



COMBIVERT MOTORS



Systembaukasten

A smooth interaction of motor and drive is necessary for high-quality, precise machine functions. KEB offer the COMBIVERT F5-Multi inverter / servo drive with the option of factory pre-setting motor data.

Complementing this KEB are able to offer both synchronous and asynchronous motor / gearbox solutions offering a variety of encoder / resolver feedback options. Gearbox options are:

- helical inline,
- shaft mounted,
- planetary
- helical worm,
- helical bevel

Optionally available with brake.

Complete solutions are therefore available for the various demands of modern machine and plant engineering. For ease of set up pre-assembled leads offer ready to connect systems.



The following pages describe the current program of closed loop synchronous and asynchronous motors.

SYNCHRONOUS MOTORS

Ideal drives for dynamic applications with low inertia and high pulse moment.

Equipped with resolvers or high-resolution SinCos encoders. Hiperface or EnDat types are also an option.

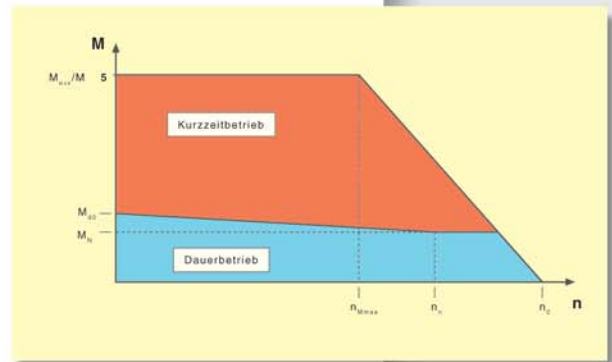
Two motor designs having up to 400 % overload capacity are available.

BASE LINE 0.2...115 Nm

- smooth surfaces
- rear connection

DYNAMIC LINE 0.2...70 Nm

- ripped surface with high thermal reserves
- lateral connections

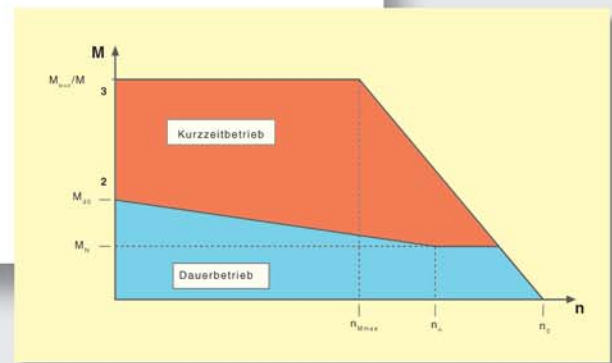


ASYNCHRONOUS SERVO MOTORS

Favoured when high inertias are to be controlled by the motor shaft. In conjunction with the KEB COMBIVERT F5-Multi and incremental or high resolution SinCos encoder feedback the motors offer a high torque ratings event at low speeds.

With the gearbox assemblies KEB COMBIGEAR the speed and torque can be ideally optimised to the requirements of the machine.

TORQUE LINE 0.12...75 kW



BASE LINE Synchronous Servo Motors SM.200

Brushless three phase AC motors with resolver feedback for classic servo applications in all areas of machine and plant engineering. Built with NdFeB permanent magnets in the rotor and 2-pole hollow shaft resolvers the motors have encoder plugs on the B-side and are optionally available with holding brake.

Features

- Smooth housing
- Flange dimension acc. to IEC-norm fitting j6 accuracy acc. to DIN 42955 tolerances acc. to R
- Balance quality acc. to DIN ISO 2373
- Isolation class F acc. to DIN 57530
- Construction type IM B5 acc. to DIN 42950
- Shaft with keyway
- Protection type IP 64
- Integrated resolver on the B-side
- High durability due to brushless technology
- rotatable female connectors

Options

- Holding brake
- Special flanges
- Shafts without keyway
- Radial shaft seal
- Shaft end A-side precisely machined for oil assembly, tolerance k5
- Tropical isolation
- High resolving Hiperface or EnDat encoder
- Gearbox mounting



37 mm



55 mm



88 mm



105 mm



142 mm



190 mm



240 mm

motor size	M _N [Nm]	M ₀ [Nm]	M _{max} [Nm]	n _N [min ⁻¹]	n _m [min ⁻¹]
11.*	0.09	0.1	0.4	6,000	12,000
12.*	0.18	0.2	0.8	6,000	12,000
21.	0.19	0.2	0.8	4,500	8,000
22.	0.36	0.4	1.6	4,500	6,000
23.	0.55	0.6	2.4	4,500	6,000
24.	0.72	0.8	3.2	4,500	6,000
31.	0.6	0.65	2.6	3,000	4,000
32.	1.15	1.3	5.2	3,000	4,000
35.	1.6	1.9	7.6	3,000	4,000
33.	2.15	2.5	10	3,000	4,000
34.	2.5	3	12	3,000	4,000
41.	2.3	2.6	10.4	3,000	4,000
42.	4.6	5.3	21.2	3,000	4,000
43.	6.4	7.5	30.0	3,000	4,000
44.	8.5	9.5	38.0	3,000	4,000
51.	5.6	6.6	19.8	3,000	4,000
52.	8.5	10.5	31.5	3,000	4,000
53.	10.7	13.5	40.5	3,000	4,000
54.	14.5	17	51.0	3,000	4,000
55.	17.5	22	66.0	3,000	36,000
61.	10.0	13.5	40.5	3,000	4,000
62.	14.0	19	57.0	3,000	4,000
63.	16.0	22	66.0	3,000	4,000
64.	24.0	29	101.5	3,000	38,000
71.	20.0	26	78	3,000	4,000
72.	23.0	32	96	3,000	4,000
73.	26.0	40	120	3,000	38,000
81.	30.0	40	120	3,000	3,500
82.	50.0	68	204	3,000	3,400
83.	70.0	93	279	2,000	2,200
84.	85.0	115	345	2,000	2,200

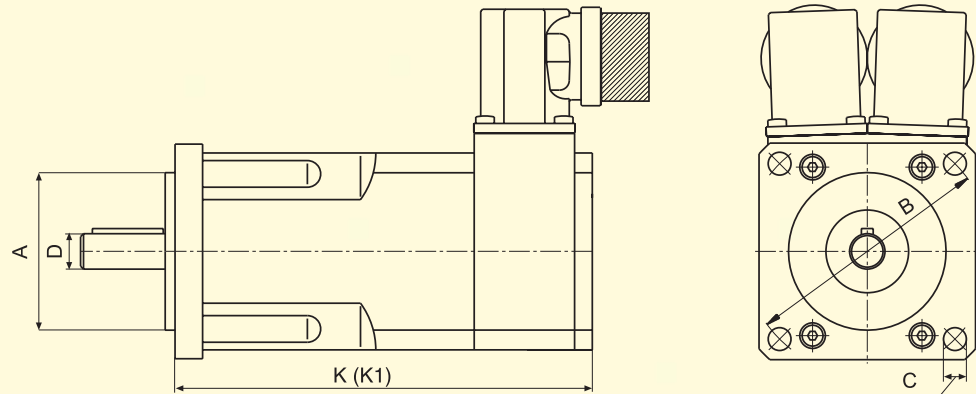
* Motor without thermo contact, connection to open mo



M _{max} [Nm]	J _L [kgcm ²]	1/3 ph. 230 V (180... 260 V)				3 ph. 400 V (305... 500 V)			
		I _{0/200V} [A]	I _{N/200V} [A]	I _{max/200V} ** [A]	recommended amplifier size	I _{0/400V} [A]	I _{N/400V} [A]	I _{max/400V} ** [A]	recommended amplifier size
0.00	0.06	0.6	0.6	2.5	05.				
0.00	0.08	0.93	0.9	4.2	05.				
0.00	0.06	0.6	0.6	2.5	05.	0.4	0.5	2.0	07.
0.00	0.08	0.9	0.9	3.9	05.	0.5	0.5	2.3	07.
0.00	0.11	1.2	1.1	5.0	05.	0.7	0.7	3.1	07.
0.00	0.13	1.5	1.5	6.5	05.	0.9	0.9	3.6	07.
0.00	0.39	1.1	1.0	4.6	05.	0.7	0.6	2.8	07.
0.00	0.65	1.7	1.6	7.2	05.	1.0	1.0	4.3	07.
0.00	0.92					1.4	1.0	6.1	07.
0.00	1.2	3.0	2.7	13.0	07.	1.8	1.6	7.7	07.
0.00	1.5					2.1	1.8	9.0	09.
0.00	1.9	3.1	3.0	18.9	09.	1.9	1.9	11.6	09.
0.00	2.65	6.3	5.7	27.5	10.	4.1	3.8	25.1	12.
0.00	4.15	8.6	7.6	38	12.	4.8	4.4	29.4	12.
0.00	6.05					6.4	6.0	38.3	13.
0.00	6.05					4.7	4.2	23.4	12.
0.00	9.3					7.2	7.7	35.9	13.
0.00	10.6					9.2	7.7	45.7	14.
0.00	9.5					10.6	9.3	52.8	14.
0.00	11.7					12.8	10.5	63.7	15.
0.00	10.8					10.6	8.4	53.0	14.
0.00	15.7					13.4	10.8	66.8	15.
0.00	18.8					15.9	11.8	74.8	15.
0.00	29.5					17.2	14.7	87.0	16.
0.00	67					16.9	14.1	65.9	16.
0.00	81					21.3	16.8	82.9	17.
0.00	101					23.9	17.3	93.0	17.
0.00	76.1					21.8	17.8	85.0	17.
0.00	113.6					35.8	27.8	139.4	19.
0.00	152.6					33.1	26.0	129.0	19.
0.00	190.1					42.1	32.4	164.3	20.

BASE LINE Synchronous Servo Motors SM.200

Dimensions



Motor size	A	B	C	D	K	m		K1	data permanent magnet brake										
						motor [kg]	brake [kg]		M_{brake} [Nm]	J_{brake} [kgcm ²]	n_{max} [min ⁻¹]	$U_{nom.}$ [V]	$I_{nom.}$ [A]	t_1 [ms]	t_2 [ms]	type			
	all dimensions in mm																		
11.	25	32	M3x7	6	83	0.8	0.14		0.4	0.032	10,000	24	0.33	6	10	01.P1			
12.	25	32	M3x7	6	99	0.8	0.14		0.4	0.032	10,000	24	0.33	6	10	01.P1			
21.	40	63	5.8	9	106	0.9	0.18	139	2	0.068	10,000	24	0.46	6	25	03.P1			
22.	40	63	5.8	9	121	1.1	0.18	154	2	0.068	10,000	24	0.46	6	25	03.P1			
23.	40	63	5.8	9	136	1.25	0.18	169	2	0.068	10,000	24	0.46	6	25	03.P1			
24.	40	63	5.8	9	151	1.45	0.18	184	2	0.068	10,000	24	0.46	6	25	03.P1			
31.	80	100	7	14	115	1.9	0.35	148	4.5	0.18	10,000	24	0.5	7	35	05.P1			
32.	80	100	7	14	133	2.3	0.35	166	4.5	0.18	10,000	24	0.5	7	35	05.P1			
33.	80	100	7	14	169	2.5	0.35	202	4.5	0.18	10,000	24	0.5	7	35	05.P1			
34.	80	100	7	14	187	3.3	0.35	220	4.5	0.18	10,000	24	0.5	7	35	05.P1			
35.	80	100	7	14	151	4.0	0.35	184	4.5	0.18	10,000	24	0.5	7	35	05.P1			
41.	95	115	9	19	155	4.5	0.52	187	9	0.54	10,000	24	0.75	7	40	06.P1			
42.	95	115	9	19	185	5.7	0.52	217	9	0.54	10,000	24	0.75	7	40	06.P1			
43.	95	115	9	19	230	7.6	0.52	262	9	0.54	10,000	24	0.75	7	40	06.P1			
44.	95	115	9	19	286	8.7	0.52	318	9	0.54	10,000	24	0.75	7	40	06.P1			
51.	130	165	12	24	186	8.0	1.0	229	18	1.66	10,000	24	0.83	10	50	07.P1			
52.	130	165	12	24	220	9.8	1.0	263	18	1.66	10,000	24	0.83	10	50	07.P1			
53.	130	165	12	24	237	11.2	1.0	280	18	1.66	10,000	24	0.83	10	50	07.P1			
54.	130	165	12	24	230	14.0	1.0	314	18	1.66	10,000	24	0.83	10	50	07.P1			
55.	130	165	12	24	286	17.0	1.0	348	18	1.66	10,000	24	0.83	10	50	07.P1			
61.	180	215	13	24	192	11.9	1.95	238	36	5.9	10,000	24	1.09	22	90	08.P1			
62.	180	215	13	24	226	18.3	1.95	272	36	5.9	10,000	24	1.09	22	90	08.P1			
63.	180	215	13	24	243	21.5	1.95	289	36	5.9	10,000	24	1.09	22	90	08.P1			
64.	180	215	13	24	311	27.5	1.95	357	36	5.9	10,000	24	1.09	22	90	08.P1			
71.	180	215	15	28	240	28.0	1.95	284	36	5.9	10,000	24	1.09	22	90	08.P1			
72.	180	215	15	28	263	32.5	1.95	307	36	5.9	10,000	24	1.09	22	90	08.P1			
73.	180	215	15	28	298	40.0	1.95	342	36	5.9	10,000	24	1.09	22	90	08.P1			
81.	230	265	14.5	38	311	43.0	5.35	379	145	39	8,000	24	2.1	65	190	10.P1			
82.	230	265	14.5	38	379	54.0	5.35	447	145	39	8,000	24	2.1	65	190	10.P1			
83.	230	265	14.5	42	447	74.0	5.35	515	145	39	8,000	24	2.1	65	190	10.P1			
84.	230	265	14.5	42	515	93.0	5.35	583	145	39	8,000	24	2.1	65	190	10.P1			

legend:

t_1 release time $I_{nom.}$ rated current
 t_2 engagement time $U_{nom.}$ nominal voltage
 (+6% / -10 %)

Connection Technology BASE- and DYNAMIC LINE

Allocation of converted wiring and plugs

Connection Resolver

Plug contact no.	description	conductor coloring
1	SIN_LO	red
2	COS_LO	pink
5	SIN_REF_LO	yellow
7	SIN-REF	green
10	SIN	blue
11	COS	grey

contacts 3, 4, 6, 8, 9 and 12 are not assigned.

Connection SIN/COS-encoder

Plug contact no.	description	conductor coloring
1	A (+)	green
2	A (-)	yellow
3	R (+)	grey
4	D (-)	purple
5	C (+)	white
6	C (-)	brown
7	GND	white/green
10	+5 V	grey/pink
11	B (+)	blue
12	B (-)	red
13	R (-)	pink
14	D (+)	black

contacts 8, 9, 15, 16 and 17 are not assigned.

Connection Hiperface-encoder

Plug contact no.	description	conductor coloring
4	REFSIN	red
5	REFCOS	yellow
6	DATA (+)	grey
7	DATA (-)	pink
8	SIN (+)	blue
9	COS (+)	green
10	+12 V	brown
11	GND	white

contacts 1 - 3 and 12 are not assigned.

Connection EnDat-encoder

Plug contact no.	description	conductor coloring
7	+5 V	brown
8	Takt (+)	black
9	Takt (-)	purple
10	GND	white
12	B (+)	blue
13	B (-)	red
14	Data (+)	grey
15	A (+)	green
16	A (-)	yellow
17	Data (-)	pink

contacts 1 - 6 and 11 are not assigned.

Connection performance plug

plug contact no.	description	cable/conductor. no.
1	U	1
4	V	2
3	W	3
2	PE	green/yellow
A	brake (+)	5
B	brake (-)	6
C	PTC-contact	7
D	PTC-contact	8



Converted wiring for

resolver

00.F5.0C1- 1 _ _ _

Sin/Cos

00.S4.209-0 _ _ _

Hiperface

00.S4.809-0 _ _ _

EnDat

00.F5.0C1- 4 _ _ _

performance connection

cross section part-no.

1,5 mm² 00.S4.019-0 _ _ _

2,5 mm² 00.S4.119-0 _ _ _

4 mm² 00.S4.219-0 _ _ _

available standard length:

2 m, 3 m, 5 m,

7 m, 10 m, 15 m,

20 m, 30 m, 50 m



DYNAMIC LINE Synchronous Servo Motors SM.000

are permanently excited, electronically commutated synchronous motors for applications with high demands on quality and positioning accuracy. Offering compact construction, size and weight. The 6 pole motors have NdFeB permanent magnets (high remanence and field strength) and 3 phase winding for sine wave commutation.



- various nominal speeds
- isolation class F
- protection type IP65 (DIN EN 60034-5)
- flange mounted motor and resolver/encoder connections for
- resolver or
- high resolution Hiperface, Endat or SSI encoder

Features:

- Thermal winding protection with sensor to 145 DegC
- Shaft with keyway
- Vibration R according to DIN VDE 0530-14
- Half spine balancing according to DIN ISO 8821 with keyway
- Flange accuracy grade R according to DIN 42955
- Radial grooved bearings with high temperature resistant grease and lifetime lubrication
- Ambient temperature from -20 ... +40 DegC
- Evaluation data dimensioned for operation mode S1
- Usage above 1000 M with no loss of performance

Options

- Holding brake
- Gear mounting
- Special shafts
- forced cooling

motor size	M_N [Nm]	M_0 [Nm]	
55 mm	A1.SM	0.32	0.34
	A2.SM	0.48	0.5
	A3.SM	0.6	0.65
	A4.SM	0.8	1.0
70 mm	B1.SM	0.6	0.65
	B2.SM	1.3	1.5
	B3.SM	2.0	2.3
	C1.SM	0.8	0.95
92 mm	C2.SM	2.4	2.7
	C3.SM	3.9	4.5
	C4.SM	5.0	6.0
	D1.SM	3.7/5.5	4.2/6.2
110 mm	D2.SM	6.1/8.7	7.0/10.5
	D3.SM	8.4/12.2	10.0/14.5
	D4.SM	9.6/15.6	12/18.5
	E1.SM	7.0/11.2	8.5/12.9
140 mm	E2.SM	12.2/18.7	14/21.5
	E3.SM	16.5/26.0	19/30
	E4.SM	21.4/33.0	27/42
	F1.SM	22.5/35.4	25/39
190 mm	F2.SM	42.0/64.0	50/75
	F3.SM	61.0/92.8	70/110
		33.0/85.0	

■ with forced cooling

M_{max} [Nm]	n_N [min ⁻¹]	n_{max} [min ⁻¹]	J_L [kgcm ²]	$I_0 / 200V$ [A]	$I_N / 200V$ [A]	$I_{max} / 200V$ [A]	** recommended amplifier size	$I_0 / 400V$ [A]	$I_N / 400V$ [A]	$I_{max} / 400V$ [A]	** recommended amplifier size
1.7	6000	9000	0.17	1.2	1.3	10.0	05.	0.85	0.9	7.1	07.
2.5	6000	9000	0.24	1.5	1.7	12.8	05.	1.0	1.1	8.5	07.
3.2	6000	9000	0.31	2.0	2.3	15.3	07.	1.2	1.3	9.2	07.
5.0	6000	9000	0.45	3.2	3.4	24.0	07.	1.6	1.7	12.0	07.
3.1	4.000	9000	0.22	1.9	2.0	16.1	07.	0.9	0.9	7.6	07.
3.1	6.000	9000	0.22	2.6	2.5	22.1	07.	1.3	1.2	11.1	07.
7.2	4.000	9000	0.36	3.2	2.9	27.2	07.	1.6	1.4	13.6	07.
7.2	6.000	9000	0.36	5.0	4.4	42.4	09.	2.4	2.1	20.4	09.
11.0	4.000	9000	0.57	5.5	4.7	46.7	10.	2.4	2.0	20.4	09.
11.0	6.000	9000	0.57	7.7	6.6	65.3	12.	3.5	3.0	29.7	09.
4.3	3.000	6.000	1.2	1.5	1.4	10.6	05.	0.8	0.75	5.6	07.
4.3	4.000	6.000	1.2	2.0	1.8	14.1	05.	1.0	0.9	7.7	07.
4.3	6.000	6.000	1.2	3.0	2.4	21.2	07.	1.6	1.3	11.3	07.
12.2	3.000	6.000	2.7	3.2	3.0	22.6	07.	1.9	1.8	13.3	07.
12.2	4.000	6.000	2.7	4.3	3.6	30.4	09.	2.5	2.1	17.6	09.
12.2	6.000	6.000	2.7	6.5	5.3	45.9	10.	3.7	3.0	26.1	10.
20.3	3.000	6.000	4.2	5.1	4.6	36.0	10.	2.9	2.7	20.5	09.
20.3	4.000	6.000	4.2	6.7	5.5	47.3	10.	3.8	3.1	26.8	10.
20.3	6.000	6.000	4.2	9.9	6.7	70.0	10.	5.6	3.8	39.5	12.
27.0	3.000	6.000	5.4	7.1	6.3	50.2	10.	4.2	3.7	29.7	10.
27.0	4.000	6.000	5.4	9.1	7.3	64.3	10.	5.5	4.4	38.9	12.
27.0	6.000	6.000	5.4	13.7	7.9	96.8	12.	7.8	4.5	55.1	12.
27.0	3.000	6.000	4.8	5.3	4.9	35.9	09.	3.0/4.1	2.8/4.2	20.4	09./10.
27.0	4.000	6.000	4.8	7.0	3.5	47.5	09.	4.0/5.4	3.5/5.0	27.2	10./12.
27.0	6.000	6.000	4.8	10.2	8.2	69.2	12.	6.0/8.1	4.8/6.7	40.7	12.
31.5	3.000	6.000	7.4	8.5	8.1	57.7	12.	4.8/6.8	4.5/6.4	32.5	12.
31.5	4.000	6.000	7.4	11.6	10.5	78.8	12.	6.4/9.2	5.8/8.4	43.4	12./13.
31.5	6.000	6.000	7.4	16.0	9.6	108.6	12.	9.9/14.2	5.9/11.7	67.2	13./14.
45.0	3.000	6.000	9.8	12.4	10.9	84.1	12.	7.2/10.4	6.3/9.2	48.8	13./14.
45.0	4.000	6.000	9.8	17.0	13.5	115.4	12.	9.7/14.1	7.7/12.2	65.8	13./14.
45.0	6.000	6.000	9.8	22.6	12.7	152.7	13.	13.6/19.7	7.6/16.0	92.3	14./15.
54.0	3.000	6.000	12.7	14.2	12.2	96.3	12.	8.5/12.3	7.3/11.5	57.7	13./14.
54.0	4.000	6.000	12.7	18.2	13.5	123.5	13.	11.6/16.8	8.6/14.7	78.8	13./15.
42	2.000	4.000	12.3	6.4	5.3	48	10.	3.7/5.6	3.1/5.0	28	10./12.
42	3.000	4.000	12.3	9.6	7.7	72	10.	5.6/8.5	4.5/7.1	42	12.
42	4.000	4.000	12.3	12.8	8.3	97	12.	7.4/11.2	4.8/8.6	56	12./13.
70	2.000	4.000	19.5	10.3	9.0	78	12.	5.6/7.8	4.9/7.5	42	12.
70	3.000	4.000	19.5	16.0	12.5	121	12.	9.0/11.6	7.0/10.9	68	12./14.
70	4.000	4.000	19.5	21.3	11.6	160	13.	12.0/15.2	6.5/13.3	90	13./14.
85	2.000	4.000	26.7	14.0	12.7	95	13.	8.1/12.8	7.3/11.5	55	12./14.
85	3.000	4.000	26.7	21.1	16.8	143	14.	12.4/19.6	9.9/16.1	84	14./15.
85	4.000	4.000	26.7	26.3	12.5	178	14.	16.2/25.6	7.7/19.1	110	14./16.
121	2.000	3.000	36.0	19.8	15.6	34	13.	11.9/15.2	9.4/14.5	80	14./15.
121	3.000	3.000	36.0	27.8	16.0	188	14.	17.3/22.2	9.9/20.2	117	15./16.
88	1.500	4.000	84.0					8.2/12.3	7.5/11.8	41	12./14.
88	2.000	4.000	84.0					11.1/16.6	9.7/15.8	55	14./16.
88	3.000	4.000	84.0					17.0/25.4	13.8/21.9	85	15./17.
88	4.000	4.000	84.0					22.2/33.2	14.8/25.5	110	15./17.
175	1.500	4.000	147					17.0/25.5	14.5/22.1	85	15./17.
175	2.000	4.000	147					22.3/33.5	17.2/28.5	111	15./17.
175	3.000	4.000	147					32.2/48.3	20.6/38.7	160	16./19.
245	1.500	4.000	210					23.1/34.8	20.9/31.8	115	17./19.
245	2.000	4.000	210					30.8/46.0	23.7/41.1	153	17./20.
245	3.000	4.000	210					46.2/69.0	22.9/56.0	229	19./21.

1/3 ph. 230 V (180... 260 V)

3 ph. 400 V (305... 500 V)

**recommended amplifier size F5-M/-S for M_{max} = approx. $2.5 \times M_N$

SERVOGEAR Planetary gears SG.AL

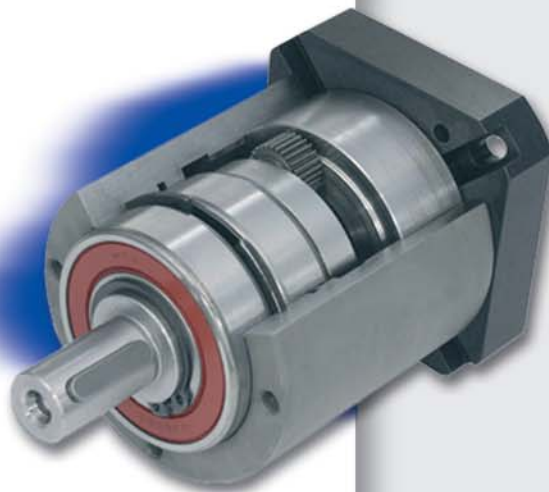
The value planetary type SG.AL provides designers with an economical, precision planetary gearbox that is perfect for today's stepper and emerging low cost servo motors.

The design incorporates single or two stages of planetary gearing to create four frames sizes with rated torque from 6 Nm up to 100 Nm. Standard backlash is 15 arc minutes with low backlash of 12 arc minutes.

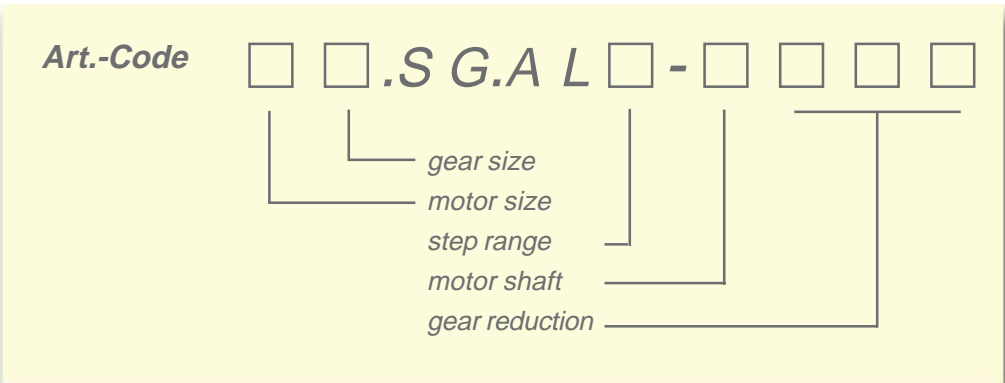
The AL reducer is available in eight standard ratios from 3:1 to 100:1. The cylindrical housing is supplied with either face mounted holes or a square NEMA flange making it a versatile gearbox for global installation.

- high reliability and overload safety
- large gear reduction range $i = 3 \dots 100$
- lifetime lubrication
- low running noise
- optimal efficiency > 95 %
- Abtriebswelle mit Paßfeder
- easy direct attachment of motor

for **BASE LINE** and **DYNAMIC LINE**



The economically efficient gearbox in compact design!

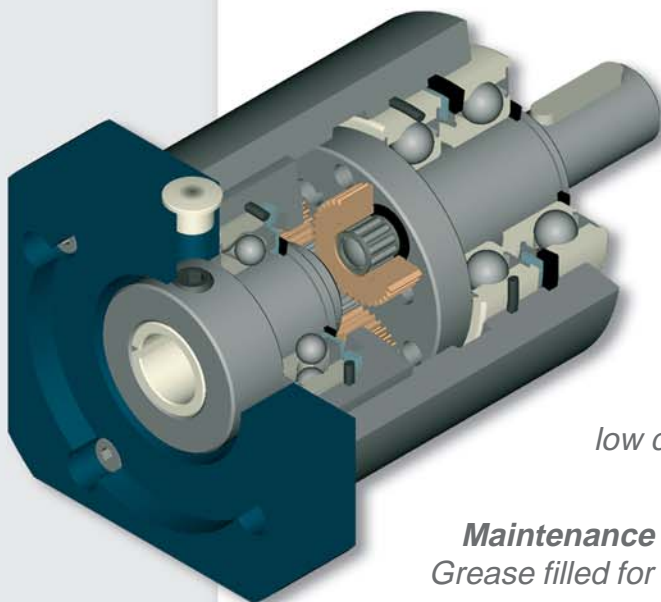


SERVOGEAR

Planetary gears SG.AL

One Piece Construction

Steel body with hardened, integral crown gear provides strength and precision in a small diameter



Universal Servo Interface

Flexible slotted bolt circle and oversized pilot equal easy motor installation and no adapt-ers.

Interchangeability

Mechanically interchangeable with many of today's metric gearboxes or supplied with a NEMA flange.

Outstanding value

Precise, simple design offers good backlash at a low cost.

Maintenance Free Operation

Grease filled for life; never needs service

Output Bearing

Forward output bearing construction allows for higher bearing loads and serves as a pilot helping to provide a more economical package.

classification table

					_1.SG.AL	_2.SG.AL	_3.SG.AL	_4.SG.AL
DYNAMIC LINE	<i>flange</i>	<i>shaft</i>	<i>hole circle</i>	<i>recess</i>				
A1 .. A4. SM.	55	9 x20	63	40	●	-	-	-
B1 .. B3. SM.0	70	11 x23	75	60	●	●	-	-
C1 .. C4. SM.0	92	14x30	100	80	-	●	●	-
D1 ..D4. SM.0	110	19x40	115	95	-	-	●	●
E1 ..E4. SM.0	140	24x50	165	130	-	-	-	●
BASE LINE	<i>flange</i>	<i>shaft</i>	<i>hole circle</i>	<i>recess</i>				
21 ...24. SM.0	55	9x24	63	40	●	-	-	-
31 ...35. SM.0	86	14x30	100	80	-	●	●	-
41 ...44. SM.0	102	19x40	115	95	-	-	●	●
51 ...55. SM.0	142	24x50	165	130	-	-	-	●

Technical data



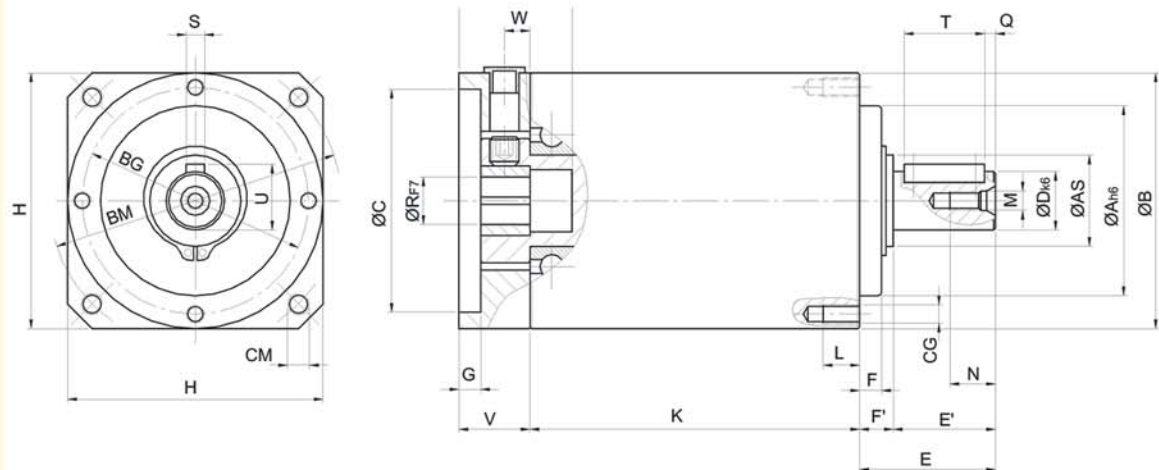
				_1.SG.AL	_2.SG.AL	_3.SG.AL	_4.SG.AL
Peak Output Torque ¹⁾	T_{max}	Nm	3/5/15/25/30/ 50	12	44	80	200
			10 / 100	11	40	74	180
Rated Output Torque ²⁾	$T_{nom.}$	Nm	3/5/15/25/30/ 50	6	22	40	100
			10 / 100	5.5	20	37	90
ratio	i		1 stage	5 / 10	3 / 5 / 10		
			2 stage	25/50/100	15/25/30/50/100		
backlash	j_t	arcmin	1 stage	<=12			
			1 stage	<=15			
torsional stiffness	C_t	Nm / arcmin	3/5/15/25/30/ 50	0.9	3.3	9	24
			10 / 100	0.75	2.8	7.5	20.5
continuous input speed	$n_{1 nom}$	min^{-1}		4000	3700	3400	2600
maximum input speed	$n_{1 max.}$	min^{-1}		8000	6000	6000	4800
maximum radial load ^{B)}	$Fr_{2 max.}$	N		650	1450	2400	4600
maximum axial load ³⁾	$Fa_{2 max.}$	N		700	1550	1900	4000
efficiency	η	%	1 stage	> 97			
			2 stage	> 95			
input inertia	J_1	$kgcm^2$	1 stage	0.060	0.29	1.73	5.5
			2 stage	0.052	0.26	1.48	4.6
weight	m	kg	1 stage	0.75	1.7	4.0	8.8
			2 stage	0.92	2.1	4.9	10.9
noise level	L_{PA}	dB (A)	measured $n_1 = 3000 min^{-1}$	≤ 69	≤ 70	≤ 72	≤ 74
life	L_h	H		20.000			
lubrication				grease			
orientation				any			

¹⁾ max. acceleration moment for cycle rating

²⁾ rated torque for continuous rating

³⁾ related to center output shaft at 100 min^{-1}

Dimensions



Size	[dimensions in mm]		1.SG.AL	2.SG.AL	3.SG.AL	4.SG.AL	
housing \varnothing	B		50	70	90	120	
pilot \varnothing	A	h6	35	52	68	90	
output shaft \varnothing	D	k6	12	16	22	32	
mounting hole circle	BG		44	62	80	108	
mounting holes	CG	4x90°	M4	M5	M6	M8	
shoulder \varnothing	AS		17	25	40	50	
shaft length from mount face	E		24.5	36	46	70	
output shaft length	E'		18	28	36	58	
pilot length	F		4	5	5	6	
thickness	F'		6.5	8	10	12	
thread depth	L		8	10	12	16	
keyway length	T		14	22	32	50	
keyway position	Q		2	3	2	4	
height with key	U		13.5	18	24.5	35	
key width	S	h9	4	5	6	10	
thread size	M		M4	M5	M8	M12	
thread depth	N		8	12.5	19	28	
reducer body length	K	1 stage	48	70	84	103.5	
		2 stage	64	91	110	136	
motor interface dimensions							
maximum motor pilot	C						
hole circle for motor	BM		see classification table				
mounting holes	CM						
max. \varnothing Motor shaft	R		14	16	24	32	
min. square flange	H		50	70	90	120	
maximum pilot length	G		4	4	4	6	
position of access hole	W		6	7	8	10	
flange thickness	V		20	25	16.5	19.5	20
					25	26	36

Further solutions for gearboxes



motor type		gear version			
<i>BASE LINE</i>	<i>DYNAMIC LINE helical</i>	<i>shaft</i>	<i>helical</i>	<i>bevel</i>	<i>helical worm</i>
SM.200	SM.000	G	F	K	S
21 ... 24	A1 ... A4	-	-	-	-
-	B1 ... B3	●	●	●	●
31 ... 33	C1 ... C4	●	●	●	●
41 ... 43	D1 ... D4	●	●	●	●
51 ... 53	E1 ... E4	●	●	●	●
61 ... 72	F1 ... F3	●	●	●	●

Selection and dimensioning of the gears acc. to PC-Programm
KEB-DRIVE!



TORQUE LINE

Asynchronous Servo Motors

The asynchronous servo motors type DK are especially designed for closed loop operation

KEB COMBIVERT F5-Multi

and serve as an economic alternative for demanding drive tasks throughout the whole speed range

- Details:**
- Motor frame B3 or B5
 - Forced cooling IP 55
 - Thermal winding protection via PTC thermistor
 - Optional spring applied brake
 - Incremental encoder 2.500 I/U / RS 422, 5 V DC, 12 pole plug

Size	power [kW]	M_N [Nm]	M_0 [Nm]	M_{max} [Nm]	n_N [min ⁻¹]	n_{max} [min ⁻¹]	J_L [kgcm ²]	brake [Nm]
63	0.12	0.8	0.8	1.7	1.400	3.000	4.0	4
63	0.18	1.2	1.2	2.4	1.405	3.000	4.0	4
71	0.25	1.7	1.7	3.2	1.385	3.000	4.0	4
71	0.37	2.6	2.6	5.2	1.370	3.000	5.0	4
80	0.55	3.6	3.6	8.2	1.400	3.000	8.7	4/8
80	0.75	5.1	5.1	10.6	1.400	3.000	10.7	4/8
90	1.1	7.5	7.5	16.8	1.410	3.000	20.7	8/16
90	1.5	10.2	10.2	23.9	1.400	3.000	26.0	8/16
100	2.2	14.2	14.2	39.6	1.420	3.000	40.0	16/32
100	3.0	20.0	20.0	50.4	1.435	3.000	72.5	32/60
112	4.0	26.6	26.6	76.6	1.435	3.000	90.0	32/60
132	5.5	36.5	36.5	98.6	1.440	3.000	150	60/100
132	7.5	49.7	49.7	130	1.440	3.000	280	100/150
160	11	72.5	72.5	215	1.450	3.000	350	100/150
160	15	98.5	98.5	266	1.465	3.000	780	150/250
180	18.5	121	121	316	1.460	3.000	900	150/250
180	22	143	143	335	1.465	3.000	1380	250/400
200	30	195	195	421	1.465	3.000	1680	250/400
225	37	240	240	540	1.470	3.000	2750	upon request
225	45	292	292	657	1.470	3.000	3130	upon request
250	55	356	356	737	1.475	3.000	5250	upon request
280	75	484	484	958	1.480	3.000	9500	upon request

power > 90 kW upon request



n with the

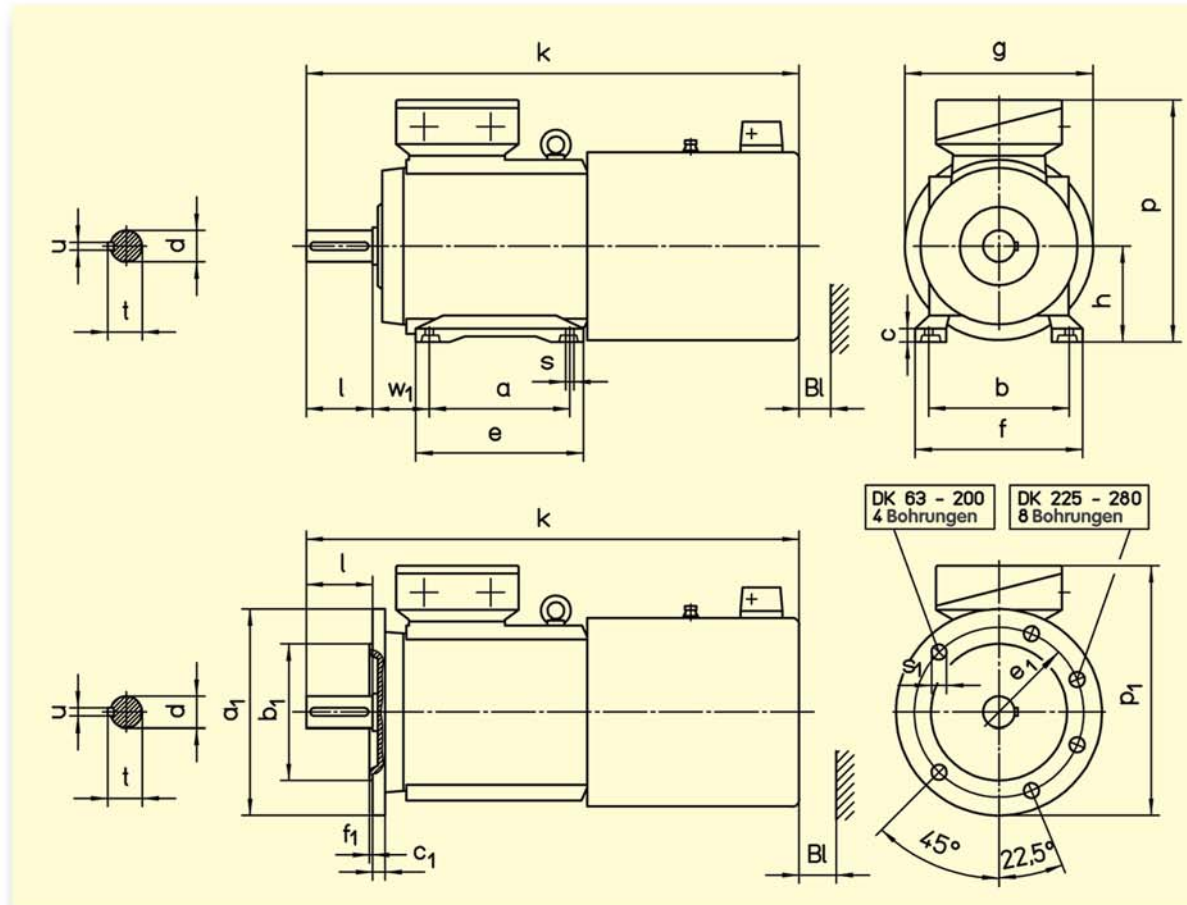
ed range.



	1/3 ph. 230 V (180... 260 V)				3 ph. 400 V (305... 500 V)			
	$I_N/200V$ [A]	$I_0/200V$ [A]	$I_{max}/200V$ [A]	recommended amplifier size	$I_N/400V$ [A]	$I_0/400V$ [A]	$I_{max}/400V$ [A]	recommended amplifier size
	0.6	0.6	1.4	09.F5.M	0.4	0.4	0.8	09.F5.M
	1.0	1.0	2.3	09.F5.M	0.6	0.6	1.3	09.F5.M
	1.4	1.4	2.6	09.F5.M	0.8	0.8	1.5	09.F5.M
	1.8	1.8	3.8	09.F5.M	1.1	1.1	2.2	09.F5.M
	2.8	2.8	6.8	09.F5.M	1.6	1.6	3.9	09.F5.M
	3.6	3.6	10.7	09.F5.M	2.1	2.1	6.2	09.F5.M
	4.5	4.5	13.9	09.F5.M	2.6	2.6	8.0	09.F5.M
	5.9	5.9	18	10.F5.M	3.4	3.4	10.4	10.F5.M
	8.9	8.9	34.5	10.F5.M	5.2	5.2	19.9	12.F5.M
	upon request				6.7	6.70	22.9	12.F5.M
	upon request				8.8	8.80	38.0	13.F5.M
	upon request				10.5	10.5	38.8	14.F5.M
	upon request				15.0	15.0	50.0	15.F5.M
	upon request				21.5	21.5	85.1	16.F5.M
	upon request				28.5	28.5	112.9	17.F5.M
	upon request				35.0	35.0	129.1	18.F5.M
	upon request				42.0	42.0	136.1	19.F5.M
	upon request				55.5	55.5	199.8	20.F5.M
	upon request				67.0	67.0	235.2	21.F5.M
	upon request				81.0	81.0	262.5	22.F5.M
	upon request				98.5	98.5	310.3	23.F5.M
	upon request				134	134	349.8	24.F5.M

recommended amplifier size F5-M for $M_{max} = \text{approx. } 2 \times M_N$

Dimensions



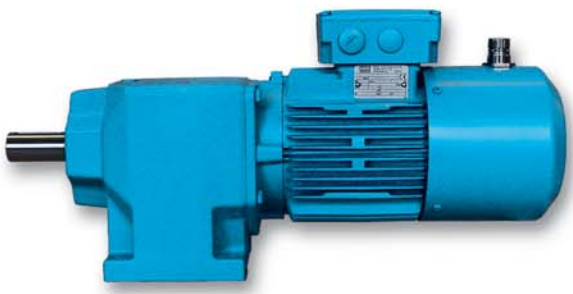
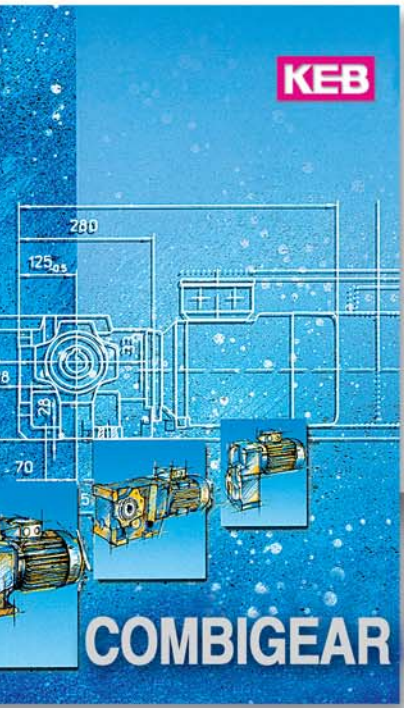
Industrial gear motors provide the adjustment of speed and torque. With the program KEB COMBIGEAR are complete assembly in the classic designs

- helical inline gear,
- helical bevel gear-,
- shaft-mounted- as well as
- helical worm gears

are available.

Main features of the series are the fine graduation of the possible ratios, the compact design and the sturdy housing out cast iron.

motor P size [kW]	a	b	C	e	f	w1	d	l	u	h	p	g	s	t	k	kB	BI	a1	b1	c1	e1	f1	s1	p1	
	[all dimensions in mm]																								
63	0.12																								
63	0.18	80	100	7	95	120	40	11	23	4	63	167	124	8	12.5	354	354	14	140	95	9	115	3	9	174
71	0.25																								
71	0.37	90	112	11	116	138	45	14	30	5	71	175	124	8	16	328	328	14	160	110	9	130	3.5	9	184
80	0.55																								
80	0.75	100	125	12	125	168	50	19	40	6	80	191	139	10	21.5	384	384	16	200	130	10	165	3.5	11	211
90	1.1																								
90	1.5	125	140	14	155	178	56	24	50	8	90	210	157	10	27	426	426	16	200	130	10	165	3.5	11	220
100	2.2	140	160	15	175	192	63	28	60	8	100	227	177	12	31	502	502	18	250	180	11	215	4	14	252
100	3	140	160	11	171	188	63	28	60	8	100	237	196	12	31	557	557	20	250	180	11	215	4	14	262
112	4	140	190	18	180	224	70	28	60	8	112	249	196	12	31	591	591	20	250	180	11	215	4	14	328
132	5.5	140	216	16	180	256	89	38	80	10	132	310	217	12	41	644	644	35	300	230	12	265	4	14	328
132	7.5	178	216	16	218	256	89	38	80	10	132	332	258	12	41	701	701	35	300	230	12	265	4	14	350
160	11	210	254	18	257	296	108	42	110	12	160	360	258	15	45	779	779	35	350	250	13	300	5	18	375
160	15	254	254	18	301	296	108	42	110	12	160	402	313	15	45	853	853	35	350	250	13	300	5	18	417
180	18.5	241	279	20	288	328	121	48	110	14	180	422	313	15	51.5	853	853	35	350	250	13	300	5	18	417
180	22	279	279	20	326	328	121	48	110	14	180	441	351	15	51.5	969	969	35	350	250	13	300	5	18	436
200	30	305	318	22	360	372	133	55	110	16	200	461	351	19	59	969	969	35	400	300	15	350	5	18	461
225	37	286	356	25	343	413	149	60	140	18	225	525	390	19	64	972		40	450	350	16	400	5	18	525
225	45	311	356	25	368	413	149	60	140	18	225	525	390	19	64	1012		40	450	350	16	400	5	18	525
250	55	349	406	28	412	471	169	65	140	18	250	576	440	24	69	1101		45	550	450	18	500	5	18	601
280	75	368	457	32	431	522	190	75	140	20	280	668	490	24	79.5	1179		50	550	450	18	500	5	18	663



people in motion



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