Contents

Type designation

The type designation for geared motors describes the construction of the unit starting from the output side.

Gear unit

K	4	3	C V
Gear Type	Size	Number of stages	Options
G–Helical gear unit			A – Foot mounted version C – Flange mounted version E – Foot-flange mounted version
F–Shaft Mounted Helical Gear unit			A – Shaft mounted version B – Shaft mounted version C – Flange mounted version D – Shaft mounted version + side areas E – Flange mounted version + side areas S – Hollow shaft with shrink disc V – Output shaft with key Z – Splined hollow shaft G - Rubber elements
S–Helical worm gear unit K–Helical bevel gear unit			A – Foot mounted version B – Shaft mounted version C – Flange mounted version D – Shaft mounted version + foot area E – Flange mounted version + foot area S – Hollow shaft with shrink disc V – Output shaft with key Z – Splined hollow shaft T1 – Torque arm

Double gearbox

F43	G12	C V
Gear unit 1	Gear unit 2	Options Gear unit 1

Gearbox input

-W2	Free input shaft, Size 2
-W3F	Free input shaft and Flange, Size 3
-M IEC112	adapter for IEC-motors, Frame size 112
-M NEMA180	adapter for Nema-motors, Frame size 180
-M S90/1	adapter for Servo-motors, Frame size 90/1

Three phase motor

DM	90S	4	F TW
Range	Frame size	Number of poles	Options
			B.. - Brake B..MB – Brake with hand release F - Forced ventilation I - Incremental encoder EAM – Absolute encoder multiturn TW – PTC thermistor sensor TS - Thermorelay (closed)

Servo motor

TA	43	V30	ER TW
Range	Frame size	Type of motor winding	Options
			BP.. - Brake ER – Resolver EAS – Absolute encoder singleturn EAM – Absolute encoder multiturn F - Forced ventilation TW – PTC thermistor sensor

Example

G23C DM80G4 B TW
G12A –M IEC71
S32G12AV DM63K4
K43BT1 TA51 V30 ER TW
DM80G6
TA42 VD0 EAM TW
F63 -W5
For full identification of geared motors, additional information has to be added to the type designation.

Product description

Values of the selection tables

Pn	Nominal power of the motor
T2	Nominal output torque of the geared motor at mounting position B3 or B5 (G) or H1 (F / S / K)
n1	Input speed of the gear unit
n2	Output speed of the gear unit related to the nominal speed of the motor or the given input speed of the gearbox
cG	Gear coefficient
i	Ratio of gear unit
is	Ratio of the worm gear stage
~kg	approximate weight of the geared motor at mounting position B3 or B5 (G) or H1 (F / S / K)
T2max	Maximum permissible continuous output torque of the gear unit for cG=1
T1max	Maximum permissible continuous input torque of the gear unit or of the input component of the gear unit
P1max	Maximum permissible continuous input power of the gear unit for cG=1
Jg	Inertia Gear unit (applied to input shaft of gearbox)
Jad	Inertia Motor adapter
η	Efficiency

Selection table Gear units

G23

i	n2 (n1=1400) [1/min]	T2max [Nm]	P1max [kW]	Jg [kgcm²]	Three phase motor DM/DA 63 71 80 90 100 112 132 160 180 200 225	Servo motor TA 31 32 33 41 42 43 51 52 53 61 62 63	-W	Motor adapter -M IEC 63 71 80 90 100 112 132 160 180	-M NEMA 56 140 180 210 250 280	-M S 70 90 110 140 190
153.41	9.1	**235**	0.22	0.07	○ ○ – – – – – – – – – –	○ – – – – – – – – – – –	W1	○ ○ – – – – – – –	○ – – – – –	○ – – – –
131.06	11	**235**	0.26	0.10	○ ○ – – – – – – – – – –	○ – – – – – – – – – – –	W1	○ ○ – – – – – – –	○ – – – – –	○ – – – –
113.42	12	**235**	0.30	0.12	○ ○ – – – – – – – – – –	○ – – – – – – – – – – –	W1	○ ○ – – – – – – –	○ – – – – –	○ – – – –

physical combinations with three-phase motor DM/DA

standard combinations with servo-motor TA

standard combinations with motor adapter

recommended size of free input shaft

○ = available, – = not available
Please consider T2max and P1max of gearbox when combining the drive.
For drives with motor adapter or free input shaft, additional consider T1max.

Selection table Helical worm gear units

S12

		n1=3400 1/min				n1=2800 1/min				n1=1700 1/min				n1=1400 1/min			
i	is	n2 [1/min]	T2max [Nm]	P1max [kW]	η	n2 [1/min]	T2max [Nm]	P1max [kW]	η	n2 [1/min]	T2max [Nm]	P1max [kW]	η	n2 [1/min]	T2max [Nm]	P1max [kW]	η
168.00	1/40	20	151	0.49	0.66	17	156	0.43	0.64	10	168	0.30	0.59	8.3	171	0.26	0.57
143.53	1/40	24	146	0.54	0.67	20	152	0.47	0.65	12	164	0.33	0.61	9.8	168	0.29	0.59

With new helical-worm gear units the tooth flanks are not completely smoothed down. The efficiency is lower than after the running in process. For a two start worm the decrease is about 6%. The running-in process is essentially concluded after 24 hours. The rated efficiencies are achieved if:
- the gear unit has been run in completely,
- the gear unit has reached the nominal operating temperature,
- the recommended lubribant is used,
- the gear unit is working with rated load.

Product description

Selection table Geared motors

n2	T2	cG	i	Type	Dimensions	~kg
[1/min]	[Nm]				Page	
3.0 kW						
17	1690	0.85	83.01	**K53A DM100LX4**	171	66
19	1510	0.95	74.48	**K53B DM100LX4**		66
21	1370	1.05	67.22	**K53C DM100LX4**		70
23	1260	1.15	61.87			

The selection table contains standard geared motors with
- Three phase motor DM/DA, 4 pole, Pn=0.12..45kW
- Ratio of gear unit i<1000
- Gear coefficient cG<3.0

Additional geared motors can be combined with help of corresponding selection table for gearboxes.

Efficiency of gearbox

The efficiency of the gear unit for helical gear units G, shaft mounted helical gear units F and helical bevel gear units K depends on the number of gear stages, 2-stage (0.96) and 3-stage (0.94).
The efficiency of helical worm gear units S depends on the ratio of the worm gear stage, the input speed into the gear unit and the temperature of the gear unit.
The efficiency of helical worm gear units S is shown in the selection table for gear units.
The efficiency of helical worm gear units S for back driving is significantly lower than the normal efficiency. In certain cases the worm gear unit can be self-locking.
At certain mounting positions the gearbox is completely filled with lubricant. At high input speed mixing losses can reduce the efficiency of the gear unit.

Dimension sheet notes

If not stated differently in the dimension sheet, the following tolerances are used:

Tolerance of shaft height	<250mm: -0.5mm	>250mm: -1mm
Tolerance of shaft diameter	≤50mm: ISO k6	>50mm: ISO m6
Flanges - Tolerance of spigot	≤230mm: ISO j6	>230mm: ISO h6

Paint

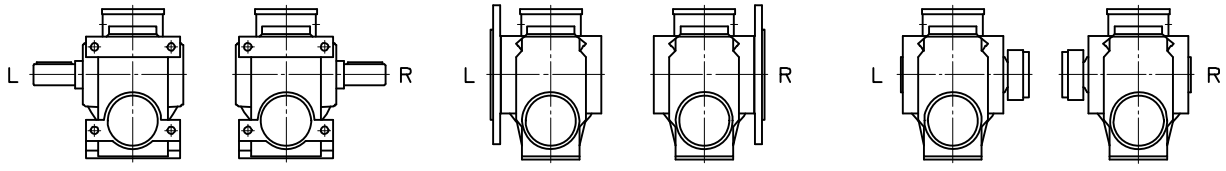
Paint	Description	Total thickness of paint ~µm	Typical area of use
Standard	1x dip-primer 1x 1-component-coat 1)	60-80	normal environment conditions up to 120°C surface temperature Humidity <90%
C1	1x dip-primer 1x 2-component-primer 1x 2-component-coat 1)	110-140	corrosive environment conditions up to 120°C surface temperature Humidity <95%
C2	1x dip-primer 2x 2-component-primer 2x 2-component-coat 1)	190-240	high corrosive environment conditions up to 120°C surface temperature Humidity ..100%

1) Standard color RAL7031 bluegrey
Different colors on request.

For the operation of the geared motors under corrosive environment the following additional options are available:
Dust- and water protection IP65 for normal and braked motors
Output shaft / hollow shaft from stainless steel

Mounting face

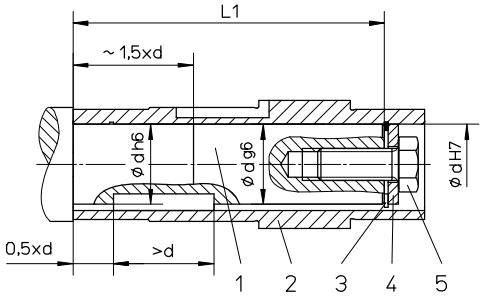
For helical-worm and helical bevel geared motors with flange, with solid shaft or with shrink disk the position of mounting face has to be specified.



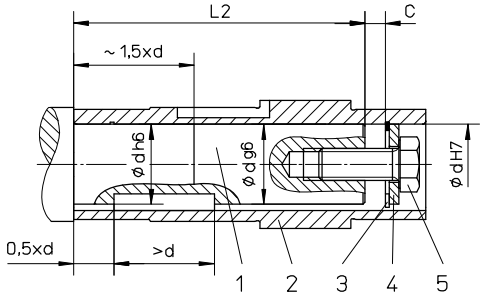
Example: Mounting face R

Product description

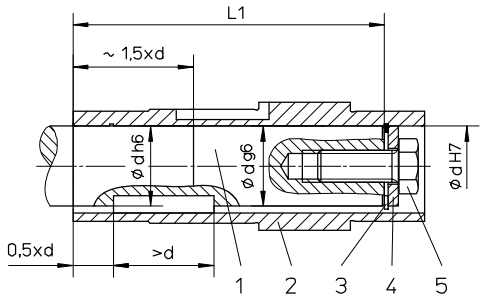
Assembly / Disassembly notes when using gear units with hollow shaft



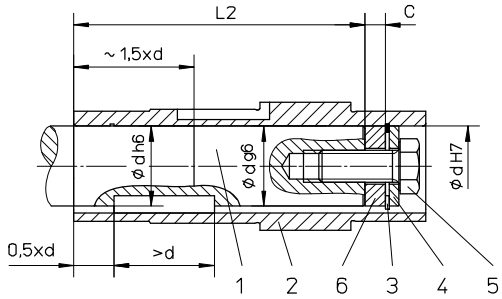
Assembly on shaft with shoulder
Length of customers shaft: L1-1mm



Assembly on shaft with shoulder
Disassembly with turn safe nut possible
Length of customers shaft: L2



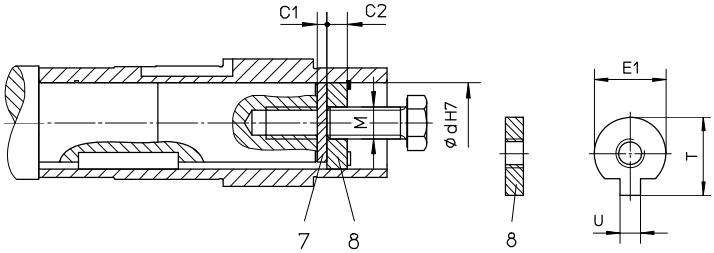
Assembly on shaft without shoulder
Length of customers shaft: L1



Assembly on shaft without shoulder
Disassembly with turn safe nut possible
Length of customers shaft: L2

Gear unit	d	L1	L2	C	C1	C2	E1	M	T	U
S0	20	76	64	12	5	6	19.7	M6	22.5	5.5
S1, F2, K2	25	105	89	16	5	10	24.7	M10	28	7.5
S2, F3, K3	30	132	116	16	5	10	29.7	M10	33	7.5
S2, F3, K3	35	132	116	16	5	10	34.7	M12	38	9.5
S3, F4, K4	40	155	137	18	5	12	39.7	M16	43	11.5
S4, F5, K5	50	185	167	18	5	12	49.7	M16	53.5	13.5
F6, K6	60	210	188	22	5	16	59.7	M20	64	17.5
F7, K7	70	270	248	22	5	16	69.7	M20	74.5	19.5
F8, K8	90	315	289	26	5	20	89.7	M24	95	24.5
K9	110	375	349	26	5	20	109.7	M24	116	27.5

1 Customer's shaft
2 Hollow shaft
3 Circlip DIN472
4 Washer
5 Screw DIN933
6 Spacer
7 Washer
8 Nut with tang



Drive selection

Selection conditions

The following conditions must be considered in the selection of the geared motor:

	T2	[Nm]	Torque of geared motor (see selection table)
T2 ≥ TA	TA	[Nm]	Counter-torque of driven machine
cG ≥ fB	cG		Gear coefficient (see selection table)
	fB		Application factor of driven machine

Further, the selection of the gearmotor is influenced by the following factors:

- Duty cycle of the motor
- Application of forces on the output shaft
- Ambient temperature and altitude
- Environment conditions

Please consult the manufacturer in the case of complicated drive applications.

Application factor fB

The service factor of the driven machine is given from the shock grade, the average operating time / day and the number of switches per hour.
The shock grade is given from the mass accelleration factor of the driven machine.

$$FJ = \frac{Jred}{Jmot}$$

FJ		Mass acceleration factor
Jred		All external inertias corrected to motor input
Jmot		Inertia (Motor)

Shock grade	FJ	Operating time hours/day	Operations per hour			
			< 10	10 ... 100	100 ... 200	> 200
I - uniform	0 ... 0.2	< 8	0.8	1.0	1.2	1.3
		8 ... 16	1.0	1.2	1.3	1.4
		16 ... 24	1.2	1.3	1.4	1.5
II - moderate shocks	0.2 ... 3	< 8	1.1	1.3	1.4	1.5
		8 ... 16	1.3	1.4	1.5	1.7
		16 ... 24	1.5	1.6	1.7	1.8
III - severe shocks	3 ... 10	< 8	1.4	1.6	1.7	1.8
		8 ... 16	1.6	1.7	1.8	2.0
		16 ... 24	1.8	1.9	2.0	2.1

Radial force on gear output shaft

$$F_R = \frac{M_{ab} \cdot 2000}{d_0} \cdot f_z$$

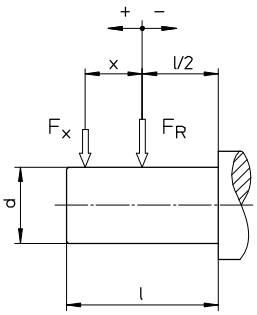
Transmission element	fz	Remarks
Gears	1.1	< 17 teeth
Sprockets	1.4	< 13 teeth
	1.2	< 20 teeth
V-belt pulleys	1.7	Influence of initial pretensioning force
Flat belt pulleys	2.5	Influence of initial pretensioning force

F_R	[N]	Radial force on gear output shaft
Mab	[Nm]	Torque of geared motor (see selection table)
d0	[mm]	Effective diameter of fitted drive element
fz		Incremental factor (see table)

The radial force determined must not exceed the permissible radial force for the gear unit.

Permissible Radial Forces for the Output Shaft

If there are radial loads on the output shaft, they should be compared with the permissible values for radial forces.
The values in the table for the permissible radial forces apply under the following conditions
gear unit with solid output shaft, normal shaft ends
constant load in continuous operation
radial load on the middle of the output shaft in the case of worst load direction
- no axial forces



Drive selection

If the radial force is not applied to the middle of the shaft, use the following formula for the conversion of the permissible radial force:

$$F_{Rx1} = F_{R1} \cdot \frac{1}{1 + \frac{x}{K_1}}$$

$$F_{Rx2} = F_{R2} \cdot \frac{1}{1 + \frac{x}{K_2}}$$

$$F_{Rxp} = \min(F_{Rx1}, F_{Rx2})$$

F_{R1}	[N]	permissible radial force for bearing lifetime application at middle of output shaft (table)
F_{R2}	[N]	permissible radial force for shaft strength application at middle of output shaft (table)
K1, K2	[mm]	Constant (table)
x	[mm]	Distance (subject to sign, see sketch)
F_{Rx1}	[N]	permissible radial force for bearing lifetime application at point x
F_{Rx2}	[N]	permissible radial force for shaft strength application at point x
F_{Rxp}	[N]	total value of permissible radial force application at point x

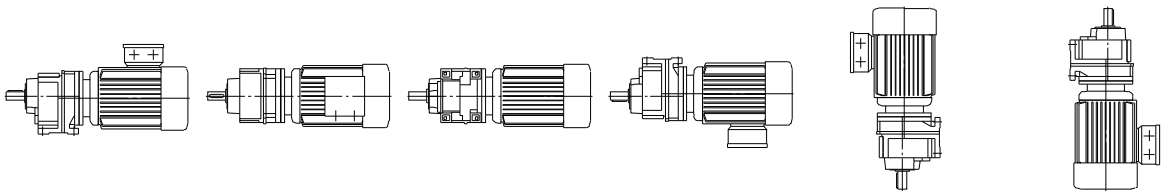
					FR1 [N]							
Gear unit	**Output shaft dxl [mm]**	**K1 [mm]**	**K2 [mm]**	**FR2 [N]**	**<16 1/min**	**<25 1/min**	**<40 1/min**	**<63 1/min**	**<100 1/min**	**<160 1/min**	**<250 1/min**	**<400 1/min**
G0	20x40	81.5	32.5	2540	2850	2430	1950	1630	1460	1200	1080	950
G1	20x40	90	20	4030	4450	3600	3040	2420	2020	1770	1600	1440
G2	25x50	110.5	25	5900	6000	4920	4180	3410	2860	2440	2240	2040
G3	30x60	132	30	7050	10400	8650	7100	5800	4700	4300	3900	3550
G3	35x70	137	54.5	6760	10000	8330	6840	5600	4530	4140	3760	3420
G4	40x80	159	60.5	11500	16500	13600	11300	9400	7950	6650	6050	5500
G5	50x100	191.5	73.5	17600	21200	17900	14700	12800	10200	9000	8150	7450
G6	60x120	218.5	83.5	24000	27400	22500	19200	16300	14000	12600	11400	10300
G7	75x140	287	97.5	30700	36100	31900	22200	20700	19600	18200	16300	14700
G8	90x170	347.5	117	50000	101000	84500	70000	62000	60500	56000	51000	
G9	110x210	410	140	63000	179000	150000	128000	119000	112000	100000	89000	
F2	25x50	131	25	5830	6250	5300	4100	3450	3250	3050	2700	2350
F3	30x60	161	30	8000	9600	8050	6250	5150	4350	4250	3900	3600
F3	35x70	166	80	7960	9300	7800	6050	5000	4200	4150	3800	3500
F4	40x80	193.5	40	12700	10100	8000	6250	5800	3900	4200	4000	3800
F5	50x100	234.5	50	18200	15100	12100	9350	7300	5500	5750	5850	5650
F6	60x120	256	60	26200	15700	12800	9350	7750	5350	6550	6700	6700
F7	75x140	313	70	41700	50300	41600	34200	29600	28600	27200	24900	22800
F8	90x170	372.5	85	61000	64700	55700	45500	40500	39700	36700	33600	
S02A	20x40	91	20	4030	5370	4410	3750	3100	2380	2080	1910	
S02C	20x40	109	20	4030	4490	3680	3130	2590	1980	1740	1590	
S1	25x50	128	25	5830	6400	5470	4170	3430	2510	2470	2230	
S2	30x60	161	30	8000	10500	8060	6700	5730	3170	3530	3230	
S2	35x70	166	80	7960	10200	7820	6500	5560	3080	3430	3130	
S3	40x80	193.5	40	12700	11800	10400	7950	6150	5450	5200	5000	
S4	50x100	234.5	50	18200	16900	15100	10500	8900	8250	7950	7650	
K2	25x50	131	25	5830	6200	5200	4300	3350	3100	2820	2600	2530
K3	30x60	161	30	8000	9650	7800	6600	5150	4050	3800	3750	3650
K3	35x70	166	80	7960	9350	7550	6400	5000	3900	3700	3650	3550
K4	40x80	193.5	40	12700	10500	8200	6400	4700	3950	3750	3600	3600
K5	50x100	234.5	50	18200	15200	12100	9400	7800	4900	5050	5350	5350
K6	60x120	256	60	26200	15800	12100	8500	5800	4700	5100	5750	
K7	75x140	313	70	41700	49100	42600	36700	33200	27200	25400	24500	
K8	90x170	372.5	85	61000	65700	55200	46700	41000	38900	35600	34900	
K9	110x210	444.5	105	77300	87200	73300	62800	57300	55100	49300	48100	

The radial force determined from the application must not exceed the permissible radial force for the gear unit.
In certain conditions, the gear unit is able to accept higher radial forces.
If no radial force is applied, the permissible axial force for the gear unit is 50% of the calculated permissible radial force.
If the radial forces found for a special drive application are higher than the values in the table, or if radial and axial forces are acting at the same time, consultation with the manufacturer is necessary.

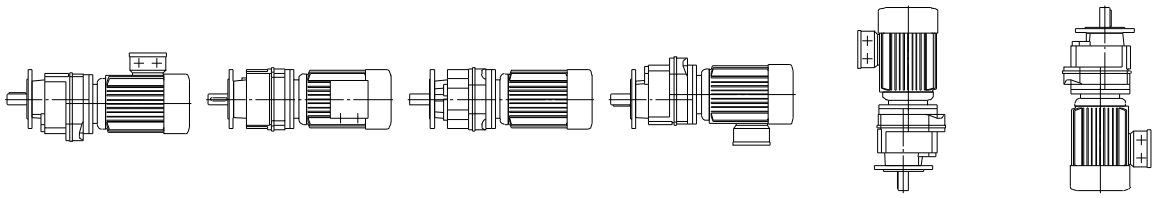
Mounting Position

Helical gear units G

B3 B6 B7 B8 V5 V6

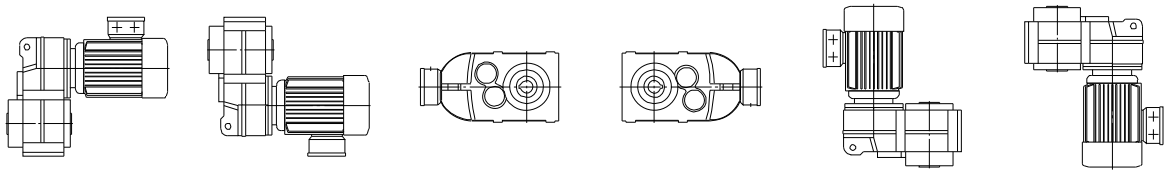


B5 B5/90 B5/270 B5/180 V1 V3



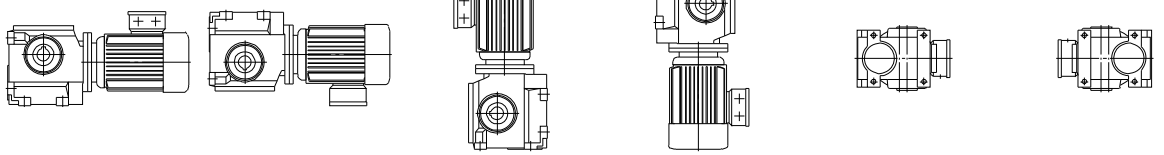
Shaft mounted helical gear units F

H1 H2 H3 H4 H5 H6



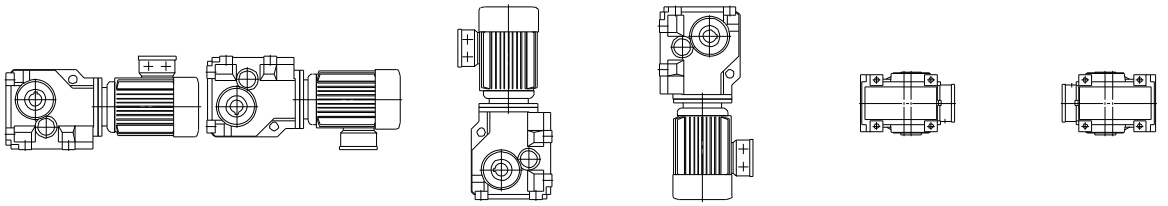
Helical worm gear units S

H1 H2 H3 H4 H5 H6



Helical bevel gear units K

H1 H2 H3 H4 H5 H6



Lubrication

The geared motors are supplied oil filled for the mounting position and ambient temperature of the order.
If the gear unit is to be used in a different mounting position as given on the nameplate, the quantity of lubricant has to be adjusted.

Quantities of lubricant

Gear unit	Mounting position Quantity of lubricant [l]					
	B3 B5	**B6 B5/90**	**B7 B5/270**	**B8 B5/180**	**V5 V1**	**V6 V3**
G0	0.1	0.25	0.25	0.35	0.4	0.45
G1	0.15	0.4	0.4	0.55	0.65	0.65
G2	0.25	0.65	0.65	0.9	1.1	1.1
G3	0.35	1.0	1.0	1.2	1.8	1.8
G4	0.5	1.7	1.7	1.9	2.6	2.7
G5	1.1	3.1	3.1	4.1	4.8	5.2
G6	1.9	7.0	7.0	8.1	8.2	8.8
G7	3.0	12.2	12.2	13.4	12.7	14.5
G8	4.8	21.0	21.0	22.2	21.5	23.2
G9	8.1	22.0	20.7	28.5	37.0	38.2
	H1	**H2**	**H3**	**H4**	**H5**	**H6**
F2	0.75	0.6	0.65	0.7	1.0	1.1
F3	1.5	1.2	1.3	1.4	1.7	2.1
F4	2.7	1.9	2.1	2.3	3.0	3.5
F5	4.6	3.6	4.0	4.1	5.9	6.4
F6	7.6	6.2	7.2	6.2	10.4	11.5
F7	11.4	9.8	10.5	10.8	16.6	18.0
F8	19.9	17.4	17.1	17.4	29.8	30.1
	H1	**H2**	**H3**	**H4**	**H5**	**H6**
S0	0.1	0.25	0.35	0.35	0.25	0.25
S1	0.3	0.55	1.0	0.75	0.6	0.6
S2	0.5	0.85	1.7	1.2	1.0	1.0
S3	0.8	1.6	3.0	2.0	1.8	1.8
S4	1.4	2.8	5.1	3.5	3.0	3.0
	H1	**H2**	**H3**	**H4**	**H5**	**H6**
K2	0.3	0.8	1.0	0.7	0.75	0.75
K3	0.6	1.7	2.0	1.1	1.4	1.4
K4	1.0	2.9	3.2	1.8	2.5	2.5
K5	1.9	5.0	6.5	3.4	4.6	4.6
K6	3.1	7.6	10.5	5.7	7.1	7.1
K7	4.7	11.3	18.5	9.7	13.1	13.1
K8	7.5	18.0	28.0	14.5	20.5	20.5
K9	12.0	30.7	46.7	22.6	35.8	35.8

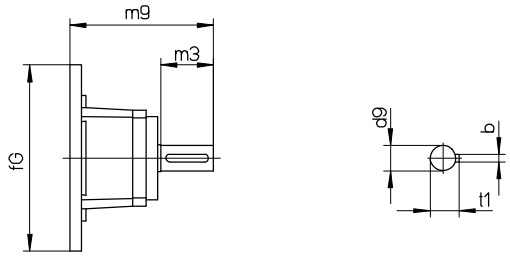
Lubrication

Type of lubricant	Area of use				Products					
	Gear unit	θ [°C]	1)	2)	ARAL	ESSO	KLÜBER	MOBIL	SHELL	FUCHS
Mineraloil										
CLP VG100	G,F,K	-20... +25	O	O	Degol BG 100	Spartan EP 100	Klüberoil GEM 1-100	Mobilgear 629	Shell Omala 100	Renolin CLP 100
	S	-20... +10	O	O						
CLP VG220	G,F,K	-10... +40	O	O	Degol BG 220	Spartan EP 220	Klüberoil GEM 1-220	Mobilgear 630	Shell Omala 220	Renolin CLP220
CLP VG680	S	0... +40	O	O	Degol BG 680		Klüberoil GEM 1-680	Mobilgear 636	Shell Omala 680	Renolin CLP460
Synthetic oil – PG										
PGLP VG220	G,F,K	-25... +80	+	+	Degol GS 220	Glycolube 220	Klübersynth GH 6-220	Glygoyle 30	Shell Tivela S220	Renolin PG220
	S	-25... +20	O	+						
PGLP VG460	S	-20... +60	+	+	Degol GS 460	Glycolube 460	Klübersynth GH 6-460	Glygoyle HE460	Shell Tivela S460	Renolin PG460
Synthetic oil – HC										
CLP HC VG220	G,F,K	-40... +80	+	++	Degol PAS 220		Klübersynth EG 4-220	Mobilgear SHC XMP220	Shell Omala HD 220	Renolin Unisyn CLP220
CLP HC VG460	S	-30... +80	+	++	Degol PAS 460		Klübersynth EG 4-460	Mobilgear SHC XMP460	Shell Omala HD 460	Renolin Unisyn CLP460
Synthetic oil Food grade										
USDA-H1 VG220	G,F,K	-30... +40	+	+	Eural Gear 220		Klüberoil 4 UH 1-220	Mobil DTE FM 220	Shell Cassida GL 220	
USDA-H1 VG460	S	-30... +40	+	+	Eural Gear 460		Klüberoil 4 UH 1-460	Mobil DTE FM 460	Shell Cassida GL 460	
Grease										
Grease GP 0 M-20	G,F,K,S	-20... +50	O	O	Aralub FDP 00	Fibrax EP 370		Mobilplex 44	Shell Alvania GL00	
Grease GP PG 00 N-50	G,F,K,S	-50... +100	O	O		Fließfett S420				
Bearing lubricants										
Mineral oil based		-25... +60						Mobilux 3	Alvania R3	
		-40... +80						Mobiltemp SHC100	Stamina EP2	
		-30... +40							Cassida RLS 2	
		Motor Iso H				Exxon Polyrex EM				

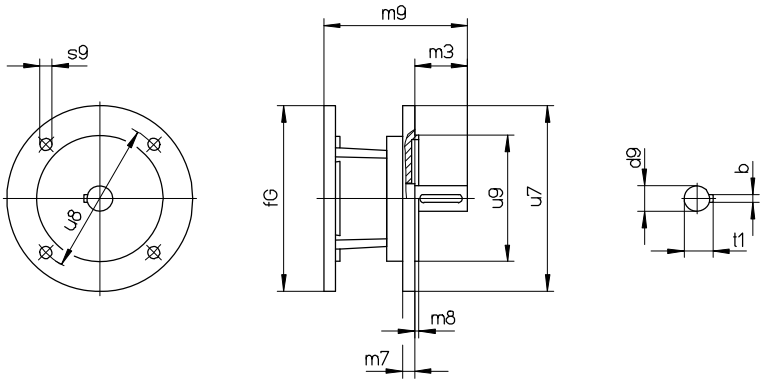
θ Ambient temperature
1) Load capacity O=normal, +=high, ++=very high
2) Resistance to ageing O=normal, +=high, ++=very high

Free input shaft -W

-W

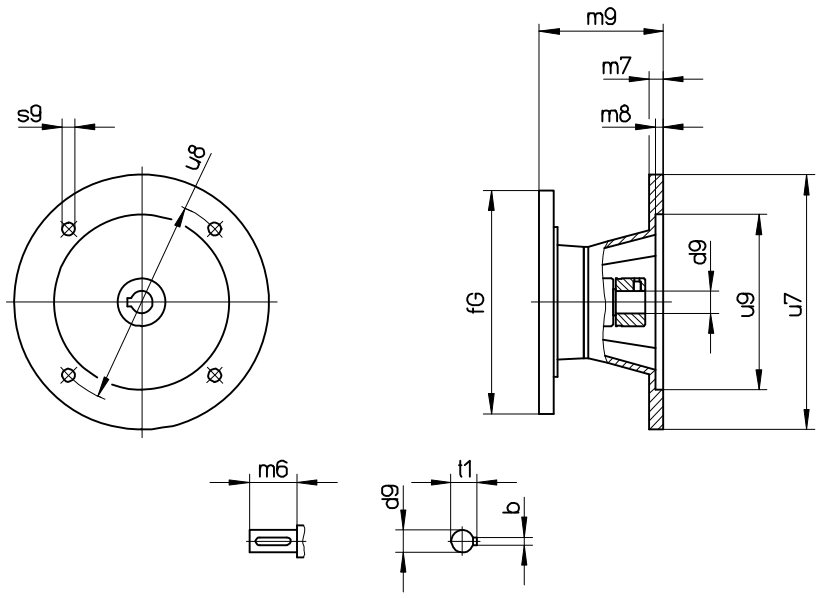


-WF



Adapter	-W1	-W2	-W3	-W4	-W5	fG	Gear unit
T1max [Nm]	4	12	30	60	180		
d9	14	19	28	38	48		
m3	30	40	60	80	110		
b	5	6	8	10	14		
t1	16	21.5	31	41	51.5		
u7	120	140	160	200	300		
u8	100	115	130	165	265		
u9	80	95	110	130	230		
m7	8	9	9	10	12		
m8	3	3	3.5	3.5	4		
s9	6.6	9	9	11	14		
m9	79.5					105	G0, S0
	78.5	113.5				120	G1, S1, F2, K2
	75.5	108.5	153.5			140	G2, S2, F3, K3
	75	110	154	192.5		160	G3, S3, F4, K4
	71.5	106.5	149.5	189		200	G4, S4, F5, K5
		101.5	146	185.5	243.5	250	G5, F6, K6
			139	178.5	237.5	300	G6, F7, K7
			132	170.5	230	350	G7, F8, K8
				154	215	400	G8, K9
					202.5	450	G9

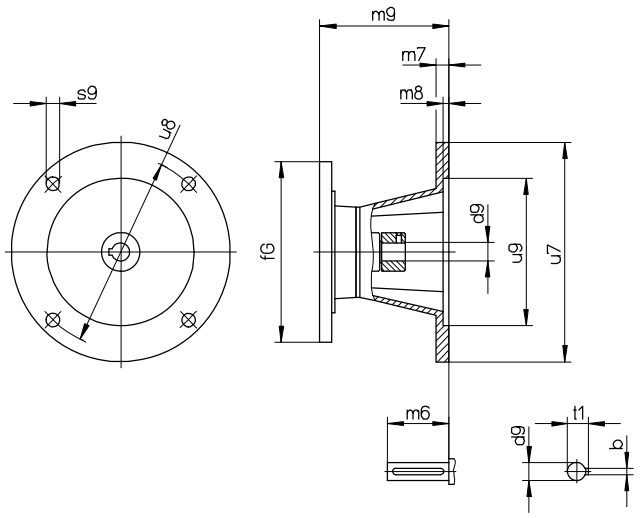
Motor adapter -M IEC



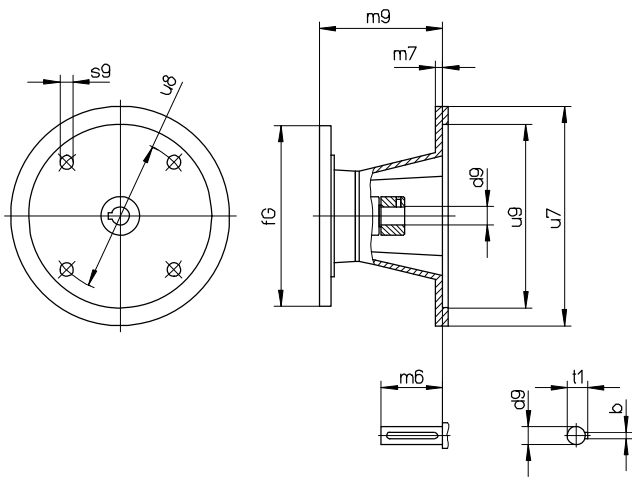
Adapter -M	IEC63	IEC71	IEC80	IEC90	IEC100	IEC112	IEC132	IEC160	IEC180		
T1max [Nm]	4	4	8	12	21	30	60	120	180		
Jad [kgcm²]	0.1	0.1	0.69	0.69	2.3	2.3	7.7	54.3	54.3		
u7	140	160	200	200	250	250	300	350	350		
u8	115	130	165	165	215	215	265	300	300		
u9	95	110	130	130	180	180	230	250	250		
s9	M8	M8	M10	M10	M12	M12	M12	M16	M16		
d9	11	14	19	24	28	28	38	42	48		
m6	23	30	40	50	60	60	80	110	110		
b	4	5	6	8	8	8	10	12	14		
t1	12.5	16	21.5	27	31	31	41	45	51.5		
m7	12	12	15	15	18	18	18	24	24		
m8	4	4.5	4.5	4.5	5	5	5	6	6	fG	Gear unit
m9	75	82								105	G0, S0
	74	81	118	128						120	G1, S1, F2, K2
	71	78	113	123	156.5	156.5				140	G2, S2, F3, K3
	70.5	77.5	114.5	124.5	157	157	196			160	G3, S3, F4, K4
	67	74	111	121	152.5	152.5	192.5			200	G4, S4, F5, K5
			106	116	149	149	189	249	249	250	G5, F6, K6
					142	142	182	243	243	300	G6, F7, K7
					135	135	174	234.5	234.5	350	G7, F8, K8
							157.5	223.5	223.5	400	G8, K9
								208	208	450	G9

Motor adapter -M NEMA

NEMA 56 .. 140

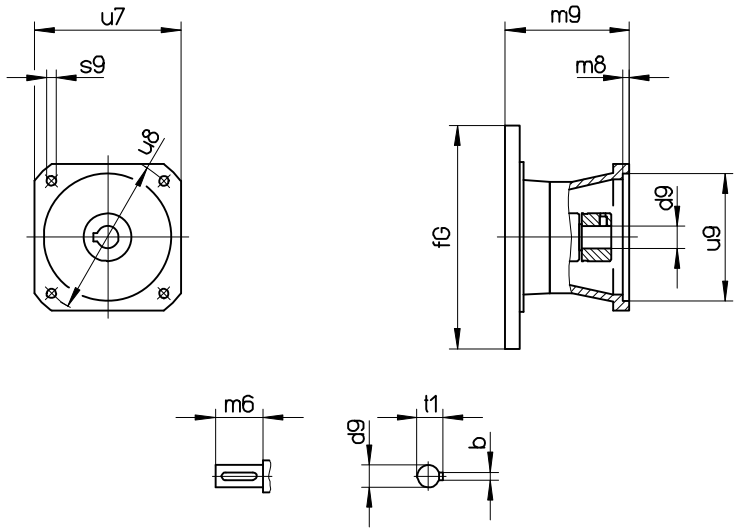


NEMA180 .. 280



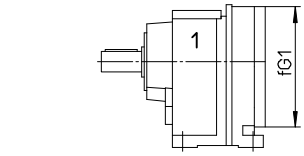
Adapter -M	NEMA56	NEMA140	NEMA180	NEMA210	NEMA250	NEMA280		
T1max [Nm]	4	12	30	60	120	180		
Jad [kgcm²]	0.1	0.69	2.3	7.7	54.3	54.3		
u7 [inch]	6.69	6.69	9.00	9.00	9.00	11.26		
u8 [inch]	5.875	5.875	7.25	7.25	7.25	9.00		
u9 [inch]	4.50	4.50	8.50	8.50	8.50	10.50		
s9 [inch]	0.41	0.41	0.59	0.59	0.59	0.59		
d9 [inch]	0.625	0.875	1.125	1.375	1.625	1.875		
m6 [inch]	2.08	2.12	2.62	3.125	3.75	4.380		
b [inch]	0.188	0.188	0.250	0.312	0.375	0.500		
t1 [inch]	0.705	0.959	1.236	1.522	1.791	2.091		
m7 [inch]	0.43	0.47	0.39	0.43	0.47	0.59		
m8 [inch]	0.17	0.17	-	-	-	-	fG [mm]	Gear unit
m9 [mm]	104.5						105	G0, S0
	103.5	132					120	G1, S1, F2, K2
	100.5	127	163				140	G2, S2, F3, K3
	100	128.5	163.5	195.5			160	G3, S3, F4, K4
	96.5	125	159	192			200	G4, S4, F5, K5
		120	155.5	188.5	234.5	250.5	250	G5, F6, K6
			148.5	181.5	228.5	244.5	300	G6, F7, K7
			141.5	173.5	220	236	350	G7, F8, K8
				157	209	225	400	G8, K9
					193.5	209.5	450	G9

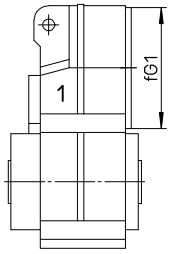
Motor adapter -M S

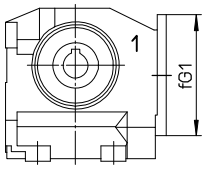


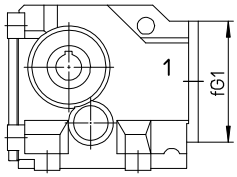
Adapter -M	S70/1	S90/1	S90/2	S110/1	S140/1	S140/2	S190/1	S190/2		
T1max [Nm]	4	8	8	12	30	30	60	60		
Jad [kgcm²]	0.1	0.69	0.69	0.69	2.3	2.3	7.7	7.7		
u7	70	92	92	110	140	140	190	190		
u8	75	100	100	115	165	130	215	165		
u9	60	80	80	95	130	110	180	130		
s9	M5	M6	M6	M8	M10	M8	M12	M10		
d9	11	14	19	19	24	24	32	32		
m6	23	30	40	40	50	50	58	58		
b	4	5	6	6	8	8	10	10		
t1	12.5	16	21.5	21.5	27	27	35	35		
m8	3.5	4	4	4	4.5	4.5	5	4.5	fG	Gear unit
m9	75								105	G0, S0
	74	108	118	118					120	G1, S1, F2, K2
	71	103	113	113	146.5	146.5			140	G2, S2, F3, K3
	70.5	104.5	114.5	114.5	147	147	174	174	160	G3, S3, F4, K4
	67	101	111	111	142.5	142.5	170.5	170.5	200	G4, S4, F5, K5
		96	106	106	139	139	167	167	250	G5, F6, K6
					132	132	160	160	300	G6, F7, K7
					125	125	152	152	350	G7, F8, K8
							135.5	135.5	400	G8, K9

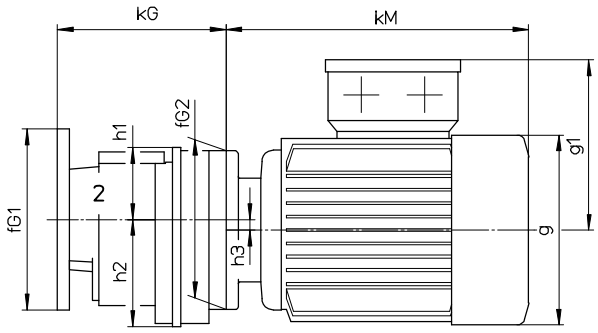
Double gearbox
Dimensions











Gear unit 1	Gear unit 2	fG1	kG	fG2	h1	h2	h3	Motor	kM	g	g1
G1, S1, F2, K2	**G0**	120	111.5	105	47.5	71	7	**DM63**	202	123	106
								DM71	228	138	119
G2, S2, F3, K3	**G1**	140	123	120	57.5	85	5	**DM63**	201	123	106
								DM71	228	138	119
G3, S3, F4, K4	**G1**	160	123					**DM80**	250	156	140
G4, S4, F5, K5	**G2**	200	145	140	62.5	100.5	11	**DM63**	198	123	106
								DM71	224	138	119
								DM80	247	156	140
G5, F6, K6	**G2**	250	142.5					**DM90S**	261.5	176	144
								DM90L	286.5	176	144
								DM100	319	194	155
G6, F7, K7	**G3**	300	173	160	73.5	120	11	**DM63**	198.5	123	106
								DM71	223.5	138	119
								DM80	247.5	156	140
								DM90S	262	176	144
G7, K8, F8	**G3**	350	168					**DM90L**	287	176	144
								DM100	319	194	155
								DM112	342	218	165
								DA132	435	245	188
G8, K9	**G4**	400	201	200	88	144.5	16	**DM71**	220	138	119
								DM80	243	156	140
								DM90S	259.5	176	144
								DM90L	284.5	176	144
G9	**G4**	450	189					**DM100**	314	194	155
								DM112	337.5	218	165
								DA132	431.5	245	188
								DA160	539.5	311	250