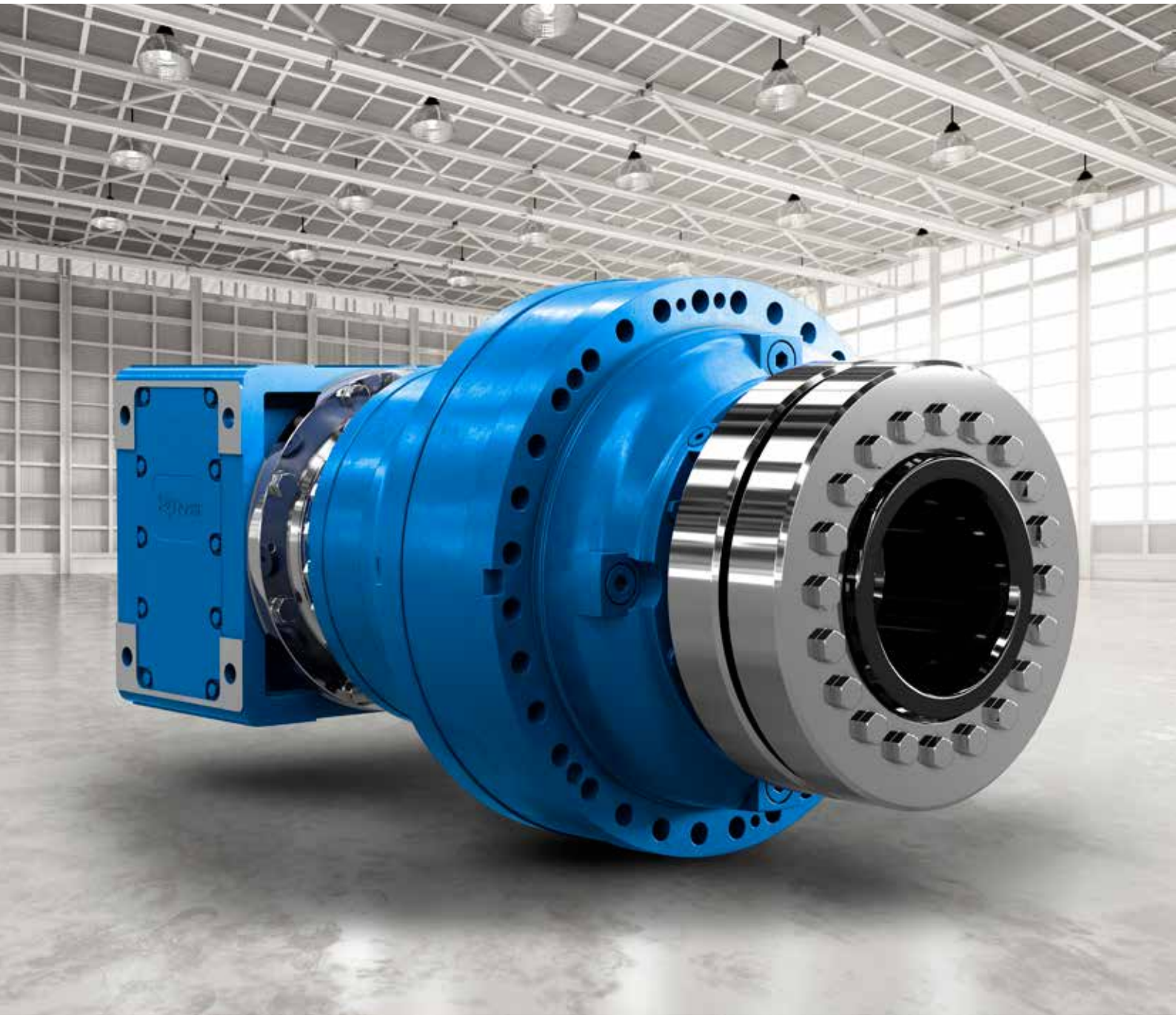
EP KING series

Rossi



High torque planetary and combined units

rossi.com

Contents

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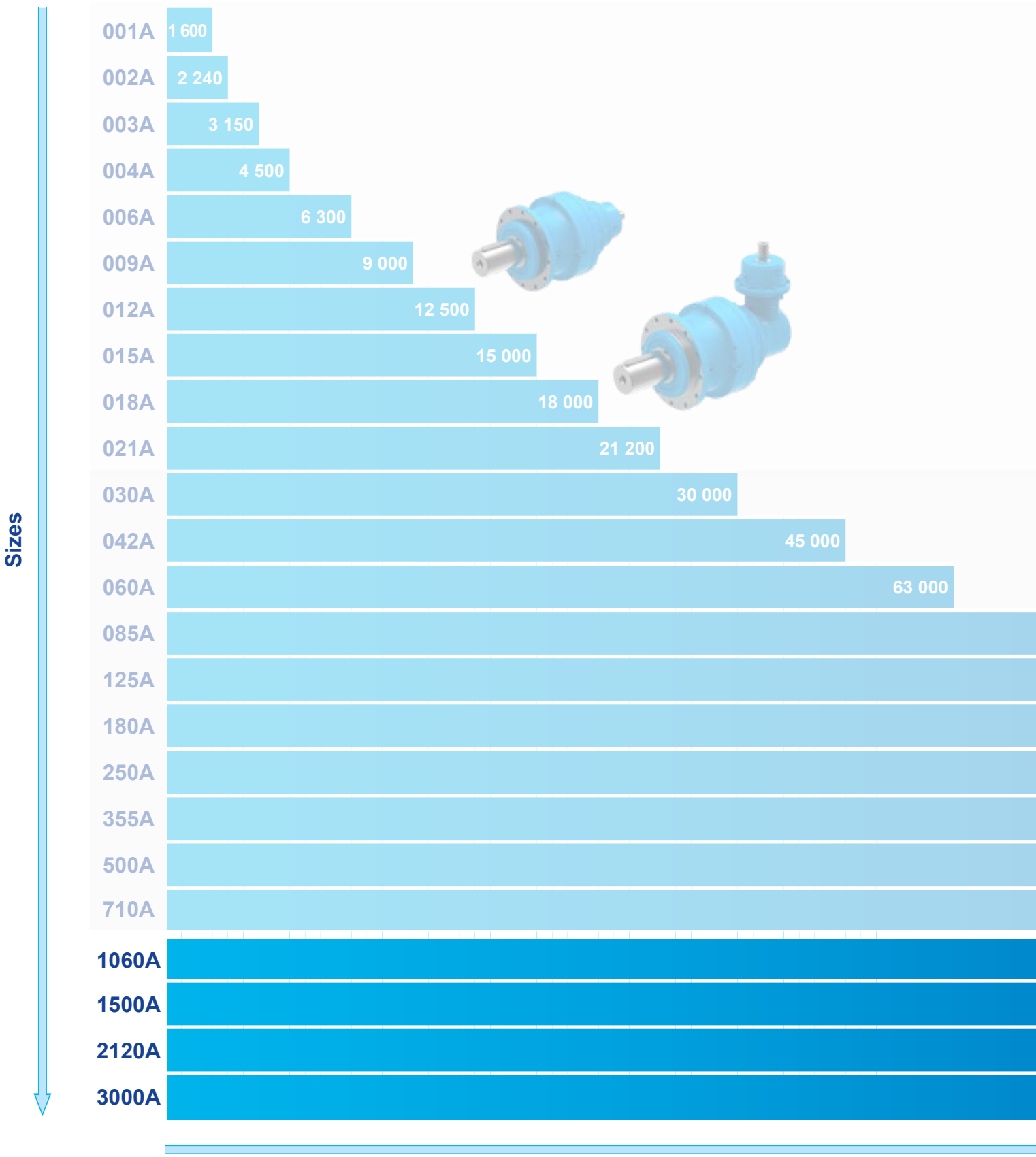
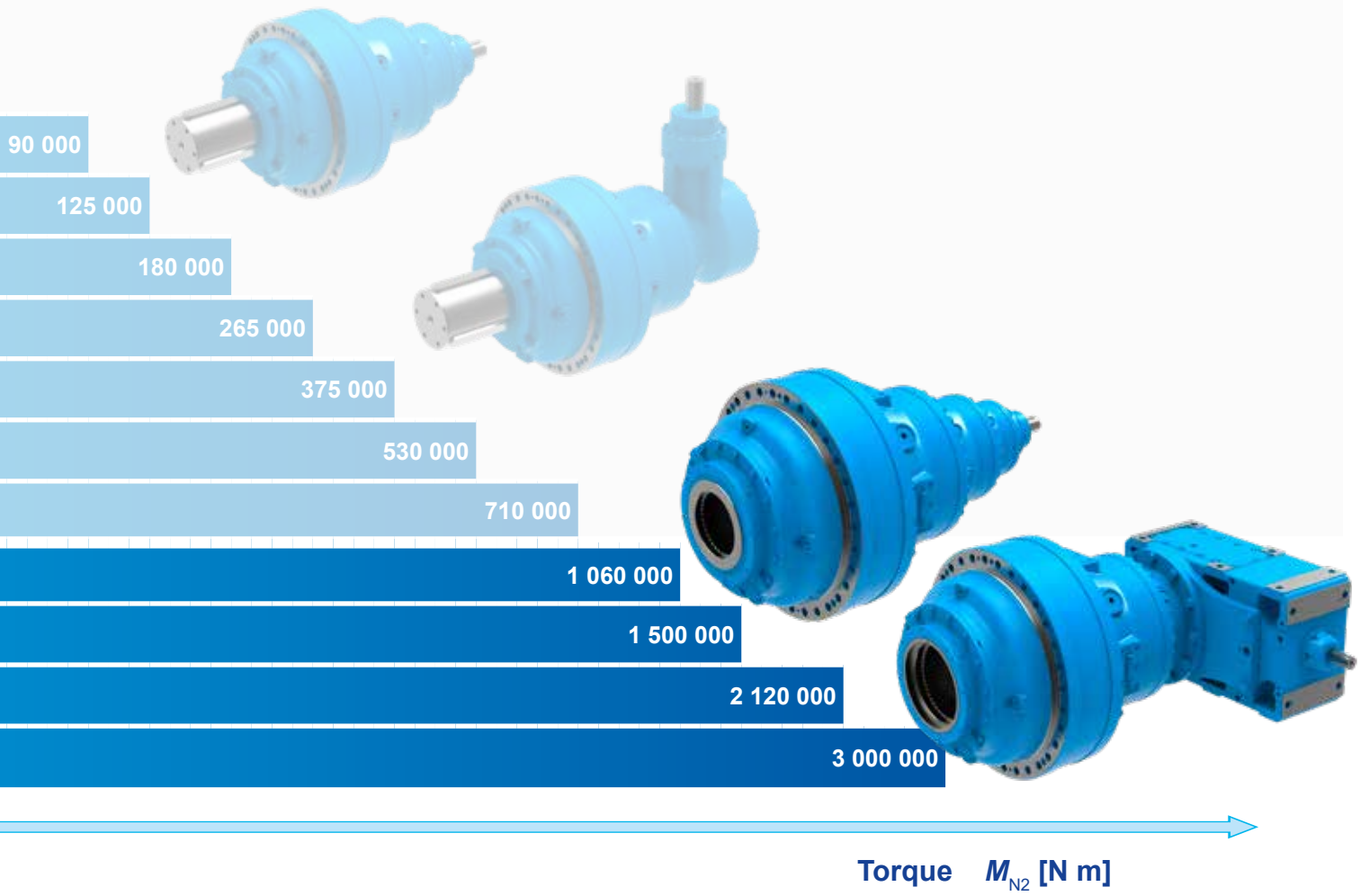
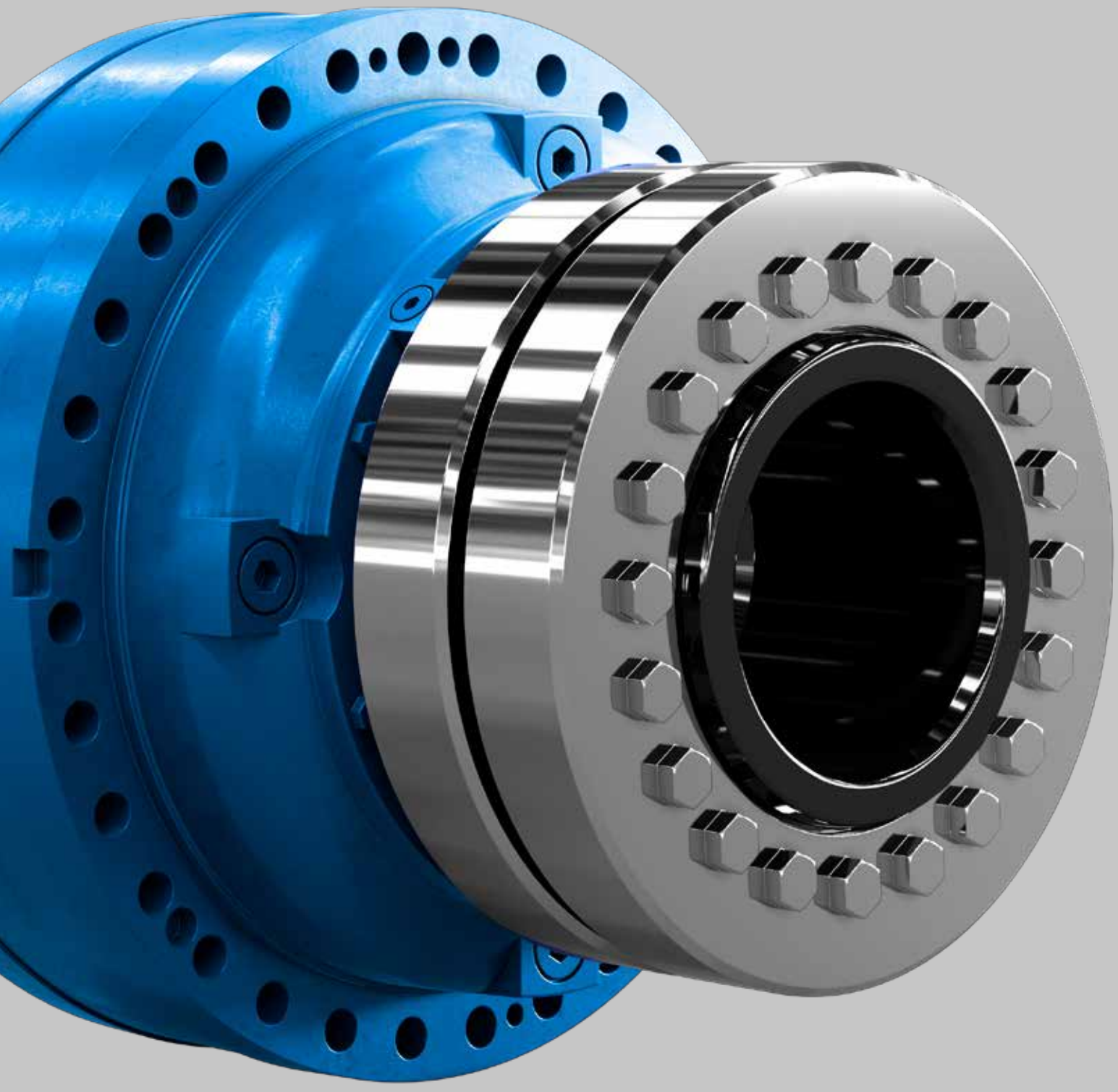
EP King product range



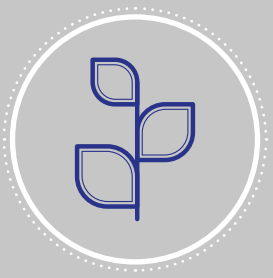

90 000
125 000
180 000
265 000
375 000
530 000
710 000
1 060 000
1 500 000
2 120 000
3 000 000
Torque M_{N2} [N m]

Features and benefits



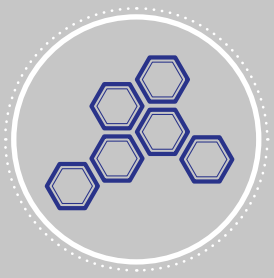
Maximum performance

We drive the heaviest applications worldwide



Sustainability

We care about environment



Modular system

For cost–effective and high quality solutions

Innovation

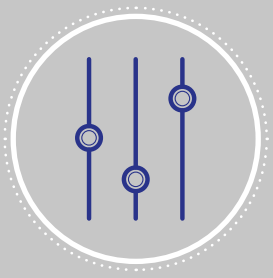
We are constantly thinking forward, solutions for an evolving industry

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

4EB
3 planet. stages and 1 bevel stage

Size
- 1060
- 1500
- 2120
- 3000

Stage composition [1]
- **A** catalog stage composition
- **X** stage composition other than catalog

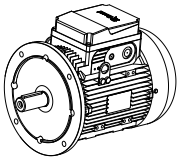
Transmission ratio [1]
- 83,1
- 105
- ...
- 571
- ...
- 1006

Type of ratio
- **Y** catalog ratio
- **Z** ratio composition other than catalog

Designation example:

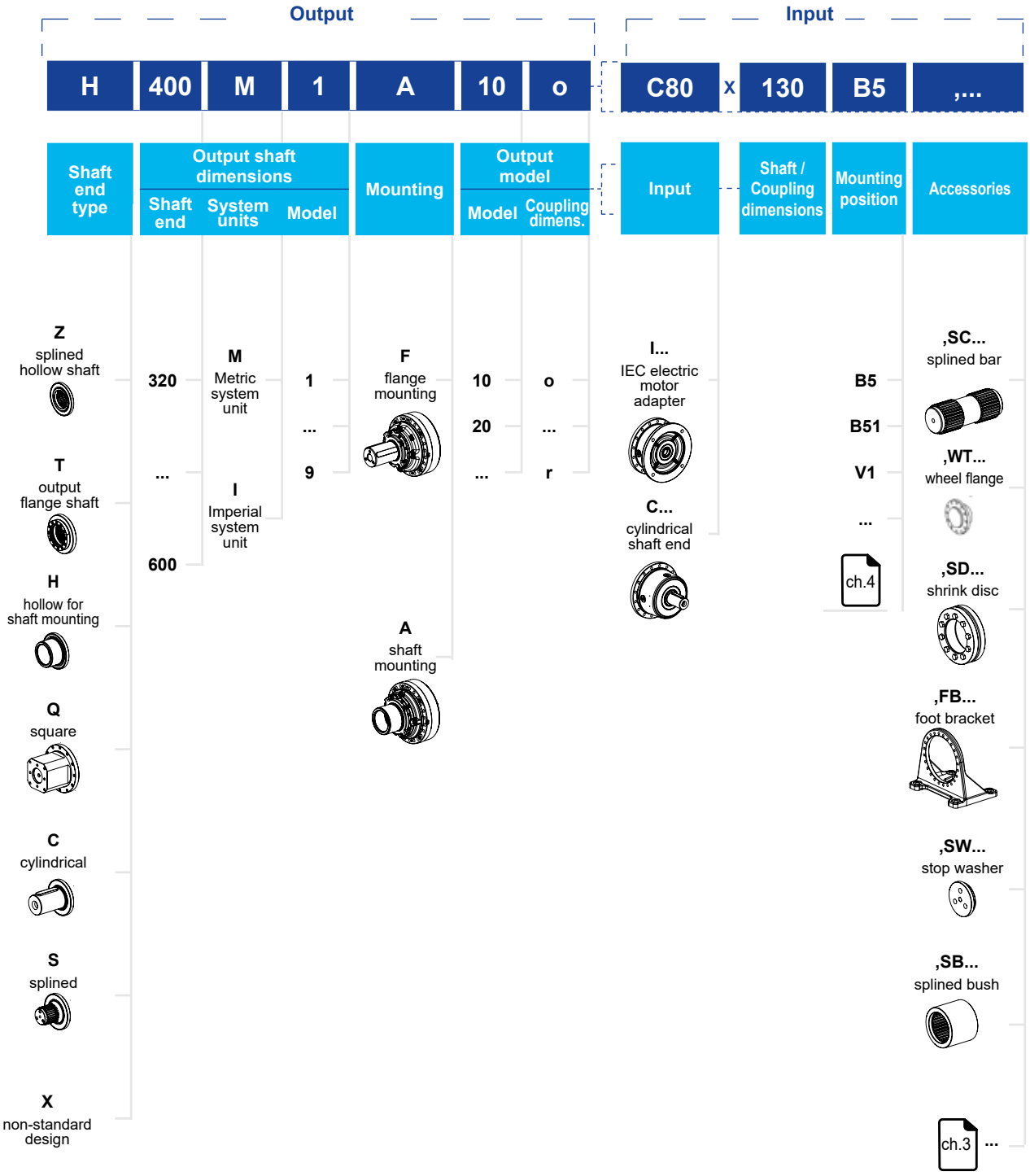
R 3EL 1060A 83,1Y H400M1 A10o I55×400 B5 ,...
R 4EB 1060A 308Y S500M1 F10o C80×130 B53 ,...
R 4EL 3000A 587Y T600M1 F10r C120×165 B5 ,...

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



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: Shaft end	Output shaft dimensions: System units	Output shaft dimensions: Model	Mounting	Output model: Model	Output model: Coupling dimens.

2EL — 2 stages inline

3EL — 3 stages inline

Size: **1060** · **1500** · **2120** · **3000**

Stage comp.: **A** catalog stage composition · **X** stage composition other than catalog

Transm. ratio: **19,9** · **83,1** · ... · **110,9** · ... · **139,8**

Type of ratio: **Y** catalog ratio · **Z** ratio composition other than catalog

Shaft end type:

Z splined hollow shaft

T output flange shaft

H hollow for shaft mounting

Q square

C cylindrical

S splined

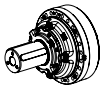
X non-standard design

Shaft end: **320** · ... · **600**

System units: **M** Metric system unit · **I** Imperial system unit

Model: **1** · ... · **9**

Mounting: **F** flange mounting



A shaft mounting

Output model — Model: **10** · **20** · ...

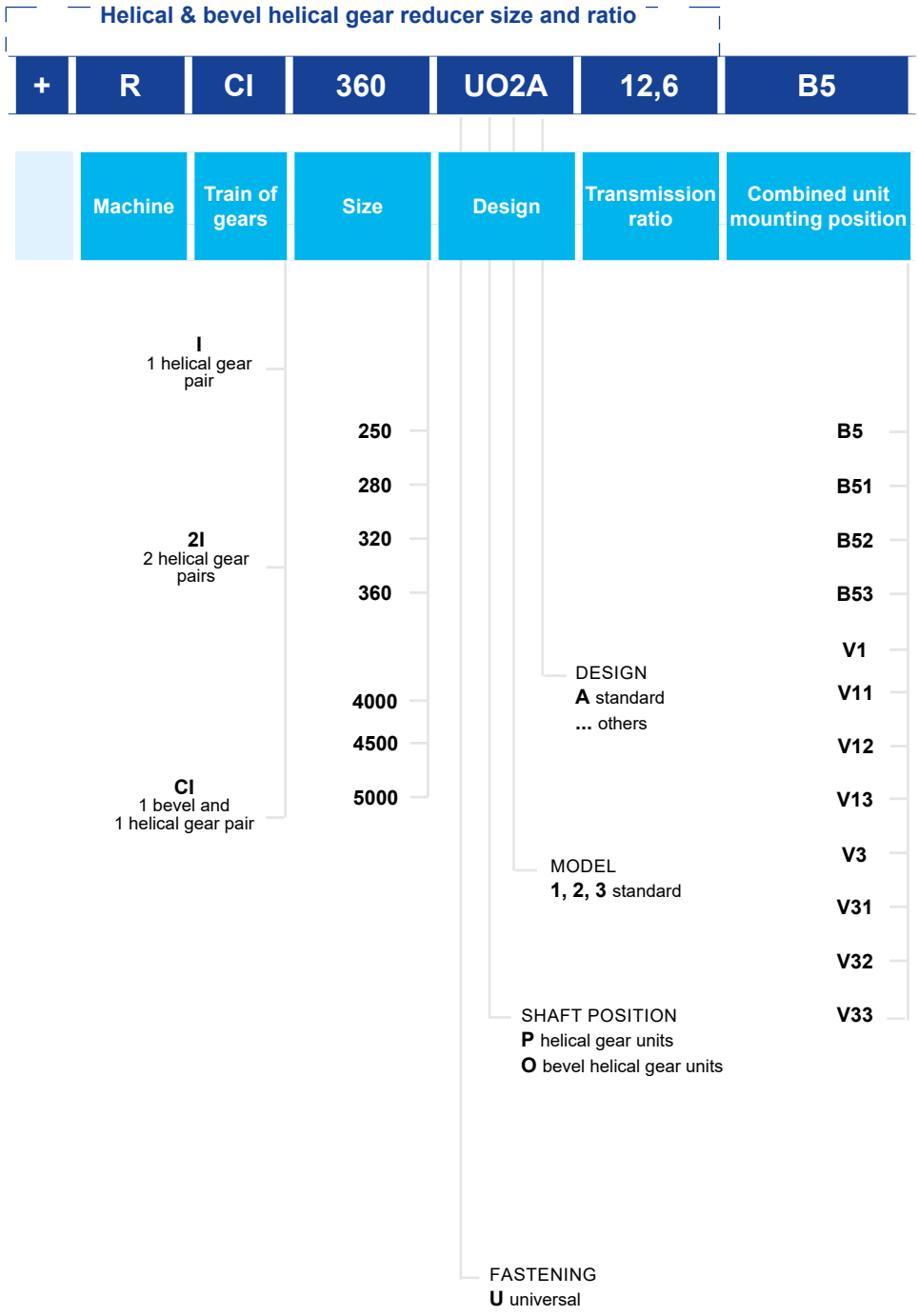
Coupling dimens.: **o** · ... · **r**

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



1

Summary of performance, dimensions and details

Sizes	
1060A	17
1500A	29
2120A	39
3000A	49

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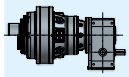
1060A
1500A
2120A
3000A

Index

			L_h = 10 000 h n_1 min^{-1} n_2 min^{-1} M_{N2} N m			M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min^{-1}	n_1 = 1 400 min^{-1} Pt [kW] at 20°C 40°C		
	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 1060A	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					

1060A Combo - Data and performance summary



L_h = 10 000 h

n_1 min^{-1}

n_2 min^{-1}

M_{N2} N m

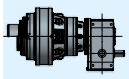
M_{N2max} / M_{2max} N m

n_{1max} / n_{1peak} min^{-1}

n_1 = 1 400 min^{-1}

P_t [kW] at 20°C 40°C

	i_N	i_{eff}	1 400	900	500	M_{N2max} / M_{2max} N m	n_{1max} / n_{1peak} min^{-1}	P_t [kW] at 20°C 40°C –		
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
	50	**49,8**	28,1 556 191	18,1 635 024	10,0 667 598					
	56	**56,4**	24,8 577 471	16,0 659 319	8,86 668 766					
	63	**64,7**	21,6 601 738	13,9 664 339	7,73 670 001					
	71	**71,7**	19,5 620 487	12,6 665 402	6,97 670 895					
	80	**79,7**	17,6 640 413	11,3 666 459	6,28 671 794					
	90	**91,6**	15,3 663 320	9,83 667 806	5,46 672 957					
	100	**101**	13,9 664 372	8,91 668 714	4,95 673 750					
	112	**107**	13,1 664 986	8,40 669 155	4,67 674 221					
	125	**118**	11,9 665 979	7,62 670 035	4,23 674 995					
	140	**145**	9,66 667 857	6,21 671 814	3,45 676 583					
R 2EL 1060A + R 2I 360	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
	200	**213**	6,58 671 316	4,23 674 999	2,35 679 458					
	224	**236**	5,94 672 186	3,82 675 798	2,12 680 207					
	250	**262**	5,35 673 062	3,44 676 610	1,91 680 973					
	280	**287**	4,88 673 809	3,14 677 304	1,74 683 026					
	315	**319**	4,39 674 704	2,82 678 097	1,57 692 927					
	355	**364**	3,85 675 703	2,47 679 086	1,37 705 621					
	400	**404**	3,46 676 519	2,23 679 861	1,24 715 854					
	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 h

n_1 min^{-1}

n_2 min^{-1}

M_{N2} N m

M_{N2max} / M_{2max} N m

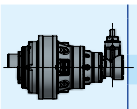
n_{1max} / n_{1peak} min^{-1}

n_1 = 1 400 min^{-1}

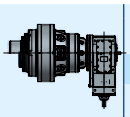
P_t [kW] at 20°C 40°C

	i_N	i_{eff}	1 400	900	500	M_{N2max} / M_{2max} N m	n_{1max} / n_{1peak} min^{-1}	P_t [kW] at 20°C 40°C –		
R 3EL 1060 + R 2I 250	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
	630	**635**	2,21 679 903	1,42 702 596	0,788 761 401					
	710	**687**	2,04 680 479	1,31 710 185	0,728 769 636					
	800	**764**	1,83 681 250	1,18 720 571	0,655 780 895					
	900	**871**	1,61 690 654	1,03 733 655	0,574 795 101					
	950	**969**	1,45 700 738	0,929 744 375	0,516 806 743					
	1000	**1043**	1,34 707 858	0,863 751 945	0,479 814 965					
	1120	**1213**	1,15 722 602	0,742 767 624	0,412 831 997					
	1250	**1344**	1,04 732 860	0,669 778 534	0,372 843 849					
	1400	**1479**	0,946 742 504	0,608 788 794	0,338 854 983					
	1600	**1637**	0,855 752 843	0,550 799 786	0,305 866 940					
	1800	**1876**	0,746 767 051	0,480 814 905	0,266 883 373					
	2000	**2079**	0,673 777 918	0,433 826 460	0,240 895 932					
	2240	**2318**	0,604 789 581	0,388 838 882	0,216 909 433					
	2500	**2690**	0,521 805 816	0,335 856 154	0,186 928 277					
	3150	**3003**	0,466 818 097	0,300 869 232	0,166 942 456					
	3550	**3414**	0,410 832 592	0,264 884 665	0,146 959 210					
	3800	**3781**	0,370 829 340	0,238 882 451	0,132 959 685					
	4000	**4189**	0,334 841 326	0,215 895 407	0,119 973 965					

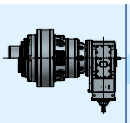
1060A - Data and performance summary



			L_h = 10 000 h					n_1 = 1 400 min^{-1}		
			n_1 min^{-1}			M_{N2max}	n_{1max}	Pt [kW] at	20°C	
			n_2 min^{-1}			M_{2max}	n_{1peak}		40°C	
			M_{N2} 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					

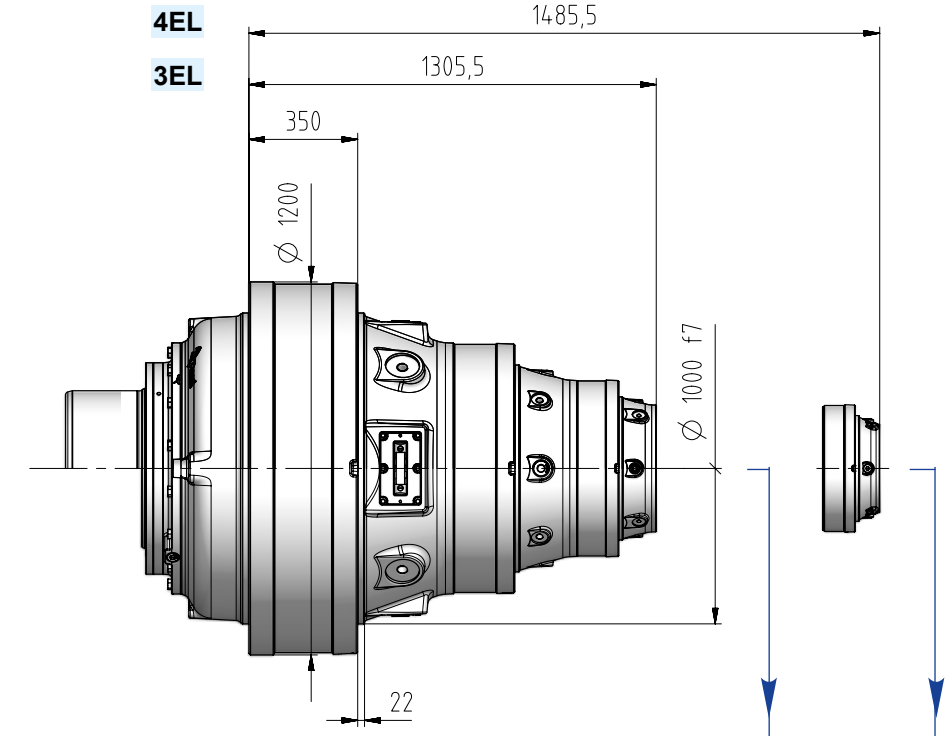


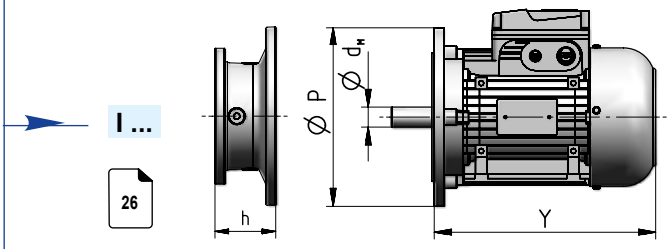
			L_h = 10 000 h n_1 min^{-1} n_2 min^{-1} M_{N2} N m			M_{N2max} M_{2max}	n_{1max} n_{1peak}	n_1 = 1 400 min^{-1} Pt [kW] at 20°C 40°C		
						N m	min^{-1}	–		
	i_N	i_{eff}	**1 400**	**900**	**500**					
R 2EL 1060A + R CI 360	160	**159**	8,79 668 745	5,65 672 610	3,14 677 304	1 060 000 1 800 000	2 000 2 800	265 200	355 265	450 340
	180	**183**	7,64 670 013	4,91 673 813	2,73 678 354					
	200	**199**	7,03 670 748	4,52 674 430	2,51 678 973					
	224	**214**	6,54 671 378	4,20 675 056	2,33 679 511					
	250	**251**	5,57 672 724	3,58 676 295	1,99 680 676					
	280	**289**	4,85 673 869	3,12 677 361	1,73 683 721					
	315	**319**	4,40 674 652	2,83 678 095	1,57 692 894					
	355	**366**	3,82 675 798	2,46 679 108	1,36 706 284					
	400	**404**	3,47 676 511	2,23 679 853	1,24 715 762					
	420	**428**	3,27 676 961	2,10 680 282	1,17 721 523					
	480	**472**	2,96 677 702	1,91 680 969	1,06 731 209					



			L_h = 10 000 h n_1 min^{-1} n_2 min^{-1} M_{N2} N m			M_{N2max} M_{2max}	n_{1max} n_{1peak}	n_1 = 1 400 min^{-1} Pt [kW] at 20°C 40°C		
						N m	min^{-1}	–		
	i_N	i_{eff}	**1 400**	**900**	**500**					
R 3EL 1060 + R CI 250	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
	355	**389**	3,60 676 254	2,32 679 571	1,29 712 002					
	400	**420**	3,33 676 856	2,14 680 146	1,19 719 692					
	450	**467**	3,00 677 656	1,93 680 893	1,07 730 155					
	500	**533**	2,63 678 644	1,69 686 065	0,938 743 467					
	560	**591**	2,37 679 403	1,52 695 759	0,846 753 972					
	630	**639**	2,19 679 971	1,41 703 154	0,783 762 007					
	750	**751**	1,86 681 132	1,20 718 949	0,666 779 141					
	800	**831**	1,68 686 242	1,08 728 953	0,602 790 002					
	900	**948**	1,48 698 657	0,950 742 163	0,528 804 334					
	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					

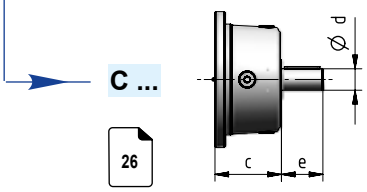
R 3EL, R 4EL





Motor size IEC	d_M XP	Y 1)		Train of gears 3EL Dimension h	Train of gears 4EL Dimension h	Code
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.

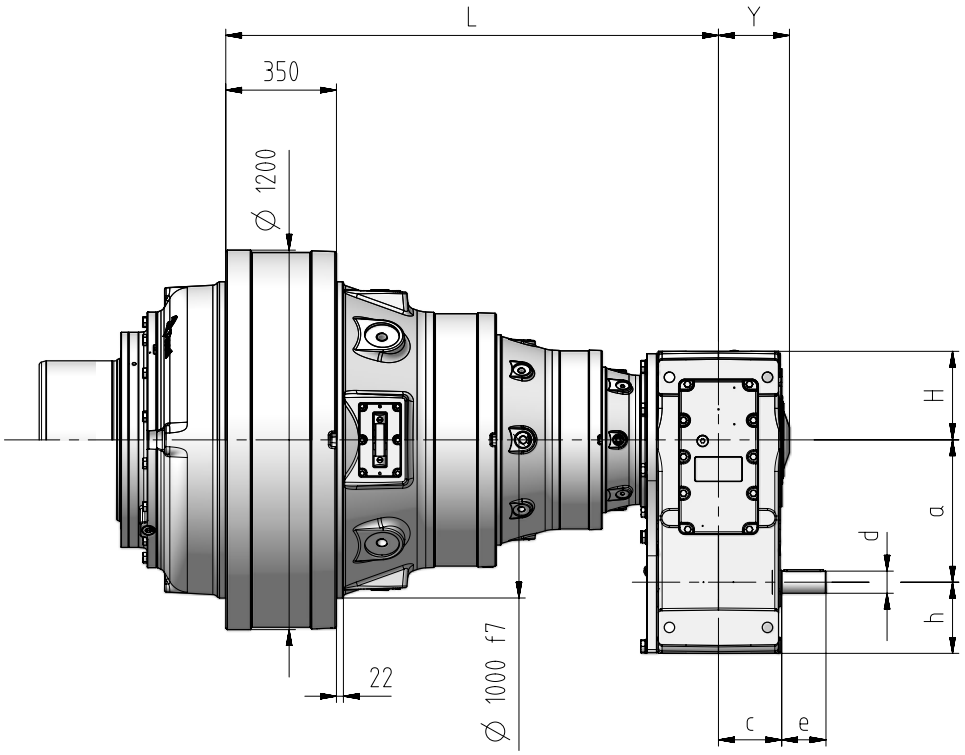


Train of gears	d	e	c	Code
3EL	120	165	277,5	C120×165
4EL	80	130	111	C80×130

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

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

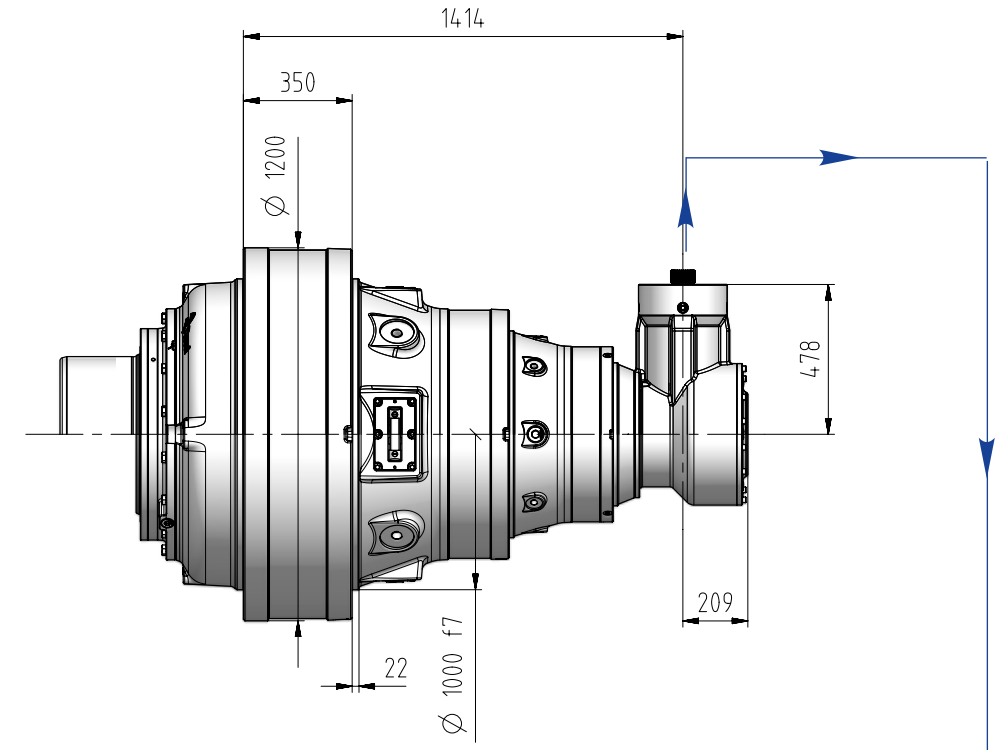
R 2EL, R 3EL combined with R I, R 2I

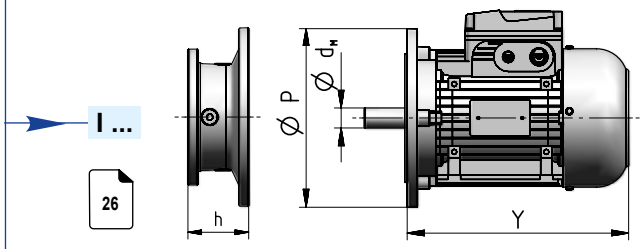


Train of gears	L	Y	H	a	h	c	d	e	d	e
							$i_N \leq 4$		$i_N \geq 4,5$	
2EL 1060 + I 360	1400,5	313,5	355	360	355	256	110	210	95	170
2EL 1060 + 2I 360	1400,5	313,5	355	610	280	245	90	170	–	–
3EL 1060 + 2I 250	1558	230,5	280	450	225	200	70	140	–	–

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

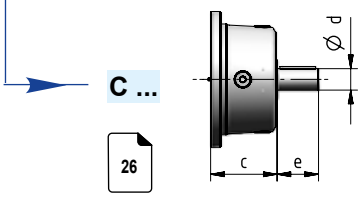
R 4EB





Motor size IEC	d_MXP	Y 1)		Train of gears 4EB Dimension **h**	Code
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.

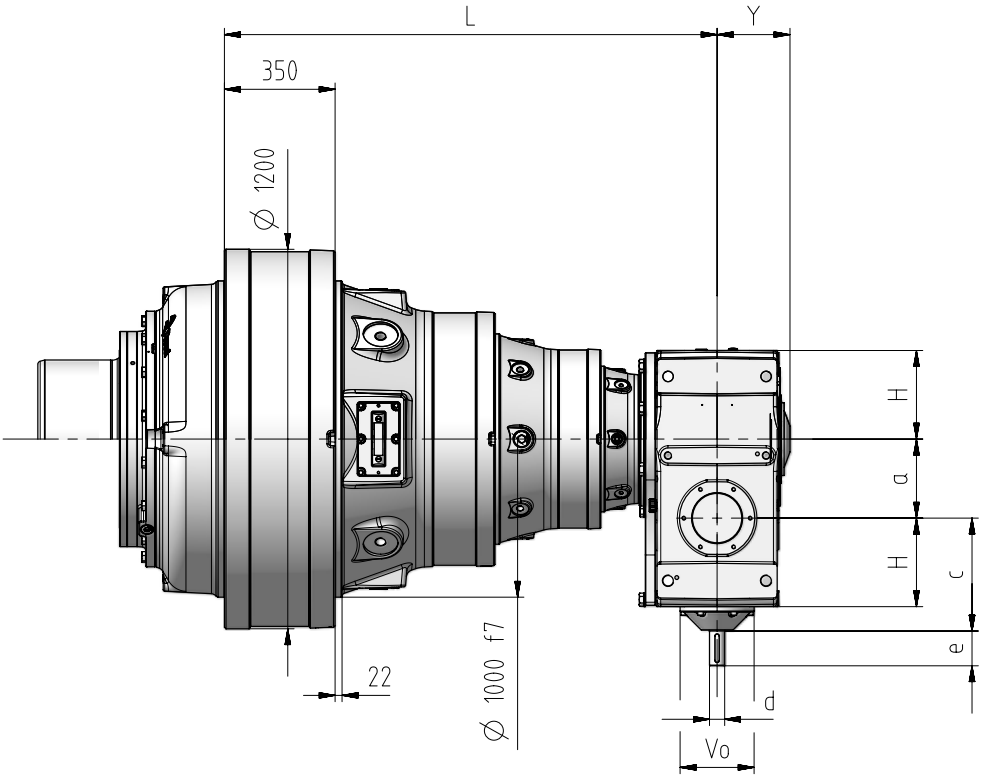


Train of gears	d	e	c	Code
4EB	80	130	111	**C80×130**

Train of gears	kg	Input Options Code						Output Options (Δ) Code					
		I42×350	**I48×350**	**I55×400**	**I60×450**	**I65×550**	**I75×550**	**C...**	**H...**	**Z...**	**T...**	**C...**	**S...**	**Q...**
4EB	5398	5398	5401	5411	5418	5418	5415	+0	-166	-142	+740	+564	+443

1060A - Main dimensions

R 2EL, R 3EL combined with R CI



Train of gears	L	Y	H	a	V_0 ⌀	c		d	e	d	e	d	e
								$i_N \leq 11,2$		$i_N = 12,5 \dots 16$		$i_N \geq 18$	
2EL 1060 + CI 360	1400,5	313,5	355	360	290	480		90	170	70	140	70	140
						$i_N \leq 10$	$i_N \geq 11,2$	$i_N \leq 10$		$i_N = 11,2 \dots 16$			
3EL 1060 + CI 250	1558	230,5	280	250	238	380	357	70	140	55	110	48	110

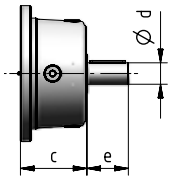
Train of gears	kg	Output Options (Δ) Code					
		H...	Z...	T...	C...	S...	Q...
2EL 1060 + CI 360	6448	+0	-166	-142	+740	+564	+443
3EL 1060 + CI 250	5850						

R 3EL, R 4EL, R 4EB

Cylindrical Shaft End Type - CODE

Input

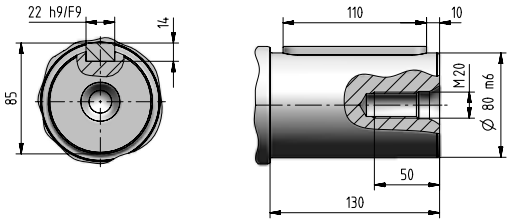
Gear reducer cylindrical shaft end		Shaft length
C...	x	...

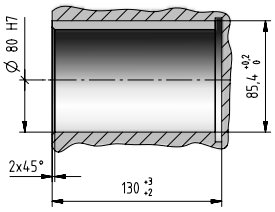


Suggested mating dimensions

R 4EL, R 4EB

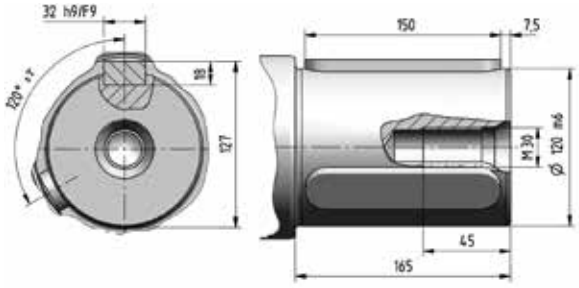
C80 x 130

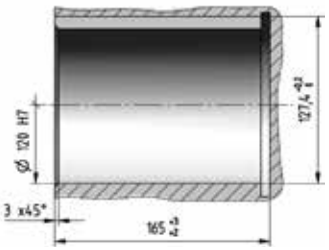




R 3EL

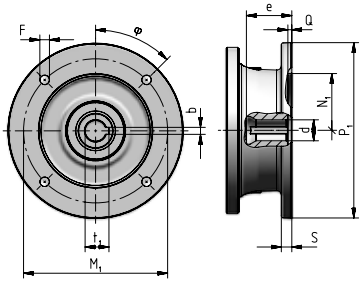
C120 x 165





Input

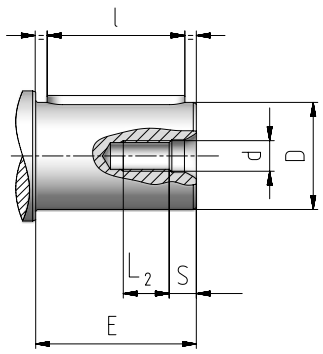
IEC electric motor adapter		
I...	x	...

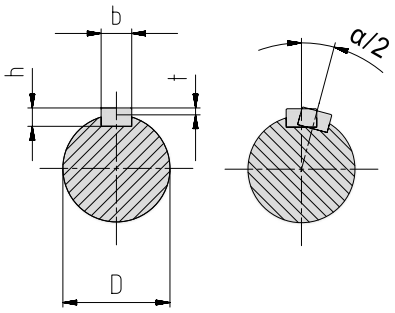


Motor size IEC	Code	P_1 Ø	S	d Ø	e max	b F9	t_1	M_1	F Ø		φ	N_1 Ø G7	Q
160	**I42×350**	350	15	42 F6	113	12	45,3	300	18	(n.4)	45°	250	6
180	**I48×350**	350	15	48 F6	113	14	51,8	300	18	(n.4)	45°	250	6
200	**I55×400**	400	15	55 E6	113	16	59,3	350	18	(n.4)	45°	300	6
225	**I60×450**	450	18	60 E6	143	18	64,4	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

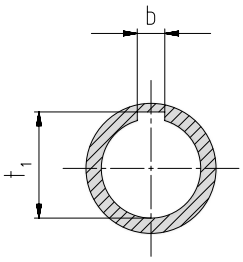
R 2EL, R 3EL combined with R I, R 2I, R CI

High speed shaft end





Gear reducer shaft



Machine shaft

Shaft end								Key			Keyway		
D Ø		**E**[1]		**d** ⌀	**S**	**L_2**[1]		$\alpha/2$[2] arc min	**b** × **h** × **l**[1] h9 h11		**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 misalignement between double extension shaft keys.

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1060A
1500A
2120A
3000A

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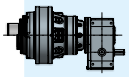
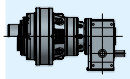
1500A - Data and performance summary

	i_N	i_{eff}	L_h = 10 000 h n_1 min^{-1} n_2 min^{-1} M_{N2} N m 1 400	900	500	M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min^{-1}	n_1 = 1 400 min^{-1} **Pt** [kW] at 20°C 40°C –		
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					

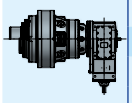
1500A Combo - Data and performance summary



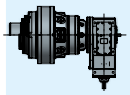
	i_N	i_{eff}	L_h = 10 000 h n_1 min^{-1} n_2 min^{-1} M_{N2} N m 1 400	900	500	M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min^{-1}	n_1 = 1 400 min^{-1} Pt [kW] at 20°C 40°C –		
R 2EL 1500A + R 2I 4000	200	**196**	7,13 1 017 384	4,58 1 022 993	2,55 1 030 008	1 500 000 2 500 000	1 600 2 120	315 236	420 315	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					



	i_N	i_{eff}	L_h = 10 000 h n_1 min^{-1} n_2 min^{-1} M_{N2} N m 1 400	900	500	M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min^{-1}	n_1 = 1 400 min^{-1} Pt [kW] at 20°C 40°C –		
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					



	i_N	i_{eff}	L_h = 10 000 h n_1 min^{-1} n_2 min^{-1} M_{N2} N m 1 400	900	500	M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min^{-1}	n_1 = 1 400 min^{-1} Pt [kW] at 20°C	40°C	H2O
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					



	i_N	i_{eff}	L_h = 10 000 h n_1 min^{-1} n_2 min^{-1} M_{N2} N m 1 400	900	500	M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min^{-1}	n_1 = 1 400 min^{-1} Pt [kW] at 20°C	40°C	H2O
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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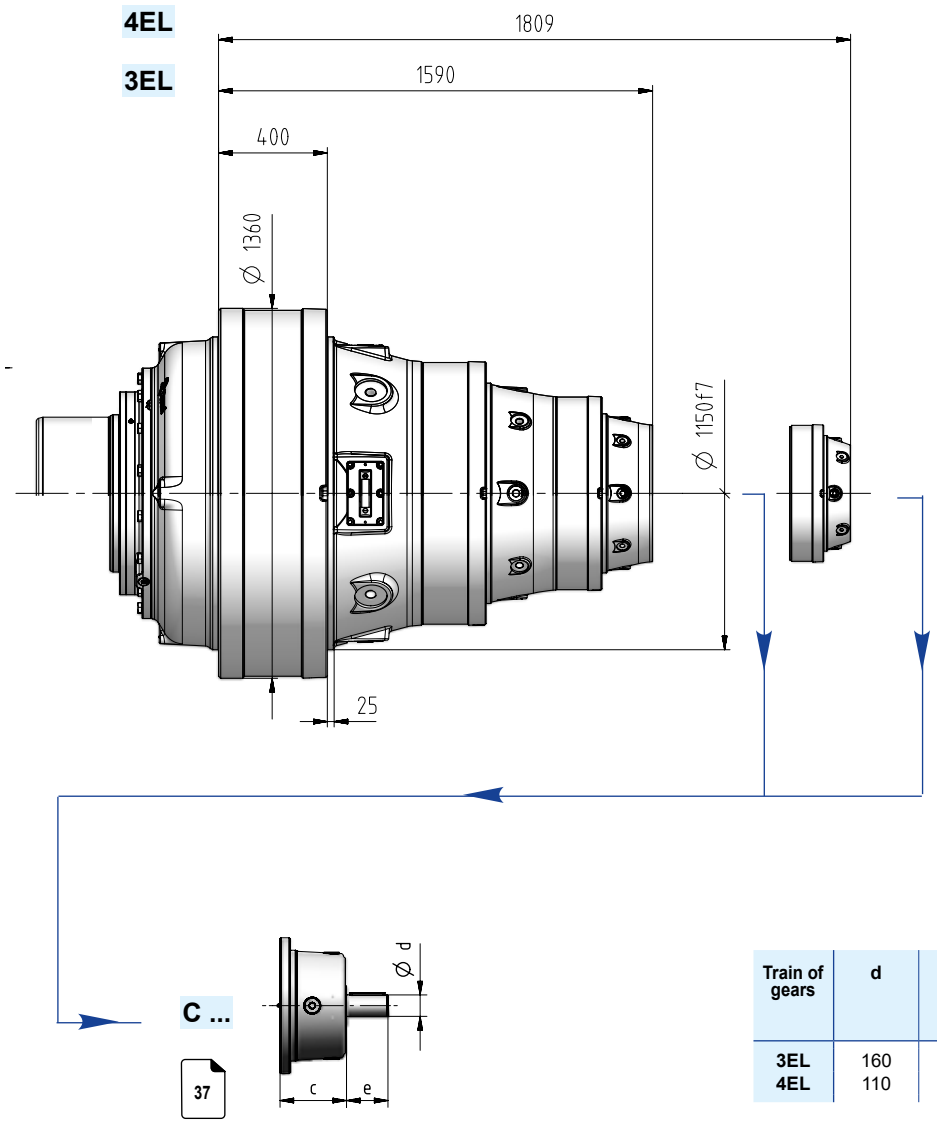
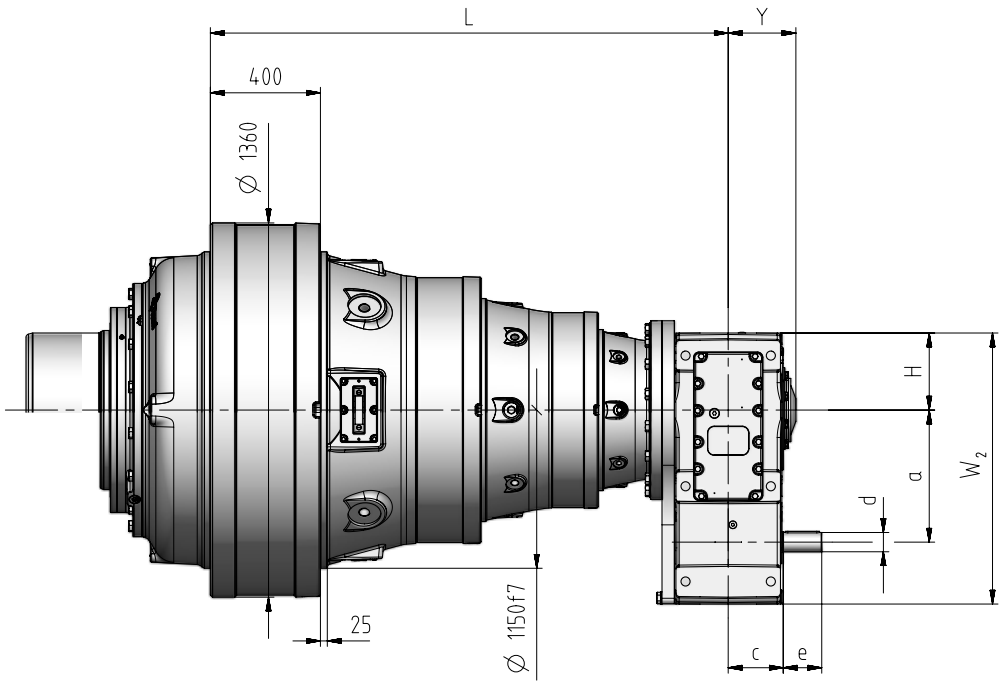
R 3EL, R 4EL



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 Code		Output Options (Δ) Code					
	C110×165	C160×240	H...	Z...	T...	C...	S...	Q...
3EL	-	7915	+0	-204	-165	+1535	+1240	+730
4EL	7965	-						

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

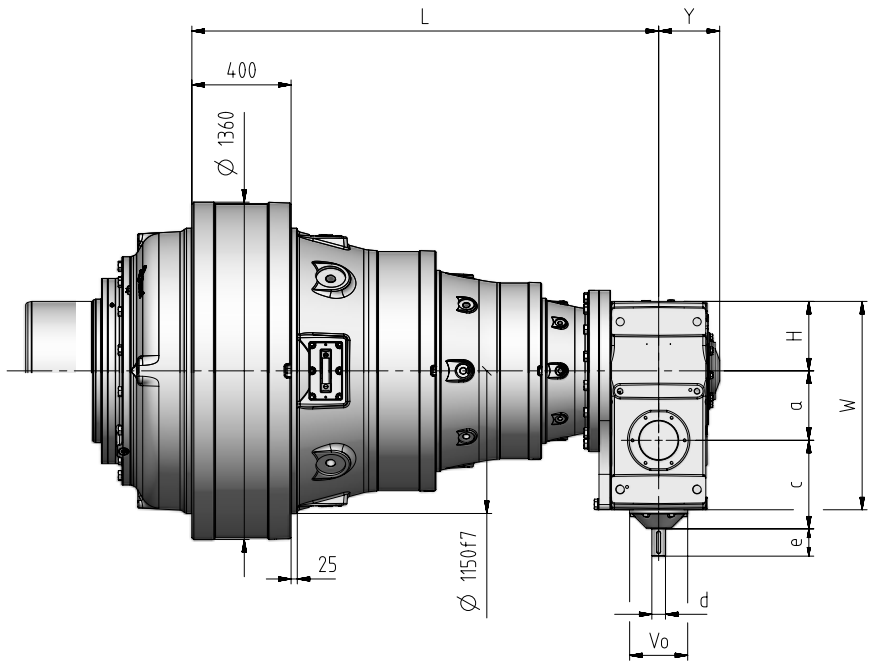


Train of gears	L	Y	H	a	c	d	e	d	e	W_2
						$i_N \leq 4$		$i_N \geq 4,5$		
2EL 1060 + 2I 4000	1684	326,5	450	700	330	110	210	90	170	1567*
3EL 1500 + 2I 280	1882	246	280	480	200	70	140	–		985

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

Train of gears	kg	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 ⌀	c		d	e	d	e	d	e	W
								$i_N \leq 11,2$		$i_N \geq 12,5$				
2EL 1500 + CI 4000	1684	326,5	450	400	372	605		110	210	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 ... 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	9950	+0	-204	-165	+1535	+1240	+730
3EL 1500 + CI 280	8550						

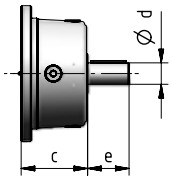
1500A - Input side details

R 3EL, R 4EL

Cylindrical Shaft End Type - CODE

Input

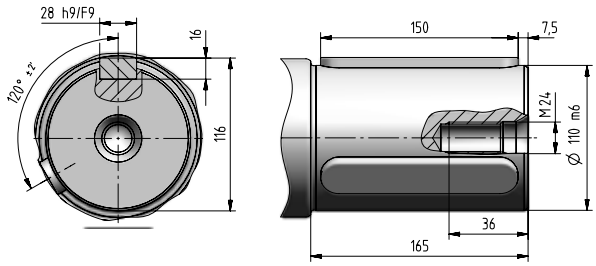
Gear reducer cylindrical shaft end		Shaft length
C...	x	...



Suggested mating dimensions

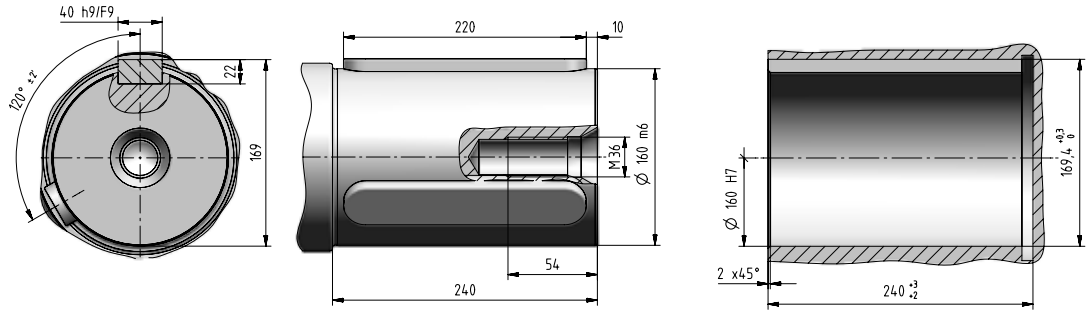
R 4EL

C110 x 165



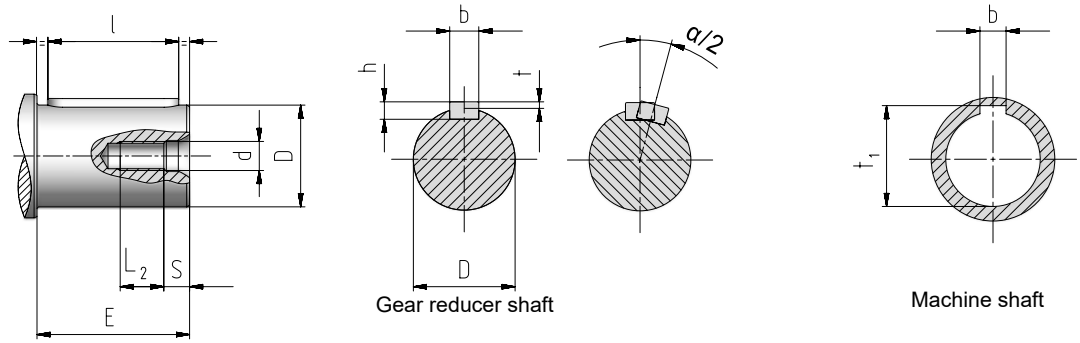
R 3EL

C160 x 240



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

High speed shaft end



Shaft end D Ø		E 1)		d Ø	S	L2 1)		α/2 2) arc min	Key b × h × l 1) b h9 × h h11 ×		Keyway b H9 hub N9 shaft	t shaft	t1 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 misalignement between double extension shaft keys.

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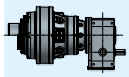
1060A
1500A
2120A
3000A

Index

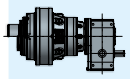
2120A - Data and performance summary 1

	i_N	i_{eff}	L_h = 10 000 h n_1 min^{-1} n_2 min^{-1} M_{N2} N m **1 400**	**900**	**500**	M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min^{-1}	n_1 = 1 400 min^{-1} **Pt** [kW] at 20°C 40°C –		
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 2120A	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					

2120A Combo - Data and performance summary

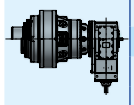


	i_N	i_{eff}	L_h = 10 000 h n_1 min^{-1} n_2 min^{-1} M_{N2} N m 1 400	900	500	M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min^{-1}	n_1 = 1 400 min^{-1} Pt [kW] at –	20°C	40°C
R 2EL 2120A + R 2I 4500	224	**226**	6,18 1 437 511	3,98 1 445 509	2,21 1 455 232	2 120 000 3 800 000	1 600 2 120	355 265	480 355	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					



	i_N	i_{eff}	L_h = 10 000 h n_1 min^{-1} n_2 min^{-1} M_{N2} N m 1 400	900	500	M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min^{-1}	n_1 = 1 400 min^{-1} Pt [kW] at –	20°C	40°C
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					

2120A Combo - Data and performance summary 1



L_h = 10 000 h

n_1 min^{-1}

n_2 min^{-1}

M_{N2} N m

	i_N	i_{eff}	1 400	900	500
R 2EL 2120A + R CI 4500	160	**162**		5,57 1 439 285	3,09 1 449 784
	180	**186**		4,84 1 442 025	2,69 1 452 099
	200	**202**		4,45 1 443 362	2,47 1 453 468
	224	**232**		3,87 1 445 823	2,15 1 455 726
	250	**256**		3,52 1 447 625	1,95 1 457 281
	280	**272**		3,31 1 448 627	1,84 1 458 219
	315	**323**		2,79 1 451 423	1,55 1 487 401
	355	**343**		2,63 1 452 400	1,46 1 500 055
	400	**410**		2,20 1 455 394	1,22 1 538 990
	450	**435**		2,07 1 456 270	1,15 1 552 043
	480	**479**		1,88 1 457 826	1,04 1 573 833
	560	**588**		1,53 1 371 746	0,851 1 392 724

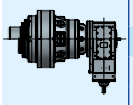
M_{N2max} / M_{2max} N m: 2 120 000 / 3 800 000

n_{1max} / n_{1peak} min^{-1}: 1 250 / 2 120

n_1 = 1 400 min^{-1}

P_t [kW] at 20°C / 40°C

–		H2O
425	560	710
315	425	530



L_h = 10 000 h

n_1 min^{-1}

n_2 min^{-1}

M_{N2} N m

	i_N	i_{eff}	1 400	900	500
R 3EL 2120A + R CI 320	315	**325**	4,31 1 444 116	2,77 1 451 631	1,54 1 488 835
	355	**380**	3,68 1 446 829	2,37 1 454 186	1,32 1 522 579
	400	**407**	3,44 1 447 999	2,21 1 455 294	1,23 1 537 625
	450	**467**	3,00 1 450 291	1,93 1 457 476	1,07 1 567 977
	500	**522**	2,68 1 452 145	1,72 1 464 464	0,958 1 593 384
	560	**584**	2,40 1 453 987	1,54 1 488 406	0,856 1 619 369
	630	**652**	2,15 1 455 770	1,38 1 512 118	0,767 1 645 204
	710	**729**	1,92 1 457 540	1,24 1 536 368	0,686 1 671 554
	800	**847**	1,65 1 473 385	1,06 1 569 803	0,591 1 707 950
	900	**919**	1,52 1 490 825	0,979 1 588 406	0,544 1 728 264
	1000	**1045**	1,34 1 518 657	0,861 1 618 045	0,478 1 760 543
	1120	**1182**	1,18 1 545 568	0,762 1 646 776	0,423 1 791 851
	1250	**1249**	1,12 1 557 847	0,721 1 659 820	0,400 1 806 066
	1400	**1382**	1,01 1 580 644	0,651 1 684 101	0,362 1 832 541
	1600	**1584**	0,884 1 611 889	0,568 1 717 410	0,316 1 868 951
	1800	**1792**	0,781 1 640 675	0,502 1 748 143	0,279 1 902 379
	2000	**1982**	0,706 1 664 697	0,454 1 773 770	0,252 1 930 289
	2240	**2241**	0,625 1 694 292	0,402 1 805 343	0,223 1 964 695
	2500	**2514**	0,557 1 722 482	0,358 1 835 430	0,199 1 997 493
	2800	**2751**	0,509 1 744 868	0,327 1 859 420	0,182 2 023 526
	3150	**3086**	0,454 1 508 118	0,292 1 602 903	0,162 1 740 781
	3550	**3376**	0,415 1 526 868	0,267 1 623 133	0,148 1 763 095

M_{N2max} / M_{2max} N m: 2 120 000 / 3 800 000

n_{1max} / n_{1peak} min^{-1}: 2 000 / 2 800

n_1 = 1 400 min^{-1}

P_t [kW] at 20°C / 40°C

–		H2O
190	250	380
140	190	280

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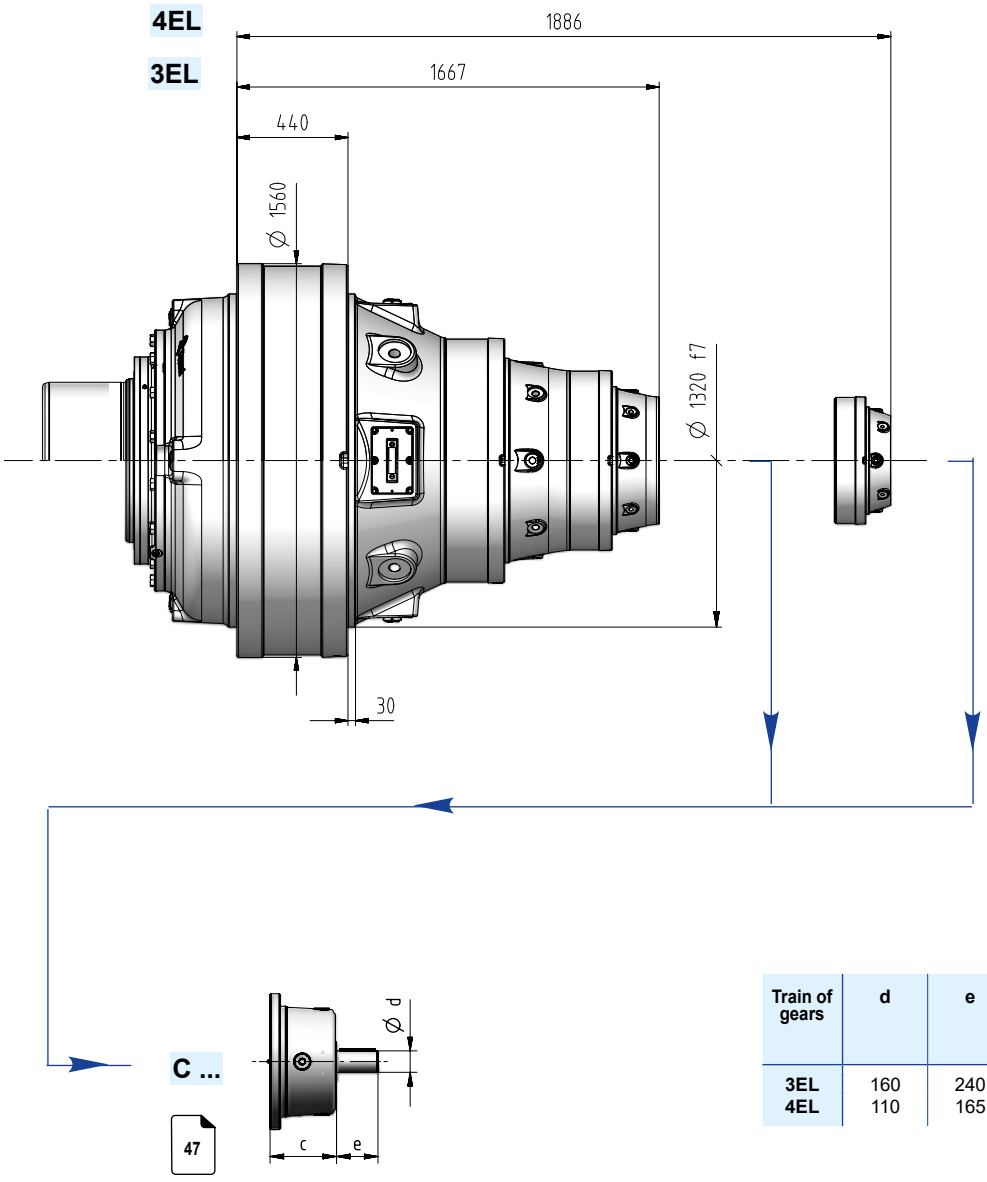
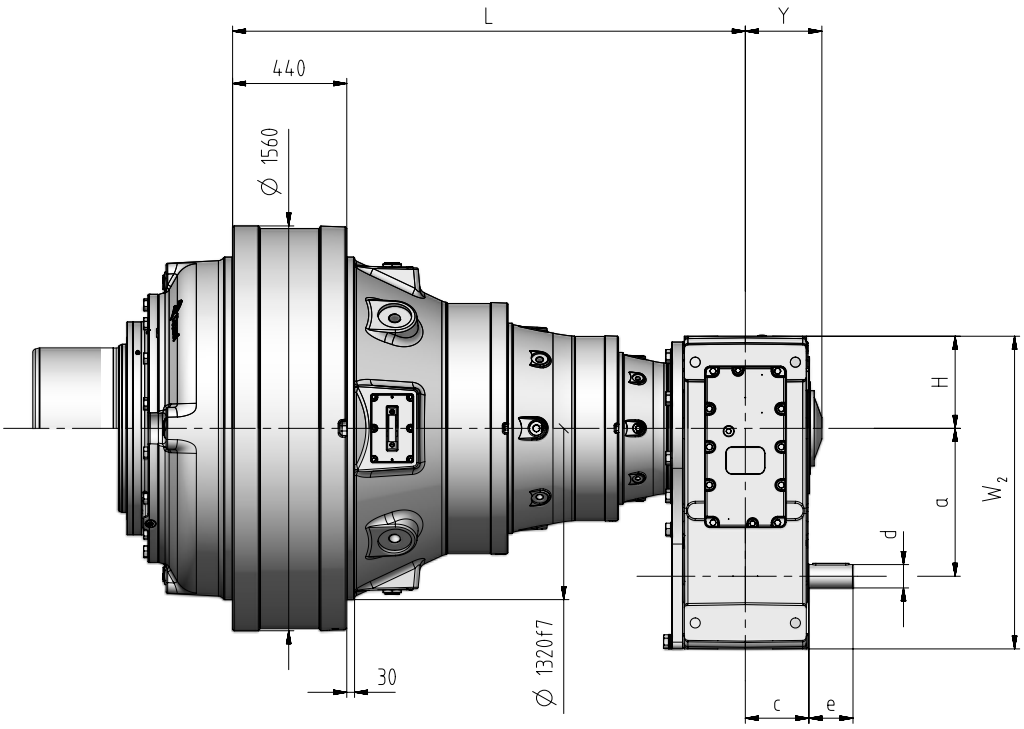
R 3EL, R 4EL



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



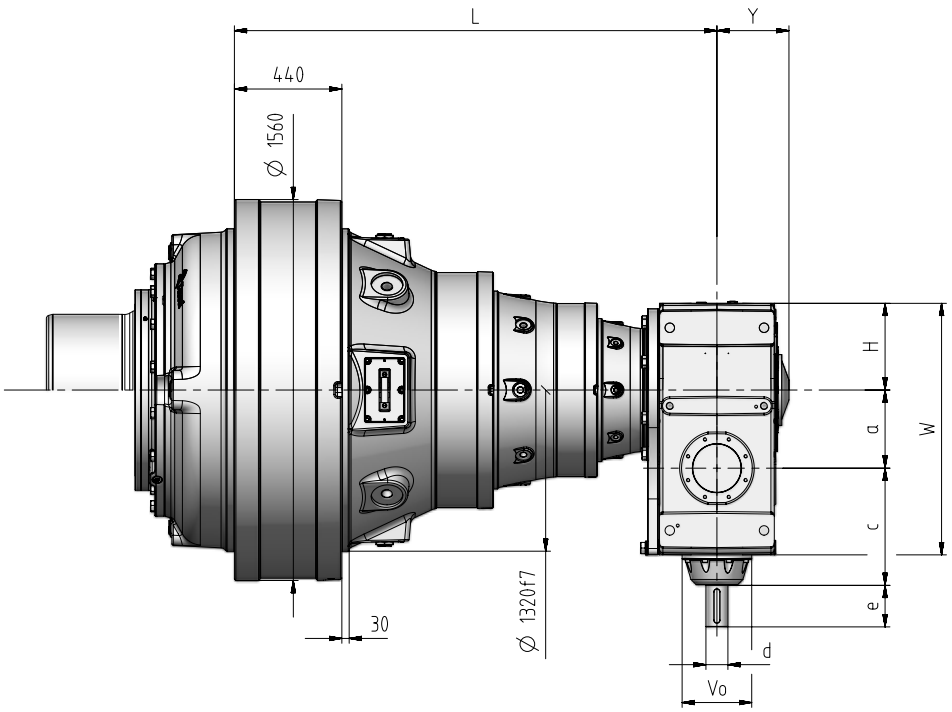
Train of gears	L	Y	H	a	c	d	e	d	e	W2
						iN ≤ 12,5		iN ≥ 14		
2EL 2120 + 2I 4500	1797	354	450	750	330	110	210	90	170	1617*
3EL 2120 + 2I 320	1976	295	355	570	245	90	170	–		1205

* For mounting positions B6, B7, V5, V6 dimension W_2 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 3EL 2120 + 2I 320	13050 11660	+0	-280	-220	+1925	+1570	+935

2120A - Main dimensions 1

R 2EL, R 3EL combined with R CI



Train of gears	L	Y	H	a	V_0 ⌀	c	d	e	d	e	d	e	W
							$i_N \leqslant 12,5$		$i_N \geqslant 14$				
2EL 2120 + CI 4500	1797	354	450	450	372	605	110	210	90	170	-		1370*
							$i_N \leqslant 10$		$i_N = 11,2 \ldots 16$		$i_N \geqslant 18$		
3EL 2120 + CI 320	1976	295	355	320	290	480	90	170	70	140	70	140	1030

* 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 2120 + CI 4500	13140	+0	-280	-220	+1925	+1570	+935
3EL 2120 + CI 320	11530						

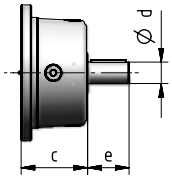
2120A - Input side details

R 3EL, R 4EL

Cylindrical Shaft End Type - CODE

Input

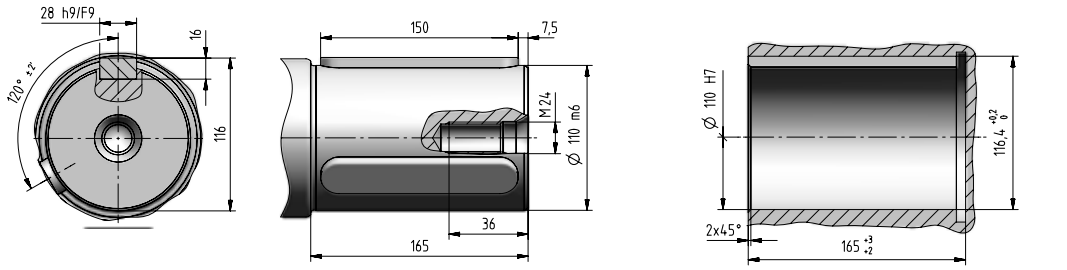
Gear reducer cylindrical shaft end		Shaft length
C...	x	...



Suggested mating dimensions

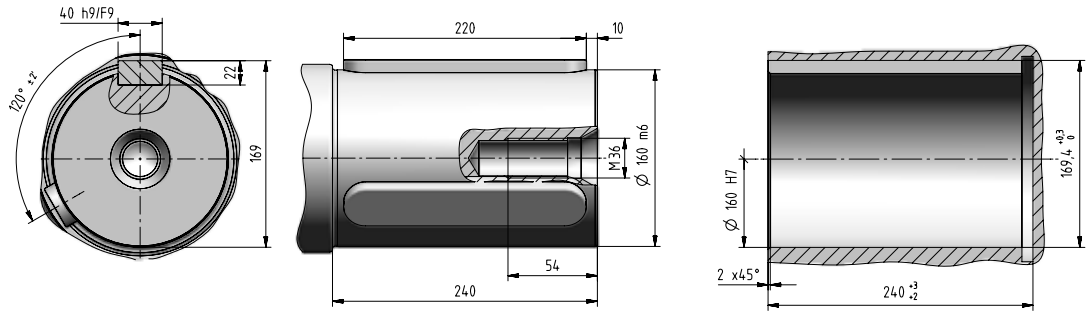
R 4EL

C110 x 165



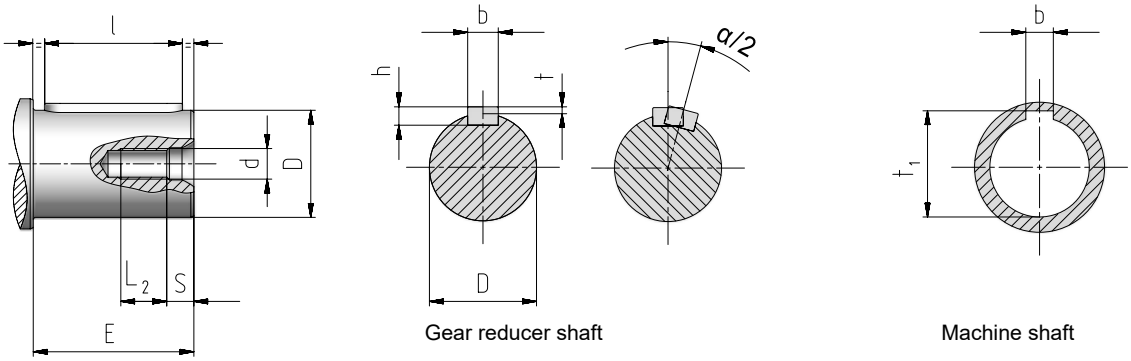
R 3EL

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** × **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 misalignement between double extension shaft keys.

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1060A
1500A
2120A
3000A

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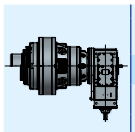
3000A - Data and performance summary

			L_h = 10 000 h			M_{N2max}	n_{1max}	n_1 = 1 400 min^{-1}		
			n_1 min^{-1}					Pt [kW] at	20°C	
			n_2 min^{-1}			M_{2max}	n_{1peak}		40°C	
			M_{N2} N m			N m	min^{-1}	–		
	i_N	i_{eff}	**1 400**	**900**	**500**					
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					

3000A Combo - Data and performance summary

			L_h = 10 000 h n_1 min^{-1} n_2 min^{-1} M_{N2} N m			M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min^{-1}	n_1 = 1 400 min^{-1} Pt [kW] at 20°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 5 400 000	1 250 2 000	500 375	670 500	950 710
	355	**363**		2,48 2 209 347	1,38 2 300 943					
	400	**397**		2,27 2 211 607	1,26 2 331 414					
	450	**454**		1,98 2 214 933	1,10 2 377 446					
	500	**510**		1,76 2 219 215	0,980 2 418 778					
	560	**561**		1,60 2 250 425	0,891 2 452 788					

			L_h = 10 000 h n_1 min^{-1} n_2 min^{-1} M_{N2} N m			M_{N2max} M_{2max} N m	n_{1max} n_{1peak} min^{-1}	n_1 = 1 400 min^{-1} Pt [kW] at 20°C 40°C		
	i_N	i_{eff}	1 400	900	500			–		
R 3EL 3000 + R 2I 360	900	**883**	1,59 2 254 184	1,02 2 404 846	0,566 2 621 262	3 000 000 5 400 000	2 000 2 360	224 170	300 224	450 340
	1000	**1013**	1,38 2 299 937	0,889 2 453 642	0,494 2 674 399					
	1120	**1122**	1,25 2 334 641	0,802 2 490 679	0,446 2 714 762					
	1250	**1246**	1,12 2 370 937	0,722 2 529 418	0,401 2 757 011					
	1400	**1365**	1,03 2 402 861	0,659 2 563 495	0,366 2 794 193					
	1600	**1517**	0,923 2 440 205	0,593 2 603 619	0,330 2 837 721					
	1800	**1733**	0,808 2 488 230	0,519 2 654 750	0,288 2 893 834					
	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	0,226 3 000 000					
	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	0,181 3 098 796					
	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					



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

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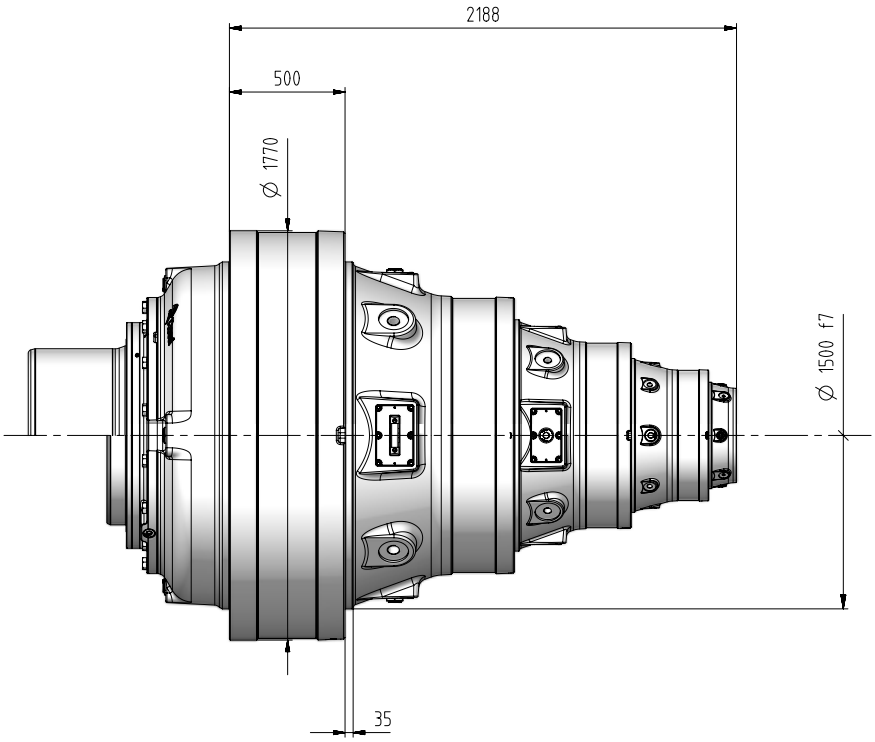
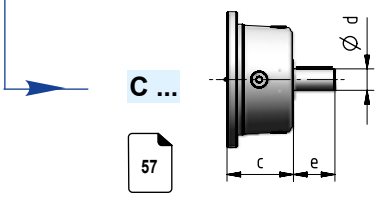
R 4EL

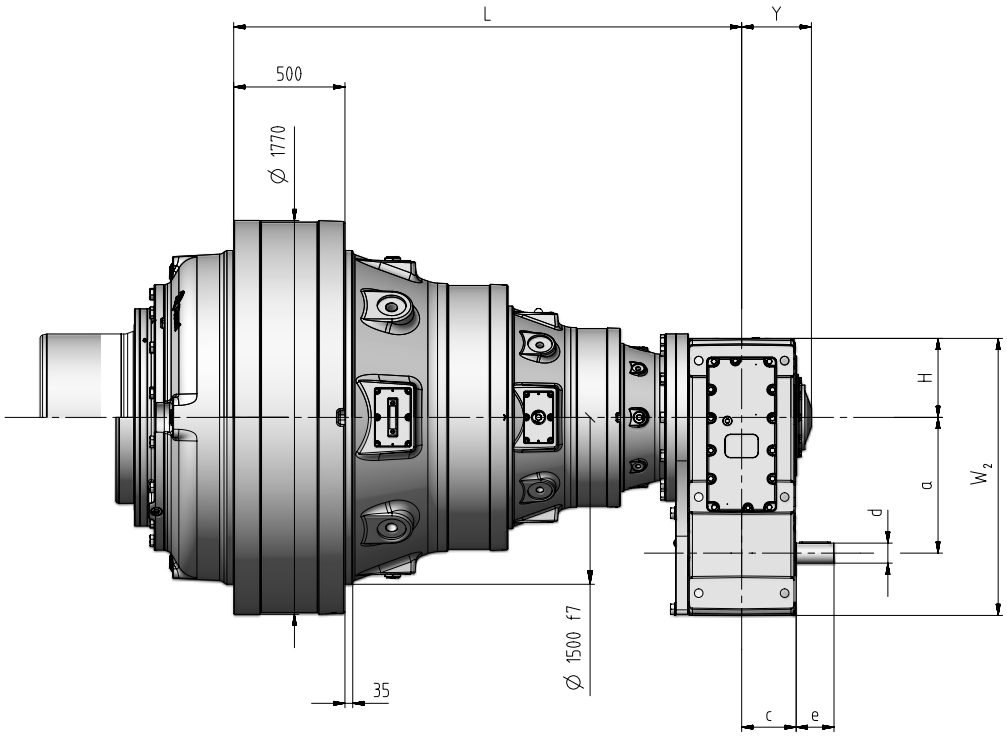




Train of gears	d	e	c	Code
4EL	120	165	277,5	C120×165

Train of gears	Input Options Code	Output Options (Δ) Code					
	C120×165	H...	Z...	T...	C...	S...	Q...
4EL	16140	+0	-470	-370	+3115	+2495	+1620

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

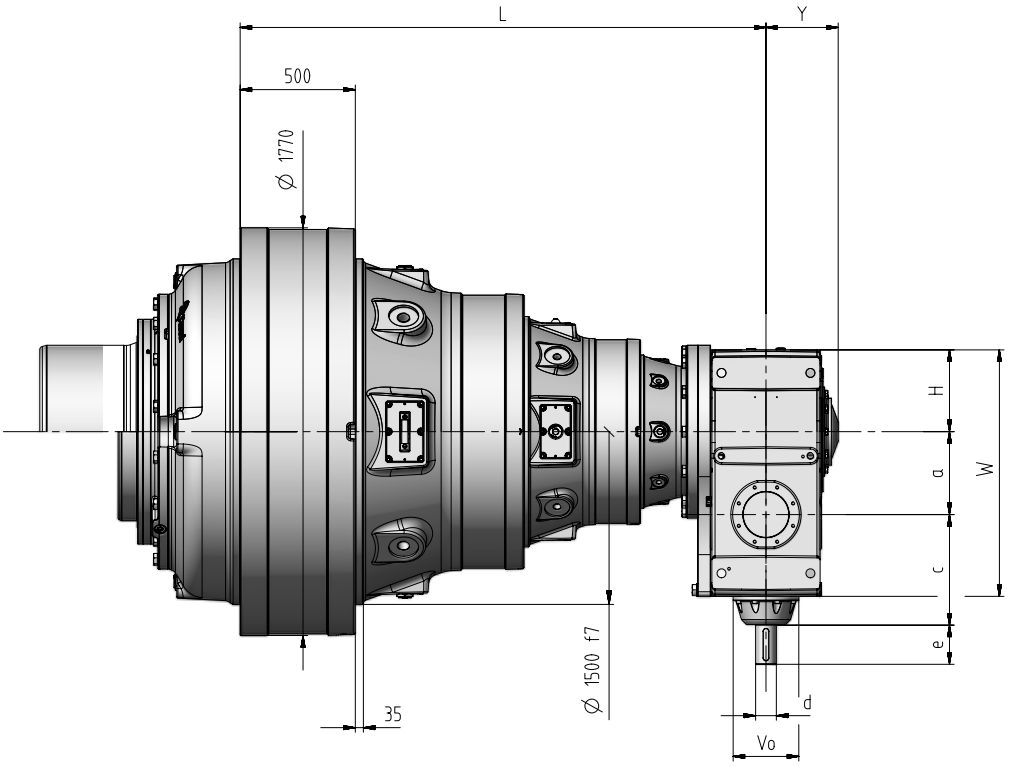


Train of gears	L	Y	H	a	c	d	e	W_2
2EL 3000 + 2I 5000	2105,5	406,5	560	875	426	110	210	1947*
3EL 3000 + 2I 360	2283	314	355	610	245	90	170	1245

* For mounting positions B6, B7, V5, V6 dimension W_2 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 **3EL 3000 + 2I 360**	20470 17620	+0	-470	-370	+3115	+2495	+1620

R 3EL combined with R CI



Train of gears	L	Y	H	a	V_0 ∅	c	d	e	d	e	d	e	W
							$i_N \leqslant 11,2$		$i_N = 12,5 \ldots 16$		$i_N \geqslant 18$		
3EL 3000 + CI 360	2283	314	355	360	290	480	90	170	70	140	70	140	1070

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

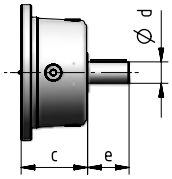
3000A - Input side details

R 4EL

Cylindrical Shaft End Type - CODE

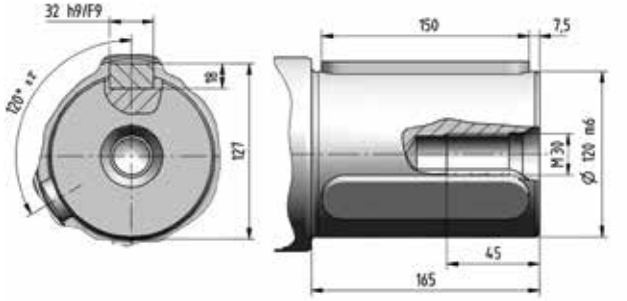
Input

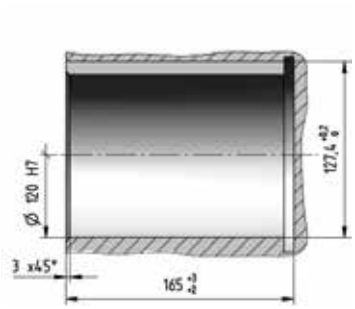
Gear reducer cylindrical shaft end		Shaft length
C...	x	...



Suggested mating dimensions

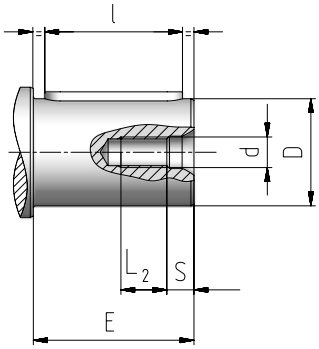
C120 x 165

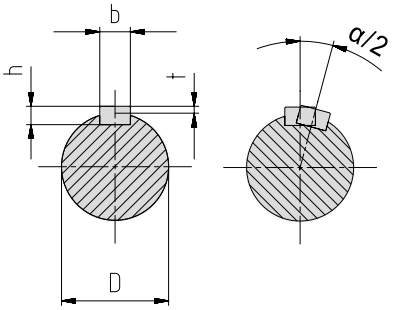




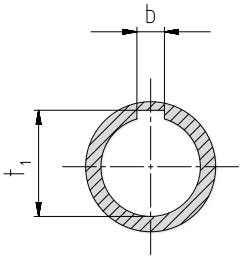
R 2EL, R 3EL combined with R 2I, R CI

High speed shaft end





Gear reducer shaft



Machine shaft

Shaft end D Ø		E[1]		d Ø	S	L_2[1]		α/2[2] arc min	Key b h9 × h h11 × l[1]	Keyway 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

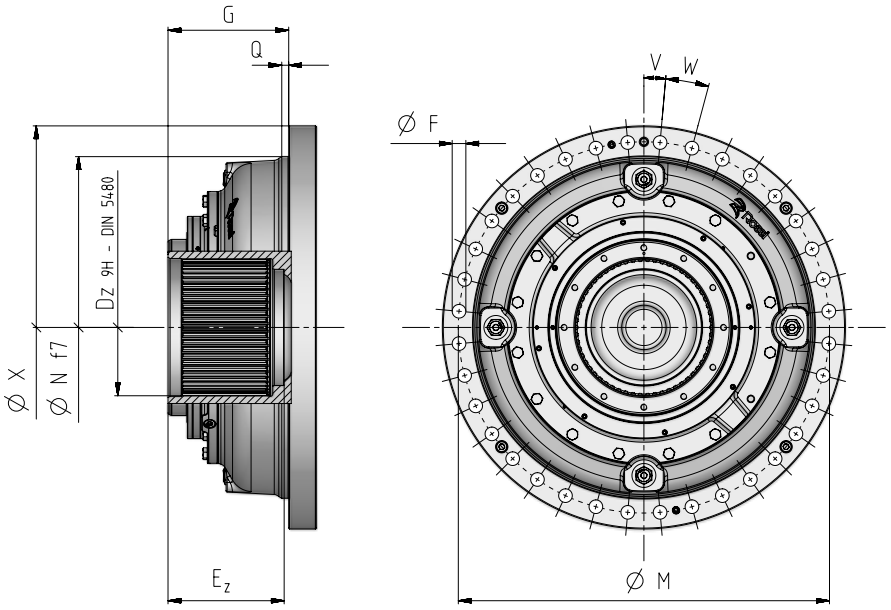
1) Values in brackets are for short shaft end.
2) Maximum angular misalignement between double extension shaft keys.

2

Main dimensions Output side details

Index

Splined hollow shaft Z



Output

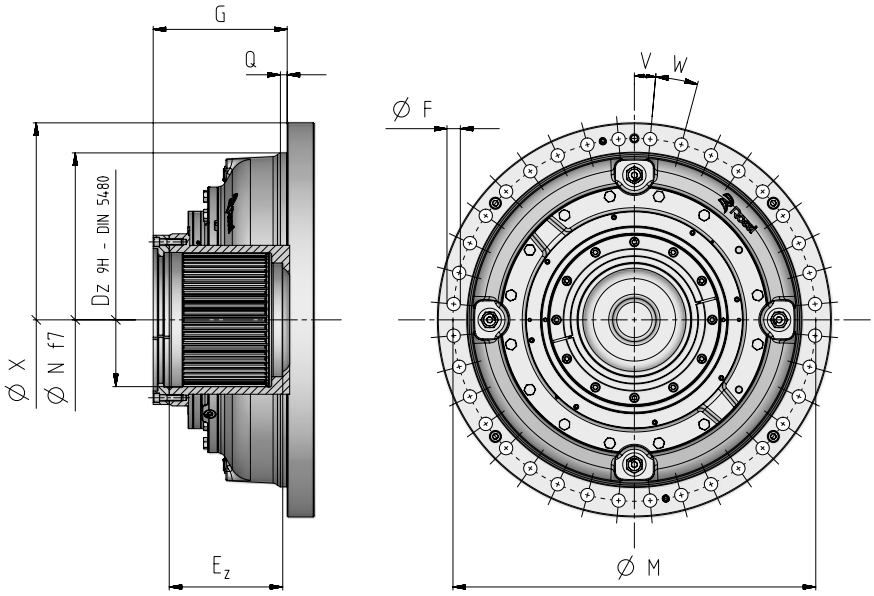
Suggested mating dimensions

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

Main dimensions - Output side details

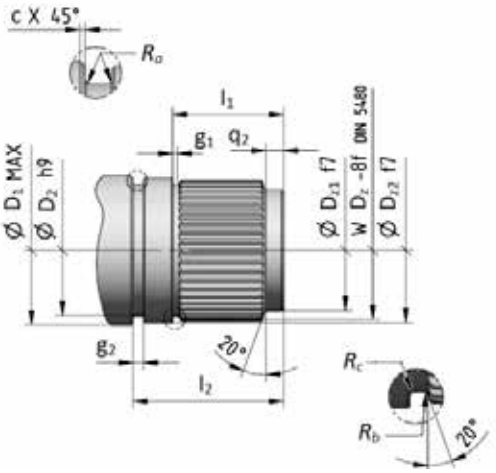
Splined hollow shaft with axial locking T

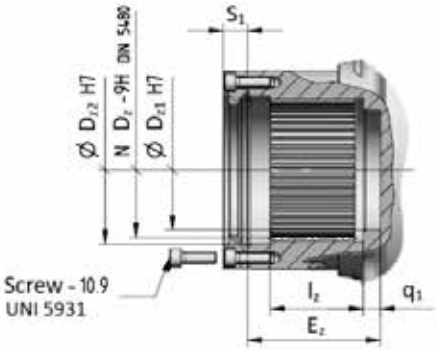


Output

Suggested mating dimensions

Gear reducer splined hollow shaft with axial locking



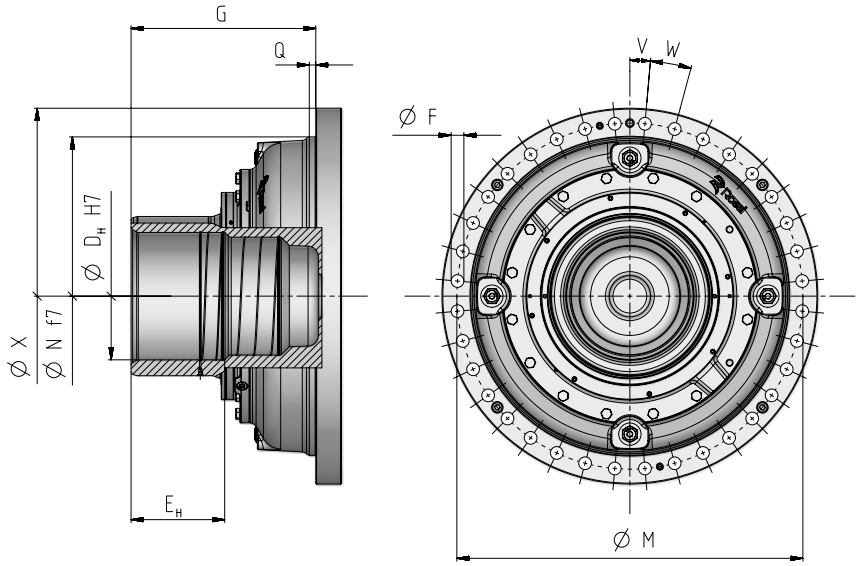


Size	Ordering code	D_z	D_{z1}	D_{z2}	E_z	l_z	q_1	S1	N	Q	G	X	M	V	W	F	Screw n. 12
1060	T400M1 A05o	400×8	340	405	340	260	35	50	1000	20	395	1200	1100	5,625°	32 × 11,25°	45	M20×65
1500	T460M1 A05p	460×8	390	465	390	300	40	58	1150	21,5	458	1360	1260	4,5°	40 × 9°	45	M22×80
2120	T500M1 A05q	500×8	420	505	430	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_z	D_1 max	D_2	l_1	l_z	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

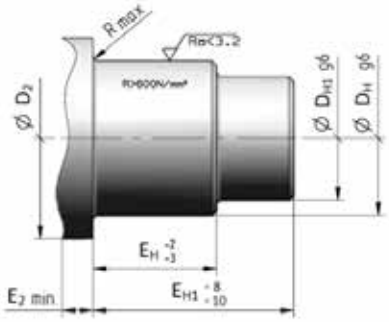
Main dimensions - Output side details 2

Hollow for shaft mounting H

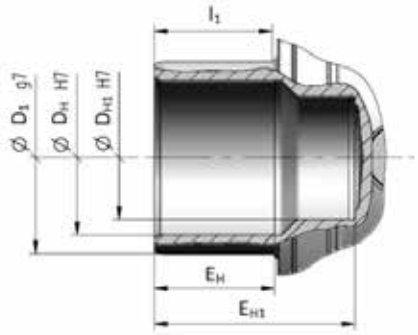


Output

Suggested mating dimensions



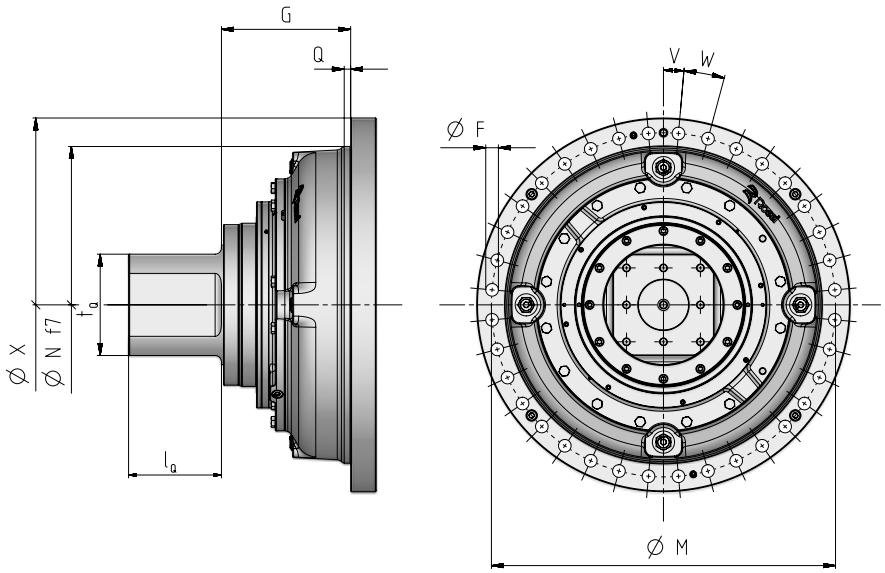
Gear reducer hollow shaft for shaft mounting

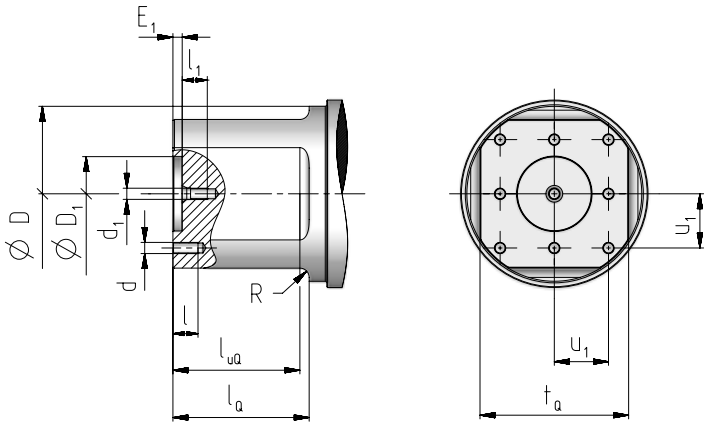


Size	Ordering code	D_H	D_{H1}	D_1	E_H	E_{H1}	l_1	N	Q	G	X	M	V	W	F	D_2 min max	E_2	R_{max}
1060	**H400M1 A10o**	400	370	500	285	470	230	1000	20	590	1200	1100	5,625°	32 × 11,25°	45	475 500	60	10
1500	**H460M1 A10p**	460	425	560	325	540	265	1150	21,5	670	1360	1260	4,5°	40 × 9°	45	530 560	60	12
2120	**H510M1 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.

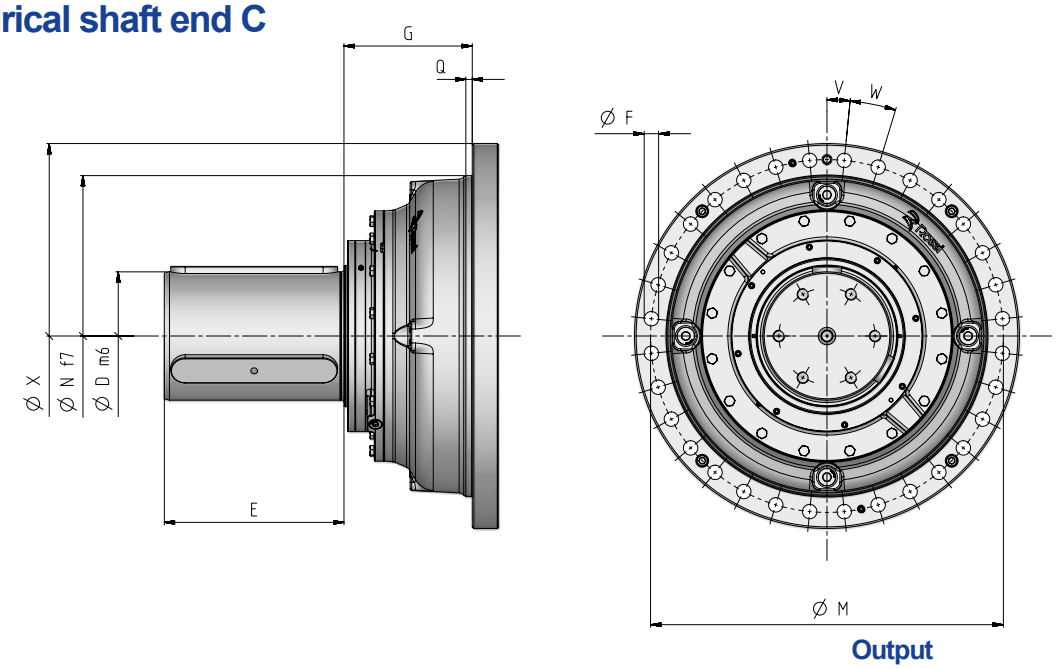
Square shaft end extension Q





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 n. 8	l	u_1	d_1× l_1 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

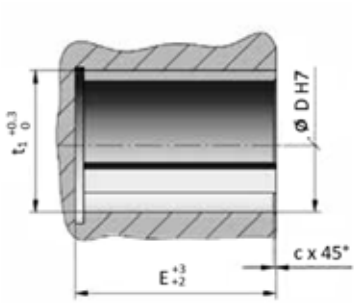
Cylindrical shaft end C

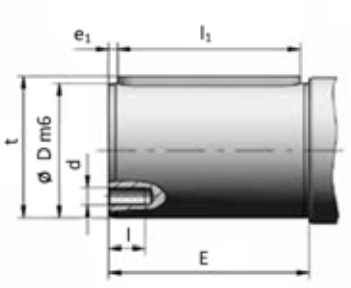


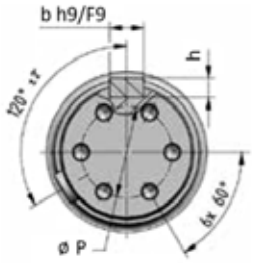
Output

Suggested mating dimensions

Gear reducer cylindrical shaft end

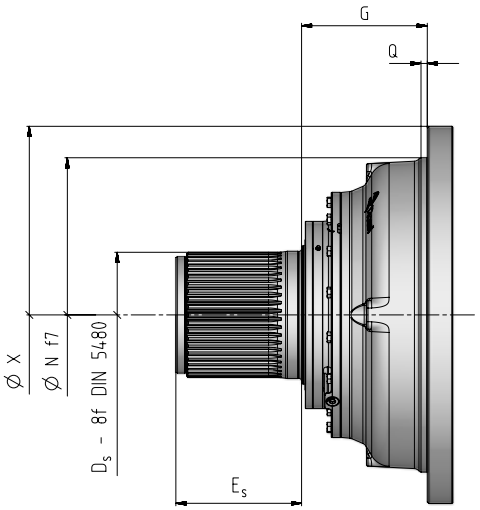


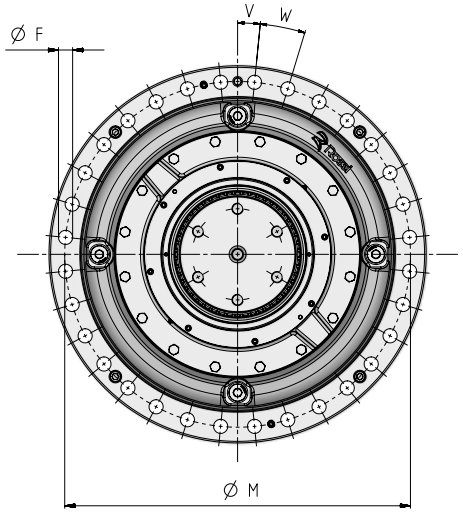




Size	Ordering code	D	E	N	Q	G	X	M	V	W	F	b	h	l_1	e_1	t	t_1	P	d x l	c
1060	C400M1 F10o	400	560	1000	20	400	1200	1100	5,625°	32 × 11,25°	45	90	45	520	20	417	417,4	300	M36×72	8
1500	C460M1 F10p	460	670	1150	21,5	450	1360	1260	4,5°	40 × 9°	45	100	50	620	25	479	479,5	350	M42×85	10
2120	C500M1 F10q	500	710	1320	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

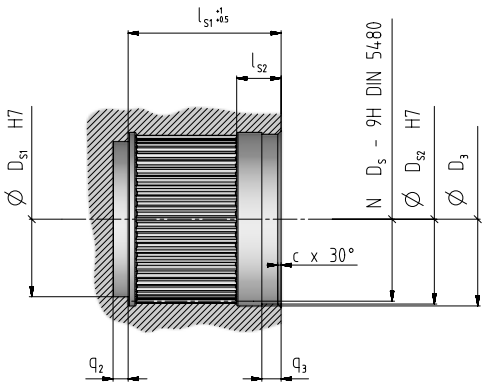
Splined shaft end S



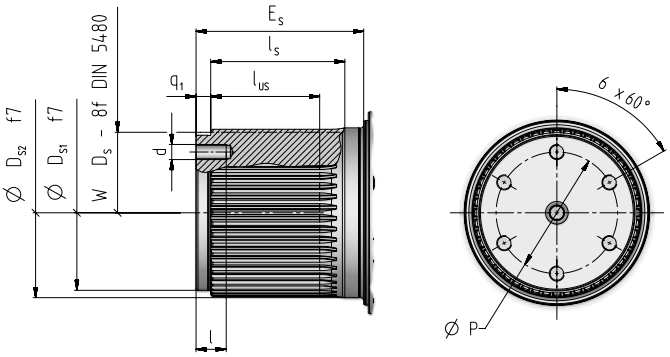


Output

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

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Accessories

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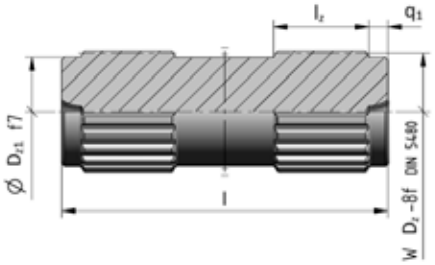
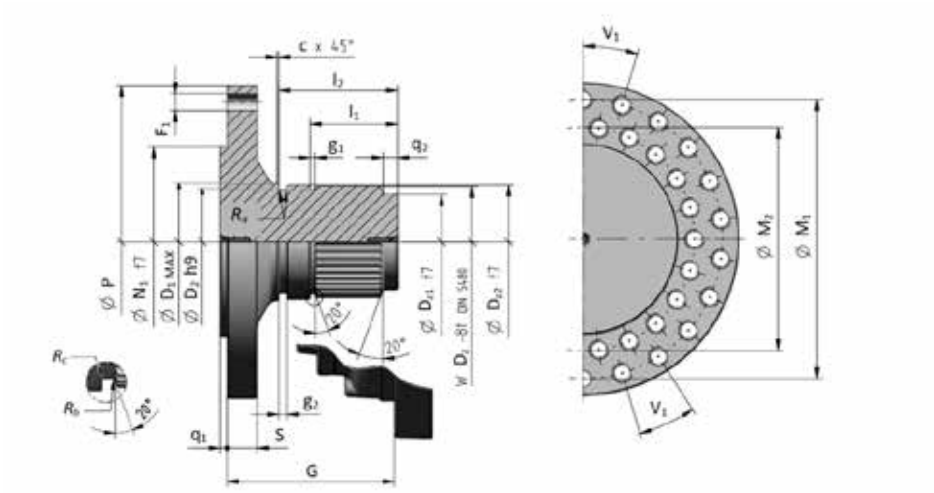
Splined bar



Size	Ordering code	D_z	D_{z1}	q_1	l_z	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

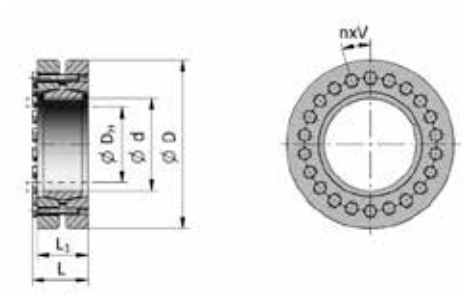
Wheel flange



Size	Ordering code	D_z	D_{z1}	D_{z2}	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

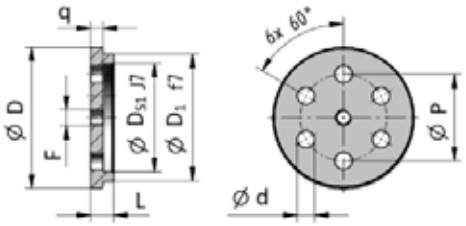
Shrink disc



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

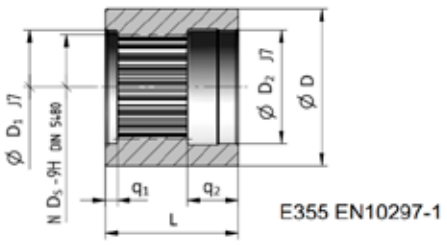
[included]



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

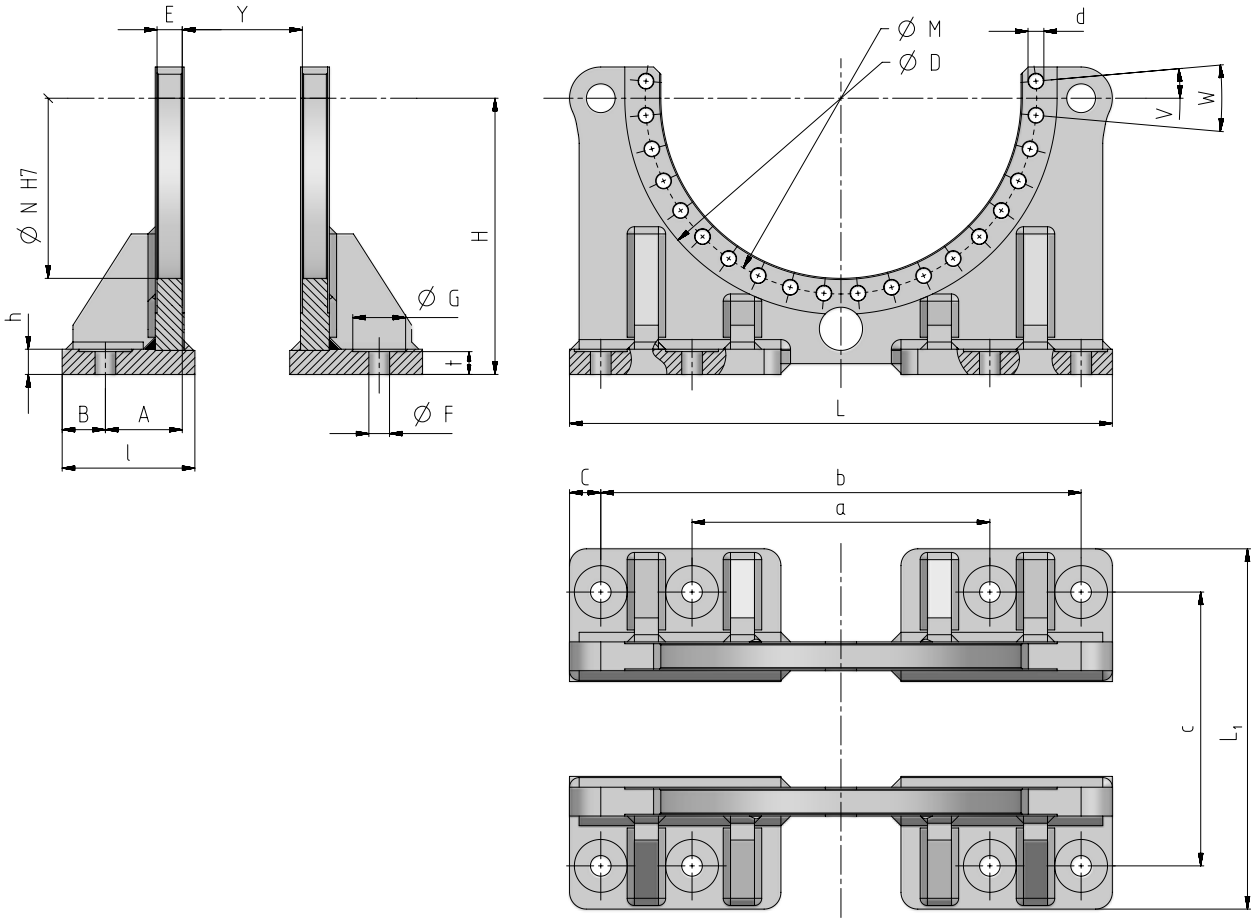
Splined bush

[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



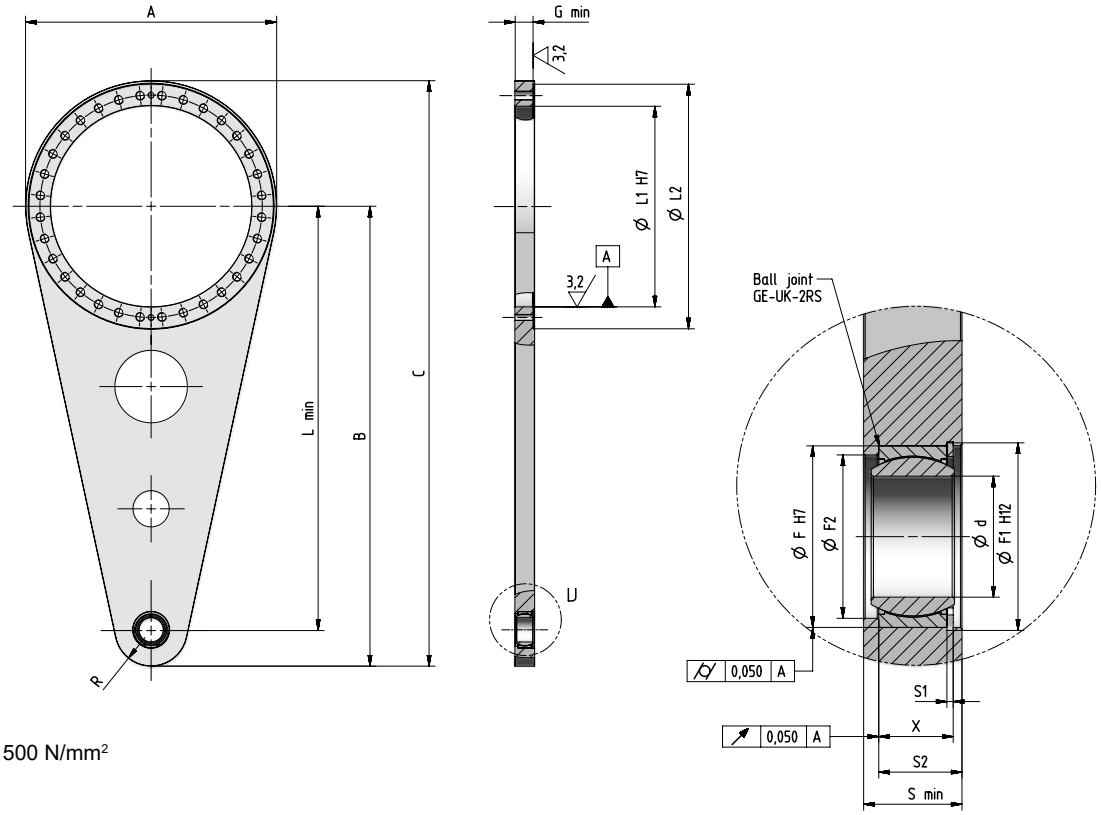
Size	Ordering code	N	D	Y	E	H	A	B	l	a	b	C	L	c	L1	F	G	t	h
1060	,FB10o	1000	1210	350	70	800	220	120	375	840	1360	90	1540	790	1030	62	155	65	70
1500	,FB10p	1150	1380	400	80	900	250	140	430	960	1560	100	1760	900	1180	70	175	75	80
2120	,FB10q	1320	1580	440	90	1000	285	160	490	1100	1760	115	1990	1010	1330	78	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 class 10.9	Washer UNI	Nut class 10 UNI	Tightening torque [Nm]	kg
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

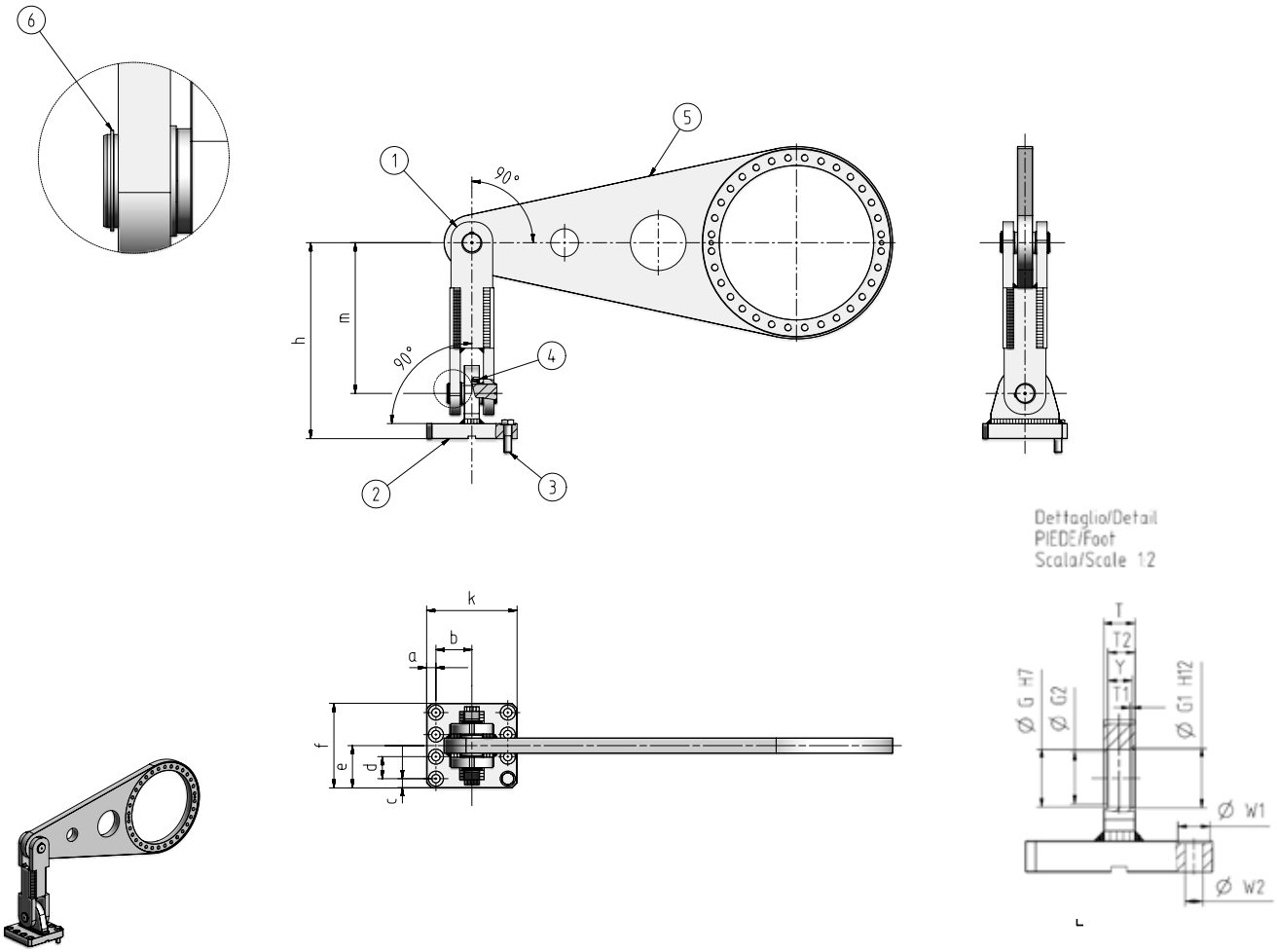


R_m min ≥ 500 N/mm²

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.



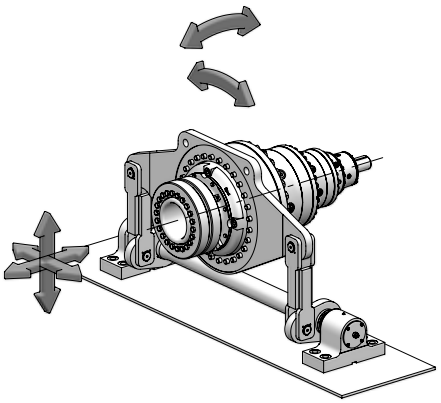
Item	Description
1	Connection Rod
2	Foot
3	Screw UNI 5739
4	Spherical plain bearing GE-UK-2RS
5	Torque Arm
6	Circlip DIN 7435

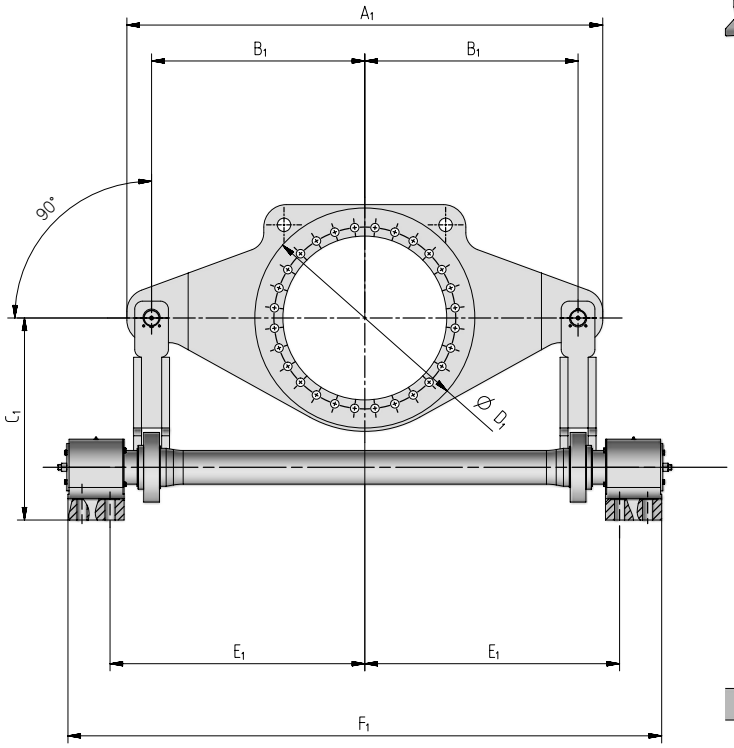
Size	m	h	c	d	e	f	a	b	k	G	G1	G2	W1	W2	Screw class 10.9	T1	T2	T	Y
1060	900	1165	52,5	100	252,5	505	55	200	510	160	165	147	85	45	M42 - 10x	4,15	67,5	80	59,2
1500	1030	1330	60	107,5	275	550	60	220	560	180	185	163	90	48	M45 - 10x	4,15	80	90	74,2
2120	1200	1550	65	125	315	630	67,5	252,5	630	210	216	185	100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

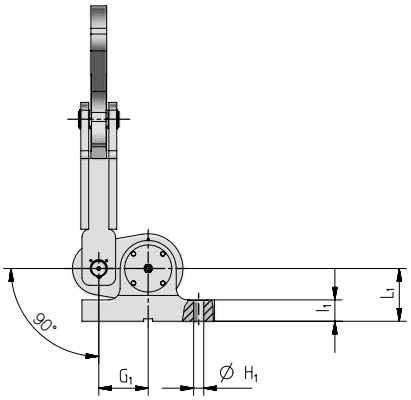
Cantilever torque arm assembly for system flexibility

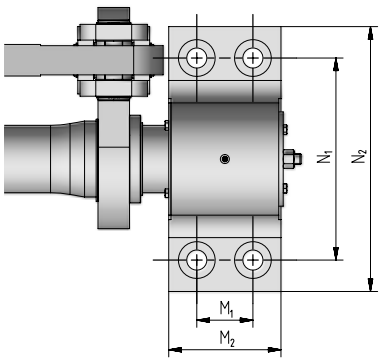
Torque arm with double fulcrum and torsion bar fixed to the ground, allows the gear reducer to follow the driven shaft movements during operation and offers an elastic reaction able to absorb the overloads of moment twisting.

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

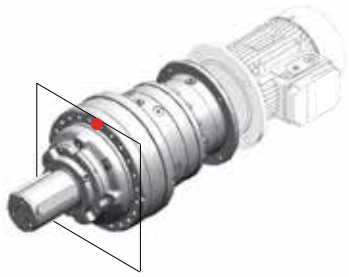
4

Mounting positions, oil quantities and tanks

1060A

Mounting positions[1] (Output mounting **... F..., ... A...**)

B5



V1*

V3**

* 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.

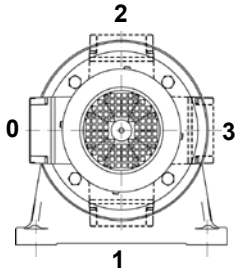
Oil quantities[2] [l]

	4EL
Q_R	1060A
B5	139
V1	272
V3	265

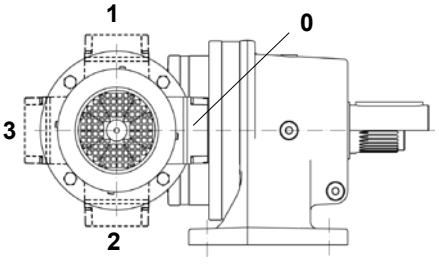
2) Stated oil quantities are approximate for provisioning. The exact quantity gear reducer is to be filled with is definitely given by the level.

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.



R 3EL ... 4EL



R 4EB

1060A

Mounting positions[1] (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 quantities[2] [l]

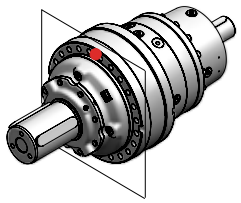
	4EB
Q_R	1060A
V3 ... V33	290
B5, B53	149
B51	280
B52	142
V1 ... V13	280

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

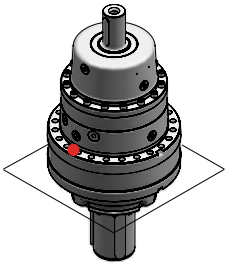
1060A ... 3000A

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

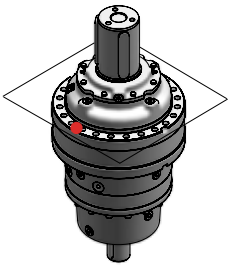
B5



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 quantities[2] [l]

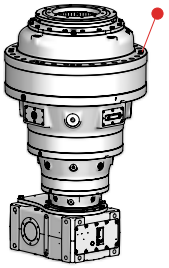
	3EL			
Q_R	1060A	1500A	2120A	
B5	139	235	315	
V1	278	460	625	
V3	273	455	616	

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

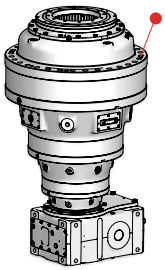
2) Stated oil quantities are approximate for provisioning. The exact quantity gear reducer is to be filled with is definitely given by the level.

Combined units

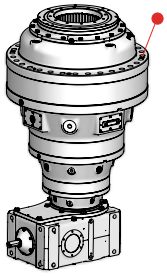
V3



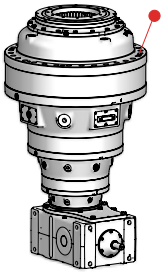
V31



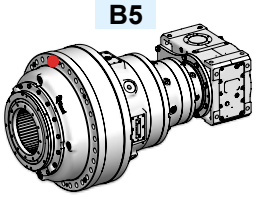
V32



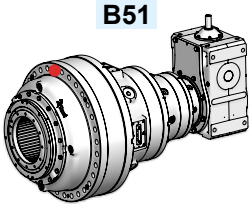
V33



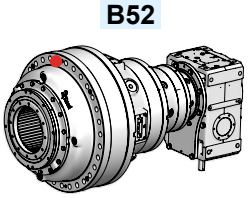
B5



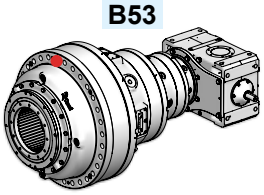
B51



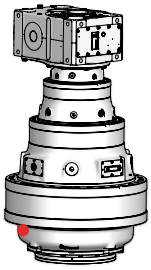
B52



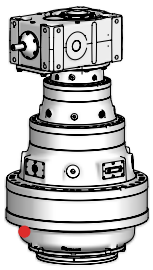
B53



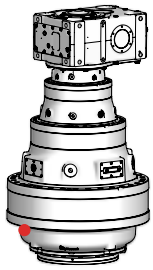
V1



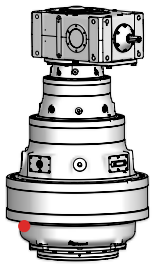
V11



V12



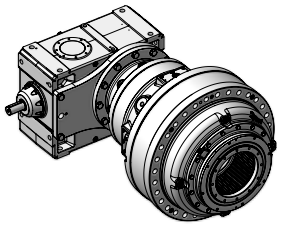
V13



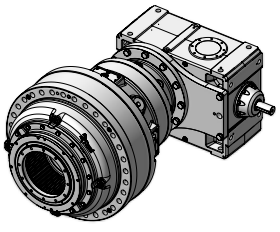
Combined unit EP + G	Planetary unit EP	Bevel-helical unit G R CI
B5 [1]	B5	B3
B51	B5	B6
B52	B5	B7
B53	B5	B3
V1	V1	V6
V11	V1	V6
V12	V1	V6
V13	V1	V6
V3	V3	V5
V31	V3	V5
V32	V3	V5
V33	V3	V5

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.

B5



B53



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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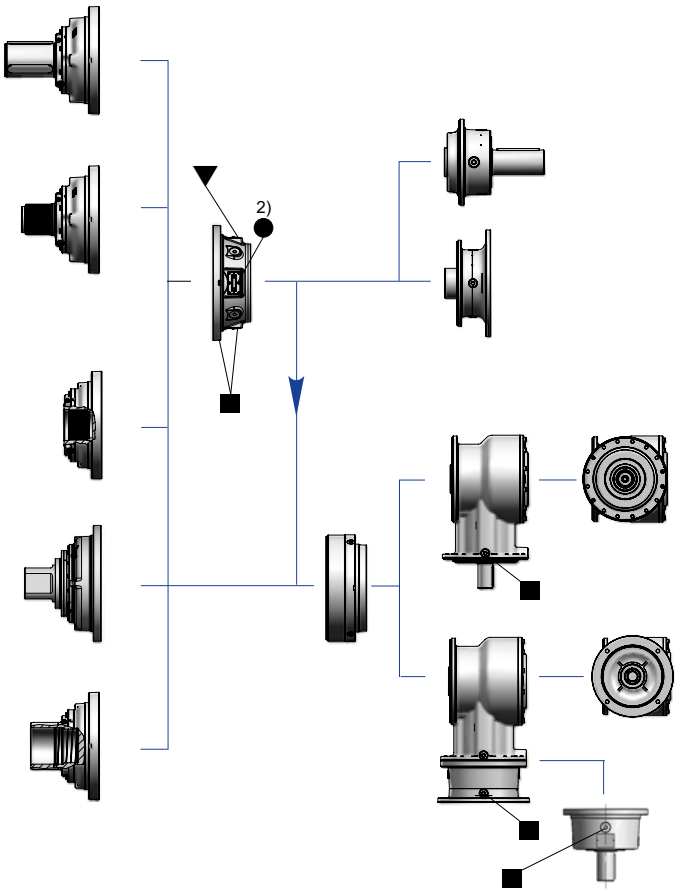
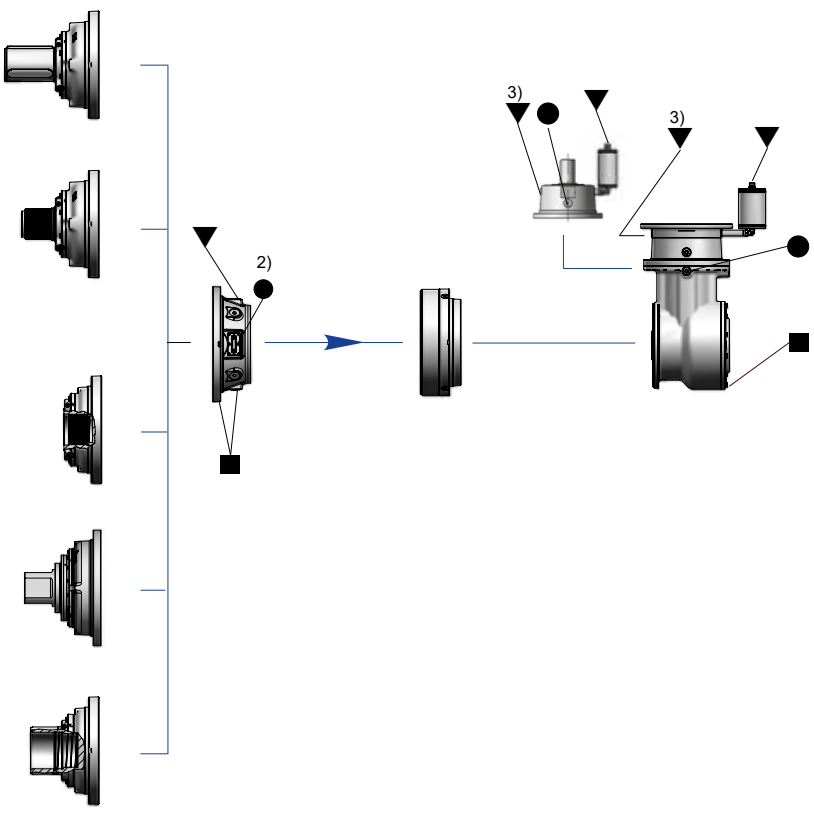
1060A ... 3000A
Plug positions and types

Mounting positions
B5, B52, B53



1060A
Plug positions and types

Mounting position
B51



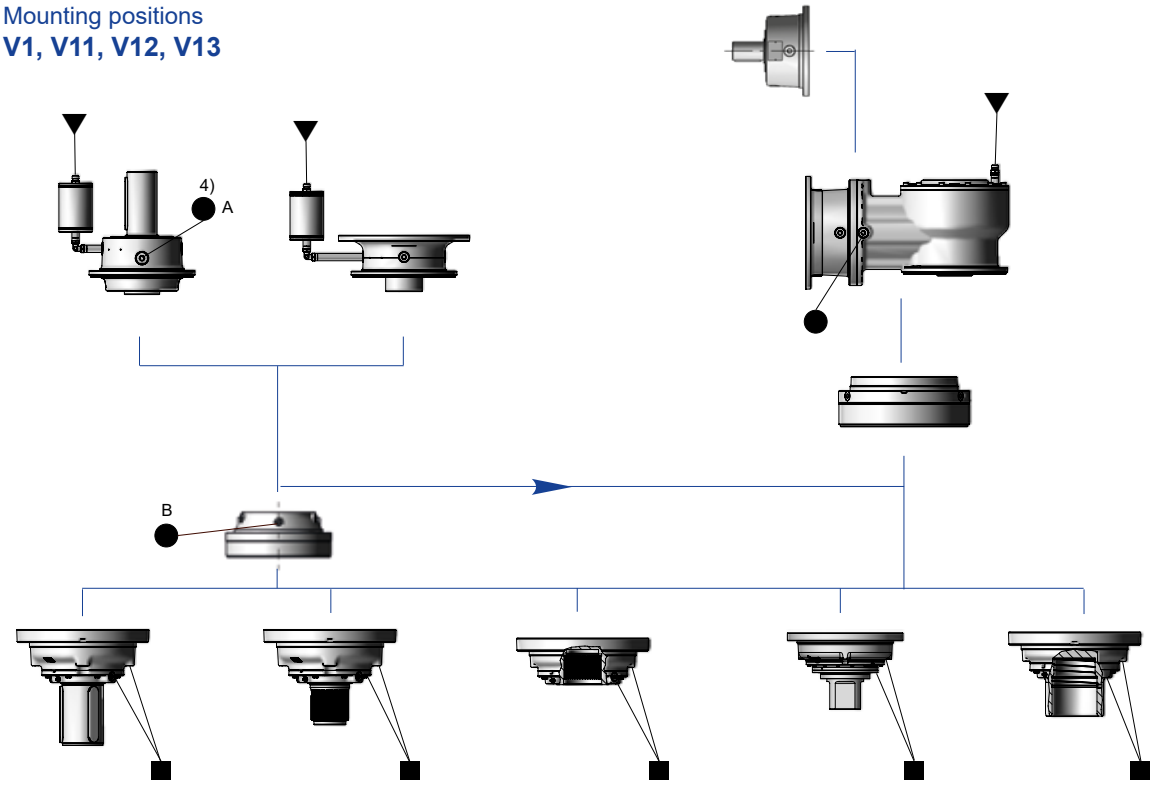
▼ Filler plug with breather
● Transparent level plug
2) Oil level indicator
Spillway plug
■ Drain plug
Expansion tank[1)]
Elbow

1) Contact Rossi.
3) When expansion tank is not necessary.
4) B is not available in presence of level plug marked with A.

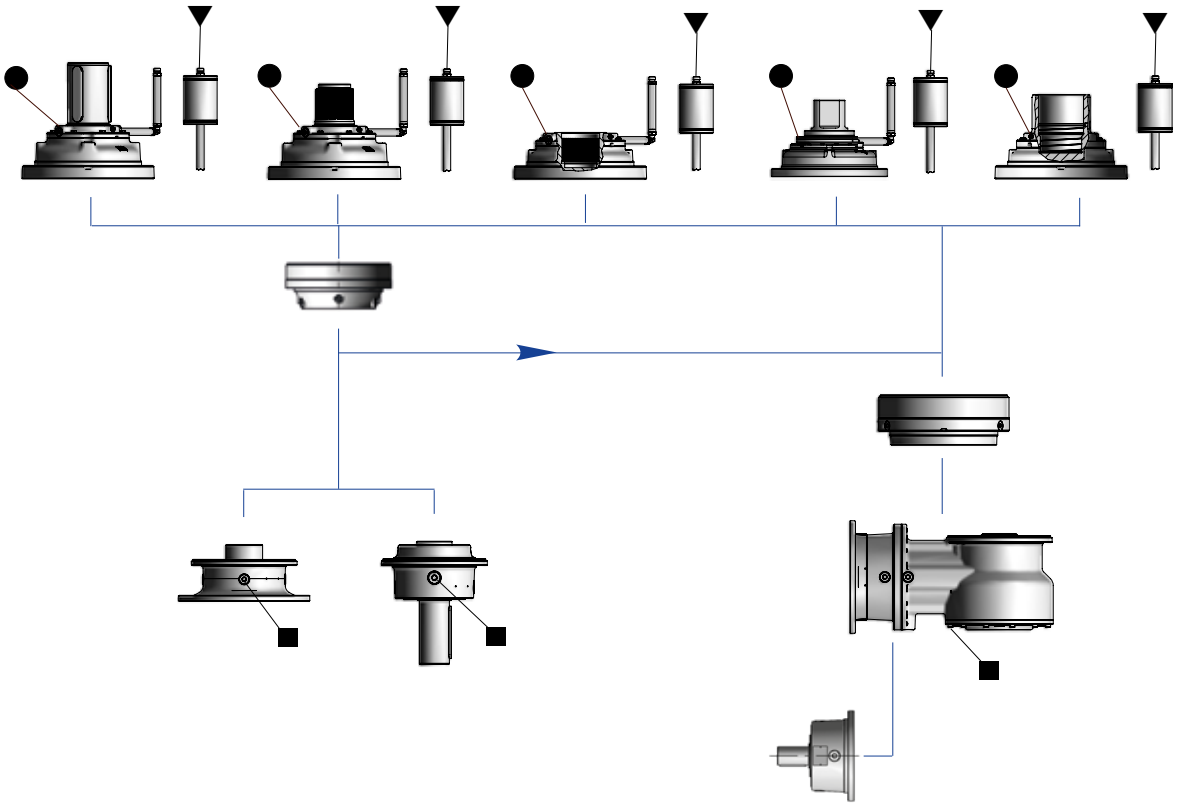
1060A ... 3000A

Plug positions and types

Mounting positions
V1, V11, V12, V13



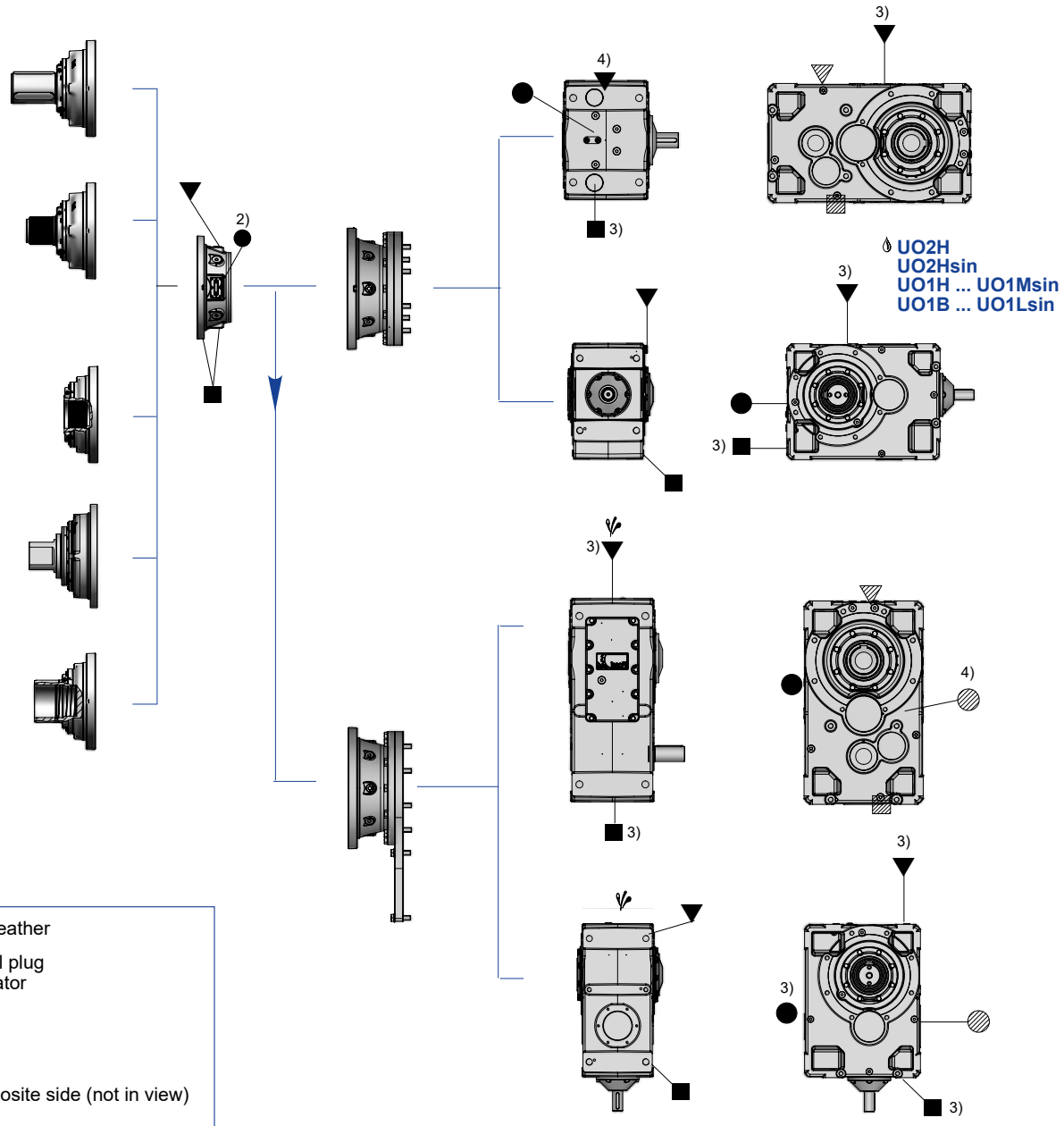
Mounting positions
V3, V31, V32, V33



Combined units

1060A ... 3000A
Plug positions and types

Mounting positions
B5, B52, B53



▼ 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 tank[1)]
Elbow

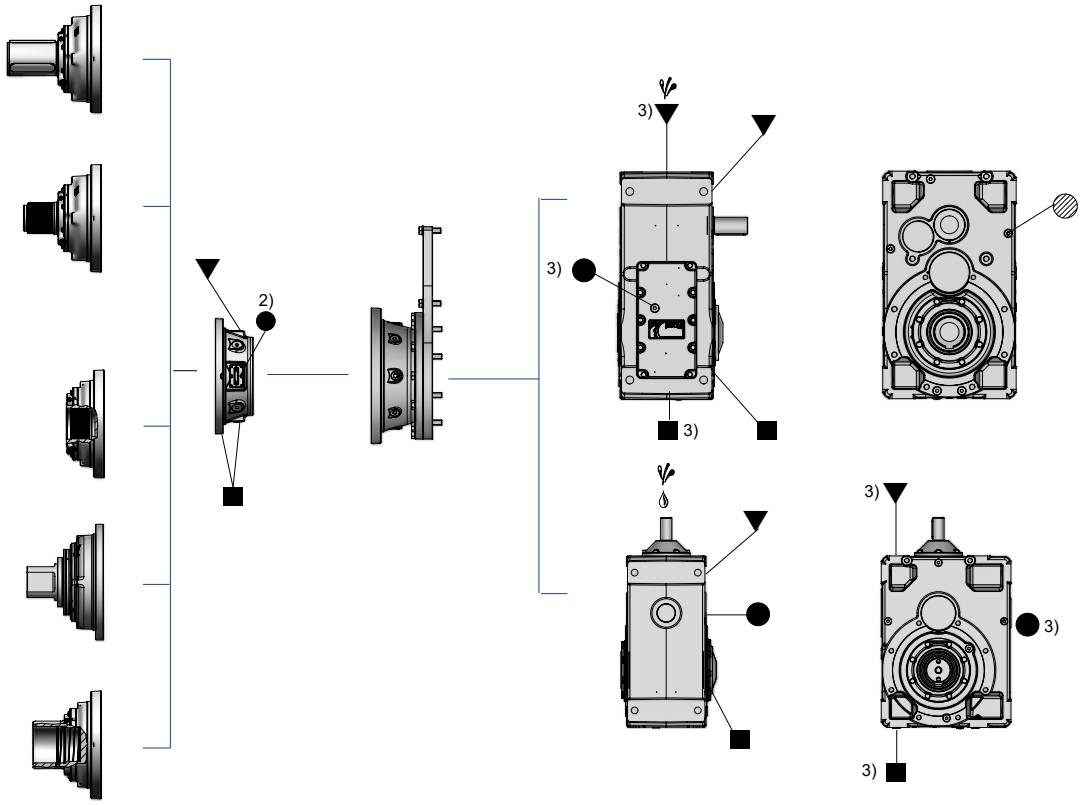
1) Contact Rossi.
3) Only for H gear reducer.
4) Only for G R I.

Possible high oil splash: for the corrective factor f_{t_3} of nominal thermal power Pt_N 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 tank[1)]
- Elbow

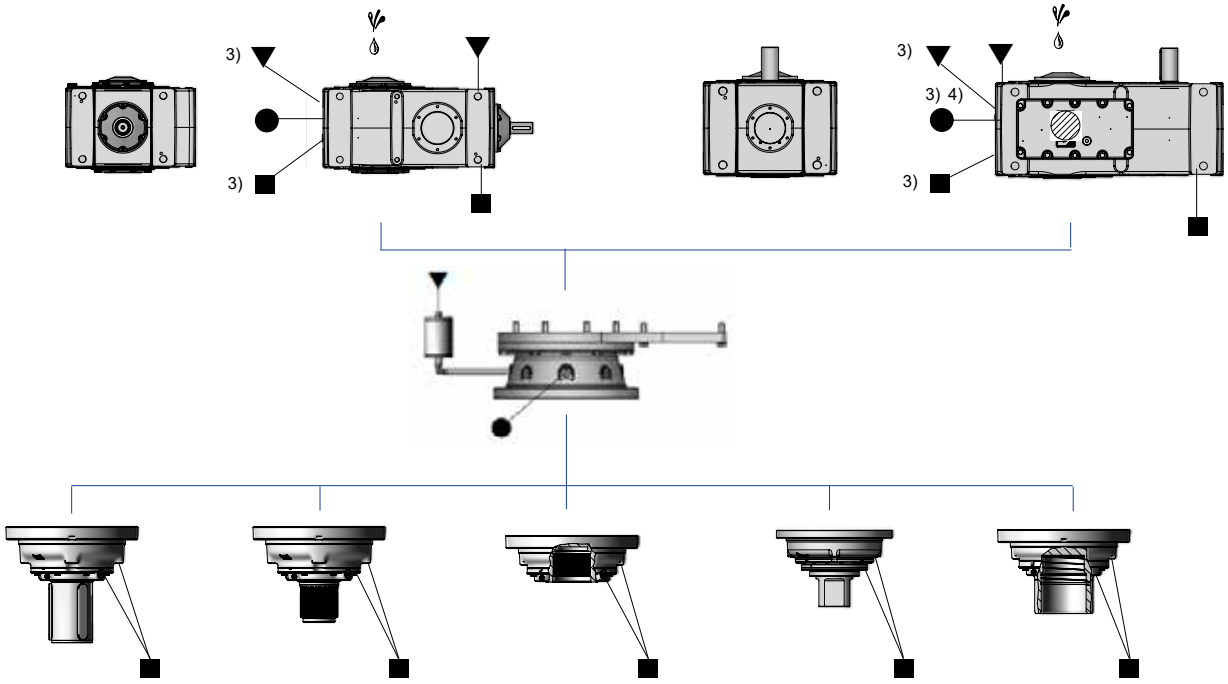
1) Contact Rossi.
3) Only for H gear reducer.
4) Only for G R I.

Possible high oil splash: for the corrective factor f_{t_3} of nominal thermal power Pt_N 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).

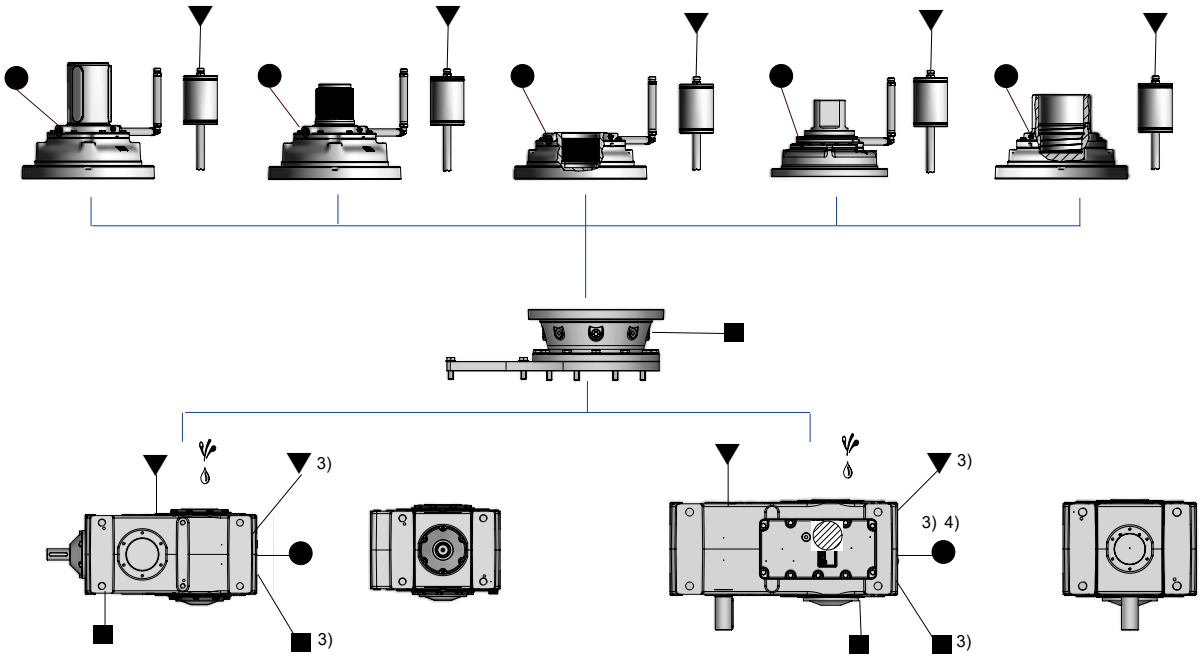
Combined units

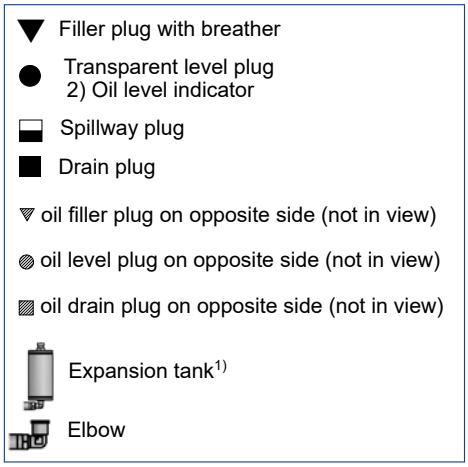
1060A ... 3000A
Plug positions and types

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_{t_3} of nominal thermal power Pt_N 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

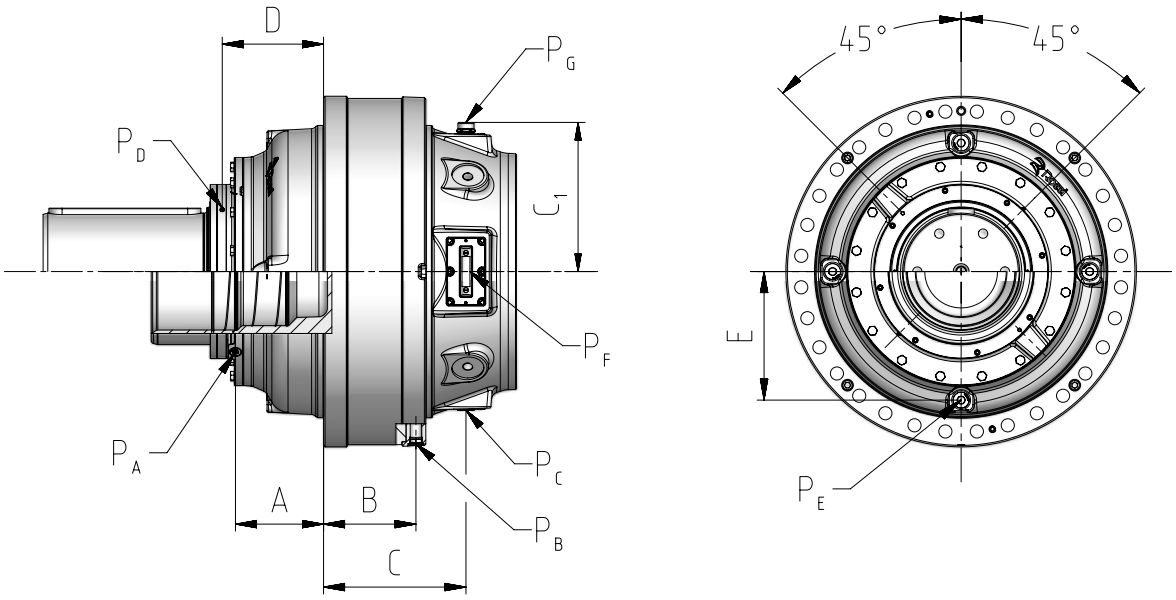
The positions of the several plugs present on the gear reducer are shown in the following figures. The number and dimensions of plugs (in inches) as well as the distances from a useful reference point (gear reducer axis, flange plane, low speed shaft shoulder, etc.) are shown in the tables, according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

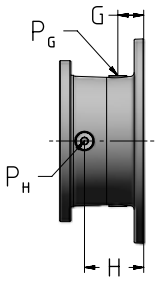
In the mounting positions with vertical low speed shaft towards upper side (V3 … V33), the gear reducer may be equipped with an elbow for the oil expansion. The relevant overall dimensions are also stated in the tables.

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



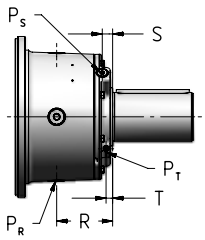
Sizes		A	B	C	C_1	D	E	P_A n° 2	P_B n° 1	P_C n° 1	P_D n° 2 grease fitting	P_E n° 4	P_F n° 2	P_O n° 1
1060A	C, S	301,5	316	487,5	505	347	440	G1”	G1 - 1/4"	G1 - 1/2"	G1/4”	G1 - 1/2"	HCX.127-P	G1 - 1/2"
	H, Z, T, Q	244,5	316	487,5	505	290	440	G1”	G1 - 1/4"	G1 - 1/2"	G1/4”	G1 - 1/2"	HCX.127-P	G1 - 1/2"
1500A	C, S	342		540	575	389	507,5	G1”	G1 - 1/4"	G1 - 1/2"	G1/4”	G1 - 1/2"	HCX.127-P	G1 - 1/2"
	H, Z, T, Q	275	361	540	575	322	507,5	G1”	G1 - 1/4"	G1 - 1/2"	G1/4”	G1 - 1/2"	HCX.127-P	G1 - 1/2"
2120A	C, S	380	396,5	615	667	429,5	562,5	G1”	G1 - 1/2"	G1 - 1/2"	G1/4”	G1 - 1/2"	HCX.127-P	G1 - 1/2"
	H, Z, T, Q	316	396,5	615	667	365,5	562,5	G1”	G1 - 1/2"	G1 - 1/2"	G1/4”	G1 - 1/2"	HCX.127-P	G1 - 1/2"
3000A	C, S	433	449,5	715	749	485	650	G1 - 1/4"	G1 - 1/2"	G1 - 1/2"	G1/4”	G1 - 1/2"	HCX.127-P	G1 - 1/2"
	H, Z, T, Q	347	449,5	715	749	399	650	G1 - 1/4"	G1 - 1/2"	G1 - 1/2"	G1/4”	G1 - 1/2"	HCX.127-P	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	–		

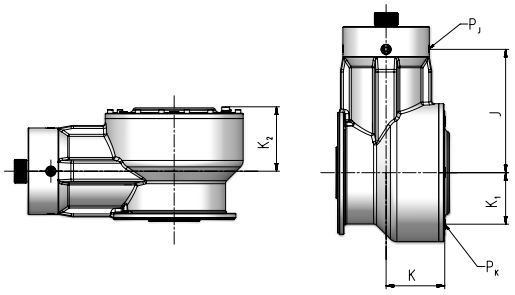
I...



3EL	4EL	4EB	R	S	T	P_R n° 2	P_S n° 2	P_T n° 2
	1060A	1060A	61	36	–	G3/4"	G3/4"	–
	1500A ... 2120A	–	115	21	13,5	n° 4 – G3/4"	G3/8"	M10x1
1060A	3000A	–	137	24	13,5	n° 4 – G1"	G3/8"	M10x1
1500A ... 2120A	–	–	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

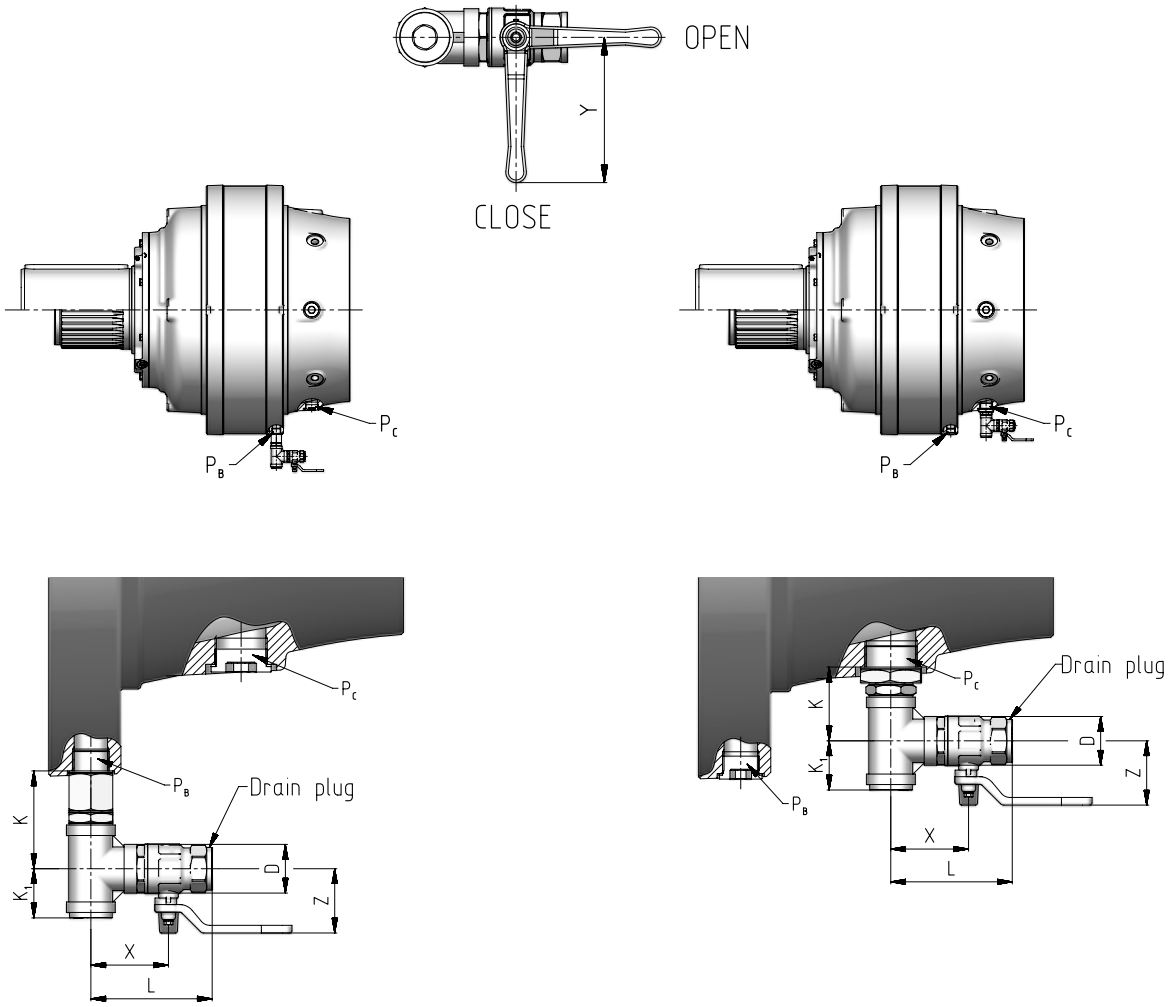
5

Input and options

Index

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**.

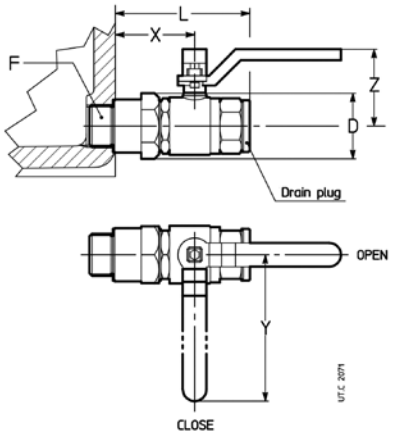


Size	P_B	P_C
1060	G 1”1/4	G 1”1/2
1500	G 1”1/4	G 1”1/2
2120	G 1”1/2	G 2"
3000	G 1”1/2	G 2"

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

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

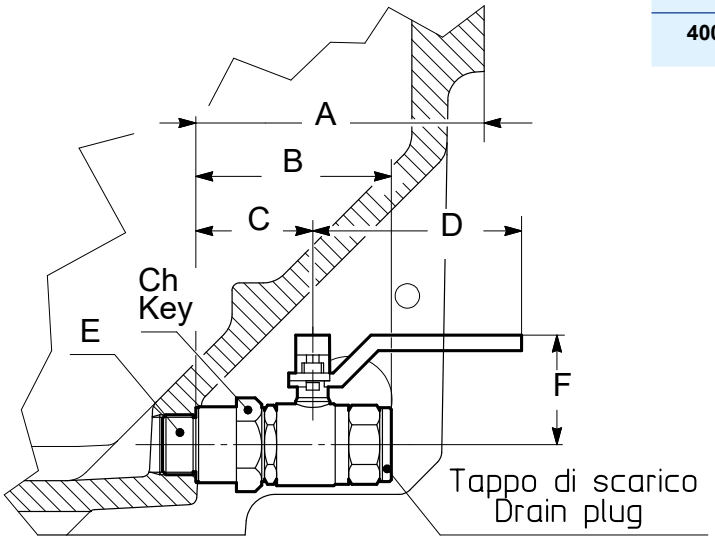
G series

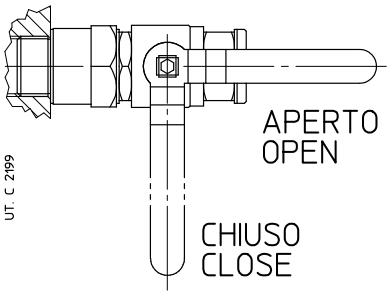


Size	F	D Ø	L ≈	X	Y	Z
160 ÷ 280	G 3/4"	40	90	56	112	55
320 ÷ 360	G 1"	46	106	66	115	60

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

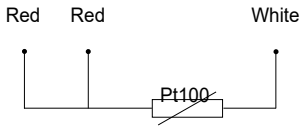
Remote oil temperature gauge; installation (at Buyer's responsibility) instead of an existing drain plug, or into a hole properly pre-arranged. The temperature gauge is realized with a thermo-resistor Pt100 having following features:

- 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

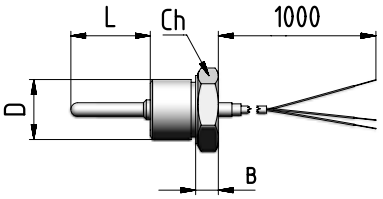
For the probe connection to relevant signalling device CT03 or CT10 (on request, consult us) use a protected section cable ≥ 1,5 mm^2 positioned separately from power cables.

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 ½''

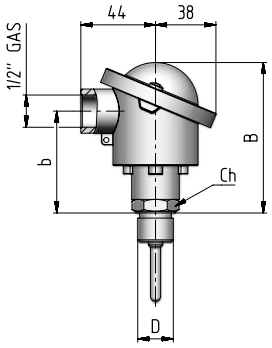
For the probe connection to relevant signalling device use a protected section cable **≥** 1,5 mm^2 positioned separately from power cables.

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

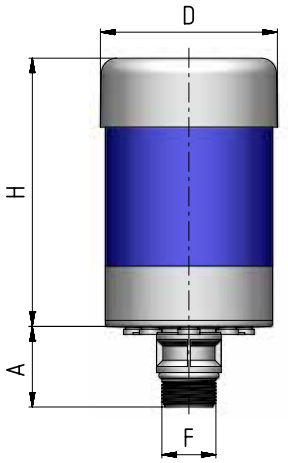
Desiccant breather with 3 stage filtration design: solid contaminant filter 2 µm, water vapor adsorbent bed in silica gel, activated carbon final filter. This filter traps water vapor and solid contaminant particles and keeps them out from the gear reducer and simultaneously holds oil vapors inside the 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 Ø	H	A
3/8 " 1"	64 104	109.4 105.4	27 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.

6

Installation and maintenance

Index

Installation and maintenance 6

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 °C ÷ +40 °C (with peaks -20 °C ÷ +50 °C), with standard seal rings and components.

The operation outside this range, with a minimum of -40 °C and a maximum of +60 °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 °C	+40 °C
	Storage condition		
	Minimum ambient temperature of storage condition	-10 °C	-10 °C
	Maximum environment temperature of storage condition	+50 °C	+50 °C
Oil Temperature T_{oil}	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 continuos running condition (S1)	+95 °C	+95 °C [3)]
	Maximum peak and occasional oil temperature allowed with intermittent duty only	+110 °C	+110 °C

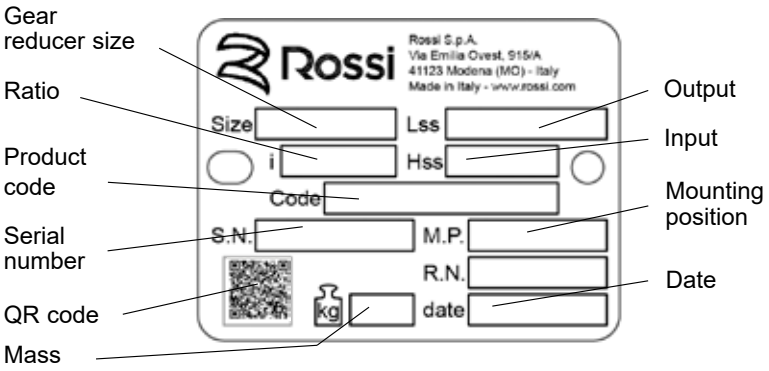
1) For selection of lubricant and optimal viscosity according to temperature T_{amb} and in case of independent lubrication unit, refer to chapter Lubrication.
For starts and services with T_{oil} < 0 °C , consider higher absorption on the electric motor according to the type of lubricant.
2) If full load service is required, provide gradual starting and stopping ramps, avoiding overloads and shocks.
3) For temperature value of T_{oil} > 75 °C and < 95 °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.

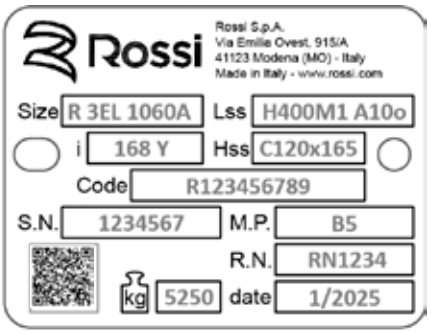
How supplied

Name plate

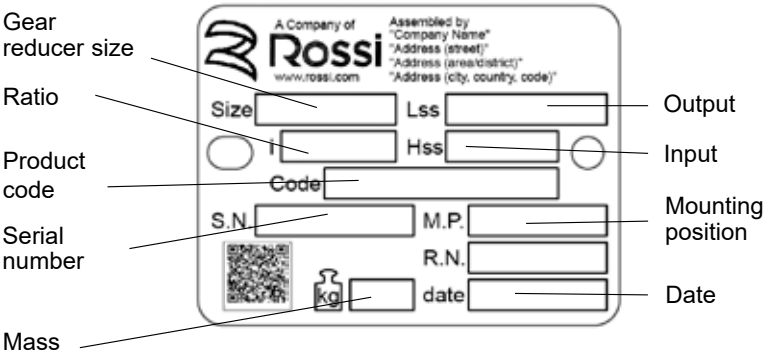
Every planetary gear reducer is provided with a name plate in anodized aluminium containing main information necessary for a correct identification of the product; the name plate must not be removed and must be kept integral and readable. All name plate data must be specified on eventual spare part orders.

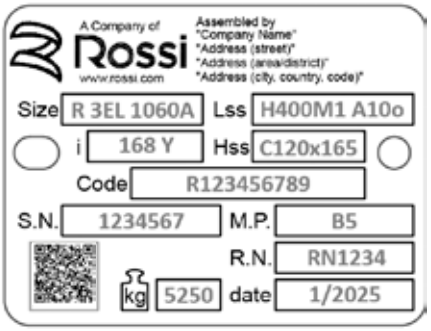
Assembled by Rossi Italy





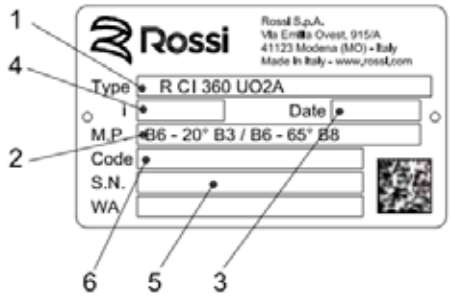
Assembled by subsidiaries



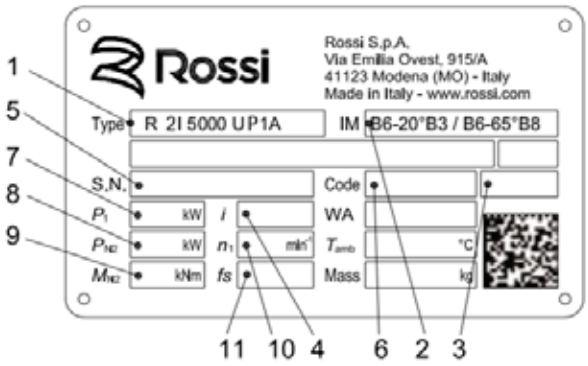


Combined units are provided with specific name plate, one for each gearbox type.

G series



H series



1 Designation (see table)
2 Mountig 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 (prepainted)	Single-compound ester epoxy or phenolic resin basis primer (prepainted) + 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.

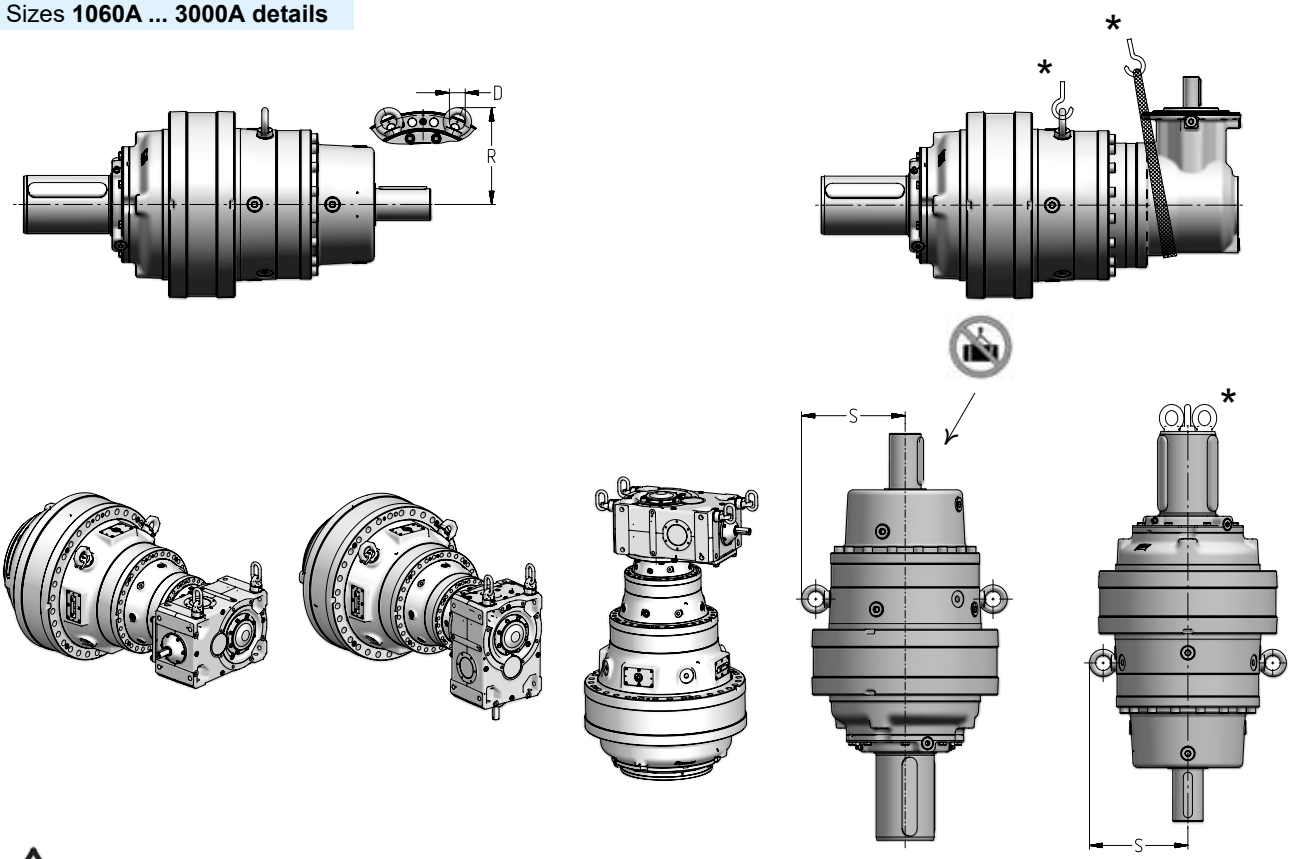
Do not use front threads at the input shaft ends to lift the gear reducers.

Warning!

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

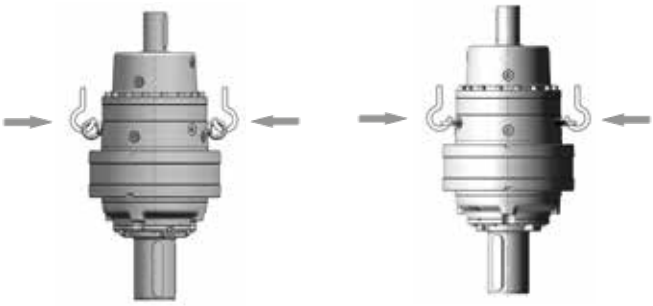
Lifting and handling

Sizes **1060A ... 3000A details**



* Not included

Warning



✓ Lifting and handling **correct**

⊗ Lifting and handling **incorrect**

Size	D ∅	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} ≤ 0,2 mm/s) to avoid damage to bearings (excessive vibration should also guarded during transit, even if within wider range) and ambient storage temperature should be 0 ÷ +40 °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 and maintenance 6

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 possibile 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 *R*a 1,6 ÷ 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.: T T 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 μ = 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

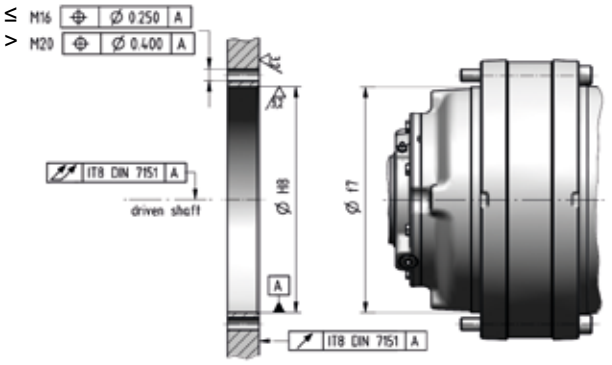
Tightening torque [N m]

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

Flange mounting

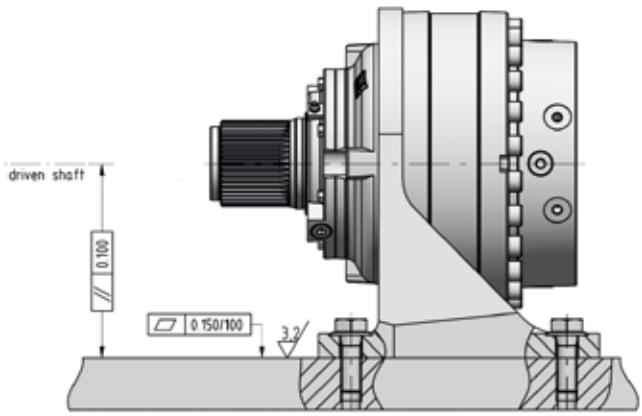
For splined couplings apply proper lubricants.
To machine the driven shaft, please refer to the dimensions shown in ch. 2.
Before mounting, pay attention to clean carefully mating surfaces.
In presence of external radial loads or torque required $M_2 \geq 0,7 \times M_{N2}$, apply locking adhesives.
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.

Sizes **1060A ... 3000A**



Foot mounting

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 adeguate 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 irremediably damage the bearings, the circlips** or other parts.

Hollow shaft mounting with shrink disc

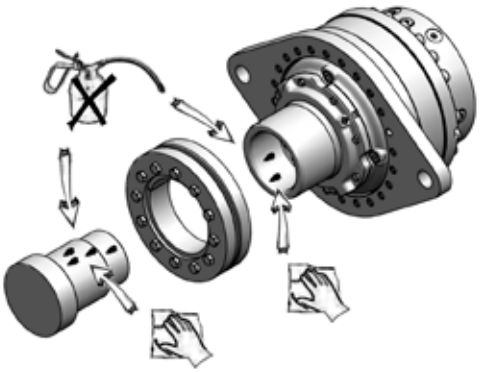
For the shaft end detail of machines where the hollow shaft of the gear reducer is to be keyed, follow the instructions below.

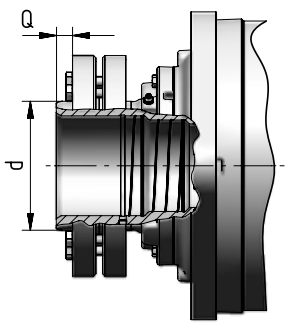
Installation

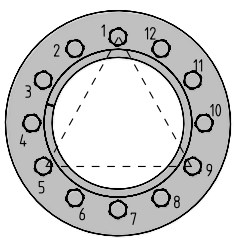
If the shrink disc is not supplied by us, please carefully follow the manufacturer's instructions

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

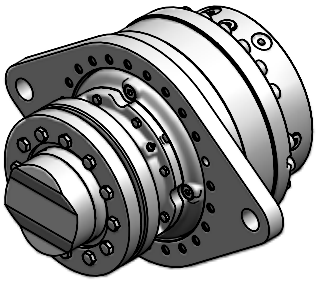


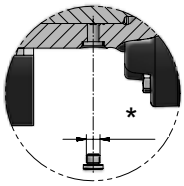




Size	d	Q
1060A	500	25
1500A	560	25
2120A	620	30
3000A	750	58

- 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)

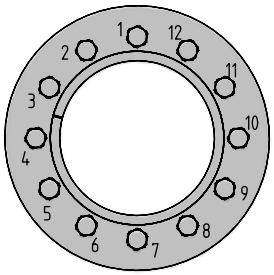




details

* 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



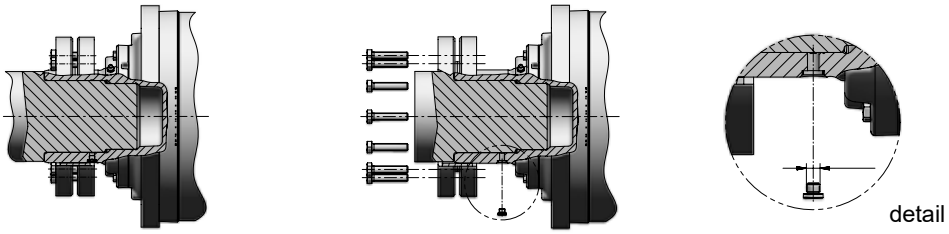
Size	Code	screw	quantity	**T...** tightening [N m]
1060A	SD500	M30	20	1970
1500A	SD560	M30	24	1970
2120A	SD620	M30	30	1970
3000A	SD750	M33	32	2650

Dismounting

Do not completely remove fastening screws before locking rings are disengaged.
Risk of serious injury!!!
Clean off any rusty areas.

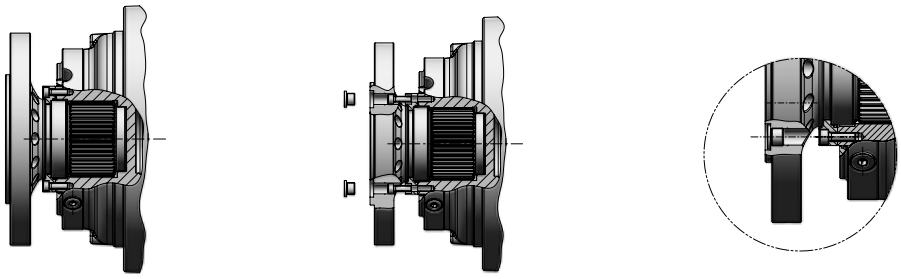
Loosen the fastening screws one after the other **only** by using approx. ½ turn at a time and by a continuous sequence (not crossing), until shrink disc can be moved on the hollow shaft.

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).



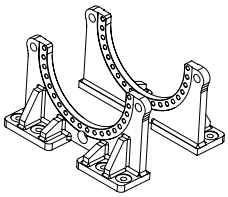
"T" outputs can be used both for gear reducer shaft mounting coupling it to the splined solid shaft and coupling it to a splined solid wheel flange.
For the mounting of "T" output to a splined solid wheel flange, carefully follow these instructions:

- 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.

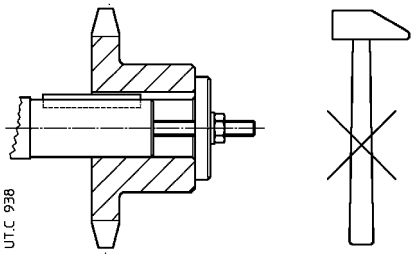


1060A ... 3000A

Foot bracket

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

Fitting of components to shaft end

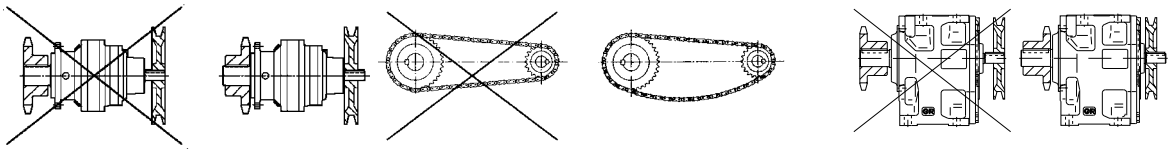


It is recommended that the bore of parts keyed to cylindrical shaft ends (spigots for splined shaft ends) is machined. Before mounting, clean mating surfaced thoroughly and lubricate against seizure and fretting corrosion. Attention! Installing and removal operations should be carried out with pullers and jacking screws using the tapped holes at the shaft butt-end (see fig. below) taking care to avoid impacts and shocks which may irremediably 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 ÷ 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.

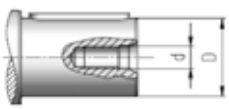
Where the transmission link between gear reducer and machine or motor generates shaft end loads, (see fig. below), ensure that the loads do not rise above the catalog values:

- 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



Incorrect Correct Incorrect Correct Incorrect Correct

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



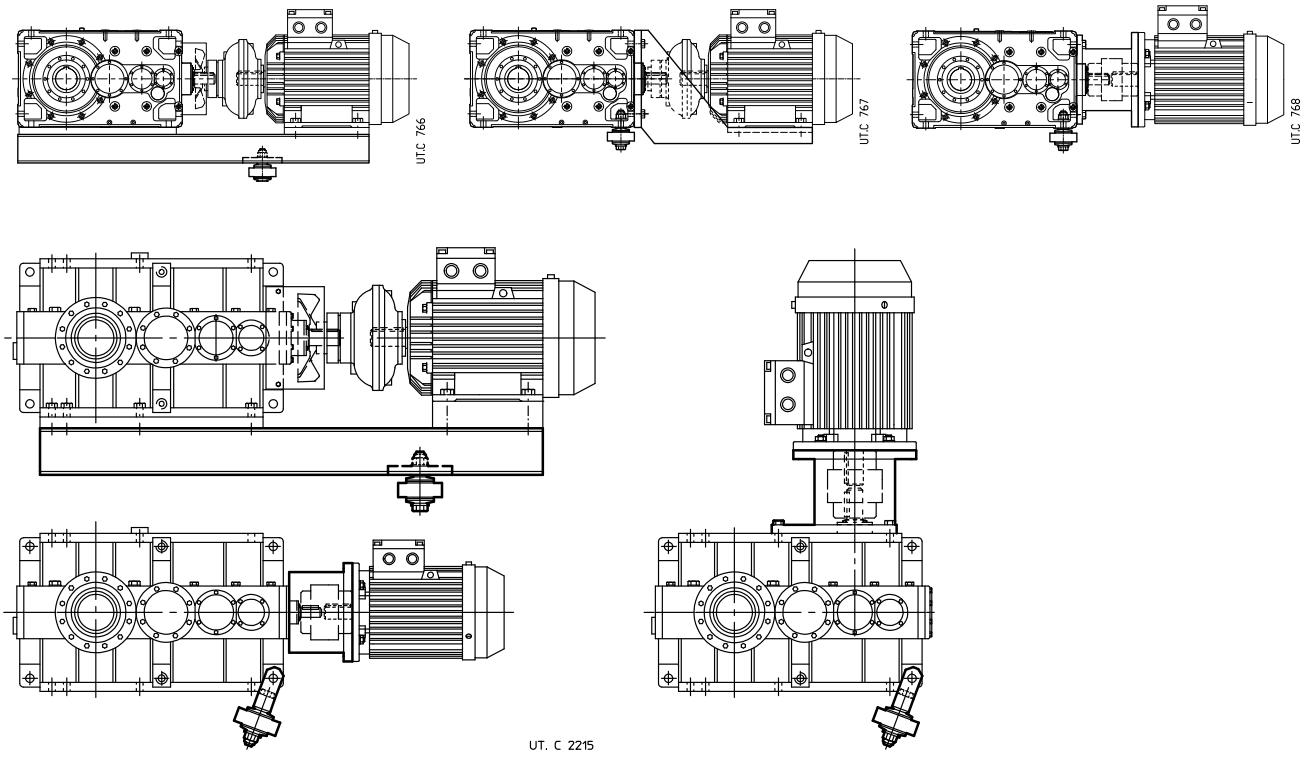
Shaft mounting arrangements

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.

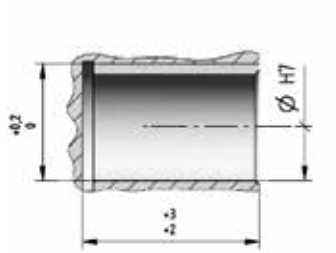
IMPORTANT. When shaft mounted, the gear reducer must be supported both axially and radially (also for mounting positions B3 ... B8) by the machine shaft end, as well as anchored against rotation only, by means of a reaction having **freedom of axial movement** and **sufficient clearance** in its couplings 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.

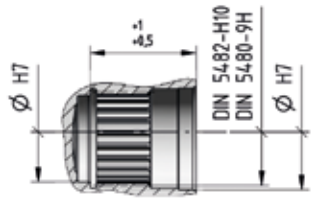
In case of axial fastening with elastic constraint, in B3 or B8 mounting position, ensure that housing oscillation while running does not exceed the perfectly horizontal position.

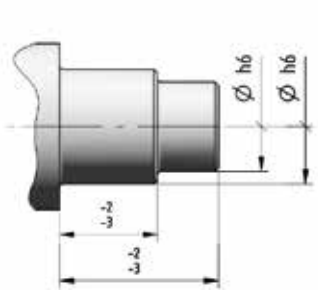


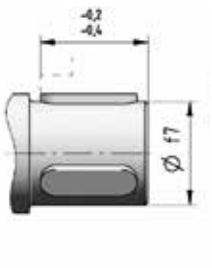
Output

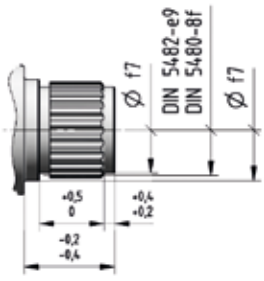
Suggested mating tolerances



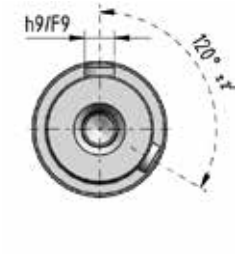


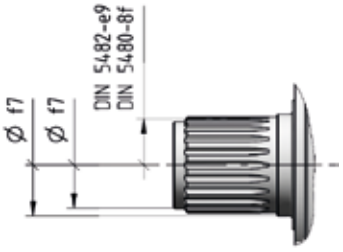


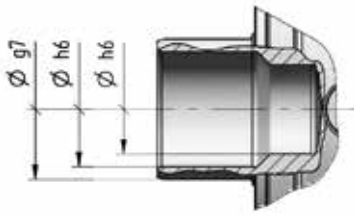


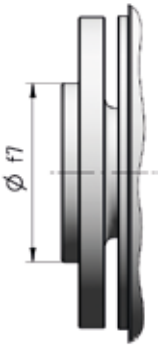


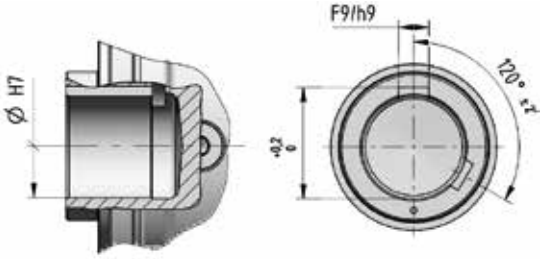
Gear reducer shaft end tolerances

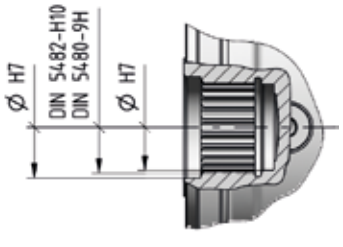








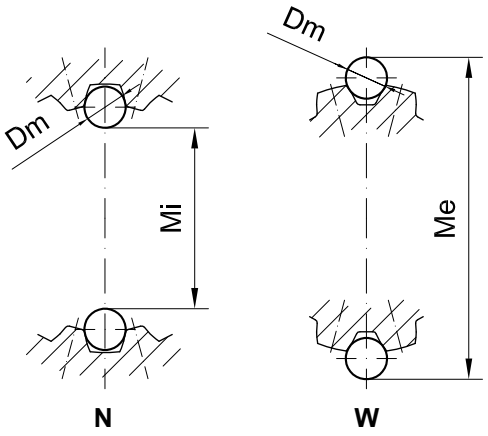




Tolerances according to ISO 286

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		Mi - Me	
					tolerance	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 ÷ 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 × 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 d ∅	Tightening torque N m 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 $\boldsymbol{M}_b$ generated by motor weight on the counter flange of gear reducer is lower than the value allowed $\boldsymbol{M}_{bmax}$, stated in the table:

$$\boldsymbol{M}_b < \boldsymbol{M}_{bmax}$$

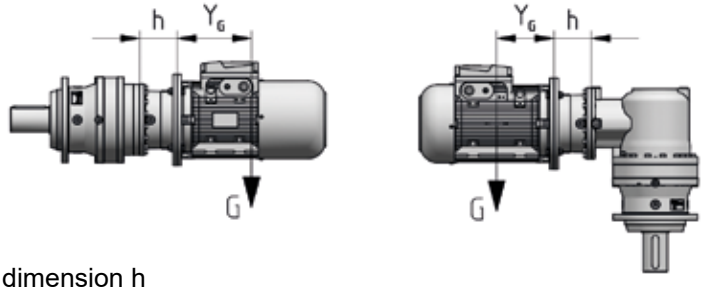
where:

$\boldsymbol{M}_b = G \cdot (Y_G + h) / 1\,000$ [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 $\boldsymbol{M}_{bmax}$ and dimension h

4EL	4EB	IEC	Code	h mm	$\boldsymbol{M}_{bmax}$ 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 level[1)] 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 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	Enersyn 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

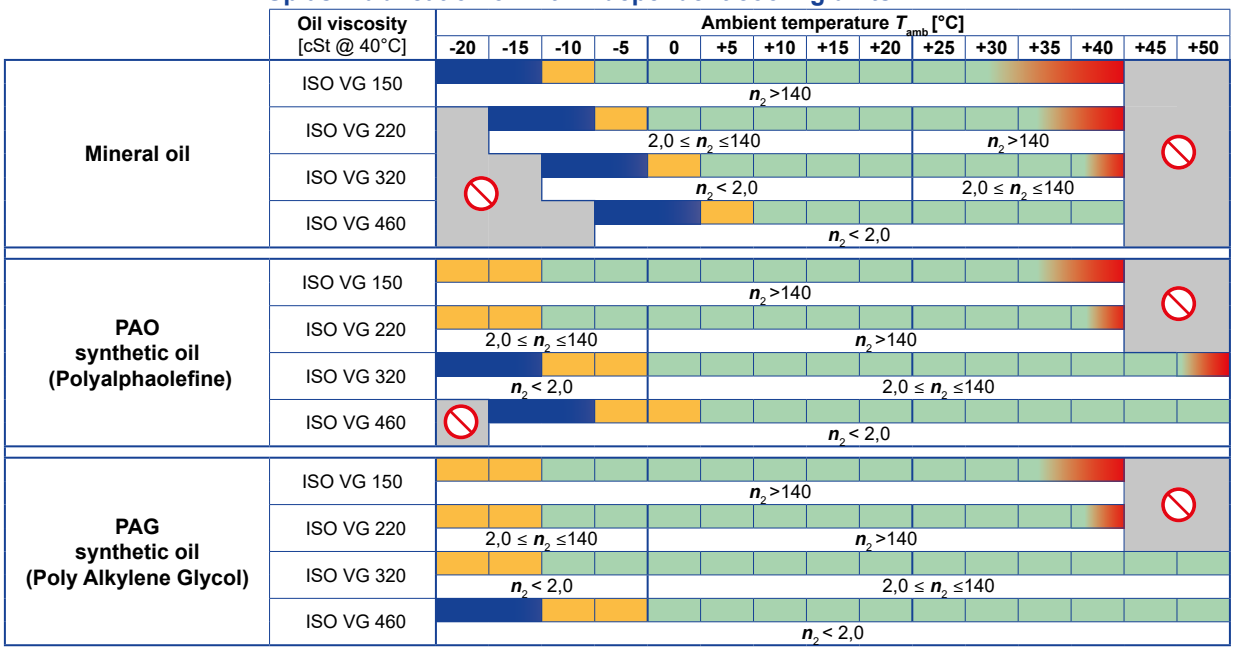
Usually the bearings are automatically and continuously lubricated (oil-bathed or splashed) with the same lubricant of gear reducer. However for certain gear reducer in vertical mounting positions V1, V3 and horizontal mounting positions B51, B52 the upper bearings have independent lubrication, with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

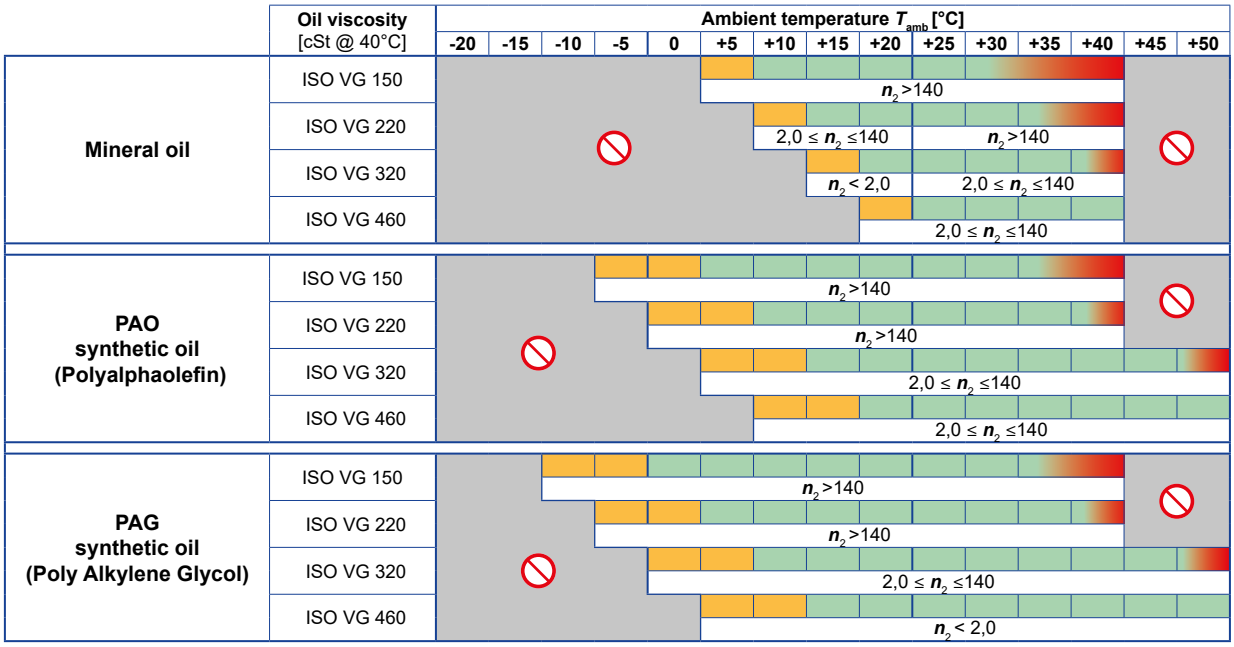
Lubricant type and viscosity selection according to output speed n_2 [min^{-1}] and ambient temperature T_{amb} [°C] range.
The following tables have been created starting from Shell lubricant characteristics, but are also valid for similar products (see table below). For further verification, especially under extreme operating conditions, always refer to the technical data sheet of the specific lubricant.

Splash lubrication or with independent cooling units [1)]



1) Provide starting of the indipendent cooling units only when the oil temperature T_{oil} is > 25°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)]



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	Enersyn 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 °) 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_{amb} = T_{oil} < 25 °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 °C, keeping in mind to follow the lubricant viscosity instructions stated in Lubrication paragraph.

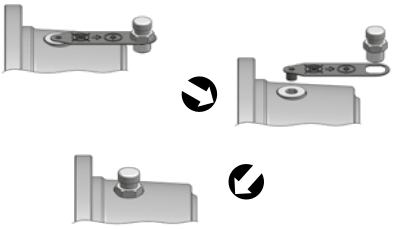
In presence of an eventual independent cooling unit with heat exchanger (but without forced lubrication, see also point A1 in table at ch. 12 (8)) of H catalog, it is necessary to drive the motorpump starting when achieving oil temperature of 60 °C.

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 °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 °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.).

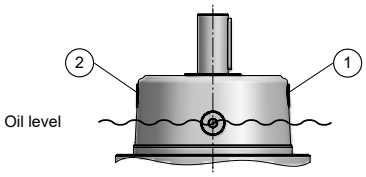
Oil filling

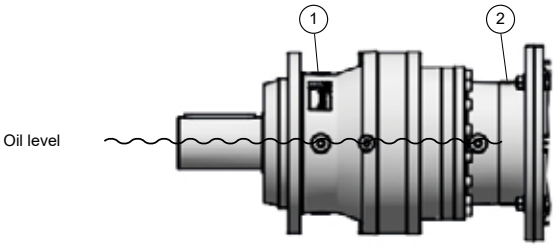
Pay attention to the correct position of the oil level plug (see ch. 4).

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 min^{-1} and the mounting position is horizontal, the gear reducer must be completely filled with oil.

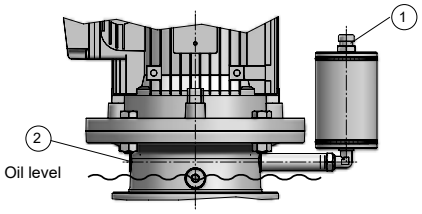




Oil filling:

a. Open the plugs 1 and 2.
b. Fill with oil by the plug 1 reaching the correct level
c. 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:

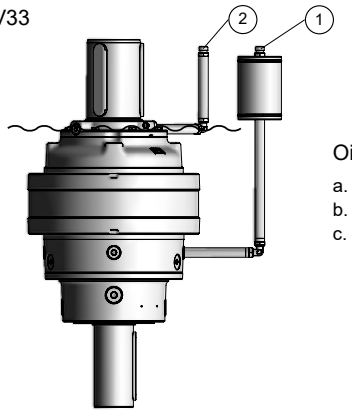
Oil filling:

a. Open plugs 1 and 2.
b. Fill with oil by the plug 1 up to reach the correct level
c. 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 level

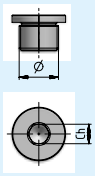


Oil filling:

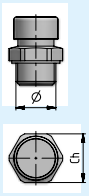
a. Open plugs 1 and 2.
b. Fill with oil by the plug 1 up to reach the correct level
c. Close plugs 1 and 2.

Plugs

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



Filler plugs		
Ø	**Ch**	**Tightening torque** [N m]
G 1/8 "	5	**8**
G 1/4"	6	**13**
G 3/8 "	8	**20**
G 1/2 "	10	**30**
G 3/4"	12	**45**
G 1"	17	**65**
G 1" 1/4	22	**100**
G 1" 1/2	24	**125**



Breather plugs		
Ø	**Ch**	**Tightening torque**[1] [N m]
G 1/4 "	17	**12**
G 3/8 "	20	**16**
G 1/2 "	24	**23**
G 3/4 "	32	**37**
G 1"	40	**58**
G 1" 1/4	50	**105**
G 1" 1/2	55	**126**

1) Values valid with washer in alluminium.

Maintenance

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

a) 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;

b) oil level and deterioration degree (check with cold gear reducer at rest);

c) 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	Check: — oil level (gear reducer standstill) — lubricant type Consult Rossi
	— excessive ambient temperature	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 spallings — excessive flanks roughness	Consult Rossi
	Bearings failure, defect or bad lubrication	
	Taper roller bearings with excessive clearance	
	Vibrations	Check the fastening
Lubricant leaking from seal rings	Seal ring with worm, bakelized, damaged or false mounted seal lip	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	$t = \frac{v}{a}$ [s] $t = \frac{Gd^2 \cdot n}{375 \cdot M}$ [s]	$t = \frac{J \cdot \omega}{M}$ [s]
velocity in rotary motion	$v = \frac{\pi \cdot d \cdot n}{60} = \frac{d \cdot n}{19,1}$ [m/s]	$v = \omega \cdot r$ [m/s]
angular velocity	$n = \frac{60 \cdot v}{\pi \cdot d} = \frac{19,1 \cdot v}{d}$ [min^{-1}]	$\omega = \frac{v}{r}$ [rad/s]
acceleration or deceleration as a function of starting or stopping time	$a = \frac{v}{t}$ [m/s^2]	
angular **acceleration** or **deceleration** as a function of a starting or stopping time, of a starting or braking torque	$\alpha = \frac{n}{9,55 \cdot t}$ [rad/s^2] $\alpha = \frac{39,2 \cdot M}{Gd^2}$ [rad/s^2]	$\alpha = \frac{\omega}{t}$ [rad/s^2] $\alpha = \frac{M}{J}$ [rad/s^2]
starting or stopping distance as a function of an **acceleration** or deceleration, of a final or initial velocity	$s = \frac{a \cdot t^2}{2}$ [m] $s = \frac{v \cdot t}{2}$ [m] $w = \frac{\alpha \cdot t^2}{2}$ [rad]	
starting or stopping **angle** as a function of an angular acceleration or deceleration, of a final or initial angular velocity	$\varphi = \frac{n \cdot t}{19,1}$ [rad]	$\varphi = \frac{\omega \cdot t}{2}$ [rad]
mass	$m = \frac{G}{g}$ [$\frac{\text{kgf s}^2}{\text{m}}$]	m è l'unità di massa [kg]
weight (weight force)	G è l'unità di peso (forza peso) [kgf]	$G = m \cdot g$ [N]
force in vertical (lifting), horizontal, inclined motion of translation (μ = coefficient of friction; φ = angle of inclination)	$F = G$ [kgf] $F = \mu \cdot G$ [kgf] $F = G\ (\mu \cdot \cos \varphi + \text{sen } \varphi)$ [kgf]	$F = m \cdot g$ [N] $F = \mu \cdot m \cdot g$ [N] $F = m \cdot g\ (\mu \cdot \cos \varphi + \text{sen } \varphi)$ [N]
dynamic moment Gd², moment of inertia J due to a motion of translation (numerically $J = \frac{Gd^2}{4}$)	$Gd^2 = \frac{365 \cdot G \cdot v^2}{n^2}$ [kgf m^2]	$J = \frac{m \cdot v^2}{\omega^2}$ [kg m^2]
torque as a function of a force, of a dynamic moment or of a moment of inertia, of a power	$M = \frac{F \cdot d}{2}$ [kgf m] $M = \frac{Gd^2 \cdot n}{375 \cdot t}$ [kgf m] $M = \frac{716 \cdot P}{n}$ [kgf m]	$M = F \cdot r$ [N m] $M = \frac{J \cdot \omega}{t}$ [N m] $M = \frac{P}{\omega}$ [N m]
work, energy in motion of translation, in rotary motion	$W = \frac{G \cdot v^2}{19,6}$ [kgf m] $W = \frac{Gd^2 \cdot n^2}{7160}$ [kgf m]	$W = \frac{m \cdot v^2}{2}$ [J] $W = \frac{J \cdot \omega^2}{2}$ [J]
power in motion of translation, in rotary motion	$P = \frac{F \cdot v}{75}$ [CV] $P = \frac{M \cdot n}{716}$ [CV]	$P = F \cdot v$ [W] $P = M \cdot \omega$ [W]
power available at the shaft of a single-phase motor ($\cos \varphi$ = power factor)	$P = \frac{U \cdot I \cdot \eta \cdot \cos \varphi}{736}$ [CV]	$P = U \cdot I \cdot \eta \cdot \cos \varphi$ [W]
power available at the shaft of a three-phase motor	$P = \frac{U \cdot I \cdot \eta \cdot \cos \varphi}{425}$ [CV]	$P = 1,73 \cdot U \cdot I \cdot \eta \cdot \cos \varphi$ [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		$M = \frac{V_g\,[cm^3/rev] \cdot \Delta p\,[bar] \cdot \eta_{mh}}{62{,}832}$ [N m]
power available at the shaft of a hydraulic motor		$P = \frac{V_g\,[cm^3/rev] \cdot \Delta p\,[bar] \cdot \eta_t \cdot n\,[min^{-1}]}{600000}$ [kW]
flow (hydraulic motor)		$q_v = \frac{V_g\,[cm^3/rev] \cdot n\,[min^{-1}]}{1000 \cdot \eta_v}$ [l/min]
speed (hydraulic motor)		$n = \frac{1000 \cdot \eta_v \cdot q_v\,[l/min]}{V_g\,[cm^3/rev]}$ [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.

Rossi360+

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.

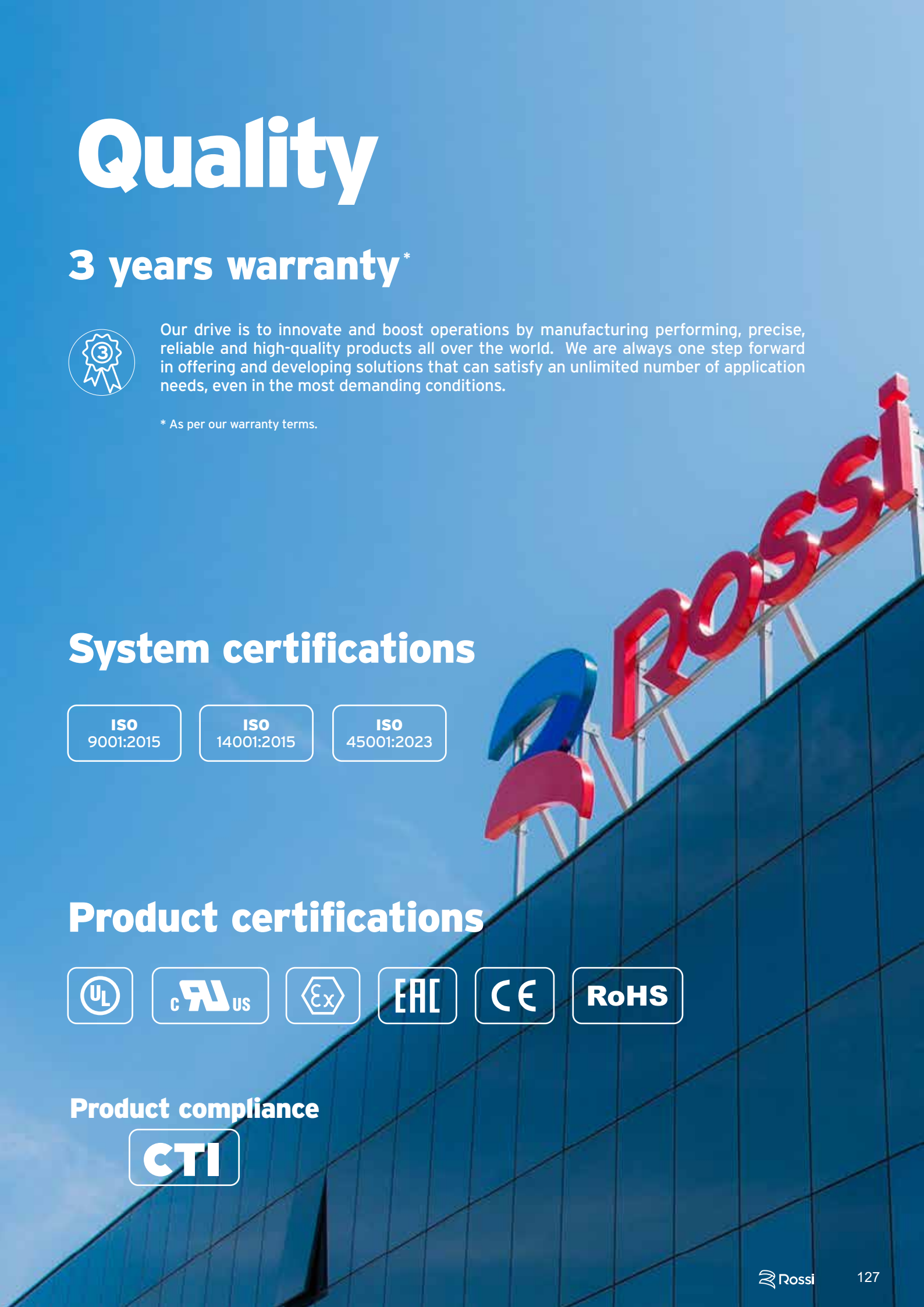
Visit us at rossi.com

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

CTI

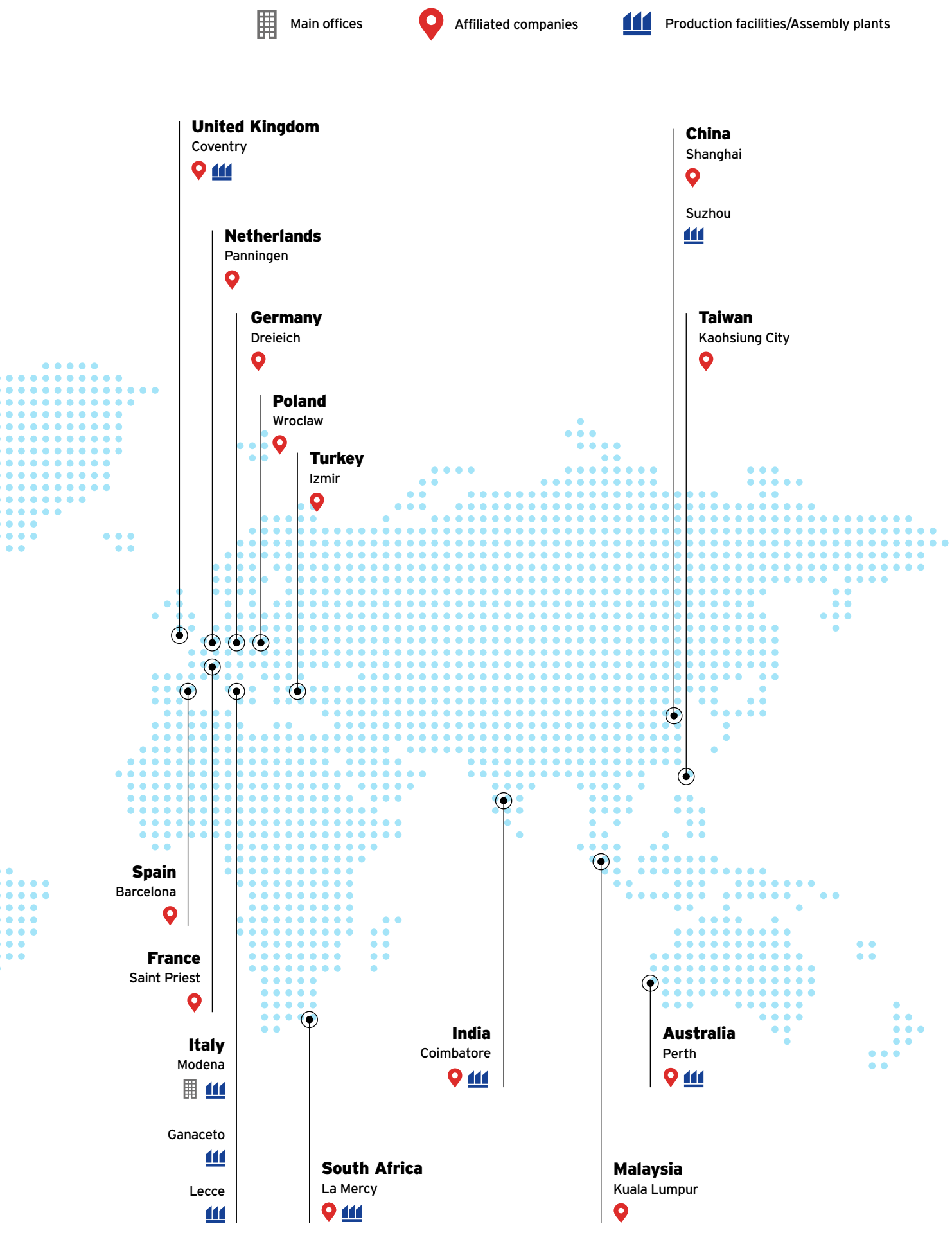
Global presence local service

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
United Kingdom
Coventry
Netherlands
Panningen
Germany
Dreieich
Poland
Wroclaw
Turkey
Izmir
China
Shanghai
Suzhou
Taiwan
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Spain
Barcelona
France
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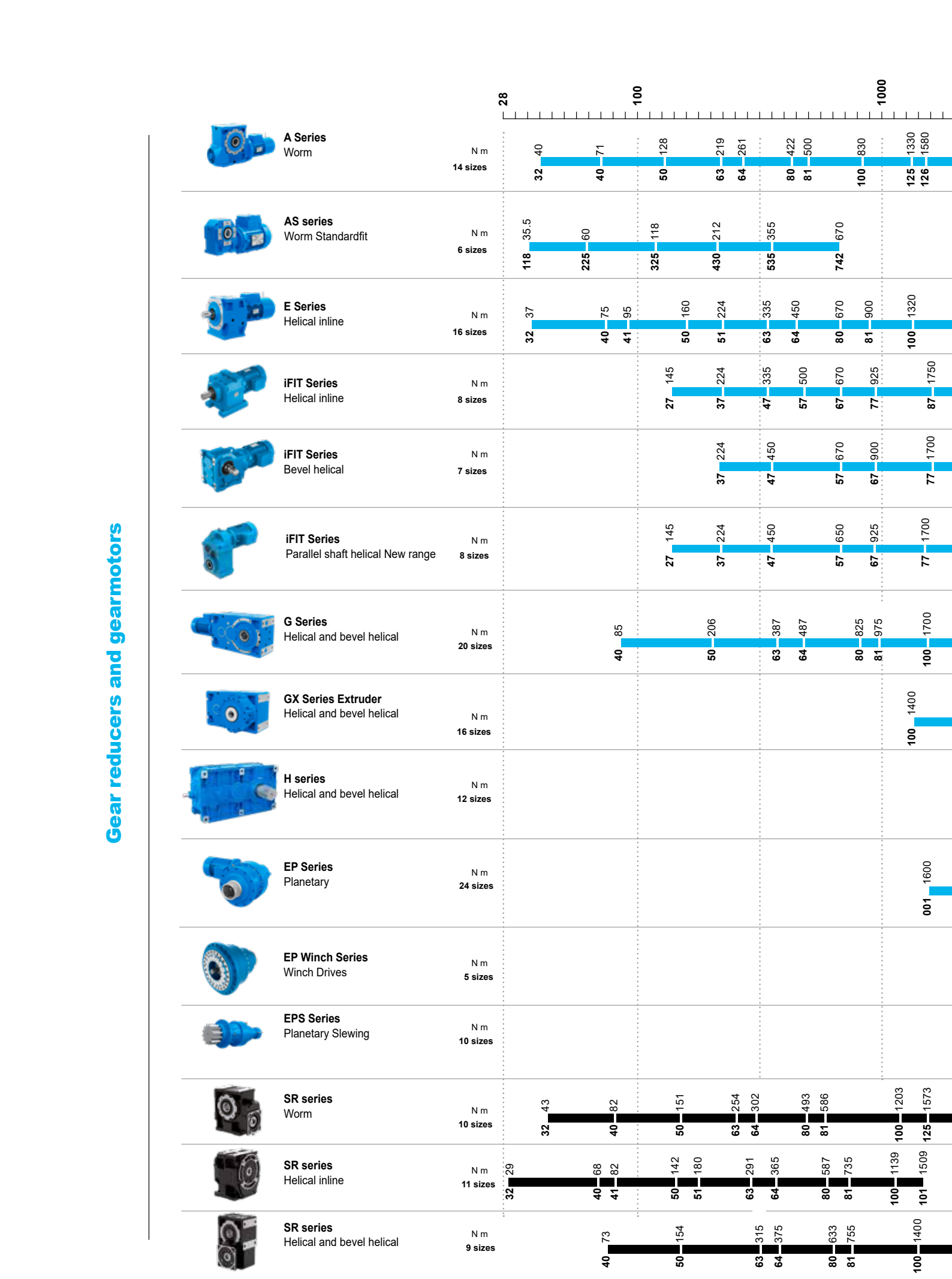
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Worm
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AS series
Worm Standardfit
N m
6 sizes
35.5 60 118 212 355 670
118 225 325 430 535 742
E Series
Helical inline
N m
16 sizes
37 75 95 160 224 335 450 670 900 1320
32 40 41 50 51 63 64 80 81 100
iFIT Series
Helical inline
N m
8 sizes
145 224 335 500 670 925 1750
27 37 47 57 67 77 87
iFIT Series
Bevel helical
N m
7 sizes
224 450 670 900 1700
37 47 57 67 77
iFIT Series
Parallel shaft helical New range
N m
8 sizes
145 224 450 650 925 1700
27 37 47 57 67 77
G Series
Helical and bevel helical
N m
20 sizes
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40 50 63 64 80 81 100
GX Series Extruder
Helical and bevel helical
N m
16 sizes
1400
100
H series
Helical and bevel helical
N m
12 sizes
EP Series
Planetary
N m
24 sizes
1600
001
EP Winch Series
Winch Drives
N m
5 sizes
EPS Series
Planetary Slewing
N m
10 sizes
SR series
Worm
N m
10 sizes
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SR series
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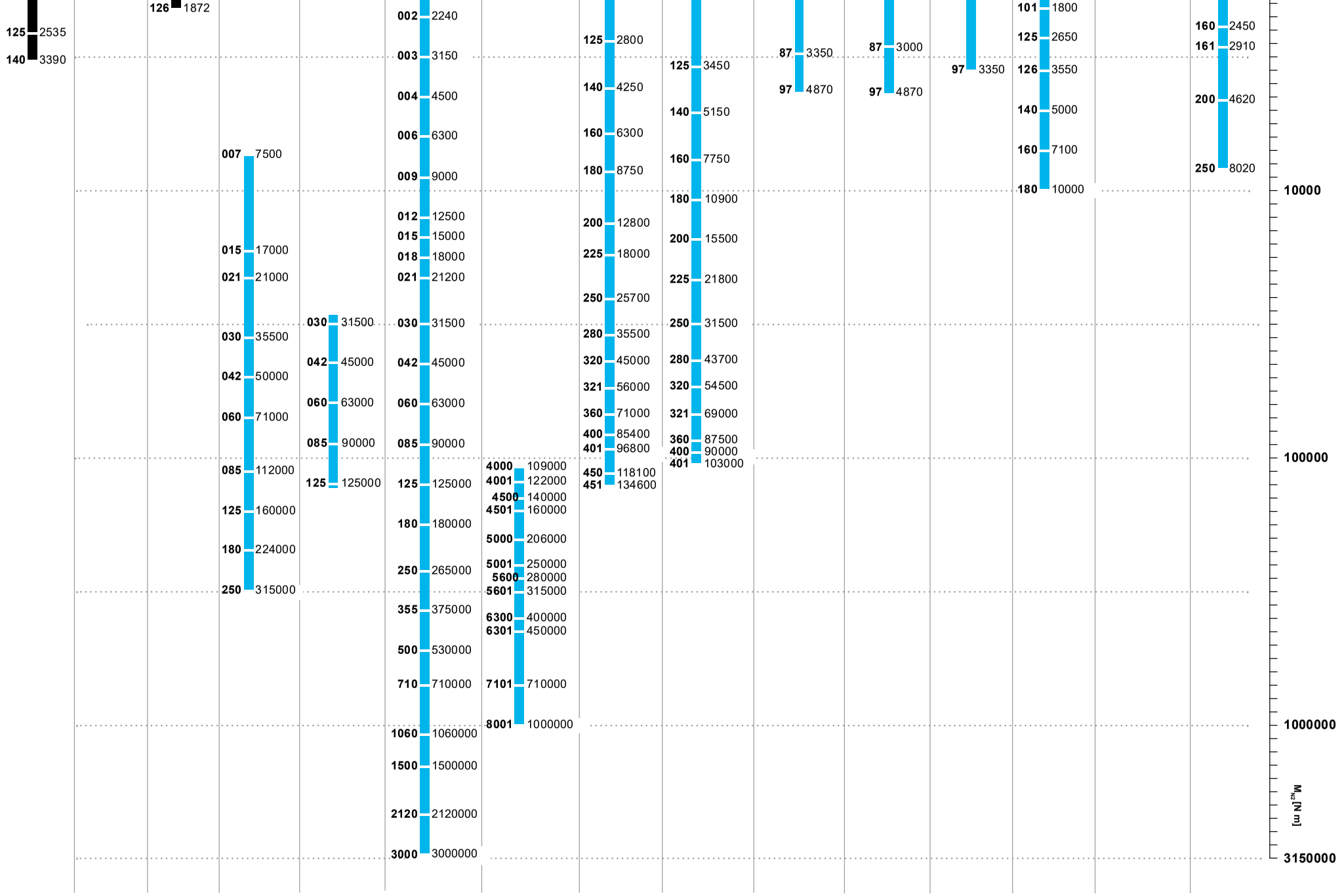
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140 5000
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180 10000
160 2450
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1000000
3150000
M_{x2} [N m]

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