

Contents

	<i>Page</i>
Highlights	4–5
Input Options	6
Output Options	7
Performance Tables	8
Symbols and units	9
Dimensions	10–15
Selection	16
Side Definition and Mounting Positions	17
Options	18–19
Lubrication	20
Technical Service and Maintenance	21
Ordering Codes	22

Any questions? Please contact us.

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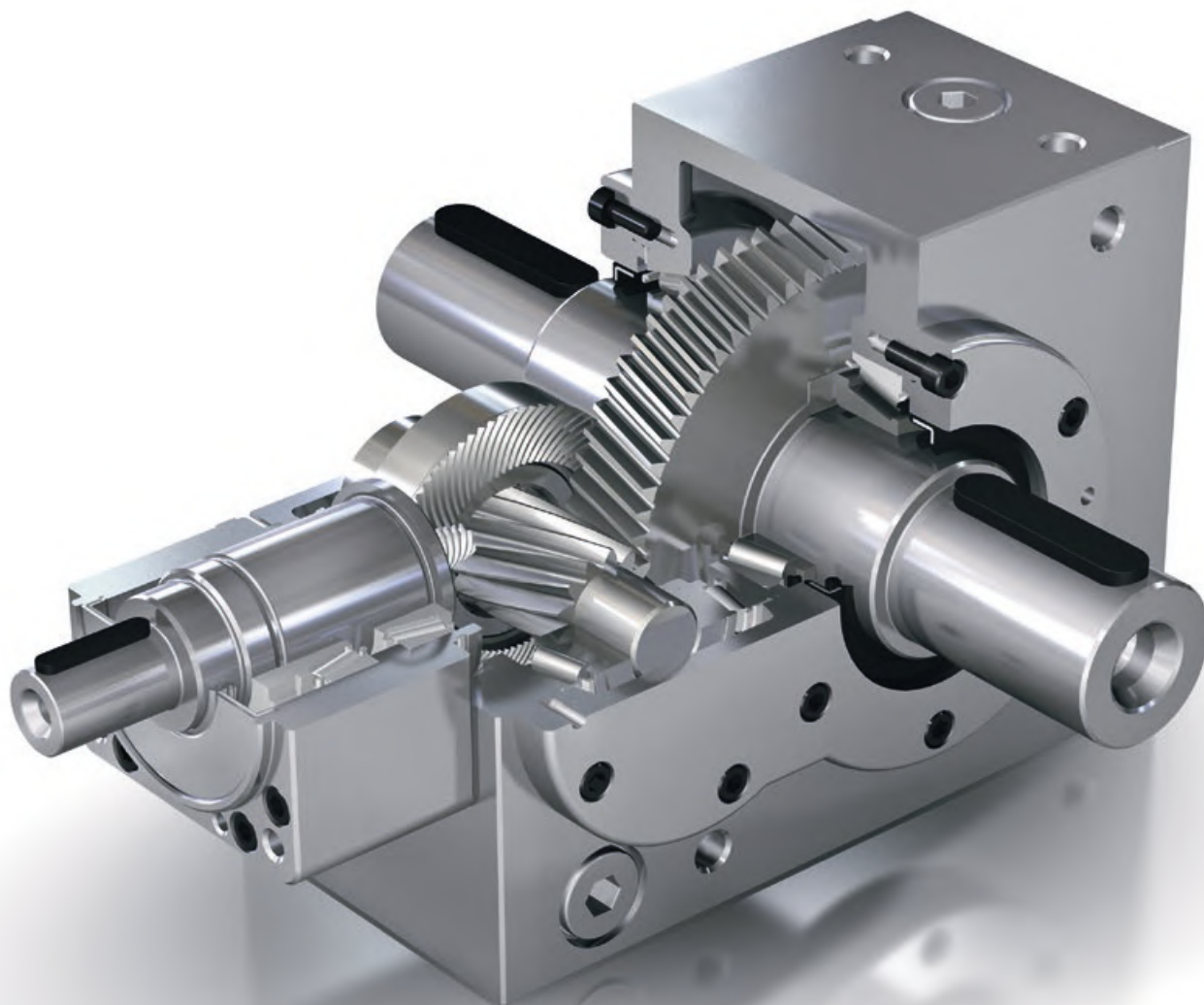
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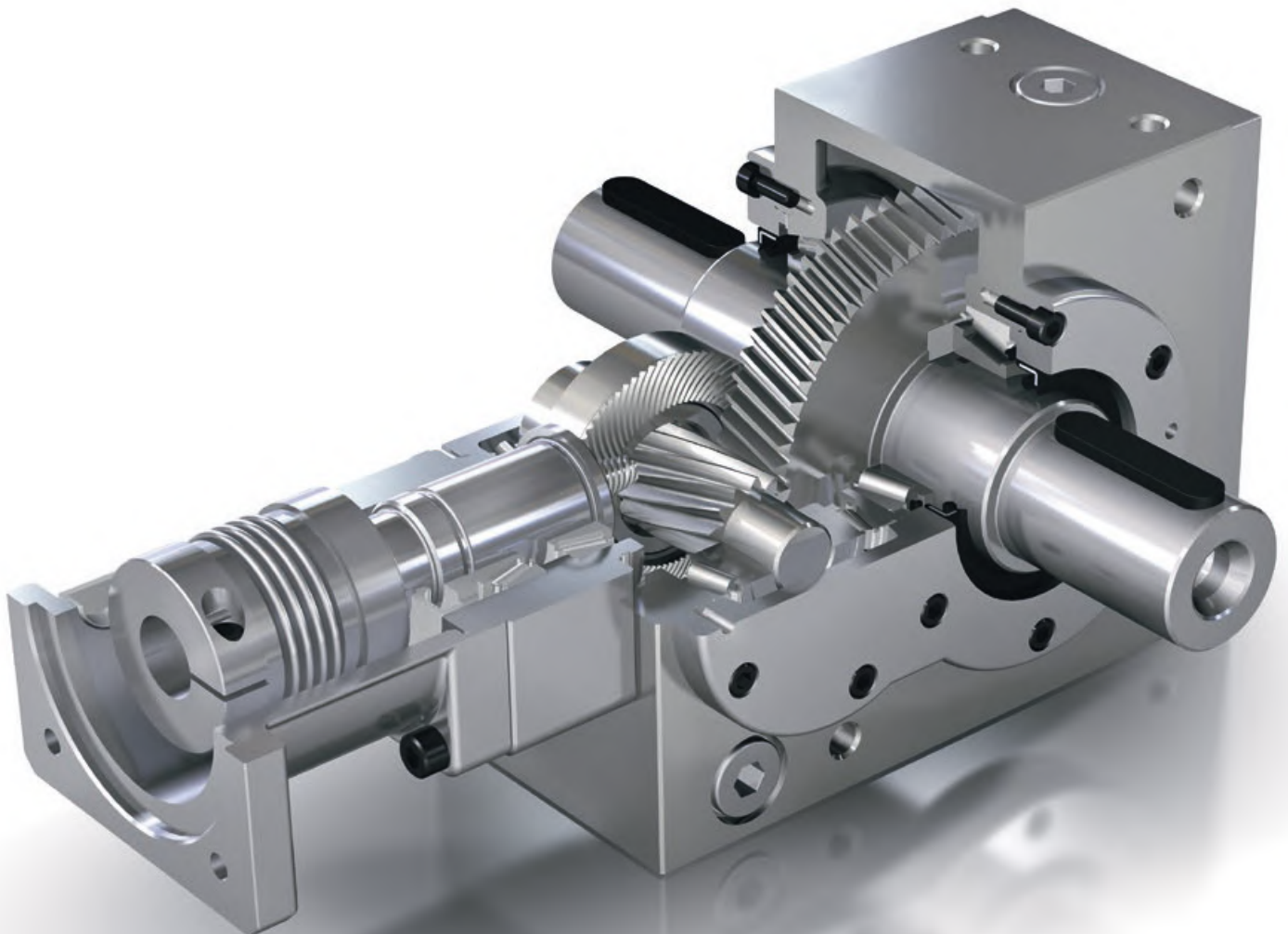
The KS TwinGear Bevel Helical Gearbox is a high performance and precision gearbox. This two-stage gearbox available in ratios up to 75:1 is very space-efficient and suits an array of applications. High torsional stiffness and low backlash ensure a high transmission accuracy.

Features and benefits:

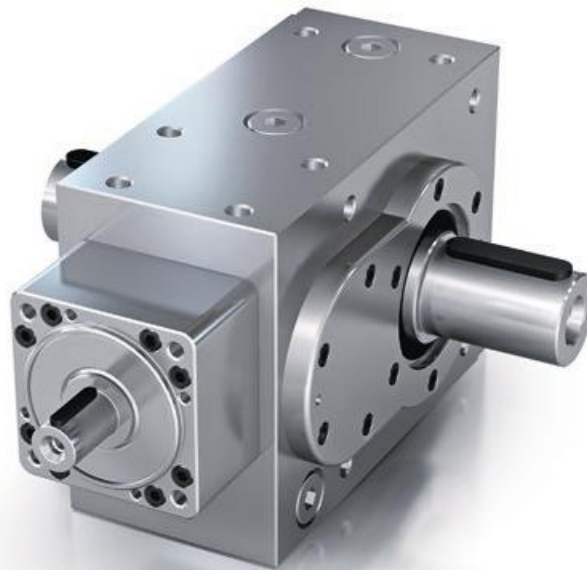
- Precision component parts
- Suitable for high input speeds
- Extremely compact design
- Motor mounting via coupling
- High torsional stiffness
- High torque
- Low-noise hypoid bevel gears



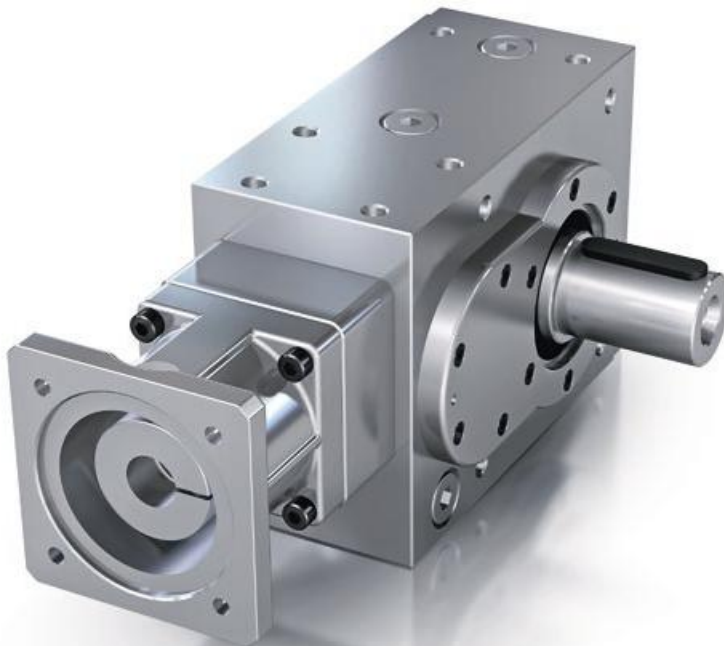
Series	L, H, KL, KH, FL, FH
Shaft arrangements	1L, 3L, 13L, 1LSV, 3LSV
Sizes	KS10 - KS70
Ratios	$i = 15.0 / 20.0 / 25.0 / 30.0 / 40.0 / 50.0 / 60.0 / 75.0$
Nominal output torque	Up to 7500 Nm
Motor mounting	With input flange/coupling (K) or direct with hollow shaft/flange (F)
Backlash	< 6 arcmin



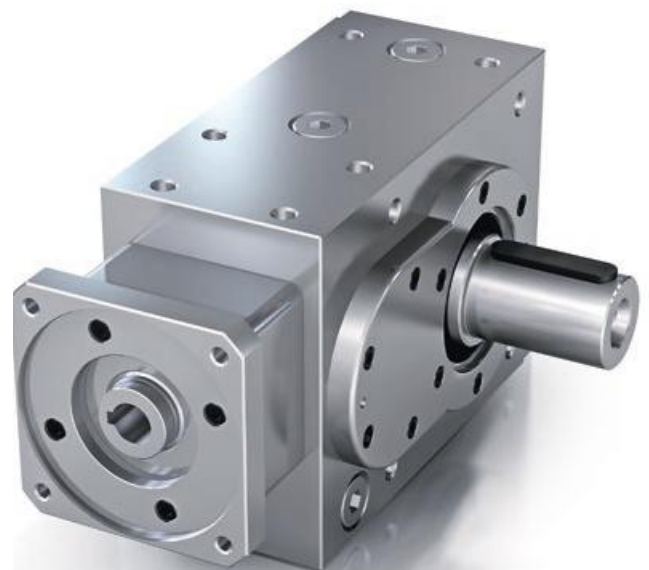
Input Options



***Series L
Solid shaft version***

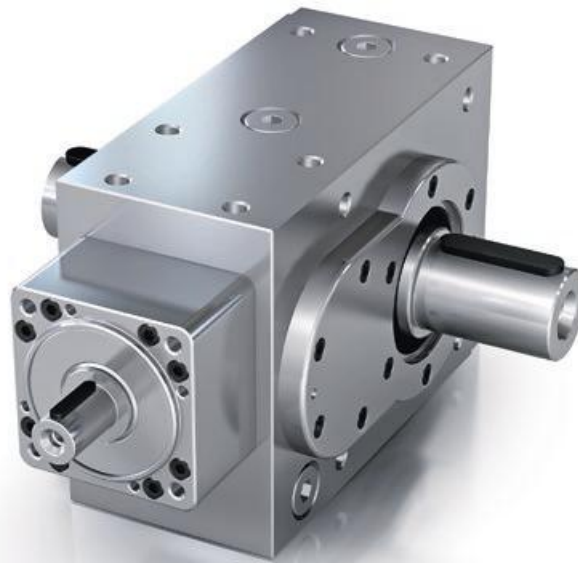


***Series K
Solid shaft version with coupling and
lantern***



***Series F
Hollow shaft version with
input flange***

Output Options



***Series L
Solid shaft version,
both sides or
one side only***



***Series H
Hollow shaft version
with keyway***



***Series H
Hollow shaft version
with extension for shrink disc***

Performance Table / Technical Data

Size		KS10	KS20	KS30	KS35	KS40	KS50	KS60	KS70
Output torque									
Ratio	i	15 / 20 / 25 / 30							
Nominal torque	T_{2N} [Nm]	150	250	480	950	1750	3200	5000	7500
Maximum acceleration ④	T_{2B} [Nm]	225	375	720	1425	2625	4800	7500	11250
EMERGENCY STOP torque ③	T_{2Not} [Nm]	300	500	960	1900	3500	6400	10000	15000
Ratio									
Ratio	i	40 / 50							
Nominal torque	T_{2N} [Nm]	110	200	360	700	1300	3200	5000	7500
Maximum acceleration ④	T_{2B} [Nm]	165	300	540	1050	1950	4800	7500	11250
EMERGENCY STOP torque ③	T_{2Not} [Nm]	220	400	720	1400	2600	6400	10000	15000
Ratio									
Ratio	i	60 / 75							
Nominal torque	T_{2N} [Nm]	75	125	250	475	900	2550	4050	5100
Maximum acceleration ④	T_{2B} [Nm]	110	185	375	710	1350	3825	6075	7650
EMERGENCY STOP torque ③	T_{2Not} [Nm]	150	250	500	950	1800	5100	8100	10200
Input speed									
Ratio	i	15 / 20 / 25 / 30 / 40 / 50 / 60 / 75							
Maximum speed ⑤	n_{1max} [min ⁻¹]	8000	7000	6000	5000	4000	4000	3500	3500
Nominal speed	n_{1N} [min ⁻¹]	on request							
Standard backlash ①	j_t [arcmin]	< 6	< 6	< 6	< 5	< 5	< 4	< 4	< 4
Permissible radial force ②	F_{2Rmax} [N]	4900	7200	10000	15000	18000	25000	30000	35000
Permissible axial force ②	F_{2Amax} [N]	2450	3600	5000	7500	9000	12500	15000	17500
Running noise i=15-50 ⑥	L_{pA} [dB(A)]	< 69	< 69	< 71	< 71	< 73	< 73	< 75	< 75
Running noise i=60-75 ⑥	L_{pA} [dB(A)]	< 67	< 67	< 69	< 69	< 71	< 71	< 73	< 73
Weight, approx.	m [kg]	10	16	27	52	75	115	190	300
Efficiency at max load	η [%]	>92 (>90 at i= 60/75)							
Service life	Lh [h]	>15 000							
Lubrication + permissible operating temperature		Please see "Service and Maintenance" page 21							
Paint		Primer RAL 9005 – dulled black							

① At the output, assuming 2 % load and max. 10 Nm

② Point of force application center of output shaft at an output speed of 400 min⁻¹

③ Max 1000 times during the service life of the gearbox

④ Max 1000 cycles per hour, please consider reducing factors in other cases

⑤ Observe permissible operating temperatures -10 °C to 90 °C

⑥ At $n_1=1500$ min⁻¹ and partial load

Maximum motor acceleration torque	T_{1BMot}	Nm
Nominal output torque	T_{2N}	Nm
Maximum output acceleration	T_{2B}	Nm
EMERGENCY STOP output torque	T_{2Not}	Nm
Maximum input speed	n_{1max}	min ⁻¹
Nominal input speed	n_{1N}	min ⁻¹
Output backlash	j_t	arcmin
Torsional output stiffness	C_{t21}	Nm/arcmin
Radial input force	F_{1Rmax}	N
Radial output force	F_{2Rmax}	N
Axial input force	F_{1Amax}	N
Axial output force	F_{2Amax}	N
Efficiency at full load	η	%
Running noise	L_{pA}	dB(A)
Weight	m	kg
Mass moment of inertia	I_1	kgcm ²
Service life	L_h	h
Run time	RT	min
Duty cycle	DC	%
Ambient temperature	t_a	°C
Thermal performance limit	P_{therm}	kW
Performance	P	kW

Dimensions

Main Dimensions and Input Option - Series L

Main Dimensions

Size	A	B	C	D	E	g ₁	g ₂	o	k ₂ ①	q	i	w ₂ ^{F7}	n ₂₁
KS10	75	110	147,5	92,5	55	10,5	10,5	7,5	M8	44	28	55	4
KS20	90	140	180	110	70	13	13	9	M10	55	30	63	4
KS30	110	170	222	137	85	13	13	14	M12	67	37	80	4
KS35	140	210	275	170	105	16	16	18	M16	85	50	95	6
KS40	170	240	322	202	120	16	16	23	M16	95	60	110	6
KS50	210	280	383	243	140	16	23	32	M16	110	75	120	6
KS60	240	360	475	295	180	18	25	38	M20	140	80	130	8
KS70	280	450	585	360	225	18	25	42	M20	175	90	160	10

① usable height of thread 1,5 x thread size

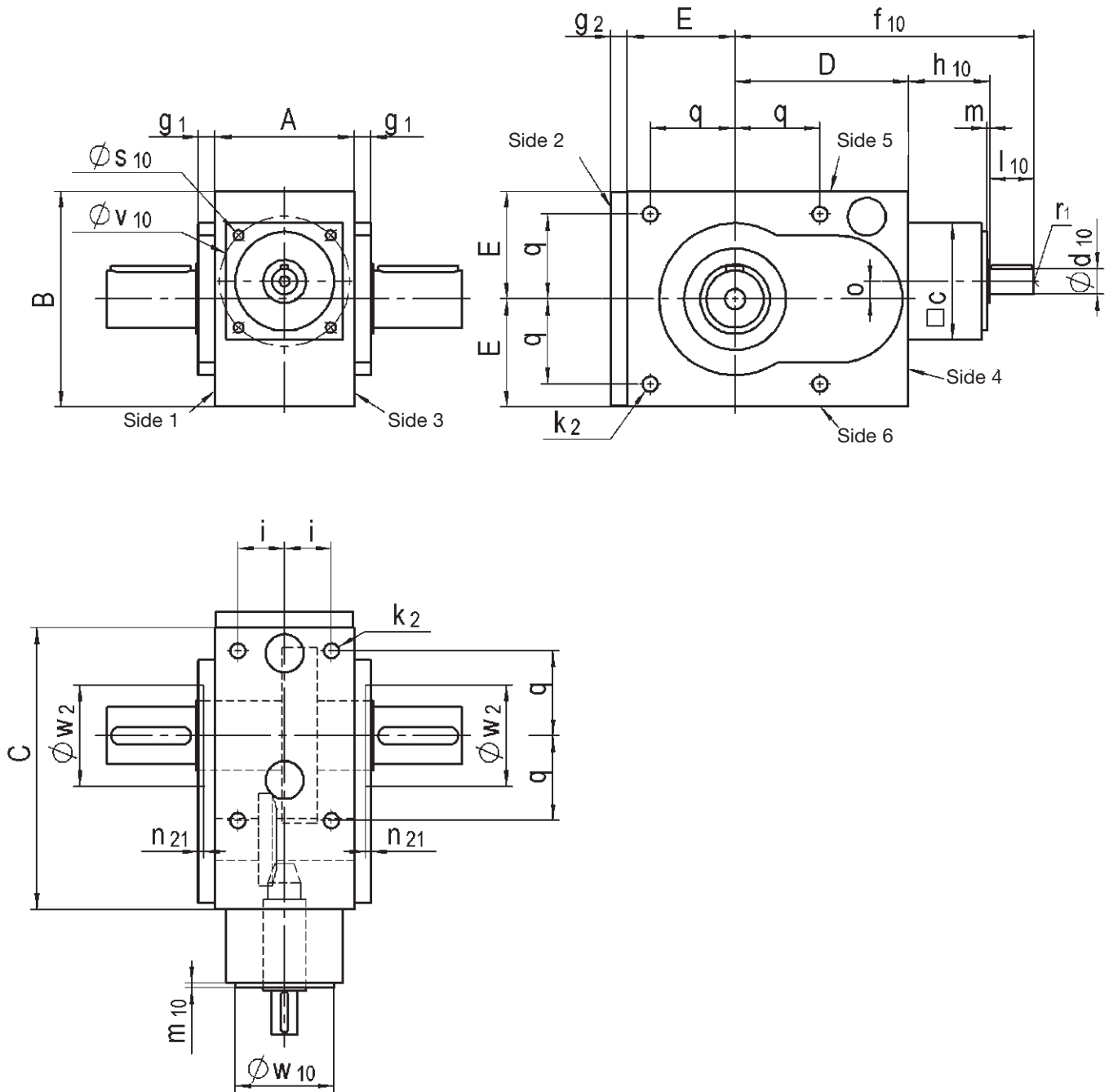
Input Option - Series L

Size	Ød ₁₀ k6	l ₁₀	r ₁ ②	m	□c	Øw ₁₀ g6	m ₁₀	Øv ₁₀	s ₁₀ ①	f ₁₀	h ₁₀	Key ③
KS10	14	25	M5	2	70	51	4	67	M6	171	53.5	5x5x20
KS20	16	30	M6	2	80	68	4	90	M6	196	56	5x5x25
KS30	20	35	M8	2	90	78	4	103	M8	236	64	6x6x32
KS35	26	45	M8	2	105	86	4	115	M8	301	86	8x7x40
KS40	32	50	M12	2	130	107	4	145	M10	356	104	10x8x45
KS50	38	55	M12	2	135	117	4	153	M10	413	115	10x8x50
KS60	45	70	M16	2	145	140	4	165	M12	485	120	14x9x63
KS70	50	80	M16	2	170	150	16	180	M12	580	140	14x9x70

② r₁ to DIN332, Form D

③ Key to DIN 6885/1

Dimensions
Main Dimensions and Input Option -
Series L



Dimensions Output Options

Solid shaft version with key

Size	$\varnothing d_{20}$ k6	l_{20}	f_{20}	n	r_2 ①	Key ②
KS10	30	50	100	2	M10	8x7x45
KS20	35	55	115	2	M12	10x8x45
KS30	45	70	140	2	M16	14x9x63
KS35	55	85	174	3	M20	16x10x80
KS40	65	110	214	3	M20	18x11x100
KS50	80	130	254	3	M20	22x14x100
KS60	90	160	301	3	M24	25x14x140
KS70	100	180	341	3	M24	28x16x160

① r_2 to DIN332, Form D

② Key to DIN 6885/1

Hollow shaft version with keyway

Size	$\varnothing d_{21}$ H7	l_{21}	f_{21}	n	Keyway ③
KS10	25	40	50	2	8x7 (DIN 6885/2)
KS20	28	28	60	2	8x7
KS30	38	38	70	2	10x8
KS35	45	45	89	3	14x9
KS40	55	55	104	3	16x10
KS50	65	65	124	3	18x11
KS60	75	75	141	3	20x12
KS70	90	90	161	3	25x14

③ Keyway to DIN 6885/1

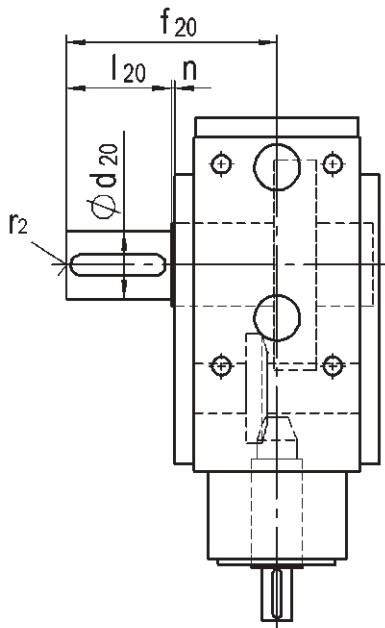
Hollow shaft version with extension for shrink disc

Size	$\varnothing d_w$ H7	$\varnothing d_s$ F7	h_{s0}	h_{s1}	f_s	f_{21}	n
KS10	25	30	22	25	77	50	2
KS20	30	36	25.5	28.5	90	60	2
KS30	40	50	29	33	104	70	2
KS35	50	62	31.5	37	126	89	3
KS40	60	68	31.5	35	141	104	3
KS50	70	80	34	41	165	124	3
KS60	75	95	46.5	51	195	141	3
KS70	90	110	52	60.5	225	161	3

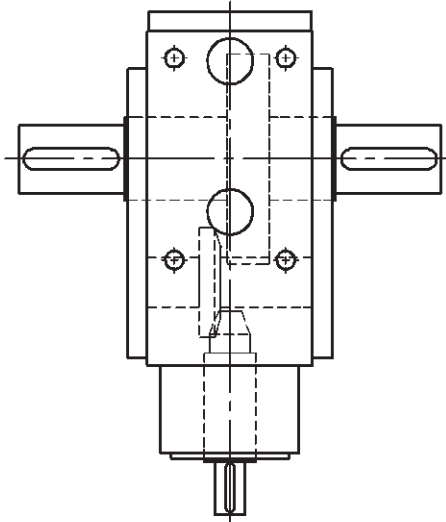
Shrink disc only supplied upon request

Dimensions
Output Options

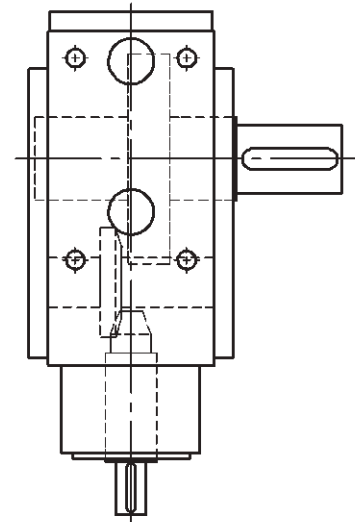
Solid shaft version with key



Shaft arrangement 1L

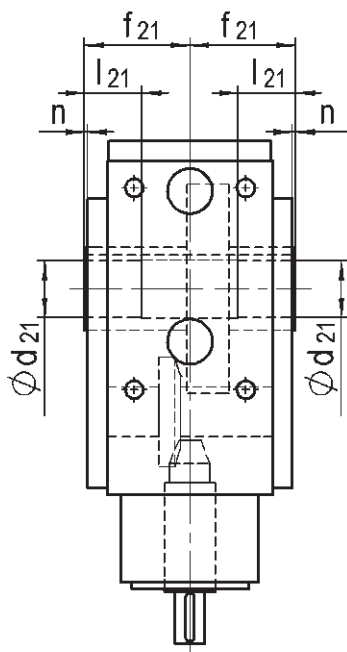


Shaft arrangement 13L



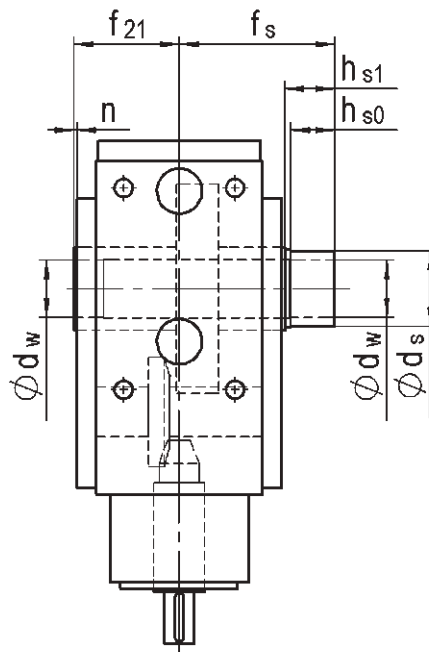
Shaft arrangement 3L

Hollow shaft version with keyway

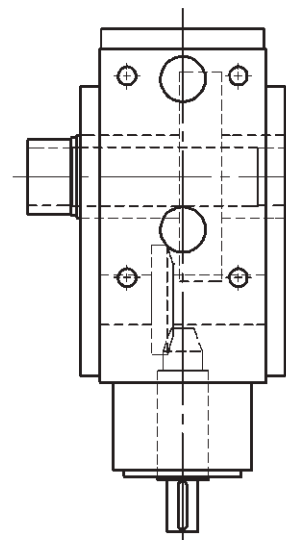


Shaft arrangement 13L

Hollow shaft version with extension for shrink disc



Shaft arrangement 1LSV



Shaft arrangement 3LSV

Dimensions Other Inputs

Series F Hollow shaft version with input flange

Size	Ød ₁₁ x l ₁₁ ①			f ₁₁	h ₁₁	t ₁₁	□c	m ₁₁
KS10	9x23	11x26	14x33	155	62,5	15	70	5
KS20	11x26	14x30	19x43	175	65	15	80	5
KS30	14x30	19x40	24x53	212	75	17	90	5
KS35	19x40	24x53	32x63	270	100	20	105	5
KS40	24x53	32x63	38x83	322	120	22	130	6
KS50	32x63	38x83	42x115	397	154	45	135	6
KS60	38x83	42x115	48x115	454	159	45	145	6
KS70	42x115	48x115	55x115	527	167	45	170	6

Flange dia Øu₁₁ / □u₁₁, pitch circle dia Øv₁₁ with tapped holes s₁₁ and spigot dia Øw₁₁ are motor-dependent.
Please enquire!

① d₁₁ with keyway to DIN6885/1

Series K Solid shaft version with input flange and coupling

Size	Coupling			Lantern		
	Ød ₁₁ x l ₁₂			□u ₁₂ x f ₁₂		
KS10	9x23	11x26	14x33	55x184	75x194	90x197
KS20	11x26	14x30	19x43	75x232	90x232	90x244
KS30	14x30	19x40	24x53	90x281	115x281	115x291
KS35	19x40	24x53	32x63	115x337	140x352	140x362
KS40	24x53	32x63	38x83	140x395	190x400	190x415
KS50	32x63	38x83	48x115	140x481	190x490	260x490
KS60	32x63	38x83	48x115	190x558	260x568	-
KS70	on request			on request		

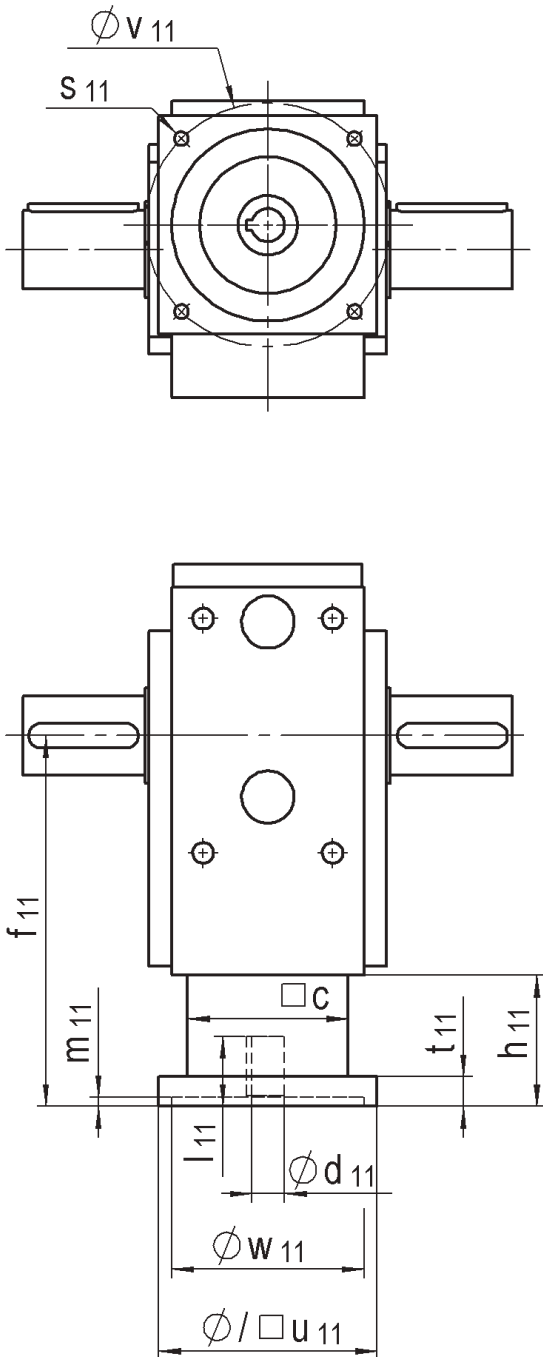
Standard square end □u₁₂ for the relevant motor size. Pitch circle dia Øv₁₂ with tapped holes s₁₂ and spigot dia Øw₁₂ including length m₁₂ are motor-dependent.

Also available with keyway

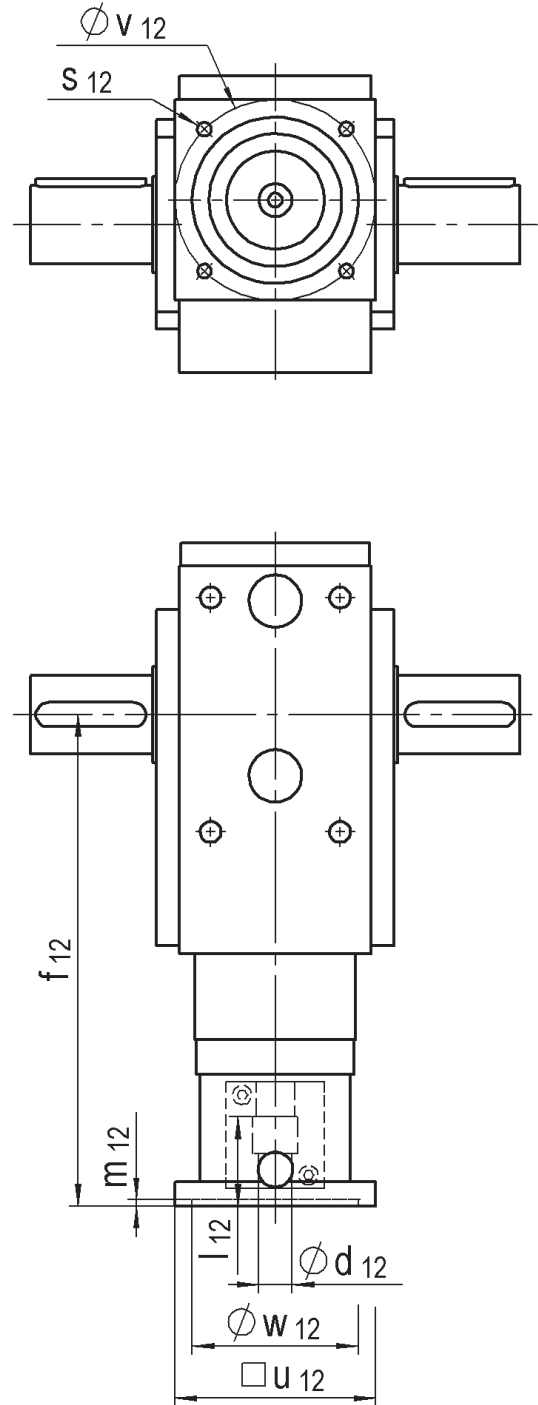
Please attach motor data sheet for Series F and K

Dimensions
Other Inputs

Series F
Hollow shaft version with input flange



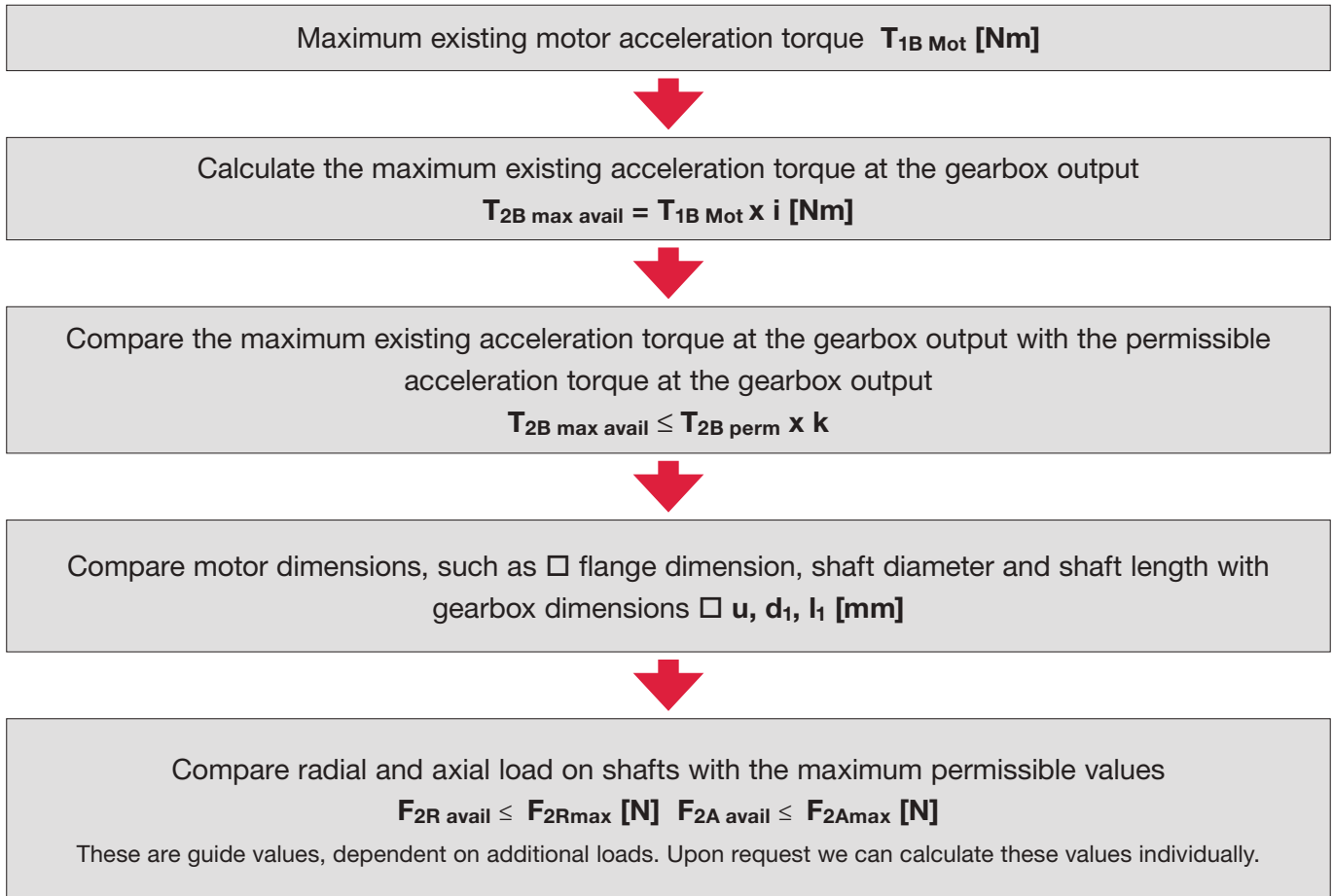
Series K
Solid shaft version with input flange and coupling



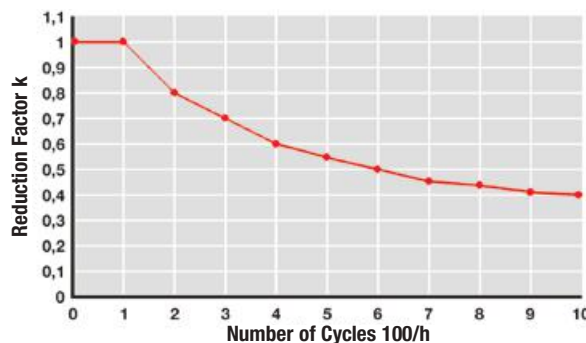
Selection

For entire KS TwinGear range

Operation mode S5 Duty Cycle DC < 60% and Run Time RT < 20 min



Reduction factor for a high number of cycles



Example operation mode S5:

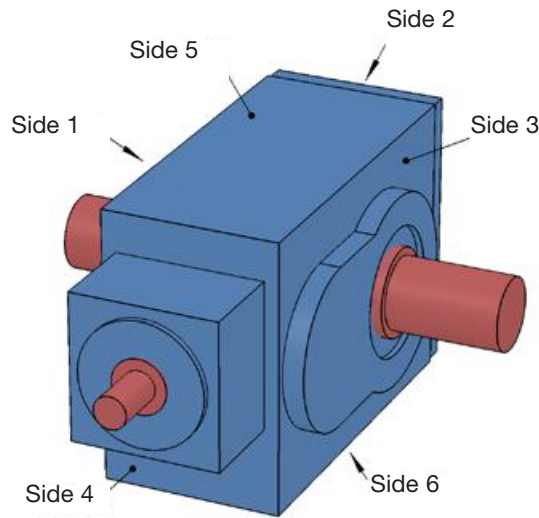
Given: Servo motor	$T_{1Bmax} = 45 \text{ Nm}$	Selection: $T_{2B max.avail} = 45 \text{ Nm} \times 25 = 1125 \text{ Nm}$
Ratio	$i = 25:1$	$T_{2B max avail} \leq T_{2B perm} \times k$
Number of cycles	2000/h	$1125 \text{ Nm} \leq 1425 \text{ Nm} \times 0.8$

Selected: KS40 25:1

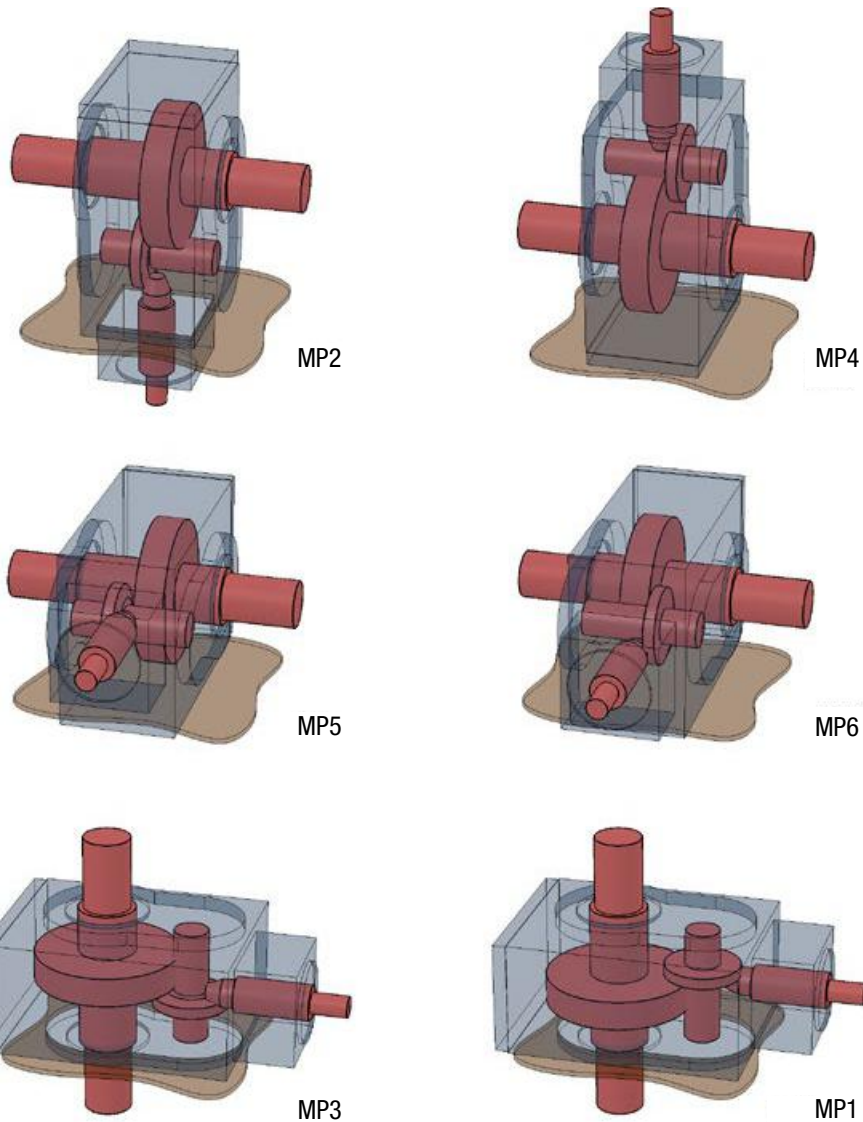
Please contact MS-Graessner in cases of continuous operation mode S1.

We will be pleased to provide detailed selection data for your application.

Side Definition



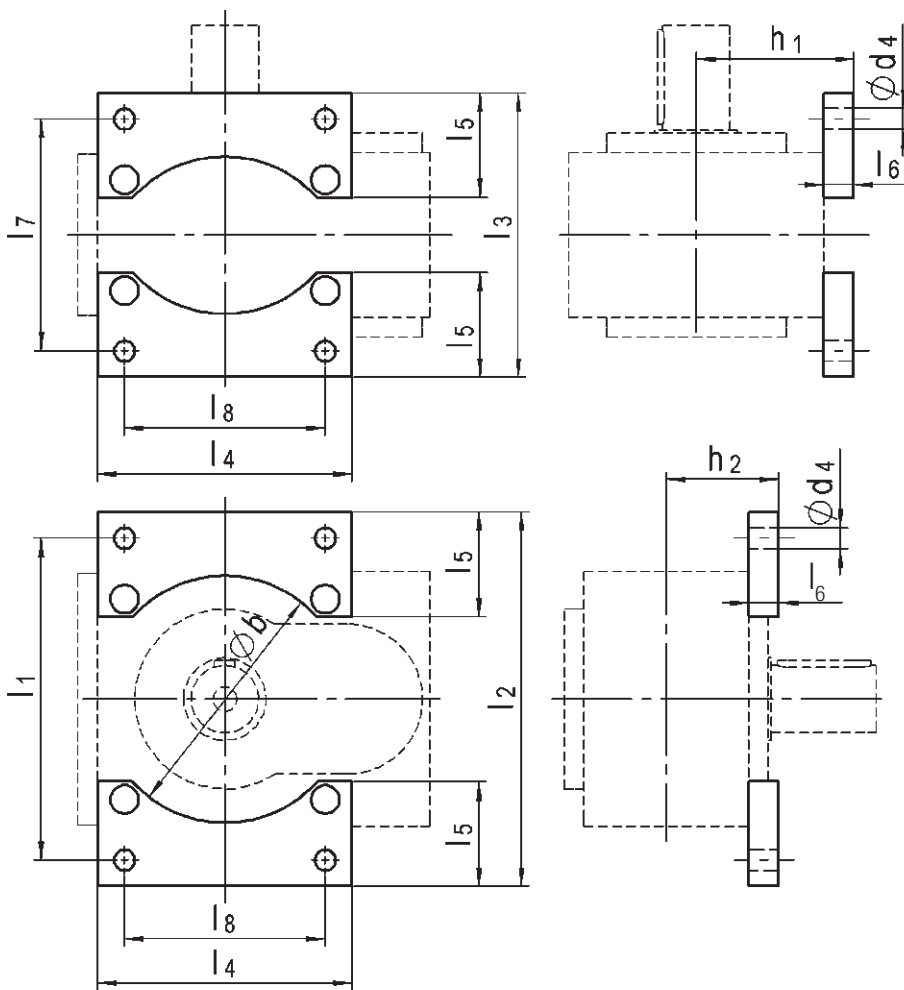
Installation Positions / Mounting Positions



Options
Mounting Components

Universal Mounting Feet

Size	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	$\emptyset b$	h_1	h_2	$\emptyset d_4$
KS10	146	168	136	110	50	17	114	88	108	72	54,4	9
KS20	178	208	158	140	60	20	128	110	135	90	65	11
KS30	215	250	190	170	70	20	155	134	165	105	75	14
KS35	265	310	240	210	90	25	195	170	205	130	95	18
KS40	295	345	275	240	100	30	225	190	235	150	115	18
KS50	335	385	315	280	100	30	265	220	275	170	135	18
KS60	430	480	360	360	125	30	310	280	350	210	150	22
KS70	520	580	410	450	140	30	350	350	440	255	170	22



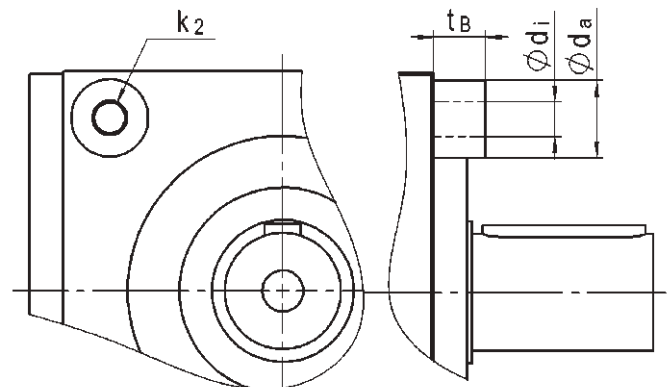
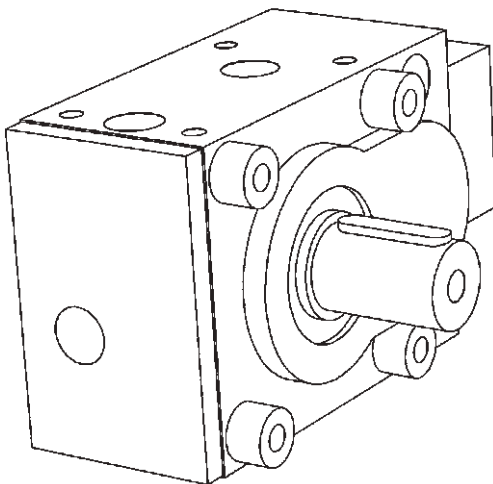
Options

Mounting Components

Space sleeves for tapped holes threads k_2

Size	k_2 ①	d_i	d_a	t_B
KS10	M8	9	20	15
KS20	M10	11	25	20
KS30	M12	13,5	30	20
KS35	M16	17,5	35	25
KS40	M16	17,5	35	25
KS50	M16	17,5	35	25
KS60	M20	22	45	30
KS70	M20	22	45	30

① usable height of thread 1,5 x thread size



Further options

- Shrink discs
- Oil filling (gearboxes are supplied without oil as standard) – please see our recommendation for lubrication on page 20

Lubrication

Recommendation for MS-Graessner Gearboxes

Lubricant	Speed up to/ above min ⁻¹	Viscosity ISO VG DIN 51519 at 40 °C (mm ² /s)	Product				
			Castrol	Castrol performance	Shell	Mobil	Klüber
Mineral oils	500	VG 220	Alpha SP 220	Optigear EP 220 Tribol 1100/220	Shell Omala F220 Shell Omala 220	Mobilgear 600 XP 220	Klüberoil GEM 1-220 N
	1000	VG 150	Alpha SP 150	Optigear EP 150 Tribol 1100/150	Shell Omala F150 Shell Omala 150	Mobilgear 600 XP 150	Klüberoil GEM 1-150 N
	1500	VG 100	Alpha SP 100	Optigear EP 100 Tribol 1100/100	Shell Omala F100 Shell Omala 100	Mobilgear 600 XP 100	Klüberoil GEM 1-100 N
	above 2000	VG 68	Alpha SP 68		Shell Omala 68	Mobilgear 600 XP 68	Klüberoil GEM 1-68 N
Mineral oils for hypoid drives	up to 2000	SAE category 85W-90				Mobilube HD-A 85W-90	
	above 2000	SAE category 80W				Mobilube GX-A 80W	
Synthetic gear oil	500	VG 220	**Alphasyn GS 220	**Tribol 800/220	Shell Tivela S 220 Shell Cassida WG 220	Mobil Glygoyle 30	Klübersynth GH 6-220
Polyglycols (CLP-PG)	1000	VG 150	**Alphasyn GS 150	**Tribol 800/150	Shell Tivela S150 Shell Cassida WG 150	Mobil Glygoyle 22	Klübersynth GH 6-150
	start at 2000	VG 100		**Tribol 800/100		Mobil Glygoyle 11	Klübersynth GH 6-100
Synthetic gear oil	500	VG 220	*Alphasyn EP 220	*Optigear Synthetic PD 220	Shell Omala HD 220	Mobil SHC 630 Mobil SHC Gear 220	Klübersynth GEM 4-220 N
Poly- α -Olefine (CLP-HC)	1000 (3000)	VG 150	*Alphasyn EP 150	*Optigear Synthetic PD 150	Shell Omala HD 150	Mobil SHC 629 Mobil SHC Gear 150	Klübersynth GEM 4-150 N
	1500	VG 100				Mobil SHC 627	
	start at 1500	VG 68				Mobil SHC 626	
Physiologically uncritical oils (PHY-Oil)	1000	VG 220		*Optileb GT 220 **Tribol FoodProof 1800/220	Shell Cassida WG 220	Mobil SHC Cibus 220	*Klüberoil 4 UH1 – 220 N **Klübersynth UH1 6-220
USDA - H1 Certified	1500	VG 150		*Optileb GT 150		Mobil SHC Cibus 150	*Klüberoil 4 UH1 – 150 **Klübersynth UH1 6-150
NSF H1 Certified	start at 1500	VG 100		*Optileb GT 100		Mobil SHC Cibus 100	*Klüberoil 4 UH1 - 68 N

* Synth. KW-Oil, Ester Oil ** Polyglycol Oil

Oil quantities (dependent on ratio, speed, shaft arrangement and installation position)

Size	KS10	KS20	KS30	KS35	KS40	KS50	KS60	KS70
Average oil quantity	0,3	0,6	1,0	1,9	3,0	5,0	9,5	21
Max. oil capacity in litres	0,4	0,75	1,5	2,7	4,5	6,5	13,5	32,5

When changing oil, we recommend that you fill the gear unit with the type of oil previously used. In particular, synthetic oils may not be mixed with mineral oils or other synthetic oils. When changing from mineral oil to synthetic oil, the gearbox must be rinsed thoroughly with new oil type.

Technical Service and Maintenance

Lubrication

KS TWINGEAR gearboxes are supplied without lubrication if not ordered additionally.

For operating temperatures of max 80°C, we recommend the use of mineral hypoid gear oil API GL-4 to MIL-L-2105-A. For operating temperatures up to 95°C (or temporarily up to 110°C), we recommend the use of synthetic gear oils based on Poly-Alpha-Olefin and for temperatures of up to 120°C, polyglycol-based synthetic gear oils to CLP DIN 51517, Part 3, to ISO VG-Class 150 (DIN 51519). Polyglycol-based oils must not be mixed with other synthetic or mineral oils, not even with oil residues. In cases of high temperatures, seals made of suitable materials must be used. Please contact us for information.

Oil change intervals

The first oil change must be carried out after 500 operating hours.

Draining the oil should take place immediately after the unit has been shut down, whilst the oil is still warm. Caution: Danger of scalding!

Further oil changes are recommended every 5000 operating hours, whereby the time intervals shall not exceed 18 months.

Oil drain plugs are fitted on all sides of the gearbox except on the "input" side.

Before re-filling, please ensure that all drain plugs have been inserted and tightened with the exception of the oil filling screw. In cases of doubt, please use new oil seals.

Upon request, gearboxes can be supplied with lubricant indicator (oil sight glass, angular oil level indicator, oil dipstick). This requires details about mounting position and speed.

Gearboxes without lubricant indicator can be filled with the recommended average quantity of oil. For low speeds and where the gearbox is installed pointing upwards. If the gearbox has a lubricant indicator, filling can be carried out precisely. The middle of the oil sight glass indicates the minimum filling level, whereas the maximum filling level is reached when an air bubble above the oil is still visible in the sight glass.

Maintenance

The condition of the gearbox, especially the leak tightness and the oil level must be checked regularly.

Shaft seals which leak must be replaced to ensure operational safety.

Service kits containing wear and tear parts including instructions are available from our service department.

Ordering Example



- | | | |
|-----------------------------|--|-----------------------------|
| 1. Gearbox range | KS TwinGear | |
| 2. Size | KS10 - KS70 | see page 8 |
| 3. Series | L, H, FL, FH, KL, KH | see page 6-7 and page 10-15 |
| 4. Ratio | | see page 8 |
| 5. Shaft arrangement | 1L, 3L, 13L, 1LSV, 3LSV | see page 12-13 |
| 6. Additional data | <ul style="list-style-type: none"> • Operating data and installation position • Options – on request • Customised design – on request | |

Please attach motor data sheet for Series F and K

Please note that

All information contained in this catalogue is provided without guarantee and is not binding. In particular, dimensions and values only provide guidance. Any exact, specific requirements must be agreed with us.

Specifications and features listed in the catalogue are subject to a written contract.

Any questions? Please contact us.

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