogue table 4, page 9
Altitude factor	f_a	1.0	Catalogue table 5, page 9
Thermal rating	PTN	142 kW, with cooling fan	Catalogue table, page 22
Thermal rating check	TN	$55 \text{ kW} < 142 \text{ kW} * 0.6 * 1.0 = 85.2 \text{ kW}$	Catalogue chapter 3.4, page 8
Example gear unit		P30 0053 N 0100-010 /VHL	Catalogue, page 6-7



**Developing and manufacturing
gear units for a combined
285 years, David Brown Santasalo
has a deep understanding
of drive system technology.**

P20...N...-010/VVN

Solid Shaft, Flange



Size	Dimensions in mm																				Mass	Quantity of oil
	A	B	C	C1	E	F	F1	G	H	P	S	Z	De	Le	Dv	Lv	u1	t1	u2	t2	kg	l
0013	450	410	370f8	340	424	435	470	78	38	205	22	8	50k6	110	150m6	220	14h9	54	36h9	158	280	10
0023	500	460	410f8	373	474	485	520	85	44	230	22	8	60m6	120	160m6	250	18h9	64	40h9	169	400	15
0033	560	510	460f8	408	524	535	570	90	46	260	26	8	70m6	140	180m6	280	20h9	75	45h9	190	540	20
0043	620	560	480f8	453	559	570	605	130	60	280	33	8	80m6	150	200m6	350	22h9	85	45h9	210	730	25
0053	650	590	530f8	490	589	600	640	140	60	300	33	8	90m6	160	220m6	400	25h9	95	50h9	231	860	32
0063	760	690	610f8	574	689	700	740	140	70	340	39	8	100m6	180	250m6	400	28h9	106	56h9	262	1350	55
0073	840	770	690f8	633	739	750	790	145	80	385	39	12	120m6	200	260m6	400	32h9	127	56h9	272	1800	65
0083	920	840	750f8	685	831	845	895	160	80	420	45	12	140m6	220	300m6	450	36h9	148	70h9	314	2400	100
0093	950	870	800f8	710	896	910	960	190	80	440	45	12	150m6	220	340m6	550	36h9	158	80h9	355	2800	115
0103	1050	960	850f8	781	946	960	1020	195	90	480	45	12	160m6	240	360m6	600	40h9	169	80h9	375	3600	145
0113	1100	1010	900f8	827	996	1010	1070	210	90	510	45	12	160m6	240	380m6	650	40h9	169	80h9	395	4300	175
0123	1150	1070	970f8	903	1076	1090	1160	220	90	540	45	16	180m6	350	420m6	650	45h9	190	90h9	437	5200	220
0133	1210	1120	1010f8	937	1106	1120	1190	220	100	560	45	16	180m6	350	450m6	700	45h9	190	100h9	469	5800	250
0143	1340	1250	1150f8	965	1203	1220	1290	230	100	580	45	16	200m6	350	480m6	750	45h9	210	100h9	499	6600	270
0153	1410	1320	1200f8	1019	1231	1245	1315	235	100	600	45	16	200m6	350	500m6	800	45h9	210	100h9	519	7800	330

1) F = Without cooling fan 2) F1 = with cooling fan

	Thermal ratings P _{TN} in kW																	
	Size																	
	n ₁ [rpm]	0013	0023	0033	0043	0053	0063	n ₁ [rpm]	0073	0083	0093	n ₁ [rpm]	0103	0113	0123	0133	0143	0153
Without cooling fan	1800	39	48	59	68	80	105	1200	145	175	203	600	253	283	328	351	415	445
	1500	41	50	62	71	84	111	1000	152	184	213	500	266	297	344	369	436	467
	1200	44	54	67	77	90	118	600	163	197	228	300	285	318	369	395	467	501
	1000	49	60	74	85	100	132	500	181	219	254	250	316	354	410	439	519	556
With cooling fan	1800	78	96	119	136	161	211	1200	290	351	407	600	506	566	656	702	830	891
	1500	82	101	125	143	169	221	1000	305	369	427	500	531	594	689	737	872	936
	1200	88	108	133	153	181	237	600	326	395	458	300	569	637	738	790	934	1002
	1000	98	120	148	170	201	263	500	363	439	509	250	633	708	820	878	1038	1114

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of + 20°C

P20...N...-010/VVN

Solid Shaft, Flange

Size	n ₁ rpm	Nominal mechanical power ratings P _{2N} in kW						
		Nominal ratio i _N						
		20	22.4	25	28	32	36	40
0013	1800	-	199	189	178	167	155	142
	1500	-	175	166	157	147	136	125
	1200	-	150	142	134	126	117	107
	1000	-	132	125	118	111	103	94
0023	1800	315	299	281	263	243	223	202
	1500	277	263	247	232	214	197	177
	1200	237	225	211	198	183	168	152
	1000	209	198	186	174	161	148	134
0033	1800	361	345	307	286	266	243	221
	1500	318	304	270	252	234	214	194
	1200	272	260	231	216	200	183	166
	1000	239	229	204	190	176	161	146
0043	1800	521	500	454	429	401	369	335
	1500	459	440	399	377	353	325	295
	1200	392	376	342	323	302	278	252
	1000	345	331	301	284	265	245	222
0053	1800	689	658	588	551	511	471	427
	1500	606	579	517	485	450	415	376
	1200	519	495	442	415	385	355	322
	1000	456	436	389	365	339	312	283
0063	1800	984	905	863	771	721	667	607
	1500	866	797	760	679	635	587	534
	1200	741	682	650	581	543	502	457
	1000	652	600	572	511	478	442	402
0073	1200	798	765	694	655	614	571	524
	1000	703	674	611	577	541	502	461
	600	491	471	427	403	378	351	322
	500	433	415	376	355	333	309	284
0083	1200	1168	1121	1018	962	902	839	771
	1000	1028	986	896	847	794	738	678
	600	719	690	627	592	555	516	474
	500	633	607	551	521	489	455	418
0093	1200	1658	1576	1490	1309	1211	1112	1006
	1000	1459	1387	1311	1152	1065	979	885
	600	1020	970	917	806	745	685	619
	500	898	854	807	709	656	603	545
0103	600	1271	1220	1107	1046	981	912	838
	500	1119	1073	975	921	864	803	737
	300	783	751	682	644	604	558	495
	250	689	661	600	566	517	465	412
0113	600	1496	1435	1303	1230	1154	1072	985
	500	1317	1263	1147	1083	1016	944	867
	300	921	883	802	757	710	660	586
	250	811	778	706	667	612	551	488
0123	600	1880	1788	1591	1489	1377	1264	1144
	500	1655	1574	1401	1311	1212	1113	1007
	300	1157	1101	980	917	848	778	704
	250	1019	969	862	807	746	685	620
0133	600	1908	1830	1661	1570	1472	1368	1257
	500	1679	1611	1462	1382	1296	1204	1106
	300	1174	1126	1023	966	906	842	774
	250	1034	991	900	851	798	741	681
0143	600	2716	2603	2357	2222	2080	1927	1762
	500	2391	2291	2074	1956	1830	1696	1551
	300	1672	1602	1451	1362	1239	1110	977
	250	1472	1410	1234	1135	1032	925	815
0153	600	3395	3257	2959	2796	2623	2439	2241
	500	2988	2867	2604	2461	2309	2147	1941
	300	2090	1988	1733	1598	1459	1314	1165
	250	1757	1656	1444	1332	1216	1095	970

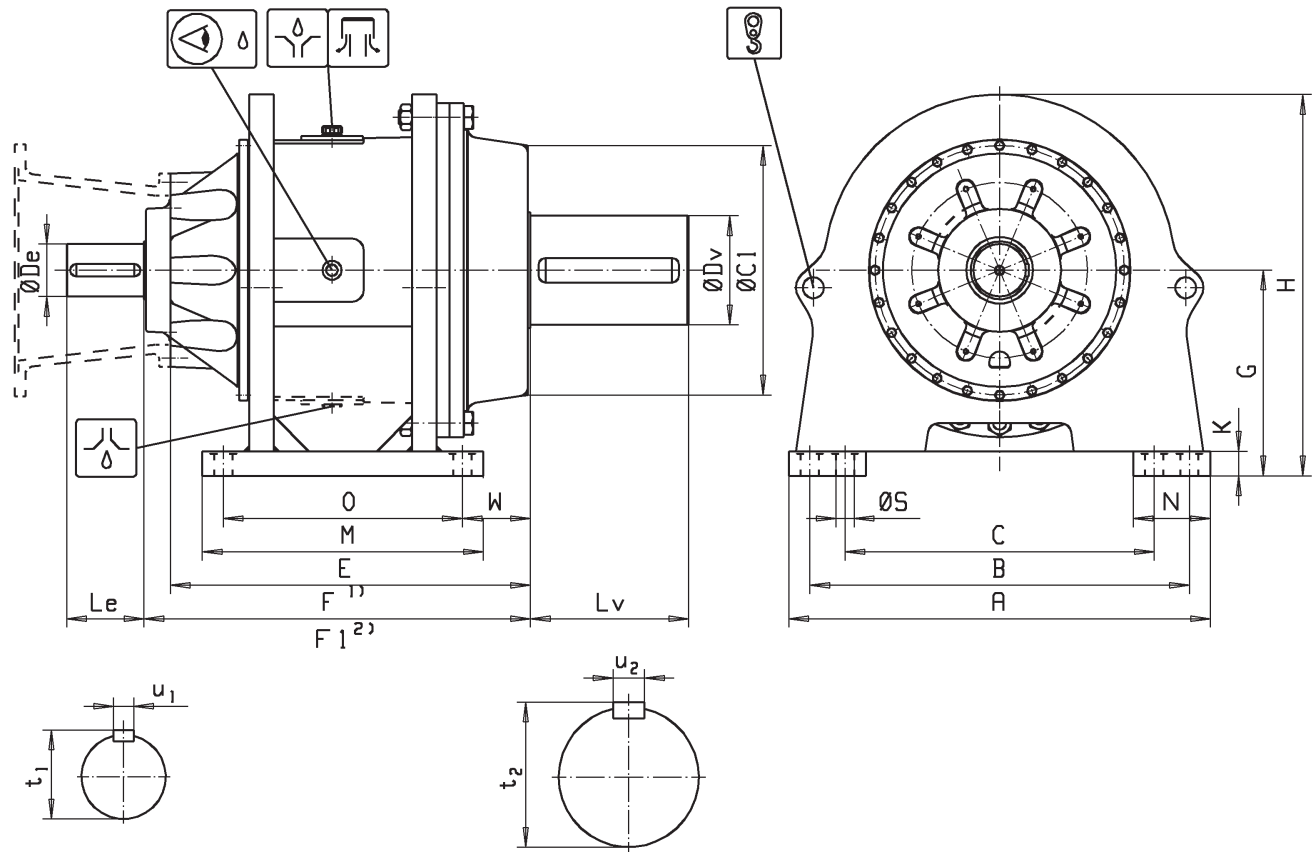
Power ratings: The ratings are nominal, application factor $K_A = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P2O...F...-010/VVN

Solid Shaft, Foot



Size	Dimensions in mm																						Mass	Quantity of oil	
	A	B	C	C1	E	F	F1	G	H	K	M	N	O	S	W	De	Le	Dv	Lv	u1	t1	u2	t2	kg	l
0013	560	510	410	340	502	513	548	283	525	30	380	100	330	22	85	50k6	110	150m6	220	14h9	54	36h9	158	370	10
0023	630	580	480	373	559	570	605	313	580	35	430	100	380	22	88	60m6	120	160m6	250	18h9	64	40h9	169	520	15
0033	700	640	540	408	614	625	660	343	640	35	460	110	400	26	99	70m6	140	180m6	280	20h9	75	45h9	190	700	20
0043	780	700	570	453	689	700	735	378	705	40	520	140	440	33	134	80m6	150	200m6	350	22h9	85	45h9	210	980	25
0053	820	730	580	490	729	740	780	393	745	40	550	160	460	39	143	90m6	160	220m6	400	25h9	95	50h9	231	1140	32
0063	950	860	710	574	829	840	880	480	885	60	600	160	510	39	147	100m6	180	250m6	400	28h9	106	56h9	262	1770	55
0073	1050	950	770	633	884	895	935	520	965	60	650	190	550	45	160	120m6	200	260m6	400	32h9	127	56h9	272	2370	65
0083	1150	1050	870	685	991	1005	1055	570	1055	70	720	190	620	45	168	140m6	220	300m6	450	36h9	148	70h9	314	3100	100
0093	1200	1080	880	710	1086	1100	1150	585	1085	70	800	220	680	52	194	150m6	220	340m6	550	36h9	158	80h9	355	3580	115
0103	1300	1180	980	781	1141	1155	1215	645	1195	80	830	220	710	52	201	160m6	240	360m6	600	40h9	169	80h9	375	3600	145
0113	1380	1240	1000	827	1206	1220	1280	680	1255	80	890	260	750	60	220	160m6	240	380m6	650	40h9	169	80h9	395	5450	175
0123	1430	1290	1050	903	1296	1310	1380	715	1315	90	950	260	810	60	226	180m6	350	420m6	650	45h9	190	90h9	437	6450	220
0133	1500	1340	1070	937	1326	1340	1410	755	1395	90	1020	290	860	70	221	180m6	350	450m6	700	45h9	190	100h9	469	7320	250
0143	1620	1460	1190	965	1436	1450	1520	830	1535	100	1050	290	890	70	236	200m6	350	480m6	750	45h9	210	100h9	499	8180	270
0153	1690	1500	1200	1019	1466	1480	1550	865	1605	100	1150	340	960	78	218	200m6	350	500m6	800	45h9	210	100h9	519	9600	330

1) F = Without cooling fan 2) F1 = with cooling fan

Thermal ratings P_{TN} in kW																	
Size																	
	n_1 [rpm]	0013	0023	0033	0043	0053	0063	n_1 [rpm]	0073	0083	0093	n_1 [rpm]	0103	0113	0123	0133	0153
Without cooling fan	1800	39	48	59	68	80	105	1200	145	175	203	600	253	283	328	351	445
	1500	41	50	62	71	84	111	1000	152	184	213	500	266	297	344	369	467
	1200	44	54	67	77	90	118	600	163	197	228	300	285	318	369	395	501
	1000	49	60	74	85	100	132	500	181	219	254	250	316	354	410	439	556
With cooling fan	1800	78	96	119	136	161	211	1200	290	351	407	600	506	566	656	702	891
	1500	82	101	125	143	169	221	1000	305	369	427	500	531	594	689	737	936
	1200	88	108	133	153	181	237	600	326	395	458	300	569	637	738	790	1002
	1000	98	120	148	170	201	263	500	363	439	509	250	633	708	820	878	1114

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of + 20°C

P20...F...-010/VVN

Solid Shaft, Foot

Size	n ₁ rpm	Nominal mechanical power ratings P _{2N} in kW						
		Nominal ratio i _N						
		20	22.4	25	28	32	36	40
0013	1800	-	199	189	178	167	155	142
	1500	-	175	166	157	147	136	125
	1200	-	150	142	134	126	117	107
	1000	-	132	125	118	111	103	94
0023	1800	315	299	281	263	243	223	202
	1500	277	263	247	232	214	197	177
	1200	237	225	211	198	183	168	152
	1000	209	198	186	174	161	148	134
0033	1800	361	345	307	286	266	243	221
	1500	318	304	270	252	234	214	194
	1200	272	260	231	216	200	183	166
	1000	239	229	204	190	176	161	146
0043	1800	521	500	454	429	401	369	335
	1500	459	440	399	377	353	325	295
	1200	392	376	342	323	302	278	252
	1000	345	331	301	284	265	245	222
0053	1800	689	658	588	551	511	471	427
	1500	606	579	517	485	450	415	376
	1200	519	495	442	415	385	355	322
	1000	456	436	389	365	339	312	283
0063	1800	984	905	863	771	721	667	607
	1500	866	797	760	679	635	587	534
	1200	741	682	650	581	543	502	457
	1000	652	600	572	511	478	442	402
0073	1200	798	765	694	655	614	571	524
	1000	703	674	611	577	541	502	461
	600	491	471	427	403	378	351	322
	500	433	415	376	355	333	309	284
0083	1200	1168	1121	1018	962	902	839	771
	1000	1028	986	896	847	794	738	678
	600	719	690	627	592	555	516	474
	500	633	607	551	521	489	455	418
0093	1200	1658	1576	1490	1309	1211	1112	1006
	1000	1459	1387	1311	1152	1065	979	885
	600	1020	970	917	806	745	685	619
	500	898	854	807	709	656	603	545
0103	600	1271	1220	1107	1046	981	912	838
	500	1119	1073	975	921	864	803	737
	300	783	751	682	644	604	558	495
	250	689	661	600	566	517	465	412
0113	600	1496	1435	1303	1230	1154	1072	985
	500	1317	1263	1147	1083	1016	944	867
	300	921	883	802	757	710	660	586
	250	811	778	706	667	612	551	488
0123	600	1880	1788	1591	1489	1377	1264	1144
	500	1655	1574	1401	1311	1212	1113	1007
	300	1157	1101	980	917	848	778	704
	250	1019	969	862	807	746	685	620
0133	600	1908	1830	1661	1570	1472	1368	1257
	500	1679	1611	1462	1382	1296	1204	1106
	300	1174	1126	1023	966	906	842	774
	250	1034	991	900	851	798	741	681
0143	600	2716	2603	2357	2222	2080	1927	1762
	500	2391	2291	2074	1956	1830	1696	1551
	300	1672	1602	1451	1362	1239	1110	977
	250	1472	1410	1234	1135	1032	925	815
0153	600	3395	3257	2959	2796	2623	2439	2241
	500	2988	2867	2604	2461	2309	2147	1941
	300	2090	1988	1733	1598	1459	1314	1165
	250	1757	1656	1444	1332	1216	1095	970

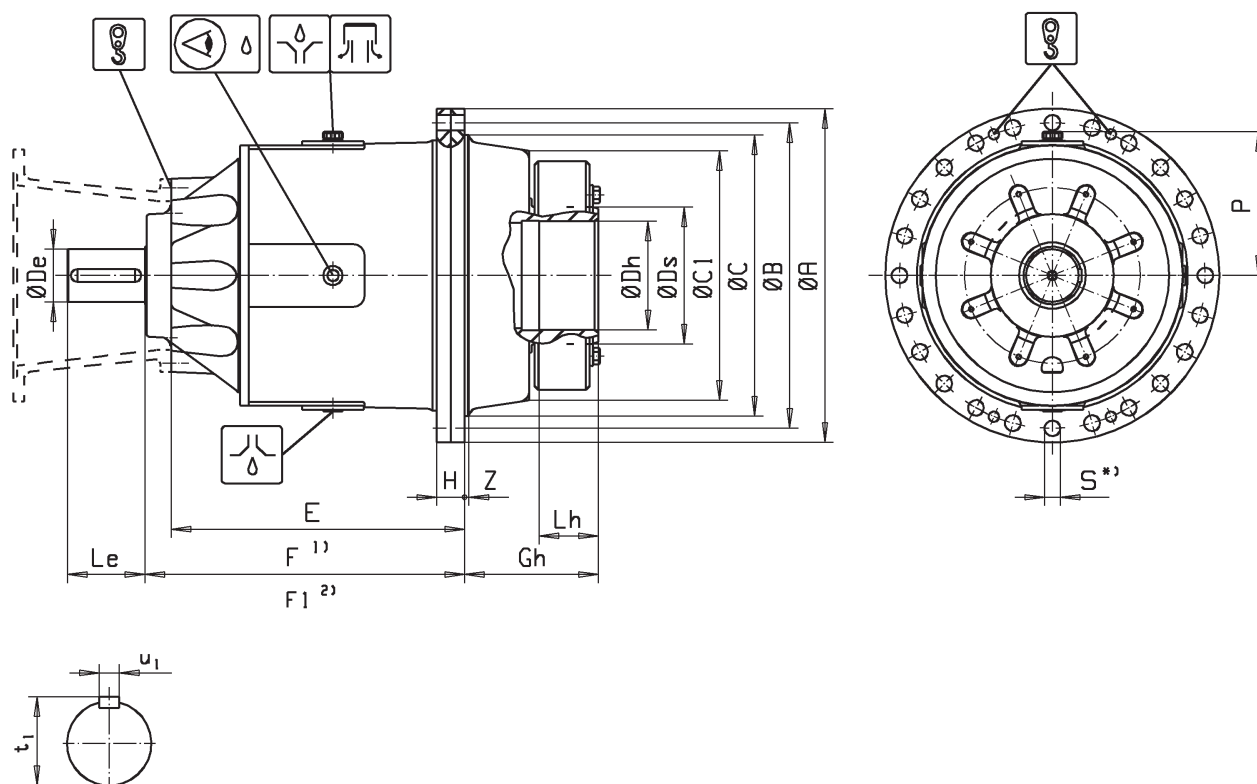
Power ratings: The ratings are nominal, application factor K_A = 1.0. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P20...N...-010/VHN

Hollow Shaft, Flange



Size	Dimensions in mm																			Mass	Quantity of oil
	A	B	C	C1	E	F	F1	Gh	H	P	S	Z	De	Le	Dh	Lh	Ds	u1	t1	kg	l
0013	450	410	370f8	340	424	435	470	170	38	205	22	8	50k6	110	140H7	100	185	14h9	54	310	10
0023	500	460	410f8	373	474	485	520	180	44	230	22	8	60m6	120	150H7	100	200	18h9	64	440	15
0033	560	510	460f8	408	524	535	570	210	46	260	26	8	70m6	140	165H7	120	220	20h9	75	590	20
0043	620	560	480f8	453	559	570	605	255	60	280	33	8	80m6	150	190H7	120	240	22h9	85	790	25
0053	650	590	530f8	490	589	600	640	275	60	300	33	8	90m6	160	210H7	135	260	25h9	95	940	32
0063	760	690	610f8	574	689	700	740	295	70	340	39	8	100m6	180	240H7	160	300	28h9	106	1470	55
0073	840	770	690f8	633	739	750	790	320	80	385	39	12	120m6	200	260H7	180	340	32h9	127	1980	65
0083	920	840	750f8	685	831	845	895	340	80	420	45	12	140m6	220	290H7	185	360	36h9	148	2600	100
0093	950	870	800f8	710	896	910	960	380	80	440	45	12	150m6	220	310H7	190	390	36h9	158	3040	115
0103	1050	960	850f8	781	946	960	1020	420	90	480	45	12	160m6	240	340H7	220	440	40h9	169	3970	145
0113	1100	1010	900f8	827	996	1010	1070	435	90	510	45	12	160m6	240	360H7	220	460	40h9	169	4730	175
0123	1150	1070	970f8	903	1076	1090	1160	465	90	540	45	16	180m6	350	380H7	240	480	45h9	190	5720	220
0133	1210	1120	1010f8	937	1106	1120	1190	460	100	560	45	16	180m6	350	420H7	240	500	45h9	190	6390	250
0143	1340	1250	1150f8	965	1203	1220	1290	500	100	580	45	16	200m6	350	430H7	270	530	45h9	210	7340	270
0153	1410	1320	1200f8	1019	1231	1245	1315	510	100	600	45	16	200m6	350	450H7	270	560	45h9	210	8580	330

1) F = Without cooling fan 2) F1 = with cooling fan

	Thermal ratings P _{TN} in kW																	
	Size																	
	n ₁ [rpm]	0013	0023	0033	0043	0053	0063	n ₁ [rpm]	0073	0083	0093	n ₁ [rpm]	0103	0113	0123	0133	0143	0153
Without cooling fan	1800	39	48	59	68	80	105	1200	145	175	203	600	253	283	328	351	415	445
	1500	41	50	62	71	84	111	1000	152	184	213	500	266	297	344	369	436	467
	1200	44	54	67	77	90	118	600	163	197	228	300	285	318	369	395	467	501
	1000	49	60	74	85	100	132	500	181	219	254	250	316	354	410	439	519	556
With cooling fan	1800	78	96	119	136	161	211	1200	290	351	407	600	506	566	656	702	830	891
	1500	82	101	125	143	169	221	1000	305	369	427	500	531	594	689	737	872	936
	1200	88	108	133	153	181	237	600	326	395	458	300	569	637	738	790	934	1002
	1000	98	120	148	170	201	263	500	363	439	509	250	633	708	820	878	1038	1114

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of + 20°C

P20...N...-010/VHN

Hollow Shaft, Flange

Size	n ₁ rpm	Nominal mechanical power ratings P _{2N} in kW						
		Nominal ratio i _N						
		20	22.4	25	28	32	36	40
0013	1800	-	199	189	178	167	155	142
	1500	-	175	166	157	147	136	125
	1200	-	150	142	134	126	117	107
	1000	-	132	125	118	111	103	94
0023	1800	315	299	281	263	243	223	202
	1500	277	263	247	232	214	197	177
	1200	237	225	211	198	183	168	152
	1000	209	198	186	174	161	148	134
0033	1800	361	345	307	286	266	243	221
	1500	318	304	270	252	234	214	194
	1200	272	260	231	216	200	183	166
	1000	239	229	204	190	176	161	146
0043	1800	521	500	454	429	401	369	335
	1500	459	440	399	377	353	325	295
	1200	392	376	342	323	302	278	252
	1000	345	331	301	284	265	245	222
0053	1800	689	658	588	551	511	471	427
	1500	606	579	517	485	450	415	376
	1200	519	495	442	415	385	355	322
	1000	456	436	389	365	339	312	283
0063	1800	984	905	863	771	721	667	607
	1500	866	797	760	679	635	587	534
	1200	741	682	650	581	543	502	457
	1000	652	600	572	511	478	442	402
0073	1200	798	765	694	655	614	571	524
	1000	703	674	611	577	541	502	461
	600	491	471	427	403	378	351	322
	500	433	415	376	355	333	309	284
0083	1200	1168	1121	1018	962	902	839	771
	1000	1028	986	896	847	794	738	678
	600	719	690	627	592	555	516	474
	500	633	607	551	521	489	455	418
0093	1200	1658	1576	1490	1309	1211	1112	1006
	1000	1459	1387	1311	1152	1065	979	885
	600	1020	970	917	806	745	685	619
	500	898	854	807	709	656	603	545
0103	600	1271	1220	1107	1046	981	912	838
	500	1119	1073	975	921	864	803	737
	300	783	751	682	644	604	558	495
	250	689	661	600	566	517	465	412
0113	600	1496	1435	1303	1230	1154	1072	985
	500	1317	1263	1147	1083	1016	944	867
	300	921	883	802	757	710	660	586
	250	811	778	706	667	612	551	488
0123	600	1880	1788	1591	1489	1377	1264	1144
	500	1655	1574	1401	1311	1212	1113	1007
	300	1157	1101	980	917	848	778	704
	250	1019	969	862	807	746	685	620
0133	600	1908	1830	1661	1570	1472	1368	1257
	500	1679	1611	1462	1382	1296	1204	1106
	300	1174	1126	1023	966	906	842	774
	250	1034	991	900	851	798	741	681
0143	600	2716	2603	2357	2222	2080	1927	1762
	500	2391	2291	2074	1956	1830	1696	1551
	300	1672	1602	1451	1362	1239	1110	977
	250	1472	1410	1234	1135	1032	925	815
0153	600	3395	3257	2959	2796	2623	2439	2241
	500	2988	2867	2604	2461	2309	2147	1941
	300	2090	1988	1733	1598	1459	1314	1165
	250	1757	1656	1444	1332	1216	1095	970

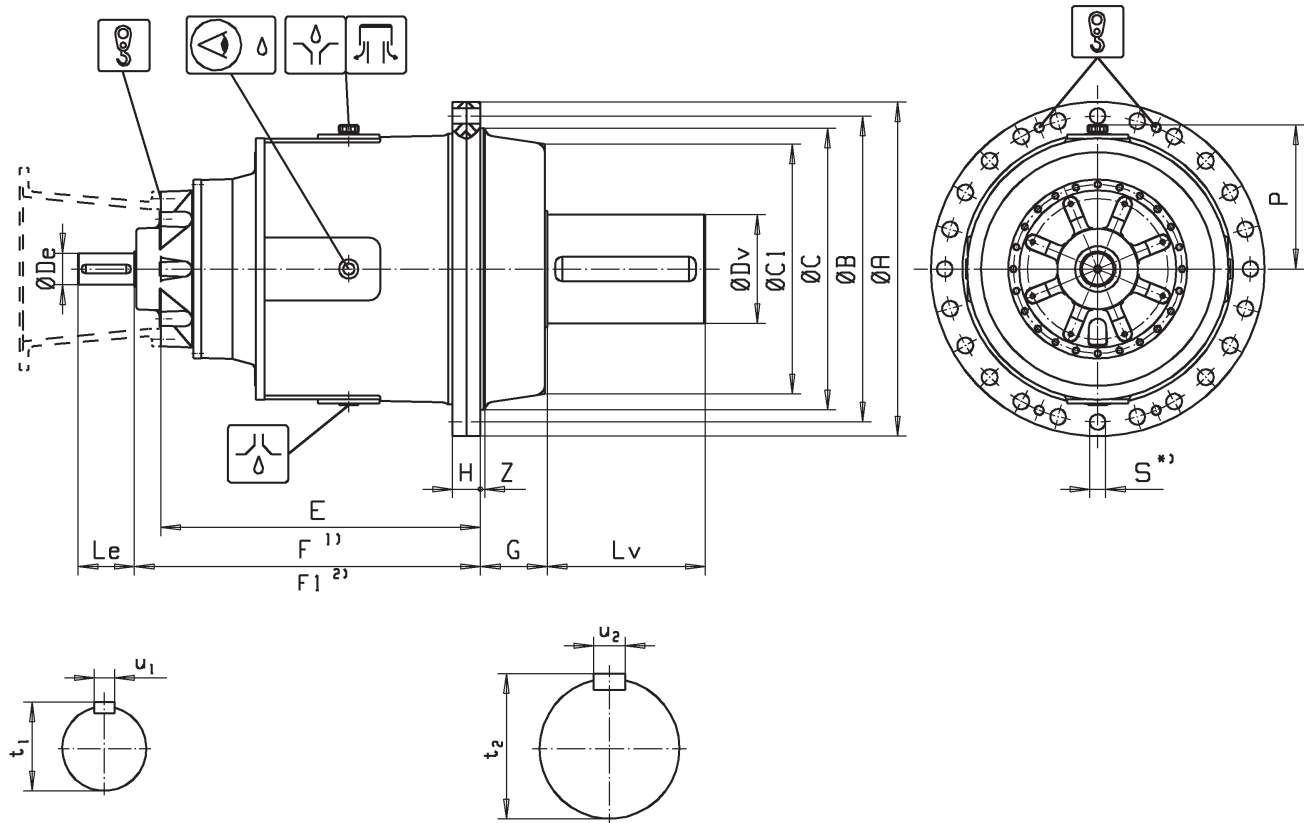
Power ratings: The ratings are nominal, application factor $K_A = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P30...N...-010/VVN

Solid Shaft, Flange



Size	Dimensions in mm																				Mass	Quantity of oil
	A	B	C	C1	E	F	F1	G	H	P	S	Z	De	Le	Dv	Lv	u1	t1	u2	t2	kg	l
0013	450	410	370f8	340	509	520	555	78	38	205	22	8	32k6	58	150m6	220	10h9	35	36h9	158	310	14
0023	500	460	410f8	373	544	555	590	85	44	230	22	8	32k6	58	160m6	250	10h9	35	40h9	169	430	19
0033	560	510	460f8	408	574	585	620	90	46	260	26	8	32k6	58	180m6	280	10h9	35	45h9	190	570	25
0043	620	560	480f8	453	704	715	750	130	60	280	33	8	70m6	140	200m6	350	20h9	75	45h9	210	800	35
0053	650	590	530f8	490	724	735	770	140	60	300	33	8	70m6	140	220m6	400	20h9	75	50h9	231	930	40
0063	760	690	610f8	574	774	785	820	140	70	340	39	8	70m6	140	250m6	400	20h9	75	56h9	262	1420	65
0073	840	770	690f8	633	869	880	920	145	80	385	39	12	90m6	160	260m6	400	25h9	95	56h9	272	1930	80
0083	920	840	750f8	685	924	935	975	160	80	420	45	12	90m6	160	300m6	450	25h9	95	70h9	314	2530	115
0093	950	870	800f8	710	974	985	1025	190	80	440	45	12	90m6	160	340m6	550	25h9	95	80h9	355	2930	130
0103	1050	960	850f8	781	1099	1110	1150	195	90	480	45	12	120m6	200	360m6	600	32h9	127	80h9	375	3900	180
0113	1100	1010	900f8	827	1149	1160	1200	210	90	510	45	12	120m6	200	380m6	650	32h9	127	80h9	395	4600	210
0123	1150	1070	970f8	903	1199	1210	1250	220	90	540	45	16	120m6	200	420m6	650	32h9	127	90h9	437	5500	255
0133	1210	1120	1010f8	937	1281	1295	1345	220	100	560	45	16	140m6	220	450m6	700	36h9	148	100h9	469	6160	300
0143	1340	1250	1150f8	965	1321	1335	1385	230	100	580	45	16	140m6	220	480m6	750	36h9	148	100h9	499	6960	320
0153	1410	1320	1200f8	1019	1346	1360	1410	235	100	600	45	16	140m6	220	500m6	800	36h9	148	100h9	519	8160	380

1) F = Without cooling fan 2) F1 = with cooling fan

	Thermal ratings P_{TN} in kW															
	Size															
	n_1 [rpm]	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153
Without cooling fan	1800	34	40	47	60	68	82	106	123	140	168	186	208	230	259	276
	1500	36	42	49	63	71	86	112	129	147	177	195	219	242	272	290
	1200	38	45	53	67	76	93	120	138	157	190	209	234	259	291	311
	1000	42	50	59	75	85	103	133	153	175	211	232	261	288	324	345
With cooling fan	1800	68	79	94	120	136	165	213	245	279	337	371	417	461	518	552
	1500	71	83	99	126	142	173	223	258	293	354	390	438	484	544	580
	1200	76	89	106	135	153	185	239	276	314	379	418	469	518	583	621
	1000	85	99	117	150	170	206	266	307	349	421	464	521	576	647	690

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of + 20°C

P30...N...-010/VVN

Solid Shaft, Flange

Size	n ₁ rpm	Nominal mechanical power ratings P _{2N} in kW													
		Nominal ratio i _N													
		80	90	100	112	125	140	160	180	200	224	250	280	320	360
0013	1800	71	68	65	61	58	54	49	42	41	37	34	30	26	22
	1500	63	60	57	54	51	46	41	35	34	31	28	25	22	18
	1200	54	51	48	44	41	37	33	28	27	25	23	20	17	15
	1000	46	43	40	37	34	31	27	24	23	21	19	17	14	12
0023	1800	113	108	103	97	91	85	78	69	62	57	51	45	39	33
	1500	99	95	90	85	80	74	66	57	52	47	43	38	33	28
	1200	85	81	77	72	66	60	53	46	41	38	34	30	26	22
	1000	75	70	65	60	55	50	44	38	35	32	28	25	22	18
0033	1800	119	113	107	100	93	86	78	70	68	64	59	54	47	39
	1500	105	100	94	88	82	75	69	61	60	56	51	45	39	33
	1200	90	85	80	75	70	65	59	53	49	45	40	36	31	26
	1000	79	75	71	66	62	57	52	46	41	37	34	30	26	22
0043	1800	186	178	170	160	151	140	129	117	103	97	88	78	67	57
	1500	164	157	149	141	133	123	114	102	88	81	73	65	56	47
	1200	140	134	128	121	113	106	94	82	71	65	58	52	45	38
	1000	124	118	112	106	98	88	78	68	59	54	49	43	37	31
0053	1800	246	236	224	212	199	185	170	154	132	124	115	103	89	75
	1500	217	207	197	187	175	163	150	135	116	107	97	86	75	63
	1200	186	177	169	160	150	140	125	108	94	86	77	69	60	50
	1000	163	156	149	141	130	117	104	90	78	72	65	57	50	42
0063	1800	119	111	104	96	88	79	70	61	48	44	40	35	31	26
	1500	99	93	86	80	73	66	58	51	40	37	33	30	26	22
	1200	79	74	69	64	58	53	47	41	32	29	27	24	20	17
	1000	66	62	58	53	49	44	39	34	27	25	22	20	17	14
0073	1800	379	363	345	327	307	285	262	238	214	201	187	172	156	134
	1500	334	319	304	287	270	251	231	209	189	177	165	152	133	112
	1200	286	273	260	246	231	215	198	179	161	151	138	122	106	89
	1000	251	240	229	216	203	189	174	157	139	128	115	102	89	74
0083	1800	555	531	505	478	449	417	381	342	315	296	275	253	224	188
	1500	488	467	445	420	395	367	335	301	277	261	242	215	187	157
	1200	418	400	380	360	338	314	287	257	235	215	194	172	149	126
	1000	368	352	335	317	297	277	253	225	196	179	162	143	124	105
0093	1800	583	554	522	490	455	419	381	342	435	411	385	348	309	268
	1500	513	488	459	431	400	369	335	301	380	351	321	290	257	223
	1200	439	417	393	369	342	316	287	257	304	281	257	232	206	179
	1000	386	367	346	324	301	278	253	226	254	234	214	193	171	149
0103	1800	975	933	889	843	793	740	683	622	549	504	456	407	356	303
	1500	858	821	783	742	698	651	601	538	458	420	380	339	297	252
	1200	734	703	669	634	597	552	493	431	366	336	304	271	237	202
	1000	646	618	589	554	508	460	411	359	305	280	254	226	198	168
0113	1800	1142	1088	1035	918	855	790	722	650	651	597	540	482	422	358
	1500	1005	958	911	808	753	696	635	572	542	497	450	402	351	299
	1200	859	819	779	691	644	595	543	489	434	398	360	321	281	239
	1000	757	721	686	608	567	524	478	426	361	331	300	268	234	199
0123	1800	1142	1088	977	918	855	790	722	650	758	714	666	615	557	474
	1500	1005	958	860	808	753	696	635	572	667	628	586	531	464	395
	1200	859	819	736	691	644	595	543	489	571	526	476	425	372	316
	1000	757	721	647	608	567	524	478	431	478	438	397	354	310	263
0133	1800	1438	1369	1294	1219	1138	1055	967	875	875	784	733	679	599	514
	1500	1266	1205	1139	1073	1002	929	851	770	771	690	632	567	499	428
	1200	1083	1031	974	918	857	794	728	659	652	556	506	453	399	343
	1000	953	908	857	808	754	699	641	580	543	463	421	378	333	286
0143	1800	1438	1369	1294	1219	1138	1055	967	875	1166	995	905	812	714	613
	1500	1266	1205	1139	1073	1002	929	851	770	972	829	754	676	595	511
	1200	1083	1031	974	918	857	794	728	659	777	664	603	541	476	409
	1000	953	908	857	808	754	699	641	580	648	553	503	451	397	341
0153	1800	1438	1369	1294	1219	1138	1055	967	875	1219	1138	1055	967	851	731
	1500	1266	1205	1139	1073	1002	929	851	770	1073	988	899	806	709	609
	1200	1083	1031	974	918	857	794	728	659	860	791	719	645	567	487
	1000	953	908	857	808	754	699	641	580	716	659	599	537	473	406

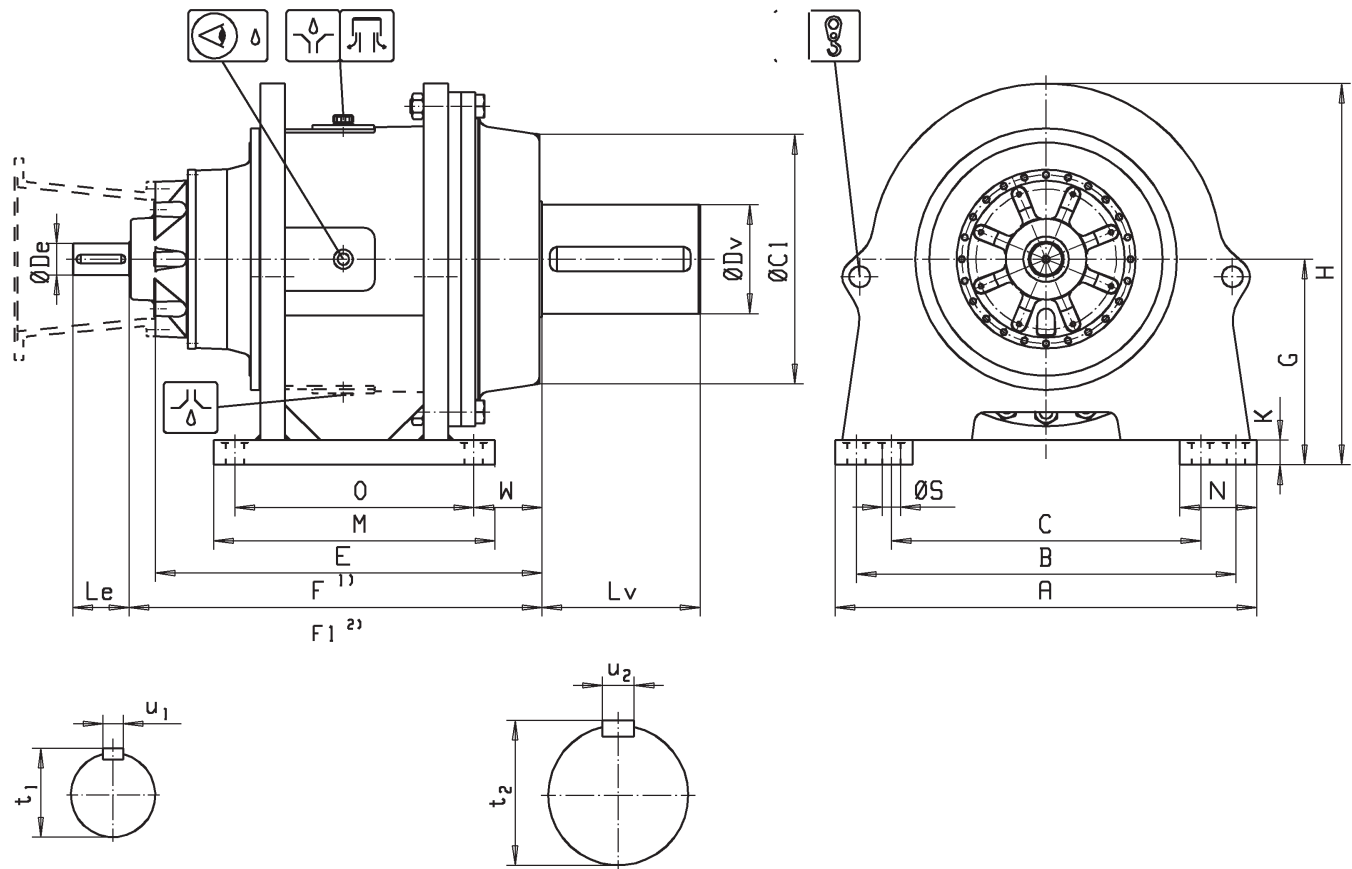
Power ratings: The ratings are nominal, application factor $K_A = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P30...F...-010/VVN

Solid Shaft, Foot



Size	Dimensions in mm																						Mass	Quantity of oil	
	A	B	C	C1	E	F	F1	G	H	K	M	N	O	S	W	De	Le	Dv	Lv	u1	t1	u2	t2	kg	l
0013	560	510	410	340	587	598	633	283	525	30	380	100	330	22	85	32k6	58	150m6	220	10h9	35	36h9	158	400	14
0023	630	580	480	373	629	640	675	313	580	35	430	100	380	22	88	32k6	58	160m6	250	10h9	35	40h9	169	550	19
0033	700	640	540	408	664	675	710	343	640	35	460	110	400	26	99	32k6	58	180m6	280	10h9	35	45h9	190	730	25
0043	780	700	570	453	834	845	880	378	705	40	520	140	440	33	134	70m6	140	200m6	350	20h9	75	45h9	210	1050	35
0053	820	730	580	490	864	875	910	393	745	40	550	160	460	39	143	70m6	140	220m6	400	20h9	75	50h9	231	1210	40
0063	950	860	710	574	914	925	960	480	885	60	600	160	510	39	147	70m6	140	250m6	400	20h9	75	56h9	262	1840	65
0073	1050	950	770	633	1014	1025	1065	520	965	60	650	190	550	45	160	90m6	160	260m6	400	25h9	95	56h9	272	2500	80
0083	1150	1050	870	685	1084	1095	1135	570	1055	70	720	190	620	45	168	90m6	160	300m6	450	25h9	95	70h9	314	3225	115
0093	1200	1080	880	710	1164	1175	1215	585	1085	70	800	220	680	52	194	90m6	160	340m6	550	25h9	95	80h9	355	3710	130
0103	1300	1180	980	781	1294	1305	1345	645	1195	80	830	220	710	52	201	120m6	200	360m6	600	32h9	127	80h9	375	3900	180
0113	1380	1240	1000	827	1359	1370	1410	680	1255	80	890	260	750	60	220	120m6	200	380m6	650	32h9	127	80h9	395	5750	210
0123	1430	1290	1050	903	1419	1430	1470	715	1315	90	950	260	810	60	226	120m6	200	420m6	650	32h9	127	90h9	437	6740	255
0133	1500	1340	1070	937	1501	1515	1565	755	1395	90	1020	290	860	70	221	140m6	220	450m6	700	36h9	148	100h9	469	7680	300
0143	1620	1460	1190	965	1551	1565	1615	830	1535	100	1050	290	890	70	236	140m6	220	480m6	750	36h9	148	100h9	499	8540	320
0153	1690	1500	1200	1019	1581	1595	1645	865	1605	100	1150	340	960	78	218	140m6	220	500m6	800	36h9	148	100h9	519	9960	380

1) F = Without cooling fan 2) F1 = with cooling fan

	Thermal ratings P _{TN} in kW															
	Size															
	n ₁ [rpm]	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153
Without cooling fan	1800	34	40	47	60	68	82	106	123	140	168	186	208	230	259	276
	1500	36	42	49	63	71	86	112	129	147	177	195	219	242	272	290
	1200	38	45	53	67	76	93	120	138	157	190	209	234	259	291	311
	1000	42	50	59	75	85	103	133	153	175	211	232	261	288	324	345
With cooling fan	1800	68	79	94	120	136	165	213	245	279	337	371	417	461	518	552
	1500	71	83	99	126	142	173	223	258	293	354	390	438	484	544	580
	1200	76	89	106	135	153	185	239	276	314	379	418	469	518	583	621
	1000	85	99	117	150	170	206	266	307	349	421	464	521	576	647	690

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of +20°C

P30...F...-010/VVN

Solid Shaft, Foot

Size	n ₁ rpm	Nominal mechanical power ratings P _{2N} in kW													
		Nominal ratio i _N													
		80	90	100	112	125	140	160	180	200	224	250	280	320	360
0013	1800	71	68	65	61	58	54	49	42	41	37	34	30	26	22
	1500	63	60	57	54	51	46	41	35	34	31	28	25	22	18
	1200	54	51	48	44	41	37	33	28	27	25	23	20	17	15
	1000	46	43	40	37	34	31	27	24	23	21	19	17	14	12
0023	1800	113	108	103	97	91	85	78	69	62	57	51	45	39	33
	1500	99	95	90	85	80	74	66	57	52	47	43	38	33	28
	1200	85	81	77	72	66	60	53	46	41	38	34	30	26	22
	1000	75	70	65	60	55	50	44	38	35	32	28	25	22	18
0033	1800	119	113	107	100	93	86	78	70	68	64	59	54	47	39
	1500	105	100	94	88	82	75	69	61	60	56	51	45	39	33
	1200	90	85	80	75	70	65	59	53	49	45	40	36	31	26
	1000	79	75	71	66	62	57	52	46	41	37	34	30	26	22
0043	1800	186	178	170	160	151	140	129	117	103	97	88	78	67	57
	1500	164	157	149	141	133	123	114	102	88	81	73	65	56	47
	1200	140	134	128	121	113	106	94	82	71	65	58	52	45	38
	1000	124	118	112	106	98	88	78	68	59	54	49	43	37	31
0053	1800	246	236	224	212	199	185	170	154	132	124	115	103	89	75
	1500	217	207	197	187	175	163	150	135	116	107	97	86	75	63
	1200	186	177	169	160	150	140	125	108	94	86	77	69	60	50
	1000	163	156	149	141	130	117	104	90	78	72	65	57	50	42
0063	1800	119	111	104	96	88	79	70	61	48	44	40	35	31	26
	1500	99	93	86	80	73	66	58	51	40	37	33	30	26	22
	1200	79	74	69	64	58	53	47	41	32	29	27	24	20	17
	1000	66	62	58	53	49	44	39	34	27	25	22	20	17	14
0073	1800	379	363	345	327	307	285	262	238	214	201	187	172	156	134
	1500	334	319	304	287	270	251	231	209	189	177	165	152	133	112
	1200	286	273	260	246	231	215	198	179	161	151	138	122	106	89
	1000	251	240	229	216	203	189	174	157	139	128	115	102	89	74
0083	1800	555	531	505	478	449	417	381	342	315	296	275	253	224	188
	1500	488	467	445	420	395	367	335	301	277	261	242	215	187	157
	1200	418	400	380	360	338	314	287	257	235	215	194	172	149	126
	1000	368	352	335	317	297	277	253	225	196	179	162	143	124	105
0093	1800	583	554	522	490	455	419	381	342	315	296	275	253	224	188
	1500	513	488	459	431	400	369	335	301	277	261	242	215	187	157
	1200	439	417	393	369	342	316	287	257	235	215	194	172	149	126
	1000	386	367	346	324	301	278	253	226	196	179	162	143	124	105
0103	1800	975	933	889	843	793	740	683	622	549	504	456	407	356	303
	1500	858	821	783	742	698	651	601	538	458	420	380	339	297	252
	1200	734	703	669	634	597	552	493	431	366	336	304	271	237	202
	1000	646	618	589	554	508	460	411	359	305	280	254	226	198	168
0113	1800	1142	1088	1035	918	855	790	722	650	551	504	456	407	356	303
	1500	1005	958	911	808	753	696	635	572	472	425	377	328	277	226
	1200	859	819	779	691	644	595	543	489	434	398	360	321	281	239
	1000	757	721	686	608	567	524	478	426	361	331	300	268	234	199
0123	1800	1142	1088	977	918	855	790	722	650	551	504	456	407	356	303
	1500	1005	958	860	808	753	696	635	572	472	425	377	328	277	226
	1200	859	819	736	691	644	595	543	489	434	398	360	321	281	239
	1000	757	721	647	608	567	524	478	431	366	336	304	271	237	202
0133	1800	1438	1369	1294	1219	1138	1055	967	875	775	728	679	629	579	514
	1500	1266	1205	1139	1073	1002	929	851	770	671	624	575	525	475	409
	1200	1083	1031	974	918	857	794	728	659	559	512	463	413	363	307
	1000	953	908	857	808	754	699	641	580	480	433	384	334	284	228
0143	1800	1438	1369	1294	1219	1138	1055	967	875	775	728	679	629	579	514
	1500	1266	1205	1139	1073	1002	929	851	770	671	624	575	525	475	409
	1200	1083	1031	974	918	857	794	728	659	559	512	463	413	363	307
	1000	953	908	857	808	754	699	641	580	480	433	384	334	284	228
0153	1800	1438	1369	1294	1219	1138	1055	967	875	775	728	679	629	579	514
	1500	1266	1205	1139	1073	1002	929	851	770	671	624	575	525	475	409
	1200	1083	1031	974	918	857	794	728	659	559	512	463	413	363	307
	1000	953	908	857	808	754	699	641	580	480	433	384	334	284	228

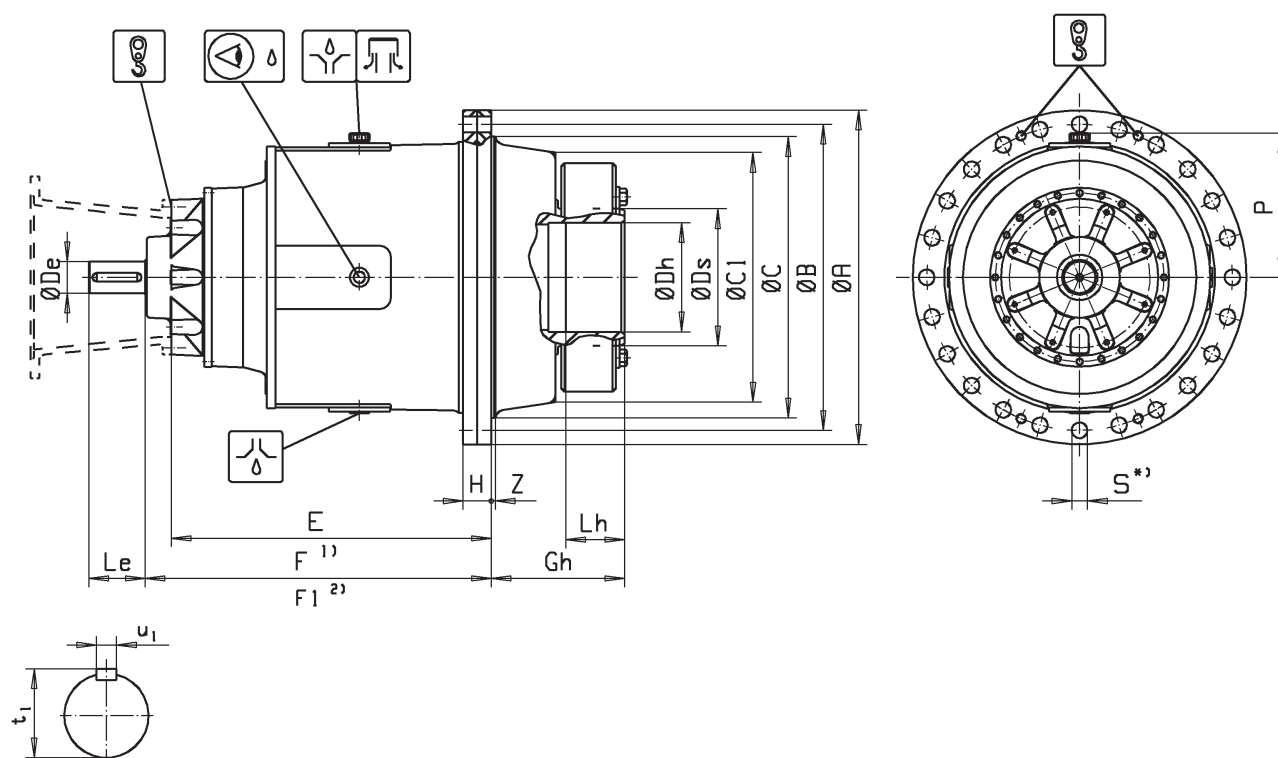
Power ratings: The ratings are nominal, application factor $K_A = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P30...N...-010/VHN

Hollow Shaft, Flange



Size	Dimensions in mm																			Weight Mass	Quantity of oil
	A	B	C	C1	E	F	F1	Gh	H	P	S	Z	De	Le	Dh	Lh	Ds	u1	t1	kg	l
0013	450	410	370f8	340	509	520	555	170	38	205	22	8	32k6	58	140H7	100	185	10h9	35	340	14
0023	500	460	410f8	373	544	555	590	180	44	230	22	8	32k6	58	150H7	100	200	10h9	35	470	19
0033	560	510	460f8	408	574	585	620	210	46	260	26	8	32k6	58	165H7	120	220	10h9	35	620	25
0043	620	560	480f8	453	704	715	750	255	60	280	33	8	70m6	140	190H7	120	240	20h9	75	860	35
0053	650	590	530f8	490	724	735	770	275	60	300	33	8	70m6	140	210H7	135	260	20h9	75	1010	40
0063	760	690	610f8	574	774	785	820	295	70	340	39	8	70m6	140	240H7	160	300	20h9	75	1540	65
0073	840	770	690f8	633	869	880	920	320	80	385	39	12	90m6	160	260H7	180	340	25h9	95	2110	80
0083	920	840	750f8	685	924	935	975	340	80	420	45	12	90m6	160	290H7	185	360	25h9	95	2730	115
0093	950	870	800f8	710	974	985	1025	380	80	440	45	12	90m6	160	310H7	190	390	25h9	95	3170	130
0103	1050	960	850f8	781	1099	1110	1150	420	90	480	45	12	120m6	200	340H7	220	440	32h9	127	4270	180
0113	1100	1010	900f8	827	1149	1160	1200	435	90	510	45	12	120m6	200	360H7	220	460	32h9	127	5030	210
0123	1150	1070	970f8	903	1199	1210	1250	465	90	540	45	16	120m6	200	380H7	240	480	32h9	127	6020	255
0133	1210	1120	1010f8	937	1281	1295	1345	460	100	560	45	16	140m6	220	420H7	240	500	36h9	148	6750	300
0143	1340	1250	1150f8	965	1321	1335	1385	500	100	580	45	16	140m6	220	430H7	270	530	36h9	148	7700	320
0153	1410	1320	1200f8	1019	1346	1360	1410	510	100	600	45	16	140m6	220	450H7	270	560	36h9	148	8940	380

1) F = Without cooling fan 2) F1 = with cooling fan

		Thermal ratings P _{TN} in kW														
		Size														
Without cooling fan	n ₁ [rpm]	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153
	1800	34	40	47	60	68	82	106	123	140	168	186	208	230	259	276
	1500	36	42	49	63	71	86	112	129	147	177	195	219	242	272	290
	1200	38	45	53	67	76	93	120	138	157	190	209	234	259	291	311
With cooling fan	1000	42	50	59	75	85	103	133	153	175	211	232	261	288	324	345
	1800	68	79	94	120	136	165	213	245	279	337	371	417	461	518	552
	1500	71	83	99	126	142	173	223	258	293	354	390	438	484	544	580
	1200	76	89	106	135	153	185	239	276	314	379	418	469	518	583	621
	1000	85	99	117	150	170	206	266	307	349	421	464	521	576	647	690

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of + 20°C

P30...N...-010/VHN

Hollow Shaft, Flange

Size	n ₁ rpm	Nominal mechanical power ratings P _{2N} in kW													
		Nominal ratio i _N													
		80	90	100	112	125	140	160	180	200	224	250	280	320	360
0013	1800	71	68	65	61	58	54	49	42	41	37	34	30	26	22
	1500	63	60	57	54	51	46	41	35	34	31	28	25	22	18
	1200	54	51	48	44	41	37	33	28	27	25	23	20	17	15
	1000	46	43	40	37	34	31	27	24	23	21	19	17	14	12
0023	1800	113	108	103	97	91	85	78	69	62	57	51	45	39	33
	1500	99	95	90	85	80	74	66	57	52	47	43	38	33	28
	1200	85	81	77	72	66	60	53	46	41	38	34	30	26	22
	1000	75	70	65	60	55	50	44	38	35	32	28	25	22	18
0033	1800	119	113	107	100	93	86	78	70	68	64	59	54	47	39
	1500	105	100	94	88	82	75	69	61	60	56	51	45	39	33
	1200	90	85	80	75	70	65	59	53	49	45	40	36	31	26
	1000	79	75	71	66	62	57	52	46	41	37	34	30	26	22
0043	1800	186	178	170	160	151	140	129	117	103	97	88	78	67	57
	1500	164	157	149	141	133	123	114	102	88	81	73	65	56	47
	1200	140	134	128	121	113	106	94	82	71	65	58	52	45	38
	1000	124	118	112	106	98	88	78	68	59	54	49	43	37	31
0053	1800	246	236	224	212	199	185	170	154	132	124	115	103	89	75
	1500	217	207	197	187	175	163	150	135	116	107	97	86	75	63
	1200	186	177	169	160	150	140	125	108	94	86	77	69	60	50
	1000	163	156	149	141	130	117	104	90	78	72	65	57	50	42
0063	1800	119	111	104	96	88	79	70	61	48	44	40	35	31	26
	1500	99	93	86	80	73	66	58	51	40	37	33	30	26	22
	1200	79	74	69	64	58	53	47	41	32	29	27	24	20	17
	1000	66	62	58	53	49	44	39	34	27	25	22	20	17	14
0073	1800	379	363	345	327	307	285	262	238	214	201	187	172	156	134
	1500	334	319	304	287	270	251	231	209	189	177	165	152	133	112
	1200	286	273	260	246	231	215	198	179	161	151	138	122	106	89
	1000	251	240	229	216	203	189	174	157	139	128	115	102	89	74
0083	1800	555	531	505	478	449	417	381	342	315	296	275	253	224	188
	1500	488	467	445	420	395	367	335	301	277	261	242	215	187	157
	1200	418	400	380	360	338	314	287	257	235	215	194	172	149	126
	1000	368	352	335	317	297	277	253	225	196	179	162	143	124	105
0093	1800	583	554	522	490	455	419	381	342	435	411	385	348	309	268
	1500	513	488	459	431	400	369	335	301	380	351	321	290	257	223
	1200	439	417	393	369	342	316	287	257	304	281	257	232	206	179
	1000	386	367	346	324	301	278	253	226	254	234	214	193	171	149
0103	1800	975	933	889	843	793	740	683	622	549	504	456	407	356	303
	1500	858	821	783	742	698	651	601	538	458	420	380	339	297	252
	1200	734	703	669	634	597	552	493	431	366	336	304	271	237	202
	1000	646	618	589	554	508	460	411	359	305	280	254	226	198	168
0113	1800	1142	1088	1035	918	855	790	722	650	651	597	540	482	422	358
	1500	1005	958	911	808	753	696	635	572	542	497	450	402	351	299
	1200	859	819	779	691	644	595	543	489	434	398	360	321	281	239
	1000	757	721	686	608	567	524	478	426	361	331	300	268	234	199
0123	1800	1142	1088	977	918	855	790	722	650	758	714	666	615	557	474
	1500	1005	958	860	808	753	696	635	572	667	628	586	531	464	395
	1200	859	819	736	691	644	595	543	489	571	526	476	425	372	316
	1000	757	721	647	608	567	524	478	431	478	438	397	354	310	263
0133	1800	1438	1369	1294	1219	1138	1055	967	875	875	784	733	679	599	514
	1500	1266	1205	1139	1073	1002	929	851	770	771	690	632	567	499	428
	1200	1083	1031	974	918	857	794	728	659	652	556	506	453	399	343
	1000	953	908	857	808	754	699	641	580	543	463	421	378	333	286
0143	1800	1438	1369	1294	1219	1138	1055	967	875	1166	995	905	812	714	613
	1500	1266	1205	1139	1073	1002	929	851	770	972	829	754	676	595	511
	1200	1083	1031	974	918	857	794	728	659	777	664	603	541	476	409
	1000	953	908	857	808	754	699	641	580	648	553	503	451	397	341
0153	1800	1438	1369	1294	1219	1138	1055	967	875	1219	1138	1055	967	851	731
	1500	1266	1205	1139	1073	1002	929	851	770	1073	988	899	806	709	609
	1200	1083	1031	974	918	857	794	728	659	860	791	719	645	567	487
	1000	953	908	857	808	754	699	641	580	716	659	599	537	473	406

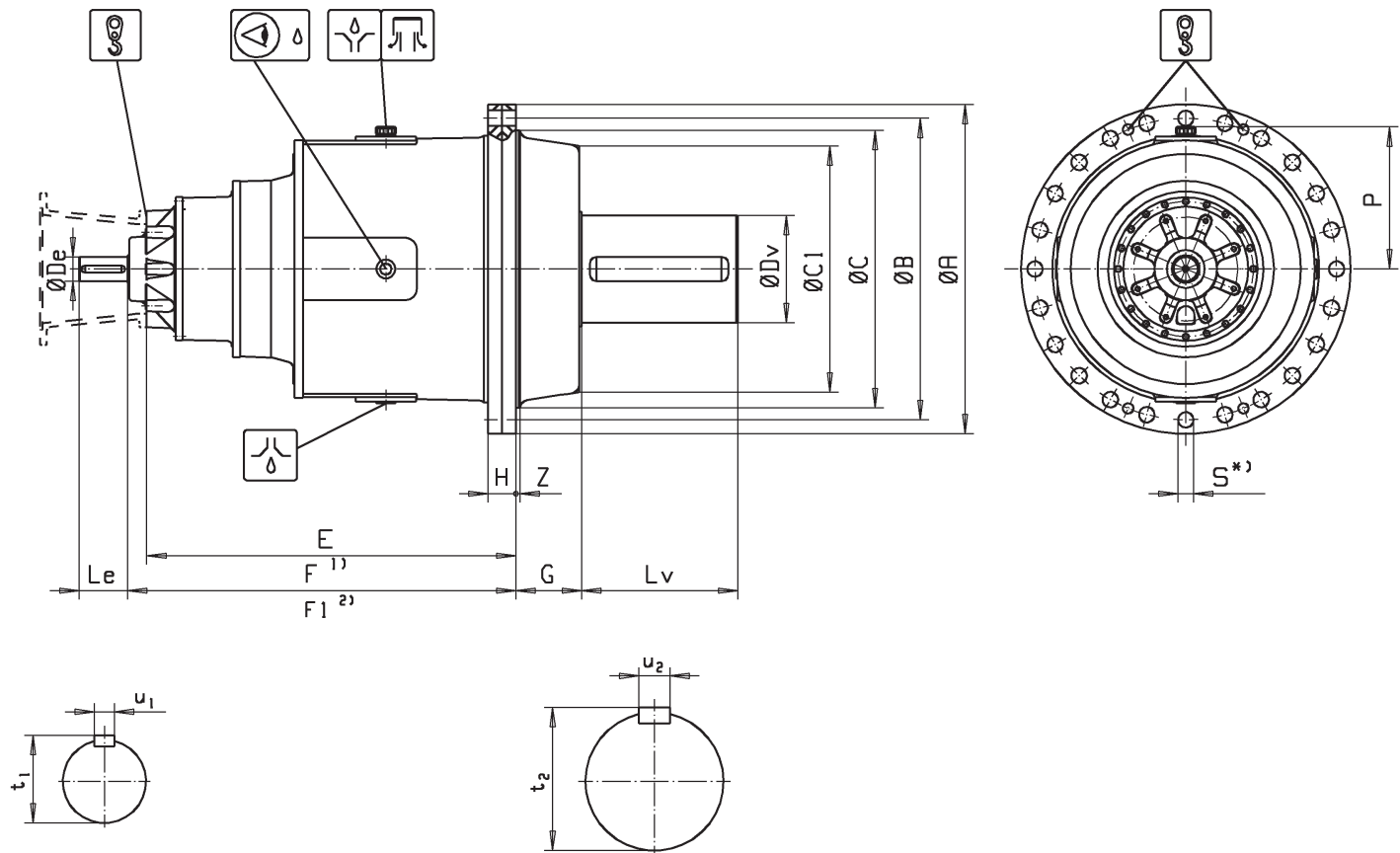
Power ratings: The ratings are nominal, application factor $K_A = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P40...N...-010/VVN

Solid Shaft, Flange



Size	Dimensions in mm																				Mass	Quantity of oil
	A	B	C	C1	E	F	F1	G	H	P	S	Z	De	Le	Dv	Lv	u1	t1	u2	t2	kg	l
0013	450	410	370f8	340	619	630	665	78	38	205	22	8	32k6	58	150m6	220	10h9	35	36h9	158	340	18
0023	500	460	410f8	373	654	665	700	85	44	230	22	8	32k6	58	160m6	250	10h9	35	40h9	169	460	23
0033	560	510	460f8	408	684	695	730	90	46	260	26	8	32k6	58	180m6	280	10h9	35	45h9	190	600	30
0043	620	560	480f8	453	754	765	800	130	60	280	33	8	32k6	58	200m6	350	10h9	35	45h9	210	830	40
0053	650	590	530f8	490	774	785	820	140	60	300	33	8	32k6	58	220m6	400	10h9	35	50h9	231	960	45
0063	760	690	610f8	574	824	835	870	140	70	340	39	8	32k6	58	250m6	400	10h9	35	56h9	262	1450	70
0073	840	770	690f8	633	1004	1015	1050	145	80	385	39	12	70m6	140	260m6	400	20h9	75	56h9	272	2000	90
0083	920	840	750f8	685	1059	1070	1105	160	80	420	45	12	70m6	140	300m6	450	20h9	75	70h9	314	2600	125
0093	950	870	800f8	710	1109	1120	1155	190	80	440	45	12	70m6	140	340m6	550	20h9	75	80h9	355	3000	140
0103	1050	960	850f8	781	1229	1240	1280	195	90	480	45	12	90m6	160	360m6	600	25h9	95	80h9	375	4030	180
0113	1100	1010	900f8	827	1279	1290	1330	210	90	510	45	12	90m6	160	380m6	650	25h9	95	80h9	395	4730	210
0123	1150	1070	970f8	903	1329	1340	1380	220	90	540	45	16	90m6	160	420m6	650	25h9	95	90h9	437	5630	255
0133	1210	1120	1010f8	937	1659	1670	1710	220	100	560	45	16	90m6	160	450m6	700	25h9	95	100h9	469	6290	300
0143	1340	1250	1150f8	965	1699	1710	1750	230	100	580	45	16	90m6	160	480m6	750	25h9	95	100h9	499	7090	320
0153	1410	1320	1200f8	1019	1719	1730	1770	235	100	600	45	16	90m6	160	500m6	800	25h9	95	100h9	519	8290	380

1) F = Without cooling fan 2) F1 = with cooling fan

	Thermal ratings P_{TN} in kW															
	Size	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153
Without cooling fan	n_1 [rpm]															
	1800	32	33	39	47	54	66	86	100	114	135	149	168	183	207	221
	1500	33	35	41	50	57	69	91	105	120	141	156	176	192	217	232
	1200	36	37	44	53	61	74	97	112	128	151	168	189	206	233	249
With cooling fan	1000	40	42	49	59	67	83	108	125	143	168	186	210	229	259	276
	1800	63	66	78	95	108	132	173	200	228	269	298	336	366	414	442
	1500	67	70	82	99	113	139	182	210	240	283	313	353	384	434	465
	1200	71	75	88	106	121	149	194	225	257	303	335	378	412	465	498
	1000	79	83	98	118	135	165	216	250	285	337	372	420	457	517	553

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of + 20°C

P40...N...-010/VVN

Solid Shaft, Flange

Size	n ₁ rpm	Nominal mechanical power ratings P _{2N} in kW																	
		Nominal ratio i _N																	
		400	450	500	560	630	710	800	900	1000	1120	1250	1400	1600	1800	2000	2240	2500	2800
0013	1800	20	18	17	14	13	12	10	9	8	7	6	6	5	5	6	6	5	5
	1500	17	15	14	12	11	10	8	7	7	6	5	5	4	4	5	5	4	4
	1200	13	12	11	10	9	8	6	6	5	5	4	4	3	3	4	4	3	3
	1000	11	10	9	8	7	6	5	5	4	4	4	3	3	3	3	3	3	3
0023	1800	33	29	24	22	19	18	16	14	13	11	11	9	9	8	7	6	6	5
	1500	27	24	20	18	16	15	14	12	10	9	9	8	8	6	6	5	5	5
	1200	22	19	16	15	13	12	11	9	8	7	7	6	6	5	5	4	4	4
	1000	18	16	13	12	11	10	9	8	7	6	6	5	5	4	4	3	3	3
0033	1800	39	33	30	27	24	21	25	24	22	19	17	14	14	12	11	9	8	7
	1500	32	28	25	23	20	17	22	20	18	16	14	12	12	10	9	8	7	6
	1200	26	22	20	18	16	14	18	16	15	13	11	9	9	8	7	6	5	5
	1000	21	18	17	15	13	12	15	13	12	11	9	8	8	6	6	5	5	4
0043	1800	58	51	56	51	46	40	34	31	28	25	22	21	18	17	15	13	17	15
	1500	49	42	48	43	38	33	29	26	24	21	18	17	15	14	13	11	14	12
	1200	39	34	38	34	30	27	23	21	19	17	15	14	12	11	10	9	11	10
	1000	32	28	32	29	25	22	19	17	16	14	12	11	10	9	8	7	9	8
0053	1800	92	84	74	69	64	54	49	45	41	36	31	30	31	29	27	23	21	18
	1500	81	74	65	61	55	48	41	38	34	30	26	25	27	25	23	19	17	15
	1200	69	63	55	49	44	38	33	30	27	24	21	20	22	20	18	15	14	12
	1000	61	54	46	41	37	32	28	25	23	20	17	17	18	17	15	13	12	10
0063	1800	116	109	101	93	85	68	59	54	61	56	51	44	45	41	37	33	29	24
	1500	102	96	89	80	71	57	49	45	54	49	43	36	37	34	31	27	24	20
	1200	84	78	71	64	57	46	39	36	45	40	35	29	30	27	25	22	19	16
	1000	70	65	59	53	47	38	33	30	37	33	29	24	25	23	21	18	16	13
0073	1800	136	123	117	110	102	89	81	77	72	67	62	56	51	48	45	42	39	35
	1500	119	109	103	97	90	78	71	67	63	59	54	49	45	42	40	37	33	29
	1200	102	93	88	83	77	67	61	58	54	50	46	42	38	36	33	30	27	23
	1000	90	82	77	73	68	59	54	51	48	44	41	37	33	30	28	25	22	19
0083	1800	199	181	171	149	137	131	119	113	106	99	91	82	72	66	66	62	57	50
	1500	175	159	150	131	121	115	105	99	93	87	79	68	60	55	58	54	48	41
	1200	149	136	129	112	103	99	90	85	79	71	63	55	48	44	48	43	38	33
	1000	132	120	113	99	91	87	78	72	66	59	53	46	40	37	40	36	32	28
0093	1800	209	190	180	169	157	171	163	156	132	119	118	107	102	92	87	79	70	61
	1500	184	167	158	148	138	149	140	130	110	99	104	94	90	80	73	66	59	51
	1200	157	143	135	127	118	119	112	104	88	79	89	80	75	64	59	53	47	41
	1000	138	126	119	112	104	99	93	87	73	66	76	66	62	53	49	44	39	34
0103	1800	349	318	301	284	265	230	220	199	187	174	155	136	119	110	100	90	80	70
	1500	307	280	265	250	233	199	194	175	160	145	129	113	99	91	84	75	67	58
	1200	263	240	227	214	195	159	162	140	128	116	104	91	79	73	67	60	54	46
	1000	231	211	196	179	162	133	135	116	107	97	86	75	66	61	56	50	45	39
0113	1800	389	350	328	306	283	270	259	233	220	205	189	166	145	134	123	111	113	98
	1500	343	308	289	269	249	238	228	205	193	178	159	139	121	112	102	92	94	82
	1200	293	263	247	230	213	203	195	171	157	142	127	111	97	90	82	74	76	66
	1000	258	230	218	203	187	176	165	143	131	118	106	92	81	75	68	62	63	55
0123	1800	389	350	328	283	258	314	286	271	255	238	220	195	171	158	144	130	115	100
	1500	343	308	289	249	227	276	252	239	225	209	186	163	142	131	120	108	96	83
	1200	293	263	247	213	194	236	216	201	184	167	149	130	114	105	96	87	77	67
	1000	258	232	218	187	171	206	181	167	154	139	124	108	95	88	80	72	64	56
0133	1800	514	490	463	407	377	343	328	313	270	246	220	194	170	157	143	129	115	99
	1500	453	431	407	358	332	300	282	264	225	205	184	162	141	131	119	108	96	83
	1200	387	369	349	307	284	240	226	211	180	164	147	129	113	104	95	86	76	66
	1000	341	325	307	270	248	200	188	176	150	137	122	108	94	87	80	72	64	55
0143	1800	514	490	463	407	377	352	331	310	264	240	216	190	166	153	140	126	112	97
	1500	453	431	407	358	332	293	276	258	220	200	180	158	138	128	117	105	93	81
	1200	387	369	349	307	284	235	221	207	176	160	144	127	111	102	93	84	75	65
	1000	341	325	307	270	248	196	184	172	147	134	120	105	92	85	78	70	62	54
0153	1800	514	490	463	407	377	364	342	320	273	248	223	196	171	158	145	130	116	100
	1500	453	431	407	358	332	303	285	267	228	207	186	163	143	132	121	109	96	84
	1200	387	369	349	307	284	242	228	213	182	166	148	131	114	105	96	87	77	67
	1000	341	325	307	270	250	202	190	178	152	138	124	109	95	88	80	72	64	56

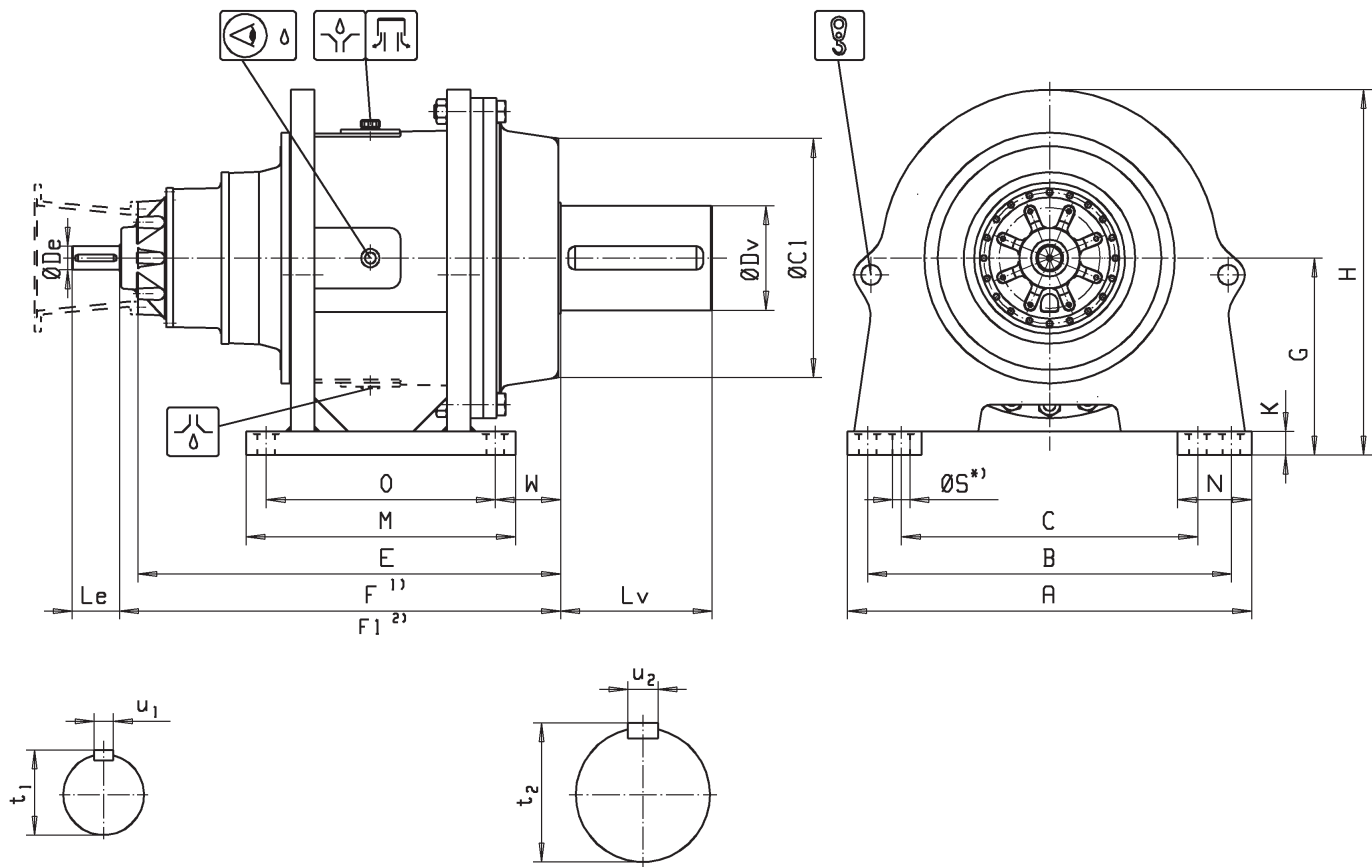
Power ratings: The ratings are nominal, application factor $K_A = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P4O...F...-010/VVN

Solid Shaft, Foot



Size	Dimensions in mm																						Mass	Quantity of oil	
	A	B	C	C1	E	F	F1	G	H	K	M	N	O	S	W	De	Le	Dv	Lv	u1	t1	u2	t2	kg	l
0013	560	510	410	340	697	708	743	283	525	30	380	100	330	22	85	32k6	58	150m6	220	10h9	35	36h9	158	430	18
0023	630	580	480	373	739	750	785	313	580	35	430	100	380	22	88	32k6	58	160m6	250	10h9	35	40h9	169	580	23
0033	700	640	540	408	774	785	820	343	640	35	460	110	400	26	99	32k6	58	180m6	280	10h9	35	45h9	190	760	30
0043	780	700	570	453	884	895	930	378	705	40	520	140	440	33	134	32k6	58	200m6	350	10h9	35	45h9	210	1080	40
0053	820	730	580	490	914	925	960	393	745	40	550	160	460	39	143	32k6	58	220m6	400	10h9	35	50h9	231	1240	45
0063	950	860	710	574	964	975	1010	480	885	60	600	160	510	39	147	32k6	58	250m6	400	10h9	35	56h9	262	1870	70
0073	1050	950	770	633	1149	1160	1195	520	965	60	650	190	550	45	160	70m6	140	260m6	400	20h9	75	56h9	272	2570	90
0083	1150	1050	870	685	1219	1230	1265	570	1055	70	720	190	620	45	168	70m6	140	300m6	450	20h9	75	70h9	314	3295	125
0093	1200	1080	880	710	1299	1310	1345	585	1085	70	800	220	680	52	194	70m6	140	340m6	550	20h9	75	80h9	355	3780	140
0103	1300	1180	980	781	1424	1435	1475	645	1195	80	830	220	710	52	200	90m6	160	360m6	600	25h9	95	80h9	375	4030	180
0113	1380	1240	1000	827	1489	1500	1540	680	1255	80	890	260	750	60	220	90m6	160	380m6	650	25h9	95	80h9	395	5880	210
0123	1430	1290	1050	903	1549	1560	1600	715	1315	90	950	260	810	60	226	90m6	160	420m6	650	25h9	95	90h9	437	6870	255
0133	1500	1340	1070	937	1879	1890	1930	755	1395	90	1020	290	860	70	221	90m6	160	450m6	700	25h9	95	100h9	469	7810	300
0143	1620	1460	1190	965	1929	1940	1980	830	1535	100	1050	290	890	70	235	90m6	160	480m6	750	25h9	95	100h9	499	8670	320
0153	1690	1500	1200	1019	1954	1965	2005	865	1605	100	1150	340	960	78	218	90m6	160	500m6	800	25h9	95	100h9	519	10100	380

1) F = Without cooling fan 2) F1 = with cooling fan

	Thermal ratings P_{TN} in kW															
	Size															
	n_1 [rpm]	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153
Without cooling fan	1800	32	33	39	47	54	66	86	100	114	135	149	168	183	207	221
	1500	33	35	41	50	57	69	91	105	120	141	156	176	192	217	232
	1200	36	37	44	53	61	74	97	112	128	151	168	189	206	233	249
	1000	40	42	49	59	67	83	108	125	143	168	186	210	229	259	276
With cooling fan	1800	63	66	78	95	108	132	173	200	228	269	298	336	366	414	442
	1500	67	70	82	99	113	139	182	210	240	283	313	353	384	434	465
	1200	71	75	88	106	121	149	194	225	257	303	335	378	412	465	498
	1000	79	83	98	118	135	165	216	250	285	337	372	420	457	517	553

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of + 20°C

P4O...F...-010/VVN

Solid Shaft, Foot

Size	n ₁ rpm	Nominal mechanical power ratings P _{2N} in kW																	
		Nominal ratio i _N																	
		400	450	500	560	630	710	800	900	1000	1120	1250	1400	1600	1800	2000	2240	2500	2800
0013	1800	20	18	17	14	13	12	10	9	8	7	6	6	5	5	6	6	5	5
	1500	17	15	14	12	11	10	8	7	7	6	5	5	4	4	5	5	4	4
	1200	13	12	11	10	9	8	6	6	5	5	4	4	3	3	4	4	3	3
	1000	11	10	9	8	7	6	5	5	4	4	4	3	3	3	3	3	3	3
0023	1800	33	29	24	22	19	18	16	14	13	11	11	9	9	8	7	6	6	5
	1500	27	24	20	18	16	15	14	12	10	9	9	8	8	6	6	5	5	5
	1200	22	19	16	15	13	12	11	9	8	7	7	6	6	5	5	4	4	4
	1000	18	16	13	12	11	10	9	8	7	6	6	5	5	4	4	3	3	3
0033	1800	39	33	30	27	24	21	25	24	22	19	17	14	14	12	11	9	8	7
	1500	32	28	25	23	20	17	22	20	18	16	14	12	12	10	9	8	7	6
	1200	26	22	20	18	16	14	18	16	15	13	11	9	9	8	7	6	5	5
	1000	21	18	17	15	13	12	15	13	12	11	9	8	8	6	6	5	5	4
0043	1800	58	51	56	51	46	40	34	31	28	25	22	21	18	17	15	13	17	15
	1500	49	42	48	43	38	33	29	26	24	21	18	17	15	14	13	11	14	12
	1200	39	34	38	34	30	27	23	21	19	17	15	14	12	11	10	9	11	10
	1000	32	28	32	29	25	22	19	17	16	14	12	11	10	9	8	7	9	8
0053	1800	92	84	74	69	64	54	49	45	41	36	31	30	31	29	27	23	21	18
	1500	81	74	65	61	55	48	41	38	34	30	26	25	27	25	23	19	17	15
	1200	69	63	55	49	44	38	33	30	27	24	21	20	22	20	18	15	14	12
	1000	61	54	46	41	37	32	28	25	23	20	17	17	18	17	15	13	12	10
0063	1800	116	109	101	93	85	68	59	54	61	56	51	44	45	41	37	33	29	24
	1500	102	96	89	80	71	57	49	45	54	49	43	36	37	34	31	27	24	20
	1200	84	78	71	64	57	46	39	36	45	40	35	29	30	27	25	22	19	16
	1000	70	65	59	53	47	38	33	30	37	33	29	24	25	23	21	18	16	13
0073	1800	136	123	117	110	102	89	81	77	72	67	62	56	51	48	45	42	39	35
	1500	119	109	103	97	90	78	71	67	63	59	54	49	45	42	40	37	33	29
	1200	102	93	88	83	77	67	61	58	54	50	46	42	38	36	33	30	27	23
	1000	90	82	77	73	68	59	54	51	48	44	41	37	33	30	28	25	22	19
0083	1800	199	181	171	149	137	131	119	113	106	99	91	82	72	66	66	62	57	50
	1500	175	159	150	131	121	115	105	99	93	87	79	68	60	55	58	54	48	41
	1200	149	136	129	112	103	99	90	85	79	71	63	55	48	44	48	43	38	33
	1000	132	120	113	99	91	87	78	72	66	59	53	46	40	37	40	36	32	28
0093	1800	209	190	180	169	157	171	163	156	132	119	118	107	102	92	87	79	70	61
	1500	184	167	158	148	138	149	140	130	110	99	104	94	90	80	73	66	59	51
	1200	157	143	135	127	118	119	112	104	88	79	89	80	75	64	59	53	47	41
	1000	138	126	119	112	104	99	93	87	73	66	76	66	62	53	49	44	39	34
0103	1800	349	318	301	284	265	230	220	199	187	174	155	136	119	110	100	90	80	70
	1500	307	280	265	250	233	199	194	175	160	145	129	113	99	91	84	75	67	58
	1200	263	240	227	214	195	159	162	140	128	116	104	91	79	73	67	60	54	46
	1000	231	211	196	179	162	133	135	116	107	97	86	75	66	61	56	50	45	39
0113	1800	389	350	328	306	283	270	259	233	220	205	189	166	145	134	123	111	113	98
	1500	343	308	289	269	249	238	228	205	193	178	159	139	121	112	102	92	94	82
	1200	293	263	247	230	213	203	195	171	157	142	127	111	97	90	82	74	76	66
	1000	258	230	218	203	187	176	165	143	131	118	106	92	81	75	68	62	63	55
0123	1800	389	350	328	283	258	314	286	271	255	238	220	195	171	158	144	130	115	100
	1500	343	308	289	249	227	276	252	239	225	209	186	163	142	131	120	108	96	83
	1200	293	263	247	213	194	236	216	201	184	167	149	130	114	105	96	87	77	67
	1000	258	232	218	187	171	206	181	167	154	139	124	108	95	88	80	72	64	56
0133	1800	514	490	463	407	377	343	328	313	270	246	220	194	170	157	143	129	115	99
	1500	453	431	407	358	332	300	282	264	225	205	184	162	141	131	119	108	96	83
	1200	387	369	349	307	284	240	226	211	180	164	147	129	113	104	95	86	76	66
	1000	341	325	307	270	248	200	188	176	150	137	122	108	94	87	80	72	64	55
0143	1800	514	490	463	407	377	352	331	310	264	240	216	190	166	153	140	126	112	97
	1500	453	431	407	358	332	293	276	258	220	200	180	158	138	128	117	105	93	81
	1200	387	369	349	307	284	235	221	207	176	160	144	127	111	102	93	84	75	65
	1000	341	325	307	270	248	196	184	172	147	134	120	105	92	85	78	70	62	54
0153	1800	514	490	463	407	377	364	342	320	273	248	223	196	171	158	145	130	116	100
	1500	453	431	407	358	332	303	285	267	228	207	186	163	143	132	121	109	96	84
	1200	387	369	349	307	284	242	228	213	182	166	148	131	114	105	96	87	77	67
	1000	341	325	307	270	250	202	190	178	152	138	124	109	95	88	80	72	64	56

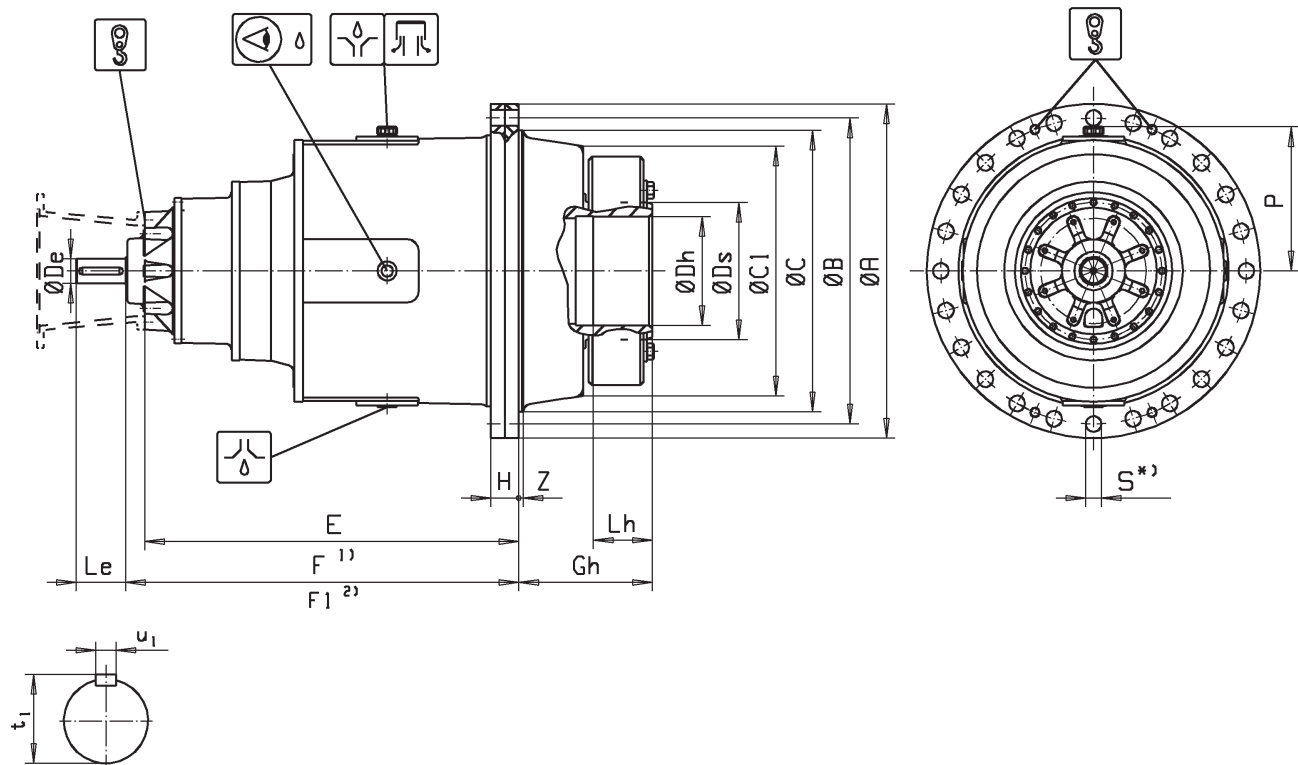
Power ratings: The ratings are nominal, application factor $K_A = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P4O...N...-010/VHN

Hollow Shaft, Flange



Size	Dimensions in mm																			Weight Mass	Quantity of oil
	A	B	C	C1	E	F	F1	Gh	H	P	S	Z	De	Le	Dh	Lh	Ds	u1	t1	kg	l
0013	450	410	370f8	340	619	630	665	170	38	205	22	8	32k6	58	140H7	100	185	10h9	35	370	18
0023	500	460	410f8	373	654	665	700	180	44	230	22	8	32k6	58	150H7	100	200	10h9	35	500	23
0033	560	510	460f8	408	684	695	730	210	46	260	26	8	32k6	58	165H7	120	220	10h9	35	650	30
0043	620	560	480f8	453	754	765	800	255	60	280	33	8	32k6	58	190H7	120	240	10h9	35	890	40
0053	650	590	530f8	490	774	785	820	275	60	300	33	8	32k6	58	210H7	135	260	10h9	35	1040	45
0063	760	690	610f8	574	824	835	870	295	70	340	39	8	32k6	58	240H7	160	300	10h9	35	1570	70
0073	840	770	690f8	633	1004	1015	1050	320	80	385	39	12	70m6	140	260H7	180	340	20h9	75	2180	90
0083	920	840	750f8	685	1059	1070	1105	340	80	420	45	12	70m6	140	290H7	185	360	20h9	75	2840	125
0093	950	870	800f8	710	1109	1120	1155	380	80	440	45	12	70m6	140	310H7	190	390	20h9	75	3240	140
0103	1050	960	850f8	781	1229	1240	1280	420	90	480	45	12	90m6	160	340H7	220	440	25h9	95	4400	180
0113	1100	1010	900f8	827	1279	1290	1330	435	90	510	45	12	90m6	160	360H7	220	460	25h9	95	5160	210
0123	1150	1070	970f8	903	1329	1340	1380	465	90	540	45	16	90m6	160	380H7	240	480	25h9	95	6150	255
0133	1210	1120	1010f8	937	1659	1670	1710	460	100	560	45	16	90m6	160	420H7	240	500	25h9	95	6880	300
0143	1340	1250	1150f8	965	1699	1710	1750	500	100	580	45	16	90m6	160	430H7	270	530	25h9	95	7130	320
0153	1410	1320	1200f8	1019	1719	1730	1770	510	100	600	45	16	90m6	160	450H7	270	560	25h9	95	9070	380

1) F = Without cooling fan 2) F1 = with cooling fan

	Thermal ratings P_{TN} in kW															
	Size															
	n_1 [rpm]	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153
Without cooling fan	1800	32	33	39	47	54	66	86	100	114	135	149	168	183	207	221
	1500	33	35	41	50	57	69	91	105	120	141	156	176	192	217	232
	1200	36	37	44	53	61	74	97	112	128	151	168	189	206	233	249
	1000	40	42	49	59	67	83	108	125	143	168	186	210	229	259	276
With cooling fan	1800	63	66	78	95	108	132	173	200	228	269	298	336	366	414	442
	1500	67	70	82	99	113	139	182	210	240	283	313	353	384	434	465
	1200	71	75	88	106	121	149	194	225	257	303	335	378	412	465	498
	1000	79	83	98	118	135	165	216	250	285	337	372	420	457	517	553

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of + 20°C

P40...N...-010/VHN

Hollow Shaft, Flange

Size	n ₁ rpm	Nominal mechanical power ratings P _{2N} in kW																	
		Nominal ratio i _N																	
		400	450	500	560	630	710	800	900	1000	1120	1250	1400	1600	1800	2000	2240	2500	2800
0013	1800	20	18	17	14	13	12	10	9	8	7	6	6	5	5	6	6	5	5
	1500	17	15	14	12	11	10	8	7	7	6	5	5	4	4	5	5	4	4
	1200	13	12	11	10	9	8	6	6	5	5	4	4	3	3	4	4	3	3
	1000	11	10	9	8	7	6	5	5	4	4	4	3	3	3	3	3	3	3
0023	1800	33	29	24	22	19	18	16	14	13	11	11	9	9	8	7	6	6	5
	1500	27	24	20	18	16	15	14	12	10	9	9	8	8	6	6	5	5	5
	1200	22	19	16	15	13	12	11	9	8	7	7	6	6	5	5	4	4	4
	1000	18	16	13	12	11	10	9	8	7	6	6	5	5	4	4	3	3	3
0033	1800	39	33	30	27	24	21	25	24	22	19	17	14	14	12	11	9	8	7
	1500	32	28	25	23	20	17	22	20	18	16	14	12	12	10	9	8	7	6
	1200	26	22	20	18	16	14	18	16	15	13	11	9	9	8	7	6	5	5
	1000	21	18	17	15	13	12	15	13	12	11	9	8	8	6	6	5	5	4
0043	1800	58	51	56	51	46	40	34	31	28	25	22	21	18	17	15	13	17	15
	1500	49	42	48	43	38	33	29	26	24	21	18	17	15	14	13	11	14	12
	1200	39	34	38	34	30	27	23	21	19	17	15	14	12	11	10	9	11	10
	1000	32	28	32	29	25	22	19	17	16	14	12	11	10	9	8	7	9	8
0053	1800	92	84	74	69	64	54	49	45	41	36	31	30	31	29	27	23	21	18
	1500	81	74	65	61	55	48	41	38	34	30	26	25	27	25	23	19	17	15
	1200	69	63	55	49	44	38	33	30	27	24	21	20	22	20	18	15	14	12
	1000	61	54	46	41	37	32	28	25	23	20	17	17	18	17	15	13	12	10
0063	1800	116	109	101	93	85	68	59	54	61	56	51	44	45	41	37	33	29	24
	1500	102	96	89	80	71	57	49	45	54	49	43	36	37	34	31	27	24	20
	1200	84	78	71	64	57	46	39	36	45	40	35	29	30	27	25	22	19	16
	1000	70	65	59	53	47	38	33	30	37	33	29	24	25	23	21	18	16	13
0073	1800	136	123	117	110	102	89	81	77	72	67	62	56	51	48	45	42	39	35
	1500	119	109	103	97	90	78	71	67	63	59	54	49	45	42	40	37	33	29
	1200	102	93	88	83	77	67	61	58	54	50	46	42	38	36	33	30	27	23
	1000	90	82	77	73	68	59	54	51	48	44	41	37	33	30	28	25	22	19
0083	1800	199	181	171	149	137	131	119	113	106	99	91	82	72	66	66	62	57	50
	1500	175	159	150	131	121	115	105	99	93	87	79	68	60	55	58	54	48	41
	1200	149	136	129	112	103	99	90	85	79	71	63	55	48	44	48	43	38	33
	1000	132	120	113	99	91	87	78	72	66	59	53	46	40	37	40	36	32	28
0093	1800	209	190	180	169	157	171	163	156	132	119	118	107	102	92	87	79	70	61
	1500	184	167	158	148	138	149	140	130	110	99	104	94	90	80	73	66	59	51
	1200	157	143	135	127	118	119	112	104	88	79	89	80	75	64	59	53	47	41
	1000	138	126	119	112	104	99	93	87	73	66	76	66	62	53	49	44	39	34
0103	1800	349	318	301	284	265	230	220	199	187	174	155	136	119	110	100	90	80	70
	1500	307	280	265	250	233	199	194	175	160	145	129	113	99	91	84	75	67	58
	1200	263	240	227	214	195	159	162	140	128	116	104	91	79	73	67	60	54	46
	1000	231	211	196	179	162	133	135	116	107	97	86	75	66	61	56	50	45	39
0113	1800	389	350	328	306	283	270	259	233	220	205	189	166	145	134	123	111	113	98
	1500	343	308	289	269	249	238	228	205	193	178	159	139	121	112	102	92	94	82
	1200	293	263	247	230	213	203	195	171	157	142	127	111	97	90	82	74	76	66
	1000	258	230	218	203	187	176	165	143	131	118	106	92	81	75	68	62	63	55
0123	1800	389	350	328	283	258	314	286	271	255	238	220	195	171	158	144	130	115	100
	1500	343	308	289	249	227	276	252	239	225	209	186	163	142	131	120	108	96	83
	1200	293	263	247	213	194	236	216	201	184	167	149	130	114	105	96	87	77	67
	1000	258	232	218	187	171	206	181	167	154	139	124	108	95	88	80	72	64	56
0133	1800	514	490	463	407	377	343	328	313	270	246	220	194	170	157	143	129	115	99
	1500	453	431	407	358	332	300	282	264	225	205	184	162	141	131	119	108	96	83
	1200	387	369	349	307	284	240	226	211	180	164	147	129	113	104	95	86	76	66
	1000	341	325	307	270	248	200	188	176	150	137	122	108	94	87	80	72	64	55
0143	1800	514	490	463	407	377	352	331	310	264	240	216	190	166	153	140	126	112	97
	1500	453	431	407	358	332	293	276	258	220	200	180	158	138	128	117	105	93	81
	1200	387	369	349	307	284	235	221	207	176	160	144	127	111	102	93	84	75	65
	1000	341	325	307	270	248	196	184	172	147	134	120	105	92	85	78	70	62	54
0153	1800	514	490	463	407	377	364	342	320	273	248	223	196	171	158	145	130	116	100
	1500	453	431	407	358	332	303	285	267	228	207	186	163	143	132	121	109	96	84
	1200	387	369	349	307	284	242	228	213	182	166	148	131	114	105	96	87	77	67
	1000	341	325	307	270	250	202	190	178	152	138	124	109	95	88	80	72	64	56

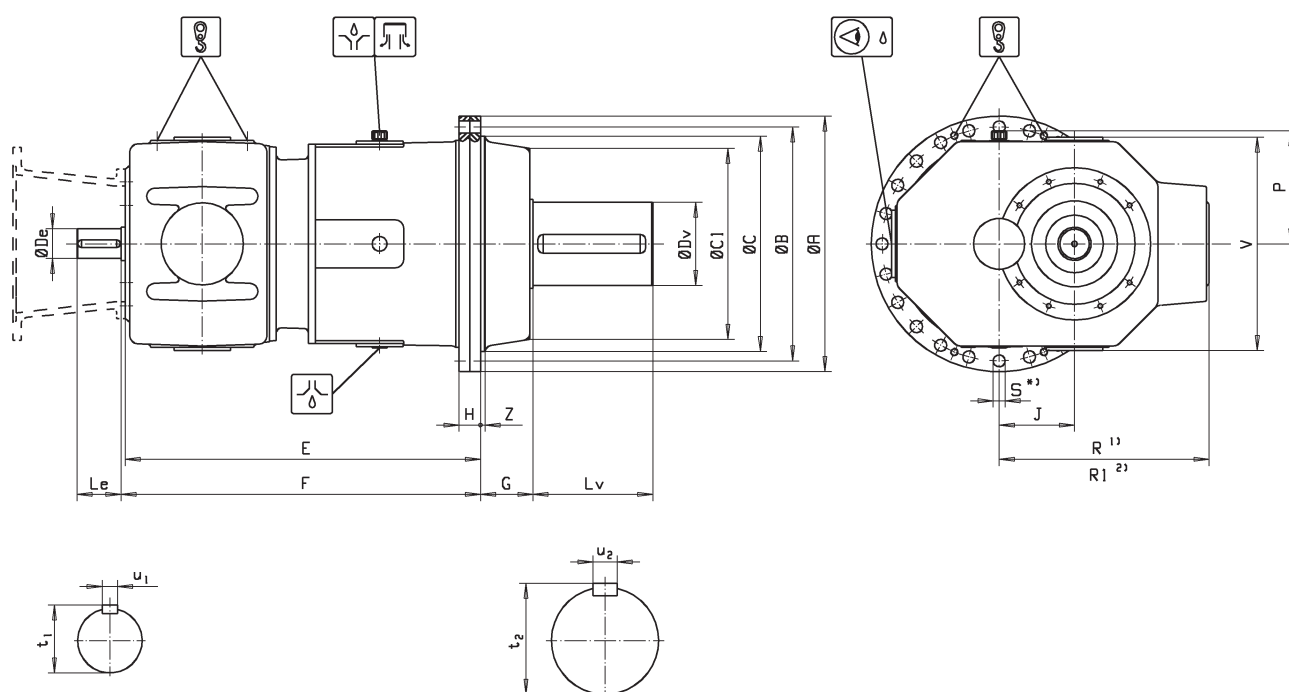
Power ratings: The ratings are nominal, application factor $K_A = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P3S...N...-112/VVN

Solid Shaft, Flange



Size	Dimensions in mm																Mass	Quantity of oil
	A	B	C	C1	F	G	H	J	R	S	V	Z	D _v	L _v	u ₂	t ₂	kg	l
0013	450	410	370f8	340	758	78	38	140	407	22	351	8	150m6	220	36h9	158	396	16
0023	500	460	410f8	373	835	85	44	160	464	22	393	8	160m6	250	40h9	169	553	23
0033	560	510	460f8	408	866	90	46	160	464	26	393	8	180m6	280	45h9	190	693	28
0043	620	560	480f8	453	922	130	60	180	520	33	436	8	200m6	350	45h9	210	939	36
0053	650	590	530f8	490	981	140	60	200	577	33	478	8	220m6	400	50h9	231	1141	47
0063	760	690	610f8	574	1083	140	70	225	647	39	531	8	250m6	400	56h9	262	1747	76
0073	840	770	690f8	633	1181	145	80	250	718	39	584	12	260m6	400	56h9	272	2341	96
0083	920	840	750f8	685	1297	160	80	280	803	45	648	12	300m6	450	70h9	314	3149	148
0093	950	870	800f8	710	1349	190	80	280	803	45	648	12	340m6	550	80h9	355	3549	163
0103	1050	960	850f8	781	1444	195	90	315	902	45	722	12	360m6	600	80h9	375	4643	226
0113	1100	1010	900f8	827	1492	210	90	315	902	45	722	12	380m6	650	80h9	395	5343	256
0123	1150	1070	970f8	903	1627	220	90	355	1014	45	807	16	420m6	650	90h9	437	6645	366
0133	1210	1120	1010f8	937	1657	220	100	355	1014	45	807	16	450m6	700	100h9	469	7245	396
0143	1340	1250	1150f8	965	1788	230	100	400	1142	45	902	16	480m6	750	100h9	499	8582	553
0153	1410	1320	1200f8	1019	1813	235	100	400	1142	45	902	16	500m6	800	100h9	519	9782	613

1) F = Without cooling fan 2) F1 = with cooling fan

Size	Dimensions in mm											
	Nominal ratio 45 ≤ iN < 140				Nominal ratio 140 ≤ iN < 200				Nominal ratio 200 ≤ iN ≤ 250			
	De	Le	u1	t1	De	Le	u1	t1	De	Le	u1	t1
013	60m6	105	18h9	69	45k6	82	14h9	54	35k6	82	12h9	43
023	65m6	105	18h9	69	50k6	82	14h9	54	40k6	82	12h9	43
033	65m6	105	18h9	69	50k6	82	14h9	54	40k6	82	12h9	43
043	75m6	130	22h9	85	60m6	105	18h9	69	45k6	82	14h9	54
053	80m6	130	22h9	85	65m6	105	18h9	69	50k6	82	14h9	54
063	90m6	130	25h9	95	70m6	105	20h9	76	55k6	82	16h9	59
073	100m6	165	28h9	106	80m6	130	22h9	85	60m6	105	18h9	64
083	110m6	165	28h9	116	90m6	130	25h9	95	65m6	105	18h9	69
093	110m6	165	28h9	116	90m6	130	25h9	95	65m6	105	18h9	69
103	110m6	200	32h9	137	100m6	165	28h9	106	75m6	105	20h9	80
113	130m6	200	32h9	137	100m6	165	28h9	106	75m6	105	20h9	80
123	130m6	200	36h9	148	110m6	165	28h9	116	85m6	130	22h9	90
133	130m6	200	36h9	148	110m6	165	28h9	116	85m6	130	22h9	90
143	150m6	200	36h9	158	120m6	165	32h9	127	100m6	165	28h9	106
153	150m6	200	36h9	158	120m6	165	32h9	127	100m6	165	28h9	106

Thermal ratings P _{TN} in kW																
Size																
n ₁ [rpm]	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153	
Without cooling fan																
1800	37	37	56	57	69	89	111	111	169	175	221	254	263	282	294	
1500	38	38	59	59	71	92	115	115	177	180	228	267	276	296	307	
1200	39	39	61	61	73	95	119	119	187	187	236	286	293	317	318	
1000	40	40	63	63	75	98	122	122	191	191	242	301	301	326	326	
With cooling fan																
1800	73	73	112	114	137	179	223	223	338	349	443	508	526	564	588	
1500	76	76	118	118	142	184	230	230	354	361	457	534	552	592	614	
1200	78	78	122	122	147	191	238	238	373	373	473	572	587	634	636	
1000	80	80	125	125	150	196	244	244	383	383	485	602	602	652	652	

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of + 20°C

P3S...N...-1 12/VVN Solid Shaft, Flange

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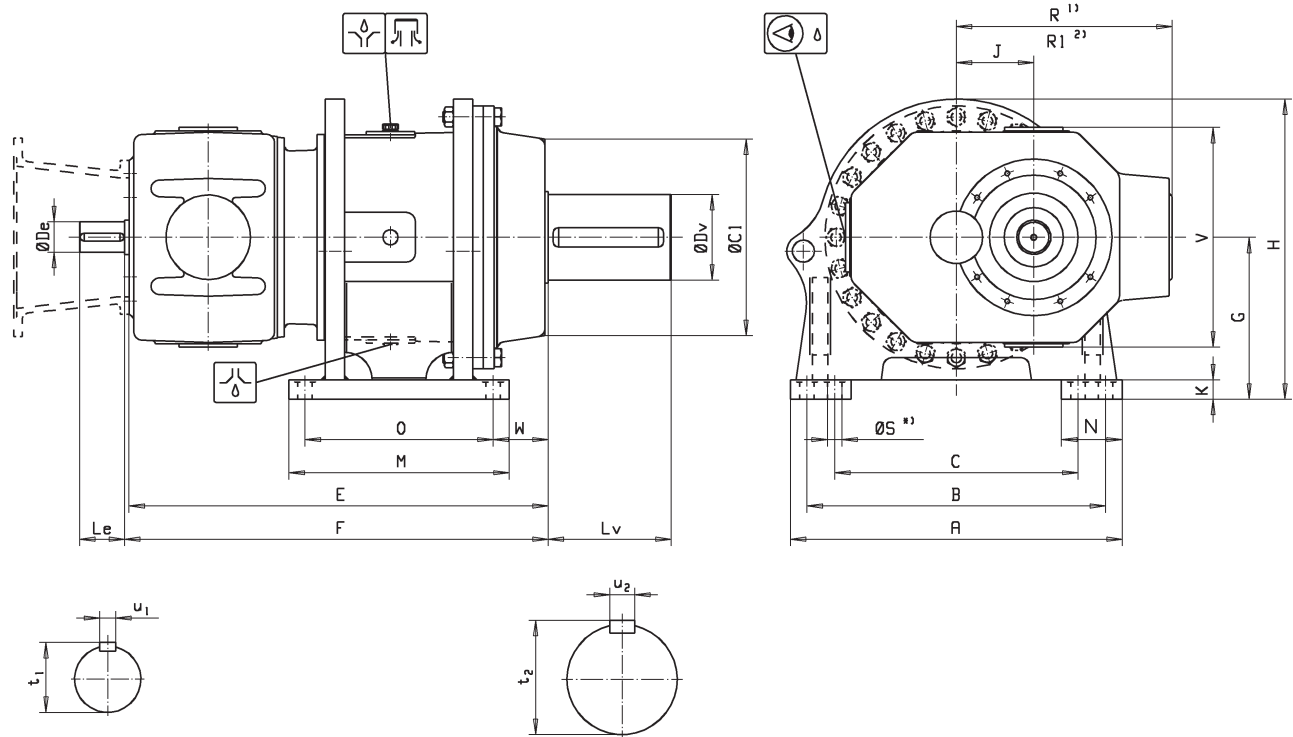
Power ratings: The ratings are nominal, application factor $K_s = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P3S...F...-112/VVN

Solid Shaft, Foot



Size	Dimensions in mm																				Weight Mass	Quantity of oil
	A	B	C	C1	F	G	H	K	J	M	N	O	R	S	V	W	Dv	Lv	u2	t2	kg	l
0013	560	510	410	340	758	283	525	30	140	380	100	330	407	22	351	85	150m6	220	36h9	158	486	16
0023	630	580	480	373	835	313	580	35	160	430	100	380	464	22	393	88	160m6	250	40h9	169	673	23
0033	700	640	540	408	866	343	640	35	160	460	110	400	464	26	393	99	180m6	280	45h9	190	853	28
0043	780	700	570	453	922	378	705	40	180	520	140	440	520	33	436	134	200m6	350	45h9	210	1189	36
0053	820	730	580	490	981	393	745	40	200	550	160	460	577	39	478	143	220m6	400	50h9	231	1421	47
0063	950	860	710	574	1083	480	885	60	225	600	160	510	647	39	531	147	250m6	400	56h9	262	2167	76
0073	1050	950	770	633	1181	520	965	60	250	650	190	550	718	45	584	160	260m6	400	56h9	272	2911	96
0083	1150	1050	870	685	1297	570	1055	70	280	720	190	620	803	45	648	168	300m6	450	70h9	314	3849	148
0093	1200	1080	880	710	1349	585	1085	70	280	800	220	680	803	52	648	194	340m6	550	80h9	355	4329	163
0103	1300	1180	980	781	1444	645	1195	80	315	830	220	710	902	52	722	201	360m6	600	80h9	375	4643	226
0113	1380	1240	1000	827	1492	680	1255	80	315	890	260	750	902	60	722	220	380m6	650	80h9	395	6493	256
0123	1430	1290	1050	903	1627	715	1315	90	355	950	260	810	1014	60	807	226	420m6	650	90h9	437	7895	366
0133	1500	1340	1070	937	1657	755	1395	90	355	1020	290	860	1014	70	807	221	450m6	700	100h9	469	8765	396
0143	1620	1460	1190	965	1788	830	1535	100	400	1050	290	890	1142	70	902	236	480m6	750	100h9	499	10162	553
0153	1690	1500	1200	1019	1813	865	1605	100	400	1150	340	960	1142	78	902	218	500m6	800	100h9	519	11582	613

1) F = Without cooling fan 2) F1 = with cooling fan

	Thermal ratings P _{TN} in kW															
	Size															
	n ₁ [rpm]	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153
Without cooling fan	1800	37	37	56	57	69	89	111	111	169	175	221	254	263	282	294
	1500	38	38	59	59	71	92	115	115	177	180	228	267	276	296	307
	1200	39	39	61	61	73	95	119	119	187	187	236	286	293	317	318
	1000	40	40	63	63	75	98	122	122	191	191	242	301	301	326	326
With cooling fan	1800	73	73	112	114	137	179	223	223	338	349	443	508	526	564	588
	1500	76	76	118	118	142	184	230	230	354	361	457	534	552	592	614
	1200	78	78	122	122	147	191	238	238	373	373	473	572	587	634	636
	1000	80	80	125	125	150	196	244	244	383	383	485	602	602	652	652

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of + 20°C

P3S...F...-112/VVN
Solid Shaft, Foot

[illegible]

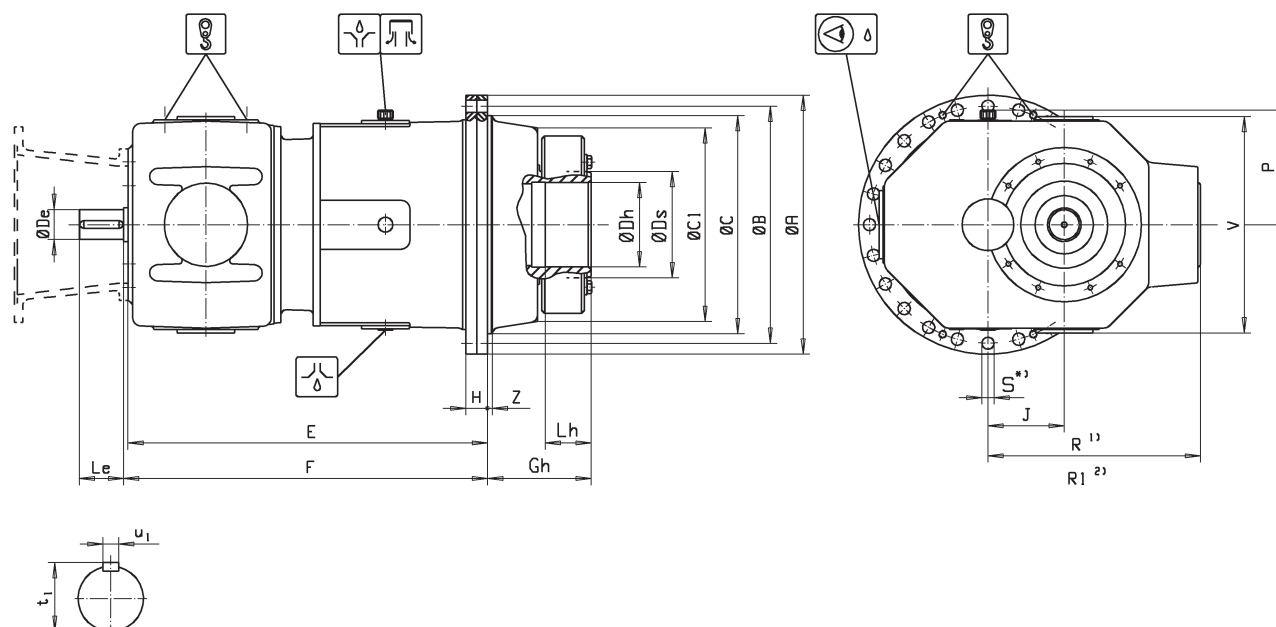
Power ratings: The ratings are nominal, application factor $K_a = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P3S...N...-112/VHN

Hollow Shaft, Flange



Size	Dimensions in mm														Weight Mass	Quantity of oil
	A	B	C	C1	F	H	J	R	S	V	Z	Dh	Lh	Ds	kg	l
0013	450	410	370f8	340	758	38	140	407	22	351	8	140H7	100	185	426	16
0023	500	460	410f8	373	835	44	160	464	22	393	8	150H7	100	200	593	23
0033	560	510	460f8	408	866	46	160	464	26	393	8	165H7	120	220	743	28
0043	620	560	480f8	453	922	60	180	520	33	436	8	190H7	120	240	999	36
0053	650	590	530f8	490	981	60	200	577	33	478	8	210H7	135	260	1221	47
0063	760	690	610f8	574	1083	70	225	647	39	531	8	240H7	160	300	1867	76
0073	840	770	690f8	633	1181	80	250	718	39	584	12	260H7	180	340	2521	96
0083	920	840	750f8	685	1297	80	280	803	45	648	12	290H7	185	360	3349	148
0093	950	870	800f8	710	1349	80	280	803	45	648	12	310H7	190	390	3789	163
0103	1050	960	850f8	781	1444	90	315	902	45	722	12	340H7	220	440	5013	226
0113	1100	1010	900f8	827	1492	90	315	902	45	722	12	360H7	220	460	5773	256
0123	1150	1070	970f8	903	1627	90	355	1014	45	807	16	380H7	240	480	7165	366
0133	1210	1120	1010f8	937	1657	100	355	1014	45	807	16	420H7	240	500	7835	396
0143	1340	1250	1150f8	965	1788	100	400	1142	45	902	16	430H7	270	530	9322	553
0153	1410	1320	1200f8	1019	1813	100	400	1142	45	902	16	450H7	270	560	10562	613

1) F = Without cooling fan 2) F1 = with cooling fan

		Thermal ratings P_{TN} in kW														
		Size														
Without cooling fan	n_1 [rpm]	013	023	033	043	053	063	073	083	093	103	113	123	133	143	153
	1800	37	37	56	57	69	89	111	111	169	175	221	254	263	282	294
	1500	38	38	59	59	71	92	115	115	177	180	228	267	276	296	307
	1200	39	39	61	61	73	95	119	119	187	187	236	286	293	317	318
	1000	40	40	63	63	75	98	122	122	191	191	242	301	301	326	326
With cooling fan	1800	73	73	112	114	137	179	223	223	338	349	443	508	526	564	588
	1500	76	76	118	118	142	184	230	230	354	361	457	534	552	592	614
	1200	78	78	122	122	147	191	238	238	373	373	473	572	587	634	636
	1000	80	80	125	125	150	196	244	244	383	383	485	602	602	652	652

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of +20°C

P3S...N...-112/VHN Hollow Shaft, Flange

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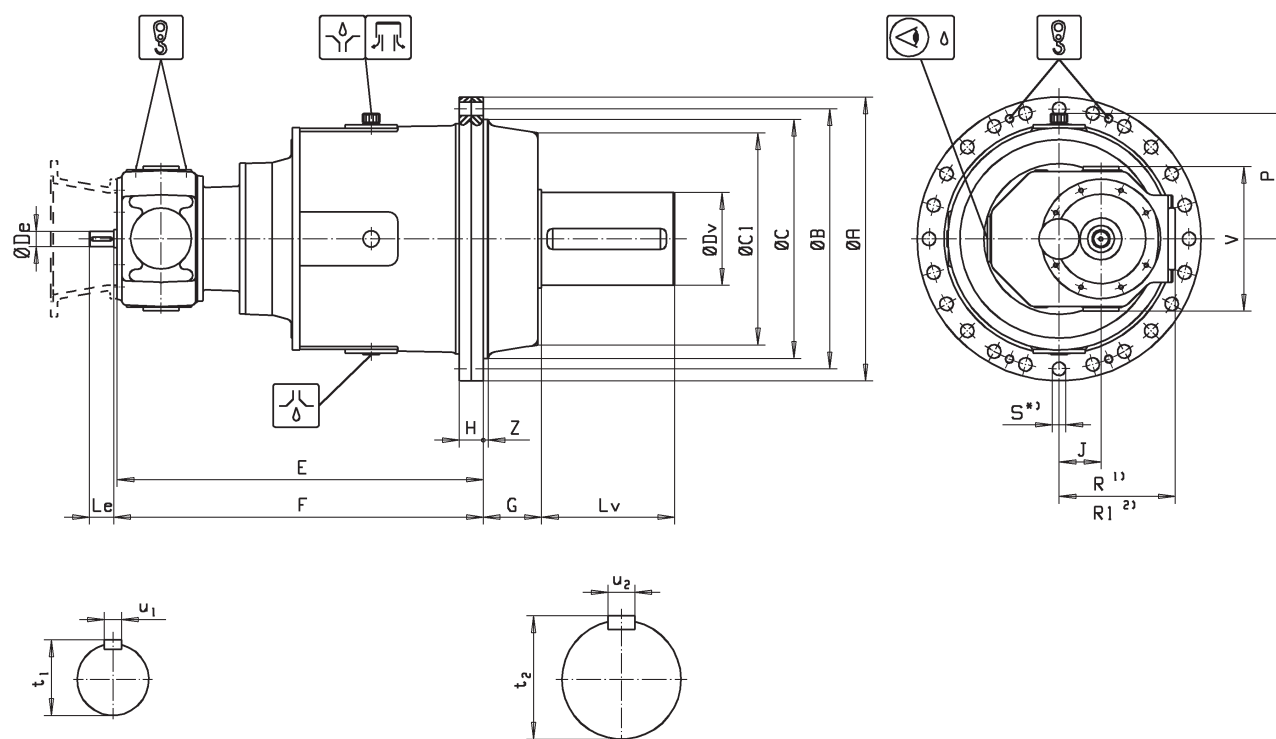
Power ratings: The ratings are nominal, application factor $K_a = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed.

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P4S...N...-112/VVN

Solid Shaft, Flange



Size	Dimensions in mm																Mass	Quantity of oil
	A	B	C	C1	F	G	H	J	R	S	V	Z	Dv	Lv	u2	t2	kg	l
0013	450	410	370f8	340	749	78	38	80	236	22	260	8	150m6	220	36h9	158	358	16
0023	500	460	410f8	373	803	85	44	90	260	22	300	8	160m6	250	40h9	169	485	21
0033	560	510	460f8	408	833	90	46	90	260	26	300	8	180m6	280	45h9	190	625	27
0043	620	560	480f8	453	942	130	60	110	325	33	300	8	200m6	350	45h9	210	880	40
0053	650	590	530f8	490	962	140	60	110	325	33	300	8	220m6	400	50h9	231	1010	45
0063	760	690	610f8	574	1040	140	70	125	362	39	324	8	250m6	400	56h9	262	1518	70
0073	840	770	690f8	633	1104	145	80	125	362	39	324	12	260m6	400	56h9	272	2028	85
0083	920	840	750f8	685	1186	160	80	140	405	45	350	12	300m6	450	70h9	314	2650	120
0093	950	870	800f8	710	1273	190	80	160	460	45	373	12	340m6	550	80h9	355	3100	138
0103	1050	960	850f8	781	1345	195	90	160	460	45	373	12	360m6	600	80h9	375	4070	188
0113	1100	1010	900f8	827	1432	210	90	180	515	45	400	12	380m6	650	80h9	395	4835	220
0123	1150	1070	970f8	903	1565	220	90	225	642	45	464	16	420m6	650	90h9	437	5920	272
0133	1210	1120	1010f8	937	1610	220	100	225	642	45	464	16	450m6	700	100h9	469	6580	317
0143	1340	1250	1150f8	965	1649	230	100	225	642	45	464	16	480m6	750	100h9	499	7380	337
0153	1410	1320	1200f8	1019	1674	235	100	225	642	45	464	16	500m6	800	100h9	519	8580	397

1) F = Without cooling fan 2) F1 = with cooling fan

Size	Dimensions in mm											
	Nominal ratio 280 ≤ iN < 800				Nominal ratio 800 ≤ iN < 1120				Nominal ratio 1120 ≤ iN ≤ 2240			
	De	Le	u1	t1	De	Le	u1	t1	De	Le	u1	t1
013	35k6	58	10h9	38	25k6	42	8h9	28	18k6	28	6h9	21
023	40k6	58	10h9	38	30k6	42	8h9	28	25k6	28	6h9	21
033	40k6	82	12h9	43	30k6	58	8h9	33	25k6	42	8h9	28
043	45k6	82	14h9	54	35k6	58	12h9	43	25k6	58	8h9	33
053	45k6	82	14h9	54	35k6	58	12h9	43	25k6	58	8h9	33
063	50k6	82	14h9	54	40k6	92	12h9	43	30k6	58	8h9	33
073	60m6	105	18h9	69	45k6	92	14h9	54	35k6	82	12h9	43
083	65m6	105	18h9	69	50k6	82	14h9	54	40k6	82	12h9	43
093	65m6	105	18h9	69	50k6	82	14h9	54	40k6	82	12h9	43
103	65m6	105	18h9	69	50k6	82	14h9	54	40k6	82	12h9	43
113	75m6	130	22h9	85	60m6	105	18h9	69	45k6	82	14h9	54
123	80m6	130	22h9	85	65m6	105	18h9	69	50k6	82	14h9	54
133	90m6	130	25h9	95	70m6	105	20h9	75	55m6	82	16h9	59
143	90m6	130	25h9	95	70m6	105	20h9	75	55m6	82	16h9	59
153	90m6	130	25h9	95	70m6	105	20h9	75	55m6	82	16h9	59

Thermal ratings P _{TN} in kW															
Size															
n ₁ [rpm]	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153
Without cooling fan															
1800	15	15	19	19	24	31	37	47	47	57	69	111	69	89	111
1500	16	16	20	20	24	32	38	48	48	59	71	115	71	92	115
1200	16	16	20	20	25	33	39	50	50	61	73	119	73	95	119
1000	17	17	21	21	26	33	40	51	51	63	75	122	75	98	122
With cooling fan															
1800	68	79	94	120	136	165	213	245	279	337	371	417	461	518	552
1500	71	83	99	126	142	173	223	258	293	354	390	438	484	544	580
1200	76	89	106	135	153	185	239	276	314	379	418	469	518	583	621
1000	85	99	117	150	170	206	266	307	349	421	464	521	576	647	690

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of + 20°C

P4S...N...-112/VVN

Solid Shaft, Flange

Size	n ₁ rpm	Nominal mechanical power ratings P _{N1} in kW																		
		Nominal ratio i _N																		
		280	320	360	400	450	500	560	630	710	800	900	1000	1120	1250	1400	1600	1800	2000	2240
0013	1800	31	27	26	24	24	24	24	24	24	24	20	16	12	8	6	6	6	6	8
	1500	26	22	22	20	20	20	20	20	20	20	17	14	10	7	5	5	5	5	7
	1200	21	18	17	16	16	16	16	16	16	16	14	11	8	6	4	4	4	4	6
	1000	17	15	14	13	13	13	13	13	13	13	11	9	7	5	3	3	3	3	5
0023	1800	44	39	35	32	32	32	32	32	32	25	20	16	12	14	10	10	10	6	8
	1500	37	32	29	27	27	27	27	27	26	21	17	14	10	11	8	8	8	5	7
	1200	30	26	23	21	21	21	21	21	21	16	14	11	8	9	7	7	7	4	6
	1000	25	21	19	18	18	18	18	18	18	14	11	9	7	8	6	6	6	3	5
0033	1800	52	47	41	38	38	38	38	38	36	33	30	24	18	14	15	10	10	10	8
	1500	46	40	35	32	32	32	32	32	31	29	25	20	15	11	12	8	8	8	7
	1200	37	32	28	25	25	25	25	25	25	25	20	16	12	9	10	7	7	7	6
	1000	31	27	23	21	21	21	21	21	21	21	17	13	10	8	8	6	6	6	5
0043	1800	80	69	60	53	49	46	42	39	36	33	30	24	25	19	19	15	15	15	14
	1500	66	58	50	46	43	40	37	35	31	29	25	20	21	16	16	12	12	12	11
	1200	53	46	40	37	37	34	32	30	27	25	20	16	17	12	13	10	10	10	9
	1000	44	38	33	30	30	30	28	26	24	21	17	13	14	10	11	8	8	8	8
0053	1800	106	92	80	73	73	73	73	73	65	51	43	35	37	26	19	19	19	15	19
	1500	88	76	66	61	61	61	61	61	55	43	36	29	31	22	16	16	16	12	16
	1200	70	61	53	48	48	48	48	48	44	34	29	23	25	18	13	13	13	10	12
	1000	59	51	44	40	40	40	40	40	36	28	24	19	21	15	11	11	11	8	10
0063	1800	152	137	109	100	100	100	97	91	84	100	84	68	54	42	31	31	31	31	19
	1500	132	115	91	83	83	83	83	80	74	83	70	57	45	35	26	26	26	26	16
	1200	106	92	73	67	67	67	67	67	59	67	56	46	36	28	21	21	21	21	13
	1000	88	76	61	56	56	56	56	56	49	56	47	38	30	23	17	17	17	17	11
0073	1800	176	159	142	130	130	130	130	130	129	109	84	68	54	42	45	45	31	31	26
	1500	155	137	118	108	108	108	108	108	107	91	70	57	45	35	38	38	26	26	22
	1200	126	110	95	86	86	86	86	86	86	73	56	46	36	28	30	30	21	21	18
	1000	105	91	79	72	72	72	72	72	72	60	47	38	30	23	25	25	17	17	15
0083	1800	254	227	198	181	181	181	181	167	155	143	126	102	74	60	68	68	45	45	42
	1500	218	189	165	151	151	151	151	147	136	126	105	85	65	50	57	57	38	38	35
	1200	175	152	132	120	120	120	120	120	117	102	84	68	54	40	45	45	30	30	28
	1000	146	126	110	100	100	100	100	100	100	85	70	57	45	33	38	38	25	25	23
0093	1800	254	228	256	236	236	201	184	167	155	143	126	102	124	95	68	68	68	68	68
	1500	224	200	213	197	197	177	162	147	136	126	105	85	103	79	57	57	57	57	57
	1200	191	171	171	158	158	151	138	125	117	102	84	68	82	63	45	45	45	45	45
	1000	168	151	142	131	131	131	122	111	103	85	70	57	69	52	38	38	38	38	38
0103	1800	416	363	309	283	283	283	283	283	265	236	193	158	124	95	102	102	68	68	60
	1500	346	303	258	236	236	236	236	236	233	196	160	132	103	79	85	85	57	57	50
	1200	277	242	206	189	189	189	189	189	189	157	128	105	82	63	68	68	45	45	40
	1000	231	202	172	157	157	157	157	157	157	130	107	88	69	52	57	57	38	38	33
0113	1800	484	433	367	337	337	337	337	320	295	274	243	217	164	135	102	102	102	102	95
	1500	413	361	306	281	281	281	281	281	259	241	214	181	145	113	85	85	85	85	79
	1200	330	289	245	225	225	225	225	225	222	206	179	144	116	90	68	68	68	68	63
	1000	275	240	204	187	187	187	187	187	187	181	149	120	97	75	57	57	57	57	52
0123	1800	484	436	486	445	445	445	445	445	445	445	445	445	445	445	396	396	360	315	268
	1500	426	383	405	371	371	371	371	371	371	371	371	371	371	371	330	330	300	262	223
	1200	364	328	324	297	297	297	297	297	297	297	297	297	297	297	264	264	240	210	178
	1000	321	289	270	247	247	247	247	247	247	247	247	247	247	247	220	220	200	175	149
0133	1800	648	587	552	471	404	379	344	320	295	274	243	217	164	185	148	148	148	148	102
	1500	570	511	460	393	356	333	303	282	259	241	214	181	145	154	123	123	123	123	85
	1200	465	409	368	314	305	285	259	241	222	206	179	144	116	123	98	98	98	98	68
	1000	387	341	307	262	262	251	228	212	195	181	149	120	97	103	82	82	82	82	57
0143	1800	648	587	658	562	562	562	562	539	507	453	378	317	233	185	206	148	148	148	135
	1500	570	516	549	468	468	468	468	468	446	383	315	264	194	154	172	123	123	123	113
	1200	488	442	439	375	375	375	375	375	375	306	251	211	155	123	137	98	98	98	90
	1000	429	389	366	312	312	312	312	312	312	255	209	176	129	103	114	82	82	82	75
0153	1800	648	587	728	670	670	641	583	539	507	453	378	317	233	278	206	206	206	148	148
	1500	570	516	607	558	558	558	513	474	446	383	315	264	194	231	172	172	172	123	123
	1200	488	442	485	446	446	446	439	406	381	306	251	211	155	185	137	137	137	98	98
	1000	429	389	404	372	372	372	372	372	357	325	255	209	176	129	154	114	114	114	82

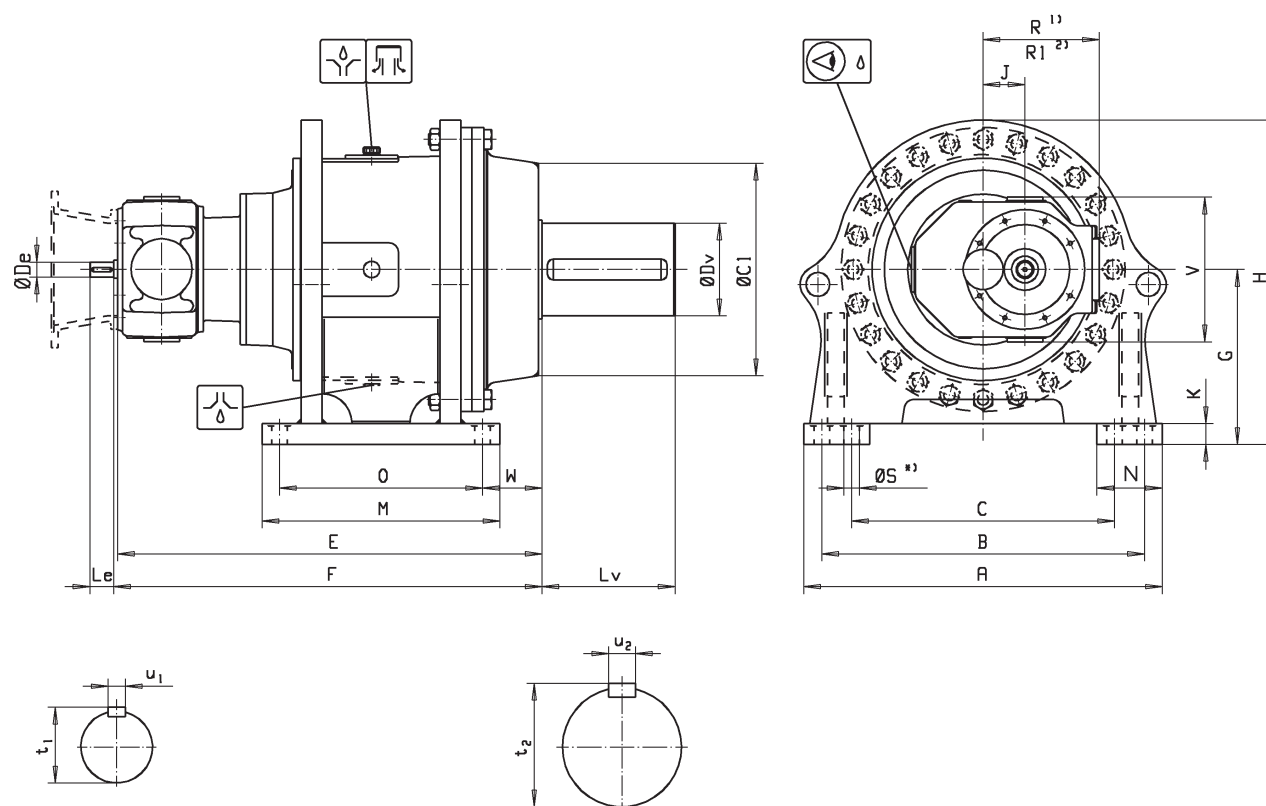
Power ratings: The ratings are nominal, application factor K_A = 1.0. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P4S...F...-112/VVN

Solid Shaft, Foot



Size	Dimensions in mm																				Weight Mass	Quantity of oil
	A	B	C	C1	F	G	H	J	K	M	N	O	R	S	V	W	Dv	Lv	u2	t2	kg	l
0013	560	510	410	340	749	283	525	80	30	380	100	330	236	22	260	85	150m6	220	36h9	158	448	16
0023	630	580	480	373	803	313	580	90	35	430	100	380	260	22	300	88	160m6	250	40h9	169	605	21
0033	700	640	540	408	833	343	640	90	35	460	110	400	260	26	300	99	180m6	280	45h9	190	785	27
0043	780	700	570	453	942	378	705	110	40	520	140	440	325	33	300	134	200m6	350	45h9	210	1130	40
0053	820	730	580	490	962	393	745	110	40	550	160	460	325	33	300	143	220m6	400	50h9	231	1290	45
0063	950	860	710	574	1040	480	885	125	60	600	160	510	362	39	324	147	250m6	400	56h9	262	1938	70
0073	1050	950	770	633	1104	520	965	125	60	650	190	550	362	39	324	160	260m6	400	56h9	272	2598	85
0083	1150	1050	870	685	1186	570	1055	140	70	720	190	620	405	45	350	168	300m6	450	70h9	314	3345	120
0093	1200	1080	880	710	1273	585	1085	160	70	800	220	680	460	45	373	194	340m6	550	80h9	355	3880	138
0103	1300	1180	980	781	1345	645	1195	160	80	830	220	710	460	45	373	201	360m6	600	80h9	375	4070	188
0113	1380	1240	1000	827	1432	680	1255	180	80	890	260	750	515	45	400	220	380m6	650	80h9	395	5985	220
0123	1430	1290	1050	903	1565	715	1315	225	90	950	260	810	642	45	464	226	420m6	650	90h9	437	7160	272
0133	1500	1340	1070	937	1610	755	1395	225	90	1020	290	860	642	45	464	221	450m6	700	100h9	469	8100	317
0143	1620	1460	1190	965	1649	830	1535	225	100	1050	290	890	642	45	464	236	480m6	750	100h9	499	8960	337
0153	1690	1500	1200	1019	1674	865	1605	225	100	1150	340	960	642	45	464	218	500m6	800	100h9	519	10380	397

1) F = Without cooling fan 2) F1 = with cooling fan

	Thermal ratings P _{IN} in kW															
	Size															
	n ₁ [rpm]	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153
Without cooling fan	1800	15	15	19	19	24	31	37	47	47	57	69	111	69	89	111
	1500	16	16	20	20	24	32	38	48	48	59	71	115	71	92	115
	1200	16	16	20	20	25	33	39	50	50	61	73	119	73	95	119
	1000	17	17	21	21	26	33	40	51	51	63	75	122	75	98	122
With cooling fan	1800	68	79	94	120	136	165	213	245	279	337	371	417	461	518	552
	1500	71	83	99	126	142	173	223	258	293	354	390	438	484	544	580
	1200	76	89	106	135	153	185	239	276	314	379	418	469	518	583	621
	1000	85	99	117	150	170	206	266	307	349	421	464	521	576	647	690

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of + 20°C

P4S...F...-112/VVN

Solid Shaft, Foot

Size	n, rpm	Nominal mechanical power ratings P _{N1} in kW																		
		Nominal ratio i _N																		
		280	320	360	400	450	500	560	630	710	800	900	1000	1120	1250	1400	1600	1800	2000	2240
0013	1800	31	27	26	24	24	24	24	24	24	24	20	16	12	8	6	6	6	6	8
	1500	26	22	22	20	20	20	20	20	20	20	17	14	10	7	5	5	5	5	7
	1200	21	18	17	16	16	16	16	16	16	16	14	11	8	6	4	4	4	4	6
	1000	17	15	14	13	13	13	13	13	13	13	11	9	7	5	3	3	3	3	5
0023	1800	44	39	35	32	32	32	32	32	32	25	20	16	12	14	10	10	10	6	8
	1500	37	32	29	27	27	27	27	27	26	21	17	14	10	11	8	8	8	5	7
	1200	30	26	23	21	21	21	21	21	21	16	14	11	8	9	7	7	7	4	6
	1000	25	21	19	18	18	18	18	18	18	14	11	9	7	8	6	6	6	3	5
0033	1800	52	47	41	38	38	38	38	38	36	33	30	24	18	14	15	10	10	10	8
	1500	46	40	35	32	32	32	32	32	31	29	25	20	15	11	12	8	8	8	7
	1200	37	32	28	25	25	25	25	25	25	25	20	16	12	9	10	7	7	7	6
	1000	31	27	23	21	21	21	21	21	21	21	17	13	10	8	8	6	6	6	5
0043	1800	80	69	60	53	49	46	42	39	36	33	30	24	25	19	19	15	15	15	14
	1500	66	58	50	46	43	40	37	35	31	29	25	20	21	16	16	12	12	12	11
	1200	53	46	40	37	37	34	32	30	27	25	20	16	17	12	13	10	10	10	9
	1000	44	38	33	30	30	30	28	26	24	21	17	13	14	10	11	8	8	8	8
0053	1800	106	92	80	73	73	73	73	73	65	51	43	35	37	26	19	19	19	15	19
	1500	88	76	66	61	61	61	61	61	55	43	36	29	31	22	16	16	16	12	16
	1200	70	61	53	48	48	48	48	48	44	34	29	23	25	18	13	13	13	10	12
	1000	59	51	44	40	40	40	40	40	36	28	24	19	21	15	11	11	11	8	10
0063	1800	152	137	109	100	100	100	97	91	84	100	84	68	54	42	31	31	31	31	19
	1500	132	115	91	83	83	83	83	80	74	83	70	57	45	35	26	26	26	26	16
	1200	106	92	73	67	67	67	67	67	59	67	56	46	36	28	21	21	21	21	13
	1000	88	76	61	56	56	56	56	56	49	56	47	38	30	23	17	17	17	17	11
0073	1800	176	159	142	130	130	130	130	130	129	109	84	68	54	42	45	45	31	31	26
	1500	155	137	118	108	108	108	108	108	107	91	70	57	45	35	38	38	26	26	22
	1200	126	110	95	86	86	86	86	86	86	73	56	46	36	28	30	30	21	21	18
	1000	105	91	79	72	72	72	72	72	72	60	47	38	30	23	25	25	17	17	15
0083	1800	254	227	198	181	181	181	181	167	155	143	126	102	74	60	68	68	45	45	42
	1500	218	189	165	151	151	151	151	147	136	126	105	85	65	50	57	57	38	38	35
	1200	175	152	132	120	120	120	120	120	117	102	84	68	54	40	45	45	30	30	28
	1000	146	126	110	100	100	100	100	100	100	85	70	57	45	33	38	38	25	25	23
0093	1800	254	228	256	236	236	201	184	167	155	143	126	102	124	95	68	68	68	68	68
	1500	224	200	213	197	197	177	162	147	136	126	105	85	103	79	57	57	57	57	57
	1200	191	171	171	158	158	151	138	125	117	102	84	68	82	63	45	45	45	45	45
	1000	168	151	142	131	131	131	122	111	103	85	70	57	69	52	38	38	38	38	38
0103	1800	416	363	309	283	283	283	283	283	265	236	193	158	124	95	102	102	68	68	60
	1500	346	303	258	236	236	236	236	236	233	196	160	132	103	79	85	85	57	57	50
	1200	277	242	206	189	189	189	189	189	189	157	128	105	82	63	68	68	45	45	40
	1000	231	202	172	157	157	157	157	157	157	130	107	88	69	52	57	57	38	38	33
0113	1800	484	433	367	337	337	337	337	320	295	274	243	217	164	135	102	102	102	102	95
	1500	413	361	306	281	281	281	281	281	259	241	214	181	145	113	85	85	85	85	79
	1200	330	289	245	225	225	225	225	225	222	206	179	144	116	90	68	68	68	68	63
	1000	275	240	204	187	187	187	187	187	187	181	149	120	97	75	57	57	57	57	52
0123	1800	484	436	486	445	445	445	445	445	445	445	445	445	445	445	396	396	360	315	268
	1500	426	383	405	371	371	371	371	371	371	371	371	371	371	371	330	330	300	262	223
	1200	364	328	324	297	297	297	297	297	297	297	297	297	297	297	264	264	240	210	178
	1000	321	289	270	247	247	247	247	247	247	247	247	247	247	247	220	220	200	175	149
0133	1800	648	587	552	471	404	379	344	320	295	274	243	217	164	185	148	148	148	148	102
	1500	570	511	460	393	356	333	303	282	259	241	214	181	145	154	123	123	123	123	85
	1200	465	409	368	314	305	285	259	241	222	206	179	144	116	123	98	98	98	98	68
	1000	387	341	307	262	262	251	228	212	195	181	149	120	97	103	82	82	82	82	57
0143	1800	648	587	658	562	562	562	562	539	507	453	378	317	233	185	206	148	148	148	135
	1500	570	516	549	468	468	468	468	468	446	383	315	264	194	154	172	123	123	123	113
	1200	488	442	439	375	375	375	375	375	375	306	251	211	155	123	137	98	98	98	90
	1000	429	389	366	312	312	312	312	312	312	255	209	176	129	103	114	82	82	82	75
0153	1800	648	587	728	670	670	641	583	539	507	453	378	317	233	278	206	206	206	148	148
	1500	570	516	607	558	558	558	513	474	446	383	315	264	194	231	172	172	172	123	123
	1200	488	442	485	446	446	446	439	406	381	306	251	211	155	185	137	137	137	98	98
	1000	429	389	404	372	372	372	372	372	357	325	255	209	176	129	154	114	114	114	82

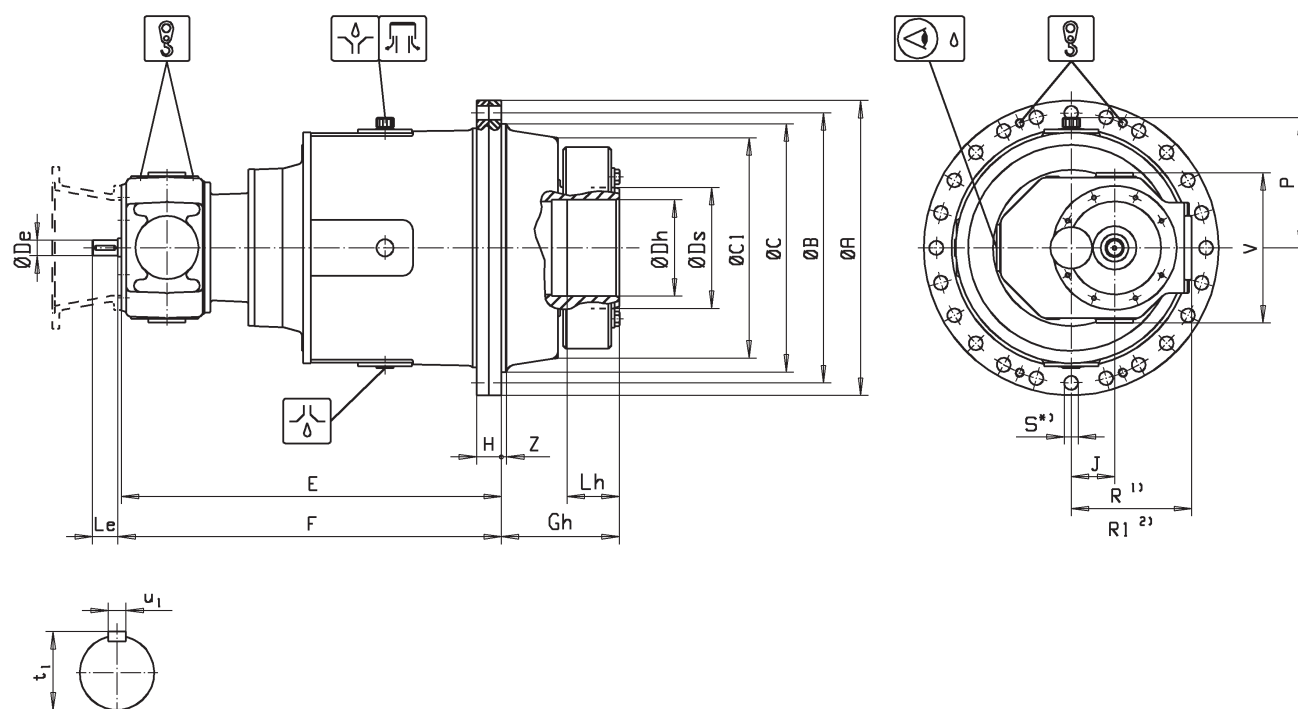
Power ratings: The ratings are nominal, application factor K_A = 1.0. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P4S...N...-112/VHN

Hollow Shaft, Flange



Size	Dimensions in mm															Weight Mass	Quantity of oil
	A	B	C	C1	F	Gh	H	J	R	S	V	Z	Dh	Lh	Ds	kg	l
0013	450	410	370f8	340	749	170	38	80	236	22	260	8	140H7	100	185	388	16
0023	500	460	410f8	373	803	180	44	90	260	22	300	8	150H7	100	200	525	21
0033	560	510	460f8	408	833	210	46	90	260	26	300	8	165H7	120	220	675	27
0043	620	560	480f8	453	942	255	60	110	325	33	300	8	190H7	120	240	940	40
0053	650	590	530f8	490	962	275	60	110	325	33	300	8	210H7	135	260	1090	45
0063	760	690	610f8	574	1040	295	70	125	362	39	324	8	240H7	160	300	1638	70
0073	840	770	690f8	633	1104	320	80	125	362	39	324	12	260H7	180	340	2208	85
0083	920	840	750f8	685	1186	340	80	140	405	45	350	12	290H7	185	360	2850	120
0093	950	870	800f8	710	1273	380	80	160	460	45	373	12	310H7	190	390	3340	138
0103	1050	960	850f8	781	1345	420	90	160	460	45	373	12	340H7	220	440	4440	188
0113	1100	1010	900f8	827	1432	435	90	180	515	45	400	12	360H7	220	460	5265	220
0123	1150	1070	970f8	903	1565	465	90	225	642	45	464	16	380H7	240	480	6440	272
0133	1210	1120	1010f8	937	1610	460	100	225	642	45	464	16	420H7	240	500	7170	317
0143	1340	1250	1150f8	965	1649	500	100	225	642	45	464	16	430H7	270	530	8120	337
0153	1410	1320	1200f8	1019	1674	510	100	225	642	45	464	16	450H7	270	560	9360	397

1) F = Without cooling fan 2) F1 = with cooling fan

	Thermal ratings P _{TN} in kW															
	n ₁ [rpm]	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153
Without cooling fan	1800	15	15	19	19	24	31	37	47	47	57	69	111	69	89	111
	1500	16	16	20	20	24	32	38	48	48	59	71	115	71	92	115
	1200	16	16	20	20	25	33	39	50	50	61	73	119	73	95	119
	1000	17	17	21	21	26	33	40	51	51	63	75	122	75	98	122
With cooling fan	1800	68	79	94	120	136	165	213	245	279	337	371	417	461	518	552
	1500	71	83	99	126	142	173	223	258	293	354	390	438	484	544	580
	1200	76	89	106	135	153	185	239	276	314	379	418	469	518	583	621
	1000	85	99	117	150	170	206	266	307	349	421	464	521	576	647	690

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of + 20°C

P4S...N...-112/VHN

Hollow Shaft, Flange

Size	n, rpm	Nominal mechanical power ratings P _{N1} in kW																		
		Nominal ratio i _N																		
		280	320	360	400	450	500	560	630	710	800	900	1000	1120	1250	1400	1600	1800	2000	2240
0013	1800	31	27	26	24	24	24	24	24	24	24	20	16	12	8	6	6	6	6	8
	1500	26	22	22	20	20	20	20	20	20	20	17	14	10	7	5	5	5	5	7
	1200	21	18	17	16	16	16	16	16	16	16	14	11	8	6	4	4	4	4	6
	1000	17	15	14	13	13	13	13	13	13	13	11	9	7	5	3	3	3	3	5
0023	1800	44	39	35	32	32	32	32	32	32	25	20	16	12	14	10	10	10	6	8
	1500	37	32	29	27	27	27	27	27	26	21	17	14	10	11	8	8	8	5	7
	1200	30	26	23	21	21	21	21	21	21	16	14	11	8	9	7	7	7	4	6
	1000	25	21	19	18	18	18	18	18	18	14	11	9	7	8	6	6	6	3	5
0033	1800	52	47	41	38	38	38	38	38	36	33	30	24	18	14	15	10	10	10	8
	1500	46	40	35	32	32	32	32	32	31	29	25	20	15	11	12	8	8	8	7
	1200	37	32	28	25	25	25	25	25	25	25	20	16	12	9	10	7	7	7	6
	1000	31	27	23	21	21	21	21	21	21	21	17	13	10	8	8	6	6	6	5
0043	1800	80	69	60	53	49	46	42	39	36	33	30	24	25	19	19	15	15	15	14
	1500	66	58	50	46	43	40	37	35	31	29	25	20	21	16	16	12	12	12	11
	1200	53	46	40	37	37	34	32	30	27	25	20	16	17	12	13	10	10	10	9
	1000	44	38	33	30	30	30	28	26	24	21	17	13	14	10	11	8	8	8	8
0053	1800	106	92	80	73	73	73	73	73	65	51	43	35	37	26	19	19	19	15	19
	1500	88	76	66	61	61	61	61	61	55	43	36	29	31	22	16	16	16	12	16
	1200	70	61	53	48	48	48	48	48	44	34	29	23	25	18	13	13	13	10	12
	1000	59	51	44	40	40	40	40	40	36	28	24	19	21	15	11	11	11	8	10
0063	1800	152	137	109	100	100	100	97	91	84	100	84	68	54	42	31	31	31	31	19
	1500	132	115	91	83	83	83	83	80	74	83	70	57	45	35	26	26	26	26	16
	1200	106	92	73	67	67	67	67	67	59	67	56	46	36	28	21	21	21	21	13
	1000	88	76	61	56	56	56	56	56	49	56	47	38	30	23	17	17	17	17	11
0073	1800	176	159	142	130	130	130	130	130	129	109	84	68	54	42	45	45	31	31	26
	1500	155	137	118	108	108	108	108	108	107	91	70	57	45	35	38	38	26	26	22
	1200	126	110	95	86	86	86	86	86	86	73	56	46	36	28	30	30	21	21	18
	1000	105	91	79	72	72	72	72	72	72	60	47	38	30	23	25	25	17	17	15
0083	1800	254	227	198	181	181	181	181	167	155	143	126	102	74	60	68	68	45	45	42
	1500	218	189	165	151	151	151	151	147	136	126	105	85	65	50	57	57	38	38	35
	1200	175	152	132	120	120	120	120	120	117	102	84	68	54	40	45	45	30	30	28
	1000	146	126	110	100	100	100	100	100	100	85	70	57	45	33	38	38	25	25	23
0093	1800	254	228	256	236	236	201	184	167	155	143	126	102	124	95	68	68	68	68	68
	1500	224	200	213	197	197	177	162	147	136	126	105	85	103	79	57	57	57	57	57
	1200	191	171	171	158	158	151	138	125	117	102	84	68	82	63	45	45	45	45	45
	1000	168	151	142	131	131	131	122	111	103	85	70	57	69	52	38	38	38	38	38
0103	1800	416	363	309	283	283	283	283	283	265	236	193	158	124	95	102	102	68	68	60
	1500	346	303	258	236	236	236	236	236	233	196	160	132	103	79	85	85	57	57	50
	1200	277	242	206	189	189	189	189	189	189	157	128	105	82	63	68	68	45	45	40
	1000	231	202	172	157	157	157	157	157	157	130	107	88	69	52	57	57	38	38	33
0113	1800	484	433	367	337	337	337	337	320	295	274	243	217	164	135	102	102	102	102	95
	1500	413	361	306	281	281	281	281	281	259	241	214	181	145	113	85	85	85	85	79
	1200	330	289	245	225	225	225	225	225	222	206	179	144	116	90	68	68	68	68	63
	1000	275	240	204	187	187	187	187	187	187	181	149	120	97	75	57	57	57	57	52
0123	1800	484	436	486	445	445	445	445	445	445	445	445	445	445	445	396	396	360	315	268
	1500	426	383	405	371	371	371	371	371	371	371	371	371	371	371	330	330	300	262	223
	1200	364	328	324	297	297	297	297	297	297	297	297	297	297	297	264	264	240	210	178
	1000	321	289	270	247	247	247	247	247	247	247	247	247	247	247	220	220	200	175	149
0133	1800	648	587	552	471	404	379	344	320	295	274	243	217	164	185	148	148	148	148	102
	1500	570	511	460	393	356	333	303	282	259	241	214	181	145	154	123	123	123	123	85
	1200	465	409	368	314	305	285	259	241	222	206	179	144	116	123	98	98	98	98	68
	1000	387	341	307	262	262	251	228	212	195	181	149	120	97	103	82	82	82	82	57
0143	1800	648	587	658	562	562	562	562	539	507	453	378	317	233	185	206	148	148	148	135
	1500	570	516	549	468	468	468	468	468	446	383	315	264	194	154	172	123	123	123	113
	1200	488	442	439	375	375	375	375	375	375	306	251	211	155	123	137	98	98	98	90
	1000	429	389	366	312	312	312	312	312	312	255	209	176	129	103	114	82	82	82	75
0153	1800	648	587	728	670	670	641	583	539	507	453	378	317	233	278	206	206	206	148	148
	1500	570	516	607	558	558	558	513	474	446	383	315	264	194	231	172	172	172	123	123
	1200	488	442	485	446	446	446	439	406	381	306	251	211	155	185	137	137	137	98	98
	1000	429	389	404	372	372	372	372	372	357	325	255	209	176	129	154	114	114	114	82

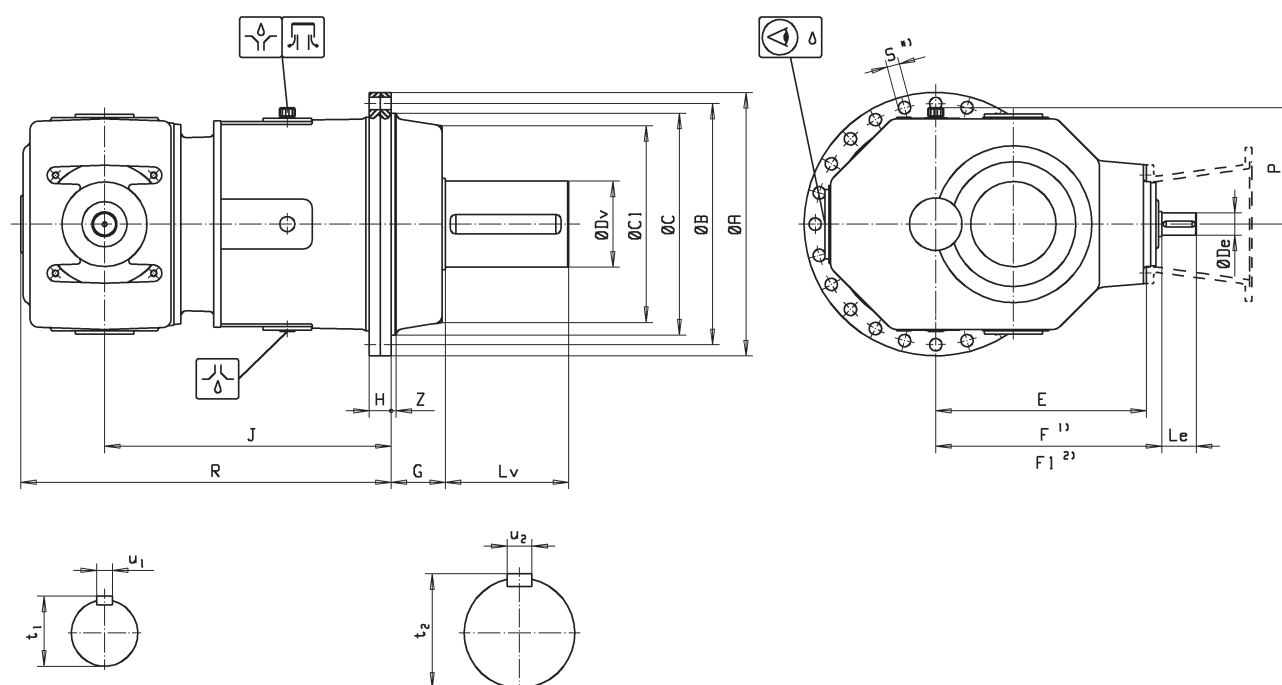
Power ratings: The ratings are nominal, application factor K_A = 1.0. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P4K...N...-212/VVN

Solid Shaft, Flange



Size	Dimensions in mm																Mass	Quantity of oil
	A	B	C	C1	E	F	G	H	J	R	S	Z	Dv	Lv	u2	t2	kg	l
0013	450	410	370f8	340	311	322	370	78	38	572	205	700	22	8	140m6	220	413	13
0023	500	460	410f8	373	311	322	370	85	44	608	230	736	22	8	150m6	220	651	23
0033	560	510	460f8	408	394	405	460	90	46	659	260	817	26	8	165m6	250	791	28
0043	620	560	480f8	453	504	515	570	13	60	707	280	903	33	8	190m6	300	981	33
0053	650	590	530f8	490	504	515	570	140	60	725	300	921	33	8	210m6	350	1301	56
0063	760	690	610f8	574	639	650	725	140	70	877	340	1121	39	8	240m6	400	1791	79
0073	840	770	690f8	633	639	650	725	145	80	924	385	1168	39	12	260m6	400	2241	89
0083	920	840	750f8	685	796	810	905	160	80	982	420	1282	45	12	290m6	450	2975	137
0093	950	870	800f8	710	796	810	905	190	80	1034	440	1334	45	12	310m6	450	3566	173
0103	1050	960	850f8	781	796	810	905	195	90	1057	480	1357	45	12	340m6	550	4632	233
0113	1100	1020	900f8	827	1006	1020	1140	210	90	1205	510	1575	45	12	360m6	600	5696	306
0123	1150	1070	970f8	903	1006	1020	1140	220	90	1258	540	1628	45	16	380m6	650	6596	351
0133	1210	1120	1010f8	937	1006	1020	1140	220	100	1288	560	1658	45	16	420m6	650	7196	381
0143	1340	1250	1150f8	965	1006	1020	1140	230	100	1327	580	1697	45	16	430m6	700	8488	459
0153	1410	1320	1200f8	1019	1006	1020	1140	235	100	1352	600	1722	45	16	450m6	750	9688	519

1) F = Without cooling fan 2) F1 = with cooling fan

Size	Dimensions in mm											
	Nominal ratio 80 ≤ iN < 320				Nominal ratio 320 ≤ iN < 450				Nominal ratio 450 ≤ iN < 800			
	De	Le	u1	t1	De	Le	u1	t1	De	Le	u1	t1
013	45k6	82	14h9	49	35k6	58	10h9	38	35k6	58	10h9	38
023	55m6	82	16h9	59	45k6	82	14h9	49	45k6	82	14h9	49
033	55m6	82	16h9	59	45k6	82	14h9	49	45k6	82	14h9	49
043	55m6	82	16h9	59	45k6	82	14h9	49	45k6	82	14h9	49
053	65m6	105	18h9	69	55m6	82	16h9	59	55m6	82	16h9	59
063	65m6	105	18h9	69	55m6	82	16h9	59	55m6	82	16h9	59
073	65m6	105	18h9	69	55m6	82	16h9	59	55m6	82	16h9	59
083	70m6	105	20h9	75	60m6	105	18h9	64	60m6	105	18h9	64
093	80m6	130	22h9	85	65m6	105	18h9	69	65m6	105	18h9	69
103	100m6	165	28h9	106	80m6	130	22h9	85	65m6	105	18h9	69
113	110m6	165	28h9	116	90m6	130	25h9	95	70m6	105	20h9	75
123	110m6	165	28h9	116	90m6	130	25h9	95	70m6	105	20h9	75
133	110m6	165	28h9	116	90m6	130	25h9	95	70m6	105	20h9	75
143	150m6	200	36h9	158	130m6	200	32h9	137	100m6	165	28h9	106
153	150m6	200	36h9	158	130m6	200	32h9	137	100m6	165	28h9	106

Thermal ratings P _{TN} in kW																
Size																
n ₁ [rpm]	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153	
Without cooling fan																
1800	35	41	53	73	79	117	117	154	154	177	238	254	263	282	294	
1500	36	43	55	77	82	122	122	160	160	186	248	267	276	296	308	
1200	38	46	57	82	85	127	127	167	167	199	259	286	296	317	330	
1000	39	51	59	88	88	131	131	173	173	220	267	318	329	330	367	
With cooling fan																
1800	70	82	106	146	158	234	234	308	308	354	476	508	526	564	588	
1500	72	86	110	154	164	244	244	320	320	372	496	534	552	592	616	
1200	76	92	114	164	170	254	254	334	334	398	518	572	592	634	660	
1000	78	102	118	176	176	262	262	346	346	440	534	636	658	660	734	

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of + 20°C

P4K...N...-212/VVN

Solid Shaft, Flange

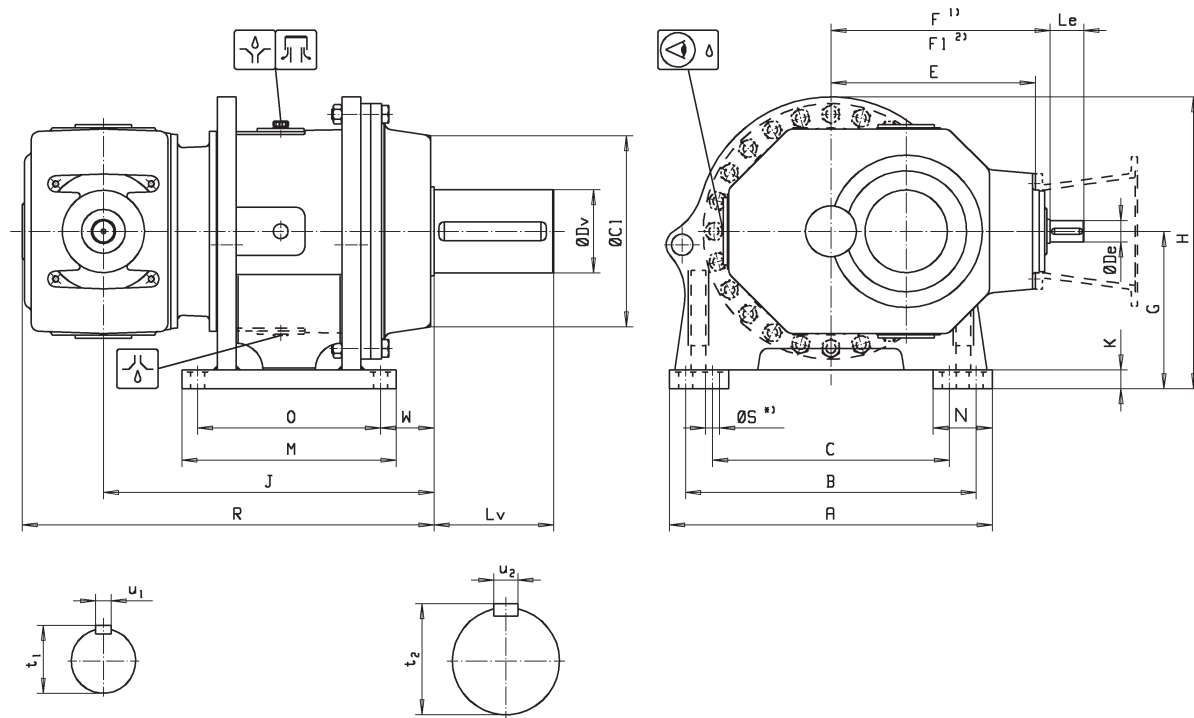
Size	n ₁ rpm	Nominal mechanical power ratings P _{N1} in kW																					
		Nominal ratio i _N																					
		80	90	100	112	125	140	160	180	200	224	250	280	320	360	400	450	500	560	630	710	800	
0013	1800	-	76	72	68	64	54	54	43	43	35	35	35	54	49	38	32	27	On request				
	1500	-	67	64	60	56	46	46	38	38	29	29	30	46	41	32	27	22					
	1200	-	57	54	51	47	37	37	32	32	23	23	24	37	33	25	22	18					
	1000	-	50	47	43	39	31	31	28	26	20	20	20	31	27	21	18	15					
0023	1800	120	114	107	100	93	77	77	77	77	77	77	68	61	56	49	38	32					
	1500	106	101	94	88	82	68	68	68	68	68	66	60	50	49	41	32	27					
	1200	91	86	81	76	70	56	56	56	56	56	53	50	40	41	33	25	22					
	1000	80	76	71	65	59	47	47	47	47	47	44	42	34	34	27	21	18					
0033	1800	138	132	117	109	102	84	84	83	83	80	80	68	56	49	38	32	27					
	1500	121	116	103	96	89	74	74	73	73	66	66	60	49	41	32	27	22					
	1200	104	99	88	82	76	63	63	62	62	53	53	50	41	33	25	22	18					
	1000	91	87	78	72	67	56	56	55	55	44	44	42	34	27	21	18	15					
0043	1800	198	190	172	163	152	127	127	127	127	127	127	127	119	104	97	81	69					
	1500	174	167	152	143	134	112	112	112	112	112	112	112	105	92	86	67	58					
	1200	149	143	130	123	114	95	95	95	95	95	95	95	86	79	70	54	46					
	1000	131	126	114	108	100	80	80	80	80	80	80	80	71	69	59	45	38					
0053	1800	261	250	181	209	194	162	162	162	162	162	158	128	119	104	97	81	69					
	1500	230	220	160	184	171	143	143	143	143	143	139	113	105	92	86	67	58					
	1200	197	188	136	158	146	122	122	122	122	122	114	96	86	79	70	54	46					
	1000	173	165	120	139	129	106	106	106	106	106	95	85	71	69	59	45	38					
0063	1800	373	344	328	293	274	230	230	230	230	230	230	230	195	204	160	140	126					
	1500	329	303	288	258	241	203	203	203	203	203	203	203	163	173	133	123	105					
	1200	281	259	247	220	206	173	173	173	173	173	173	168	130	139	107	106	84					
	1000	247	228	217	194	181	145	145	145	145	145	145	140	108	114	89	90	70					
0073	1800	406	389	353	333	312	266	266	266	266	266	266	253	248	195	204	160	140					
	1500	357	343	311	293	275	234	234	234	234	234	234	222	212	163	173	133	123					
	1200	306	293	266	251	235	201	201	201	201	201	201	191	168	130	139	107	106					
	1000	269	258	234	221	207	177	177	177	177	177	177	168	140	108	114	89	90					
0083	1800	583	560	508	480	451	385	385	385	385	385	385	296	297	295	248	248	183					
	1500	513	493	447	423	397	339	339	339	339	339	339	259	261	261	219	219	161					
	1200	439	421	383	362	339	290	290	290	290	290	290	223	222	222	187	188	138					
	1000	386	371	337	318	299	255	255	255	255	255	255	196	196	196	165	165	122					
0093	1800	828	787	744	654	605	502	502	502	502	502	402	502	297	295	248	248	183					
	1500	729	693	655	575	532	442	442	442	442	442	352	442	261	261	219	219	161					
	1200	623	592	560	492	455	374	374	374	374	374	301	374	222	222	187	188	138					
	1000	549	521	493	433	395	312	312	312	312	312	266	312	196	196	165	165	122					
0103	1800	1051	1008	915	865	811	692	692	692	692	506	507	507	424	424	326	327	225					
	1500	925	887	805	761	714	609	609	609	609	447	445	447	375	374	288	288	199					
	1200	791	759	689	651	611	502	502	502	502	382	382	382	320	319	245	246	169					
	1000	696	668	606	573	524	418	418	418	418	335	335	336	282	282	216	216	149					
0113	1800	1218	1168	1060	1001	939	801	801	801	801	801	801	687	646	576	543	514	354					
	1500	1072	1028	933	881	826	705	705	705	705	705	705	604	569	508	478	452	311					
	1200	917	879	798	754	707	581	581	581	581	581	581	518	487	434	408	387	267					
	1000	807	774	702	663	608	485	485	485	485	485	485	455	428	382	360	341	235					
0123	1800	1530	1455	1295	1212	1120	931	931	931	931	931	931	931	918	704	704	514	354					
	1500	1346	1280	1140	1066	986	819	819	819	819	819	819	819	807	618	619	452	311					
	1200	1152	1095	975	912	844	701	701	701	701	701	701	701	692	529	529	387	267					
	1000	1014	964	858	803	743	617	617	617	617	617	617	617	608	465	466	341	235					
0133	1800	1552	1489	1352	1277	1198	1023	1023	1023	943	888	832	687	646	576	543	514	354					
	1500	1366	1310	1190	1124	1054	900	900	900	829	781	731	604	569	508	478	452	311					
	1200	1169	1121	1018	962	902	770	770	770	709	668	625	518	487	434	408	387	267					
	1000	1029	987	896	846	794	678	678	678	625	589	550	455	428	382	360	341	235					
0143	1800	2021	2021	1917	1808	1692	1434	1434	1401	1205	1198	1103	979	918	704	704	703	647					
	1500	1778	1778	1688	1592	1489	1213	1213	1213	1060	1056	970	862	807	618	619	618	570					
	1200	1522	1522	1444	1352	1230	971	971	971	907	902	830	736	692	529	529	530	487					
	1000	1339	1339	1226	1127	1025	809	809	809	797	794	730	648	608	465	466	466	429					
0153	1800	2021	2021	2021	2021	2021	1735	1735	1735	1580	1198	1103	979	918	704	704	703	647					
	1500	1778	1778	1778	1778	1778	1446	1446	1446	1389	1056	970	862	807	618	619	618	570					
	1200	1522	1522	1522	1522	1449	1156	1156	1156	1156	902	830	736	692	529	529	530	487					
	1000	1339	1339	1339	1323	1207	964	964	964	964	794	730	648	608	465	466	466	429					

Power ratings: The ratings are nominal, application factor $K_A = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

P4K...F...-212/VVN

Solid Shaft, Foot



Size	Dimensions in mm																				Weight Mass	Quantity of oil
	A	B	C	C1	E	F	G	H	J	K	M	N	O	R	S	W	Dv	Lv	u2	t2	kg	l
0013	560	510	410	340	394	405	283	525	599	30	380	100	330	758	22	84.5	150m6	220	36h9	158	503	13
0023	630	580	480	373	504	515	313	580	678	35	430	100	380	875	22	88	160m6	250	40h9	169	771	23
0033	700	640	540	408	504	515	343	640	709	35	460	110	400	906	26	99	180m6	280	45h9	190	951	28
0043	780	700	570	453	504	515	378	705	725	40	520	140	440	922	33	134	200m6	350	45h9	210	1231	33
0053	820	730	580	490	639	650	393	745	790	40	550	160	460	1033	39	143	220m6	400	50h9	231	1581	56
0063	950	860	710	574	639	650	480	885	840	60	600	160	510	1083	39	147	250m6	400	56h9	262	2211	79
0073	1050	950	770	633	639	650	520	965	887	60	650	190	550	1130	45	160	260m6	400	56h9	272	2811	89
0083	1150	1050	870	685	708	720	570	1055	968	70	720	190	620	1236	45	168	300m6	450	70h9	314	3675	137
0093	1200	1080	880	710	796	810	585	1085	1052	70	800	220	680	1349	52	194	340m6	550	80h9	355	4346	173
0103	1300	1180	980	781	893	910	645	1195	1112	80	830	220	710	1444	52	200.5	360m6	600	80h9	375	4632	233
0113	1380	1240	1000	827	1006	1020	680	1255	1202	80	890	260	750	1574	60	219.5	380m6	650	80h9	395	6846	306
0123	1430	1290	1050	903	1006	1020	715	1315	1255	90	950	260	810	1627	60	226	420m6	650	90h9	437	7846	351
0133	1500	1340	1070	937	1006	1020	755	1395	1285	90	1020	290	860	1657	70	221	450m6	700	100h9	469	8716	381
0143	1620	1460	1190	965	1135	1150	830	1535	1372	100	1050	290	890	1788	70	235.5	480m6	750	100h9	499	10068	459
0153	1690	1500	1200	1019	1135	1150	865	1605	1397	100	1150	340	960	1813	78	218	500m6	800	100h9	519	11488	519

1) F = Without cooling fan 2) F1 = with cooling fan

Size	Dimensions in mm															
	Nominal ratio 80 ≤ iN < 320				Nominal ratio 320 ≤ iN < 450				Nominal ratio 450 ≤ iN < 800							
	De	Le	u1	t1	De	Le	u1	t1	De	Le	u1	t1	De	Le	u1	t1
0013	45k6	82	14h9	49	35k6	58	10h9	38	35k6	58	10h9	38				
0023	55m6	82	16h9	59	45k6	82	14h9	49	45k6	82	14h9	49				
0033	55m6	82	16h9	59	45k6	82	14h9	49	45k6	82	14h9	49				
0043	55m6	82	16h9	59	45k6	82	14h9	49	45k6	82	14h9	49				
0053	65m6	105	18h9	69	55m6	82	16h9	59	55m6	82	16h9	59				
0063	65m6	105	18h9	69	55m6	82	16h9	59	55m6	82	16h9	59				
0073	65m6	105	18h9	69	55m6	82	16h9	59	55m6	82	16h9	59				
0083	70m6	105	20h9	75	60m6	105	18h9	64	60m6	105	18h9	64				
0093	80m6	130	22h9	85	65m6	105	18h9	69	65m6	105	18h9	69				
0103	100m6	165	28h9	106	80m6	130	22h9	85	65m6	105	18h9	69				
0113	110m6	165	28h9	116	90m6	130	25h9	95	70m6	105	20h9	75				
0123	110m6	165	28h9	116	90m6	130	25h9	95	70m6	105	20h9	75				
0133	110m6	165	28h9	116	90m6	130	25h9	95	70m6	105	20h9	75				
0143	150m6	200	36h9	158	130m6	200	32h9	137	100m6	165	28h9	106				
0153	150m6	200	36h9	158	130m6	200	32h9	137	100m6	165	28h9	106				

Thermal ratings P _{TN} in kW															
Size															
n ₁ [rpm]	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153
Without cooling fan															
1800	35	41	53	73	79	117	117	154	154	177	238	254	263	282	294
1500	36	43	55	77	82	122	122	160	160	186	248	267	276	296	308
1200	38	46	57	82	85	127	127	167	167	199	259	286	296	317	330
1000	39	51	59	88	88	131	131	173	173	220	267	318	329	330	367
With cooling fan															
1800	70	82	106	146	158	234	234	308	308	354	476	508	526	564	588
1500	72	86	110	154	164	244	244	320	320	372	496	534	552	592	616
1200	76	92	114	164	170	254	254	334	334	398	518	572	592	634	660
1000	78	102	118	176	176	262	262	346	346	440	534	636	658	660	734

Notes: P_{TN} = nominal thermal rating relating to an ambient air temperature of + 20°C

P4K...F...-212/VVN

Solid Shaft, Foot

Size	n ₁ rpm	Nominal mechanical power ratings P _{N1} in kW																					
		Nominal ratio i _N																					
		80	90	100	112	125	140	160	180	200	224	250	280	320	360	400	450	500	560	630	710	800	
0013	1800	-	76	72	68	64	54	54	43	43	35	35	35	54	49	38	32	27	On request				
	1500	-	67	64	60	56	46	46	38	38	29	29	30	46	41	32	27	22					
	1200	-	57	54	51	47	37	37	32	32	23	23	24	37	33	25	22	18					
	1000	-	50	47	43	39	31	31	28	26	20	20	20	31	27	21	18	15					
0023	1800	120	114	107	100	93	77	77	77	77	77	77	68	61	56	49	38	32					
	1500	106	101	94	88	82	68	68	68	68	68	66	60	50	49	41	32	27					
	1200	91	86	81	76	70	56	56	56	56	56	53	50	40	41	33	25	22					
	1000	80	76	71	65	59	47	47	47	47	47	44	42	34	34	27	21	18					
0033	1800	138	132	117	109	102	84	84	83	83	80	80	68	56	49	38	32	27					
	1500	121	116	103	96	89	74	74	73	73	66	66	60	49	41	32	27	22					
	1200	104	99	88	82	76	63	63	62	62	53	53	50	41	33	25	22	18					
	1000	91	87	78	72	67	56	56	55	55	44	44	42	34	27	21	18	15					
0043	1800	198	190	172	163	152	127	127	127	127	127	127	127	119	104	97	81	69					
	1500	174	167	152	143	134	112	112	112	112	112	112	112	105	92	86	67	58					
	1200	149	143	130	123	114	95	95	95	95	95	95	95	86	79	70	54	46					
	1000	131	126	114	108	100	80	80	80	80	80	80	80	71	69	59	45	38					
0053	1800	261	250	181	209	194	162	162	162	162	162	158	128	119	104	97	81	69					
	1500	230	220	160	184	171	143	143	143	143	143	139	113	105	92	86	67	58					
	1200	197	188	136	158	146	122	122	122	122	122	114	96	86	79	70	54	46					
	1000	173	165	120	139	129	106	106	106	106	106	95	85	71	69	59	45	38					
0063	1800	373	344	328	293	274	230	230	230	230	230	230	230	195	204	160	140	126					
	1500	329	303	288	258	241	203	203	203	203	203	203	203	163	173	133	123	105					
	1200	281	259	247	220	206	173	173	173	173	173	173	168	130	139	107	106	84					
	1000	247	228	217	194	181	145	145	145	145	145	145	140	108	114	89	90	70					
0073	1800	406	389	353	333	312	266	266	266	266	266	266	253	248	195	204	160	140					
	1500	357	343	311	293	275	234	234	234	234	234	234	222	212	163	173	133	123					
	1200	306	293	266	251	235	201	201	201	201	201	201	191	168	130	139	107	106					
	1000	269	258	234	221	207	177	177	177	177	177	177	168	140	108	114	89	90					
0083	1800	583	560	508	480	451	385	385	385	385	385	385	296	297	295	248	248	183					
	1500	513	493	447	423	397	339	339	339	339	339	339	259	261	261	219	219	161					
	1200	439	421	383	362	339	290	290	290	290	290	290	223	222	222	187	188	138					
	1000	386	371	337	318	299	255	255	255	255	255	255	196	196	196	165	165	122					
0093	1800	828	787	744	654	605	502	502	502	502	502	402	502	297	295	248	248	183					
	1500	729	693	655	575	532	442	442	442	442	442	352	442	261	261	219	219	161					
	1200	623	592	560	492	455	374	374	374	374	374	301	374	222	222	187	188	138					
	1000	549	521	493	433	395	312	312	312	312	312	266	312	196	196	165	165	122					
0103	1800	1051	1008	915	865	811	692	692	692	692	506	507	507	424	424	326	327	225					
	1500	925	887	805	761	714	609	609	609	609	447	445	447	375	374	288	288	199					
	1200	791	759	689	651	611	502	502	502	502	382	382	382	320	319	245	246	169					
	1000	696	668	606	573	524	418	418	418	418	335	335	336	282	282	216	216	149					
0113	1800	1218	1168	1060	1001	939	801	801	801	801	801	801	687	646	576	543	514	354					
	1500	1072	1028	933	881	826	705	705	705	705	705	705	604	569	508	478	452	311					
	1200	917	879	798	754	707	581	581	581	581	581	581	518	487	434	408	387	267					
	1000	807	774	702	663	608	485	485	485	485	485	485	455	428	382	360	341	235					
0123	1800	1530	1455	1295	1212	1120	931	931	931	931	931	931	931	918	704	704	514	354					
	1500	1346	1280	1140	1066	986	819	819	819	819	819	819	819	807	618	619	452	311					
	1200	1152	1095	975	912	844	701	701	701	701	701	701	701	692	529	529	387	267					
	1000	1014	964	858	803	743	617	617	617	617	617	617	617	608	465	466	341	235					
0133	1800	1552	1489	1352	1277	1198	1023	1023	1023	943	888	832	687	646	576	543	514	354					
	1500	1366	1310	1190	1124	1054	900	900	900	829	781	731	604	569	508	478	452	311					
	1200	1169	1121	1018	962	902	770	770	770	709	668	625	518	487	434	408	387	267					
	1000	1029	987	896	846	794	678	678	678	625	589	550	455	428	382	360	341	235					
0143	1800	2021	2021	1917	1808	1692	1434	1434	1401	1205	1198	1103	979	918	704	704	703	647					
	1500	1778	1778	1688	1592	1489	1213	1213	1213	1060	1056	970	862	807	618	619	618	570					
	1200	1522	1522	1444	1352	1230	971	971	971	907	902	830	736	692	529	529	530	487					
	1000	1339	1339	1226	1127	1025	809	809	809	797	794	730	648	608	465	466	466	429					
0153	1800	2021	2021	2021	2021	2021	1735	1735	1735	1580	1198	1103	979	918	704	704	703	647					
	1500	1778	1778	1778	1778	1778	1446	1446	1446	1389	1056	970	862	807	618	619	618	570					
	1200	1522	1522	1522	1522	1449	1156	1156	1156	1156	902	830	736	692	529	529	530	487					
	1000	1339	1339	1339	1323	1207	964	964	964	964	794	730	648	608	465	466	466	429					

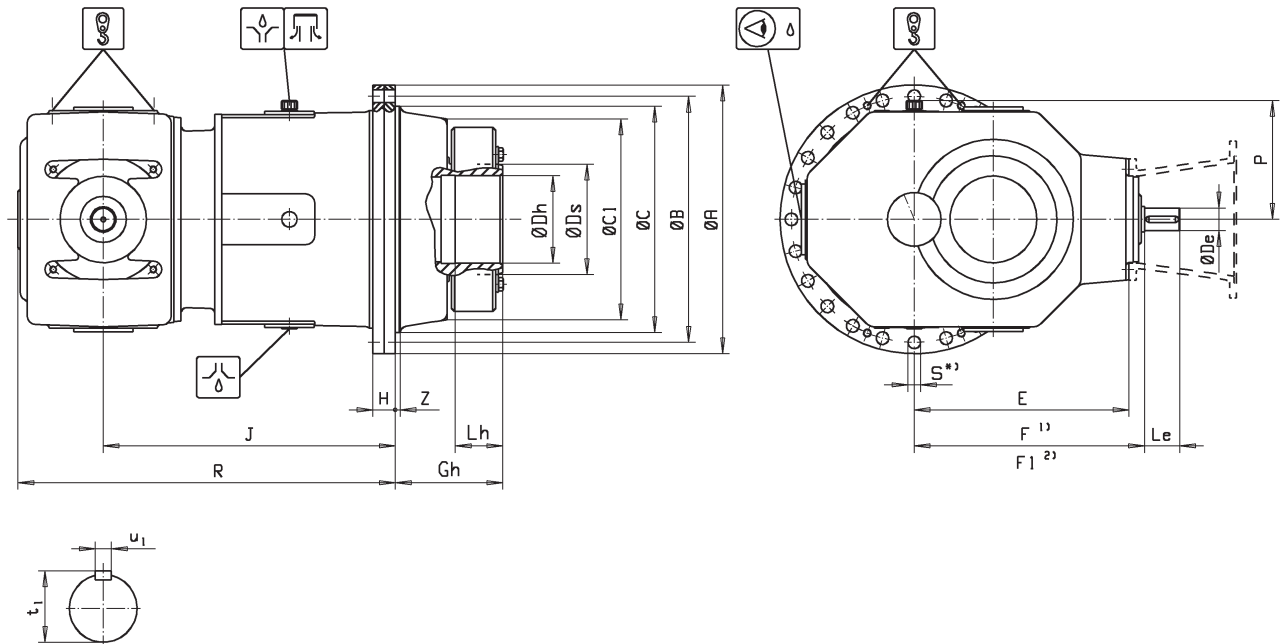
Power ratings: The ratings are nominal, application factor $K_A = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

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P4K...N...-212/VHN

Hollow Shaft, Flange



Size	Dimensions in mm															Weight Mass	Quantity of oil
	A	B	C	C1	E	F	Gh	H	J	R	S	Z	Dh	Lh	Ds	kg	l
0013	450	410	370f8	340	394	405	170	38	599	758	22	8	140H7	100	185	443	13
0023	500	460	410f8	373	504	515	180	44	678	875	22	8	150H7	100	200	691	23
0033	560	510	460f8	408	504	515	210	46	709	906	26	8	165H7	120	220	841	28
0043	620	560	480f8	453	504	515	255	60	725	922	33	8	190H7	120	240	1041	33
0053	650	590	530f8	490	639	650	275	60	790	1033	33	8	210H7	135	260	1381	56
0063	760	690	610f8	574	639	650	295	70	840	1083	39	8	240H7	160	300	1911	79
0073	840	770	690f8	633	639	650	320	80	887	1130	39	12	260H7	180	340	2421	89
0083	920	840	750f8	685	708	720	340	80	968	1236	45	12	290H7	185	360	3175	137
0093	950	870	800f8	710	796	810	380	80	1052	1349	45	12	310H7	190	390	3806	173
0103	1050	960	850f8	781	893	910	420	90	1112	1444	45	12	340H7	220	440	5002	233
0113	1100	1010	900f8	827	1006	1020	435	90	1202	1574	45	12	360H7	220	460	6126	306
0123	1150	1070	970f8	903	1006	1020	465	90	1255	1627	45	16	380H7	240	480	7116	351
0133	1210	1120	1010f8	937	1006	1020	460	100	1285	1657	45	16	420H7	240	500	7786	381
0143	1340	1250	1150f8	965	1135	1150	500	100	1372	1788	45	16	430H7	270	530	9228	459
0153	1410	1320	1200f8	1019	1135	1150	510	100	1397	1813	45	16	450H7	270	560	10468	519

1) F = Without cooling fan 2) F1 = with cooling fan

Size	Dimensions in mm							
	Nominal ratio iN ≤ 2500				Nominal ratio iN > 2500			
	De	Le	u1	t1	De	Le	u1	t1
0013	28k6	42	8h9	31	20k6	36	6h9	23
0023	28k6	42	8h9	31	20k6	36	6h9	23
0033	28k6	42	8h9	31	20k6	36	6h9	23
0043	35k6	58	10h9	38	25k6	42	8h9	28
0053	35k6	58	10h9	38	25k6	42	8h9	28
0063	45k6	82	14h9	49	35k6	58	10h9	38
0073	45k6	82	14h9	49	35k6	58	10h9	38
0083	45k6	82	14h9	49	35k6	58	10h9	38
0093	45k6	82	14h9	49	35k6	58	10h9	38
0103	45k6	82	14h9	49	35k6	58	10h9	38
0113	55m6	82	16h9	59	45k6	82	14h9	49
0123	55m6	82	16h9	59	45k6	82	14h9	49
0133	55m6	82	16h9	59	45k6	82	14h9	49
0143	65m6	105	18h9	69	55m6	82	16h9	59
0153	65m6	105	18h9	69	55m6	82	16h9	59

Thermal ratings P _{TN} in kW																	
Size																	
n ₁ [rpm]	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153		
Without cooling fan																	
1800	35	41	53	73	79	117	117	154	154	177	238	254	263	282	294		
1500	36	43	55	77	82	122	122	160	160	186	248	267	276	296	308		
1200	38	46	57	82	85	127	127	167	167	199	259	286	296	317	330		
1000	39	51	59	88	88	131	131	173	173	220	267	318	329	330	367		
With cooling fan																	
1800	70	82	106	146	158	234	234	308	308	354	476	508	526	564	588		
1500	72	86	110	154	164	244	244	320	320	372	496	534	552	592	616		
1200	76	92	114	164	170	254	254	334	334	398	518	572	592	634	660		
1000	78	102	118	176	176	262	262	346	346	440	534	636	658	660	734		

Notes: P_{TN}=nominal thermal rating relating to an ambient air temperature of + 20°C

P4K...N...-212/VHN

Hollow Shaft, Flange

Size	n ₁ rpm	Nominal mechanical power ratings P _{N1} in kW																					
		Nominal ratio i _N																					
		80	90	100	112	125	140	160	180	200	224	250	280	320	360	400	450	500	560	630	710	800	
0013	1800	-	76	72	68	64	54	54	43	43	35	35	35	54	49	38	32	27	On request				
	1500	-	67	64	60	56	46	46	38	38	29	29	30	46	41	32	27	22					
	1200	-	57	54	51	47	37	37	32	32	23	23	24	37	33	25	22	18					
	1000	-	50	47	43	39	31	31	28	26	20	20	20	31	27	21	18	15					
0023	1800	120	114	107	100	93	77	77	77	77	77	77	68	61	56	49	38	32					
	1500	106	101	94	88	82	68	68	68	68	68	66	60	50	49	41	32	27					
	1200	91	86	81	76	70	56	56	56	56	56	53	50	40	41	33	25	22					
	1000	80	76	71	65	59	47	47	47	47	47	44	42	34	34	27	21	18					
0033	1800	138	132	117	109	102	84	84	83	83	80	80	68	56	49	38	32	27					
	1500	121	116	103	96	89	74	74	73	73	66	66	60	49	41	32	27	22					
	1200	104	99	88	82	76	63	63	62	62	53	53	50	41	33	25	22	18					
	1000	91	87	78	72	67	56	56	55	55	44	44	42	34	27	21	18	15					
0043	1800	198	190	172	163	152	127	127	127	127	127	127	127	119	104	97	81	69					
	1500	174	167	152	143	134	112	112	112	112	112	112	112	105	92	86	67	58					
	1200	149	143	130	123	114	95	95	95	95	95	95	95	86	79	70	54	46					
	1000	131	126	114	108	100	80	80	80	80	80	80	80	71	69	59	45	38					
0053	1800	261	250	181	209	194	162	162	162	162	162	158	128	119	104	97	81	69					
	1500	230	220	160	184	171	143	143	143	143	143	139	113	105	92	86	67	58					
	1200	197	188	136	158	146	122	122	122	122	122	114	96	86	79	70	54	46					
	1000	173	165	120	139	129	106	106	106	106	106	95	85	71	69	59	45	38					
0063	1800	373	344	328	293	274	230	230	230	230	230	230	230	195	204	160	140	126					
	1500	329	303	288	258	241	203	203	203	203	203	203	203	163	173	133	123	105					
	1200	281	259	247	220	206	173	173	173	173	173	173	168	130	139	107	106	84					
	1000	247	228	217	194	181	145	145	145	145	145	145	140	108	114	89	90	70					
0073	1800	406	389	353	333	312	266	266	266	266	266	266	253	248	195	204	160	140					
	1500	357	343	311	293	275	234	234	234	234	234	234	222	212	163	173	133	123					
	1200	306	293	266	251	235	201	201	201	201	201	201	191	168	130	139	107	106					
	1000	269	258	234	221	207	177	177	177	177	177	177	168	140	108	114	89	90					
0083	1800	583	560	508	480	451	385	385	385	385	385	385	296	297	295	248	248	183					
	1500	513	493	447	423	397	339	339	339	339	339	339	259	261	261	219	219	161					
	1200	439	421	383	362	339	290	290	290	290	290	290	223	222	222	187	188	138					
	1000	386	371	337	318	299	255	255	255	255	255	255	196	196	196	165	165	122					
0093	1800	828	787	744	654	605	502	502	502	502	502	402	502	297	295	248	248	183					
	1500	729	693	655	575	532	442	442	442	442	442	352	442	261	261	219	219	161					
	1200	623	592	560	492	455	374	374	374	374	374	301	374	222	222	187	188	138					
	1000	549	521	493	433	395	312	312	312	312	312	266	312	196	196	165	165	122					
0103	1800	1051	1008	915	865	811	692	692	692	692	506	507	507	424	424	326	327	225					
	1500	925	887	805	761	714	609	609	609	609	447	445	447	375	374	288	288	199					
	1200	791	759	689	651	611	502	502	502	502	382	382	382	320	319	245	246	169					
	1000	696	668	606	573	524	418	418	418	418	335	335	336	282	282	216	216	149					
0113	1800	1218	1168	1060	1001	939	801	801	801	801	801	801	687	646	576	543	514	354					
	1500	1072	1028	933	881	826	705	705	705	705	705	705	604	569	508	478	452	311					
	1200	917	879	798	754	707	581	581	581	581	581	581	518	487	434	408	387	267					
	1000	807	774	702	663	608	485	485	485	485	485	485	455	428	382	360	341	235					
0123	1800	1530	1455	1295	1212	1120	931	931	931	931	931	931	931	918	704	704	514	354					
	1500	1346	1280	1140	1066	986	819	819	819	819	819	819	819	807	618	619	452	311					
	1200	1152	1095	975	912	844	701	701	701	701	701	701	701	692	529	529	387	267					
	1000	1014	964	858	803	743	617	617	617	617	617	617	617	608	465	466	341	235					
0133	1800	1552	1489	1352	1277	1198	1023	1023	1023	943	888	832	687	646	576	543	514	354					
	1500	1366	1310	1190	1124	1054	900	900	900	829	781	731	604	569	508	478	452	311					
	1200	1169	1121	1018	962	902	770	770	770	709	668	625	518	487	434	408	387	267					
	1000	1029	987	896	846	794	678	678	678	625	589	550	455	428	382	360	341	235					
0143	1800	2021	2021	1917	1808	1692	1434	1434	1401	1205	1198	1103	979	918	704	704	703	647					
	1500	1778	1778	1688	1592	1489	1213	1213	1213	1060	1056	970	862	807	618	619	618	570					
	1200	1522	1522	1444	1352	1230	971	971	971	907	902	830	736	692	529	529	530	487					
	1000	1339	1339	1226	1127	1025	809	809	809	797	794	730	648	608	465	466	466	429					
0153	1800	2021	2021	2021	2021	2021	1735	1735	1735	1580	1198	1103	979	918	704	704	703	647					
	1500	1778	1778	1778	1778	1778	1446	1446	1446	1389	1056	970	862	807	618	619	618	570					
	1200	1522	1522	1522	1522	1449	1156	1156	1156	1156	902	830	736	692	529	529	530	487					
	1000	1339	1339	1339	1323	1207	964	964	964	964	794	730	648	608	465	466	466	429					

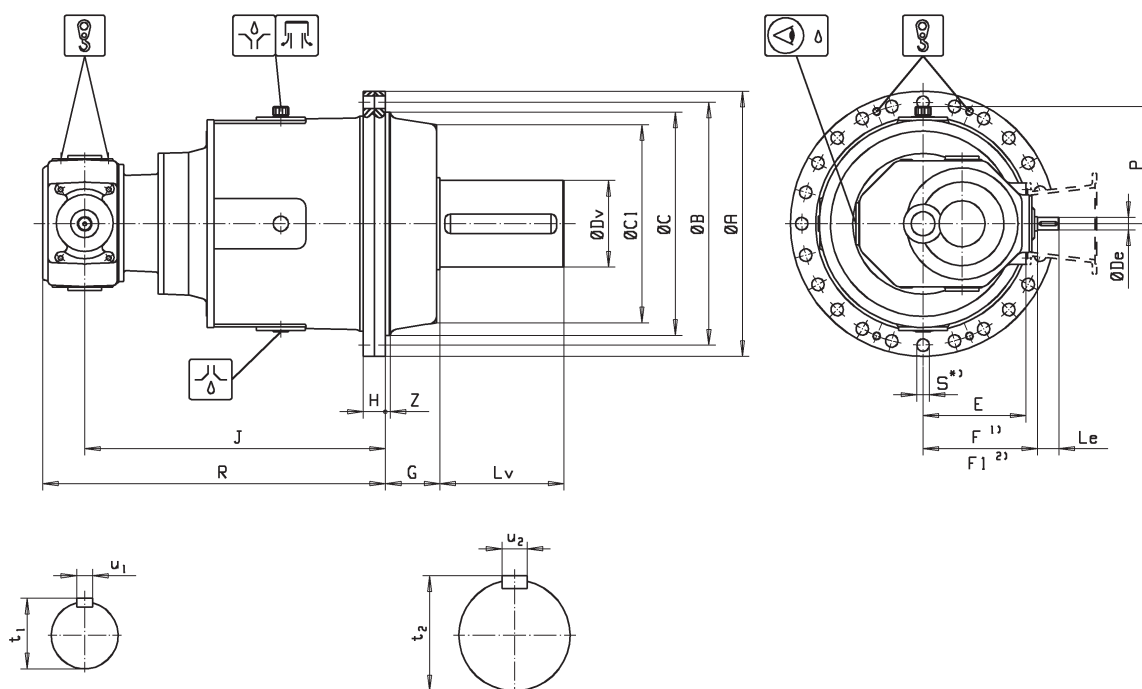
Power ratings: The ratings are nominal, application factor $K_A = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P5K...N...-212/VVN

Solid Shaft, Flange



Size	Dimensions in mm																Mass	Quantity of oil
	A	B	C	C1	E	F	G	H	J	R	S	Z	Dv	Lv	u2	t2	kg	l
0013	450	410	370f8	340	249	260	78	38	660	768	22	8	150m6	220	36h9	158	365	16
0023	500	460	410f8	373	249	260	85	44	695	803	22	8	160m6	250	40h9	169	485	21
0033	560	510	460f8	408	249	260	90	46	725	833	26	8	180m6	280	45h9	190	625	27
0043	620	560	480f8	453	311	322	130	60	814	942	33	8	200m6	350	45h9	210	880	40
0053	650	590	530f8	490	311	322	140	60	834	962	33	8	220m6	400	50h9	231	1010	45
0063	760	690	610f8	574	394	405	140	70	909	1067	39	8	250m6	400	56h9	262	1540	70
0073	840	770	690f8	633	394	405	145	80	973	1131	39	12	260m6	400	56h9	272	2050	85
0083	920	840	750f8	685	394	405	160	80	1028	1186	45	12	300m6	450	70h9	314	2650	120
0093	950	870	800f8	710	394	405	190	80	1078	1236	45	12	340m6	550	80h9	355	3050	135
0103	1050	960	850f8	781	394	405	195	90	1150	1308	45	12	360m6	600	80h9	375	4020	185
0113	1100	1010	900f8	827	504	515	210	90	1233	1431	45	12	380m6	650	80h9	395	4835	220
0123	1150	1070	970f8	903	504	515	220	90	1283	1481	45	16	420m6	650	90h9	437	5735	265
0133	1210	1120	1010f8	937	504	515	220	100	1328	1526	45	16	450m6	700	100h9	469	6395	310
0143	1340	1250	1150f8	965	631	642	230	100	1404	1647	45	16	480m6	750	100h9	499	7340	337
0153	1410	1320	1200f8	1019	631	642	235	100	1429	1672	45	16	500m6	800	100h9	519	8540	397

1) F = Without cooling fan 2) F1 = with cooling fan

Size	Dimensions in mm							
	Nominal ratio iN ≤ 2500				Nominal ratio iN > 2500			
	De	Le	u1	t1	De	Le	u1	t1
0013	28k6	42	8h9	31	20k6	36	6h9	23
0023	28k6	42	8h9	31	20k6	36	6h9	23
0033	28k6	42	8h9	31	20k6	36	6h9	23
0043	35k6	58	10h9	38	25k6	42	8h9	28
0053	35k6	58	10h9	38	25k6	42	8h9	28
0063	45k6	82	14h9	49	35k6	58	10h9	38
0073	45k6	82	14h9	49	35k6	58	10h9	38
0083	45k6	82	14h9	49	35k6	58	10h9	38
0093	45k6	82	14h9	49	35k6	58	10h9	38
0103	45k6	82	14h9	49	35k6	58	10h9	38
0113	55m6	82	16h9	59	45k6	82	14h9	49
0123	55m6	82	16h9	59	45k6	82	14h9	49
0133	55m6	82	16h9	59	45k6	82	14h9	49
0143	65m6	105	18h9	69	55m6	82	16h9	59
0153	65m6	105	18h9	69	55m6	82	16h9	59

Thermal ratings P _{TN} in kW															
Size															
n ₁ (rpm)	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153
Without cooling fan															
1800	24	24	24	24	35	35	35	53	53	53	79	79	79	79	117
1500	25	25	25	25	36	36	36	55	55	55	82	82	82	82	122
1200	26	26	26	26	38	38	38	57	57	57	85	85	85	85	127
1000	27	27	27	27	39	39	39	59	59	59	88	88	88	88	131
With cooling fan															
1800	48	48	48	48	70	70	70	106	106	106	158	158	158	158	234
1500	50	50	50	50	72	72	72	110	110	110	164	164	164	164	244
1200	52	52	52	52	76	76	76	114	114	114	170	170	170	170	254
1000	54	54	54	54	78	78	78	118	118	118	176	176	176	176	262

Notes: P_{TN}=nominal thermal rating relating to an ambient air temperature of + 20°C

P5K...N...-212/VVN

Solid Shaft, Flange

Size	n ₁ rpm	Nominal mechanical power ratings P _{N1} in kW										
		Nominal ratio i _N										
		900	1000	1120	1250	1400	1600	1800	2000	2240	2500	2800
0013	1800	10	10	10	10	10	10	10	8	8	5	6
	1500	8	8	8	8	8	8	8	7	7	4	5
	1200	6	6	6	6	6	6	6	6	5	4	4
	1000	5	5	5	5	5	5	5	5	4	3	3
0023	1800	14	14	14	14	14	14	13	8	8	5	6
	1500	12	12	12	12	12	12	11	7	7	4	5
	1200	10	10	10	10	10	10	9	6	5	4	4
	1000	8	8	8	8	8	8	7	5	4	3	3
0033	1800	17	17	17	17	17	16	13	8	8	15	6
	1500	14	14	14	14	14	14	11	7	7	13	5
	1200	11	11	11	11	11	11	9	6	5	10	4
	1000	10	10	10	10	10	9	7	5	4	9	3
0043	1800	24	24	20	21	17	16	13	21	16	15	13
	1500	20	20	18	18	14	14	11	17	13	13	11
	1200	16	16	15	14	11	11	9	14	11	10	9
	1000	13	13	13	12	10	9	7	12	9	9	7
0053	1800	33	33	33	33	33	33	27	21	16	15	13
	1500	28	28	28	28	28	28	22	17	13	13	11
	1200	22	22	22	22	22	22	18	14	11	10	9
	1000	18	18	18	18	18	18	15	12	9	9	7
0063	1800	44	44	43	43	35	35	27	21	44	38	32
	1500	37	37	37	37	29	30	22	17	37	32	27
	1200	29	29	29	29	23	24	18	14	29	25	22
	1000	25	25	25	25	20	20	15	12	25	21	18
0073	1800	58	54	43	43	35	35	27	56	49	38	32
	1500	49	48	38	38	29	30	22	49	41	32	27
	1200	39	39	32	32	23	24	18	39	33	25	22
	1000	32	32	28	26	20	20	15	32	27	21	18
0083	1800	82	82	82	82	80	68	61	56	49	38	32
	1500	68	68	68	68	66	60	50	49	41	32	27
	1200	55	55	55	55	53	50	40	41	33	25	22
	1000	45	45	45	45	44	42	34	34	27	21	18
0093	1800	100	103	83	83	80	68	61	56	49	38	32
	1500	88	89	73	73	66	60	50	49	41	32	27
	1200	71	71	62	62	53	50	40	41	33	25	22
	1000	59	59	55	55	44	42	34	34	27	21	18
0103	1800	127	127	83	83	80	68	61	56	49	81	32
	1500	106	106	73	73	66	60	50	49	41	67	27
	1200	85	85	62	62	53	50	40	41	33	54	22
	1000	71	71	55	55	44	42	34	34	27	45	18
0113	1800	151	151	151	151	151	128	119	104	97	81	69
	1500	126	126	126	126	126	113	105	92	86	67	58
	1200	100	100	100	100	100	96	86	79	70	54	46
	1000	84	84	84	84	84	84	71	69	59	45	38
0123	1800	181	186	171	170	158	128	119	104	97	81	69
	1500	160	164	150	150	139	113	105	92	86	67	58
	1200	133	133	129	128	114	96	86	79	70	54	46
	1000	111	111	111	111	95	85	71	69	59	45	38
0133	1800	181	186	171	170	158	128	119	104	97	81	69
	1500	160	164	150	150	139	113	105	92	86	67	58
	1200	136	140	129	128	114	96	86	79	70	54	46
	1000	117	117	113	113	95	85	71	69	59	45	38
0143	1800	249	249	171	170	158	128	119	104	97	160	140
	1500	208	208	150	150	139	113	105	92	86	133	123
	1200	166	166	129	128	114	96	86	79	70	107	106
	1000	139	139	113	113	95	85	71	69	59	89	90
0153	1800	297	297	297	297	297	253	248	195	204	160	140
	1500	248	248	248	248	248	222	212	163	173	133	123
	1200	198	198	198	198	198	191	168	130	139	107	106
	1000	165	165	165	165	165	165	140	108	114	89	90

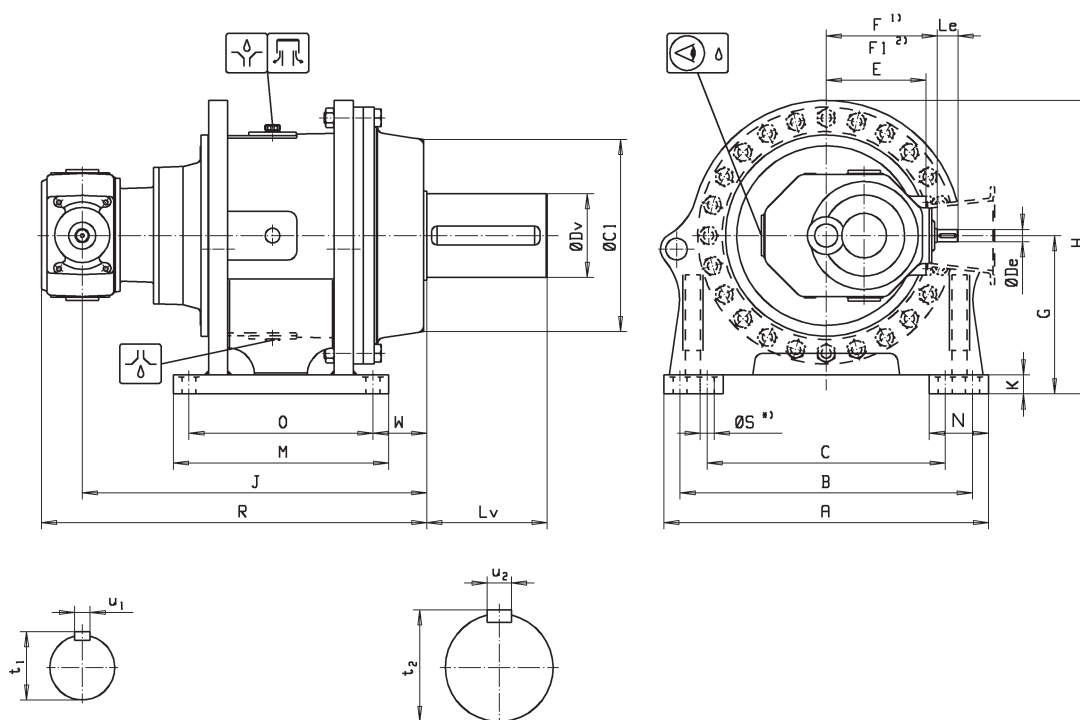
Power ratings: The ratings are nominal, application factor K_A = 1.0. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P5K...F...-212/VVN

Solid Shaft, Foot



Size	Dimensions in mm																				Weight Mass	Quantity of oil
	A	B	C	C1	E	F	G	H	J	K	M	N	O	R	S	W	Dv	Lv	u2	t2	kg	l
0013	560	510	410	340	249	260	283	525	660	30	380	100	330	768	22	85	150m6	220	36h9	158	455	16
0023	630	580	480	373	249	260	313	580	695	35	430	100	380	803	22	88	160m6	250	40h9	169	605	21
0033	700	640	540	408	249	260	343	640	725	35	460	110	400	833	26	99	180m6	280	45h9	190	785	27
0043	780	700	570	453	311	322	378	705	814	40	520	140	440	942	33	134	200m6	350	45h9	210	1130	37
0053	820	730	580	490	311	322	393	745	834	40	550	160	460	962	33	143	220m6	400	50h9	231	1290	45
0063	950	860	710	574	394	405	480	885	909	60	600	160	510	1067	39	147	250m6	400	56h9	262	1960	70
0073	1050	950	770	633	394	405	520	965	973	60	650	190	550	1131	39	160	260m6	400	56h9	272	2620	85
0083	1150	1050	870	685	394	405	570	1055	1028	70	720	190	620	1186	45	168	300m6	450	70h9	314	3345	120
0093	1200	1080	880	710	394	405	585	1085	1078	70	800	220	680	1236	45	194	340m6	550	80h9	355	3830	135
0103	1300	1180	980	781	394	405	645	1195	1150	80	830	220	710	1308	45	201	360m6	600	80h9	375	4020	185
0113	1380	1240	1000	827	504	515	680	1255	1233	80	890	260	750	1431	45	220	380m6	650	80h9	395	5985	220
0123	1430	1290	1050	903	504	515	715	1315	1283	90	950	260	810	1481	45	226	420m6	650	90h9	437	6975	265
0133	1500	1340	1070	937	504	515	755	1395	1328	90	1020	290	860	1526	45	221	450m6	700	100h9	469	7915	310
0143	1620	1460	1190	965	631	642	830	1535	1404	100	1050	290	890	1647	45	236	480m6	750	100h9	499	8920	337
0153	1690	1500	1200	1019	631	642	865	1605	1429	100	1150	340	960	1672	45	218	500m6	800	100h9	519	10340	397

1) F = Without cooling fan 2) F1 = with cooling fan

Size	Dimensions in mm							
	Nominal ratio iN ≤ 2500				Nominal ratio iN > 2500			
	De	Le	u1	t1	De	Le	u1	t1
0013	28k6	42	8h9	31	20k6	36	6h9	23
0023	28k6	42	8h9	31	20k6	36	6h9	23
0033	28k6	42	8h9	31	20k6	36	6h9	23
0043	35k6	58	10h9	38	25k6	42	8h9	28
0053	35k6	58	10h9	38	25k6	42	8h9	28
0063	45k6	82	14h9	49	35k6	58	10h9	38
0073	45k6	82	14h9	49	35k6	58	10h9	38
0083	45k6	82	14h9	49	35k6	58	10h9	38
0093	45k6	82	14h9	49	35k6	58	10h9	38
0103	45k6	82	14h9	49	35k6	58	10h9	38
0113	55m6	82	16h9	59	45k6	82	14h9	49
0123	55m6	82	16h9	59	45k6	82	14h9	49
0133	55m6	82	16h9	59	45k6	82	14h9	49
0143	65m6	105	18h9	69	55m6	82	16h9	59
0153	65m6	105	18h9	69	55m6	82	16h9	59

Thermal ratings P _{TN} in kW															
Size															
n ₁ [rpm]	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153
Without cooling fan															
1800	24	24	24	24	35	35	35	53	53	53	79	79	79	79	117
1500	25	25	25	25	36	36	36	55	55	55	82	82	82	82	122
1200	26	26	26	26	38	38	38	57	57	57	85	85	85	85	127
1000	27	27	27	27	39	39	39	59	59	59	88	88	88	88	131
With cooling fan															
1800	48	48	48	48	70	70	70	106	106	106	158	158	158	158	234
1500	50	50	50	50	72	72	72	110	110	110	164	164	164	164	244
1200	52	52	52	52	76	76	76	114	114	114	170	170	170	170	254
1000	54	54	54	54	78	78	78	118	118	118	176	176	176	176	262

Notes: P_{TN}=nominal thermal rating relating to an ambient air temperature of + 20°C

P5K...F...-212/VVN

Solid Shaft, Foot

Size	n ₁ rpm	Nominal mechanical power ratings P _{N1} in kW										
		Nominal ratio i _N										
		900	1000	1120	1250	1400	1600	1800	2000	2240	2500	2800
0013	1800	10	10	10	10	10	10	10	8	8	5	6
	1500	8	8	8	8	8	8	8	7	7	4	5
	1200	6	6	6	6	6	6	6	6	5	4	4
	1000	5	5	5	5	5	5	5	5	4	3	3
0023	1800	14	14	14	14	14	14	13	8	8	5	6
	1500	12	12	12	12	12	12	11	7	7	4	5
	1200	10	10	10	10	10	10	9	6	5	4	4
	1000	8	8	8	8	8	8	7	5	4	3	3
0033	1800	17	17	17	17	17	16	13	8	8	15	6
	1500	14	14	14	14	14	14	11	7	7	13	5
	1200	11	11	11	11	11	11	9	6	5	10	4
	1000	10	10	10	10	10	9	7	5	4	9	3
0043	1800	24	24	20	21	17	16	13	21	16	15	13
	1500	20	20	18	18	14	14	11	17	13	13	11
	1200	16	16	15	14	11	11	9	14	11	10	9
	1000	13	13	13	12	10	9	7	12	9	9	7
0053	1800	33	33	33	33	33	33	27	21	16	15	13
	1500	28	28	28	28	28	28	22	17	13	13	11
	1200	22	22	22	22	22	22	18	14	11	10	9
	1000	18	18	18	18	18	18	15	12	9	9	7
0063	1800	44	44	43	43	35	35	27	21	44	38	32
	1500	37	37	37	37	29	30	22	17	37	32	27
	1200	29	29	29	29	23	24	18	14	29	25	22
	1000	25	25	25	25	20	20	15	12	25	21	18
0073	1800	58	54	43	43	35	35	27	56	49	38	32
	1500	49	48	38	38	29	30	22	49	41	32	27
	1200	39	39	32	32	23	24	18	39	33	25	22
	1000	32	32	28	26	20	20	15	32	27	21	18
0083	1800	82	82	82	82	80	68	61	56	49	38	32
	1500	68	68	68	68	66	60	50	49	41	32	27
	1200	55	55	55	55	53	50	40	41	33	25	22
	1000	45	45	45	45	44	42	34	34	27	21	18
0093	1800	100	103	83	83	80	68	61	56	49	38	32
	1500	88	89	73	73	66	60	50	49	41	32	27
	1200	71	71	62	62	53	50	40	41	33	25	22
	1000	59	59	55	55	44	42	34	34	27	21	18
0103	1800	127	127	83	83	80	68	61	56	49	81	32
	1500	106	106	73	73	66	60	50	49	41	67	27
	1200	85	85	62	62	53	50	40	41	33	54	22
	1000	71	71	55	55	44	42	34	34	27	45	18
0113	1800	151	151	151	151	151	128	119	104	97	81	69
	1500	126	126	126	126	126	113	105	92	86	67	58
	1200	100	100	100	100	100	96	86	79	70	54	46
	1000	84	84	84	84	84	84	71	69	59	45	38
0123	1800	181	186	171	170	158	128	119	104	97	81	69
	1500	160	164	150	150	139	113	105	92	86	67	58
	1200	133	133	129	128	114	96	86	79	70	54	46
	1000	111	111	111	111	95	85	71	69	59	45	38
0133	1800	181	186	171	170	158	128	119	104	97	81	69
	1500	160	164	150	150	139	113	105	92	86	67	58
	1200	136	140	129	128	114	96	86	79	70	54	46
	1000	117	117	113	113	95	85	71	69	59	45	38
0143	1800	249	249	171	170	158	128	119	104	97	160	140
	1500	208	208	150	150	139	113	105	92	86	133	123
	1200	166	166	129	128	114	96	86	79	70	107	106
	1000	139	139	113	113	95	85	71	69	59	89	90
0153	1800	297	297	297	297	297	253	248	195	204	160	140
	1500	248	248	248	248	248	222	212	163	173	133	123
	1200	198	198	198	198	198	191	168	130	139	107	106
	1000	165	165	165	165	165	165	140	108	114	89	90

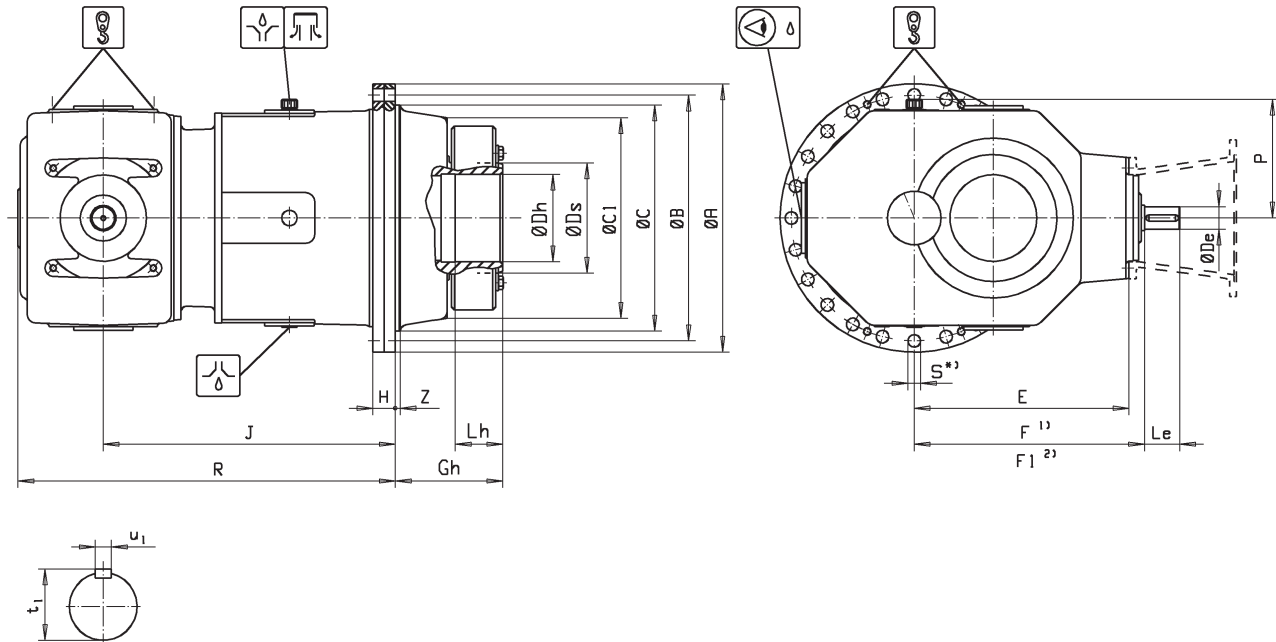
Power ratings: The ratings are nominal, application factor $K_A = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

P5K...N...-212/VHN

Hollow Shaft, Flange



Size	Dimensions in mm															Weight Mass	Quantity of oil
	A	B	C	C1	E	F	Gh	H	J	R	S	Z	Dh	Lh	Ds	kg	l
0013	450	410	370f8	340	249	260	170	38	660	768	22	8	140H7	100	185	395	16
0023	500	460	410f8	373	249	260	180	44	695	803	22	8	150H7	100	200	525	21
0033	560	510	460f8	408	249	260	210	46	725	833	26	8	165H7	120	220	675	27
0043	620	560	480f8	453	311	322	255	60	814	942	33	8	190H7	120	240	940	40
0053	650	590	530f8	490	311	322	275	60	834	962	33	8	210H7	135	260	1090	45
0063	760	690	610f8	574	394	405	295	70	909	1067	39	8	240H7	160	300	1660	70
0073	840	770	690f8	633	394	405	320	80	973	1131	39	12	260H7	180	340	2230	85
0083	920	840	750f8	685	394	405	340	80	1028	1186	45	12	290H7	185	360	2850	120
0093	950	870	800f8	710	394	405	380	80	1078	1236	45	12	310H7	190	390	3290	135
0103	1050	960	850f8	781	394	405	420	90	1150	1308	45	12	340H7	220	440	4390	185
0113	1100	1010	900f8	827	504	515	435	90	1233	1431	45	12	360H7	220	460	5265	220
0123	1150	1070	970f8	903	504	515	465	90	1283	1481	45	16	380H7	240	480	6255	265
0133	1210	1120	1010f8	937	504	515	460	100	1328	1526	45	16	420H7	240	500	6985	310
0143	1340	1250	1150f8	965	631	642	500	100	1404	1647	45	16	430H7	270	530	8080	337
0153	1410	1320	1200f8	1019	631	642	510	100	1429	1672	45	16	450H7	270	560	9320	397

1) F = Without cooling fan 2) F1 = with cooling fan

Size	Dimensions in mm							
	Nominal ratio iN ≤ 2500				Nominal ratio iN > 2500			
	De	Le	u1	t1	De	Le	u1	t1
0013	28k6	42	8h9	31	20k6	36	6h9	23
0023	28k6	42	8h9	31	20k6	36	6h9	23
0033	28k6	42	8h9	31	20k6	36	6h9	23
0043	35k6	58	10h9	38	25k6	42	8h9	28
0053	35k6	58	10h9	38	25k6	42	8h9	28
0063	45k6	82	14h9	49	35k6	58	10h9	38
0073	45k6	82	14h9	49	35k6	58	10h9	38
0083	45k6	82	14h9	49	35k6	58	10h9	38
0093	45k6	82	14h9	49	35k6	58	10h9	38
0103	45k6	82	14h9	49	35k6	58	10h9	38
0113	55m6	82	16h9	59	45k6	82	14h9	49
0123	55m6	82	16h9	59	45k6	82	14h9	49
0133	55m6	82	16h9	59	45k6	82	14h9	49
0143	65m6	105	18h9	69	55m6	82	16h9	59
0153	65m6	105	18h9	69	55m6	82	16h9	59

Thermal ratings P _{TN} in kW															
Size															
n ₁ [rpm]	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153
Without cooling fan															
1800	24	24	24	24	35	35	35	53	53	53	79	79	79	79	117
1500	25	25	25	25	36	36	36	55	55	55	82	82	82	82	122
1200	26	26	26	26	38	38	38	57	57	57	85	85	85	85	127
1000	27	27	27	27	39	39	39	59	59	59	88	88	88	88	131
With cooling fan															
1800	48	48	48	48	70	70	70	106	106	106	158	158	158	158	234
1500	50	50	50	50	72	72	72	110	110	110	164	164	164	164	244
1200	52	52	52	52	76	76	76	114	114	114	170	170	170	170	254
1000	54	54	54	54	78	78	78	118	118	118	176	176	176	176	262

Notes: P_{TN}=nominal thermal rating relating to an ambient air temperature of + 20°C

P5K...N...-212/VHN

Hollow Shaft, Flange

Size	n ₁ rpm	Nominal mechanical power ratings P _{N1} in kW										
		Nominal ratio i _N										
		900	1000	1120	1250	1400	1600	1800	2000	2240	2500	2800
0013	1800	10	10	10	10	10	10	10	8	8	5	6
	1500	8	8	8	8	8	8	8	7	7	4	5
	1200	6	6	6	6	6	6	6	6	5	4	4
	1000	5	5	5	5	5	5	5	5	4	3	3
0023	1800	14	14	14	14	14	14	13	8	8	5	6
	1500	12	12	12	12	12	12	11	7	7	4	5
	1200	10	10	10	10	10	10	9	6	5	4	4
	1000	8	8	8	8	8	8	7	5	4	3	3
0033	1800	17	17	17	17	17	16	13	8	8	15	6
	1500	14	14	14	14	14	14	11	7	7	13	5
	1200	11	11	11	11	11	11	9	6	5	10	4
	1000	10	10	10	10	10	9	7	5	4	9	3
0043	1800	24	24	20	21	17	16	13	21	16	15	13
	1500	20	20	18	18	14	14	11	17	13	13	11
	1200	16	16	15	14	11	11	9	14	11	10	9
	1000	13	13	13	12	10	9	7	12	9	9	7
0053	1800	33	33	33	33	33	33	27	21	16	15	13
	1500	28	28	28	28	28	28	22	17	13	13	11
	1200	22	22	22	22	22	22	18	14	11	10	9
	1000	18	18	18	18	18	18	15	12	9	9	7
0063	1800	44	44	43	43	35	35	27	21	44	38	32
	1500	37	37	37	37	29	30	22	17	37	32	27
	1200	29	29	29	29	23	24	18	14	29	25	22
	1000	25	25	25	25	20	20	15	12	25	21	18
0073	1800	58	54	43	43	35	35	27	56	49	38	32
	1500	49	48	38	38	29	30	22	49	41	32	27
	1200	39	39	32	32	23	24	18	39	33	25	22
	1000	32	32	28	26	20	20	15	32	27	21	18
0083	1800	82	82	82	82	80	68	61	56	49	38	32
	1500	68	68	68	68	66	60	50	49	41	32	27
	1200	55	55	55	55	53	50	40	41	33	25	22
	1000	45	45	45	45	44	42	34	34	27	21	18
0093	1800	100	103	83	83	80	68	61	56	49	38	32
	1500	88	89	73	73	66	60	50	49	41	32	27
	1200	71	71	62	62	53	50	40	41	33	25	22
	1000	59	59	55	55	44	42	34	34	27	21	18
0103	1800	127	127	83	83	80	68	61	56	49	81	32
	1500	106	106	73	73	66	60	50	49	41	67	27
	1200	85	85	62	62	53	50	40	41	33	54	22
	1000	71	71	55	55	44	42	34	34	27	45	18
0113	1800	151	151	151	151	151	128	119	104	97	81	69
	1500	126	126	126	126	126	113	105	92	86	67	58
	1200	100	100	100	100	100	96	86	79	70	54	46
	1000	84	84	84	84	84	84	71	69	59	45	38
0123	1800	181	186	171	170	158	128	119	104	97	81	69
	1500	160	164	150	150	139	113	105	92	86	67	58
	1200	133	133	129	128	114	96	86	79	70	54	46
	1000	111	111	111	111	95	85	71	69	59	45	38
0133	1800	181	186	171	170	158	128	119	104	97	81	69
	1500	160	164	150	150	139	113	105	92	86	67	58
	1200	136	140	129	128	114	96	86	79	70	54	46
	1000	117	117	113	113	95	85	71	69	59	45	38
0143	1800	249	249	171	170	158	128	119	104	97	160	140
	1500	208	208	150	150	139	113	105	92	86	133	123
	1200	166	166	129	128	114	96	86	79	70	107	106
	1000	139	139	113	113	95	85	71	69	59	89	90
0153	1800	297	297	297	297	297	253	248	195	204	160	140
	1500	248	248	248	248	248	222	212	163	173	133	123
	1200	198	198	198	198	198	191	168	130	139	107	106
	1000	165	165	165	165	165	165	140	108	114	89	90

Power ratings: The ratings are nominal, application factor $K_A = 1.0$. Selection of gear unit: see selection procedure

Lubrication: Bath lubrication is used, except in cases where additional water cooling is needed

Cooling: Artificial cooling is required if the mechanical power actually transmitted is higher than the thermal rating

Keyways / Centre Holes

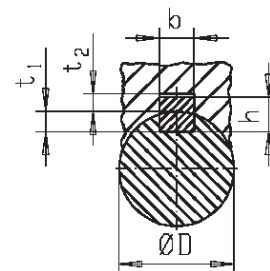
Shaft diameter from - to	Keys Type B			Keyways with tolerance			
	b	h	t ₁	b	t ₁		
17 - 22	6	6	3.5	6	2.8	+0.1	
22 - 30	8	7	4.0	8	3.3		
30 - 38	10	8	5.0	10	3.3		
38 - 44	12	8	5.0	12	3.3		
44 - 50	14	9	5.5	14	3.8		
50 - 58	16	10	6.0	16	4.3		
58 - 65	18	11	7.0	18	4.4		
65 - 75	20	12	7.5	20	4.9		
75 - 85	22	14	9.0	22	5.4		
85 - 95	25	14	9.0	25	5.4		
95 - 110	28	16	10.0	28	6.4		
110 - 130	32	18	11.0	32	7.4		
130 - 150	36	20	12.0	36	8.4		
150 - 170	40	22	13.0	40	9.4		
170 - 200	45	25	15.0	45	10.4		
200 - 230	50	28	17.0	50	11.4		
230 - 260	56	32	20.0	56	12.4		
260 - 290	63	32	20.0	63	12.4		
290 - 330	70	36	22.0	70	14.4		
330 - 380	80	40	25	80	15.4		
380 - 440	90	45	25.0	90	17.4		
440 - 500	100	50	31.0	100	19.5		

Dimensions only valid for coaxial design

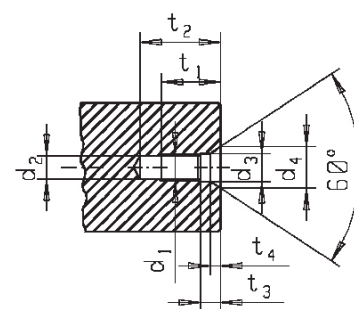
Shaft diameter from - to	Centre hole Type D							
	d1	d2	d3	d4	t1	t2	t3	t4
16 - 21	M6	5.0	6.4	10.0	16	21	5.0	2.8
21 - 24	M8	6.8	8.4	12.5	19	25	6.0	3.3
24 - 30	M10	8.5	10.5	15.5	22	30	7.5	3.8
30 - 38	M12	10.2	13.0	18.5	28	37	9.5	4.4
38 - 50	M16	14.0	17.0	24.0	36	45	12.0	5.2
50 - 85	M20	17.5	21.0	30.0	42	53	15.0	6.4
85 - 130	M24	21.0	25.0	36.0	50	63	18.0	8.0
130 - 180	M30	26.5	31.0	44.0	60	75	21.0	9.5
	Type B							
	d1	d2	d3	a1	a2	a3	b	t
180 - 225	6.3	13.2	18	120°	60°	120°	1.4	12.9
225 - 450	10.0	21.2	28	120°	60°	120°	2.0	20.4

$$H_{Fan} = H + F1 - F$$

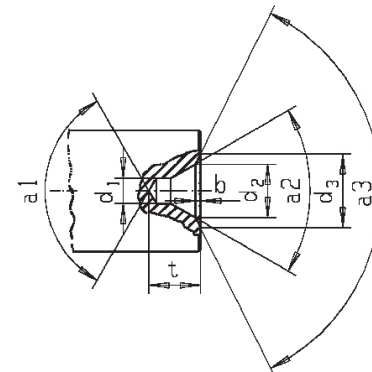
Type B



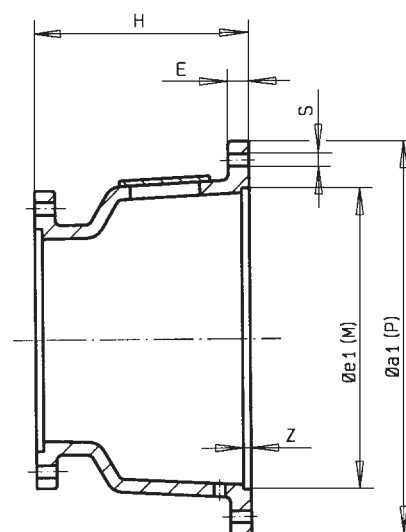
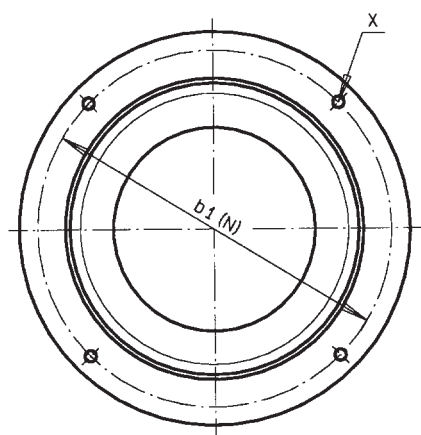
Type D



Type B

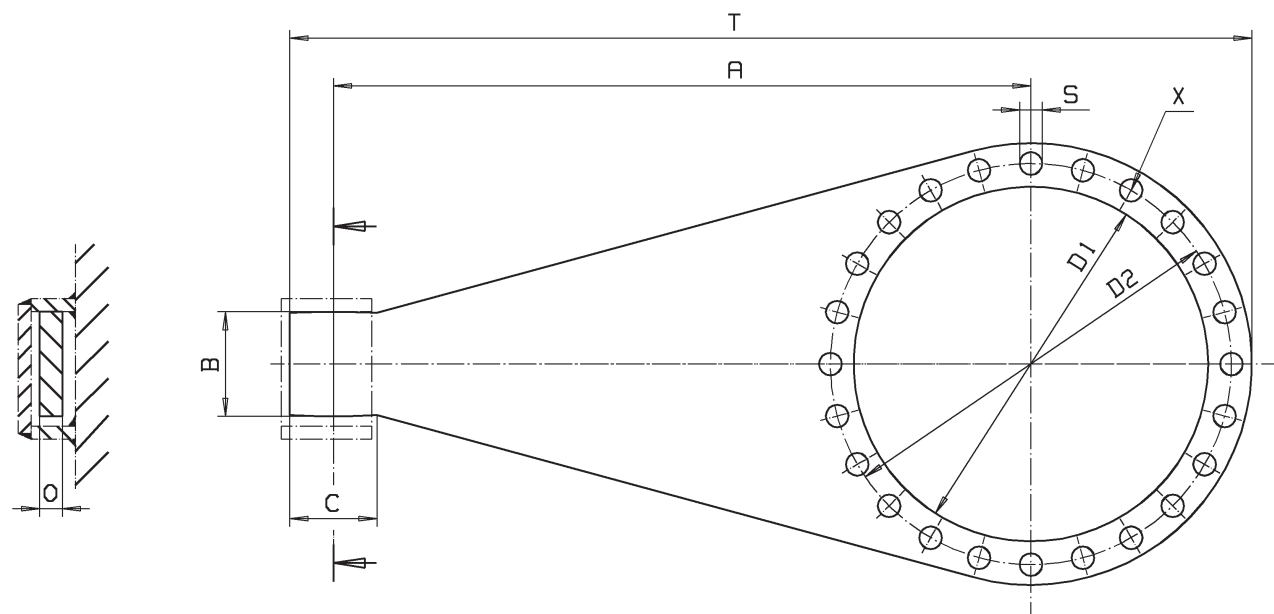


Motor Adapters



Motor size	Dimension in mm								Length of Input Shaft																					
	DIN a1 ISO P	DIN b1 ISO N	DIN e1 ISO M	E	Z	S	X		25	28	30	42	58	82	105	110	120	130	140	150	160	165	180	200	220					
80	200	165	130	15	5	M 10	4 x 90°	78	81	89	95																			
90S								88	91	99	105	121																		
90L								88	91	99	105	121																		
100L										110	116	132	206																	
112M	250	215	180	6	M 12					110	116	132	206																	
132S										136	152	226	249																	
132M										136	152	226	249																	
160M											183	257	280	285	295															
160L	350	300	250	25							183	257	280	285	295															
180M											183	257	280	285	295															
180L												183	257	280	285	295														
200L												183	257	280	285	295														
225S-4/8	450	400	350	28	7	M 16							287	310	315	325	335	345	355	385	390	405	425	448						
225M-2													257	280	285	295	305	315	325	355	360	375	395	418						
225M-4-8													287	310	315	325	335	345	355	385	390	405	425	448						
250M													287	310	315	325	335	345	355	385	390	405	425	448						
280S	550	500	450									287	310	315	325	335	345	355	385	390	405	425	448							
280M												287	310	315	325	335	345	355	385	390	405	425	448							
315S-2												287	310	315	325	335	345	355	385	390	405	425	448							
315S-4-8												317	340	345	355	365	375	385	415	420	435	455	478							
315M-2	660	600	550	32	8	M 20						287	310	315	325	335	345	355	385	390	405	425	448							
315M-4-8												317	340	345	355	365	375	385	415	420	435	455	478							
315L-2												287	310	315	325	335	345	355	385	390	405	425	448							
315L-4-8												317	340	345	355	365	375	385	415	420	435	455	478							
355L-2	800	740	680									287	310	315	325	335	345	355	385	390	405	425	448							
355L-4-8												317	340	345	355	365	375	385	415	420	435	455	478							
400L-2												317	340	345	355	365	375	385	415	420	435	455	478							
400L-4-8												357	380	385	395	405	415	425	455	460	475	495	518							
450-2	1000	940	880	40								317	340	345	355	365	375	385	415	420	435	455	478							
450-4-8												357	380	385	395	405	415	425	455	460	475	495	518							

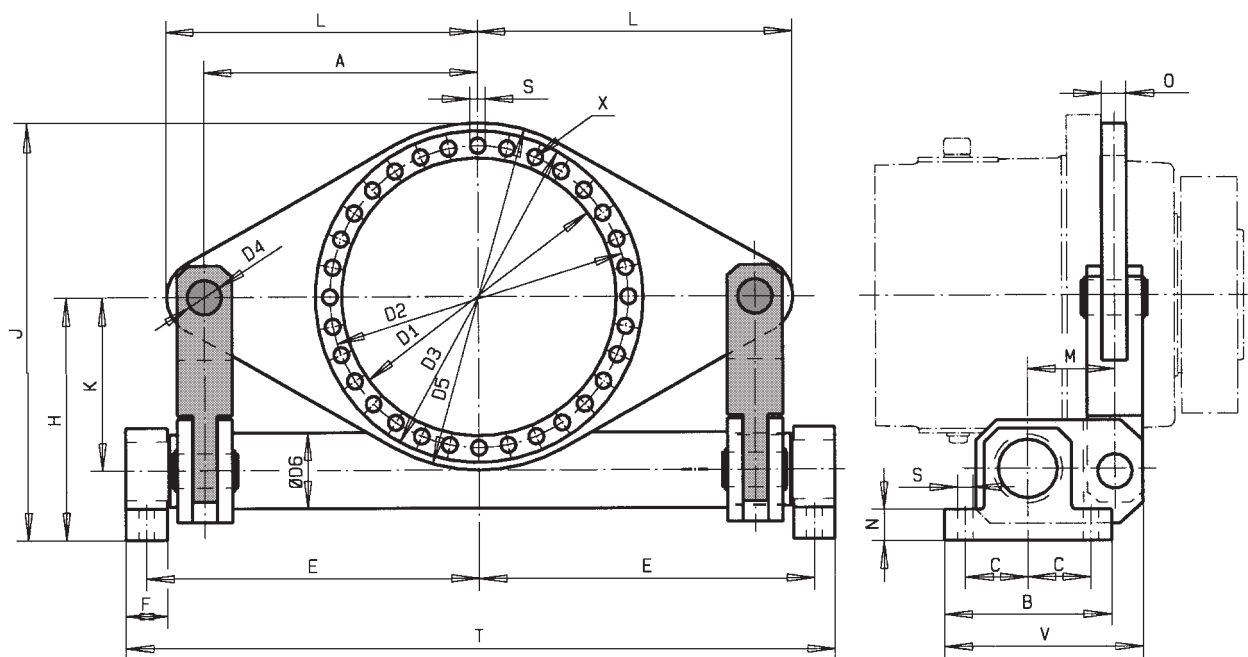
Torque Arm Single Side



Size	Dimensions in mm									Quantity screws
	A	B	C	D1	D2	D5	O	S	T	X
0013	600	70	60	375	410	450	30	22	855	20
0023	670	90	70	415	460	500	35	22	955	24
0033	750	110	90	465	510	560	35	26	1075	20
0043	900	150	120	485	560	620	40	33	1270	20
0053	1000	160	130	535	590	650	40	33	1390	24
0063	1200	180	150	615	690	760	60	39	1655	24
0073	1400	200	170	695	770	840	60	39	1955	24
0083	1600	230	200	755	840	920	70	45	2160	24
0093	1900	260	230	805	870	950	70	45	2490	24
0103	2200	290	260	855	960	1050	80	45	2855	24

Note: Other sizes on request Details of screws on Page 58

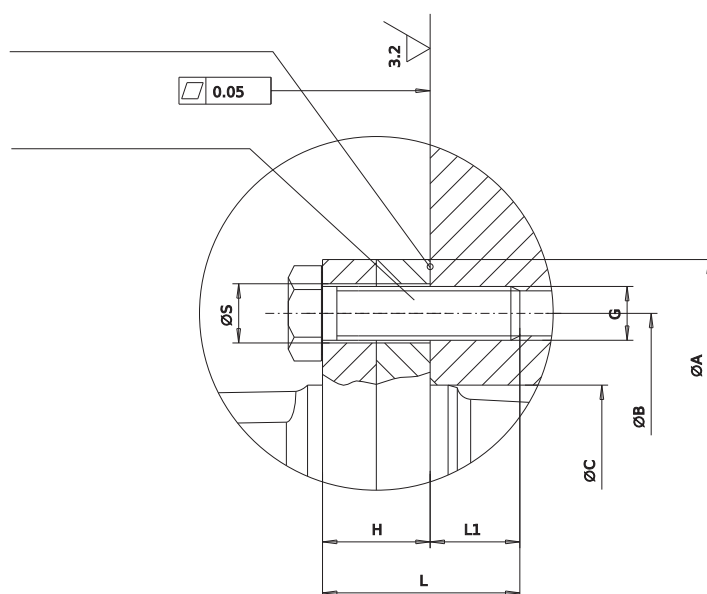
Torque Arm Double Side



Size	Dimensions in mm																				Quantity screws	
	A	B	C	D1	D2	D3	D4	D5	D6	E	F	H	J	K	L	M	N	O	S	T	V	X
0063	500	500	190	610	690	770	90	810	200	370	110	640	1045	460	595	240	70	60	39	1140	560	24
0073	600	500	190	690	770	850	90	890	200	470	110	640	1085	460	695	240	70	60	39	1340	560	24
0083	700	520	200	750	840	930	100	970	220	555	120	71	1195	520	810	260	80	70	45	1560	600	24
0093	800	520	200	800	870	960	100	1000	220	655	120	710	1210	520	910	260	80	70	45	1760	600	24
0103	800	550	215	850	960	1060	110	1100	240	645	120	830	1380	590	925	280	90	80	45	1780	645	24
0113	900	550	215	900	1010	1110	110	1150	240	745	120	830	1405	590	1025	280	90	80	45	1980	645	24
0123	1000	580	230	970	1070	1160	120	1200	260	835	120	910	1510	650	1135	320	100	90	45	2200	710	32
0133	1000	580	230	1010	1120	1220	120	1280	260	835	120	910	1550	650	1135	320	100	90	45	2200	710	32
0143	1000	590	235	1150	1250	1350	130	1410	280	825	120	1010	1715	750	1150	360	100	100	45	2220	765	32
0153	1150	590	235	1200	1320	1420	130	1480	280	975	120	1010	1750	750	1300	360	100	100	45	2520	765	36

Note: Other sizes on request Details of screws on Page 58

Flange & Foot Mounting Screws



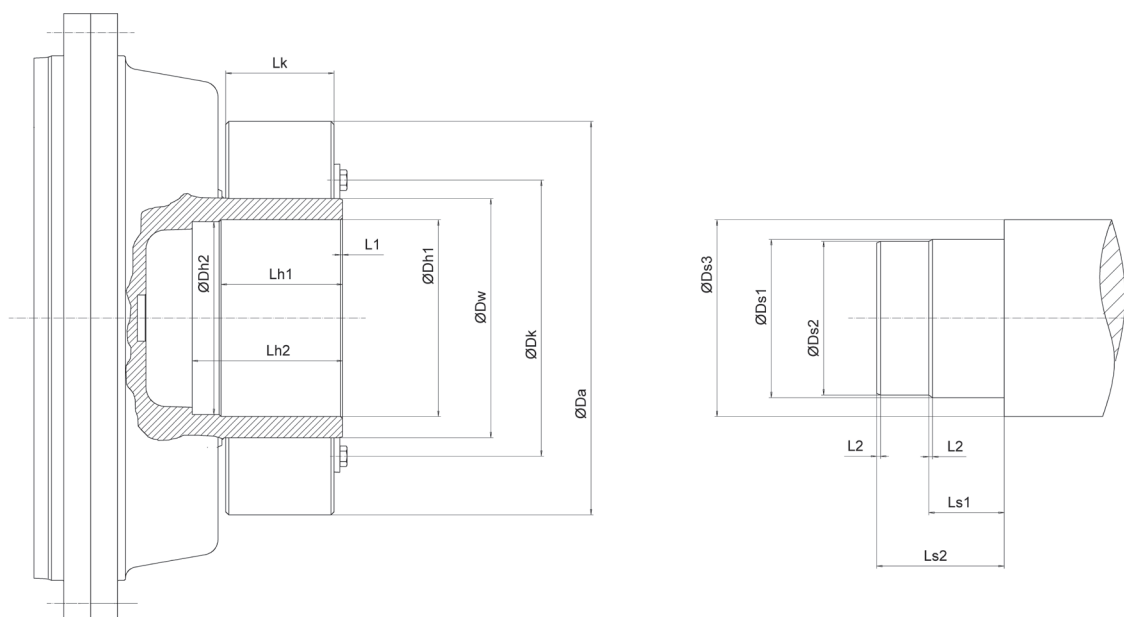
Flange Mounting Screws

Size	Screw	Thread	Quantity	Strength	Tightening torque	Dimensions in mm						
	DIN					S	H	L	L1	A	B	C f8
0013	912/931	M20	20	10.9	590	22	38	74	36	450	410	370
0023	912/931	M20	24	10.9	590	22	50	86	36	500	460	410
0033	912/931	M24	20	10.9	1020	26	46	86	40	560	510	460
0043	912/931	M30	20	10.9	2030	33	60	110	50	640	580	490
0053	912/931	M30	24	10.9	2030	33	60	110	50	650	590	530
0063	912/931	M36	24	10.9	3555	39	70	130	60	760	690	610
0073	912/931	M36	24	10.9	3555	39	80	140	60	840	770	690
0083	912/931	M42	24	10.9	5696	45	80	150	70	920	840	750
0093	912/931	M42	24	10.9	5696	45	80	150	70	950	870	800
0103	912/931	M42	24	10.9	5696	45	90	160	70	1050	960	850
0113	912/931	M42	24	10.9	5696	45	90	160	70	1100	1010	900
0123	912/931	M42	32	10.9	5696	45	90	170	80	1150	1070	970
0133	912/931	M42	32	10.9	5696	45	100	180	80	1210	1120	1010
0143	912/931	M42	32	10.9	5696	45	100	180	80	1340	1250	1150
0153	912/931	M42	36	10.9	5696	45	100	180	80	1410	1320	1200

Foot Mounting Screws

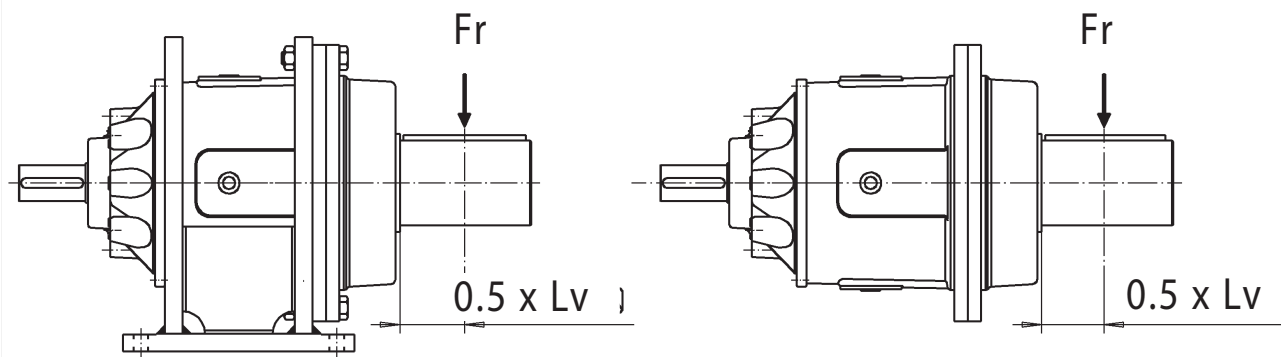
Size	Screw	Thread	Quantity	Strength	Tightening torque
	DIN				Nm ±20%
0013	912/931	M20	8	8.8	310
0023	912/931	M20	8	8.8	310
0033	912/931	M24	8	8.8	540
0043	912/931	M30	8	8.8	1100
0053	912/931	M36	8	8.8	1830
0063	912/931	M36	8	8.8	1830
0073	912/931	M42	8	8.8	3200
0083	912/931	M42	8	8.8	3200
0093	912/931	M48	8	8.8	4600
0103	912/931	M48	8	8.8	4600
0113	912/931	M56	8	8.8	7400
0123	912/931	M56	8	8.8	7400
0133	912/931	M64	8	8.8	10500
0143	912/931	M64	8	8.8	10500
0153	912/931	M72	8	8.8	14000

Shrink Discs



Size	Shrink disc type	Nominal torque shrink disc [Nm]	Thread	Tighte. torque screw [Nm]	Dimensions in mm															
					Dh1 H7	Dh2 H8	Dw	Dk	Da	Lh1	Lh2	L1	Lk	Ds1 h6	Ds2 g7	Ds3 max	Ls1	Ls2	L2	R max
0013	DBS-185	82000	M16	290	140	130	185	224	330	100	128	3	77	140	130	145	105	118	5	3
0023	DBS-200	102000	M16	290	150	140	200	240	350	100	128	3	77	150	140	155	105	116	5	3
0033	DBS-220	134000	M20	570	165	155	220	270	370	120	153	3	94	165	155	165	125	143	5	3
0043	DBS-240	172000	M20	570	190	180	240	296	405	120	160	5	97	190	180	180	125	149	5	5
0053	DBS-260	226000	M20	570	210	200	260	318	430	135	180	5	109	210	200	200	140	170	5	5
0063	DBS-300	367000	M24	980	240	230	300	360	485	160	205	5	132	240	230	230	165	195	5	5
0073	DBS-340	525000	M24	980	260	250	340	402	570	180	230	5	146	260	250	260	185	219	5	5
0083	DBS-360	553000	M24	980	290	280	360	424	590	185	235	5	150	290	280	280	190	222	5	5
0093	DBS-390	666700	M27	1450	310	300	390	458	650	190	245	5	152	310	300	300	195	232	5	5
0103	DBS-440	1081000	M27	1450	340	330	440	516	740	220	280	5	181	340	330	350	225	265	5	5
0113	DBS-460	1214000	M27	1450	360	350	460	536	770	220	280	5	181	360	350	370	225	265	5	5
0123	DBS-480	1393000	M27	1450	380	370	480	556	800	240	300	5	201	380	370	390	245	282	5	5
0133	DBS-500	1525000	M27	1450	420	410	500	580	850	240	300	5	201	420	410	410	245	280	5	5
0143	DBS-530	1960000	M30	1950	430	420	530	616	910	270	335	5	226	430	420	440	275	315	5	5
0153	DBS-560	2457000	M30	1950	450	440	560	646	940	270	340	5	223	450	440	460	275	323	5	8

Overhung Loads Output Side

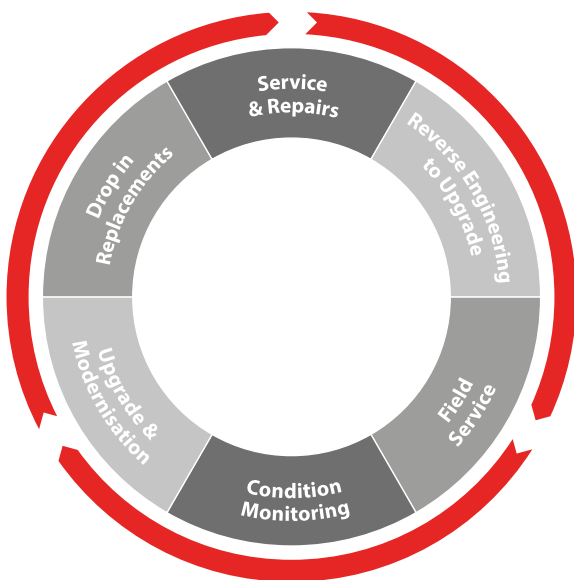


Values are valid for n = 10 rpm at Low Speed Shaft and bearing lifetime of LH > 15000 h

	Size														
	0013	0023	0033	0043	0053	0063	0073	0083	0093	0103	0113	0123	0133	0143	0153
Radial force (Fr [N])	150000	180000	190000	235000	270000	360000	400000	500000	540000	630000	700000	760000	800000	920000	980000

Calculation of bearing lifetime L_{h10}^* of different radial force FR^* and speed n^*

$$Lh10^* = \left(\frac{F_R}{F_R^*}\right)^{\left(\frac{10}{3}\right)} \left(\frac{10}{n^*}\right) \times 15,000 \text{ h}$$



**David Brown Santasalo
understands how to service
mission-critical gear units
to ensure optimal results
and long gear unit life**



Exact Ratios

P20 Size	Ratio						
	20	22.4	25	28	32	36	40
0013	-	23.11	24.89	27.04	29.71	33.12	37.59
0023	22.01	23.53	25.35	27.55	30.29	33.77	38.35
0033	20.36	21.62	24.89	27.04	29.71	33.12	37.59
0043	21.10	22.39	25.71	27.88	30.55	33.91	38.29
0053	21.10	22.39	25.71	27.88	30.55	33.91	38.29
0063	20.30	22.85	24.47	28.73	31.64	35.33	40.19
0073	21.18	22.49	25.86	28.07	30.78	34.21	38.66
0083	21.07	22.36	25.65	27.81	30.46	33.81	38.16
0093	21.63	23.00	24.61	28.87	31.77	35.46	40.31
0103	21.42	22.74	26.10	28.30	31.02	34.44	38.88
0113	21.30	22.61	25.97	28.17	30.88	34.30	38.74
0123	20.56	21.85	25.16	27.35	30.07	33.52	38.07
0133	21.42	22.74	26.10	28.30	31.02	34.44	38.88
0143	21.43	22.77	26.24	28.53	31.38	35.00	39.76
0153	21.26	22.55	T114	28.05	30.73	34.11	38.50

P30 Size	Ratio													
	80	90	100	112	125	140	160	180	200	224	250	280	320	360
0013	100.34	106.96	114.82	124.31	135.99	150.71	169.85	195.75	202.23	221.23	245.18	276.32	318.44	378.63
0023	95.56	101.86	109.35	118.39	129.51	143.53	161.76	186.42	206.27	225.65	250.08	281.84	324.81	386.20
0033	88.39	94.22	101.15	109.51	119.79	132.76	149.63	172.44	202.23	221.23	245.18	276.32	318.44	378.63
0043	91.62	97.66	104.84	113.50	124.16	137.61	155.08	178.73	205.98	225.33	249.72	281.44	324.35	385.64
0053	91.62	97.66	104.84	113.50	124.16	137.61	155.08	178.73	205.98	225.33	249.72	281.44	324.35	385.64
0063	88.13	93.94	100.85	109.18	119.43	132.37	149.18	171.92	216.20	236.51	262.12	295.41	340.44	404.78
0073	91.94	98.01	105.21	113.91	124.61	138.10	155.64	179.36	207.97	227.50	252.14	284.16	327.48	389.37
0083	91.50	97.54	104.71	113.36	124.01	137.43	154.89	178.50	205.27	224.56	248.87	280.48	323.24	384.33
0093	93.91	100.10	107.46	116.34	127.27	141.05	158.96	183.20	200.27	216.82	237.19	262.87	296.25	341.42
0103	93.94	99.98	107.12	115.69	126.17	139.26	156.09	178.54	209.95	228.96	252.72	283.27	324.00	381.02
0113	88.25	93.40	99.41	115.03	125.45	138.46	155.20	177.52	209.19	228.13	251.80	282.24	322.83	379.64
0123	85.19	90.16	102.82	111.04	121.10	133.66	149.82	171.36	205.56	224.17	247.44	277.35	317.22	373.06
0133	94.80	100.75	107.75	116.11	126.25	138.83	154.84	175.91	195.54	229.11	251.94	281.00	319.23	371.79
0143	94.81	100.76	107.76	116.12	126.26	138.84	154.85	175.92	199.95	234.28	257.62	287.33	326.42	380.17
0153	94.07	99.97	106.92	115.20	125.27	137.75	153.64	174.54	208.62	226.84	249.45	278.21	316.06	368.11

P40 Size	Ratio																	
	400	450	500	560	630	710	800	900	1000	1120	1250	1400	1600	1800	2000	2240	2500	2800
0013	411.20	464.40	498.60	575.40	629.40	713.00	864.60	936.00	1024.00	1134.80	1278.90	1442.80	1626.00	1802.10	2036.70	2228.10	2469.30	2782.90
0023	391.60	448.10	530.70	588.10	662.80	727.30	780.70	924.60	1024.70	1154.90	1330.90	1582.50	1613.90	1911.40	2118.30	2387.40	2387.40	2751.30
0033	386.10	448.70	490.90	544.00	613.10	713.00	828.60	906.50	1004.60	1132.20	1304.80	1551.40	1582.30	1873.90	2076.80	2340.60	2697.40	3207.20
0043	375.40	429.60	508.80	563.90	635.50	726.20	844.00	923.30	1023.30	1153.20	1329.00	1408.30	1611.60	1744.80	1908.70	2269.40	2515.10	2834.50
0053	375.40	429.60	508.80	563.90	635.50	726.20	844.00	923.30	1023.30	1153.20	1329.00	1408.30	1611.60	1744.80	1908.70	2269.40	2515.10	2834.50
0063	413.20	447.40	489.40	542.40	611.30	762.30	885.90	969.10	1074.00	1210.40	1395.00	1658.60	1609.90	1761.10	1951.80	2199.60	2535.00	3014.10
0073	399.20	456.80	494.60	541.10	599.60	728.90	834.10	903.00	987.80	1094.80	1233.80	1422.00	1627.20	1761.60	1927.10	2135.70	2407.00	2774.00
0083	397.30	454.70	492.20	596.80	672.50	719.50	823.30	891.30	975.00	1080.60	1217.90	1403.50	1606.10	1738.80	1902.10	2108.10	2375.80	2738.00
0093	407.80	466.60	505.20	552.60	612.40	759.90	810.10	869.60	1029.90	1141.40	1286.40	1482.50	1580.30	1836.60	2009.10	2226.60	2509.40	2892.00
0103	407.90	465.10	502.30	547.80	604.70	740.20	787.80	911.60	994.20	1097.30	1230.00	1406.80	1609.90	1742.90	1906.60	2113.00	2381.40	2744.50
0113	405.60	462.50	499.50	544.70	601.20	737.50	785.00	908.30	990.60	1093.40	1225.50	1401.70	1604.00	1736.60	1899.70	2105.40	2372.80	2734.50
0123	391.50	446.40	482.20	580.40	650.50	724.70	826.50	892.60	973.40	1074.40	1204.30	1377.40	1576.20	1706.50	1866.70	2068.90	2331.60	2687.10
0133	411.60	437.50	467.90	548.20	602.80	747.00	793.90	849.10	994.80	1094.00	1220.10	1386.10	1586.20	1717.20	1878.50	2081.90	2346.30	2704.00
0143	411.70	437.50	467.90	548.20	602.90	763.90	811.80	868.20	1017.30	1118.60	1247.60	1417.30	1621.90	1755.90	1920.90	2128.80	2399.20	2765.00
0153	408.40	434.10	464.20	543.90	598.10	739.60	786.00	840.70	985.00	1083.10	1208.00	1372.40	1570.40	1700.20	1859.90	2061.30	2323.10	2677.20

Exact Ratios

P3S Size	Ratio															
	45	50	56	63	71	80	90	100	112	125	140	160	180	200	224	250
0013	47.21	53.57	53.57	59.95	66.59	83.96	93.45	106.77	119.26	119.26	132.27	169.17	189.61	211.24	239.89	239.89
0023	48.15	48.15	54.64	61.15	67.93	76.69	85.64	95.32	108.90	121.65	134.92	154.98	170.26	190.25	218.71	244.69
0033	47.40	53.33	53.33	59.97	66.51	82.93	94.59	107.41	118.56	118.56	133.15	166.92	186.52	209.73	239.89	239.89
0043	48.28	48.28	54.32	60.31	68.30	75.49	84.96	97.71	107.78	119.47	134.85	151.63	168.15	189.63	216.98	243.85
0053	48.09	48.09	54.56	61.47	68.07	76.58	85.23	97.09	107.51	121.26	134.02	154.83	173.22	193.12	216.98	238.25
0063	44.37	50.35	56.34	62.59	70.66	78.90	90.04	100.34	109.92	126.60	141.32	156.05	180.02	197.11	222.59	222.59
0073	48.55	48.55	55.09	61.65	68.48	77.32	86.34	97.27	109.80	123.42	136.93	152.88	171.45	191.46	215.69	244.18
0083	47.92	47.92	54.38	60.85	67.60	76.32	85.22	96.01	108.37	121.82	135.15	150.90	169.23	192.71	214.42	243.50
0093	50.38	50.38	57.02	63.64	72.55	80.61	91.36	100.77	113.17	125.96	142.75	159.39	181.38	201.53	229.89	257.19
0103	48.60	48.60	55.00	61.39	69.98	77.76	88.13	97.20	109.16	121.50	137.70	153.75	174.96	194.40	221.76	244.39
0113	49.07	49.07	55.34	61.58	68.06	77.48	87.48	97.51	107.61	124.29	139.11	156.72	174.33	196.79	218.96	243.50
0123	47.58	47.58	53.85	60.10	68.52	74.98	86.29	95.17	106.88	118.96	133.23	152.27	170.40	188.52	212.37	238.42
0133	48.60	48.60	55.00	61.39	69.98	76.58	88.13	97.20	109.16	121.50	136.08	155.52	174.03	192.55	216.91	243.51
0143	49.93	49.93	56.65	63.39	70.42	79.51	88.79	101.31	112.91	126.18	142.46	159.02	178.90	202.56	227.18	247.37
0153	48.34	48.34	54.86	61.38	68.19	76.99	85.97	98.10	109.33	122.18	137.94	153.98	173.23	196.14	219.97	239.52

P4S Size	Ratio																		
	280	320	360	400	450	500	560	630	710	800	900	1000	1120	1250	1400	1600	1800	2000	2240
0013	267.52	308.30	360.74	394.62	436.13	490.86	564.50	616.76	693.17	794.78	876.06	971.47	1097.61	1255.99	1411.64	1564.48	1763.17	2031.99	2149.61
0023	288.54	332.53	367.95	402.52	444.85	500.67	575.79	629.09	707.03	810.67	893.58	990.90	1119.57	1278.69	1437.03	1592.62	1794.88	2072.63	2192.60
0033	266.00	306.56	359.52	393.30	442.45	492.41	556.43	613.73	695.29	774.29	884.90	988.62	1115.75	1253.62	1376.51	1561.39	1759.69	2027.97	2149.61
0043	274.71	316.60	364.87	400.59	450.65	501.53	566.74	625.10	708.18	788.65	901.31	1006.94	1148.09	1282.04	1437.43	1553.83	1751.16	2018.15	2185.33
0053	274.71	316.60	364.87	399.14	450.65	510.30	574.22	637.14	701.02	812.78	892.63	995.20	1117.24	1287.59	1437.43	1593.06	1795.38	2018.15	2194.20
0063	264.25	304.54	342.77	386.89	426.39	484.81	547.70	609.99	673.56	760.71	873.82	972.91	1090.41	1214.84	1365.49	1493.76	1655.48	1865.73	2171.80
0073	275.69	317.73	368.40	403.00	455.01	508.09	565.51	646.11	721.73	800.47	919.50	1023.77	1147.42	1278.35	1451.71	1608.88	1794.68	2068.30	2224.98
0083	276.29	315.81	363.17	397.29	449.11	495.35	565.01	641.58	708.21	795.31	888.01	997.03	1114.14	1280.81	1432.90	1588.04	1789.72	2062.58	2159.53
0093	283.55	326.79	357.24	386.76	427.44	478.28	545.54	619.48	683.81	767.91	857.41	962.68	1073.78	1209.62	1383.53	1513.51	1677.37	1890.37	2178.60
0103	277.50	318.47	374.51	408.42	451.37	508.02	584.24	644.48	714.36	806.33	906.68	1005.43	1133.90	1277.34	1458.11	1609.42	1807.54	2067.44	2173.25
0113	274.92	315.59	371.90	405.57	456.26	507.77	578.47	640.52	722.42	798.46	922.45	1032.02	1150.58	1292.75	1452.83	1603.59	1797.43	2055.89	2117.99
0123	265.39	303.55	364.13	397.10	448.34	500.64	564.04	636.65	715.63	793.95	886.49	1008.78	1120.86	1278.61	1430.44	1578.89	1769.74	2024.21	2380.47
0133	274.28	311.60	346.39	405.85	458.23	509.96	580.97	643.28	725.54	801.90	926.42	1036.47	1155.54	1303.59	1425.59	1567.64	1748.42	1986.28	2367.71
0143	274.31	311.63	354.19	415.00	468.56	523.21	597.03	665.35	728.86	839.49	937.11	1034.73	1193.69	1332.97	1475.95	1602.97	1787.82	2031.05	2154.30
0153	272.15	309.18	369.54	401.83	453.69	506.61	578.09	644.24	705.73	812.85	907.38	1001.90	1155.82	1265.54	1429.12	1571.51	1752.74	1966.60	2290.43

P4K Size	Ratio																				
	80	90	100	112	125	140	160	180	200	224	250	280	320	360	400	450	500	560	630	710	800
0013	-	91.10	98.10	106.60	130.56	148.21	165.34	186.02	210.08	241.32	241.32	273.37	332.86	371.67	417.29	468.87	526.43	On request			
0023	87.11	93.13	100.33	109.06	119.88	133.12	151.17	169.76	192.08	215.70	240.84	280.11	312.76	339.52	379.10	425.64	478.25				
0033	80.58	85.59	98.50	107.04	117.62	131.09	166.43	188.31	211.47	236.12	236.12	274.61	332.86	371.67	417.29	468.87	541.12				
0043	84.20	89.35	102.57	111.23	120.91	134.24	151.57	167.52	191.46	211.61	244.47	276.42	319.34	335.05	387.07	433.05	492.64				
0053	84.20	89.35	101.75	111.23	121.89	135.33	152.80	167.52	191.46	211.61	244.47	276.42	319.34	335.05	387.07	433.05	492.64				
0063	80.99	91.18	97.63	114.66	126.24	140.06	156.41	178.09	197.57	220.61	257.62	287.65	322.59	349.30	391.71	440.65	494.16				
0073	83.43	88.62	101.94	110.64	121.36	134.86	154.27	171.16	194.87	216.20	241.40	281.90	314.77	352.99	382.22	428.63	482.18				
0083	85.25	90.44	103.76	109.57	120.03	133.21	150.44	166.95	190.03	210.88	243.52	274.98	317.53	353.54	385.58	429.30	486.42				
0093	87.49	93.03	99.55	116.79	128.51	143.43	158.81	179.99	198.88	225.40	257.22	286.39	335.39	373.42	407.26	453.44	513.77				
0103	84.41	89.59	105.58	114.49	125.46	139.30	157.28	176.04	201.96	217.42	242.77	276.25	316.05	359.64	384.38	437.40	484.91				
0113	85.81	89.10	102.34	111.01	124.93	138.75	156.71	175.40	201.23	225.22	253.73	285.94	322.14	352.41	397.02	441.62	488.71				
0123	82.84	88.01	101.36	110.18	121.11	132.08	149.99	167.99	194.09	217.38	248.44	274.80	314.05	342.60	391.55	433.96	480.23				
0133	86.30	91.59	105.14	114.02	124.94	135.68	153.19	176.04	201.96	226.04	254.66	286.98	323.31	353.69	398.46	443.23	490.49				
0143	86.31	91.73	105.71	114.95	126.40	140.97	156.65	175.44	202.70	227.03	259.46	286.99	327.99	357.80	408.92	457.60	501.54				
0153	85.64	90.86	104.23	113.00	123.79	137.39	155.07	175.08	199.35	219.83	251.23	277.89	317.58	346.46	395.95	443.09	485.63				

P5K Size	Ratio										
	900	1000	1120	1250	1400	1600	1800	2000	2240	2500	2800
0013	869.11	967.86	1104.27	1229.75	1405.43	1596.99	1825.12	2039.00	2178.24	2433.49	2802.21
0023	886.49	987.22	1126.36	1254.35	1433.54	1628.93	1861.62	2079.78	2221.80	2482.16	2858.25
0033	869.11	967.86	1104.27	1229.75	1405.43	1596.99	1825.12	2039.00	2178.24	2488.79	2802.21
0043	885.22	985.81	1124.74	1252.55	1431.48	1626.59	1858.95	2095.54	2308.97	2534.93	2897.66
0053	877.47	991.01	1114.92	1259.17	1446.40	1638.49	1882.11	2095.54	2308.97	2534.93	2897.66
0063	841.93	950.88	1069.77	1208.18	1387.82	1572.13	1805.89	2010.68	2137.46	2399.84	2696.47
0073	896.89	1000.59	1125.69	1271.34	1460.37	1654.32	1900.30	2014.37	2249.20	2525.30	2837.43
0083	885.27	994.14	1124.81	1263.13	1410.37	1640.32	1831.55	1988.27	2220.06	2492.58	2800.67
0093	854.77	959.88	1086.05	1219.61	1361.78	1583.81	1768.45	1919.77	2143.57	2406.70	2704.18
0103	906.29	1001.70	1146.86	1287.90	1438.03	1672.48	1867.47	2027.26	2263.59	2589.42	2855.59
0113	903.01	998.07	1140.65	1260.72	1456.48	1646.83	1902.54	1996.14	2306.10	2580.04	2935.03
0123	887.34	980.75	1120.86	1238.84	1431.21	1618.25	1869.53	1961.51	2266.09	2535.28	2884.11
0133	906.90	1002.38	1145.57	1266.15	1462.76	1653.93	1910.74	2004.75	2316.05	2591.17	2947.69
0143	934.86	1037.17	1171.39	1294.69	1495.72	1691.20	1953.81	2049.93	2368.24	2597.44	2921.91
0153	905.20	1004.26	1143.41	1268.53	1416.41	1654.08	1846.90	2071.18	2242.67	2515.02	2829.20



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