Standard Three-Phase Motors SM/I, with Cage Rotor, Surface Cooled, for 230/400 V, 50 Hz

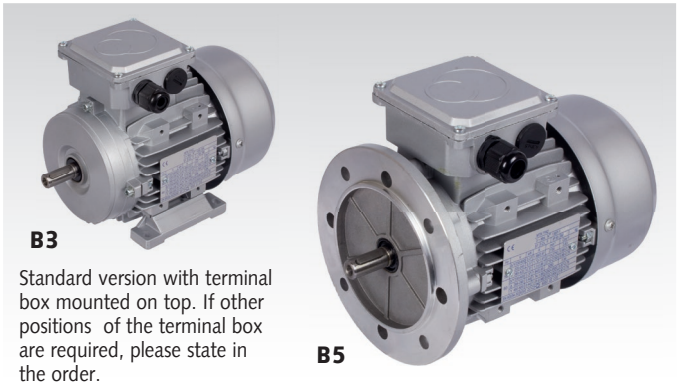
These motors comply with the recommendations IEC 72. Electrical characteristics according to VDE 0530 and recommendation IEC 34-1. Housing aluminium die-cast. The motors are self-ventilated and are fitted with radial plastic fans, which cool independently of the sense of rotation. Fan cover made from steel sheet. Protection class IP 55. Isolation class F.

The rated output stated below refers to continuous duty, an operating frequency of 50 Hz, a maximum ambient temperature of 40°C and an altitude 1,000 m above sea level.

From 0.75 kW in efficiency class IE2 (only 2 - 6 pole motors).

Special versions on request: With non-standard voltage and frequency, dual speed, with electromagnetical DC spring-tension disc brake; AC capacitor motor 230 Volt.

Ordering details: e.g.: Type, Model, Product No.



B3

Standard version with terminal box mounted on top. If other positions of the terminal box are required, please state in the order.

B5

2 Poles approx. 3000 min^{-1}

Model B3 Product No.	Model B5 Product No.	Size	Nominal Power kW	Nominal Speed min^{-1}	J kgm^2	η at speed 4/4n 3/4n 2/4n %	Power Factor cos φ	Current at 400V A	Nominal Torque T_n [Nm]	Starting Torque T_a/T_n	Starting Current I_d/I_n	max. Torque T_{max}/T_n	Weight B3 kg
430 004 00	**430 024 00**	63	0,25	2710	0,00024	65 / - / -	0,78	0,71	0,88	2,2	6,0	2,4	4,4
430 005 00	**430 025 00**	71	0,37	2730	0,00035	65 / - / -	0,79	0,97	1,3	2,2	6,0	2,4	5,6
430 006 00	**430 026 00**	71	0,55	2760	0,00052	65 / - / -	0,79	1,42	1,9	2,2	6,0	2,4	6,1
430 007 00	**430 027 00**	80	0,75	2840	0,00073	77,4 / 77,4 / 74,3	0,80	1,75	2,5	2,9	5,8	3,3	8,7
430 008 00	**430 028 00**	80	1,1	2850	0,00090	79,6 / 79,5 / 77,0	0,82	2,42	3,7	3,5	6,8	3,6	10,5
430 009 00	**430 029 00**	90 S	1,5	2850	0,00125	81,3 / 81,2 / 78,8	0,83	3,20	5,0	3,5	6,9	3,6	13,1
430 010 00	**430 030 00**	90 L	2,2	2860	0,00145	83,2 / 83,4 / 81,4	0,84	4,54	7,4	4,1	7,9	4,1	15,0
430 011 00	**430 031 00**	100 L	3	2880	0,00310	84,6 / 84,2 / 82,0	0,87	5,88	9,9	3,4	7,8	3,4	24,2
430 012 00	**430 032 00**	112 M-T	4	2890	0,00550	85,8 / 85,8 / 83,9	0,89	7,54	13,2	2,7	7,5	3,3	25,8
430 013 00	**430 033 00**	132 S	5,5	2900	0,01040	87,0 / 87,6 / 86,6	0,89	10,20	18,1	2,4	7,7	3,0	43,8

4 Poles approx. 1500 min^{-1}

Model B3 Product No.	Model B5 Product No.	Size	Nominal Power kW	Nominal Speed min^{-1}	J kgm^2	η at speed 4/4n 3/4n 2/4n %	Power Factor cos φ	Current at 400V A	Nominal Torque T_n [Nm]	Starting Torque T_a/T_n	Starting Current I_d/I_n	max. Torque T_{max}/T_n	Weight B3 kg
430 043 00	**430 063 00**	63	0,18	1350	0,0003	59 / - / -	0,65	0,68	1,3	2,2	6,0	2,4	4,3
430 044 00	**430 064 00**	71	0,25	1350	0,0007	60 / - / -	0,72	0,84	1,8	2,2	6,0	2,4	5,4
430 045 00	**430 065 00**	71	0,37	1370	0,0010	65 / - / -	0,74	1,11	2,6	2,2	6,0	2,4	6,2
430 046 00	**430 066 00**	80	0,55	1370	0,0020	67 / - / -	0,75	1,58	3,7	2,2	6,0	2,4	9,0
430 047 00	**430 067 00**	80	0,75	1410	0,0022	79,6 / 80,6 / 79,1	0,76	1,79	5,1	2,8	5,3	3,0	10,5
430 048 00	**430 068 00**	90 S	1,1	1420	0,0024	81,4 / 82,0 / 80,1	0,78	2,50	7,4	3,8	6,7	2,6	14,5
430 049 00	**430 069 00**	90 L	1,5	1420	0,0030	82,8 / 83,3 / 81,4	0,79	3,31	10,1	4,0	7,2	2,7	17,6
430 050 00	**430 070 00**	100 L	2,2	1440	0,0056	84,3 / 84,4 / 82,5	0,78	4,83	14,6	3,6	7,4	3,6	20,0
430 051 00	**430 071 00**	100 L	3	1440	0,0069	85,5 / 85,7 / 84,0	0,80	6,33	19,9	3,8	7,8	3,5	21,1
430 052 00	**430 072 00**	112 M-T	4	1440	0,0097	86,6 / 87,2 / 86,2	0,81	8,23	26,5	3,1	7,1	2,9	30,8
430 053 00	**430 073 00**	132 S	5,5	1450	0,0221	87,7 / 88,1 / 87,2	0,83	10,90	36,2	2,6	7,4	2,7	43,0

6 Poles approx. 1000 min^{-1}

Model B3 Product No.	Model B5 Product No.	Size	Nominal Power kW	Nominal Speed min^{-1}	J kgm^2	η at speed 4/4n 3/4n 2/4n %	Power Factor cos φ	Current at 400V A	Nominal Torque T_n [Nm]	Starting Torque T_a/T_n	Starting Current I_d/I_n	max. Torque T_{max}/T_n	Weight B3 kg
430 104 00	**430 124 00**	71	0,25	900	0,0013	59 / - / -	0,70	0,87	2,65	2,1	4,0	2,2	6,5
430 105 00	**430 125 00**	80	0,37	900	0,0016	62 / - / -	0,70	1,23	3,93	1,9	4,0	1,9	8,2
430 106 00	**430 126 00**	80	0,55	900	0,0026	67 / - / -	0,72	1,65	5,84	2,0	4,0	2,3	9,9
430 107 00	**430 127 00**	90 S	0,75	925	0,0031	75,9 / 75,0 / 70,5	0,71	2,01	7,7	3,1	4,7	3,1	12,1
430 108 00	**430 128 00**	90 L	1,1	930	0,0038	78,1 / 78,1 / 75,2	0,72	2,82	11,3	3,2	5,0	3,2	16,6
430 109 00	**430 129 00**	100 L	1,5	940	0,0075	79,8 / 80,0 / 77,6	0,73	3,71	15,2	3,1	5,9	2,9	21,8
430 110 00	**430 130 00**	112 M-T	2,2	945	0,0143	81,8 / 82,5 / 81,0	0,75	5,17	22,2	2,6	5,5	2,8	29,5
430 111 00	**430 131 00**	132 S	3	960	0,0238	83,3 / 84,4 / 83,5	0,76	6,84	29,8	2,2	5,7	2,7	35,0
430 112 00	**430 132 00**	132 M	4	960	0,0321	84,6 / 85,3 / 84,1	0,77	8,86	39,8	2,4	6,2	2,7	49,7
430 113 00	**430 133 00**	132 M	5,5	960	0,0436	86,0 / 86,4 / 85,3	0,77	12,0	54,7	2,6	6,7	2,7	54,7

8 Poles approx. 750 min^{-1}

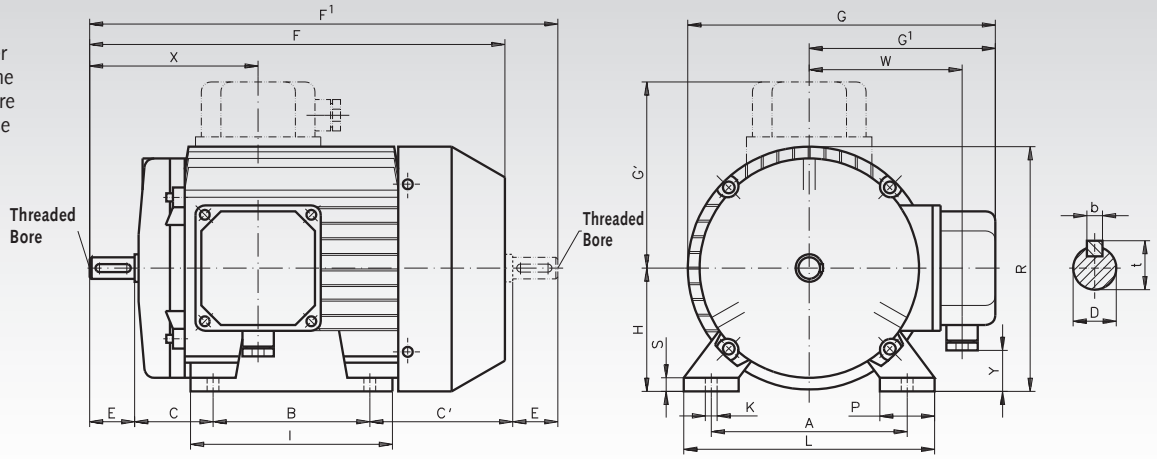
Model B3 Product No.	Model B5 Product No.	Size	Nominal Power kW	Nominal Speed min^{-1}	J kgm^2	η at speed 4/4n %	Power Factor cos φ	Current at 400V A	Nominal Torque T_n [Nm]	Starting Torque T_a/T_n	Starting Current I_d/I_n	max. Torque T_{max}/T_n	Weight B3 kg
430 144 00	**430 164 00**	80	0,25	680	0,00254	56	0,61	1,06	3,5	1,6	2,7	2,0	10,9
430 145 00	**430 165 00**	90 S	0,37	680	0,00242	63	0,63	1,35	5,2	1,6	2,8	1,8	14,8
430 146 00	**430 166 00**	90 L	0,55	680	0,00320	66	0,65	1,85	7,7	1,6	3,0	1,8	17,2
430 147 00	**430 167 00**	100 L	0,75	710	0,00519	66	0,67	2,45	10,1	1,7	3,5	2,1	17,5
430 148 00	**430 168 00**	100 L	1,1	710	0,00668	72	0,69	3,20	14,8	1,7	3,5	2,1	19,7
430 149 00	**430 169 00**	112 M-T	1,5	710	0,01220	74	0,68	4,30	20,2	1,8	4,2	2,1	25,6
430 150 00	**430 170 00**	132 S	2,2	720	0,01940	75	0,71	5,96	29,2	2,0	5,5	2,0	35,5
430 151 00	**430 171 00**	132 M	3	720	0,03430	77	0,73	7,70	39,8	2,0	5,5	2,0	45,0

Other power rates and model B14 available at short time.

Motor-tensioning rails see page 695.

Dimensions Table Standard Three-Phase Motors SM/I, Model B 3

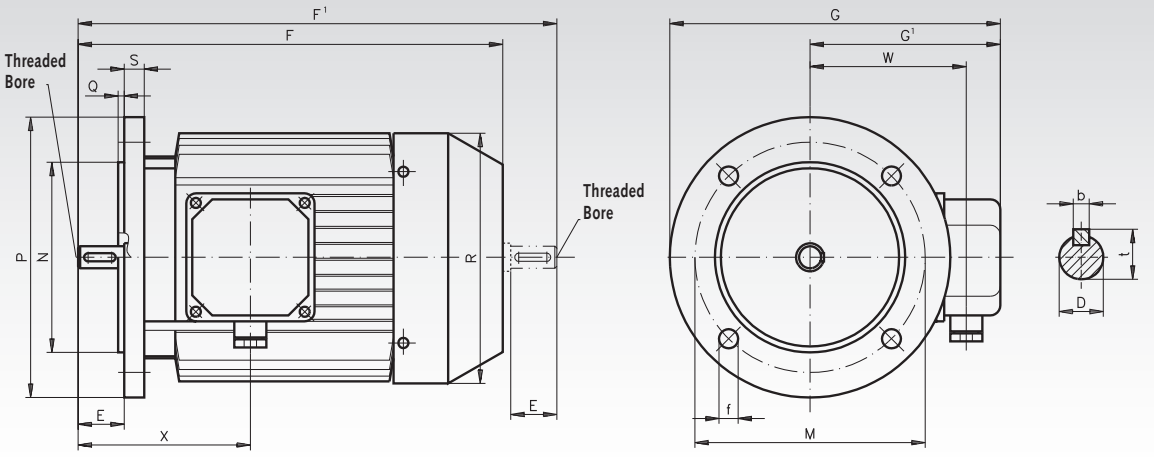
Standard version with terminal box mounted on top. If other positions of the terminal box are required, please state in the order.



Position of terminal box: standard on top (against drawing!)

Size	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H +0 -0.5 mm	K mm	I mm	L mm	P mm	R mm	S mm	C1 mm	F1 mm	G1 mm	X mm	Y mm	W mm	b mm	t mm	PG-Screw Connect.	Threaded Bore
63	100	80	40	11j6	23	212	158	63	6	103	128	28	125	7	73	239	113	86	18	68	4	12,5	Pg11	M4x0,7
71	112	90	45	14j6	30	238	185	71	7	101	137	24	144	10	85.5	280	125	111	20	88	5	16	Pg11	M5x0,8
80	125	100	50	19j6	40	274	210	80	9	122	155	30	164	10	93.5	323	133	113	30	96	6	21,5	Pg11	M6x1
90S	140	100	56	24j6	50	297	230	90	10	125	175	34	180	12	118	374	148	134	30	115	8	27	Pg13.5	M8x1,25
90L	140	125	56	24j6	50	322	230	90	10	150	175	34	180	12	118	399	148	134	30	115	8	27	Pg13.5	M8x1,25
100L	160	140	63	28j6	60	361	253	100	12	173	198	37	205	14	107	430	156	160	35	123	8	31	Pg13.5	M10x1,5
112M-T	190	140	70	28j6	60	361	265	112	12	178	224	38	217	15	100	430	173	160	47	123	8	31	Pg13.5	M10x1,5
132S	216	140	89	38k6	80	470	328	132	13	225	258	50	264	19	167	556	189	198	50	162	10	41	Pg21	M12x1,75
132M	216	178	89	38k6	80	496	328	132	13	225	258	50	264	19	173	600	189	198	50	162	10	41	Pg21	M12x1,75

Dimensions Table Standard Three-Phase Motors SM/I, Model B 5



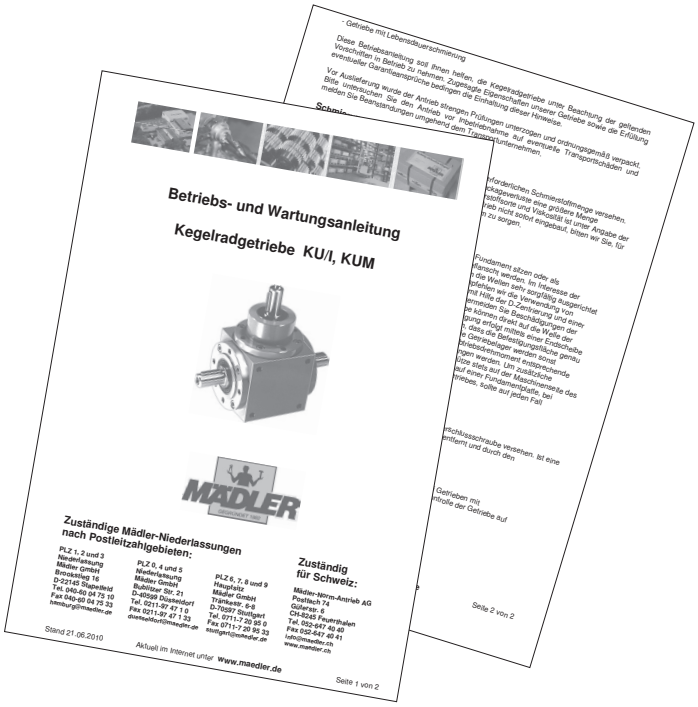
Size	D mm	E mm	F mm	f mm	G mm	M mm	N mm	P mm	Q mm	R mm	S mm	Flange-bores*	F1 mm	G1 mm	X mm	W mm	b mm	t mm	PG-Screw Connect.	Threaded Bore
63	11j6	23	212	9,5	165	115	95j6	140	3	125	10	4	239	113	86	68	4	12,5	Pg11	M4x0,7
71	14j6	30	238	9,5	195	130	110j6	160	3,5	148	10	4	280,5	125	111	88	5	16	Pg11	M5x0,8
80	19j6	40	274	11,5	226	165	130j6	200	3,5	170	12	4	323,4	133	113	96	6	21,5	Pg11	M6x1
90S	24j6	50	297	11,5	242	165	130j6	200	3,5	185	12	4	374	148	134	115	8	27	Pg13.5	M8x1,25
90L	24j6	50	322	11,5	242	165	130j6	200	3,5	185	12	4	399	148	134	115	8	27	Pg13.5	M8x1,25
100L	28j6	60	361	14	280	215	180j6	250	4	210	14	4	430	173	160	123	8	31	Pg13.5	M10x1,5
132S	38k6	80	470	14	350	265	230j6	300	4	260	14	4	556	189	198	162	10	41	Pg21	M12x1,75
132M	38k6	80	496	14	350	265	230j6	300	4	260	14	4	600	189	198	162	10	41	Pg21	M12x1,75

* Number of Flange boreholes.

Operating and maintenance instructions

on the internet at www.maedler.de

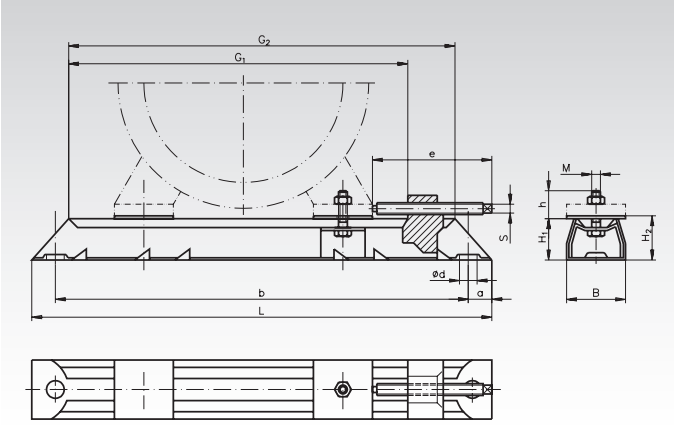
in the Section Downloads

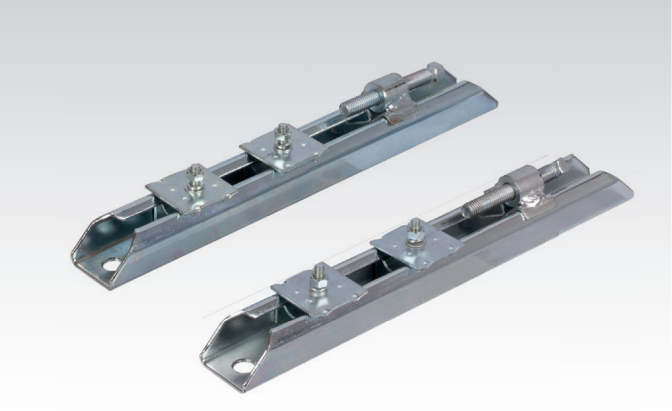


On our website you can find operating and maintenance instructions in various languages for all our technically-sophisticated products. We are continuously extending this list of instructions.

Instructions available:	Language		
Bevel Gearboxes DZA, DZR	German	English	French
Bevel Gearboxes KU/I	German	English	French
Continuously Variable Geared Motors MUN/I	German	English	
Couplings DX	German	English	
Couplings RN / RNI / RNG	German	English	French
Couplings BW / BOS / BOZ	German	English	French
Electronic Drip Oilers ELO	German	English	
Frequency Converters FU6	German		
Frequency Converters RoFre 897	German		
Helical Gear Boxes BT/I	German	English	
Helical Geared Motor HR/I	German	English	
Helical Geared Motor NR/I	German	English	French
Linear Drives (Actuator Systems) GR/I	German	English	
Motor Controllers SFRG 05	German		
Motor Controllers SFRG 3	German		
Precision Worm Gear Sets	German		
Safety Clutches CM	German		
Safety Clutches SI	German	English	French
Shaft Mounted Gearboxes BOC/I	German	English	
Sliding Hubs FA	German		
Sliding Hubs FS	German	English	
Sliding Hubs ROBA®	German		
Sliding Hubs with Coupling RNR	German		
Slip Clutches KF	German	English	
Slip Clutches R2, R6	German		
SPANNBOX®, SPANNBOY®	Deutsch	English	
Standard Three-Phase-Motors SM/I	German		
Taper Bushes	German	English	French
Telescopic Slides Accuride	German	English	French
Worm Geared Motors HMD I / HMD II	German	English	French
Worm-Geared Motors MEG / MEK / MH / MZ	German	English	French
Worm-Geared Motors R / RH / RL / RM / RS	German	English	French
Worm-Geared Motors SRM / SRS	German	English	French
Worm-Geared Motors SZM, ZMD	German	English	French
Worm Gear Screw Jacks NP/I	German		
Worm Gear Units G/II	German	English	French
Worm Gear Units ZM	German	English	French

Motor-Tensioning Rail Sets, Made from Steel, SPS, with Movable Attachment Clamps





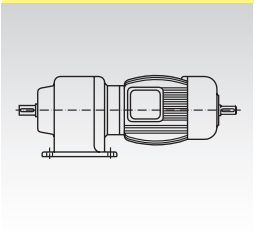
Ordering details: e.g.: Type, Overall Length, Product No.

Sold in pairs: 1 x Product No. = 1 pair

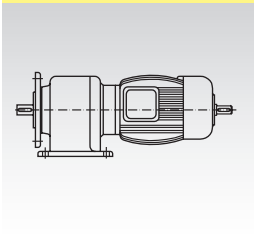
Product No. Pair	Overall Length L mm	Sliding Length G_1 mm	Motor Size	M x h mm	e x S mm	G_2 mm	a mm	b mm	Ød mm	B mm	H_1 mm	H_2 mm	Weight kg
430 180 00	312	240	63/71	M6 x 19	75 x 6	262	16	280	12	40	28	30	1,5
430 182 00	395	302	80/90	M8 x 28	97 x 8	325	20	355	12	50	40	43	3,3
430 184 00	495	405	100/112/132	M10 x 35	97 x 8	425	20	455	12	50	40	43	4,15
430 186 00	630	515	132	M10 x 37	119 x 9	542	25	580	14	60	50	54	8,1

Models Helical Geared Motors (The pictures only show the models, not the gearbox version)

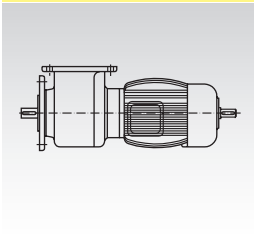
B 3



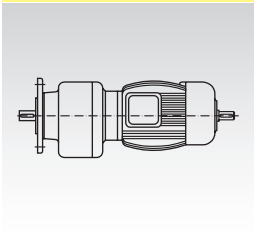
B 3 / B 5



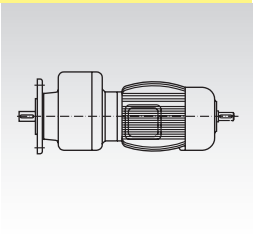
B 8 / B 5



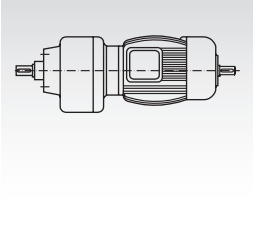
B 5



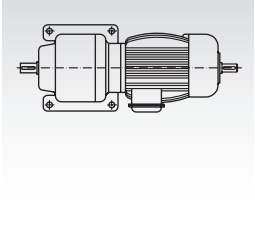
B 5a



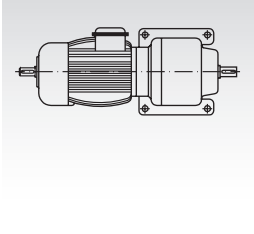
B 5 without Flange



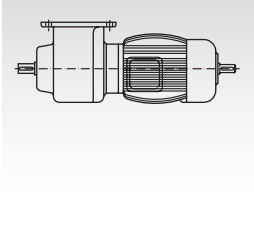
B 6



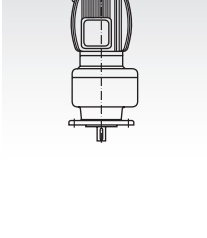
B 7



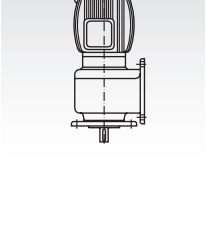
B 8



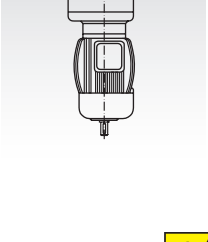
V 1



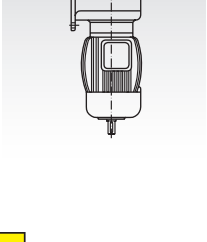
V 1 / V 5



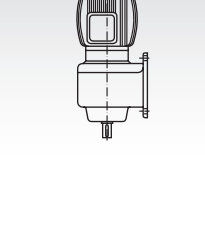
V 3



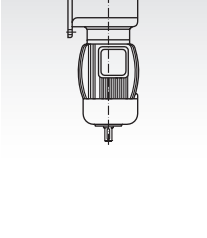
V 3 / V 6



V 5

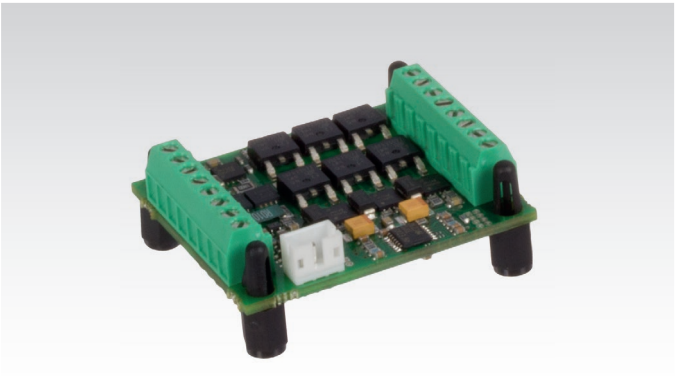


V 6

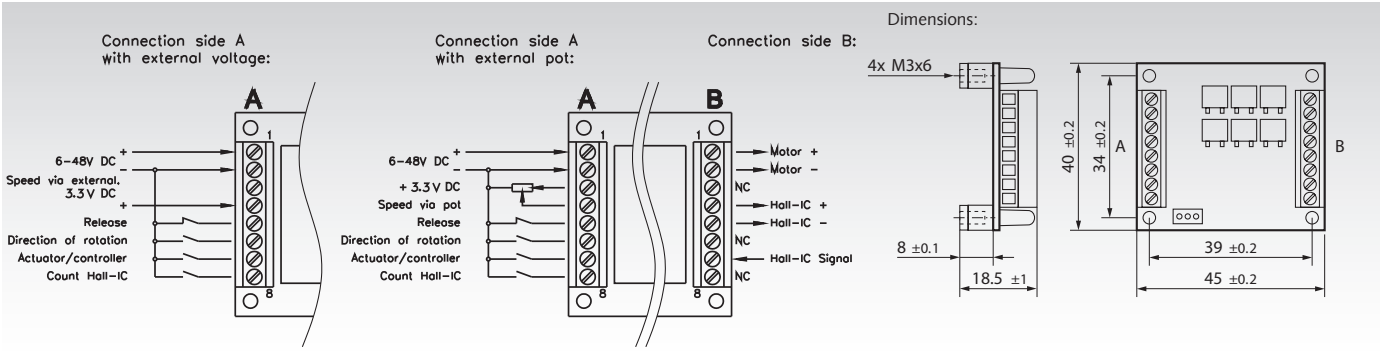


Motor controller SFRG 05 for DC-drives

- Intelligent motor controller with PWM output for speed setting or controlling of brushed DC motors.
- Supply voltage: 6 - 48 V DC.
- Motor current: 2,5 A continuous load (5 A peak current).
- Speed setting device or PI-controller operation.
- 4 logical inputs.
- Usable for CANopen.
- Setpoint setting possible via external pot (not included) or external voltage.
- Compact Version thanks to SMD technology.•



Ordering Details: Product No. 430 460 05, Control Unit SFRG 05



Product No. 430 460 05, Control Unit SFRG 05

Electrical data

Supply voltage:	6 V ... 48 V DC.
Motor nominal current:	2.5 A continuous load (peak current max. 5 A).
Speed selection:	0 V ... 3.3 V DC via 10 kOhm or external voltage.
Logical Inputs:	0 V ... 3.3 V, max. 50 mA.
Output switching frequency:	approx. 20 kHz.
No load current:	at 6 V ... 48 V DC, 70 mA...20 mA.

General data

Protection class:	3.
Protection rating:	open module IP00 as per IEC529 / EN 60529 / DIN VDE 0470 T1.
Isolation:	Low voltage operation.
Shock protection:	not needed.
Level of contamination:	2. Weight 25 g.

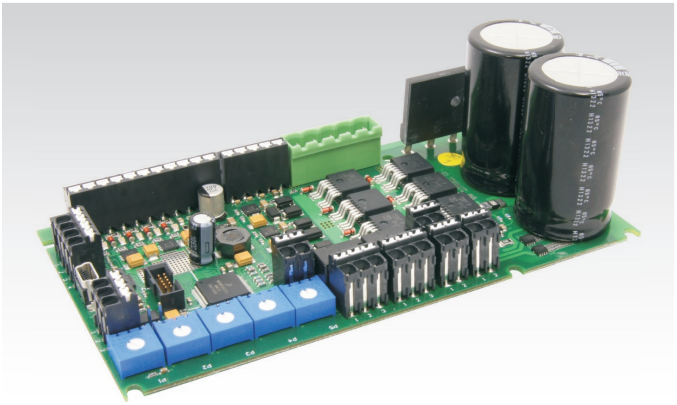
Permissible ambient operating temperature: -20 to +80°C.

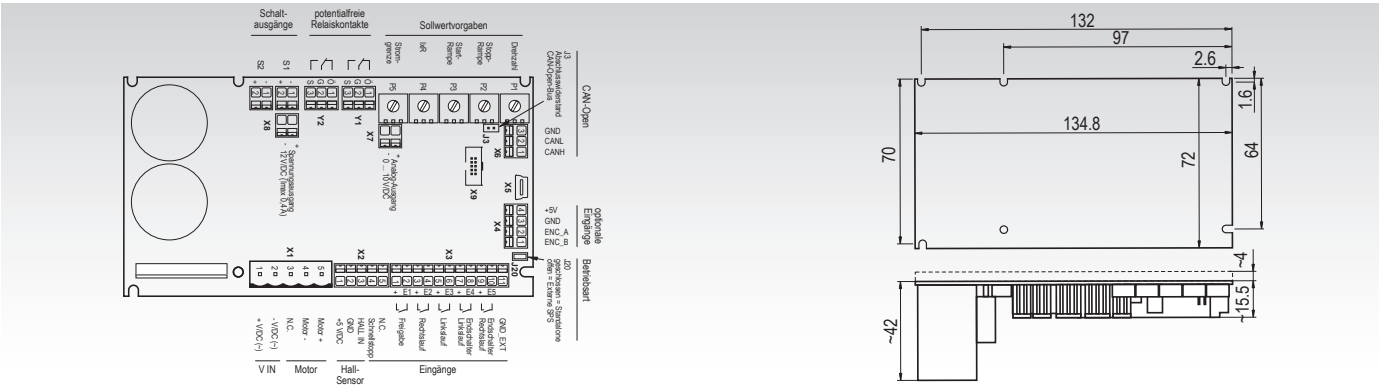
The circuit board is designed for installing in a closed control cabinet or similar housing made from metal with protection class IP 4x. Adequate ventilation is to be provided (free convection). The wiring has to be carried out as per EMC requirements.

Motor controller SFRG 3 for DC-drives

- Intelligent motor controller with PWM output for speed setting or controlling (option) of brushed DC motors.
- Supply voltages: 10 - 36 V DC or 10 - 24 V AC.
- Motor current up to 10 A continuous load.
- Usable for CANopen.
- 5 potential-free switching inputs or 5 voltage input signals 10 - 24 V (switchable per jumpers), 5 setting potentiometers.
- 2 counting inputs for hall sensors or encoder.
- 2 switching outputs, max. 1.5 A.
- 2 zero-voltage relays with changeover contacts.
- Output 12V DC max. 0,4 A, e.eg. to supply stop switches.
- Ramp function for start / stop.
- Motor current monitoring.
- pre-programmed functions: Left, right, stop, release.

Ordering Details: Product No. 430 460 30, Control Unit SFRG 3





Product No. 430 460 30, Control Unit SFRG 3

Electrical data

Supply voltage:	10 V... 36 V DC/10 V... 24 V AC.
Motor nominal current:	10 A continuous load (peak current max. 25 A).
Motor current limit:	adjustable (stepless 0-100 % in 1% steps).
Speed setting range:	up to 50:1 (setting mode IxR / controlled operation.)
Digital inputs:	potential-free NO contact, approx. 2 mA or voltage input signals 10 - 24V DC, (switchable per jumpers).
Output switching frequency:	approx. 18 kHz.
Switching outputs:	max. 1.5 A.
Relay outputs:	max. 1A / 24 V DC.
Ramp function:	Rise time/fall time 0-100 % in 1% steps.
Interfaces:	CANopen.

General data

Connector technology:	plug-in spring-type terminals.
Approvals:	complies to the CE standard.
Protection class:	3.
Protection rating:	open module IP00 as per IEC529 / EN 60529 / DIN VDE 0470 T1.
Isolation:	Low voltage operation.
Shock protection:	not needed.
Level of contamination:	2. Weight 120 g.

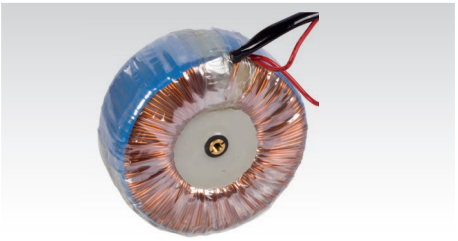
Permissible ambient operating temperature: -10 to +60°C.

The circuit board is designed for installing in a closed control cabinet or similar housing made from metal with protection class IP 4x. Adequate ventilation is to be provided (free convection). The wiring has to be carried out as per EMC requirements.

Application specific matching of the software functions is possible, as well as terminal connection for external pots as an option.

Toroidal transformers for motor controller SFRG 3

- Safety and separation transformers as per EN 61558.
- Insulating class B (130°C).
- Maximum ambient temperature ta = +60°C.
- Primary and secondary connection via leads, length: 200 mm.
- Temperature switch (120°C) integrated in the primary windings.
- Pressureless central fastening with an M5 screw.
- Preparation for protection class II (as per VDE 0100).



Ordering Details: e.g.: Product No. 430 460 01, toroidal transformer 120 VA

Product No.	Power VA	Primary voltage V(AC)	Secondary voltage V(AC)	Nominal current A	Outside Ø mm	Length mm	Weight kg
430 460 01	120	1x230	1x24	5,00	98	48	1,25
430 460 02	192	1x230	1x24	8,00	115	48	1,85

Note for usage

These transformers are suitable for powering control units with a rectifier (e.g. SFRG 3). Use with the SFRG 05 control unit without rectifier is not possible.

Frequency Converters FU6 (for 3-phase current Drives)

To 0.75 KW

From 1.5 KW

Main features of the Series FU6 are easy parametrisation, a clearly arranged control panel and an extremely easy operation.

Ordering details: e.g.: 460 310 25 Frequency Converters FU6, 0.25 kW Output Power, 1 Phase

Prod. No.	Number of Phases	Output Power kW	Output Voltage V	Output Current A	Input Voltage V	Input Current A	Input Fuse Protection A	Dimensions H x B x T mm	Weight kg
460 310 25	1	0,25	3 x 0-240	1,4	1 x 230	3,0	16	132 x 72 x 118	0,8
460 310 37	1	0,37	3 x 0-240	2,3	1 x 230	5,2	16	132 x 72 x 118	0,8
460 310 75	1	0,75	3 x 0-240	4,2	1 x 230	9,4	16	132 x 72 x 118	0,8
460 311 50	1	1,50	3 x 0-240	7,5	1 x 230	16,6	20	143 x 118 x 172	1,7
460 312 20	1	2,20	3 x 0-240	10,5	1 x 230	23,2	25	143 x 118 x 172	1,8
460 331 50	3	1,50	3 x 0-400	3,8	3 x 400	5,0	10	143 x 118 x 172	1,6
460 332 20	3	2,20	3 x 0-400	5,2	3 x 400	6,7	10	143 x 118 x 172	1,6

Output
- Rotating-field frequency 0-200 Hz.
- Voltage boost 10%.
- Overload 150% I_n / 60s.

Input
- Voltage 1 x 230 V +/-10% 50/60 Hz.
  or 3 x 400 V +/-10% 50/60 Hz.

Control unit
- Cycle rate: 4-16 kHz, adjustable in steps.
- Stop functions: Ramp (0.1-999s), DC braking, coast, brake with chopper from 1.5kW.
- Protection systems: Surge current (200% I_n), overload, IGBT excessive temperature, overvoltage, undervoltage.
- Analog input: 0-10 V, 0-20 mA or 10kOhm potentiometer.
- Analog output: 0-10 V (with current output frequency).
- Digital input: Dry contacts or external 24 V DC industrial logic for start up, reversion of rotation 2 programmable inputs (inching mode, fixed setpoint, emergency stop, reset, external control).
- Digital output: Dry contact, programmable.
- Monitoring: Short circuit phase-phase or phase-earth.

Displays / Operating elements
- Control keys: Setting of system functions.
- Display: Operating mode and error message.

Environment
- Ambient temperature: -10...+40°C.
- Cooling: Fan.
- Rel. humidity: 0...95% not condensing.

Mechanic
- Protection class IP20.

EMC
- Filter class A included, optional upgrading to class B.

Diagnostic memory
- Retrieval of the last 3 operational faults.

Optional
- DIN rail mount adapter, brake resistor, setpoint potentiometer 10 kOhm, EMC filter class B.

Frequency Converters ROfre 897 (for 3-phase current Drives)

With Power Cable

With Power Cable and Emergency-Stop Button

- Protection class IP 54, i.e. can be used outside electrical cabinet.
- Completely wired with 2 m screened motor cable, 2 m mains cable with plug and potentiometer.
- Optional with integrated emergency-stop switch (right picture).
- Optional with selector switch for left-right.
- Optional with socket for external operation.

Ordering details: e.g.: 460 410 25, Frequency Converters ROfre 897, 0.25 kW Output Power without Emergency Stop

Prod. No.	Emergency Stop	Output Power kW	Output Voltage V	Output Current A	Input Voltage V	Input Current A	Input Fuse Protection A	Dimensions H x B x T mm	Weight kg
460 410 25	No	0,25	3 x 0-240	1,4	1 x 230	3,0	16	200 x 130 x 120	2,2
460 410 37	No	0,37	3 x 0-240	2,3	1 x 230	5,2	16	200 x 130 x 120	2,2
460 410 75	No	0,75	3 x 0-240	4,2	1 x 230	9,4	16	200 x 140 x 140	2,6
460 510 25	Yes	0,25	3 x 0-240	1,4	1 x 230	3,0	16	200 x 130 x 120	2,2
460 510 37	Yes	0,37	3 x 0-240	2,3	1 x 230	5,2	16	200 x 130 x 120	2,2
460 510 75	Yes	0,75	3 x 0-240	4,2	1 x 230	9,4	16	200 x 140 x 140	2,6

Output
- Rotating-field frequency 0-200 Hz.
- Voltage boost 10%.
- Overload 150% I_n / 60s.

Input
- Voltage 1 x 230 V +/- 10% 50/60 Hz.

Control unit
- Cycle rate: 4-16 kHz, adjustable in steps.
- Stop functions: Ramp (0.1-999s), DC braking, coast, brake with chopper from 1.5kW.
- Protection systems: Surge current (200% I_n), overload, IGBT excessive temperature, overvoltage, undervoltage.
- Analog input*: 0-10 V, 0-20 mA or 10kOhm potentiometer.
- Analog output*: 0-10 V (with current output frequency).
- Digital input*: Dry contacts or external 24 V DC industrial logic for start up, reversion of rotation. 2 programmable inputs (inching mode, fixed setpoint, emergency stop, reset, external control).
- Digital output*: Dry contact, programmable.
- Monitoring: Short circuit phase-phase or phase-earth.

* Only for optional version with socket for external operation.

Displays / Operating elements
- Control keys: Setting of system functions.
- Display: Operating mode and error message.
- Setpoint potentiometer: For continuous adjustment of speed.

Environment
- Ambient temperature: -10...+40°C.
- Cooling: Convection.
- Rel. humidity: 0...95% not condensing.

Mechanic
- Protection class IP20.

EMC
- Filter class A included.

Diagnostic memory
- Retrieval of the last 3 operational faults.

Small Geared Motors CRO, Version A

Motor: For 230V, 50Hz. Synchronous motor for both rotational directions (s. motor data overview).

Gearbox: Spur gears, straight toothed, made from plastic.

Ambient temperature: -5 to +70°C

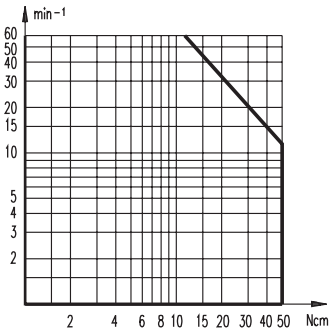
Capacitor: Enclosed in delivery.

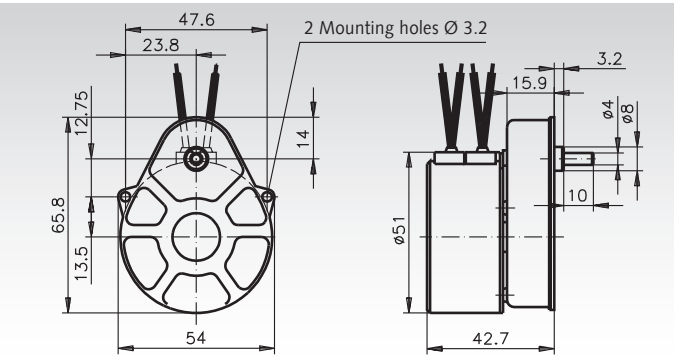
Ordering details: e.g.: Type, Version, Output Speed, Product No.

Product No.	Standard Speed min^{-1}	Weight kg
430 200 00	60	0,25
430 200 01	30	0,25
430 200 02	15	0,25
430 200 03	10	0,25
430 200 06	5	0,25
430 200 08	3,12	0,25
430 200 09	2	0,25
430 200 10	1	0,25

Max. permiss. static load on bearing:
axial = 10 N, radial = 80 N

Torque-Speed Table



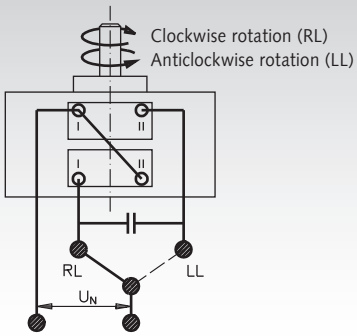


Motor data/Technical data	
Moment of inertia for rotor	18.8 g·cm²
Absorbed power	3.5 W
Stall torque [1]	2.1 Ncm
Starting torque	1.9 Ncm
Max. coil temperature	120 °C
Ambient temperature	-5...+70 °C
Storage temperature	-40...+100 °C
Insulation resistance	>10³ MV
Electric strength (50 Hz)	> 2400 V
Weight of motor	210 g
Protection class	IP 40

Motor data/Technical data	
Standard nominal voltage (-15 + 10%)	220 / 240 V
Absorbed power	16 / 17.3 mA
Frequency	50 Hz
Speed	375 min^{-1}
Capacitor values ±10%	0.12 / 600 µf/V
Connection	A
Colours of leads for standard motors	Blue: Terminal 1 White Terminal 2

[1] Max. torque of the motor at continuous operation with nominal voltage and frequency.

Wiring for parallel line connection A



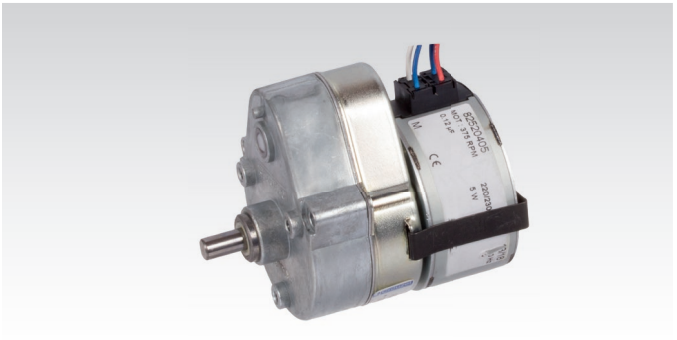
Small Geared Motors CRO, Version B

Motor: For 230V, 50Hz synchronous motor for both rotational directions (see motor data overview).

Gearbox: Spur gears, straight toothed, made from plastic.

Ambient temperature: -5 to +70°C

Capacitor: Included in delivery.

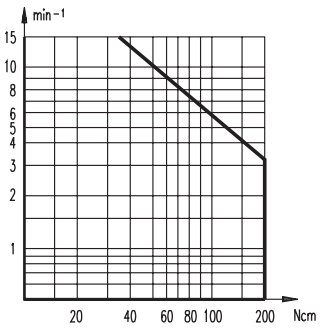


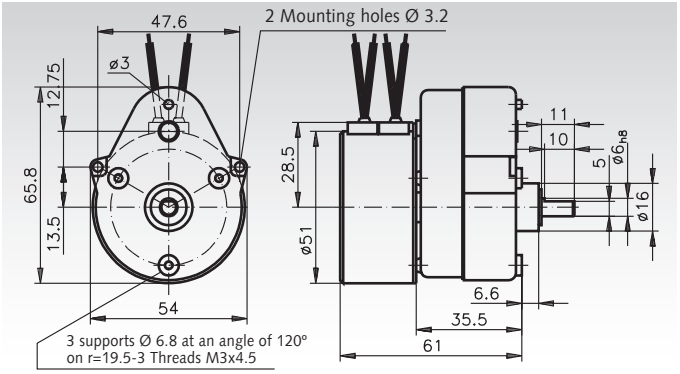
Ordering details: e.g.: Type, Version, Output Speed, Product No.

Product No.	Standard Speed min^{-1}	Weight kg
430 205 00	15	0,32
430 205 01	7,5	0,32
430 205 02	5	0,32
430 205 03	1	0,32
430 205 04	0,25	0,32

Max. permiss. static load on bearing:
axial = 10 N, radial = 100 N

Torque-Speed Table



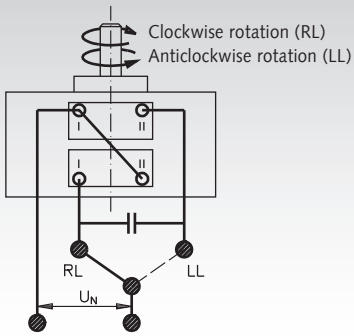


Motor data/Technical data	
Moment of inertia for rotor	18.8 g·cm²
Absorbed power	3.5 W
Stall torque [1]	2.1 Ncm
Starting torque	1.9 Ncm
Max. coil temperature	120 °C
Ambient temperature	-5 +70 °C
Storage temperature	-40 +100 °C
Insulation resistance	>10³ MV
Electric strength (50 Hz)	> 2400 V
Weight of motor	210 g
Protection class	IP 40

Motor data/Technical data	
Standard nominal voltage (-15 + 10%)	220/240 V
Absorbed power	16/17.3 mA
Frequency	50 Hz
Speed	375 min^{-1}
Capacitor values ±10%	0.12/600 µf/V
Connection	A
Colours of leads for standard motors	Blue: Terminal 1 White: Terminal 2

[1] Max. torque of the motor at continuous operation with nominal voltage and frequency.

Wiring for parallel line connection A



Small Geared Motors GE/I with Capacitor Motor, AC

General data: Light model range, extremely high ratios.

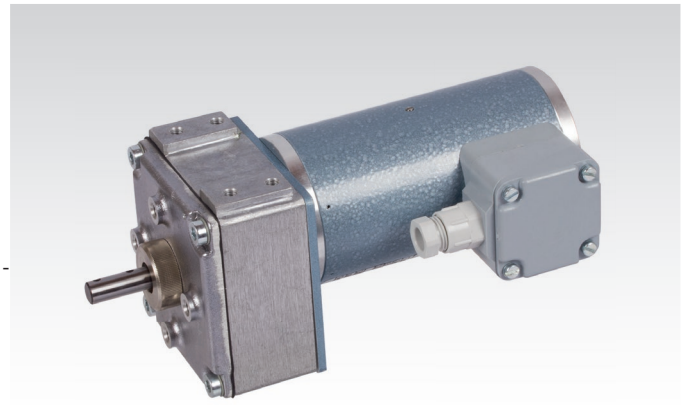
Housing: Aluminium die-cast, sealed against lubricant leaks and protected against dust, can be mounted in any position.

Gearing: Depending on the arrangement of the gear stages milled from high-grade platic or steel.

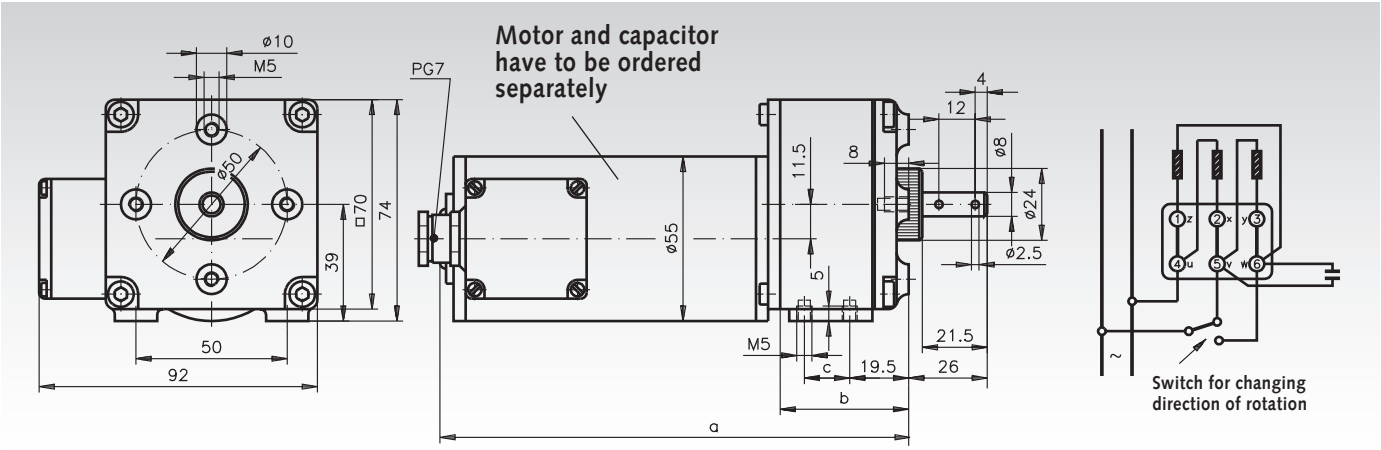
Bearing system: Motor: roller bearing. Gearbox: sintered bronze slide bearing.

Lubrication: Maintenance-free grease lubrication.

Motor: Capacitor motor for 230 V, 50 Hz, direction of rotation reversible. Pinion milled into motor shaft. The cable gland of the terminal box can be moved 4 x 90°.
Please note: At continuous operation the motor heats up to 70°C.



Ordering details: e.g.: Type, Product No. 430 401 00 Capacitor Motor
Product No. 430 301 01 Gearbox 15:1
Product No. 436 352 00 Operating Capacitor
(has to be ordered separately)



Capacitor motor: Product No. 430 401 00, Weight 1.2 kg ***Motor, gearbox and capacitor have to be ordered separately.***

Gearbox Product No.	Capacitor Motor Product No.	Output Speed in Relation to Motor Speed 2600 min^{-1}	Ratio i	Limit Load Gearbox max. continous Torque Ncm	max. starting Torque Ncm	Nominal Power Watt	Gearbox Efficiency-grad %	Dimensions a mm	b mm	c mm	Weight Gearbox kg
430 301 01	**430 401 00**	173,3	15 : 1	30	40	6,7	80	181	42,5	15	0,3
430 302 01	**430 401 00**	86,6	30 : 1	42	65	6,7	72	181	42,5	15	0,3
430 303 01	**430 401 00**	57,7	45 : 1	62	90	6,7	72	181	42,5	15	0,3
430 304 01	**430 401 00**	43,3	60 : 1	70	120	6,7	70	181	42,5	15	0,3
430 305 01	**430 401 00**	28,8	90 : 1	100	180	6,7	70	181	42,5	15	0,3
430 306 01	**430 401 00**	21,6	120 : 1	130	230	6,7	65	181	42,5	15	0,3
430 307 01	**430 401 00**	19,2	135 : 1	150	260	6,7	65	181	42,5	15	0,3
430 308 01	**430 401 00**	14,4	180 : 1	150	260	6,7	65	181	42,5	15	0,3
430 309 01	**430 401 00**	10,8	240 : 1	200	300	6,7	60	195	56,5	26	0,45
430 310 01	**430 401 00**	9,6	270 : 1	200	300	6,7	60	181	42,5	15	0,43
430 311 01	**430 401 00**	7,2	360 : 1	200	300	6,7	60	195	56,5	26	0,45
430 312 01	**430 401 00**	6,4	405 : 1	220	300	6,7	60	181	42,5	15	0,43
430 313 01	**430 401 00**	5,4	480 : 1	220	300	6,7	50	195	56,5	26	0,45
430 314 01	**430 401 00**	4,8	540 : 1	220	300	6,7	55	195	56,5	26	0,45
430 315 01	**430 401 00**	3,6	720 : 1	220	300	6,7	50	195	56,5	26	0,45
430 316 01	**430 401 00**	3,2	810 : 1	220	300	6,7	55	195	56,5	26	0,45
430 317 01	**430 401 00**	2,7	960 : 1	220	300	6,7	45	195	56,5	26	0,45
430 318 01	**430 401 00**	2,4	1080 : 1	220	300	6,7	45	195	56,5	26	0,45
430 319 01	**430 401 00**	2,1	1215 : 1	220	300	6,7	45	195	56,5	26	0,45
430 320 01	**430 401 00**	1,8	1440 : 1	220	300	6,7	45	195	56,5	26	0,45
430 321 01	**430 401 00**	1,6	1620 : 1	220	300	6,7	45	195	56,5	26	0,45
430 322 01	**430 401 00**	1,2	2160 : 1	220	300	6,7	45	195	56,5	26	0,45
430 323 01	**430 401 00**	1,06	2430 : 1	220	300	6,7	45	195	56,5	26	0,45
430 324 01	**430 401 00**	0,80	3240 : 1	240	300	6,7	45	195	56,5	26	0,45
430 325 01	**430 401 00**	0,71	3645 : 1	240	300	6,7	45	195	56,5	26	0,45
430 326 01	**430 401 00**	0,60	4320 : 1	240	300	6,7	45	195	56,5	26	0,45
430 327 01	**430 401 00**	0,53	4860 : 1	240	300	6,7	40	195	56,5	26	0,45
430 328 01	**430 401 00**	0,40	6480 : 1	240	300	6,7	40	195	56,5	26	0,45
430 329 01	**430 401 00**	0,35	7290 : 1	240	300	6,7	40	195	56,5	26	0,45
430 330 01	**430 401 00**	0,30	8640 : 1	240	300	6,7	40	195	56,5	26	0,45
430 331 01	**430 401 00**	0,26	9720 : 1	240	300	6,7	40	195	56,5	26	0,45

To prevent the gearbox from being overloaded, the max. continuous torques and starting torques stated above must not be exceeded. The effective transmissible torque corresponds to the values at the gearbox shaft. At reversed operation, the load limit must be multiplied with 0.75.

Small Geared Motors GE/I with DC Motor

General data: Light model range, extremely high ratios.

Housing: Aluminium die-cast, sealed against lubricant leaks and protected against dust, can be mounted in any position.

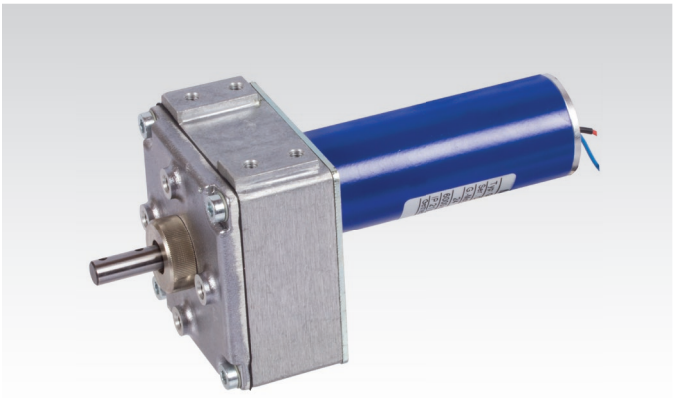
Gearing: Depending on the arrangement of the gear stages milled from high-grade platic or steel.

Bearing system: Motor: roller bearing. Gearbox: sintered bronze slide bearing.

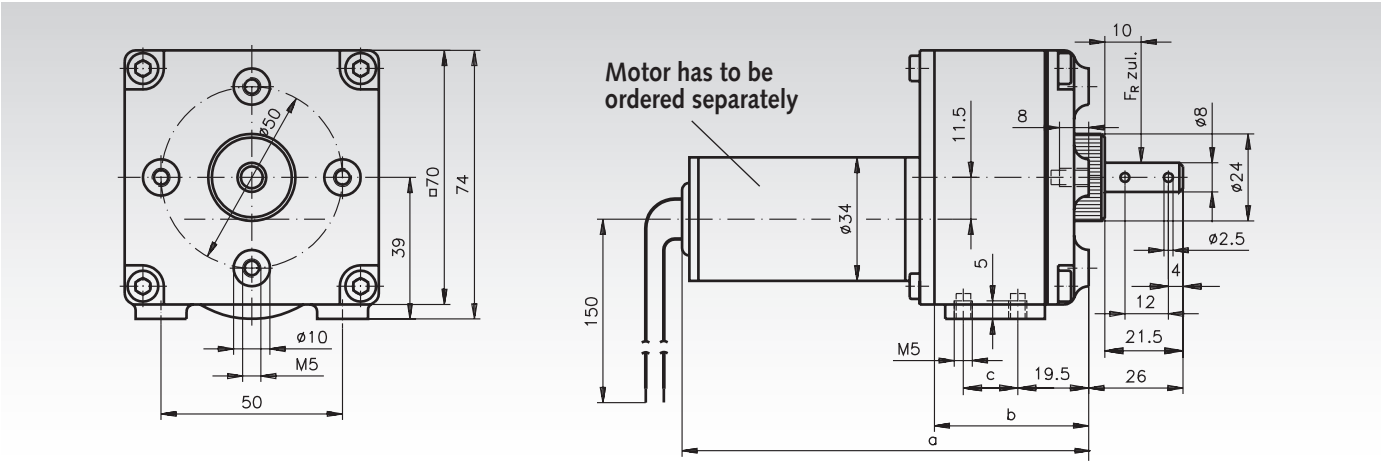
Lubrication: Maintenance free grease lubrication.

Motor: DC motor for 12 Volt or 24 Volt. Pinion pressed onto motor shaft. Free lead ends. Sense of rotation can be changed by swopping leads over

Please note: At continuous operation the motor heats up to 50 to 60°C.



Ordering details: e.g.: Type, **Product No. DC Motor**
Product No. Gearbox



DC motor 12 Volt: Product No. 430 403 00

Motor and gearbox have to be ordered separately.

DC motor 24 Volt: Product No. 430 405 00. Weight 0.33 kg

Gearbox Product No.	Output Speed Relating to Motor speed 6000 min^{-1}	Ratio i	max. continous Torque Ncm	max. starting Torque Ncm	Nominal Power Watt	Gearbox Efficiency %	Dimensions a mm	b mm	c mm	Weight Gearbox kg
430 301 01	400	15 : 1	30	40	13	80	138	42,5	15	0,3
430 302 01	200	30 : 1	42	65	8,8	72	138	42,5	15	0,3
430 303 01	134	45 : 1	62	90	8,7	72	138	42,5	15	0,3
430 304 01	100	60 : 1	70	120	7,3	70	123	42,5	15	0,3
430 305 01	67	90 : 1	100	180	7,0	70	123	42,5	15	0,3
430 306 01	50	120 : 1	130	230	6,8	65	123	42,5	15	0,3
430 307 01	44	135 : 1	150	260	7,0	65	123	42,5	15	0,3
430 308 01	33	180 : 1	150	260	5,2	65	123	42,5	15	0,3
430 309 01	25	240 : 1	200	300	5,2	60	137	56,5	26	0,45
430 310 01	22	270 : 1	200	300	4,7	60	123	42,5	15	0,43
430 311 01	17	360 : 1	200	300	3,5	60	137	56,5	26	0,45
430 312 01	15	405 : 1	220	300	3,4	60	123	42,5	15	0,43
430 313 01	13	480 : 1	220	300	2,9	50	137	56,5	26	0,45
430 314 01	11	540 : 1	220	300	2,6	55	137	56,5	26	0,45
430 315 01	8,3	720 : 1	220	300	1,9	50	137	56,5	26	0,45
430 316 01	7,4	810 : 1	220	300	1,7	55	137	56,5	26	0,45
430 317 01	6,3	960 : 1	220	300	1,4	45	137	56,5	26	0,45
430 318 01	5,6	1080 : 1	220	300	1,3	45	137	56,5	26	0,45
430 319 01	4,9	1215 : 1	220	300	1,1	45	137	56,5	26	0,45
430 320 01	4,2	1440 : 1	220	300	0,96	45	137	56,5	26	0,45
430 321 01	3,7	1620 : 1	220	300	0,85	45	137	56,5	26	0,45
430 322 01	2,8	2160 : 1	220	300	0,64	45	137	56,5	26	0,45
430 323 01	2,5	2430 : 1	220	300	0,57	45	137	56,5	26	0,45
430 324 01	1,9	3240 : 1	240	300	0,47	45	137	56,5	26	0,45
430 325 01	1,6	3645 : 1	240	300	0,41	45	137	56,5	26	0,45
430 326 01	1,4	4320 : 1	240	300	0,35	45	137	56,5	26	0,45
430 327 01	1,2	4860 : 1	240	300	0,31	40	137	56,5	26	0,45
430 328 01	0,9	6480 : 1	240	300	0,23	40	137	56,5	26	0,45
430 329 01	0,8	7290 : 1	240	300	0,21	40	137	56,5	26	0,45
430 330 01	0,7	8640 : 1	240	300	0,17	40	137	56,5	26	0,45
430 331 01	0,6	9720 : 1	240	300	0,16	40	137	56,5	26	0,45

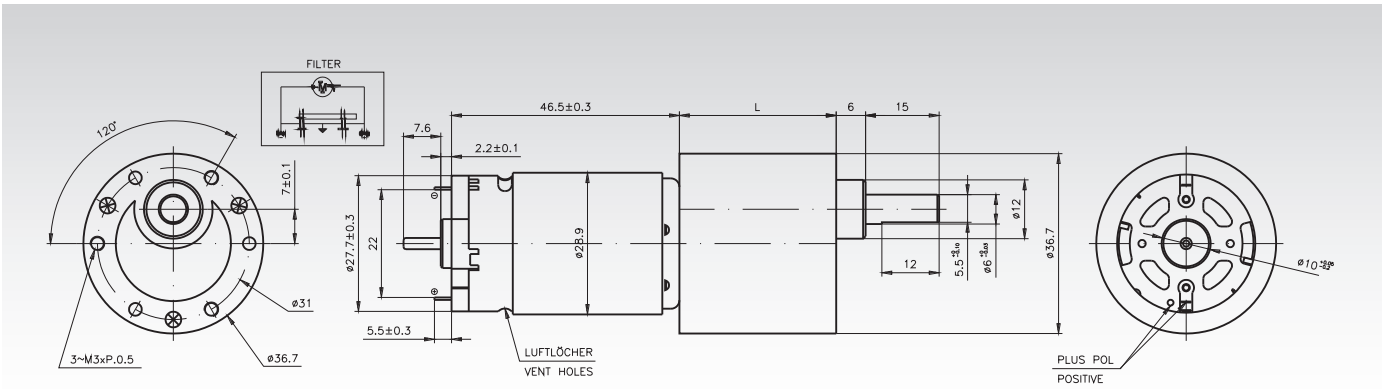
To prevent the gearbox from being overloaded, the max. continuous and starting torques stated above must not be exceeded. The effective transmissible torque corresponds to the values at the gearbox shaft.

Helical Small Geared Motor SF with DC motor, 24V

Housing: Steel, zinc-plated.
Can be mounted in any position.
Teeth: Steel gears.
Bearing: Sintered bronze plain bearings.
Lubrication: Maintenance free grease lubrication.
Motor: DC motor 24 V. motor speed 6500 min^{-1}, interference-free. Change the direction of rotation by switching the polarity.
Protection class acc. to EN 60529: IP 20.
Operating mode as per VDE 0530: S2-10 min.
Permissible ambient operating temperature: -10 to +60°C.

Ideal drive for short term operation, e.g. for actuating device.

Ordering Details: e.g.: Type, idle speed, Product No.



Product No. 24V	Idle Speed n_0 min^{-1}	Nominal Speed n_N min^{-1}	Nominal Torque M_N Nm	Nominal Current I_N A	Nominal Power P_N W	Tightening Torque M_A Nm	Ratio i	Dimension L mm	Weight g
430 460 24	2	1,5	2,00	0,4	0,31	2,1	3000:1	32,0	220
430 461 24	6	5,0	1,60	0,4	0,84	1,9	1000:1	29,5	210
430 463 24	27	22,0	1,30	0,4	2,99	1,6	250:1	27,0	200
430 464 24	43	38,0	0,80	0,4	3,18	1,2	150:1	27,0	200
430 466 24	90	75,0	0,45	0,6	3,53	0,8	75:1	24,5	200
430 467 24	130	115,0	0,30	0,6	3,61	0,6	50:1	24,5	200
430 468 24	210	190,0	0,18	0,6	3,58	0,4	30:1	22,0	190
430 469 24	610	530,0	0,10	0,6	5,55	0,2	10:1	19,5	190

Permissible radial shaft load F_R: (10 mm from bearing collar): 9.8 N.
Permissible axial shaft load F_A: 6.7 N.

Note

All values are averages, measured with the motor cold. Deviations of 15% are possible.
To prevent the gearbox from being overloaded, the stated limit loads must not be exceeded.

Other types (other speeds, optional incremental encoder) available on request.

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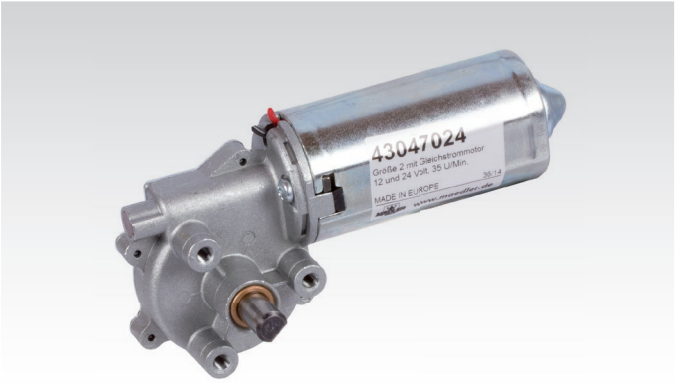
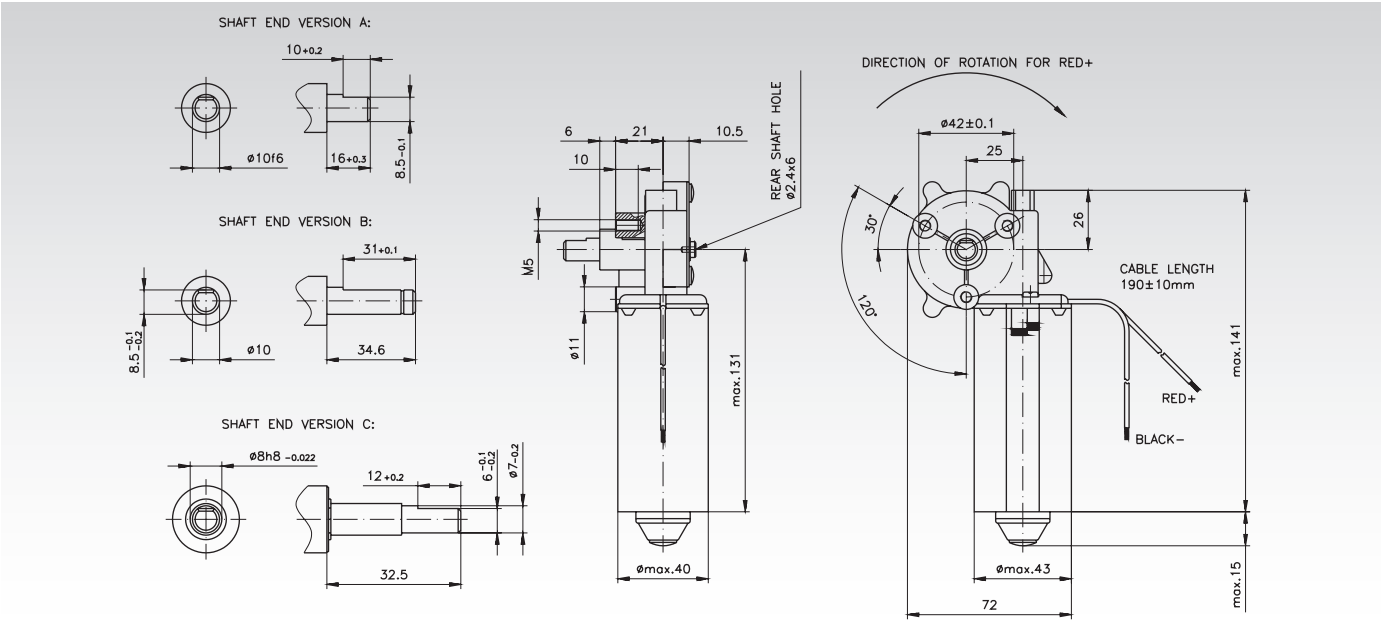
Small Worm Geared Motors SFS Size 2 with DC Motor 12 or 24V

Housing: Motor: Steel, zinc-plated. Gearbox: Aluminium.
Can be mounted in any position.
Teeth: Worm gear set made from plastic.
Bearing: Output side, plain bearing, motor side, ball bearing.
Lubrication: Maintenance free grease lubrication.
Motor: DC motor 12 V or 24 V, interference-free.
Change the direction of rotation by switching the polarity.
Protection class acc. to EN 60529: IP 30.
Operating mode as per VDE 0530: S2-10 min.
Permissible ambient operating temperature: -10 to +60°C.

Ideal drive for short term operation, e.g. for actuating devices.



Ordering Details: e.g.: Type, idle speed, Product No.



Product No.	Nominal Voltage V	Idle Speed n_0 min^{-1}	Nominal Speed n_N min^{-1}	Nominal Torque M_N Nm	Nominal Current I_N A	Nominal Power P_N W	Tightening Torque M_A Nm	Ratio i	Shaft-End Type	Weight g
430 470 12	12	25	21,0	1,00	0,9	2,1	6	62:1	A	700
430 470 24	24	35	28,0	2,00	1,0	5,9	10	62:1	A	700
430 471 24	24	50	40,0	2,00	1,48	8,4	10	62:1	B	700
430 472 24	24	95	69,0	5,00	3,1	35,0	18	62:1	A	700
430 473 24	24	140	124,0	2,00	3,0	26,0	18	62:1	B	700
430 474 24	24	210	158,0	2,00	4,0	33,0	8	59:3	C	700

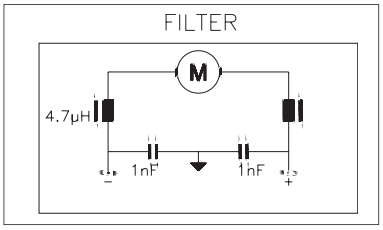
Permissible radial shaft load F_R: 60 N (10 mm from bearing collar).
Permissible axial shaft load F_A: 10 N tensile load or 15 N compressive load.

Note

All values are averages, measured with the motor cold. Deviations of 10% are possible.
To prevent the gearbox from being overloaded, the stated limit loads must not be exceeded.

Other types on request.

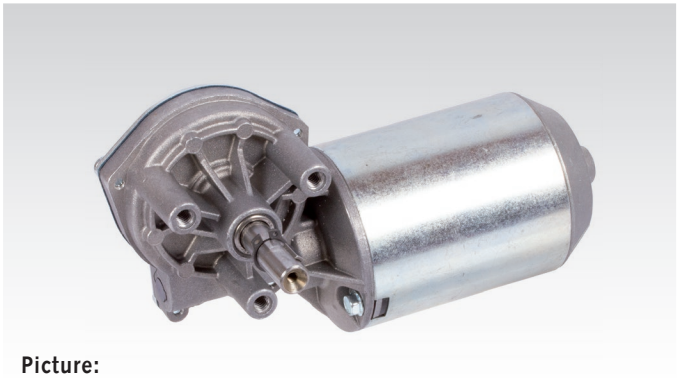
Factory interference suppression



Small Worm Geared Motors SFS Size 3 with DC Motor 12 or 24V

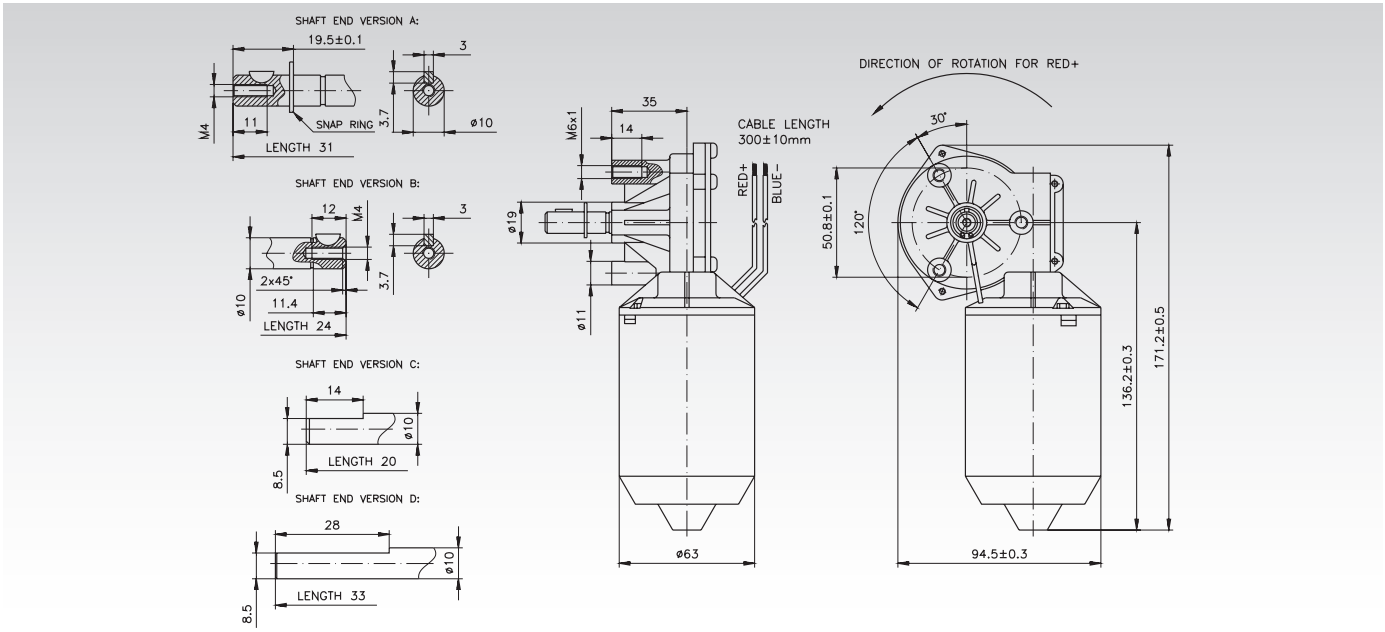
Housing: Motor: Steel, zinc-plated. Gearbox: Aluminium.
Can be mounted in any position.
Teeth: Worm gear set made from plastic.
Bearing: Output side, plain bearing, motor side, ball bearing.
Lubrication: Maintenance free grease lubrication.
Motor: DC motor 12 V or 24 V, interference-free.
Change the direction of rotation by switching the polarity.
Protection class acc. to EN 60529: IP 30.
Operating mode as per VDE 0530: S2-10 min.
Permissible ambient operating temperature: -10 to +60°C.

Caution: Output shaft and shaft form side as per the table.



Picture:
Output shaft right

Ordering Details: e.g.: Type, idle speed, Product No.



Product No. 24V	Idle Speed n_0 min^{-1}	Nominal Speed n_N min^{-1}	Nominal Torque M_N Nm	Nominal Current I_N A	Nominal Power P_N W	Tightening Torque M_A Nm	Ratio i	Output-Shaft Side	Shaft-end Type	Weight g
430 480 24	13	7,4	6,0	1,0	4,6	14,0	69:1	right	A	1100
430 481 24	35	24,7	10,0	2,9	26,0	34,0	69:1	right	B	1100
430 482 24	50	41,0	2,5	1,0	11,0	14,0	52:2	left	A	1100
430 484 24	110	88,0	3,3	2,9	30,0	17,0	52:2	left	A	1100
430 486 24	180	170,0	1,3	2,4	23,0	25,0	52:2	right	A	1100
430 487 24	240	192,0	1,5	2,7	30,0	7,5	44:4	left	C	1100
430 488 24	280	249,0	1,0	3,0	26,0	9,0	44:4	left	D	1100
430 489 24	580	543,0	1,0	5,3	56,0	16,0	41:4	right	D	1100

Permissible radial shaft load F_R: 120 N (10 mm from bearing collar).
Permissible axial shaft load F_A: 15 N tensile load or 10 N compressive load.

Note

All values are averages, measured with the motor cold. Deviations of 10% are possible.
To prevent the gearbox from being overloaded, the stated limit loads must not be exceeded.

Other types on request.

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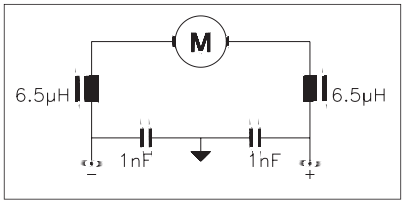
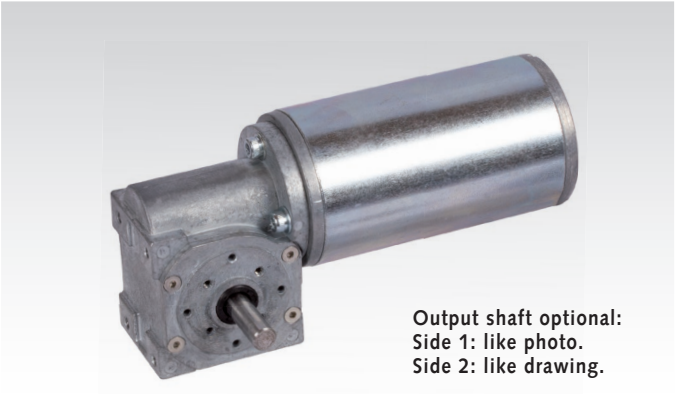
Factory interference suppression



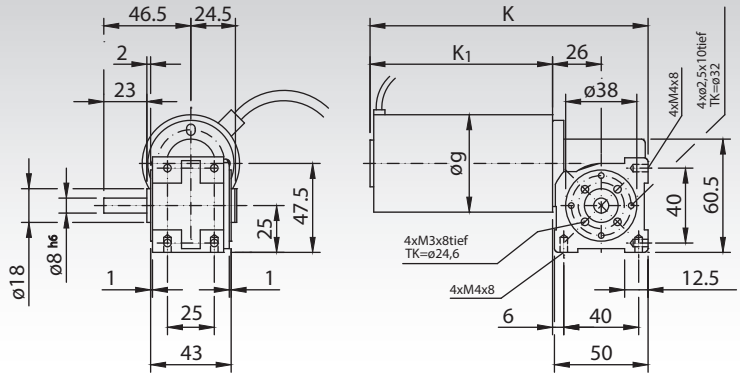
Small Worm Geared Motors Type SG with Permanent Magnet DC Motor 24V

Housing: Aluminium, sealed against lubricant leaks and protected against dust, can be mounted in any position.
Output shaft: Optional on side 1 or side 2.
Teeth: Worm gear made from special brass, worm made from steel, hardened and ground.
Bearing: Motor and gearbox with roller bearing.
Lubrication: Maintenance free grease lubrication.
Motor: Permanent magnet DC Motor 24 V.
Nominal motor speed 3,000 min^{-1}, with relatively constant speed characteristics. Free lead ends. Sense of rotation can be changed by swapping leads over.
Protection class IP 40. Insulation class B. Operating mode S1.

Ordering Details: e.g.: Type, Power, Output Side, Output Speed, Product No.



Output shaft optional:
Side 1: like photo.
Side 2: like drawing.



Output shaft optional:
Side 1: like photo.
Side 2: like drawing.

Other dimensions:

Power Watt	g mm	k mm	k_1 mm
28	52	149	98
54	52	179	128

Dimensions without stated tolerances are non-binding!

Load Bearing Capacity of the Output Shaft: radial 40 N, axial 40 N

Motor Data 28 Watt, 3000 min^{-1}, ca. 2.0 A at 24 Volt

Product No. Output Side 1	**Product No. Output Side 2**	Output-Speed min^{-1}	Ratio i =	Torque at the Output Shaft effective Nm	max. permissible* Nm	Weight kg
430 491 01	**430 492 01**	44	68 : 1	2,1	4,2	1,3
430 491 02	**430 492 02**	75	40 : 1	1,2	4,7	1,3
430 491 03	**430 492 03**	100	30 : 1	1,0	4,3	1,3
430 491 04	**430 492 04**	143	21 : 1	0,9	4,1	1,3
430 491 05	**430 492 05**	200	15 : 1	0,7	3,7	1,3
430 491 06	**430 492 06**	286	10,5 : 1	0,6	4,1	1,3
430 491 07	**430 492 07**	429	7 : 1	0,4	4,3	1,3
430 491 08	**430 492 08**	1000	3 : 1	0,2	2,6	1,3

* Stability related max. torque.

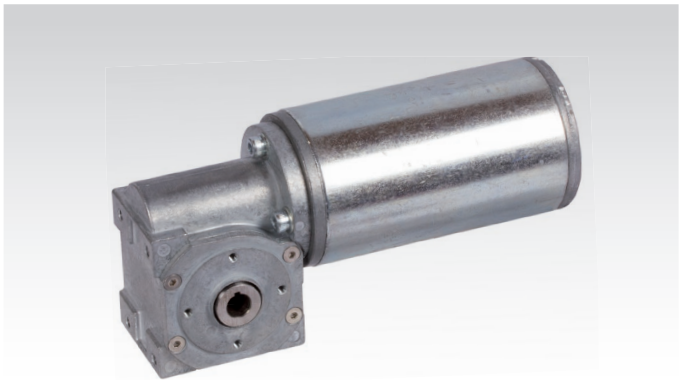
Motor Data 54 Watt, 3000 min^{-1}, ca. 3.0 A at 24 Volt

Product No. Output Side 1	**Product No. Output Side 2**	Output-Speed min^{-1}	Ratio i =	Torque at the Output Shaft effective Nm	max. permissible* Nm	Weight kg
430 491 09	**430 492 09**	44	68 : 1	4,0	4,2	1,6
430 491 10	**430 492 10**	75	40 : 1	2,3	4,7	1,6
430 491 11	**430 492 11**	100	30 : 1	2,0	4,3	1,6
430 491 12	**430 492 12**	143	21 : 1	1,7	4,1	1,6
430 491 13	**430 492 13**	200	15 : 1	1,4	3,7	1,6
430 491 14	**430 492 14**	286	10,5 : 1	1,1	4,1	1,6
430 491 15	**430 492 15**	429	7 : 1	0,9	4,3	1,6
430 491 16	**430 492 16**	1000	3 : 1	0,4	2,6	1,6

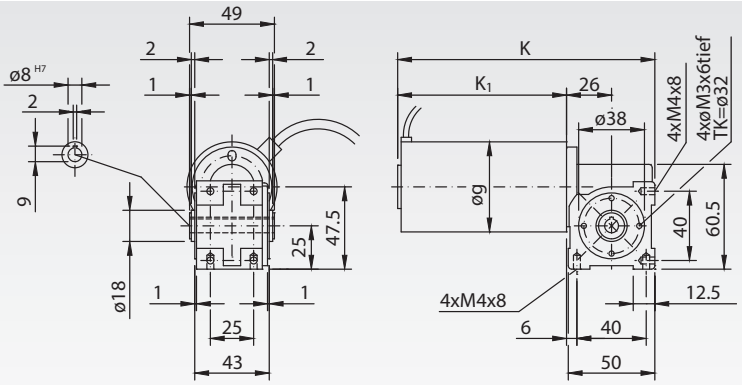
* Stability related max. torque.

Small Worm Geared Motors Type SG-H with Permanent magnet DC Motor 24V, with Hollow Shaft

Housing: Aluminium, sealed against lubricant leaks and protected against dust, can be mounted in any position.
Output shaft: Hollow shaft.
Teeth: Worm gear made from special brass, worm made from steel, hardened and ground.
Bearing: Motor and gearbox with roller bearing.
Lubrication: Maintenance free grease lubrication.
Motor: Permanent magnet DC Motor 24 V.
Nominal motor speed 3,000 min^{-1}, with relatively constant speed characteristics. Free lead ends. Sense of rotation can be changed by swapping leads over.
Protection class IP 40. Insulation class B. Operating mode S1.



Ordering Details: e.g.: Type, Power, Output Speed, Product No.



With hollow shaft

Other dimensions:

Power Watt	g mm	k mm	k_1 mm
28	52	149	98
54	52	179	128

Dimensions without stated tolerances are non-binding!

Load Bearing Capacity of the Output Shaft: radial 40 N, axial 40 N

Motor Data 28 Watt, 3000 min^{-1}, ca. 2.0 A at 24 Volt

Product No. with Hollow Shaft	Output-Speed min^{-1}	Ratio i =	Torque at the Output Shaft effective Nm	max. permissible* Nm	Weight kg
430 490 01	44	68 : 1	2,1	4,2	1,3
430 490 03	100	30 : 1	1,0	4,3	1,3
430 490 05	200	15 : 1	0,7	3,7	1,3
430 490 07	429	7 : 1	0,4	4,3	1,3

* Stability related max. torque.

Motor Data 54 Watt, 3000 min^{-1}, ca. 3.0 A at 24 Volt

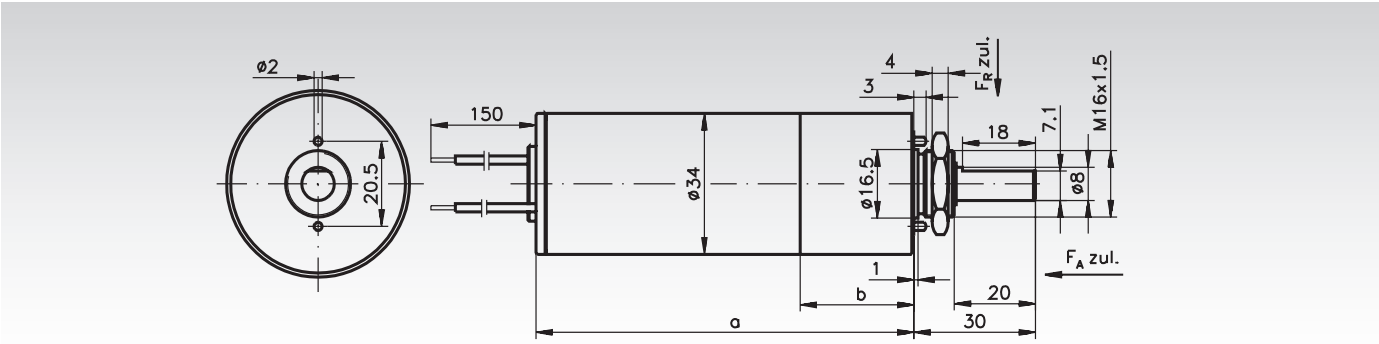
Product No. with Hollow Shaft	Output-Speed min^{-1}	Ratio i =	Torque at the Output Shaft effective Nm	max. permissible* Nm	Weight kg
430 490 09	44	68 : 1	4,0	4,2	1,6
430 490 11	100	30 : 1	2,0	4,3	1,6
430 490 13	200	15 : 1	1,4	3,7	1,6
430 490 15	429	7 : 1	0,9	4,3	1,6

* Stability related max. torque.

Planetary Small Geared Motor PE with DC Motor, Size 1

Housing: Steel, zinc-plated, sealed against lubricant leaks and protected against dust, can be mounted in any position.
Gearbox: 1st gearbox stage: plastic gears, other gears made from steel.
Bearing: Motor roller bearing. Gearbox: sintered bronze plain bearing.
Lubrication: Maintenance free grease lubrication.
Motor: DC motor 24 V. Nominal motor speed 6,000 min^{-1},
Pinion milled into motor shaft. Free lead ends.
Sense of rotation can be changed by swapping leads over.
Protection class according to VDE 0530: IP 21.
Insulation class according to VDE 0530: E.
Operating mode as per VDE 0530: S1.

Ordering Details: e.g.: Type, Size 1, Voltage, Output Speed, Product No.



Size 1

Product No. 24 V	Nominal Output Speed min^{-1}	Ratio i	max. continous Torque Nm	max. Starting Torque Nm	Nominal Motor Power W	Output Power W	Gearbox Efficiency %	a mm	b mm	Weight kg
430 440 24	200	30:1	0,46	0,6	12	9,6	80	141	27	0,55
430 441 24	67	90:1	1,20	1,8	12	8,4	70	148	34	0,6
430 442 24	50	120:1	1,60	2,2	12	8,4	70	148	34	0,6
430 443 24	29	210:1	2,80	3,3	12	8,4	70	148	34	0,6
430 444 24	22	270:1	2,90	3,3	10	6,7	65	155	41	0,65

Permissible radial shaft load F_R: 30 N (middle shaft).
Permissible axial shaft load F_A: 0 N.
Tolerances +/- 10%.

Note

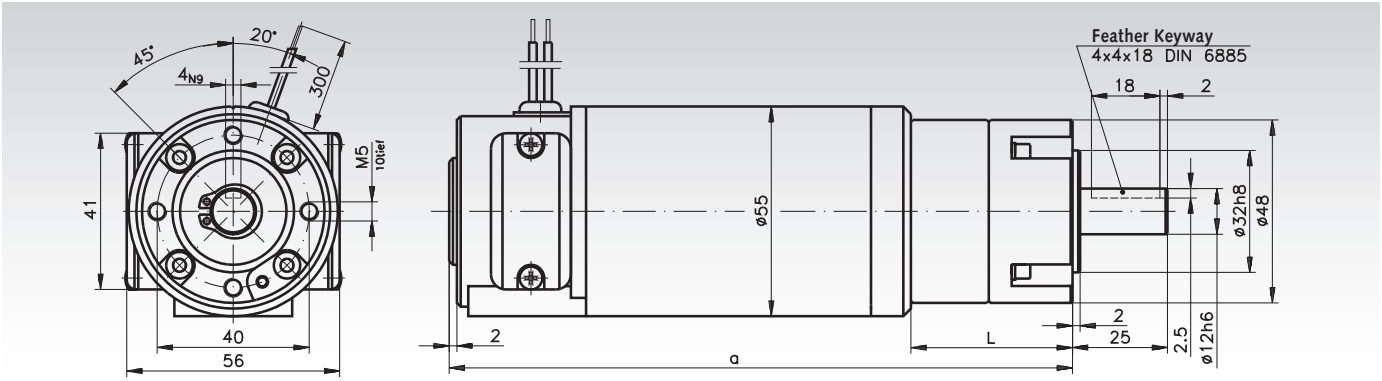
The efficiency stated in the table is valid for properly run-in gearboxes at operating temperature. To prevent the gearbox from being overloaded, the stated limit loads must not be exceeded. At reversed operation the limit loads must be multiplied with the factor 0.75.

Also available as an option with 12 V motors and larger gear ratio up to 54880:1.

Planetary Small Geared Motor PE with DC Motor, Size 2

Housing: Steel, zinc-plated, sealed against lubricant leaks and protected against dust, can be mounted in any position.
Gearbox: 1st gearbox stage: plastic gears, other gears made from steel.
Bearing: Motor roller bearing. Gearbox roller bearing / plain bearing.
Lubrication: Maintenance free grease lubrication.
Motor: DC motor 24 V. Nominal motor speed 3,000 min^{-1}, Pinion milled into motor shaft. Free lead ends. Sense of rotation can be changed by swapping leads over.
Protection class according to VDE 0530: IP 41.
Insulation class according to VDE 0530: F.
Operating mode as per VDE 0530: S1.

Ordering Details: e.g.: Type, Size 2, Voltage, Output Speed, Product No.



Size 2

Product No. 24 V	Nominal Output Speed min^{-1}	Ratio i	max. continous Torque Nm	max. Starting Torque Nm	Nominal Motor Power W	Output Power W	Gearbox Efficiency %	a mm	b mm	Weight kg
430 450 24	600	5:1	1,00	3,0	54	49	90	164,5	43,0	1,5
430 451 24	500	6:1	1,30	3,5	54	49	90	164,5	43,0	1,5
430 452 24	392	7,66:1	1,00	3,0	46	41	90	164,5	43,0	1,5
430 453 24	143	21:1	3,20	12,0	55	47	85	181,0	59,5	1,6
430 454 24	120	25:1	4,00	14,5	55	47	85	181,0	59,5	1,6
430 455 24	100	30:1	4,80	14,5	55	47	85	181,0	59,5	1,6
430 456 24	83	36:1	5,50	16,0	55	47	85	181,0	59,5	1,6
430 457 24	65	46:1	5,60	16,0	45	38	85	181,0	59,5	1,6
430 458 24	51	59:1	6,00	16,0	48	32	85	181,0	59,5	1,6

Permissible radial shaft loadF_R: from i=5:1 to i=7,66:1: 112 N; from i=21:1 to i=59:1: 150 N (always middle shaft).
Permissible axial shaft load F_A: from i=5:1 to i=7,66:1: 100 N; from i=21:1 to i=59:1: 110 N.
Tolerances +/- 10%.

Note

The efficiency stated in the table is valid for properly run-in gearboxes at operating temperature. To prevent the gearbox from being overloaded, the stated limit loads must not be exceeded. At reversed operation the limit loads must be multiplied with the factor 0.75.

Optionally also available with DC speed sensor, incremental encoder and brake.

Also available as an option with larger gear ratio up to 450:1.

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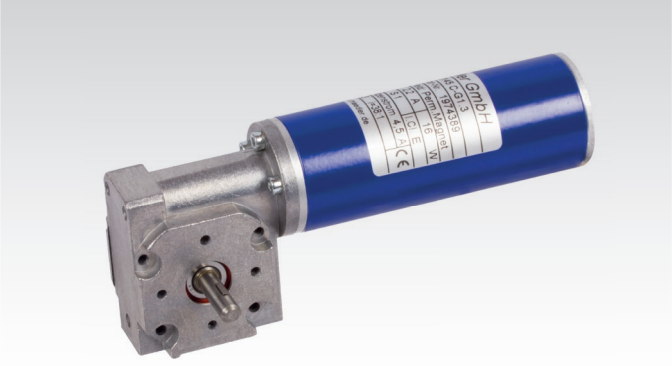
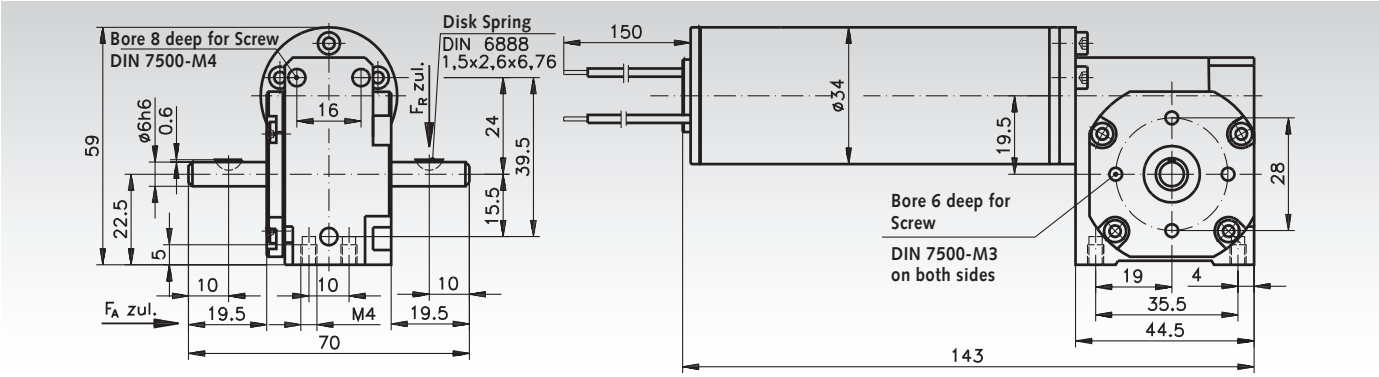
Small Geared Motor SE with DC Motor, Size 1

Housing: Aluminium, sealed against lubricant leaks and protected against dust, can be mounted in any position.
Teeth: Worm gear made from plastic, worm made from steel, ground. Not self-locking.
Bearing: Motor and gearbox with roller bearing.
Lubrication: Maintenance free grease lubrication.
Motor: DC Motor 12 V or 24 V.
Nominal motor speed 6,000 min^{-1}, worm pinned on motor shaft.
Free lead ends. Sense of rotation can be changed by swapping leads over.
Protection class according to VDE 0530: IP 21
Insulation class according to VDE 0530: E
Operating mode as per VDE 0530: S1



Ordering Details: e.g.: Type, Size 1, Voltage, Output Speed, Product No.



Size 1

Product No. 12 V	Product No. 24 V	Nominal Output Speed min^{-1}	Ratio i	max. continous Torque Nm	max. Starting Torque Nm	Nominal Motor Power W	Output Power W	Gearbox Efficiency %	Weight kg
430 410 12	**430 410 24**	822	7,3:1	0,15	0,83	16	13	79	0,52
430 411 12	**430 411 24**	522	11,5:1	0,23	1,3	16	12	77	0,52
430 412 12	**430 412 24**	400	15:1	0,28	1,7	16	12	73	0,52
430 413 12	**430 413 24**	261	23:1	0,41	2,0	16	11	70	0,52
430 414 12	**430 414 24**	200	30:1	0,55	2,0	16	11	66	0,52
430 415 12	**430 415 24**	158	38:1	0,63	1,2	16	10	65	0,52

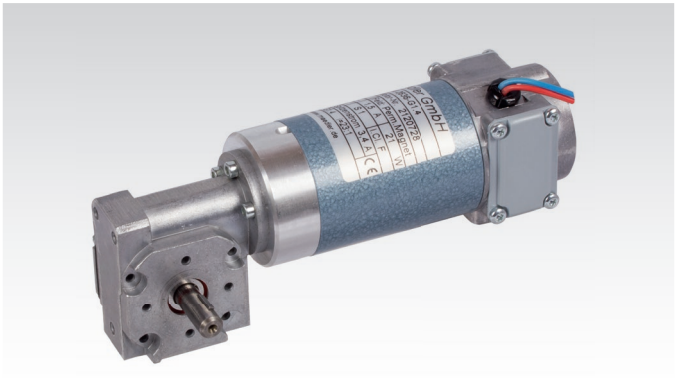
Permissible radial shaft load F_R: 30 N (middle shaft).
Permissible axial shaft load F_A: 12 N.
Tolerances +/- 10%.

Note

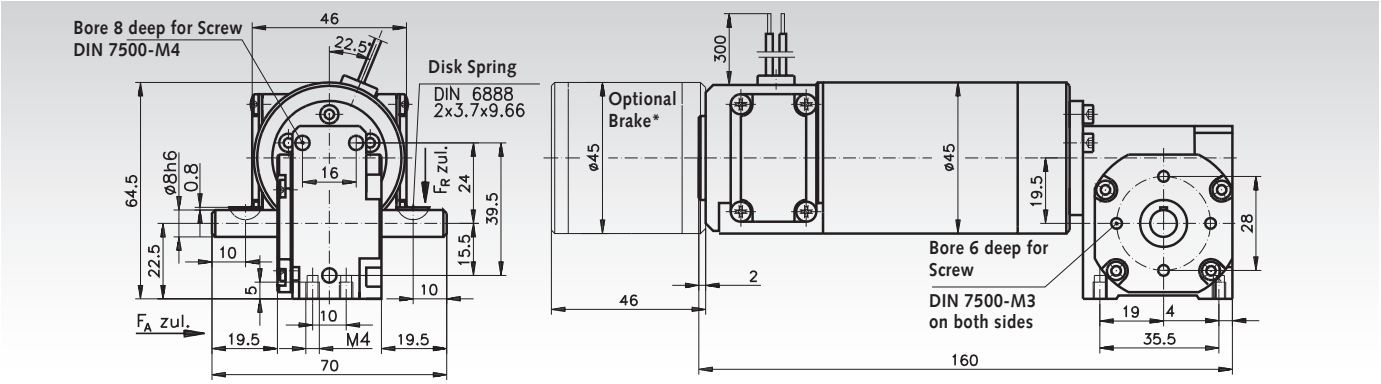
The efficiency stated in the table is valid for properly run-in gearboxes at operating temperature. To prevent the gearbox from being overloaded, the stated limit loads must not be exceeded. At reversed operation the limit loads must be multiplied with the factor 0.75.

Small Geared Motor SE with DC Motor, Size 2

Housing: Aluminium, sealed against lubricant leaks and protected against dust, can be mounted in any position.
Teeth: Worm gear made from plastic, worm made from steel, ground. Not self-locking.
Bearing: Motor and gearbox with roller bearing.
Lubrication: Maintenance free grease lubrication.
Motor: DC motor 24 V.
Nominal motor speed 3,000 min^{-1}, worm pinned on motor shaft.
Free lead ends. Sense of rotation can be changed by swapping leads over. *Brake on request.
Protection class according to VDE 0530: IP 41.
Insulation class according to VDE 0530: F.
Operating mode as per VDE 0530: S1.



Ordering Details: e.g.: Type, Size 2, Voltage, Output Speed, Product No.



Size 2

Product No. 24 V	Nominal Output Speed min^{-1}	Ratio i	max. continuous Torque Nm	Max. Starting Torque Nm	Nominal Motor power W	Output Power W	Gearbox Efficiency %	Weight kg
430 420 24	411	7,3:1	0,35	2,0	20	15	76	0,8
430 421 24	261	11,5:1	0,50	2,0	19	14	73	0,8
430 422 24	200	15:1	0,65	2,0	20	14	70	0,8
430 423 24	130	23:1	1,00	2,0	21	14	67	0,8
430 424 24	100	30:1	1,10	2,0	19	12	63	0,8
430 425 24	79	38:1	1,05	1,2	15	9	60	0,8

Permissible radial shaft load F_R: 110 N (middle shaft).
Permissible axial shaft load F_A: 60 N.
Tolerances +/- 10%.

Note

The efficiency stated in the table is valid for properly run-in gearboxes at operating temperature. To prevent the gearbox from being overloaded, the stated limit loads must not be exceeded. At reversed operation the limit loads must be multiplied with the factor 0.75.

* Optionally also available with DC speed sensor, incremental encoder and brake.

Speed controllers
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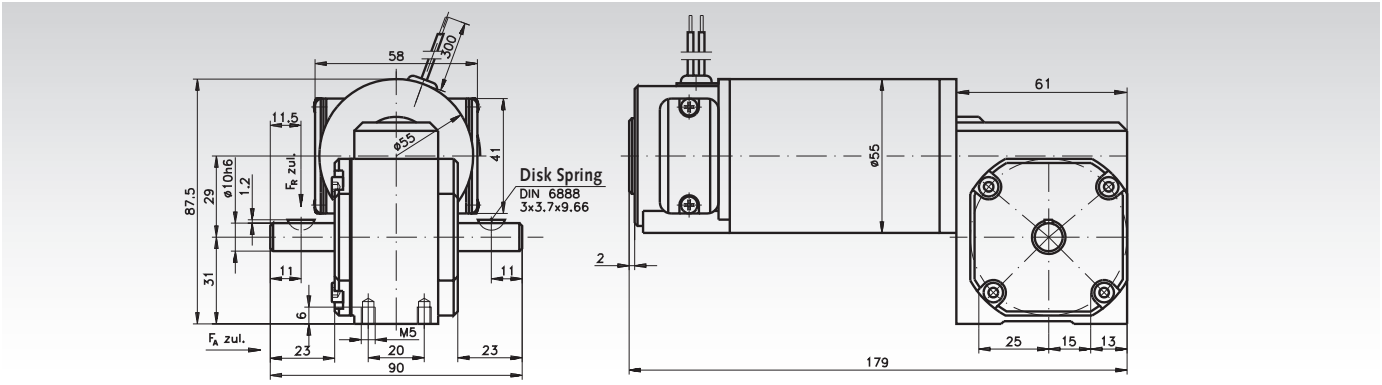
Small Geared Motor SE with DC Motor, Size 3

Housing: Aluminium, sealed against lubricant leaks and protected against dust, can be mounted in any position.
Teeth: Worm gear made from plastic, worm made from steel, ground. Not self-locking.
Bearing: Motor and gearbox with roller bearing.
Lubrication: Maintenance free grease lubrication.
Motor: DC motor 24 V.
Worm pinned on motor shaft. Free lead ends.
Sense of rotation can be changed by swapping leads over.
Protection class according to VDE 0530: IP 41.
Insulation class according to VDE 0530: F.
Operating mode as per VDE 0530: S1.

Ordering Details: e.g.: Type, Size 3, Voltage, Output Speed, Product No.



Size 3

Product No. 24 V	Nominal Output Speed min^{-1}	Ratio i	Nominal Motor Speed min^{-1}	max. continous Torque Nm	max. Starting Torque Nm	Nominal Motor Power W	Output Power W	Gearbox Efficiency %	Weight kg
430 430 24	833	4,8:1	4000	0,70	7,0	70	57	82	1,6
430 431 24	625	4,8:1	3000	0,70	7,0	55	45	82	1,6
430 432 24	429	9,33:1	4000	1,30	7,0	70	56	80	1,6
430 433 24	333	12:1	4000	1,60	7,0	70	56	80	1,6
430 434 24	276	14,5:1	4000	1,95	7,0	70	56	80	1,6
430 435 24	200	20:1	4000	2,40	8,0	70	49	70	1,6
430 436 24	160	25:1	4000	2,70	8,0	68	45	66	1,6
430 437 24	133	30:1	4000	3,00	7,0	63	42	67	1,6
430 438 24	100	30:1	3000	3,20	7,0	52	34	66	1,6
430 439 24	83	36:1	3000	2,40	5,0	34	21	62	1,6

Permissible radial shaft load F_R: 150 N (middle shaft).
Permissible axial shaft load F_A: 60 N.
Tolerances +/- 10%.

Note

The efficiency stated in the table is valid for properly run-in gearboxes at operating temperature. To prevent the gearbox from being overloaded, the stated limit loads must not be exceeded. At reversed operation the limit loads must be multiplied with the factor 0.75.

Optionally also available with DC speed sensor, incremental encoder and brake.

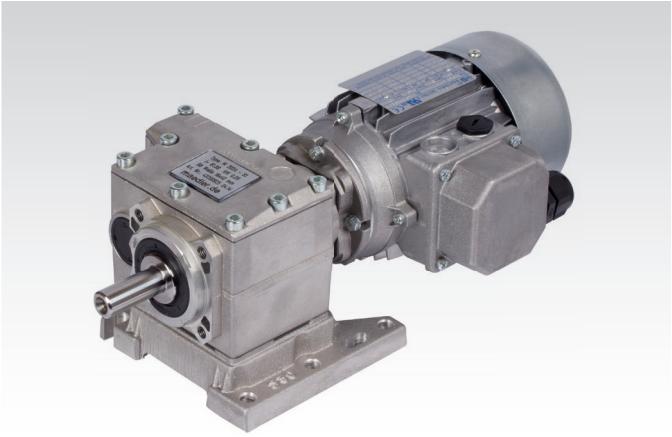
Housing: Aluminium, corrosion-inhibiting coating, with mounting holes for foot and flange mounting and with removable twist cap for easy service.
Gearing: Hardened and ground.
Lubrication: Synthetic oil (lubricated for life).
Motor: Standard three-phase motor with small flange B14, 230/400V, 50 Hz.

From 0.75 kW in efficiency class IE2.

Other Motor versions (AC Motor, posistor, forced ventilation, break etc.) on request.

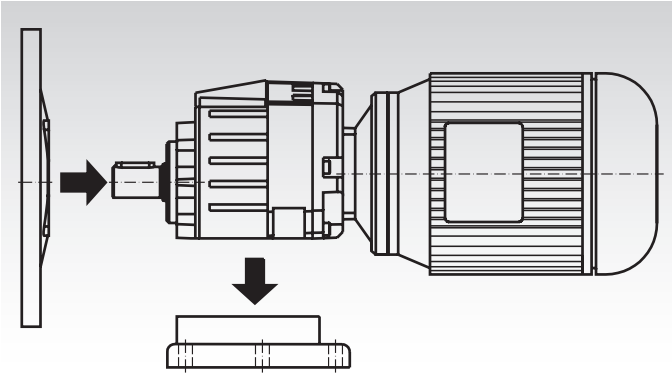
Light-weight, high-quality model range with many mounting options.

These maintenance free, geared motors without ventilation can be used in **any mounting position.**



Variable mounting:
These geared motors are supplied with a screwed-on foot mounting. If flange mounting is required or if the motor is to be mounted on an existing base plate, this foot can simply be unscrewed.

Retrofittable flange:
If the motor is to be flange mounted on the output side, a flange can be srewed on by the customer. These flanges B5 are available in several diameters and have to be ordered separately.



Ordering details: e.g.: Prod. No., Type, Motor Power, Output Speed
If required: Output Flange, Prod. No., Diameter

Product No. Model B3	P kW	n_2 min^{-1}	M_a Nm	f_B	$i_{ges.}$	F_R [1] N	F_A [2] N	Gearbox Size	Motor Size	Weight kg
432 009 05	0,09	5,1	157	1,0	177,09	3000	600	40/3	63A6	10,10
432 009 10	0,09	7,9	101	1,6	177,09	3000	600	40/3	56B4	9,20
432 009 15	0,09	10,3	77	2,1	135,69	3000	600	40/3	56B4	9,20
432 009 20	0,09	14,5	55	2,9	96,85	3000	600	40/3	56B4	9,20
432 009 25	0,09	22,6	36	1,9	61,89	1900	380	20/2	56B4	6,60
432 009 30	0,09	28,1	29	2,4	49,76	1900	380	20/2	56B4	6,60
432 009 35	0,09	37,1	22	3,2	37,69	1900	380	20/2	56B4	6,60
432 009 40	0,09	53	16	3,9	26,31	1900	380	20/2	56B4	6,60
432 009 45	0,09	66	12	4,8	21,15	1900	380	20/2	56B4	6,60
432 009 50	0,09	75	11	5,4	18,78	1700	340	20/2	56B4	6,60
432 009 55	0,09	93	9	6,7	15,10	1500	340	20/2	56B4	6,60
432 009 60	0,09	107	8	7,8	13,03	1500	340	20/2	56B4	6,60
432 009 65	0,09	123	7	8,9	11,42	1500	340	20/2	56B4	6,60
432 012 05	0,12	7,9	146	1,1	177,09	3000	600	40/3	63A4	10,10
432 012 10	0,12	10,3	112	1,4	135,69	3000	600	40/3	63A4	10,10
432 012 15	0,12	13,6	85	2,1	102,89	3000	600	40/3	63A4	10,10
432 012 20	0,12	16,2	72	1,9	86,66	3000	600	40/3	63A4	10,10
432 012 25	0,12	19,1	61	2,9	73,43	3000	600	40/3	63A4	10,10
432 012 30	0,12	22,6	53	1,3	61,89	1900	3800	20/2	63A4	7,50
432 012 35	0,12	28,1	42	1,7	49,76	1900	3800	20/2	63A4	7,50
432 012 40	0,12	37,1	32	2,2	37,69	1900	3800	20/2	63A4	7,50
432 012 45	0,12	48,5	25	2,8	28,88	1900	3800	20/2	63A4	7,50
432 012 50	0,12	53	22	2,7	26,31	1900	3800	20/2	63A4	7,50

[1] Radial load F_R max. (on middle of the Output Shaft) for $F_A = 0$.
[2] Axial load F_A max. for $F_R = 0$.

Dimensions table page 718.

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Product No. Model B3	P kW	n_2 min^{-1}	M_a Nm	f_B	$i_{ges.}$	F_R [1] N	F_A [2] N	Gearbox Size	Motor Size	Weight kg
432 018 05	0,18	10,3	155	1,0	135,69	3000	600	40/3	63B4	10,50
432 018 10	0,18	13,6	117	1,5	102,89	3000	600	40/3	63B4	10,50
432 018 15	0,18	16,2	99	1,4	86,88	3000	600	40/3	63B4	10,50
432 018 20	0,18	19,7	81	2,0	70,95	3000	600	40/3	63B4	10,50
432 018 25	0,18	22,9	70	2,3	61,22	3000	600	40/3	63B4	10,50
432 018 30	0,18	27,6	58	2,8	50,64	3000	600	40/3	63B4	10,50
432 018 35	0,18	32	50	3,0	43,69	3000	600	40/3	63B4	10,50
432 018 40	0,18	39	42	1,7	35,91	1900	380	20/2	63B4	7,90
432 018 45	0,18	48,5	34	2,1	28,88	1900	380	20/2	63B4	7,90
432 018 50	0,18	64	26	2,3	21,84	1900	380	20/2	63B4	7,90
432 018 55	0,18	75	22	2,7	18,78	1700	340	20/2	63B4	7,90
432 018 60	0,18	86	19	3,1	16,2	1500	300	20/2	63B4	7,90
432 018 65	0,18	93	18	3,4	15,1	1500	270	20/2	63B4	7,90
432 018 70	0,18	123	13	4,5	11,42	1350	246	20/2	63B4	7,90
432 025 05	0,25	5,8	384	0,9	241,82	5000	1000	50/3	71A4	18,00
432 025 10	0,25	7,8	286	1,2	180,4	5000	1000	50/3	71A4	18,00
432 025 15	0,25	10,2	217	1,6	136,62	5000	1000	50/3	71A4	18,00
432 025 20	0,25	15,1	147	2,2	92,78	5000	1000	50/3	71A4	18,00
432 025 25	0,25	19,7	113	1,4	70,95	3000	600	40/3	71A4	12,20
432 025 30	0,25	22,9	97	1,6	61,22	3000	600	40/3	71A4	12,20
432 025 35	0,25	27,6	80	2,0	50,64	3000	600	40/3	71A4	12,20
432 025 40	0,25	32	69	2,2	43,69	3000	600	40/3	71A4	12,20
432 025 45	0,25	37,1	62	1,1	37,69	1900	380	20/2	71A4	9,60
432 025 50	0,25	48,5	47	1,5	28,88	1900	380	20/2	71A4	9,60
432 025 55	0,25	64	36	1,7	21,84	1900	380	20/2	71A4	9,60
432 025 60	0,25	75	31	2,0	18,78	1700	340	20/2	71A4	9,60
432 025 65	0,25	107	21	2,8	13,03	1500	300	20/2	71A4	9,60
432 025 70	0,25	123	19	3,2	11,42	1350	270	20/2	71A4	9,60
432 025 75	0,25	142	16	3,7	9,85	1320	246	20/2	71A4	9,60
432 025 80	0,25	194	12	4,2	7,2	1320	185	20/2	71A4	9,60
432 025 85	0,25	257	9	5,6	5,45	756	151	20/2	71A4	9,60
432 037 05	0,37	7,8	423	0,8	180,4	5000	1000	50/3	71B4	18,60
432 037 10	0,37	15,1	218	1,5	92,78	5000	1000	50/3	71B4	18,60
432 037 15	0,37	18,3	180	2,0	76,69	5000	1000	50/3	71B4	18,60
432 037 20	0,37	21,1	155	2,1	66,22	5000	1000	50/3	71B4	18,60
432 037 25	0,37	25,6	128	2,8	54,73	5000	1000	50/3	71B4	18,60
432 037 30	0,37	29,9	114	1,2	46,86	3000	600	40/2	71B4	12,40
432 037 35	0,37	36,5	90	1,9	38,4	3000	600	40/3	71B4	12,80
432 037 40	0,37	39	87	1,2	35,91	1900	380	30/2	71B4	10,50
432 037 45	0,37	48,5	70	1,0	28,88	1900	380	20/2	71B4	10,20
432 037 50	0,37	64	53	1,1	21,84	1900	380	20/2	71B4	10,20
432 037 55	0,37	75	46	1,3	18,78	1700	340	20/2	71B4	10,20
432 037 60	0,37	86	39	1,5	16,2	1500	300	20/2	71B4	10,20
432 037 65	0,37	107	32	1,9	13,03	1500	300	20/2	71B4	10,20
432 037 70	0,37	123	28	2,2	11, 42	1350	270	20/2	71B4	10,20
432 037 75	0,37	142	24	2,5	9,85	1320	246	20/2	71B4	10,20
432 037 80	0,37	181	19	2,7	7,74	1320	246	20/2	71B4	10,20
432 055 05	0,55	8,5	577	0,9	165,29	6500	1300	60/3	80A4	23,20
432 055 10	0,55	11,1	442	1,1	126,65	6500	1300	60/3	80A4	23,20
432 055 15	0,55	13,4	365	1,4	104,68	6500	1300	60/3	80A4	23,20
432 055 20	0,55	15,1	324	1,0	92,78	5000	1000	50/3	80A4	20,60
432 055 25	0,55	18,3	268	1,3	76,69	5000	1000	50/3	80A4	20,60
432 055 30	0,55	21,1	231	1,4	66,22	5000	1000	50/3	80A4	20,60
432 055 35	0,55	25,6	191	1,9	54,73	5000	1000	50/3	80A4	20,60
432 055 40	0,55	29,6	165	2,1	47,22	5000	1000	50/3	80A4	20,60
432 055 45	0,55	34,6	146	2,0	40,5	5000	1000	50/2	80A4	20,40
432 055 50	0,55	39	129	1,1	35,91	3000	600	40/2	80A4	14,40
432 055 55	0,55	47,6	106	1,5	29,4	3000	600	40/2	80A4	14,40
432 055 60	0,55	63	80	2,1	22,29	3000	600	40/2	80A4	14,40
432 055 65	0,55	74	68	2,0	18,8	2700	540	40/2	80A4	14,40
432 055 70	0,55	86	58	2,4	16,2	2400	480	40/2	80A4	14,40
432 055 75	0,55	91	55	2,9	15,37	2400	480	40/2	80A4	14,40
432 055 80	0,55	107	47	2,4	13,03	1500	300	30/2	80A4	12,50
432 055 85	0,55	123	41	2,8	11,42	1350	270	30/2	80A4	12,50
432 055 90	0,55	142	35	2,7	9,85	1320	246	30/2	80A4	12,50
432 055 95	0,55	181	28	2,9	7,74	1320	246	30/2	80A4	12,50
432 055 96	0,55	257	20	2,5	5,45	756	151	30/2	80A4	12,50

[1] Radial load F_R max at $F_A = 0$.
[2] Axial load F_A max at $F_R = 0$.
Dimensions table page 718.

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Product No. Model B3	P kW	n_2 min^{-1}	M_a Nm	f_B	$i_{ges.}$	F_R [1] N	F_A [2] N	Gearbox Size	Motor Size	Weight kg
432 075 05	0,75	11,1	603	0,8	126,65	6500	1300	60/3	80B4	24,70
432 075 10	0,75	13,4	498	1,0	104,68	6500	1300	60/3	80B4	24,70
432 075 15	0,75	16,7	398	1,1	83,59	6500	1300	60/3	80B4	24,70
432 075 20	0,75	21,1	315	1,0	66,22	5000	1000	50/3	80B4	22,10
432 075 25	0,75	25,6	260	1,4	54,73	5000	1000	50/3	80B4	22,10
432 075 30	0,75	29,6	225	1,6	47,22	5000	1000	50/3	80B4	22,10
432 075 32	0,75	34,6	199	1,5	40,5	5000	1000	50/2	80B4	21,90
432 075 35	0,75	39,3	175	1,9	35,58	5000	1000	50/2	80B4	21,90
432 075 37	0,75	47,6	144	2,5	29,41	4500	900	50/2	80B4	21,90
432 075 40	0,75	56	123	2,0	24,98	4500	900	50/2	80B4	21,90
432 075 42	0,75	63	109	1,5	22,29	3000	600	40/2	80B4	15,90
432 075 45	0,75	74	92	1,5	18,8	2700	540	40/2	80B4	15,90
432 075 47	0,75	86	80	1,7	16,2	2400	480	40/2	80B4	15,90
432 075 50	0,75	106	65	2,5	13,26	2400	480	40/2	80B4	15,90
432 075 52	0,75	120	57	3,0	11,66	2240	448	40/2	80B4	15,90
432 075 55	0,75	139	49	3,0	10,06	2240	448	40/2	80B4	15,90
432 075 57	0,75	165	42	1,2	5,45	1320	246	30/2	90S6	16,50
432 075 60	0,75	194	35	2,0	7,2	1320	246	30/2	80B4	14,00
432 075 65	0,75	225	31	2,3	6,23	924	185	30/2	80B4	14,00
432 075 70	0,75	257	27	1,9	5,45	776	151	30/2	80B4	14,00
432 075 75	0,75	327	21	2,4	4,28	700	140	30/2	80B4	14,00
432 075 80	0,75	407	17	3,0	3,44	700	140	30/2	80B4	14,00
432 110 05	1,1	18,3	535	0,9	76,69	6500	1300	60/3	90S4	27,20
432 110 10	1,1	21,1	462	1,1	66,22	6500	1300	60/3	90S4	27,20
432 110 15	1,1	25,6	382	1,3	54,73	6500	1300	60/3	90S4	27,20
432 110 20	1,1	29,6	330	1,5	47,22	6500	1300	60/3	90S4	27,20
432 110 25	1,1	35,2	278	1,6	39,79	6500	1300	60/3	90S4	27,20
432 110 30	1,1	39,3	256	1,3	35,58	5000	1000	50/2	90S4	24,40
432 110 35	1,1	47,6	212	1,7	29,41	4500	900	50/2	90S4	24,40
432 110 40	1,1	56	180	1,4	24,98	4500	900	50/2	90S4	24,40
432 110 45	1,1	65	155	1,0	21,54	3000	600	40/2	90S4	18,40
432 110 50	1,1	78	130	1,2	18,04	2700	540	40/2	90S4	18,40
432 110 55	1,1	91	111	1,4	15,37	2400	480	40/2	90S4	18,40
432 110 57	1,1	106	96	1,7	13,26	2400	480	40/2	90S4	18,40
432 110 60	1,1	120	84	2,1	11,66	2240	448	40/2	90S4	18,40
432 110 62	1,1	139	72	2,1	10,06	2240	448	40/2	90S4	18,40
432 110 65	1,1	181	56	1,4	7,74	1320	246	30/2	90S4	16,50
432 110 67	1,1	194	52	1,3	7,2	1320	246	30/2	90S4	16,50
432 110 70	1,1	225	45	1,6	6,23	924	185	30/2	90S4	16,50
432 110 75	1,1	257	39	1,3	5,45	756	151	30/2	90S4	16,50
432 110 80	1,1	327	31	1,6	4,28	700	140	30/2	90S4	16,50
432 110 85	1,1	407	25	2,0	3,44	700	140	30/2	90S4	16,50
432 150 05	1,5	25,6	521	1,0	54,73	6500	1300	60/3	90LA4	29,70
432 150 10	1,5	29,6	449	1,1	47,22	6500	1300	60/3	90LA4	29,70
432 150 15	1,5	35,2	379	1,1	39,79	6500	1300	60/3	90LA4	29,70
432 150 20	1,5	39,3	349	0,9	35,58	5000	1000	50/2	90LA4	26,90
432 150 25	1,5	47,6	289	1,2	29,41	4500	900	50/2	90LA4	26,90
432 150 30	1,5	56	245	1,0	24,98	4500	900	50/2	90LA4	26,90
432 150 35	1,5	70	197	1,7	20,1	3900	780	50/2	90LA4	26,90
432 150 40	1,5	84	163	2,2	16,62	3900	780	50/2	90LA4	26,90
432 150 45	1,5	99	140	1,8	14,21	3500	700	50/2	90LA4	26,90
432 150 50	1,5	120	114	1,5	11,66	2240	448	40/2	90LA4	20,90
432 150 55	1,5	139	99	1,5	10,06	2240	448	40/2	90LA4	20,90
432 150 60	1,5	177	78	1,5	7,89	2030	406	40/2	90LA4	20,90
432 150 65	1,5	191	72	1,7	7,33	2030	406	40/2	90LA4	20,90
432 150 70	1,5	220	62	1,5	6,36	1800	360	40/2	90LA4	20,90
432 150 75	1,5	257	54	0,9	5,45	756	151	30/2	90LA4	19,00
432 150 80	1,5	327	42	1,2	4,28	700	140	30/2	90LA4	19,00
432 150 85	1,5	407	34	1,5	3,44	700	140	30/2	90LA4	19,00

[1] Radial load F_R max at $F_A = 0$.
[2] Axial load F_A max at $F_R = 0$.

Dimensions table page 718.

Note for Dimensioning

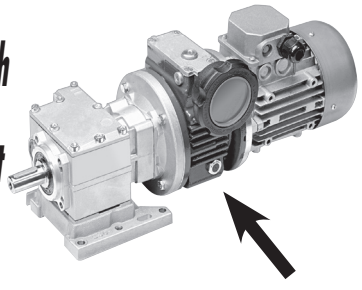
Three-phase motors have a very high starting torque. The max. permissible, stability related torque of the gearbox is the product of output torque and operating factor: $M_{max.} = M_a \times f_B$

This torque must never be exceeded.

Furthermore, depending on kind of operation,

factors for shock load and acceleration must be considered.

Optionally also available with additional manual adjustment mechanism (on request).



Output Flanges for Helical Geared Motors HR/I

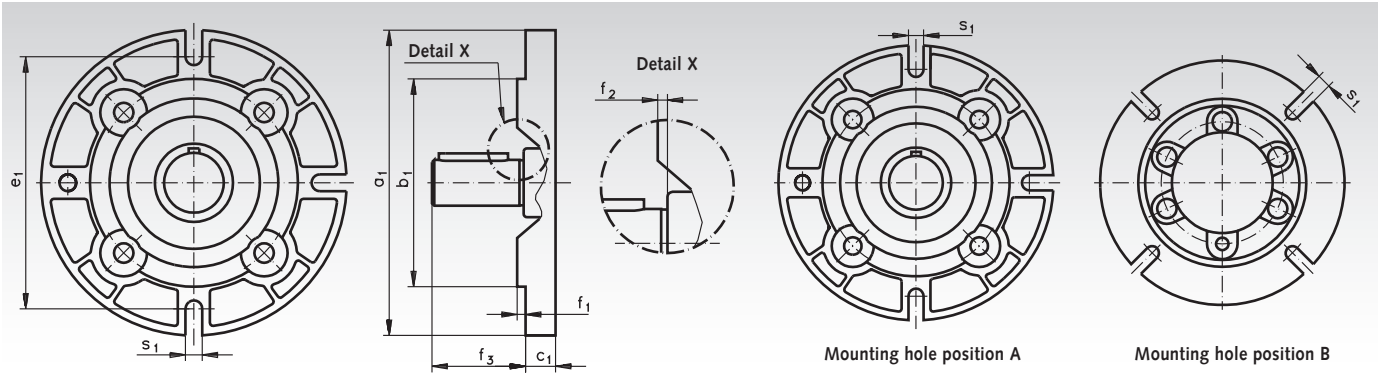
Material: Aluminium.

Output-side flange for helical geared motor HR/I to be mounted by the customer, for modification from foot mounting B3 to flange mounting B5.

For every gearbox size there are flanges in several, common diameters available.

The flange is supplied with the required mounting screws and can be easily screwed on. The screwed on foot mounting can be taken off the gearbox, if required.

Ordering details: e.g.: Prod. No. 432 020 12, Output Flange for Gearbox Size 20/2 and 30/2



Output Flange Gearbox Size 20/2 and 30/2

Product No.	a_1 mm	b_1 mm	c_1 mm	e_1 mm	f_1 mm	f_2 mm	f_3 mm	s_1 mm	Mount. Hole Position	Weight kg
432 020 12	120	80	11,5	100	3,0	6,5	36,5	9	A	0,23
432 020 14	140	95	11,5	115	3,0	6,5	36,5	9	B	0,32
432 020 16	160	110	11,5	130	3,5	7,0	36,5	9	B	0,41
432 020 20	200	130	11,5	165	3,5	7,0	36,5	11	B	0,61

Output Flange Gearbox Size 40/2 and 40/3

Product No.	a_1 mm	b_1 mm	c_1 mm	e_1 mm	f_1 mm	f_2 mm	f_3 mm	s_1 mm	Mount. Hole Position	Weight kg
432 040 12	120	80	10	100	3,0	6,0	47	9	B	0,24
432 040 14	140	95	10	115	3,0	6,0	47	9	B	0,32
432 040 16	160	110	10	130	3,0	6,0	47	9	B	0,42
432 040 20	200	130	11	165	3,5	6,5	47	11	B	0,67

Output Flange Gearbox Size 50/2, 50/3 und 60/3

Product No.	a_1 mm	b_1 mm	c_1 mm	e_1 mm	f_1 mm	f_2 mm	f_3 Size 50 mm	f_3 Size 60 mm	s_1 mm	Mount. Hole Position	Weight kg
432 050 16	160	110	14,0	130	3,5	6,0	57,5	67,5	9	B	0,52
432 050 20	200	130	13,0	165	3,5	6,0	57,5	67,5	11	B	0,71
432 050 25	250	180	15,5	215	4,0	6,5	57,5	67,5	14	B	1,24

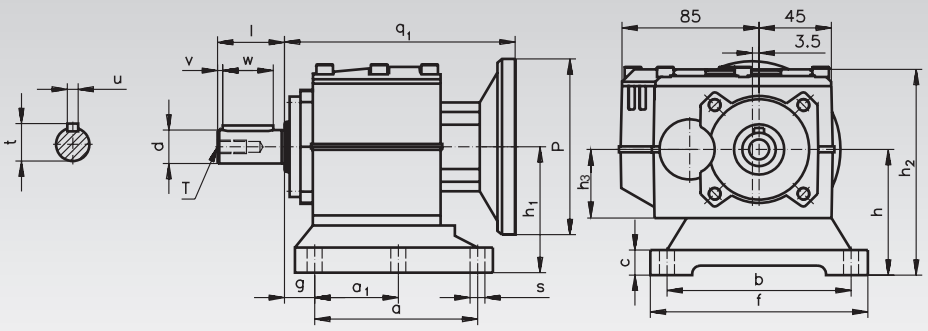
Lubricant Volume in Litre (dm^3)

The gearbox is lubricated for life, using synthetic oil. At normal operating conditions, no change is required. The lubricant volume is the same for all mounting positions.

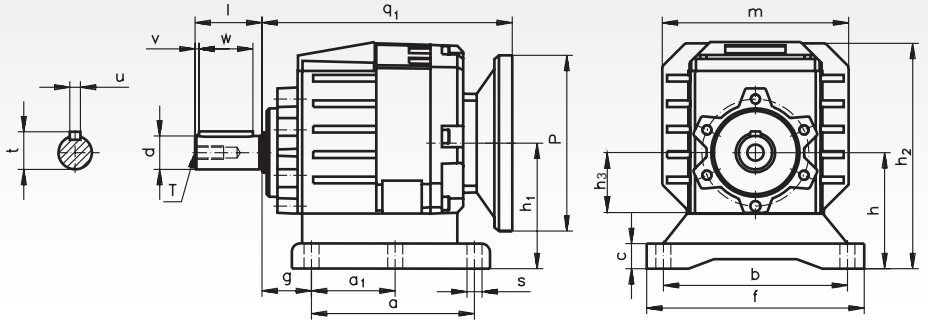
Size	20/2	30/2	40/2	40/3	50/2	50/3	60/3
Oil volume	0.15	0.15	0.40	0.45	1.10	1.15	1.25

Dimensions Table Helical Geared Motors HR/I

Gearbox Size
20/2
30/2

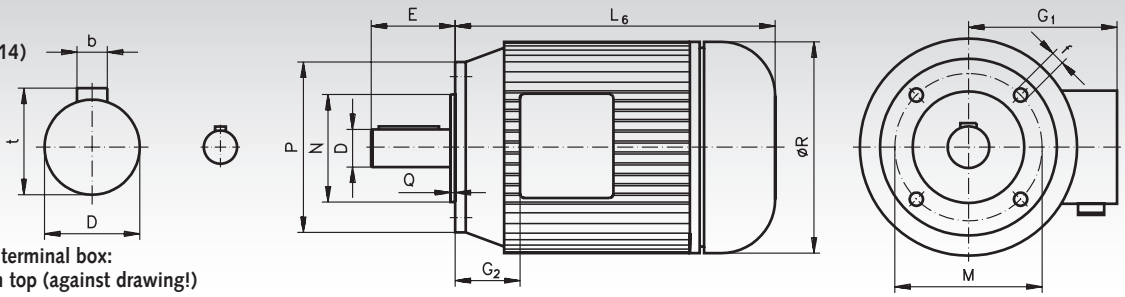


Gearbox Size
40/2
40/3
50/2
50/3
60/3



Gear Size	Motor Size	Output Shaft d mm	l mm	t mm	T mm	u mm	v mm	w mm	Gearbox Housing and Foot a mm	a_1 mm	b mm	c mm	f mm	g mm	h mm	h_1 mm	h_2 mm	h_3 mm	m mm	P m	q_1 mm	s mm
20/2	**56**	16	40	18,0	M6	5	3	30	110	50	110	15	130	18	75	75,0	115,5	41	-	78	137,5	9,0
20/2	**63**	16	40	18,0	M6	5	3	30	110	50	110	15	130	18	75	75,0	115,5	41	-	90	133,5	9,0
20/2	**71**	16	40	18,0	M6	5	3	30	110	50	110	15	130	18	75	75,0	115,5	41	-	105	133,0	9,0
30/2	**71**	20	40	22,5	M8	6	3	30	110	50	110	15	130	18	75	75,0	115,5	41	-	105	149,5	9,0
30/2	**80**	20	40	22,5	M8	6	3	30	110	50	110	15	130	18	75	75,0	115,5	41	-	120	150,5	9,0
30/2	**90**	20	40	22,5	M8	6	3	30	110	50	110	15	130	18	75	75,0	115,5	41	-	140	151,5	9,0
40/2	**71**	25	50	28,0	M8	8	3	40	90	50	110	15	145	18	75	82,0	155,0	45,5	139	105	178,5	9,0
40/2	**80**	25	50	28,0	M8	8	3	40	90	50	110	15	145	18	75	82,0	155,0	45,5	139	120	179,5	9,0
40/2	**90**	25	50	28,0	M8	8	3	40	90	50	110	15	145	18	75	82,0	155,0	45,5	139	140	180,5	9,0
40/3	**56**	25	50	28,0	M8	8	3	40	90	50	110	15	145	18	75	78,2	155,0	45,5	139	78	186,5	9,0
40/3	**63**	25	50	28,0	M8	8	3	40	90	50	110	15	145	18	75	78,2	155,0	45,5	139	90	181,5	9,0
40/3	**71**	25	50	28,0	M8	8	3	40	90	50	110	15	145	18	75	78,2	155,0	45,5	139	105	182,0	9,0
50/2	**80**	30	60	33,0	M10	8	5	50	165	-	135	24	170	30	115	120,3	216,5	69,5	178	120	226,0	13,5
50/2	**90**	30	60	33,0	M10	8	5	50	165	-	135	24	170	30	115	120,3	216,5	69,5	178	140	226,0	13,5
50/3	**71**	30	60	33,0	M10	8	5	50	165	-	135	24	170	30	115	130,0	216,5	69,5	178	105	234,5	13,5
50/3	**80**	30	60	33,0	M10	8	5	50	165	-	135	24	170	30	115	130,0	216,5	69,5	178	120	235,5	13,5
60/3	**80**	35	70	38,0	M10	10	5	60	165	-	135	24	170	30	115	130,5	218,0	69,5	202	120	254,0	13,5
60/3	**90**	35	70	38,0	M10	10	5	60	165	-	135	24	170	30	115	130,5	218,0	69,5	202	140	255,0	13,5

Motor
(Model B14)



Position of terminal box:
standard on top (against drawing!)

Motor Size	D mm	b mm	t mm	E mm	f mm	G_1 mm	G_2 mm	L_6 mm	M mm	N mm	P mm	Q mm	R mm	Weight kg
56B	9	3	10,2	20	M5	112	13	179	65	50	80	2,5	108	2,9
63A	11	4	12,5	23	M5	113	19	185	75	60	90	2,5	120	3,8
63B	11	4	12,5	23	M5	113	19	185	75	60	90	2,5	120	4,2
71A	14	5	16	30	M6	125	24	206	85	70	105	2,5	130	5,9
71B	14	5	16	30	M6	125	24	225	85	70	105	2,5	141	6,5
80A	19	6	21,5	40	M6	133	23	256	100	80	120	3	159	8,5
80B	19	6	21,5	40	M6	133	23	256	100	80	120	3	159	10
90S	24	8	27	50	M8	148	28	255	115	95	140	3	170	12,5
90L	24	8	27	50	M8	148	28	280	115	95	140	3	170	15

Housing: One-part, torsion-resistant block-shaped housing made from grey cast iron type GG20 or GGG40. The high torsional stiffness helps to achieve an optimum production accuracy, leading to low noise and thus a longer service life.

Gearing: The helical gearwheels are produced from forged blanks, the gears are case hardened and ground or scraped. The calculations were carried out according to DIN 3990.

Bearing system: Generously dimensioned roller bearings.

Shafts: Ø according to ISO k6. Feather key groove according to DIN 6885/1. Centering points with threads according to DIN 332/2.

Lubrication: The gear boxes are delivered filled with the correct level of oil or grease, which offers sufficient lubrication for about 10.000 operating hours, or for an operation period of 2 years, at a temperature of -5°C to +40°C. When changing the lubricant, always clean the gearbox thoroughly.

Motor: 230/400 V, 50 Hz, according to DIN 40050-VDE 0530, IP 55, insulation class „B" VDE 0530, temperature limit +80°C at max. ambient temperature of 40°C.

From 0.75 kW in efficiency class IE2.

Gearbox with higher power, other speeds, fitted brake motors, explosion-proof or dual-speed motors and other models on request.

Note

The oil volume and venting position depends on the model and the mounting position. Please read the operating and maintenance instructions carefully.

Ordering details: e.g.: Type, Motor Power, Output Speed, Model, Product No.

Product No. Model B3	P kW	n_2 min^{-1}	M_a Nm	f_B	$i_{tot.}$	Standard Bearing F_R [1] N	Standard Bearing F_A [2] N	Dimen.-Table	Weight kg
431 002 01	0,12	3,2	209*	0,8	420,83	2980	4000	1	19
431 002 04	0,12	4,9	220*	0,8	275,12	2890	4000	1	19
431 002 06	0,12	6,8	169	1,2	195,78	3240	4000	1	19
431 002 07	0,12	8,4	136	1,2	159,36	3400	4000	1	19
431 002 08	0,12	10	115	1,3	132,45	3490	4000	1	19
431 003 04	0,12	18	64	1,4	73,06	2270	3270	2	12
431 003 06	0,12	25	46	1,9	53,68	2340	3270	2	12
431 003 08	0,12	40	29	3,4	33,42	2390	3270	2	12
431 003 10	0,12	58	20	3,9	23,13	2400	3270	2	12
431 003 12	0,12	84	14	5,3	15,95	2410	3270	2	12
431 003 13	0,12	104	11	6,4	12,82	2410	3270	2	12
431 003 16	0,12	144	8	8,2	9,28	2390	3270	2	12
431 003 19	0,12	194	6	10,3	6,89	2170	3270	2	12
431 003 21	0,12	277	4	13,8	4,82	1930	3240	2	12
431 003 23	0,12	395	3	16,5	3,38	1720	2780	2	12
431 010 01	0,18	2,5	668	1,0	524,08	5700	9000	3	43
431 010 02	0,18	3,1	555	1,2	421,32	6110	9000	3	43
431 010 03	0,18	3,9	441	1,5	339,15	6380	9000	3	43
431 011 01	0,18	5,1	337	1,0	262,24	4520	5600	4	31
431 011 02	0,18	6,2	282	1,2	217,73	4820	5600	4	31
431 011 04	0,18	8,7	198	1,5	151,44	5150	5600	4	31
431 014 01	0,18	18	96	0,9	73,06	2080	3270	2	12
431 014 03	0,18	25	69	1,3	53,68	2250	3270	2	12
431 014 05	0,18	40	43	2,2	33,42	2350	3270	2	12
431 014 07	0,18	57	30	2,6	23,13	2380	3270	2	12
431 014 09	0,18	83	21	3,5	15,95	2400	3270	2	12
431 014 10	0,18	103	17	4,2	12,82	2400	3270	2	12
431 014 13	0,18	143	12	5,4	9,28	2370	3270	2	12
431 014 16	0,18	192	9	6,8	6,89	2160	3270	2	12
431 014 18	0,18	275	6	9,1	4,82	1920	3190	2	12
431 014 20	0,18	329	4	10,9	3,38	1710	2760	2	12
431 024 01	0,25	19	126	1,1	72,63	3440	4000	5	15
431 024 02	0,25	22	109	1,4	61,35	3510	4000	5	15
431 025 01	0,25	26	92	1,0	53,68	2110	3270	6	13
431 025 03	0,25	41	58	1,6	33,42	2300	3270	6	13
431 025 05	0,25	60	40	2,0	23,13	2360	3270	6	13
431 025 07	0,25	87	27	2,6	15,95	2390	3270	6	13
431 025 08	0,25	108	22	3,2	12,82	2400	3270	6	13
431 025 11	0,25	149	16	4,1	9,28	2310	3270	6	13
431 025 14	0,25	200	12	5,1	6,89	2110	3270	6	13
431 025 16	0,25	286	8	6,8	4,82	1830	3140	6	13
431 025 18	0,25	408	6	8,2	3,38	1680	2720	6	13

* Max. output torque: at f_B = 0.8. Dimensions table page 721.

Helical Geared Motors NR/I

Product No. Model B3	P kW	n_2 min^{-1}	M_a Nm	f_B	i tot.	Standard Mounting F_R [1] N	F_A [2] N	Dimens. Table	Weight kg
431 034 02	0,37	11	321	1,1	124,17	4610	5600	7	33
431 036 01	0,37	16	221	1,1	86,30	5070	5600	8	25
431 036 02	0,37	19	186	1,4	69,81	5190	5600	8	25
431 036 03	0,37	25	141	2,3	55,28	5300	5600	8	25
431 038 01	0,37	33	107	0,9	41,58	1990	3270	6	14
431 038 02	0,37	41	86	1,1	33,42	2150	3270	6	14
431 038 06	0,37	59	60	1,3	23,13	2290	3270	6	14
431 038 08	0,37	85	42	1,7	15,95	2350	3270	6	14
431 038 09	0,37	106	33	2,1	12,82	2380	3270	6	14
431 038 12	0,37	147	24	2,7	9,28	2270	3270	6	14
431 038 15	0,37	197	18	3,4	6,89	2080	3270	6	14
431 038 17	0,37	282	13	4,5	4,82	1850	3270	6	14
431 044 01	0,55	14	375	0,9	100,60	4270	5600	9	35
431 044 02	0,55	16	328	1,0	88,45	4570	5600	9	35
431 046 01	0,55	20	263	1,0	69,81	4910	5600	10	27
431 046 02	0,55	25	210	1,5	55,28	5110	5600	10	27
431 047 01	0,55	29	181	1,0	47,87	2480	4000	11	18
431 047 02	0,55	36	146	1,3	38,31	3030	4000	11	18
431 047 03	0,55	44	119	1,4	31,19	3370	4000	11	18
431 047 04	0,55	53	99	1,4	25,92	3210	4000	11	18
431 048 02	0,55	57	92	1,0	24,39	1910	3270	12	16
431 048 03	0,55	67	78	0,9	20,59	2200	3270	12	16
431 048 04	0,55	86	61	1,2	15,95	2290	3270	12	16
431 048 05	0,55	107	49	1,4	12,82	2330	3270	12	16
431 048 06	0,55	122	43	1,6	11,27	2310	3270	12	16
431 048 07	0,55	138	38	1,7	9,95	2240	3270	12	16
431 048 08	0,55	148	35	1,8	9,28	2190	3270	12	16
431 048 11	0,55	200	26	2,3	6,89	2010	3270	12	16
431 058 01	0,75	36	199	0,9	38,31	600	4000	11	19
431 058 02	0,75	44	163	1,0	31,19	1350	4000	11	19
431 058 03	0,75	53	135	1,0	25,92	1890	4000	11	19
431 058 04	0,75	65	110	1,5	21,28	2960	4000	11	19
431 058 05	0,75	73	98	1,6	18,79	2890	4000	11	19
431 058 06	0,75	82	87	1,8	16,73	2830	4000	11	19
431 059 02	0,75	107	67	1,0	12,82	2260	3270	12	17
431 059 04	0,75	138	52	1,2	9,95	2150	3270	12	17
431 059 06	0,75	168	43	1,5	8,19	2040	3270	12	17
431 059 08	0,75	200	36	1,7	6,89	1950	3270	12	17
431 059 10	0,75	285	25	2,3	4,82	1760	3090	12	17
431 059 12	0,75	407	18	2,7	3,38	1590	2730	12	17
431 069 01	1,10	31	339	0,9	45,90	1250	5600	13	31
431 069 03	1,10	40	263	1,3	35,55	3170	5600	13	31
431 069 04	1,10	49	214	1,4	29,31	3920	5600	13	31
431 069 05	1,10	58	181	1,4	24,73	4300	5600	13	31
431 069 06	1,10	72	146	2,0	20,03	4120	5600	13	31
431 070 03	1,10	86	122	1,3	16,73	1920	4000	14	22
431 070 04	1,10	107	98	1,5	13,39	2270	4000	14	22
431 070 06	1,10	149	71	1,9	9,65	2300	4000	14	22
431 070 08	1,10	220	48	2,6	6,53	2080	3650	14	22
431 070 10	1,10	291	36	3,2	4,93	1940	3360	14	22
431 070 12	1,10	361	29	3,5	3,98	1810	3080	14	22
431 080 01	1,50	41	349	1,0	34,69	343	381	13	33
431 080 02	1,50	49	292	1,3	28,80	1000	5600	13	33
431 080 03	1,50	60	239	1,4	23,74	2000	5600	13	33
431 080 04	1,50	71	202	1,4	20,03	2600	5600	13	33
431 081 01	1,50	85	169	0,9	16,73	239	272	14	24
431 081 02	1,50	106	135	1,1	13,39	600	3920	14	24
431 081 04	1,50	147	97	1,4	9,65	1650	3760	14	24
431 081 06	1,50	217	66	1,9	6,53	1980	3380	14	24
431 081 08	1,50	287	50	2,3	4,93	1870	2140	14	24
431 081 10	1,50	356	40	2,5	3,98	1750	2920	14	24
431 081 11	1,50	417	34	2,6	3,39	1690	2780	14	24

[1] Radial load F_R max at $F_A = 0$.
[2] Axial load F_A max at $F_R = 0$.

Dimensions table page 721.

Note for Dimensioning

Three-phase motors have a very high starting torque. The max. permissible, stability related torque of the gearbox is the product of output torque and operating factor: $M_{max.} = M_a \times f_B$

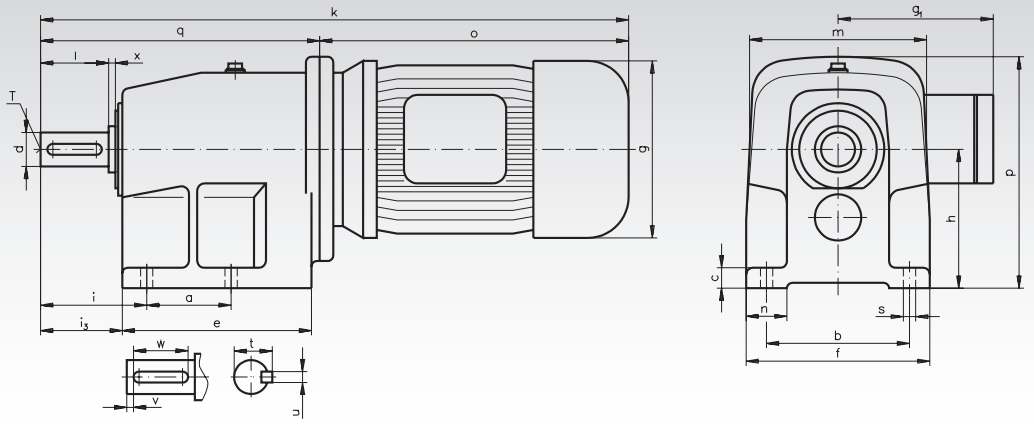
This torque must never be exceeded.

Furthermore, depending on kind of operation,

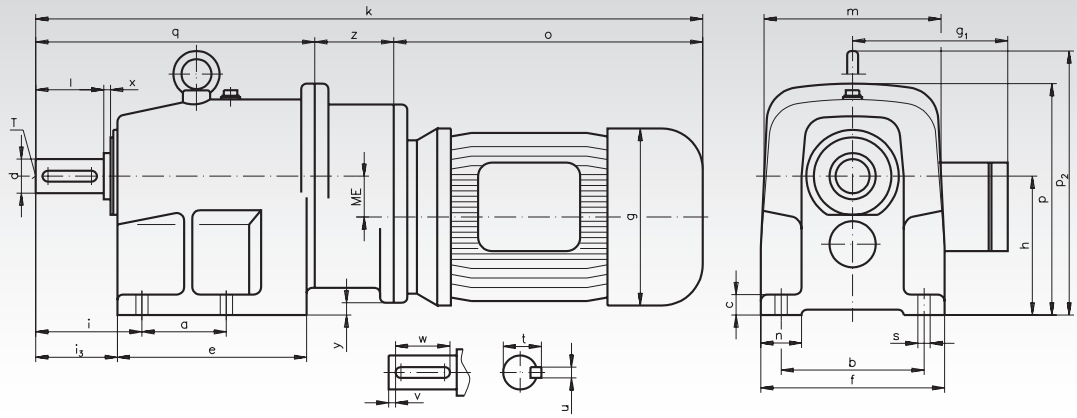
factors for shock load and acceleration must be considered.

Dimensions Table Helical Geared Motors NR/I

Two-Stage, Dimensions Table 2, 5, 6, 8, 10, 11, 12, 13, 14



Three-Stage, Dimensions Table 1, 3, 4, 7, 9



Dim. / Table	Mounting Dimensions (Foot) a mm	b mm	c mm	e mm	f mm	n mm	s mm	Dimensions and Connecting Dimensions g mm	g_1 mm	h mm	i mm	i_3 mm	k mm	m mm	o mm	p mm	p_2 mm	q mm	y mm	z mm	ME mm	Shaft Dimensions d mm	l mm	t mm	u mm	v mm	w mm	x mm	T mm
1	62	105	15	139	135	30	9	130	115	102	78	60	490	130	227	170	-	205	9	58	30,0	25	50	28	8	6	40	4	M10
2	60	110	12	134	130	25	9	130	115	86	52	43	409	130	227	153	-	182	-	-	-	20	40	22,5	6	5	32	4	M6
3	120	185	20	214	210	40	13	130	115	155	96	79	586	200	227	257	292	299	37	60	50,0	40	80	43	12	5	70	6	M16
4	80	160	18	175	185	30	11	130	115	125	74	59	526	200	227	225	-	239	7	60	42,5	30	60	33	8	7	50	5	M10
5	62	105	15	139	135	30	9	145	124	102	78	60	453	130	248	175	-	205	-	-	-	25	50	28	8	6	40	4	M10
6	60	110	12	134	130	25	9	145	124	86	52	43	430	130	248	159	-	182	-	-	-	20	40	22,5	6	5	32	4	M6
7	80	160	18	175	185	30	11	145	124	125	74	59	547	200	248	225	-	239	7	60	42,5	30	60	33	8	7	50	5	M10
8	80	160	18	175	185	30	11	145	124	125	74	59	481	200	242	225	-	239	-	-	-	30	60	33	8	7	50	5	M10
9	80	160	18	175	185	30	11	165	142	125	74	59	571	200	272	225	-	239	7	60	42,5	30	60	33	8	7	50	5	M10
10	80	160	18	175	185	30	11	165	142	125	74	59	505	200	266	225	-	239	-	-	-	30	60	33	8	7	50	5	M10
11	62	105	15	139	135	30	9	165	142	102	78	60	477	130	272	183	-	205	-	-	-	25	50	28	8	6	40	4	M10
12	60	110	12	134	130	25	9	165	142	86	52	43	454	130	272	167	-	182	-	-	-	20	40	22,5	6	5	32	4	M6
13	80	160	18	175	185	30	11	182	147	125	74	59	543	200	304	225	-	239	-	-	-	30	60	33	8	7	50	5	M10
14	62	105	15	139	135	30	9	182	147	102	78	60	515	130	310	195	-	205	-	-	-	25	50	28	8	6	40	5	M10

Note

Standard model is B3 (= catalogue product number). Other models on request. The model/mounting position must always be stated, as different models/mounting positions require different oil volumes and venting positions.

Worm Geared Motors

The worm geared motors on page 660 to 670 are delivered with the standard voltage 400 V for a mains frequency of 50 Hz. With help of the enclosed operating capacitor they can however be connected to 230 V, 50 Hz one-phase mains using the Steinmetz circuit. Please note that with this circuit, the power drops by 30 - 50% below the stated value.

The smaller gearboxes form a completely oil-proof and dust protected unit with the driving motors. The larger gearboxes are designed with ventilation. Before the start of operational use the sealing screw must be exchanged with the supplied venting screw.

All listed worm geared motors have the protection class IP 54 and can be supplied with an electromagnetically controlled disk brake (except for the 45 W motor on page 723). This makes the worm geared motor about 40mm longer.

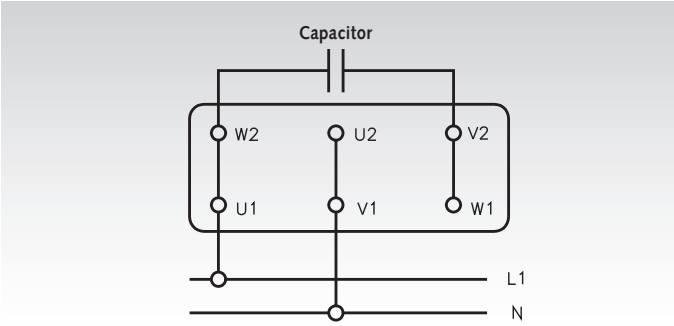
The steel worms used are hardened and ground, while the worm gears are made from high-quality special brass with perfect gliding properties. In most applications, there is no relubrication or change of lubricant required. These worm geared motors are therefore suitable for low-maintenance applications.

Gearbox and shaft position according to the respective dimensional drawing. Required ordering specifications: Type, voltage/frequency with or without operating capacitor, motor data, transmission ratio/output speed, product no.

Steinmetz Circuit

The three-phase motor can be connected to one-phase mains with the circuit pictured on the right using a capacitor! On the following pages the required capacitors are matched with their respective worm geared motors.

To change the sense of rotation the phase L1 has to be disconnected from the terminal U1 and connected to the terminal W1.



Safety Note

Only qualified personnel should be authorized to work on the worm geared motors always regarding the safety regulations.

Before starting the assembly please read the enclosed operating and maintenance instructions.

Operating Capacitors KST

Aluminium housing, metal-polypropylene. For 30,000 operating hours. According to VDE to 25µF. The capacitors have a protective cap made from aluminium and a 180mm cable connected on the side. On the bottom there is a mounting screw with toothed lock washer and nut.

Technical Data:
Capacity tolerance ±10%.
Frequency 50 to 60 Hz.
Voltage 400 V.
Loss < 0.3%.

Temperature range -25 to +85°C.
Insulation test voltage (2 Sec.) 2.5 kV (to ground).

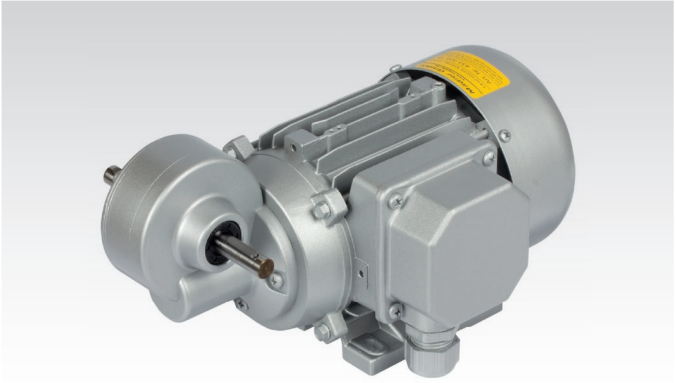
Product No.	Capacity µF	Ø x Length mm	Weight kg
436 352 00	2,0	26 x 87	0,71
436 356 00	5,0	36 x 105	1,39
436 359 00	10,0	36 x 102	1,18
436 361 00	16,0	45 x 110	1,50
436 362 00	20,0	45 x 123	1,80
436 363 00	25,0	50 x 118	2,00

Worm Geared Motors MEK with One-Stage Worm Gear Unit

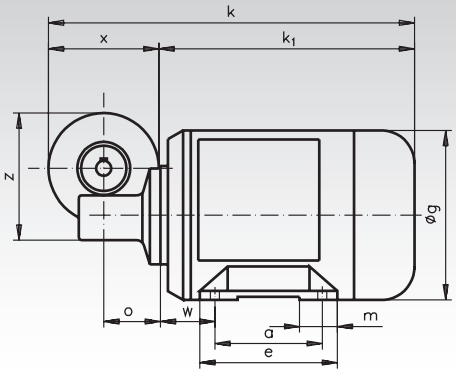
230/400V, 50Hz, IP54, can also be connected to alternating current using an operating capacitor.

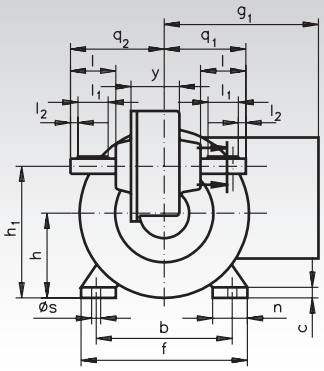
General data page 722.

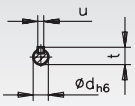
Motor and gearbox with roller bearing.
Worms hardened and ground.
Worm gears made from special brass.



Ordering details: Type, Voltage/Frequency, poss. Operating Capacitor, Motor Data, Ratio, Product No.







Feather key not according to DIN

Load Bearing Capacity of the Output Shaft: radial 100 N, axial 60 N

Power / Watt	a mm	b mm	c mm	e mm	f mm	h mm	h_1 mm	m mm	n mm	Øs mm	w mm	g mm	g_1 mm	k mm	k_1 mm	o mm	q_1 mm	q_2 mm	x mm	y mm	z mm	Ød mm	l mm	l_1 mm	l_2 mm	t mm	u m
45	90	80	7	110	100	56	87	30	34	6,6	14	107	87	196	122	37,5	54	62	74	32	84	10	30	20	5	11,5	4
90	71	90	6	84	110	56	87	22	23	6	36	112	102	242	168	37,5	54	62	74	32	84	10	30	20	5	11,5	4

Dimensions without stated tolerances are non-binding!

Motor Data without Ventilation 45 Watt, 1400 min^{-1}, ca. 0.18 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 5µF
433 01 005	280	5 : 1	1,2	3,7	**436 356 00**
433 01 007	200	7 : 1	1,7	3,7	**436 356 00**
433 01 010	140	10 : 1	2,1	3,7	**436 356 00**
433 01 015	93	15 : 1	3,0	3,7	**436 356 00**
433 01 020	70	20 : 1	3,7	3,7	**436 356 00**
433 01 024	58	24 : 1	3,6	3,7	**436 356 00**
433 01 030	47	30 : 1	4,5	3,7	**436 356 00**
433 01 038	37	38 : 1	5,6	3,7	**436 356 00**
433 01 050	28	50 : 1	5,7	3,7	**436 356 00**
433 01 055	25	55 : 1	7,3	3,7	**436 356 00**
433 01 075	19	75 : 1	6,4	3,7	**436 356 00**
433 01 100	14	100 : 1	8,9*	3,7	**436 356 00**

* Stability related max. torque.

Motor Data 90 Watt, 1400 min^{-1}, ca. 0.45 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 10µF
433 02 005	280	5 : 1	2,4	4,1	**436 359 00**
433 02 007	200	7 : 1	3,3	4,1	**436 359 00**
433 02 010	140	10 : 1	4,3	4,1	**436 359 00**
433 02 015	93	15 : 1	6,1	4,1	**436 359 00**
433 02 020	70	20 : 1	7,5	4,1	**436 359 00**
433 02 024	58	24 : 1	7,2	4,1	**436 359 00**
433 02 030	47	30 : 1	9,0	4,1	**436 359 00**
433 02 038	37	38 : 1	11,0	4,1	**436 359 00**
433 02 050	28	50 : 1	11,0*	4,1	**436 359 00**
433 02 055	25	55 : 1	13,0*	4,1	**436 359 00**
433 02 075	19	75 : 1	8,8*	4,1	**436 359 00**
433 02 100	14	100 : 1	8,9*	4,1	**436 359 00**

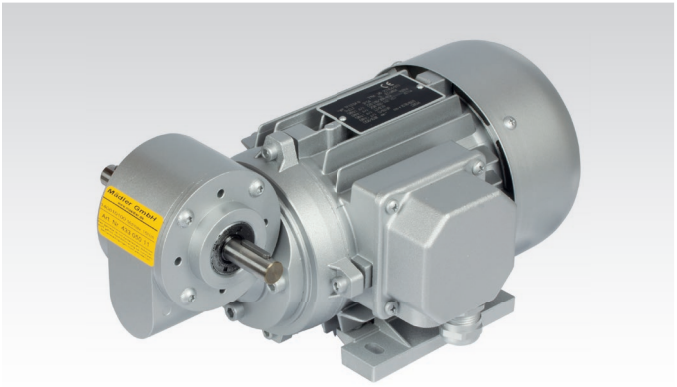
* Stability related max. torque.

Worm Geared Motors MEG with One-Stage Worm Gear Unit

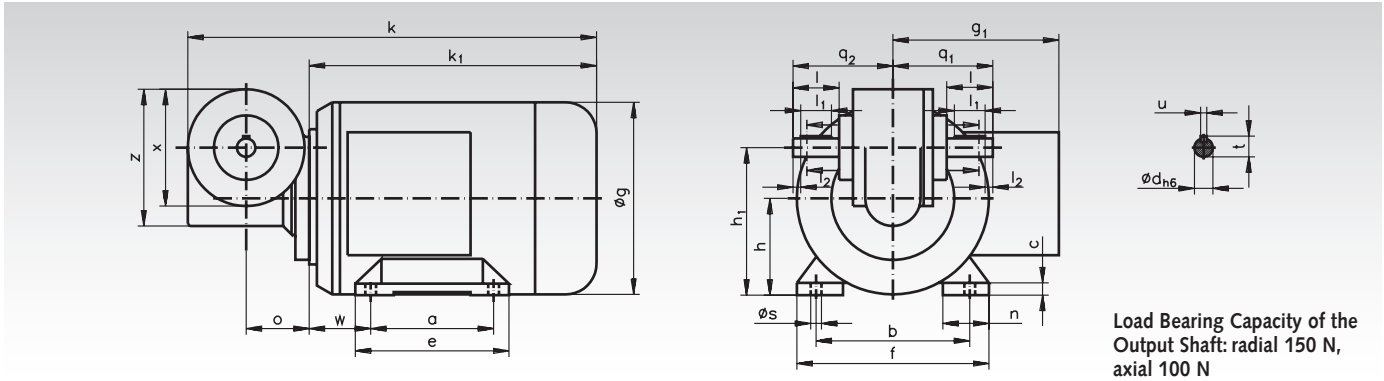
230/400V, 50Hz, IP54, can also be connected to alternating current using an operating capacitor.

General data page 722.

Motor and gearbox with roller bearing.
Worms hardened and ground.
Worm gears made from special brass.



Ordering details: Type, Voltage/Frequency, poss. Operating Capacitor, Motor Data, Ratio, Product No.



Load Bearing Capacity of the Output Shaft: radial 150 N, axial 100 N

a mm	b mm	c mm	e mm	f mm	h mm	h_1 mm	n mm	Ø s mm	w mm	g mm	g_1 mm	k mm	k_1 mm	o mm	q_1 mm	q_2 mm	x mm	z mm	Ø d mm	l mm	l_1 mm	l_2 mm	t mm	u mm
80	100	7,5	96	122	63	96	25	7	40	125	108	266	187	41	65	65	76	89	12	30	20	5	13,5	4

Dimensions without stated tolerances are non-binding!

Motor Data 180 Watt, 1400 min^{-1}, ca. 0.7 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 20µF
433 05 005	280	5 : 1	4,8	6,2	**436 362 00**
433 05 007	200	7 : 1	6,4	6,2	**436 362 00**
433 05 011	124	11 : 1	9,3	6,2	**436 362 00**
433 05 015	93	15 : 1	11	6,2	**436 362 00**
433 05 017	82	17 : 1	13	6,2	**436 362 00**
433 05 020	70	20 : 1	14	6,2	**436 362 00**
433 05 024	58	24 : 1	15	6,2	**436 362 00**
433 05 030	47	30 : 1	15*	6,2	**436 362 00**
433 05 032	44	32 : 1	16*	6,2	**436 362 00**
433 05 038	37	38 : 1	17*	6,2	**436 362 00**
433 05 056	25	56 : 1	12*	6,2	**436 362 00**
433 05 075	19	75 : 1	11*	6,2	**436 362 00**

* Stability related max. torque.

Motor Data 250 Watt, 2800 min^{-1}, ca. 0.75 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 25µF
433 06 005	560	5 : 1	3,5	6,3	**436 363 00**
433 06 007	400	7 : 1	4,6	6,3	**436 363 00**
433 06 011	247	11 : 1	6,8	6,3	**436 363 00**
433 06 015	187	15 : 1	8,3	6,3	**436 363 00**
433 06 017	165	17 : 1	9,6	6,3	**436 363 00**
433 06 020	140	20 : 1	10	6,3	**436 363 00**
433 06 024	117	24 : 1	11	6,3	**436 363 00**
433 06 030	93	30 : 1	13	6,3	**436 363 00**
433 06 032	88	32 : 1	14	6,3	**436 363 00**
433 06 038	74	38 : 1	15	6,3	**436 363 00**
433 06 056	50	56 : 1	12*	6,3	**436 363 00**
433 06 075	37	75 : 1	11*	6,3	**436 363 00**

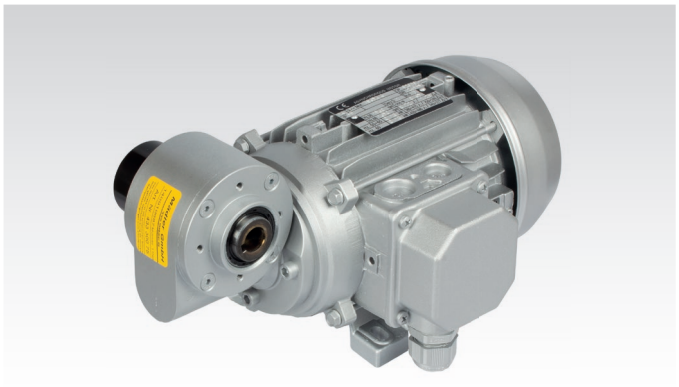
* Stability related max. torque.

Worm Geared Motors MH with One-Stage Worm Gear Unit and Hollow Shaft

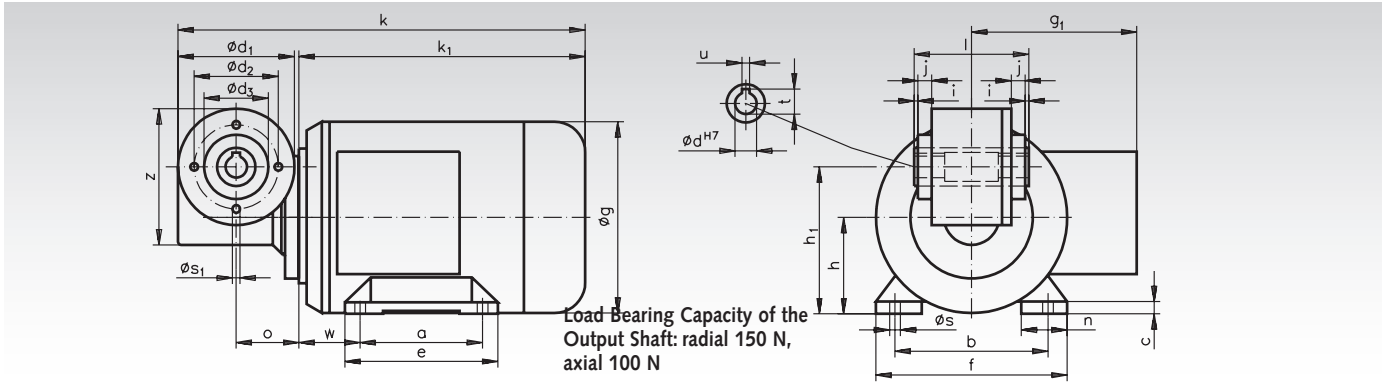
230/400V, 50Hz, IP54, can also be connected to alternating current using an operating capacitor.

General data page 722.

Motor and gearbox with roller bearing.
Worms hardened and ground.
Worm gears made from special brass.



Ordering details: Type, Voltage/Frequency, poss. Operating Capacitor, Motor Data, Ratio, Product No.



Load Bearing Capacity of the Output Shaft: radial 150 N, axial 100 N

a mm	b mm	c mm	$Ød_1$ mm	$Ød_2$ mm	$Ød_3$ mm	e mm	f mm	h mm	h_1 mm	j mm	n mm	Øs mm	$Øs_1$ mm	w mm	g mm	g_1 mm	k mm	k_1 mm	o mm	z mm	Ød mm	i mm	l mm	t mm	u mm
80	100	7,5	76	55	42	96	122	63	96	9	25	7	M5	40	125	108	266	187	41	89	14	3	75	16,3	5

Hollow shaft centre 35mm relieved!
Dimensions without stated tolerances are non-binding!

Motor Data 180 Watt, 1400 min^{-1}, ca. 0.7 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 20µF
433 30 005	280	5 : 1	4,8	6,4	**436 362 00**
433 30 007	200	7 : 1	6,4	6,4	**436 362 00**
433 30 011	124	11 : 1	9,3	6,4	**436 362 00**
433 30 015	93	15 : 1	11	6,4	**436 362 00**
433 30 017	82	17 : 1	13	6,4	**436 362 00**
433 30 020	70	20 : 1	14	6,4	**436 362 00**
433 30 024	58	24 : 1	15	6,4	**436 362 00**
433 30 030	47	30 : 1	15*	6,4	**436 362 00**
433 30 032	44	32 : 1	16*	6,4	**436 362 00**
433 30 038	37	38 : 1	17*	6,4	**436 362 00**
433 30 056	25	56 : 1	12*	6,4	**436 362 00**
433 30 075	19	75 : 1	11*	6,4	**436 362 00**

*** Stability related max. torque.**

Motor Data 250 Watt, 2800 min^{-1}, ca. 0.75 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 25µF
433 31 005	560	5 : 1	3,5	6,5	**436 363 00**
433 31 007	400	7 : 1	4,6	6,5	**436 363 00**
433 31 011	247	11 : 1	6,8	6,5	**436 363 00**
433 31 015	187	15 : 1	8,3	6,5	**436 363 00**
433 31 017	165	17 : 1	9,6	6,5	**436 363 00**
433 31 020	140	20 : 1	10	6,5	**436 363 00**
433 31 024	117	24 : 1	11	6,5	**436 363 00**
433 31 030	93	30 : 1	13	6,5	**436 363 00**
433 31 032	88	32 : 1	14	6,5	**436 363 00**
433 31 038	74	38 : 1	15	6,5	**436 363 00**
433 31 056	50	56 : 1	12*	6,5	**436 363 00**
433 31 075	37	75 : 1	11*	6,5	**436 363 00**

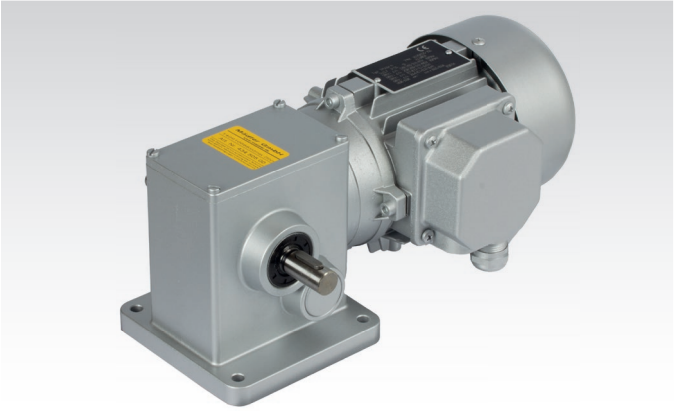
*** Stability related max. torque.**

Worm Helical Geared Motors SRM

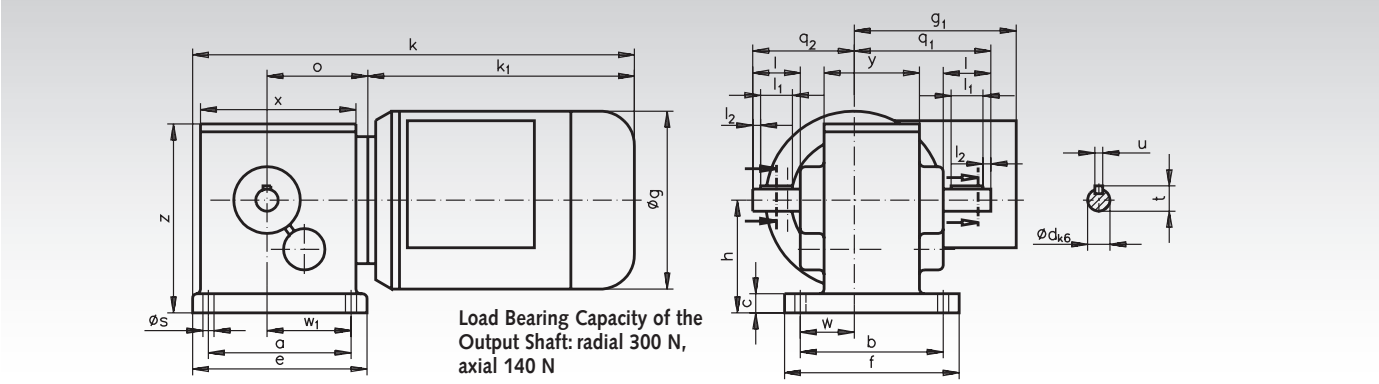
230/400V, 50Hz, IP54, can also be connected to alternating current using an operating capacitor.

General data page 722.

Motor and output shaft with roller bearing.
Intermediate shaft with slide bearing.
1st stage: Worms hardened and ground,
Worm gears special brass.
2nd stage: Helical gear set hardened and ground.



Ordering details: Type, Voltage/Frequency, poss. Operating Capacitor, Motor Data, Ratio, Product No.



Load Bearing Capacity of the Output Shaft: radial 300 N, axial 140 N

a	b	c	e	f	h	Ø s	w	w_1	g	g_1	k	k_1	o	q_1	q_2	x	y	z	Ø d	l	l_1	l_2	t	u
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
90	90	12	110	110	71	7	34	53	112	102	278,5	168	63,5	86	64	98	60	119	14	30	20	5	16	5

Dimensions without stated tolerances are non-binding!

Motor Data 90 Watt, 1400 min^{-1}, ca. 0.45 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 10µF
434 50 012	112	12,5 : 1	6,1	5,2	**436 359 00**
434 50 021	65	21 : 1	10	5,2	**436 359 00**
434 50 025	56	25 : 1	12	5,2	**436 359 00**
434 50 035	40	35 : 1	16	5,2	**436 359 00**
434 50 060	23	60 : 1	24	5,2	**436 359 00**
434 50 090	16	90 : 1	25*	5,2	**436 359 00**
434 50 100	14	100 : 1	25*	5,2	**436 359 00**
434 50 120	12	120 : 1	25*	5,2	**436 359 00**
434 50 150	9,3	150 : 1	25*	5,2	**436 359 00**
434 50 190	7,4	190 : 1	25*	5,2	**436 359 00**
434 50 375	3,7	375 : 1	25*	5,2	**436 359 00**
434 50 500	2,8	500 : 1	25*	5,2	**436 359 00**

* Stability related max. torque.

Motor Data 120 Watt, 2800 min^{-1}, ca. 0.5 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 16µF
434 51 012	224	12,5 : 1	4,1	5,2	**436 361 00**
434 51 021	131	21 : 1	6,8	5,2	**436 361 00**
434 51 025	112	25 : 1	8	5,2	**436 361 00**
434 51 035	80	35 : 1	11	5,2	**436 361 00**
434 51 060	47	60 : 1	17	5,2	**436 361 00**
434 51 090	31	90 : 1	23	5,2	**436 361 00**
434 51 100	28	100 : 1	25*	5,2	**436 361 00**
434 51 120	23	120 : 1	25*	5,2	**436 361 00**
434 51 150	19	150 : 1	25*	5,2	**436 361 00**
434 51 190	15	190 : 1	25*	5,2	**436 361 00**
434 51 375	7,5	375 : 1	25*	5,2	**436 361 00**
434 51 500	5,6	500 : 1	25*	5,2	**436 361 00**

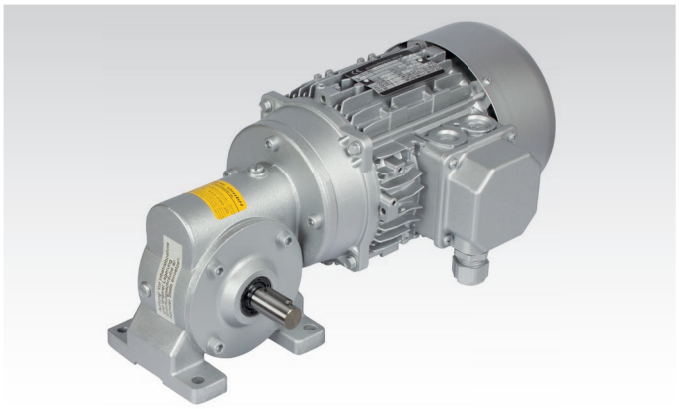
* Stability related max. torque.

Worm Geared Motors R with One-Stage Worm Gears

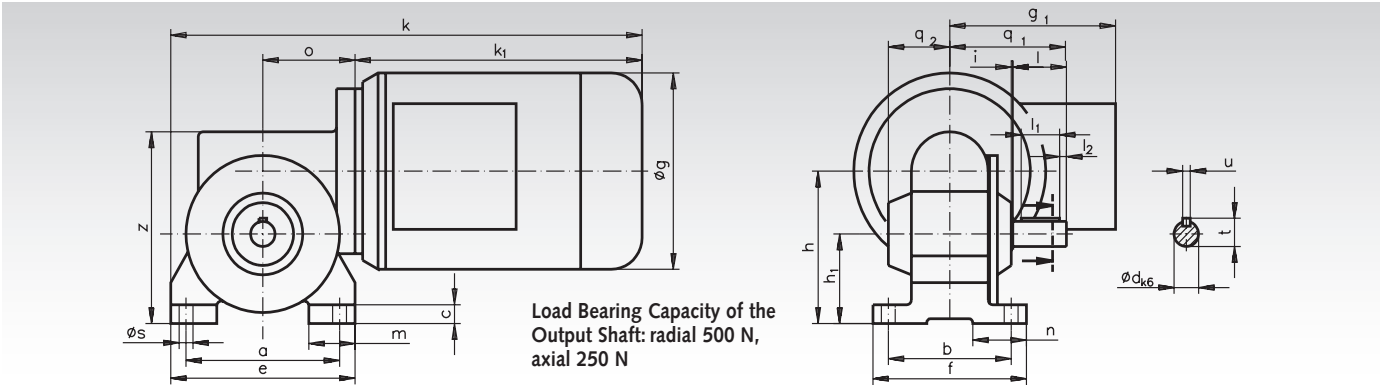
230/400V, 50Hz, IP54, can also be connected to alternating current using an operating capacitor.

General data page 722.

Motor and gearbox with roller bearing.
Worms hardened and ground.
Worm gears made from special brass.



Ordering details: Type, Voltage/Frequency, possibly Operating Capacitor, Motor Data, Ratio, Product No.



Load Bearing Capacity of the Output Shaft: radial 500 N, axial 250 N

Power Watt	a mm	b mm	c mm	e mm	f mm	h mm	h_1 mm	m mm	n mm	Øs mm	g mm	g_1 mm	k mm	k_1 mm	o mm	q_1 mm	q_2 mm	z mm	Ød mm	i mm	l mm	l_1 mm	l_2 mm	t mm	u mm
180	100	80	12	120	100	97	57	30	35	9	125	108	307	187	60	76	40	122	16	1	35	25	5	18	5
250	100	80	12	120	100	97	57	30	35	9	140	114	327	207	60	76	40	122	16	1	35	25	5	18	5

Dimensions without stated tolerances are non-binding!

Motor Data 180 Watt, 1400 min^{-1}, ca. 0.7 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 20µF
433 08 007	207	7 : 1	6,5	6,5	**436 362 00**
433 08 008	175	8 : 1	7,4	6,5	**436 362 00**
433 08 010	140	10 : 1	9,1	6,5	**436 362 00**
433 08 012	117	12 : 1	10	6,5	**436 362 00**
433 08 015	93	15 : 1	12	6,5	**436 362 00**
433 08 020	70	20 : 1	15	6,5	**436 362 00**
433 08 025	56	25 : 1	17	6,5	**436 362 00**
433 08 030	47	30 : 1	20	6,5	**436 362 00**
433 08 040	35	40 : 1	23	6,5	**436 362 00**
433 08 050	28	50 : 1	27	6,5	**436 362 00**
433 08 060	23	60 : 1	21	6,5	**436 362 00**
433 08 080	18	80 : 1	24*	6,5	**436 362 00**

* Stability related max. torque.

Motor Data 250 Watt, 1400 min^{-1}, ca. 0,8 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 25µF
433 09 007	207	7 : 1	9	7,8	**436 363 00**
433 09 008	175	8 : 1	10	7,8	**436 363 00**
433 09 010	140	10 : 1	13	7,8	**436 363 00**
433 09 012	117	12 : 1	14	7,8	**436 363 00**
433 09 015	93	15 : 1	17	7,8	**436 363 00**
433 09 020	70	20 : 1	21	7,8	**436 363 00**
433 09 025	56	25 : 1	23	7,8	**436 363 00**
433 09 030	47	30 : 1	27	7,8	**436 363 00**
433 09 040	35	40 : 1	31	7,8	**436 363 00**
433 09 050	28	50 : 1	32*	7,8	**436 363 00**
433 09 060	23	60 : 1	23*	7,8	**436 363 00**
433 09 080	18	80 : 1	24*	7,8	**436 363 00**

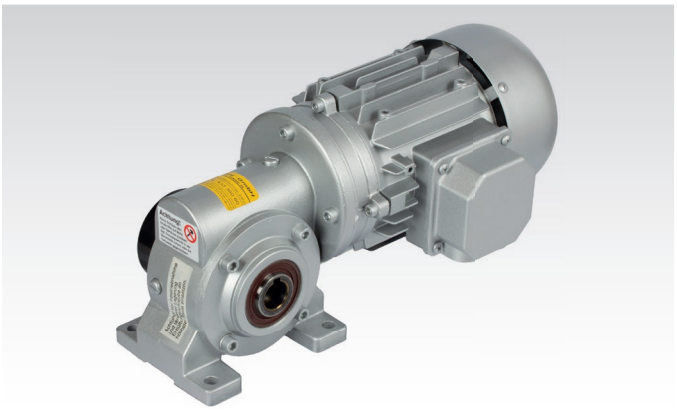
* Stability related max. torque.

Worm Geared Motors RH with One-Stage Worm Gears and Hollow Shafts

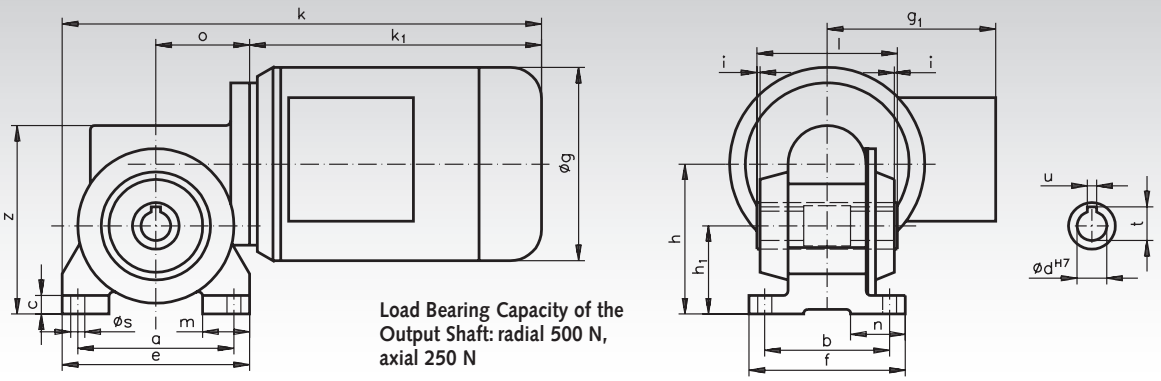
230/400V, 50Hz, IP54, can also be connected to alternating current using an operating capacitor.

General data page 722.

Motor and gearbox with roller bearing.
Worms hardened and ground.
Worm gears made from special brass.



Ordering details: Type, Voltage/Frequency, possibl. Operating Capacitor, Motor Data, Ratio, Product No.



Load Bearing Capacity of the Output Shaft: radial 500 N, axial 250 N

Power Watt	a mm	b mm	c mm	e mm	f mm	h mm	h_1 mm	m mm	n mm	Øs mm	g mm	g_1 mm	k mm	k_1 mm	o mm	z mm	Ød mm	i mm	l mm	t mm	u mm
180	100	80	12	120	100	97	57	30	35	9	125	108	307	187	60	122	19	2	90	21,8	6
250	100	80	12	120	100	97	57	30	35	9	140	114	327	207	60	122	19	2	90	21,8	6

Hollow shaft centre 30mm relieved!
Dimensions without stated tolerances are non-binding!

Motor Data 180 Watt, 1400 min^{-1}, ca. 0.7 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 20µF
433 36 007	207	7 : 1	6,5	6,9	**436 362 00**
433 36 008	175	8 : 1	7,4	6,9	**436 362 00**
433 36 010	140	10 : 1	9,1	6,9	**436 362 00**
433 36 012	117	12 : 1	10	6,9	**436 362 00**
433 36 015	93	15 : 1	12	6,9	**436 362 00**
433 36 020	70	20 : 1	15	6,9	**436 362 00**
433 36 025	56	25 : 1	17	6,9	**436 362 00**
433 36 030	47	30 : 1	20	6,9	**436 362 00**
433 36 040	35	40 : 1	23	6,9	**436 362 00**
433 36 050	28	50 : 1	27	6,9	**436 362 00**
433 36 060	23	60 : 1	21	6,9	**436 362 00**
433 36 080	18	80 : 1	24*	6,9	**436 362 00**

* Stability related max. torque.

Motor Data 250 Watt, 1400 min^{-1}, ca. 0.8 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 25µF
433 37 007	207	7 : 1	9	8,2	**436 363 00**
433 37 008	175	8 : 1	10	8,2	**436 363 00**
433 37 010	140	10 : 1	13	8,2	**436 363 00**
433 37 012	117	12 : 1	14	8,2	**436 363 00**
433 37 015	93	15 : 1	17	8,2	**436 363 00**
433 37 020	70	20 : 1	21	8,2	**436 363 00**
433 37 025	56	25 : 1	23	8,2	**436 363 00**
433 37 030	47	30 : 1	27	8,2	**436 363 00**
433 37 040	35	40 : 1	31	8,2	**436 363 00**
433 37 050	28	50 : 1	32*	8,2	**436 363 00**
433 37 060	23	60 : 1	23*	8,2	**436 363 00**
433 37 080	18	80 : 1	24*	8,2	**436 363 00**

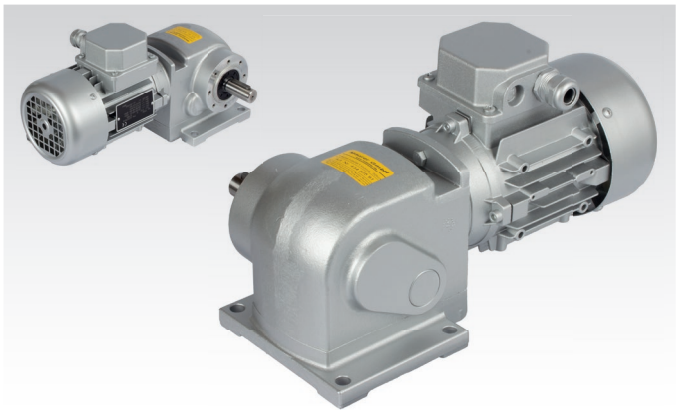
* Stability related max. torque.

Worm Helical Geared Motors SRS

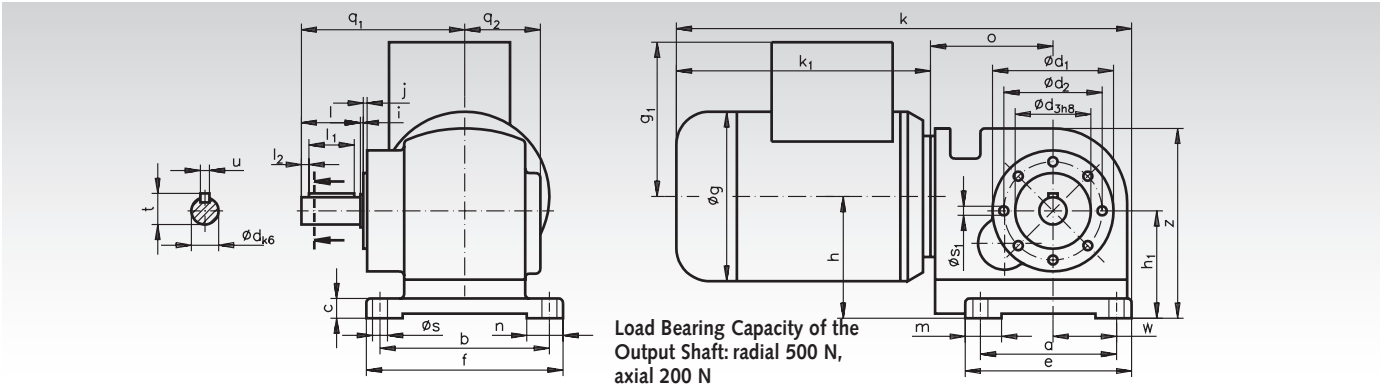
230/400V, 50Hz, IP54, can also be connected to alternating current using an operating capacitor.

General data page 722.

Motor and gear shaft with roller bearing.
1st stage: Worms hardened and ground,
Worm gears special brass.
2nd stage: Helical gear set hardened and ground.



Ordering details: Type, Voltage/Frequency, possibl. Operating Capacitor, Motor Data, Ratio, Product No.



Load Bearing Capacity of the Output Shaft: radial 500 N, axial 200 N

a	b	c	Ød1	Ød2	Ød3	e	f	h	h1	j	m	n	Øs	Øs1	w	g	g1	k	k1	o	q1	q2	z	Ød	i	l	l1	l2	t	u
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
90	112	13	80	65	50	110	130	80,5	70,9	2,5	24	24	10	M5	42	112	102	301	168	81	108	50	125,5	18	0,8	40	30	5	20,5	6

Dimensions without stated tolerances are non-binding!

Motor Data 90 Watt, 1400 min^{-1}, ca. 0.45 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 10µF
434 55 015	95	15 : 1	7,2	6,6	**436 359 00**
434 55 030	47	30 : 1	14	6,6	**436 359 00**
434 55 041	34	41 : 1	19	6,6	**436 359 00**
434 55 059	24	59 : 1	24	6,6	**436 359 00**
434 55 071	20	71 : 1	29	6,6	**436 359 00**
434 55 089	16	89 : 1	34	6,6	**436 359 00**
434 55 106	13	106 : 1	38	6,6	**436 359 00**
434 55 142	10	142 : 1	41	6,6	**436 359 00**
434 55 177	7,9	177 : 1	50*	6,6	**436 359 00**
434 55 295	4,7	295 : 1	50*	6,6	**436 359 00**
434 55 443	3,2	443 : 1	50*	6,6	**436 359 00**
434 55 591	2,4	591 : 1	50*	6,6	**436 359 00**

* Stability related max. torque.

Motor Data 120 Watt, 2800 min^{-1}, ca. 0.5 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 16µF
434 56 015	190	15 : 1	4,9	6,6	**436 361 00**
434 56 030	95	30 : 1	9,4	6,6	**436 361 00**
434 56 041	68	41 : 1	13	6,6	**436 361 00**
434 56 059	47	59 : 1	17	6,6	**436 361 00**
434 56 071	39	71 : 1	20	6,6	**436 361 00**
434 56 089	32	89 : 1	24	6,6	**436 361 00**
434 56 106	26	106 : 1	27	6,6	**436 361 00**
434 56 142	20	142 : 1	30	6,6	**436 361 00**
434 56 177	16	177 : 1	37	6,6	**436 361 00**
434 56 295	9,5	295 : 1	46	6,6	**436 361 00**
434 56 443	6,3	443 : 1	50*	6,6	**436 361 00**
434 56 591	4,7	591 : 1	50*	6,6	**436 361 00**

* Stability related max. torque.

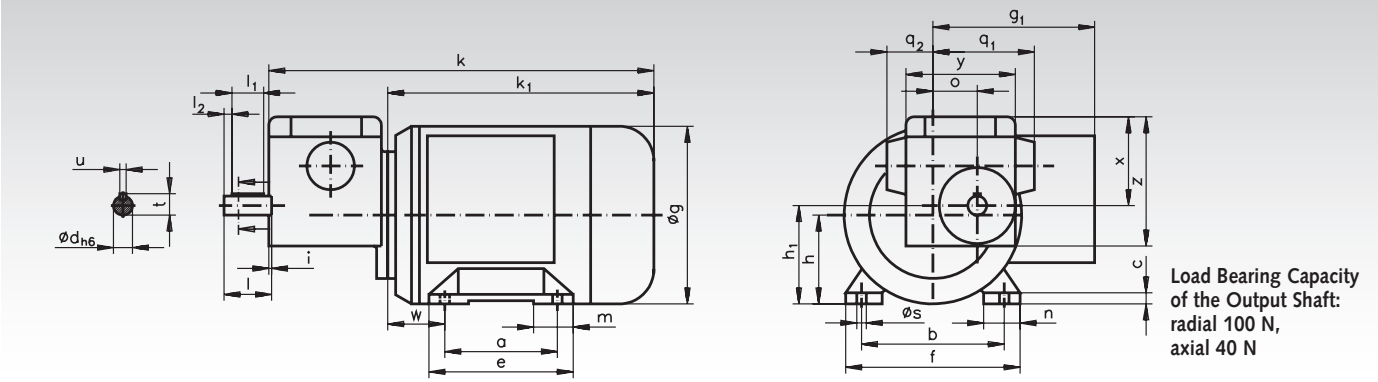
Worm Geared Motors MZ with Two-Stage Worm Gears

230/400V, 50Hz, IP54, can also be connected to alternating current using an operating capacitor.

General data page 722.

Motor with roller bearing, gearbox with slide bearing.
Worms hardened and ground.
Worm gears made from special bronze.

Ordering details: Type, Voltage/Frequency, possibly Operating Capacitor, Motor Data, Ratio, Product No.



Load Bearing Capacity of the Output Shaft: radial 100 N, axial 40 N

a	b	c	e	f	h	h_1	m	n	Ø s	w	g	g_1	k	k_1	o	q_1	q_2	x	y	z	Ø d	i	l	l_1	l_2	t	u
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
71	90	6	84	110	56	62	22	23	6	36	112	102	243	168	28	64	30	56	70	81	12	1	30	20	5	13,5	4

Dimensions without stated tolerances are non-binding!

Motor Data 90 Watt, 1400 min^{-1}, ca. 0.45 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 10µF
434 02 012	112	12,5 : 1	4,8*	4,2	**436 359 00**
434 02 025	56	25 : 1	7,8*	4,2	**436 359 00**
434 02 050	28	50 : 1	7,8*	4,2	**436 359 00**
434 02 070	20	70 : 1	7,1*	4,2	**436 359 00**
434 02 100	14	100 : 1	6,1*	4,2	**436 359 00**
434 02 125	11	125 : 1	7,8*	4,2	**436 359 00**
434 02 250	5,6	250 : 1	7,1*	4,2	**436 359 00**
434 02 400	3,5	400 : 1	7,4*	4,2	**436 359 00**
434 02 750	1,9	750 : 1	7,1*	4,2	**436 359 00**
434 02 990	1,1	1250 : 1	6,1*	4,2	**436 359 00**
434 02 992	0,9	1500 : 1	7,1*	4,2	**436 359 00**

* Stability related max. torque.

Motor Data 120 Watt, 2800 min^{-1}, ca. 0.5 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 16µF
434 03 012	224	12,5 : 1	3,4	4,2	**436 361 00**
434 03 025	112	25 : 1	6,6	4,2	**436 361 00**
434 03 050	56	50 : 1	7,8*	4,2	**436 361 00**
434 03 070	40	70 : 1	7,1*	4,2	**436 361 00**
434 03 100	28	100 : 1	6,1*	4,2	**436 361 00**
434 03 125	22	125 : 1	7,8*	4,2	**436 361 00**
434 03 250	11	250 : 1	7,1*	4,2	**436 361 00**
434 03 400	7	400 : 1	7,4*	4,2	**436 361 00**
434 03 750	3,7	750 : 1	7,1*	4,2	**436 361 00**
434 03 990	2,2	1250 : 1	6,1*	4,2	**436 361 00**
434 03 992	1,9	1500 : 1	7,1*	4,2	**436 361 00**

* Stability related max. torque.

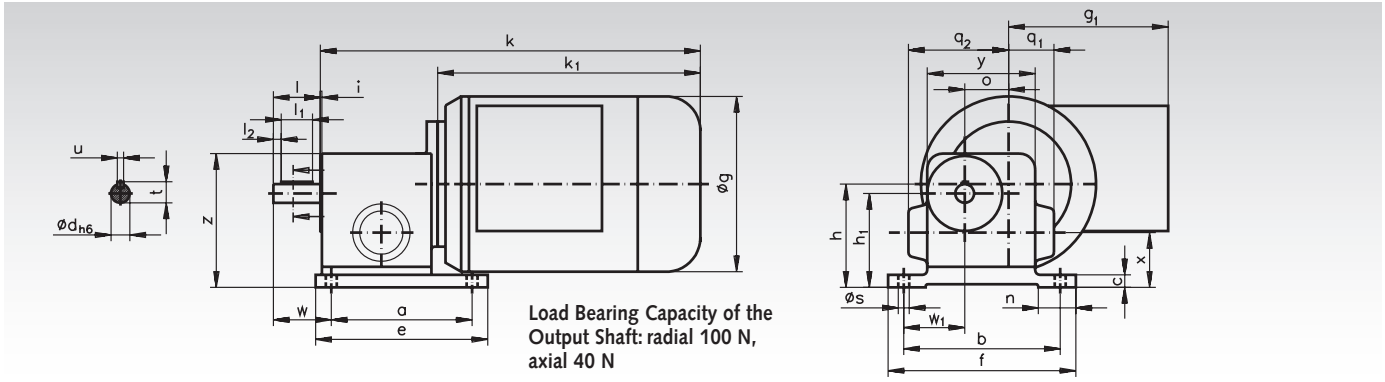
Worm Geared Motors RL with Two-Stage Worm Gears

230/400V, 50Hz, IP54, can also be connected to alternating current using an operating capacitor.

General data page 722.

Motor with roller bearing, gearbox with slide bearing.
Worms hardened and ground.
Worm gears made from special brass.

Ordering details: Type, Voltage/Frequency, possibl. Operating Capacitor, Motor Data, Ratio, Product No.



Load Bearing Capacity of the Output Shaft: radial 100 N, axial 40 N

a	b	c	e	f	h	h_1	n	Øs	w	w_1	g	g_1	k	k_1	o	q_1	q_2	x	y	z	Ød	i	l	l_1	l_2	t	u
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
90	100	8	110	120	66	60	24	6	37	40	112	102	243	168	28	30	64	35	70	85	12	1	30	20	5	13,5	4

Dimensions without stated tolerances are non-binding!

Motor Data 90 Watt, 1400 min^{-1}, ca. 0.45 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 10µF
434 05 012	112	12,5 : 1	4,8	4,2	**436 359 00**
434 05 025	56	25 : 1	7,8*	4,2	**436 359 00**
434 05 050	28	50 : 1	7,8*	4,2	**436 359 00**
434 05 070	20	70 : 1	7,1*	4,2	**436 359 00**
434 05 100	14	100 : 1	6,1*	4,2	**436 359 00**
434 05 125	11	125 : 1	7,8*	4,2	**436 359 00**
434 05 250	5,6	250 : 1	7,1*	4,2	**436 359 00**
434 05 400	3,5	400 : 1	7,4*	4,2	**436 359 00**
434 05 750	1,9	750 : 1	7,1*	4,2	**436 359 00**
434 05 990	1,1	1250 : 1	6,1*	4,2	**436 359 00**
434 05 992	0,9	1500 : 1	7,1*	4,2	**436 359 00**

* Stability related max. torque.

Motor Data 120 Watt, 2800 min^{-1}, ca. 0.5 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 16µF
434 06 012	224	12,5 : 1	3,4	4,2	**436 361 00**
434 06 025	112	25 : 1	6,6	4,2	**436 361 00**
434 06 050	56	50 : 1	7,8*	4,2	**436 361 00**
434 06 070	40	70 : 1	7,1*	4,2	**436 361 00**
434 06 100	28	100 : 1	6,1*	4,2	**436 361 00**
434 06 125	22	125 : 1	7,8*	4,2	**436 361 00**
434 06 250	11	250 : 1	7,1*	4,2	**436 361 00**
434 06 400	7	400 : 1	7,4*	4,2	**436 361 00**
434 06 750	3,7	750 : 1	7,1*	4,2	**436 361 00**
434 06 990	2,2	1250 : 1	6,1*	4,2	**436 361 00**
434 06 992	1,9	1500 : 1	7,1*	4,2	**436 361 00**

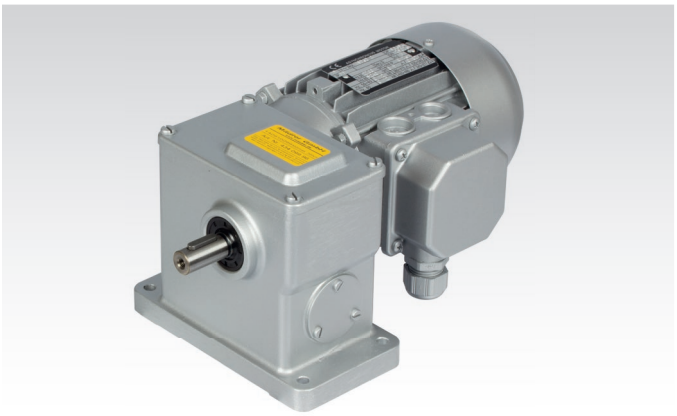
* Stability related max. torque.

Worm Geared Motors RM with Two-Stage Worm Gears

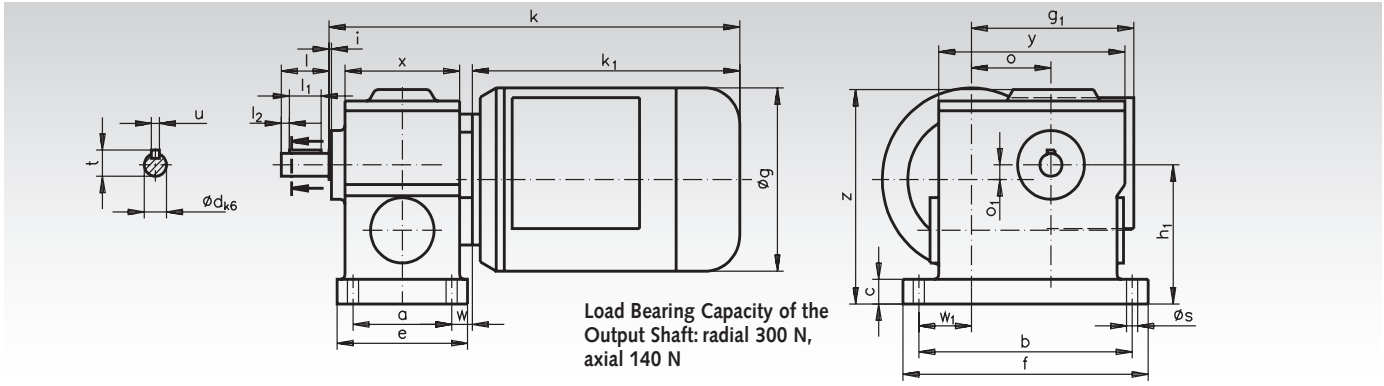
230/400V, 50Hz, IP54, can also be connected to alternating current using an operating capacitor.

General data page 722.

Motor and gearbox with roller bearing.
Worms hardened and ground.
Worm gears made from special brass.



Ordering details: Type, Voltage/Frequency, possibly Operating Capacitor, Motor Data, Ratio, Product No.



Load Bearing Capacity of the Output Shaft: radial 300 N, axial 140 N

a mm	b mm	c mm	e mm	f mm	h_1 mm	Ø s mm	w mm	w_1 mm	g mm	g_1 mm	k mm	k_1 mm	o mm	o_1 mm	x mm	y mm	z mm	Ø d mm	i mm	l mm	l_1 mm	l_2 mm	t mm	u mm
62	134	15	82	154	85	6,6	13	33	112	102	258	168	50	9	72	117	131	14	1,5	30	20	5	16	5

Dimensions without stated tolerances are non-binding!

Motor Data 90 Watt, 1400 min^{-1}, ca. 0.45 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 10µF
434 08 050	28	50 : 1	18	5,7	**436 359 00**
434 08 100	14	100 : 1	32	5,7	**436 359 00**
434 08 200	7	200 : 1	35*	5,7	**436 359 00**
434 08 300	4,7	300 : 1	36*	5,7	**436 359 00**
434 08 380	3,7	380 : 1	35*	5,7	**436 359 00**
434 08 500	2,8	500 : 1	35*	5,7	**436 359 00**
434 08 750	1,9	750 : 1	36*	5,7	**436 359 00**
434 08 988	1,2	1140 : 1	36*	5,7	**436 359 00**
434 08 992	0,9	1500 : 1	36*	5,7	**436 359 00**
434 08 996	0,6	2250 : 1	36*	5,7	**436 359 00**

* Stability related max. torque.

Motor Data 120 Watt, 2800 min^{-1}, ca. 0.5 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 16µF
434 09 050	56	50 : 1	13	5,7	**436 361 00**
434 09 100	28	100 : 1	23	5,7	**436 361 00**
434 09 200	14	200 : 1	35*	5,7	**436 361 00**
434 09 300	9,3	300 : 1	36*	5,7	**436 361 00**
434 09 380	7,4	380 : 1	35*	5,7	**436 361 00**
434 09 500	5,6	500 : 1	35*	5,7	**436 361 00**
434 09 750	3,7	750 : 1	36*	5,7	**436 361 00**
434 09 988	2,5	1140 : 1	36*	5,7	**436 361 00**
434 09 992	1,9	1500 : 1	36*	5,7	**436 361 00**
434 09 996	1,2	2250 : 1	36*	5,7	**436 361 00**

* Stability related max. torque.

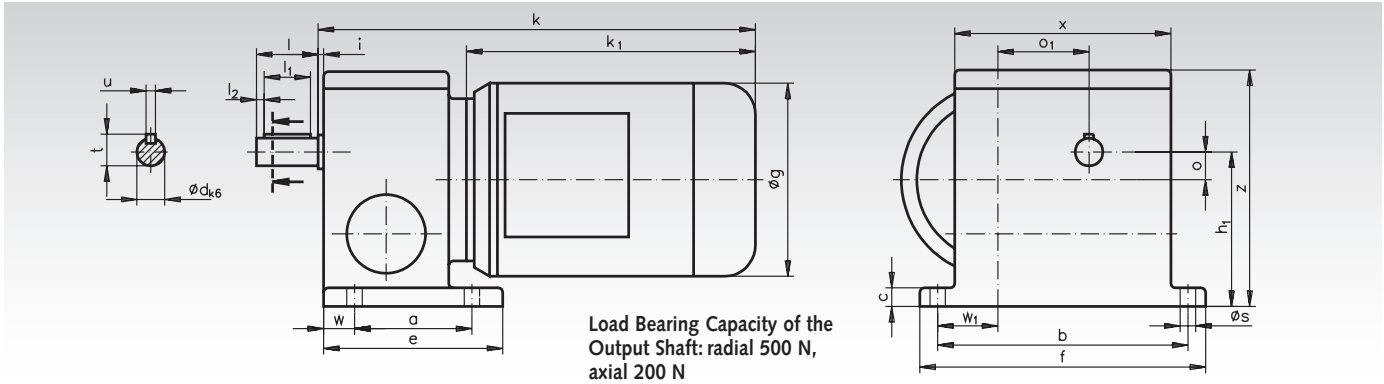
Worm Geared Motors RS with Two-Stage Worm Gears

230/400V, 50Hz, I54, can also be connected to alternating current using an operating capacitor.

General data page 722.

Motor and gearbox with roller bearing.
Worms hardened and ground.
Worm gears made from special brass.

Ordering details: Type, Voltage/Frequency, possibl. Operating Capacitor, Motor Data, Ratio, Product No.



Load Bearing Capacity of the Output Shaft: radial 500 N, axial 200 N

a mm	b mm	c mm	e mm	f mm	h_1 mm	Øs mm	w mm	w_1 mm	g mm	k mm	k_1 mm	o mm	o_1 mm	x mm	z mm	Ød mm	i mm	l mm	l_1 mm	l_2 mm	t mm	u mm
76	162	12	116	185	100	10	20	39	125	283	187	18	59	140	153	18	3,5	40	30	5	20,5	6

Dimensions without stated tolerances are non-binding!

Motor Data 180 Watt, 1400 min^{-1}, ca. 0.75 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 20µF
434 12 070	20	70 : 1	46	9,5	**436 362 00**
434 12 105	13	105 : 1	58	9,5	**436 362 00**
434 12 150	9,3	150 : 1	73	9,5	**436 362 00**
434 12 225	6,2	225 : 1	90*	9,5	**436 362 00**
434 12 276	5,1	276 : 1	81*	9,5	**436 362 00**
434 12 360	3,9	360 : 1	93*	9,5	**436 362 00**
434 12 450	3,1	450 : 1	93*	9,5	**436 362 00**
434 12 570	2,5	570 : 1	81*	9,5	**436 362 00**
434 12 750	1,9	750 : 1	93*	9,5	**436 362 00**
434 12 986	1,3	1050 : 1	113*	9,5	**436 362 00**
434 12 994	0,9	1520 : 1	81*	9,5	**436 362 00**
434 12 998	0,6	2500 : 1	72*	9,5	**436 362 00**

* Stability related max. torque.

Motor Data 250 Watt, 2800 min^{-1}, ca. 0.75 A at 400 Volt

Product No.	Output-Speed min^{-1}	Ratio i =	Permiss. Torque at the Output Shaft Nm	Weight kg	Product No. Operating Capacitor 25µF
434 13 070	40	70 : 1	34	9,6	**436 363 00**
434 13 105	27	105 : 1	45	9,6	**436 363 00**
434 13 150	19	150 : 1	57	9,6	**436 363 00**
434 13 225	12	225 : 1	83	9,6	**436 363 00**
434 13 276	10	276 : 1	81*	9,6	**436 363 00**
434 13 360	7,8	360 : 1	93*	9,6	**436 363 00**
434 13 450	6,2	450 : 1	93*	9,6	**436 363 00**
434 13 570	4,9	570 : 1	81*	9,6	**436 363 00**
434 13 750	3,7	750 : 1	93*	9,6	**436 363 00**
434 13 986	2,7	1050 : 1	113*	9,6	**436 363 00**
434 13 994	1,8	1520 : 1	81*	9,6	**436 363 00**
434 13 998	1,1	2500 : 1	72*	9,6	**436 363 00**

* Stability related max. torque.

Worm Geared Motors HMD/I

Housing: Aluminium, corrosion-inhibited coating, with mounting holes for flexible foot and flange mounting.
Worm shaft: Hardened and ground.
Worm gear: Bronze on grey cast iron hub.
Lubrication: Synthetic oil (lubricated for life).
Motor: Standard three-phase motor with small flange B14, 230/400V, 50Hz. **From 0.75 kW in efficiency class IE2.**
Other motor versions (AC motor, posistor, forced ventilation, brake etc.) on request.

Light-weight, high-quality model range with many mounting options. These maintenance-free, geared motors without ventilation can be used in **any mounting position**. The mounting positions V5 and V6 (worm shaft vertical) are however not recommended for continuous operation.

Output shaft push-in type: The basic gearbox version has a hollow shaft. They can, however, also be supplied with a push-in type output shaft (single sided, to be used left and right, or double sided). These output shafts have their own product number and have to be ordered separately.

Variable mounting: The geared motors are supplied without foot mounting. The foot mounting, which has to be ordered separately, can however easily be screwed on, if a foot mounting is required. The position of the foot can be changed for different mounting positions.

Retrofittable flange: If an output-side flange mounting is required, this flange can easily be mounted by the customer. These flanges have their own product number and have to be ordered separately.

Ordering details: e.g.: Prod. No., Type, Motor power, Output Speed
If required: Output shaft single sided (or double sided), Prod. No., Gearbox Size
Foot Mounting, Gearbox Size, Prod. No.
Output Flange, Gearbox Size, Prod. No.
Torque Arm, Gearbox Size, Prod. No.

P = Power
n_2 = Output Speed
T_2 = Output torque
f_B = Operating factor
i_{ist} = Ratio

Product No. Standard Version	P kW	n_2 min^{-1}	T_2 Nm	f_B	i_{ist}	Gearbox Size	Motor Size	Accessories (order separately)* Product No. Single-Sided Output Shaft	Product No. Double-Sided Output Shaft	Product No. Foot Mounting	Product No. Output Flange
438 009 05	0,09	9	44	1,2	100	050	63A6	**438 051 00**	**438 052 00**	**438 053 00**	**438 054 00**
438 009 10	0,09	12,9	34	1,1	70	045	63A6	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 009 15	0,09	15	30	1,5	60	045	63A6	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 009 20	0,09	19,6	24	1,9	46	045	63A6	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 009 25	0,09	23	19	1	61	030	56B4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**
438 009 30	0,09	35	14	1,4	40	030	56B4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**
438 009 35	0,09	46,7	11	1,8	30	030	56B4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**
438 009 40	0,09	70	8	2,2	20	030	56B4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**
438 009 45	0,09	93	7	2,7	15	030	56B4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**
438 009 50	0,09	140	5	3,2	10	030	56B4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**
438 009 55	0,09	200	3	4,7	7	030	56B4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**
438 012 05	0,12	12,9	49	0,8	70	045	63B6	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 012 10	0,12	17,5	38	1,4	80	050	63A4	**438 051 00**	**438 052 00**	**438 053 00**	**438 054 00**
438 012 15	0,12	20,6	34	1,6	68	050	63A4	**438 051 00**	**438 052 00**	**438 053 00**	**438 054 00**
438 012 20	0,12	30,4	24	1,6	46	045	63A4	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 012 25	0,12	35	20	1	40	030	63A4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**
438 012 30	0,12	46,7	16	1,2	30	030	63A4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**
438 012 35	0,12	50	16	2,4	28	045	63A4	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 012 40	0,12	70	12	1,5	20	030	63A4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**
438 012 45	0,12	93	10	1,9	15	030	63A4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**
438 012 50	0,12	140	7	2,2	10	030	63A4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**
438 012 55	0,12	200	5	1,5	7	030	63A4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**
438 018 05	0,18	9,6	86	1,4	94	063	71A6	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 018 10	0,18	14	61	0,8	100	050	63B4	**438 051 00**	**438 052 00**	**438 053 00**	**438 054 00**
438 018 15	0,18	17,5	53	1	80	050	63B4	**438 051 00**	**438 052 00**	**438 053 00**	**438 054 00**
438 018 20	0,18	20,6	48	1,2	68	050	63B4	**438 051 00**	**438 052 00**	**438 053 00**	**438 054 00**
438 018 25	0,18	30,4	33	1,2	46	045	63B4	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 018 30	0,18	37,8	29	1,4	37	045	63B4	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 018 35	0,18	50	22	1,7	28	045	63B4	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 018 40	0,18	70	16	1,1	20	030	63B4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**
438 018 45	0,18	100	13	2,2	14	045	63B4	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 018 50	0,18	140	10	1,6	10	030	63B4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**
438 018 55	0,18	200	7	2,3	7	030	63B4	**438 031 00**	**438 032 00**	**438 033 00**	**438 034 00**

*More details and further accessories see page 736.

Note for dimensioning and dimensions table see page 738.

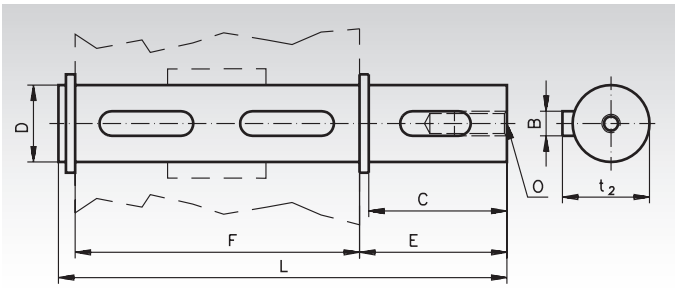
Product No. Standard Version	P kW	n_2 min^{-1}	T_2 Nm	f_B	i_{ist}	Gearbox Size	Motor Size	Accessories (order separately)* Product No. Single-Sided Output Shaft	Product No. Double-Sided Output Shaft	Product No. Foot Mounting	Product No. Output Flange
438 025 05	0,25	9,6	120	1	94	063	71B6	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 025 10	0,25	13,4	100	1,3	67	063	71B6	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 025 15	0,25	17,5	78	1,5	80	063	71A4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 025 20	0,25	20,9	69	1,7	67	063	71A4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 025 25	0,25	25	62	2,6	36	063	71B6	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 025 30	0,25	32,6	48	1,3	43	050	71A4	**438 051 00**	**438 052 00**	**438 053 00**	**438 054 00**
438 025 35	0,25	38,9	42	1,6	36	050	71A4	**438 051 00**	**438 052 00**	**438 053 00**	**438 054 00**
438 025 40	0,25	50	31	1,3	28	045	71A4	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 025 45	0,25	67	24	1,6	21	045	71A4	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 025 50	0,25	100	18	1,6	14	045	71A4	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 025 55	0,25	140	13	2,2	10	045	71A4	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 025 60	0,25	200	10	3	7	045	71A4	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 037 05	0,37	14,9	123	0,8	94	063	71B4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 037 10	0,37	17,5	115	1	80	063	71B4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 037 15	0,37	20,9	101	1,2	67	063	71B4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 037 20	0,37	31,1	75	1,7	45	063	71B4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 037 25	0,37	38,9	62	2,3	36	063	71B4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 037 30	0,37	46,7	56	2,5	30	063	71B4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 037 35	0,37	54	45	1,4	26	050	71B4	**438 051 00**	**438 052 00**	**438 053 00**	**438 054 00**
438 037 40	0,37	67	36	1,1	21	045	71B4	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 037 45	0,37	78	34	1,7	18	050	71B4	**438 051 00**	**438 052 00**	**438 053 00**	**438 054 00**
438 037 50	0,37	100	27	1,1	14	045	71B4	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 037 55	0,37	140	20	1,5	10	045	71B4	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 037 60	0,37	200	14	2,1	7	045	71B4	**438 041 00**	**438 042 00**	**438 043 00**	**438 044 00**
438 055 05	0,55	9,4	280	0,9	96	085	80B6	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 055 10	0,55	13,4	239	1,2	67	085	80B6	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 055 15	0,55	18,9	161	1,6	74	085	80A4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 055 20	0,55	20,9	163	1,7	67	085	80A4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 055 25	0,55	26,9	129	2,1	52	085	80A4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 055 30	0,55	31,1	111	1,2	45	063	80A4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 055 35	0,55	38,9	92	1,5	36	063	80A4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 055 40	0,55	46,7	83	1,7	30	063	80A4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 055 45	0,55	58	68	2	24	063	80A4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 055 50	0,55	74	56	2,4	19	063	80A4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 055 55	0,55	93	44	2,9	15	063	80A4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 055 60	0,55	140	30	2	10	050	80A4	**438 051 00**	**438 052 00**	**438 053 00**	**438 054 00**
438 075 05	0,75	14,6	260	0,9	96	085	80B4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 075 10	0,75	18,9	220	1,2	74	085	80B4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 075 15	0,75	20,9	223	1,2	67	085	80B4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 075 20	0,75	26,9	176	1,6	52	085	80B4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 075 25	0,75	30,4	160	1,9	46	085	80B4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 075 30	0,75	36,8	138	2,3	38	085	80B4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 075 35	0,75	46,7	114	1,2	30	063	80B4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 075 40	0,75	58	92	1,5	24	063	80B4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 075 45	0,75	74	76	1,7	19	063	80B4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 075 50	0,75	93	61	2,2	15	063	80B4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 075 55	0,75	100	57	1,1	14	050	80B4	**438 051 00**	**438 052 00**	**438 053 00**	**438 054 00**
438 075 60	0,75	140	41	1,4	10	050	80B4	**438 051 00**	**438 052 00**	**438 053 00**	**438 054 00**
438 110 05	1,1	18,9	322	0,8	74	085	90S4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 110 10	1,1	20,9	327	0,8	67	085	90S4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 110 15	1,1	26,9	258	1,1	52	085	90S4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 110 20	1,1	30,4	235	1,3	46	085	90S4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 110 25	1,1	36,8	202	1,6	38	085	90S4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 110 30	1,1	38,9	184	0,8	36	063	90S4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 110 35	1,1	46,7	167	0,8	30	063	90S4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 110 40	1,1	50	158	2,1	28	085	90S4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 110 45	1,1	58	135	1	24	063	90S4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 110 50	1,1	64	129	2,2	22	085	90S4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 110 55	1,1	74	111	1,2	19	063	90S4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 110 60	1,1	93	89	1,5	15	063	90S4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 110 65	1,1	100	82	3,5	14	085	90S4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 110 70	1,1	140	61	2,1	10	063	90S4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 115 05	1,5	26,9	351	0,8	52	085	90LA4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 115 10	1,5	30,4	320	1	46	085	90LA4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 115 15	1,5	36,8	276	1,2	38	085	90LA4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 115 20	1,5	50	215	1,5	28	085	90LA4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 115 25	1,5	64	176	1,6	22	085	90LA4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 115 30	1,5	70	162	1,7	20	085	90LA4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 115 35	1,5	74	152	0,9	19	063	90LA4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 115 40	1,5	93	121	1,1	15	063	90LA4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**
438 115 45	1,5	100	112	2,6	14	085	90LA4	**438 081 00**	**438 082 00**	**438 083 00**	**438 084 00**
438 115 50	1,5	140	83	1,5	10	063	90LA4	**438 061 00**	**438 062 00**	**438 063 00**	**438 064 00**

Note for dimensioning and dimensions table see page 738.

Push-In Output Shafts HMD, Single Sided

Material: Steel.

To change the gearboxes HMD/I over from hollow shaft to solid shaft. The shaft is only pushed in and secured with the enclosed cover disc and mounting screw.



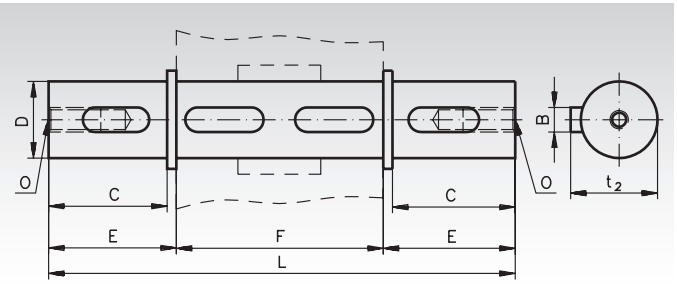
Ordering details: e.g.: Prod. No. 438 031 00, Push-In Output Shaft, Single Sided, Gearbox Size 030

Product No.	Gearbox Size	B mm	C mm	D mm	E mm	F mm	L mm	O mm	t_2 mm	Weight kg
438 031 00	030	5	25	14	35,5	55	94,5	M5x14	15,8	0,12
438 041 00	045	6	32	18	43,0	65	113,0	M6x18	20,5	0,23
438 051 00	050	8	52	25	59,5	81	146,0	M8x20	28	0,57
438 061 00	063	8	60	25	63,2	120	190,0	M8x20	28	0,73
438 081 00	085	10	60	35	73,5	135	214,5	M10x23	38	1,52

Push-In Output Shafts HMD, Double Sided

Material: Steel.

To change the gearboxes HMD/I over from hollow shaft to solid shaft. The shaft is only pushed in and secured with the enclosed cover disc and mounting screw.



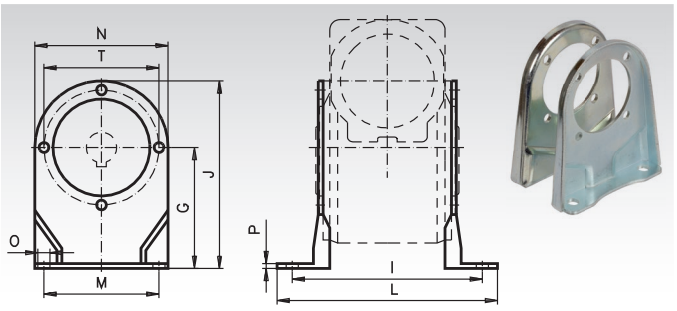
Ordering details: e.g.: Prod. No. 438 032 00, Push-In Output Shaft, Double Sided, Gearbox Size 030

Product No.	Gearbox Size	B mm	C mm	D mm	E mm	F mm	L mm	O mm	t_2 mm	Weight kg
438 032 00	030	5	25	14	35,5	55	126,0	M5x14	15,8	0,16
438 042 00	045	6	32	18	43,0	65	151,0	M6x18	20,5	0,33
438 052 00	050	8	52	25	59,5	81	200,0	M8x20	28	0,77
438 062 00	063	8	60	25	63,2	120	246,4	M8x20	28	0,93
438 082 00	085	10	60	35	73,5	135	282,0	M10x23	38	1,73

Foot Mountings HMD/I

Material: Steel sheet, zinc plated.

Retrofit kit: Foot mounting.
The position of the feet can be changed by 4x90 (Size 063: 8x 45°). 8 mounting screws are included in the delivery (4 screws per side).



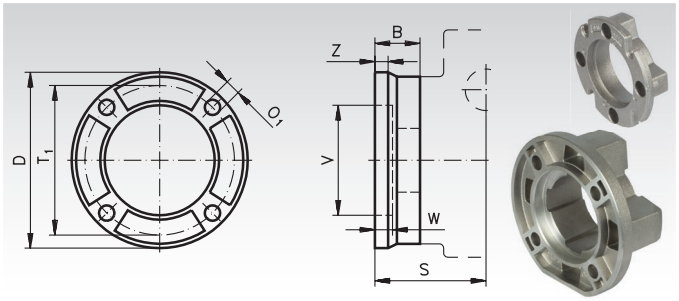
Ordering details: e.g.: Prod. No. 438 033 00, Foot Mounting, Gearbox Size 030

Product No.	Gearbox Size	G mm	I mm	J mm	L mm	M mm	N mm	O mm	P mm	T mm	Screws Size	Weight kg
438 033 00	030	55	66	94	87	50	78	6,5	3	65	M6	0,27
438 043 00	045	72	81	121	100	52	98	10,5	3	65	M6	0,49
438 053 00	050	82	98,5	138,5	123	63	113	10,5	3,5	94	M6	0,82
438 063 00	063	100	111	170	144	95	133	10,5	4	90	M8	1,23
438 083 00	085	142	145	236,5	182	140	180	10,5	5	130	M10	2,70

Output-Side Flanges HMD/I

Material: Aluminium.

Retrofit kit: Flange B5 with mounting screws.



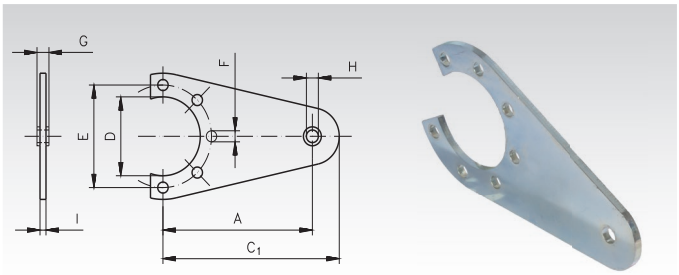
Ordering details: e.g.: Prod. No. 438 034 00, Output-Side Flange, Ø 80 mm

Product No.	Gearbox Size	D mm	B mm	O_1 mm	S mm	T_1 mm	V mm	W mm	Z mm	Screws Amount x Size	Weight kg
438 034 00	030	80	20,5	7,0	50,5	68	50	6	6	4 x M6	0,11
438 044 00	045	110	25,5	8,5	60,5	87	60	9	9	4 x M6	0,20
438 054 00	050	123	47	10,5	85,0	90	70	9	12	4 x M6	0,40
438 064 00	063	175	41	11	86,0	150	115	7	13	4 x M8	0,60
438 084 00	085	205	40	13,0	108,0	176	152	5	16	4 x M10	0,88

Torque Arms HMD/I

Material: Steel sheet, zinc plated.

Retrofit kit: Torque arm with mounting screws.
The position can be changed by 4x90° (Size 063: 8x45°).



Ordering details: e.g.: Prod. No. 438 035 00, Torque Arm, Gearbox Size 030

Product No.	Gearbox Size	A mm	C_1 mm	D mm	E mm	F mm	G mm	H mm	I mm	Screws Amount x Size	Weight kg
438 035 00	030	100	118	50	65	7	4	8,2	4	4 x M6	0,21
438 045 00	045	100	113	50	65	7	4	8,2	4	4 x M6	0,21
438 055 00	050	100	118	68	94	7	4	8,2	4	4 x M6	0,26
438 065 00	063	150	180	75	90	9	20	11	6	4 x M8	0,70
438 085 00	085	200	240	110	130	11	25	21	6	4 x M10	1,44

Permissible Radial and Axial Loads

The values are calculated for the middle of the input shaft end also calculating in the output speed n_2 in min^{-1}. F_R is the max. permissible radial load for $F_A = 0$. F_A is the max. permiss. axial load for $F_R = 0$.

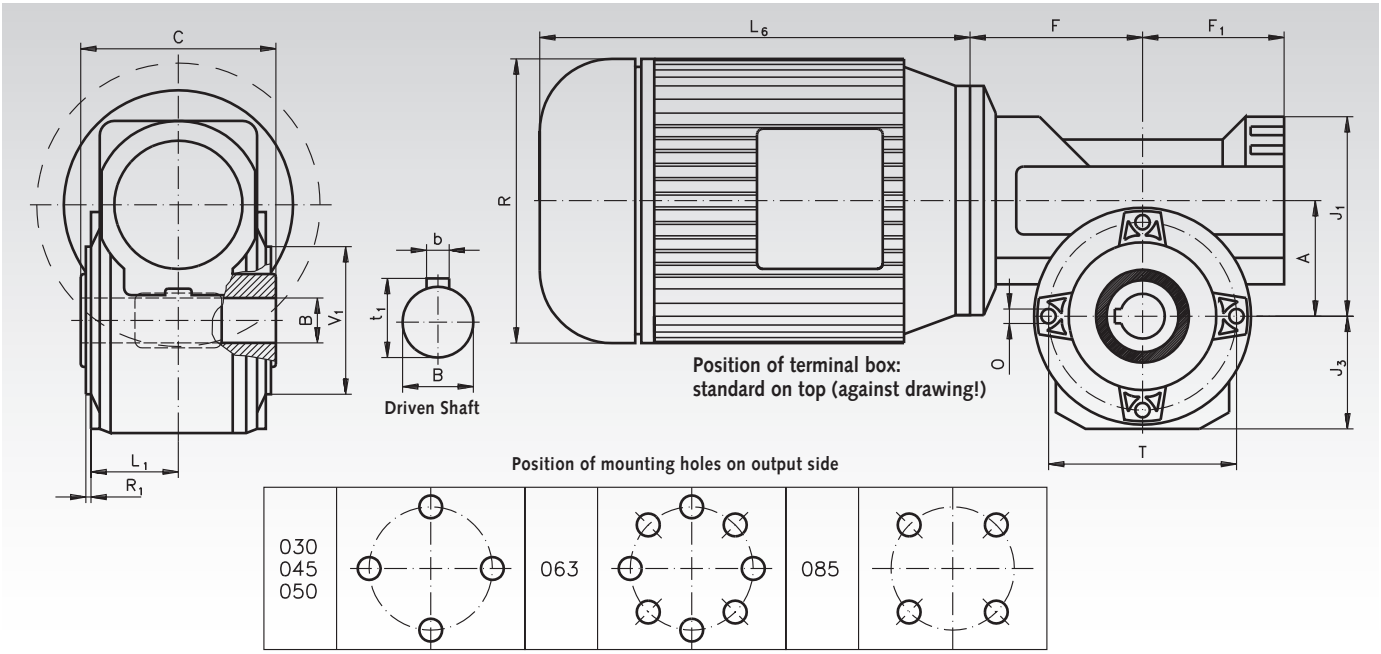
Gearbox Size	200 min^{-1}		150 min^{-1}		100 min^{-1}		75 min^{-1}		50 min^{-1}		25 min^{-1}		15 min^{-1}	
	F_R N	F_A N	F_R N	F_A N	F_R N	F_A N	F_R N	F_A N	F_R N	F_A N	F_R N	F_A N	F_R N	F_A N
030	600	120	700	140	800	160	900	180	1000	200	1250	250	1400	280
045	900	180	1000	200	1100	220	1200	240	1400	260	1800	300	2000	400
050	1200	240	1400	280	1500	300	1700	340	1900	380	2500	480	2800	560
063	1800	360	2000	400	2300	460	2500	500	3000	600	3800	700	4000	800
085	2500	500	2900	580	3000	600	3500	700	4000	800	5000	1000	5800	1160

Lubricant Volume in Litre (dm^3)

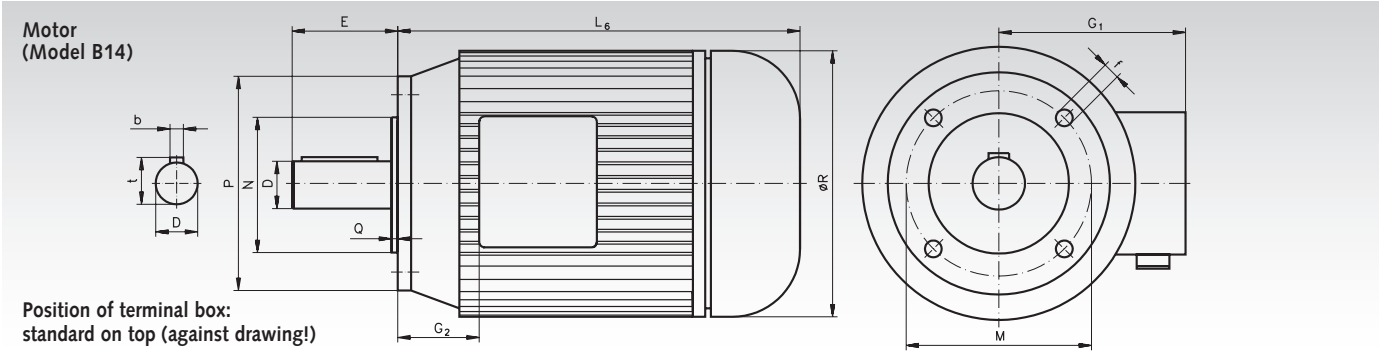
The gearbox is lubricated for life, using synthetic oil. At normal operating conditions, no change is required. The lubricant volume is the same for all mounting positions. The mounting positions V5 and V6 (worm shaft vertical) are however not recommended for continuous operation.

Size	030	045	050	063	085
Oil volume	0.03	0.09	0.14	0.40	1.20

Dimensions Table Worm Geared Motors HMD/I



Gearbox Size	A mm	B^{H7} mm	b mm	t_1 mm	C mm	$F_{max.}$ mm	F_1 mm	J_1 mm	J_3 mm	L_1 mm	O Amount/Size	R_1 mm	T mm	V_1^{h8} mm	Weight kg
030	30	14	5	16,3	55	62,5	46	51	39	30	4/M6x9	2	65	50	1,0
045	45	18	6	20,8	65	74	55	72	49	35	4/M6x14	2	65	50	2,4
050	50	25	8	28,3	81	81,5	65	81	54,4	38	4/M6x9	3	94	68	3,0
063	63	25	8	28,3	120	99,5	79	100	70	45	8/M8x17	5	90	75	6,0
085	85	35	10	38,3	135	124	98	138	94,5	64	4/M10x18	3,5	130	110	11,0



Motor Size	D mm	b mm	t mm	E mm	f mm	G_1 mm	G_2 mm	L_6 mm	M mm	N mm	P mm	Q mm	R mm	Weight kg
56B	9	3	10,2	20	M5	112	13	179	65	50	80	2,5	108	2,9
63A	11	4	12,5	23	M5	113	19	185	75	60	90	2,5	120	3,8
63B	11	4	12,5	23	M5	113	19	185	75	60	90	2,5	120	4,2
71A	14	5	16	30	M6	125	24	206	85	70	105	2,5	130	5,9
71B	14	5	16	30	M6	125	24	225	85	70	105	2,5	141	6,5
80A	19	6	21,5	40	M6	133	23	256	100	80	120	3	159	8,5
80B	19	6	21,5	40	M6	133	23	256	100	80	120	3	159	10
90S	24	8	27	50	M8	148	28	255	115	95	140	3	170	12,5
90L	24	8	27	50	M8	148	28	280	115	95	140	3	170	15

Note for Dimensioning

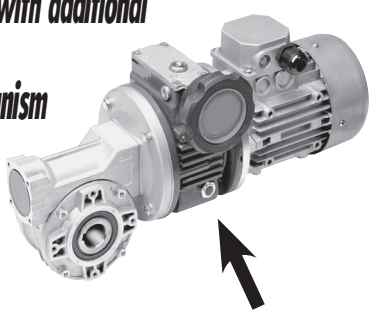
Three-phase motors have a very high starting torque. The max. permissible, stability related torque of the gearbox is the product of output torque and operating factor: $T_{max.} = T_2 \times f_B$

This torque must never be exceeded.

Furthermore, depending on kind of operation,

factors for shock load and acceleration must be considered.

Optionally also available with additional manual adjustment mechanism (on request).



Worm Geared Motors HMD/II

Housing: Aluminium, corrosion-inhibiting coating, with mounting holes for flexible foot and flange mounting.
Worm shaft: hardened and ground.
Worm Gear: Bronze, on cast iron hub.
Lubrication: synthetic oil (lubricated for life).
Motor: Standard three-phase motor with small flange B14, 230/400V, 50Hz. **From 0.75 kW in efficiency class IE2.**
Other motor versions (AC motor, posistor, forced ventilation, brake etc.) on request.

Lightweight, high quality model range. These maintenance-free geared motors, without ventilation can be used in any mounting position. The mounting positions V5 and V6 (worm shaft vertical) are however not recommended for continuous operation.

Output shaft push-in type: The basic gearbox version has a hollow shaft. They can, however, also be supplied with a push in type output shaft (single sided, to be used left and right, or double sided). These output shafts have their own product No. and have to be ordered separately.

Variable mounting: The gearboxes are supplied with mounting holes on all sides.

Retrofittable flange: If an output-side flange mounting is required, this flange can easily be mounted by the customer.
These flanges have their own product number and have to be ordered separately (Flange type, either square or round).

Ordering Details: e.g.: Product No., Type, Motor power, Output Speed
If required: Output shaft single sided (or double sided), Product No., Gearbox Size
Output Flange, Gearbox Size, Prod.-No.
Torque Arm, Gearbox Size, Prod. No.

Product No. Standard Version	P kW	n_2 min^{-1}	T_2 Nm	f_B	i_{ist}	Gearbox Size	Motor Size	Accessories (order separately)* Product No. Single-Sided Output Shaft	Product No. Double-Sided Output Shaft	Product No. Square Output Flange	Product No. Round Output Flange
439 009 05	0,09	9	44	1,2	100	050	63A6	**438 051 00**	**438 052 00**	**439 053 00**	**439 054 00**
439 009 10	0,09	12,9	34	1,1	70	045	63A6	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 009 15	0,09	15	30	1,5	60	045	63A6	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 009 20	0,09	19,6	24	1,9	46	045	63A6	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 009 25	0,09	23	19	1	61	030	56B4	**438 031 00**	**438 032 00**	**439 033 00**	–
439 009 30	0,09	35	14	1,4	40	030	56B4	**438 031 00**	**438 032 00**	**439 033 00**	–
439 009 35	0,09	46,7	11	1,8	30	030	56B4	**438 031 00**	**438 032 00**	**439 033 00**	–
439 009 40	0,09	70	8,5	2,2	20	030	56B4	**438 031 00**	**438 032 00**	**439 033 00**	–
439 009 45	0,09	93	7	2,7	15	030	56B4	**438 031 00**	**438 032 00**	**439 033 00**	–
439 009 50	0,09	140	4,8	3,2	10	030	56B4	**438 031 00**	**438 032 00**	**439 033 00**	–
439 009 55	0,09	200	3	4,7	7	030	56B4	**438 031 00**	**438 032 00**	**439 033 00**	–
439 012 05	0,12	12,9	49	0,8	70	045	63B6	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 012 10	0,12	17,5	38	1,4	80	050	63A4	**438 051 00**	**438 052 00**	**439 053 00**	**439 054 00**
439 012 15	0,12	20,6	34	1,6	68	050	63A4	**438 051 00**	**438 052 00**	**439 053 00**	**439 054 00**
439 012 20	0,12	30,4	24	1,6	46	045	63A4	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 012 25	0,12	35,9	20	1	39	030	63A4	**438 031 00**	**438 032 00**	**439 033 00**	–
439 012 30	0,12	46,7	16	1,2	30	030	63A4	**438 031 00**	**438 032 00**	**439 033 00**	–
439 012 35	0,12	50	16	2,4	28	045	63A4	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 012 40	0,12	74	12	1,5	19	030	63A4	**438 031 00**	**438 032 00**	**439 033 00**	–
439 012 45	0,12	93	10	1,9	15	030	63A4	**438 031 00**	**438 032 00**	**439 033 00**	–
439 012 50	0,12	132	7	2,2	10,6	030	63A4	**438 031 00**	**438 032 00**	**439 033 00**	–
439 012 55	0,12	200	5	1,5	7	030	63A4	**438 031 00**	**438 032 00**	**439 033 00**	–
439 018 05	0,18	9,6	86	1,4	94	063	71A6	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 018 10	0,18	14	61	0,8	100	050	63B4	**438 051 00**	**438 052 00**	**439 053 00**	**439 054 00**
439 018 15	0,18	17,5	53	1	80	050	63B4	**438 051 00**	**438 052 00**	**439 053 00**	**439 054 00**
439 018 20	0,18	20,6	48	1,2	68	050	63B4	**438 051 00**	**438 052 00**	**439 053 00**	**439 054 00**
439 018 25	0,18	30,4	33	1,2	46	045	63B4	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 018 30	0,18	37,8	29	1,4	37	045	63B4	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 018 35	0,18	50	22	1,7	28	045	63B4	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 018 40	0,18	74	16	1,1	19	030	63B4	**438 031 00**	**438 032 00**	**439 033 00**	–
439 018 45	0,18	100	13	2,2	14	045	63B4	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 018 50	0,18	132	10	1,6	10,6	030	63B4	**438 031 00**	**438 032 00**	**439 033 00**	–
439 018 55	0,18	200	7	2,3	7	030	63B4	**438 031 00**	**438 032 00**	**439 033 00**	–

*More details and further accessories see page 741.

Note for dimensioning see page 741. Dimensions table see page 743.

Optionally also available with additional manual adjustment mechanism (on request).

Worm Geared Motors HMD/II

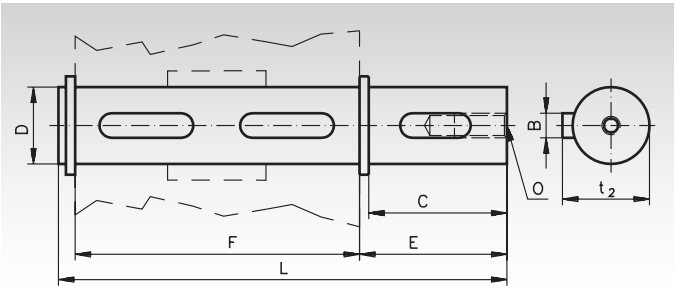
Product No. Standard Version	P kW	n_2 min^{-1}	T_2 Nm	f_B	i_{ist}	Gearbox Size	Motor Size	Accessories (order separately)* Product No. Single-Sided Output Shaft	Product No. Double-Sided Output Shaft	Product No. Square Output Flange	Product No. Round Output Flange
439 025 05	0,25	9,6	120	1	94	063	71B6	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 025 10	0,25	13,4	100	1,3	67	063	71B6	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 025 15	0,25	17,5	78	1,5	80	063	71A4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 025 20	0,25	20,9	69	1,7	67	063	71A4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 025 25	0,25	25	62	2,6	36	063	71B6	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 025 30	0,25	32,6	48	1,3	43	050	71A4	**438 051 00**	**438 052 00**	**439 053 00**	**439 054 00**
439 025 35	0,25	38,9	42	1,6	36	050	71A4	**438 051 00**	**438 052 00**	**439 053 00**	**439 054 00**
439 025 40	0,25	50	31	1,3	28	045	71A4	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 025 45	0,25	67	24	1,6	21	045	71A4	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 025 50	0,25	100	18	1,6	14	045	71A4	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 025 55	0,25	140	13	2,2	10	045	71A4	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 025 60	0,25	200	10	3	7	045	71A4	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 037 05	0,37	14,9	123	0,8	94	063	71B4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 037 10	0,37	17,5	115	1	80	063	71B4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 037 15	0,37	20,9	101	1,2	67	063	71B4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 037 20	0,37	31,1	75	1,7	45	063	71B4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 037 25	0,37	38,9	62	2,3	36	063	71B4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 037 30	0,37	46,7	56	2,5	30	063	71B4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 037 35	0,37	54	45	1,4	26	050	71B4	**438 051 00**	**438 052 00**	**439 053 00**	**439 054 00**
439 037 40	0,37	67	36	1,1	21	045	71B4	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 037 45	0,37	78	34	1,7	18	050	71B4	**438 051 00**	**438 052 00**	**439 053 00**	**439 054 00**
439 037 50	0,37	100	27	1,1	14	045	71B4	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 037 55	0,37	140	20	1,5	10	045	71B4	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 037 60	0,37	200	14	2,1	7	045	71B4	**438 041 00**	**438 042 00**	**439 043 00**	**439 044 00**
439 055 05	0,55	9,4	280	0,9	96	085	80B6	**438 081 00**	**438 082 00**	–	**439 084 00**
439 055 10	0,55	13,4	239	1,2	67	085	80B6	**438 081 00**	**438 082 00**	–	**439 084 00**
439 055 15	0,55	18,9	161	1,6	74	085	80A4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 055 20	0,55	20,9	163	1,7	67	085	80A4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 055 25	0,55	26,9	129	2,1	52	085	80A4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 055 30	0,55	31,1	111	1,2	45	063	80A4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 055 35	0,55	38,9	92	1,5	36	063	80A4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 055 40	0,55	46,7	83	1,7	30	063	80A4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 055 45	0,55	58	68	2	24	063	80A4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 055 50	0,55	74	56	2,4	19	063	80A4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 055 55	0,55	93	44	2,9	15	063	80A4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 055 60	0,55	140	30	2	10	050	80A4	**438 051 00**	**438 052 00**	**439 053 00**	**439 054 00**
439 075 05	0,75	14,6	260	0,9	96	085	80B4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 075 10	0,75	18,9	220	1,2	74	085	80B4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 075 15	0,75	20,9	223	1,2	67	085	80B4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 075 20	0,75	26,9	176	1,6	52	085	80B4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 075 25	0,75	30,4	160	1,9	46	085	80B4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 075 30	0,75	36,8	138	2,3	38	085	80B4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 075 35	0,75	46,7	114	1,2	30	063	80B4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 075 40	0,75	58	92	1,5	24	063	80B4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 075 45	0,75	74	76	1,7	19	063	80B4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 075 50	0,75	93	61	2,2	15	063	80B4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 075 55	0,75	100	57	1,1	14	050	80B4	**438 051 00**	**438 052 00**	**439 053 00**	**439 054 00**
439 075 60	0,75	140	41	1,4	10	050	80B4	**438 051 00**	**438 052 00**	**439 053 00**	**439 054 00**
439 110 05	1,1	18,9	322	0,8	74	085	90S4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 110 10	1,1	20,9	327	0,8	67	085	90S4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 110 15	1,1	26,9	258	1,1	52	085	90S4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 110 20	1,1	30,4	235	1,3	46	085	90S4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 110 25	1,1	36,8	202	1,6	38	085	90S4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 110 30	1,1	38,9	184	0,8	36	063	90S4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 110 35	1,1	46,7	167	0,8	30	063	90S4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 110 40	1,1	50	158	2,1	28	085	90S4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 110 45	1,1	58	135	1	24	063	90S4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 110 50	1,1	64	129	2,2	22	085	90S4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 110 55	1,1	74	111	1,2	19	063	90S4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 110 60	1,1	93	89	1,5	15	063	90S4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 110 65	1,1	100	82	3,5	14	085	90S4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 110 70	1,1	140	61	2,1	10	063	90S4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 150 05	1,5	26,9	351	0,8	52	085	90LA4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 150 10	1,5	30,4	320	1	46	085	90LA4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 150 15	1,5	36,8	276	1,2	38	085	90LA4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 150 20	1,5	50	215	1,5	28	085	90LA4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 150 25	1,5	64	176	1,6	22	085	90LA4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 150 30	1,5	70	162	1,7	20	085	90LA4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 150 35	1,5	74	152	0,9	19	063	90LA4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 150 40	1,5	93	121	1,1	15	063	90LA4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**
439 150 45	1,5	100	112	2,6	14	085	90LA4	**438 081 00**	**438 082 00**	–	**439 084 00**
439 150 50	1,5	140	83	1,5	10	063	90LA4	**438 061 00**	**438 062 00**	**439 063 00**	**439 064 00**

Note for dimensioning see page 741. Dimensions table see page 743.

Push-In Output Shafts HMD, Single Sided

Material: Steel.

To change the gearboxes HMD/II over from hollow shaft to solid shaft. The shaft is only pushed in and secured with the enclosed cover disc and mounting screw.



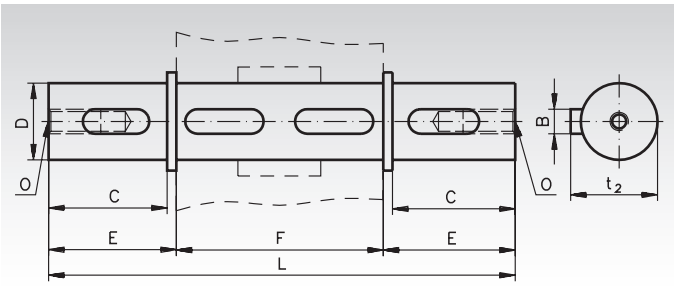
Ordering Details: e.g.: Product No. 438 031 00, Push-In Output Shaft, Single Sided, Gearbox Size 030

Product No.	Gearbox Size	B mm	C mm	D mm	E mm	F mm	L mm	O mm	t_2 mm	Weight kg
438 031 00	030	5	25	14	35,5	55	94,5	M5x14	15,8	0,12
438 041 00	045	6	32	18	43,0	65	113,0	M6x18	20,5	0,23
438 051 00	050	8	52	25	59,5	81	146,0	M8x20	28	0,57
438 061 00	063	8	60	25	63,2	120	190,0	M8x20	28	0,73
438 081 00	085	10	60	35	73,5	135	214,5	M10x23	38	1,52

Push-In Output Shafts HMD, Double Sided

Material: Steel.

To change the gearboxes HMD/II over from hollow shaft to solid shaft on both sides. The shaft is only pushed in and secured with the enclosed circlip.



Ordering Details: e.g.: Product No. 438 032 00, Push-In Output Shaft, Double Sided, Gearbox Size 030

Product No.	Gearbox Size	B mm	C mm	D mm	E mm	F mm	L mm	O mm	t_2 mm	Weight kg
438 032 00	030	5	25	14	35,5	55	126,0	M5x14	15,8	0,16
438 042 00	045	6	32	18	43,0	65	151,0	M6x18	20,5	0,33
438 052 00	050	8	52	25	59,5	81	200,0	M8x20	28	0,77
438 062 00	063	8	60	25	63,2	120	246,4	M8x20	28	0,93
438 082 00	085	10	60	35	73,5	135	282,0	M10x23	38	1,73

Permissible Radial and Axial Loads

The values are calculated for the middle of the input shaft end as a function of the output speed n_2 in rpm. F_R is the max. permissible radial load for $F_A = 0$. F_A is the max. permissible axial load for $F_R = 0$.

Gearbox Size	200 min^{-1}		150 min^{-1}		100 min^{-1}		75 min^{-1}		50 min^{-1}		25 min^{-1}		15 min^{-1}	
	F_R N	F_A N	F_R N	F_A N	F_R N	F_A N	F_R N	F_A N	F_R N	F_A N	F_R N	F_A N	F_R N	F_A N
030	600	120	700	140	800	160	900	180	1000	200	1250	250	1400	280
045	900	180	1000	200	1100	220	1200	240	1400	260	1800	300	2000	400
050	1200	240	1400	280	1500	300	1700	340	1900	380	2500	480	2800	560
063	1800	360	2000	400	2300	460	2500	500	3000	600	3800	700	4000	800
085	2500	500	2900	580	3000	600	3500	700	4000	800	5000	1000	5800	1160

Lubricant Volume in Litre (dm³)

The gearbox is lubricated for life, using synthetic oil. At normal operating conditions no change is required. The lubricant volume is the same for all mounting positions.
The mounting positions V5 and V6 (worm shaft vertical) are however not recommended for continuous operation.

Size	030	045	050	063	085
Oil volume	0.03	0.09	0.14	0.30	1.20

Note for Dimensioning

Three-phase motors have a very high starting torque. The max. permissible, stability related torque of the gearbox is the product of output torque and operating factor: $T_{max.} = T_2 \times f_B$

This torque must never be exceeded.

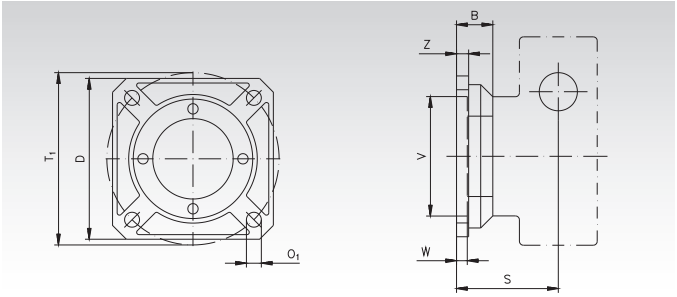
Furthermore, depending on kind of operation,

factors for shock load and acceleration must be considered.

Output-side Flanges HMD/II, square

Material: Aluminium.
Square flange with fixing screws for retrofitting.





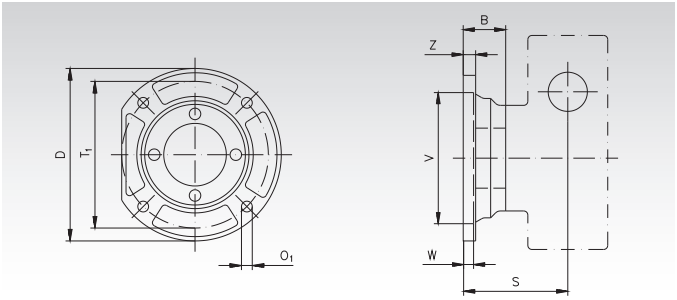
Ordering Details: e.g.: Product No. 439 033 00, Output-Side Flange, 70 x 70 mm

Product No.	Gearbox Size	D mm	B mm	O1 mm	S mm	T1 mm	V mm	W mm	Z mm	Screws Amount x size	Weight kg
439 033 00	030	70	25,5	6,5	54,5	68	50	4	6	4 x M6	0,11
439 043 00	045	95	30,5	9	67	75	60	4	7	4 x M6	0,20
439 053 00	050	110	46,5	11	90	85	70	5	9	4 x M8	0,40
439 063 00	063	142	33,0	11	86	150	115	6	12	4 x M8	0,60

Output-side Flanges HMD/II, round

Material: Aluminium.
Round flange with fixing screws for retrofitting.





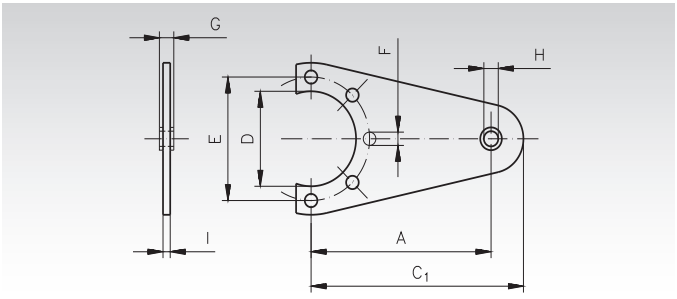
Ordering Details: e.g.: Product No. 439 044 00, Output-Side Flange, Ø 140 mm.

Product No.	Gearbox Size	D mm	B mm	O_1 mm	S mm	T_1 mm	V mm	W mm	Z mm	Screws Amount x Size	Weight kg
439 044 00	045	140	43,5	9,5	80	115	95	5	9	4 x M6	0,20
439 054 00	050	160	45,5	9,5	89	130	110	5	10	4 x M8	0,40
439 064 00	063	200	57,0	13,0	110	165	130	7	13	4 x M8	0,60
439 084 00	085	200	53,5	11,5	117,5	165	130	5	13	4 x M10	0,88

Torque Arms HMD/II

Material: Steel sheet, zinc plated.
Torque arm with mounting screws for retrofitting.
The position can be changed in steps of 90°.

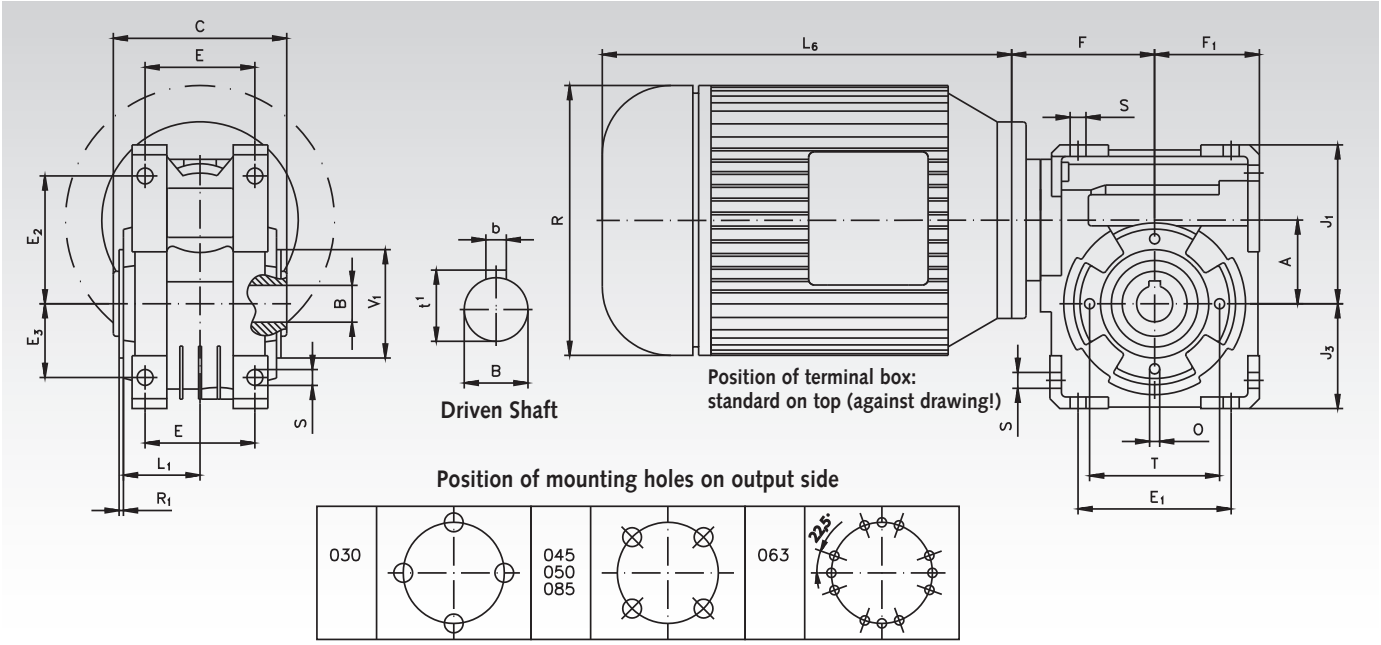




Ordering Details: e.g.: Product No. 439 035 00, Torque Arm, Gearbox Size 030

Product No.	Gearbox Size	A mm	C_1 mm	D mm	E mm	F mm	G mm	H mm	I mm	Screws Amount x Size	Weight kg
439 035 00	030	85	100	55	65	7	14	8	4	3 x M6	0,21
439 045 00	045	100	118	60	75	7	14	10	4	3 x M6	0,21
439 055 00	050	100	118	70	85	9	14	10	4	3 x M8	0,26
439 065 00	063	150	180	75	90	9	20	11	6	3 x M8	0,70
439 085 00	085	200	240	110	130	11	25	21	6	3 x M10	1,44

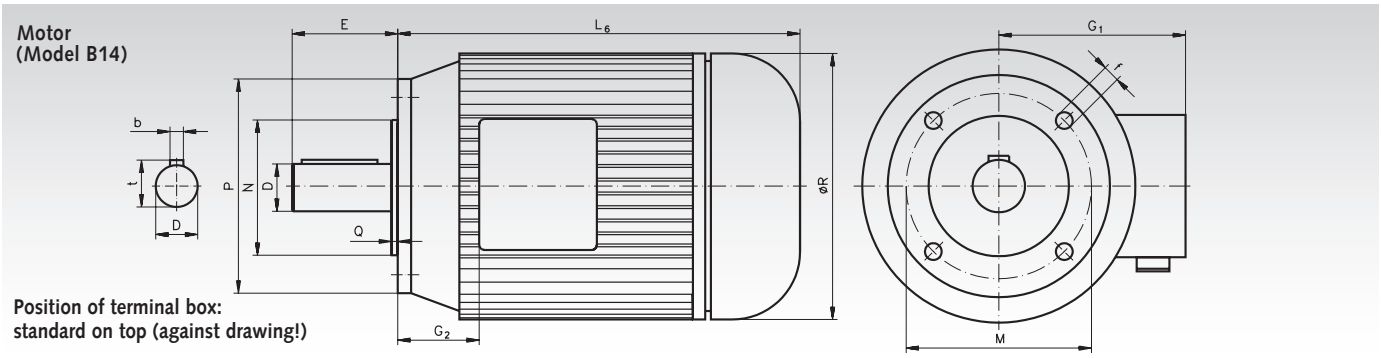
Dimensions Table Worm Geared Motors HMD/II



Gearbox Size	A mm	B^{H7} mm	b mm	t_1 mm	C mm	$F_{max.}$ mm	F_1 mm	J_1 mm	J_3 mm	L_1 mm	R_1 mm	V_1^{h8} mm	Weight kg
030	30	14	5	16,3	55	62,5	40	57	40	29	2,5	55	1,2
045	45	18	6	20,8	65	80	50	71,5	50	36,5	2,5	60	2,3
050	50	25	8	28,3	81	79	60	84	60	43,5	2,5	70	3,3
063	63	25	8	28,3	120	99,5	72,5	110	72,5	53	3,0	75	6,0
085	85	35	10	38,3	135	124	100	145,5	100	64	3,5	110	12

Mounting Holes

Gearbox Size	E mm	E_1 mm	E_2 mm	E_3 mm	S mm	T mm	O Amount+Size
030	44	54	44	27	6,5	65	4xM6x11
045	60	70	55	35	6,5	75	4xM6x12
050	70	80	64	40	8,5	85	4xM8x11
063	76	102	88,5	51	9,5	90	12xM8x14
085	101	144	117,5	72	11	130	4xM10x17



Motor Size	D mm	b mm	t mm	E mm	f mm	G_1 mm	G_2 mm	L_6 mm	M mm	N mm	P mm	Q mm	R mm	Weight kg
56B	9	3	10,2	20	M5	112	13	179	65	50	80	2,5	108	2,9
63A	11	4	12,5	23	M5	113	19	185	75	60	90	2,5	120	3,8
63B	11	4	12,5	23	M5	113	19	185	75	60	90	2,5	120	4,2
71A	14	5	16	30	M6	125	24	206	85	70	105	2,5	130	5,9
71B	14	5	16	30	M6	125	24	225	85	70	105	2,5	141	6,5
80A	19	6	21,5	40	M6	133	23	256	100	80	120	3	159	8,5
80B	19	6	21,5	40	M6	133	23	256	100	80	120	3	159	10
90S	24	8	27	50	M8	148	28	255	115	95	140	3	170	12,5
90L	24	8	27	50	M8	148	28	280	115	95	140	3	170	15

Worm Geared Motors ZMD/I

General data: Versatile, high-performance gearboxes.
4 sizes, centre distance 40, 50, 63 and 80 mm. Centre distance 100 - 315 mm available on request.

Housing: High-quality grey cast iron, all sides machined and with mounting holes on 4 sides.

Gearing: 12 ratios from 5 to 83 : 1; worm shaft hardened and ground. Worm gear made from special centrifugally cast bronze.

Efficiency factor: The efficiency factors stated in the selection tables are guideline values for properly run-in and lubricated gearboxes at operating temperature with nominal load and driving worm shaft. Proper running in is a crucial factor influencing the lifetime of the gearbox. The starting efficiency factor (η_A) is, as the operating efficiency factor (h), depending on the lead angle.

Self-locking: Self-locking only occurs in worm gear units, when the unit cannot be driven from the output side. Worms with 4 and 6 threads sometimes permit transmission ratios for gearing up (i = 5 : 1 to 13,3 : 1). If a gearbox must be implicitly self-locking, or must implicitly not be self-locking, we urge you to contact us.

Bearing system: All gearbox shafts with generously dimensioned roller bearings.

Lubrication: The gearboxes are lubricated for life using synthetic oil. Under normal operating conditions, no maintenance is required. The housing should be checked for leakages at an interval of approx. 2 years.

Ventilation: Size (centre distance) 40 is supplied without ventilation. With the other gearboxes, the seal plug has to be exchanged with the separately packed venting filter.

Motor: From 0.75 kW in efficiency class IE2. Datas page 748.

Version A with output-side shaft right, on request also on the left or double sided (without picture).

Version HL with output-side hollow shaft.

Position of terminal box: standard on top (against photo).
Output flange and foot mounting available at extra charge.

Weights

Gearbox Size	kg	Motor	kg
40	7	**63 S/L**	5 / 6
50	12	**71 S/L**	7 / 8
63	18	**80 S/L**	10 / 11
80	28	**90 S/L**	18 / 22

Venting Filter (VF)

Size	A mm	B mm	C mm	D mm	E mm	F mm
40	-	-	-	-	-	-
50	50	20	33	22	58	25
63	62,5	27,5	37	22	67	25
80	77,5	32,5	57	22	82	25

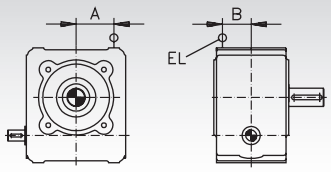
Lubricant Volume in Litre (dm³)

Size	Mounting Position 1	2	3 + 4	5 + 6
40	0,20	0,25	0,20	0,20
50	0,30	0,60	0,45	0,45
63	0,50	1,10	0,70	0,80
80	0,90	2,10	1,40	1,60

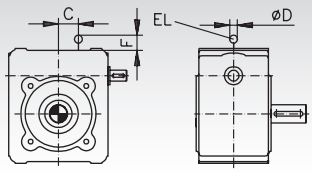
The standard lubrication volume is calculated for mounting position 2. For other mounting positions and high permanent speeds it might have to be reduced, to prevent oil leakages.

Position of Oil Fittings Gearbox Size 50 - 80

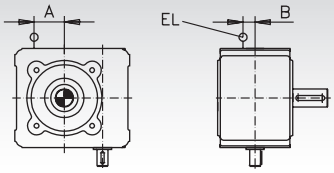
Mounting Position 1



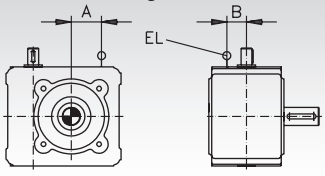
Mounting Position 2



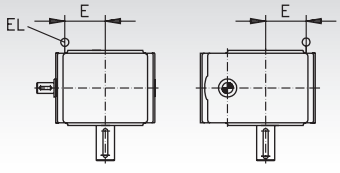
Mounting Position 3



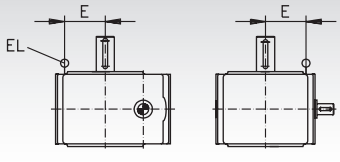
Mounting Position 4



Mounting Position 5



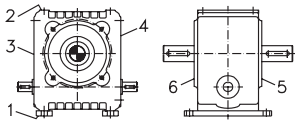
Mounting Position 6



Mounting Sides

The worm gear units can be mounted in any position and the shaft ends can be positioned to your order.

Sizes 40 - 80



Worm Geared Motors ZMD/I, Technical Data (Other Power Settings and Output Speeds On Request)

Version A Output Side 5 Product No.	Version HL Product No.	P_1 kW	n_2 min^{-1}	$T_{2nom.}$ Nm	f_B	T_{2A} Nm	i_{ist}	Gearbox Size	Motor Size
437 510 13	**437 010 13**	0,12	13,4	46	1,08	53	63	**40**	63L/6
437 510 16	**437 010 16**	0,12	16,3	37	1,04	54	82	**40**	63S/4
437 510 21	**437 010 21**	0,12	21,2	31	1,59	41	63	**40**	63S/4
437 510 29	**437 010 29**	0,12	29,1	27	2,17	31	29	**40**	63L/6
437 510 34	**437 010 34**	0,12	34,2	23	2,51	34	39	**40**	63S/4
437 510 43	**437 010 43**	0,12	43,3	21	2,41	29	19,5	**40**	63L/6
437 510 46	**437 010 46**	0,12	46,0	18	2,9	25	29	**40**	63S/4
437 510 51	**437 010 51**	0,12	51,4	17	2,32	30	26	**40**	63S/4
437 510 65	**437 010 65**	0,12	65,0	15	2,66	23	13	**40**	63L/6
437 520 14	**437 020 14**	0,18	14,3	71	1,55	64	62	**50**	71S/6
437 520 17	**437 020 17**	0,18	17,4	65	1,38	69	51,4	**50**	71S/6
437 520 22	**437 020 22**	0,18	22,7	50	1,29	53	39	**40**	71S/6
437 520 25	**437 020 25**	0,18	25,3	44	1,14	65	52	**40**	63S/2
437 520 33	**437 020 33**	0,18	33,1	29	1,31	38	82	**40**	63S/2
437 520 34	**437 020 34**	0,18	34,7	39	2,07	46	25,5	**50**	71S/6
437 520 45	**437 020 45**	0,18	45,4	30	1,67	35	19,5	**40**	71S/6
437 520 51	**437 020 51**	0,18	51,4	26	1,52	43	26	**40**	63L/4
437 520 67	**437 020 67**	0,18	67,4	21	2,41	32	19,5	**40**	63L/4
437 521 01	**437 021 01**	0,18	101,2	15	2,06	26	13	**40**	63L/4
437 530 14	**437 030 14**	0,25	14,4	98	1,12	92	62	**50**	71L/6
437 530 17	**437 030 17**	0,25	17,5	89	1,00	101	51	**50**	71L/6
437 530 22	**437 030 22**	0,25	22,8	77	2,78	77	39	**50**	71L/6
437 530 26	**437 030 26**	0,25	26,8	61	1,39	78	51	**50**	71S/4
437 530 33	**437 030 33**	0,25	33,1	40	0,95	60	82	**40**	63L/2
437 530 35	**437 030 35**	0,25	35,0	48	1,22	60	39	**40**	71S/4
437 530 45	**437 030 45**	0,25	45,6	41	1,21	51	19,5	**40**	71L/6
437 530 52	**437 030 52**	0,25	52,5	35	1,13	53	26	**40**	71S/4
437 530 70	**437 030 70**	0,25	70,0	28	1,8	40	19,5	**40**	71S/4
437 531 05	**437 031 05**	0,25	105,0	20	1,53	32	13	**40**	71S/4
437 540 14	**437 040 14**	0,37	14,8	152	1,37	143	61	**63**	80S/6
437 540 17	**437 040 17**	0,37	17,0	152	1,89	165	53	**80**	80S/6
437 540 22	**437 040 22**	0,37	22,0	108	1,69	93	61	**63**	71L/4
437 540 26	**437 040 26**	0,37	26,3	99	1,96	103	51	**63**	71L/4
437 540 33	**437 040 33**	0,37	33,4	70	2,0	77	82	**63**	71S/2
437 540 35	**437 040 35**	0,37	35,3	74	1,66	77	38	**50**	71L/4
437 540 46	**437 040 46**	0,37	46,2	61	2,65	59	29	**63**	71L/4
437 540 52	**437 040 52**	0,37	52,6	54	1,42	69	25,5	**50**	71L/4
437 540 70	**437 040 70**	0,37	70,3	36	1,26	49	39	**40**	71S/2
437 540 92	**437 040 92**	0,37	92,4	32	1,57	39	14,5	**40**	71L/4
437 541 05	**437 041 05**	0,37	105,4	27	1,49	43	26	**40**	71S/2
437 541 37	**437 041 37**	0,37	137,4	23	1,75	32	9,75	**40**	71L/4
437 542 10	**437 042 10**	0,37	210,8	15	2,04	26	13	**40**	71S/2
437 550 14	**437 050 14**	0,55	14,4	245	1,37	217	62	**80**	80L/6
437 550 17	**437 050 17**	0,55	17,6	210	0,97	236	51	**63**	80L/6
437 550 22	**437 050 22**	0,55	22,0	161	1,14	138	61	**63**	80S/4
437 550 26	**437 050 26**	0,55	26,3	147	1,32	153	51	**63**	80S/4
437 550 33	**437 050 33**	0,55	33,7	104	1,35	127	82	**63**	71L/2
437 550 35	**437 050 35**	0,55	35,3	110	1,12	114	38	**50**	80S/4
437 550 45	**437 050 45**	0,55	45,9	97	2,21	120	19,5	**63**	80L/6
437 550 52	**437 050 52**	0,55	52,6	81	0,96	102	25,5	**50**	80S/4
437 550 72	**437 050 72**	0,55	72,6	55	1,54	78	38	**50**	71L/2
437 550 92	**437 050 92**	0,55	92,4	49	2,24	58	14,5	**50**	80S/4
437 551 05	**437 051 05**	0,55	105,1	44	1,36	61	12,75	**50**	80S/4
437 551 41	**437 051 41**	0,55	141,5	31	1,41	53	19,5	**40**	71L/2
437 552 16	**437 052 16**	0,55	216,5	22	2,54	42	12,75	**50**	71L/2
437 560 14	**437 060 14**	0,75	14,5	333	1,01	330	62	**80**	90S/6
437 560 17	**437 060 17**	0,75	17,0	308	0,93	375	53	**80**	90S/6
437 560 21	**437 060 21**	0,75	21,7	234	1,25	252	62	**80**	80L/4
437 560 26	**437 060 26**	0,75	26,4	199	0,97	268	51	**63**	80L/4
437 560 34	**437 060 34**	0,75	34,5	159	1,17	211	39	**63**	80L/4
437 560 44	**437 060 44**	0,75	44,8	132	2,07	167	30	**80**	80L/4
437 560 53	**437 060 53**	0,75	53,5	102	1,39	202	51	**63**	80S/2
437 560 71	**437 060 71**	0,75	71,8	76	1,13	150	38	**50**	80S/2
437 560 92	**437 060 92**	0,75	92,9	69	2,38	103	14,5	**63**	80L/4
437 561 05	**437 061 05**	0,75	105,5	60	1,00	110	12,75	**50**	80L/4
437 561 41	**437 061 41**	0,75	141,6	46	1,94	82	9,5	**50**	80L/4
437 562 14	**437 062 14**	0,75	214,1	30	1,85	83	12,75	**50**	80S/2

Dimensions table page 747.

Worm Geared Motors ZMD/I, Technical Data (Other Power Settings and Output Speeds On Request)

Version A Output Side 5 Product No.	Version HL Product No.	P_1 kW	n_2 min^{-1}	$T_{2\ nom.}$ Nm	f_B	T_{2A} Nm	i_{ist}	Gearbox Size	Motor Size
437 570 29	**437 070 29**	1,10	29,8	281	1,11	321	30	**80**	90L/6
437 570 33	**437 070 33**	1,10	33,8	262	0,99	362	26,5	**80**	90L/6
437 570 44	**437 070 44**	1,10	44,8	204	1,72	273	20	**80**	90L/6
437 570 52	**437 070 52**	1,10	52,3	174	1,42	246	26,5	**80**	90S/4
437 570 71	**437 070 71**	1,10	71,0	129	1,45	181	19,5	**63**	90S/4
437 570 92	**437 070 92**	1,10	92,3	103	2,65	142	15	**80**	90S/4
437 571 08	**437 071 08**	1,10	108,6	88	1,54	145	12,75	**63**	90S/4
437 572 78	**437 072 78**	1,10	278,9	34	2,65	95	9,5	**50**	80L/2
437 580 34	**437 080 34**	1,50	34,6	331	0,91	398	40	**80**	90L/4
437 580 46	**437 080 46**	1,50	46,2	256	1,05	308	30	**80**	90L/4
437 580 52	**437 080 52**	1,50	52,3	237	1,04	348	26,5	**80**	90L/4
437 580 69	**437 080 69**	1,50	69,3	184	1,67	262	20	**80**	90L/4
437 580 95	**437 080 95**	1,50	95,5	133	1,21	190	14,5	**63**	90L/4
437 581 40	**437 081 40**	1,50	140,3	91	2,06	153	20	**80**	90S/2

Dimensions table page 747.

Note for Dimensioning

Three-phase motors have a very high starting torque T_{2A}.
The max. permissible, stability related torque of the gearbox is the product of output torque and operating factor: $\mathbf{T_{max.} = T_{2\ nom.} \times f_B}$

This torque must never be exceeded.

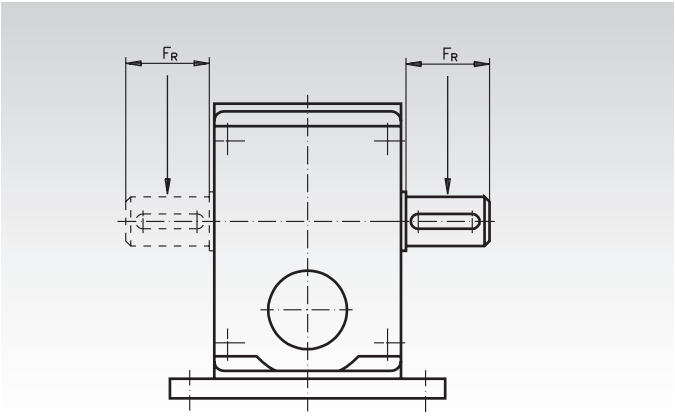
Furthermore, depending on kind of operation,

factors for shock load and acceleration must be considered.

Permissible Radial Loads F_R [N] for Normal Output Shaft and Bearing System

The values for permissible radial loads stated in the table are calculated for the centre of the output shaft end, also calculating in the output speed and nominal output torque. The values were calculated for the most unfavourable load direction.

The permiss. radial loads only apply to unilateral load. If in your application high radial loads occur in combination with axial loads, we ask you to contact us.

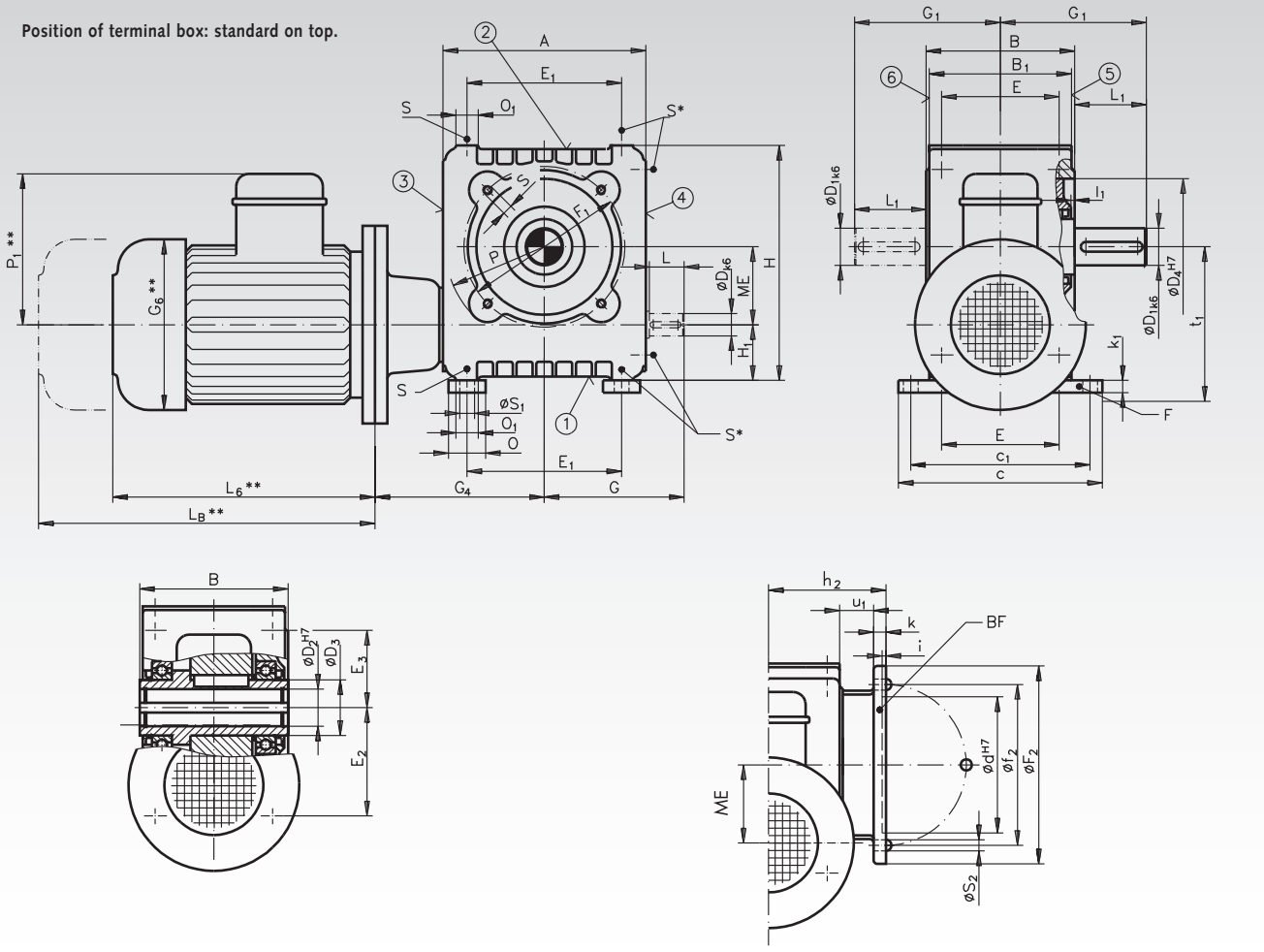


Gearbox Size	Output Torque Nm	Permiss. Radial Load [N] at Output Speeds n_2 [min^{-1}]																	
		6	8	10	12	16	20	25	32	40	50	63	80	100	125	160	200	250	320
40	0 - 80	2500	2375	2250	2125	2000	1875	1775	1675	1575	1400	1325	1250	1175	1125	1050	925	875	800
50	0 - 125	3500	3325	3150	2970	2800	2620	2480	2340	2200	1960	1850	1750	1640	1570	1470	1290	1220	1120
	125 - 160	3200	3040	2880	2720	2560	2400	2270	2140	2010	1790	1700	1600	1500	1440	1340	1180	1120	1020
63	0 - 200	5000	4750	4500	4250	4000	3750	3550	3350	3150	2800	2650	2500	2350	2250	2100	1850	1750	1600
	200 - 250	4600	4360	4140	3910	3680	3450	3260	3080	2900	2570	2440	2300	2160	2070	1930	1700	1610	1470
	250 - 320	3500	3325	3150	2975	2800	2625	2485	2345	2205	1960	1855	1750	1645	1575	1470	1295	1225	1120
80	0 - 500	7500	7120	6740	6370	6000	5620	5320	5000	4700	4200	4000	3750	3500	3370	3140	2770	2620	2400

Dimensions Table Worm Geared Motors ZMD/I

Output flange and foot mounting brackets can be delivered at extra charge.

Position of terminal box: standard on top.



With Hollow Shaft

Flange Version

Surfaces (1) to (6) are all machined. Aapart from side (3), they can serve as mounting surfaces. The foot mountings F can be attached to surfaces (1), (2) and (4). Surfaces (5) and (6) serve to attach the flange BF. The geared motor can turn in any position. The required mounting position has to be stated in the order. Feather keys and grooves according to DIN 6885/1. Shaft ends with thread alignment according to DIN 332/2. As standard, the terminal box is mounted on side (2). It can be turned by 4x90°. On request, side (4) can accommodate the shaft end. The speed of this shaft end is equal to the speed of the motor.

Gearbox – Dimensions

Gearbox Size	ME mm	A mm	B mm	B_1 mm	c mm	c_1 mm	d mm	D_4 mm	D x L mm	D_1 x L_1 mm	D_2 mm	D_3 mm	E mm	E_1 mm	E_2 mm	E_3 mm	P mm	F_2 mm
40	40	104	90	85	125	110	80	70	14 x 24	22 x 36	22	35	70	70	55	35	53	116
50	50	140	105	100	150	130	95	90	16 x 28	25 x 42	25	40	80	100	70	50	65	136
63	63	164	120	115	165	145	110	110	18 x 28	30 x 58	30	45	95	125	87,5	62,5	80	160
80	80	204	140	135	190	165	130	140	24 x 36	38 x 58	38	55	115	155	107,5	77,5	100	200

Gearbox Size	F_1 mm	f_2 mm	G mm	G_1 mm	G_4 mm	H_1 mm	h_2 mm	H mm	i mm	l mm	k mm	k_1 mm	O mm	O_1 mm	S* mm	S_1 mm	S_2 mm	t_1 mm	u_1 mm
40	85	100	79	81	89	32	70	124	3	3	8	8	25	14	M6 x 12	10	7	80	17
50	110	115	100	94,5	118	40	80	160	3	3	8	10	30	18	M8 x 14	12	9	100	19,5
63	130	130	113	118	137	45	95	190	3	3	10	10	30	18	M8 x 14	12	9	118	25
80	165	165	141	128	164	55	110	237	3,5	3	12	12	35	22	M10 x 17	15	11	147	28

* Threaded bores on side 4 at extra charge.

Dimensions Table Worm Geared Motors ZMD/I

Motor – Dimensions (mm)

Gearbox Size	Motor Size	G_6*	L_6*	L_B*	P_1*
40	**63 S/L**	123	188	238	113
40	**71 S/L**	138	212	272	122
50	**71 S/L**	138	212	272	122
50	**80 S/L**	156	234	299	141
63	**71 S/L**	138	212	272	122
63	**80 S/L**	156	234	299	141
63	**90 S**	176	251	311	149
63	**90 L**	176	276	356	149
80	**80 S/L**	156	234	299	141
80	**90 S**	176	251	311	149
80	**90 L**	176	276	356	149

* Dimensions may be subject to change.

Three-Phase Motors

The following single-phase motors conform to DIN IEC 34-1.
From 0.75 kW in efficiency class IE2.
Other types (dual-speed, one-phase AC, brake motors) on request. The nominal power is calculated for continuous operation, operation mode S1, at nominal voltage and nominal speed calculated for a max. temperature of the cooling agent of 40°C and an altitude of 1,000 m above sea level.
The motors are supplied with a normal voltage of 230/400 V (permiss. voltage fluctuation +6% and -10%). Other voltages and frequencies available on request.

Size	Nominal Power kW	Nominal Speed min^{-1}	Nominal Current at 230/400 V A	Power Factor cos φ	Nominal Torque Nm	Starting Torque to nom. Torque M_A/M_N	Starting Current to nom. Current I_A/I_N
			3000 min^{-1}				
63S/2	0,18	2710	0,97/0,56	0,79	0,63	2,4	3,5
63L/2	0,25	2715	1,22/0,77	0,82	0,86	2,5	3,8
71S/2	0,37	2740	1,72/0,99	0,84	1,26	2,2	3,9
71L/2	0,55	2745	2,46/1,42	0,83	1,9	2,4	4,2
80S/2	0,75	2730	3,53/2,04	0,80	2,6	4,4	8,3
80L/2	1,1	2735	4,76/2,75	0,83	3,76	3,8	7,0
90S/2	1,5	2805	6,1/3,51	0,85	5,1	4,1	7,0
			1500 min^{-1}				
63S/4	0,12	1335	0,9/0,52	0,64	0,84	2,3	2,5
63L/4	0,18	1315	1,3/0,75	0,67	1,26	2,2	2,5
71S/4	0,25	1365	1,4/0,83	0,72	1,7	2,0	3,1
71L/4	0,37	1340	1,9/1,11	0,76	2,5	1,8	3,1
80S/4	0,55	1340	2,8/1,6	0,77	3,8	1,75	3,1
80L/4	0,75	1345	3,6/2,1	0,77	5,2	4,0	5,8
90S/4	1,1	1385	4,8/2,85	0,78	7,5	3,1	6,4
90L/4	1,5	1385	6,4/3,7	0,80	10,1	3,6	6,7
			1000 min^{-1}				
63L/6	0,12	845	1,1/0,6	0,65	1,29	1,9	1,9
71S/6	0,18	885	1,3/0,75	0,68	1,94	1,6	2,4
71L/6	0,25	890	1,6/0,95	0,69	2,58	1,7	2,6
80S/6	0,37	900	2,1/1,2	0,71	3,84	1,8	3,1
80L/6	0,55	895	2,85/1,65	0,74	5,71	1,8	3,2
90S/6	0,75	900	4,1/2,35	0,70	7,83	3,0	4,4
90L/6	1,1	895	5,7/3,3	0,71	11,5	3,7	5,7

Worm Helical Geared Motors SZM/I

General data: Versatile, high-performance geared motors, 3 sizes, centre distance 50, 63 and 80 mm. Up to centre distance 125 mm, on request.

Housing: High-quality grey cast iron, all sides machined and with mounting holes on 5 sides.

Gearing: Helical gear ratio between 2,5 and 8,9 : 1 and worm gear ratio between 5 and 83 : 1, allow precisely tuned output speeds from 3,0 to 114,6 min^{-1}. One-stage helical gear stage, made from special steels, hardened and ground, worm shafts hardened and ground, worm gears made from special bronze.

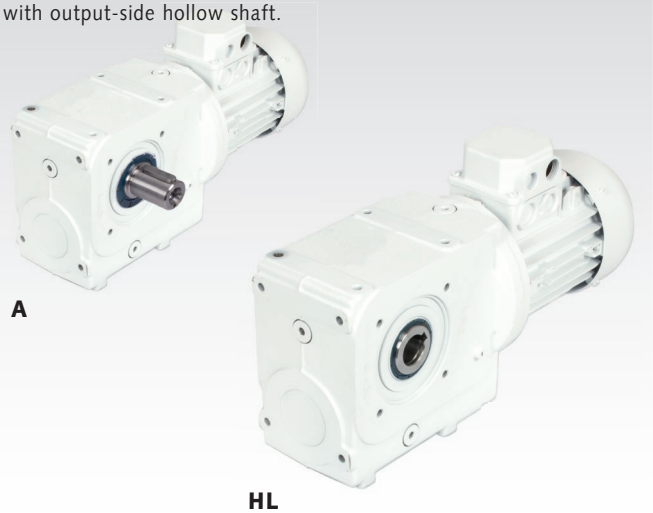
Motor: From 0.75 kW in efficiency class IE2. Datas page 699.

Output flange and foot mounting brackets can be delivered at extra charge.

Bearing system, Efficiency, Self-Locking, Permissible Radial Loads, Lubrication see worm gear units Type ZM/I page 685.

Version A with output-side shaft on the right, on request shaft can be provided on the left or on both sides (without picture).

Version HL
with output-side hollow shaft.



A

HL

Ordering details: e.g.: Type, Version, Motor power, Output Speed, Mounting Position, Connecting Side, Shaft Position, Product No.

Venting Filter (VF)

Gearbox Size	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	K mm
50	98	23	116	20	62	6	25	10	80	78
63	105	23	123	20	69,5	6	35	10	92	93
80	126,5	23	149,5	20	79,5	7	42,5	5	111,25	124

Lubricant Volume in Litre (dm^3)

Gearbox Size	Mounting Position 1	2 + 3	4	5 + 6
50	0,5	1,0	1,0	0,8
63	0,8	1,5	1,8	1,2
80	1,3	2,5	3,2	2,0

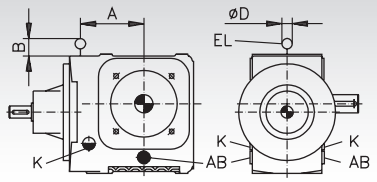
The standard lubrication volume is calculated for maximum (for mounting position 4). For other mounting positions and high permanent speeds it might have to be reduced,to prevent oil leakages.

Weights

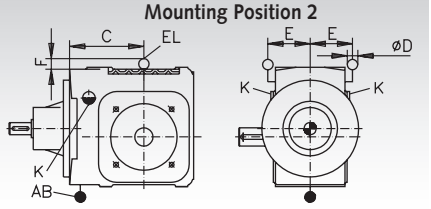
Gearbox Size	kg	Motor	kg
50	14	**63 L**	6
63	20	**71 S/L**	7 / 8
80	35	**80 S/L**	10 / 13
		90 S/L	18 / 22
		100 L	25

Position of the Oil Fittings Gearbox Size 50 - 80

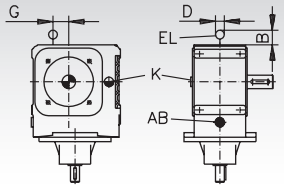
Mounting Position 1



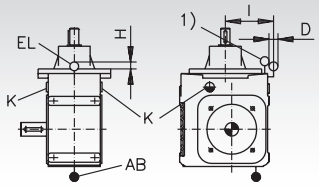
Mounting Position 2



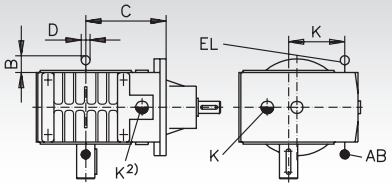
Mounting Position 3



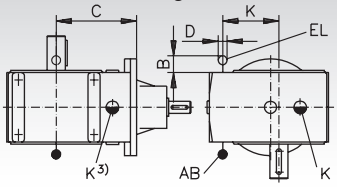
Mounting Position 4



Mounting Position 5



Mounting Position 6



EL = Venting Filter.
AB= Oil Drain.
K = Oil-Level.
1) Ventilation on side 3 possible as special version.
2) Ventilation on side 1 possible as special version.
3) Either side 2 or side 4.

Helical Worm-Geared Motors SZM/I, Technical Data

Version A Output Side 5 Product No.	Version HL Product No.	P_1 kW	n_2 min^{-1}	$T_{2\ nom.}$ Nm	f_B -	T_{2A} Nm	Ratio $i_1 \times i_2$	Gearbox Size -	Motor Size -
435 510 03	**435 010 03**	0,12	3,0	210	0,90	289	7,27 x 38,0	**50**	63L/6
435 510 04	**435 010 04**	0,12	4,0	166	1,29	221	7,27 x 29,0	**50**	63L/6
435 510 06	**435 010 06**	0,12	6,1	132	1,16	193	7,27 x 19,0	**50**	63L/6
435 510 09	**435 010 09**	0,12	9,7	86	1,70	152	7,27 x 19,0	**50**	63S/4
435 510 16	**435 010 16**	0,12	16,0	59	2,67	88	7,27 x 7,25	**50**	63L/6
435 520 03	**435 020 03**	0,18	3,3	299	1,41	342	9,11 x 29,0	**63**	71S/6
435 520 04	**435 020 04**	0,18	4,1	212	1,07	250	3,55 x 61,0	**63**	71S/6
435 520 06	**435 020 06**	0,18	6,2	166	1,27	250	7,27 x 29,0	**50**	63L/4
435 520 09	**435 020 09**	0,18	9,5	131	1,12	218	7,27 x 19,0	**50**	63L/4
435 520 15	**435 020 15**	0,18	15,5	90	1,42	118	6,00 x 9,50	**50**	71S/6
435 520 26	**435 020 26**	0,18	26,2	55	2,13	70	3,55 x 9,50	**50**	71S/6
435 530 03	**435 030 03**	0,25	3,4	413	1,02	495	9,11 x 29,0	**63**	71L/6
435 530 04	**435 030 04**	0,25	4,2	337	1,21	385	7,27 x 29,0	**63**	71S/4
435 530 05	**435 030 05**	0,25	5,8	253	1,39	340	6,00 x 39,0	**63**	71S/4
435 530 09	**435 030 09**	0,25	9,3	162	1,20	214	5,07 x 29,0	**50**	71S/4
435 530 15	**435 030 15**	0,25	15,7	115	1,45	169	6,00 x 14,5	**50**	71S/4
435 530 23	**435 030 23**	0,25	23,9	83	1,43	133	6,00 x 9,50	**50**	71S/4
435 530 40	**435 030 40**	0,25	40,1	51	2,64	79	4,69 x 7,25	**50**	71S/4
435 540 03	**435 040 03**	0,37	3,9	555	1,29	677	7,64 x 30,0	**80**	80S/6
435 540 05	**435 040 05**	0,37	5,8	391	1,72	441	7,64 x 30,0	**80**	71L/4
435 540 09	**435 040 09**	0,37	9,7	240	1,33	266	3,55 x 39,0	**63**	71L/4
435 540 13	**435 040 13**	0,37	13,0	178	1,04	198	3,55 x 29,0	**50**	71L/4
435 540 18	**435 040 18**	0,37	18,2	148	1,09	189	5,07 x 14,5	**50**	71L/4
435 540 30	**435 040 30**	0,37	30,1	99	1,14	137	4,69 x 9,50	**50**	71L/4
435 540 45	**435 040 45**	0,37	45,5	67	1,98	91	4,06 x 7,25	**50**	71L/4
435 550 05	**435 050 05**	0,55	5,8	581	1,16	652	7,64 x 30,0	**80**	80S/4
435 550 09	**435 050 09**	0,55	9,4	425	1,59	555	6,31 x 15,0	**80**	80L/6
435 550 13	**435 050 13**	0,55	13,7	264	1,15	277	2,50 x 39,0	**63**	80S/4
435 550 18	**435 050 18**	0,55	18,2	226	1,55	279	5,07 x 14,5	**63**	80S/4
435 550 22	**435 050 22**	0,55	22,9	194	1,28	266	6,00 x 9,75	**63**	80S/4
435 550 29	**435 050 29**	0,55	29,3	154	1,52	208	4,69 x 9,75	**63**	80S/4
435 550 39	**435 050 39**	0,55	39,4	115	1,19	155	4,69 x 7,25	**50**	80S/4
435 550 59	**435 050 59**	0,55	59,1	79	1,64	109	4,69 x 4,83	**50**	80S/4
435 560 09	**435 060 09**	0,75	9,1	542	1,15	817	4,94 x 30,0	**80**	80L/4
435 560 13	**435 060 13**	0,75	13,5	386	1,51	549	3,32 x 30,0	**80**	80L/4
435 560 22	**435 060 22**	0,75	22,8	251	1,35	413	4,06 x 14,5	**63**	80L/4
435 560 27	**435 060 27**	0,75	27,6	211	1,18	343	2,50 x 19,5	**63**	80L/4
435 560 34	**435 060 34**	0,75	34,0	183	1,26	343	4,06 x 9,75	**63**	80L/4
435 560 52	**435 060 52**	0,75	52,3	120	1,09	223	3,55 x 7,25	**50**	80L/4
435 560 62	**435 060 62**	0,75	62,8	101	1,26	284	6,00 x 7,25	**50**	80S/2
435 570 13	**435 070 13**	1,10	13,0	634	1,01	979	5,33 x 20,0	**80**	90S/4
435 570 18	**435 070 18**	1,10	18,5	461	1,32	689	3,75 x 20,0	**80**	90S/4
435 570 26	**435 070 26**	1,10	26,9	317	1,04	473	3,55 x 14,5	**63**	90S/4
435 570 40	**435 070 40**	1,10	40,7	226	1,30	386	4,69 x 7,25	**63**	90S/4
435 570 61	**435 070 61**	1,10	61,1	156	1,42	274	4,69 x 4,83	**63**	90S/4
435 570 76	**435 070 76**	1,10	76,4	123	1,01	206	2,50 x 7,25	**50**	90S/4
435 571 14	**435 071 14**	1,10	114,6	84	1,41	145	2,50 x 4,83	**50**	90S/4
435 580 24	**435 080 24**	1,50	24,6	485	1,19	744	3,75 x 15,0	**80**	90L/4
435 580 32	**435 080 32**	1,50	32,3	391	1,35	685	4,28 x 10,0	**80**	90L/4
435 580 47	**435 080 47**	1,50	47,0	269	1,08	471	4,06 x 7,25	**63**	90L/4
435 580 61	**435 080 61**	1,50	61,0	212	1,04	387	4,69 x 4,83	**63**	90L/4
435 581 14	**435 081 14**	1,50	114,6	115	1,03	206	2,50 x 4,83	**50**	90L/4

Other power ratings and output speeds on request.

Note for Dimensioning

Three-phase motors have a very high starting torque T_{2A}.
The max. permissible, stability related torque of the gearbox is the product of output torque and operating factor: $\mathbf{T_{max.} = T_{2\ nom.} \times f_B}$

This torque must never be exceeded.

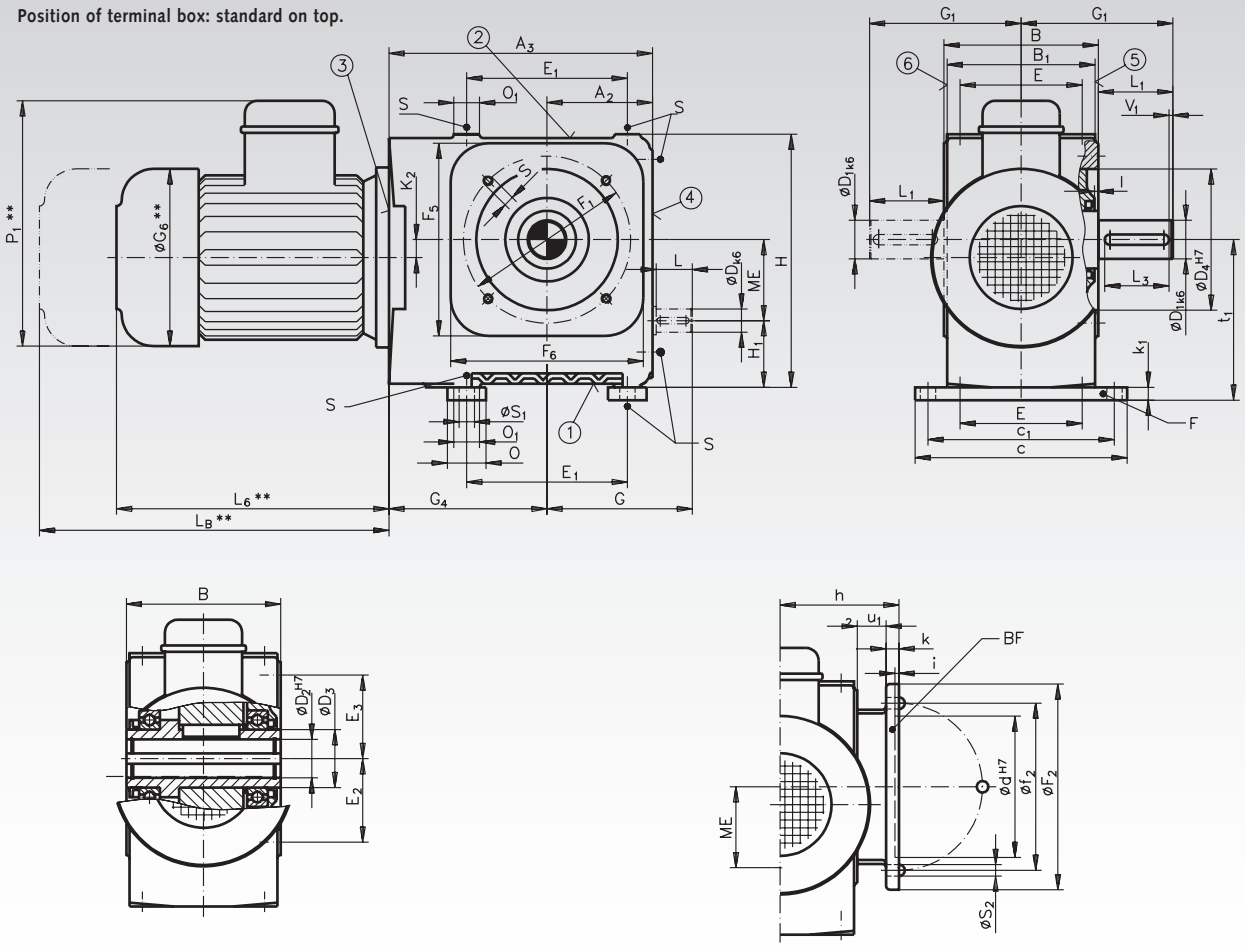
Furthermore, depending on kind of operation,

factors for shock load and acceleration must be considered.

Dimensions Table Worm Helical Geared Motors SZM/I

Output flange and foot mounting brackets can be delivered at extra charge.

Position of terminal box: standard on top.



With Hollow Shaft

Flange Version

Surfaces (1) to (6) are all machined. Apart from side (3), they can serve as mounting surfaces. The foot mountings F can be attached to surfaces (1), (2) and (4). Surfaces (5) and (6) serve to attach the flange BF. The geared motor can turn in any position. The required mounting position has to be stated in the order. Feather keys and grooves according to DIN 6885/1. Shaft ends with thread alignment according to DIN 332/2. As standard, the terminal box is mounted on side (2). It can be turned by 4x90°. On request, side (4) can accommodate the shaft end. The speed of the shaft end is calculated from n_2 x transmission ration of the worm gear stage as stated in the performance table.

Gearbox Size	ME	A_3 mm	A_2 mm	B mm	B_1 mm	C mm	C_1 mm	d mm	D_4 mm	D x L mm	D_1 x L_1 mm	D_2 mm	D_3 mm	E mm	E_1 mm
50	50	186	70	105	100	150	130	95	90	16 x 28	25 x 42	25	40	80	100
63	63	205	82	120	115	165	145	110	110	18 x 28	30 x 58	30	45	95	125
80	80	251,5	102	140	135	190	165	130	140	24 x 36	38 x 58	38	55	115	155

Gearbox Size	E_2 mm	E_3 mm	F_2 mm	F_5 mm	F_6 mm	F_1 mm	f_2 mm	G mm	G_1 mm	G_4 mm	H_1 mm	h_2 mm	H mm	i mm	l mm
50	70	50	136	132	161	110	115	100	94,5	116	50	80	170	3	3
63	87,5	62,5	160	150	150	130	130	113	118	123	52	95	197	3	3
80	120,5	71,5	200	190	190	165	165	141	128	149,5	65	110	247	3,5	3

Gearbox Size	k mm	k_1 mm	K_2 mm	L_3 mm	O mm	O_1 mm	S mm	S_1 mm	S_2 mm	t_1 mm	u_1 mm	V_1 mm
50	8	10	0,92	36	30	20	M8 x 14	12	4 x Ø 9	110	19,5	2
63	10	10	13,92	50	30	21	M8 x 14	12	4 x Ø 9	125	25	3
80	12	12	16,2	50	35	25	M10 x 17	15	4 x Ø11	157	28	3

Motor – Dimensions (mm)

Gearbox Size	Motor Size	G_6*	L_6*	L_B*	P_1*
50	**63 L**	123	187,5	238	182,5
50	**71 S/L**	138	227,5	287,5	201,5
50	**80 S/L**	156	243,5	309	238,5
50	**90 S**	176	260,5	341	248,5
50	**90 L**	176	285,5	366	248,5
63	**71 S/L**	138	227,5	287,5	201,5
63	**80 S/L**	156	243,5	309	238,5
63	**90/S**	176	261,0	341	248,5
63	**90/L**	176	285,5	366	248,5
80	**71 S/L**	138	212,0	272	201,5
80	**80 S/L**	156	233,5	299	238,5
80	**90 S**	176	250,5	331	248,5
80	**90 L**	176	275,5	356	248,5
80	**100 L**	194	325,5	406	254,5

* Dimensions may be subject to change.

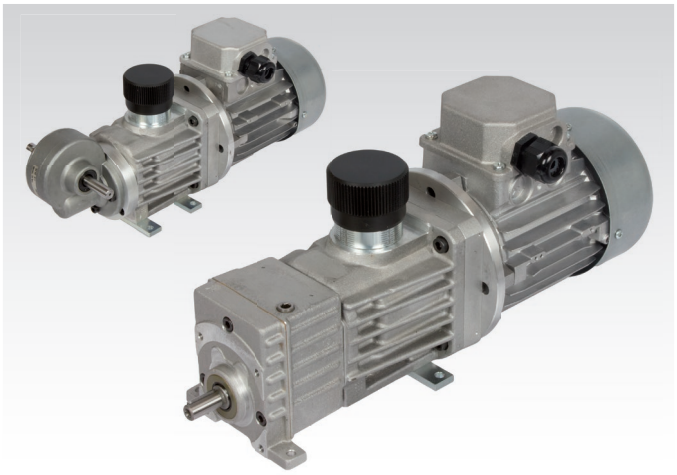
Three-Phase Motors

The following single-phase motors conform to DIN IEC 34-1.
From 0.75 kW in efficiency class IE2.
Other types (dual-speed, one-phase AC, brake motors) on request. The nominal power is calculated for continuous operation, operation mode S1, at nominal voltage and nominal speed calculated for a max. temperature of the cooling agent of 40°C and an altitude of 1,000 m above sea level.
The motors are supplied with a normal voltage of 230/400 V (permiss. voltage fluctuation +6% and -10%). Other voltages and frequencies available on request.

Size	Nominal Power kW	Nominal Speed min^{-1}	Nominal Current at 230/400 V A	Power Factor cos φ	Nom.Torque Nm	Starting Torque to nom.Torque M_A/M_N	Starting Current to nom. Current I_A/I_N
			3000 min^{-1}				
80S/2	0,75	2730	3,53/2,04	0,80	2,6	4,4	8,3
			1500 min^{-1}				
63L/4	0,18	1315	1,3/0,75	0,67	1,26	2,2	2,5
71S/4	0,25	1365	1,4/0,83	0,72	1,7	2,0	3,1
71L/4	0,37	1340	1,9/1,11	0,76	2,5	1,8	3,1
80S/4	0,55	1340	2,8/1,6	0,77	3,8	1,75	3,1
80L/4	0,75	1345	3,6/2,1	0,77	5,2	4,0	5,8
90S/4	1,1	1385	4,8/2,85	0,78	7,5	3,1	6,4
90L/4	1,5	1385	6,4/3,7	0,80	10,1	3,6	6,7
			1000 min^{-1}				
63L/6	0,12	845	1,1/0,6	0,65	1,29	1,9	1,9
71S/6	0,18	885	1,3/0,75	0,68	1,94	1,6	2,4
71L/6	0,25	890	1,6/0,95	0,69	2,58	1,7	2,6
80S/6	0,37	900	2,1/1,2	0,71	3,84	1,8	3,1
80L/6	0,55	895	2,85/1,65	0,74	5,71	1,8	3,2
100L/6	1,5	930	6,95/4,0	0,74	15,1	2,0	6,2

Continuously Variable Geared Motors MUN/I

- Motor 230/400 V, 50 Hz.
- Input power 0,18 kW.
- Output torque to 70 Nm.
- Output speed 0.17 to 4200 min^{-1}
- Adjustment range 1 : 9.
- Adjustable with motor stopped.
- Constant speed, smooth running, long life time and high efficiency.
- Lubricated for life, thus maintenance free.
- Can be mounted in any position (apart from Size 250 and 260).



Working Principle

Two axially-parallel hollow-cone disks are mounted, with pre-tension, around a steel ball. The ball rolls, at almost punctiform point of contact, over the hollow-cone disks and transfers the power from the input shaft - maintaining the sense of rotation - onto the output shaft. The system works at both rotational directions. A slidable ball track on the control device continuously changes the transmission ratio between input and output shaft. This allows a adjustment range from 3 : 1 to 1 : 3, i.e. a total value of R = 9. The adjustment of the speed is done with an adjustment screw. To pass through the entire adjustment range 10 full turns are required.

Attachments for the Input Side

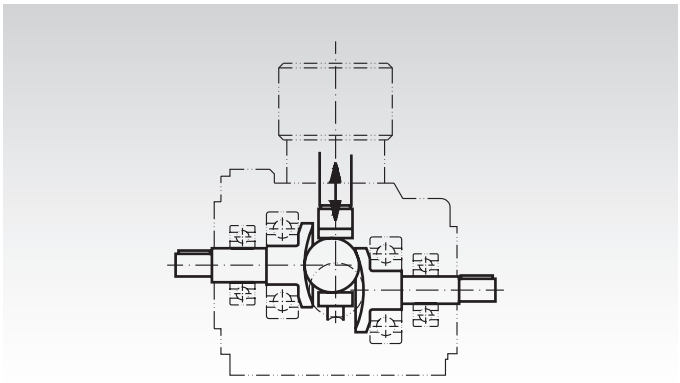
Attached Motor
The input is done by a B14 standard motor. As standard, 4-pole, three-phase motors, three-phase explosion proof or one-phase AC motors are used. The motor dimensions stated in the dimensions tables refer to three-phase standard motors.
Attention
When three-phase explosion proof or one-phase AC motors are used, the overall dimensions change. Please ask for the respective dimensions tables!

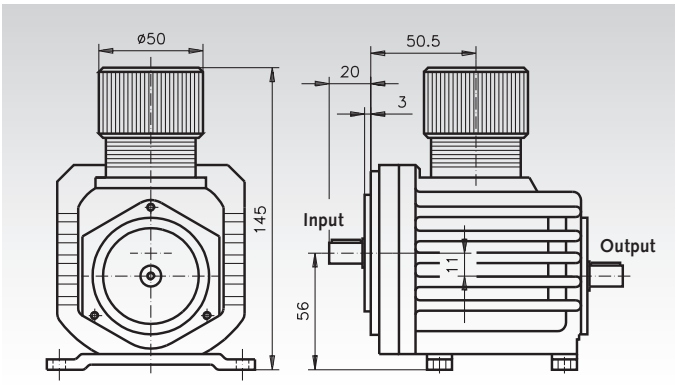
Attachments for the Output Side

To adjust the output speeds to the specific circumstances the following can be mounted:
- Helical gear unit, 1 to 7 stage.
- Helical and, on request, bevel gear units.
- Worm gear units.

Standard Adjustment Device

To pass through the entire adjustment range 10 full turns of the handwheel are required. The adjusting collar is marked with a linear scale of 1 - 10, which is however not directly connected to the output speed, as the adjustment graph shows an almost logarithmic curve progression.





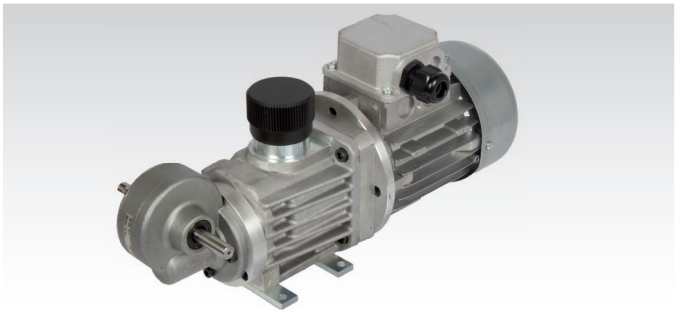
Version B: Input Power 0,18 kW, Variable Range 1 : 9

Ordering details: z. B.:
Type, Version, Output Speed, Product No.

Product No.	Output Speeds n_2 at n_1 = 1400 min^{-1} min^{-1}	Output Torque M_2 Nm	Size	Gear Ratio i	Dimensional Drawing	Weight kg
450 202 00	155 - 1400	2,5 - 0,75	21	3	2	6,8
450 202 01	92 - 824	4,3 - 1,3	21	5,1	2	6,8
450 202 02	71 - 640	5,6 - 1,7	21	6,6	2	6,8
450 203 00	58 - 522	6,6 - 2,0	22	8,0	3	7,3
450 203 01	34 - 306	11,2 - 3,3	22	13,7	3	7,3
450 203 02	26 - 234	14,6 - 4,3	22	17,8	3	7,3
450 206 00	22 - 194	17,2 - 5,1	239	21,6	4	7,8
450 205 00	16,5 - 149	*10 - 6,7	24	28	5	6,7
450 206 01	12,6 - 113	29 - 8,5	239	37	4	7,8
450 205 02	10,8 - 97	*10 - *10	24	43	5	6,7
450 206 02	9,7 - 87	*30 - 11,5	239	48	4	7,8
450 205 03	9 - 81	*10 - *10	24	51,3	5	6,7
450 207 01	4,7 - 42	*30 - 23	249	100	4	7,8
450 207 02	3,5 - 31	*30 - *30	249	130	4	7,8
450 209 00	3 - 27	*30 - *30	259	158	4	7,9
450 213 01	1,7 - 15	*70 - 64	250	272	6	9,5
450 213 02	1,3 - 12	*70 - *70	250	353	6	9,5
450 212 01	0,63 - 5,7	*70 - *70	260	735	6	9,7
450 214 00	0,48 - 4,3	*30 - *30	269	955	4	7,9
450 215 00	0,46 - 4,16	*10 - *10	27	1006	5	6,8
450 215 01	0,30 - 2,7	*10 - *10	27	1540	5	6,8
450 215 02	0,17 - 1,5	*10 - *10	27	2806	5	6,8

*Constructive speed limit of the tranmission gearing. Dimensional drawings page 755.

Version E: Input Power 0,18 kW, Variable Range 1 : 9 with Worm Gear Units



Ordering details: z. B.:
Type, Version, Output Speed, Product No.

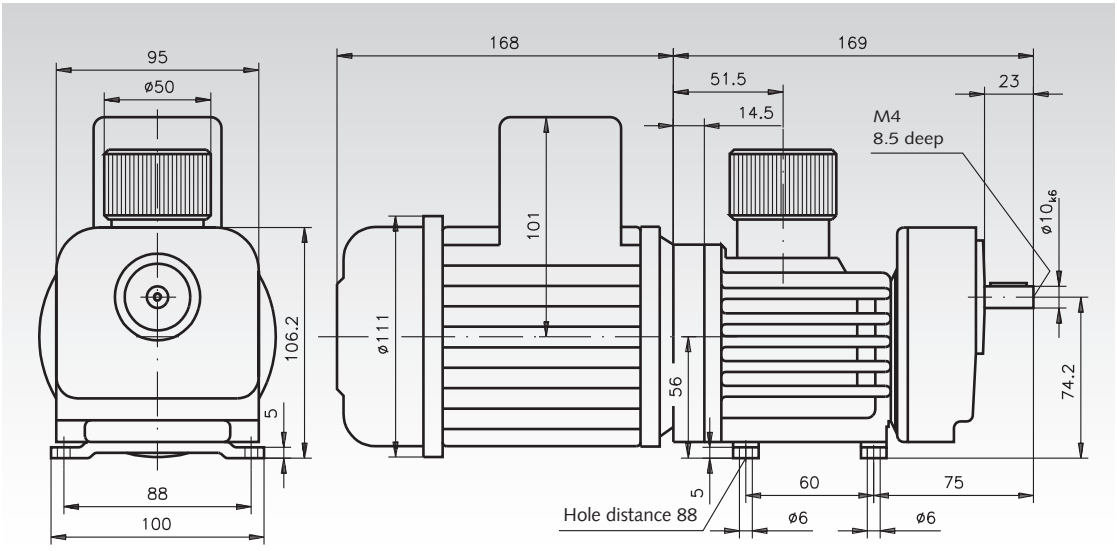
Product No.	Output Speeds n_2 at n_1 = 1400 min^{-1} min^{-1}	Output Torque M_2 Nm	Size	Gear Ratio i	Dimensional Drawing	Weight kg
450 501 00	92 - 830	2,9 - 0,87	2S1	5	9	6,7
450 501 01	67 - 600	4,1 - 1,2	2S1	7	9	6,7
450 501 02	47 - 420	5,4 - 1,6	2S1	10	9	6,7
450 501 04	31 - 280	8,1 - 2,4	2S1	15	9	6,7
450 501 05	26 - 233	8,1 - 2,4	2S1	18	9	6,7
450 501 06	19 - 174	*9,2 - 2,9	2S1	24	9	6,7
450 501 08	15 - 135	*10,3 - 3,2	2S1	30	9	6,7
450 501 09	12 - 108	*11,4 - 4,1	2S1	38	9	6,7
450 501 10	8,5 - 76	*10,4 - 4,5	2S1	55	9	6,7
450 501 12	6,2 - 56	*7,3 - 5,1	2S1	75	9	6,7

*Constructive speed limit of the tranmission gearing. Dimensional drawings page 755.

Model B3, Feather Key according to DIN 6885/1 (all Dimensions in mm)

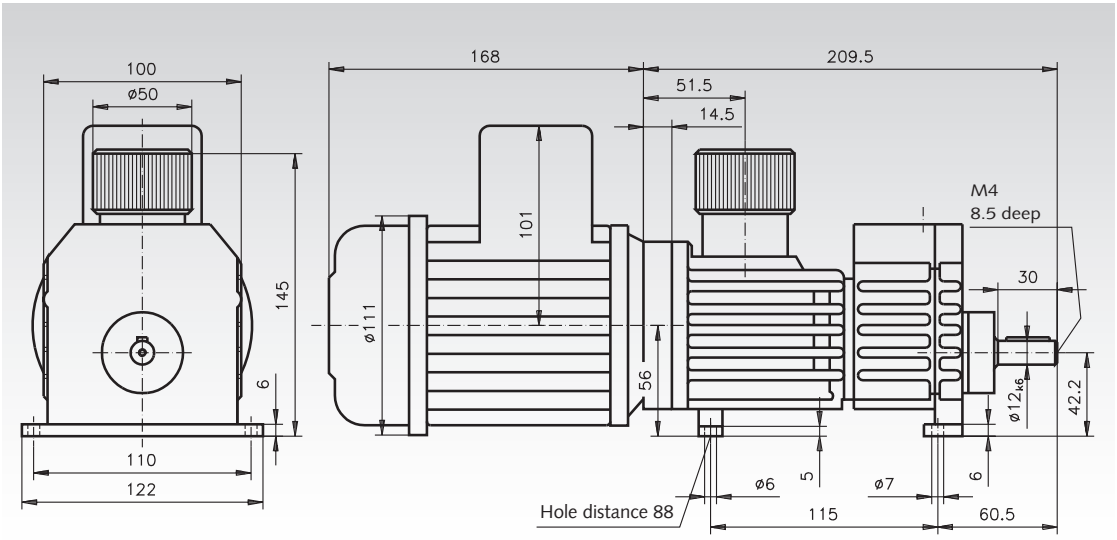
Dimens. No. 2

Size 21



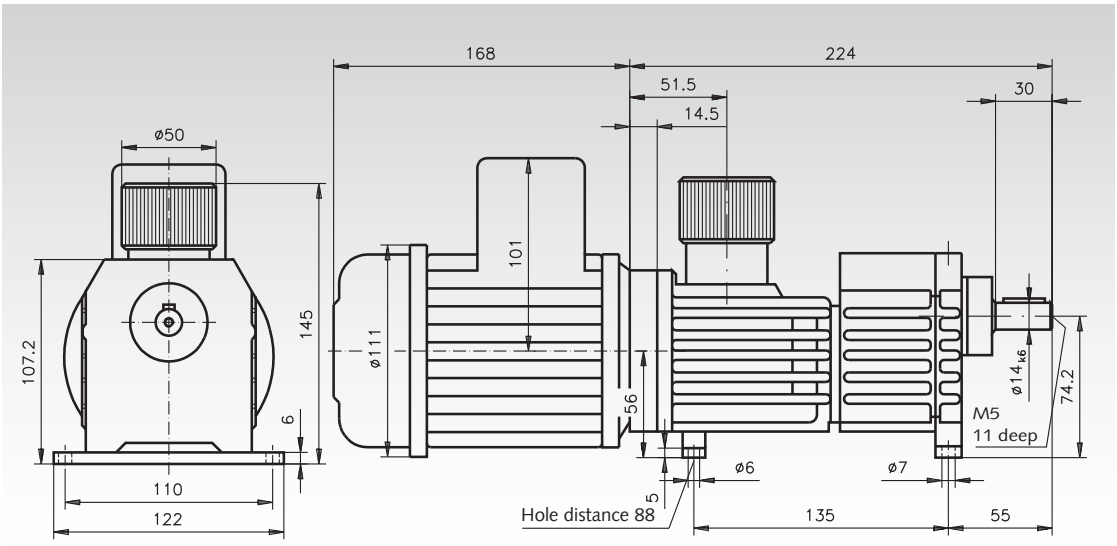
Dimens. No. 3

Size 22



Dimens. No. 4

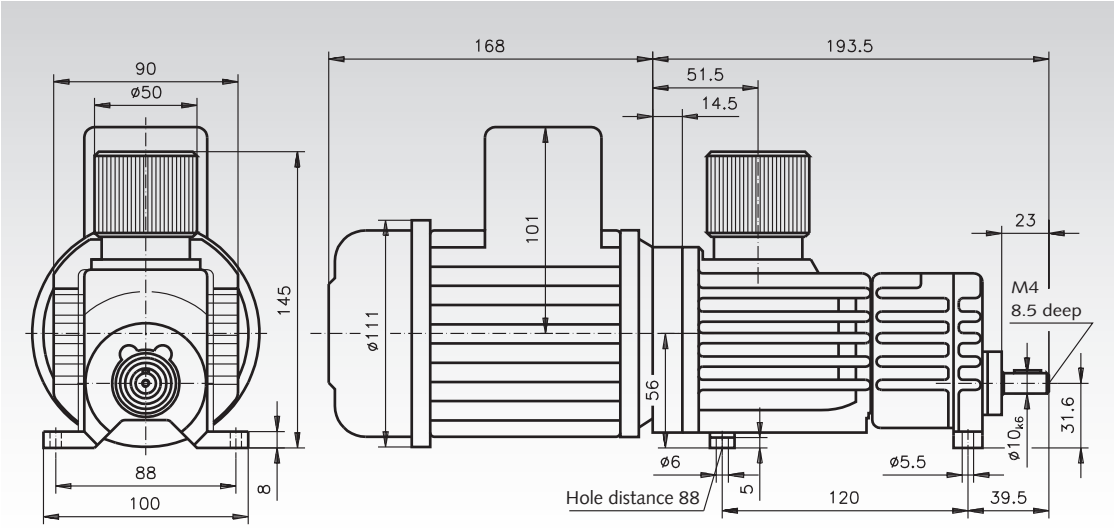
Size 239 - 269



Model B3, Feather Key according to DIN 6885/1 (all Dimensions in mm)

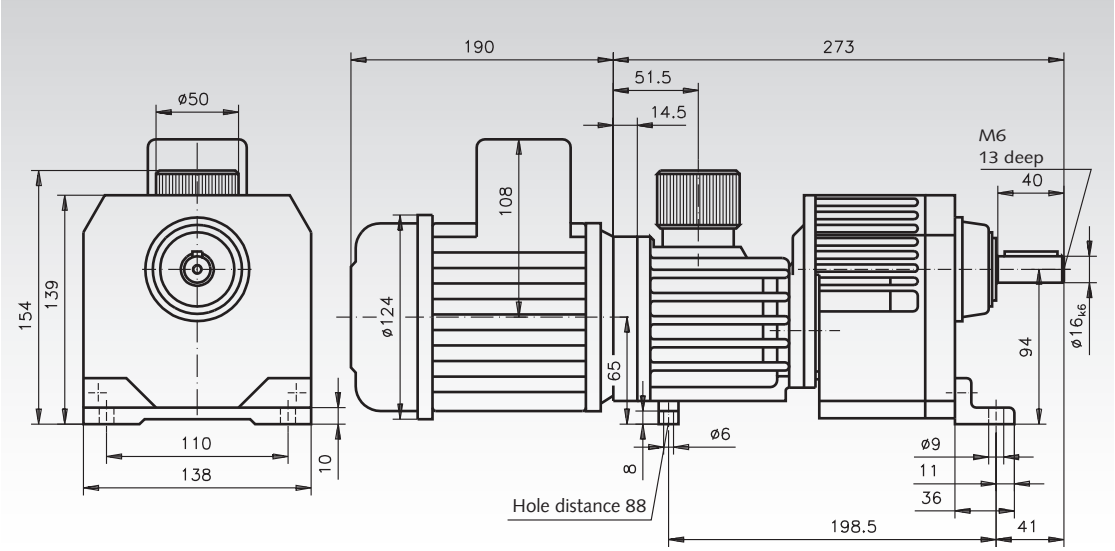
Dimens. No. 5

Size 24 + 27



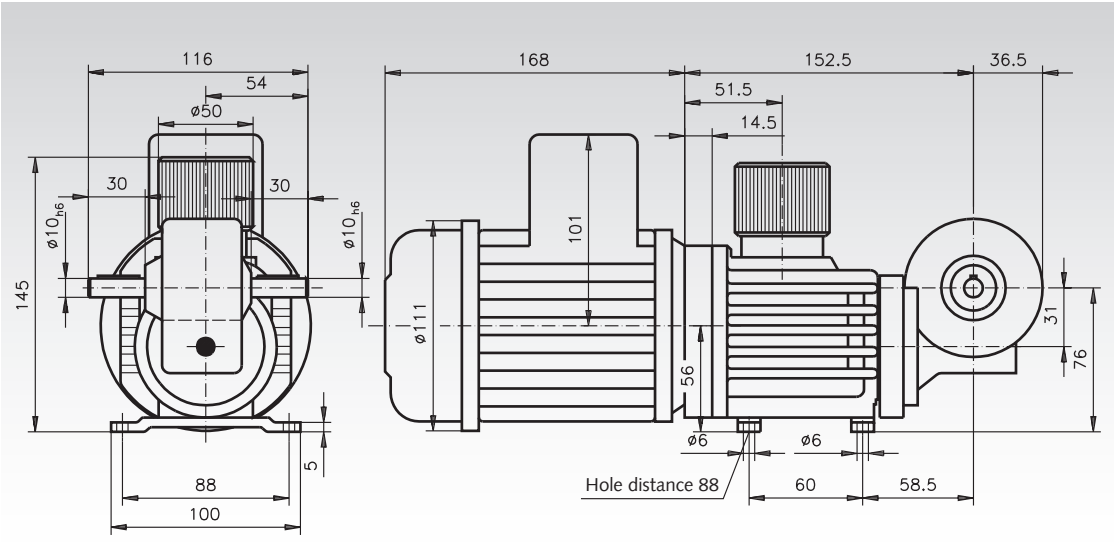
Dimens. No. 6

Size 250 + 260



Dimens. No. 9

Size 2S1



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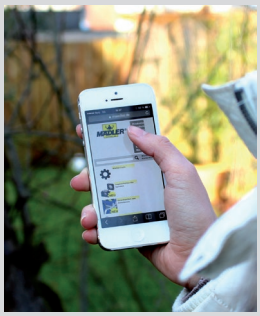

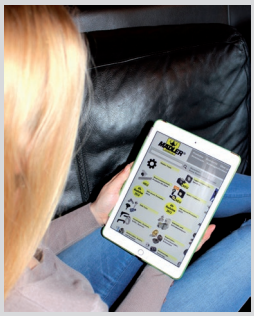

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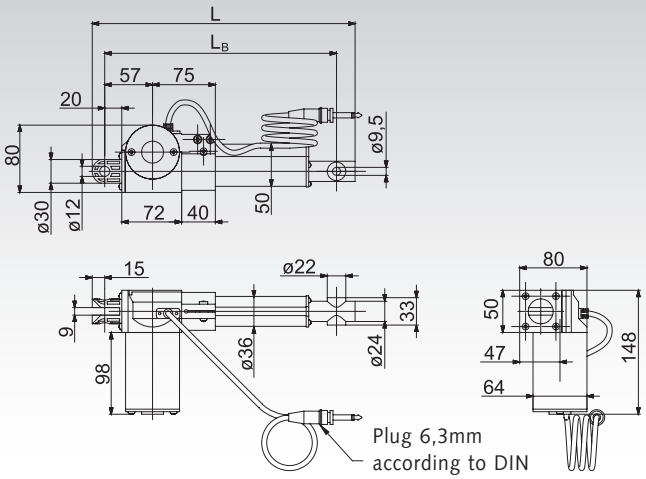
...we keep things moving

Linear Actuator Systems GR/I

General description:
Linear actuator, control box and hand operator make a ready-to-operate linear drive.
Voltage supply 230V or 24V on choice.
Up to 4 linear actuators can be operated with only one hand operator.
Usage: Universal use, for operating windows, gates, and for many other processes with swivel motion or linear motion.

Linear actuators, control box and hand operator have to be ordered separately.

Linear Actuators GR/I



2 speeds.
8 stroke lengths. Other lengths in 50mm steps on request.
To be used with 230V AC or 24V DC-control box.
Motor voltage 24V DC. Protection class IP 43. Cabel length approx. 1,2 m.
Up to 4 actuators can be operated separately with only one hand operator.
Linear actuators, control box and hand operator have to be ordered separately.

Ordering details: e.g.: Prod.-No. 475 130 10, Linear actuator 5 mm/sec, stroke 100 mm

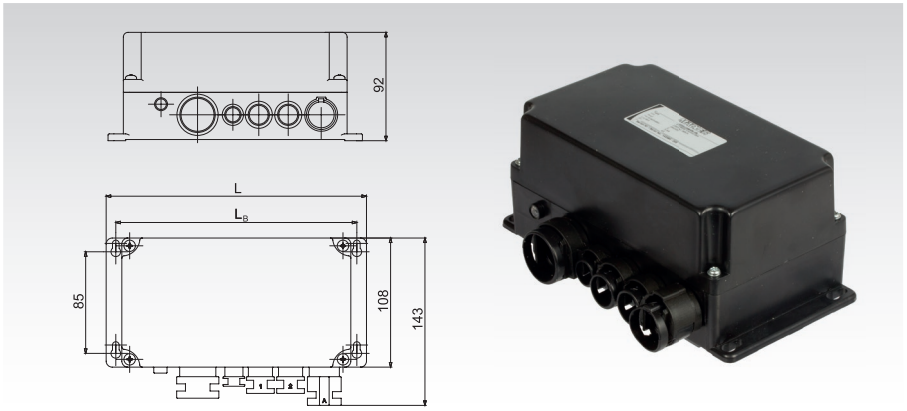
Product No.	Speed mm/sec	Stroke length mm	max. Load tensil *L N	max. Load compressing * N	Length mm	Hole distance L_B mm	Weigth kg
475 130 10	5	100	6000	6000	315	275	1,98
475 130 20	5	200	6000	6000	415	375	2,12
475 130 30	5	300	6000	3900	515	475	2,40
475 130 40	5	400	6000	2300	615	575	2,62
475 130 50	5	500	6000	1500	715	675	2,78
475 130 60	5	600	6000	1100	815	775	2,98
475 130 80	5	800	6000	610	1015	975	3,40
475 131 00	5	1000	6000	400	1215	1175	3,80
475 140 10	20	100	2000	2000	315	275	1,98
475 140 20	20	200	2000	2000	415	375	2,12
475 140 30	20	300	2000	1300	515	475	2,40
475 140 40	20	400	2000	766	615	575	2,62
475 140 50	20	500	2000	509	715	675	2,78
475 140 60	20	600	2000	366	815	775	2,98
475 140 80	20	800	2000	202	1015	975	3,40
475 141 00	20	1000	2000	133	1215	1175	3,80

* Static and dynamic.

Control Boxes for Linear Actuators GR/I

Material: Housing in shock resistant, black plastic.

For voltage supply and processing the actuators.
On choice for 230V AC or 24V DC.
On choice for 1 actuator, 2 actuators or up to 4 actuators.
Limit switch and overload protection are integrated.
230V-version with IEC power cord with plug, cable length approx. 2.5 m.
24V-version with 2 m-connecting cable.
Protection class IP 43.



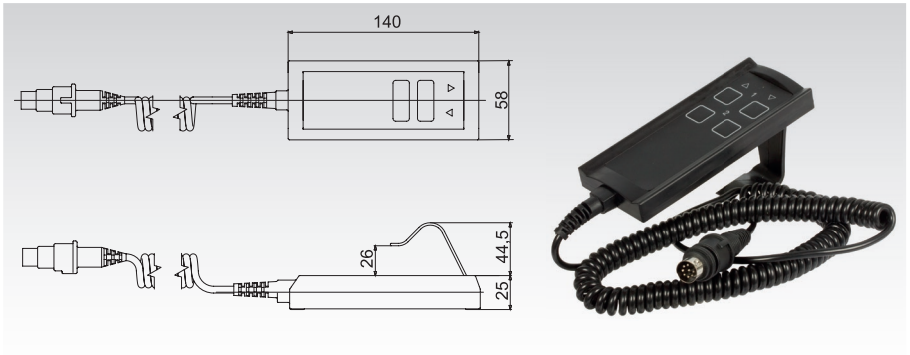
Ordering details: e.g.: Prod.-No. 475 190 01, control box 230V for 1 actuator

Product No.	Voltage supply	Suitable for	Length L mm	Distance L_B mm	Weight kg
475 190 01	230V AC	1 actuator	216	200	1,60
475 190 02	230V AC	1-2 actuators	216	200	1,66
475 190 04	230V AC	1-4 actuators	320	306	1,98
475 191 01	24V DC	1 actuator	216	200	0,80
475 191 02	24V DC	1-2 actuators	216	200	0,86
475 191 04	24V DC	1-4 actuators	320	306	1,18

Hand Operators for Linear Actuators GR/I

Material: Housing in shock resistant, black plastic.

For operating the linear actuators.
To be used with 230V AC or 24V DC control box.
On choice for 1 actuator, 2 actuators or up to 4 actuators.
The actuators can be operated separately by holding down the key.
With spiral cable, length 1m, tensiled approx. 2m.
Protection class IP 54.



Ordering details: e.g.: Prod. No. 475 192 01, Hand operator for 1 actuator

Product No.	Suitable for	Number of Keys	Weight kg
475 192 01	1 actuator	1 pair of keys	0,20
475 192 02	1-2 actuators	2 pair of keys	0,22
475 192 04	1-4 actuators	4 pair of keys	0,24

Alternatively to the Hand Operator: Connecting cable for customer`s controller.

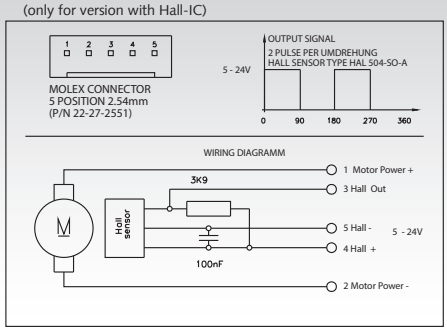
Linear Drives (lifting devices) SFL 12 V - 24 V

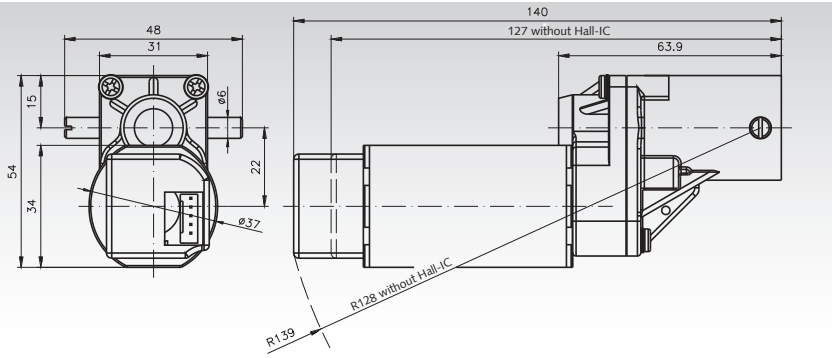
Housing: Motor: Steel, zinc-plated. Gearbox: Aluminium.
Can be mounted in any position.
Gearbox: Metal gears, trapezoidal thread nuts made from plastic.
Bearing: Plain bearings.
Lubrication: Spindle nut must be greased by the customer.
Motor: DC motor 12 V or 24 V switching voltage, interference-free.
Change the direction of rotation by switching the polarity.
Protection class acc. to EN 60529: IP 30. Operating mode as per VDE 0530: S2.

Universal use linear drives, e.g. for actuating devices.
Either with or without Hall-IC for positioning, end position limit or speed control. For Spindle Tr. 10 x 3 mm.
The required spindle length depends on the required stroke length.
The spindles have to be ordered separately. Mounting eye and stop block qfor spindle ends are included with the linear drive.

Ordering Details: e.g.: 1 Piece Product No. 475 201 01, Linear Drive 1000N without Hall IC (Spindles have to be ordered separately).

Wiring diagram
(only for version with Hall-IC)





Product No. without Hall-IC	Product No. with Hall-IC	F Nom [1] N	I Nom [2] A	12 Volt-Operation F max [3] N	V [4] mm/s	ED [5] %	24 Volt-Operation F max [3] N	V [4] mm/s	ED [5] %	ratio i	Hall Pulses per linear motion puls/mm	Weight g
475 201 01	**475 201 11**	1000	1,0	-	-	-	1700	5,0	70	50:1	33,3	500
475 201 02	**475 201 12**	1200	3,2	600	5,0	50	2100	10,0	30	50:1	33,3	500
475 201 03	**475 201 13**	400 (200)*	1,5 (0,95)*	300	8,6	80	700	18,5	50	12:1	8,0	500
475 201 04	**475 201 14**	400	3,6	600	20,0	50	800	40,0	30	12:1	8,0	500

[1] Nominal lifting power. [2] Nominal current. [3] Maximum lifting power. [4] Idle speed. [5] Maximum duty cycle.
* Datas in brackets are valid for 12V-Operation.

Speed controllers Page 696

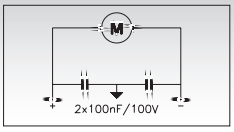
Connecting Cable for Linear Drives with Hall-IC

Product No. 475 201 10 Connecting cable with one Molex plug for linear drives SFL with Hall-IC, length 500mm

Note

All values are averages, measured with the motor cold. Deviations of 10% are possible. To prevent the gearbox from being overloaded, the stated limit loads must not be exceeded.
Important: The thread of the spindle nut has to be greased by the customer!

Factory interference suppression



Spindles for linear drives (lifting devices) SFL

Material: Choice of C15 Steel or Stainless Steel 1.4305.

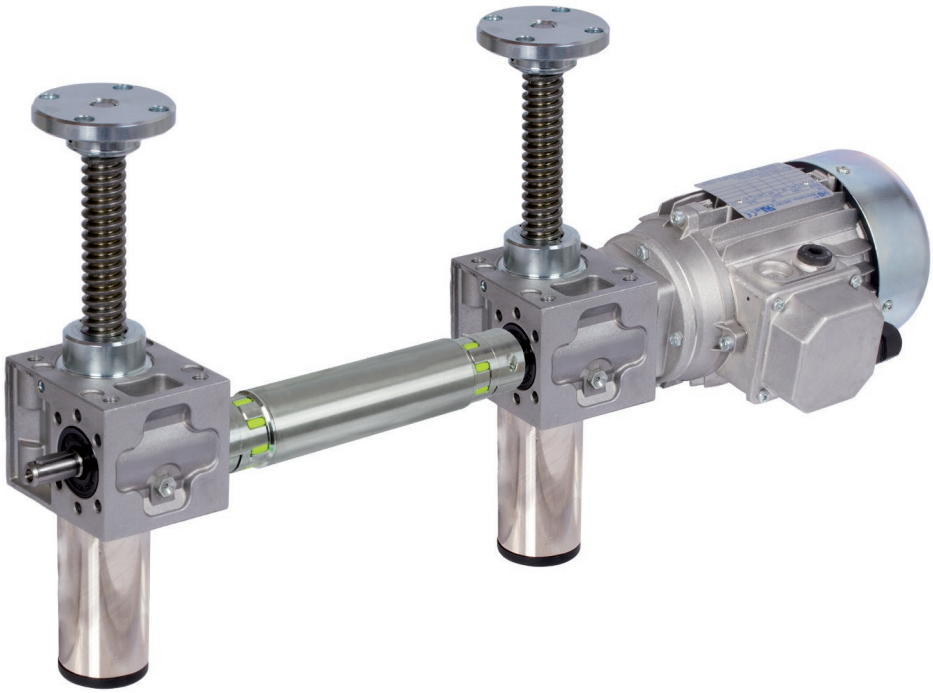
STAINLESS

Design: Either ready-to –use for 300mm stroke lengths or by the metre for further processing by the customer.
Caution: Due to kinking, the max stroke length under compressive loads is limited to 300 mm.
The spindle has to be adequately lubricated before screwing in and operating (with normal machine grease).
Mounting eye and stop block are included with the linear drive.

Ordering Details: e.g.: 1 Piece Spindle Product No. 475 201 30 for stroke lengths 300mm

Product No.	Length mm	Material	Weight g	Design
475 201 30	383	Steel C15	230	Ready-to-Install. For stroke lengths 300mm.
640 010 00	1000	Steel C15	600	Sold by the metre, for further processing by the customer.
640 990 10	1000	Stainless Steel	600	Sold by the metre, for further processing by the customer.

Lifting Devices & complete Systems



MÄDLER® is not only a supplier for single screw jack gearboxes and motors. We also deliver complete lifting systems, ready to install.

- Screw jacks with cube housing.
- Screw jacks with classic housing.
- Safety nuts.
- Foot mounted motors (B3).
- Face-mounted motors (B14) with adaptor and elastic coupling.
- Backlash-free couplings.
- Bevel gearboxes.
- Connecting shafts.
- Additional parts (bellows, flange plates, hand wheels,etc).

Actuators, control boxes and hand operators have to be ordered seperately.

Ready assembled according your wishes!

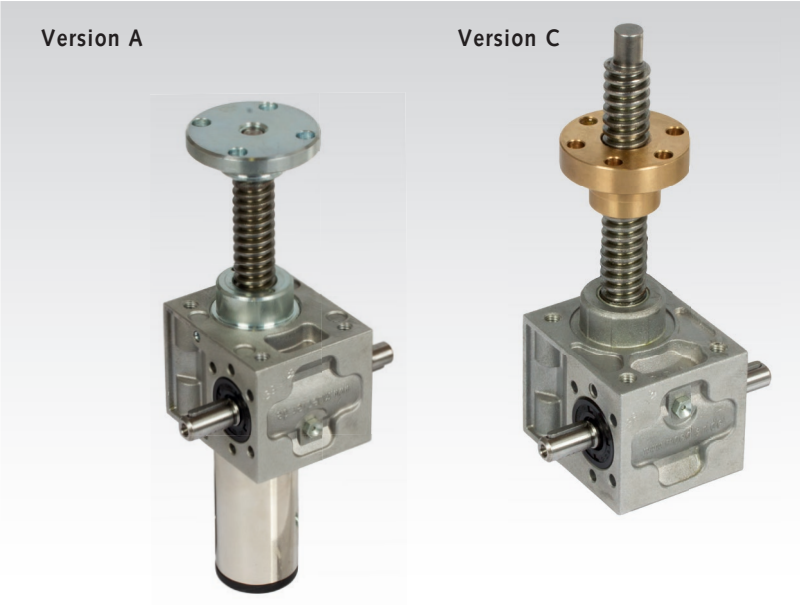
Worm Gear Screw Jacks NP/I

Housing: Up to size 3 made from aluminium alloy in die-cast version. Size 4 made from grey or spheroidal cast iron. All sides machined. As standard filled with lubricant.

Gearing: Worm made from ETG100, Gear made from Gbz12. Self-locking to a certain extend. Vibration, an increase in the spindle pitch or the use of rolling screw elements release the self-locking. In this case, e.g., a brake motor should be included in the system. For lower stroke speeds, worm gear sets with higher transmission ratios can be supplied on request.

Spindle: Material C15, from size 4 C45. On request also available as left-hand, stainless steel or ball screw version.

Protective sleeve: The versions A and B are, unless stated otherwise in the order, supplied with a protective sleeve.



Versions

Version A: With this standard version the threaded spindle moves 1 mm in axial direction with every full rotation of the worm shaft. The spindle has to be secured against twisting.

Version B: Is the same as version A, but inside the gear unit a groove secures the spindle over its entire length against twisting. Thus the load can simply be applied.

Version C: In this version the spindle is fixed to the worm gear. The axial movement is taken over by the threaded nut running outside the gear unit (also 1 mm stroke per full rotation of the worm shaft).

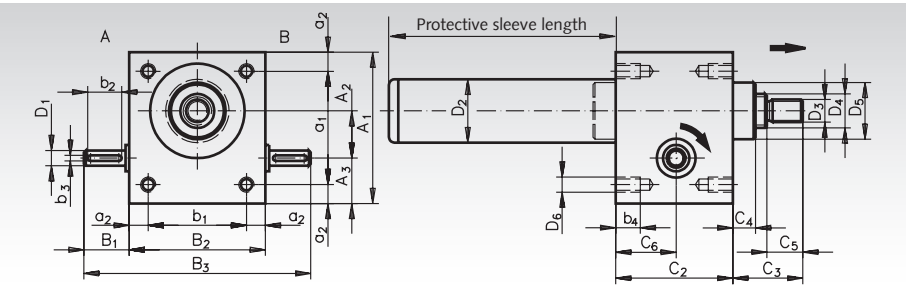
Versions A and B are avaliable with an optional spindle end safety feature. This means the threaded spindle is locked before the safety sleeve is mounted, to limit the stroke in extended position so that the spindle cannot be screwed out of the gear unit. Attention: this safety feature means the safety sleeve is by about 20 mm longer.

The product numbers below only refer to the basic gear units without spindle. Please ask for the price of the complete unit including spindle and accessories as, e.g., flange plate/travelling nut, bellow or coil spring cover, fastening strips. On request a version for lower stroke speed can be supplied.

Technical Data and Dimensions Tables

Version A: Standard version.

Version B: With anti-rotation guide.



Ordering details: e.g.: Prod. No. Type, Size, Stroke Length, accessories

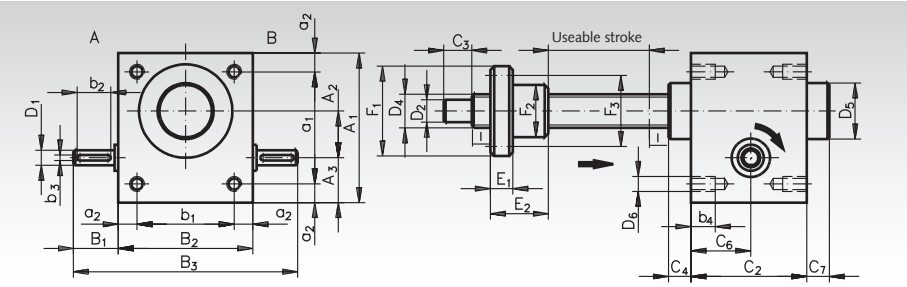
Product No. Vers. A	Product No. Vers. B	Size	max. Stroke Force N	D_4 Spindle	Efficiency %	Stroke[1] mm	MD[2] Nm	A_1 mm	A_2 mm	A_3 mm	a_1 mm	a_2 mm	B_1 mm	B_2 mm	B_3 mm
475 000 00	**475 006 00**	0	2500	Tr.16x4	33	1	1,5	64	22,62	17,38	48	8	20	54	94
475 001 00	**475 011 00**	1	5000	Tr.18x4	33	1	3,2	80	25	24	60	10	24	72	120
475 002 00	**475 012 00**	2	10000	Tr.20x4	31	1	7	100	32	28	78	11	27,5	85	140
475 003 00	**475 013 00**	3	25000	Tr.30x6	31	1	16	130	45	31	106	12	45	105	195
475 004 00	**475 014 00**	4	50000	Tr.40x7	28	1	34	180	63	39	150	15	47,5	145	240

Size	b_1 mm	b_2 mm	b_3 P9 mm	b_4 mm	C_2 mm	C_3 mm	C_4 mm	C_5 mm	C_6 mm	D_1 h6 mm	D_2 mm	D_3 mm	D_5 mm	D_6 mm	Protective Sleeve[3] mm	Weight[4] kg
0	38	16	3	11	50	30	12	15	25	9	33,5	M10	30	M6	Stroke +20 (45)	0,6
1	52	18	3	13	62	35	12	19	32	10	33,5	M12	30	M8	Stroke +20 (48)	1,2
2	63	20	5	15	75	45	18	19	37	14	42	M14	39	M8	Stroke +30 (55)	2,1
3	81	36	5	15	82	50	23	22	41	16	50	M20	46	M10	Stroke +30 (60)	6
4	115	36	6	16	117	65	32	29	59	20	65	M30	60	M12	Stroke +50 (85)	17

[1] Stroke pro full rotation of the input shaft. [2] Required torque at max. load (only under optimum conditions, with run-in spindle).
[3] Length in brackets for version with spindle end safety feature. [4] Only weight of gearbox without spindle and accessories.

Technical Data and Dimensions tables

Version C: Travelling nut version.



Ordering details: e.g.: Prod. No. Type, Size, Stroke Length, Accessories

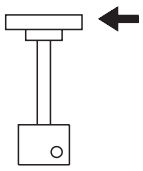
Product No. Version C	Size	Max. Stroke Force N	D_4 Spindle	Degree of Efficiency %	Stroke* mm	MD** Nm	A_1 mm	A_2 mm	A_3 mm	a_1 mm	a_2 mm	B_1 mm	B_2 mm	B_3 mm
475 020 00	0	2500	Tr.16x4	33	1	1,5	64	22,62	17,38	48	8	20	54	94
475 021 00	1	5000	Tr.18x4	33	1	3,2	80	25	24	60	10	24	72	120
475 022 00	2	10000	Tr.20x4	31	1	7	100	32	28	78	11	27,5	85	140
475 023 00	3	25000	Tr.30x6	31	1	16	130	45	31	106	12	45	105	195
475 024 00	4	50000	Tr.40x7	28	1	34	180	63	39	150	15	47,5	145	240

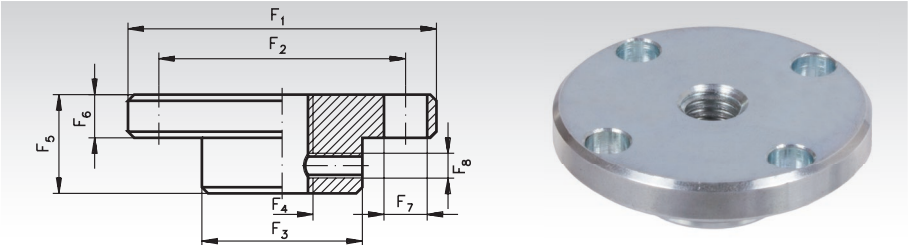
Size	b_1 mm	b_2 mm	b_3^{P9} mm	b_4 mm	C_2 mm	C_3 mm	C_4 mm	C_6 mm	C_7 mm	l mm	D_1^{h6} mm	D_2^{j6} mm	D_5 mm	D_6 mm	E_1 mm	E_2 mm	F_1 mm	F_2^{h9} mm	F_3 mm	Mounting Bore Travelling Nut	Weight only Gearbox kg
0	38	16	3	11	50	12	12	25	17	10	9	10	30	M6	10	25	45	25	35	6 x Ø6	0,6
1	52	18	3	13	62	15	12	32	17	10	10	12	30	M8	12	44	48	28	38	6 x Ø6	1,2
2	63	20	5	15	75	20	18	37	23	15	14	15	39	M8	12	44	55	32	45	6 x Ø7	2,1
3	81	36	5	15	82	25	23	41	28	20	16	20	46	M10	14	46	62	38	50	6 x Ø7	6
4	115	36	6	16	117	30	32	59	37	25	20	25	60	M12	16	73	95	63	78	6 x Ø9	17

* Stroke pro full rotation of the input shaft.
** Required torque at max. load (only under optimum conditions, with run-in spindle).

Accessories: Flange Plates for Version A and B

Material: Steel 16MnCr5.

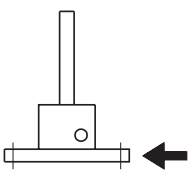


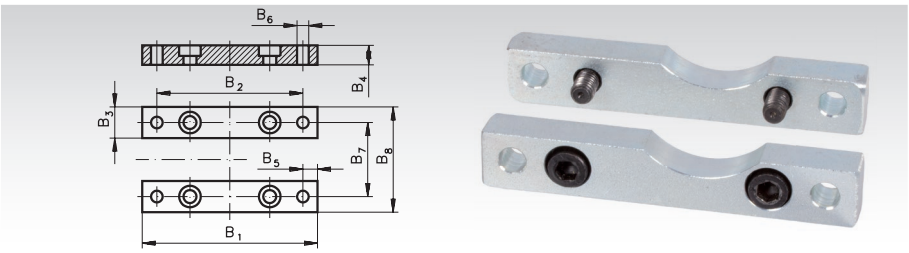


Size	F_1 mm	F_2 mm	F_3 mm	F_4	F_5 mm	F_6 mm	F_7 mm	F_8	Weight kg
0	50	40	26	M10	16	7	7	M4	0,1
1	65	48	29	M12	20	7	9	M5	0,2
2	80	60	39	M14	21	8	11	M6	0,3
3	90	67	46	M20	23	10	11	M8	0,6
4	110	85	60	M30	30	15	13	M8	1,3

Accessories: Fastening Strip Sets

Material: Steel St52.



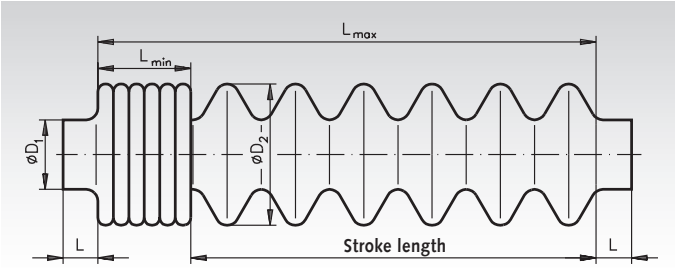


Size	B_1 mm	B_2 mm	B_3 mm	B_4 mm	B_5 mm	B_6 mm	B_7 mm	B_8 mm	Weight kg
0	90	75	15	10	7,5	6,5	38	54	0,1
1	120	100	20	10	10	8,5	52	72	0,3
2	140	120	20	10	10	8,5	63	85	0,5
3	170	150	25	12	10	11	81	105	1
4	230	204	30	16	13	13,5	115	145	1,8

Accessories For Worm Gear Screw Jacks

Bellows FB (Standard Version) Material: Molerit TH 59 for Worm Gear Screw Jacks Version A + B

Bellows protect the spindles against dirt and reduce the danger of accidents.
Not yet available for size 0.



The product number is only required if the bellows is to be delivered separately (not on the gear unit).

Product No.	Size	D_1 mm	D_2 mm	L mm	L_{min} mm	L_{max} mm	max. stroke [1] mm	Spindle length extension [2] mm	Weight kg
475 001 10	1	30	61	15	40	215	175	36	0,1
475 002 10	2	39	80	10	80	420	340	66	0,1
475 003 10	3	46	90	10	70	420	350	40	0,2
475 004 10	4	60	116	20	120	750	630	120	0,8

[1] For other stroke lengths on request. Alternatively with coil spring cover.
[2] With other stroke lengths the dimensions change! Extension has to be calculated for the dimensions C_3 Page 762.

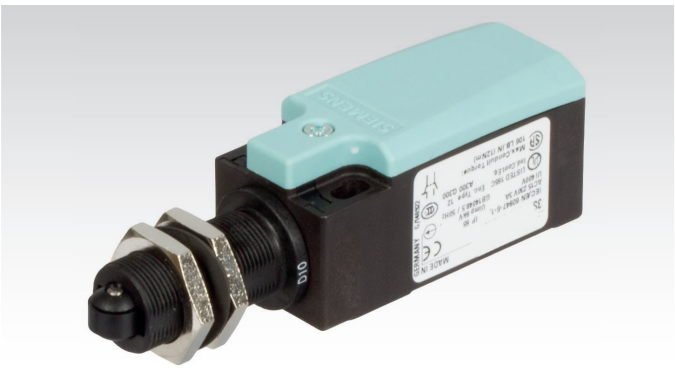
End Switches ES-2 with Roller Push Rod

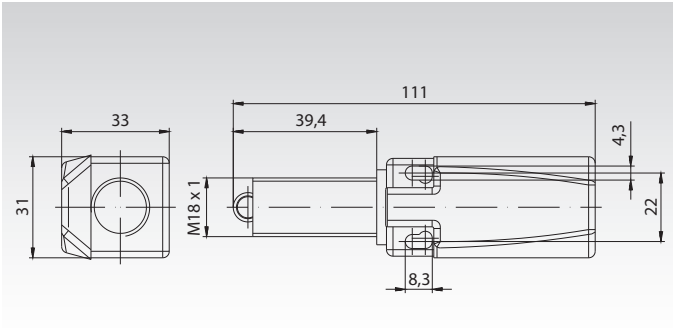
Optional Accessories for Worm Gear Screw Jacks. For end position switching off. Mounting for screw jacks version A and B in protective tube. Special versions of protective tube and spindle are required for this. The end switches have to be ordered together with the jack.

Ordering Details: e.g.: Worm Gear Screw Jack Type ... with two end switches ES-2 mounted in the protective tube.

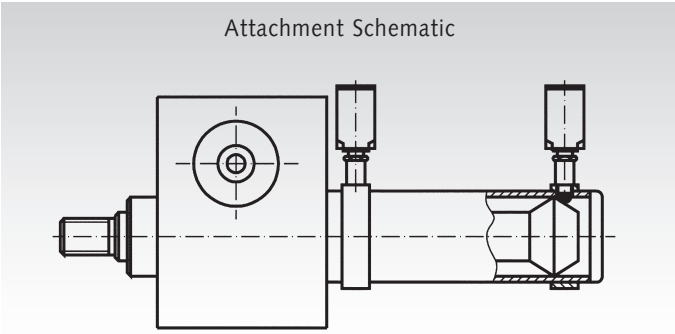
Dimensions: Overall length x width x height = 111 x 31 x 33mm.
NC and NO contacts switch simultaneously.

Minimum operating rate 0.01m/s.
Fastening threads M18.
Wiring M20x1.5
Protection class IP65.





Attachment Schematic



Connecting Shafts Page 766

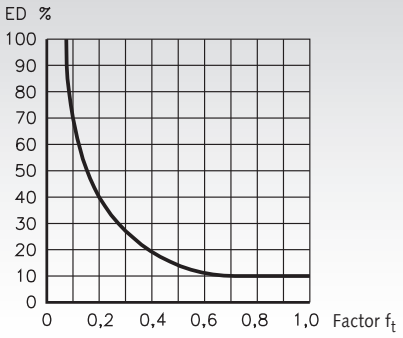
Operating Time Worm Gear Screw Jacks NP/I

The stroke force and stroke speed predetermine which model and size should be chosen. A further decision criterion is the heating up caused by friction. To keep this value within limits, the nominal values must be corrected, using a temperature factor (f_t). The heating-up process depends on the operating time (OT) per time unit (in %).
For stroke speed V_H = const. applies: $F_{eff} = F_{Nom.} \cdot f_t$

For stroke force F = const. applies:

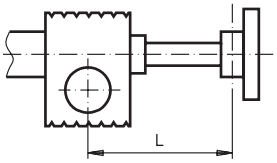
F_{eff} = effective stroke force
$F_{Nom.}$ = Nominal stroke force for model and size

OT-f_t-Diagram Example: OT = 40% = A f_t = 0,2



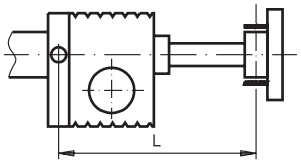
Buckling

Euler-Case 1 f_k=0.5



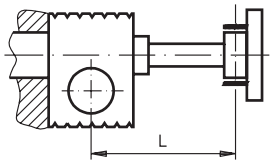
Version A and B
unguided stroke
fixed gear unit

Euler-Case 2 f_k=1



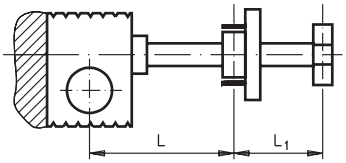
Version A and B
guided stroke
with swivel plate

Euler-Case 3 f_k=1.4



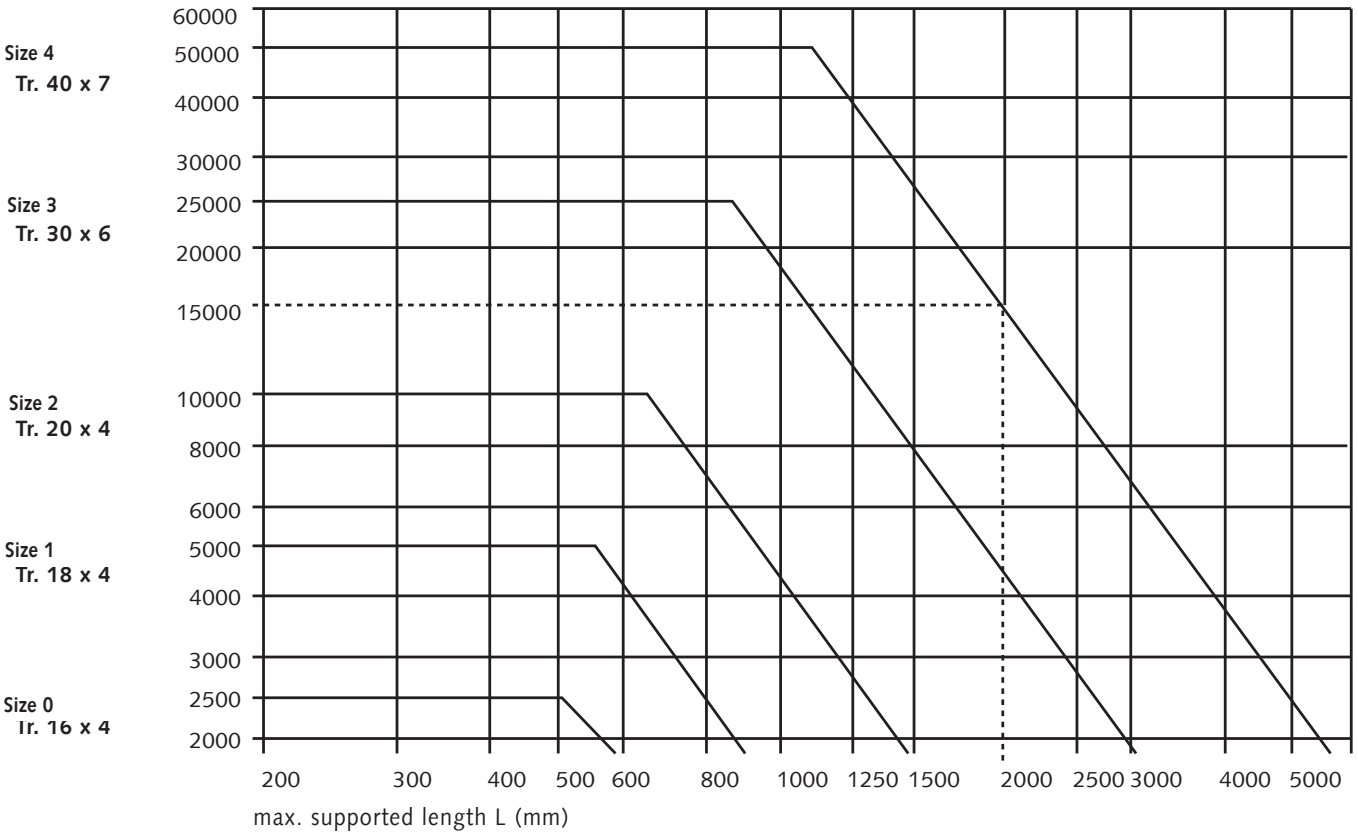
Version A and B
guided stroke
fixed gear unit

Euler-Case 4 f_k=2



Version C
for small L_1 applies: f_k = 1.4 (Euler 3)

Buckling Force Pk [N]



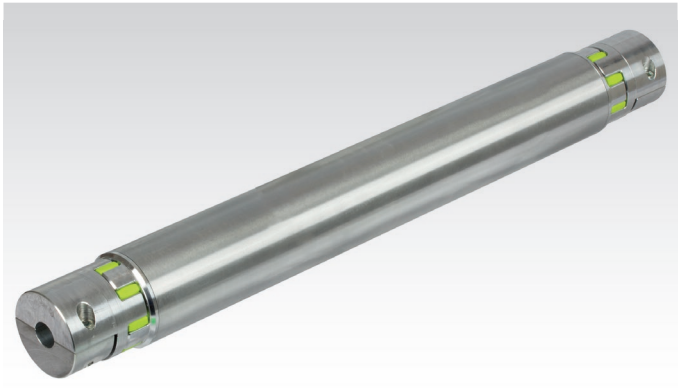
Example

Worm Gear Screw Jacks with Tr 40 x 7 and a spindle length of 2000 mm (stroke + nut + overrun), assumed safety factor S_k = 4
P_k from table: 15,000 N

Mounting set up Euler 1 = $P_{k\ permiss.}$ = 15,000 x 0.5 x 1/4
Mounting set up Euler 2 = $P_{k\ permiss.}$ = 15,000 x 1.0 x 1/4
Mounting set up Euler 3 = $P_{k\ permiss.}$ = 15,000 x 1.4 x 1/4
Mounting set up Euler 4 = $P_{k\ permiss.}$ = 15,000 x 2.0 x 1/4

Connecting Shafts W, blacklash free, with half shell clamp

Material: Hubs and tube made of aluminium (stainless steel on request). Insert made of elastomere, shore hardness 64D.

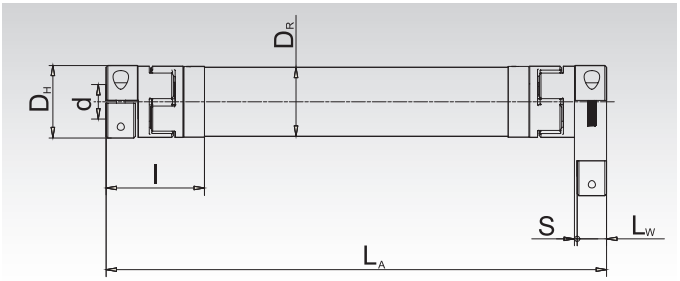


- Zero backlash, insertable elastic connecting shaft.
- Vibration-damping, ideal for connecting of gearbox shafts.
- Compensation of large shaft misalignment.
- With half shell clamp hubs, ready-to-install, for rapid mounting / demounting without removal of the other units.

Temperature range: 0°C to +70°C (at lower charge: -20°C to + 100°C).

Every shaft will be custom made in short time.
Delivery time: Regulary only 7 days.

Length: The total length LA can be choosen stepless in a wide range.
Boreholes: The bores can be choosen in a wide range.
Ordering details: Type, size - total length LA - bore / bore - speed1).
The product no. will be created in accordance with the customer´s specifications.



Example: **W1 - 0934 - 12 / 16 - 1500**

- **Type, Size**
- **Total Length L_A (mm)**
- **Boreholes (mm)**
- **Speed (min^{-1})**

Note: Total length and speed must be specificated with 4 digits.

Type Size	Torques $T_{K\ nom.}$ [2] Nm	Torques $T_{K\ max.}$ [2] Nm	Length L_A for choosen mm	Boreholes d for choosen [3] mm	D_H mm	D_R mm	l mm	L_W mm	s mm	Weight Couplings kg	Weight Tube kg/m
W1	12	25	99-3000	9-16	32	30	34	15	1,5	0,14	0,58
W2	17	34	133-3000	11-22	42	40	46	17	1,5	0,36	0,76
W3	60	120	177-4500	11-32	56	60	63	30	2	0,94	0,97
W4	160	320	205-4500	12-32	67	60	73	35	2	1,42	0,97
W5	325	650	249-6000	16-45	82	80	84	40	2	2,98	2,00
W6	530	1060	283-6000	25-55	102	100	97	50	2	4,62	2,47

[1] Each shaft will be tested at the specificated speed. The max. speed depends on the size and on the total length LA. See chart on next page.

[2] These torques can be endured by the insert. For the dimensioning, the max. torque rates of the clamp hubs must also be considered.

[3] Standard boreholes see next page. Other bores on request.

Further Details

Type Size	Screw Size DIN 912	Tightening Torque Nm	Torsion Stiffness dyn. Insert Nm/rad	Torsion Stiffness dyn. Tube/m Nm/rad	Moment of inertia coupling [4] 10^{-3} Kgm^2	Moment of inertia shaft/m 10^{-3} Kgm^2
W1	M4	4	1650	1104	0,01	0,11
W2	M5	8	2540	2332	0,08	0,2
W3	M6	15	7940	8292	0,24	0,8
W4	M8	35	13400	8292	0,01	0,8
W5	M10	70	23700	29102	2,4	3,0
W6	M12	120	55400	58178	6,0	5,8

[4] Moment for one coupling, calculated at the biggest borehole.

Spare Part Inserts

Product-No. Spare Part Insert	Type Size	Ø ca. mm	Weight g
605 164 14	W1	32	5
605 164 19	W2	42	7
605 164 24	W3	56	22
605 164 28	W4	67	32
605 164 38	W5	82	58
605 164 48	W6	102	98

Connecting Shafts W, further details

Standard boreholes [mm] und maximum torques of the clamp hubs [Nm]

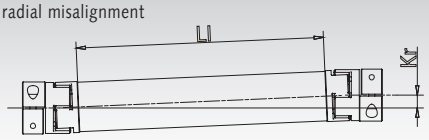
Standard boreholes [mm][1)]

Size of connecting shaft	9	11	12	14	16	18	19	20	22	24	25	28	30	32	38	40	42	45	48	55
1	21	26		22	37															
2		41		52	60		70	74	81											
3		60		76	87		103	109	120	131	136	153	164	175						
4			80		120	135		188	207		235			301						
5					325		386	406	447	487	508	568	609	650	772		854	915		
6											570	638		730	866	912	960	1030	1095	1250

[1)] Standard bores are only these bores, at whom there is a torque shown in the table.
Other boreholes on request.

Max. shaft disalignment

radial misalignment

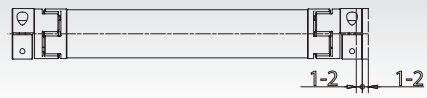


Kr max. 1,5 mm pro 100 mm LI

angular misalignment

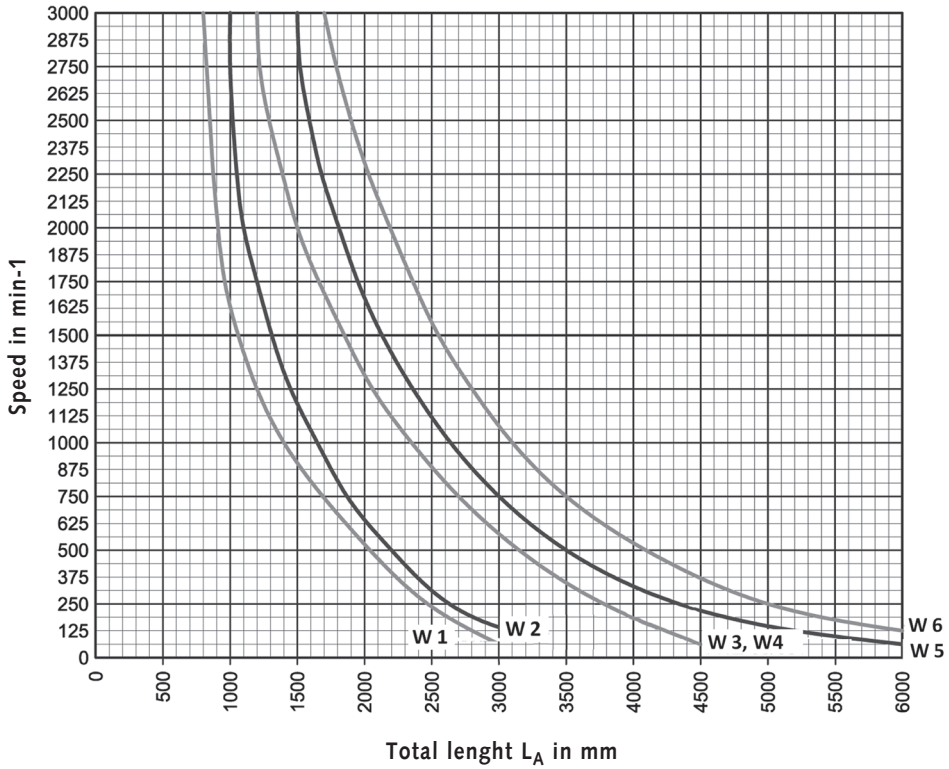
max. 2° (1° pro coupling)

axial misalignment



approx. +/- 1 to 2 mm

Max. speed in relation to the total length L_A



Further models on request

One side stiff:
One side stiff, other side with elastic coupling.
For example for use with a pillow block bearing at the stiff side.

Both sides stiff:
Both sides stiff, without any elastic coupling.
To use only, if there is no misalignement.

Stainless steel:
All models are also available in stainless steel (couplings and also the tube).

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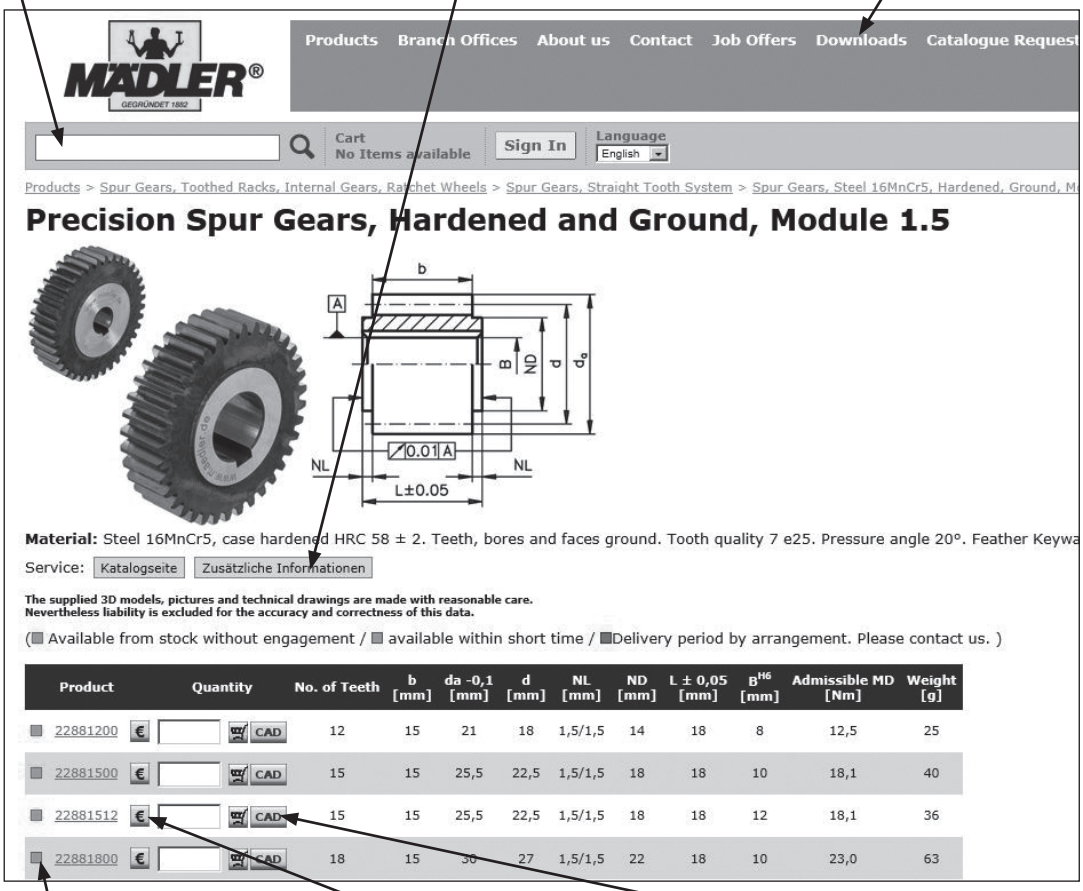
Find the PDF-catalog page and further information

Manual instructions, certificates, safety data sheets in the section Downloads



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