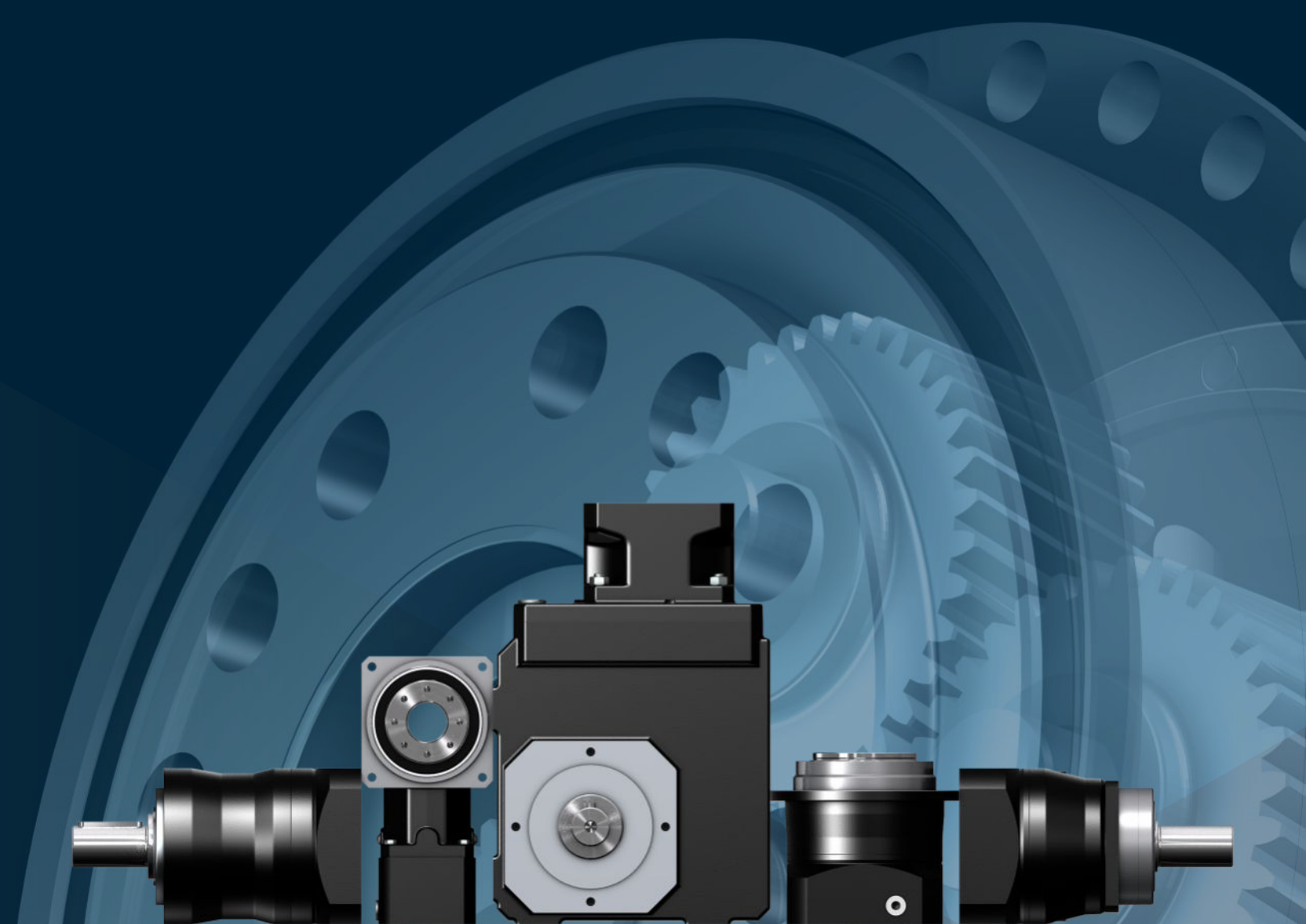


Lubricant fill volumes

STÖBER

Lubricant fill volumes

Table of contents

1 P planetary gear units

Fill volumes for single-stage gear units with standard bearings/radially reinforced bearings

Type	V	$V_{rev,op}$
P231	13	18
P331	33	46
P431	60	85
P531	118	165
P731	218	310
P831	550	780
P931	900	1230

Fill volumes for single-stage gear units with axially reinforced bearings

Type	V	$V_{rev,op}$
P331	31	43
P431	56	78
P531	103	146
P731	200	285
P831	520	740
P931	820	1130

Symbol	Unit	Explanation
V	ml	Fill volumes
$V_{rev,op}$	ml	Fill volumes for reverse operation and horizontally aligned output

Fill volumes for two-stage gear units with standard bearings/radially reinforced bearings

Type	i =12	i=16, 20, 25, 28	i=32	i=35, 40, 50	i=56	i=70	i=100
	V	V	V	V	V	V	V
P332	65	68	68	68	68	68	65
P432	108	115	124	115	124	124	124
P532	219	239	239	239	239	239	239
P732	445	445	445	445	445	430	430
P832	1010	1065	1010	1065	1010	1010	960
P932	0	1875	1875	1875	1875	1750	1750

Fill volumes for two-stage gear units with axially reinforced bearings

Type	i =12	i=16, 20, 25, 28	i=32	i=35, 40, 50	i=56	i=70	i=100
	V	V	V	V	V	V	V
P332	61	64	64	64	64	64	61
P432	99	106	115	106	115	115	115
P532	196	216	216	216	216	216	216
P732	415	415	415	415	415	400	400
P832	955	1010	955	1010	955	955	905
P932	0	1735	1735	1735	1735	1610	1610

Symbol	Unit	Explanation
V	ml	Fill volumes

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

2 PH planetary gear units

Fill volumes for single-stage gear units

Type	V	$V_{rev,op}$
PH331	25	35
PH431	42	58
PH531	80	114
PH731	185	264
PH831	490	690

Fill volumes for two-stage gear units

Type	i=16	i=20	i=25, 35, 50	i=28, 40	i=70, 100
	V	V	V	V	V
PH332	–	52	52	49	49
PH432	88	88	88	88	84
PH532	175	175	175	175	158
PH732	372	372	390	372	372
PH832	950	950	905	950	855

Symbol	Unit	Explanation
V	ml	Fill volumes
$V_{rev,op}$	ml	Fill volumes for reverse operation and horizontally aligned output

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

3 PHQ planetary gear units

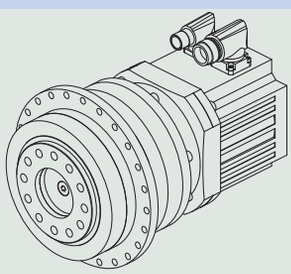
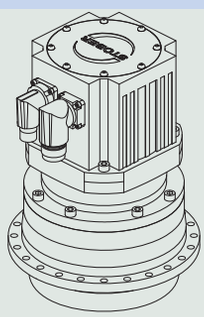
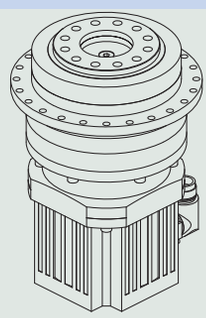
Fill volumes for single-stage gear units

Type	V	$V_{rev,op}$
PHQ431	37	55
PHQ531	72	110
PHQ731	170	255
PHQ831	430	650

Fill volumes for two-stage gear units

Type	V	$V_{rev,op}$
PHQ432	80	88
PHQ532	155	168
PHQ732	350	370
PHQ832	810	900

Mounting positions of three-stage gear units

EL1	EL5	EL6
		
Horizontal output	Vertical downward output	Vertical upward output

Fill volumes for three-stage gear units

Type	EL1		EL5			EL6
	V	$V_{rev,op}$	V_2	V_1	V_Σ	V
PHQ733	280	445	170	150	320	390
PHQ833	650	1050	810	55	865	860

Symbol	Unit	Explanation
V	ml	Fill volumes
$V_{rev,op}$	ml	Fill volumes for reverse operation and horizontally aligned output
V_2	ml	Fill volumes for the output stage
V_1	ml	Fill volumes for the input stage
V_Σ	ml	Total fill volumes

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

4 PHV planetary gear units

Fill volumes

Type	V	$V_{rev,op}$
PHV933	1910	2230
PHV1033	3060	3810

Symbol	Unit	Explanation
V	ml	Fill volumes
$V_{rev,op}$	ml	Fill volumes for reverse operation and horizontally aligned output

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

5 PE planetary gear units

Fill volumes for single-stage gear units

Type	V
PE221	10 g (11 ml)
PE321	21 g (24 ml)
PE421	35 g (40 ml)
PE521	72 g (82 ml)

Fill volumes for two-stage gear units

Type	V_2	V_1	V_Σ
PE222	6 g (7 ml)	9 g (10 ml)	15 g (17 ml)
PE322	9 g (10 ml)	10 g (11 ml)	19 g (21 ml)
PE422	35 g (40 ml)	16 g (18 ml)	51 g (58 ml)
PE522	72 g (82 ml)	25 g (82 ml)	97 g (110 ml)

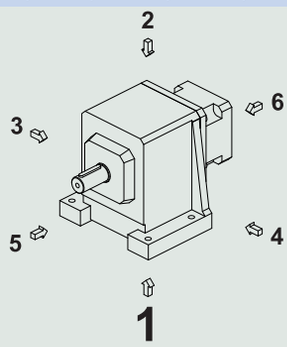
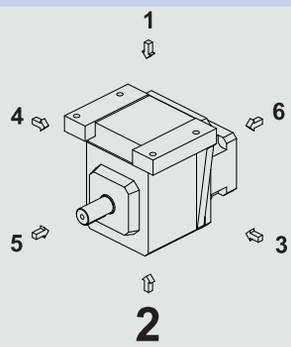
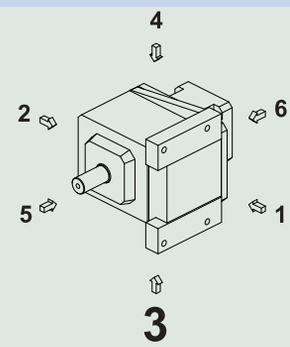
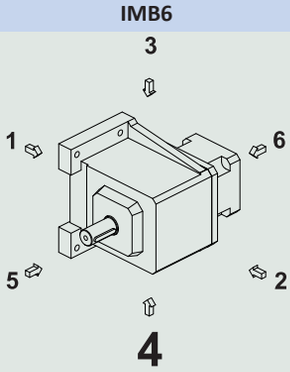
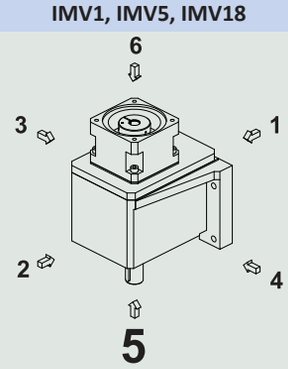
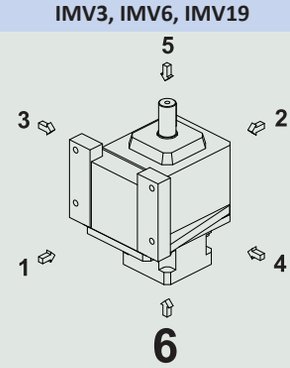
Symbol	Unit	Explanation
V	g (ml)	Fill volumes
V_2	g (ml)	Fill volumes for the output stage
V_1	g (ml)	Fill volumes for the input stage
V_Σ	g (ml)	Total fill volumes

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

6 C helical gear units

The following table shows the standard mounting positions.

The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.

EL1 IMB3, IMB5, IMB14, IMB34, IMB35	EL2 IMB8	EL3 IMB7
		
EL4 **IMB6**	**EL5** **IMV1, IMV5, IMV18**	**EL6** **IMV3, IMV6, IMV19**
		

Fill volumes

Type	V_{EL1}	V_{EL2}	V_{EL3}	V_{EL4}	$V_{EL5,GG,GF}$	$V_{EL5,GQ}$	$V_{EL5,GN}$	V_{EL6}
C002	0.3	0.4	0.3	0.3	0.44	0.50	0.50	0.5
C102	0.6	0.8	0.6	0.6	1.02	1.13	1.16	1.1
C103	0.8	1.0	0.9	0.9	1.25	1.35	1.45	1.4
C202	0.8	1.2	1.0	1.0	1.46	1.58	1.58	1.6
C203	1.0	1.5	1.1	1.1	1.85	2.00	1.95	2.0
C302	1.2	1.6	1.4	1.4	2.17	2.35	2.34	2.2
C303	1.4	1.8	1.5	1.5	2.45	2.65	2.65	2.5
C402	1.8	2.7	2.2	2.2	3.52	3.70	3.75	3.3
C403	2.0	3.0	2.3	2.3	4.04	4.20	4.30	3.7
C502	2.8	4.0	3.4	3.4	5.34	–	5.80	5.0
C503	3.0	4.5	3.6	3.6	6.10	–	6.40	5.4
C612	4.0	5.0	4.2	4.2	6.00	–	6.60	6.2
C613	4.3	5.5	4.5	4.5	6.95	–	7.50	6.6
C712	6.6	8.0	6.4	6.4	9.80	–	10.30	9.4
C713	6.5	8.6	6.8	6.8	10.40	–	11.00	10.0
C812	12.5	15.5	13.5	13.5	17.00	–	19.00	16.5
C813	13.5	16.5	14.5	14.5	18.50	–	21.50	19.0
C912	19.0	23.5	20.5	20.5	30.00	–	32.00	30.5
C913	20.5	25.0	22.0	22.0	33.00	–	35.00	32.0

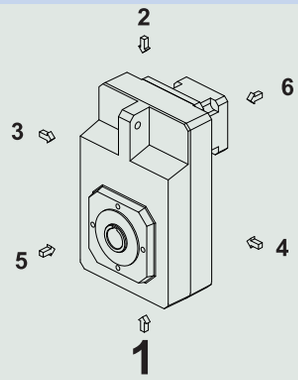
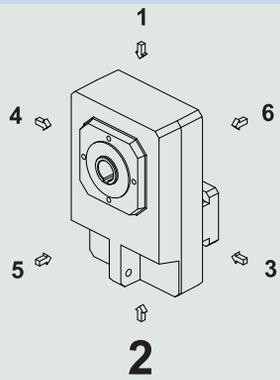
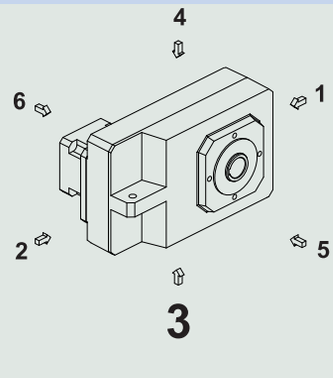
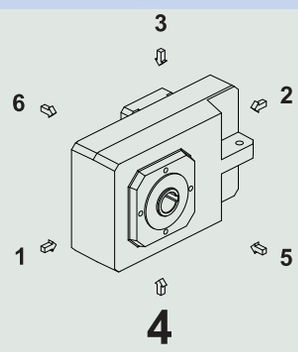
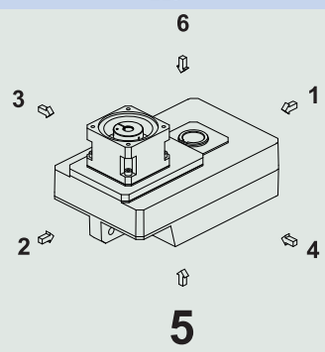
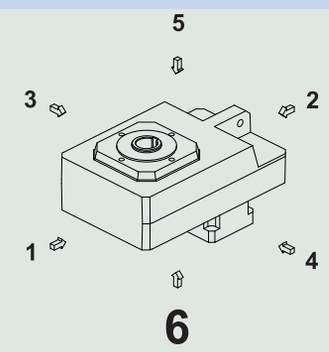
Symbol	Unit	Explanation
$V_{EL5,GG,GF}$	l	Fill volumes for mounting position EL5 and housing design with pitch circle diameter/round flange
$V_{EL5,GQ}$	l	Fill volumes for mounting position EL5 and housing design with square flange
$V_{EL5,GN}$	l	Fill volumes for mounting position EL5 and housing design with foot

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

7 F offset helical gear units

The following table shows the standard mounting positions.

The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.

EL1	EL2	EL3
		
EL4	**EL5**	**EL6**
		

Fill volumes

Type	V_{EL1}	V_{EL2}	V_{EL3}	V_{EL4}	$V_{EL5,WA,WS}$	$V_{EL5,WV}$	V_{EL6}
F102	0.7	0.8	0.7	0.7	0.90	0.90	0.7
F202	1.4	1.8	1.2	1.2	2.10	2.15	1.6
F203	2.0	2.2	1.4	1.4	2.25	2.40	1.9
F302	2.2	2.5	2.0	2.0	3.00	3.35	2.0
F303	2.8	3.1	2.3	2.3	3.45	3.50	2.3
F402	3.0	3.6	2.8	2.8	4.60	4.70	3.0
F403	4.1	3.9	3.0	3.0	4.95	5.30	3.5
F602	5.3	6.0	4.8	4.8	7.60	7.70	5.5
F603	7.4	7.0	5.4	5.4	8.10	8.20	6.5

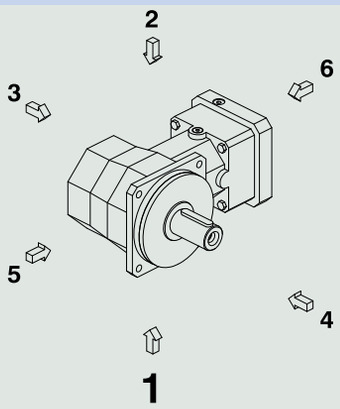
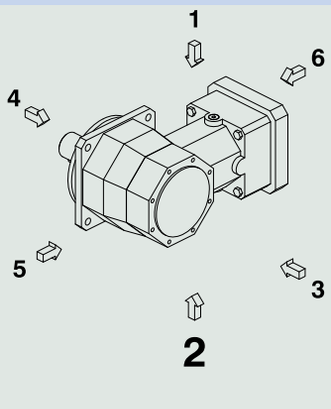
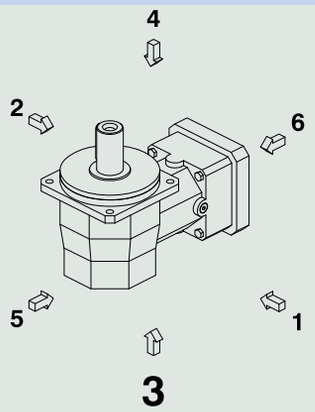
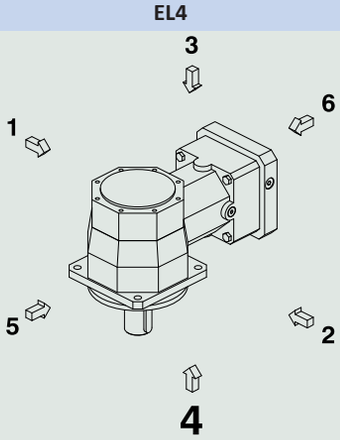
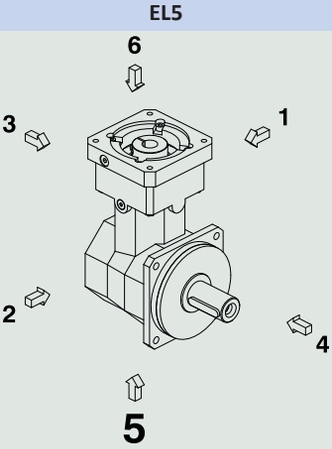
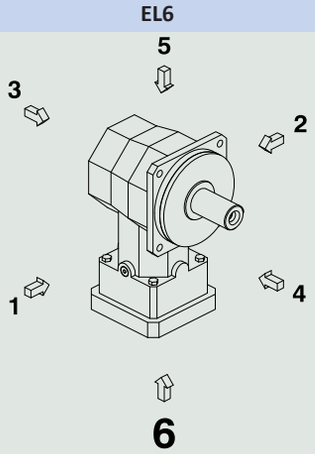
Symbol	Unit	Explanation
$V_{EL5,WA,WS}$	l	Fill volumes for mounting position EL5 and hollow shaft/hollow shaft with shrink ring
$V_{EL5,WV}$	l	Fill volumes for mounting position EL5 and solid shaft

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

8 KS right-angle servo gear units

The following table shows the standard mounting positions.

The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.

EL1	EL2	EL3
		
EL4	**EL5**	**EL6**
		

Fill volumes for two-stage gear units

Type	6≤i≤20	i=6			8≤i≤10			14≤i≤20		
	$V_{EL1,2,4,6}$	$V_{EL5, WP,WG}$	$V_{EL5, WS}$	$V_{EL5, WF}$	$V_{EL5, WP,WG}$	$V_{EL5, WS}$	$V_{EL5, WF}$	$V_{EL5, WP,WG}$	$V_{EL5, WS}$	$V_{EL5, WF}$
KS402	145	250	241	236	250	241	236	250	241	236
KS502	255	415	402	391	415	402	391	420	406	395
KS702	475	807	777	759	819	788	772	824	793	776

Fill volumes for three-stage gear units

Type	24≤i≤200			
	$V_{EL1,2,4,6}$	$V_{EL5, WP,WG}$	$V_{EL5, WS}$	$V_{EL5, WF}$
KS403	155	283	273	268
KS503	280	495	480	470
KS703	520	958	928	913

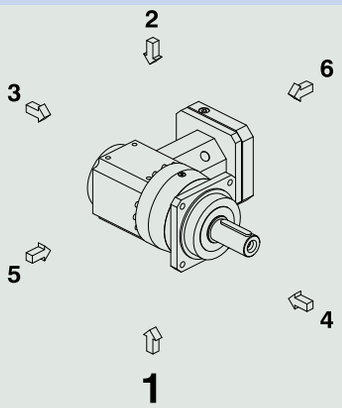
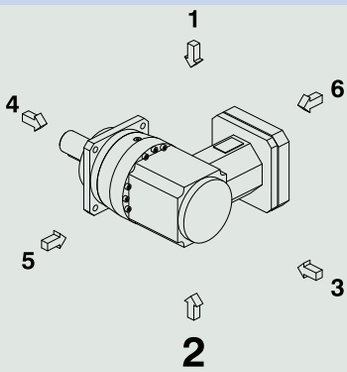
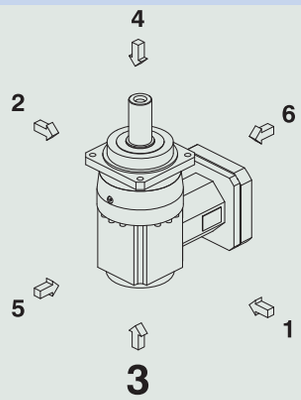
Symbol	Unit	Explanation
$V_{EL5,WP,WG}$	ml	Fill volumes for mounting position EL5 and solid shaft with feather key/solid shaft without feather key
$V_{EL5,WS}$	ml	Fill volumes for mounting position EL5 and hollow shaft with shrink ring
$V_{EL5,WF}$	ml	Fill volumes for mounting position EL5 and flange hollow shaft

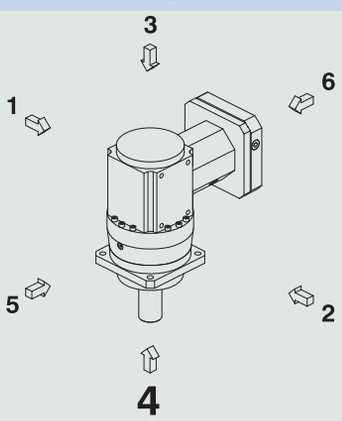
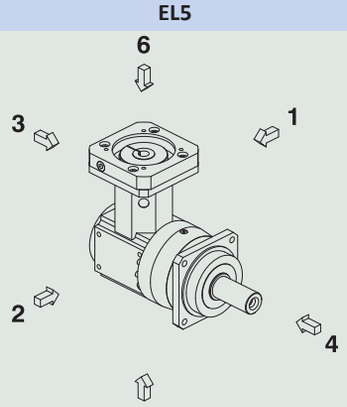
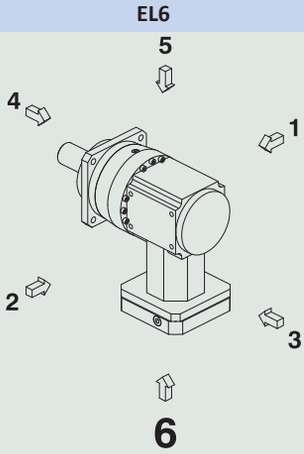
The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

9 PKX right-angle planetary gear units

The following table shows the standard mounting positions.

The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.

EL1	EL2	EL3
		

EL4	EL5	EL6
		

Fill volumes for single-stage gear units with standard bearings/radially reinforced bearings

Type	EL1, EL2, EL5, EL6			EL3, EL4		
	V_2 (P)	V_1 (KX)	V_Σ	V_2 (P)	V_1 (KX)	V_Σ
P231_KX301	13	42	55	13	42	55
P331_KX301	33	42	75	33	42	75
P431_KX401	60	80	140	60	80	140
P531_KX501	118	160	278	118	160	278
P731_KX701	218	390	608	218	390	608
P831_KX801	550	820	1370	550	820	1370

Fill volumes for single-stage gear units with axially reinforced bearings

Type	EL1, EL2, EL5, EL6			EL3, EL4		
	V_2 (P)	V_1 (KX)	V_Σ	V_2 (P)	V_1 (KX)	V_Σ
P331_KX301	31	42	73	31	42	73
P431_KX401	56	80	136	56	80	136
P531_KX501	103	160	263	103	160	263
P731_KX701	200	390	590	200	390	590
P831_KX801	520	820	1340	520	820	1340

Fill volumes for two-stage gear units in horizontal mounting positions (EL1, EL2, EL5 and EL6) with standard bearings/radially reinforced bearings

Type	V_2 (P)	V_1 (KX)
P332_KX301	43	42
P432_KX301	82	42
P532_KX401	155	80
P732_KX501	295	160
P832_KX701	710	390
P932_KX701	1350	390

Fill volumes for two-stage gear units in vertical mounting positions (EL3 and EL4) with standard bearings/radially reinforced bearings

Type	i =12	i=16, 20, 25, 28	i=32	i=35, 40, 50	i=56	i=70	i=100	
	V_2 (P)	V_2 (P)	V_2 (P)	V_2 (P)	V_2 (P)	V_2 (P)	V_2 (P)	V_1 (KX)
P332_KX301	65	68	68	68	68	68	65	42
P432_KX301	108	115	124	115	124	124	124	42
P532_KX401	219	239	239	239	239	239	239	80
P732_KX501	445	445	445	445	445	430	430	160
P832_KX701	1010	1065	1010	1065	1010	1010	960	390
P932_KX701	–	1875	1875	1875	1875	1750	1750	390

Fill volumes for two-stage gear units in horizontal mounting positions (EL1, EL2, EL5 and EL6) with axially reinforced bearings

Type	V_2 (P)	V_1 (KX)
P332_KX301	41	42
P432_KX301	77	42
P532_KX401	142	80
P732_KX501	278	160
P832_KX701	680	390
P932_KX701	1275	390

Fill volumes for two-stage gear units in vertical mounting positions (EL3 and EL4) with axially reinforced bearings

Type	i =12	i=16, 20, 25, 28	i=32	i=35, 40, 50	i=56	i=70	i=100	
	V_2 (P)	V_2 (P)	V_2 (P)	V_2 (P)	V_2 (P)	V_2 (P)	V_2 (P)	V_1 (KX)
P332_KX301	61	64	64	64	64	64	61	42
P432_KX301	99	106	115	106	115	115	115	42
P532_KX401	196	216	216	216	216	216	216	80
P732_KX501	415	415	415	415	415	400	400	160
P832_KX701	955	1010	955	1010	955	955	905	390
P932_KX701	–	1735	1735	1735	1735	1610	1610	390

In mounting positions EL1, EL2, EL5 and EL6, the input stage and output stage have the same oil chamber because there is no shaft seal ring installed between them. In mounting positions EL3 and EL4, the input stage and output stage have separate oil chambers because a shaft seal ring is installed between them.

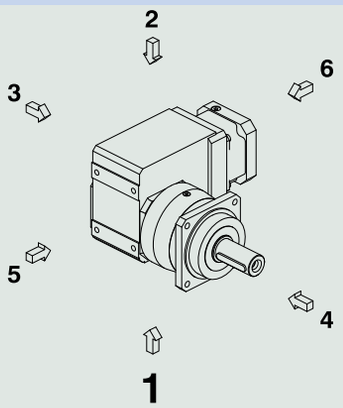
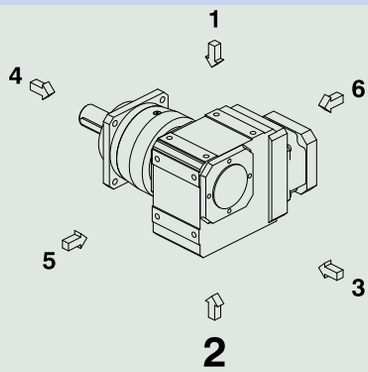
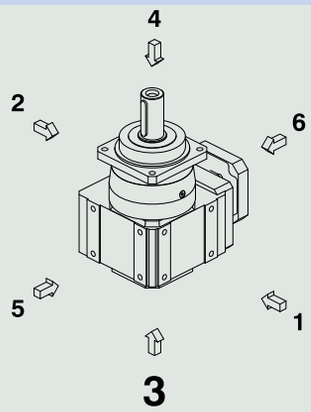
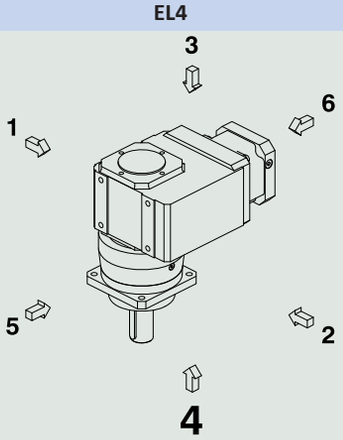
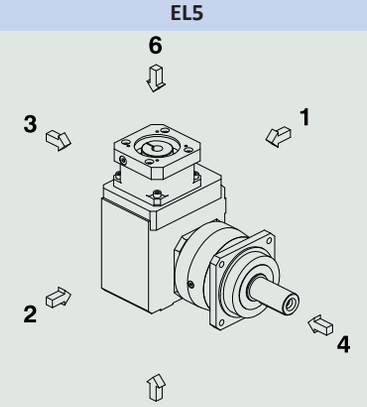
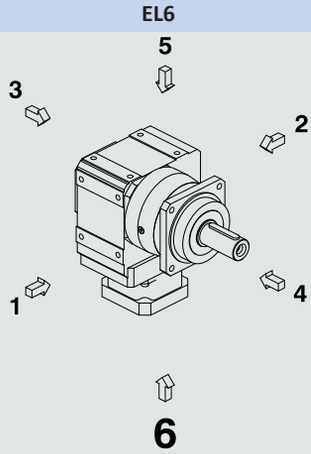
Symbol	Unit	Explanation
V_2	ml	Fill volumes for the output stage
V_1	ml	Fill volumes for the input stage
V_Σ	ml	Total fill volumes

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

10 PK right-angle planetary gear units

The following table shows the standard mounting positions.

The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.

EL1	EL2	EL3
		
EL4	**EL5**	**EL6**
		

Fill volumes for single-stage gear units with standard bearings/radially reinforced bearings

Type	V_2 (P)	V_1 (K)
P531_K102	118	–
P731_K102	218	–
P731_K202	218	–
P831_K202	550	–
P831_K302	550	–
P931_K402	900	–

Fill volumes for single-stage gear units with axially reinforced bearings

Type	V_2 (P)	V_1 (K)
P531_K102	103	–
P731_K102	200	–
P731_K202	200	–
P831_K202	520	–
P831_K302	520	–
P931_K402	820	–

Fill volumes for input stage K can be found in the chapter [▷ 14].

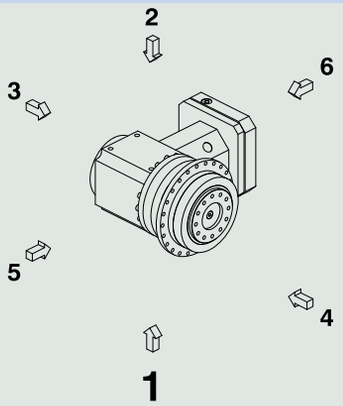
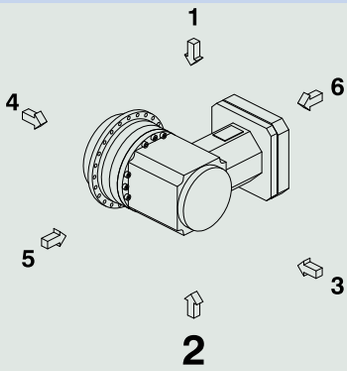
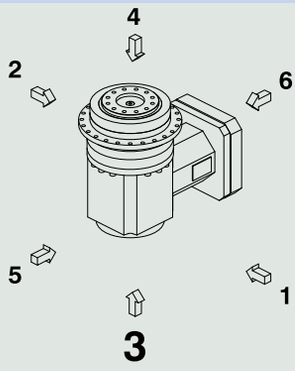
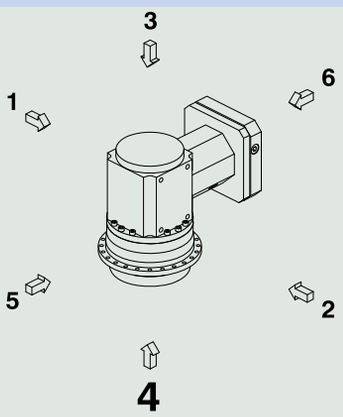
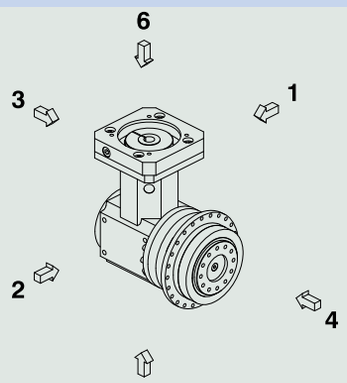
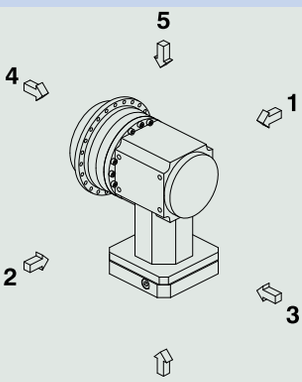
Symbol	Unit	Explanation
V_2	ml	Fill volumes for the output stage
V_1	ml	Fill volumes for the input stage

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

11 PHKX right-angle planetary gear units

The following table shows the standard mounting positions.

The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.

EL1	EL2	EL3
		
EL4	**EL5**	**EL6**
		

Fill volumes for single-stage gear units

Type	EL1, EL2, EL5, EL6			EL3, EL4		
	V_2 (PH)	V_1 (KX)	V_Σ	V_2 (PH)	V_1 (KX)	V_Σ
PH331_KX301	25	42	67	25	42	67
PH431_KX401	42	80	122	42	80	122
PH531_KX501	80	160	240	80	160	240
PH731_KX701	185	390	575	185	390	575
PH831_KX801	490	820	1310	490	820	1310

Fill volumes for two-stage gear units in horizontal mounting positions (EL1, EL2, EL5 and EL6)

Type	V_2 (PH)	V_1 (KX)
PH332_KX301	35	42
PH432_KX301	63	42
PH532_KX401	120	80
PH732_KX501	260	160
PH832_KX701	645	390

Fill volumes for two-stage gear units in vertical mounting positions (EL3 and EL4)

Type	i=16 V_2 (PH)	i=20 V_2 (PH)	i=25, 35, 50 V_2 (PH)	i=28, 40 V_2 (PH)	i=70, 100 V_2 (PH)	V_1 (KX)
PH332_KX301	–	52	52	49	49	42
PH432_KX301	88	88	88	88	84	42
PH532_KX401	175	175	175	175	158	80
PH732_KX501	372	372	390	372	372	160
PH832_KX701	950	950	905	950	855	390

Symbol	Unit	Explanation
V_2	ml	Fill volumes for the output stage
V_1	ml	Fill volumes for the input stage
V_Σ	ml	Total fill volumes

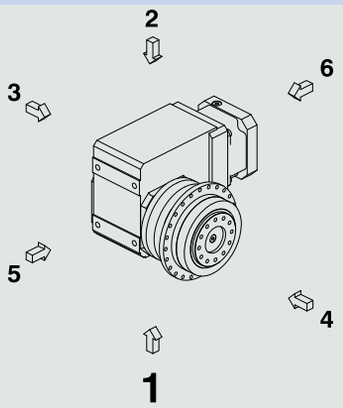
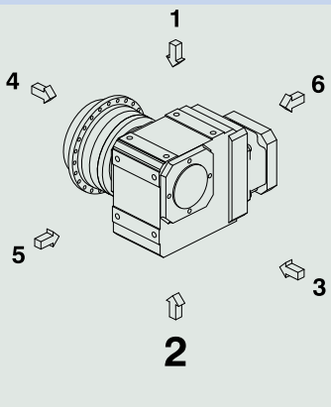
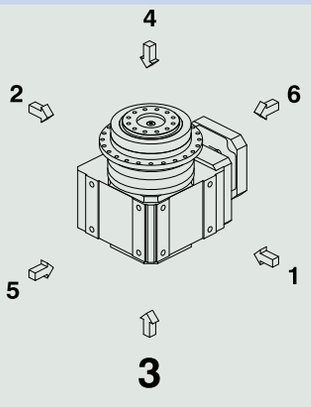
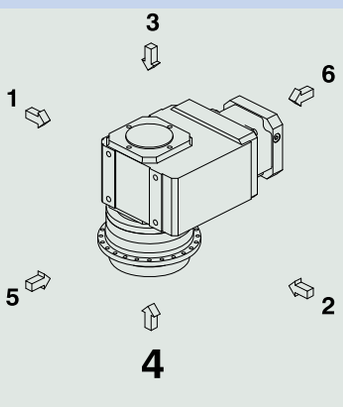
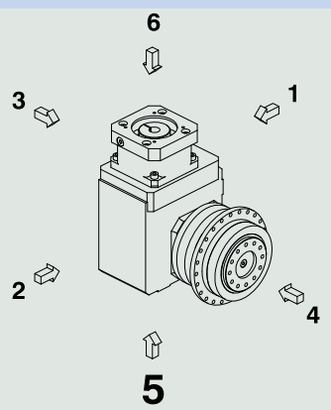
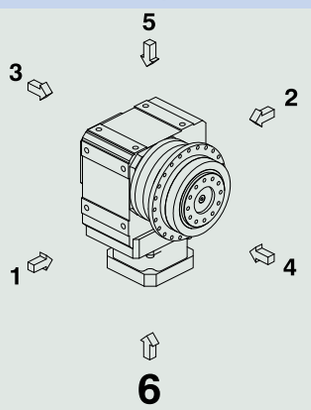
The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

12 PHK/PHQK right-angle planetary gear units

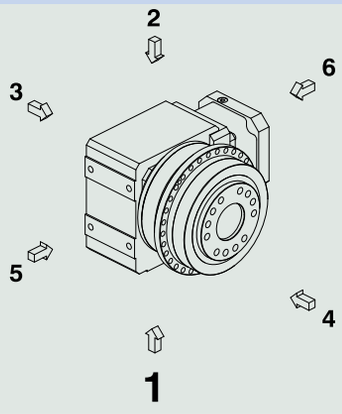
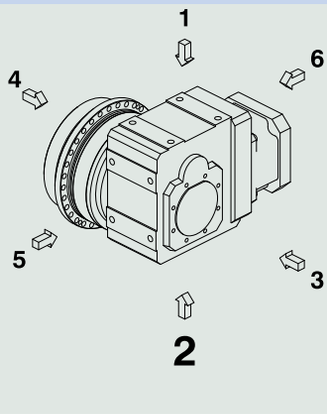
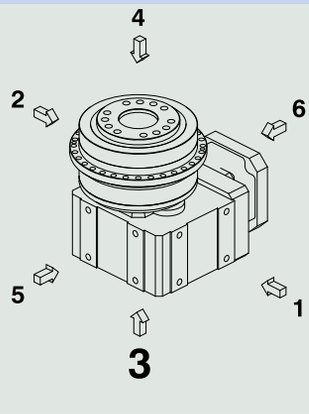
The following table shows the standard mounting positions.

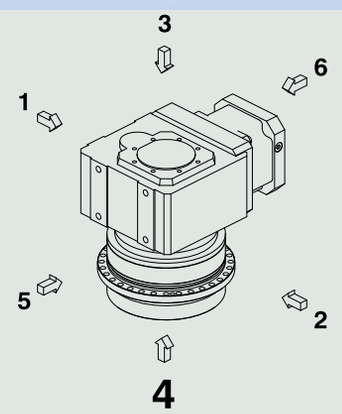
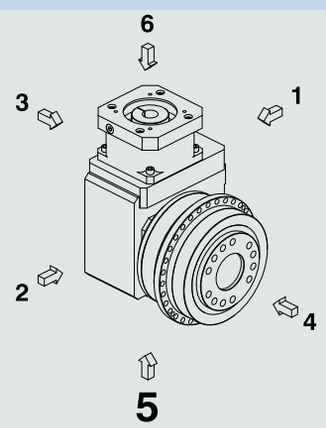
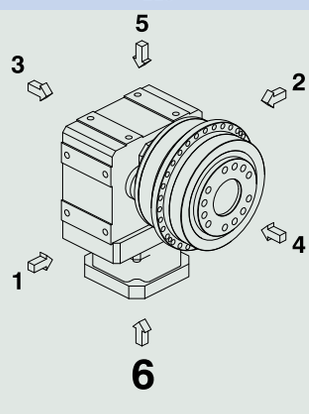
The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.

PH5K1 – PH8K3 / PHQ5K1 – PHQ8K4

EL1	EL2	EL3
		
EL4	**EL5**	**EL6**
		

PH9K5 – PH10K6 / PHQ9K5 – PHQ12K9

EL1	EL2	EL3
		

EL4	EL5	EL6
		

Fill volumes for single-stage PHK gear units

Type	V_2 (PH)	V_1 (K)
PH531_K102	80	–
PH731_K102	185	–
PH731_K202	185	–
PH831_K202	490	–
PH831_K302	490	–

Fill volumes for single-stage PHQK gear units

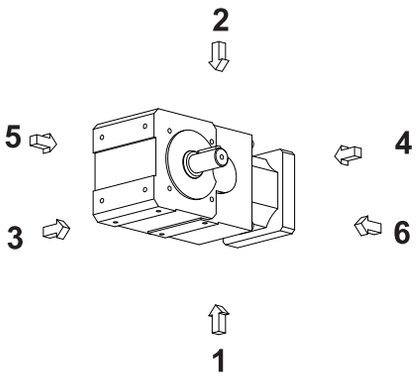
Type	V_2 (PHQ)	V_1 (K)
PHQ531_K102	72	1320
PHQ731_K202	170	2350
PHQ831_K402	430	5300

Symbol	Unit	Explanation
V_2	ml	Fill volumes for the output stage
V_1	ml	Fill volumes for the input stage

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

13 KL helical bevel gear units

The numbers identify the gear unit sides.



Fill volumes

Type	V
KL102	0.196
KL202	0.409

Symbol	Unit	Explanation
V	l	Fill volumes

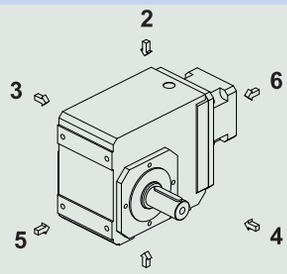
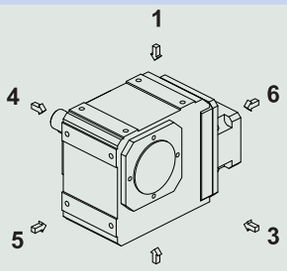
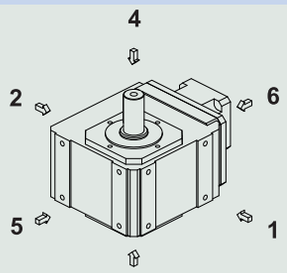
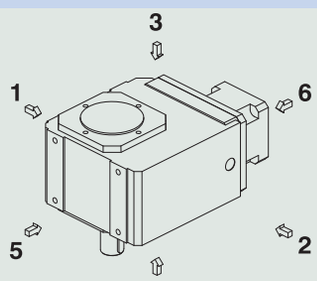
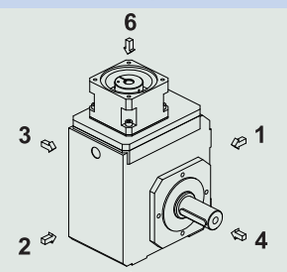
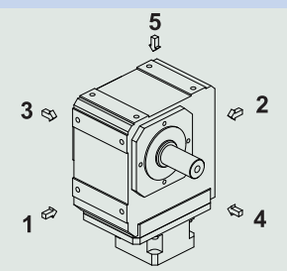
The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

14 K helical bevel gear units

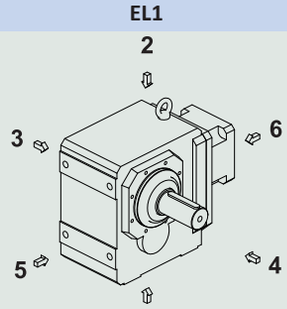
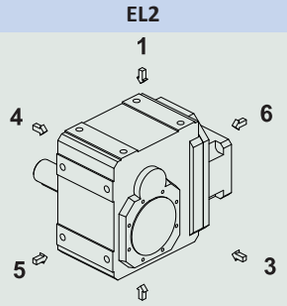
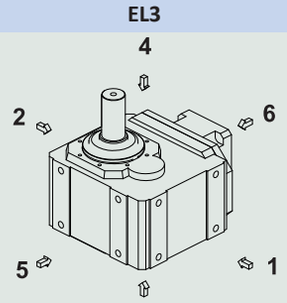
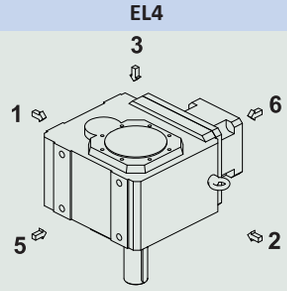
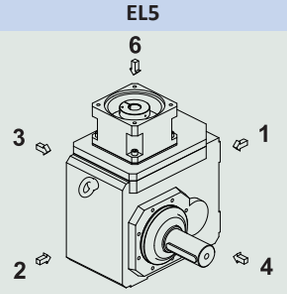
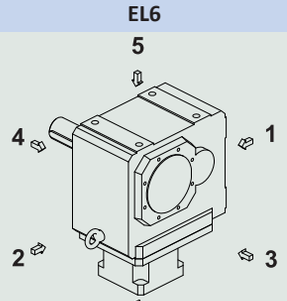
The following table shows the standard mounting positions.

The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.

Mounting positions for gear unit sizes K1 – K4

EL1	EL2	EL3
		
EL4	**EL5**	**EL6**
		

Mounting positions for gear unit sizes K5 – K10

EL1	EL2	EL3
		
EL4	**EL5**	**EL6**
		

Fill volumes

Type	V_{EL1}	V_{EL2}	V_{EL3}	V_{EL4}	$V_{EL5,WDR2}$	$V_{EL5,WDR4}$	$V_{EL5,WV}$	V_{EL6}
K102	0.4	1.1	0.7	0.7	1.31	1.31	1.32	0.9
K202	0.8	1.9	1.6	1.6	2.35	2.30	2.35	2.0
K203	1.5	2.2	1.9	1.9	2.50	2.45	2.50	2.4
K302	1.2	2.8	2.3	2.3	3.50	3.45	3.50	3.0
K303	1.8	3.0	2.7	2.7	3.75	3.70	3.75	3.5
K402	2.5	4.0	3.5	3.5	5.30	5.25	5.30	4.0
K403	3.5	4.5	4.0	4.0	5.65	5.50	5.65	4.5
K513	3.0	4.5	3.5	3.5	5.85	5.70	6.00	4.0
K514	4.0	4.5	4.0	4.0	6.35	6.30	6.50	5.0
K613	4.2	6.8	5.5	5.5	8.60	8.50	8.75	6.0
K614	5.4	7.3	6.0	6.0	9.30	9.20	9.45	6.5
K713	6.0	9.0	7.0	7.0	11.40	11.30	11.60	8.5
K714	8.0	9.5	8.0	7.5	12.50	12.40	12.80	9.5
K813	12.0	15.0	13.0	13.0	20.70	20.50	21.00	14.0
K814	14.0	16.0	15.0	14.0	22.30	21.90	23.30	15.0
K913	21.0	28.0	26.0	26.0	37.00	0.00	38.00	25.0
K914	24.0	30.0	29.0	29.0	38.50	0.00	40.30	28.0
K1013	30.0	47.0	50.0	50.0	60.50	0.00	60.50	43.0
K1014	33.0	52.0	55.0	55.0	63.00	0.00	63.00	49.0

Symbol	Unit	Explanation
$V_{EL5,WDR2}$	l	Fill volumes for mounting position EL5 and all shaft designs, 2 shaft seal rings on the output except solid shaft on both sides
$V_{EL5,WDR4}$	l	Fill volumes for mounting position EL5 and all shaft designs, 4 shaft seal rings on the output except solid shaft on both sides
$V_{EL5,WV}$	l	Fill volumes for mounting position EL5 and solid shaft

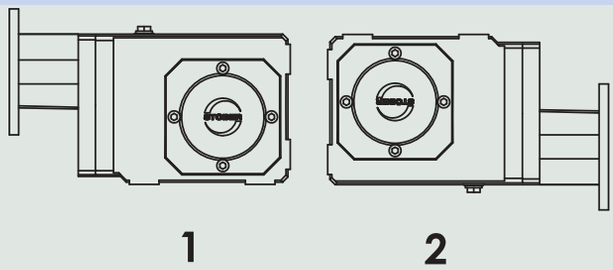
The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

15 KSS helical bevel gear units

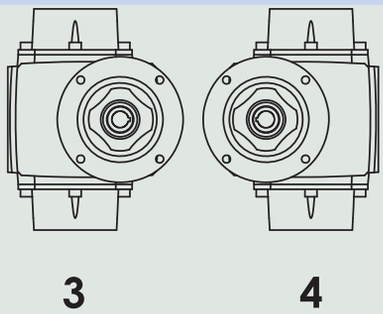
The following table shows the standard mounting positions.

The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.

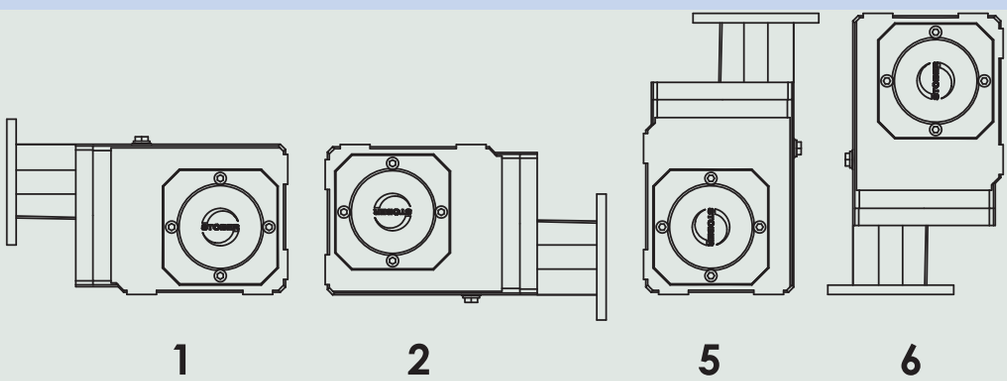
EL12



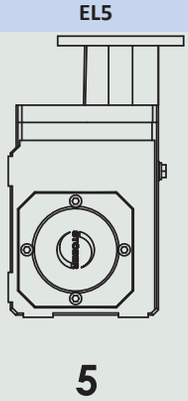
EL34



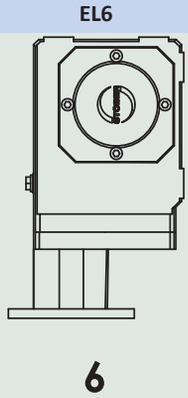
EL1256



EL5



EL6



Fill volumes

Type	V_{EL12}	V_{EL34}	V_{EL1256}	V_{EL5}	V_{EL6}
KSS102	0.57	0.56	0.93	0.93	0.68
KSS202	1.10	0.96	1.63	1.63	1.22
KSS203	1.28	1.30	1.72	1.72	1.44
KSS302	1.46	1.45	2.40	2.40	1.74
KSS303	1.88	2.05	2.52	2.52	2.05
KSS402	2.40	2.30	3.90	3.90	2.70
KSS403	2.70	3.20	4.10	4.10	3.20

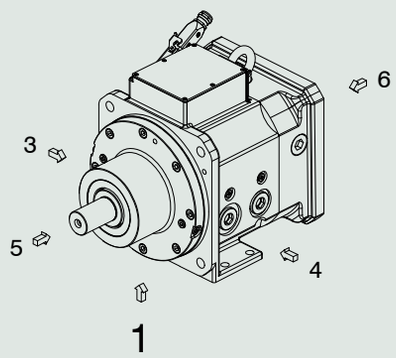
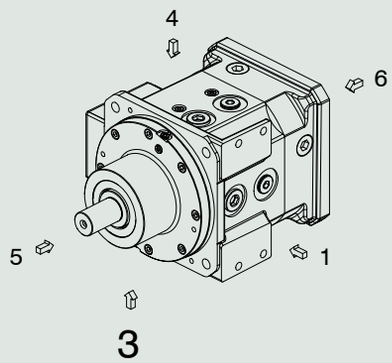
Symbol	Unit	Explanation
V_{EL12}	l	Fill volumes for mounting position EL12
V_{EL34}	l	Fill volumes for mounting position EL34
V_{EL1256}	l	Fill volumes for mounting position EL1256
V_{EL5}	l	Fill volumes for mounting position EL5
V_{EL6}	l	Fill volumes for mounting position EL6

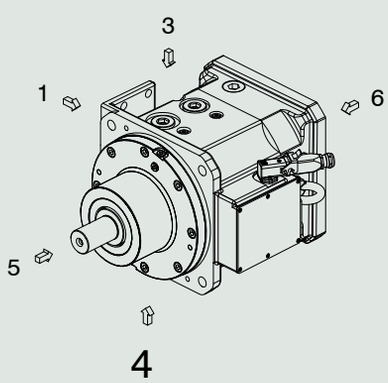
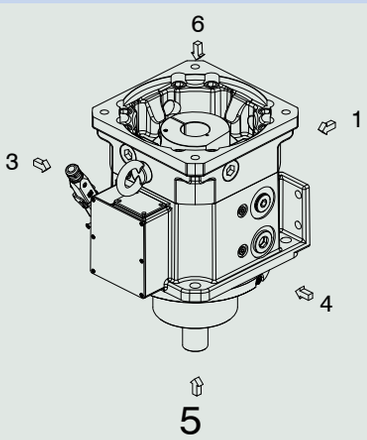
The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

16 PS two-speed gearboxes

The following table shows the standard mounting positions.

The numbers indicate the sides of the two-speed gearbox. The mounting position is defined by the side of the two-speed gearbox that is facing downward.

EL1	EL2	EL3
	Not permitted	

EL4	EL5	EL6
		Not permitted

Fill volumes

Type	V_{EL1}	$V_{EL3,4}$	$V_{EL5,LS}$	$V_{EL5,LM}$	$V_{EL5,LL}$
PS25	0.99	0.99	2.37	2.45	2.55
PS30	1.05	1.05	2.40	2.50	2.60

Symbol	Unit	Explanation
$V_{EL5,LS}$	l	Fill volumes for mounting position EL5 and short bearing distance
$V_{EL5,LM}$	l	Fill volumes for mounting position EL5 and medium bearing distance
$V_{EL5,LL}$	l	Fill volumes for mounting position EL5 and long bearing distance

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

17 P planetary gear units (G2)

Fill volumes for single-stage gear units with standard bearings/radially reinforced bearings

Type	V	$V_{rev,op}$
P221	13	18
P321	39	52
P421	62	90
P521	135	180
P721	225	330
P821	550	800
P921	1000	1450

Fill volumes for single-stage gear units with axially reinforced bearings

Type	V	$V_{rev,op}$
P321	32	47
P421	49	80
P521	97	155
P721	190	300
P821	450	720
P921	780	1260

Symbol	Unit	Explanation
V	ml	Fill volumes
$V_{rev,op}$	ml	Fill volumes for reverse operation and horizontally aligned output

Fill volumes for two-stage gear units with standard bearings/radially reinforced bearings

Type	12 ≤ i ≤ 15	16 ≤ i ≤ 100	12 ≤ i ≤ 100
	V	V	V
P222	–	–	34
P322	–	–	76
P422	–	–	143
P522	260	–	–
P522	–	275	–
P722	–	–	520
P822	–	–	1230
P922	–	–	2180

Fill volumes for two-stage gear units with axially reinforced bearings

Type	12 ≤ i ≤ 15	16 ≤ i ≤ 100	12 ≤ i ≤ 100
	V	V	V
P322	–	–	69
P422	–	–	130
P522	232	–	–
P522	–	247	–
P722	–	–	494
P822	–	–	1140
P922	–	–	1930

Symbol	Unit	Explanation
V	ml	Fill volumes

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

18 PA planetary gear units (G2)

Fill volumes for single-stage gear units with axially reinforced bearings

Type	V	$V_{rev,op}$
PA321	32	47
PA421	49	80
PA521	97	155
PA721	190	300
PA821	450	720

Fill volumes for two-stage gear units with axially reinforced bearings

Type	12 ≤ i ≤ 15	16 ≤ i ≤ 100	12 ≤ i ≤ 100
	V	V	V
PA322	–	–	69
PA422	–	–	117
PA522	210	–	–
PA522	–	225	–
PA722	–	–	460
PA822	–	–	1080

Symbol	Unit	Explanation
V	ml	Fill volumes
$V_{rev,op}$	ml	Fill volumes for reverse operation and horizontally aligned output

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

19 PH planetary gear units (G2)

Fill volumes for single-stage gear units

Type	V	$V_{rev,op}$
PH321	23	37
PH421	38	62
PH521	70	116
PH721	200	300
PH821	505	750

Fill volumes for two-stage gear units

Type	12 ≤ i ≤ 60 V	70 ≤ i ≤ 100 V
PH322	53	49
PH422	110	104
PH522	209	192
PH722	480	480
PH822	1200	1110
PH932	2040	–
PH1032	2850	–

Symbol	Unit	Explanation
V	ml	Fill volumes
$V_{rev,op}$	ml	Fill volumes for reverse operation and horizontally aligned output

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

20 PHA planetary gear units (G2)

Fill volumes for single-stage gear units

Type	V	$V_{rev,op}$
PHA321	23	37
PHA421	38	62
PHA521	70	116
PHA721	200	300
PHA821	505	750

Fill volumes for two-stage gear units

Type	12 ≤ i ≤ 60 V	70 ≤ i ≤ 100 V
PHA322	53	49
PHA422	97	92
PHA522	186	174
PHA722	450	450
PHA822	1130	1040
PHA932	1950	0
PHA1032	2850	0

Symbol	Unit	Explanation
V	ml	Fill volumes
$V_{rev,op}$	ml	Fill volumes for reverse operation and horizontally aligned output

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

21 PHQ planetary gear units (G2)

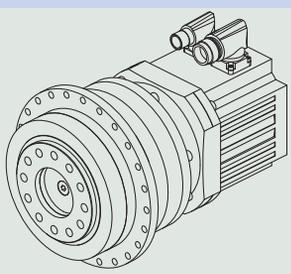
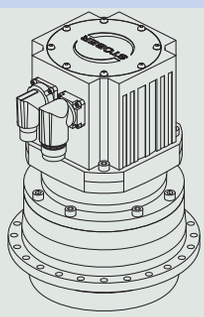
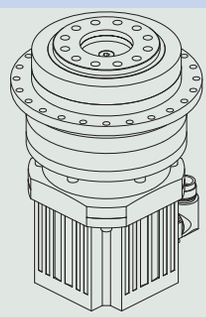
Fill volumes for single-stage gear units

Type	V	$V_{rev,op}$
PHQ421	38	58
PHQ521	87	112
PHQ721	200	300

Fill volumes for two-stage gear units

Type	V	$V_{rev,op}$
PHQ422	100	115
PHQ522	191	225
PHQ722	440	465
PHQ822	1040	1080
PHQ932	2020	2370
PHQ1032	3600	3820
PHQ1132	5800	6220
PHQ1232	11900	12800

Mounting positions of three-stage gear units

EL1	EL5	EL6
		
Horizontal output	Vertical downward output	Vertical upward output

Fill volumes for three-stage gear units

Type	EL1		EL5			EL6
	V	$V_{rev,op}$	V_2	V_1	V_Σ	V
PHQ723	320	570	190	215	405	500
PHQ823	720	1280	605	450	1055	1100
PHQ933	1400	2600	800	1120	1920	2400
PHQ1033	2600	4700	1300	2150	3450	4375
PHQ1133	4300	7500	5800	550	6350	6860
PHQ1233	8600	15500	8600	4900	13500	14500

Symbol	Unit	Explanation
V	ml	Fill volumes
$V_{rev,op}$	ml	Fill volumes for reverse operation and horizontally aligned output
V_2	ml	Fill volumes for the output stage
V_1	ml	Fill volumes for the input stage
V_Σ	ml	Total fill volumes

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

22 PHQA planetary gear units (G2)

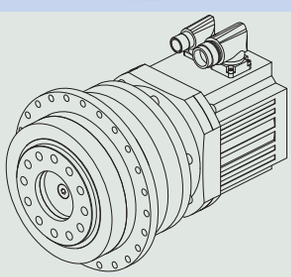
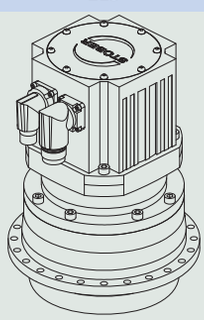
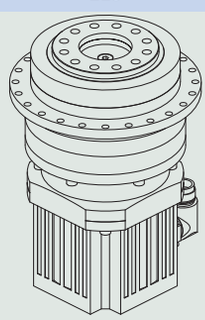
Fill volumes for single-stage gear units

Type	V	$V_{rev,op}$
PHQA421	38	58
PHQA521	87	112
PHQA721	200	300

Fill volumes for two-stage gear units

Type	V	$V_{rev,op}$
PHQA422	87	105
PHQA522	171	210
PHQA722	410	435
PHQA822	970	1015
PHQA932	1900	2090
PHQA1032	3600	3820

Mounting positions of three-stage gear units

EL1	EL5	EL6
		
Horizontal output	Vertical downward output	Vertical upward output

Fill volumes for three-stage gear units

Type	EL1		EL5			EL6
	V	$V_{rev,op}$	V_2	V_1	V_Σ	V
PHQA723	290	515	190	200	390	440
PHQA823	670	1200	460	410	870	1000
PHQA933	1400	2480	800	990	1790	2260
PHQA1033	2600	4700	1300	2150	3450	4375

Symbol	Unit	Explanation
V	ml	Fill volumes
$V_{rev,op}$	ml	Fill volumes for reverse operation and horizontally aligned output
V_2	ml	Fill volumes for the output stage
V_1	ml	Fill volumes for the input stage
V_Σ	ml	Total fill volumes

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

23 PHVA planetary gear units (G2)

Fill volumes

Type	V	$V_{rev,op}$
PHVA933	1910	2230
PHVA1033	3060	3810

Symbol	Unit	Explanation
V	ml	Fill volumes
$V_{rev,op}$	ml	Fill volumes for reverse operation and horizontally aligned output

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

24 PE planetary gear units (G1)

Fill volumes for single-stage gear units

Type	V
PE211	5 g (6 ml)
PE311	18 g (20 ml)
PE411	32 g (35 ml)
PE511	66 g (73 ml)

Fill volumes for two-stage gear units

Type	V
PE212	10 g (11 ml)
PE312	28 g (31 ml)
PE412	51 g (57 ml)
PE512	107g (119 ml)

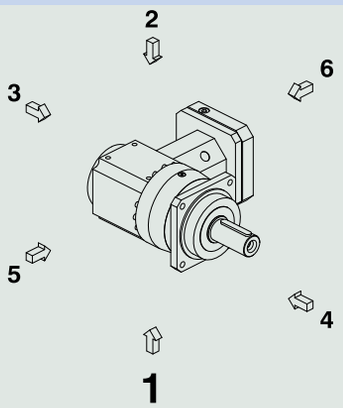
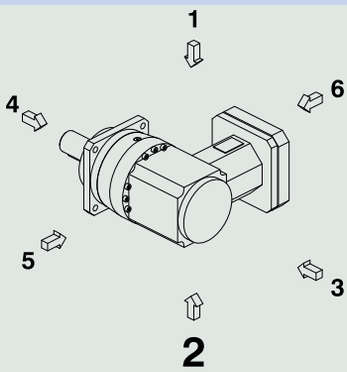
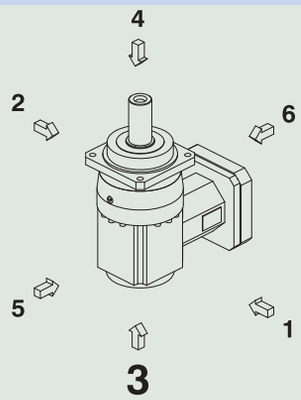
Symbol	Unit	Explanation
V	g (ml)	Fill volumes

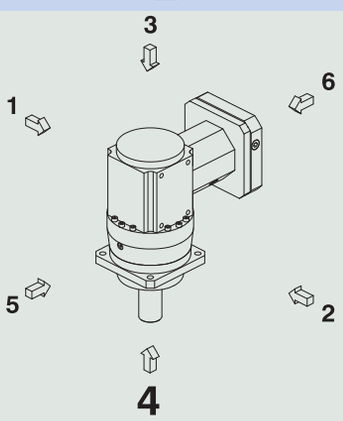
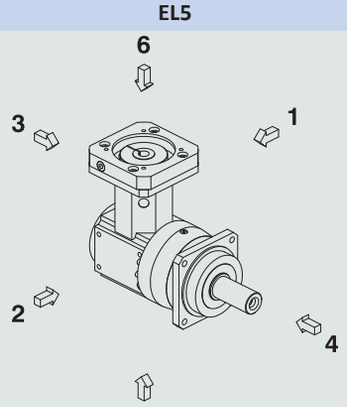
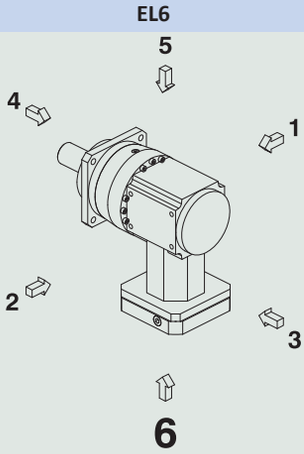
The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

25 PKX right-angle planetary gear units (G2)

The following table shows the standard mounting positions.

The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.

EL1	EL2	EL3
		

EL4	EL5	EL6
		

Fill volumes for single-stage gear units with standard bearings/radially reinforced bearings

Type	EL1, EL2, EL5, EL6			EL3, EL4		
	V_2 (P)	V_1 (KX)	V_Σ	V_2 (P)	V_1 (KX)	V_Σ
P221_KX301	13	42	55	13	42	55
P321_KX301	39	42	81	39	42	81
P421_KX401	62	80	142	62	80	142
P521_KX501	135	160	295	135	160	295
P721_KX701	225	390	615	225	390	615
P821_KX801	550	820	1370	550	820	1370

Fill volumes for single-stage gear units with axially reinforced bearings

Type	EL1, EL2, EL5, EL6			EL3, EL4		
	V_2 (P)	V_1 (KX)	V_Σ	V_2 (P)	V_1 (KX)	V_Σ
P321_KX301	32	42	74	32	42	74
P421_KX401	49	80	129	49	80	129
P521_KX501	97	160	257	97	160	257
P721_KX701	190	390	580	190	390	580
P821_KX801	450	820	1270	450	820	1270

Fill volumes for two-stage gear units with standard bearings/radially reinforced bearings

Type	EL1, EL2, EL5, EL6			EL3, EL4		
	V_2 (P)	V_1 (KX)	V_Σ	V_2 (P)	V_1 (KX)	V_Σ
P222_KX301	22	42	64	34	42	76
P322_KX301	53	42	95	76	42	118
P422_KX301	87	42	129	143	42	185
P522_KX401	162	80	242	275	80	355
P722_KX501	305	160	465	520	160	680
P822_KX701	715	390	1105	1230	390	1620
P922_KX801	1340	820	2160	2180	820	3000

Fill volumes for two-stage gear units with axially reinforced bearings

Type	EL1, EL2, EL5, EL6			EL3, EL4		
	V_2 (P)	V_1 (KX)	V_Σ	V_2 (P)	V_1 (KX)	V_Σ
P322_KX301	50	42	92	69	42	111
P422_KX301	77	42	119	130	42	172
P522_KX401	140	80	220	247	80	327
P722_KX501	283	160	443	494	160	654
P822_KX701	670	390	1060	1140	390	1530
P922_KX801	1230	820	2050	1930	820	2750

In mounting positions EL1, EL2, EL5 and EL6, the input stage and output stage have the same oil chamber because there is no shaft seal ring installed between them. In mounting positions EL3 and EL4, the input stage and output stage have separate oil chambers because a shaft seal ring is installed between them.

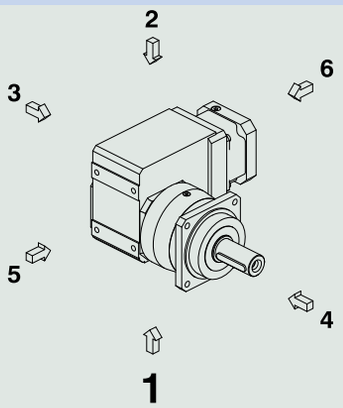
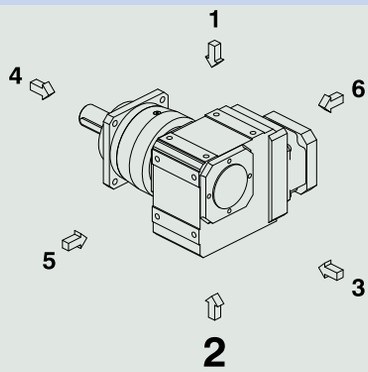
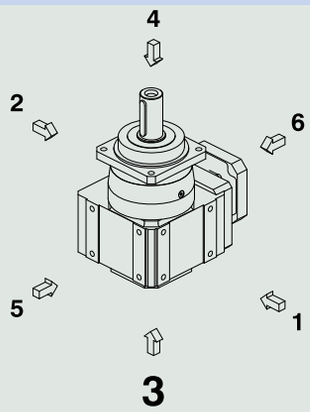
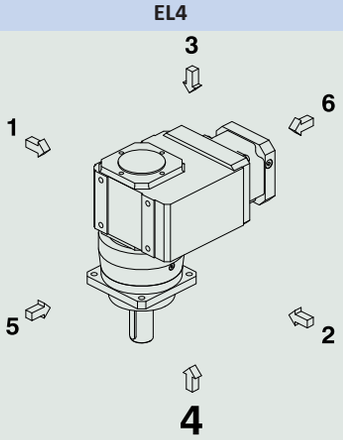
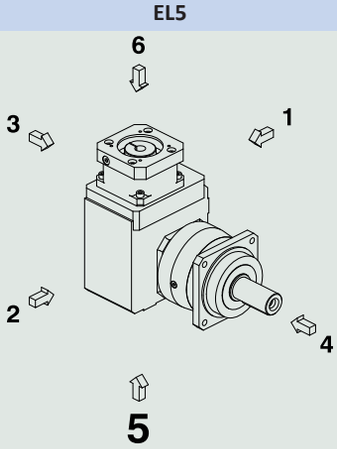
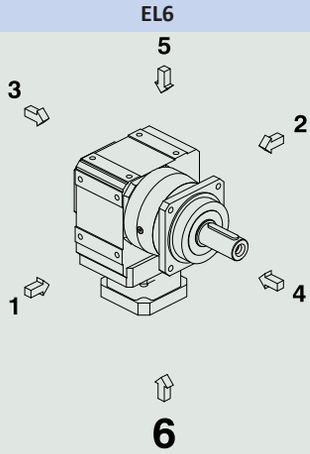
Symbol	Unit	Explanation
V_2	ml	Fill volumes for the output stage
V_1	ml	Fill volumes for the input stage
V_Σ	ml	Total fill volumes

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

26 PK right-angle planetary gear units (G2)

The following table shows the standard mounting positions.

The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.

EL1	EL2	EL3
		
EL4	**EL5**	**EL6**
		

Fill volumes for single-stage gear units with standard bearings/radially reinforced bearings

Type	V_2 (P)	V_1 (K)
P521_K102	135	–
P721_K102	225	–
P721_K202	225	–
P821_K202	550	–
P821_K302	550	–
P921_K402	1000	–

Fill volumes for single-stage gear units with axially reinforced bearings

Type	V_2 (P)	V_1 (K)
P521_K102	97	–
P721_K102	190	–
P721_K202	190	–
P821_K202	450	–
P821_K302	450	–
P921_K402	780	–

Fill volumes for input stage K can be found in the chapter [14].

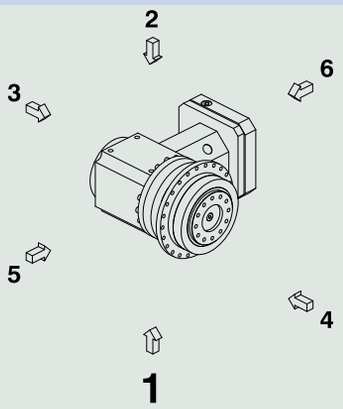
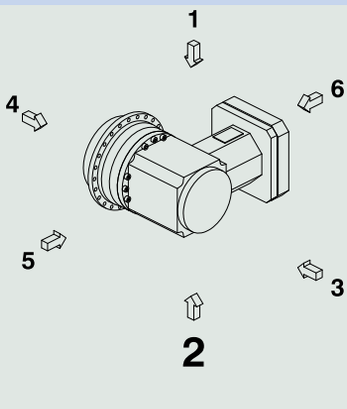
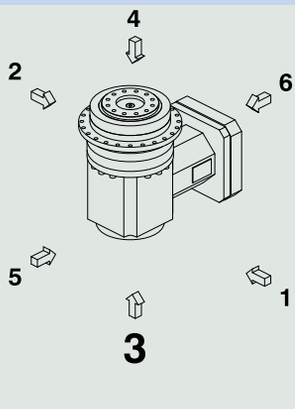
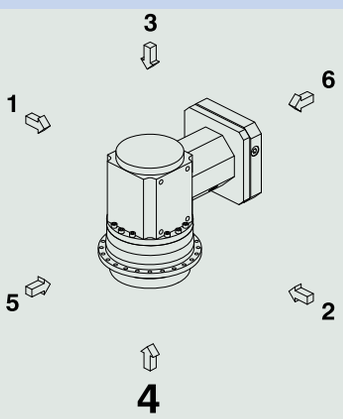
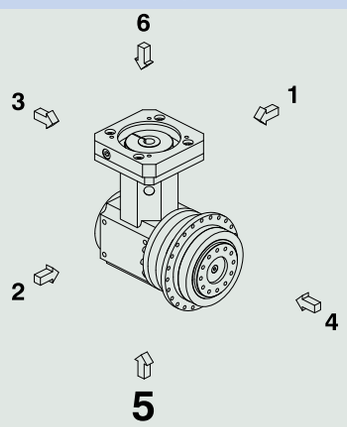
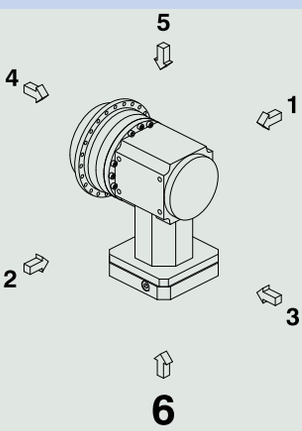
Symbol	Unit	Explanation
V_2	ml	Fill volumes for the output stage
V_1	ml	Fill volumes for the input stage

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

27 PHKX right-angle planetary gear units (G2)

The following table shows the standard mounting positions.

The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.

EL1	EL2	EL3
		
EL4	**EL5**	**EL6**
		

Fill volumes for single-stage gear units

Type	EL1, EL2, EL5, EL6			EL3, EL4		
	V_2 (PH)	V_1 (KX)	V_Σ	V_2 (PH)	V_1 (KX)	V_Σ
PH321_KX301	23	42	65	23	42	65
PH421_KX401	38	80	118	38	80	118
PH521_KX501	70	160	230	70	160	230
PH721_KX701	200	390	590	200	390	590
PH821_KX801	505	820	1325	505	820	1325

Fill volumes for two-stage gear units

Type	EL1, EL2, EL5, EL6			EL3, EL4				
	V_2 (PH)	V_1 (KX)	V_Σ	V_2 16 ≤ i ≤ 20	V_2 25 ≤ i ≤ 50	V_2 70 ≤ i ≤ 100	V_2 12 ≤ i ≤ 60	V_1 (KX)
PH322_KX301	36	42	78	53	53	49	0	42
PH422_KX301	75	42	117	110	110	104	0	42
PH522_KX401	135	80	215	209	209	192	0	80
PH722_KX501	280	160	440	480	480	480	0	160
PH822_KX701	700	390	1090	1200	1140	1110	0	390
PH932_KX801	1270	820	2090	0	0	0	2040	820
PH1032_KX801	1680	820	2500	0	0	0	2850	820

Symbol	Unit	Explanation
V_2	ml	Fill volumes for the output stage
V_1	ml	Fill volumes for the input stage
V_Σ	ml	Total fill volumes

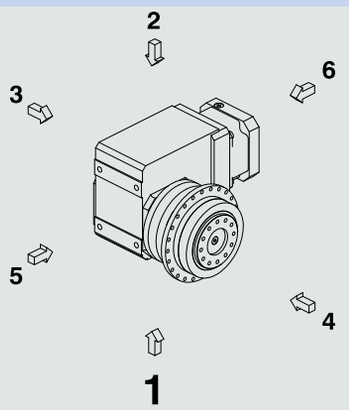
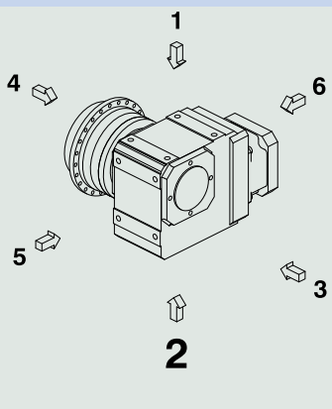
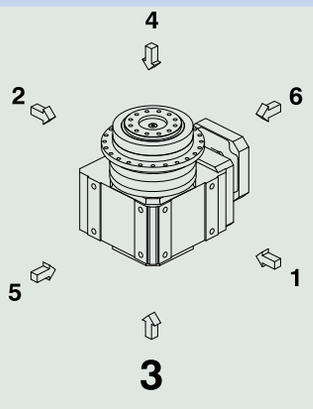
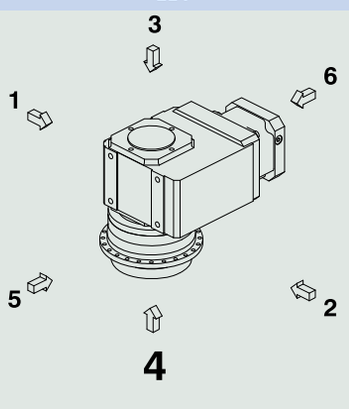
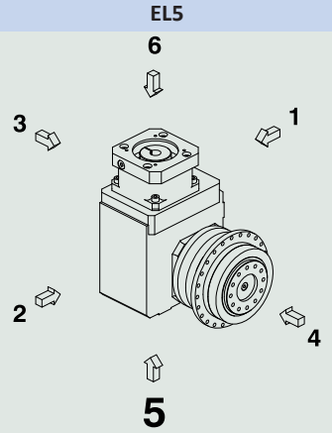
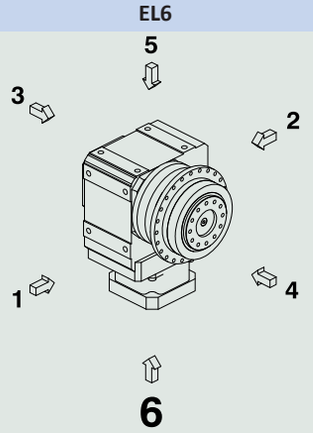
The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

28 PHK/PHQK right-angle planetary gear units (G2)

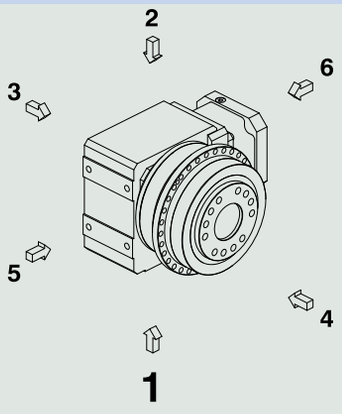
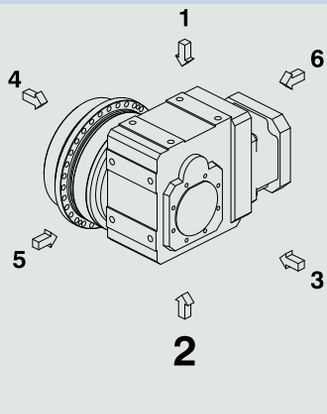
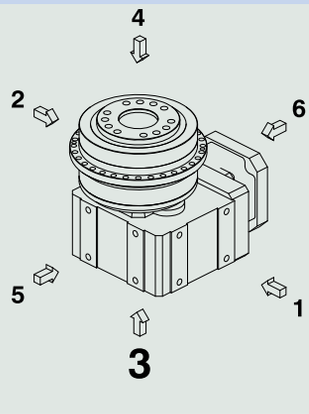
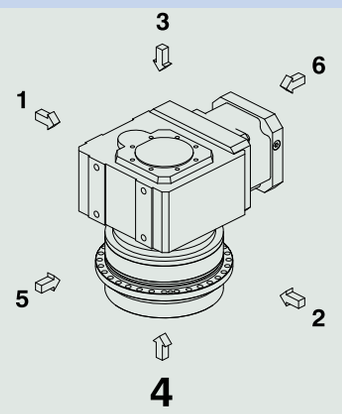
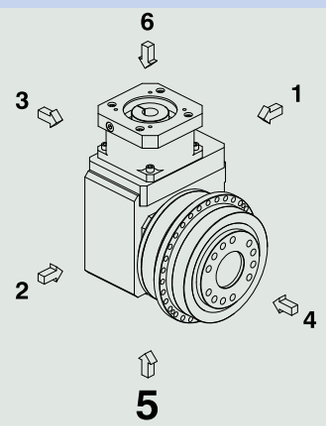
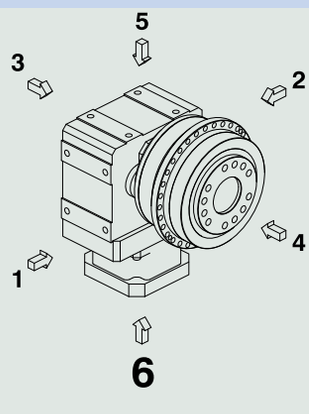
The following table shows the standard mounting positions.

The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.

PH5K1 – PH8K3 / PHQ5K1 – PHQ8K4

EL1	EL2	EL3
		
EL4	**EL5**	**EL6**
		

PH9K5 – PH10K6 / PHQ9K5 – PHQ12K9

EL1	EL2	EL3
		
EL4	**EL5**	**EL6**
		

Fill volumes for single-stage PHK gear units

Type	V_2 (PH)	V_1 (K)
PH521_K102	70	–
PH721_K102	200	–
PH721_K202	200	–
PH821_K202	505	–
PH821_K302	505	–
PH931_K513	940	–
PH1031_K613	1400	–

Fill volumes for single-stage PHQK gear units

Type	V_2 (PHQ)	V_1 (K)
PHQ521_K102	87	1320
PHQ721_K202	200	2350
PHQ821_K402	505	5300
PHQ931_K513	940	6000
PHQ1031_K713	1800	11600
PHQ1131_K813	4700	21000
PHQ1231_K913	8600	38000

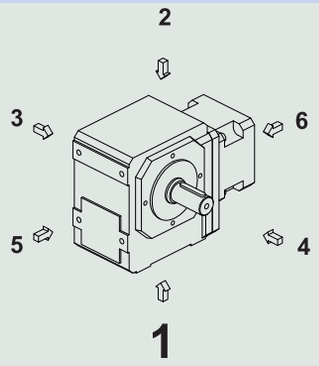
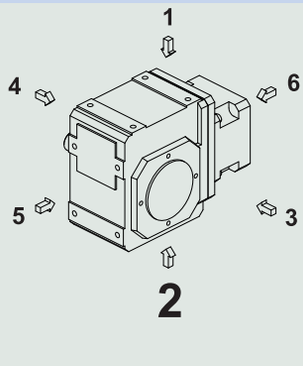
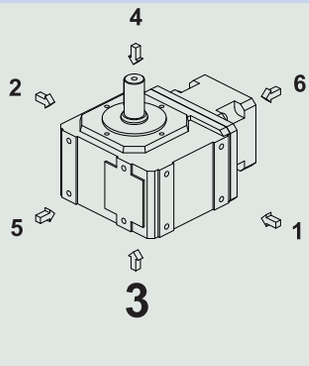
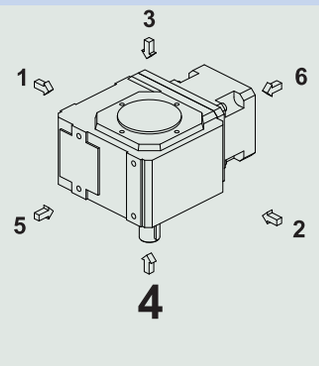
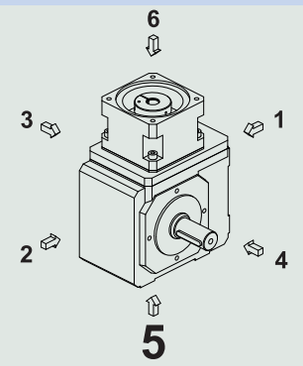
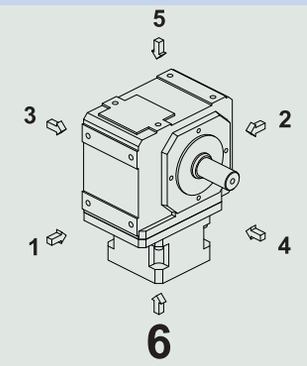
Symbol	Unit	Explanation
V_2	ml	Fill volumes for the output stage
V_1	ml	Fill volumes for the input stage

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

29 S helical worm gear units

The following table shows the standard mounting positions.

The numbers identify the gear unit sides. The mounting position is defined by the gear side facing downwards.

EL1	EL2	EL3
		
EL4	**EL5**	**EL6**
		

Fill volumes

Type	V_{EL1}	V_{EL2}	V_{EL3}	V_{EL4}	$V_{EL5,WA,WS}$	$V_{EL5,WV}$	V_{EL6}
S002	0.30	0.50	0.36	0.36	0.53	0.53	0.44
S102	0.50	0.76	0.60	0.60	0.91	0.91	0.70
S202	1.00	1.50	1.20	1.20	1.80	1.90	1.60
S203	1.20	1.40	1.40	1.40	2.10	2.20	1.80
S302	1.55	2.20	1.80	1.80	3.00	3.10	2.40
S303	1.85	2.50	2.50	2.50	3.28	3.38	2.70
S402	2.60	3.50	2.70	2.70	4.40	4.50	3.50
S403	3.20	4.00	3.60	3.60	4.80	4.90	3.80

Symbol	Unit	Explanation
$V_{EL5,WA,WS}$	l	Fill volumes for mounting position EL5 and hollow shaft/hollow shaft with shrink ring
$V_{EL5,WV}$	l	Fill volumes for mounting position EL5 and solid shaft

The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at https://id.stober.com.

ID 441871_en.16 08/2021

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