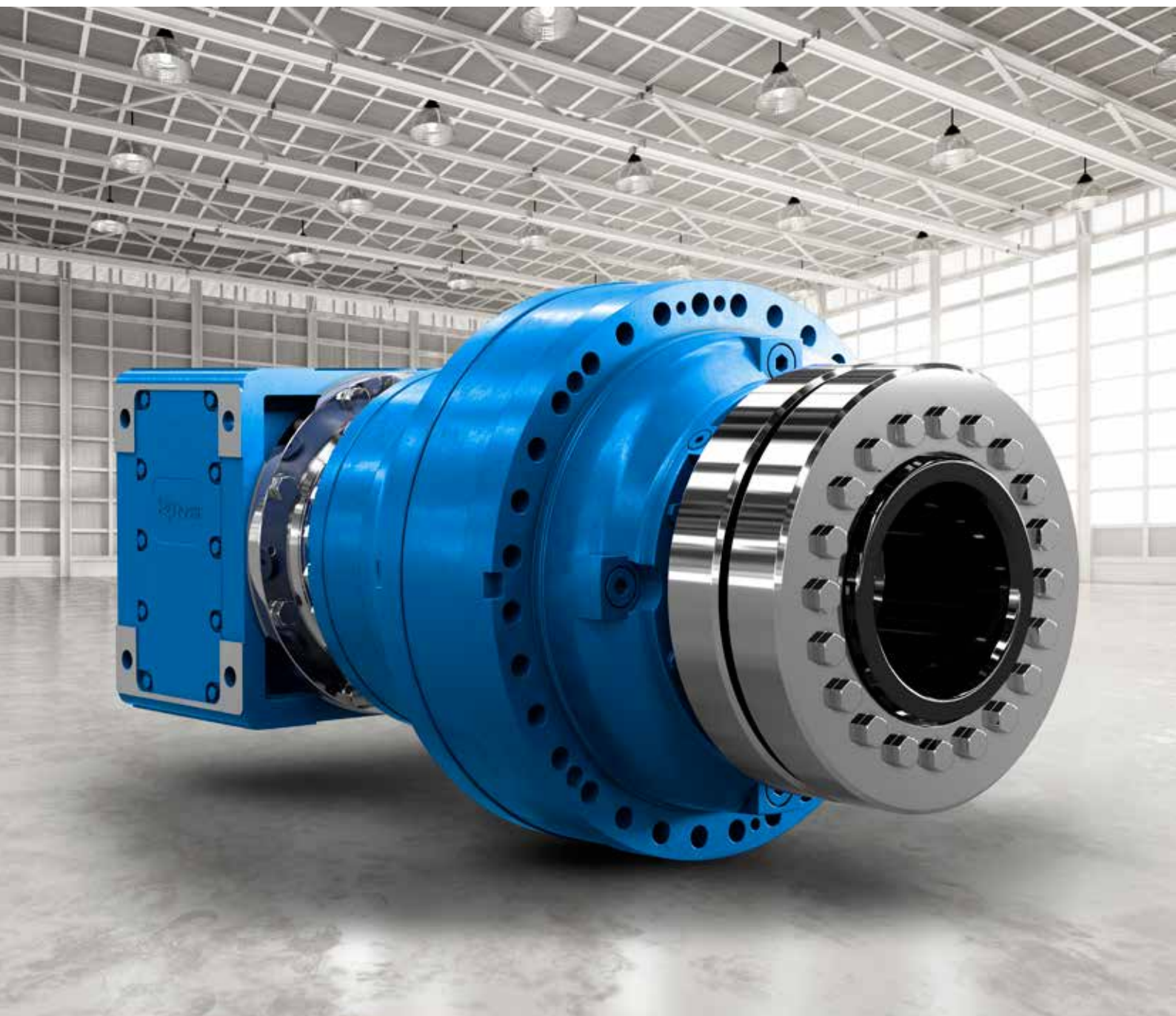


EP KING series



High torque planetary and combined units

rossi.com

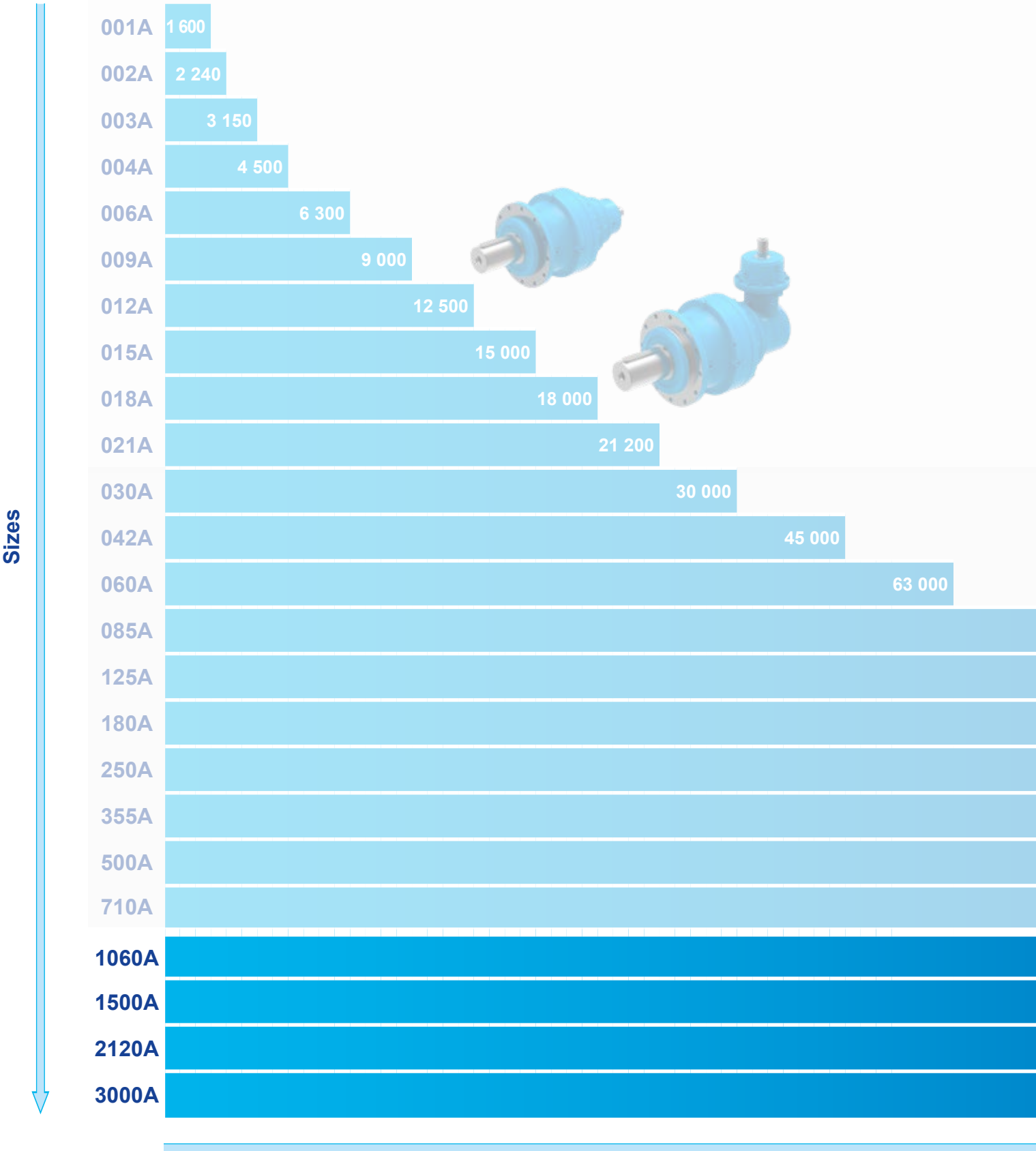
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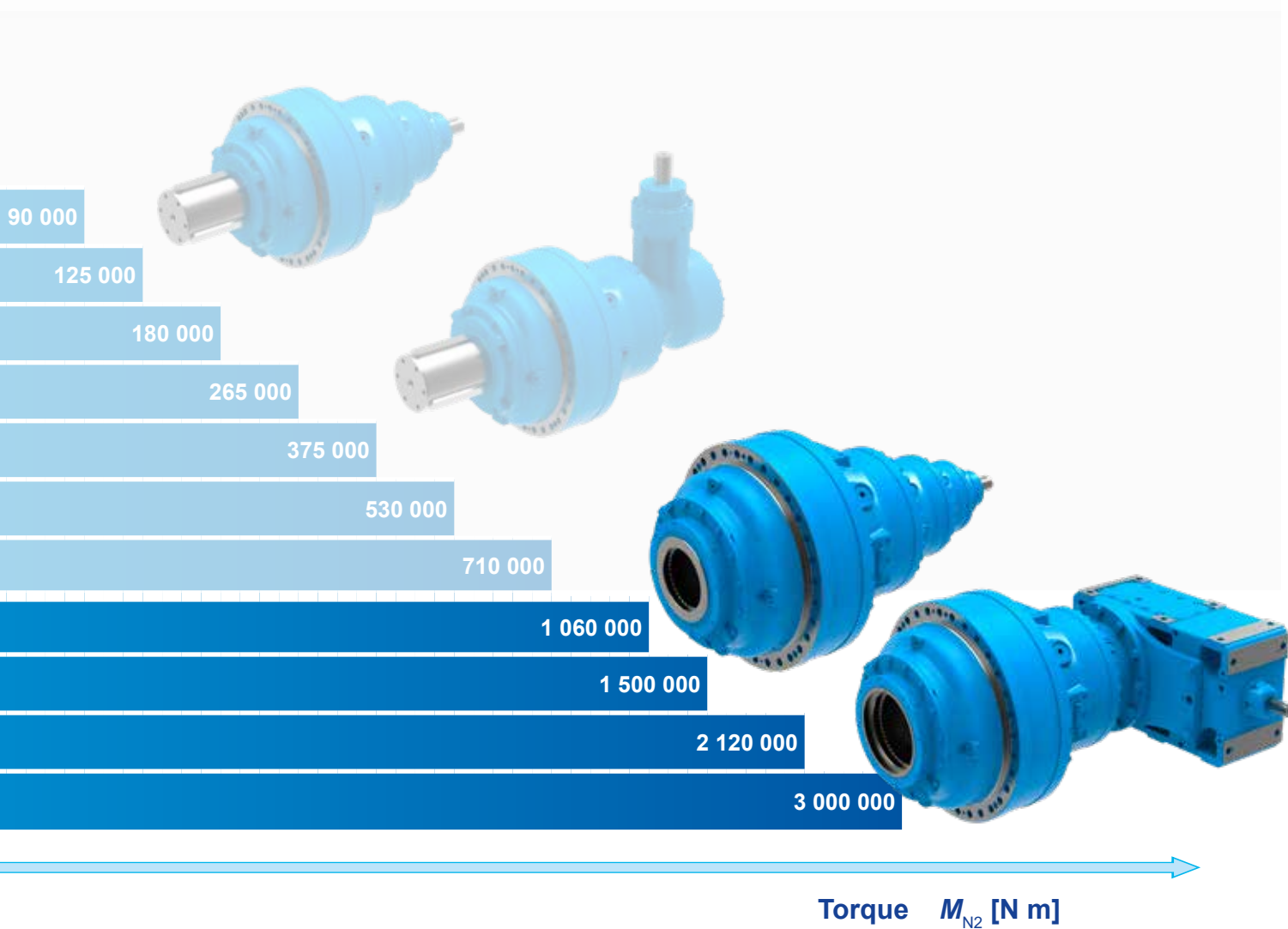
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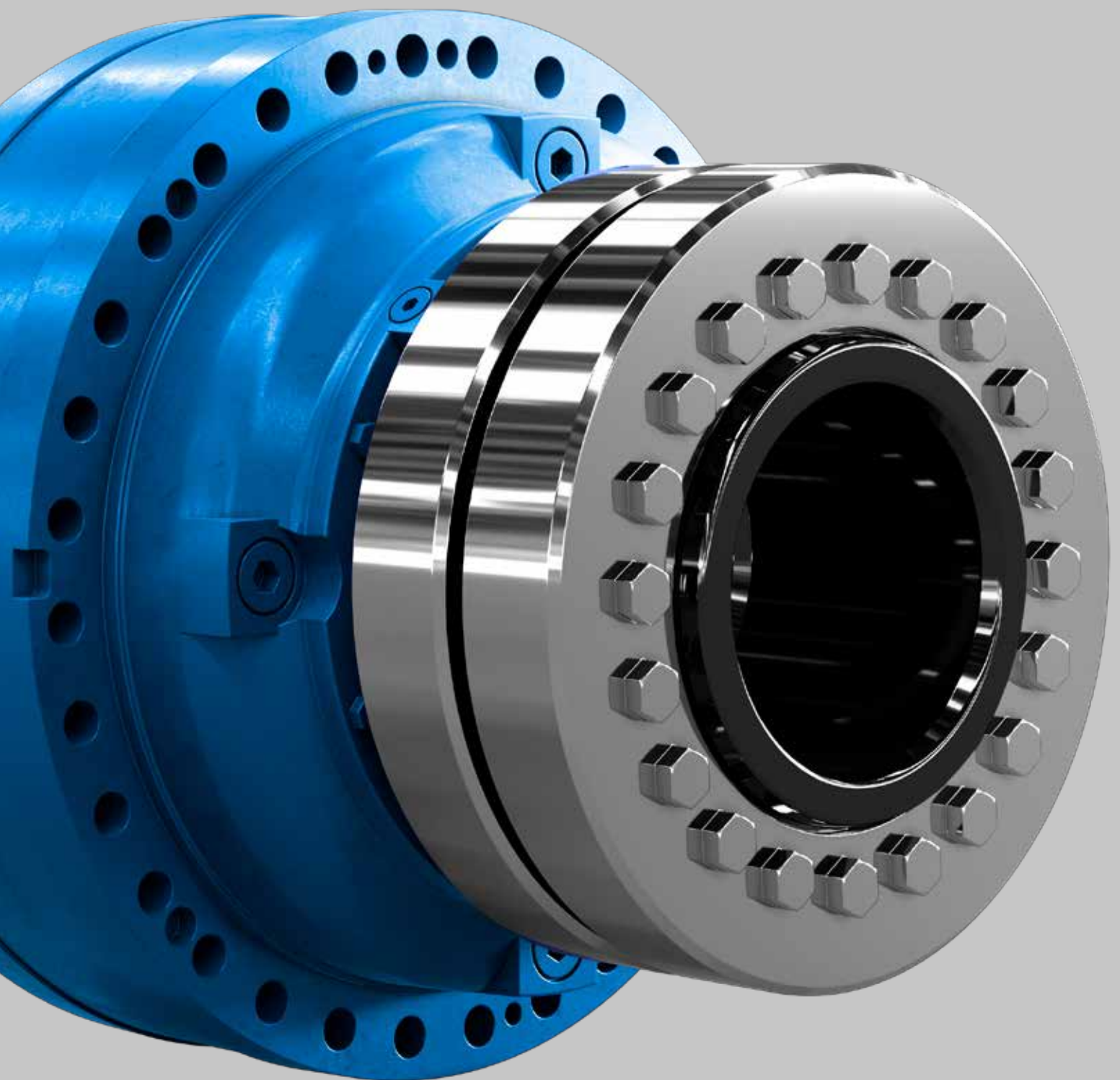
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EP King product range





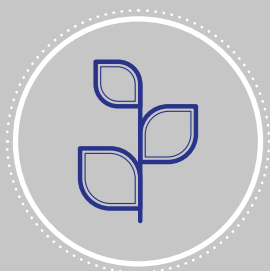
Features and benefits





Maximum performance

We drive the heaviest applications worldwide



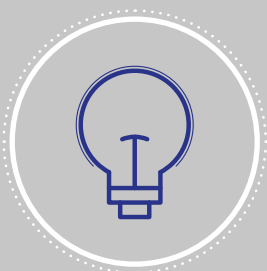
Sustainability

We care about environment



Modular system

For cost-effective and high quality solutions



Innovation

We are constantly thinking forward, solutions for an evolving industry



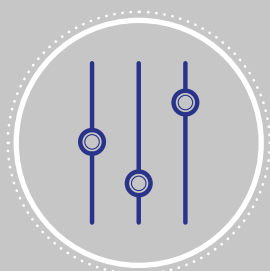
Digitalization

Rossi for You is always at your disposal for any info



Know-how

We support you through interdisciplinary know-how



Customization

Cost-effective solutions starting from standard products

Design features

Designation - Planetary Gear Unit

Gear reducer size and ratio					
R	4EL	1060	A	83,1	Y
Machine	Train of gears PLANETARY	Size	Stage composition ¹⁾	Transmission ratio ¹⁾	Type of ratio
	3EL 3 stages inline  4EL 4 stages inline 	1060 1500 2120 3000	A catalog stage composition X stage composition other than catalog	83,1 105 ... 571 ... 1006	Y catalog ratio Z ratio composition other than catalog

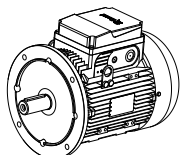
Designation example:

R 3EL 1060A 83,1Y H400M1 A10o I55×400 B5 ,...

R 4EB 1060A 308Y S500M1 F10o C80×130 B53 ,...

R 4EL 3000A 587Y T600M1 F10r C120×165 B5 ,...

1) More stage compositions and ratios are available on request. Use selection software or contact Rossi S.p.A..



When gearmotor is supplied with a Rossi standard motor, please state motor designation according to catalog TX. For terminal box position refer to ch. 6.

Design features

Output							Input				
H	400	M	1	A	10	o	C80	x	130	B5	,...
Shaft end type	Output shaft dimensions			Mounting	Output model		Input	Shaft / Coupling dimensions	Mounting position	Accessories	
	Shaft end	System units	Model		Model	Coupling dims.					
Z splined hollow shaft 	320	M Metric system unit	1	F flange mounting 	10	o	I... IEC electric motor adapter 		B5	,SC... splined bar 	
T output flange shaft 	...	I Imperial system unit	9		20	...	C... cylindrical shaft end 		B51	,WT... wheel flange 	
H hollow for shaft mounting 	600			A shaft mounting 					V1	,SD... shrink disc 	
Q square 										,FB... foot bracket 	
C cylindrical 										,SW... stop washer 	
S splined 										,SB... splined bush 	
X non-standard design										 ...	

Design features

Designation - Combined Units

Planetary gear reducer size and ratio												
R	2EL	1060	A	23,3	Y	H	400	M	1	A	10	o
Machine	Train of gears	Size	Stage comp. ¹⁾	Transm. ratio ¹⁾	Type of ratio	Shaft end type	Output shaft dimensions			Mounting	Output model	
							Shaft end	System units	Model		Model	Coupling dims.
2EL 2 stages inline  3EL 3 stages inline 		1060		19,9		Z splined hollow shaft 				F flange mounting 		
		1500		83,1								
		2120		...		T output flange shaft 	320		1		10	o
		3000		110,9					...		20	...
	A catalog stage composition X stage composition other than catalog			139,8	Y catalog ratio	H hollow for shaft mounting 	...	M Metric system unit	9	A shaft mounting 	...	r
						Q square 	600					
					Z ratio composition other than catalog	C cylindrical 		I Imperial system unit				
						S splined 						
						X non-standard design 						

Designation example:

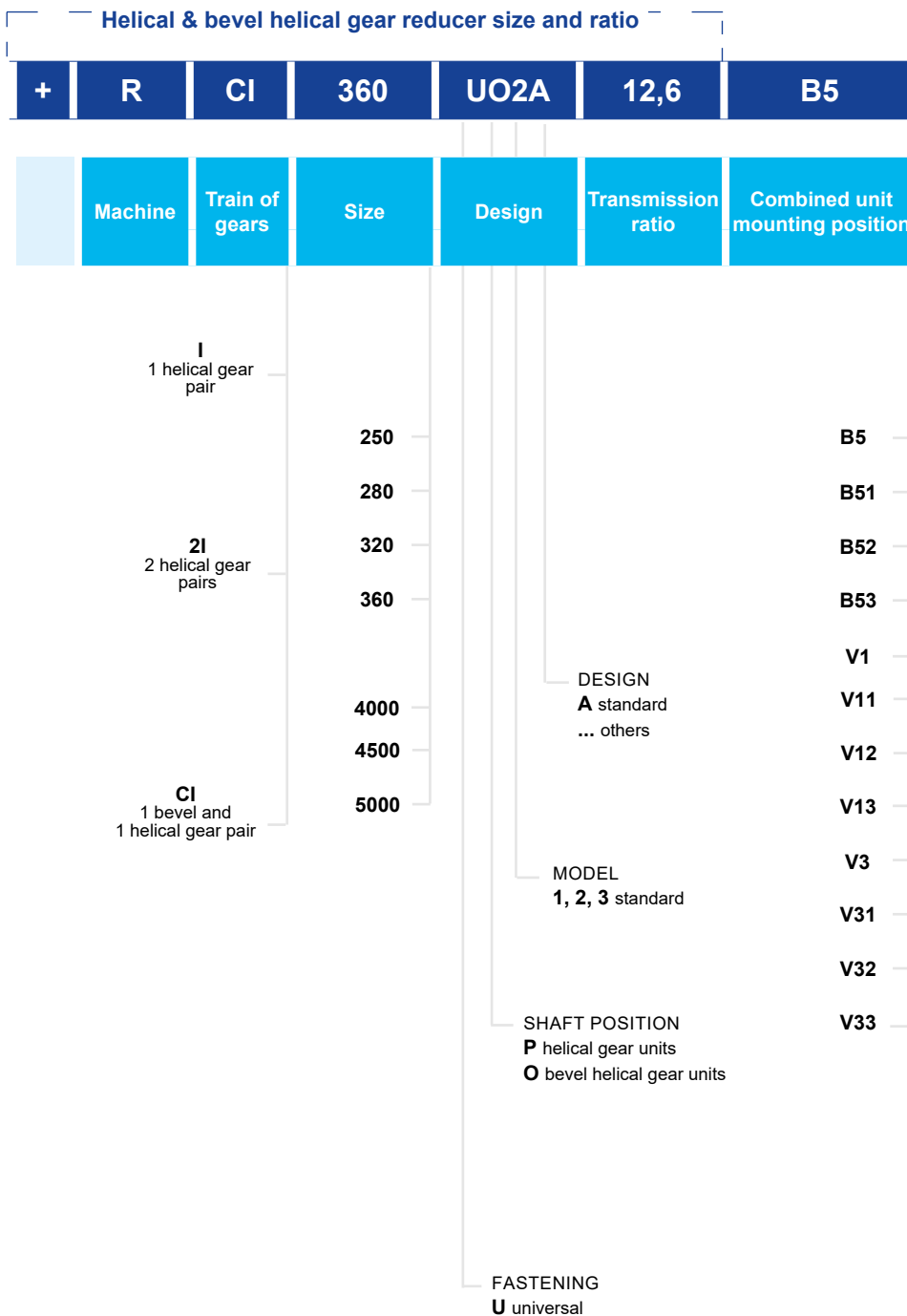
R 3EL1060A 83,1Y H360M1 A10o + R CI 250 UO2A 11,4 B5

R 2EL 1500A 19,9Y Z460M1 F05p + R CI 4000 UO1LS - 12,8 B5

R 3EL 3000A 110,9Y Q480M1 F05r + R 2I 360 UP2A - 25,7 B5

Design features

Designation - Combined Units



Summary of performance, dimensions and details

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1060A

1500A

2120A

3000A

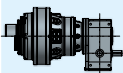
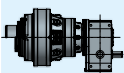
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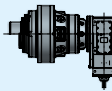
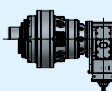
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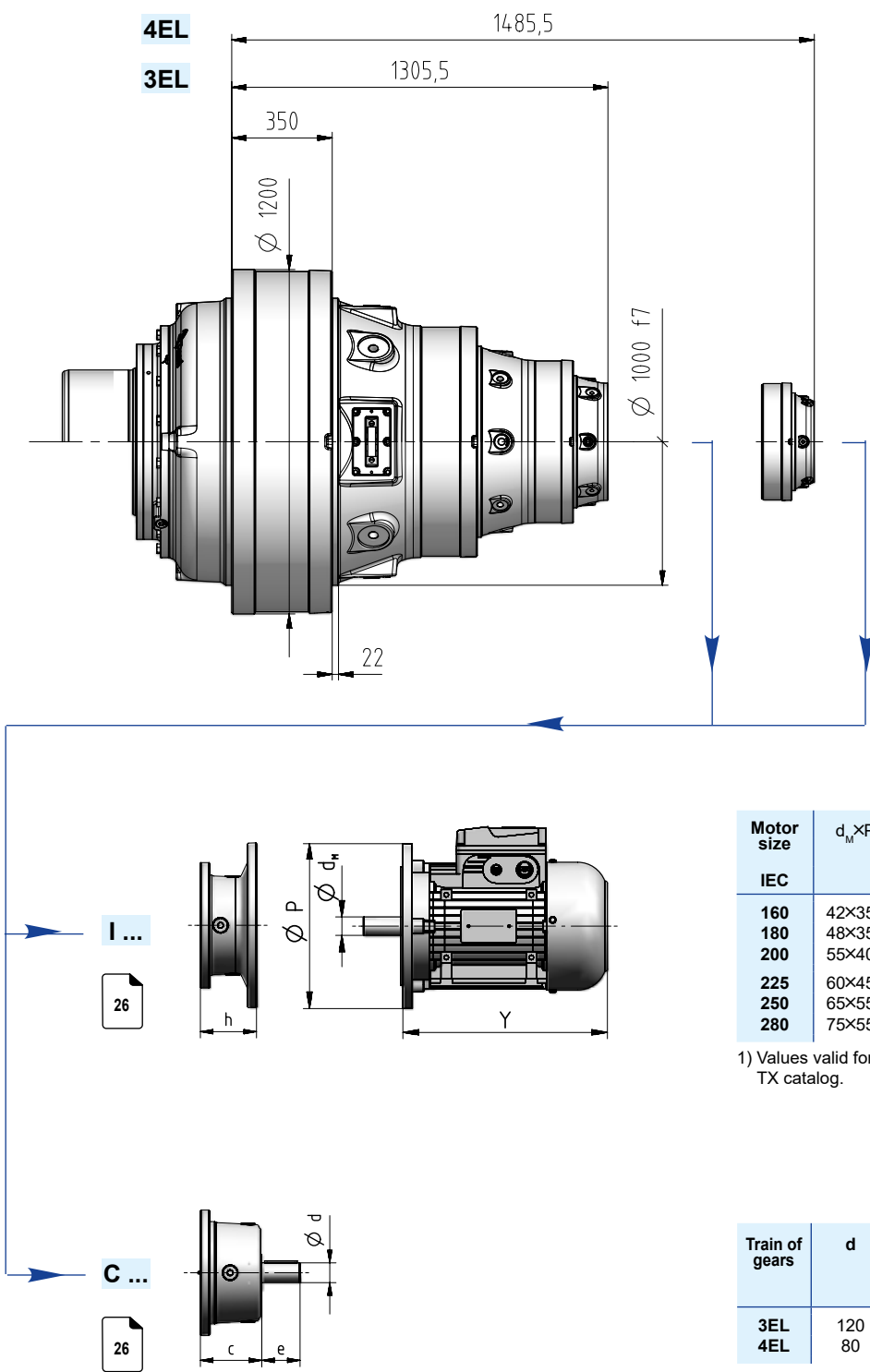
			$L_h = 10\,000\text{ h}$			M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min ⁻¹	$n_i = 1\,400\text{ min}^{-1}$		
			$n_1\text{ min}^{-1}$					P_t [kW] at 20°C		
			$n_2\text{ min}^{-1}$					40°C		
			$M_{N2}\text{ N m}$							
	i_N	i_{eff}	1 400	900	500			—		
R 3EL 1060 A	80	83,1		10,8 666 865	6,02 672 352	1 060 000 1 800 000	1 250 2 000	160 125	- -	- -
	100	105		8,54 668 858	4,74 674 215					
	112	117		7,70 670 003	4,28 674 906					
	125	123		7,30 670 447	4,06 675 317					
	140	137		6,59 671 362	3,66 676 137					
	160	168		5,37 673 038	2,98 677 739					
R 4EL 1060 A	355	348	4,03 675 627	2,59 679 008	1,44 702 368	1 060 000 1 800 000	2 000 2 800	130 100	- -	- -
	400	406	3,45 676 614	2,21 679 926	1,23 716 300					
	450	441	3,18 677 219	2,04 680 506	1,13 724 742					
	500	515	2,72 678 425	1,75 682 996	0,970 740 707					
	560	571	2,45 679 169	1,58 692 503	0,875 750 910					
	630	633	2,21 679 923	1,42 702 730	0,790 761 466					
	710	716	1,96 680 831	1,26 714 734	0,699 774 516					
	800	819	1,71 685 124	1,10 728 147	0,610 789 089					
	1000	1006	1,39 705 303	0,895 748 213	0,497 811 830					

			$L_n = 10\,000\text{ h}$					$n_1 = 1\,400\text{ min}^{-1}$						$L_n = 10\,000\text{ h}$					$n_1 = 1\,400\text{ min}^{-1}$				
			$n_1\text{ min}^{-1}$			M_{N2max} M_{2max}	n_{1max} n_{1peak}							Pt [kW] at 20°C 40°C	$n_1\text{ min}^{-1}$			M_{N2max} M_{2max}				n_{1max} n_{1peak}	Pt [kW] at 20°C 40°C
			$n_2\text{ min}^{-1}$												$n_2\text{ min}^{-1}$								
			$M_{N2}\text{ N m}$												$M_{N2}\text{ N m}$								
	i_N	i_{eff}				N m	min ⁻¹	—				i_N	i_{eff}				N m	min ⁻¹	—				
R 2EL 1060A + R I 360	45	45,5	30,8 541 437	19,8 618 178	11,0 666 735	1 060 000 1 800 000	1 800 2 360	425 315	450 340	450 340		560	543	2,58 678 749	1,66 687 758	0,921 745 292	1 060 000 1 800 000	2 800 3 500	125 95	160 125	250 190		
	50	49,8	28,1 556 191	18,1 635 024	10,0 667 598							630	635	2,21 679 903	1,42 702 596	0,788 761 401							
	56	56,4	24,8 577 471	16,0 659 319	8,86 668 766							710	687	2,04 680 479	1,31 710 185	0,728 769 636							
	63	64,7	21,6 601 738	13,9 664 339	7,73 670 001							800	764	1,83 681 250	1,18 720 571	0,655 780 895							
	71	71,7	19,5 620 487	12,6 665 402	6,97 670 895							900	871	1,61 690 654	1,03 733 655	0,574 795 101							
	80	79,7	17,6 640 413	11,3 666 459	6,28 671 794							950	969	1,45 700 738	0,929 744 375	0,516 806 743							
	90	91,6	15,3 663 320	9,83 667 806	5,46 672 957							1000	1043	1,34 707 858	0,863 751 945	0,479 814 965							
	100	101	13,9 664 372	8,91 668 714	4,95 673 750							1120	1213	1,15 722 602	0,742 767 624	0,412 831 997							
	112	107	13,1 664 986	8,40 669 155	4,67 674 221							1250	1344	1,04 732 860	0,669 778 534	0,372 843 849							
	125	118	11,9 665 979	7,62 670 035	4,23 674 995							1400	1479	0,946 742 504	0,608 788 794	0,338 854 983							
	140	145	9,66 667 857	6,21 671 814	3,45 676 583							1600	1637	0,855 752 843	0,550 799 786	0,305 866 940							
	180	185	7,55 670 118	4,85 673 854	2,70 678 442	1 060 000 1 800 000	2 000 2 360	224 170	300 224	450 340		1800	1876	0,746 767 051	0,480 814 905	0,266 883 373							
	200	213	6,58 671 316	4,23 674 999	2,35 679 458							2000	2079	0,673 777 918	0,433 826 460	0,240 895 932							
	R 2EL 1060A + R 2I 360	224	236	5,94 672 186	3,82 675 798	2,12 680 207							2240	2318	0,604 789 581	0,388 838 882	0,216 909 433						
250		262	5,35 673 062	3,44 676 610	1,91 680 973							2500	2690	0,521 805 816	0,335 856 154	0,186 928 277							
280		287	4,88 673 809	3,14 677 304	1,74 683 026							3150	3003	0,466 818 097	0,300 869 232	0,166 942 456							
315		319	4,39 674 704	2,82 678 097	1,57 692 927							3550	3414	0,410 832 592	0,264 884 665	0,146 959 210							
355		364	3,85 675 703	2,47 679 086	1,37 705 621							3800	3781	0,370 829 340	0,238 882 451	0,132 959 685							
400		404	3,46 676 519	2,23 679 861	1,24 715 854							4000	4189	0,334 841 326	0,215 895 407	0,119 973 965							
450		457	3,06 677 456	1,97 680 733	1,09 727 965																		
500		513	2,73 678 350	1,76 682 383	0,975 739 461																		
560		580	2,41 679 267	1,55 694 029	0,862 742 427																		
630		667	2,10 680 268	1,35 707 408	0,749 756 561																		
710	736	1,90 681 001	1,22 716 902	0,680 766 646																			

			$L_h = 10\,000\text{ h}$					$n_1 = 1\,400\text{ min}^{-1}$		
			$n_1\text{ min}^{-1}$			M_{N2max} M_{2max}	n_{1max} n_{1peak}	Pt [kW] at 20°C 40°C		
			$n_2\text{ min}^{-1}$							
			$M_{N2}\text{ N m}$			N m	min^{-1}	—  		
	i_N	i_{eff}	1 400	900	500					
R 4EB 1060 A	200	208		4,33 673,346	2,41 678,249	1 060 000 1 800 000	1 120 2 500	125 95	-	-
	250	264		3,41 676,799	1,90 681,149					
	315	308		2,92 677,873	1,62 690,179					
	400	389		2,32 679,637	1,29 712,805					
	500	493		1,83 681,291	1,01 736,585					
	630	616		1,46 700 662	0,811 759 294					

			$L_h = 10\,000\text{ h}$			M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min ⁻¹	$n_1 = 1\,400\text{ min}^{-1}$			P_t [kW] at 20°C 40°C		$L_h = 10\,000\text{ h}$			M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min ⁻¹	$n_1 = 1\,400\text{ min}^{-1}$			P_t [kW] at 20°C 40°C	
			$n_1\text{ min}^{-1}$ $n_2\text{ min}^{-1}$ $M_{N2}\text{ N m}$																			
i_N	i_{eff}		1 400	900	500																	
R 2EL 1060A + R CI 360	160	159	8,79 668 745	5,65 672 610	3,14 677 304	1 060 000 1 800 000	2 000 2 800	265 200	355 265	450 340			315	332	4,21 675 039	2,71 678 415	1,50 696 967	1 060 000 1 800 000	2 360 3 350	118 90	160 118	240 180
	180	183	7,64 670 013	4,91 673 813	2,73 678 354								355	389	3,60 676 254	2,32 679 571	1,29 712 002					
	200	199	7,03 670 748	4,52 674 430	2,51 678 973								400	420	3,33 676 856	2,14 680 146	1,19 719 692					
	224	214	6,54 671 378	4,20 675 056	2,33 679 511								450	467	3,00 677 656	1,93 680 893	1,07 730 155					
	250	251	5,57 672 724	3,58 676 295	1,99 680 676								500	533	2,63 678 644	1,69 686 065	0,938 743 467					
	280	289	4,85 673 869	3,12 677 361	1,73 683 721								560	591	2,37 679 403	1,52 695 759	0,846 753 972					
	315	319	4,40 674 652	2,83 678 095	1,57 692 894								630	639	2,19 679 971	1,41 703 154	0,783 762 007					
	355	366	3,82 675 798	2,46 679 108	1,36 706 284								750	751	1,86 681 132	1,20 718 949	0,666 779 141					
	400	404	3,47 676 511	2,23 679 853	1,24 715 762								800	831	1,68 686 242	1,08 728 953	0,602 790 002					
	420	428	3,27 676 961	2,10 680 282	1,17 721 523								900	948	1,48 698 657	0,950 742 163	0,528 804 334					
480	472	2,96 677 702	1,91 680 969	1,06 731 209																		
R 3EL 1060 + R CI 250													1000	1049	1,34 708 391	0,858 752 485	0,477 815 557					
													1120	1168	1,20 718 918	0,770 763 697	0,428 827 735					
													1260	1242	1,13 724 999	0,724 756 144	0,402 819 793					
													1400	1474	0,950 742 121	0,611 788 378	0,339 854 539					
													1600	1646	0,851 753 417	0,547 800 386	0,304 867 592					
													1800	1871	0,748 766 724	0,481 814 557	0,267 882 995					
													2000	2087	0,671 778 315	0,431 826 892	0,240 896 401					
													2240	2202	0,636 784 041	0,409 832 985	0,227 903 024					
													2500	2637	0,531 803 662	0,341 853 862	0,190 925 784					
													2800	2966	0,472 816 680	0,303 867 722	0,169 940 821					
													3150	3129	0,447 822 695	0,288 874 128	0,160 947 770					
													3550	3467	0,404 834 364	0,260 886 555	0,144 961 260					
													4000	3911	0,358 848 270	0,230 901 360	0,128 977 346					
													4500	4334	0,323 860 307	0,208 914 181	0,115 991 280					
													5300	5319	0,263 870 021	0,169 926 438	0,094 1 008 122					

R 3EL, R 4EL



Motor size	d _m ×P	Y 1)		Train of gears		Code
				3EL	4EL	
IEC				Dimension h		
160	42×350	573	640	—	111	I42×350
180	48×350	613	734	—	111	I48×350
200	55×400	654	734	—	111	I55×400
225	60×450	710	—	—	141	I60×450
250	65×550	735	—	—	141	I65×550
280	75×550	819	—	—	141	I75×550

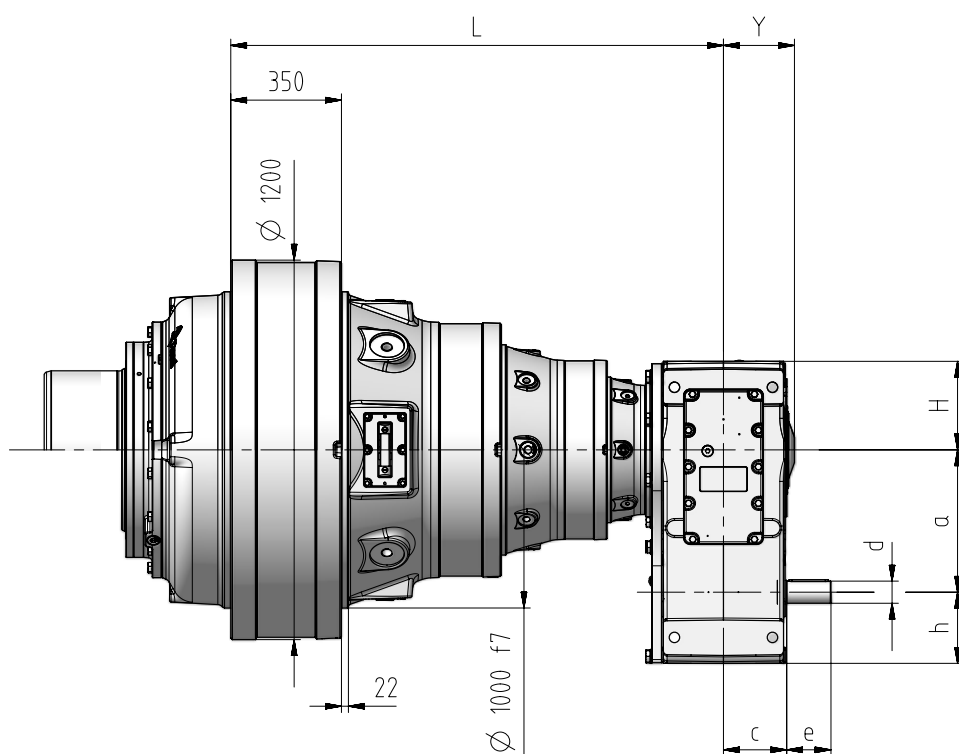
1) Values valid for brake motor; for other dimensions see TX catalog.

Train of gears	d	e	c	Code
3EL	120	165	277,5	C120×165
4EL	80	130	111	C80×130

Train of gears	kg	Input Options Code					
		I42×350	I48×350	I55×400	I60×450	I65×550	I75×550
3EL	–	–	–	–	–	–	–
4EL	5240	5240	5243	5253	5260	5260	5245 5257

Output Options (Δ) Code					
H...	Z...	T...	C...	S...	Q...
+0	-166	-142	+740	+564	+443

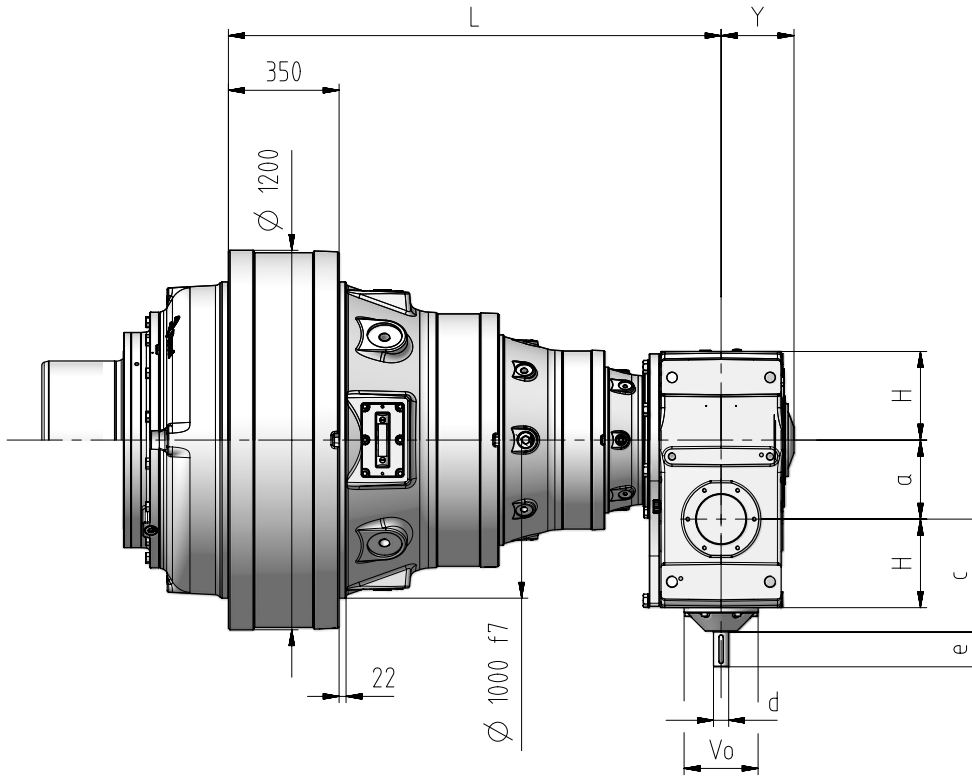
R 2EL, R 3EL combined with R I, R 2I



Train of gears	L	Y	H	a	h	c	d	e	d	e
2EL 1060 + I 360	1400,5	313,5	355	360	355	256	$i_N \leq 4$		$i_N \geq 4,5$	
2EL 1060 + 2I 360	1400,5	313,5	355	610	280	245	90	170	—	—
3EL 1060 + 2I 250	1558	230,5	280	450	225	200	70	140	—	—

Train of gears	 kg	Output Options (Δ) Code					
		H...	Z...	T...	C...	S...	Q...
2EL 1060 + I 360	6372	+0	-166	-142	+740	+564	+443
2EL 1060 + 2I 360	6731						
3EL 1060 + 2I 250	5838						

R 2EL, R 3EL combined with R CI



Train of gears	L	Y	H	a	V ₀	c	d	e	d	e	d	e
					Ø						$i_N \geq 18$	
2EL 1060 + CI 360	1400,5	313,5	355	360	290	480	$i_N \leq 11,2$		$i_N = 12,5 \dots 16$		70	140
3EL 1060 + CI 250	1558	230,5	280	250	238	$i_N \leq 10$ 380	$i_N \geq 11,2$ 357	$i_N \leq 10$ 70	$i_N = 11,2 \dots 16$ 140	$i_N = 11,2 \dots 16$ 55	110	48

Train of gears	kg	Output Options (Δ) Code					
		H...	Z...	T...	C...	S...	Q...
2EL 1060 + CI 360	6448	+0	-166	-142	+740	+564	+443
3EL 1060 + CI 250	5850						

R 3EL, R 4EL, R 4EB

Cylindrical Shaft End Type - CODE

Input

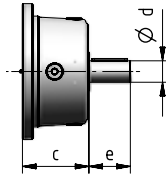
Gear reducer
cylindrical shaft end

Shaft length

C...

x

...



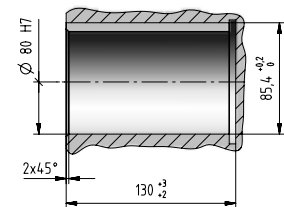
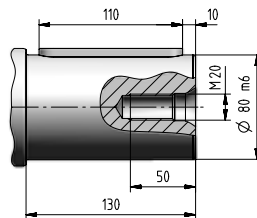
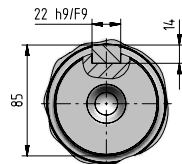
Suggested mating dimensions

R 4EL, R 4EB

C80

x

130

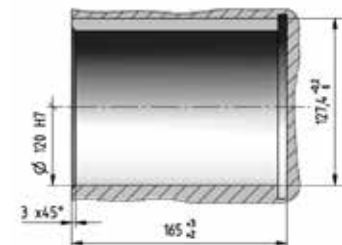
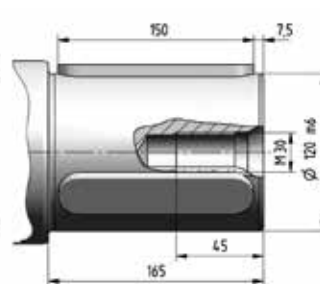
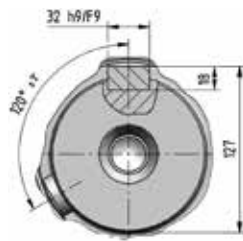


R 3EL

C120

x

165



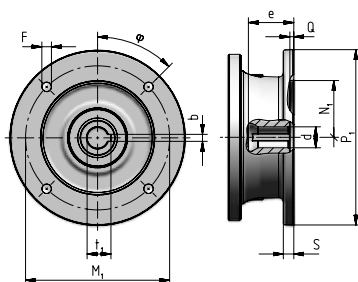
Input

IEC electric motor adapter

I...

x

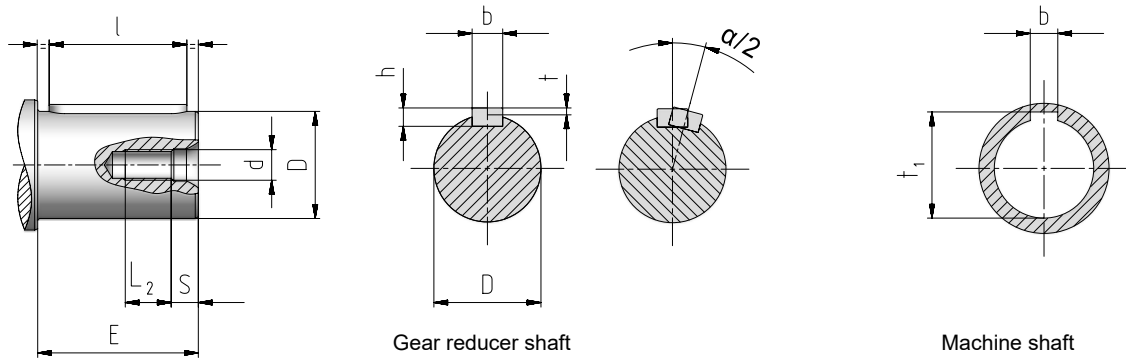
...



Motor size	Code	P ₁	S	d	e	b	t ₁	M ₁	F	φ	N ₁	Q
		∅		∅	max				∅		∅	
IEC						F9					G7	
160	I42×350	350	15	42 F6	113	12	45,3	300	18	(n.4)	45°	250 6
180	I48×350	350	15	48 F6	113	14	51,8	300	18	(n.4)	45°	250 6
200	I55×400	400	15	55 E6	113	16	59,3	350	18	(n.4)	45°	300 6
225	I60×450	450	18	60 E6	143	18	64,4	400	18	(n.8)	22,5°	350 6
250	I65×550	550	18	65 E6	142	18	69,4	500	18	(n.8)	22,5°	450 6
280	I75×550	550	18	75 E6	142	20	79,9	500	18	(n.8)	22,5°	450 6

R 2EL, R 3EL combined with R I, R 2I, R CI

High speed shaft end



Shaft end							Key			Keyway					
D Ø		E ¹⁾	d Ø	S	L ₂ ¹⁾		α/2 ²⁾ arc min	b h9	h h11	l ¹⁾	b H9 hub N9 shaft	t shaft	t ₁ hub		
48	k 6	110 (82)	M 12	9,5	22,5	(26,5)	3,08	14	×	9	×	90 (70)	14	5,5	51,8
55	m 6	110	M 12	9,5	22,5		—	16	×	10	×	90	16	6	59,3
70	m 6	140 (105)	M 16	12,7	27,3	(35,3)	2,55	20	×	12	×	125 (90)	20	7,5	74,9
90	m 6	170 (130)	M 20	16	34	(44)	1,99	25	×	14	×	140 (110)	25	9	95,4
95	m 6	170	M 20	16	34		—	25	×	14	×	140	25	9	100,4
110	m 6	210 (165)	M 24	19	41		1,63	28	×	16	×	180 (140)	28	10	116,4

1) Values in brackets are for short shaft end.

2) Maximum angular misalignment between double extension shaft keys.

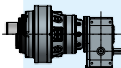
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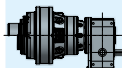
1060A
1500A
2120A
3000A

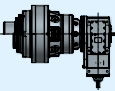
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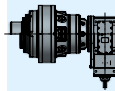
Data and performance summary	30
Main Dimensions	34
Input side details	37

			$L_h = 10\,000\text{ h}$			M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min ⁻¹	$n_1 = 1\,400\text{ min}^{-1}$		
			$n_1\text{ min}^{-1}$ $n_2\text{ min}^{-1}$ $M_{N2}\text{ N m}$					$P_t\text{ [kW] at } 20^{\circ}\text{C}$ 40°C		
	i_N	i_{eff}	1 400	900	500			—		
R 3EL 1500 A	80	83,3		10,8 1 010 586	6,00 1 019 746	1 500 000 2 500 000	1 000 1 400	210 180	- -	- -
	100	97,4		9,24 1 013 652	5,14 1 021 644					
	112	114		7,91 1 015 877	4,39 1 023 610					
	125	119		7,53 1 016 497	4,18 1 024 154					
	140	140		6,44 1 018 693	3,58 1 025 918					
	160	171		5,25 1 021 396	2,92 1 028 553					
R 4EL 1500A	355	348	4,03 1 024 584	2,59 1 029 824	1,44 1 066 347	1 500 000 2 500 000	1 400 2 500	160 125	- -	- -
	400	406	3,45 1 026 562	2,21 1 031 685	1,23 1 089 261					
	450	441	3,18 1 027 487	2,04 1 032 567	1,13 1 101 329					
	500	515	2,72 1 029 349	1,75 1 036 405	0,970 1 126 189					
	560	571	2,45 1 030 503	1,58 1 051 903	0,875 1 142 155					
	630	603	2,32 1 031 092	1,49 1 059 495	0,830 1 150 450					
	710	739	1,89 1 033 472	1,22 1 091 307	0,676 1 184 947					
	800	819	1,71 1 039 685	1,10 1 106 409	0,610 1 201 446					
	1000	908	1,54 1 055 038	0,992 1 122 375	0,551 1 218 798					
	1000	1006	1,39 1 070 312	0,895 1 138 644	0,497 1 236 465					

			$L_h = 10\,000\text{ h}$			M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min ⁻¹	$n_1 = 1\,400\text{ min}^{-1}$			P_t [kW] at 20°C 40°C		
			$n_1\text{ min}^{-1}$										
			$n_2\text{ min}^{-1}$										
			$M_{N2}\text{ N m}$										
	i_N	i_{eff}	1 400	900	500								
R 2EL 1500A + R 2I 4000	200	196	7,13 1 017 384	4,58 1 022 993	2,55 1 030 008	1 500 000 2 500 000	1 600 2 120	315 236	420 315	560 425			
	224	223	6,27 1 019 097	4,03 1 024 573	2,24 1 031 521								
	250	247	5,66 1 020 432	3,64 1 025 815	2,02 1 032 673								
	280	281	4,98 1 022 060	3,20 1 027 339	1,78 1 034 099								
	315	320	4,37 1 023 680	2,81 1 028 867	1,56 1 052 689								
	350	351	3,98 1 024 809	2,56 1 029 938	1,42 1 066 442								
	380	379	3,70 1 025 709	2,38 1 030 794	1,32 1 077 640								
	400	411	3,41 1 026 677	2,19 1 031 719	1,22 1 090 011								
	450	473	2,96 1 028 338	1,90 1 033 314	1,06 1 111 873								
	500	524	2,67 1 029 508	1,72 1 038 590	0,955 1 127 766								
630	643	2,18 1 031 837	1,40 1 068 861	0,778 1 160 620									

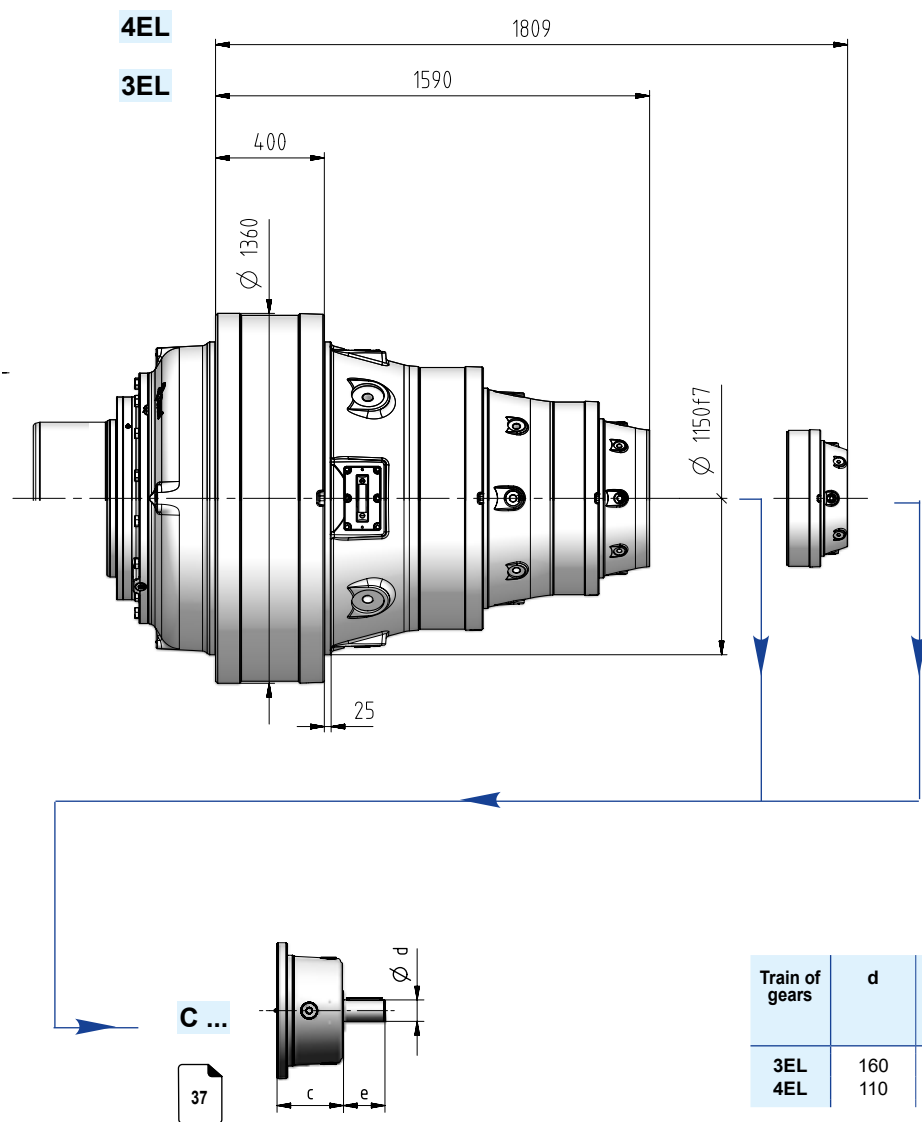
			$L_h = 10\,000\text{ h}$			M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min ⁻¹	$n_1 = 1\,400\text{ min}^{-1}$			P_t [kW] at 20°C 40°C		
			$n_1\text{ min}^{-1}$										
			$n_2\text{ min}^{-1}$										
			$M_{N2}\text{ N m}$										
	i_N	i_{eff}	1 400	900	500								
R 3EL 1500 + R 2I 280	800	768	1,82 1 033 827	1,17 1 095 848	0,651 1 189 977	1 500 000 2 500 000	2 800 3 500	140 106	180 140	280 210			
	900	867	1,61 1 047 718	1,04 1 114 626	0,577 1 210 385								
	1000	991	1,41 1 067 469	0,908 1 135 684	0,505 1 233 297								
	1120	1109	1,26 1 084 472	0,812 1 153 750	0,451 1 252 941								
	1250	1224	1,14 1 099 579	0,735 1 169 836	0,408 1 270 444								
	1400	1354	1,03 1 115 273	0,664 1 186 549	0,369 1 288 631								
	1600	1528	0,916 1 134 255	0,589 1 206 766	0,327 1 310 727								
	1800	1746	0,802 1 155 690	0,515 1 229 595	0,286 1 335 526								
	2000	1954	0,716 1 174 079	0,461 1 249 191	0,256 1 356 834								
	2240	2157	0,649 1 190 437	0,417 1 266 640	0,232 1 375 807								
	2500	2396	0,584 1 208 170	0,376 1 285 534	0,209 1 396 373								
	2800	2647	0,529 1 225 160	0,340 1 303 745	0,189 1 416 068								
	3150	2941	0,476 1 243 424	0,306 1 323 153	0,170 1 437 379								
	3550	3438	0,407 1 271 015	0,262 1 352 514	0,145 1 469 276								
	3800	3798	0,369 1 288 901	0,237 1 371 564	0,132 1 489 947								
	4200	4220	0,332 1 308 238	0,213 1 392 058	0,118 1 512 234								

			$L_h = 10\,000\text{ h}$			M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min ⁻¹	$n_1 = 1\,400\text{ min}^{-1}$		
			$n_1\text{ min}^{-1}$ $n_2\text{ min}^{-1}$ $M_{N2}\text{ N m}$					P_t [kW] at 20°C 40°C		
								 		
i_N	i_{eff}		1 400	900	500			—		
R 2EL 1500A + R CI 4000	160	155		5,82 1 019 934	3,23 1 027 293	1 500 000 2 500 000	1 250 2 120	300 224	400 300	560 425
	180	176		5,12 1 021 705	2,85 1 028 785					
	200	202		4,45 1 023 370	2,47 1 030 412					
	224	222		4,06 1 024 587	2,25 1 031 447					
	250	237		3,80 1 025 283	2,11 1 032 130					
	280	283		3,18 1 027 475	1,77 1 034 342					
	315	299		3,01 1 028 048	1,67 1 042 378					
	355	330		2,72 1 029 226	1,51 1 057 235					
	380	379		2,38 1 030 794	1,32 1 077 640					
	400	419		2,15 1 031 943	1,19 1 093 040					
450	514		1,75 1 035 923	0,972 1 124 869						

			$L_h = 10\,000\text{ h}$			M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min ⁻¹	$n_1 = 1\,400\text{ min}^{-1}$			
			$n_1\text{ min}^{-1}$ $n_2\text{ min}^{-1}$ $M_{N2}\text{ N m}$					P_t [kW] at 20°C 40°C			
								 			
i_N	i_{eff}		1 400	900	500			—			
R 3EL 1500A + R CI 280	670	679	2,06 1 032 451	1,33 1 077 083	0,736 1 169 577	1 500 000 2 500 000	2 360 3 350	170 125	224 170	340 250	
	710	749	1,87 1 033 554	1,20 1 092 088	0,667 1 185 889						
	800	849	1,65 1 044 585	1,06 1 111 293	0,589 1 206 772						
	950	937	1,49 1 059 135	0,961 1 126 777	0,534 1 223 606						
	1000	1071	1,31 1 079 145	0,841 1 148 079	0,467 1 246 782						
	1120	1182	1,18 1 094 177	0,762 1 164 084	0,423 1 264 196						
	1250	1344	1,04 1 114 086	0,670 1 185 285	0,372 1 287 266						
	1400	1499	0,934 1 131 236	0,600 1 203 550	0,334 1 307 246						
	1600	1665	0,841 1 148 068	0,540 1 221 474	0,300 1 326 712						
	1800	1884	0,743 1 168 097	0,478 1 242 817	0,265 1 349 903						
	2000	2151	0,651 1 189 979	0,418 1 266 134	0,232 1 375 263						
	2240	2390	0,586 1 207 702	0,377 1 285 020	0,209 1 395 814						
	2800	2703	0,518 1 228 789	0,333 1 307 599	0,185 1 420 277						
	3550	3429	0,408 1 270 507	0,263 1 351 973	0,146 1 468 687						

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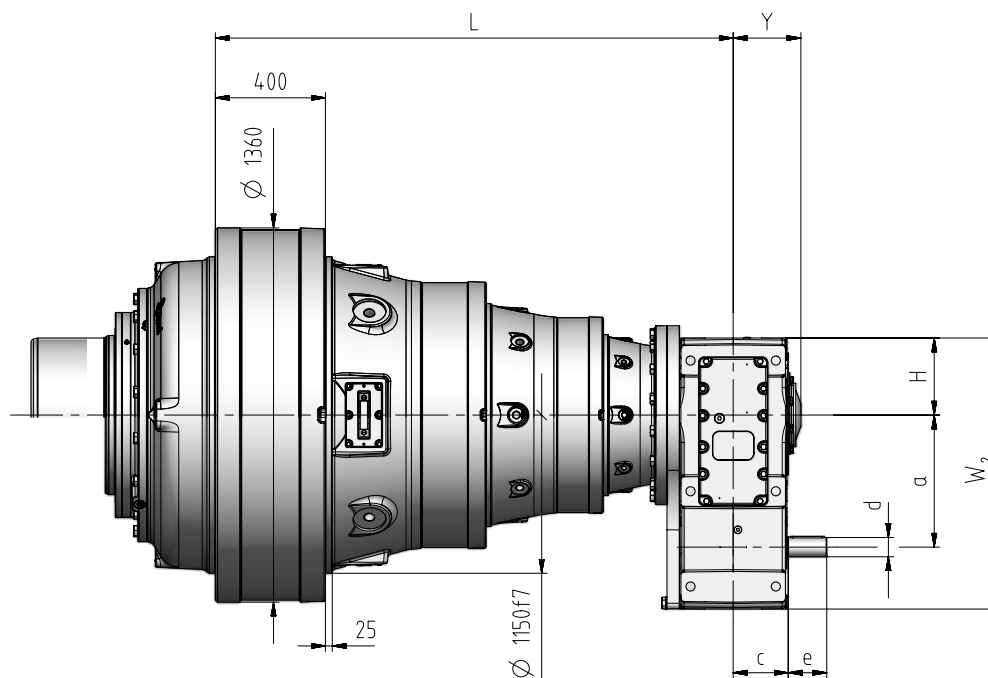
R 3EL, R 4EL



Train of gears	d	e	c	Code
3EL	160	240	317,5	C160×240
4EL	110	165	200	C110×165

Train of gears	Input Options		Output Options (Δ)					
	kg	Code	H...	Z...	T...	C...	S...	Q...
3EL	-	7915	+0	-204	-165	+1535	+1240	+730
4EL	7965	-						

R 2EL, R 3EL combined with R 2I

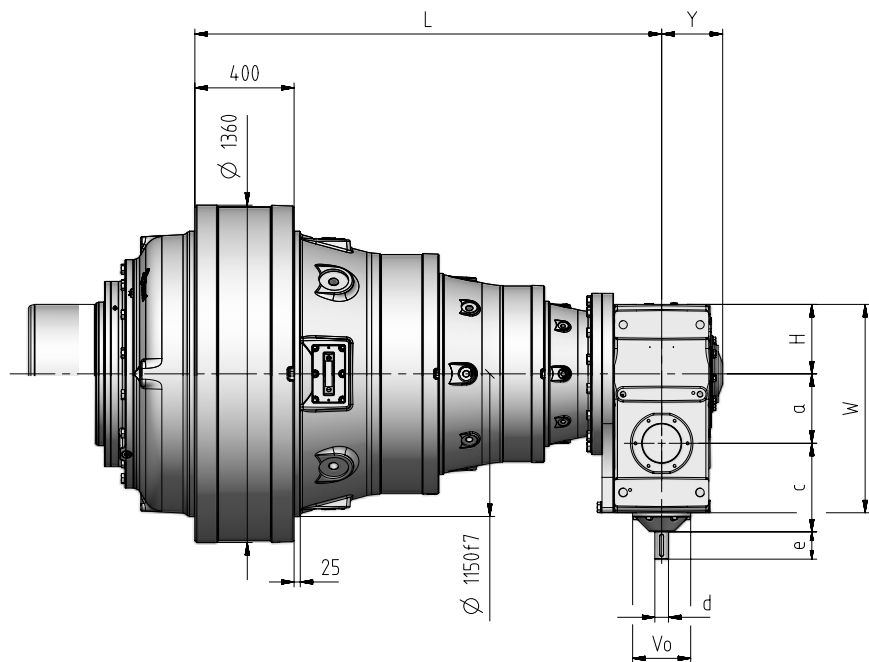


Train of gears	L	Y	H	a	c	d	e	d	e	W ₂
2EL 1060 + 2I 4000	1684	326,5	450	700	330	$i_N \leq 4$		$i_N \geq 4,5$		1567*
3EL 1500 + 2I 280	1882	246	280	480	200	70	140	-		985

* For mounting positions B6, B7, V5, V6 dimension W2 increases by approximately 20 mm for filler plug dimensions.

Train of gears		Output Options (Δ) Code					
		H...	Z...	T...	C...	S...	Q...
2EL 1500 + 2I 4000	10050	+0	-204	-165	+1535	+1240	+730
3EL 1500 + 2I 280	8700						

R 2EL, R 3EL combined with R CI



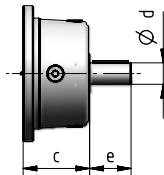
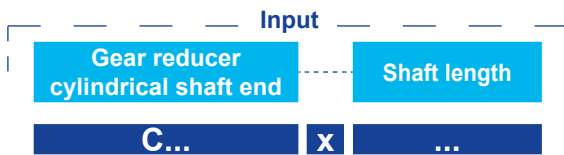
Train of gears	L	Y	H	a	V ₀ Ø	c	d	e	d	e	d	e	W
2EL 1500 + CI 4000	1684	326,5	450	400	372	605	$i_N \leq 11,2$ 110	210	$i_N \geq 12,5$ 90	170	-	-	1320*
3EL 1500 + CI 280	1882	246	280	280	238	$i_N \leq 11,2$ 380 $i_N \geq 12,5$ 357	$i_N \leq 11,2$ 70	140	$i_N = 12,5 \dots 16$ 55	110	$i_N \geq 18$ 48	110	840

* For mounting positions B6, B7, V5, V6 dimension W increases by approximately 20 mm for filler plug dimensions.

Train of gears	 kg	Output Options (Δ) Code					
		H...	Z...	T...	C...	S...	Q...
2EL 1500 + CI 4000 3EL 1500 + CI 280	9950 8550	+0	-204	-165	+1535	+1240	+730

R 3EL, R 4EL

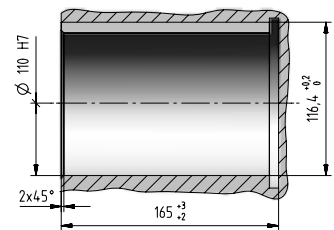
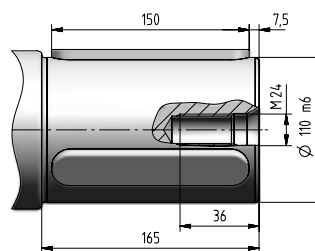
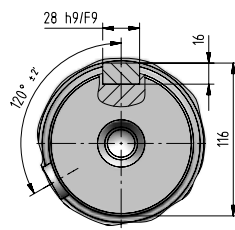
Cylindrical Shaft End Type - CODE



Suggested mating dimensions

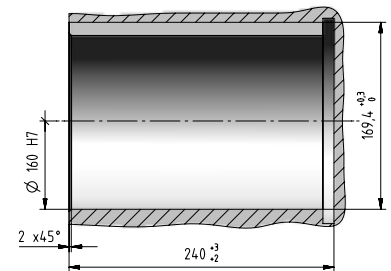
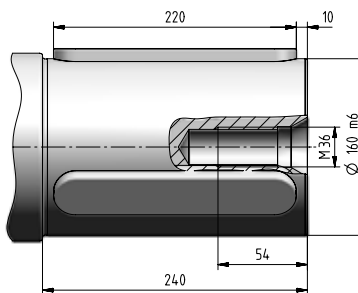
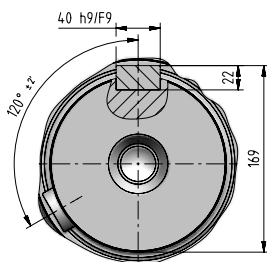
R 4EL

C110 x 165



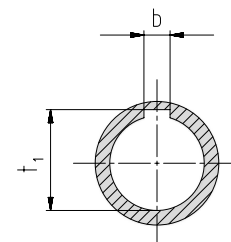
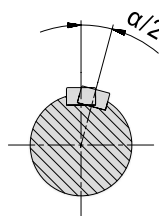
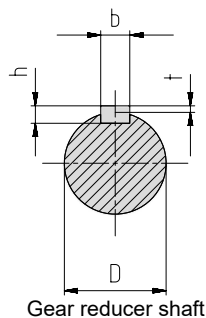
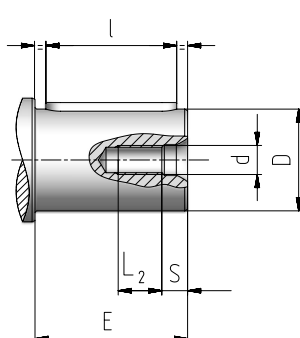
R 3EL

C160 x 240



R 2EL, R 3EL combined with R 2I, R CI

High speed shaft end



Gear reducer shaft

Machine shaft

D Ø		Shaft end					$\alpha/2^{(2)}$ arc min	Key			Keyway		
		E ¹⁾		d Ø	S	L ₂ ¹⁾		b × h h9 × h11	l ¹⁾		b H9 hub N9 shaft	t shaft	t ₁ hub
48	k 6	110	(82)	M 12	9,5	22,5	(26,5)	3,08	14 × 9 × 90 (70)		14	5,5	51,8
55	m 6	110		M 12	9,5	22,5		—	16 × 10 × 90		16	6	59,3
70	m 6	140	(105)	M 16	12,7	27,3	(35,3)	2,55	20 × 12 × 125 (90)		20	7,5	74,9
90	m 6	170	(130)	M 20	16	34	(44)	1,99	25 × 14 × 140 (110)		25	9	95,4
110	m 6	210	(165)	M 24	19	41		1,63	28 × 16 × 180 (140)		28	10	116,4

1) Values in brackets are for short shaft end.

2) Maximum angular misalignment between double extension shaft keys.

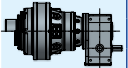
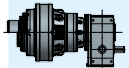
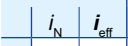
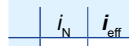
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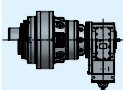
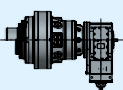
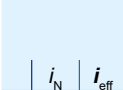
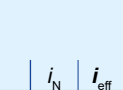
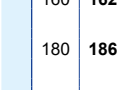
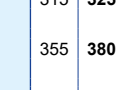
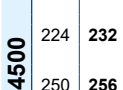
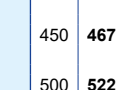
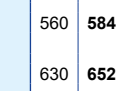
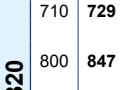
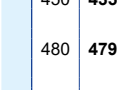
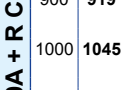
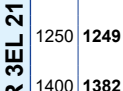
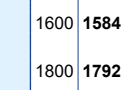
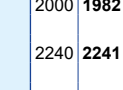
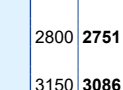
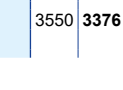
1060A
1500A
2120A
3000A

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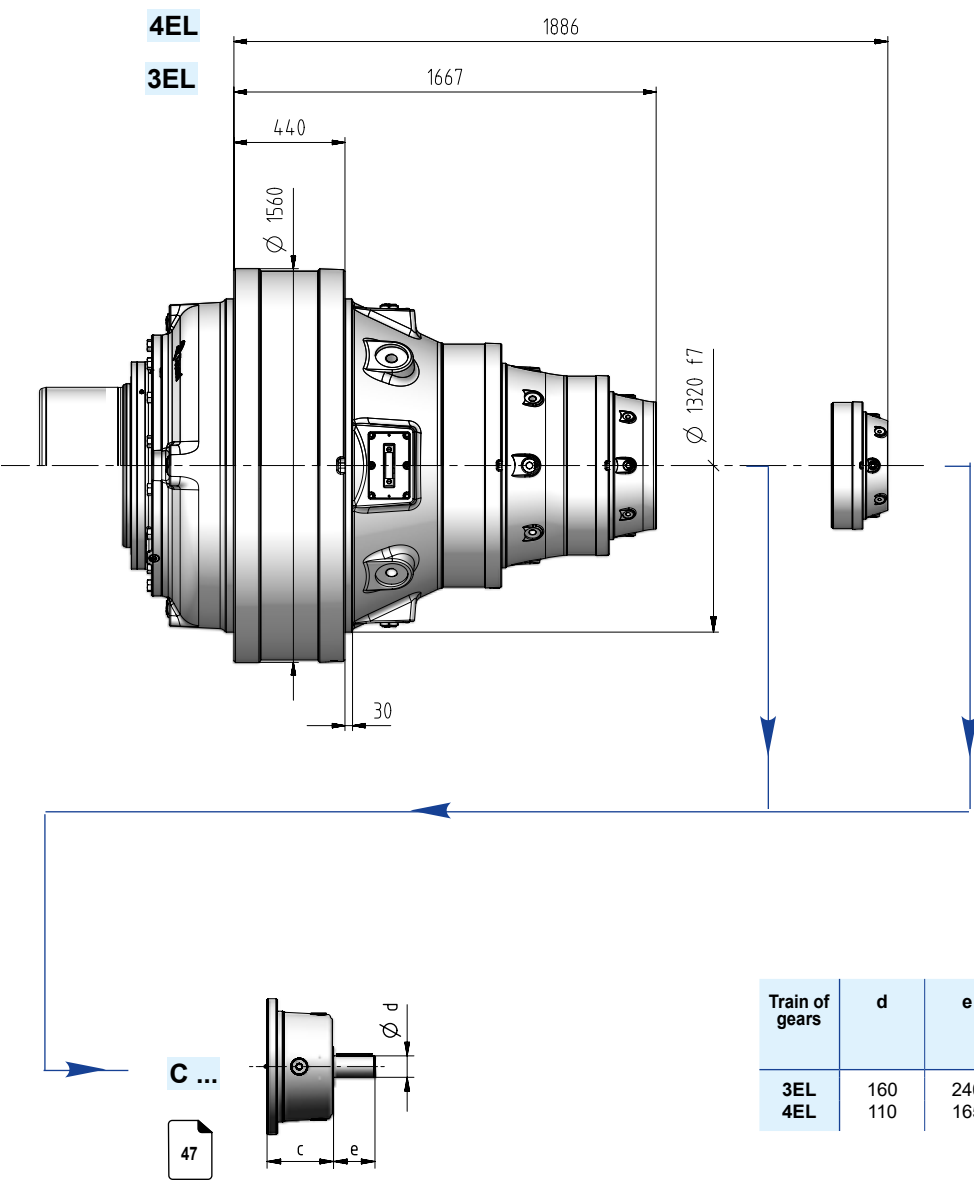
			$L_h = 10\,000\text{ h}$			M_{N2max} M_{2max}	n_{1max} n_{1peak}	$n_1 = 1\,400\text{ min}^{-1}$		
			$n_1\text{ min}^{-1}$					$Pt_{[kW]}\text{ at } 20^{\circ}\text{C}$		
			$n_2\text{ min}^{-1}$					40°C		
			$M_{N2}\text{ N m}$					 		
	i_N	i_{eff}	1 400	900	500	N m	min ⁻¹	—		
R 3EL 2120 A	80	83,3		10,8 1 425 021	6,00 1 437 794	2 120 000 3 800 000	1 000 1 400	265 200	-	-
	100	97,4		9,24 1 429 321	5,14 1 440 913				-	-
	112	114		7,91 1 432 563	4,39 1 443 728					
	125	119		7,53 1 433 471	4,18 1 444 520					
	140	140		6,44 1 436 638	3,58 1 447 311					
	160	171		5,25 1440 536	2,92 1450 807					
R 4EL 2120 A	355	348	4,03 1 445 375	2,59 1 453 014	1,44 1 505 116	2 120 000 3 800 000	1 400 2 500	200 150	-	-
	400	406	3,45 1 447 959	2,21 1 455 292	1,23 1 538 355				-	-
	450	441	3,18 1 449 302	2,04 1 456 568	1,13 1 555 256					
	500	515	2,72 1 451 961	1,75 1 462 068	0,970 1 591 791					
	560	571	2,45 1 453 617	1,58 1 484 387	0,875 1 614 927					
	630	603	2,32 1 454 462	1,49 1 495 415	0,830 1 626 991					
	710	739	1,89 1 457 727	1,22 1 541 256	0,676 1 676 782					
	800	819	1,71 1 466 800	1,10 1 563 211	0,610 1 700 801					
	900	908	1,54 1 488 918	0,992 1 586 299	0,551 1 725 927					
	1000	1006	1,39 1 510 185	0,895 1 609 849	0,497 1 751 543					

 $L_h = 10\,000\text{ h}$ $n_1\text{ min}^{-1}$ $n_2\text{ min}^{-1}$ $M_{N2}\text{ N m}$ M_{N2max} M_{2max} N m n_{1max} n_{1peak} min^{-1} $n_1 = 1\,400\text{ min}^{-1}$ $P_t\text{ [kW]}$ at 20°C 40°C													
 $L_h = 10\,000\text{ h}$ $n_1\text{ min}^{-1}$ $n_2\text{ min}^{-1}$ $M_{N2}\text{ N m}$ M_{N2max} M_{2max} N m n_{1max} n_{1peak} min^{-1} $n_1 = 1\,400\text{ min}^{-1}$ $P_t\text{ [kW]}$ at 20°C 40°C													
 i_N i_{eff} 1 400 900 500													
 i_N i_{eff} 1 400 900 500													
R 2EL 2120A + R 2I 4500	224	226	6,18 1 437 511	3,98 1 445 509	2,21 1 455 232	2 120 000 3 800 000	1 600 2 120	355 265	480 355	710 530			
	250	257	5,45 1 439 863	3,51 1 447 672	1,95 1 457 256								
	280	285	4,91 1 441 771	3,16 1 449 442	1,75 1 460 989								
	315	323	4,33 1 444 014	2,78 1 451 536	1,55 1 487 604								
	340	333	4,20 1 444 548	2,70 1 452 037	1,50 1 494 106								
	380	378	3,70 1 446 730	2,38 1 454 009	1,32 1 521 321								
	400	435	3,22 1 449 102	2,07 1 456 270	1,15 1 552 043								
	500	512	2,73 1 451 738	1,76 1 460 548	0,976 1 589 058								
	560	543	2,58 1 452 803	1,66 1 472 977	0,920 1 602 580								
	600	599	2,34 1 454 303	1,50 1 493 601	0,835 1 625 051								
	710	735	1,91 1 365 973	1,22 1 377 862	0,681 1 434 836								
R 3EL 2120 + R 2I 280	500	534	2,62 1 452 529	1,68 1 469 448	0,936 1 598 740	2 120 000 3 800 000	2 000 2 360	200 150	265 200	400 300			
	630	625	2,24 1 455 070	1,44 1 502 755	0,801 1 634 987								
	710	669	2,09 1 456 172	1,35 1 517 604	0,748 1 651 151								
	800	770	1,82 1 458 407	1,17 1 548 451	0,650 1 684 712								
	850	857	1,63 1 476 042	1,05 1 572 634	0,583 1 711 058								
	900	958	1,46 1 499 666	0,940 1 597 805	0,522 1 738 487								
	1000	1052	1,33 1 519 972	0,856 1 619 414	0,475 1 762 069								
	1120	1189	1,18 1 546 959	0,757 1 648 184	0,420 1 793 417								
	1250	1325	1,06 1 571 082	0,679 1 673 973	0,377 1 821 490								
	1400	1480	0,946 1 596 267	0,608 1 700 785	0,338 1 850 849								
	1600	1625	0,861 1 617 854	0,554 1 723 808	0,308 1 875 921								
	1800	1866	0,750 1 650 351	0,482 1 758 465	0,268 1 913 619								
	2000	2081	0,673 1 676 379	0,432 1 786 215	0,240 1 943 868								
	2240	2350	0,596 1 705 841	0,383 1 817 649	0,213 1 978 125								
	2500	2600	0,538 1 730 803	0,346 1 844 468	0,192 2 007 184								
	2800	2986	0,469 1 765 602	0,301 1 881 494	0,167 2 047 738								
	3150	3191	0,439 1 782 525	0,282 1 899 525	0,157 2 067 366								
	3550	3539	0,396 1 536 821	0,254 1 633 844	0,141 1 774 977								
	4000	4285	0,327 1 577 888	0,210 1 678 187	0,117 1 823 941								

 $L_h = 10\,000\text{ h}$ $n_1\text{ min}^{-1}$ $n_2\text{ min}^{-1}$ $M_{N2}\text{ N m}$													
 $L_h = 10\,000\text{ h}$ $n_1\text{ min}^{-1}$ $n_2\text{ min}^{-1}$ $M_{N2}\text{ N m}$													
 M_{N2max} M_{2max} N m													
 M_{N2max} M_{2max} N m													
 n_{1max} n_{1peak} min⁻¹													
 n_{1max} n_{1peak} min⁻¹													
 $P_t\text{ [kW] at } 20^\circ\text{C}$ 40°C													
 $P_t\text{ [kW] at } 20^\circ\text{C}$ 40°C													
 i_N i_{eff}													
 i_N i_{eff}													
 $1\,400$ 900 500													
 $1\,400$ 900 500													
 $2\,120\,000$ $3\,800\,000$													
 $2\,120\,000$ $3\,800\,000$													
 190 250 380													
 190 250 380													
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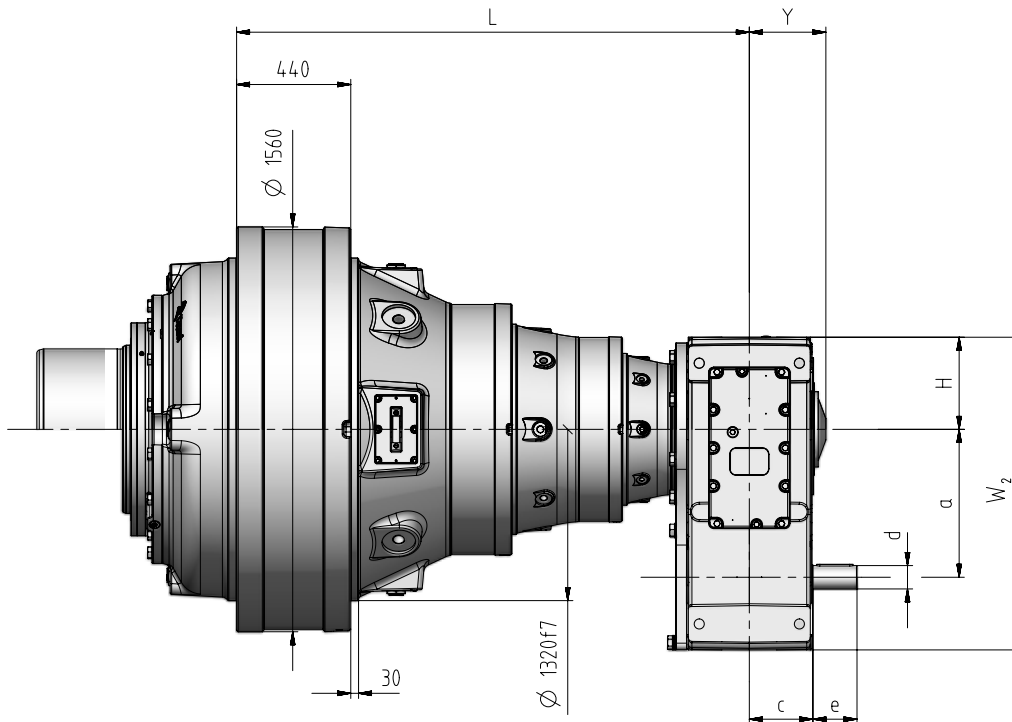
R 3EL, R 4EL



Train of gears	d	e	c	Code
3EL	160	240	317,5	C160×240
4EL	110	165	200	C110×165

Train of gears	Input Options Code		Output Options (Δ) Code					
	C110×165	C160×240	H...	Z...	T...	C...	S...	Q...
3EL	-	10320	+0	-280	-220	+1925	+1570	+935
4EL	10370	-						

R 2EL, 3EL combined with R 2I

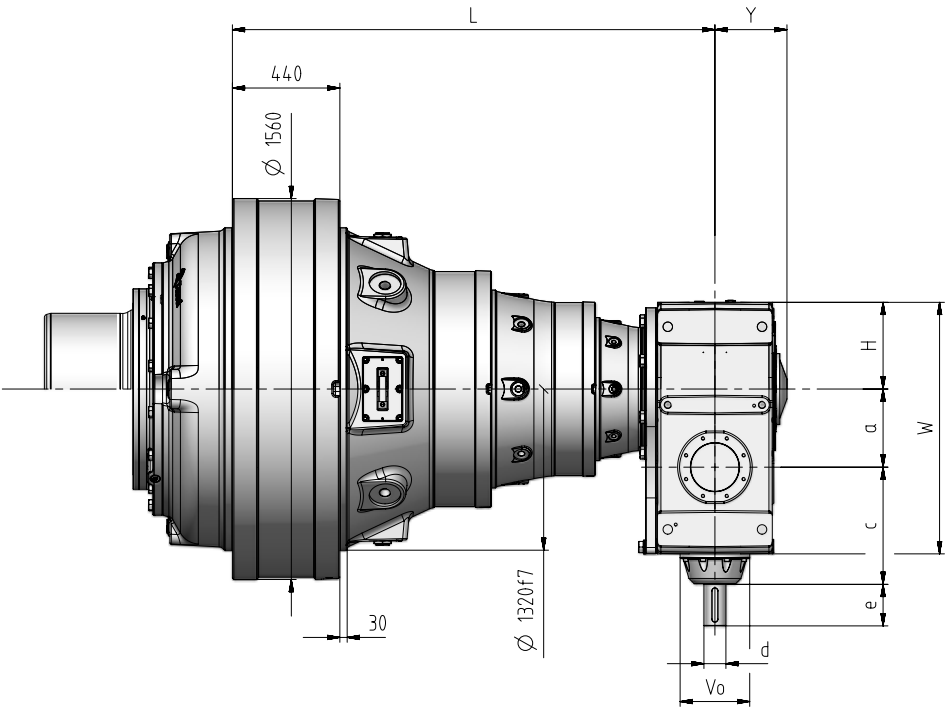


Train of gears	L	Y	H	a	c	d	e	d	e	W ₂
2EL 2120 + 2I 4500	1797	354	450	750	330	$i_N \leq 12,5$		$i_N \geq 14$		1617*
3EL 2120 + 2I 320	1976	295	355	570	245	90	170	-		1205

* For mounting positions B6, B7, V5, V6 dimension W₂ increases by approximately 20 mm for filler plug dimensions.

Train of gears	kg	Output Options (Δ) Code					
		H...	Z...	T...	C...	S...	Q...
2EL 2120 + 2I 4500	13050	+0	-280	-220	+1925	+1570	+935
3EL 2120 + 2I 320	11660						

R 2EL, R 3EL combined with R CI



Train of gears	L	Y	H	a	V ₀ Ø	c	d	e	d	e	d	e	W
2EL 2120 + CI 4500	1797	354	450	450	372	605	$i_N \leq 12,5$ 110	210	$i_N \geq 14$ 90	170	-	-	1370*
3EL 2120 + CI 320	1976	295	355	320	290	480	$i_N \leq 10$ 90	170	$i_N = 11,2 \dots 16$ 70	140	$i_N \geq 18$ 70	140	1030

* For mounting positions B6, B7, V5, V6 dimension W increases by approximately 20 mm for filler plug dimensions.

Train of gears		Output Options (Δ) Code					
		H...	Z...	T...	C...	S...	Q...
2EL 2120 + CI 4500 3EL 2120 + CI 320	13140 11530	+0	-280	-220	+1925	+1570	+935

R 3EL, R 4EL

Cylindrical Shaft End Type - CODE

Input

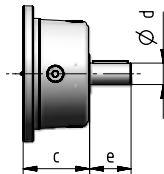
Gear reducer
cylindrical shaft end

Shaft length

C...

x

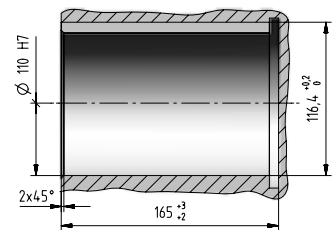
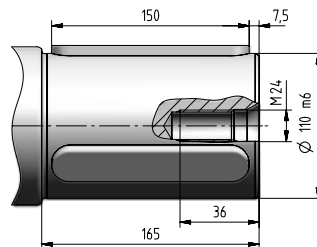
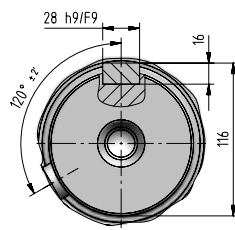
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Suggested mating dimensions

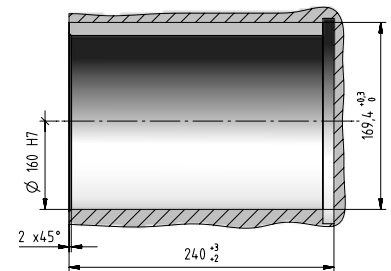
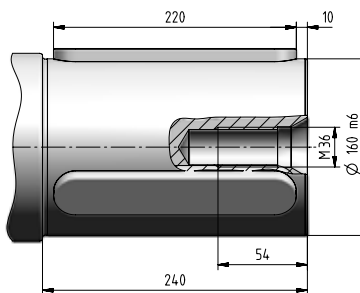
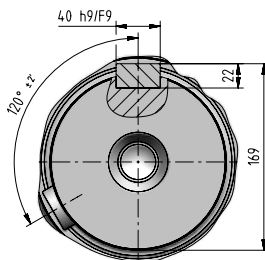
R 4EL

C110 x 165



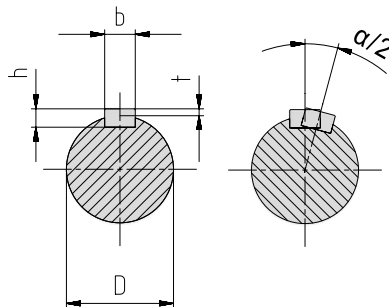
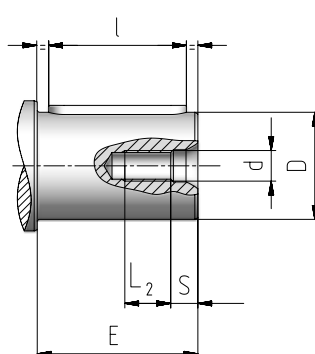
R 3EL

C160 x 240

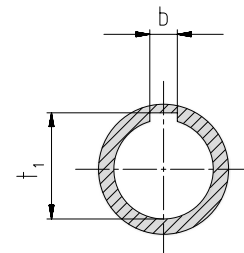


R 2EL, R 3EL combined with R 2I, R CI

High speed shaft end



Gear reducer shaft



Machine shaft

Shaft end									Key			Keyway		
D Ø		E ¹⁾		d Ø	S	L ₂ ¹⁾		α/2 ²⁾ arc min	b h9	× h11	h × l ¹⁾	b H9 hub N9 shaft	t shaft	t ₁ hub
70	m 6	140	(105)	M 16	12,7	27,3	(35,3)	2,55	20	× 12	× 125 (90)	20	7,5	74,9
90	m 6	170	(130)	M 20	16	34	(44)	1,99	25	× 14	× 140 (110)	25	9	95,4
110	m 6	210	(165)	M 24	19	41		1,63	28	× 16	× 180 (140)	28	10	116,4

1) Values in brackets are for short shaft end.

2) Maximum angular misalignment between double extension shaft keys.

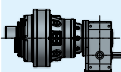
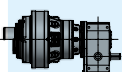
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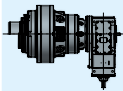
1060A
1500A
2120A
3000A

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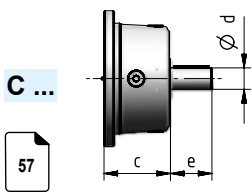
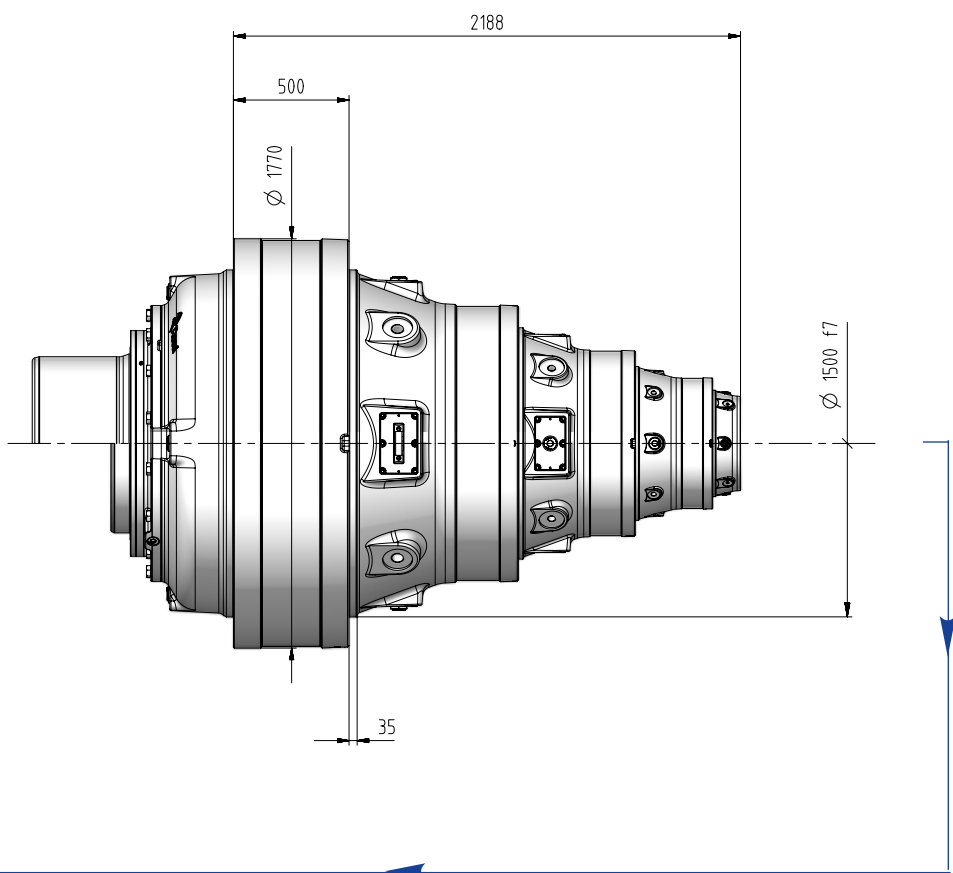
	$L_h = 10\,000\text{ h}$				M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min ⁻¹	$n_1 = 1\,400\text{ min}^{-1}$			
	$n_1\text{ min}^{-1}$						$P_t\text{ [kW] at } 20^{\circ}\text{C}$			
	$n_2\text{ min}^{-1}$ $M_{N2}\text{ N m}$						40°C			
	i_N	i_{eff}	1 400	900	500	N m	min ⁻¹	—		
R 4EL 3000A	400	396		2,27 2 210 119	1,26 2 330 447	3 000 000 5 400 000	1 250 2 000	265 200	- -	- -
	450	463		1,95 2 215 654	1,08 2 386 311					
	500	502		1,79 2 217 529	1,00 2 413 965					
	560	587		1,53 2 267 016	0,852 2 470 784					
	630	650		1,38 2 300 762	0,769 2 507 487					
	710	720		1,25 2 335 421	0,694 2 544 161					
	800	798		1,13 2 370 784	0,626 2 583 907					

			$L_h = 10\,000\text{ h}$ $n_1\text{ min}^{-1}$ $n_2\text{ min}^{-1}$ $M_{N_2}\text{ N m}$			$M_{N_2\text{max}}$ $M_{2\text{max}}$ N m	$n_{1\text{max}}$ $n_{1\text{peak}}$ min ⁻¹	$n_1 = 1\,400\text{ min}^{-1}$ $P_t\text{ [kW] at } 20^\circ\text{C}$ 40°C 						$L_h = 10\,000\text{ h}$ $n_1\text{ min}^{-1}$ $n_2\text{ min}^{-1}$ $M_{N_2}\text{ N m}$			$M_{N_2\text{max}}$ $M_{2\text{max}}$ N m	$n_{1\text{max}}$ $n_{1\text{peak}}$ min ⁻¹	$n_1 = 1\,400\text{ min}^{-1}$ $P_t\text{ [kW] at } 20^\circ\text{C}$ 40°C 				
i_N	i_{eff}		1 400	900	500																		
R 2EL 3000A + R 2I 5000			315	317		2,84 2 205 931	1,58 2 256 374	3 000 000	1 250	500	670	950		900	883	1,59 2 254 184	1,02 2 404 846	0,566 2 621 262	3 000 000	2 000	224	300	450
			355	363		2,48 2 209 347	1,38 2 300 943	5 400 000	2 000	375	500	710		1000	1013	1,38 2 299 937	0,889 2 453 642	0,494 2 674 399	5 400 000	2 360	170	224	340
			400	397		2,27 2 211 607	1,26 2 331 414							1120	1122	1,25 2 334 641	0,802 2 490 679	0,446 2 714 762					
			450	454		1,98 2 214 933	1,10 2 377 446							1250	1246	1,12 2 370 937	0,722 2 529 418	0,401 2 757 011					
			500	510		1,76 2 219 215	0,980 2 418 778							1400	1365	1,03 2 402 861	0,659 2 563 495	0,366 2 794 193					
			560	561		1,60 2 250 425	0,891 2 452 788							1600	1517	0,923 2 440 205	0,593 2 603 619	0,330 2 837 721					
R 3EL 3000 + R 2I 360			1800	1733		0,808 2 488 230	0,519 2 654 750						2000	1926	0,727 2 526 931	0,467 2 696 014	0,260 2 938 825						
			2240	2215		0,632 2 579 204	0,406 2 751 798							2500	2442	0,573 2 616 546	0,369 2 791 454	0,205 3 043 061					
			2800	2763		0,507 2 664 301	0,326 2 842 571							3150	3177	0,441 2 719 393	0,283 2 901 607	0,157 3 163 251					
			3550	3503		0,400 2 758 565	0,257 2 943 379										0,143 3 208 980						

		$L_h = 10\,000\text{ h}$			M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min ⁻¹	$n_1 = 1\,400\text{ min}^{-1}$			
		$n_1\text{ min}^{-1}$					P_t [kW] at 20°C			
		$n_2\text{ min}^{-1}$					40°C			
		$M_{N2}\text{ N m}$					 			
i_N	i_{eff}	1 400	900	500	N m	min ⁻¹	—			
R 3EL 3000A + R CI 360	750	759 2 216 825	1,85 2 352 055	1,19 2 563 495	0,659 2 540 000	3 000 000 5 400 000	2 000 2 800	265 200	355 265	530 400
	850	872 2 250 281	1,60 2 400 683	1,03 2 616 734	0,573 2 616 734					
	900	948 2 277 930	1,48 2 430 155	0,949 2 648 827	0,527 2 648 827					
	1000	1088 2 324 386	1,29 2 479 734	0,827 2 702 831	0,459 2 702 831					
	1120	1196 2 356 759	1,17 2 514 285	0,752 2 740 504	0,418 2 740 504					
	1250	1376 2 405 484	1,02 2 566 295	0,654 2 797 248	0,363 2 797 248					
	1400	1517 2 440 082	0,923 2 603 488	0,593 2 837 577	0,330 2 837 577					
	1800	1745 2 490 678	0,802 2 657 358	0,516 2 896 675	0,287 2 896 675					
	1900	1924 2 526 530	0,728 2 695 586	0,468 2 938 358	0,260 2 938 358					
	2000	2040 2 548 333	0,686 2 718 847	0,441 2 963 757	0,245 2 963 757					
	2240	2249 2 584 983	0,623 2 757 983	0,400 3 006 507	0,222 3 006 507					
	2800	2760 2 663 878	0,507 2 842 119	0,326 3 098 304	0,181 3 098 304					

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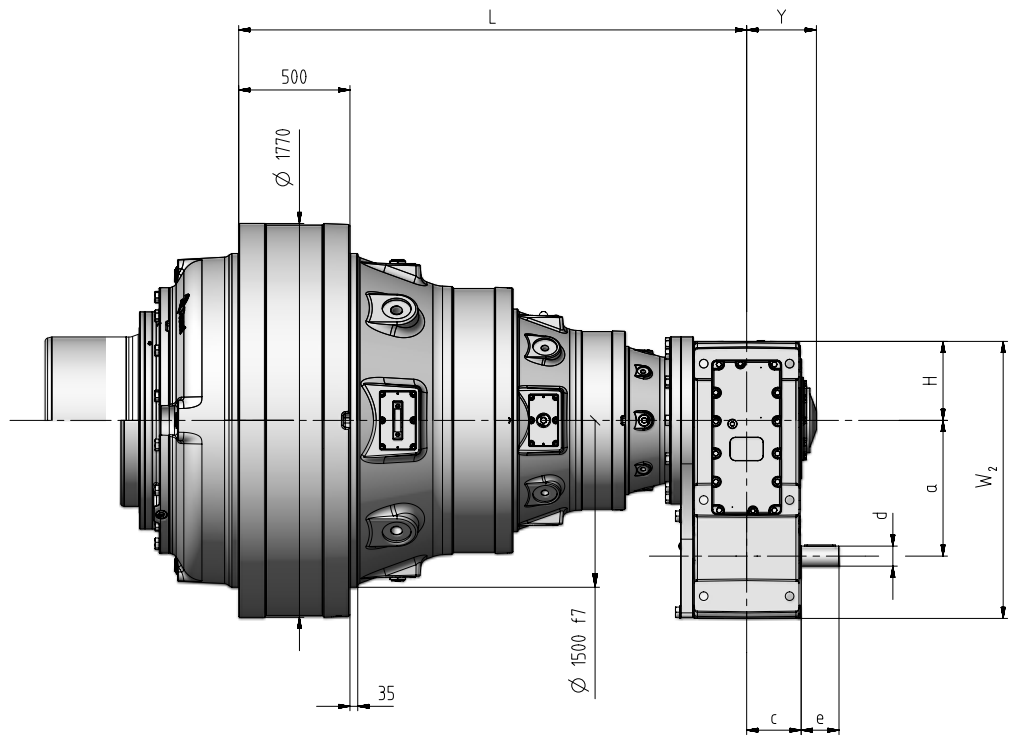
R 4EL



Train of gears	d	e	c	Code
4EL	120	165	277,5	C120×165

Train of gears	 Input Options Code C120x165	Output Options (Δ) Code					
		H...	Z...	T...	C...	S...	Q...
4EL	16140	+0	-470	-370	+3115	+2495	+1620

R 2EL, R 3EL combined with R 2I

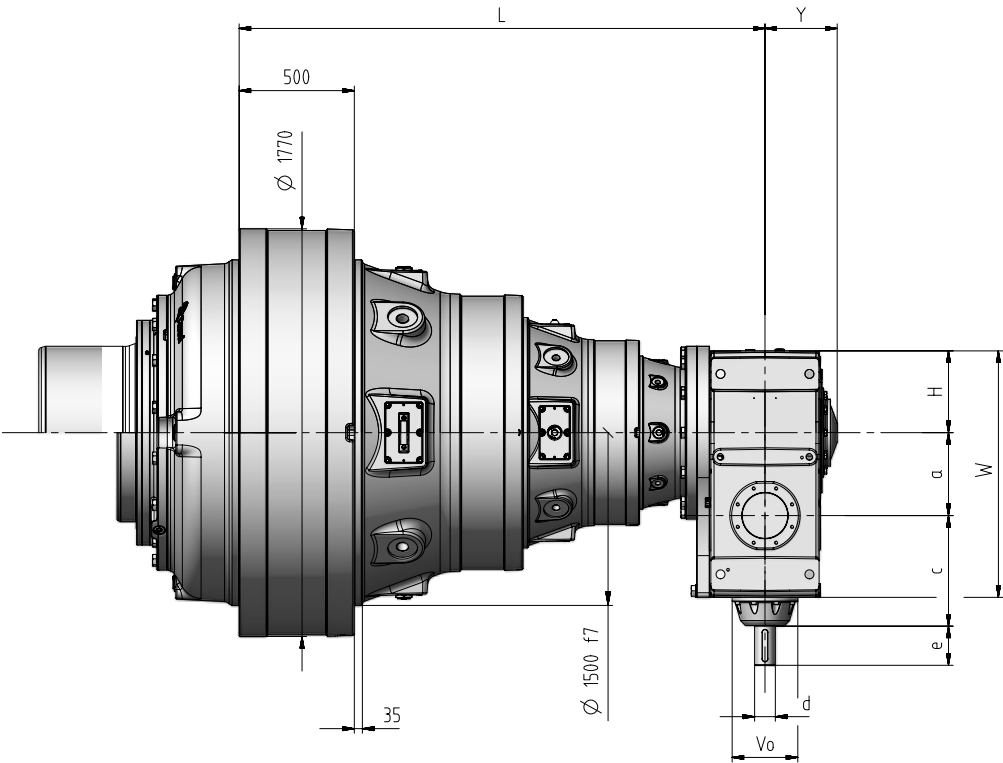


Train of gears	L	Y	H	a	c	d	e	W ₂
2EL 3000 + 2I 5000	2105,5	406,5	560	875	426	110	210	1947*
3EL 3000 + 2I 360	2283	314	355	610	245	90	170	1245

* For mounting positions B6, B7, V5, V6 dimension W₂ increases by approximately 20 mm for filler plug dimensions.

Train of gears	kg	Output Options (Δ) Code					
		H...	Z...	T...	C...	S...	Q...
2EL 3000 + 2I 5000	20470	+0	-470	-370	+3115	+2495	+1620
3EL 3000 + 2I 360	17620						

R 3EL combined with R CI

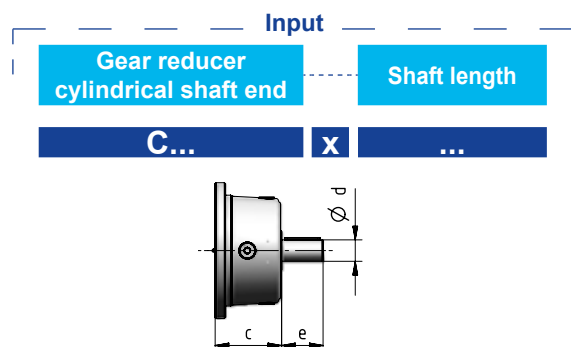


Train of gears	L	Y	H	a	V ₀ Ø	c	d	e	d	e	d	e	W
							$i_N \leq 11,2$		$i_N = 12,5 \dots 16$		$i_N \geq 18$		
3EL 3000 + CI 360	2283	314	355	360	290	480	90	170	70	140	70	140	1070

Train of gears		Output Options (Δ) Code					
		H...	Z...	T...	C...	S...	Q...
3EL 3000 + CI 360	17600	+0	-470	-370	+3115	+2495	+1620

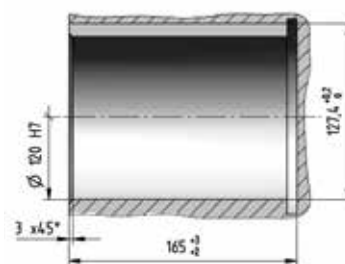
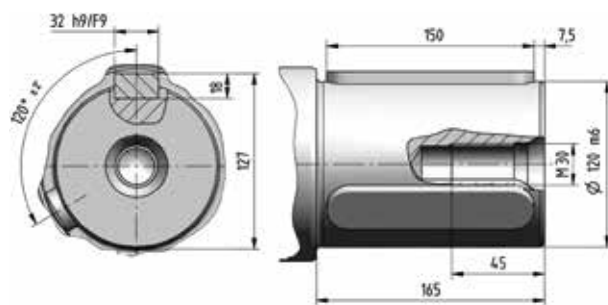
R 4EL

Cylindrical Shaft End Type - CODE



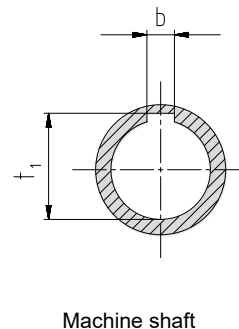
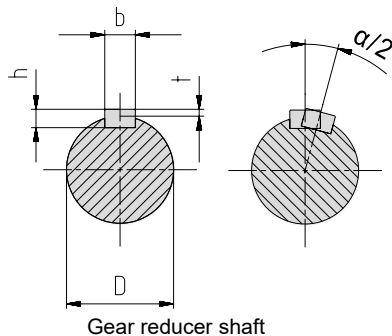
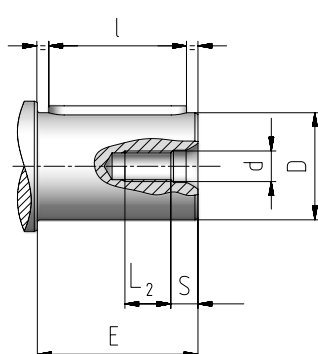
Suggested mating dimensions

C120 x 165



R 2EL, R 3EL combined with R 2I, R CI

High speed shaft end



Shaft end									Key			Keyway		
D Ø		E ¹⁾		d Ø	S	L ₂ ¹⁾		α/2 ²⁾ arc min	b h9	× h h11	× l ¹⁾	b H9 hub N9 shaft	t shaft	t ₁ hub
70	m 6	140	(105)	M 16	12,7	27,3	(35,3)	2,55	20	× 12	× 125 (90)	20	7,5	74,9
90	m 6	170	(130)	M 20	16	34	(44)	1,99	25	× 14	× 140 (110)	25	9	95,4
110	m 6	210	(165)	M 24	19	41		1.63	28	× 16	× 180 (140)	28	10	116,4

1) Values in brackets are for short shaft end.

2) Maximum angular misalignment between double extension shaft keys.

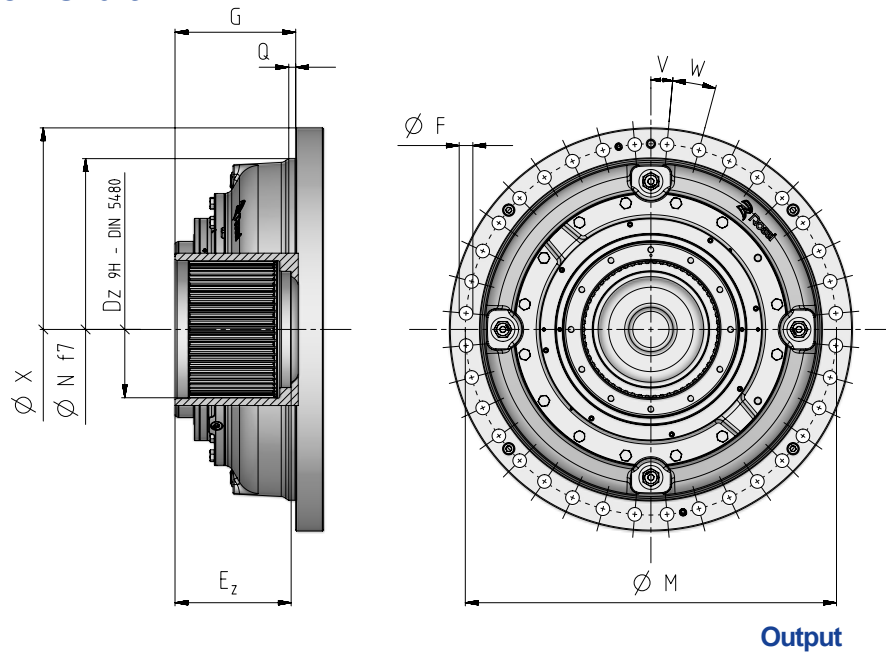
Main dimensions

Output side details

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Splined hollow shaft Z	60
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Cylindrical shaft end C	64
Splined shaft end S	65

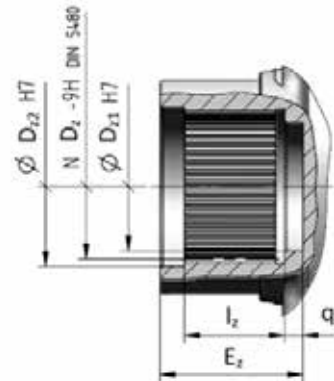
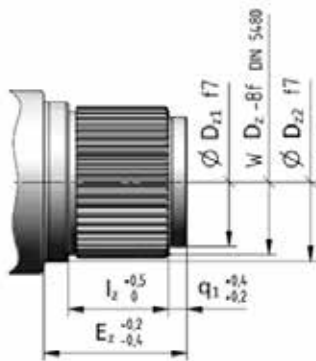
Splined hollow shaft Z



Output

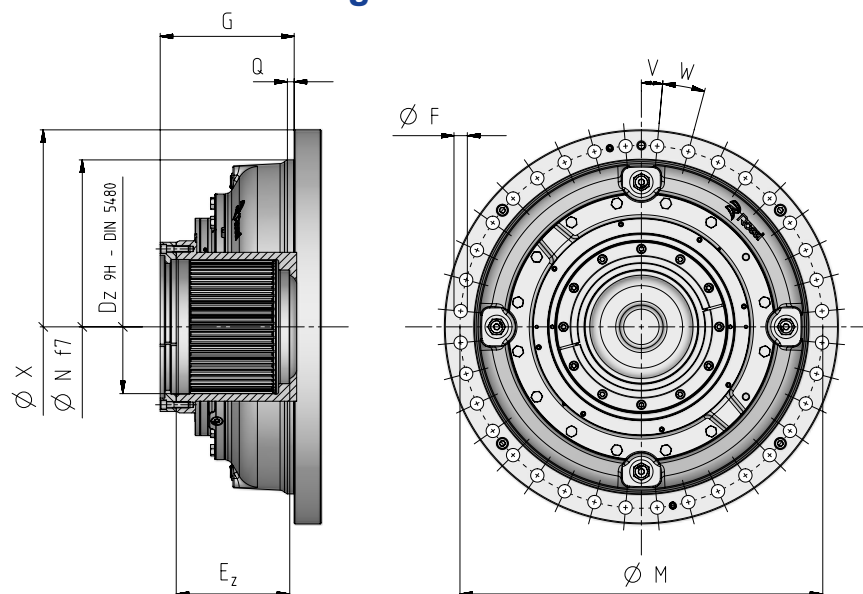
Suggested mating dimensions

Gear reducer splined hollow shaft



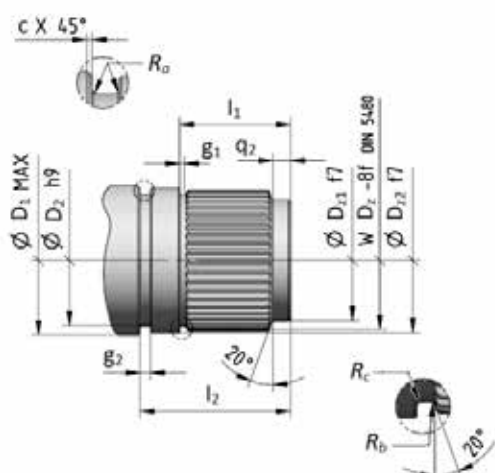
Size	Ordering code	D _z	D _{z1}	D _{z2}	E _z	l _z	q ₁	N	Q	G	X	M	V	W	F
1060	Z400M1 F05o	400×8	340	405	340	260	35	1000	20	345	1200	1100	5,625°	32 × 11,25°	45
1500	Z460M1 F05p	460×8	390	465	390	300	40	1150	21,5	400	1360	1260	4,5°	40 × 9°	45
2120	Z500M1 F05q	500×8	420	505	430	330	45	1320	30	440	1560	1440	4,5°	40 × 9°	50
3000	Z600M1 F05r	600×10	510	605	510	400	50	1500	30,5	530	1770	1630	5°	36 × 10°	60

Splined hollow shaft with axial locking T

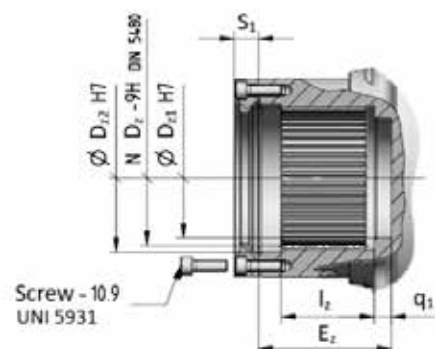


Output

Suggested mating dimensions



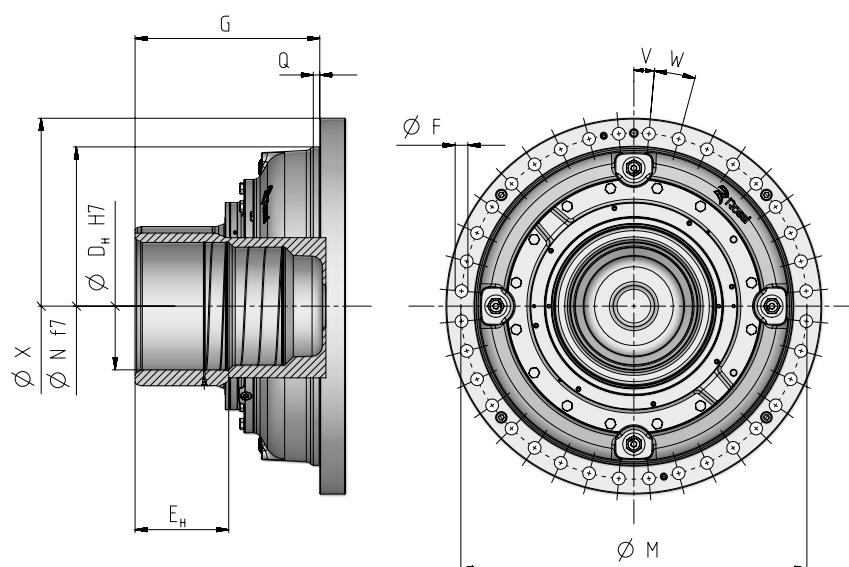
Gear reducer splined hollow shaft with axial locking



Size	Ordering code	D ₂	D ₂₁	D ₂₂	E ₂	I ₂	q ₁	S1	N	Q	G	X	M	V	W	F	Screw n. 12
1060	T400M1 A05o	400×8	340	405	340	260	35	50	1000	20	395	1200	1100	5,625°	32 × 11,25°	45	M20×65
1500	T460M1 A05p	460×8	390	465	390	300	40	58	1150	21,5	458	1360	1260	4,5°	40 × 9°	45	M22×80
2120	T500M1 A05q	500×8	420	505	430	330	45	65	1320	30	505	1560	1440	4,5°	40 × 9°	50	M24×90
3000	T600M1 A05r	600×10	510	605	510	400	50	72	1500	30,5	602	1770	1630	5°	36 × 10°	60	M27×100

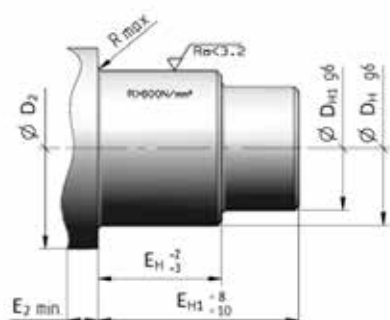
Size	Ordering code	D ₂	D ₁ max	D ₂	I ₁	I ₂	q ₂	g ₁	g ₂	c	R _a	R _b	R _c
1060	T400M1 A05o	400×8	425	380	297	372,5	37	11	18	10	2,5	8	4
1500	T460M1 A05p	460×8	485	435	342	427	40	13	21	12,5	3	9	4,5
2120	T500M1 A05q	500×8	528	472	377	472	47	13	23	14	3	9	4,5
3000	T600M1 A05r	600×10	630	565	453	559	53	15	27	15	3,5	12	6

Hollow for shaft mounting H

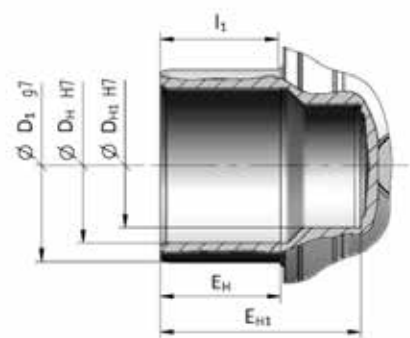


Output

Suggested mating dimensions



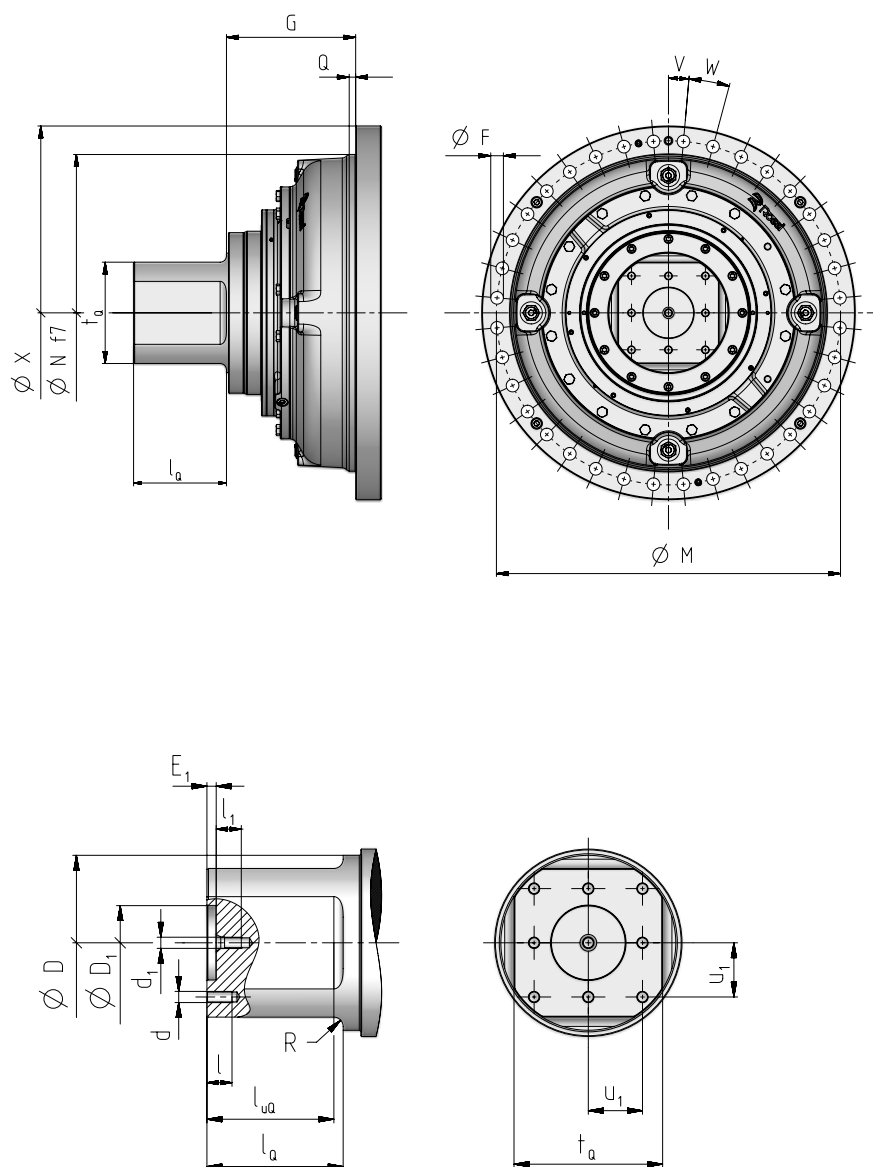
Gear reducer hollow shaft for shaft mounting



Size	Ordering code	D _H	D _{H1}	D ₁	E _H	E _{H1}	I ₁	N	Q	G	X	M	V	W	F	D ₂	E ₂	R _{max}
																min max		
1060	H400M1 A10o	400	370	500	285	470	230	1000	20	590	1200	1100	5,625°	32 × 11,25°	45	475 500	60	10
1500	H460M1 A10p	460	425	560	325	540	265	1150	21,5	670	1360	1260	4,5°	40 × 9°	45	530 560	60	12
2120	H510M1 A10q	510	470	620	375	610	310	1320	30	770	1560	1440	4,5°	40 × 9°	50	590 620	60	15
3000	H600M1 A10r	600	555	750	425	705	364	1500	30,5	870	1770	1630	5°	36 × 10°	60	710 750	70	15

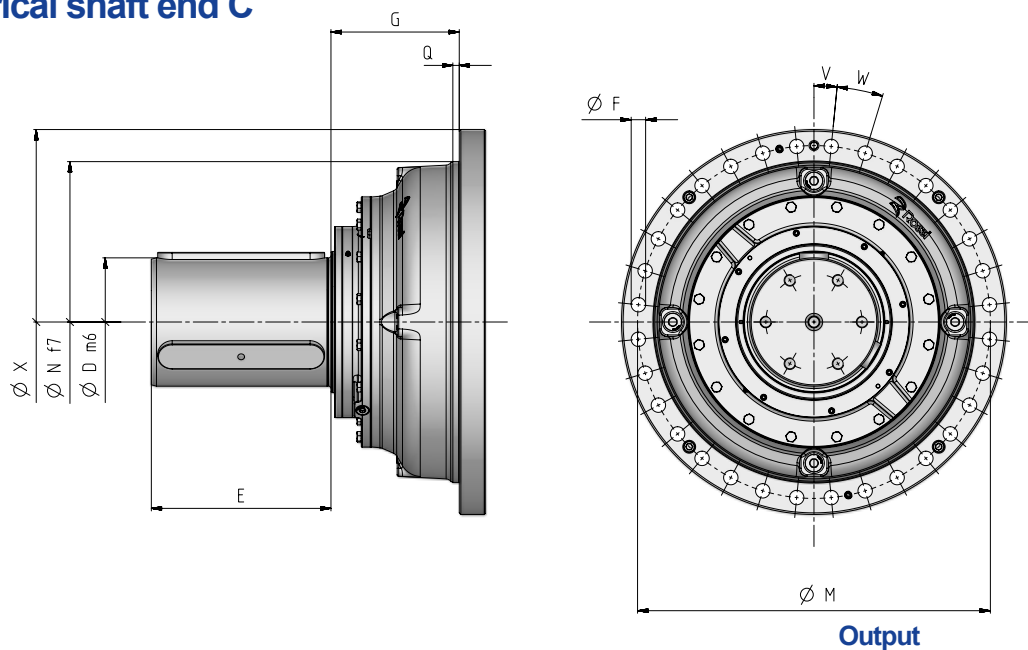
In the event of a shrink disk, see page 69.

Square shaft end extension Q



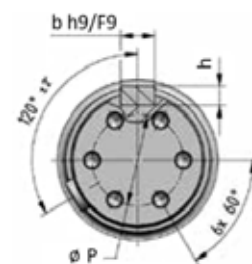
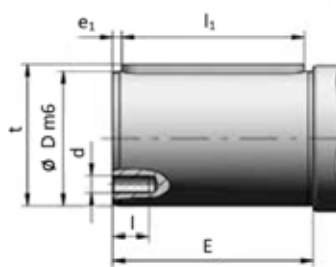
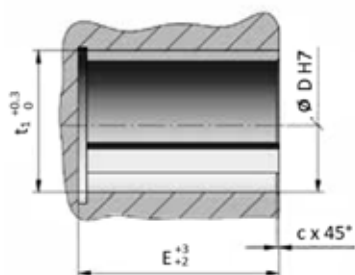
Size	Ordering code	t _q g10	D	l _q	l _{uq}	R	N	Q	G	X	M	V	W	F	D ₁	E ₁	d	l	u ₁	d ₁ × l ₁ n. 8 DIN 332
1060	Q320M1 F05o	320	380	290	270	20	1000	20	395	1200	1100	5,625°	32 × 11,25°	45	160	20	M24	50	115	M36×81
1500	Q370M1 F05p	370	435	340	310	30	1150	21,5	458	1360	1260	4,5°	40 × 9°	45	180	23	M27	60	135	M36×81
2120	Q400M1 F05q	400	472	370	340	30	1320	30	505	1560	1440	4,5°	40 × 9°	50	200	25	M30	65	145	M36×81
3000	Q480M1 F05r	480	565	440	410	30	1500	30,5	612	1770	1630	5°	36 × 10°	60	240	30	M36	80	175	M36×81

Cylindrical shaft end C



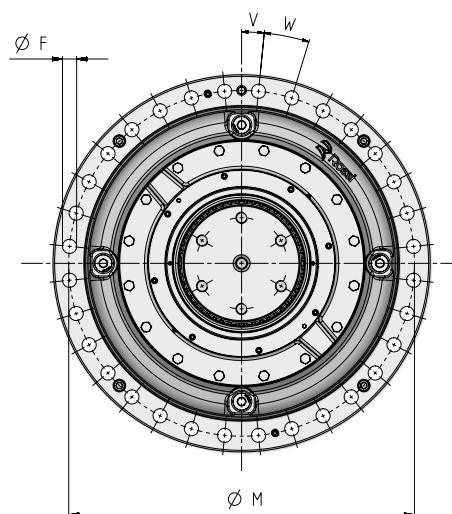
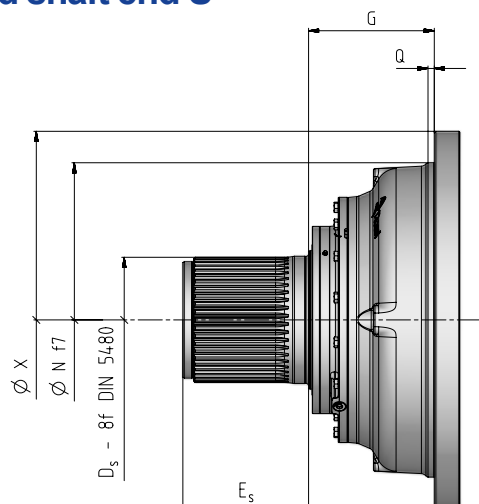
Suggested mating dimensions

Gear reducer cylindrical shaft end



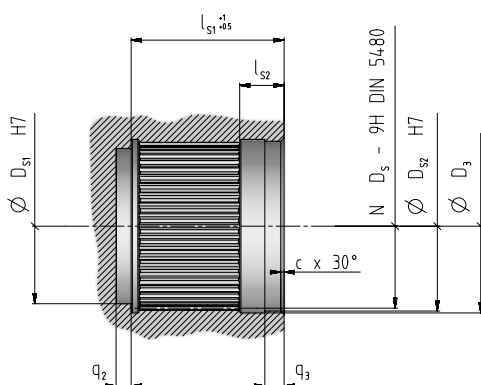
Size	Ordering code	D	E	N	Q	G	X	M	V	W	F	b	h	l ₁	e ₁	t	t ₁	P	d x l	c
1060	C400M1 F10o	400	560	1000	20	400	1200	1100	5,625°	32 × 11,25°	45	90	45	520	20	417	417,4	300	M36×72	8
1500	C460M1 F10p	460	670	1150	21,5	450	1360	1260	4,5°	40 × 9°	45	100	50	620	25	479	479,5	350	M42×85	10
2120	C500M1 F10q	500	710	1320	30	500	1560	1440	4,5°	40 × 9°	50	100	50	660	25	519	519,5	370	M48×96	10
3000	C600M1 F10r	600	850	1500	30,5	550	1770	1630	5°	36 × 10°	60	130	65	800	25	625	625,5	450	M56×112	12

Splined shaft end S

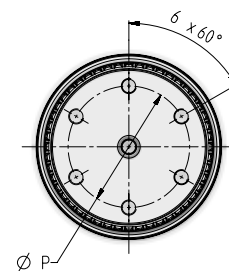
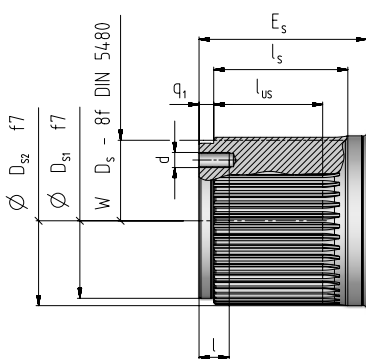


Output

Suggested mating dimensions



Gear reducer
splined shaft end



Size	Ordering code	D_s	E_s	N	Q	G	X	M	V	W	F	D_{s1}	D_{s2}	q_1	l_{us}	l_s	P	d x l
1060	S400M1 F10o	400×8	400	1000	20	400	1200	1100	5,625°	32 × 11,25°	45	370	405	35	260	320	290	M36×72
1500	S460M1 F10p	460×8	460	1150	21,5	450	1360	1260	4,5°	40 × 9°	45	430	465	40	300	370	330	M42×85
2120	S500M1 F10q	500×8	500	1320	30	500	1560	1440	4,5°	40 × 9°	50	470	505	45	330	400	360	M48×96
3000	S600M1 F10r	600×10	600	1500	30,5	550	1770	1630	5°	36 × 10°	60	565	605	50	400	490	430	M56×112

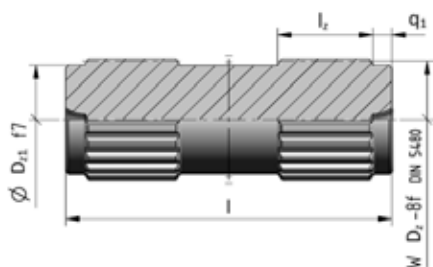
Size	Ordering code	D_s	D_3	l_{s1}	l_{s2}	q_2	q_3	c
1060	S400M1 F10o	400×8	406,5	365	106	36	46	8
1500	S460M1 F10p	460×8	466,5	420	121	41	51	10
2120	S500M1 F10q	500×8	507	455	126	46	56	10
3000	S600M1 F10r	600×10	607	550	151	51	61	12

Accessories

Index

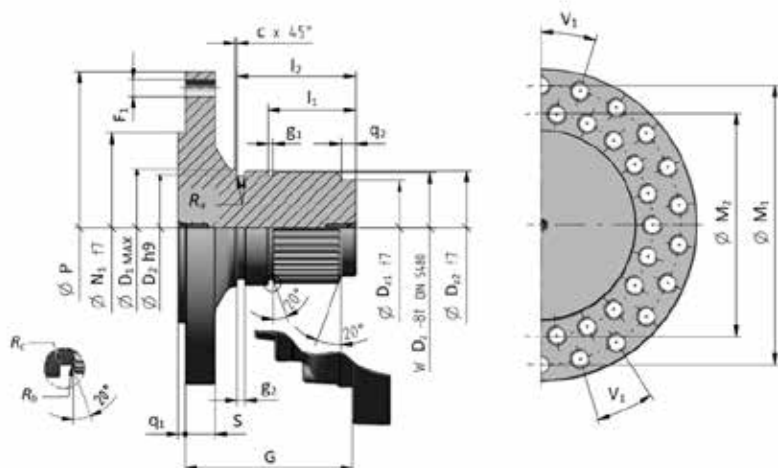
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Asymmetrical torque arm with spherical plain bearing	71
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Cantilever torque arm assembly for system flexibility	73

Splined bar



Size	Ordering code	D ₂	D ₂₁	q ₁	l ₂	l	kg
1060	,SC400	400×8	340	37	279	946	870
1500	,SC460	460×8	390	40	320,5	1100	1350
2120	,SC500	500×8	420	47	344	1240	1795
3000	,SC600	600×10	510	53	398,5	1400	2920

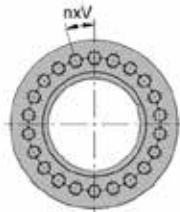
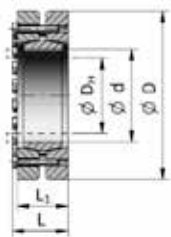
Wheel flange



Size	Ordering code	D ₂	D ₂₁	D ₂₂	D ₁ max	D ₂	l ₁	l ₂	q ₂	g ₁	g ₂	c	R _a	R _b	R _c
1060	,WT400	400×8	340	405	425	380	297	372,5	37	11	18	10	2,5	8	4
1500	,WT460	460×8	390	465	485	435	342	427	40	13	21	12,5	3	9	4,5
2120	WT500	500×8	420	505	528	472	377	472	47	13	23	14	3	9	4,5
3000	,WT600	600×10	510	605	630	565	453	559	53	15	27	15	3,5	12	6

Size	Ordering code	P	N ₁	S	q ₁	G	M ₁	M ₂	V ₁	F ₁	kg
1060	,WT400	990	640	75	15	515	890	750	18°	20+20 M42	890
1500	,WT460	1140	750	85	18	600	1040	870	16,364°	20+22 M42	1360
2120	WT500	1310	880	90	20	670	1200	1020	16,364°	20+22 M48	1900
3000	,WT600	1480	1000	100	22	780	1350	1150	18°	20+20 M56	2900

Shrink disc

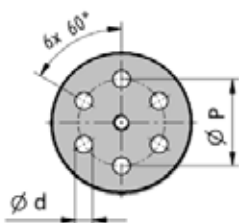
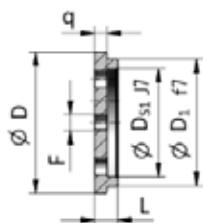


Size	Ordering code	D _H	d	D	L ₁ max	L max	Screws class 12.9 DIN 933	n x V	Tightening torque [Nm]	kg
1060	,SD500	400	500	850	223	246,7	M30	20 x 18°	1970	590
1500	,SD560	460	560	940	258	281,7	M30	24x15°	1970	783
2120	,SD620	510	620	1020	306	329,7	M30	30x12°	1970	1180
3000	,SD750	600	750	1230	320	346	M33	32x11,25°	2650	1732

Stop washer



[included]

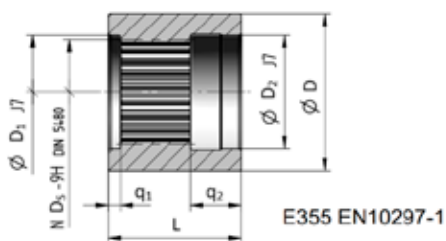


Size	Ordering code	D	D _{s1}	D ₁	q	L	F	d	P	kg
1060	,SW400	490	370	430	42	76	M36	38	290	82
1500	,SW460	560	430	495	48	87	M42	45	330	120
2120	,SW500	610	470	540	52	94	M48	50	360	153
3000	,SW600	740	565	650	63	111	M56	60	430	271

Splined bush

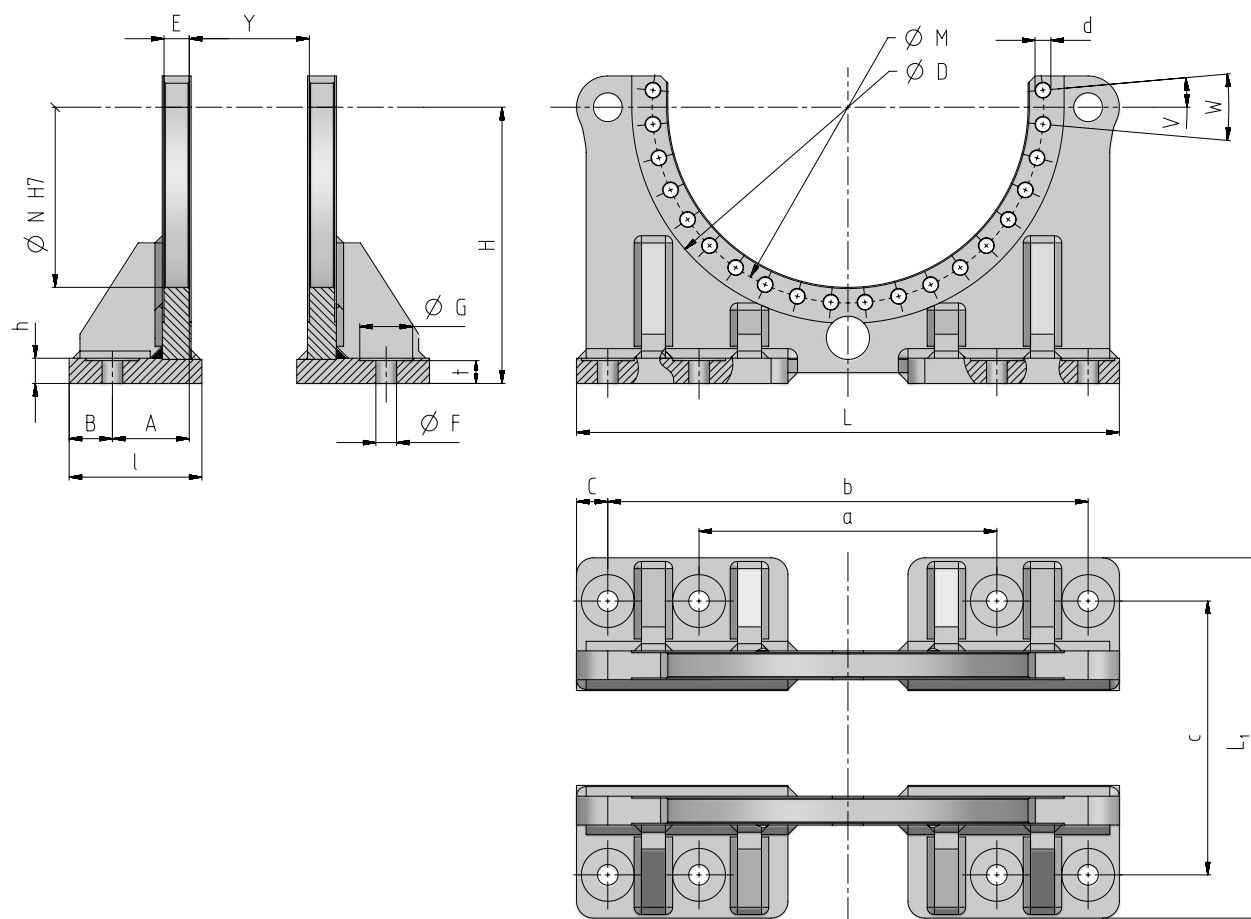


[included]



Size	Ordering code	D _s	D ₁	D ₂	D	L	q ₁	q ₂	kg
1060	,SB400	400x8	430	405	580	400	35	105	428
1500	,SB460	460x8	495	465	660	460	40	120	624
2120	,SB500	500x8	540	505	720	500	45	125	812
3000	,SB600	600x10	650	605	870	600	50	150	1445

Foot bracket



Size	Ordering code	N	D	Y	E	H	A	B	l	a	b	C	L	c	L1	F	G	t	h
1060	,FB10o	1000	1210	350	70	800	220	120	375	840	1360	90	1540	790	1030	62	155	65	70
1500	,FB10p	1150	1380	400	80	900	250	140	430	960	1560	100	1760	900	11890	70	175	75	80
2120	,FB10q	1320	1580	440	90	1000	285	160	490	1100	1760	115	1990	1010	1330	78	195	85	90
3000	,FB10r	1500	1800	500	105	1150	320	180	555	1240	2000	130	2260	1140	1500	86	220	95	105

Size	Ordering code	M	d	V	W	Stud bolt	Washer	Nut class 10	Tightening torque	kg
						class 10.9	UNI	UNI	[Nm]	
1060	,FB10o	1100	45	5,625°	18x11,25°	M42x630 (x18) M42x490 (x14)	5714	5588	5800	1150
1500	,FB10p	1260	45	4,5°	22x9°	M42x700 (x22) M42x540 (x18)	5714	5588	5800	1800
2120	,FB10q	1440	50	4,5°	22x9°	M48x800 (x22) M48x620 (x18)	5714	5588	8400	2000
3000	,FB10r	1630	62	5°	20x10°	M56x910 (x20) M56x700 (x16)	5714	5588	13800	4755

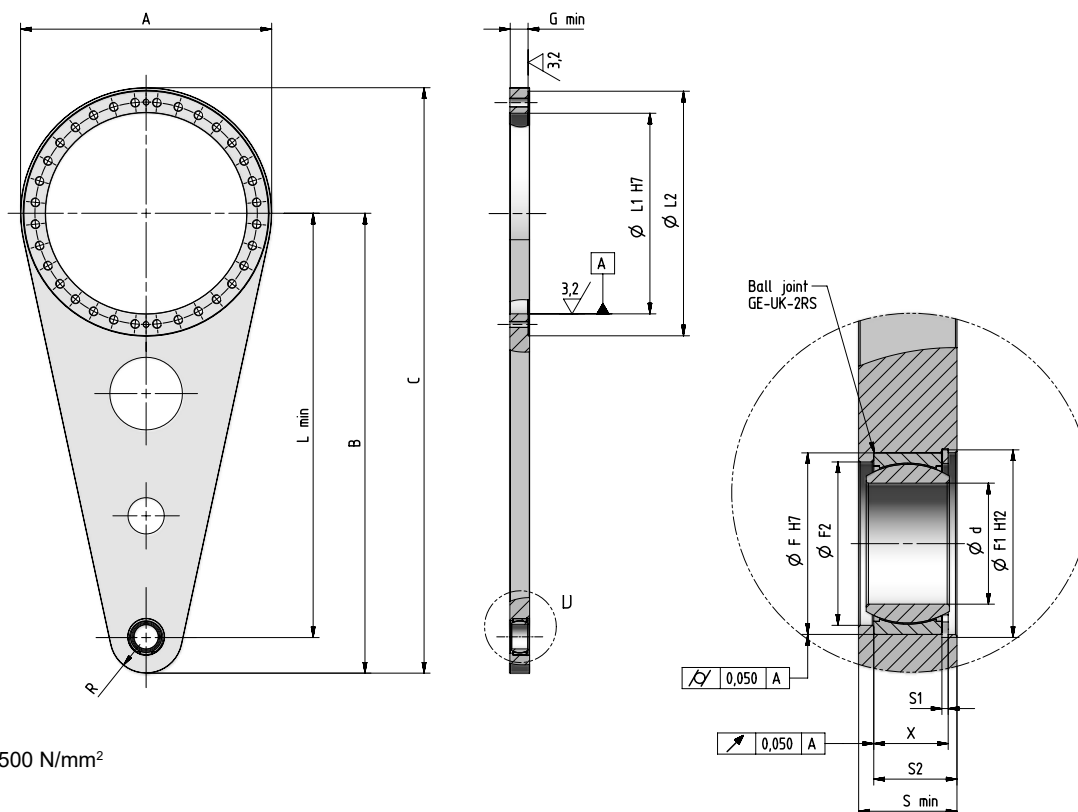
Asymmetrical torque arm with spherical plain bearing

H output design can be considered with rigid shaft fastening.

T type outputs are to be considered less rigid as a consequence of splined shaft connection and mounting backlash.

H output is to be preferred only when following conditions are met:

- shaft mounting where gear reducer is supporting overhanging masses, e.g. EP+G+motor combined units and eventual accessories on support base, and with high bending moments
- applications where you want to reduce the backlash value to a minimum
- in presence of heavy operating conditions, frequent reversals, dusty and particularly aggressive environments
- high reliability over the years

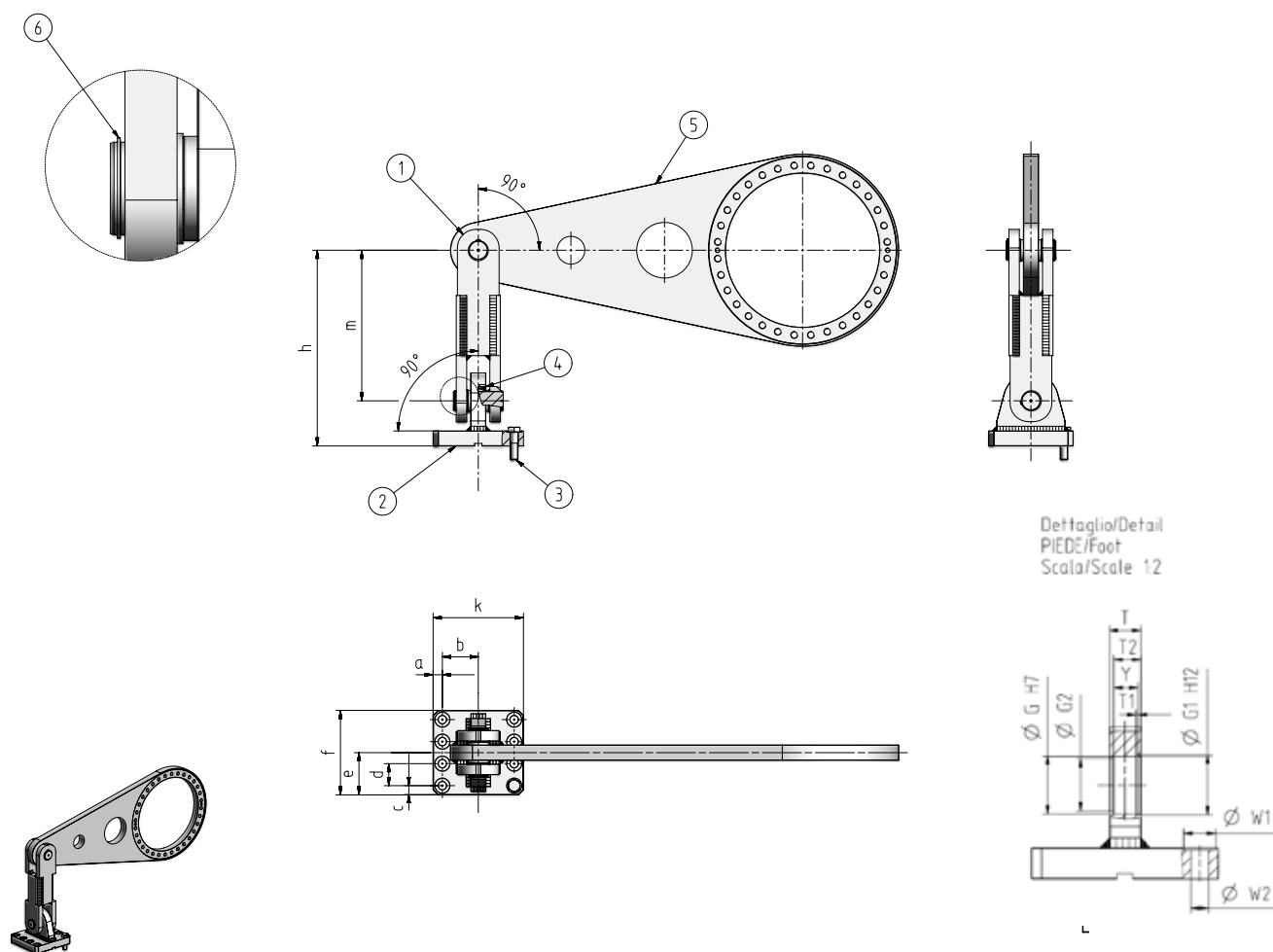


$R_m \min \geq 500 \text{ N/mm}^2$

Size	L _{min}	B	A	C	R	G _{min}	S _{min}	S1	S2	X	F	F1	d mm	Spherical Plain Bearings Schaeffler	F2	L1	L2	kg
1060	2200	2360	1240	2980	160	75	80	4,15	67,5	59,2	160	165	110	GE110-UK-2RS	147	1000	1210	900
1500	2500	2680	1400	3380	180	80	90	4,15	80	74,2	180	185	120	GE120-UK-2RS	163	1150	1370	1380
2120	2800	3010	1600	3810	210	90	100	5,15	85	75,5	210	216	140	GE140-UK-2RS	185	1320	1570	1950
3000	3200	3430	1820	4340	230	100	110	5,15	95	85,2	230	236	160	GE160-UK-2RS	210	1500	1785	2770

Asymmetrical torque arm foot

Here below are the recommended dimensions for the torque arm ground connection brackets.
Customized solutions on request.



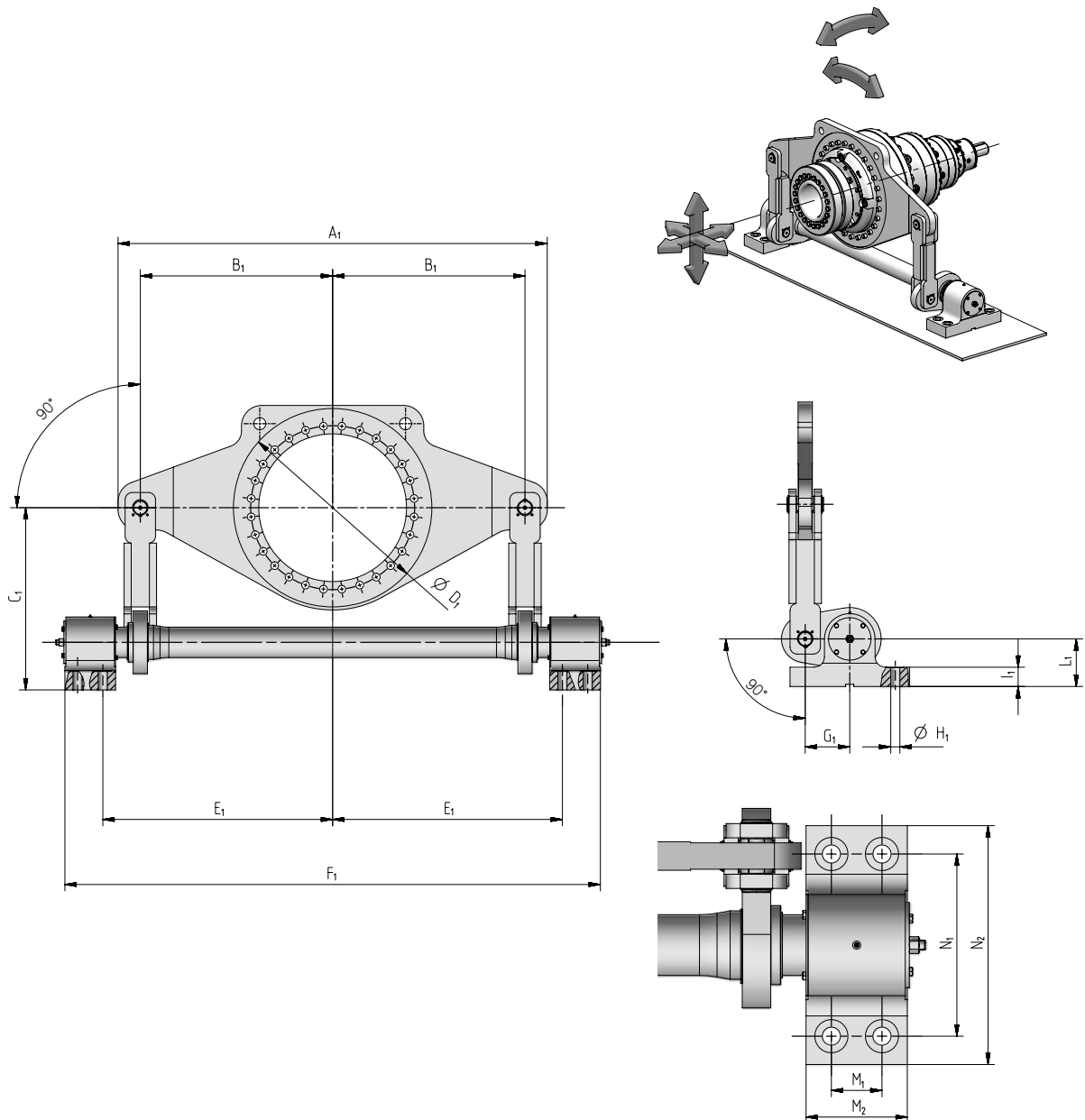
Item	Description
1	Connection Rod
2	Foot
3	Screw UNI 5739
4	Spherical plain bearing GE-UK-2RS
5	Torque Arm
6	Circlip DIN 7435

Size	m	h	c	d	e	f	a	b	k	G	G1	G2	W1	W2	Screw class 10.9	T1	T2	T	Y
1060	900	1165	52,5	100	252,5	505	55	200	510	160	165	147	85	45	M42 - 10x	4,15	67,5	80	59,2
1500	1030	1330	60	107,5	275	550	60	220	560	180	185	163	90	48	M45 - 10x	4,15	80	90	74,2
2120	1200	1550	65	125	315	630	67,5	252,5	630	210	216	185	100	52	M48 - 10x	5,15	85	100	75,5
3000	1350	1750	80	140	365	730	75	290	730	230	236	210	120	62	M56 - 10x	5,15	95	110	85,2

Cantilever torque arm assembly for system flexibility

Torque arm with double fulcrum and torsion bar fixed to the ground, allows the gear reducer to follow the driven shaft movements during operation and offers an elastic reaction able to absorb the overloads of moment twisting.

The allowed displacement values are shown in the figure, are a function of the quantities and must be checked during accessory selection.



Size	A ₁	B ₁	C ₁	D ₁	E ₁	F ₁	G ₁	H ₁	I ₁	L ₁	M ₁	M ₂	N ₁	N ₂
1060	2750	1250	1250	1230	1443,5	3327	255	52	130	300	150	290	530	700
1500	3080	1360	1350	1390	1600	3673	280	62	130	300	158	315	560	750
2120	3520	1550	1500	1590	1794	4116	320	70	160	375	178	350	620	840
3000	3920	1750	1800	1800	1975	4770	360	86	200	500	280	540	760	1120

Mounting positions, oil quantities and tanks

1060A

Mounting positions¹⁾ (Output mounting ... F..., ... A...)



* Based on the motor size, the expansion tank is required (contact Rossi).
** Based on the output design, the expansion tank is required (contact Rossi).
● Reference hole for the identification of the mounting position.
1) The drawings show the terminal box in position 0. For different positions of terminal box see below.

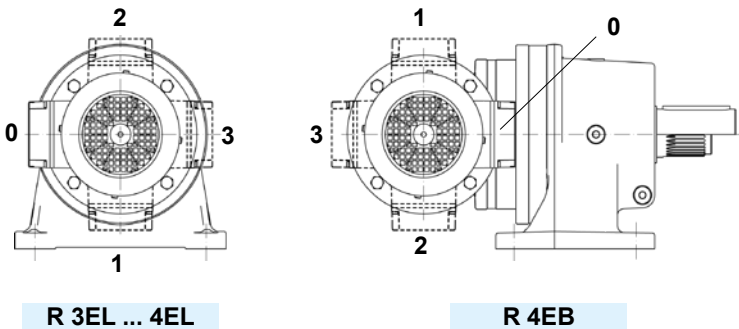
Oil quantities²⁾ [l]

Q_R	4EL 1060A
B5	139
V1	272
V3	265

2) Stated oil quantities are approximate for provisioning. The exact quantity gear reducer is to be filled with is definitely given by the level.

1060A - Terminal box positions

Unless otherwise stated, the gearmotors are supplied with motor terminal box mounted in position 0 motor fan side (see figure).
On request, positions 1, 2 and 3 are available.
Code for the **designation**: ,TB0 (standard) ,TB1 ,TB2 ,TB3.
The cable input is at Buyer's care.
In position 1 for inline and 2 for bevel helical, the terminal box may overhang from feet base plane.
The following figures refer to mounting positions B5.



1060A

Mounting positions¹⁾ (Output mounting ... F..., ... A...)



* Based on the output design, the expansion tank is required (contact Rossi).

● Reference hole for the identification of the mounting position.

1) The drawings show the terminal box in position 0. For different positions of terminal box see page 76.

Oil quantities²⁾ [l]

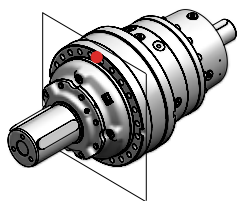
Q_R	4EB 1060A
V3 ... V33	290
B5, B53	149
B51	280
B52	142
V1 ... V13	280

2) Stated oil quantities are approximate for provisioning. The exact quantity gear reducer is to be filled with is definitely given by the level.

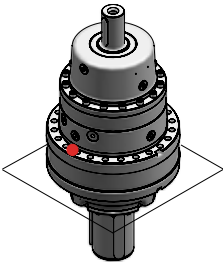
1060A ... 3000A

Mounting positions (Output mounting ... F..., ... A...)

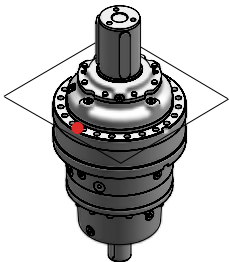
B5



V1*



V3**



** Based on the output design, the expansion tank is required (contact Rossi)
* Based on the gear reducer size and input type, the expansion tank is required (contact Rossi).
● Reference hole for the identification of the mounting position.

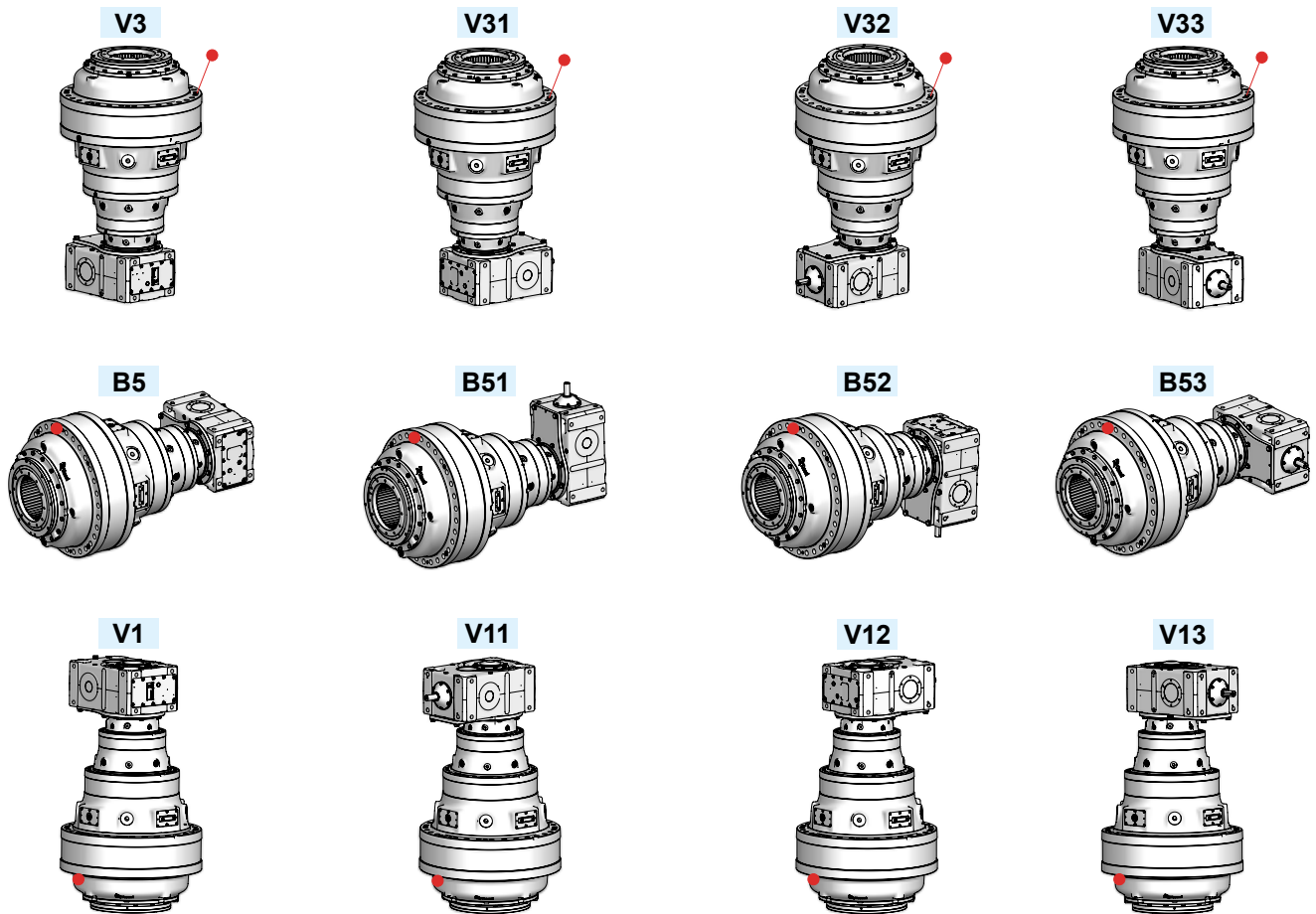
Oil quantities²⁾ [l]

Q _R	3EL		
	1060A	1500A	2120A
B5	139	235	315
V1	278	460	625
V3	273	455	616

Q _R	4EL			
	1060A	1500A	2120A	3000A
B5	139	235	315	465
V1	278	466	627	928
V3	265	465	622	922

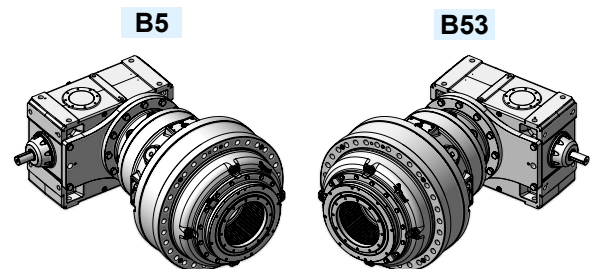
2) Stated oil quantities are approximate for provisioning. The exact quantity gear reducer is to be filled with is definitely given by the level.

Combined units



Combined unit	Planetary unit	Bevel-helical unit
EP + G	EP	G R CI
B5 ¹⁾	B5	B3
B51	B5	B6
B52	B5	B7
B53	B5	B3
V1	V1	V6
V11	V1	V6
V12	V1	V6
V13	V1	V6
V3	V3	V5
V31	V3	V5
V32	V3	V5
V33	V3	V5

1) The planetary unit is always connected to the bevel-helical unit on groove side (valid for G gear units only), except for mounting position B5. The difference between mounting position B5 and mounting position B53 of the combined unit is given by the side where the planetary unit is connected to the bevel-helical unit.



Size	Combined unit					
	Oil quantity [l]					
	B5	B51	B52	B53	V3 ... V33	V1 ... V13
R 2EL 1060A + R I 360	127 120	127 127	127 141	127 120	248 150	232 71
R 2EL 1060A + R 2I 360	127 100	127 156	127 140	127 100	248 140	232 140
R 3EL 1060A + R 2I 250	130 47	130 75	130 67	130 47	254 67	250 67
R 2EL 1060A + R CI 360	127 120	127 127	127 141	127 120	248 150	232 150
R 3EL 1060A + R CI 250	130 40	130 52	130 57	130 40	254 67	250 67
R 2EL 1500A + R 2I 4000	197 118	197 150	197 224	197 118	386 250 (236)*	366 250 (236)*
R 3EL 1500A + R 2I 280	235 51	235 80	235 72	235 51	458 72	448 72
R 2EL 1500A + R CI 4000	197 100	197 150	197 160	197 100	386 118 (112)*	366 118 (112)*
R 3EL 1500A + R CI 280	235 61	235 65	235 72	235 61	458 77	448 77
R 2EL 2120A + R 2I 4500	295 112	295 140	295 236	295 112	582 250 (224)*	570 250 (224)*
R 3EL 2120A + R 2I 320	315 97	315 152	315 137	315 97	616 137	607 137
R 2EL 2120A + R CI 4500	295 132	295 190	295 212	295 132	582 170 (140)*	570 170 (140)*
R 3EL 2120A + R CI 320	315 78	315 102	315 111	315 78	616 130	607 130
R 2EL 3000A + R 2I 5000	440 236	440 300	440 450	440 236	868 500 (475)*	837 500 (475)*
R 3EL 3000A + R 2I 360	460 100	460 156	460 140	460 100	911 140	900 140
R 3EL 3000A + R CI 360	460 120	460 127	460 141	460 120	911 150	900 150

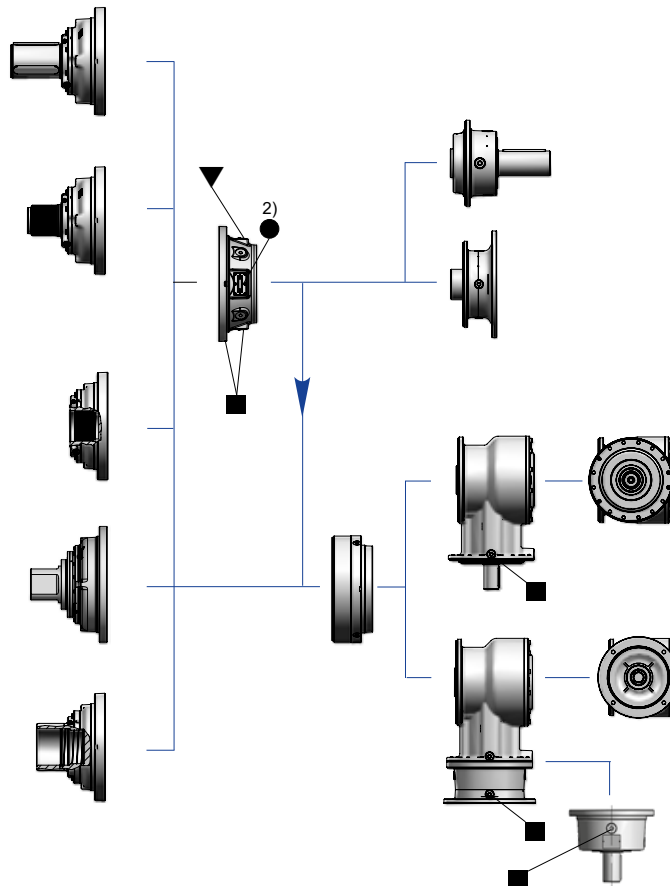
*With low speed wheel on bottom.

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1060A ... 3000A

Plug positions and types

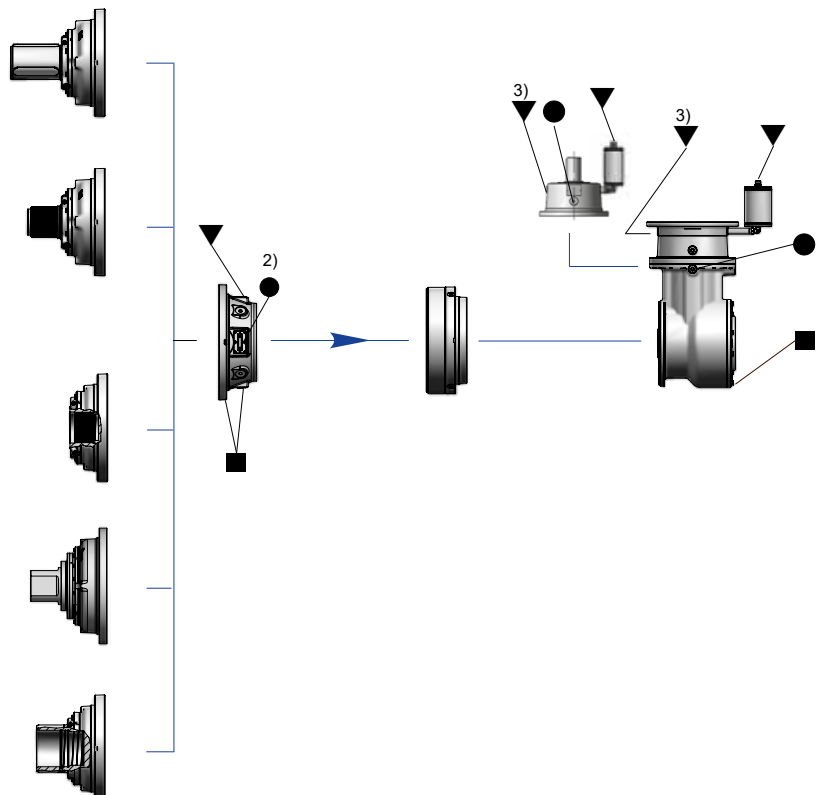
Mounting positions
B5, B52, B53



1060A

Plug positions and types

Mounting position
B51



- ▼ Filler plug with breather
- Transparent level plug
2) Oil level indicator
- Spillway plug
- Drain plug
- Expansion tank¹⁾
- Elbow

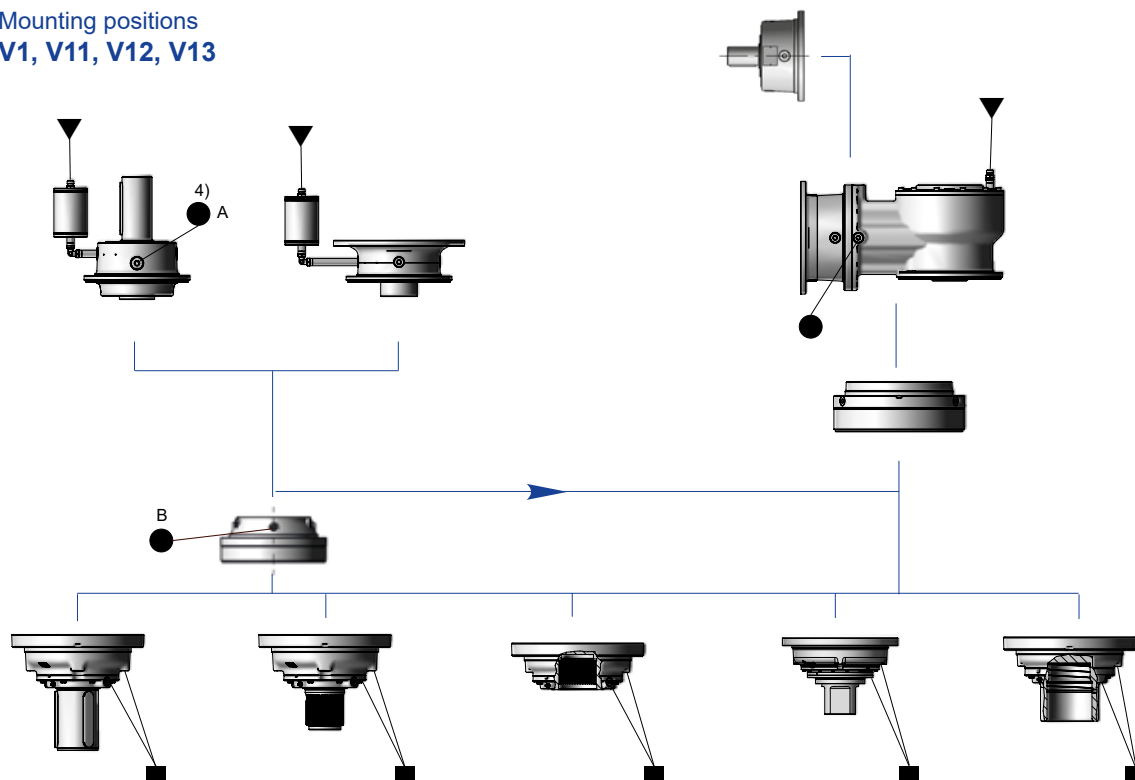
1) Contact Rossi.

3) When expansion tank is not necessary.

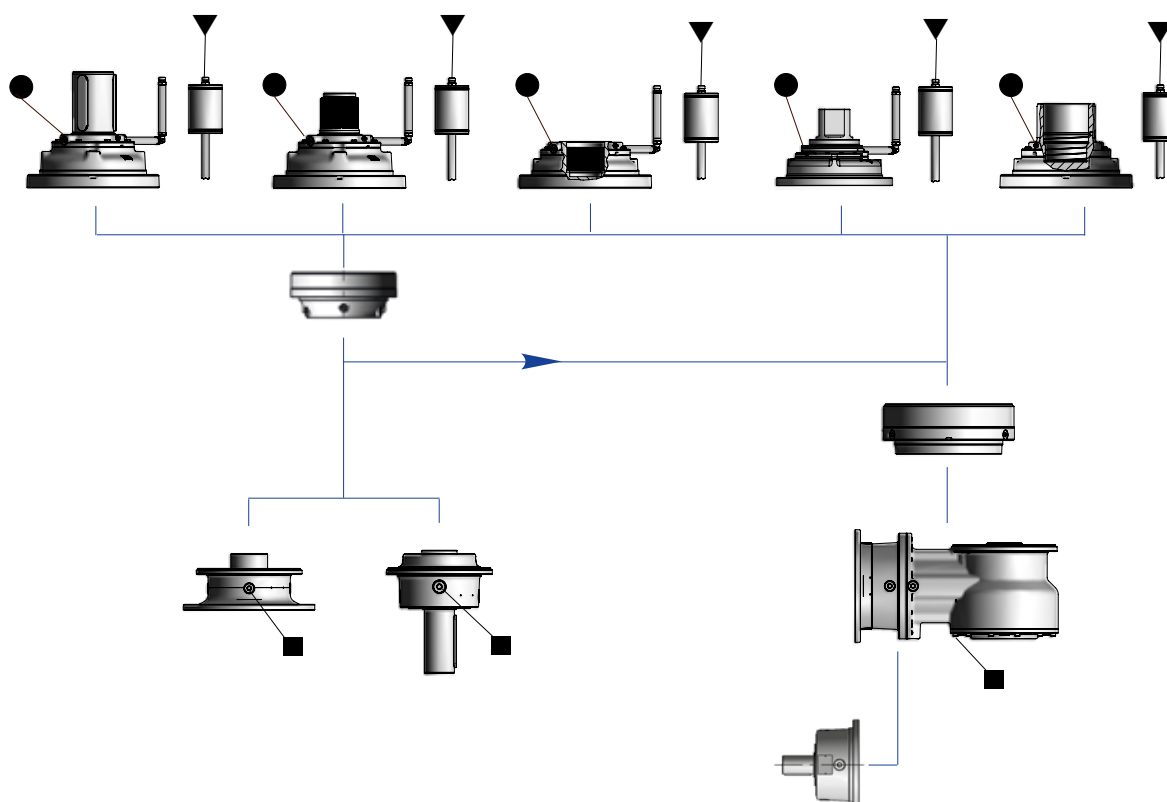
4) B is not available in presence of level plug marked with A.

1060A ... 3000A Plug positions and types

Mounting positions
V1, V11, V12, V13



Mounting positions
V3, V31, V32, V33

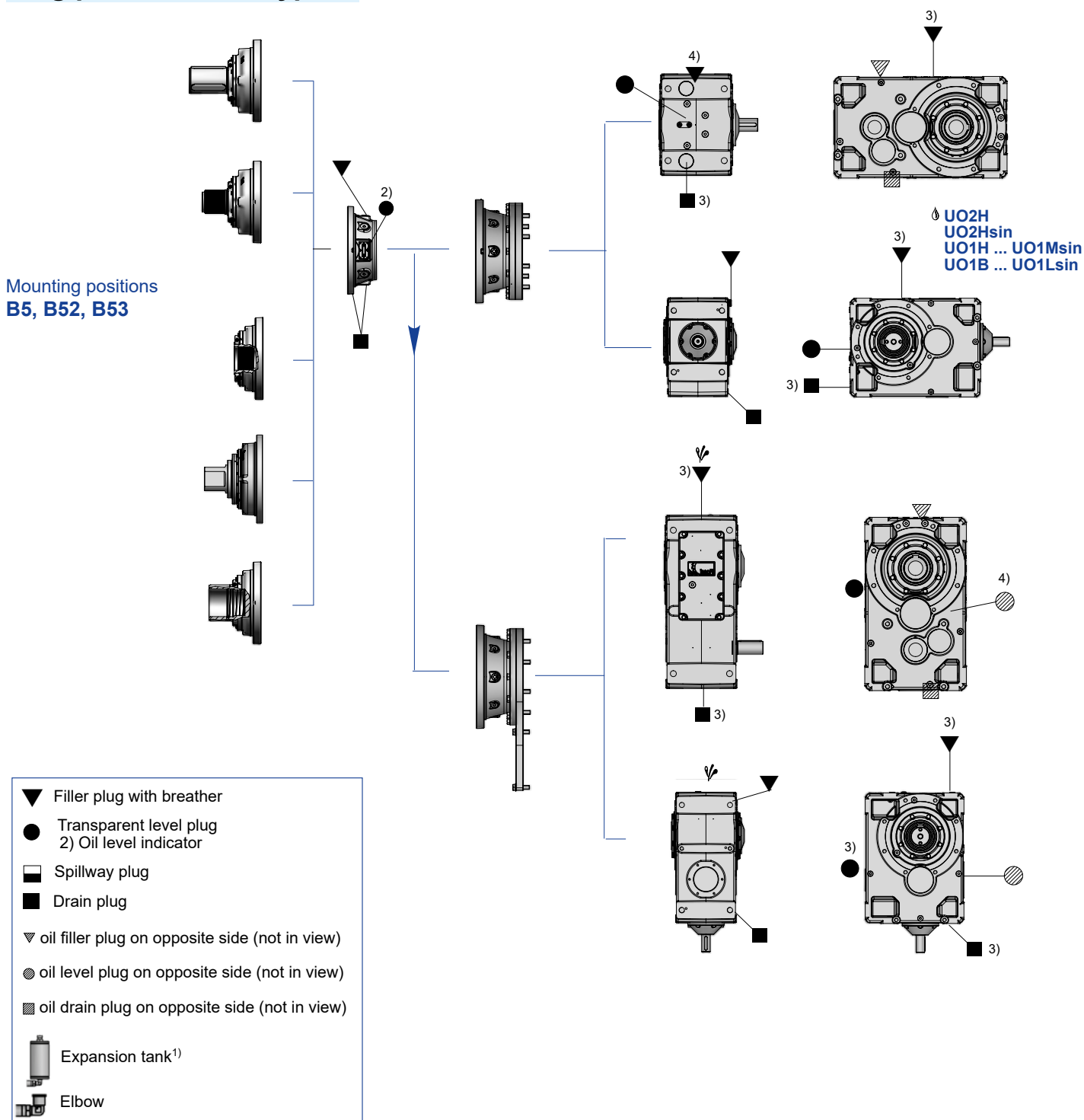


Combined units

1060A ... 3000A

Plug positions and types

Mounting positions
B5, B52, B53



1) Contact Rossi.

3) Only for H gear reducer.

4) Only for G R I.

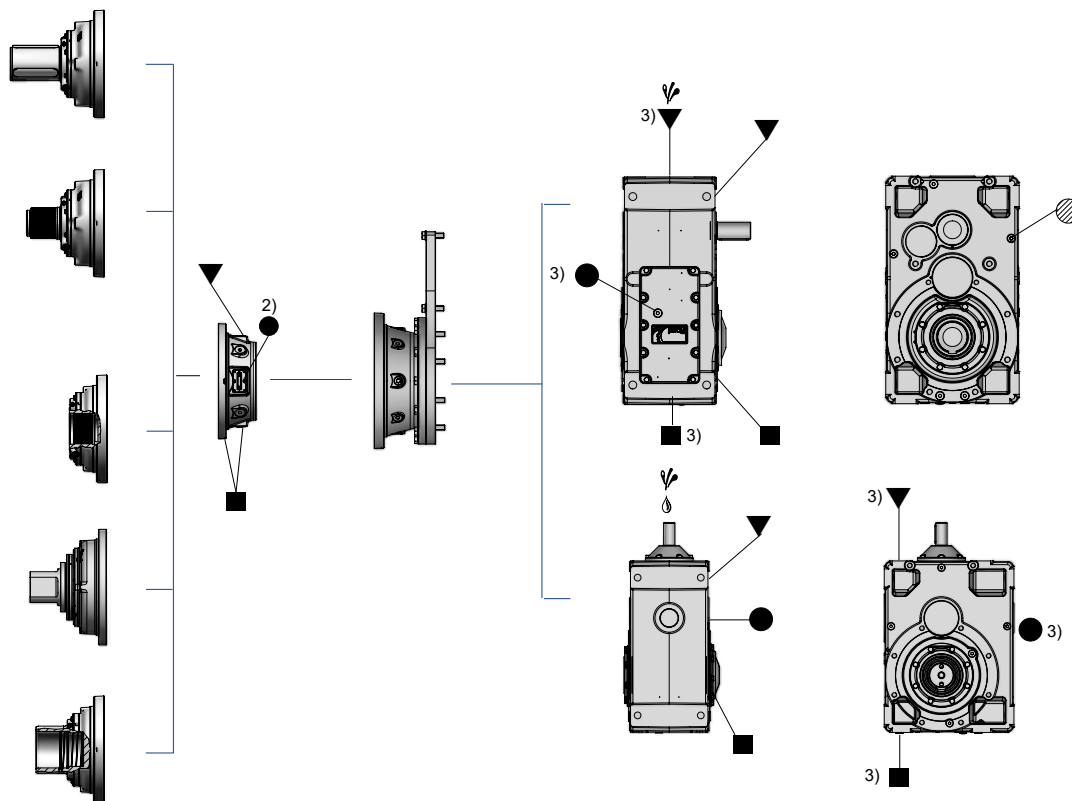
⚡ Possible high oil splash: for the corrective factor f_t of nominal thermal power P_{tN} see ch. 4 of G and H catalogs.
⚡ Possible bearing lubrication pump or high speed shaft lubrication device (see ch. 17 (19) of G catalog).

Combined units

1060A ... 3000A

Plug positions and types

Mounting positions B51



- ▼ Filler plug with breather
- Transparent level plug
- 2) Oil level indicator
- ▬ Spillway plug
- Drain plug
- ▼ oil filler plug on opposite side (not in view)
- oil level plug on opposite side (not in view)
- ▬ oil drain plug on opposite side (not in view)
- Expansion tank¹⁾
- Elbow

1) Contact Rossi.
3) Only for H gear reducer.
4) Only for G R I.

▼ Possible high oil splash: for the corrective factor f_{ts} of nominal thermal power P_{tn} see ch. 4 of G and H catalogs.
⚡ Possible bearing lubrication pump or high speed shaft lubrication device (see ch. 17 (19) of G catalog).

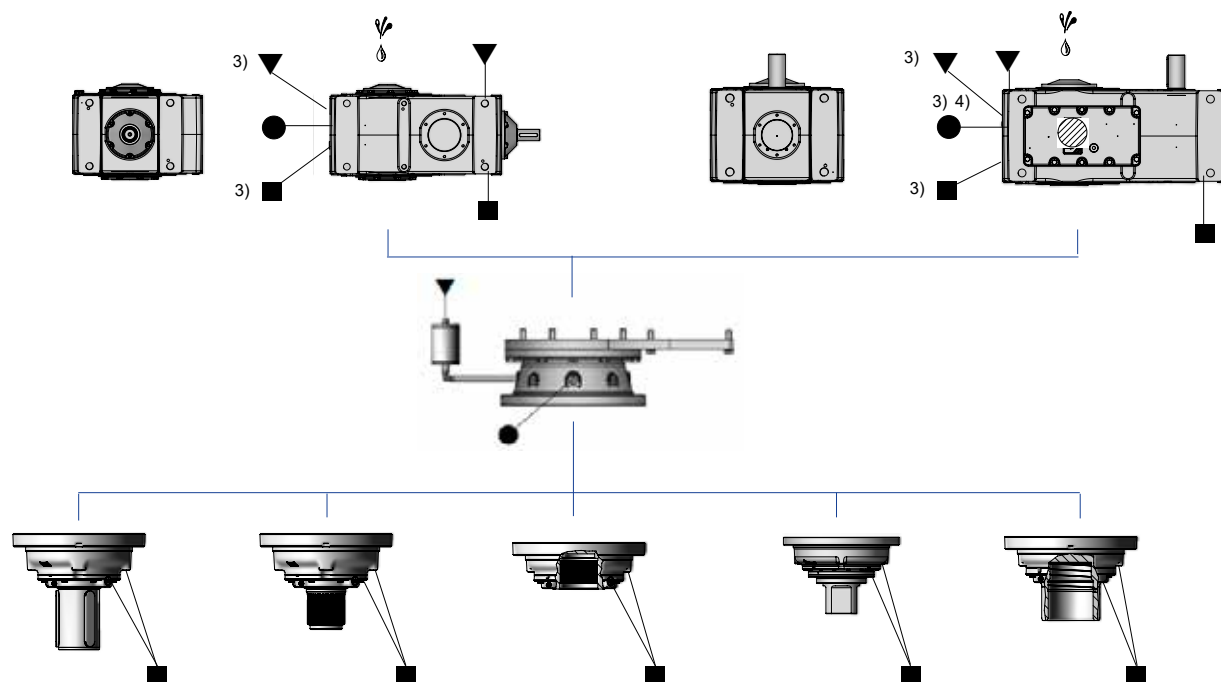
Combined units

1060A ... 3000A

Plug positions and types

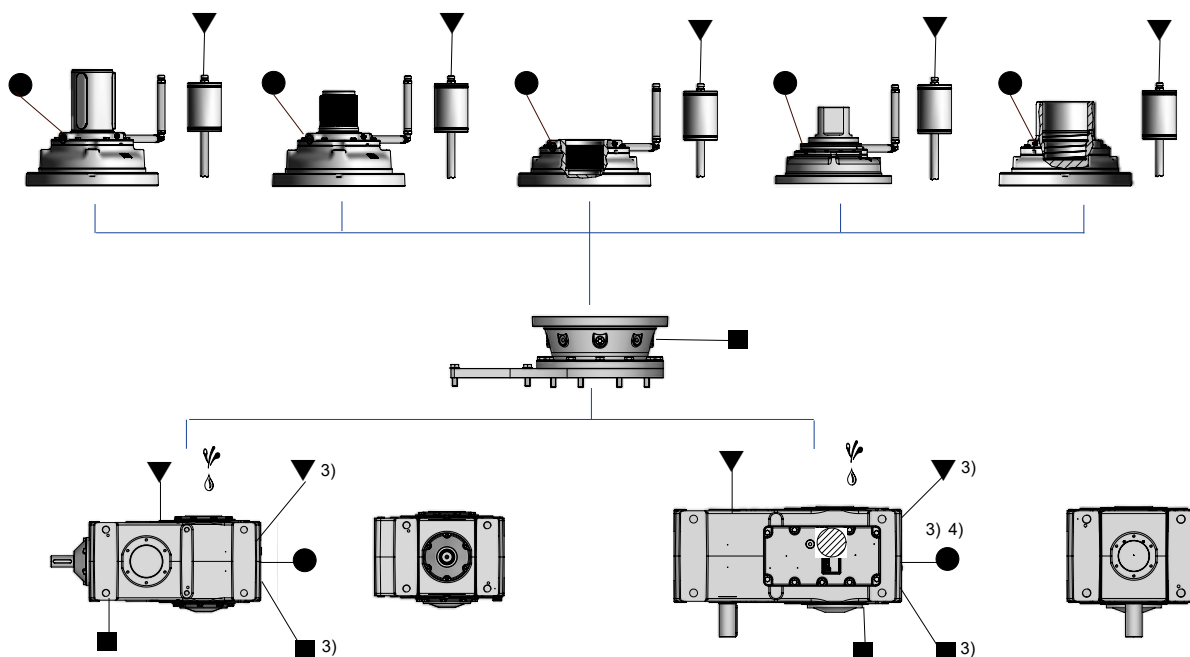
Mounting positions

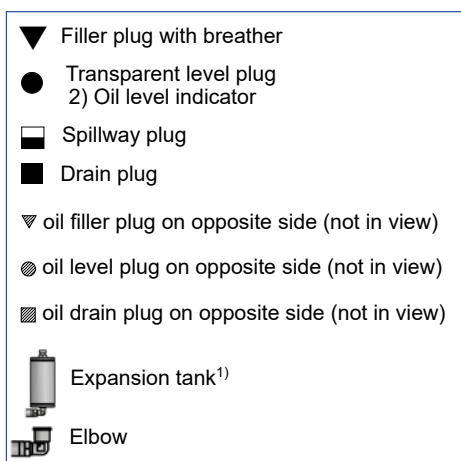
V1, V11, V12, V13



Mounting positions

V3, V31, V32, V33





1) Contact Rossi.

3) Only for H gear reducer.

4) Only for G R I.

⚡ Possible high oil splash: for the corrective factor f_{ts} of nominal thermal power P_{tn} see ch. 4 of G and H catalogs.

⚙ Possible bearing lubrication pump or high speed shaft lubrication device (see ch. 17 (19) of G catalog).

1060A ... 3000A - Output side details

Plug positions and types

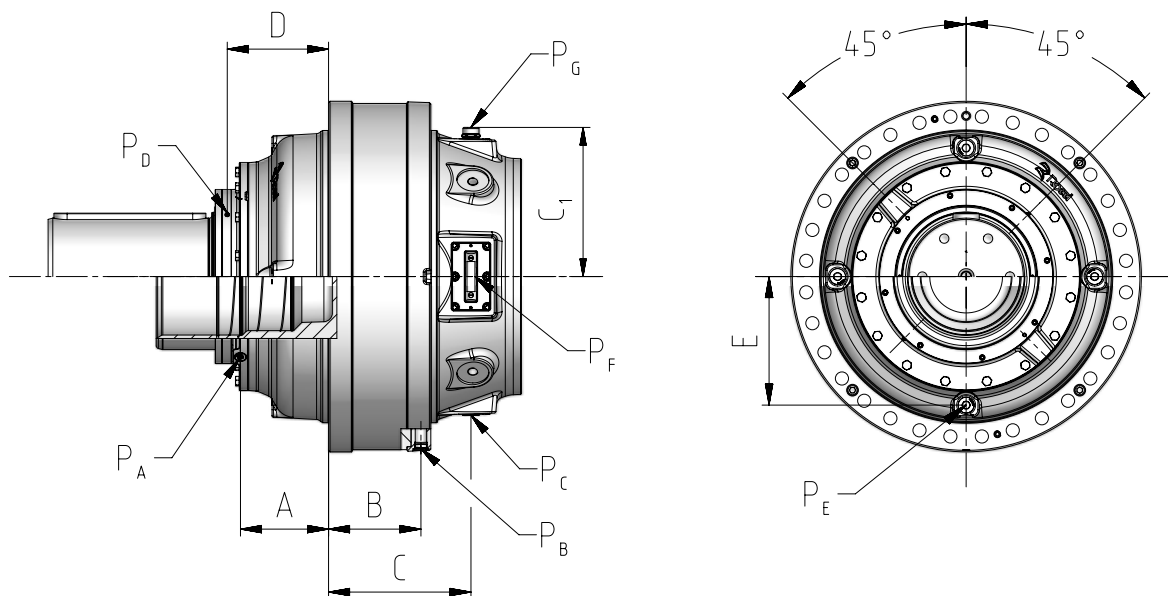
The positions of the several plugs present on the gear reducer are shown in the following figures. The number and dimensions of plugs (in inches) as well as the distances from a useful reference point (gear reducer axis, flange plane, low speed shaft shoulder, etc.) are shown in the tables, according to gear reducer size.

In the following pages the function of each plug (filler, drain, level, etc.) is also given when changing the design.

Usually the filler plug with breather overhangs from the gear reducer; the maximum overall dimensions are shown in the tables.

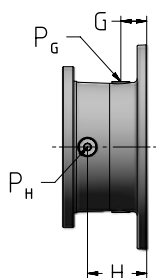
In the mounting positions with vertical low speed shaft towards upper side (V3 ... V33), the gear reducer may be equipped with an elbow for the oil expansion. The relevant overall dimensions are also stated in the tables.

As standard, gearboxes are supplied in the sealed execution with labyrinth and grease nipple on low speed shaft.



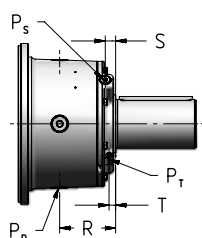
Sizes	A	B	C	C ₁	D	E	P _A n° 2	P _B n° 1	P _C n° 1	P _D n° 2 grease fitting	P _E n° 4	P _F n° 2	P _O n° 1
1060A C, S H, Z, T, Q	301,5 244,5	316 316	487,5 487,5	505 505	347 290	440 440	G1" G1"	G1 - 1/4" G1 - 1/4"	G1 - 1/2" G1 - 1/2"	G1/4" G1/4"	G1 - 1/2" G1 - 1/2"	HCX.127-P HCX.127-P	G1 - 1/2" G1 - 1/2"
1500A C, S H, Z, T, Q	342 275	361 361	540 540	575 575	389 322	507,5 507,5	G1" G1"	G1 - 1/4" G1 - 1/4"	G1 - 1/2" G1 - 1/2"	G1/4" G1/4"	G1 - 1/2" G1 - 1/2"	HCX.127-P HCX.127-P	G1 - 1/2" G1 - 1/2"
2120A C, S H, Z, T, Q	380 316	396,5 396,5	615 615	667 667	429,5 365,5	562,5 562,5	G1" G1"	G1 - 1/2" G1 - 1/2"	G1 - 1/2" G1 - 1/2"	G1/4" G1/4"	G1 - 1/2" G1 - 1/2"	HCX.127-P HCX.127-P	G1 - 1/2" G1 - 1/2"
3000A C, S H, Z, T, Q	433 347	449,5 449,5	715 715	749 749	485 399	650 650	G1 - 1/4" G1 - 1/4"	G1 - 1/2" G1 - 1/2"	G1 - 1/2" G1 - 1/2"	G1/4" G1/4"	G1 - 1/2" G1 - 1/2"	HCX.127-P HCX.127-P	G1 - 1/2" G1 - 1/2"

1060A ... 3000A - Input side details



4EL	4EB	IEC	G	H	P _G n° 2	P _H n° 2
1060A	1060A	160	58	—	G1/2" n° 4	—
		180	58	—		
		200	58	—		
		225	88	—		
		250	88	—		
		280	88	—		

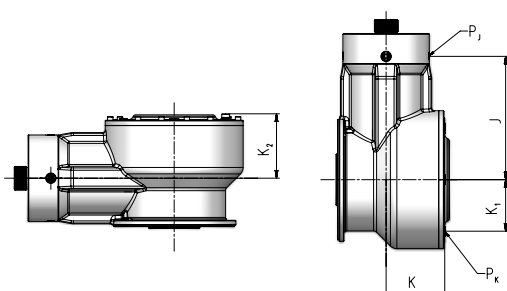
I...



3EL	4EL	4EB	R	S	T	P _R n° 2	P _S n° 2	P _T n° 2
1060A 1500A ... 2120A	1060A	1060A	61	36	—	G3/4"	G3/4"	—
	1500A ... 2120A	—	115	21	13,5	n° 4 – G3/4"	G3/8"	M10x1
	3000A	—	137	24	13,5	n° 4 – G1"	G3/8"	M10x1
	—	—	137	30	17	n° 4 – G1"	G3/8"	M10x1

C...

1060A - Input side details



4EB	J	K	K ₁	K ₂	P _J	P _K
1060A	407	191	170	213	n° 4 - G3/4"	n° 4 - G1/2"

BEVEL STAGE

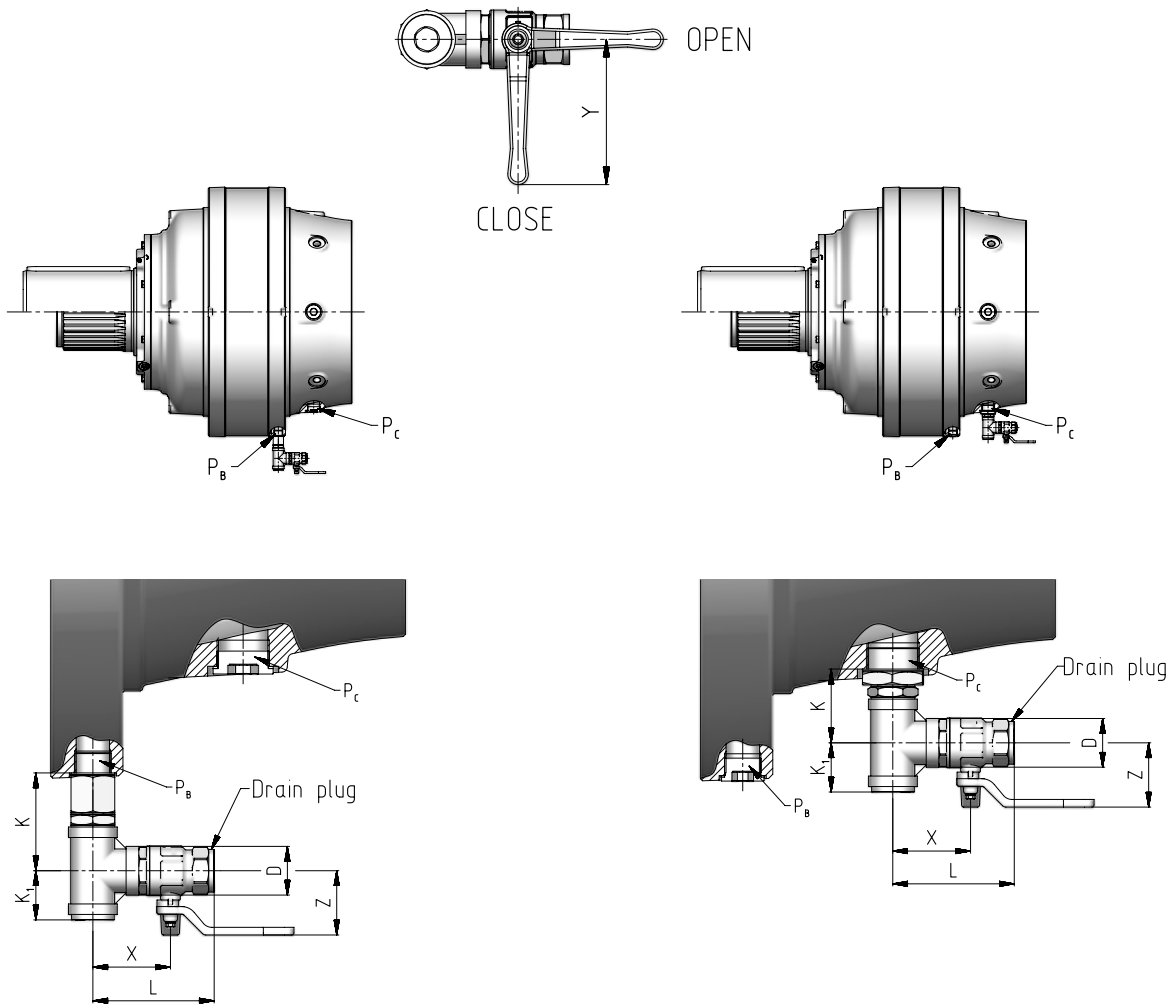
Input and options

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Oil drain tap	92
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Oil temperature probe with terminal box and amperometric transducer 4 - 20 mA	94
Desiccant breather	95
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Oil drain tap

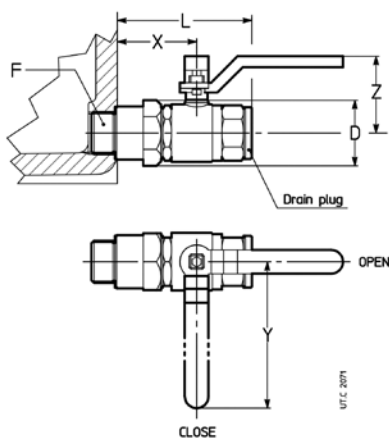
Drain tap may be provided for some sizes of gearboxes, it is necessary to completely drain the oil.
It is recommended to place the tap in the lowest point of the gear reducer (P_B); however, where it is not allowed, you can exploit the nearest hole (P_C).
Code for the **designation**: ,TA.



Size	P_B	P_C	P_B, P_C	Oil drain tap	D Ø	L	X	Y	Z	K_1	K
1060	G 1"1/4	G 1"1/2	G 1" 1/4		57	131	85,5	138	75	55	112
1500	G 1"1/4	G 1"1/2	G 1" 1/2								126
2120	G 1"1/2	G 2"	G 2"								126
3000	G 1"1/2	G 2"									

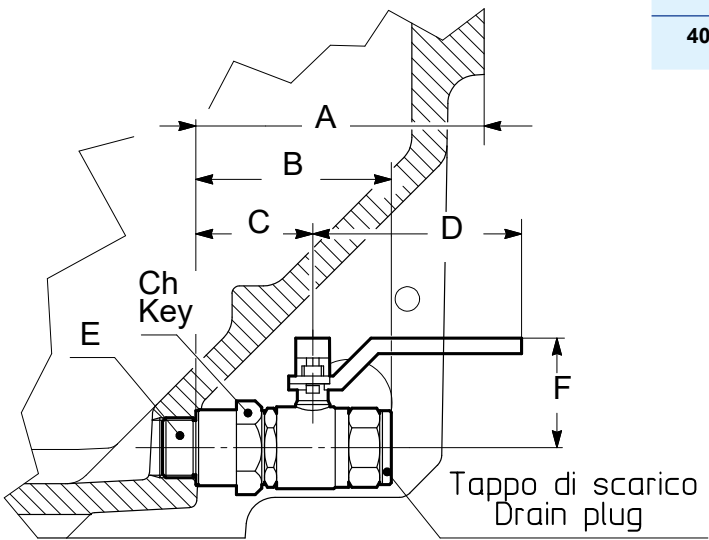
In the event of combined units, drain tap (accessory already assembled) may be provided for some gearboxes of G and H series.

G series

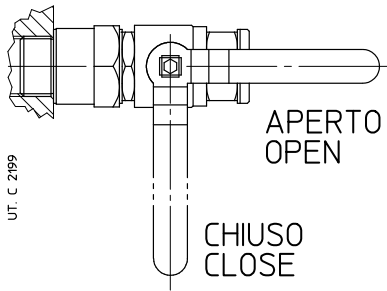


Size	F	D Ø	L ≈	X	Y	Z
160 ÷ 280	G 3/4"	40	90	56	112	55
320 ÷ 360	G 1"	46	106	66	115	60

H series



Gear reducer size	A	B	C	D	Ch Key	E	F
4000, 4500	158	106	66	115	46	G1"	60
5000	208	106	66	115	46	G1"	60



In a closed position, the tap lever does not overhang from gear reducer.

Oil temperature probe Pt100

Remote oil temperature gauge; installation (at Buyer's responsibility) instead of an existing drain plug, or into a hole properly pre-arranged. The temperature gauge is realized with a thermo-resistor Pt100 having following features:

- platinum wire with 100 Ω at 0 °C according to EN 60751
- precision class B according to EN 60751
- operation temperature field -40 °C ÷ +200 °C
- max current 3 mA
- 3 wires connection according to IEC 751 (see fig. below)
- stainless steel probe AISI 316; diameter 6 mm
- cable 1 m long with free end

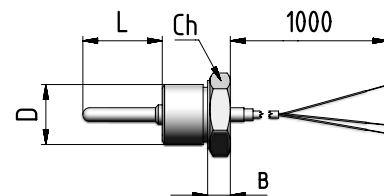
For the probe connection to relevant signalling device CT03 or CT10 (on request, consult us) use a protected section cable $\geq 1,5 \text{ mm}^2$ positioned separately from power cables.

In case of gear reducer supplied with oil and optional oil temperature probe, in order to assemble them, it is necessary to position the gear reducer so that the probe seating hole is upwards.

Code for the **designation**: ,IT4.



B	Ch (key)	D	L
8	22	G 3/8"	35
8	22	G 1/2"	35
10	32	G 3/4"	35
15	36	G 1"	35



Oil temperature probe with terminal box and amperometric transducer 4 ÷ 20 mA

Remote oil temperature gauge, with terminal box and amperometric transducer; installation (at Buyer's responsibility) instead of drain plug. The temperature gauge is realized with a thermo-resistor Pt100 having following features:

- platinum wire with 100 Ω at 0 °C according to EN 60751
- precision class B according to EN 60751
- temperature range -40 °C ÷ +200 °C
- 3 wires connection according to IEC 751 (see fig. below)
- stainless steel probe AISI 316; diameter 6 mm
- amperometric transducer with output signal 4 ÷ 20 mA
- alluminium terminal block (supplied without cable gland)
- protection IP65
- input cables G 1/2"

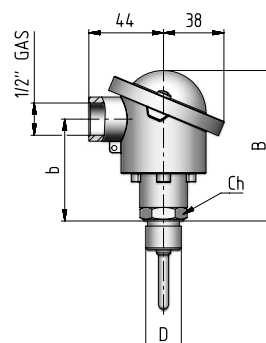
For the probe connection to relevant signalling device use a protected section cable $\geq 1,5 \text{ mm}^2$ positioned separately from power cables.

ATTENTION. Accessory available only for technical feasibility evaluation by Rossi S.p.A.: consult us.

In case of gear reducer supplied with oil and optional oil temperature probe, in order to assemble them, it is necessary to position the gear reducer so that the probe seating hole is upwards.

Code for the **designation**: ,IT7.

B	Ch (key)	b	D
90	24	60	G 3/8"
90	24	60	G 1/2"
92	32	62	G 3/4"
97	36	67	G 1"



Desiccant breather

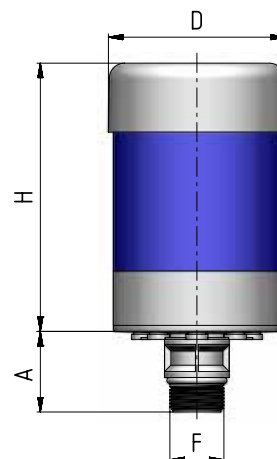
Desiccant breather with 3 stage filtration design: solid contaminant filter 2 µm, water vapor adsorbent bed in silica gel, activated carbon final filter. This filter traps water vapor and solid contaminant particles and keeps them out from the gear reducer and simultaneously holds oil vapors inside the gear reducer.

Key features:

- replaceable cartridge with true-life indicator of filter conditions
- alkali, oil, non-oxidizing acids, salt water and mineral and synthetic oil resistant
- shock resistant cover and housing
- temperature range of application: -28 °C ÷ +93 °C

Code for the **designation**: ,**TM5**.

F	D	H	A
	Ø		
3/8 "	64	109.4	27
1"	104	105.4	47



Miscellaneous

In the event of combined units, for G and H series gearboxes, refer to ch.12 (H catalog) and ch. 17 (G catalog) for relevant accessories.

Installation and maintenance

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General information

Important:

The gear reducers supplied by Rossi S.p.A. are intended to be incorporated in finished appliances or systems and **it is forbidden to start them up until the appliance, or the system in which the component, has been incorporated has been declared compliant:**

- with **Machinery Directive 2006/42/EC and subsequent updates; in particular, any accident prevention protections for unused shaft ends and any accessible fan cover passages (or other) shall be the responsibility of the Buyer;**
- with **"Electromagnetic Compatibility (EMC)" Directive 2004/108/EC and subsequent updates.**

This document provides information on the handling, installation, and maintenance of planetary gear reducers. Personnel working with these products should carefully read and strictly apply all of the following instructions. The information and data contained in this document reflect the technical level reached at the time of printing. Rossi reserves the right to make, without prior notice, any changes deemed appropriate for product improvement.

Recycling



Keep in mind applicable requirements:

- the housing elements, gears, shafts and bearings of the gear reducer shall be transformed into scrap steel. Cast iron elements will undergo the same treatment subject to other specific performance
- waste oils must be recovered and treated in accordance with applicable law requirements

Safety

The paragraphs marked with the following symbols contain provisions that must be strictly observed in order to ensure the safety of persons and prevent major damage to the machine or system



- Electrical hazard
- Surface temperature above 50 °C
- Moving parts during operation
- Warning



- Do not use for lifting



- Lifting point



Warning!

We recommend that you follow all instructions in this catalogue, all applicable regulations regarding proper installation, as well as all applicable safety regulations. In the event of hazards for persons or property, connected with the possibility that the gear reducer or parts of it fall or are projected, provide appropriate safety measures (accident prevention protections) against:

- **loosening or breaking of the fastening screws**
- **rotation or sliding of the driven shaft resulting from accidental failure of the reaction constraint**
- **accidental breakage of the driven shaft**
- **unprotected moving or rotating parts that characterize the connection with the machine** (e.g. shaft ends and accessories such as shrink disc, stop washer, splined bush, splined bar, wheel fange)

If an abnormal event occur (temperature rise, unusual vibration or noise, etc.) stop the machine immediately.

Installation safety

Improper installation, misuse, removal of guards, disconnection of protective devices, lack of inspection and maintenance, improper connections, can cause serious personal injury or property damage.

The component must be handled, installed, commissioned, operated, inspected, maintained and repaired exclusively by qualified and specifically trained personnel, provided with the necessary experience to recognize possible risks associated with these products and avoid possible emergency situations.

The gear reducers in this catalogue are normally intended for use in industrial areas: additional guards that may be necessary must be put in place and ensured by the persons responsible for the installation.



Warning! Special design components may feature details other than those described and may require additional information.



Warning! For installation, use and maintenance of electric motors (standard, self-braking or special ones) or of variable speed drives and/or electrical power supply equipment (frequency converter, soft-start, etc.), and/or of accessories (e.g.: flow switch, autonomous cooling unit, thermostat etc.), see the specific documentation attached thereto. Request it if necessary.

Maintenance safety

Any operation on the gear reducer or its components must be carried out with the **machine stopped, disconnected from the power supply, and after cooling down**: disconnect the motor (including auxiliary equipment) from the power supply, the gear reducer from the load, and ensure that the safety systems against unintentional start-up have been activated and, if necessary, provide mechanical locking devices (to be removed before commissioning).



Warning!

During operation, the gear reducers may have **hot surfaces**; always wait until the gear reducer or gearmotor has cooled down before performing any operation.

Further technical documentation can be found on the website www.rossi.com.



Warning!

For any clarification and/or information, please contact Rossi S.p.A. specifying all data found on the identification plate.

Operating conditions

Gear reducers are suitable to operate at ambient temperature $0\text{ °C} \div +40\text{ °C}$ (with peaks $-20\text{ °C} \div +50\text{ °C}$), with standard seal rings and components.

The operation outside this range, with a minimum of -40 °C and a maximum of $+60\text{ °C}$, must be evaluated in relation to the specific operating conditions, duty cycle, type of lubricant, type of seals and cooling/heating system (where possible); please contact Rossi S.p.A.

Allowed operational and storage ambient temperature in relation to lubricant type ¹⁾

		Synthetic Lubricant	Mineral Lubricant
Ambient Temperature T_{amb}	Running conditions		
	Minimum ambient temperature ⁴⁾	-20 °C	-10 °C
	Maximum ambient temperature	$+50\text{ °C}$	$+40\text{ °C}$
	Storage condition		
Oil Temperature T_{oil}	Minimum ambient temperature of storage condition	-10 °C	-10 °C
	Maximum environment temperature of storage condition	$+50\text{ °C}$	$+50\text{ °C}$
	Minimum oil temperature for partial load starting condition ^{2) 4)}	-20 °C	-10 °C
	Minimum oil temperature for full load starting condition	-10 °C	-5 °C
	Maximum nominal stabilized oil temperature allowed in continuous running condition (S1)	$+95\text{ °C}$	$+95\text{ °C}$ ³⁾
	Maximum peak and occasional oil temperature allowed with intermittent duty only	$+110\text{ °C}$	$+110\text{ °C}$

1) For selection of lubricant and optimal viscosity according to temperature T_{amb} and in case of independent lubrication unit, refer to chapter Lubrication.

For starts and services with $T_{oil} < 0\text{ °C}$, consider higher absorption on the electric motor according to the type of lubricant.

2) If full load service is required, provide gradual starting and stopping ramps, avoiding overloads and shocks.

3) For temperature value of $T_{oil} > 75\text{ °C}$ and $< 95\text{ °C}$ it is recommended to use oils with at least viscosity grade 30 cSt at 95 °C .

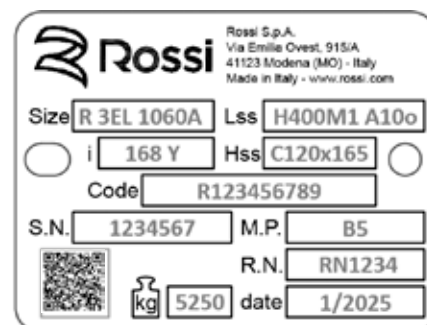
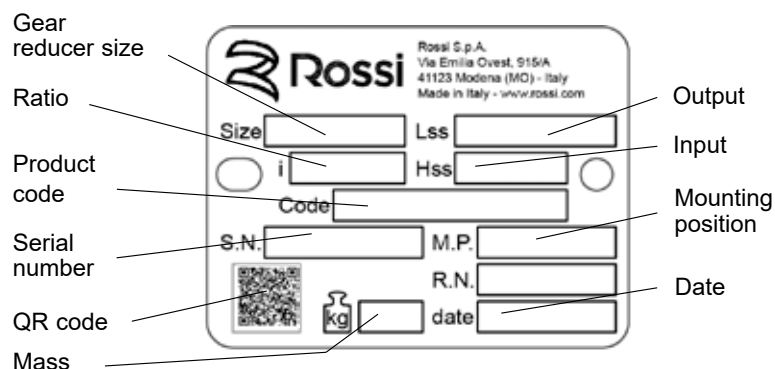
4) For G series combined units, minimum ambient temperature is -10 °C .

How supplied

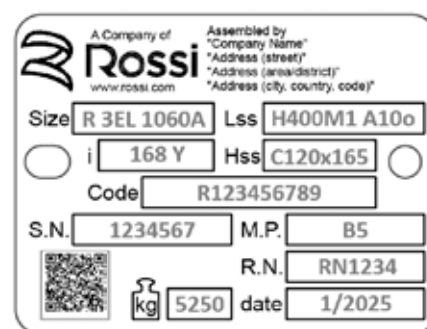
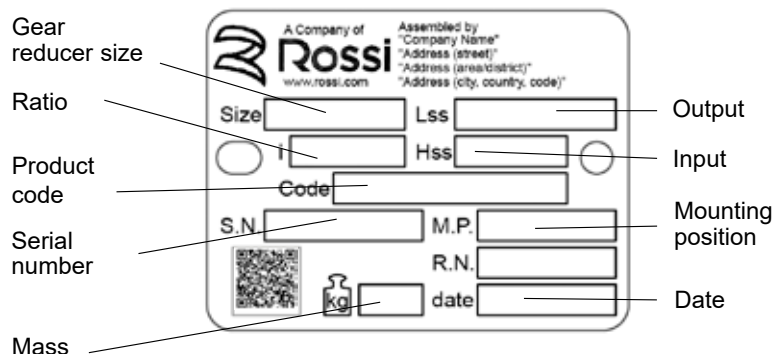
Name plate

Every planetary gear reducer is provided with a name plate in anodized aluminium containing main information necessary for a correct identification of the product; the name plate must not be removed and must be kept integral and readable. All name plate data must be specified on eventual spare part orders.

Assembled by Rossi Italy

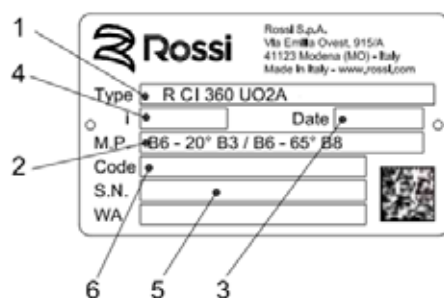


Assembled by subsidiaries



Combined units are provided with specific name plate, one for each gearbox type.

G series



H series



- 1 Designation (see table)
- 2 Mounting position
- 3 Date of manufacture
- 4 Transmission ratio
- 5 Serial number
- 6 Code
- 7 Motor power
- 8 Gear reducer nominal power
- 9 Gear reducer nominal output torque
- 10 Input speed
- 11 Service factor

Standard painting

Internal painting	External painting		Notes
	Final color Blue RAL 5010	Features	
Single-compound ester epoxy or phenolic resin basis primer (preainted)	Single-compound ester epoxy or phenolic resin basis primer (preainted) + Water-soluble polyurethane dual-compound enamel	Resistant to atmospheric and aggressive agents (atmospheric corrosivity category C3 L according to ISO 12944-1 and ISO 12944-2). Suitable for further coats of dual-compound paints only ¹⁾	The internal painting does not resist polyglycol synthetic oils (polyalphaolefines synthetic oils are suitable). Remove by a scraper or solvent the possible paint of gear reducer coupling surfaces

1) Before adding further coats of paint, properly protect the seal rings and carefully degrease and sand the gear reducer surfaces (instead of sanding it is possible to apply a water-based primer coat).

Protections and packing

Overhanging free shaft ends and hollow shafts are treated with protective anti-rust long life oil.

All internal parts are protected with protective anti-rust oil. Unless otherwise agreed in the order, products are adequately packed: on pallet, protected with a polyethylene film, wound with adhesive tape and strap (bigger sizes); in carton pallet, wound with adhesive tape and strap (smaller sizes); in carton boxes wound with tape (for small dimensions and quantities).

If necessary, gear reducers are conveniently separated by means of anti-shock foam cells or of filling cardboard.

Generally the packing is suitable for the normal road/rail transport. For sea transport it is necessary to foresee a special packing, when ordering.

Before handling or transporting the gear reducers, be sure that the packing is in good conditions and suitable for the transport. Do not stock packed products on top of each other.

Lifting, handling and storage

Receipt

At receipt verify that the unit corresponds to the one ordered and has not been damaged during the transport, in case of damages, report them immediately to the courier.

Avoid commissioning gear reducers, that are even slightly damaged. Report any non-compliance to Rossi.

Lifting and handling

First make sure that the lifting equipment (e.g. crane, hook, eye bolt, straps etc.) is suitable for the weight and size of the gear reducer (the weight of the product are given in the name plate). When lifting, use only the attachment point marked in the following figures.

Pay attention to avoid lifting (max 15° during handling) and, if necessary, use additional straps only to balance the load.

Do not use front threads at the input shaft ends to lift the gear reducers.

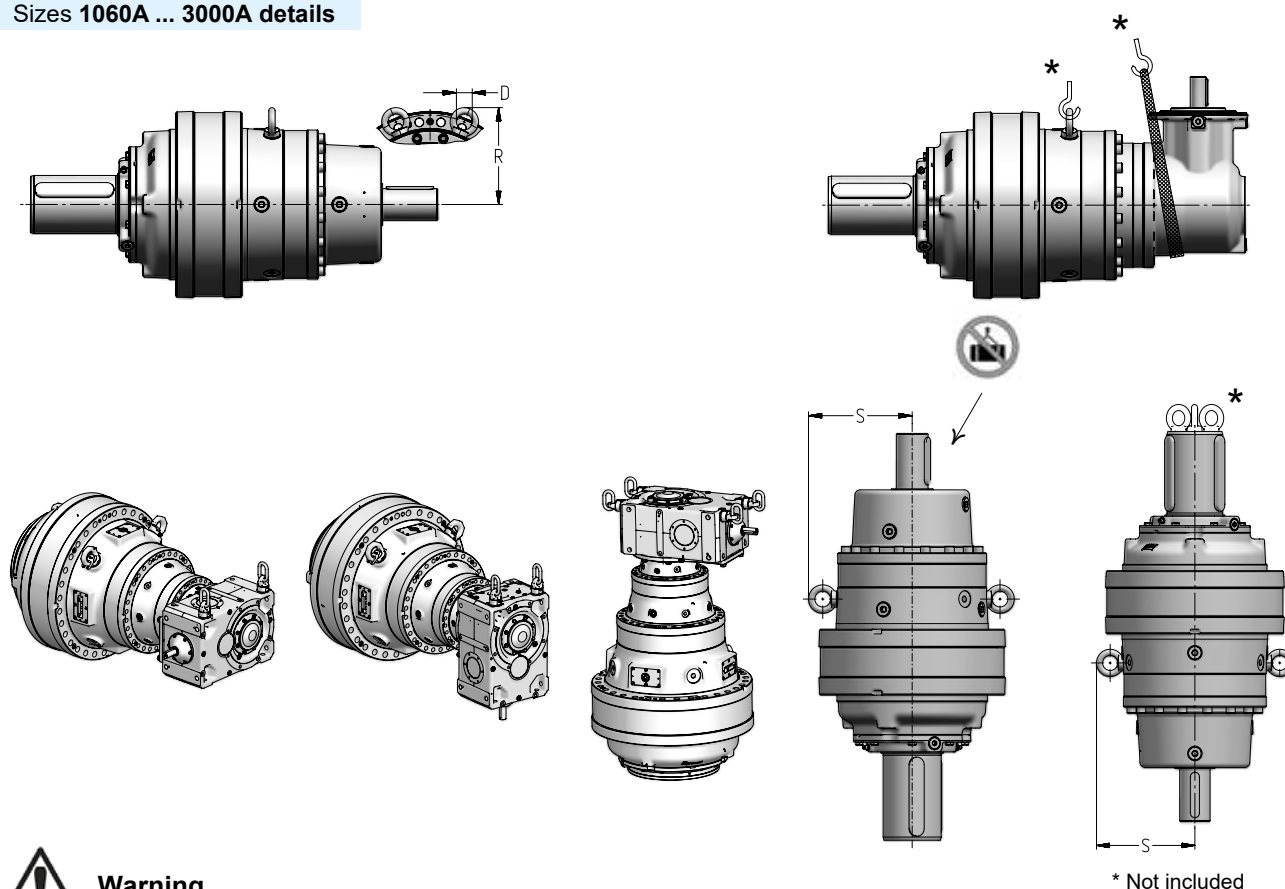


Warning!

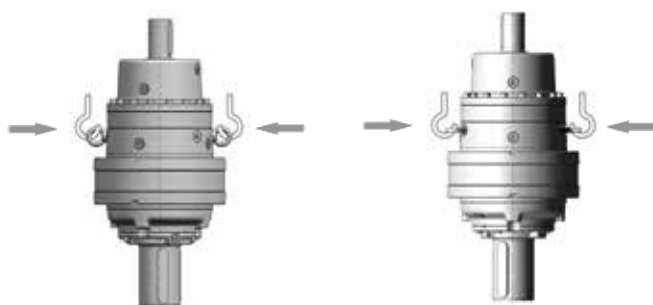
- Suspended load can fall
- Do not stand under the load
- Improper transport may result in damage to the gear reducer

Lifting and handling

Sizes 1060A ... 3000A details



Warning



✓ Lifting and handling **correct**

⊗ Lifting and handling **incorrect**

Size	D Ø	R 3EL ... 4EL 4EB	S 3EL ... 4EL 4EB
1060A	90	470	640
1500A	84	520	700
2120A	94	565	797
3000A	110	660	932

Storage

Environment should be sufficiently clean, dry and free from excessive vibrations ($v_{eff} \leq 0,2 \text{ mm/s}$) to avoid damage to bearings (excessive vibration should also be guarded during transit, even if within wider range) and ambient storage temperature should be $0 \div +40 \text{ °C}$: peaks of 10 °C above and below are acceptable (see also operating conditions in this chapter).

The gear reducer filled with oil must be positioned according to the mounting position mentioned on the name plate.

Every six months rotate the shafts (some revolutions are sufficient) to prevent damage to bearings and seal rings.

In normal environments and provided there has been adequate protection during transport, the product is provided for a storage period of up to 1 year.

For a 2 year storage period in normal environment it is necessary to pay attention also to the following instructions:

- generously grease the sealing, the shafts and the unpainted machined surfaces, if any, and periodically control conservation state of the protective anti rust oil
- completely fill the gear reducers with lubrication oil

For storages longer than 2 years or in aggressive environment or outdoors, consult Rossi S.p.A..

Installation

General

Before the installation, verify that:

- there are no damages on shafts and on mating surfaces
- design is suitable to the environment (temperature, atmosphere, etc.). In case of installation in environment with the risk of explosion occur to require during the order the execution ATEX II 2GD e 3GD
- be sure that the structure on which gear reducer is fitted is plane, levelled and strong enough in order to assure fitting stability and vibration absence (vibration speed $v_{eff} \leq 3,5$ mm/s for $P_N < 15$ kW and $v_{eff} \leq 4,5$ mm/s for $P_N > 15$ kW are acceptable), keeping in mind all transmitted forces due to the masses, to the torque, to the radial and axial loads
- the actual mounting position corresponds to the name plate data
- where backstop device is provided, verify the correct direction according to application requirements
- carefully align the gear reducer with the motor and the driven machine (with the aid of shims if need be), interposing flexible couplings whenever possible
- mount the gear reducer so as to allow a free passage of air for cooling both gear reducer and motor (especially at their fan side, accessory fan cooling if provided)
- avoid any obstruction to the air flow; heat sources near the gear reducer that might affect the temperature of cooling air and of gear reducer (for radiation); insufficient air recycle and applications hindering the steady dissipation of heat
- verify that the gear reducer housing is dust-free in order to achieve an efficient heat dissipation
- gear reducers and gearmotors should be protected, whenever possible and by appropriate means, from solar radiation and extremis of weather; weather protection **becomes essential** when high or low speed shafts are vertically disposed or when the motor is installed vertical with fan upward
- mating surfaces (of gear reducer and machine) must be clean and sufficiently rough to provide a good friction coefficient (indicatively $Ra 1,6 \div 3,2$ μm). Remove by a scraper or solvent the eventual paint of gear reducer on coupling surfaces and, especially in presence of external radial loads or torque required $M_2 \geq 0,7 \times M_{N2}$, apply **locking adhesives**
- when external loads are present use pins or locking blocks, if necessary

Before wiring-up the gearmotor make sure that motor voltage corresponds to input voltage. If direction of rotation is not as desired, invert two phases at the terminals.

Y- Δ starting should be adopted for no-load starting (or with a very small load) and for smooth starts, low starting current and limited stresses, if requested.

If overloads are imposed for long periods or if shocks or danger of jamming are envisaged, then motor-protection, electronic torque limiters, fluid couplings, safety couplings, control units or other similar devices should be fitted.

Protection of the motor with a thermal cut-out is recommended. Where duty cycles involve a high number of on-load starts, it is necessary to utilise **thermal probes** for motor protection (fitted on the wiring); magnetothermic breaker is unsuitable since its threshold must be set higher than the motor nominal current of rating.

Connect thermal probes, if any, to auxiliary safety circuits.

Use varistors and/or RC filters to limit voltage peaks due to contactors.

- For accessories not supplied by Rossi pay attention to their correct dimensioning; if necessary consult us.



Warning!

Bearings life, safe shaft and coupling running depend on precise alignment of the shafts.

In presence of backstop device it is not recommended to temporarily dismount the motor from the reducer to avoid damaging the device.

Carefully align the gear reducer with the motor and the driven machine (with the aid of shims if need be), interposing flexible couplings whenever possible.

Whenever a leakage of lubricant could cause heavy damages, increase the frequency of inspections and/or envisage appropriate control devices (e.g.: remote oil level gauge, lubricant for food industry, etc.).

In polluting environment, take suitable precautions against lubricant contamination through seal rings or other.

For brake or special motors, consult us for specific information.

Screws and tightening torque

According to the design and size stated on nameplate, use screws and tightening torques as shown in the following tables; at least class 10.9 is necessary but in case of heavy stresses, alternate loads and shocks use class 12.9. Screws of class 12.9 must be equipped (where indicated, e.g.:  see following table) with ISO 7089 washers (300 HV min.).

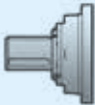
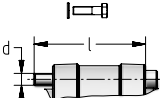
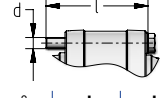
Be careful to the tightening of the 12.9 screws. Over tightening can damage them.

The suggested tightening torque value are valid for an estimated friction coefficient of $\mu = 0,14$ typical for lightly oiled steel bolts, black annealed or phosphatised and dry, cut mating threads in steel or cast iron.

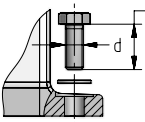
Do not use lubricants altering the friction coefficient for they may overload the screw connection.

Always use dynamometric wrench or similar and verify the tightening torque after the first hours of running.

Sizes 1060A ... 3000A

Size	Design (e.g. C400M1 F10o)		
	C... F...		
	S... F...		
	H... A...		
	Z... F...		
	Q... F...		
	T... A...		
			
			
	n°	d Ø	l min
1060A	32	M42	440
1500A	40	M42	490
2120A	40	M48	545
3000A	36	M56	620

Sizes 1060A ... 3000A

Size	Accessories ,FB			
			12.9 with washer (300 HV min.)	
				
	n°	d Ø	l min	
	1060A	8	M60	200
	1500A	8	M68	220
	2120A	8	M76	250
3000A	8	M80	270	

Sizes 1060A ... 3000A

Size 	Accessories (e.g. WF... , WT...)		
	n°	d 10.9	l min
1060A	40	M42	150
1500A	44	M42	160
2120A	44	M48	180
3000A	40	M56	220

Tightening torque [N m]



Ø	Class		
	8.8 $M_2 < 70\% M_{n2}$	10.9	12.9 Washer must be always used (300 HV min.)
M10	50	70	85
M12	85	120	145
M14	135	190	230
M16	210	300	355
M20	400	560	675
M22	530	770	895
M24	690	1000	1165
M27	1010	1400	1705
M30	1380	1950	2330
M33	2000	2800	3375
M36	2500	3550	4220
M39	2950	4200	4980
M42	4100	5800	6920
M45	5000	7100	8440
M48	6000	8400	10100
M52	7600	10700	12800
M56	9800	13800	16540
M60	11900	16800	20200
M68	17600	24700	29700
M76	24900	35100	42100
M80	29300	41200	49400

For splined couplings apply proper lubricants.

To machine the driven shaft, please refer to the dimensions shown in ch. 2.

Before mounting, pay attention to clean carefully mating surfaces.

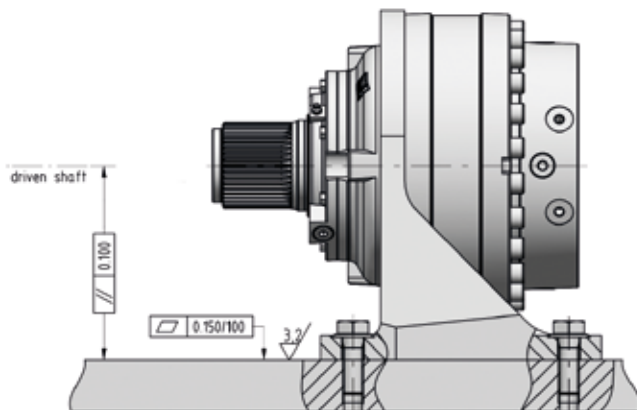
In presence of external radial loads or torque required $M_2 \geq 0,7 \times M_{N2}$, apply locking adhesives.

Tighten the screws according to the values given in the table on previous page.

To machine the matching frame, please refer to the drawings below.

[illegible]

Sizes 1060A ... 3000A



Shaft mounting arrangements

When shaft mounted, the gear reducer must be supported both axially and radially (also for mounting positions B5 ... B53 see ch. 4) by the shaft end of the driven machine as well as anchored against rotation only by means of a reaction having freedom of axial movement and sufficient clearance in its couplings to permit minor oscillations – always in evidence – without provoking dangerous overloads on the gear reducer. It is recommended to use the torque arm symmetrically to the gear reducer low speed shaft because, in this way, the torque reaction is equally distributed on the two constraints without loading the machine bearings. Foresee adequate elastic bushes and lubricate with proper products the hinges and the parts subject to sliding. Regarding the reaction system, follow the instructions contained in the specific technical documentation.

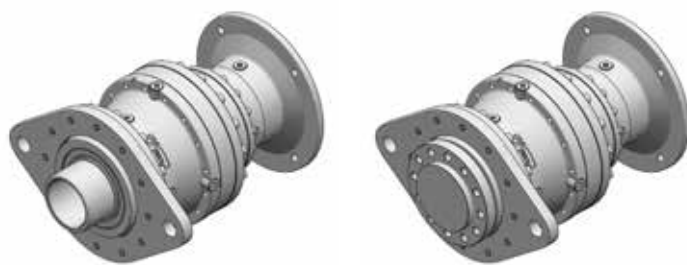


Whenever personal injury or property damage may occur, due to falling or projecting parts of the gear reducer or of its parts, foresee adequate supplementary protection devices against:

- rotation or unthreading of the gear reducer from shaft end of driven machine following to accidental breakage of the reaction arrangement
- accidental breakage of shaft end of driven machine



Attention! For **vertical ceiling-type** mounting and only for gear reducers equipped with locking rings or bush, gear reducer support is due only to friction, for this reason it is advisable to provide it with a fastening system.



Shaft end mounting

Before mounting clean mating surface thoroughly and lubricate against seizure and fretting corrosion, except for hollow shaft mounting (see below).

For shaft end type **T + WT** use screws and tightening torques as shown at page 105.



Attention! Installing and removal operations should be carried out with **pullers** and **jacking screws** using the tapped holes at the shaft butt-end (see ch. «Fitting of components to shaft end») taking care to avoid impacts and shocks which **may irretrievably damage the bearings, the circlips** or other parts.

Hollow shaft mounting with shrink disc

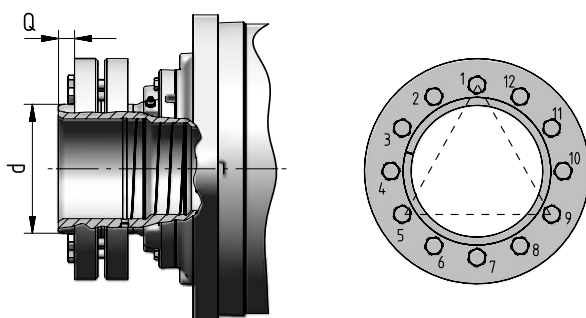
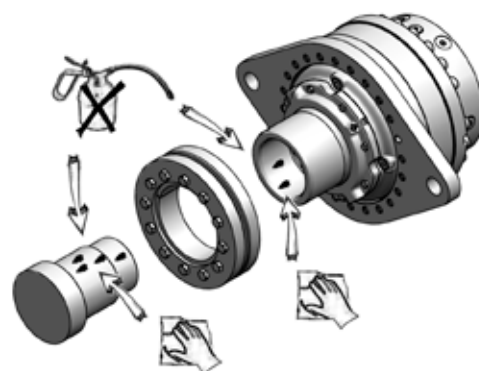
For the shaft end detail of machines where the hollow shaft of the gear reducer is to be keyed, follow the instructions below.

Installation

If the shrink disc is not supplied by us, please carefully follow the manufacturer's instructions

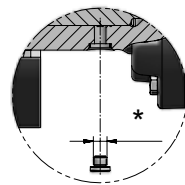
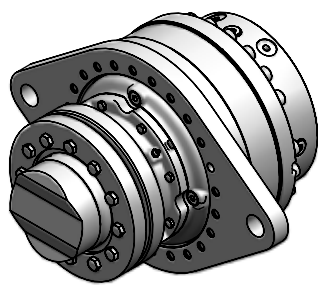
When keying the shrink disc supplied by Rossi, follow these instructions:

- carefully degrease the surfaces of hollow shaft and shaft end of driven machine to be fitted
- mount the shrink disc on gear reducer hollow shaft by lubricating first only the external surface of hollow shaft; pay attention to locate axially the shrink disc at dimension «Q» shown in table below (values valid only for our shrink disc)
- slightly tighten a first group of three screws positioned at about 120° as shown for example in the figure



Size	d	Q
1060A	500	25
1500A	560	25
2120A	620	30
3000A	750	58

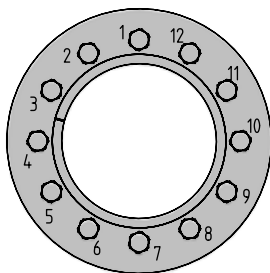
- mount the gear reducer on the machine shaft end; insert the shaft slowly to allow an air escape (from size 030A, open the plug located on the shaft, see below)



details

* valid for
G 1/4" 1060 - 1500
G 3/8" 2120 - 3000

- gradually and uniformly tighten, by means of dynamometric wrench, the screws of shrink disc at torque value shown in the fig. below, by a continuous sequence (not crossing) using approximately ¼ turns for several passes until ¼ turns can no longer be achieved
- continue to apply overtorque for 1 or 2 more passes and at the end verify the bolt tightening torque
- when having heavy duty cycles, with frequent reversals, verify the bolt tightening torque again, after some hours of running



Size	Code	screw	quantity	T... tightening [N m]
1060A	SD500	M30	20	1970
1500A	SD560	M30	24	1970
2120A	SD620	M30	30	1970
3000A	SD750	M33	32	2650

Dismounting



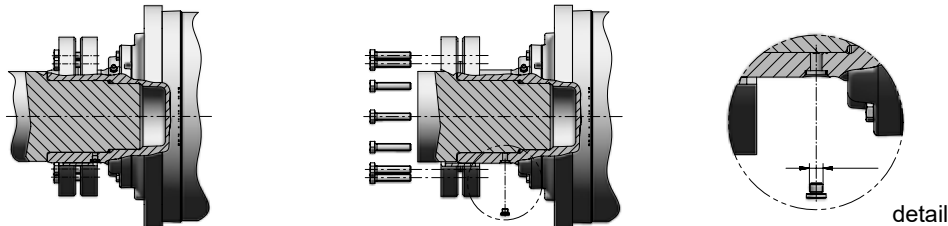
Do not completely remove fastening screws before locking rings are disengaged.

Risk of serious injury!!!

Clean off any rusty areas.

Loosen the fastening screws one after the other **only** by using approx. ½ turn at a time and by a continuous sequence (not crossing), until shrink disc can be moved on the hollow shaft.

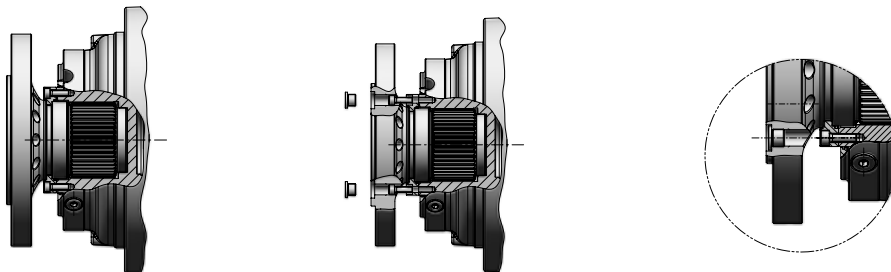
Remove the customer shaft or the gear reducer. To make it easier it is possible to inject low pressure oil through a threaded hole located on the hollow shaft (see below).



"T" outputs can be used both for gear reducer shaft mounting coupling it to the splined solid shaft and coupling it to a splined solid wheel flange.

For the mounting of "T" output to a splined solid wheel flange, carefully follow these instructions:

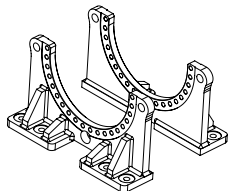
- remove the metal plugs positioned on splined wheel flange holes, prearranged for the fastening screws
- carefully lubricate the splined parts with grease for industrial applications with heavy and long lasting loads
- insert the O-ring seal on flange shaft
- (in case of mounting with wheel flange) - orientate the accessory before mounting; identify the tooth of splined shaft timing with the relevant recess positioned on gear reducer shaft. Timed tooth and recess are identified as per hole, see fig.
- insert slowly the splined shaft in order to have an air outlet
- radially mount the cover, compressing the O-ring
- screw with crossed tightening the tightening screws of half rings taking care to tighten to the relevant torque
- close the holes of splined wheel flange with plugs



Accessories mounting

Carefully clean the coupling surfaces, apply locking adhesives (recommended only with torque arm or foot bracket) and assemble the accessory to the gear reducer. Tighten the screws by a dynamometric wrench at values shown in the following tables.

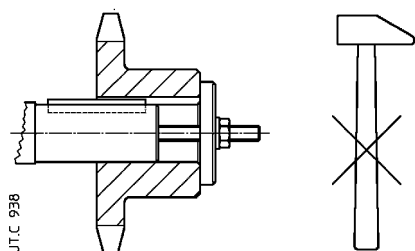
Foot bracket



1060A ... 3000A

Code	stud bolts			washer	nut		tightening torque
	d x l	class	ISO	DIN	class	UNI	[Nm]
FB10o	M42x630 (x18)	10.9	ISO 888:2012	6916	10	5588	5800
	M42x490 (x14)		ISO 4759-1				
FB10p	M42x700 (x22)	10.9	ISO 888:2012	6916	10	5588	5800
	M42x540 (x18)		ISO 4759-1				
FB10q	M48x800 (x22)	10.9	ISO 888:2012	6916	10	5588	8400
	M48x620 (x18)		ISO 4759-1				
FB10r	M56x910 (x20)	10.9	ISO 888:2012	6916	10	5588	13800
	M56x700 (x16)		ISO 4759-1				

Fitting of components to shaft end

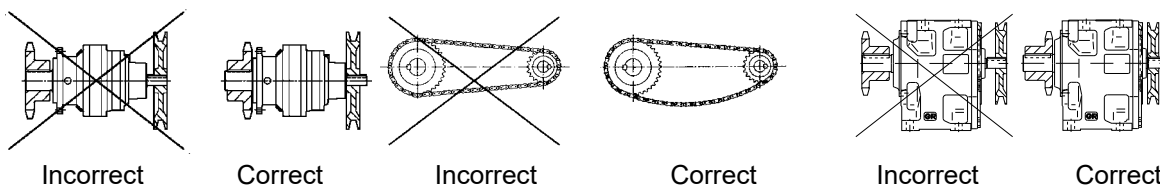


It is recommended that the bore of parts keyed to cylindrical shaft ends (spigots for splined shaft ends) is machined. Before mounting, clean mating surfaced thoroughly and lubricate against seizure and fretting corrosion. Attention! Installing and removal operations should be carried out with pullers and jacking screws using the tapped holes at the shaft butt-end (see fig. below) taking care to avoid impacts and shocks which may irretrievably damage the bearings, the circlips or other parts. For H7/m6, K7/k6 and K7/m6 fits it is advisable that the part to be keyed is preheated to a temperature of $80 \div 100$ °C.

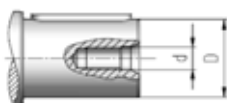
For splined couplings apply adequate grease or paste. The couplings having a tip speed on external diameter up to 20 m/s must be statically balanced; for higher tip speeds they must be dynamically balanced.

Where the transmission link between gear reducer and machine or motor generates shaft end loads, (see fig. below), ensure that the loads do not rise above the catalog values:

- transmission overhang is kept to a minimum
- gear-type transmission must guarantee a minimum of backlash on all mating flanks
- drive-chains should not be tensioned (if necessary – alternating loads and/or motion – foresee suitable chain tighteners)
- drive-belts should not be over-tensioned



D Ø	d Ø
42 ÷ 55	M 12
60 ÷ 75	M 16
80 ÷ 95	M 20
100 ÷ 110	M 24
120 ÷ 140	M 30
160 ÷ 210	M 36



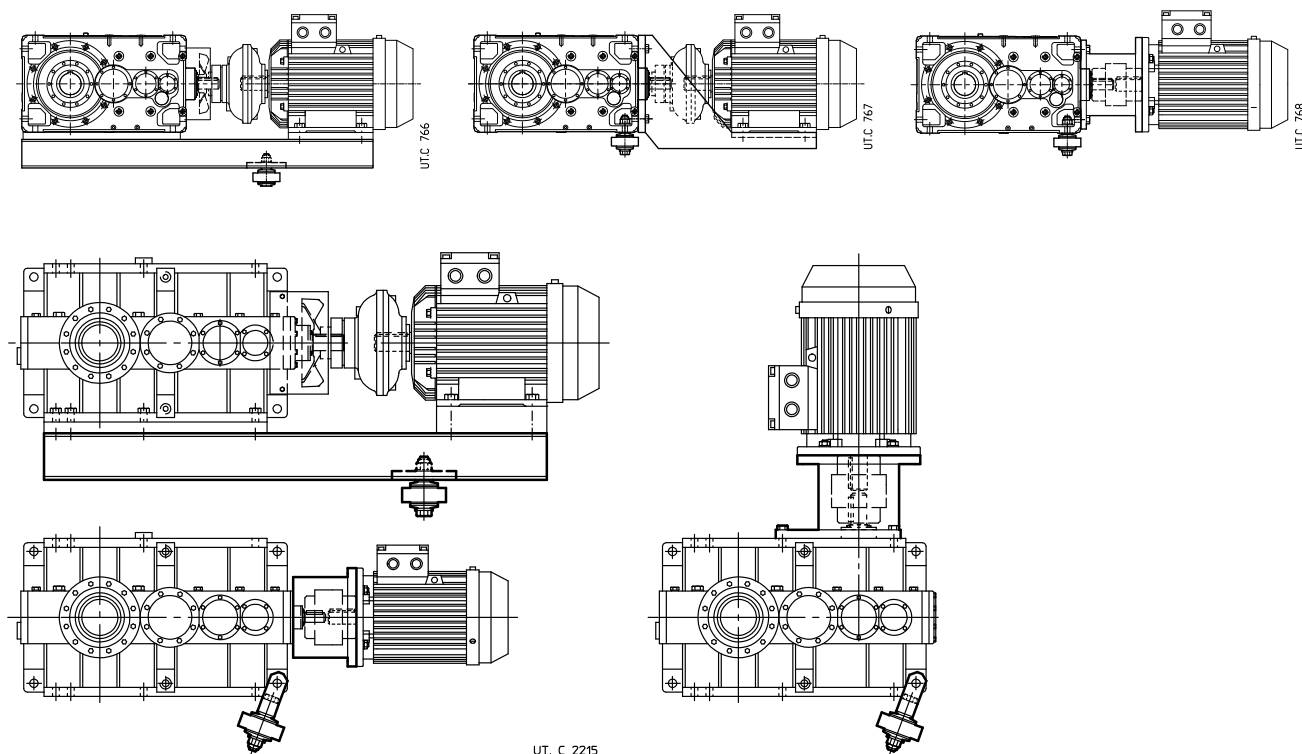
Shaft mounting arrangements

The strength and shape of the housing offer **advantageous** possibilities for shaft mounting even – for instance – in the case of gearmotor with belt drive, hydraulic coupling, etc.

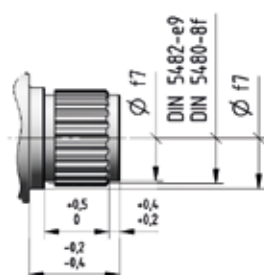
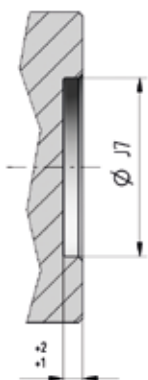
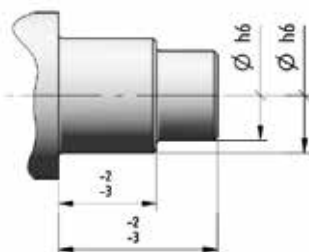
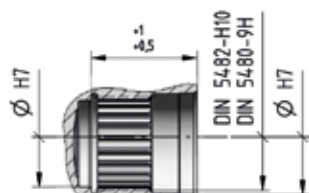
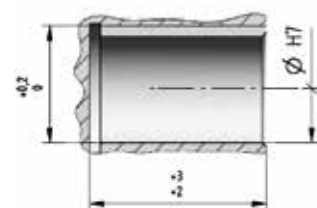
A few possible examples of shaft mounting arrangements are shown.

IMPORTANT. When shaft mounted, the gear reducer must be supported both axially and radially (also for mounting positions B3 ... B8) by the machine shaft end, as well as anchored against rotation only, by means of a reaction having **freedom of axial movement** and **sufficient clearance** in its couplings to permit minor oscillations always in evidence without provoking dangerous overloading on the gear reducer. Lubricate with proper products the hinges and the parts subject to sliding; when mounting the screws it is recommended to apply locking adhesives type LOCTITE 601.

In case of axial fastening with elastic constraint, in B3 or B8 mounting position, ensure that housing oscillation while running does not exceed the perfectly horizontal position.

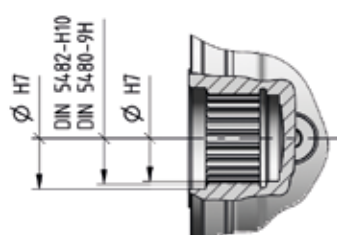
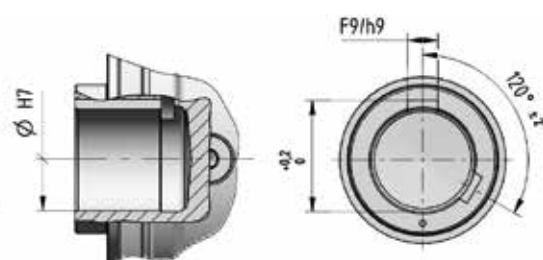
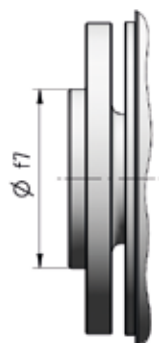
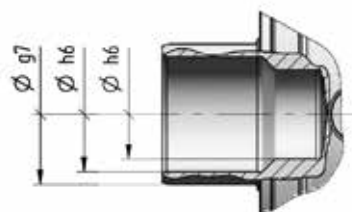
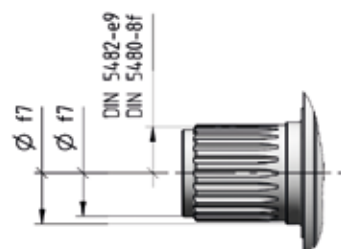
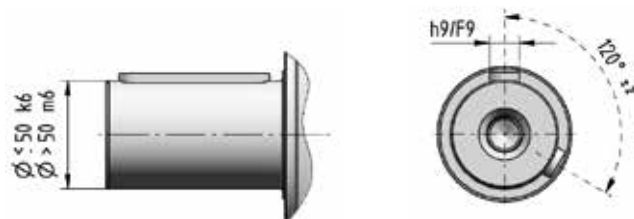


Suggested mating tolerances



Output

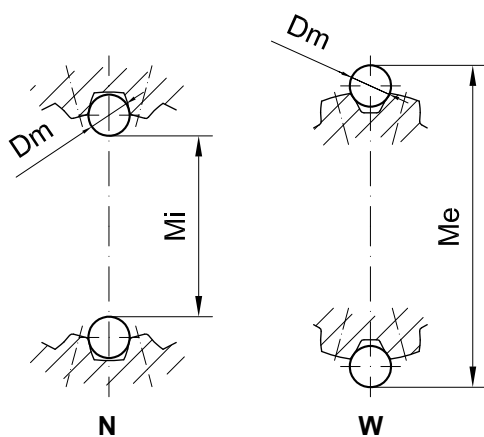
Gear reducer shaft end tolerances



Tolerances according to ISO 286

mm	e7	f7	g6	g7	h6	h9	k6	m6	E6	F6	F9	G7	H6	H7	J7
from 1	-0,014	-0,006	-0,002	-0,002	0	0	+0,006	+0,008	+0,020	+0,012	+0,031	+0,012	+0,006	+0,010	+0,004
to 3	-0,024	-0,016	-0,008	-0,012	-0,006	-0,025	0	+0,002	+0,014	+0,006	+0,006	+0,002	0	0	-0,006
> 3	-0,020	-0,010	-0,004	-0,004	0	0	+0,009	+0,012	+0,028	+0,018	+0,040	+0,016	+0,008	+0,012	+0,006
to 6	-0,032	-0,022	-0,012	-0,016	-0,008	-0,030	+0,001	+0,004	+0,020	+0,010	+0,010	+0,004	0	0	-0,006
> 6	-0,025	-0,013	-0,005	-0,005	0	0	+0,010	+0,015	+0,034	+0,022	+0,049	+0,020	+0,009	+0,015	+0,008
to 10	-0,040	-0,028	-0,014	-0,020	-0,009	-0,036	+0,001	+0,006	+0,025	+0,013	+0,013	+0,005	0	0	-0,007
> 10	-0,032	-0,016	-0,006	-0,006	0	0	+0,012	+0,018	+0,043	+0,027	+0,059	+0,024	+0,011	+0,018	+0,010
to 18	-0,050	-0,034	-0,017	-0,024	-0,011	-0,043	+0,001	+0,007	+0,032	+0,016	+0,016	+0,006	0	0	-0,008
> 18	-0,040	-0,020	-0,007	-0,007	0	0	+0,015	+0,021	+0,053	+0,033	+0,072	+0,028	+0,013	+0,021	+0,012
to 30	-0,061	-0,041	-0,020	-0,028	-0,013	-0,052	+0,002	+0,008	+0,040	+0,020	+0,020	+0,007	0	0	-0,009
> 30	-0,050	-0,025	-0,009	-0,009	0	0	+0,018	+0,025	+0,066	+0,041	+0,087	+0,034	+0,016	+0,025	+0,014
to 50	-0,075	-0,050	-0,025	-0,034	-0,016	-0,062	+0,002	+0,009	+0,050	+0,025	+0,025	+0,009	0	0	-0,011
> 50	-0,060	-0,030	-0,010	-0,010	0	0	+0,021	+0,030	+0,079	+0,049	+0,104	+0,040	+0,019	+0,030	+0,018
to 80	-0,090	-0,060	-0,029	-0,040	-0,019	-0,074	+0,002	+0,011	+0,060	+0,030	+0,030	+0,010	0	0	-0,012
> 80	-0,072	-0,036	-0,012	-0,012	0	0	+0,025	+0,035	+0,094	+0,058	+0,123	+0,047	+0,022	+0,035	+0,022
to 120	-0,107	-0,071	-0,034	-0,047	-0,022	-0,087	+0,003	+0,013	+0,072	+0,036	+0,036	+0,012	0	0	-0,013
> 120	-0,085	-0,043	-0,014	-0,014	0	0	+0,028	+0,040	+0,110	+0,068	+0,143	+0,054	+0,025	+0,040	+0,026
to 180	-0,125	-0,083	-0,039	-0,054	-0,025	-0,100	+0,003	+0,015	+0,085	+0,043	+0,043	+0,014	0	0	-0,014
> 180	-0,100	-0,050	-0,015	-0,015	0	0	+0,033	+0,046	+0,129	+0,079	+0,165	+0,061	+0,029	+0,046	+0,030
to 250	-0,146	-0,096	-0,044	-0,061	-0,029	-0,115	+0,004	+0,017	+0,100	+0,050	+0,050	+0,015	0	0	-0,016
> 250	-0,110	-0,056	-0,017	-0,017	0	0	+0,036	+0,052	+0,142	+0,088	+0,186	+0,069	+0,032	+0,052	-0,036
to 315	-0,162	-0,108	-0,049	-0,069	-0,032	-0,130	+0,004	+0,020	+0,110	+0,056	+0,056	+0,017	0	0	-0,016
> 315	-0,125	-0,062	-0,018	-0,018	0	0	+0,040	+0,057	+0,161	+0,098	+0,202	+0,075	+0,036	+0,057	+0,039
to 400	-0,182	-0,119	-0,054	-0,075	-0,036	-0,140	+0,004	+0,021	+0,125	+0,062	+0,062	+0,018	0	0	-0,018
> 400	-0,135	-0,068	-0,020	-0,018	0	0	+0,045	+0,063	+0,165	+0,102	+0,223	+0,083	+0,040	+0,063	+0,043
to 500	-0,198	-0,131	-0,060	-0,081	-0,040	-0,155	+0,005	+0,023	+0,125	+0,062	+0,068	+0,020	0	0	-0,020
> 500	-0,145	-0,076	-0,022	-	0	0	+0,044	+0,07	+0,189	+0,12	+0,251	+0,092	+0,044	+0,07	-
to 630	-0,215	-0,146	-0,066	-	-0,044	-0,175	0	+0,026	+0,145	+0,076	+0,076	+0,022	0	0	-

Splined shafts - measurement over pins



DIN 5480	female male	m	z	Dm	tolerance	Mi - Me	
						max	min
400x8	N	8	48	14	9H	371,155	371,033
	W			16	8f	416,356	416,278
460x8	N	8	56	14	9H	431,155	431,014
	W			16	8f	476,788	476,698
500x8	N	8	61	14	9H	470,997	470,856
	W			16	8f	516,660	516,570
600x10	N	10	58	18	9H	562,423	562,285
	W			20	8f	620,635	620,547

For more detail see specific literature DIN 5480.

Motor mounting or replacement

Electric motors

Check the mating dimensions for standards IEC 72-1 be sure that the mating surfaces are machined under accuracy rating (IEC 60072-1, UNEL 13501-69; DIN 42955) – for NEMA standards please refer to NEMA C-FACE chart;

- clean surfaces to be fitted thoroughly;
- check and, if necessary, lower the parallel key so as to leave a clearance of $0,1 \div 0,2$ mm between its top and the bottom of the keyway of the hole. If shaft keyway is without shoulder, lock the key with a pin.
- lubricate surfaces to be fitted against fretting corrosion (Klüberpaste 46 MR 401 is recommended).
- insert the motor down to shoulder on gear reducer flange; this operation can be facilitate vertically positioning the gear reducer with motor flange mounted upwards;



Do not force the motor shaft into the gear reducer coupling. A serious damage may occur!

- check that motor centering is in the relevant gear reducer flange seat
- check that the length of the screws is enough to have $2 \times$ pitch over the nut
- tighten the motor fastening screws to gear reducer flange in order to achieve the tightening torque as per following table:

Bolt	Tightening torque
d	N m
Ø	class 8.8
M8	25
M10	56
M12	85
M14	135
M16	205

Maximum allowed bending moment

In case of assembly of motors supplied by the customer, verify that the static bending moment M_b generated by motor weight on the counter flange of gear reducer is lower than the value allowed M_{bmax} , stated in the table:

$$M_b < M_{bmax}$$

where:

$$M_b = G \cdot (Y_g + h) / 1\,000 \text{ [N m]}$$

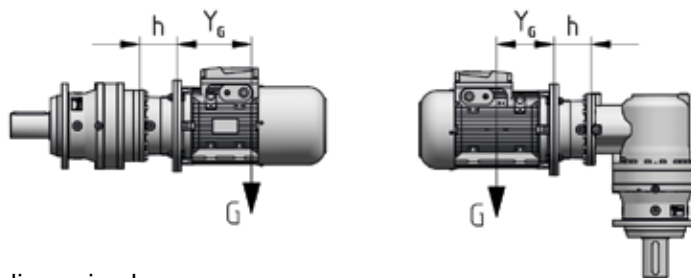
G [N] motor weight, nearly numerically equal to motor mass, expressed in kg, multiplied by 10

Y_g [mm] distance from motor center of gravity from flange surface

h [mm] supplied in the table, according to gear reducer size and IEC motor size

Too long and thin motors, though with bending moments lower than prescribed limits, may generate anomalous vibrations during the operation. In these cases it is necessary to foresee a proper additional motor support (see motor specific documentation).

Loads higher than permissible loads may be present in dynamical applications where the gearmotor is subjected to translations, rotations or oscillations: consult us for the study of every specific case.



Bending moment M_{bmax} and dimension h

4EL	4EB	IEC	Code	h	M_{bmax}
				mm	N m
1060A	1060A	160	I42×350	111	4500
		180	I48×350	111	
		200	I55×400	111	
		225	I60×450	141	
		250	I65×550	141	
		280	I75×550	141	

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Lubrication

Gear pairs are oil-bath lubricated, bearings are either oil bathed or splashed or lubricated «for life» with grease. For some mounting positions with continuous duty at high speed, an expansion tank is foreseen: consult us.

Important!: Verify the mounting position, keeping in mind that if gear reducer is installed in a mounting position differing from the one stated on name plate, it could need the addition of the difference between the two lubricant quantities. In any cases, always check the correct oil quantities through the level plug.

Sizes 1060A ... 3000A: gear reducers are supplied **without oil**; before putting into service, fill to the specified level¹⁾ with synthetic or mineral oil (see table below).

1) The lubricant quantities stated in ch. 4 of present instructions are approximate and indicative for provisioning. The exact oil quantity the gear reducer is to be filled with is definitely given by the level. When output speed n_2 is lower than $0,3 \text{ min}^{-1}$, for all mounting positions please refer to the approximate oil quantities stated for V1 position.

Important:

Inappropriate lubricants can cause damage to the gear reducer. Polyalphaolefin (PAO) base synthetic lubricants must be preferred over Polyglycol (PAG) base synthetic lubricants.

Never mix different type or brand of synthetic oil; if the oil-change involves switching to a different type from the one used so far, then give the gear reducer a through clean-out.

In case of first filling of Polyglycol (PAG) base synthetic lubricant it is mandatory to clean the gear reducer thoroughly before the final filling through a preliminary internal washing to eliminate the residues of any lubricants.

Rossi S.p.A. declines any responsibility deriving from the use of other lubricants or from the use outside the expected ambient temperature range. The indications on lubricants do not bind Rossi S.p.A. on the quality of the lubricant supplied by each respective manufacturer.

Use only lubricants with **EP** (extreme pressure) **additives**.

In case of mineral lubricant choice, follow the instructions about the service factor (EP catalog).

Manufacturer	PAO synthetic oil ISO VG 320	mineral oil ISO VG 150 ... 460
AGIP	Blasia SX	Blasia
ARAL	Degol PAS	Degol BG
BP	Energol EPX	Energol GR-XP
CASTROL	Alphasyn EP	Alpha SP
FUCHS	Renolin Unisys	Renolin CLP

Manufacturer	PAO synthetic oil ISO VG 320	mineral oil ISO VG 150 ... 460
KLÜBER	Klübersynth GEM4	Klübersynth GEM1
MOBIL	Mobil SHC Gear	Mobilgear 600 XP
SHELL	Omala S4 GX	Omala S2 G
TEXACO	Pinnacle	Meropa
TOTAL	Carter SH	Carter EP

For lubricant viscosity selection, refer to the table in the next page.

Bearings with independent lubrication

Usually the bearings are automatically and continuously lubricated (oil-bathed or splashed) with the same lubricant of gear reducer. However for certain gear reducer in vertical mounting positions V1, V3 and horizontal mounting positions B51, B52 the upper bearings have independent lubrication, with special grease for «long life» lubrication in absence of external pollution.

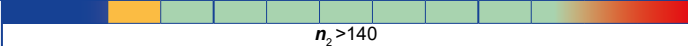
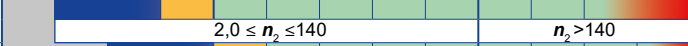
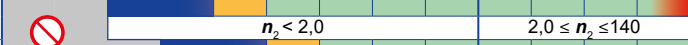
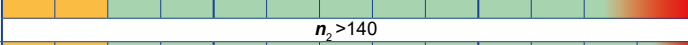
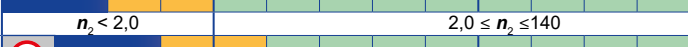
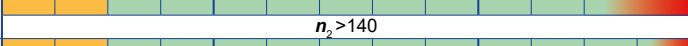
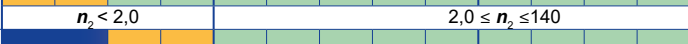
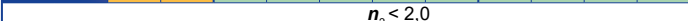
Combined gear reducer units. Lubrication remains independent, thus data relative to each single gear reducer hold good.

Planetary gear reducers - Lubricant

Lubricant type and viscosity selection according to output speed n_2 [min⁻¹] and ambient temperature T_{amb} [°C] range.

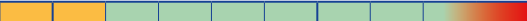
The following tables have been created starting from Shell lubricant characteristics, but are also valid for similar products (see table below). For further verification, especially under extreme operating conditions, always refer to the technical data sheet of the specific lubricant.

Splash lubrication or with independent cooling units ¹⁾

		Oil viscosity [cSt @ 40°C]	Ambient temperature T_{amb} [°C]													
			-20	-15	-10	-5	0	+5	+10	+15	+20	+25	+30	+35	+40	+45
Mineral oil	ISO VG 150	 $n_2 > 140$														
	ISO VG 220	 $2,0 \leq n_2 \leq 140$														
	ISO VG 320	 $n_2 < 2,0$														
	ISO VG 460	 $n_2 < 2,0$														
PAO synthetic oil (Polyalphaolefine)	ISO VG 150	 $n_2 > 140$														
	ISO VG 220	 $2,0 \leq n_2 \leq 140$														
	ISO VG 320	 $n_2 < 2,0$														
	ISO VG 460	 $n_2 < 2,0$														
PAG synthetic oil (Poly Alkylene Glycol)	ISO VG 150	 $n_2 > 140$														
	ISO VG 220	 $2,0 \leq n_2 \leq 140$														
	ISO VG 320	 $n_2 < 2,0$														
	ISO VG 460	 $n_2 < 2,0$														

1) Provide starting of the independent cooling units only when the oil temperature T_{oil} is $> 25^\circ\text{C}$. During the starting, it may take a short period of time for the oil to circulate completely between the unit and the gearbox, depending on the viscosity level and the morphology of pipes and oil connections. During this transitional period, operation of the gear unit is permitted.

Forced lubrication with/without heat exchanger ²⁾

Oil viscosity [cSt @ 40°C]		Ambient temperature T_{amb} [°C]															
		-20	-15	-10	-5	0	+5	+10	+15	+20	+25	+30	+35	+40	+45	+50	
Mineral oil	ISO VG 150																
	ISO VG 220						$n_2 > 140$										
	ISO VG 320						$2,0 \leq n_2 \leq 140$					$n_2 > 140$					
	ISO VG 460						$n_2 < 2,0$					$2,0 \leq n_2 \leq 140$					
		$2,0 \leq n_2 \leq 140$															
PAO synthetic oil (Polyalphaolefin)	ISO VG 150																
	ISO VG 220						$n_2 > 140$										
	ISO VG 320						$n_2 > 140$					$2,0 \leq n_2 \leq 140$					
	ISO VG 460						$2,0 \leq n_2 \leq 140$					$2,0 \leq n_2 \leq 140$					
		$2,0 \leq n_2 \leq 140$															
PAG synthetic oil (Poly Alkylene Glycol)	ISO VG 150																
	ISO VG 220						$n_2 > 140$										
	ISO VG 320						$n_2 > 140$					$2,0 \leq n_2 \leq 140$					
	ISO VG 460						$n_2 < 2,0$										

2) In the case of forced lubrication, the gear unit should only be operated when the oil temperature T_{oil} is higher than the temperature indicated in the table. During start-up of the lubrication unit, a short period of preheating may be necessary, to be carried out with the gear unit at standstill, before complete circulation of the oil and proper lubrication of the internal components is achieved.

- Admitted application field, optimal range.
- Admitted application field where higher absorption is expected due to higher viscosity; prefer gradual starts and partial load operation.
- Non-optimal application range; in this case it is recommended to use oils with viscosity grade at least 30 cSt referred to max oil temperature (T_{oil}) during the operation.
- Non-optimal application range; in this case it is necessary to foresee oil with Pour Point at least 10°C lower than the minimum temperature indicated by the field. Foresee a phase of rotation at no load (pre-heating) at least up to the attainment of a temperature T_{amb} equal or superior to the minimum indicated in the field of application admitted.
- Application field not allowed. If necessary contact Rossi S.p.A.
- $n_2 > 140$ Indicative output speed for selection of lubricant viscosity

Helical and bevel helical gear reducers - Lubricant

Gear pairs are oil-bath lubricated.

Bearings are either oil-bathed or splashed with the exception of the top bearings which are lubricated with a pump or lubricated «for life» with grease (with or without NILOS ring according to speed).

Gear reducers are supplied **without oil**; before putting into service, fill to the specified level with **mineral oil** having the ISO viscosity grade given in the table, according to ambient temperature and output speed.

When it is required to increase oil change interval («long life»), the ambient temperature range, and/or to reduce oil temperature, use **synthetic oil** with **polyalphaolefines** basis having ISO viscosity grade as indicated in the table.

For continuous duty, the use of synthetic oil is recommended in the following case of gear reducers with size and mounting position marked with (see ch. 4) and bevel helical gear reducers with double extension high speed shaft.

An overall guide to oil-change interval is given in the table, and assumes pollution-free surroundings. When heavy overloads are present, halve the values.

Apart from running hours:

- replace mineral oil at least each 3 years;
- replace or regenerate synthetic oil each 5 – 8 years according to gear reducer size, running and environmental conditions.

Never mix different makes of synthetic oil; if oil-change involves switching to a type different from that used hitherto, then give the gear reducer a through clean-out.

Seal rings: duration depends on several factors such as dragging speed, temperature, ambient conditions, etc.: as a rough guide, it can vary from 3 150 to 25 000 h.

Warning: before unscrewing the filler plug with valve (symbol ) wait until the unit has cooled and then open with caution.

ISO viscosity grade

Mean kinematic viscosity [cSt] at 40 °C.

Speed n_2 min ⁻¹	Ambient temperature ¹⁾ [°C]				
	mineral oil			synthetic oil	
	-20 – 0 ³⁾	0 – 20	20 – 40	-20 – 0 ³⁾	0 – 40
> 224	150	150	150	150	150
224 – 22,4	150	150	220	150	220
22,4 – 5,6	150	220	320	220	320
< 5,6	220	320	460	320	460

Oil temperature °C	Oil-change interval [h]	
	mineral oil	oil synthetic
≤ 65	8 000	25 000
65 – 80	4 000	18 000
80 – 95	2 000	12 500
95 – 110 ²⁾	–	9 000

Oil list table

Brand	PAO synthetic oil ISO VG 150 ... 460	Mineral Oil ISO VG 150 ... 460
ENI	Blasia SX	Blasia
ARAL	Degol PAS	Degol BG
BP	Energyn EPX	Energol GR XP
CASTROL	Alphasyn EP	Alpha SP
FUCHS	Renolin Unisys CLP	Renolin CLP
KLÜBER	Klübersynth GEM 4	Klüberoil GEM 1
MOBIL	Mobil SHC Gear	Mobilgear 600 XP
SHELL	Omala S4 GX	Omala S2 G
TEXACO	Pinnacle	Meropa
TOTAL	Carter SH	Carter EP

1) Peaks of 10 °C below and 10 °C above the ambient temperature range are acceptable. For the running at **cold starting** ($T_{amb} = T_{oil} < 25^\circ$) and **forced lubrication systems**, **always foresee the oil heater** (see paragraph “Gear reducer starting at low ambient temperature”).

2) Values admissible for not continuous duty, only.

3) For size ≥ 4001, only.

Gear reducer starting at low ambient temperature ($T_{\text{amb}} = T_{\text{oil}} < 25\text{ }^{\circ}\text{C}$)

The **minimum** ambient temperature (equal to the oil one) to which it is allowed to start the gear reducer, depends on lubrication system and type of lubricant applied.

Gear reducers with splash lubrication

The gear reducer can be started with ambient/oil temperature $> -20\text{ }^{\circ}\text{C}$, keeping in mind to follow the lubricant viscosity instructions stated in Lubrication paragraph.

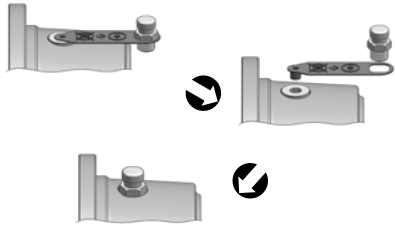
In presence of an eventual independent cooling unit with heat exchanger (but without forced lubrication, see also point A1 in table at ch. 12 (8)) of H catalog, it is necessary to drive the motorpump starting when achieving oil temperature of $60\text{ }^{\circ}\text{C}$.

Gear reducers with forced lubrication of bearings

In presence of forced lubrication systems of bearings (see ch. 6 and ch. 12 (8) and (9) of H catalog), the gear reducer can be started only if oil temperature is $> 25\text{ }^{\circ}\text{C}$, following the lubricant viscosity instructions in the Lubrication paragraph.

Therefore, before gear reducer starting it is necessary to pre-heat the oil bath through the use of heaters (see ch. 12 (10) of H catalog) up to a temperature of $25\text{ }^{\circ}\text{C}$.

Commissioning



Carry out an overall check, making particularly sure that the gear reducer is filled with lubricant up to level and mounted according to the mounting position stated on name plate.



The filler plug and breather is supplied disassembled, positioned near its housing. Before commissioning, after positioning the gear reducer in the mounting position stated in the nameplate, replace the closed plug with the filler plug and breather (see fig.).

Oil filling

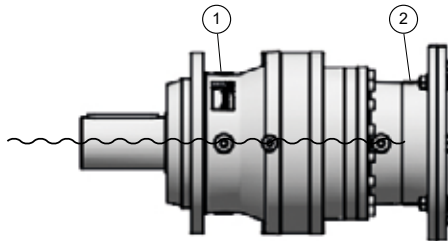
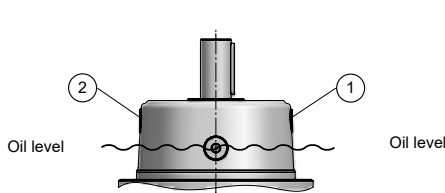


Pay attention to the correct position of the oil level plug (see ch. 4).

Where gear reducers is provided without lubricant, is necessary to fill it with appropriate oil before commissioning.

For mounting positions with input side in vertical position, during the oil filling, it is very important to always open the plug located up to the level of air escape in order to reach the correct level.

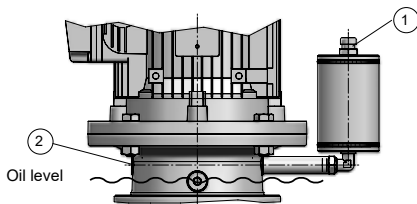
When the output speed n_2 is lower than $0,3 \text{ min}^{-1}$ and the mounting position is horizontal, the gear reducer must be completely filled with oil.



Oil filling:

- Open the plugs 1 and 2.
- Fill with oil by the plug 1 reaching the correct level
- Close the plugs 1 and 2.

Expansion tanks



For some mounting positions an expansion tank is needed in order to allow the correct oil level and the natural thermal expansion of lubricant.

It is very important that it must always be placed above the oil level.

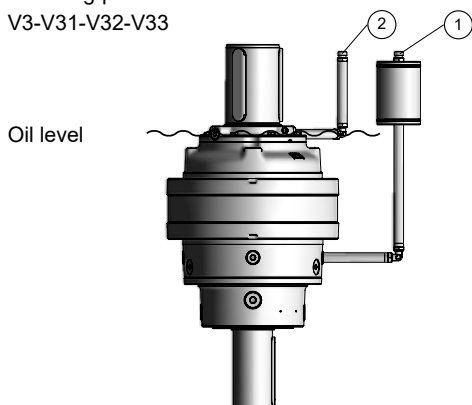
For the oil filling consider the diagram below:

Oil filling:

- Open plugs 1 and 2.
- Fill with oil by the plug 1 up to reach the correct level
- Close plugs 1 and 2.

With mounting positions V3-V31-V32-V33, when ordered, the expansion tank kit does not include the piping arrangement. In these cases, please refer to the diagram below:

Mounting positions
V3-V31-V32-V33

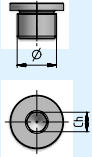
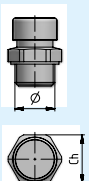


Oil filling:

- Open plugs 1 and 2.
- Fill with oil by the plug 1 up to reach the correct level
- Close plugs 1 and 2.

Plugs

For EP series plugs are magnetic. Size of plugs and breather plugs and values of tightening torque are shown below.

	Filler plugs				Breather plugs		
	Ø	Ch	Tightening torque [N m]		Ø	Ch	Tightening torque ¹⁾ [N m]
	G 1/8 "	5	8		G 1/4 "	17	12
	G 1/4 "	6	13		G 3/8 "	20	16
	G 3/8 "	8	20		G 1/2 "	24	23
	G 1/2 "	10	30		G 3/4 "	32	37
	G 3/4 "	12	45		G 1"	40	58
	G 1"	17	65		G 1" 1/4	50	105
	G 1" 1/4	22	100		G 1" 1/2	55	126
	G 1" 1/2	24	125				

1) Values valid with washer in aluminium.

Maintenance

At machine rest, verify at regular intervals (more or less frequently according to environment and use):

- all external surfaces are clean and air passages to the gear reducer are free, in order that cooling remains fully effective. An accumulation of dust impedes efficient heat dispensal from the gear reducer housing and must be removed;
- oil level and deterioration degree (check with cold gear reducer at rest);
- correct fastening screws tightening.

During operation, check periodically:

- noise level;
- vibrations;
- sealings;
- etc.

Attention! After a running period, gear reducer is subject to a light internal overpressure which may cause burning liquid discharge. Therefore, before loosening whichever plug (filler plug included) wait until gear reducer has become cold and open it carefully; if not possible, take the necessary protection measures against burning due to warm oil contact. In all cases, always proceed with great care.

Maximum oil temperatures indicated on lubrication table do not represent a hindrance to the gear reducer regular running.

Consider the lubrication interval stated in the table for all re-lubrication operations.

Use only lubricants of the same type stated on lubrication nameplate.

Oil temperature [°C]	Oil-change interval [h] - Planetary gear reducers	
	synthetic oil	mineral oil
≤ 65	12 500	5 600
65 ÷ 80	10 000	2 800
80 ÷ 95	6 300	1 400

Oil-change intervals assume pollution-free environment. When heavy overloads are present, halve the values.

Independently from running times, change the oil:

every 2 ÷ 4 years, for synthetic oil;

every 1 ÷ 2 years, for mineral oil;

During oil change operation, after unscrewing also the filler plug in order to facilitate oil draining (for plug position see ch. 4):

- wash the inside part of gear reducer housing using the same oil type suitable for the running (stated on lubrication nameplate); the oil used for this wash can be applied for further washings after proper filtering by 25 µm of filtration standard;
- clean, using a compressed air stream, all magnetic plugs, taking care to assemble them again in their original position;
- fill in the gear reducer with new oil up to level, using only oil of the same type and viscosity as per lubrication nameplate.

1) The lubricant quantities stated in ch. 4 are approximate and indicative for provisioning. The exact oil quantity the gear reducer is to be filled with is definitely given by the level. When output speed n_2 is lower than 0,3 min⁻¹, for all mounting positions please refer to the approximate oil quantities stated for V1 position.

Replace the seal rings in case of dismounting or of periodical check; in this case, the new ring must be positioned so that it does not work on the same sliding race of previous ring.

Seal rings - Planetary gear reducers

Duration depends on several factors such as dragging speed, temperature, ambient conditions, etc.; as a rough guide it can vary from 1 600 ÷ 12 500 h.

Refill output seals with grease every 3 000 operating hours or at least every 6 months.

Troubles: causes and corrective actions

Trouble	Possible causes	Corrective actions
Excessive temperature (in continuous duty or of bearings)	Inadequate lubrication: — excessive of insufficient oil quantity — exhaust lubricant — too tightened taper roller bearings — excessive ambient temperature	Check: — oil level (gear reducer standstill) — lubricant type Consult Rossi Increase the cooling or correct the ambient temperature
	Obstructed suction openings of fan cover	Clean the fan cover
	Bearing failure, defect or bad lubrication	Consult Rossi
	Inefficient or out of service oil cooling system: obstructed filter, insufficient oil (exchanger) or water (coil) flow rate, pump out of service, etc.	Check the pump, the pipes, the oil filter and safety devices efficiency (manostats, thermostats, etc.)
Anomalous noise	One or more teeth with — dents or spillings — excessive flanks roughness	Consult Rossi
	Bearings failure, defect or bad lubrication	
	Taper roller bearings with excessive clearance	
	Vibrations	
Lubricant leaking from seal rings	Seal ring with worm, bakelized, damaged or false mounted seal lip	Check the fastening Replace the seal ring
	Damaged rotating seating (scoring, rust, dent, etc.)	Restore the seating
	Mounting position differs from the one stated on the name plate	Correctly position the gear reducer

NOTE

When consulting Rossi state:

- all data on gear reducer or gearmotor name plate;
- failure nature and duration;
- when and under what conditions the failure happened;
- during the warranty period, in order not to loose its validity, do not dissamble nor open the gear reducer without the approval of Rossi.

Main formulae concerning mechanical drives, according to the Technical System and International Unit System (SI).

Frame size	With Technical System units	With SI units
starting or stopping time as a function of an acceleration or deceleration, of a starting or braking torque	$t = \frac{v}{a} \text{ [s]}$ $t = \frac{Gd^2 \cdot n}{375 \cdot M} \text{ [s]}$	$t = \frac{J \cdot \omega}{M} \text{ [s]}$
velocity in rotary motion	$v = \frac{\pi \cdot d \cdot n}{60} = \frac{d \cdot n}{19,1} \text{ [m/s]}$	$v = \omega \cdot r \text{ [m/s]}$
angular velocity	$n = \frac{60 \cdot v}{\pi \cdot d} = \frac{19,1 \cdot v}{d} \text{ [min}^{-1}\text{]}$	$\omega = \frac{v}{r} \text{ [rad/s]}$
acceleration or deceleration as a function of starting or stopping time	$a = \frac{v}{t} \text{ [m/s}^2\text{]}$	
angular acceleration or deceleration as a function of a starting or stopping time, of a starting or braking torque	$\alpha = \frac{n}{9,55 \cdot t} \text{ [rad/s}^2\text{]}$ $\alpha = \frac{39,2 \cdot M}{Gd^2} \text{ [rad/s}^2\text{]}$	$\alpha = \frac{\omega}{t} \text{ [rad/s}^2\text{]}$ $\alpha = \frac{M}{J} \text{ [rad/s}^2\text{]}$
starting or stopping distance as a function of an acceleration or deceleration, of a final or initial velocity	$s = \frac{a \cdot t^2}{2} \text{ [m]}$ $s = \frac{v \cdot t}{2} \text{ [m]}$ $w = \frac{\alpha \cdot t^2}{2} \text{ [rad]}$	
starting or stopping angle as a function of an angular acceleration or deceleration, of a final or initial angular velocity	$\varphi = \frac{n \cdot t}{19,1} \text{ [rad]}$	$\varphi = \frac{\omega \cdot t}{2} \text{ [rad]}$
mass	$m = \frac{G}{g} \left[\frac{\text{kgf s}^2}{\text{m}} \right]$	m è l'unità di massa [kg]
weight (weight force)	G è l'unità di peso (forza peso) [kgf]	$G = m \cdot g \text{ [N]}$
force in vertical (lifting), horizontal, inclined motion of translation (μ = coefficient of friction; φ = angle of inclination)	$F = G \text{ [kgf]}$ $F = \mu \cdot G \text{ [kgf]}$ $F = G (\mu \cdot \cos \varphi + \sin \varphi) \text{ [kgf]}$	$F = m \cdot g \text{ [N]}$ $F = \mu \cdot m \cdot g \text{ [N]}$ $F = m \cdot g (\mu \cdot \cos \varphi + \sin \varphi) \text{ [N]}$
dynamic moment Gd^2 , moment of inertia J due to a motion of translation (numerically $J = \frac{Gd^2}{4}$)	$Gd^2 = \frac{365 \cdot G \cdot v^2}{n^2} \text{ [kgf m}^2\text{]}$	$J = \frac{m \cdot v^2}{\omega^2} \text{ [kg m}^2\text{]}$
torque as a function of a force, of a dynamic moment or of a moment of inertia, of a power	$M = \frac{F \cdot d}{2} \text{ [kgf m]}$ $M = \frac{Gd^2 \cdot n}{375 \cdot t} \text{ [kgf m]}$ $M = \frac{716 \cdot P}{n} \text{ [kgf m]}$	$M = F \cdot r \text{ [N m]}$ $M = \frac{J \cdot \omega}{t} \text{ [N m]}$ $M = \frac{P}{\omega} \text{ [N m]}$
work, energy in motion of translation, in rotary motion	$W = \frac{G \cdot v^2}{19,6} \text{ [kgf m]}$ $W = \frac{Gd^2 \cdot n^2}{7160} \text{ [kgf m]}$	$W = \frac{m \cdot v^2}{2} \text{ [J]}$ $W = \frac{J \cdot \omega^2}{2} \text{ [J]}$
power in motion of translation, in rotary motion	$P = \frac{F \cdot v}{75} \text{ [CV]}$ $P = \frac{M \cdot n}{716} \text{ [CV]}$	$P = F \cdot v \text{ [W]}$ $P = M \cdot \omega \text{ [W]}$
power available at the shaft of a single-phase motor ($\cos \varphi$ = power factor)	$P = \frac{U \cdot I \cdot \eta \cdot \cos \varphi}{736} \text{ [CV]}$	$P = U \cdot I \cdot \eta \cdot \cos \varphi \text{ [W]}$
power available at the shaft of a three-phase motor	$P = \frac{U \cdot I \cdot \eta \cdot \cos \varphi}{425} \text{ [CV]}$	$P = 1,73 \cdot U \cdot I \cdot \eta \cdot \cos \varphi \text{ [W]}$

Main formulae concerning mechanical drives, according to the Technical System and International Unit System (SI).

Frame Size	With Technical System units	With SI units
torque transmissible by a hydraulic motor		$M = \frac{V_g [\text{cm}^3/\text{rev}] \cdot \Delta p [\text{bar}] \cdot \eta_{mh}}{62,832} \quad [\text{N m}]$
power available at the shaft of a hydraulic motor		$P = \frac{V_g [\text{cm}^3/\text{rev}] \cdot \Delta p [\text{bar}] \cdot \eta_l \cdot n [\text{min}^{-1}]}{600000} \quad [\text{kW}]$
flow (hydraulic motor)		$q_v = \frac{V_g [\text{cm}^3/\text{rev}] \cdot n [\text{min}^{-1}]}{1000 \cdot \eta_v} \quad [\text{l/min}]$
speed (hydraulic motor)		$n = \frac{1000 \cdot \eta_v \cdot q_v [\text{l/min}]}{V_g [\text{cm}^3/\text{rev}]} \quad [\text{min}^{-1}]$

Note. Acceleration or deceleration are understood constant; motion of translation and rotary motion are understood rectilinear and circular respectively.

Key figures



over
1,000 people around
the world



5,000 customers
worldwide



70 years of
experience



50 million euros investments
in new technologies and methodologies
to improve manufacturing efficiency



18 affiliated
companies



5 production
facilities



8 assembly
plants



18 authorized
service centers

After-sale service



Highly trained mechanics and support teams can ensure a fast and efficient after-sale service providing support worldwide.



Our new space is your gateway to a world of information, assistance, and seamless access to the solutions you need. Whether you're an end user, distributor, or OEM partner you will find a personalized area to explore and manage all things related to your Rossi products.

Visit us at
rossi.com

Quality

3 years warranty*



Our drive is to innovate and boost operations by manufacturing performing, precise, reliable and high-quality products all over the world. We are always one step forward in offering and developing solutions that can satisfy an unlimited number of application needs, even in the most demanding conditions.

* As per our warranty terms.

System certifications

ISO
9001:2015

ISO
14001:2015

ISO
45001:2023

Product certifications



Product compliance



Global presence local service



Local support

Sales, customer service,
technical support, spare parts



18 branches*



Worldwide distribution network*



*All contacts available on www.rossi.com



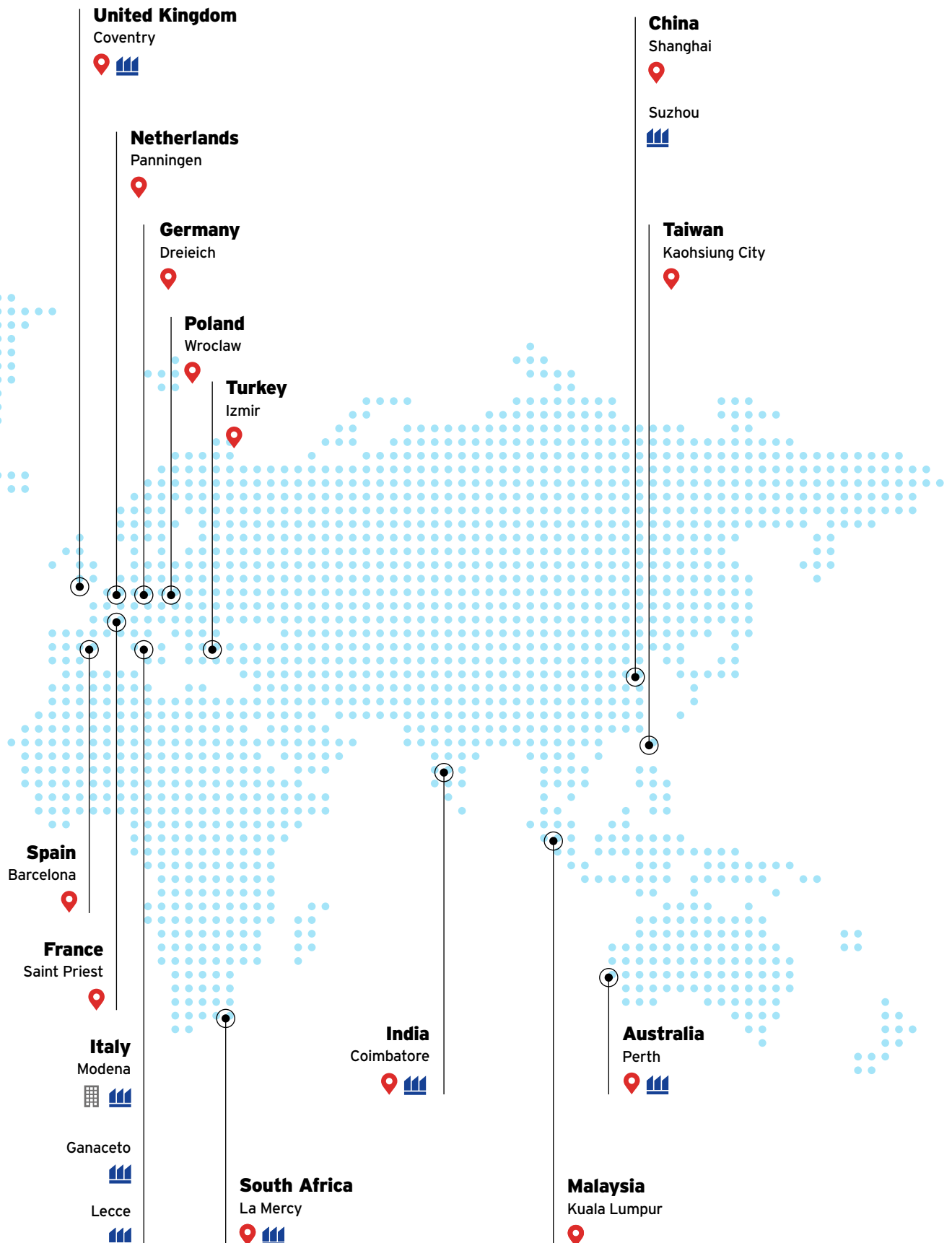
Main offices



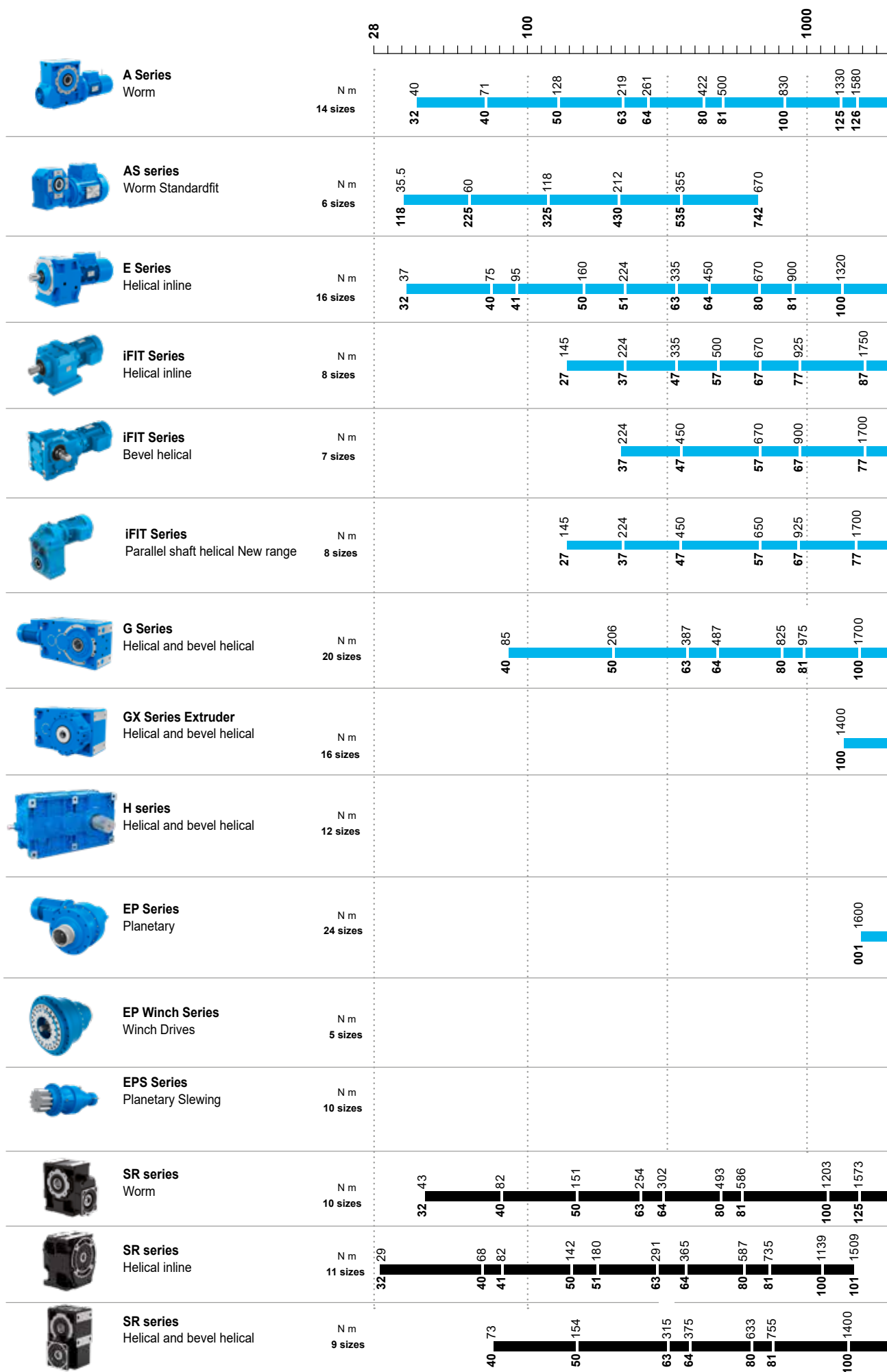
Affiliated companies

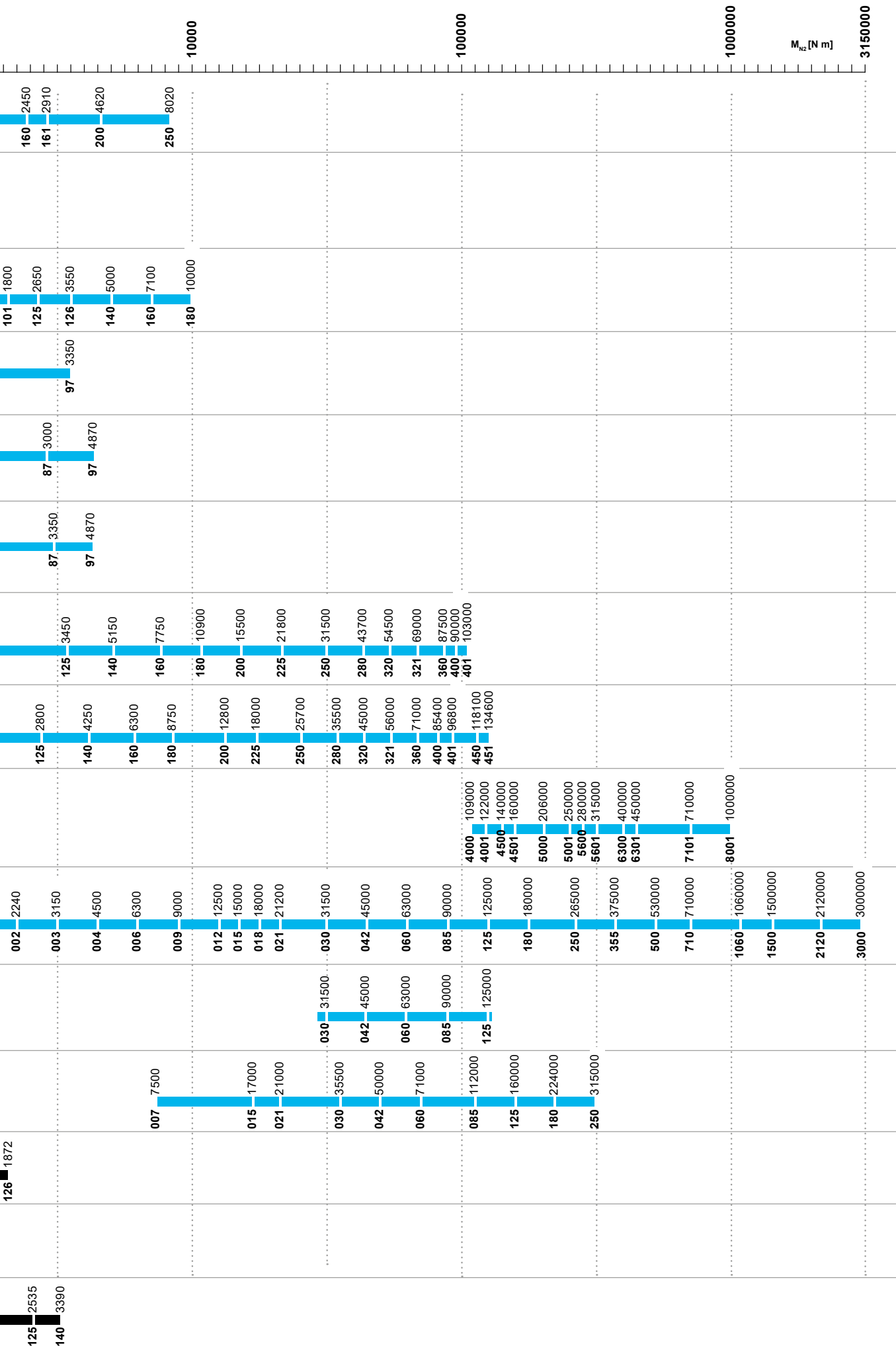


Production facilities/Assembly plants



Gear reducers and gearmotors







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