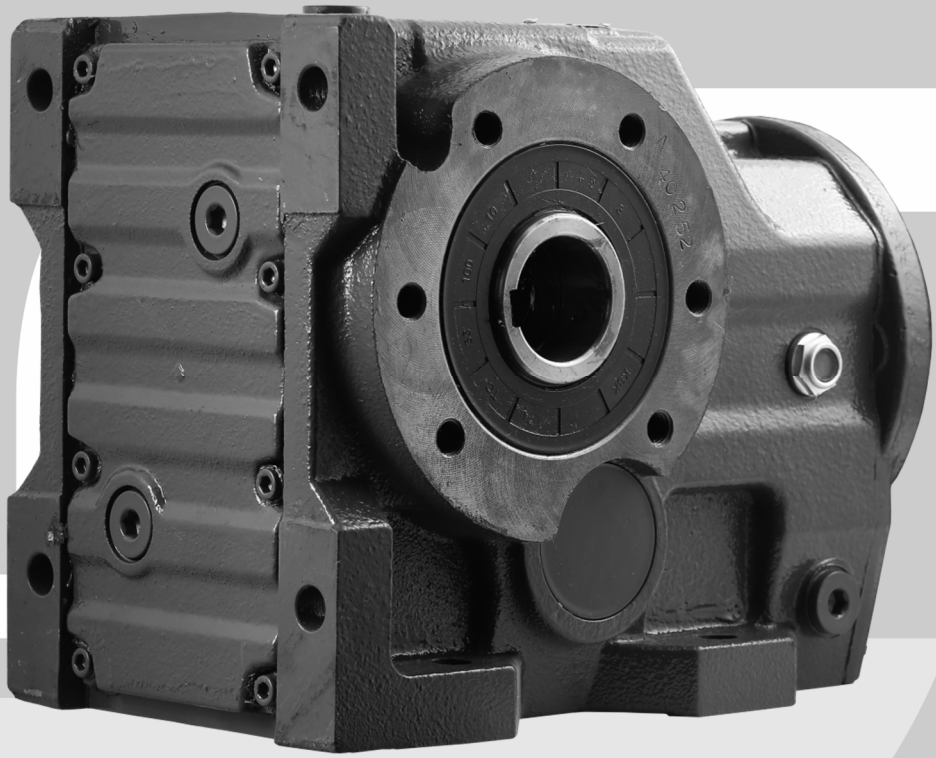
MORGENSEN
DRIVE WITH YOU

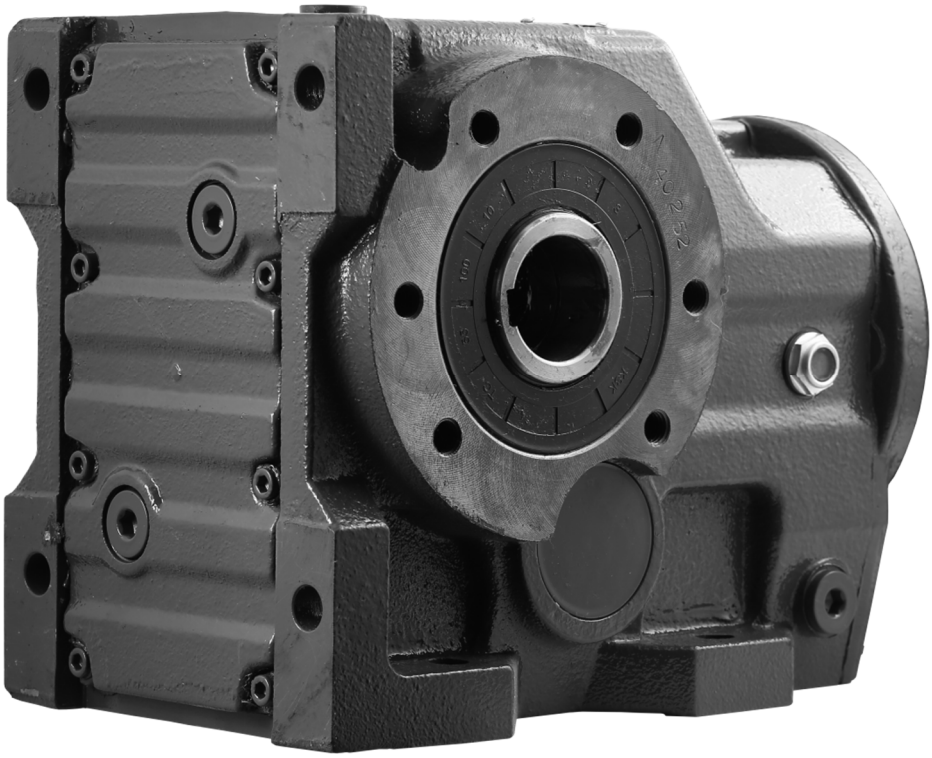


USER MANUAL
Helical bevel gearboxes

MSK

MSK series

Helical bevel gearboxes



We are pleased to present a new generation of MORGENSEN gearboxes.

Thanks to new, innovative technological developments, even more robust gearboxes and components will provide even more reliable operation, providing a reassuring support to our partners.
The robust design guarantees that our gearboxes are able to withstand the toughest conditions in all areas of the industry.

Our gear units have the following advantages:

- even greater load capacity
- even greater operational safety
- longer service life

We install our gearwheels at our Hungarian site at any speed and size that our customers require.

Designation

M S	K	3 7	2	FA	12,87	P90	B5
1	2	3	4	5	6	7	8

1 – Morgensen series
2 – Type of the gearbox
- R – In line helical gear reducer
- F – Parallel shaft gear reducer
- K – Helical bevel gear reducer
- W – Worm gear reducer

3 – Gearbox size
4 – Number of the stages
5 – Flange
- FA – Flange mounted gear reducer
- \- – Foot mounted gear reducer

6 – Ratio
7 – Motor size
8 – Motor flange
- B5
- B14 – only at worm gear reducers

General informations

P1 – Power

This is the power of the driver at the input site of the gearbox

Pn – Nominal load

This is the power that the gearbox can be loaded with.

Pt – Thermal load capacity

The maximum power the gear motor is loaded with, it still can transfer the amount of the produced heat to the environment through the heat transfer surface. In the case of helical gearmotors, this is almost always greater than the load capacity.

n1 – Input speed

This is the driver speed at the input site of the gearbox

n2 – Output speed

This is the speed at the output site of the gearbox
n2=n1/i

i – Ratio

The ratio of a gearbox is the coefficient of the input and output speed of the gearbox. It depends on the number of the teeth of the gears inside the gearbox.
i=n1/n2

η – Efficiency

This value shows the amount of percenatges the driver power uses on the output site of the gearbox. The efficiency of the helical gearboxes is 97% at each stage.
So the efficiency is at a 2 stage gearbox: 97% x 97% = 94%

Mr2 – Demanded (Required) torque

This is the torque that is demanded at the application.

M2 – Output torque

This is the effective output torque of the gearbox. It is related to the power of the driver and output rpm. It can be calculated according to the following:
M2=9550 x P x η / n2

M2 = output torque (Nm)
P = motor power (kW)
η = efficiency
n2 = output speed

fs – Service factor

This value indicates how a certain drive system is to be oversized in order to assure the requested service and stand up to shocks. The tables given in the catalogue offer a wide range of drive systems with different service factors able to satisfy most types of applications. To correctly understand service factor values sf given for each item, approximate values for load classes A, B and C along with the number of hours of daily operation h/d and number of start-ups/hours need to be known.
Once the load class required for the application has been determined, locate corresponding value sf to be used when selecting the most suitable drive system.
The value of the service factor depends on the technical and load characteristics of the driven machine. There are three main load characteristics:

Type of load	Service factor
Uniform	1 – 1,2
Moderate shock	1,2 – 1,5
Heavy shock	1,5 – 2,5

a. Selecting of the service factor:

sf - uniform load									
h/d	number of start up / hour								
	2	4	8	16	32	63	125	250	500
4	0.8	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.2
8	1.0	1.0	1.0	1.0	1.3	1.3	1.3	1.3	1.3
16	1.3	1.3	1.3	1.3	1.5	1.5	1.5	1.5	1.5
24	1.5	1.5	1.5	1.5	1.8	1.8	1.8	1.8	1.8

sf - moderate shock load									
h/d	number of start up / hour								
	2	4	8	16	32	63	125	250	500
4	1.0	1.0	1.0	1.0	1.3	1.3	1.3	1.3	1.3
8	1.3	1.3	1.3	1.3	1.5	1.5	1.5	1.5	1.5
16	1.5	1.5	1.5	1.5	1.8	1.8	1.8	1.8	1.8
24	1.8	1.8	1.8	1.8	2.2	2.2	2.2	2.2	2.2

sf - heavy shock load									
h/d	number of start up / hour								
	2	4	8	16	32	63	125	250	500
4	1.3	1.3	1.3	1.3	1.5	1.5	1.5	1.5	1.5
8	1.5	1.5	1.5	1.5	1.8	1.8	1.8	1.8	1.8
16	1.8	1.8	1.8	1.8	2.2	2.2	2.2	2.2	2.2
24	2.2	2.2	2.2	2.2	2.5	2.5	2.5	2.5	2.5

b. Calculating of the service factor:

fs=Pn/P1
fs: service factor
Pn: the nominal power of the gearbox
P1: the power of the driver machine

If there is more information available about the drive, then you can find a more detailed definition below.

Type of load	Service factor
Uniform	fa <= 0,3
Moderate shock	fa <= 3
Heavy shock	fa <= 10

fa = J1 / J2 - where J1 is the momentum of the gearbox, J2 is the momentum of the driven machine

Selecting of the gearmotor

In order to select the right gearbox, use the following steps:

1. Defining the safety factor by following the steps above.
2. In case the required motor power is known see paragraph number 3. In case the required torque is known then calculate the applying motor power according to the following formula:
$$P=M2 \times n2 / 9550 \times \eta$$
3. From the gear selection table, select the gear that has higher load rating than the required gearmotor power at the required speed multiplied by the selected safety factor.

Installation and storage of the gearmotors

- Only qualified personnel should install, service or maintain the gear units.
- When purchasing make sure that the gear unit is undamaged and compare the nameplate with your order.
- Do not store the gear unit in high humidity or high temperatures.
- Lubricate the shaft joint with a suitable protective agent (eg Loctite Antiseize 767) to prevent surface abrasion and seepage. This operation should be repeated every year.
- Protect the shaft from shocks to save bearings.
- Always fix the gear unit securely and ensure that the mounting surface is smooth and strong.
- Ensure that the connected shafts are aligned.
- Install a torque limiter if dynamic backlashes can occur during operation.
- Always ensure that the operating conditions are safe before starting.
- For outdoor operation, provide the gear unit with a weatherproof cover.
- Do not expose the gear unit to aggressive materials (unless it was stated on the order and the gear unit
- has been selected accordingly).
- Make sure that all connecting surfaces are properly treated to prevent rusting on the contact surfaces.
- Make sure that all retaining screws are tightened.
- Check if the amount of lubricant is suitable for for the mounting position you have chosen.

Structural characteristics

- Our gearwheels are made exclusively of high-quality cast iron housings, which are more durable than other aluminum housings.
- Thanks to their design and high quality alloys they are capable of withstanding high torque loads.
- The efficiency of our gear units can be up to 98% depending on the gear.
- Precise machining of gears for easy, smooth running and low noise.
- Long service life even in extreme conditions.
- Oil-free housing: Leak-proof operation is guaranteed thanks to a sealing system that provides better sealing than other types.
- Only standard IEC flanged motor couplings are used, which, while making our geared motors structurally more robust, significantly simplifies subsequent servicing procedures.

Material specification

- Gear housing: Cast steel alloy.
- Hardened and ground gears with high wear resistance.
- Anti-corrosion housing: The outer and inner surfaces of the gear housing are treated with epoxy-polyester paint.

Appearance

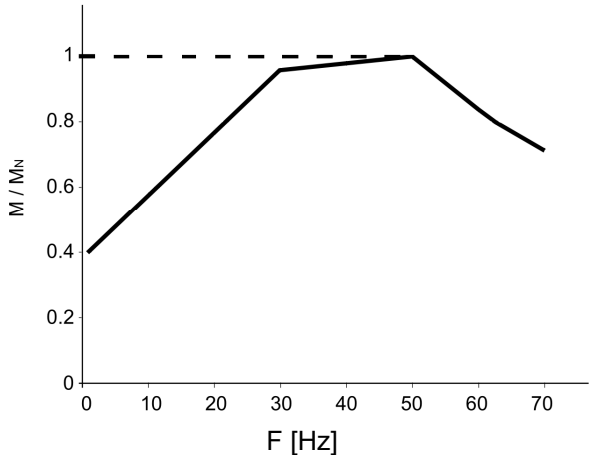
- In addition to its aesthetic appearance, the exterior paint also provides a high degree of corrosion protection for the gear unit.

Drive control

Nowadays, electronic speed control of electric motors is essential for modern drives. However, by using a frequency inverter, you can not only change the speed, but also make your machines much safer. With any type of our frequency inverters you can set either current or thermal protection, different programs, runs, rushes. Not to mention the fact that the use of inverters are significantly money and energy saving. All our geared electric motors are suitable for normal and frequency inverter operation.

In case of a variable speed drive, select the value for the nominal speed of the gear motor at which the drive operates the most. If the range is wide, keep in mind that the maximum speed of the motors is usually set at 3000 rpm, and an electric motor should only be used with forced cooling under 25 Hz. These values are indicative, but highly dependent on the nature, magnitude and temporal distribution of the load. If you are unsure of the selection or need help, please contact our support team, where our colleagues will be happy to assist you.

The following figure shows the torque curve of the electric motors operated by the frequency inverters. The dashed line indicates the torque of the external forced cooling electric motors



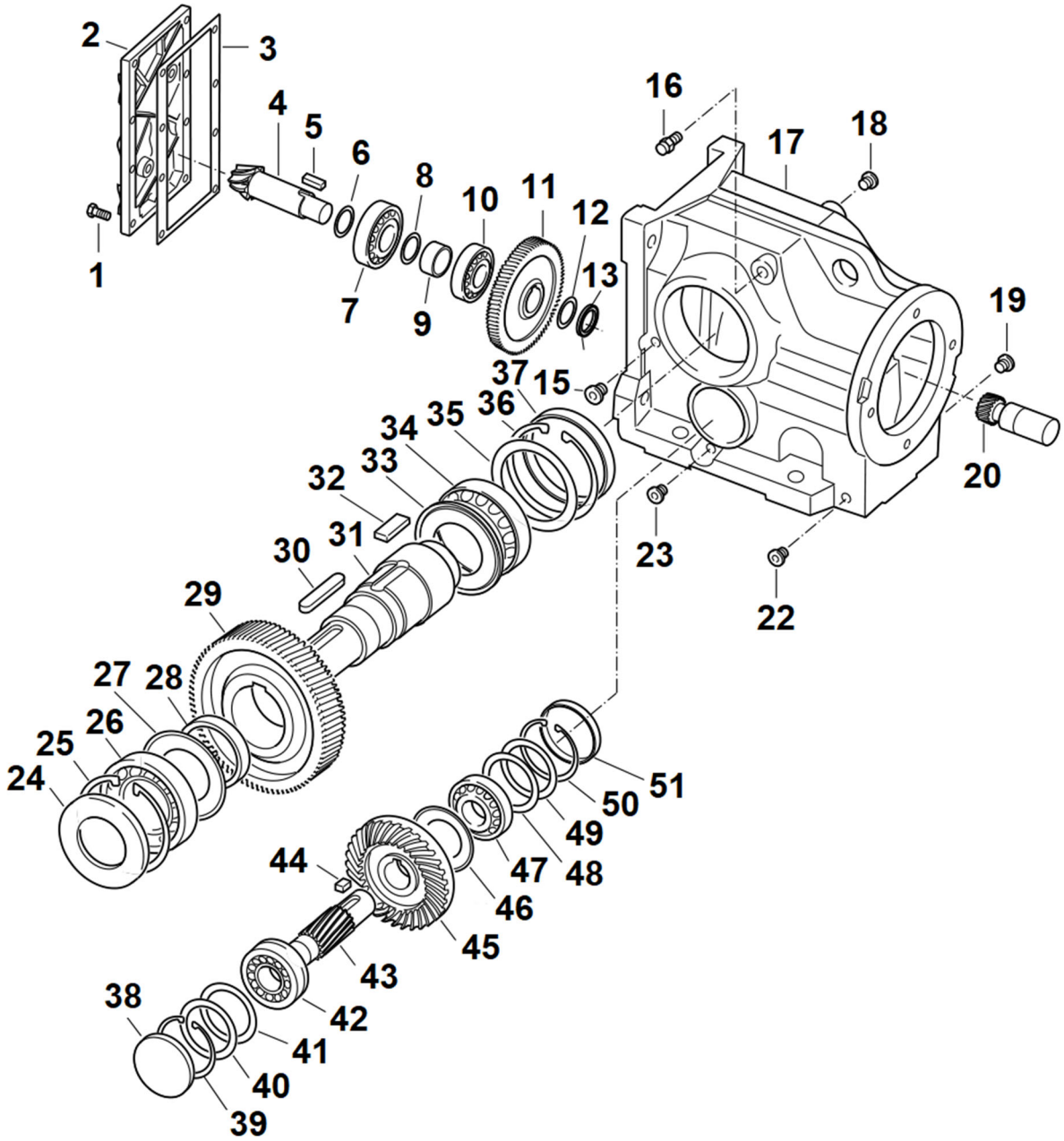
Energy saving

All of our gear units can be delivered with IE2, IE3 and IE4 high efficiency, energy saving electric motors. Not only does this mean protecting the environment, but depending on the duration of use, the difference in price will pay off in one year compared to a conventional electric motor.

Available Options for electric motors

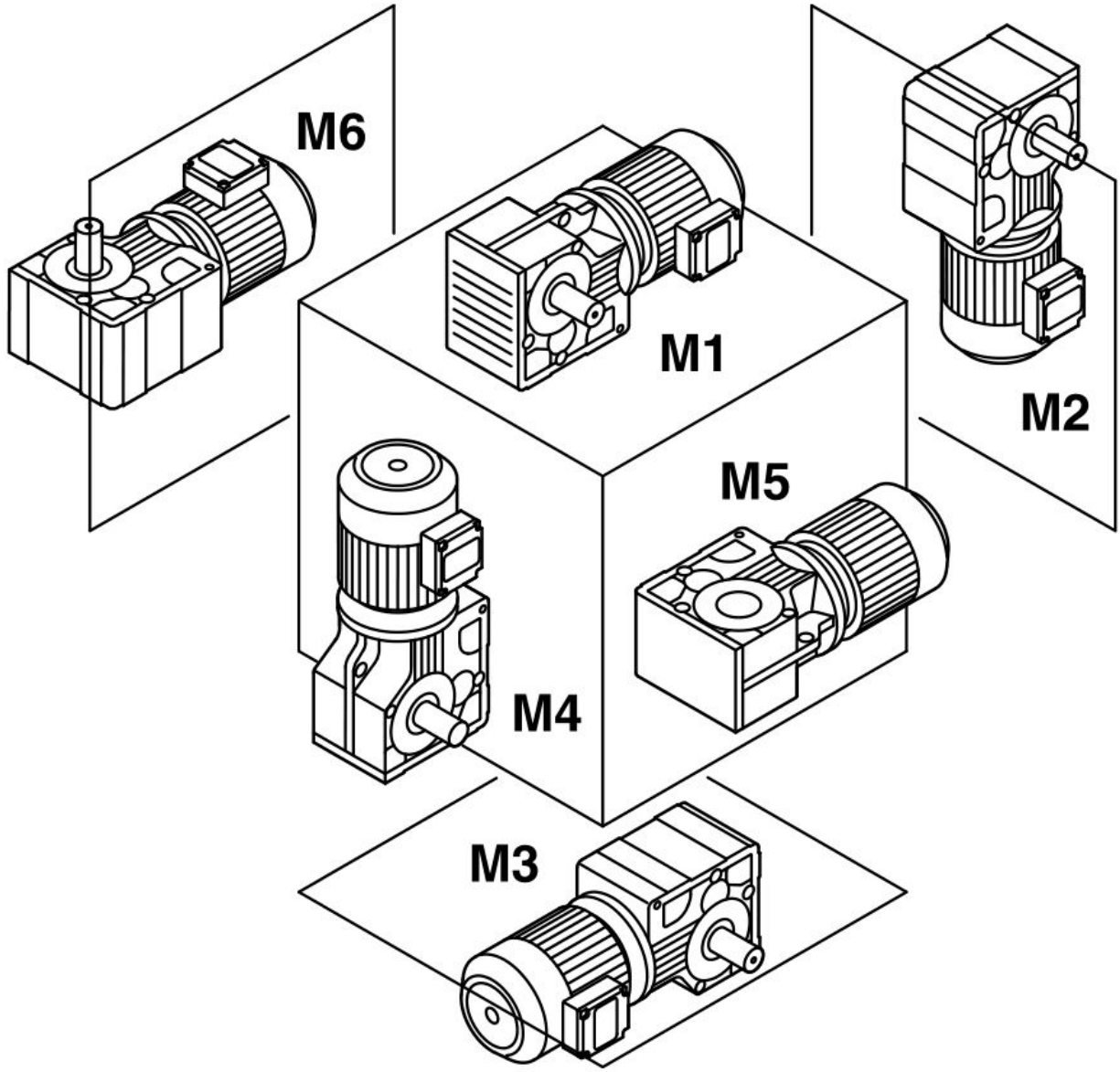
- Brake motor
- Backstop
- Explosion-proof design
- External cooling
- PTO and PTC thermal protection
- Encoder
- Class H insulation
- Higher degree of protection (IP65, IP56, IP66)
- Reinforced bearing
- Custom drive shaft drives
- Rain Cover

Parts list



1	hex head screw	14	key	28	adjusting shim	41	shim
2	inspection cover	15	screw plug	29	gear	42	bearing
3	gasket	16	breather valve	30	key	43	pinion
4	pinion	17	gear unit housing	31	hollow shaft	44	key
5	key	18	screw plug	32	key	45	gear
6	shim	19	screw plug	33	shield ring	46	shield ring
7	bearing	20	pinion	34	bearing	47	bearing
8	shim	22	screw plug	35	shim	48	shim
9	adjusting shim	23	screw plug	36	retaining ring	49	shim
10	bearing	24	oil seal	37	closing cap	50	retaining ring
11	gear	25	retaining ring	38	closing cap	51	closing cap
12	multitang washer	26	bearing	39	retaining ring		
13	slotted nut	27	shield ring	40	shield ring		

Mounting positions



Lubrication

Our gearboxes are oil lubricated. In any case, make sure there is enough oil in the gear unit.

Recommended types of synthetic oils:

AGIP Blasia S 220
BP Energol SG XP220
ESSO Glycolube 220
MOBIL Glygoyle 30
Shell Tivela Oil SC 320

Always use mineral or synthetic oil according to the type of load and ambient temperatur:

	Ambient temperatur: -20°C - +25°C		Ambient temperatur: -10°C - +40°C	
Type of load	Mineral oil	Synthetic oil	Type of load	Mineral oil
Uniform	ISO VG150	ISO VG150	**Uniform**	ISO VG150
Moderate shock	ISO VG150	ISO VG150	**Moderate shock**	ISO VG150
Heavy shock	ISO VG220	ISO VG220	**Heavy shock**	ISO VG220

The following table shows the required oil level for the gear units. Please specify the installation position when ordering.

Gearbox type	Oil quantity (L)					
Mounting position	M1	M2	M3	M4	M5	M6
MSR37	0.3/1	0.9	1	1.1	0.8	1
MSR47	0.7/1.5	1.6	1.5	1.7	1.5	1.5
MSR57	0.8/1.7	1.9	1.7	2.1	1.7	1.7
MSR67	1.1/2.3	2.6/3.5	2.8	3.2	1.8	2
MSR77	1.2/3	3.8/4.3	3.6	4.3	2.5	3.4
MSR87	2.3/6	6.7/6.4	7.2	7.7	6.3	6.5
MSR97	4.6/9.8	11.7/14	11.7	13.4	11.3	11.7
MSR107	8/13.7	16.3	16.9	19.2	13.2	15.9
MSR137	10/25	28	29.5	31.5	25	25
MSR147	15.4/40	46.5	48	52	39.5	41
MSR167	27/70	82	78	88	66	69

Weight

Type	MSR37	MSR47	MSR57	MSR67	MSR77	MSR87	MSR97	MSR107	MSR137	MSR147	MSR167
Weight [kg]	8,50	10,00	18,00	25,00	36,00	63,00	101,00	153,00	220,00	400,00	700,00

Technical data

MSK37				200Nm
i	n2 [1/min]	M max [Nm]	F rad [N]	Pn [kW]
5,36	261	140	1810	4,21
6,8	206	150	1950	3,55
7,98	175	155	1980	3,13
8,91	157	160	2110	2,89
10,49	133	160	2200	2,46
12,14	115	160	2410	2,12
13,08	107	165	2600	2,03
15,31	91	175	2650	1,84
17,18	81	180	2780	1,69
20,19	69	185	2900	1,48
23,36	60	195	3110	1,34
24,99	56	200	3260	1,29
28,83	49	200	3330	1,12
29,96	47	200	3580	1,08
35,57	39	200	3650	0,91
37,97	37	200	3970	0,85
44,46	31	200	4100	0,72
49,79	28	200	4420	0,65
58,6	24	200	4660	0,55
67,6	21	200	5020	0,48
72,54	19	200	5360	0,44
83,69	17	200	5520	0,38
97,81	14	200	5640	0,33
106,38	13	200	5640	0,30
637	2	145	5640	0,04

MSK47 400Nm

i	n2 [1/min]	M max [Nm]	F rad [N]	Pn [kW]
5,81	241	230	3140	6,38
6,58	213	240	3270	5,88
7,36	190	250	3390	5,47
8,56	164	270	3500	5,08
9,1	154	280	3540	4,96
10,56	133	280	3830	4,27
11,77	119	280	4080	3,83
12,19	115	350	3720	4,63
13,65	103	360	3890	4,25
15,86	88	380	4080	3,86
16,86	83	380	4230	3,63
19,58	72	400	4440	3,29
21,81	64	400	4710	2,95
24,06	58	400	4970	2,68
25,91	54	400	5170	2,49
29,32	48	400	5520	2,20
31,3	45	400	5700	2,06
35,39	40	400	5920	1,82
39,61	35	400	5920	1,63
46,03	30	400	5920	1,40
48,95	29	400	5920	1,32
56,83	25	400	5920	1,13
63,3	22	400	5920	1,02
69,84	20	400	5920	0,92
75,2	19	400	5920	0,86
85,12	16	400	5920	0,76
90,86	15	400	5920	0,71
104,37	13	400	5920	0,62
121,48	12	400	5920	0,53
131,87	11	400	5920	0,49

MSK57 600Nm

i	n2 [1/min]	M max [Nm]	F rad [N]	Pn [kW]
6,57	213	345	4190	8,46
7,55	185	365	4380	7,79
8,71	161	390	4520	7,21
9,59	146	405	4650	6,80
11,26	124	415	4990	5,94
11,92	117	415	5150	5,61
13,25	106	510	5190	6,20
15,22	92	535	5430	5,66
17,57	80	665	5740	6,10
19,34	72	575	5910	4,79
22,71	62	600	6280	4,26
24,06	58	600	6480	4,02
27,34	51	600	6930	3,54
30,28	46	600	7310	3,19
36,7	38	600	7470	2,63
38,49	36	600	7470	2,51
44,43	32	600	7470	2,18
48,89	29	600	7470	1,98
57,42	24	600	7470	1,68
60,81	23	600	7470	1,59
69,12	20	600	7470	1,40
76,56	18	600	7470	1,26
90,26	16	600	7470	1,07
102,88	14	600	7470	0,94
108,29	13	600	7470	0,89
123,85	11	600	7470	0,78
145,14	10	600	7470	0,67

MSK67 820Nm

i	n2 [1/min]	M max [Nm]	F rad [N]	Pn [kW]
7,28	192	420	10700	9,29
8,37	167	440	11100	8,47
9,66	145	480	11600	8,00
10,63	132	500	11800	7,58
12,48	112	530	12300	6,84
13,22	106	670	11500	8,16
15,19	92	700	11300	7,42
17,54	80	740	11000	6,80
19,3	73	760	10800	6,34
22,68	62	780	10700	5,54
24	58	800	10500	5,37
27,28	51	820	10300	4,84
30,22	46	820	10300	4,37
35,62	39	820	10300	3,71
38,39	36	820	10500	3,44
44,32	32	820	10300	2,98
48,77	29	820	10300	2,71
57,28	24	820	10300	2,31
60,66	23	820	10300	2,18
63,95	22	820	10300	2,07
76,37	18	820	10300	1,73
90,04	16	820	10300	1,47
102,62	14	820	10300	1,29
108,03	13	820	10300	1,22
123,54	11	820	10300	1,07
144,79	10	820	10300	0,91

MSK77 1550Nm

i	n2 [1/min]	M max [Nm]	F rad [N]	Pn [kW]
7,24	193	820	13100	18,25
8,48	165	890	13500	16,91
9,56	146	940	13900	15,84
10,84	129	990	14400	14,71
12,36	113	1000	15100	13,03
13,52	104	1340	14800	15,97
15,84	88	1400	15500	14,24
17,87	78	1450	16100	13,07
20,25	69	1500	15700	11,93
23,06	61	1550	15400	10,83
25,62	55	1550	15400	9,75
29,27	48	1550	15400	8,53
30,89	45	1550	15400	8,08
35,2	40	1550	15400	7,09
38,39	36	1550	15700	6,50
40,04	35	1550	15400	6,24
45,16	31	1550	15400	5,53
51,18	27	1550	15400	4,88
58,34	24	1550	15400	4,28
64,75	22	1550	15400	3,86
68,97	20	1550	15400	3,62
73,99	19	1550	15400	3,37
78,07	18	1550	15400	3,20
97,05	14	1550	15400	2,57
113,56	12	1550	15400	2,20
128,62	11	1550	15400	1,94
135,28	10	1550	15400	1,85
154,02	9	1550	15400	1,62
179,37	8	1450	16100	1,30
192,16	7	1450	16100	1,22

MSK87 2700Nm

i	n2 [1/min]	M max [Nm]	F rad [N]	Pn [kW]
7,21	194	1300	13200	29,05
8,29	169	1400	13500	27,21
10	140	1600	14200	25,78
11,17	125	1500	14900	21,63
12,56	111	2000	14800	25,65
14,45	97	2100	15300	23,41
17,42	80	2200	16000	20,35
18	78	1800	16300	16,11
19,45	72	2300	16800	19,05
22,41	62	2300	17900	16,53
24,92	56	2500	18000	16,16
27,88	50	2600	18500	15,02
31,39	45	2700	19200	13,86
36,52	38	2503	21400	11,04
44,02	32	2600	22600	9,51
49,16	28	2700	23500	8,85
56,64	25	2700	25000	7,68
63	22	2700	26200	6,90
70,46	20	2700	27300	6,17
79,34	18	2700	27300	5,48
86,34	16	2700	27300	5,04
102,71	14	2700	27300	4,23
115,62	12	2700	27300	3,76
126,91	11	2700	27300	3,43
147,32	10	2700	27300	2,95
164,34	9	2700	27300	2,65
174,19	8	2700	27300	2,50
197,37	7	2700	27300	2,20

MSK97 4300Nm

i	n2 [1/min]	M max [Nm]	F rad [N]	Pn [kW]
8,71	161	2660	15800	49,20
10,41	134	2870	16400	44,41
11,99	117	3890	16200	52,27
13,85	101	4300	16100	50,02
16,56	85	4300	17800	41,83
18,96	74	4300	19100	36,54
22,37	63	4300	20900	30,97
24,76	57	4300	22000	27,98
27,91	50	4300	23300	24,82
30,82	45	4300	24500	22,48
34,23	41	4300	25700	20,24
38,3	37	4300	27100	18,09
41,87	33	4300	28300	16,54
47,93	29	4300	30000	14,45
56,55	25	4300	32300	12,25
62,55	22	4300	33800	11,07
70,54	20	4300	37100	9,82
77,89	18	4300	37100	8,89
86,52	16	4300	38800	8,01
96,8	14	4300	40000	7,16
105,13	13	4300	40000	6,59
123,93	11	4300	40000	5,59
140,28	10	4300	40000	4,94
153,21	9	4300	40000	4,52
176,05	8	4300	40000	3,93

MSK107 8000Nm

i	n2 [1/min]	M max [Nm]	F rad [N]	Pn [kW]
8,69	161	4070	24600	75,45
9,94	141	4190	25800	67,91
11,73	119	4300	27500	59,05
13,43	104	4300	29200	51,58
14,64	96	6890	21900	75,82
16,75	84	7050	23600	67,80
19,74	71	7200	26100	58,76
22,62	62	7200	28900	51,28
26,32	53	7200	32000	44,07
29	48	7200	34000	40,00
31,28	45	6800	36700	35,02
32,69	43	7200	36300	35,48
37	38	7200	38500	31,35
42,33	33	7360	40600	28,01
49,9	28	7840	42200	25,31
57,17	24	8000	44400	22,54
66,52	21	8000	47600	19,37
73,3	19	8000	49700	17,58
82,61	17	8000	52400	15,60
90,96	15	8000	54600	14,17
100,75	14	8000	57000	12,79
112,41	12	8000	59700	11,46
121,46	12	8000	61700	10,61
143,47	10	8000	65000	8,98

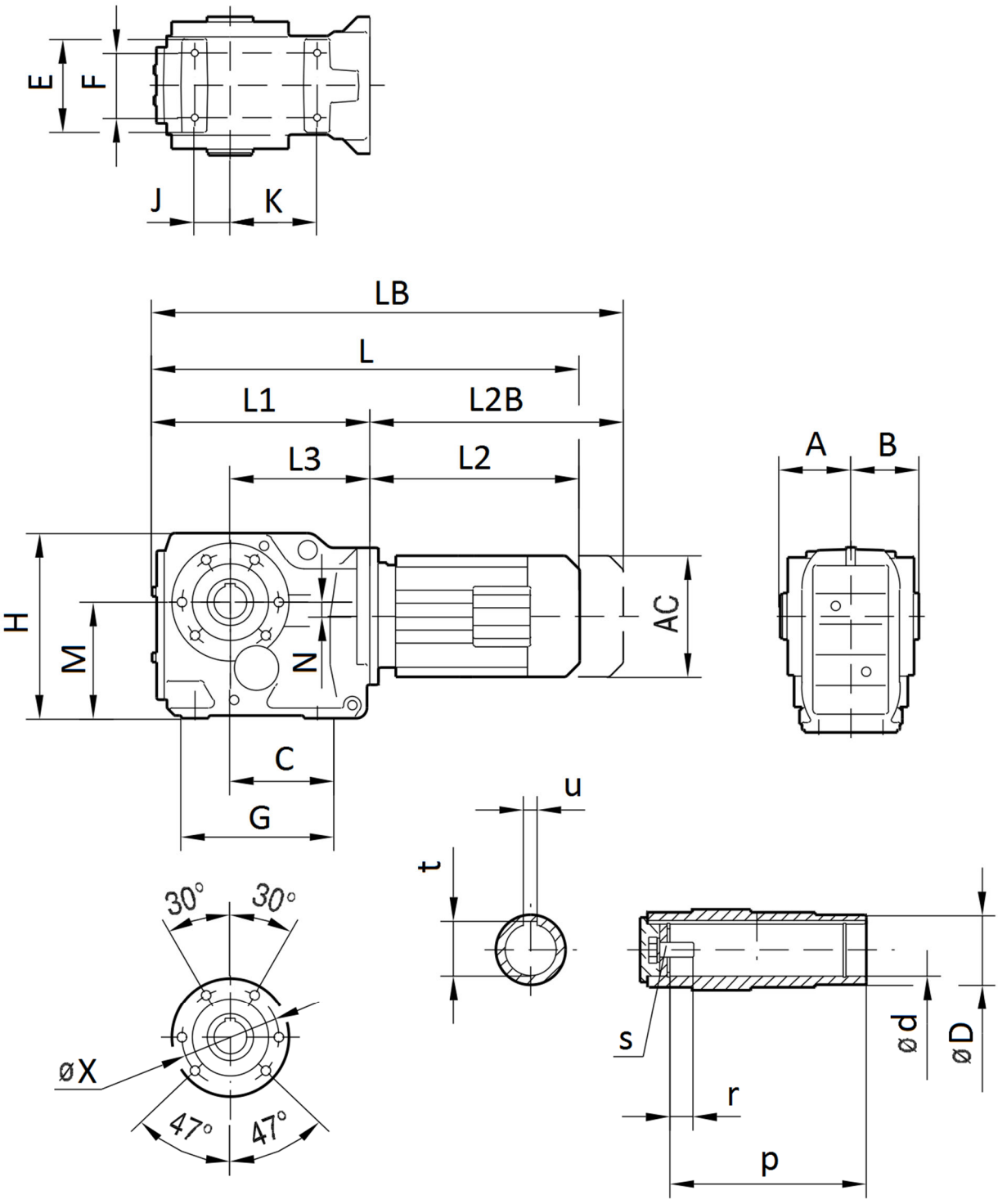
MSK127 — 13000Nm

i	n2 [1/min]	M max [Nm]	F rad [N]	Pn [kW]
8,68	161	7230	32500	129,90
10,74	130	8000	33900	116,17
12,79	109	8530	35400	104,01
14,35	98	12100	31800	131,50
17,77	79	13000	33600	114,09
21,15	66	13000	37200	95,86
23,91	59	13000	39800	84,79
27,68	51	13000	43000	73,24
31,37	45	13000	45900	64,63
36,25	39	13000	49400	55,93
40,19	35	13000	52000	50,45
47,82	29	13000	56500	42,40
54,07	26	13000	59900	37,50
62,6	22	13000	64000	32,39
70,95	20	13000	67700	28,58
81,98	17	13000	72100	24,73
89,89	16	13000	75100	22,55
110,18	13	13000	79200	18,40
122,48	11	13000	79200	16,55
136,14	10	13000	79200	14,89
146,07	10	13000	79200	13,88

MSK157 — 18000Nm

i	n2 [1/min]	M max [Nm]	F rad [N]	Pn [kW]
12,65	111	17000	36700	216,49
14,92	94	16000	38200	172,76
19,37	72	18000	43200	149,70
21,31	66	18000	47000	136,07
23,95	58	16000	50000	107,62
27,62	51	18000	54000	104,99
31,3	45	16000	57500	82,35
38,02	37	18000	63300	76,27
46,79	30	18000	70000	61,97
54,29	26	18000	74900	53,41
61,02	23	18000	79000	47,52
70,38	20	18000	84200	41,20
79,75	18	18000	88900	36,36
91,65	15	16000	94400	28,12
100,22	14	18000	98000	28,93
122,39	11	16000	106500	21,06
150,41	9	18000	112200	19,28

Dimensions



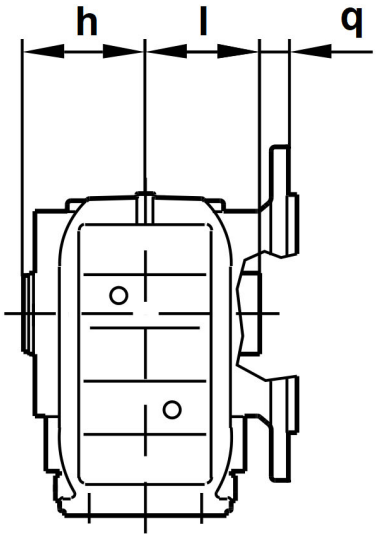
Gear size	A	B	C	E	F	G	H	J	K	M	N	X	Shaft dimensions						
													d	D	p	r	s	t	u
MSK37	63	60	97	100	60	147	164	35	82	100	8,5	94	30 H7	45	105	17	M10x25	33,3	8
MSK47	78	75	115	110	70	170	185	40	100	112	7,2	102	35H7	50	132	22	M10x25	38,3	10
MSK57	86	83	120	122	88	182	215	47	105	132	13,1	125	40 H7	55	142	29	M16x40	43,3	12
MSK67	94	90	125	130	88	182	226	42	110	140	20	125	40 H7	55	156	29	M16x40	43,3	12
MSK77	108	105	139	154	102	204	286	48	122	180	31,3	142	50 H7	70	183	32	M16x45	53,8	14
MSK87	123	120	190	170	118	280	338	65	160	212	25,9	178	60 H7	85	210	36	M20x50	64,4	18
MSK97	153	150	190	226	160	298	414	83	165	265	32,3	220	70 H7	95	270	34	M20x50	74,9	20
MSK107	178	175	230	266	190	370	500	100	190	315	52	260	90 H7	118	313	40	M24x60	95,4	25
MSK127	208	205	390	300	400	440	526	115	235	375	53	300	110 H7	135	373	38	M24x60	106,4	28
MSK157	253	250	426	420	500	480	634	140	240	450	71,7	340	120 H7	155	460	36	M24x60	127,4	32

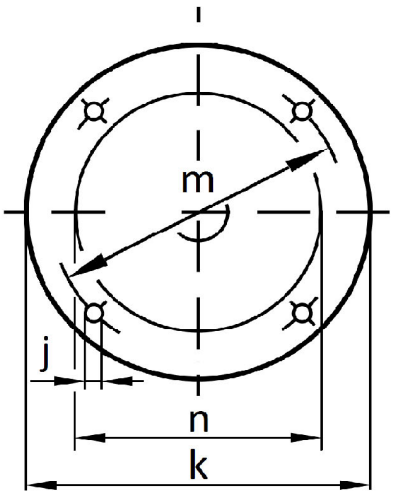
Gear size	Motor size	L1	L3	Gearmotor dimensions				AC
				with standard motor		with brake motor		
				L2	L	L2B	LB	
MSK37	IEC63	210	139	197	407	219	429	130
	IEC71	210	139	211	421	235	445	147
	IEC80	210	139	250	460	276	486	163
	IEC90S	210	139	262	472	290	500	183
	IEC90L	210	139	287	497	290	500	183
MSK47	IEC63	243	166	197	440	219	462	130
	IEC71	243	166	211	454	235	478	147
	IEC80	243	166	250	493	276	519	163
	IEC90S	243	166	262	505	290	533	183
	IEC90L	243	166	287	530	290	533	183
	IEC100	243	166	309	552	348	591	205
MSK57	IEC63	269	173	197	466	219	488	130
	IEC71	269	173	211	480	235	504	147
	IEC80	269	173	250	519	276	545	163
	IEC90S	269	173	262	531	290	559	183
	IEC90L	269	173	287	556	290	559	183
	IEC100	269	173	309	578	348	617	205
MSK67	IEC63	274	179	197	471	219	493	130
	IEC71	274	179	211	485	235	509	147
	IEC80	274	179	250	524	276	550	163
	IEC90S	274	179	262	536	290	564	183
	IEC90L	274	179	287	561	290	564	183
	IEC100	274	179	309	583	348	622	205
	IEC112	274	179	335	609	379	653	229

Gear size	Motor size	L1	L3	Gearmotor dimensions				AC
				with standard motor		with brake motor		
				L2	L	L2B	LB	
MSK77	IEC63	312	202	197	509	219	531	130
	IEC71	312	202	211	523	235	547	147
	IEC80	312	202	250	562	276	588	163
	IEC90S	312	202	262	574	290	602	183
	IEC90L	312	202	287	599	290	602	183
	IEC100	312	202	309	621	348	660	205
	IEC112	312	202	335	647	379	691	229
	IEC132S	312	202	357	669	407	719	265
	IEC132M	312	202	395	707	445	757	265
	IEC132L	312	202	421	733	471	783	265
MSK87	IEC80	390	257	250	640	276	666	163
	IEC90S	390	257	262	652	290	680	183
	IEC90L	390	257	287	677	290	680	183
	IEC100	390	257	309	699	348	738	205
	IEC112	390	257	335	725	379	769	229
	IEC132S	390	257	357	747	407	797	265
	IEC132M	390	257	395	785	445	835	265
	IEC132L	390	257	421	811	471	861	265
	IEC160M	390	257	549	939	609	999	330
	IEC160L	390	257	604	994	664	1054	330
	IEC180M	390	257	628	1018	698	1088	380
	IEC180L	390	257	668	1058	738	1128	380
MSK97	IEC100	435	277	309	744	348	783	205
	IEC112	435	277	335	770	379	814	229
	IEC132S	435	277	357	792	407	842	265
	IEC132M	435	277	395	830	445	880	265
	IEC132L	435	277	421	856	471	906	265
	IEC160M	435	277	549	984	609	1044	330
	IEC160L	435	277	604	1039	664	1099	330
	IEC180M	435	277	628	1063	698	1133	380
	IEC180L	435	277	668	1103	738	1173	380
	IEC200	435	277	660	1095	788	1223	400
	IEC225S	435	277	680	1115	780	1215	470
	IEC225M	435	277	705	1140	805	1240	470
MSK107	IEC100	537	341	309	846	348	885	205
	IEC112	537	341	335	872	379	916	229
	IEC132S	537	341	357	894	407	944	265
	IEC132M	537	341	395	932	445	982	265
	IEC132L	537	341	421	958	471	1008	265
	IEC160M	537	341	549	1086	609	1146	330
	IEC160L	537	341	604	1141	664	1201	330
	IEC180M	537	341	628	1165	698	1235	380

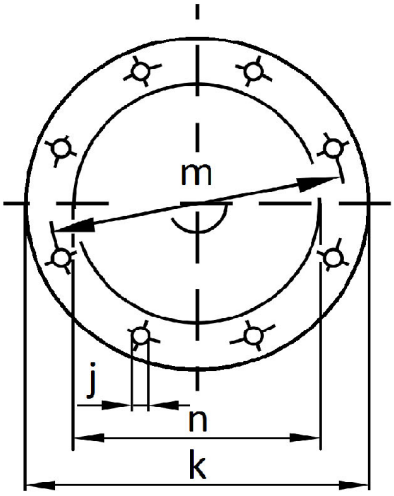
Gear size	Motor size	L1	L3	Gearmotor dimensions				AC
				with standard motor		with brake motor		
				L2	L	L2B	LB	
MSK127	IEC180L	537	341	668	1205	738	1275	380
	IEC200	537	341	660	1197	788	1325	400
	IEC225S	537	341	680	1217	780	1317	470
	IEC225M	537	341	705	1242	805	1342	470
	IEC132S	706	426	357	1063	407	1113	265
	IEC132M	706	426	395	1101	445	1151	265
	IEC132L	706	426	421	1127	471	1177	265
	IEC160M	706	426	549	1255	609	1315	330
	IEC160L	706	426	604	1310	664	1370	330
	IEC180M	706	426	628	1334	698	1404	380
	IEC180L	706	426	668	1374	738	1444	380
	IEC200	706	426	660	1366	788	1494	400
	IEC225S	706	426	680	1386	780	1486	470
	IEC225M	706	426	705	1411	805	1511	470
MSK157	IEC132S	615	390	357	972	407	1022	265
	IEC132M	615	390	395	1010	445	1060	265
	IEC132L	615	390	421	1036	471	1086	265
	IEC160M	615	390	549	1164	609	1224	330
	IEC160L	615	390	604	1219	664	1279	330
	IEC180M	615	390	628	1243	698	1313	380
	IEC180L	615	390	668	1283	738	1353	380
	IEC200	615	390	660	1275	788	1403	400
	IEC225S	615	390	680	1295	780	1395	470
	IEC225M	615	390	705	1320	805	1420	470
	IEC250	615	390	770	1385	870	1485	510
	IEC280S	615	390	845	1460	-	-	547
	IEC280M	615	390	895	1510	-	-	547

Flange dimensions





Type 1



Type 2

Gear size	Flange type	Flange dimensions						
		k	m	n	j	h	l	q
MSK37	1	160	130	110	9	63	60	24
MSK47	1	200	165	130	11	78	75	25
MSK57	1	250	215	180	13,5	86	83	23,5
MSK67	1	250	215	180	13,5	93	90	23
MSK77	1	300	265	230	13,5	108	105	37
MSK87	1	350	300	250	17,5	123	120	30
MSK97	2	450	400	350	17,5	153	150	41,5
MSK107	2	450	400	350	17,5	178	175	41
MSK127	2	550	500	450	17,5	208	205	51
MSK157	2	660	600	550	22	253	250	60

Notes

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