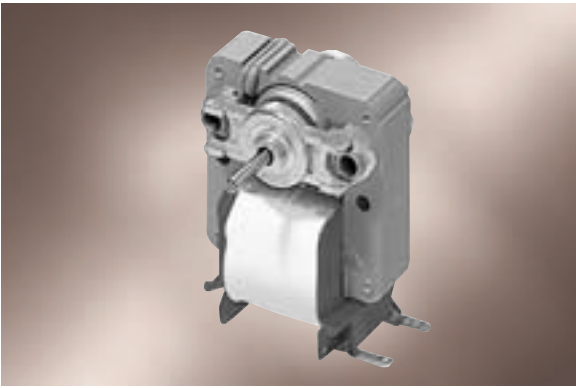


# Shaded Pole Motors

EM 21

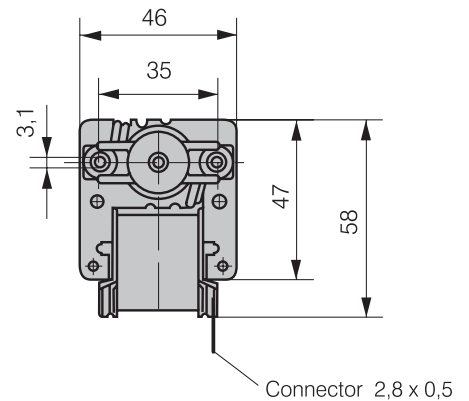
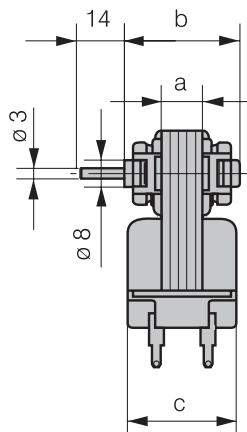
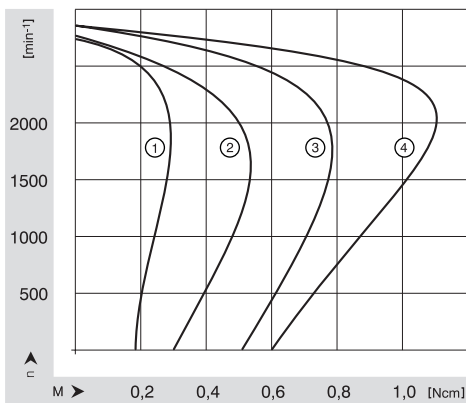


Standard version:

- direction of rotation clockwise
- mounting position with horizontal shaft
- mode of operation S1
- sintered sleeve bearings with additional lubricant depot
- permissible ambient temperature 0 – 60° C.

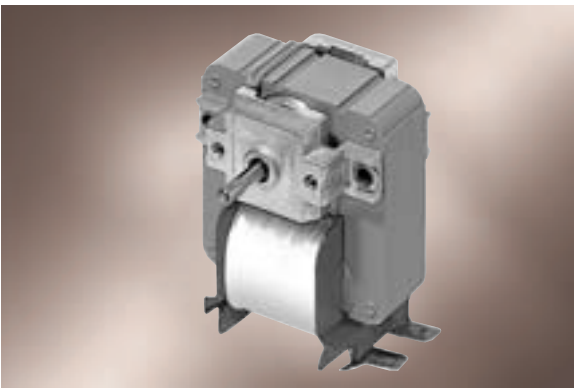
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Nominal Data	Power output	Power input	Rated voltage	Frequency	Rated speed	Rated current	Rated torque	Mass	Dimensions mm			Characteristic curve
	W	W	V	Hz	min <sup>-1</sup>	mA	Ncm	kg	a	b	c	
EM 2108	0.6	6.2	230	50	2100	60	0.28	0.20	8	31	24	1
EM 2112	1.0	9.5	230	50	2200	90	0.46	0.25	12	35	32	2
EM 2118	1.5	12.0	230	50	2300	100	0.7	0.32	18	41	38	3
EM 2124	2.0	13.5	230	50	2350	120	1.0	0.40	24	47	44	4



# Shaded Pole Motors

## EM 25

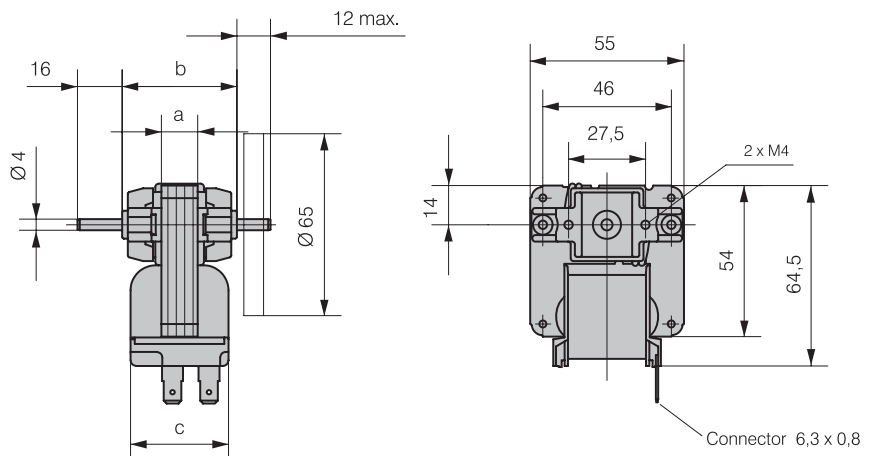
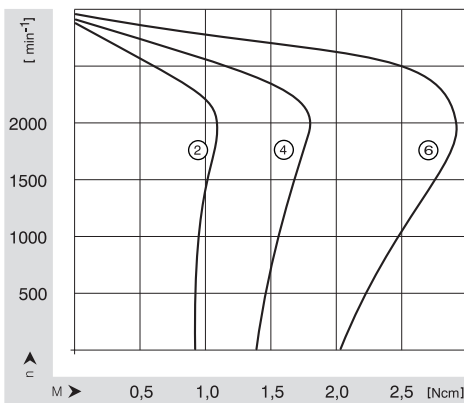
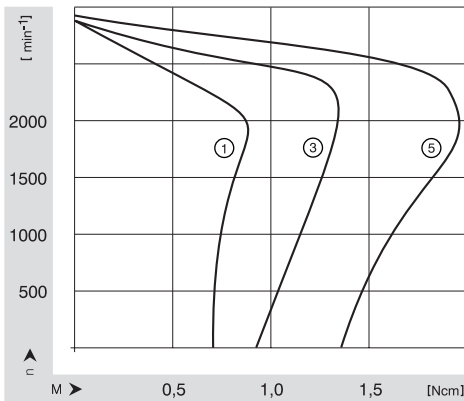


Standard version:

- direction of rotation clockwise
- mounting position with horizontal shaft
- mode of operation S1
- sintered sleeve bearings with additional lubricant depot
- permissible ambient temperature 0 – 60° C.

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Nominal Data	Power output	Power input	Rated voltage	Frequency	Rated speed	Rated current	Rated torque	with/without cooling blades	Mass	Dimensions mm			Characteristic curve
	W	W	V	Hz	min <sup>-1</sup>	mA	Ncm		kg	a	b	c	
EM 2513	1.4	14	230	50	2300	135	0.55	without	0.40	13	42	35	1
EM 2513	1.8	16	230	50	2500	185	0.70	with	0.40	13	42	35	2
EM 2518	2.7	16	230	50	2500	150	1.05	without	0.50	18	47	40	3
EM 2518	3.7	23	230	50	2500	260	1.45	with	0.50	18	47	40	4
EM 2524	4.0	22	230	50	2600	200	1.55	without	0.60	24	53	46	5
EM 2524	6.2	30	230	50	2500	350	2.40	with	0.60	24	53	46	6



# Shaded Pole Motors

## EM 30

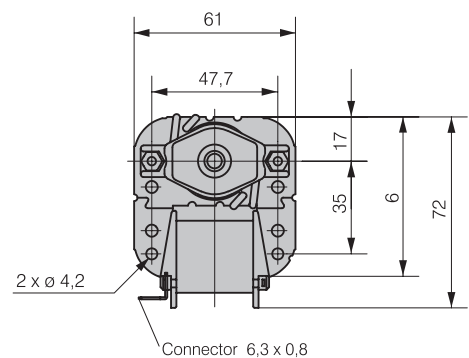
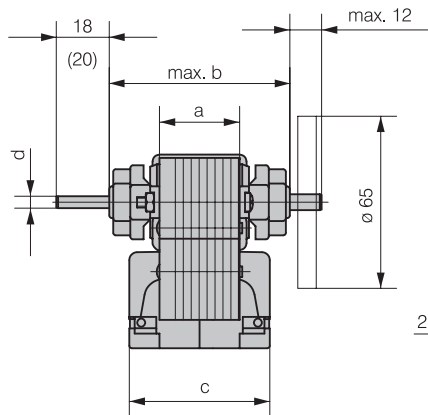
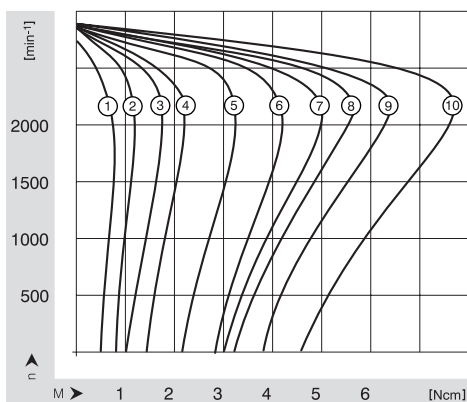


Standard version:

- direction of rotation clockwise
- mounting position with horizontal shaft
- mode of operation S1
- sintered sleeve bearings with additional lubricant depot
- permissible ambient temperature 0 – 60° C.

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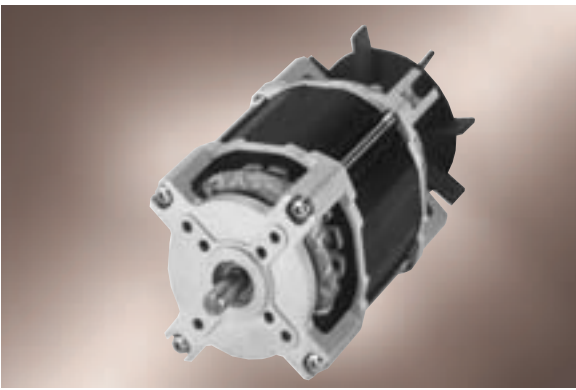
Nominal Data	Power output	Power input	Rated voltage	Frequency	Rated speed	Rated current	Rated torque	with/without cooling blades	Mass	Dimensions mm				Characteristic curve
	W	W	V	Hz	min <sup>-1</sup>	mA	Ncm		kg	a	b	c	d	
<b>EM 3010</b>	0.75	8	230	50	2600	90	0.28	without	0.40	10	48	32	4.5	1
<b>EM 3015</b>	1.9	12	230	50	2600	120	0.7	without	0.50	15	53	37	4.5	2
<b>EM 3020</b>	2.8	16	230	50	2600	150	1.05	without	0.70	20	58	42	4.5	3
<b>EM 3020</b>	5.6	38	230	50	2600	380	2.1	with	0.70	20	58	42	4.5	4
<b>EM 3025</b>	4.0	22	230	50	2600	200	1.5	without	0.80	25	63	47	4.5	5
<b>EM 3025</b>	7.5	46	230	50	2600	440	2.8	with	0.80	25	63	47	4.5	6
<b>EM 3030</b>	8.3	50	230	50	2600	460	3.1	with	0.90	30	69	52	6.0	7
<b>EM 3038</b>	11.0	54	230	50	2600	480	3.9	with	1.20	38	76	60	6.0	8
<b>EM 3045</b>	12.0	56	230	50	2600	500	4.3	with	1.30	45	84	67	6.0	9
<b>EM 3060</b>	14.5	68	230	50	2600	600	5.45	with	1.70	60	99	82	6.0	10



bracket shape may differ from drawing

# Capacitor Motors

## KM 40 IP00



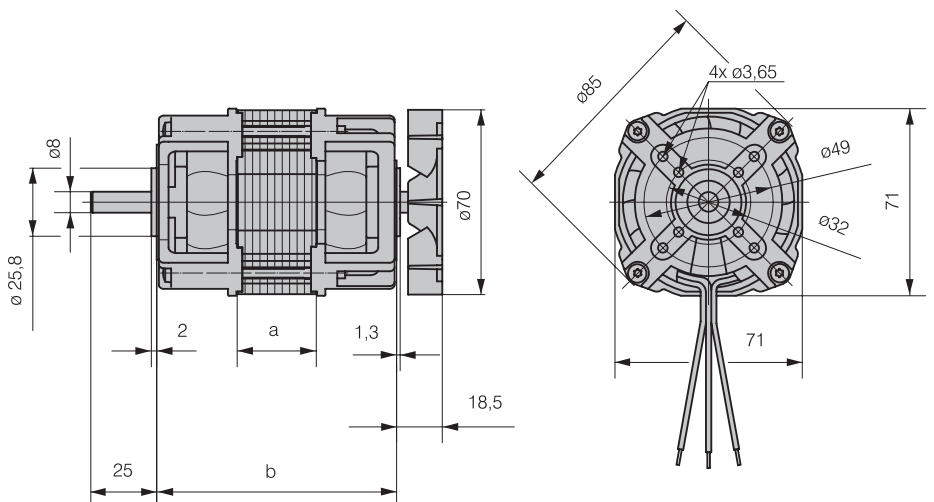
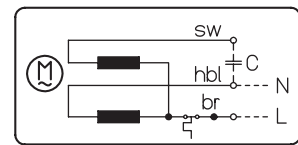
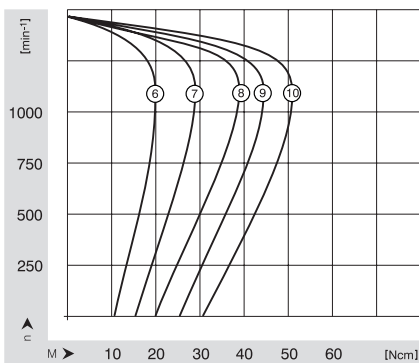
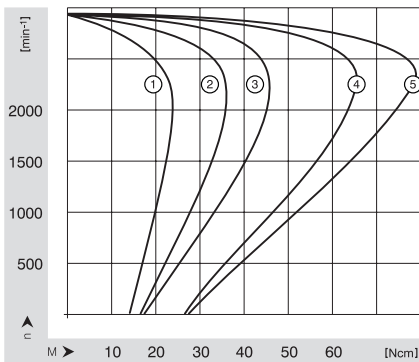
Standard version:

- direction of rotation clockwise (see connection diagram)
- winding symmetrical, also for rotation counterclockwise
- continuous operation S1
- ball bearings
- insulation class F(VDE/EN)

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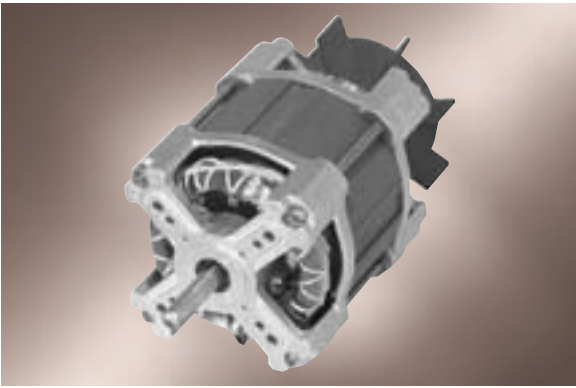
Nominal Data	Number of poles	Power output	Power input	Rated voltage	Frequency	Rated speed	Rated current	Rated torque	Capacitor	Mass	Dimensions mm		Characteristic curve
											a	b	
Type		W	W	V	Hz	min <sup>-1</sup>	mA	Ncm	µF*)	kg			
KM 4020/2-..	2	45.0	115	230	50	2600	490	16	3.5	1.0	20	82	1
KM 4030/2-..	2	67.0	142	230	50	2700	620	23	4.0	1.4	30	92	2
KM 4040/2-..	2	100.0	190	230	50	2700	820	36	5.0	1.6	40	102	3
KM 4050/2-..	2	138.0	230	230	50	2700	970	47	7.0	1.8	50	112	4
KM 4060/2-..	2	176.0	275	230	50	2700	1200	62	7.0	2.0	60	122	5
KM 4020/4-..	4	19.5	72	230	50	1300	330	14	2.0	1.0	20	82	6
KM 4030/4-..	4	31.0	84	230	50	1300	380	22	2.5	1.4	30	92	7
KM 4040/4-..	4	38.0	93	230	50	1350	420	26	3.0	1.6	40	102	8
KM 4050/4-..	4	44.0	104	230	50	1350	470	31	3.5	1.8	50	112	9
KM 4060/4-..	4	49.0	112	230	50	1350	500	34	4.0	2.0	60	122	10

\*) not supplied



# Capacitor Motors

## KM 43 IP00



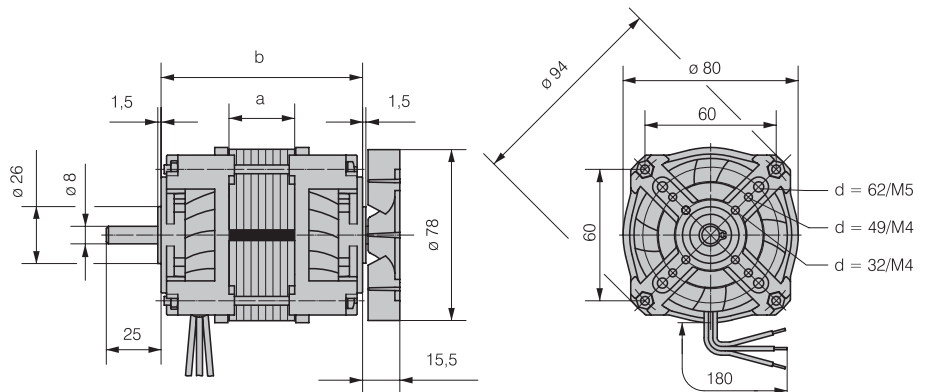
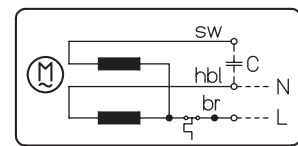
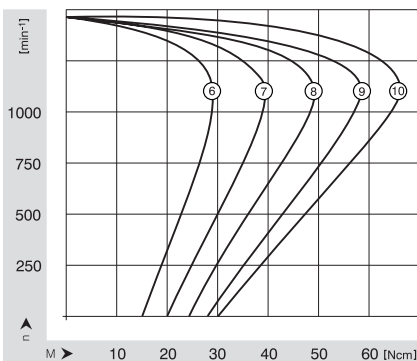
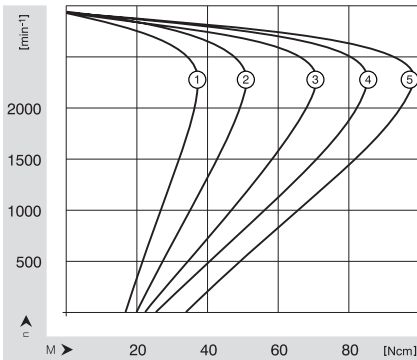
Standard version:

- direction of rotation clockwise (see connection diagram)
- winding symmetrical, also for rotation counterclockwise
- continuous operation S1
- ball bearings
- insulation class F(VDE/EN)

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Nominal Data	Number of poles	Power output	Power input	Rated voltage	Frequency	Rated speed	Rated current	Rated torque	Capacitor	Mass	Dimensions mm	Characteristic curve	
Type		W	W	V	Hz	min <sup>-1</sup>	mA	Ncm	μF*)	kg	a	b	
KM 4320/2-3..	2	58	150	230	50	2650	690	20	4.0	1.2	20	83	1
KM 4330/2-3..	2	90	190	230	50	2700	900	31	5.0	1.5	30	93	2
KM 4340/2-3..	2	105	285	230	50	2750	850	38	7.0	1.8	40	103	3
KM 4350/2-3..	2	165	260	230	50	2750	1150	57	8.0	2.2	50	113	4
KM 4360/2-3..	2	180	275	230	50	2750	1200	62	9.0	2.5	60	123	5
KM 4320/4-3..	4	27	85	230	50	1300	380	20	2.5	1.1	20	83	6
KM 4330/4-3..	4	39	100	230	50	1300	440	28	3.0	1.4	30	93	7
KM 4340/4-3..	4	46	105	230	50	1350	460	33	3.5	1.8	40	103	8
KM 4350/4-3..	4	51	115	230	50	1350	500	36	4.0	2.1	50	113	9
KM 4360/4-3..	4	67	145	230	50	1350	620	47	4.5	2.4	60	123	10

\*) not supplied



# Capacitor Motors

## KM 43 IP20



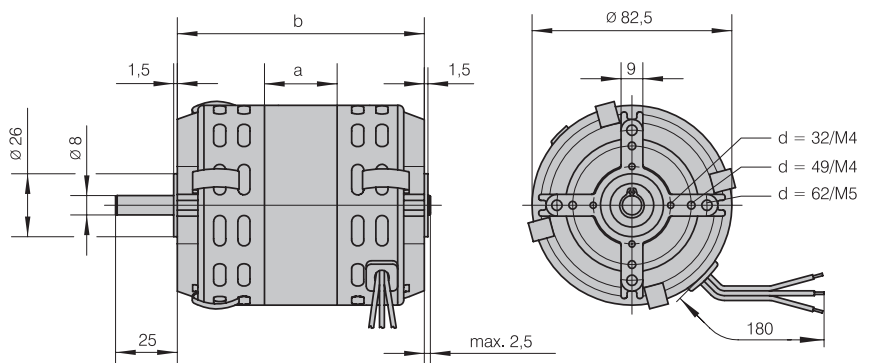
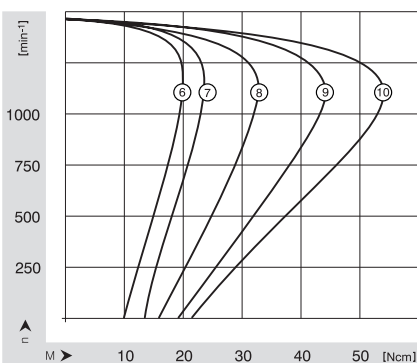
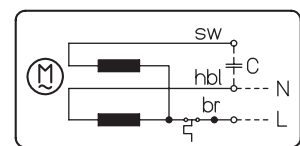
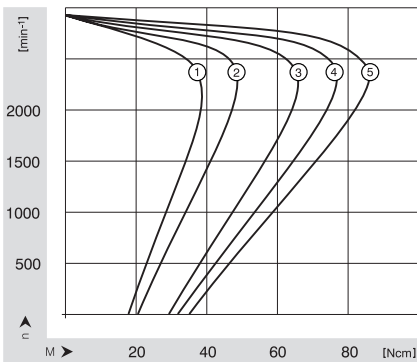
Standard version:

- direction of rotation clockwise (see connection diagram)
- winding symmetrical, also for rotation counterclockwise
- continuous operation S1
- ball bearings
- insulation class F(VDE/EN)

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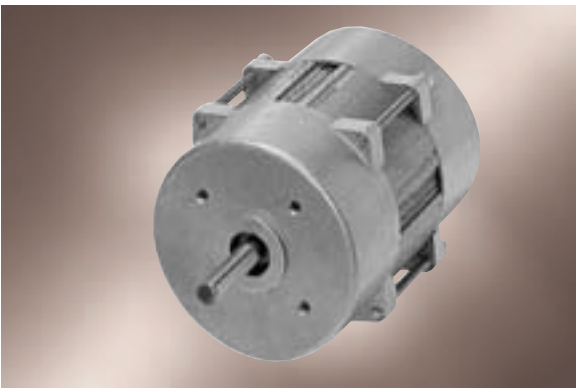
Nominal Data	Number of poles	Power output	Power input	Rated voltage	Frequency	Rated speed	Rated current	Rated torque	Capacitor	Mass	Dimensions mm		Characteristic curve
											a	b	
Type		W	W	V	Hz	min <sup>-1</sup>	mA	Ncm	μ F*)	kg			
KM 4320/2-1..	2	64	135	230	50	2650	600	23	4.0	1.3	20	93	1
KM 4330/2-1..	2	100	180	230	50	2700	800	36	5.0	1.6	30	103	2
KM 4340/2-1..	2	105	190	230	50	2750	1000	40	7.0	1.9	40	113	3
KM 4350/2-1..	2	155	245	230	50	2750	1100	55	8.0	2.3	50	123	4
KM 4360/2-1..	2	165	255	230	50	2750	1150	67	9.0	2.6	60	133	5
KM 4320/4-1..	4	23	70	230	50	1300	350	17	2.5	1.2	20	93	6
KM 4330/4-1..	4	27	65	230	50	1300	280	20	3.0	1.5	30	103	7
KM 4340/4-1..	4	35	85	230	50	1350	350	25	3.5	1.8	40	113	8
KM 4350/4-1..	4	47	100	230	50	1350	430	33	4.0	2.2	50	123	9
KM 4360/4-1..	4	49	110	230	50	1350	500	35	4.5	2.5	60	133	10

\*) not supplied



# Capacitor Motors

## KM 43 closed



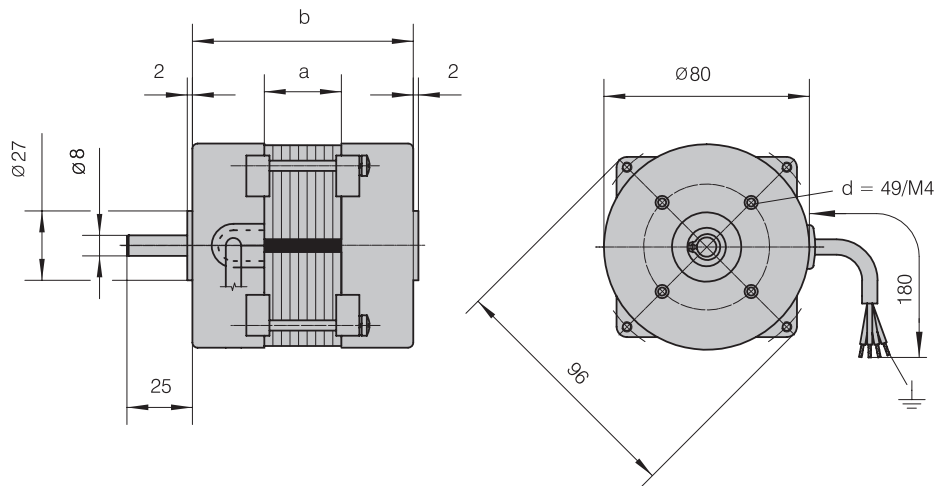
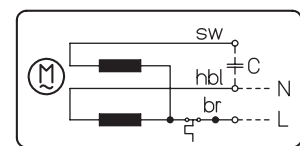
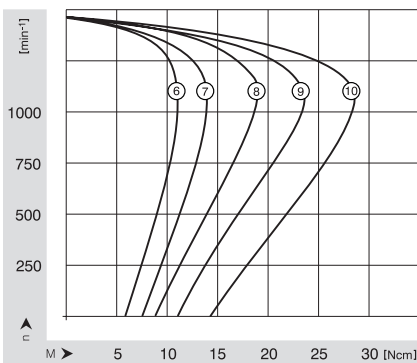
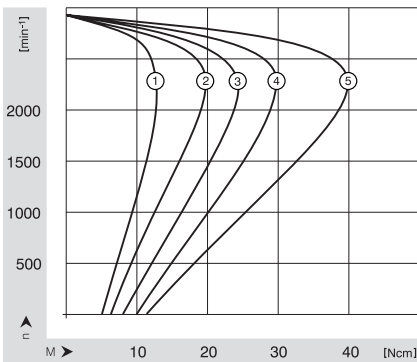
Standard version:

- direction of rotation clockwise (see connection diagram)
- winding symmetrical, also for rotation counterclockwise
- continuous operation S1
- ball bearings
- insulation class F(VDE/EN)

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Nominal Data	Number of poles	Power output	Power input	Rated voltage	Frequency	Rated speed	Rated current	Rated torque	Capacitor	Mass	Dimensions mm	Characteristic curve	
Type		W	W	V	Hz	min <sup>-1</sup>	mA	Ncm	μF*)	kg	a	b	
KM 4320/2-2..	2	26	55	230	50	2650	230	9	1.4	1.2	20	77	1
KM 4330/2-2..	2	32	70	230	50	2700	260	11	1.6	1.5	30	87	2
KM 4340/2-2..	2	42	80	230	50	2750	320	14	2.0	1.8	40	97	3
KM 4350/2-2..	2	56	100	230	50	2750	380	19	2.5	2.1	50	107	4
KM 4360/2-2..	2	77	120	230	50	2750	530	27	2.5	2.4	60	117	5
KM 4320/4-2..	4	12	35	230	50	1300	140	8	1.0	1.1	20	77	6
KM 4330/4-2..	4	17	40	230	50	1300	170	12	1.2	1.4	30	87	7
KM 4340/4-2..	4	18	45	230	50	1350	200	13	1.4	1.8	40	97	8
KM 4350/4-2..	4	22	50	230	50	1350	220	16	1.6	2.1	50	107	9
KM 4360/4-2..	4	28	70	230	50	1350	290	20	1.8	2.4	60	117	10

\*) not supplied



# Gear Motors

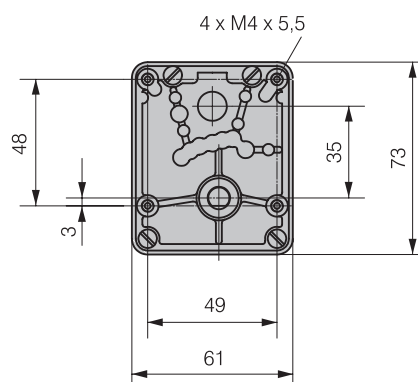
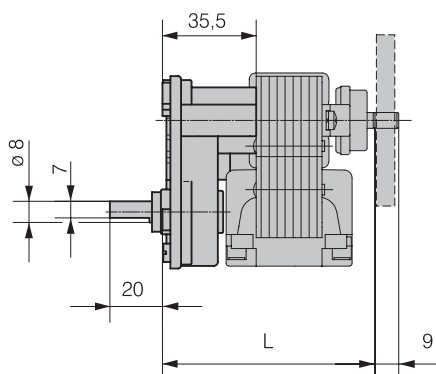
## Gtg 50



- spur gear with zinc diecast housing
- output shaft with sintered sleeve bearings
- max. permissible radial load 60N
- max. permissible axial load 40N
- lifetime lubrication

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Nominal Data	Rated speed	Rated torque	Gear ratio	Number of steps	Motor speed	Rated motor power	Mass	Dimensions mm
Type	min <sup>-1</sup>	Nm	i		min <sup>-1</sup>	W	kg	L
EM 3045/Gtg 50	250	0.4	10.5 : 1	2	2600	12.0	1.5	101
EM 3045/Gtg 50	200	0.5	12.8 : 1	2	2600	12.0	1.5	101
EM 3045/Gtg 50	150	0.6	17.2 : 1	2	2600	12.0	1.5	101
EM 3045/Gtg 50	125	0.7	20.8 : 1	2	2600	12.0	1.5	101
EM 3045/Gtg 50	100	1.0	26.4 : 1	2	2600	12.0	1.5	101
EM 3045/Gtg 50	75	1.1	34.3 : 1	3	2600	12.0	1.5	101
EM 3045/Gtg 50	50	1.6	51.6 : 1	3	2600	12.0	1.5	101
EM 3045/Gtg 50	40	2.1	66.9 : 1	3	2600	12.0	1.5	101
EM 3045/Gtg 50	30	2.8	88.2 : 1	3	2600	8.3	1.5	86
EM 3030/Gtg 50	25	2.2	101.2 : 1	3	2600	8.3	1.1	86
EM 3030/Gtg 50	20	2.9	131.5 : 1	3	2600	8.3	1.1	86
EM 3030/Gtg 50	15	3.8	174.0 : 1	3	2600	8.3	1.1	86
EM 3020/Gtg 50	10	3.7	267.0 : 1	4	2600	5.6	0.8	74
EM 3020/Gtg 50	7.5	4.9	353.0 : 1	4	2600	5.6	0.8	74
EM 3020/Gtg 50	5	5.0	526.0 : 1	4	2600	5.6	0.8	74
EM 3020/Gtg 50	3	5.0	882.0 : 1	4	2600	5.6	0.8	74

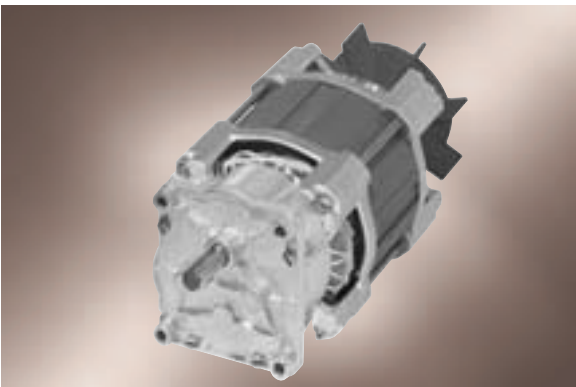


For motor dimensions, see motor EM30.



# Gear Motors

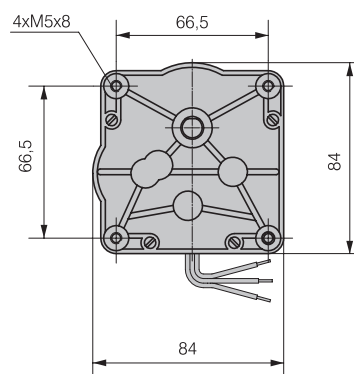
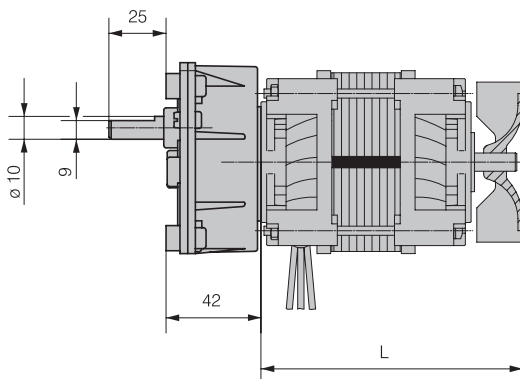
## Gtg 92



- spur gear with zinc diecast housing
- output shaft with needle bearings
- max. permissible radial load 150N
- max. permissible axial load 50N
- lifetime lubrication

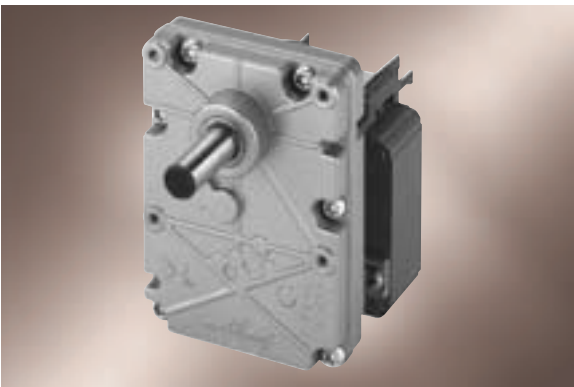
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Nominal Data	Rated speed	Rated torque	Gear ratio	Number of steps	Motor speed	Rated motor power	Mass	Dimensions mm
Type	min <sup>-1</sup>	Nm	i		min <sup>-1</sup>	W	kg	L
KM 4330/2-Gtg 92	180	3.2	15.5 : 1	2	2700	90	2.0	145
KM 4330/2-Gtg 92	150	3.8	18.4 : 1	2	2700	90	2.0	145
KM 4330/2-Gtg 92	120	4.8	23.1 : 1	2	2700	90	2.0	145
KM 4330/2-Gtg 92	90	6.4	31.1 : 1	2	2700	90	2.0	145
KM 4330/2-Gtg 92	70	8.3	40.1 : 1	2	2700	90	2.0	145
KM 4330/2-Gtg 92	50	10.2	55.0 : 1	3	2700	90	2.0	145
KM 4330/2-Gtg 92	40	13.1	70.4 : 1	3	2700	90	2.0	145
KM 4330/2-Gtg 92	30	15.0	92.3 : 1	3	2700	90	2.0	145
KM 4320/2-Gtg 92	20	14.7	142.0 : 1	3	2650	58	1.7	135
KM 4320/2-Gtg 92	15	15.0	185.0 : 1	3	2650	58	1.7	135
KM 4320/2-Gtg 92	10	15.0	275.0 : 1	3	2650	58	1.7	135
KM 4320/4-Gtg 92	9	13.2	142.0 : 1	3	1300	27	1.7	135
KM 4320/4-Gtg 92	7	15.0	185.0 : 1	3	1300	27	1.7	135
KM 4320/4-Gtg 92	5	15.0	275.0 : 1	3	1300	27	1.7	135



# Gear Motors

## Gtg 78

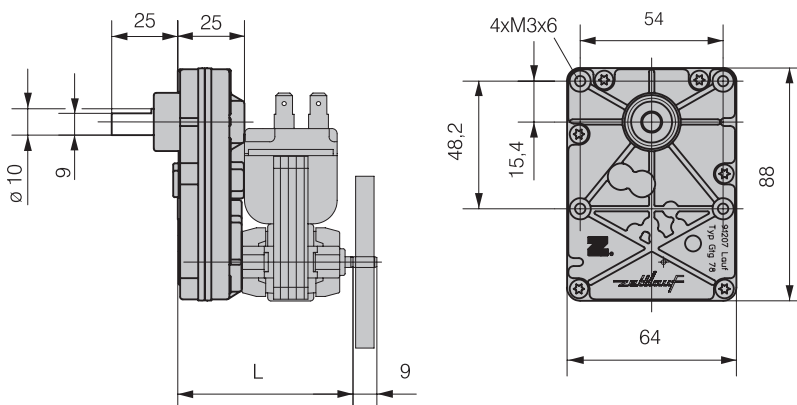


- spur gear with zinc diecast housing
- output shaft with needle bearings
- max. permissible radial load 150N
- max. permissible axial load 50N
- lifetime lubrication

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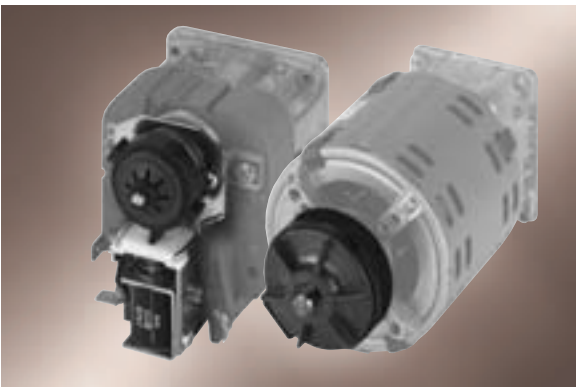
Nominal Data	Number of steps	possible gear ratio	Rated speed	max. torque	Mass	Dimensions mm
Type		i	min <sup>-1</sup> *)	Nm *)	kg	L
EM 3030/Gtg 78	3	48 ... 221:1	54 ... 11	8	1.2	91
EM 2524/Gtg 78	4	180 ... 1127:1	14 ... 2.3	9	0.95	75
EM 2524/Gtg 78	5	840 ... 4270:1	3.1 ... 0.6	12	1.0	75

\*) Actual performance data depending on motor design and gear ratio



# Brakes

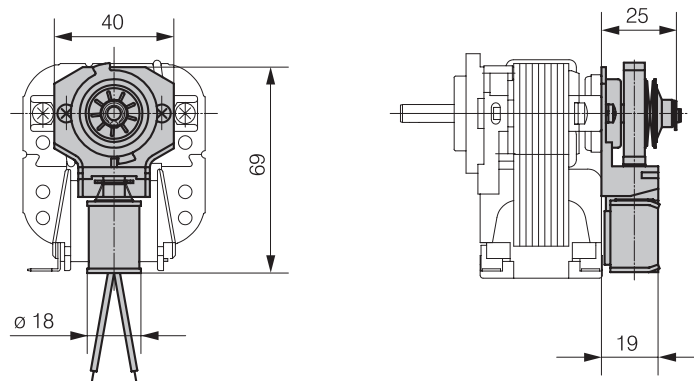
B1 / B2



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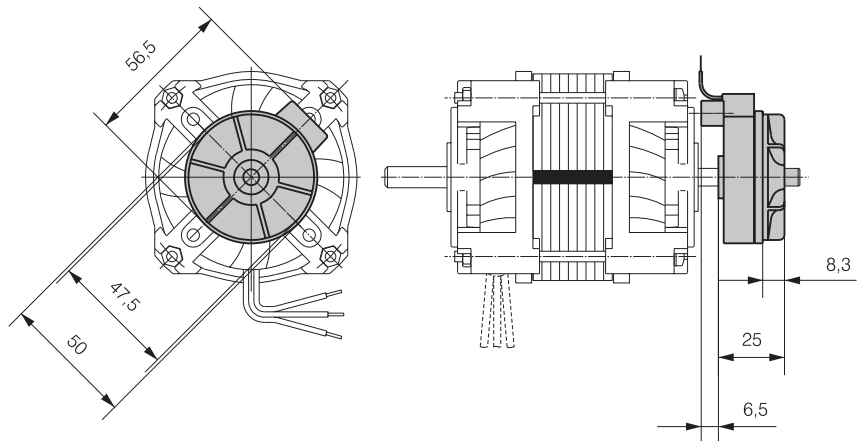
## Motor brake B1

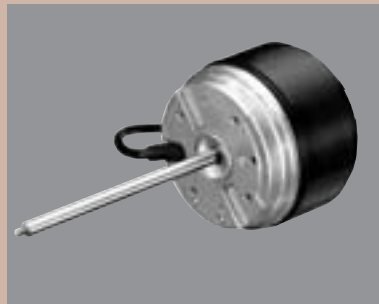
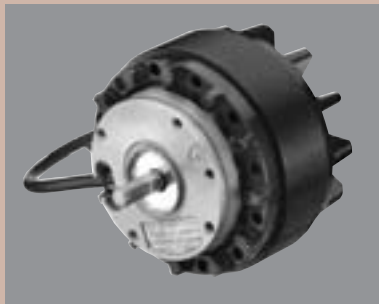
The motor brake B1 is designed as a lifting magnet brake and can be adapted to EM30 and KM motors. It brakes without electricity by spring-force and is released under voltage together with the motor winding. The armature of the brake locks a cam disc, fixed on the motor shaft between two friction surfaces.



## Disc brake B2

This brake can be applied in connection with motors EM30 and KM, if higher brake torque and switching cycles are required. The brake works without electricity and with spring-force, but it is electromagnetically released. The brake is switched parallel to the motor winding. Construction according to VDE 0580.





## Alternating Current

### Technical Notes

As drive motors, external-rotor motors operate at constant speed and very low noise level. Their short and compact design is of further advantage. Due to their rather high inertia, external-rotor motors guarantee constant speeds at varying loads.

The motors listed here only serve as overview on our standard range of motors. Whenever necessary, the motor design may be adapted and optimised to meet individual customer specifications.

Motors for thermostats and beverage coolers come as closed design and have a shaft of stainless steel. All rotors are stove-enamelled in black.

There are also external-rotor motors available in electronically commutated (EC) motor design.

These motors have high efficiency and can, with regard to their electronics, be offered in various options. Connecting them to a 230 V AC power supply is one of these options.

### Performance Data

All performance data refer to open motors of protection class IP 00.

For IP 44, performance is lower by about 25 – 30 % in order not to exceed the maximum admissible temperature. This, however, does not apply if the motor is placed in the air stream of a fan. We gladly assist you in selecting the best type for your application and to optimise performance of the unit. Data on the temperature rise of the wiring was established in keeping with EN 60034-1.

### Speed Control

Their special motor characteristic makes external-rotor motors easily speed-controllable in relation to their loads by simply reducing the voltage. Depending on the application, fixed resistors and other, motor-integrated, controls can be used, such as speed graduation, autotransformer, capacitive resistor, electronic controls etc.

## Motor types

### S = Shaded-Pole Motor

Self-starting, comparatively low starting torque, low efficiency, limited range for speed control.

### E = Single-Phase Capacitor Motor

Comparatively high starting torque, good speed control properties resulting in less than optimum efficiency.

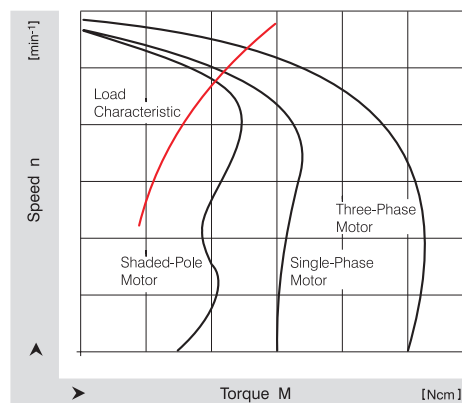
### D\* = Three-Phase Motor

Steinmetz configuration with capacitor, high pullout torque, steep torque / speed curve, high efficiency, high level of speed stability.

### D = Three-Phase Motor

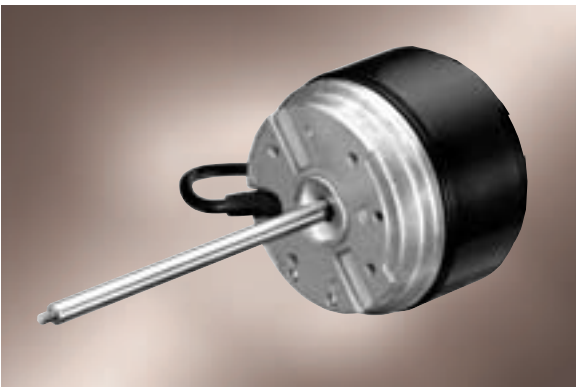
Exceptionally high starting torque, very good efficiency, good speed control characteristic 400 V  $\Delta$  / Y version for two speed levels available on request.

### Torque characteristics



# External-rotor motor

for agitating machines, size 068

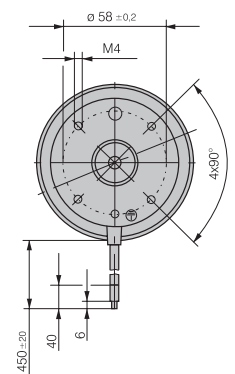
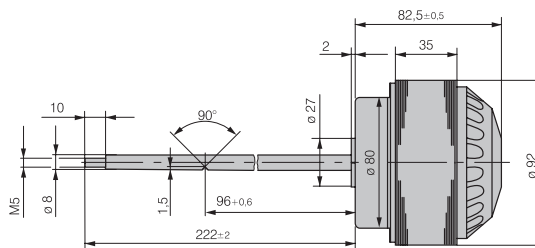
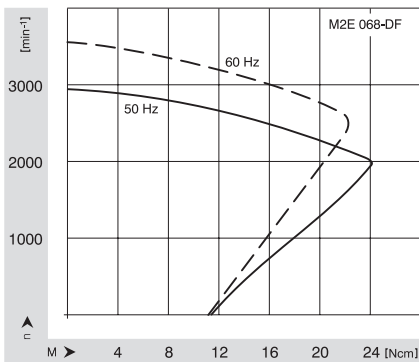


- Mounting flange in diecast aluminium
- Rotor stove-enamelled in black
- Shaft in stainless steel
- Maintenance-free ball bearings
- Direction of rotation clockwise, viewed on rotor
- Type of protection IP 44 when installed  
(final evaluation has to be carried out in customer's application)
- CE Approval

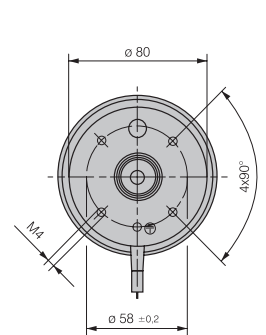
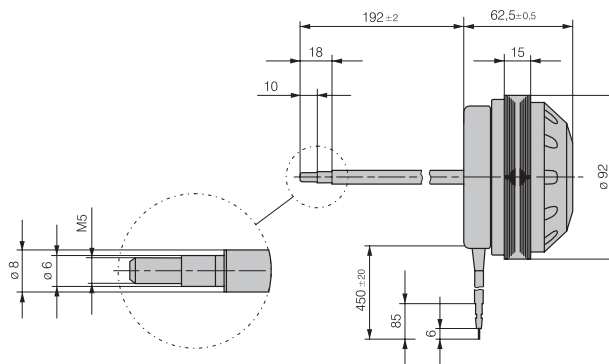
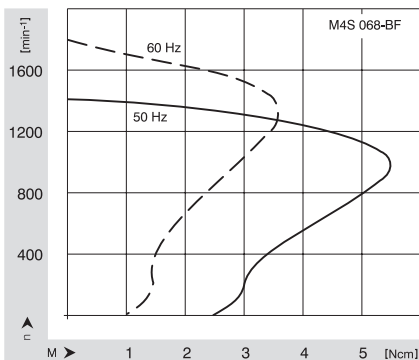
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Nominal Data	Voltage	Frequency	Speed	Power output	Power input	Input current	Capacitor	Starting torque	Torque	Temperature rise	approx. Mass
Type	VAC	Hz	min <sup>-1</sup>	W	W	A	mF/VDB	Ncm	Ncm	K	kg
<b>M2E 068-DF 65 -03</b>	230	50	2500	50	92	0.45	2.0 / 400	11.0	19.0	60	2.0
		60	3100	54	85	0.37	2.0 / 400	10.7	16.6	40	2.0
<b>M4S 068-BF 08 -08</b>	230	50	1200	5.8	28	0.18	—	2.5	4.6	55	1.1
		60	1400	5.3	25	0.16	—	1.5	3.6	45	1.1

Type M2E 068 -DF



Type M4S 068-BF



# External-rotor motor

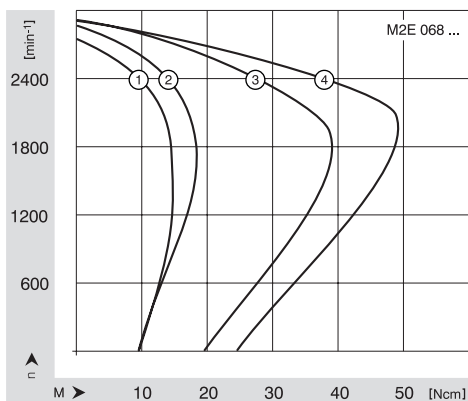
Drive motor, size 068



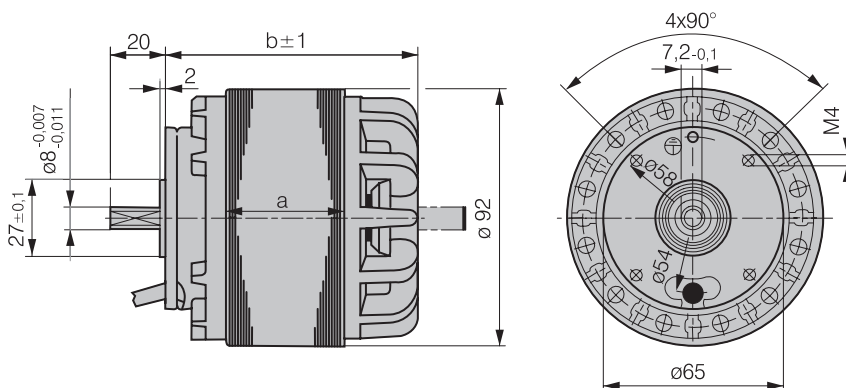
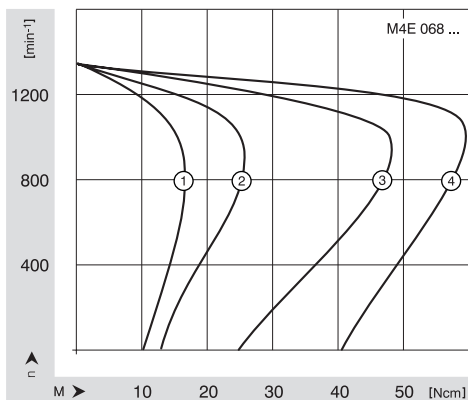
- Mounting flange in diecast aluminium
- Rotor stove-enamelled in black
- Shaft in roller bearing steel
- Maintenance-free ball bearings
- Direction of rotation either clockwise or counterclockwise rotation, viewed on rotor.
- Type of protection IP 00
- CE Approval

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Nominal Data	Voltage	Frequency	Speed	Power output	Power input	Input current	Capacitor	Starting torque	Torque	Temperature rise	approx. Mass	Characteristic curve
Type	VAC	Hz	min <sup>-1</sup>	W	W	A	mF/VDB	Ncm	Ncm	K	kg	
M2E 068-BF07 -**	230	50	2200	24	82	0.38	2.0 / 400	9.4	10.5	50	1.0	1
M2E 068-CF01 -**	230	50	2400	37	78	0.35	2.0 / 450	9.5	15.0	30	1.4	2
M2E 068-DF05 -**	230	50	2500	75	143	0.63	4.0 / 400	19.0	28.5	48	1.9	3
M2E 068-EC01 -**	230	50	2500	105	200	0.88	5.0 / 400	24.5	40.0	60	2.2	4
M4E 068-BF09 -**	230	50	1200	19	50	0.23	1.5 / 400	10.5	15.0	60	1.1	1
M4E 068-CF01 -**	230	50	1250	31	62	0.28	1.5 / 400	13.0	23.5	43	1.5	2
M4E 068-DF01 -**	230	50	1300	50	100	0.44	3.0 / 400	25.0	36.0	50	1.9	3
M4E 068-EC03 -**	230	50	1250	65	130	0.60	5.0 / 450	40.0	50.0	75	2.1	4



Type	a	b
M*E 068 -BF	15	62
M*E 068 -CF	25	72,5
M*E 068 -DF	35	84
M*E 068 -EC	42	91



# External-rotor motor

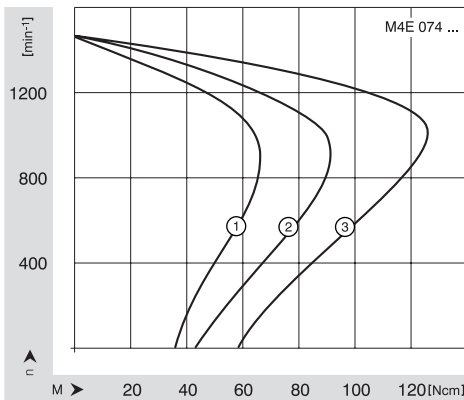
## Drive motor, size 074

- Mounting flange in diecast aluminium
- Rotor stove-enamelled in black
- Shaft in roller bearing steel
- Maintenance-free ball bearings
- Direction of rotation either clockwise or counterclockwise rotation, viewed on rotor.
- Type of protection IP 00
- CE Approval

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Nominal Data	Voltage	Frequency	Speed	Power output	Power input	Input current	Capacitor	Starting torque	Torque	Temperature rise	approx. Mass	Characteristic curve
Type	VAC	Hz	min <sup>-1</sup>	W	W	A	mF/VDB	Ncm	Ncm	K	kg	
M4E 074-DF13 -**	230	50	1350	64	112	0.50	4.0 / 400	35.0	45.0	85	2.5	1
M4E 074-EI15 -**	230	50	1350	92	153	0.68	5.0 / 400	42.0	65.0	65	3.5	2
M4E 074-GA07 -**	230	50	1350	133	218	0.96	6.0 / 400	57.0	94.0	100	4.5	3
M6E 074-DF20 -**	230	50	850	46	98	0.44	2.5 / 450	26.0	51.0	100	2.5	1
M6E 074-EI10 -**	230	50	850	61	118	0.52	3.0 / 450	34.0	68.0	90	3.5	2
M6E 074-GA06 -**	230	50	850	78	150	0.67	4.0 / 450	48.0	88.0	90	4.5	3



Type	e	d
M*E 074 -DF	35	104
M*E 074 -EI	48	117
M*E 074 -GA	60	129

