



Lubricant fill volumes

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1 User information

This document contains information on lubricant fill volumes for all current gear unit series as well as for gear unit series which are no longer current. These are indicated by the generation in brackets (e.g. G3).

Using the nameplate of your gear unit, the type designation and your order documents you can find the chapter that corresponds to your product.

Alternatively, you can easily find the lubricant specification and mandatory lubricant fill volume for your gear unit entering the serial number of your gear unit at <https://id.stober.com>

2 Planetary gear units P2 – P9

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

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, 80	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	–	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, 80	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	–	1735	1735	1735	1735	1610	1610

Symbol	Unit	Explanation
V	ml	Fill volume
V _{rev,op}	ml	Fill volume 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 Planetary gear units PH3 – PH8

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 volume
$V_{rev,op}$	ml	Fill volume 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>.

4 Planetary gear units PH9 – PH10

Fill volumes for two-stage gear units

Type	i=12, 16, 20, 28, 32, 40	i=18, 24, 30, 42, 48, 60	V
Symbol	Unit	Explanation	
PH942	ml	Fill volume	–
PH1042	ml	Fill volume	2585

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 Planetary gear units PHQ4 – PHQ8

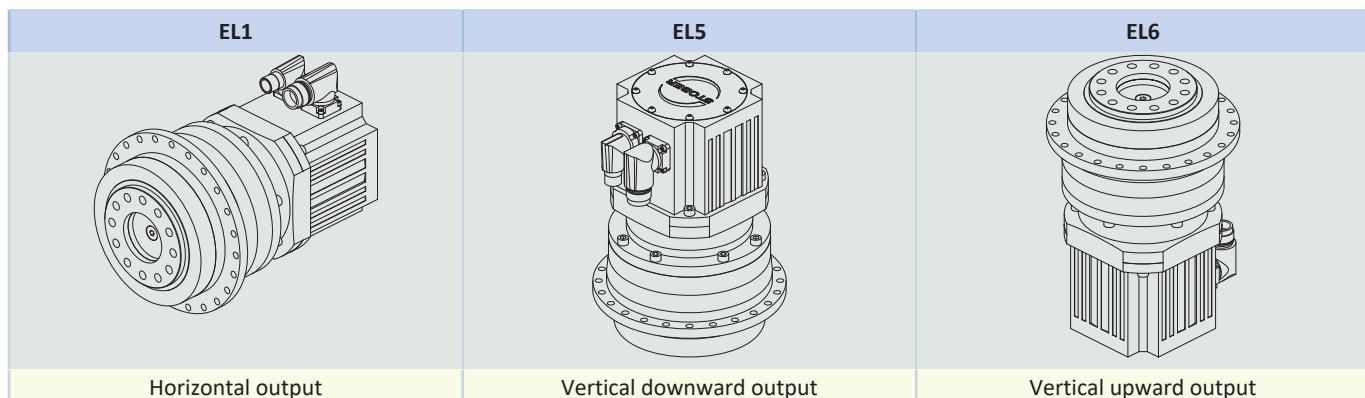
Fill volumes for single-stage gear units

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



Fill volumes for three-stage gear units

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

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

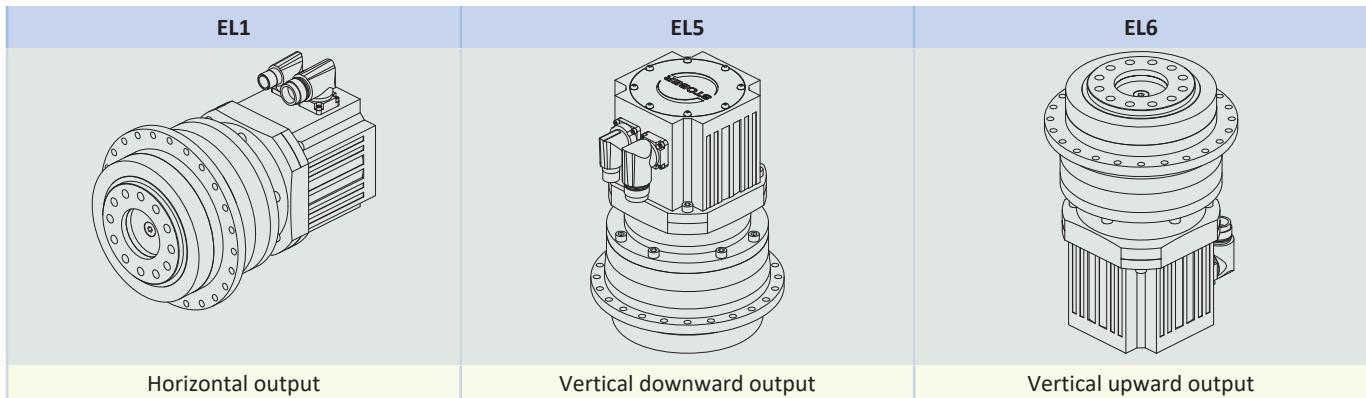
The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at <https://id.stober.com>.

6 Planetary gear units PHQ9 – PHQ12

Fill volumes for two-stage gear units

Type	V	$V_{rev,op}$	i=24, 30	i=18, 42, 60	i=42, 60	i=42	i=60
PHQ942	1650	–	1935	1890	–	–	–
PHQ1042	2280	–	2785	–	2710	–	–
PHQ1142	5600	–	6325	–	–	6190	6000
PHQ1242	10800	12000	–	–	–	–	–

Mounting positions of three-stage gear units



Fill volumes for three-stage gear units in mounting position EL1

Type	V	i=96, 120, 150, 168, 210, 240, 300	i=72, 420, 600
Type	V	$V_{rev,op}$	$V_{rev,op}$
PHQ943	1350	2220	2170

Type	V	i=96, 120	i=150, 168, 210, 240, 300	i=420, 600
Type	V	$V_{rev,op}$	$V_{rev,op}$	$V_{rev,op}$
PHQ1043	2175	3650	3580	3460

Type	V	i=96, 120, 150, 168, 210	i=240, 300
Type	V	$V_{rev,op}$	$V_{rev,op}$
PHQ1143	4300	7070	6930

Type	V	i=96, 120, 168, 240	i=210, 294, 420
Type	V	$V_{rev,op}$	$V_{rev,op}$
PHQ1243	8000	13370	12900

Fill volumes for three-stage gear units in mounting position EL5

Type		i=72, 96, 168, 240	i=120, 150, 210, 300, 420, 600
Type	V ₂	V ₁	V ₁
PHQ943	1000	880	800
Type		i=96, 120, 150, 168, 210, 240, 300	i=420, 600
Type	V ₂	V ₁	V ₁
PHQ1043	1500	1490	1360
Type		V ₂	V ₁
PHQ1143		3500	2160
Type		V ₂	V ₁
PHQ1243		6700	3650

Fill volumes for three-stage gear units in mounting position EL6

Type		V
PHQ943		1930
Type	i=96, 120, 150, 168	i=210, 240, 300, 420, 600
Type	V	V
PHQ1043	3200	3100
Type		V
PHQ1143		5700
Type	i=96, 120, 168, 240	i=210, 294, 420
Type	V	V
PHQ1243	10700	10200
Symbol	Unit	Explanation
V	ml	Fill volume
V ₁	ml	Fill volume for the input stage
V ₂	ml	Fill volume for the output stage
V _{rev,op}	ml	Fill volume 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>.

7 Planetary gear units PHV9 – PHV10

Fill volumes

Type	V	$V_{rev,op}$
PHV943	1910	2230
PHV1043	3060	3810

Symbol	Unit	Explanation
V	ml	Fill volume
$V_{rev,op}$	ml	Fill volume 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>.

8 Planetary gear units PE2 – PE5

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
PE222	6 g (7 ml)	9 g (10 ml)
PE322	9 g (10 ml)	10 g (11 ml)
PE422	35 g (40 ml)	16 g (18 ml)
PE522	72 g (82 ml)	25 g (82 ml)

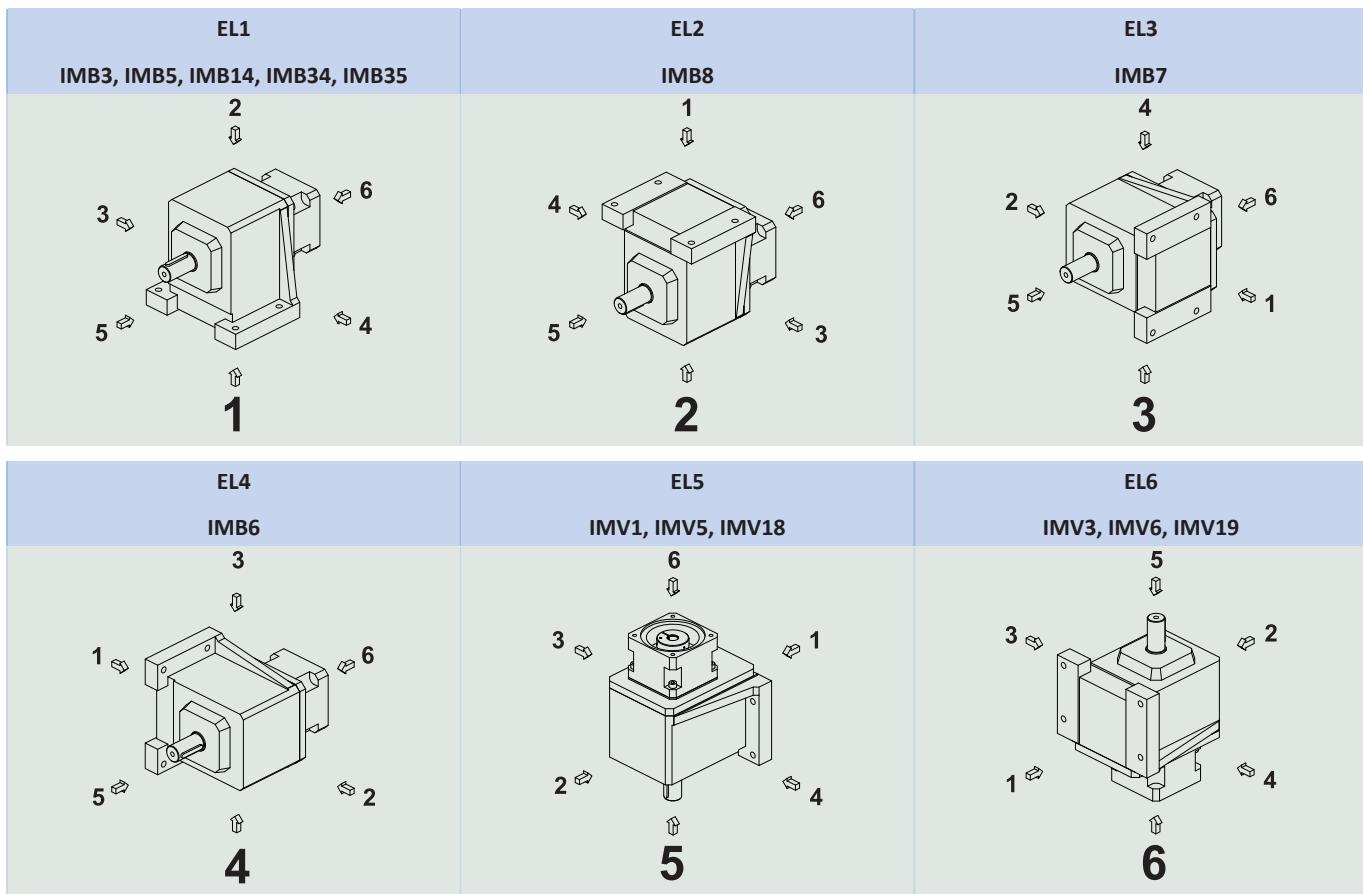
Symbol	Unit	Explanation
V	g (ml)	Fill volume
V_1	g (ml)	Fill volume for the input stage
V_2	g (ml)	Fill volume for the output stage

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>.

9 Helical gear units C0 – C9

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.



Fill volumes

Type	V _{EL1}	V _{EL2}	V _{EL3}	V _{EL4}	V _{EL5,GG,GF}	V _{EL5,GN}	V _{EL5,GQ}	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	1.16	1.13	1.1
C103	0.8	1.0	0.9	0.9	1.25	1.45	1.35	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	1.95	2.00	2.0
C302	1.2	1.6	1.4	1.4	2.17	2.34	2.35	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	3.75	3.70	3.3
C403	2.0	3.0	2.3	2.3	4.04	4.30	4.20	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

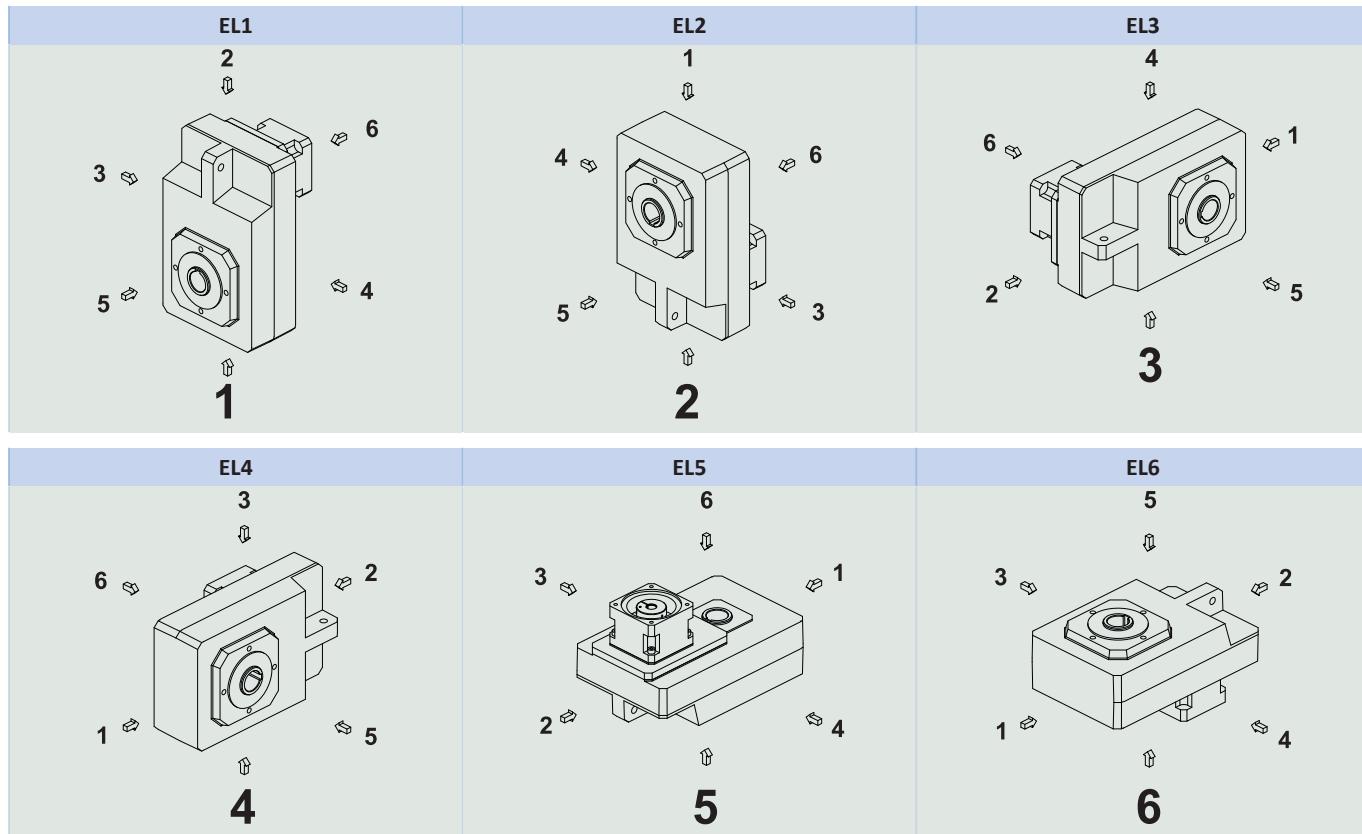
Symbol	Unit	Explanation
V_{EL1}	l	Fill volume for mounting position EL1
V_{EL2}	l	Fill volume for mounting position EL2
V_{EL3}	l	Fill volume for mounting position EL3
V_{EL4}	l	Fill volume for mounting position EL4
$V_{EL5,GG,GF}$	l	Fill volume for mounting position EL5 and housing design with pitch circle diameter/round flange
$V_{EL5,GN}$	l	Fill volume for mounting position EL5 and housing design with foot
$V_{EL5,GQ}$	l	Fill volume for mounting position EL5 and housing design with square flange
V_{EL6}	l	Fill volume 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>.

10 Offset helical gear units F1 – F6

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.



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

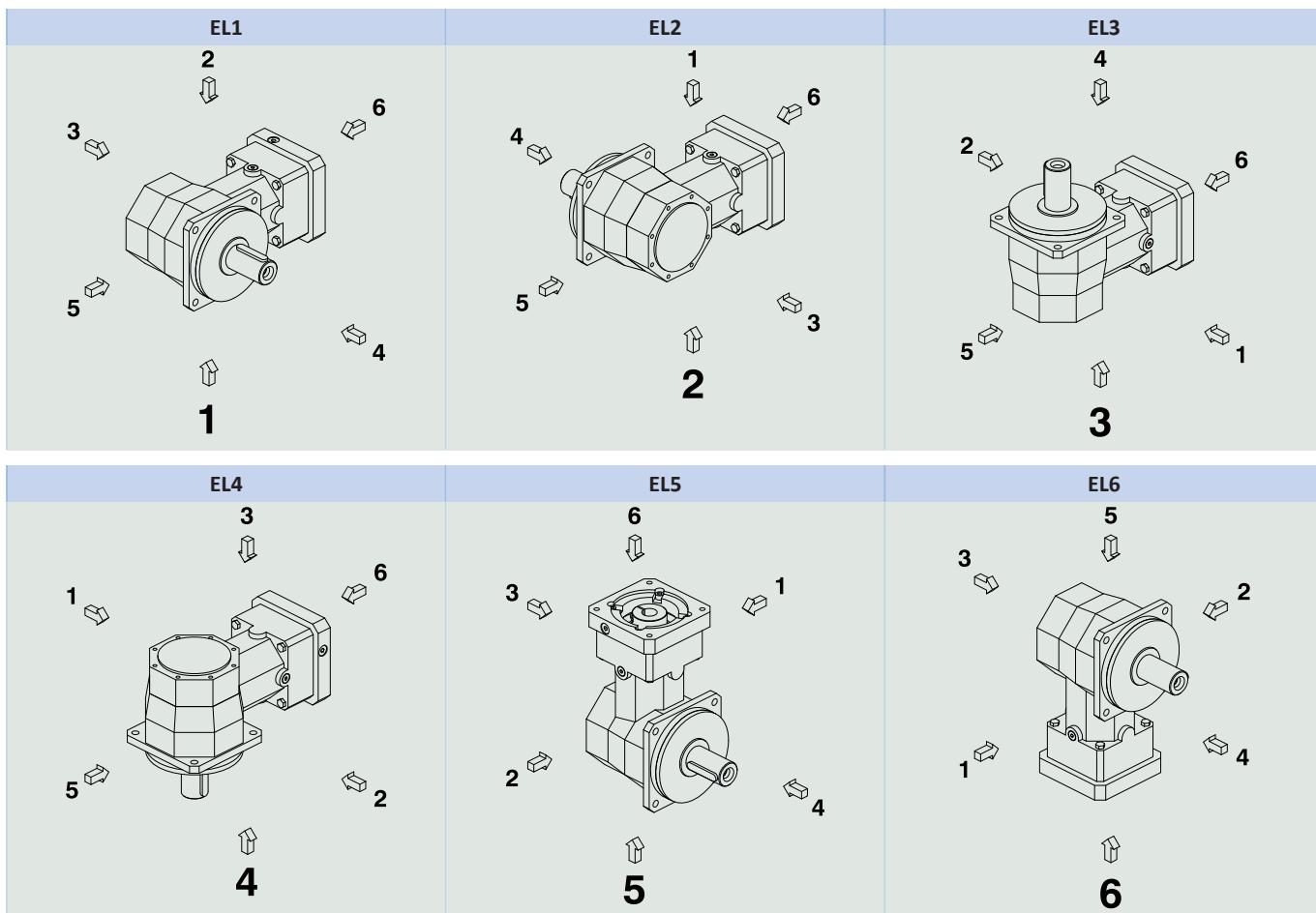
Symbol	Unit	Explanation
V _{EL1}	l	Fill volume for mounting position EL1
V _{EL2}	l	Fill volume for mounting position EL2
V _{EL3}	l	Fill volume for mounting position EL3
V _{EL4}	l	Fill volume for mounting position EL4
V _{EL5,WA,WS}	l	Fill volume for mounting position EL5 and hollow shaft/hollow shaft with shrink ring
V _{EL5,WV}	l	Fill volume for mounting position EL5 and solid shaft
V _{EL6}	l	Fill volume 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>.

11 Right-angle servo gear units KS4 – KS7

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.



Fill volumes for two-stage gear units

Type	6≤i≤20		i=6			8≤i≤10			14≤i≤20		
	V _{EL1,2,3,4,6}	V _{ELS,WF}	V _{ELS,WP,WG}	V _{ELS,WS}	V _{ELS,WF}	V _{ELS,WP,WG}	V _{ELS,WS}	V _{ELS,WF}	V _{ELS,WP,WG}	V _{ELS,WS}	
KS402	145	236	250	241	236	250	241	236	250	241	
KS502	255	391	415	402	391	415	402	395	420	406	
KS702	475	759	807	777	772	819	788	776	824	793	

Fill volumes for three-stage gear units

Type	V _{EL1,2,3,4,6}	V _{ELS,WF}	V _{ELS,WP,WG}	V _{ELS,WS}
KS403	155	268	283	273
KS503	280	470	495	480
KS703	520	913	958	928

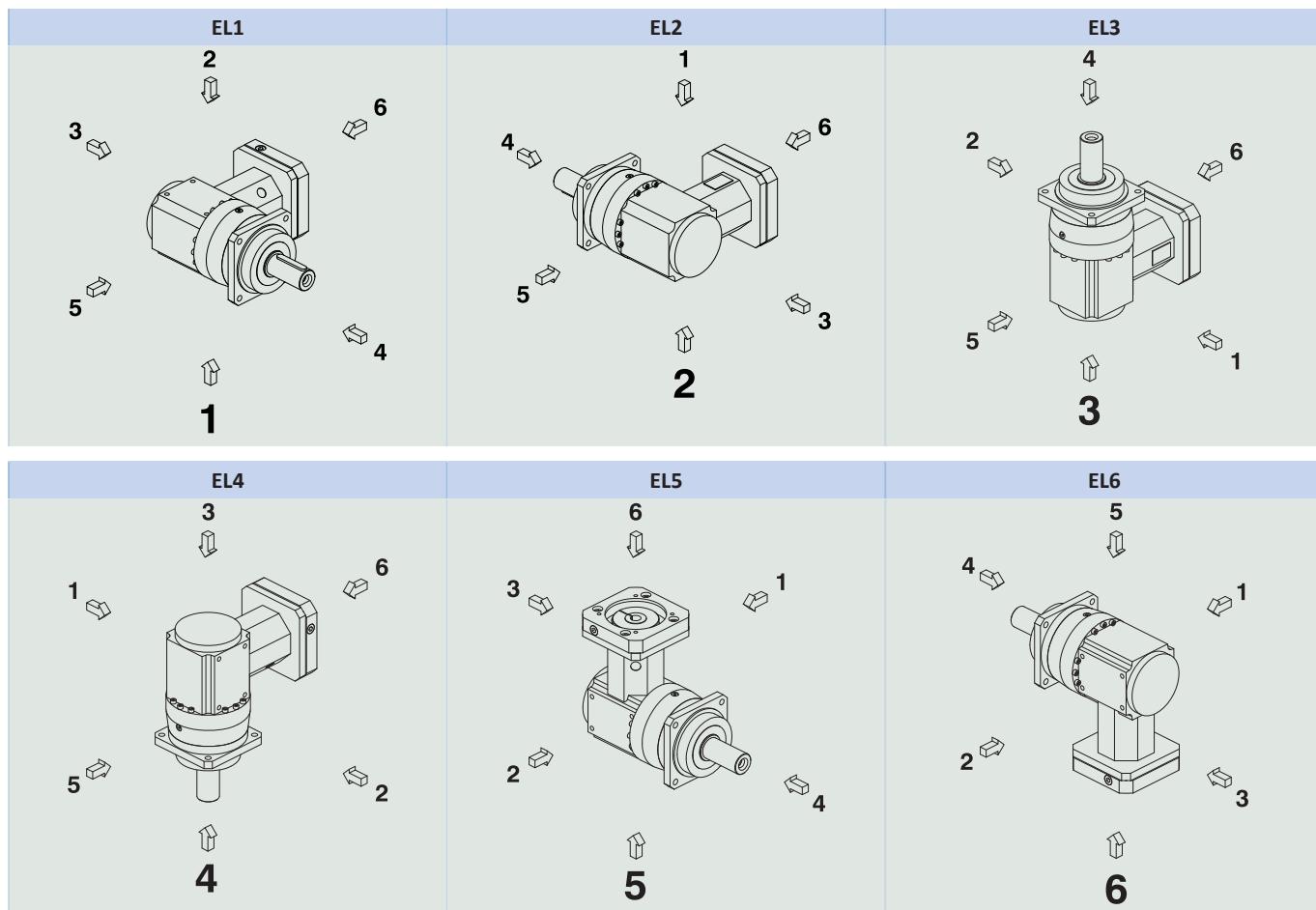
Symbol	Unit	Explanation
V _{EL1,2,3,4,6}	ml	Fill volume for mounting position EL1, EL2, EL3, EL4 and EL6
V _{ELS,WF}	ml	Fill volume for mounting position EL5 and flange hollow shaft
V _{ELS,WP,WG}	ml	Fill volume for mounting position EL5 and solid shaft with feather key/solid shaft without feather key
V _{ELS,WS}	ml	Fill volume for mounting position EL5 and hollow shaft with shrink ring

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 Right-angle planetary gear units P2KX3 – P9KX7

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.



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

Type	V ₂ (P)	V ₁ (KX)
P231_KX301	13	42
P331_KX301	33	42
P431_KX401	60	80
P531_KX501	118	160
P731_KX701	218	390
P831_KX801	550	820

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

Type	V ₂ (P)	V ₁ (KX)
P331_KX301	31	42
P431_KX401	56	80
P531_KX501	103	160
P731_KX701	200	390
P831_KX801	520	820

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, 35, 40, 50	i=32, 56	i=70	i=100	V ₁ (KX)
	V ₂ (P)	V ₂ (P)	V ₂ (P)	V ₂ (P)	V ₂ (P)	
P332_KX301	65	68	68	68	65	42
P432_KX301	108	115	124	124	124	42
P532_KX401	219	239	239	239	239	80
P732_KX501	445	445	445	430	430	160
P832_KX701	1010	1065	1010	1010	960	390
P932_KX701	—	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, 35, 40, 50	i=32, 56	i=70	i=100	V ₁ (KX)
	V ₂ (P)	V ₂ (P)	V ₂ (P)	V ₂ (P)	V ₂ (P)	
P332_KX301	61	64	64	64	61	42
P432_KX301	99	106	115	115	115	42
P532_KX401	196	216	216	216	216	80
P732_KX501	415	415	415	400	400	160
P832_KX701	955	1010	955	955	905	390
P932_KX701	—	1735	1735	1610	1610	390

In the mounting positions EL3 and EL4, there is a shaft seal ring between the input and output stages; so the gear units have separate oil chambers.

In the mounting positions EL1, EL2, EL5 and EL6, there is no shaft seal ring between the input and output stages, so the gear units have a common oil chamber. Nevertheless, the lubricant is filled separately for the input and output stages.

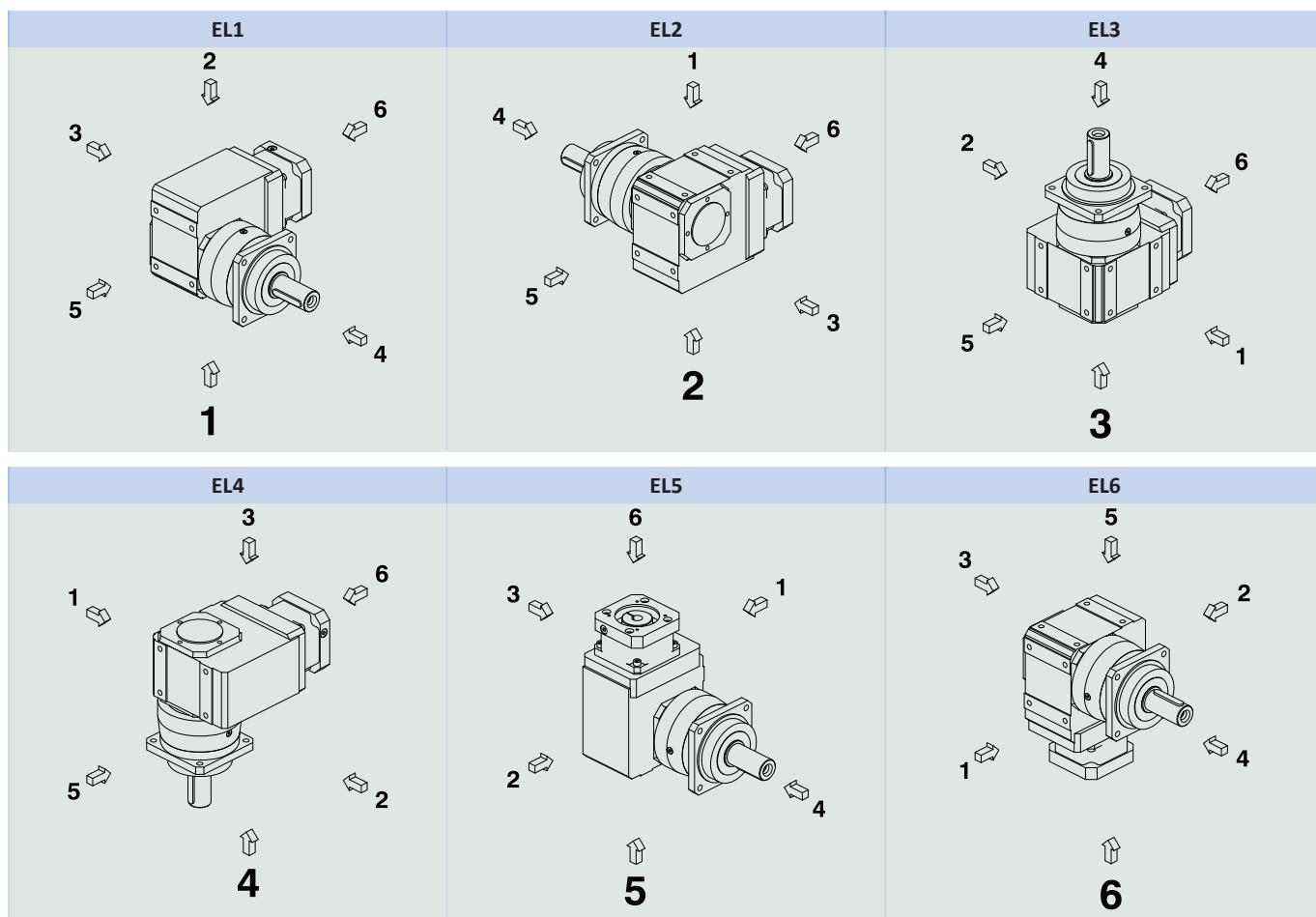
Symbol	Unit	Explanation
V ₁	ml	Fill volume for the input stage
V ₂	ml	Fill volume for the output stage

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 Right-angle planetary gear units P5K1 – P9K4

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.



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

Type	V_1 (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_2 (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 [▶ 19].

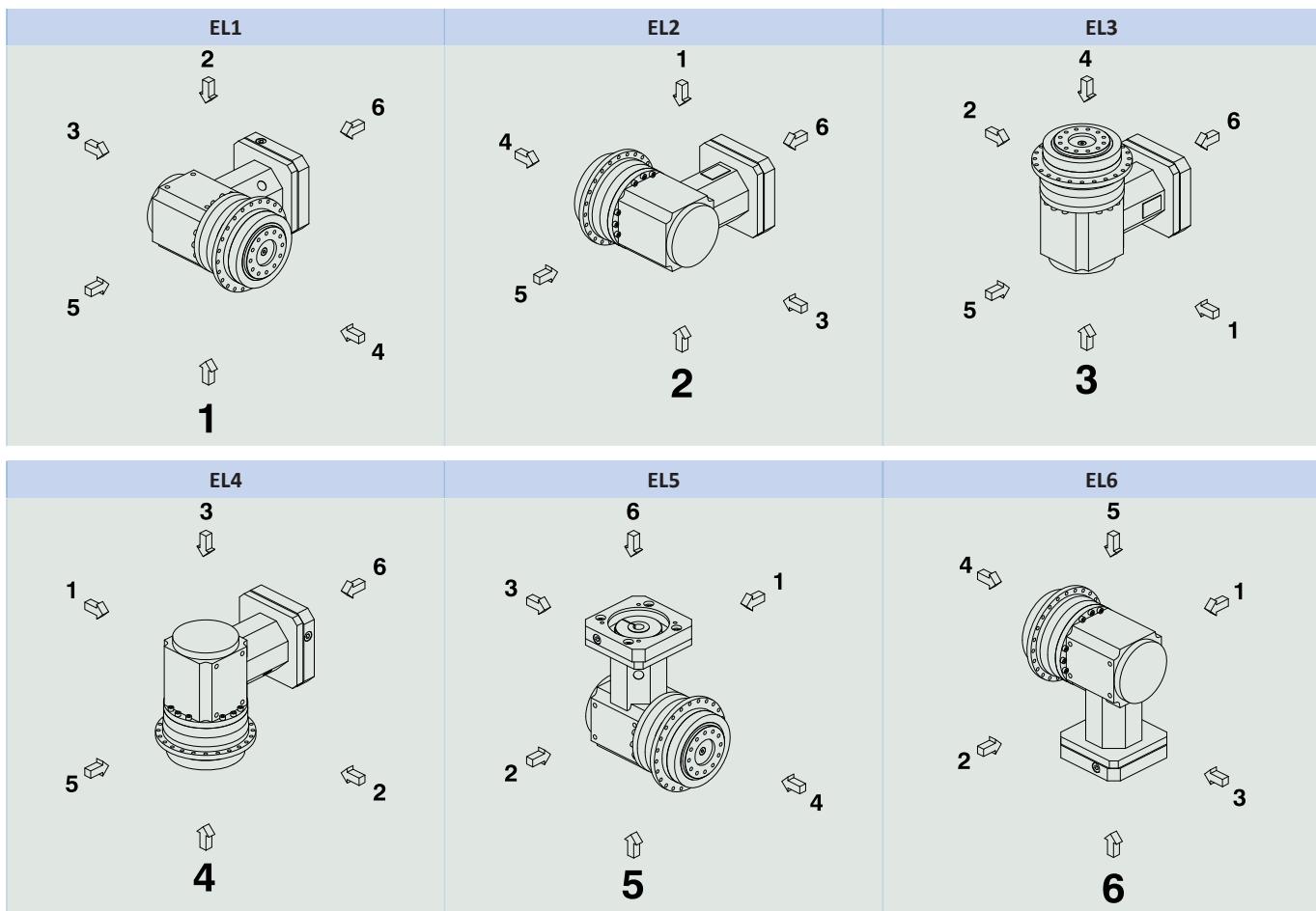
Symbol	Unit	Explanation
V_1	ml	Fill volume for the input stage
V_2	ml	Fill volume for the output stage

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>.

14 Right-angle planetary gear units PH3KX3 – PH8KX8

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.



Fill volumes for single-stage gear units

Type	V_2 (PH)	V_1 (KX)
PH331_KX301	25	42
PH431_KX401	42	80
PH531_KX501	80	160
PH731_KX701	185	390
PH831_KX801	490	820

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	i=20	i=25, 35, 50	i=28, 40	i=70, 100	V ₁ (KX)
	V ₂ (PH)					
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

In the mounting positions EL3 and EL4, there is a shaft seal ring between the input and output stages; so the gear units have separate oil chambers.

In the mounting positions EL1, EL2, EL5 and EL6, there is no shaft seal ring between the input and output stages, so the gear units have a common oil chamber. Nevertheless, the lubricant is filled separately for the input and output stages.

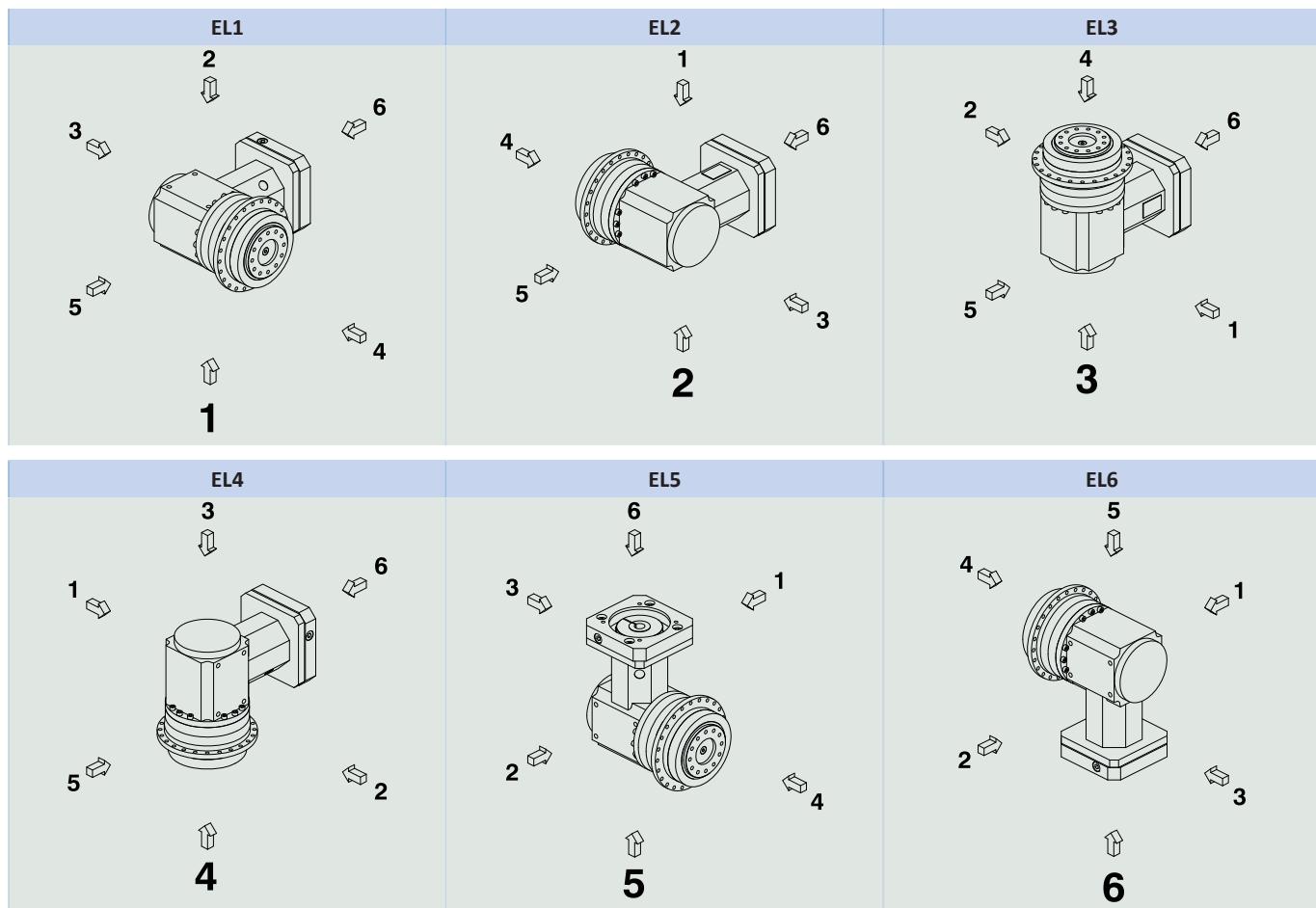
Symbol	Unit	Explanation
V ₁	ml	Fill volume for the input stage
V ₂	ml	Fill volume for the output stage

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>.

15 Right-angle planetary gear units PH9KX7 – PH10KX7

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.



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

Type	V_2 (PH)	V_1 (KX)
PH942_KX701	720	390
PH1042_KX701	1050	390

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

Type	i=12, 16, 20, 28, 32, 40	i=18, 24, 30, 42, 48, 60	V_2 (PH)	V_1 (KX)
	V_2 (PH)	V_2 (PH)		
PH942_KX701	1825	1725	–	390
PH1042_KX701	–	–	2585	390

In the mounting positions EL3 and EL4, there is a shaft seal ring between the input and output stages; so the gear units have separate oil chambers.

In the mounting positions EL1, EL2, EL5 and EL6, there is no shaft seal ring between the input and output stages, so the gear units have a common oil chamber. Nevertheless, the lubricant is filled separately for the input and output stages.

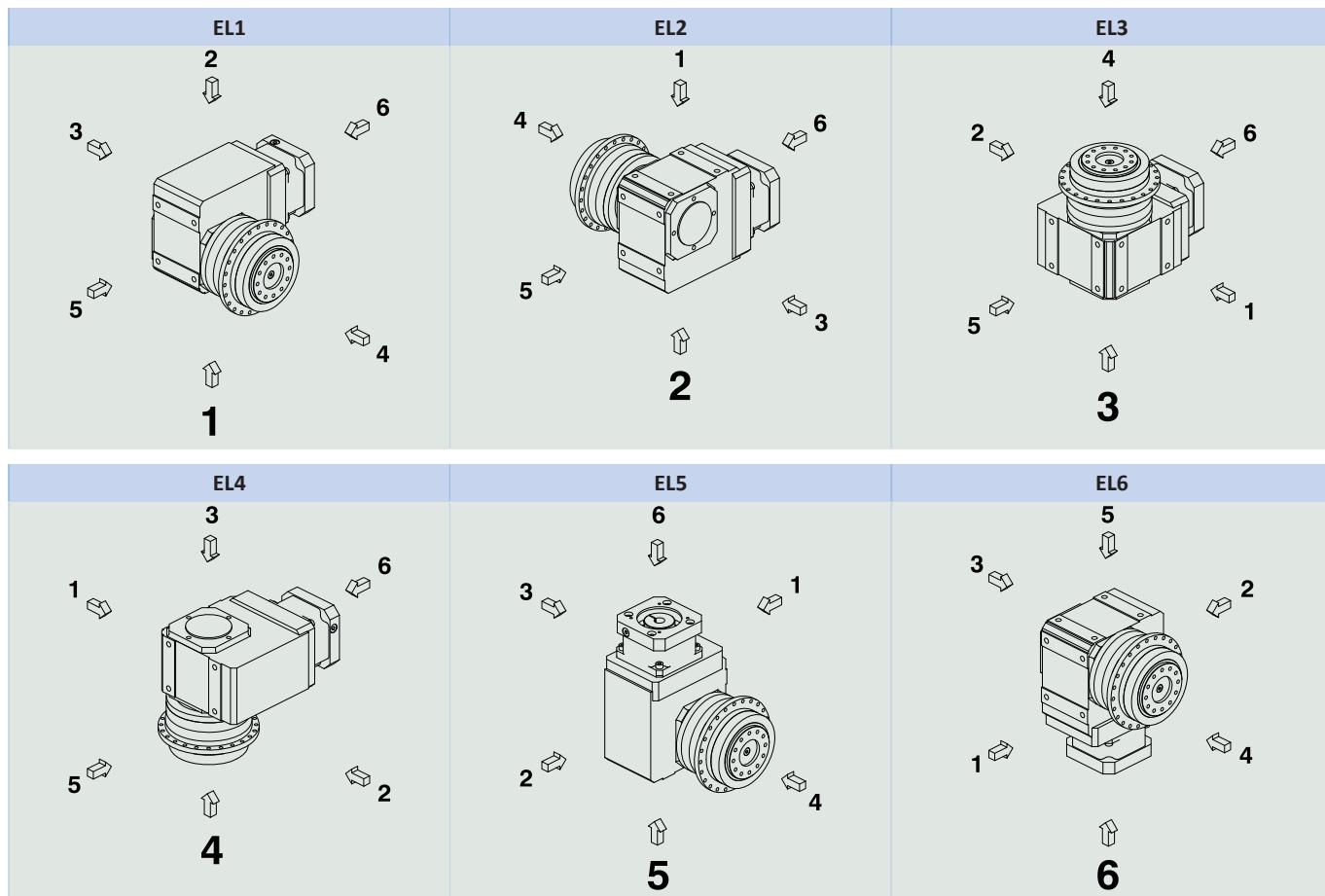
Symbol	Unit	Explanation
V_1	ml	Fill volume for the input stage
V_2	ml	Fill volume for the output stage

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>.

16 Right-angle planetary gear units PH5K1 – PH8K3 / PHQ5K1 – PHQ8K4

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.



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	–
PHQ731_K202	170	–
PHQ831_K402	430	–

Fill volumes for input stage K can be found in the chapter [\[19 \]](#).

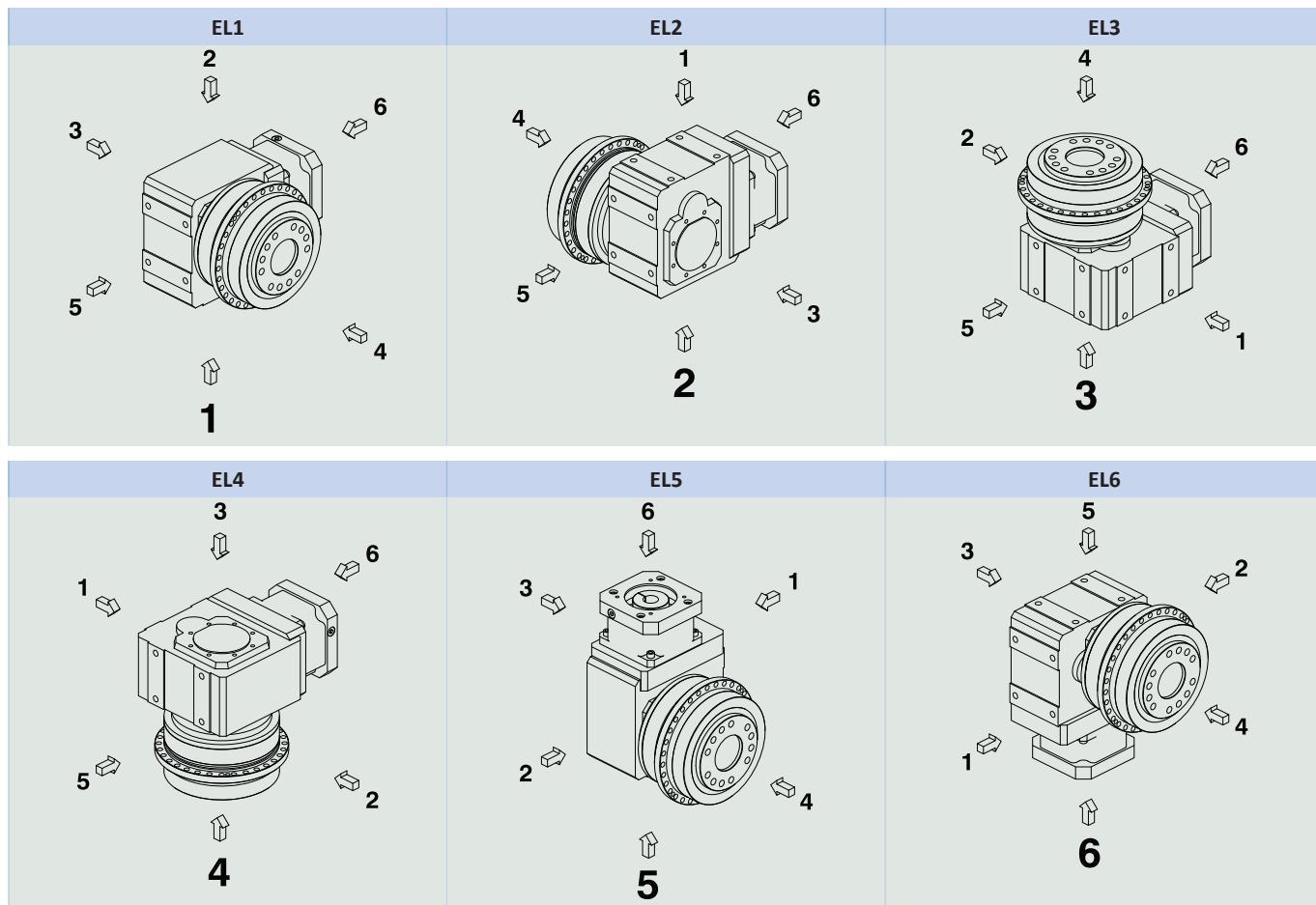
Symbol	Unit	Explanation
V_1	ml	Fill volume for the input stage
V_2	ml	Fill volume for the output stage

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>.

17 Right-angle planetary gear units PH9K5 – PH10K6 / PHQ9K5 – PHQ12K9

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.



Fill volumes for single-stage PHK gear units

Type	i=4, 6	i=6	V ₁ (K)
	V ₂ (PH)	V ₂ (PH)	
PH941_K513	940	–	–
PH1041_K613	–	1200	–

Fill volumes for single-stage PHQK gear units

Type	V ₂ (PHQ)	V ₁ (K)
PHQ941_K513	720	–
PHQ1041_K713	1020	–
PHQ1141_K813	2500	–
PHQ1241_K913	5200	–

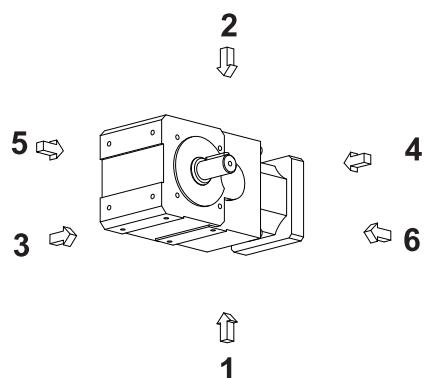
Fill volumes for input stage K can be found in the chapter [19](#).

Symbol	Unit	Explanation
V ₁	ml	Fill volume for the input stage
V ₂	ml	Fill volume for the output 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>.

18 Helical bevel gear units KL1 – KL2

The numbers identify the gear unit sides.



Fill volumes

Type	V
KL102	0.196
KL202	0.409

Symbol	Unit	Explanation
V	l	Fill volume

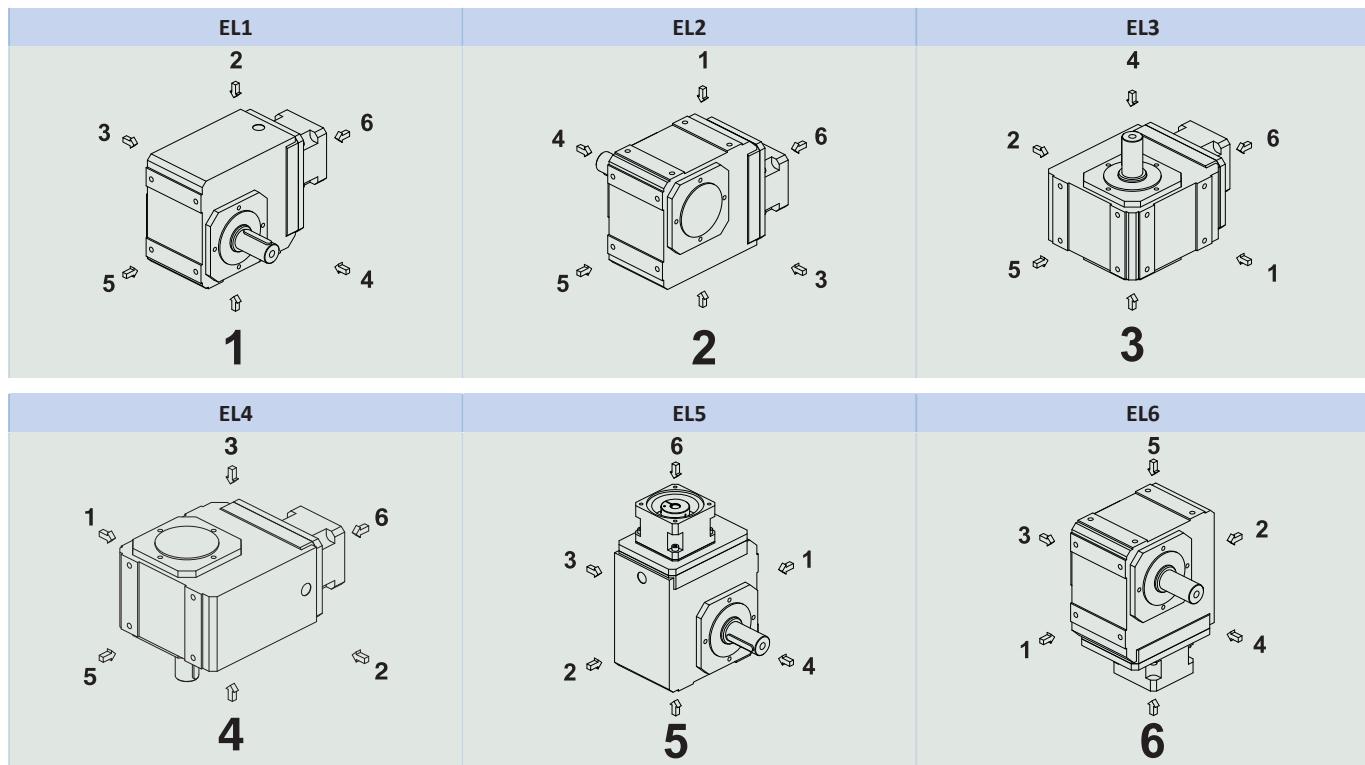
The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at <https://id.stober.com>.

19 Helical bevel gear units K1 – K10

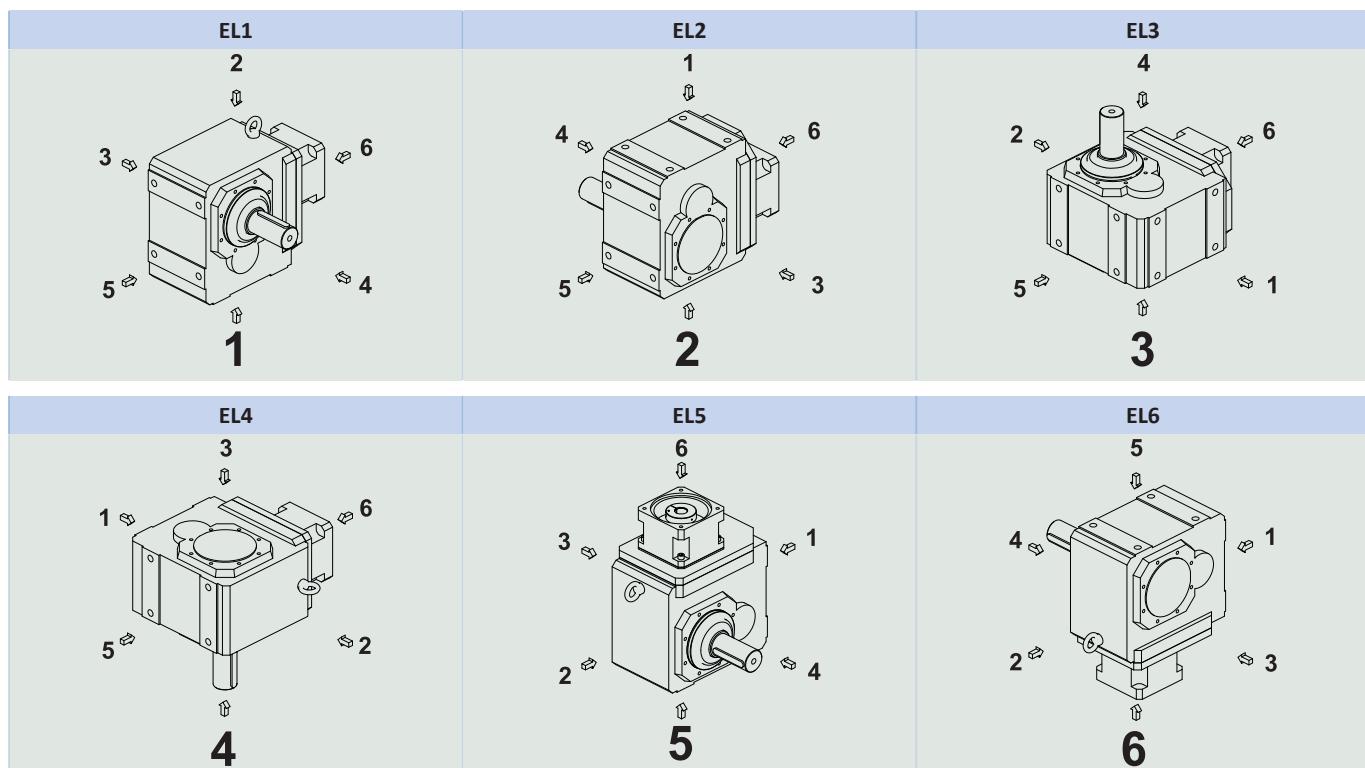
The following table shows the standard mounting positions.

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



Mounting positions for gear unit sizes K5 – K10



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

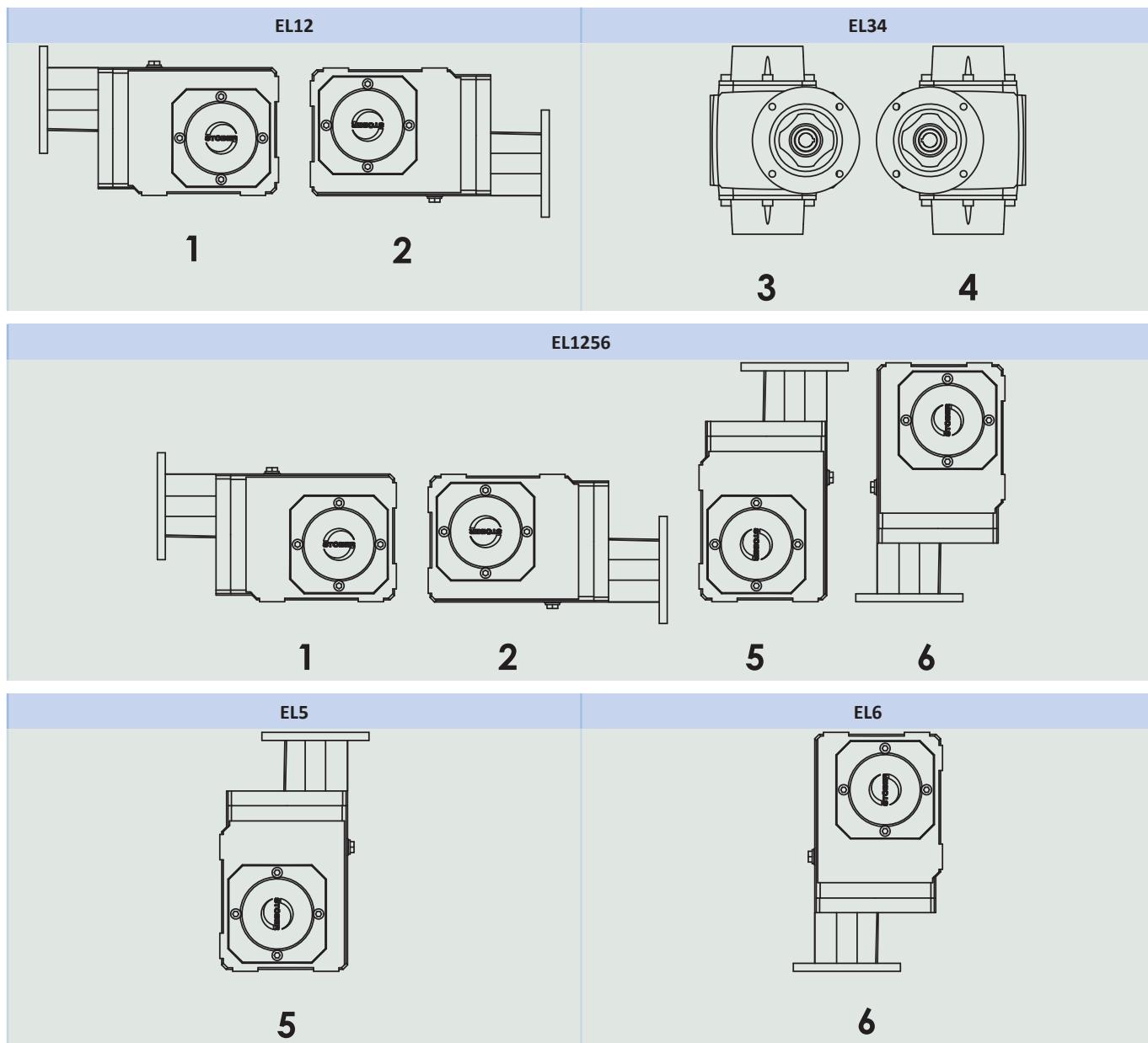
Symbol	Unit	Explanation
V_{EL1}	l	Fill volume for mounting position EL1
V_{EL2}	l	Fill volume for mounting position EL2
V_{EL3}	l	Fill volume for mounting position EL3
V_{EL4}	l	Fill volume for mounting position EL4
$V_{EL5,WDR2}$	l	Fill volume for mounting position EL5 and all shaft designs, 2 shaft seal rings on the output except solid shaft on both sides
$V_{EL5,WDR4}$	l	Fill volume 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 volume for mounting position EL5 and solid shaft
V_{EL6}	l	Fill volume 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>.

20 Helical bevel gear units KSS1 – KSS4

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.



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 volume for mounting position EL12
V_{EL34}	l	Fill volume for mounting position EL34
V_{EL1256}	l	Fill volume for mounting position EL1256
V_{EL5}	l	Fill volume for mounting position EL5
V_{EL6}	l	Fill volume 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>.

21 Two-speed gearboxes PS25 – PS30

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	$V_{EL1,3,4}$	$V_{EL5,LS}$	$V_{EL5,LM}$	$V_{EL5,LL}$
PS25	0.99	2.37	2.45	2.55
PS30	1.05	2.40	2.50	2.60

Symbol	Unit	Explanation
$V_{EL1,3,4}$	l	Fill volume for mounting position EL1, EL3 and EL4
$V_{EL5,LS}$	l	Fill volume for mounting position EL5 and short bearing distance
$V_{EL5,LM}$	l	Fill volume for mounting position EL5 and medium bearing distance
$V_{EL5,LL}$	l	Fill volume 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>.

22 Planetary gear units P2 – P9 (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

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	V	V	V
P222	–	–	–	–	34	34
P322	–	–	–	–	76	76
P422	–	–	–	–	143	143
P522	260	–	–	–	–	–
P522	–	–	275	–	–	–
P722	–	–	–	–	520	520
P822	–	–	–	–	1230	1230
P922	–	–	–	–	2180	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	V	V	V
P322	–	–	–	–	69	69
P422	–	–	–	–	130	130
P522	232	–	–	–	–	–
P522	–	–	247	–	–	–
P722	–	–	–	–	494	494
P822	–	–	–	–	1140	1140
P922	–	–	–	–	1930	1930

Symbol	Unit	Explanation
V	ml	Fill volume
V _{rev,op}	ml	Fill volume 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>.

23 Planetary gear units PA3 – PA8 (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	$12 \leq i \leq 15$	$16 \leq i \leq 100$	$12 \leq i \leq 100$
	V	V	V
PA322	–	–	69
PA422	–	–	117
PA522	210	–	–
PA522	–	225	–
PA722	–	–	460
PA822	–	–	1080

Symbol	Unit	Explanation
V	ml	Fill volume
$V_{rev,op}$	ml	Fill volume 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 Planetary gear units PH3 – PH10 (G2/G3)

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	$12 \leq i \leq 60$	$70 \leq i \leq 100$
	V	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 volume
$V_{rev,op}$	ml	Fill volume 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>.

25 Planetary gear units PHA3 – PHA10 (G2/G3)

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	$12 \leq i \leq 60$		$70 \leq i \leq 100$	
	V	V	V	V
PHA322	53		49	
PHA422	97		92	
PHA522	186		174	
PHA722	450		450	
PHA822	1130		1040	
PHA932	1950		–	
PHA1032	2850		–	

Symbol	Unit	Explanation
V	ml	Fill volume
$V_{rev,op}$	ml	Fill volume 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>.

26 Planetary gear units PHQ4 – PHQ12 (G2/G3)

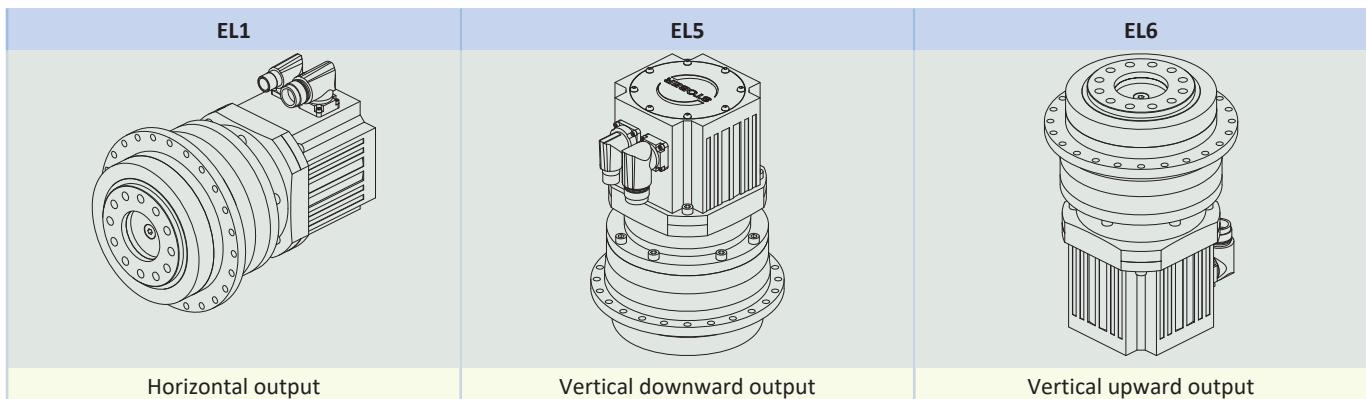
Fill volumes for single-stage gear units

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



Fill volumes for three-stage gear units

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

Symbol	Unit	Explanation
V	ml	Fill volume
$V_{rev,op}$	ml	Fill volume for reverse operation and horizontally aligned output
V_1	ml	Fill volume for the input stage
V_2	ml	Fill volume for the output 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 Planetary gear units PHQA4 – PHQA10 (G2/G3)

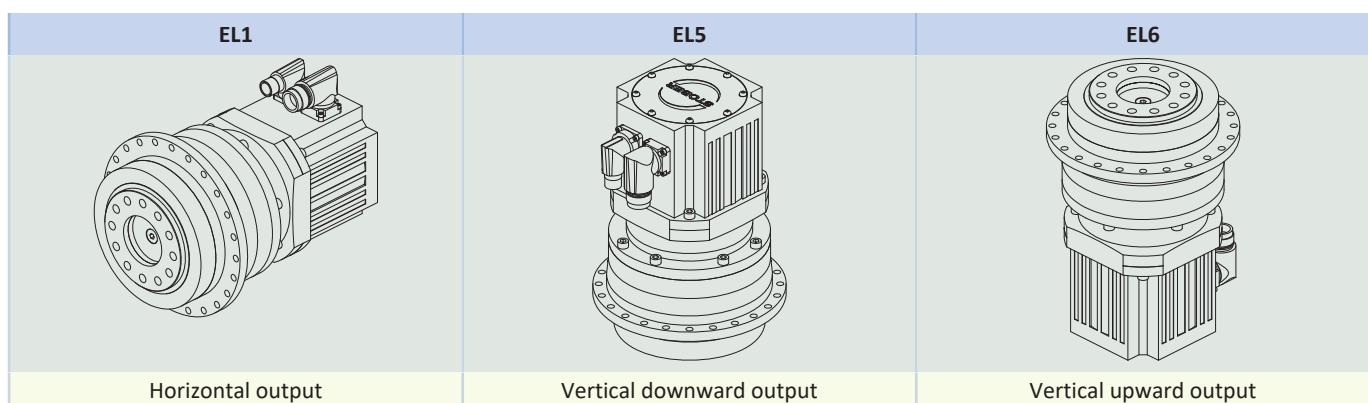
Fill volumes for single-stage gear units

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



Fill volumes for three-stage gear units

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

Symbol	Unit	Explanation
V	ml	Fill volume
$V_{rev,op}$	ml	Fill volume for reverse operation and horizontally aligned output
V_1	ml	Fill volume for the input stage
V_2	ml	Fill volume for the output 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>.

28 Planetary gear units PHV9 – PHV10 (G3)

Fill volumes

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

Symbol	Unit	Explanation
V	ml	Fill volume
$V_{rev,op}$	ml	Fill volume 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>.

29 Planetary gear units PHVA9 – PHVA10 (G3)

Fill volumes

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

Symbol	Unit	Explanation
V	ml	Fill volume
$V_{rev,op}$	ml	Fill volume 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>.

30 Planetary gear units PE2 – PE5 (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)

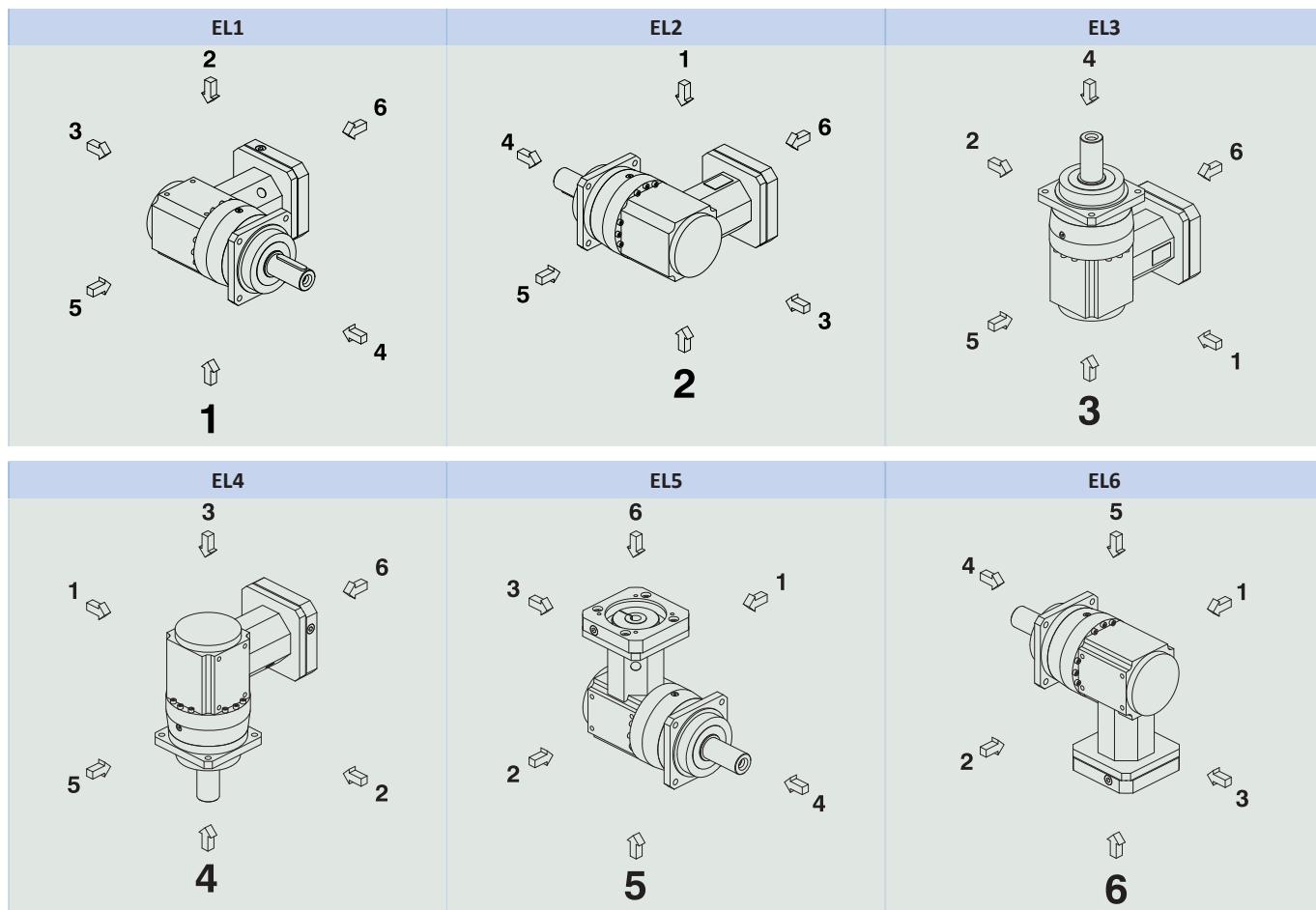
Symbol	Unit	Explanation
V	g (ml)	Fill volume

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>.

31 Right-angle planetary gear units P2KX3 – P9KX8 (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.



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

Type	V ₂ (P)	V ₁ (KX)
P221_KX301	13	42
P321_KX301	39	42
P421_KX401	62	80
P521_KX501	135	160
P721_KX701	225	390
P821_KX801	550	820

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

Type	V ₂ (P)	V ₁ (KX)
P321_KX301	32	42
P421_KX401	49	80
P521_KX501	97	160
P721_KX701	190	390
P821_KX801	450	820

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 ₂ (P)	V ₁ (KX)
P222_KX301	22	42	34	42
P322_KX301	53	42	76	42
P422_KX301	87	42	143	42
P522_KX401	162	80	275	80
P722_KX501	305	160	520	160
P822_KX701	715	390	1230	390
P922_KX801	1340	820	2180	820

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 ₂ (P)	V ₁ (KX)
P322_KX301	50	42	69	42
P422_KX301	77	42	130	42
P522_KX401	140	80	247	80
P722_KX501	283	160	494	160
P822_KX701	670	390	1140	390
P922_KX801	1230	820	1930	820

In the mounting positions EL3 and EL4, there is a shaft seal ring between the input and output stages; so the gear units have separate oil chambers.

In the mounting positions EL1, EL2, EL5 and EL6, there is no shaft seal ring between the input and output stages, so the gear units have a common oil chamber. Nevertheless, the lubricant is filled separately for the input and output stages.

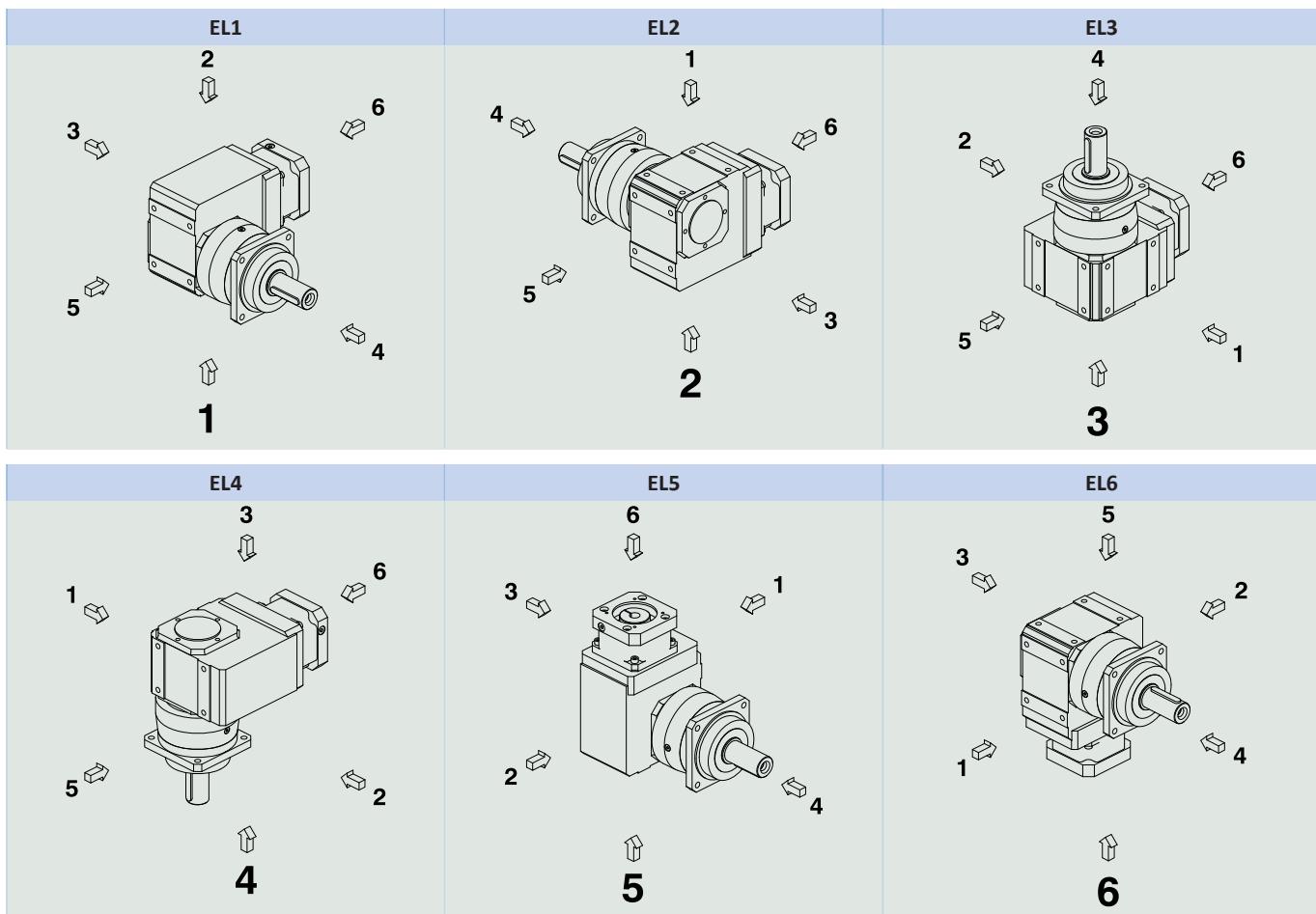
Symbol	Unit	Explanation
V ₁	ml	Fill volume for the input stage
V ₂	ml	Fill volume for the output stage

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>.

32 Right-angle planetary gear units P5K1 – P9K4 (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.



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

Type	V_1 (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_2 (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 [▶ 19].

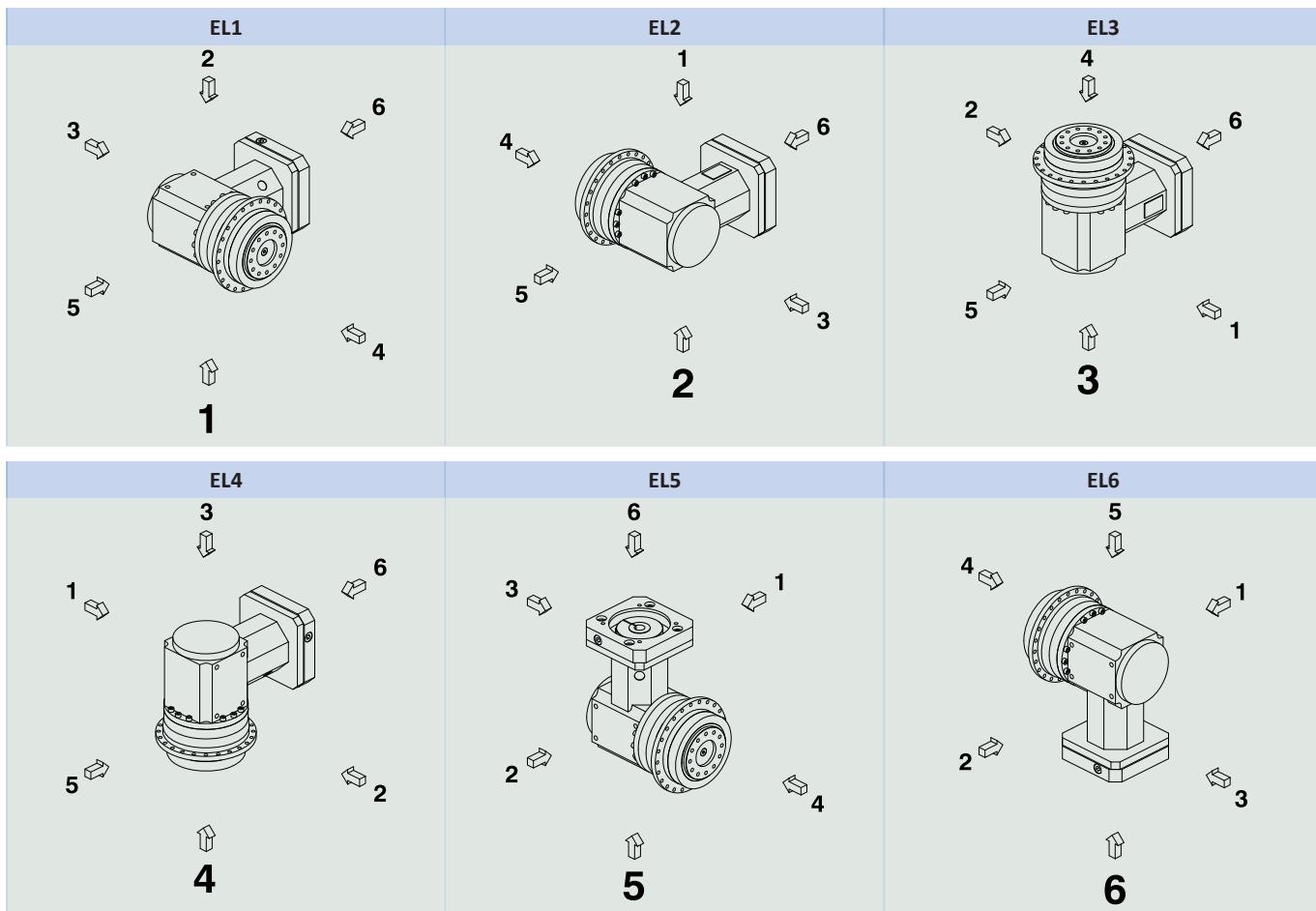
Symbol	Unit	Explanation
V_1	ml	Fill volume for the input stage
V_2	ml	Fill volume for the output stage

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>.

33 Right-angle planetary gear units PH3KX3 – PH10KX8 (G2/G3)

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.



Fill volumes for single-stage gear units

Type	V ₂ (PH)	V ₁ (KX)
PH321_KX301	23	42
PH421_KX401	38	80
PH521_KX501	70	160
PH721_KX701	200	390
PH821_KX801	505	820

Fill volumes for two-stage gear units

Type	EL1, EL2, EL5, EL6		EL3, EL4				V ₁ (KX)
	V ₂ (PH)	V ₁ (KX)	V ₂ 16 ≤ i ≤ 20	V ₂ 25 ≤ i ≤ 50	V ₂ 70 ≤ i ≤ 100	V ₂ 12 ≤ i ≤ 60	
PH322_KX301	36	42	53	53	49	–	42
PH422_KX301	75	42	110	110	104	–	42
PH522_KX401	135	80	209	209	192	–	80
PH722_KX501	280	160	480	480	480	–	160
PH822_KX701	700	390	1200	1140	1110	–	390
PH932_KX801	1270	820	–	–	–	2040	820
PH1032_KX801	1680	820	–	–	–	2850	820

In the mounting positions EL3 and EL4, there is a shaft seal ring between the input and output stages; so the gear units have separate oil chambers.

In the mounting positions EL1, EL2, EL5 and EL6, there is no shaft seal ring between the input and output stages, so the gear units have a common oil chamber. Nevertheless, the lubricant is filled separately for the input and output stages.

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

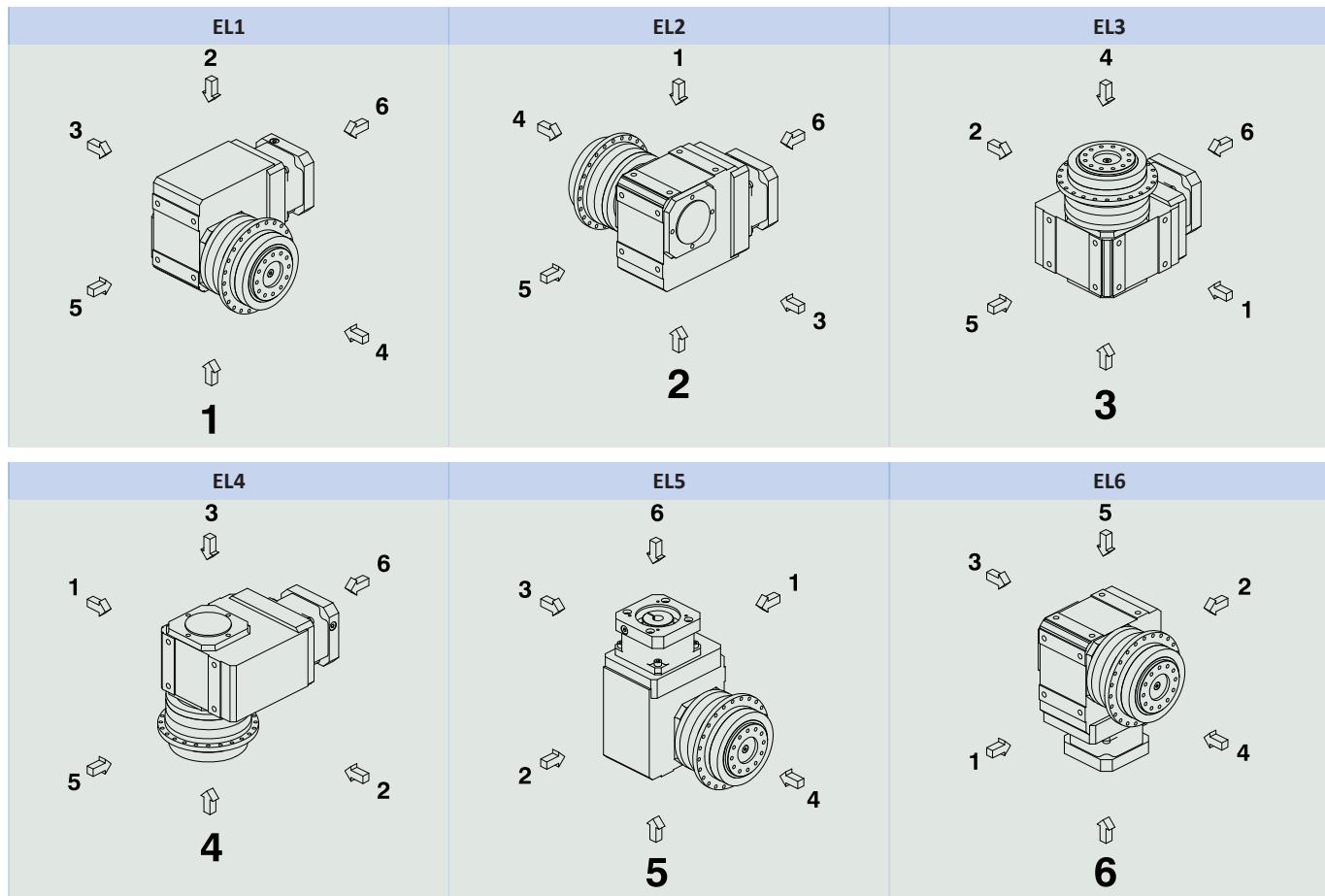
The lubricant specification and mandatory lubricant fill volume for your gear unit can be found on the nameplate or by entering the serial number of the gear unit at <https://id.stober.com>.

34 Right-angle planetary gear units PH5K1 – PH10K6 / PHQ5K1 – PHQ12K9 (G2/G3)

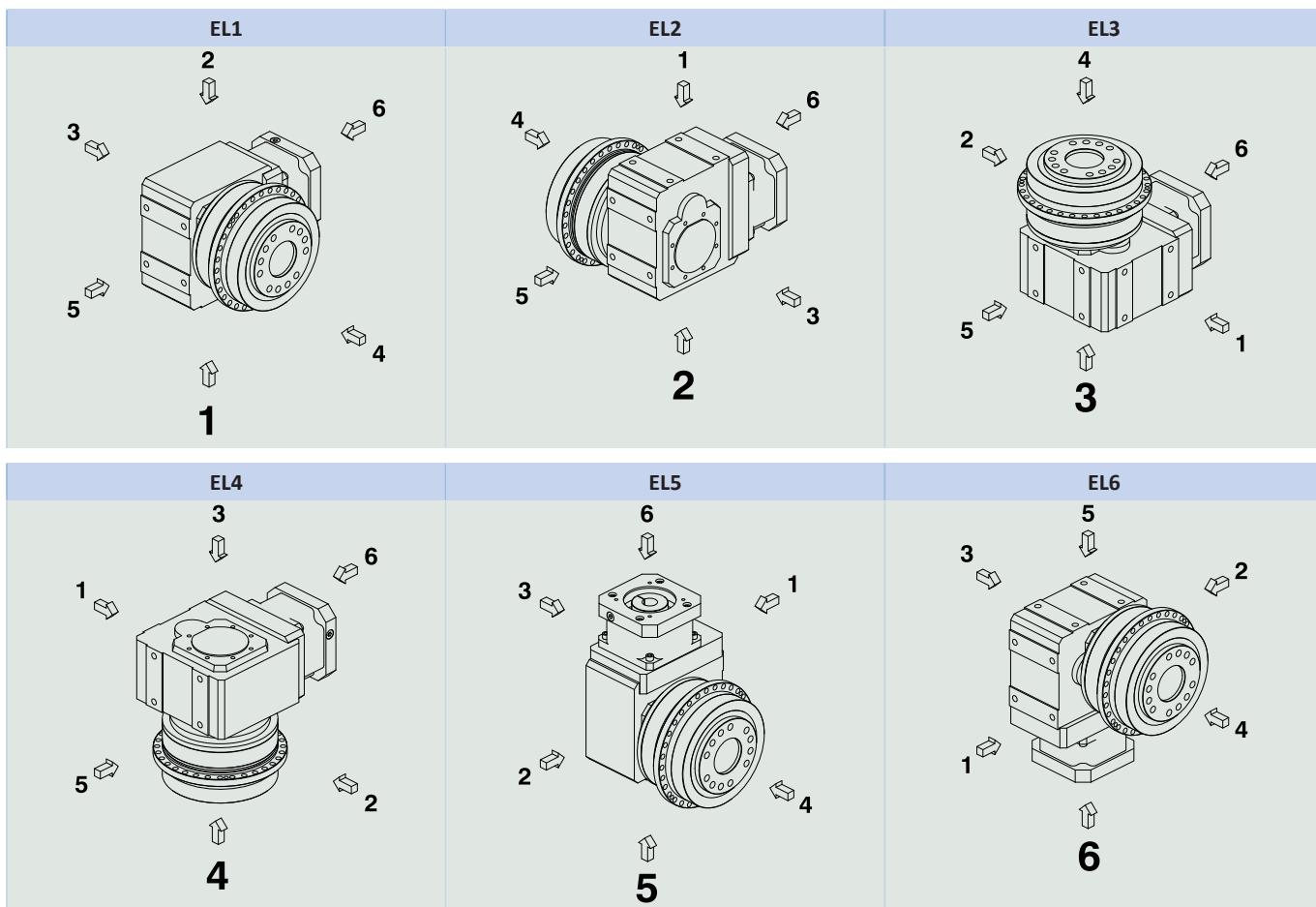
The following table shows the standard mounting positions.

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

PH5K1 – PH8K3 / PHQ5K1 – PHQ8K4



PH9K5 – PH10K6 / PHQ9K5 – PHQ12K9



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	–
PHQ721_K202	200	–
PHQ821_K402	505	–
PHQ931_K513	940	–
PHQ1031_K713	1800	–
PHQ1131_K813	4700	–
PHQ1231_K913	8600	–

Fill volumes for input stage K can be found in the chapter [▶ 19].

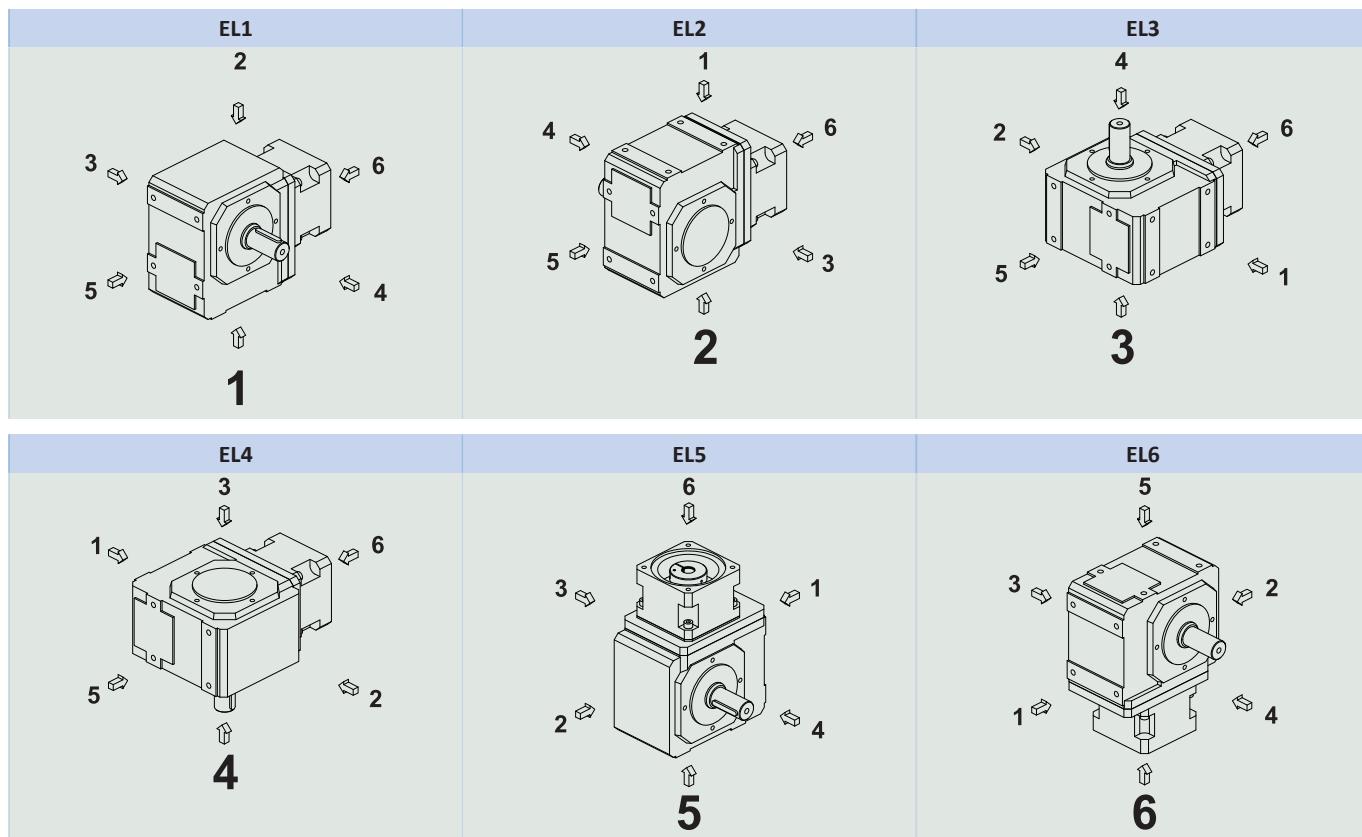
Symbol	Unit	Explanation
V ₁	ml	Fill volume for the input stage
V ₂	ml	Fill volume for the output stage

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>.

35 Helical worm gear units S0 – S4 (G0)

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.



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 _{EL1}	l	Fill volume for mounting position EL1
V _{EL2}	l	Fill volume for mounting position EL2
V _{EL3}	l	Fill volume for mounting position EL3
V _{EL4}	l	Fill volume for mounting position EL4
V _{EL5,WA,WS}	l	Fill volume for mounting position EL5 and hollow shaft/hollow shaft with shrink ring
V _{EL5,WV}	l	Fill volume for mounting position EL5 and solid shaft
V _{EL6}	l	Fill volume 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>.



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